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AFOSR awards grants and contracts for research in areas of science relevant to the needs of the Air Force. Research is selected for support from unsolicited proposals originating from scientists investigating problems involving the search for new knowledge and the expansion of scientific principles. Selection is on the basis of scientific potential for improving Air Force operational capabilities, originality, significance to science, the qualification of the principal investigators, and the reasonableness of the proposed budget.

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SUBJECT INDEX

SUBJECT INDEX

*ABSTRACTS
Final Report on Grant AFOSR-78-3574, 1978-1983.*
AD-A136 519
The Stability and Dynamics of Elastic Structures and Fluid Flows.*
AD-A137 184
Progress Report, Grant AFOSR-79-0134, September 1, 1982 - April 30, 1983.*
AD-A137 823
Progress Report, Grant AFOSR-79-0134, January 1, 1983 - September 30, 1983.*
AD-A137 838

*ACETYLCHOLINE
Anticholinesterase Effects on Number and Function of Brain Muscarinic Receptors and Central Cholinergic Activity: Drug Intervention.*
AD-A138 746

*ACOUSTIC MEASUREMENT
Reprint: Noise Generation by a Low-Mach-Number Jet.
AD-A138 698

*ACOUSTIC PROPERTIES
Applications of Non-Self-Adjoint Operator Theory to the Singularity Expansion Method (SEM) and to the Eigenmode Expansion Method (EEM) in Acoustic and Electromagnetic Problems.*
AD-A135 177

*ACOUSTIC SCATTERING
Reprint: Far Field Patterns for the Impedance Boundary Value Problem in Acoustic Scattering.
AD-A135 254
Rough Surface Scattering via the Smoothing Method.*
AD-A137 025

*ACOUSTIC WAVES
Reprint: Far Field Patterns for the Impedance Boundary Value Problem in Acoustic Scattering.
AD-A135 254
Rough Surface Scattering via the Smoothing Method.*
AD-A137 025

*ACOUSTOOPTICS
Acousto-Optic Processing of 2-D Signals Using Temporal and Spatial Integration.*
AD-A136 086

*ADAPTATION(PHYSIOLOGY)
Reprint: Adaptation of Vascular Pressure-Flow-Volume Hysteresis in Isolated Rabbit Lungs.
AD-A135 139
Physiological Adjustments to Hemorrhage, Altitude, and Work.*
AD-A137 781

*ADAPTIVE SYSTEMS
Study on Extremizing Adaptive Systems and Applications to Synthetic Aperture Radars.*
AD-A137 725

*ADENINE
Reprint: Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose.
AD-A137 078

*ADENOSINE
The Molecular Toxicology of Chromatin.*
AD-A135 399
Reprint: Probable Helical Conformation of Poly(ADP-ribose).
AD-A135 741
Reprint: Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose.
AD-A137 078

*ADHESIVE BONDING
Durability and Failure Analyses of a Silane Treated Alpha-A1203/Polyethylene Joint in Wet Environment.*
AD-A136 089

*ADSORPTION
Reprint: On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water-Sucrose-NaCl at the Mercury Solution Interface.
AD-A135 779
Reprint: Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes.
AD-A137 023
Reprint: Orientation of Aromatic Compounds Adsorbed on Platinum Electrodes. The Effect of Temperature.
AD-A137 045
Reprint: Specific Adsorption of Halide and Pseudohalide Ions at Electrochemically Roughened Versus Smooth Silver-Aqueous Interfaces.
AD-A137 099
Reprint: Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques.
AD-A137 111
Final Technical Report of Research Performed under Grant AFOSR-80-0262.*
AD-A137 892

*AERODYNAMIC DRAG
Studies of Aerodynamic Drag.*
AD-A137 740

*AERODYNAMIC FORCES
Aeroelastic Analysis Using Nonlinear Aerodynamic Methods.*
AD-A135 133
Reprint: Apparent-Mass Coefficients for Isosceles Triangles and Cross Sections Formed by Two Circles.
AD-A138 612

*AEROELASTICITY
Aeroelastic Analysis Using

Nonlinear Aerodynamic Methods.*
AD-A135 133
Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.*
AD-A137 047

*AEROSPACE SYSTEMS
Center of Excellence in Aerospace Manufacturing Automation.*
AD-A136 477
Return Difference Feedback Design for Robust Uncertainty Tolerance in Stochastic Multivariable Control Systems.*
AD-A136 495

*AIR FORCE PERSONNEL
Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.*
AD-A135 211

*AIR FORCE RESEARCH
Center of Excellence in Aerospace Manufacturing Automation.*
AD-A136 477
Research in Stochastic Processes.*
AD-A137 738

*AIRFOILS
Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.*
AD-A137 070
Unsteady Separated Flows: Vorticity and Turbulence.*
AD-A138 593

*ALGAE
Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?*
AD-A137 735

*ALGEBRA
An Algebraic Approach to Analysis and Control of Time-Scales.*
AD-A135 115

*ALGEBRAIC FUNCTIONS
Research in Algebraic Manipulation.*
AD-A137 742
Research in Algebraic Manipulation.*
AD-A137 776

*ALGORITHMS
Estimation Techniques for Transport Equations.*
AD-A135 092
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.*
AD-A135 109
Search Algorithms and Their Implementation.*
AD-A135 154
Reprint: Finding Repeated Elements.
AD-A135 221
Reprint: Improving Resolution for Autoregressive Spectral Estimation by Decimation.
AD-A135 425
Annual Scientific Report for Grant AFOSR-81-0205.*
AD-A135 452
Reprint: Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface.
AD-A135 722
Summary of Work Done on Grant AFOSR-82-0078.*
AD-A136 570
Further Development of a Computer Algorithm for the Automatic Determination of Space Vehicle Potential in Real Time.*
AD-A137 041
Reprint: Reconstruction of Objects Having Latent Reference Points.
AD-A137 044
Time Domain Analysis and Synthesis of Robust Controllers for Large Scale LQG (Linear Quadratic Gaussian) Regulators.*
AD-A137 760
Optimization for Vibration Isolation.*
AD-A137 895
New Techniques for Measuring Single Event Related Brain Potentials.*
AD-A138 694

*ALUMINUM ALLOYS
Reprint: Fatigue Crack Initiation and Microcrack Propagation in X7091 Type Aluminum P/M Alloys.
AD-A135 126
Reprint: Lattice Parameter Variation of Al3 (Ti,V,Zr,Hf) in Al 2 at.% (Ti,V,Zr,Hf) Alloys.
AD-A135 756
Synthesis and Properties of Elevated Temperature P/M Aluminum Alloys.*
AD-A135 956
A Fundamental Study of P/M processed Elevated Temperature Aluminum Alloys.*
AD-A136 154
Reprint: Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds.
AD-A137 764
The Fatigue of Powder Metallurgy Alloys.*
AD-A138 714

*AMINES
Reprint: Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes.
AD-A137 425

*AMPLIFIERS
Research on New Approaches to Optical Systems for Inertial Rotation Sensing.*
AD-A138 045

*ANALOG SYSTEMS
Simply Instrumentable and Optimal Digitization of Analog Information Sources.
AD-A135 124

*ANALYTICAL CHEMISTRY
Reprint: A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer
AD-A138 641

*ANIONS
Production of Negative Ions by Electron Impact.*
AD-A135 176
Reprint: Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport.
AD-A135 491
Reprint: Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques.
AD-A137 111

*ANODES(ELECTROLYTIC CELL)
Reprint: Stochastic Effects in the Formation of Condensed Thymine Films at the Water-Mercury Interface.
AD-A135 778
Reprint: On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water Sucrose NaCl at the Mercury Solution Interface.
AD-A135 779

*ANODIC COATINGS
Reprint: Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds.
AD-A137 764

*ANTHRAQUINONES
Reprint: Electrochemical and Spectroscopic Studies of 9, 10-Anthraquinone in a Room Temperature Molten Salt.
AD-A135 195
Reprint: Rigid-Ladder Polymers: Polymers Containing Anthraquinone Recurring Units.
AD-A136 012

*ANTIFERROMAGNETISM
Reprint: Surface Polaritons on Uniaxial Antiferromagnets.
AD-A135 974

*ANTIMONY COMPOUNDS
Reprint: Synthesis and Spectra of Tetravinyldistibines.
AD-A137 733

*APPLIED MATHEMATICS
Progress Report, Grant AFOSR-79-0134, September 1, 1981 - August 31, 1982.*
AD-A137 749
Progress Report, Grant AFOSR-79-0134, September 1, 1982 - April 30, 1983.*
AD-A137 823
Progress Report, Grant AFOSR-79-0134, January 1, 1983 - September 30, 1983.*
AD-A137 838

*APPROXIMATION(MATHEMATICS)
Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.*
AD-A135 110
Reprint: Rational Approximations to Linear Forms of Exponentials and Binomials.
AD-A135 136
Reprint: Collisional Ionization as a Nonlocalized Process and the Breakdown of the Franck-Condon Approximation.
AD-A136 040
Reprint: Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.
AD-A136 077
Reprint: Diffusion Approximation for a Class of Markov Processes Satisfying a Nonlinear Fokker-Planck Equation.
AD-A136 582

*AQUATIC ORGANISMS
Sublethal Effects of JP-4 on Aquatic Organisms and Communities.*
AD-A138 807

*AROMATIC COMPOUNDS
Reprint: Competitive Rates of Reactions of Molybdenum Atoms with Arenes.
AD-A136 078
Reprint: Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?
AD-A136 149
Reprint: Orientation of Aromatic Compounds Adsorbed on Platinum Electrodes. The Effect of Temperature.
AD-A137 045
Reprint: The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds.
AD-A137 075
Reprint: Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757

*ARTIFICIAL INTELLIGENCE
Knowledge Representation and Natural-Language Semantics.*
AD-A135 476
Elements of Knowledge-Based Expert Systems.*
AD-A136 093
Logic Programming and Knowledge Base Maintenance.*
AD-A137 062
Study on Extremizing Adaptive Systems and Applications to

Synthetic Aperture Radars.*
AD-A137 725

*ASTROPHYSICS
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.*
AD-A136 205

*ASYNCHRONOUS SYSTEMS
Asynchronous Discrete Control of Continuous Processes.*
AD-A135 257

*ATMOSPHERIC PRECIPITATION
A Study of Low Energy Electron Precipitations and Auroral Phenomena by Using the USAF Polar Orbiting Satellites.*
AD-A137 888

*ATOMIC ENERGY LEVELS
Reprint: Energetics and Mechanism of Mg(3P) Production in Mg/N2O/CO Flames.
AD-A135 356
Reprint: Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory.
AD-A136 198

*ATOMIC ORBITALS
Reprint: Why Life Exists?
AD-A136 069
Reprint: Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.
AD-A136 197

*ATOMIC PROPERTIES
Reprint: Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique.
AD-A137 051

*ATOMS
Reprint: Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.
AD-A137 036
Spectroscopic Studies of the Products of the Reactions of Excited Noble-Gas Atoms.*
AD-A137 750

*ATTENTION
Reprint: Individual Differences in Multiple-Task Performance as a Function of Response Strategy.
AD-A135 500
Neuromagnetic Investigation of Workload and Attention.*
AD-A136 172

*AUDITORY PERCEPTION
Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.*
AD-A135 545

*AURORAE
A Study of Low Energy Electron Precipitations and Auroral Phenomena by Using the USAF Polar Orbiting Satellites.*
AD-A137 888

*AUTOMATIC
Approaches to Automatic Strategy Analysis and Synthesis.*
AD-A137 067

*AUTOMATION
Center of Excellence in Aerospace Manufacturing Automation.*
AD-A136 477

*AUTONOMOUS NAVIGATION
Optical Data Processing for Missile Guidance.*
AD-A136 216

*AVIONICS
Control Strategies for Complex Systems for Use in Aerospace Avionics.*
AD-A135 072

*AZOLES
Reprint: Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-Like Benzobisoxazole Polymers.
AD-A137 795
Reprint: CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis- and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles.
AD-A137 833

*BANACH SPACE
Reprint: Tightness and Strong Laws of Large Numbers in Banach Spaces.
AD-A135 097

*BASINS(GEOGRAPHIC)
Large-Scale Numerical Analysis of Seismic Waves in Basins.*
AD-A136 313

*BAYES THEOREM
Reprint: Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data.
AD-A136 048

*BEHAVIOR
Reprint: A Psychophysiological Theory of Reinforcement, Drive, Motivation and Attention.
AD-A135 495

*BENZENE COMPOUNDS
Reprint: Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne.
AD-A135 724
Reprint: Time Resolved Observations of NH2 and Benzyl Radicals Produced in the Infrared Multiple Photon Dissociation of Benzylamine.
AD-A136 013
Reprint: Critical Behavior in annealed and Unannealed Crystals of Benzil.
AD-A136 061

*BENZOIN
Reprint: Critical Fluctuations at the Phase Transition in Benzil.
AD-A138 567

*BIAXIAL STRESSES
Analysis of a High-Strength Concrete Model under Biaxial Compression.*
AD-A137 050

*BIBLIOGRAPHIES
Theory of Image Analysis and Recognition.*
AD-A135 453
The Stability and Dynamics of Elastic Structures and Fluid Flows.*
AD-A137 184
Applications of Functional Analytic and Martingale Methods to Problems in Queueing Network Theory.*
AD-A137 748
Progress Report, Grant AFOSR-79-0134, September 1, 1981 - August 31, 1982,*
AD-A137 749
Progress Report, Grant AFOSR-79-0134, September 1, 1982 - April 30, 1983,*
AD-A137 823
Progress Report, Grant AFOSR-79-0134, January 1, 1983 - September 30, 1983,*
AD-A137 838

*BINARY ALLOYS
Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.*
AD-A136 237

*BIOLOGICAL RHYTHMS
Reprint: The Generation of Rhythmic Activity in a Distributed Motor System.
AD-A135 470
Reprint: Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea.
AD-A135 530

*BIONICS
Study on Extremizing Adaptive Systems and Applications to Synthetic Aperture Radars.*
AD-A137 725

*BIPOLAR TRANSISTORS
Reprint: DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.
AD-A135 662
Development of a Planar Heterojunction Bipolar Transistor for Very High Speed Logic.*
AD-A136 341

*BISTABLE DEVICES
Topical Meeting on Optical Bistability Held at Rochester, New York on 15-17 June 983.*
AD-A138 998

*BLOCKING
Reprint: Complete Designs with Blocks of Maximal Multiplicity.
AD-A136 070

*BLOOD CIRCULATION
Reprint: A Digital Computer Model of the Human Circulatory System.
AD-A135 379
Reprint: On the Pressure-Volume Relationship in Circulatory Elements.
AD-A135 475

*BLUNT BODIES
Numerical Analysis of Dusty Supersonic Flow Past Blunt Axisymmetric Bodies.*
AD-A135 135

*BODIES OF REVOLUTION
Three-Dimensional Turbulent Boundary Layer on a Body of Revolution at Incidence.*
AD-A135 454

*BONDED JOINTS
Durability and Failure Analyses of a Silane Treated Alpha-A1203/Polyethylene Joint in Wet Environment.*
AD-A136 089
Silicon Nitride Joining.*
AD-A136 547

*BOUNDARY LAYER
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 1. Objectives, Evaluation of Data, Specifications of Test Cases, Discussion, and Position Papers.*
AD-A135 569
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.*
AD-A135 570
Unsteady Boundary Layers on Thin Bodies of Revolution.*
AD-A136 257
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.*
AD-A137 052
Experimental Observations of Vortex Ring Interaction with the Fluid Adjacent to a Surface.*
AD-A138 999

*BOUNDARY LAYER FLOW
Reprint: Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers.
AD-A135 729
Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.*
AD-A137 070
The Unsteady Boundary Layer on

an Elliptic Cylinder Following the Impulsive Onset of Translational and Rotational Motion.*
AD-A138 725

*BOUNDARY LAYER TRANSITION
Reprint: Estimates of the Errors Incurred in Various Asymptotic Representations of Wave Packets.
AD-A135 165
Reprint: Influence of Free-Stream Turbulence on Boundary Layer Transition in Favorable Pressure Gradients.
AD-A135 825
A Synthesized Model of the Near-Wall Behavior in Turbulent Boundary Layers.*
AD-A137 029
The Hydrodynamic Stability of a Supersonic Laminar Boundary Layer over a Rough Wall.*
AD-A137 056

*BOUNDARY VALUE PROBLEMS
Computer Program for Evaluating the Ives Transformation in Turbomachinery Cascades. Revision.*
AD-A137 064
Reprint: Modified Green's Functions and the Third Boundary Value Problem for the Helmholtz Equation.
AD-A137 756
Fractal Phase Screens.*
AD-A137 804

*BRAIN
Reprint: The Generation of Rhythmic Activity in a Distributed Motor System.
AD-A135 470
Reprint: Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea.
AD-A135 530
Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.*
AD-A135 545
New Techniques for Measuring Single Event Related Brain Potentials.*
AD-A138 694

*BRILLOUIN ZONES
Reprint: Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.
AD-A138 608

*BUBBLE MEMORIES
A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.*
AD-A138 919

*CADMIUM SULFIDES
Excitonic Solids.*
AD-A135 972

*CADMIUM TELLURIDES
Reprint: Mechanisms of Optical Phase Conjugation in Hg(1-x)Cd(x)Te.
AD-A135 699
Reprint: Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe.
AD-A135 772
Reprint: Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.
AD-A136 177

*CAPACITANCE
Reprint: The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface.
AD-A137 113

*CARBENES
Reprint: Computers, Lasers Aid Carbene Chemistry.
AD-A136 002

*CARBON
Reprint: Why Life Exists?
AD-A136 069
Ionic Mechanisms of Carbon Formation in Flames.*
AD-A137 079

*CARBON COMPOUNDS
Reprint: Model for Raman Scattering from Incompletely Graphitized Carbons.
AD-A136 458

*CARBON DIOXIDE LASERS
Investigation of Cold Cathode and RF Excitation for Long Life CO2 Waveguide Lasers.*
AD-A136 088

*CARCINOGENESIS
Reprint: In vitro Transformation of Cultured Human Diploid Fibroblasts.
AD-A135 474
Correlation of Mutagenic, Carcinogenic and Co-Carcinogenic Effects of Chemical Substances. Granuloma Pouch Assay.*
AD-A137 794

*CARCINOGENS
Chemical Carcinogen-Induced Changes in tRNA Metabolism in Human Cells.*
AD-A138 715

*CARDIOLOGY
Reprint: Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219

*CARDIOVASCULAR SYSTEM
Mathematical Simulation of the Cardiopulmonary System.*
AD-A135 460

*CASCADES(FLUID DYNAMICS)
Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.*
AD-A135 711

*CATALYSIS
Reprint: Simulation of the

Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism.
AD-A138 640

*CATHETERS
Reprint: Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219

*CERAMIC MATERIALS
Ultrastructure Processing and Environmental Stability of Advanced Structural and Electronic Materials.*
AD-A135 107

*CHARGE CARRIERS
Reprint: Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.
AD-A136 177
Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080

*CHARGE COUPLED DEVICES
Optical Processing in Radon Space.*
AD-A137 033

*CHARGE TRANSFER
Reprint: Charge Transfer between Neon Ions and Metastable Helium.
AD-A136 517

*CHELATE COMPOUNDS
Reprint: Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphosphine))bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7.
AD-A135 723

*CHEMICAL ANALYSIS
Reprint: Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine.
AD-A135 140
Reprint: Computers, Lasers Aid Carbene Chemistry.
AD-A136 002

*CHEMICAL DISSOCIATION
Production of Negative Ions by Electron Impact.*
AD-A135 176
Reprint: Time Resolved Observations of NH2 and Benzyl Radicals Produced in the Infrared Multiple Photon Dissociation of Benzylamine.
AD-A136 013

*CHEMICAL LASERS
Energetics and Collision Dynamics of Electronic Transition Lasers.*
AD-A135 894
Rates of Relaxation in the Upper Vibrational Levels of HF (Hydrogen Fluoride) and DF (Deuterium Fluoride).*
AD-A136 238

*CHEMICAL PROPERTIES
Reprint: Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System.
AD-A135 112

*CHEMICAL REACTIONS
Reprint: Nonequilibrium Effects in the Energy Distribution Function.
AD-A135 192
Reprint: Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes.
AD-A136 046
Reprint: Influence of Nuclear Spin on Chemical Reactions. Magnetic Isotope and Magnetic Field Effects. A Review.
AD-A136 175

*CHEMIL'JMINESCENCE
Reprint: Product Vibrational State Distributions in Thermal Energy Associative Detachment Reactions: F- H,D Yields HF8v), DF(v)e-.
AD-A136 049
Reprint: Infrared Chemiluminescence from Vibrationally Excited NO: Product Bracnhing in the N O2 Ion-Molecule Reaction.
AD-A136 074
Structural and Dynamic Studies of Materials Possessing High Energy Content.*
AD-A136 250

*CHLORINE COMPOUNDS
Reprint: Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine.
AD-A135 728
Reprint: Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.
AD-A138 608

*CHOLINESTERASE INHIBITORS
Anticholinesterase Effects on Number and Function of Brain Muscarinic Receptors and Central Cholinergic Activity: Drug Intervention.*
AD-A138 746

*CHROMATIN
The Molecular Toxicology of Chromatin.*
AD-A135 399

*CIRCUIT ANALYSIS
Reprint: A Semi-Direct Method for Modular Circuits.
AD-A135 138

*COANDA EFFECT
Reattachment of a Three-Dimensional, Incompressible Jet to

an Adjacent Axisymmetric Inclined Surface.*
AD-A136 288

*COBALT
Reprint: Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4' Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes.
AD-A137 425

*COBALT COMPOUNDS
Reprint: Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition.
AD-A136 004
Reprint: Dependence of Electrocatalysis for Oxygen Reduction by Adsorbed Dicobalt Cofacial Porphyrins Upon Catalyst Structure.
AD-A136 096

*CODING
Simply Instrumentable and Optimal Digitization of Analog Information Sources.*
AD-A135 124
Adaptive Hybrid Picture Coding.*
AD-A138 876

*COHERENT ELECTROMAGNETIC RADIATION
High Po[illegible] Submillimeter and Infrared [illegible] ation from Intense Relativisti[illegible] Electron Beams.*
AD-A136 287

*COLD CATHODE TUBES
Investigation of Cold Cathode and RF Excitation for Long Life CO2 Waveguide Lasers.*
AD-A136 088

*COLLISIONS
Reprint: Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.
AD-A137 036

*COMBUSTION
Prediction of an Apparent Flame Length in a Co-Axial Jet Diffusion Flame Combustor.*
AD-A135 088

*COMMUNICATION AND RADIO SYSTEMS
Robust Procedures for Communication Data.*
AD-A136 540
Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.*
AD-A136 561

*COMMUNICATIONS NETWORKS
Performance Evaluation and Control of Distributed Computer Communication Networks.*
AD-A135 121
Applications of Functional Analytic and Martingale Methods to Problems in Queueing Network Theory.*
AD-A137 748

*COMPARISON
A Comparison of Optical versus Hardware Fourier Transforms.*
AD-A136 223

*COMPILERS
An Analysis of Application Generators.*
AD-A137 159

*COMPOSITE MATERIALS
Ultrastructure Processing and Environmental Stability of Advanced Structural and Electronic Materials.*
AD-A135 107
TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.*
AD-A137 048

*COMPOSITE STRUCTURES
Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.*
AD-A137 047

*COMPRESSIBLE FLOW
Final Report on Grant AFOSR-82-0171.*
AD-A135 152
Reprint: Thrust Augmenting Ejectors. Part 1.
AD-A135 498
Reprint: An Admissibility Criterion for Fluids Exhibiting Phase Transitions.
AD-A136 103
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.*
AD-A137 022

*COMPUTATIONS
Reprint: Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum.
AD-A135 999
Reprint: The Calculations of an Inverse Potential Problem
AD-A136 067
Reprint: Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.
AD-A136 197
Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.*
AD-A136 237
Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.*
AD-A136 561
Summary of Work Done on Grant AFOSR-82-0078.*
AD-A136 570
Reprint: The Viscosity-Capillarity Criterion for Shocks and Phase Transitions.
AD-A137 003
Reprint: On a Theorem of Hermite and Hurwitz.
AD-A137 061

*COMPUTER AIDED DESIGN
Reprint: DELIGHT SPICE: An Optimization Based System for the Design of Integrated Circuits.
AD-A135 662

*COMPUTER AIDED DIAGNOSIS
Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.*
AD-A137 828

*COMPUTER APPLICATIONS
Reprint: Some Aspects of Modern Electrochemical Instrumentation.
AD-A135 769
Computer-Based Methods for Thermodynamic Analysis of Materials Processing.*
AD-A136 085
Approaches to Automatic Strategy Analysis and Synthesis.*
AD-A137 067
Manufacturing Information System.*
AD-A137 891

*COMPUTER COMMUNICATIONS
Summary of Research, 15 June 1982 to 14 June 1983, Grant AFOSR-81-0197.*
AD-A135 074
Performance Evaluation and Control of Distributed Computer Communication Networks.*
AD-A135 121
A Distributed Procedure to Detect and/or Deadlock.*
AD-A135 459

*COMPUTER FILES
File Searching Problems in Logic Programming Systems.*
AD-A136 522

*COMPUTER LOGIC
Knowledge Representation and Natural-Language Semantics.*
AD-A135 476
Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.*
AD-A136 457
Logic Programming and Knowledge Base Maintenance.*
AD-A137 062
Parallel Logic Programming and ZMOB and Parallel Systems Software and Hardware.*
AD-A137 068

*COMPUTER PROGRAMMING
Reprint: Finding Repeated Elements.
AD-A135 221
Synthesis of Efficient Structures for Concurrent Computation.*
AD-A135 892
Logic Programming and Knowledge Base Maintenance.*
AD-A137 062
Computer Program for Evaluating the Ives Transformation in Turbomachinery Cascades. Revision.*
AD-A137 064
Parallel Logic Programming and ZMOB and Parallel Systems Software and Hardware.*
AD-A137 068
Programming Productivity Enhancement by the Use of Application Generators.*
AD-A137 124
An Analysis of Application Generators.*
AD-A137 159

*COMPUTER PROGRAMS
International Conference on Stiff Computation Held at Park City, Utah on April 12, 13 and 14, 1982.*
AD-A135 265
Research in Programming Languages and Software Engineering.*
AD-A136 037
Reprint: Requirements Analysis - A Management Perspective.
AD-A136 106
Markov Texture Generation.*
AD-A136 168
Aspects of Pattern Theory.*
AD-A136 506

*COMPUTERIZED SIMULATION
Mathematical Simulation of the Cardiopulmonary System.*
AD-A135 460
Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.*
AD-A135 711
Development of a Stress-Dependent Finite Element Slab Model.*
AD-A135 836
Mathematical Models for Damageable Structures.*
AD-A136 574

*COMPUTERS
Summary of Research, 15 June 1982 to 14 June 1983, Grant AFOSR-81-0197.*
AD-A135 074

*CONCENTRATION(CHEMISTRY)
Reprint: Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.
AD-A136 177

*CONCRETE
Analysis of a High-Strength Concrete Model under Biaxial Compression.*
AD-A137 050

*CONDENSATION
Reprint: A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls.
AD-A137 894

*CONFORMAL MAPPING
Reprint: Apparent-Mass Coefficients for Isosceles

Triangles and Cross Sections Formed by Two Circles.
AD-A138 612

*CONTROL SYSTEMS
Control Strategies for Complex Systems for Use in Aerospace Avionics.*
AD-A135 072
Final Report on Scientific Activities Pursuant to the Provisions of AFOSR Grant-79-0018, Nov 1, 1981 through October 31, 1982.*
AD-A135 146
Return Difference Feedback Design for Robust Uncertainty Tolerance in Stochastic Multivariable Control Systems.*
AD-A136 495
Time Domain Analysis and Synthesis of Robust Controllers for Large Scale LQG (Linear Quadratic Gaussian) Regulators.*
AD-A137 760

*CONTROL THEORY
Final Report on Scientific Activities Pursuant to the Provisions of AFOSR Grant 79-0018, Nov 1, 1981 through October 31, 1982.*
AD-A135 146
Asynchronous Discrete Control of Continuous Processes.*
AD-A135 257
Reprint: Boundary Feedback Stabilization for a Quasi-Linear Wave Equation.
AD-A137 004

*CONVERGENCE
Convergence of Quadratic Forms in p-Stable Random Variables and Theta sub p-Radonifying Operators.*
AD-A135 314

*CONVEX SETS
Analysis of Adaptive Differential PCM (Pulse-Code Modulator) of a Stationary Gauss-Markov Input.*
AD-A136 518

*COPPER
Reprint: Electrochemical Studies of Cu(I) and Cu(II) in an Aluminum Chloride-N(n-Butyl) Pyridinium Chloride Ionic Liquid.
AD-A135 178

*CORROSION
High Energy Density Non-Aqueous Battery System.*
AD-A135 395

*COUPLING(INTERACTION)
Reprint: Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate.
AD-A137 763

*CRACK PROPAGATION
Fatigue Crack Propagation in Ti-Mn Alloys: The Role of the Bauschinger Effect.*
AD-A136 036
The Fatigue of Powder Metallurgy Alloys.*
AD-A138 714

*CROSSED FIELD DEVICES
Reprint: Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL).
AD-A136 014

*CROSSLINKING(CHEMISTRY)
Reprint: Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757

*CRYSTAL LATTICES
Reprint: Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 179

*CRYSTAL STRUCTURE
Reprint: Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphosphine))bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7.
AD-A135 723
Reprint: The X-Ray Crystal Structure of Tetramesityldisilene.
AD-A135 957
Reprint: Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl.
AD-A136 326

*CRYSTALLOGRAPHY
Reprint: Critical Behavior in annealed and Unannealed Crystals of Benzil.
AD-A136 061

*CUES(STIMULI)
Visual Cues in the Simulation of Low-Level Flight.*
AD-A135 461
Reprint: Hemispheric Asymmetries in a Signal Detection Task.
AD-A138 806

*CURRENT DENSITY
Reprint: Initial Oxide Growth Rate on Newly Generated Surfaces.
AD-A135 969

*CYANINE DYES
Reprint: Multicolor Electrochromic Display Technology.
AD-A136 286

*CYCLIC COMPOUNDS
Reprint: SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy

Transfer in 1B1 Difluorodiazirine.
AD-A137 034

*CYCLOTRON RESONANCE
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.*
AD-A136 205
Relativistic Broadening Near Cyclotron Resonance.*
AD-A136 224

*CYCLOTRONS
Possible Detection of Thermal Cyclotron Lines from Small Sources within Solar Active Regions.*
AD-A136 218

*CYSTEINE
Development of an in vivo Assay for Mistranslation: Inducing Activity of Pollutants and Characterization of Amino Acid Substitutions.*
AD-A137 069

*DAMAGE ASSESSMENT
Mathematical Models for Damageable Structures.*
AD-A136 574

*DATA BASES
On Acyclic Database Decompositions.*
AD-A135 105
Notions of Dependency Satisfaction.*
AD-A135 303
Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. I. Preparation of a Large-Scale Database.*
AD-A135 631
Universal Relation Database Systems.*
AD-A135 707
Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.*
AD-A136 577

*DATA COMPRESSION
An Interpolation and Compaction Technique for Gridded Data.*
AD-A137 107
Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.*
AD-A138 736
Adaptive Hybrid Picture Coding.*
AD-A138 876

*DATA MANAGEMENT
Development of Statistical Techniques to Better Utilize Data Characterized by Being Below Instrument Detection Thresholds and by Small Sample Size.*
AD-A135 408
A Distributed Procedure to Detect and/or Deadlock.*
AD-A135 459
Universal Relation Database Systems.*
AD-A135 707

*DATA PROCESSING
Statistical Data Processing, System Modeling and Reliability.*
AD-A135 208
Optical Data Processing for Missile Guidance.*
AD-A136 216
Design of Office Information Systems.*
AD-A136 523
Real-Time Implementation of Nonlinear Optical Processing Functions.*
AD-A138 843

*DATA TRANSMISSION SYSTEMS
Adaptive Hybrid Picture Coding.*
AD-A138 876

*DECISION MAKING
Approaches to Automatic Strategy Analysis and Synthesis.*
AD-A137 067

*DECISION THEORY
Preserving Asymmetry by Symmetric Processes and Distributed Fair Conflict Resolution.*
AD-A135 458

*DEFECT ANALYSIS
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.*
AD-A135 663

*DEFECTS(MATERIALS)
Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.*
AD-A136 095

*DELAY
Reprint: Assigning Processes to Processors in Distributed Systems.
AD-A135 497

*DENSE GASES
Physics of High Temperature, Dense Plasmas.*
AD-A138 872

*DEPOSITION
Reprint: Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.
AD-A135 171
Ion Beam Assisted Deposition of SiO2.*
AD-A136 247

*DESERTS
The Behavior of the Atmosphere in the Desert Planetary Boundary Layer.*
AD-A135 962

*DESORPTION
Reprint: Angle-Resolved SIMS (secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111).
AD-A135 128

*DETERMINANTS(MATHEMATICS)

Estimation and Reconstruction for Stochastic Processes and Deterministic Functions.*
AD-A136 571

*DEUTERIUM
Reprint: Comparisons between Theoretical and Experimental Deuterium Isotope Effects for Some Outer-Sphere Electrochemical Reactions.
AD-A137 098

*DEWAR FLASKS
Reprint: Dewar Design for Optically Pumped Semiconductor Ring Laser.
AD-A136 041

*DIAGNOSTIC EQUIPMENT
Reprint: Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams.
AD-A137 038

*DIAMAGNETISM
Excitonic Solids.*
AD-A135 972

*DIELECTRIC PROPERTIES
Reprint: A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line.
AD-A135 649

*DIELECTRICS
Reprint: The Structure of Charged Interfaces.
AD-A135 763

*DIFFERENTIAL EQUATIONS
Reprint: Accurate Multistep Methods for Smooth Stiff Problems.
AD-A135 220
International Conference on Stiff Computation Held at Park City, Utah on April 12, 13 and 14, 1982.*
AD-A135 265
Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.*
AD-A136 507
Research in Algebraic Manipulation.*
AD-A137 742

*DIFFUSION
Reprint: Diffusion Approximation for a Class of Markov Processes Satisfying a Nonlinear Fokker-Planck Equation.
AD-A136 582

*DIMETHYLHYDRAZINES
Immune Dysfunctions and Abrogation of the Inflammatory Response by Environmental Chemicals.*
AD-A137 768

*DISKS
Reprint: Rhesus Monkey Intervertebral Disk Viscoelastic Response To Shear Stress.
AD-A135 161

*DISPLAY SYSTEMS
Quantification of Interference and Detectability Properties of Visual Stimuli for Optimal Display Design.*
AD-A135 438
Visual Cues in the Simulation of Low-Level Flight.*
AD-A135 461

*DISTRIBUTED DATA PROCESSING
Preserving Asymmetry by Symmetric Processes and Distributed Fair Conflict Resolution.*
AD-A135 458

*DISTRIBUTION FUNCTIONS
Reprint: Nonequilibrium Effects in the Energy Distribution Function.
AD-A135 192
Reprint: Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data.
AD-A136 048
Reprint: The Role of Functional Equations in Stochastic Model Building.
AD-A137 013

*DOPPLER RADAR
Reprint: Can A VHF Doppler Radar Provide Synoptic Wind Data? A comparison of 30 Days of Radar and Radiosonde Data.
AD-A135 357

*DUST
Numerical Analysis of Dusty Supersonic Flow Past Blunt Axisymmetric Bodies.*
AD-A135 135
The Behavior of the Atmosphere in the Desert Planetary Boundary Layer.*
AD-A135 962

*DYES
Reprint: Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique.
AD-A137 051

*DYNAMIC LOADS
Determining and Modeling the Response of Piezoresistance Transducers to Dynamic Loading.*
AD-A137 121

*DYNAMIC RESPONSE
Determining and Modeling the Response of Piezoresistance Transducers to Dynamic Loading.*
AD-A137 121

*DYNAMICS
Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.*
AD-A137 047
Transverse Mode Dynamics in a Free Electron Laser.*
AD-A137 738

*EJECTORS

Reprint: Thrust Augmenting Ejectors. Part 1.
AD-A135 498

*ELECTRIC BATTERIES
High Energy Density Non-Aqueous Battery System.*
AD-A135 395

*ELECTRIC CURRENT
Reprint: Uniformly Accessible Electrodes.
AD-A135 205

*ELECTRIC LASERS
Reprint: Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL).
AD-A136 014

*ELECTRICAL ENGINEERING
Basic Research in Electronics (JSEP) Joint Services Electronics Program.*
AD-A136 290

*ELECTRICAL LASERS
High Power Submillimeter and Infrared Radiation from Intense Relativistic Electron Beams.*
AD-A136 287
Investigation of Optimum Magnet Geometries for Gain Expanded Free-Electron Lasers.*
AD-A136 494
Transverse Mode Dynamics in a Free Electron Laser.*
AD-A137 738

*ELECTROCATALYSTS
Electrocatalysis of Oxygen Using Water Soluble Metal Porphyrins and Chemically Modified Porphyrin Electrodes.*
AD-A136 062
Reprint: Dependence of Electrocatalysis for Oxygen Reduction by Adsorbed Dicobalt Cofacial Porphyrins Upon Catalyst Structure.
AD-A136 096
Reprint: Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins.
AD-A138 637

*ELECTROCHEMISTRY
Reprint: Electrochemical Studies of Fe(II) and Fe(III) in an Aluminum Chloride-Butylpyridinium Chloride Ionic Liquid.
AD-A135 101
Molten Salt Electrochemical Systems.*
AD-A135 108
Reprint: Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.
AD-A135 170
Reprint: Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.
AD-A135 171
Reprint: Electrochemical Studies of Cu(I) and Cu(II) in an Aluminum Chloride-N(n-Butyl) Pyridinium Chloride Ionic Liquid.
AD-A135 178
Reprint: Electrochemical and Spectroscopic Studies of 9, 10-Anthraquinone in a Room Temperature Molten Salt.
AD-A135 195
Reprint: Some Aspects of Modern Electrochemical Instrumentation.
AD-A135 769
Reprint: Orientation of Aromatic Compounds Adsorbed on Platinum Electrodes. The Effect of Temperature.
AD-A137 045
Reprint: The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds.
AD-A137 075
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Reprint: Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques.
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Reprint: The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface.
AD-A137 113
Reprint: Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 179
Final Technical Report of Research Performed under Grant AFOSR-80-0262.*
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Reprint: Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins.
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Reprint: Electrochemistry of Oxygen Reduction. 4. Oxygen to Water Conversion by Iron(II) tetrakis(N-Methyl-4-Pyridyl)Porphyrin via Hydrogen Peroxide.
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Reprint: Prospects in the

Analysis of Chemically Modified Electrodes.
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Reprint: A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer.
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*ELECTRODEPOSITION
Reprint: Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg -I.
AD-A137 071
Reprint: The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface.
AD-A137 113
Reprint: Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 179

*ELECTRODES
Reprint: Uniformly Accessible Electrodes
AD-A135 205
Reprint: Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes.
AD-A137 023
Reprint: Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg -I.
AD-A137 071
Reprint: Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes.
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Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.
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Reprint: Specific Adsorption of Halide and Pseudohalide Ions at Electrochemically Roughened Versus Smooth Silver-Aqueous Interfaces.
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Reprint: Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques.
AD-A137 111
Reprint: The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface.
AD-A137 113
Reprint: Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
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Reprint: Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes.
AD-A137 425
Reprint: Prospects in the Analysis of Chemically Modified Electrodes.
AD-A138 639
Reprint: Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism.
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*ELECTROENCEPHALOGRAPHY
New Techniques for Measuring Single Event Related Brain Potentials.*
AD-A138 694

*ELECTROMAGNETIC FIELDS
Interaction of Electromagnetic Fields with Plasma.*
AD-A135 173

*ELECTROMAGNETIC PROPERTIES
Applications of Non-Self-Adjoint Operator Theory to the Singularity Expansion Method (SEM) and to the Eigenmode Expansion Method (EEM) in Acoustic and Electromagnetic Problems.*
AD-A135 177

*ELECTROMECHANICAL DEVICES
Reprint: The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems.
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*ELECTRON BEAMS
Interim Scientific Report on Virtual Cathode Oscillations.*
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High Power Submillimeter and Infrared Radiation from Intense Relativistic Electron Beams.*
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Investigation of Optimum Magnet Geometries for Gain-Expanded Free-Electron Lasers.*
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Reprint: Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams.
AD-A137 038

*ELECTRON EMISSION
Microwave Emission from Relativistic Electron Beams.*

AD-A137 752

*ELECTRON MICROSCOPY
Reprint: Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas
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Reprint: Possibility of Isotope Separation by Selective Radiative Scattering.
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Reprint: Electron Spin Resonance Studies of 1,4-Disilacyclohexa-2,5-Diene Free Radical Reactions.
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Reprint: Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F H sub 2 Collisions
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Energetics and Collision Dynamics of Electronic Transition Lasers.*
AD-A135 894
Reprint: Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory.
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*ELECTRONIC STATES
Energetics and Collision Dynamics of Electronic Transition Lasers.*

AD-A135 894
Reprint: Single Collision Ion-Molecule Reactions at Thermal Energy: Rotational and Vibrational Distributions from N CO Yields N CO.
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Reprint: The Low-Lying 2Sigma- States of OH.
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Reprint: Long Range Behavior of the Gerade States near the 2P3/2 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.
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Picosecond Laser Studies of Excited State Processes.*
AD-A136 137
Reprint: Auger and Radiative Deexcitation of P(4) Ions.
AD-A137 747
Reprint: Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant.
AD-A137 834

*ELECTRONICS
Joint Services Electronics Program.*
AD-A136 058
Basic Research in Electronics (JSEP) Joint Services Electronics Program.*
AD-A136 290

*ELECTRONS
A Study of Low Energy Electron Precipitations and Auroral Phenomena by Using the USAF Polar Orbiting Satellites.*
AD-A137 888

*ELECTROOPTICS
Reprint: Fast Relaxing Absorptive Nonlinear Refraction in Superlattices.
AD-A136 243

*ELECTROSTATICS
An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.*
AD-A135 880

*EMULSIONS
Reprint: Stereochemistry of Photoinitiated Emulsion Polymerization.
AD-A135 193

*ENERGY BANDS
Reprint: Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe.
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*ENERGY GAPS
Reprint: Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers.
AD-A136 349

*ENERGY LEVELS
Reprint: Nonequilibrium Effects in the Energy Distribution Function.
AD-A135 192
Reprint: Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethane.
AD-A135 970

*ENERGY TRANSFER
Reprint: Very Low Energy Collision Induced Vibrational Relaxation of (1)A sub u Glyoxal.
AD-A135 106
Reprint: Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach.
AD-A135 127
Reprint: SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy Transfer in 181 Difluorodiazirine.
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Reprint: Classical Trajectory

Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.
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*EPITAXIAL GROWTH
A Comparative Thermodynamic Analysis of Impurity Incorporation in Vapor Phase Epitaxial InP and GaAs.*
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Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.*
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Scientific Report on the International Conference on Metastable and Modulated Semiconductor Structures (MMSS) held at Pasadena, California on 6-10 December 1982.*
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*EQUATIONS
Orbit Connections in a Parabolic Equation.*
AD-A135 986
Reprint: An Admissibility Criterion for Fluids Exhibiting Phase Transitions.
AD-A136 103
Reprint: The Role of Functional Equations in Stochastic Model Building.
AD-A137 013

*EQUATIONS OF MOTION
Transverse Mode Dynamics in a Free Electron Laser.*
AD-A137 738
Evolution of the Transverse Modes in a FEL (Free Electron Lasers), and Application to the Orsay Experiment.*
AD-A137 797

*EQUATIONS OF STATE
Reprint: Sphericalization of Nonspherical Interactions.
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*ERGONOMICS
Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.*
AD-A135 211

*ESTERS
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.*
AD-A135 464

*ESTIMATES
Estimation Techniques for Transport Equations.*
AD-A135 092
Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.*
AD-A135 093
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.*
AD-A135 109
Reprint: Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data.
AD-A136 048

*ETHERS
Reprint: Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757

*EXERCISE(PHYSIOLOGY)
Reprint: Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.
AD-A135 426
Reprint: Hemodynamic Responses of Runners and Water Polo Players during Exertion in Water.
AD-A135 469

*EXPERIMENTAL DESIGN
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.*
AD-A137 103

*EXPLOSION EFFECTS
Reinforced Concrete Response to Near Field Explosions.*
AD-A135 876

*FABRICATION
Film Synthesis and New Superconductors.*
AD-A135 102
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.*
AD-A137 103

*FATIGUE(MECHANICS)
Reprint: Fatigue Crack Initiation and Microcrack Propagation in X7091 Type Aluminum P/M Alloys.
AD-A135 126
Fatigue Crack Propagation in Ti-Mn Alloys: The Role of the Bauschinger Effect.*
AD-A136 036
Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.*
AD-A137 047
The Fatigue of Powder Metallurgy Alloys.*
AD-A138 714

*FEASIBILITY STUDIES
The Mark III Linac as a High Current Source for FEL (Free Electron Lasers) Experiments.*
AD-A136 312
Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.*
AD-A138 736

*FERROELECTRIC MATERIALS
Research on Ferroelectric Materials for Millimeter Wave Application.*
AD-A137 128

*FERROMAGNETIC MATERIALS
Reprint: Inelastic Scattering of Neutrons by Surface Spin Waves on Ferromagnets.
AD-A136 336

*FIBER REINFORCEMENT
The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.*
AD-A136 124

*FIBROBLASTS
Reprint: In vitro Transformation of Cultured Human Diploid Fibroblasts.
AD-A135 474

*FIELD EFFECT TRANSISTORS
Reprint: DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.
AD-A135 662
Microwave Semiconductor Research - Materials, Devices, Circuits.*
AD-A137 798

*FILM COOLING
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.*
AD-A137 022
Film Cooling on a Gas Turbine Blade Near the End Wall.*
AD-A138 794

*FILMS
Laser Chemical Vapor Deposition.*
AD-A137 827

*FILTERS
Optical Processing in Radon Space.*
AD-A137 033

*FINITE ELEMENT ANALYSIS
Development and Application of the P-Version of the Finite Element Method.*
AD-A137 059

*FLAMES
Prediction of an Apparent Flame Length in a Co-Axial Jet Diffusion Flame Combustor.*
AD-A135 088
Reprint: Energetics and Mechanism of Mg(3P) Production in Mg/N2O/CO Flames.
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Atomic and Molecular Gas Phase Spectrometry.*
AD-A135 971
Ionic Mechanisms of Carbon Formation in Flames.*
AD-A137 079

*FLIGHT ENVELOPE
Quantification of Subjective Ratings through Conjoint Measurement Analysis.*
AD-A138 810

*FLIGHT SIMULATION
Visual Cues in the Simulation of Low-Level Flight.*
AD-A135 461

*FLOW
Reprint: Mechanisms of Inlet-Vortex Formation.
AD-A135 471

*FLOW FIELDS
The Effects of Cylindrical Surface Modifications on Turbulent Boundary Layers.*
AD-A136 296

*FLOW SEPARATION
Analysis of Three-Dimensional Viscous Internal Flows.*
AD-A135 762
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.*
AD-A137 052
Three Dimensional/Boundary Layer Interaction: Laminar and Turbulent Behaviour.*
AD-A137 060
Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.*
AD-A137 070
Unsteady Separated Flows: Vorticity and Turbulence.*
AD-A138 593

*FLOW VISUALIZATION
A Synthesized Model of the Near-Wall Behavior in Turbulent Boundary Layers.*
AD-A137 029
Visualization of Accelerating Flow around an Airfoil at High Angles of Attack.*
AD-A138 636

*FLUID DYNAMICS
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 1. Objectives, Evaluation of Data, Specifications of Test Cases, Discussion, and Position Papers.*
AD-A135 569
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.*
AD-A135 570
Rotordynamic Forces Developed by Labyrinth Seals.*
AD-A136 217
The Changing Scene in Computational Fluid Dynamics.*
AD-A138 661

*FLUID FLOW
Final Report on Grant AFOSR-82-0171.*
AD-A135 152
Reprint: Viscoelastic Fluid Flow Exhibiting Hysteritic Phase

Changes.
AD-A135 411
Reprint: One-Dimensional Models of Anisotropic Fluids.
AD-A135 734
Reprint: An Admissibility Criterion for Fluids Exhibiting Phase Transitions.
AD-A136 103
Reprint: The Viscosity-Capillarity Criterion for Shocks and Phase Transitions.
AD-A137 003

*FLUORINATION
Reprint: Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane.
AD-A137 723

*FORCE(MECHANICS)
Rotordynamic Forces Developed by Labyrinth Seals.*
AD-A136 217

*FOURIER TRANSFORMATION
Reprint: Comments on 'The Reconstruction of a Multidimensional Sequence from the Phase or Magnitude of Its Fourier Transform'.
AD-A136 011
A Comparison of Optical versus Hardware Fourier Transforms.*
AD-A136 223

*FRACTURE(MECHANICS)
Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.*
AD-A137 047

*FREE ELECTRONS
Reprint: Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys.
AD-A136 227
Investigation of Optimum Magnet Geometries for Gain-Expanded Free-Electron Lasers.*
AD-A136 494
Transverse Mode Dynamics in a Free Electron Laser.*
AD-A137 738
Reprint: Storage Ring Free Electron Lasers: Experimental Progress and Future Prospects.
AD-A137 745
New Results of the ACO Storage Ring Free Electron Laser.*
AD-A137 785

*FREQUENCY MODULATION
Reprint: An Action Spectrum for Spatial-Frequency Adaptation.
AD-A137 758

*FUNCTIONS(MATHEMATICS)
Reprint: The Reliability of K out of N Systems.
AD-A135 246

*FUSED SALTS
Molten Salt Electrochemical Systems.*
AD-A135 108
Reprint: Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System.
AD-A135 112

*GAIN
New Results of the ACO Storage Ring Free Electron Laser.*
AD-A137 785

*GALAXIES
Reprint: The Variability of the Spectrum of Arakelian 120.
AD-A135 796

*GALLIUM ARSENIDES
Microwave Semiconductor Research - Materials, Devices, Circuits.*
AD-A137 798

*GAME THEORY
Reprint: Self Tuning Leader-Follower Games.
AD-A135 099
Search with Limited Resources.*
AD-A136 122

*GAMMA SPECTROMETERS
Shuttle Flight Test of an Advanced Gamma-Ray Detection System.*
AD-A136 157
Shuttle Flight Test of an Advanced Gamma-Ray Detection System.*
AD-A136 681

*GARNET
A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.*
AD-A138 919

*GAS DYNAMICS
Reprint: A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering.
AD-A135 976
Reprint: Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7.
AD-A137 015

*GAS FLOW
An Assessment of Recent Results on Pseudo-Stationary Oblique-Shock-Wave Reflections.*
AD-A135 260
Reprint: Acoustic Streaming in Swirling Flow and the Ranque-Hilsch (Vortex-Tube) Effect.
AD-A135 427
Studies of Aerodynamic Drag.*
AD-A137 740

*GAS SURFACE INTERACTIONS
Reprint: A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering.
AD-A135 976

*GAS TURBINE BLADES
Film Cooling on a Gas Turbine Blade Near the End Wall.*

AD-A138 794

*(ATES(CIRCUITS)
Microwave Semiconductor Research - Materials, Devices, Circuits.*
AD-A137 798

*GENERATORS
An Analysis of Application Generators.*
AD-A137 159

*GERMANIUM
Shuttle Flight Test of an Advanced Gamma-Ray Detection System.*
AD-A136 157

*GERMANIUM ALLOYS
Reprint: Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys.
AD-A136 227

*GERMANIUM COMPOUNDS
Reprint: Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane.
AD-A137 723

*GLASSY CARBON
Reprint: Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas.
AD-A138 749

*GRANULOMA
Correlation of Mutagenic, Carcinogenic and Co-Carcinogenic Effects of Chemical Substances. Granuloma Pouch Assay.*
AD-A137 794

*GRAPHITE
Reprint: Raman Scattering from Low-Frequency Phonos in Stage-2 Graphite-Rubidium Intercalation Compounds.
AD-A136 001

Reprint: Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition.
AD-A136 004

Reprint: Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds.
AD-A136 005

Reprint: Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds.
AD-A136 010

Reprint: The Effect of Intercalation on the Lattice Constants of Graphite.
AD-A136 081

Reprint: Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds.
AD-A136 300

Reprint: Lattice-Dynamical Model for Graphite.
AD-A136 332

Reprint: Lattice-Dynamical Model for Alkali-Metal-Graphite Intercalation Compounds.
AD-A136 357

Reprint: High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*GRAPHITED MATERIALS
Reprint: Model for Raman Scattering from Incompletely Graphitized Carbons.
AD-A136 458

*GRIDS
An Interpolation and Compaction Technique for Gridded Data.*
AD-A137 107

*GRIDS(COORDINATES)
Adaptive Grid Generation Using Elliptic Generating Equations with Precise Coordinate Controls.*
AD-A137 006

*GROUND EFFECT
An Investigation of Turbulence Mechanisms in V/STOL Upwash Flow Fields.*
AD-A137 775

*GROUND STATE
Reprint: Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine.
AD-A135 728

*GROUPS(MATHEMATICS)
Harmonizable Stable Processes on Groups: Spectral, Ergodic and Interpolation Properties.*
AD-A136 504

*GUIDED MISSILES
Optical Data Processing for Missile Guidance.*
AD-A136 216

*GYROSCOPES
Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080

*HALIDES
Reprint: Specific Adsorption of Halide and Pseudohalide Ions at Electrochemically Roughened Versus Smooth Silver-Aqueous Interfaces.
AD-A137 099

*HARMONIC GENERATORS
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.*
AD-A136 205

*HEAT RESISTANT ALLOYS
Synthesis and Properties of Elevated Temperature P/M Aluminum Alloys.*
AD-A135 956

*HEAT TRANSFER
Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 1. Experimental Data.
AD-A135 713
Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 2. Analysis of Results.
AD-A135 714
Reprint: Influence of Free-Stream Turbulence on Boundary Layer Transition in Favorable Pressure Gradients.
AD-A135 825

*HEATING
Reprint: Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group).
AD-A138 560

*HELIUM
Reprint: Charge Transfer between Neon Ions and Metastable Helium.
AD-A136 517

*HETEROCYCLIC COMPOUNDS
Reprint: Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies.
AD-A137 762

*HIGH ENERGY
Structural and Dynamic Studies of Materials Possessing High Energy Content.*
AD-A136 250

*HIGH EXPLOSIVES
Reinforced Concrete Response to Near Field Explosions.*
AD-A135 878

*HIGH LEVEL LANGUAGES
AdaRel: A Relational Extension of Ada.*
AD-A137 108

*HIGH LIFT
Effects of Blowing Spanwise from the Tips of Low-Aspect Ratio Wings of Varying Taper Ratio, with Application to Improving STOL capability of Fighter Aircraft.*
AD-A135 688

*HIGH STRENGTH
Analysis of a High-Strength Concrete Model under Biaxial Compression.*
AD-A137 050

*HIGH TEMPERATURE
Physics of High Temperature, Dense Plasmas.*
AD-A138 872

*HOLOGRAPHY
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.*
AD-A135 663
Reprint: Reconstruction of Objects Having Latent Reference Points.
AD-A137 044

*HOT WIRE ANEMOMETERS
Hot-Wire Measurements of Velocity and Temperature Fluctuations in a Heated Turbulent Boundary Layer.*
AD-A135 212

*HYBRID COMPUTERS
Optical Analog & Hybrid Computer Solution of Partial Differential Equations.*
AD-A137 028

*HYDRAZINES
The Effects of Hydrazines and Related Compounds on Calcium Calmodulin Regulated Synaptic Processes.*
AD-A137 985

*HYDRAZONES
Reprint: Novel Oxidative Rearrangement of Beta, Gamma-Unsaturated Ketone Hydrazones on Iodination in Base.
AD-A135 094

*HYDRIDES
Reprint: Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane.
AD-A137 723
Reprint: Synthesis and Spectra of Tetravinyldistibines.
AD-A137 733

*HYDROCARBONS
Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?*
AD-A137 735

*HYDROGEN FLUORIDE LASERS
Rates of Relaxation in the Upper Vibrational Levels of HF (Hydrogen Fluoride) and DF (Deuterium Fluoride).*
AD-A136 238

*HYDROLYSIS
Reprint: Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane.
AD-A136 583

*HYDROXYL RADICALS
Reprint: The Low-Lying 2Sigma- States of OH.
AD-A136 075

*HYPERSONIC FLOW
Reprint: Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7.
AD-A137 015

*HYSTERESIS
Reprint: Adaptation of Vascular Pressure-Flow-Volume Hysteresis in Isolated Rabbit Lungs.

AD-A135 139

*ILLUMINATION
Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.
AD-A137 097

*IMAGE PROCESSING
Theory of Image Analysis and Recognition.*
AD-A135 453
Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. I. Preparation of a Large-Scale Database.*
AD-A135 631
Markov Texture Generation.*
AD-A136 168
A Versatile Parallel Image Processor System.*
AD-A136 292
Optical Analog & Hybrid Computer Solution of Partial Differential Equations.*
AD-A137 028
Reprint: Reconstruction of Objects Having Latent Reference Points.
AD-A137 044
Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. 8. Interim Report.*
AD-A137 726
Adaptive Hybrid Picture Coding.*
AD-A138 876

*IMAGES
Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.*
AD-A138 736

*IMMUNITY
Immune Dysfunctions and Abrogation of the Inflammatory Response by Environmental Chemicals.*
AD-A137 768

*IMPURITIES
A Comparative Thermodynamic Analysis of Impurity Incorporation in Vapor Phase Epitaxial InP and GaAs.*
AD-A135 739

*INDUSTRIAL ENGINEERING
Manufacturing Information System.*
AD-A137 891

*INELASTIC SCATTERING
Reprint: Inelastic Scattering of Neutrons by Surface Spin Waves on Ferromagnets.
AD-A136 336

*INERTIAL SYSTEMS
Research on New Approaches to Optical Systems for Inertial Rotation Sensing.*
AD-A136 045

*INFORMATION PROCESSING
Development and Applications of the Microchannel Spatial Light Modulator.*
AD-A136 132
The Event Related Brain Potential as an Index of Information Processing, Cognitive Activity, and Skill Acquisition: A Program of Basic Research.*
AD-A137 779

*INFORMATION RETRIEVAL
The Program Complexity of Searching a Table.*
AD-A135 299

*INFORMATION SYSTEMS
Simply Instrumentable and Optimal Digitization of Analog Information Sources.*
AD-A135 124
Annual Scientific Report for Grant AFOSR-81-0205.*
AD-A135 452
Design of Office Information Systems.*
AD-A136 523
Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.*
AD-A137 828

*INFORMATION THEORY
Linear and Nonlinear Filtering and Related Inverse Scattering Problems.*
AD-A135 175
Interim Report on Grant AFOSR-81-0047, 1 October 1982 to 30 September 1983.*
AD-A136 560

*INFRARED DETECTORS
Recursive Interpolation of Space-Limited Scenes.*
AD-A136 215

*INFRARED SPECTRA
Reprint: Product Vibrational State Distributions in Thermal Energy Associative Detachment Reactions: F- H,D Yields HF8v), DF(v)e-.
AD-A136 049

*INFRARED SPECTROSCOPY
Reprint: Electrochemical and Spectroscopic Studies of 9, 10-Anthraquinone in a Room Temperature Molten Salt.
AD-A135 195

*INHALATION
Modeling of Inhalation Administration of Vapors with Capacity Limited Clearance.*
AD-A138 847

*INPUT OUTPUT PROCESSING
Control and Identification of Time Varying Systems.*
AD-A135 223

*INSECTS

Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.
AD-A136 080
Reprint: Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.
AD-A136 082
Picosecond Laser Studies of Excited State Processes.*
AD-A136 137

*PHOTOELECTRIC CELLS(SEMICONDUCTOR)
Reprint: Current-Voltage Analysis of Photoelectrochemical Cells under Mass and Light Flux Variation.
AD-A135 162

*PHOTOINTERPRETABILITY
Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. I. Preparation of a Large-Scale Database.*
AD-A135 631

*PHOTOLUMINESCENCE
Reprint: Measurement Photon Yields.
AD-A136 148

*PHOTOLYSIS
Reprint: Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals.
AD-A136 114
Reprint: Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154

*PHOTONS
Reprint: Measurement Photon Yields.
AD-A136 148
Reprint: Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

*PHYSICAL PROPERTIES
Synthesis and Properties of Elevated Temperature P/M Aluminum Alloys.*
AD-A135 956
A Fundamental Study of P/M processed Elevated Temperature Aluminum Alloys.*
AD-A136 154

*PHYSICS
Final Report on Grant AFOSR-78-3574, 1978-1983.*
AD-A136 519

*PICTURES
Adaptive Hybrid Picture Coding.*
AD-A138 876

*PIEZOELECTRIC GAGES
Determining and Modeling the Response of Piezoresistance Transducers to Dynamic Loading.*
AD-A137 121

*PIEZOELECTRIC TRANSDUCERS
Determining and Modeling the Response of Piezoresistance Transducers to Dynamic Loading.*
AD-A137 121

*PLANE WAVES
Fractal Phase Screens.*
AD-A137 804

*PLASMA DIAGNOSTICS
Interaction of Electromagnetic Fields with Plasma.*
AD-A135 173
Reprint: Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.
AD-A137 024
Reprint: Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma.
AD-A137 026
Reprint: Evaluation of an Inductively Coupled Plasma with an Extended Sleeve Torch as an Atomization Cell for Laser Excited Fluorescence Spectrometry.
AD-A137 072
Reprint: Atomic Fluorescence Spectrometry with Inductively Coupled Plasma as Excitation Source and Atomization Cell.
AD-A137 076

*PLASMA OSCILLATIONS
Interim Scientific Report on Virtual Cathode Oscillations.*
AD-A135 120

*PLASMAS(PHYSICS)
An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.*
AD-A135 880
Atomic and Molecular Gas Phase Spectrometry.*
AD-A135 971
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.*
AD-A136 205
Relativistic Broadening Near Cyclotron Resonance.*
AD-A136 224
Reprint: Pulsed Plasma Source Spectrometry in the 80-8000-eV X-Ray Region.
AD-A137 724
Reprint: Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy.
AD-A138 695
Reprint: Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas.
AD-A138 749
Physics of High Temperature, Dense Plasmas.*
AD-A138 872

AD-A136 506

*PAVEMENT BASES
Development of a Stress-Dependent Finite Element Slab Model.*
AD-A135 836

*PAVEMENTS
Development of a Stress-Dependent Finite Element Slab Model.*
AD-A135 836

*PERCEPTION(PSYCHOLOGY)
The Event Related Brain Potential as an Index of Information Processing, Cognitive Activity, and Skill Acquisition: A Program of Basic Research.*
AD-A137 779
Reprint: Hemispheric Asymmetries in a Signal Detection Task.
AD-A138 806

*PERFORMANCE(ENGINEERING)
Control Strategies for Complex Systems for Use in Aerospace Avionics.*
AD-A135 072

*PERFORMANCE(HUMAN)
Reprint: Individual Differences in Multiple-Task Performance as a Function of Response Strategy.
AD-A135 500
Neuromagnetic Investigation of Workload and Attention.*
AD-A136 172
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.*
AD-A136 268
Reprint: Hemispheric Asymmetries in a Signal Detection Task.
AD-A138 806

*PERMANENT MAGNET GENERATORS
Reprint: Recent Results of the ACO Storage Ring F.E.L. Experiment.
AD-A137 803

*PHASE DIAGRAMS
Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.*
AD-A136 237

*PHASE TRANSFORMATIONS
Deterministic Chaos in Materials Exhibiting Phase Transitions.*
AD-A135 172
Reprint: The Viscosity-Capillarity Criterion for Shocks and Phase Transitions.
AD-A137 003
Reprint: Critical Fluctuations at the Phase Transition in Benzil.
AD-A138 567
Reprint: Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.
AD-A138 608

*PHENYL RADICALS
Reprint: Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals.
AD-A136 114

*PHONONS
Reprint: Raman Scattering from Low-Frequency Phonos in Stage-2 Graphite-Rubidium Intercalation Compounds.
AD-A136 001

*PHOSPHINE
Studies of Polymer-Bound Macrocyclic Polytertiary Phosphines.*
AD-A135 718

*PHOSPHORESCENCE
Reprint: Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.
AD-A136 244

*PHOSPHORUS
Reprint: Auger and Radiative Deexcitation of P(4) Ions.
AD-A137 747

*PHOTOACTIVATION ANALYSIS
Reprint: Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation.
AD-A135 181

*PHOTOCHEMICAL REACTIONS
Reprint: Natural Correlation Diagrams. A Unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions.
AD-A136 003
Reprint: The I(2P1/2)02 Reverse Yield I(2P3/2)02(1Delta) Equilibrium.
AD-A136 052
Reprint: Electron Spin Resonance Studies of 1,4-Disilacyclohexa-2,5-Diene Free Radical Reactions.
AD-A136 072
Reprint: Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.
AD-A136 076
Reprint: Interactions of Ruthenium(II) Photosensitizers with Triton X-100.
AD-A136 079
Reprint: Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2-bipyridine)ruthenium(II) to Laser Dyes.
AD-A136 203
Structural and Dynamic Studies of Materials Possessing High Energy Content.*
AD-A136 250

*PHOTODISSOCIATION
Reprint: Long Range Behavior of the Gerade States near the 2P3/2 2P3/2 Iodine Dissociation Limit by

Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls.
AD-A137 894

*OXIDATION
Reprint: The Anodic Behavior of Iodide at Platinum in the Presence of an Iodine Film under Potentiostatic Steady-State and Hydrodynamic Modulation Conditions.
AD-A135 113
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.*
AD-A135 464
Reprint: Initial Oxide Growth Rate on Newly Generated Surfaces.
AD-A135 969
Reprint: Oxidation of Dodecamethylcyclohexasilane by m-Chloroperbenzoic Acid.
AD-A136 327
Reprint: The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds.
AD-A137 075

*OXIDATION REDUCTION REACTIONS
Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.
AD-A137 097

*OXIDES
Reprint: Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine.
AD-A135 140

*OXYGEN
Reprint: The I(2P1/2)02 Reverse Yield I(2P3/2)02(1Delta) Equilibrium.
AD-A136 052
Electrocatalysis of Oxygen Using Water Soluble Metal Porphyrins and Chemically Modified Porphyrin Electrodes.*
AD-A136 062
Reprint: Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins.
AD-A138 637
Reprint: Electrochemistry of Oxygen Reduction. 4. Oxygen to Water Conversion by Iron(II) tetrakis(N-Methyl-4-Pyridyl)Porphyrin via Hydrogen Peroxide.
AD-A138 638

*P TYPE SEMICONDUCTORS
Reprint: Degenerate Four-Wave Mixing due to Intervalance Band Transition in rho-Type Mercury Cadmium Telluride.
AD-A135 771

*PARALLEL PROCESSING
Reprint: Assigning Processes to Processors in Distributed Systems.
AD-A135 497
Synthesis of Efficient Structures for Concurrent Computation.*
AD-A135 892
High Performance Parallel Computing.*
AD-A137 774

*PARALLEL PROCESSORS
A Versatile Parallel Image Processor System.*
AD-A136 292
A CRAY-Class Multiprocessor Simulator.*
AD-A136 555
Parallel Logic Programming and ZMOB and Parallel Systems Software and Hardware.*
AD-A137 068

*PARTIAL DIFFERENTIAL EQUATIONS
Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.*
AD-A135 110
Final Report on Scientific Activities Pursuant to the Provisions of AFOSR Grant-79-0018, Nov 1, 1981 through October 31, 1982.*
AD-A135 146
Optical Analog & Hybrid Computer Solution o Partial Differential Equations.*
AD-A137 028

*PARTICLE COLLISIONS
Reprint: Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach.
AD-A135 127
Reprint: Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F H sub 2 Collisions.
AD-A135 180
Reprint: Collisional Ionization as a Nonlocalized Process and the Breakdown of the Franck-Condon Approximation.
AD-A136 040
Reprint: Single Collision Ion-Molecule Reactions at Thermal Energy: Rotational and Vibrational Distributions from N CO Yields N CO.
AD-A136 066

*PARTS
Effects of Assuming Independent Component Failure Times, if They Are Actually Dependent, in a Series System.*
AD-A136 567

*PATTERN RECOGNITION
A Versatile Parallel Image Processor System.*
AD-A136 292

*PATTERNS
Aspects of Pattern Theory.*

Characteristics of an Integrated Optics Ring Resonator.*
AD-A135 878

*OPTICAL LENSES
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.*
AD-A137 103

*OPTICAL PROCESSING
Topical Meeting on Signal Recovery and Synthesis with Incomplete Information and Partial Constraints Held at Incline Village, Nevada on January 12-14, 1983.*
AD-A135 629
Acousto-Optic Processing of 2-D Signals Using Temporal and Spatial Integration.*
AD-A136 086
Optical Data Processing for Missile Guidance.*
AD-A136 216
A Comparison of Optical versus Hardware Fourier Transforms.*
AD-A136 223
Optical Analog & Hybrid Computer Solution of Partial Differential Equations.*
AD-A137 028
Optical Processing in Radon Space.*
AD-A137 033
Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.*
AD-A138 736
Real-Time Implementation of Nonlinear Optical Processing Functions.*
AD-A138 843

*OPTICAL PROPERTIES
Reprint: Mechanisms of Optical Phase Conjugation in Hg(1-x)Cd(x)Te.
AD-A135 699
Reprint: Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe.
AD-A135 772
Reprint: Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.
AD-A136 197
Topical Meeting on Optical Bistability Held at Rochester, New York on 15-17 June 983.*
AD-A138 998

*OPTICAL WAVEGUIDES
Characteristics of an Integrated Optics Ring Resonator.*
AD-A135 878
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.*
AD-A137 103

*OPTICS
Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.*
AD-A136 561

*OPTIMIZATION
Optimization for Vibration Isolation.*
AD-A137 895

*ORBITS
Orbit Connections in a Parabolic Equation.*
AD-A135 986

*ORGANIC COMPOUNDS
Reprint: Angle-Resolved SIMS (secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111).
AD-A135 128
Reprint: Orbital Symmetry Analysis of the Reaction of Silylenes with Acetylenes and the Dimerization of 1-Silacyclopropenes.
AD-A136 006
Reprint: Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry.
AD-A136 140

*ORGANIC PHOSPHORUS COMPOUNDS
Reprint: Novel Di-isopropylamino Derivatives of Trivalent Phosphorus.
AD-A135 468
Polyphosphorus Compounds Containing Phosphorus-Nitrogen Bonds.*
AD-A137 722
Anticholinesterase Effects on Number and Function of Brain Muscarinic Receptors and Central Cholinergic Activity: Drug Intervention.*
AD-A138 746

*ORGANIC SOLUTES
Reprint: Stochastic Effects in the Formation of Condensed Thymine Films at the Water-Mercury Interface.
AD-A135 778

*ORGANOMETALLIC COMPOUNDS
Reprint: Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphosphine))bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7.
AD-A135 723
Reprint: A Simple High-Yield Preparation of Potassium Tris(oxalato)iridate(III) with a Novel Solvent Extraction Step.
AD-A136 245
Synthesis and Chemistry of Energetic Metallotetraazadienes.*
AD-A136 269
Reprint: Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl.
AD-A136 326
Reprint: A New Synthesis for Methyl/Trifluoromethyl

Reprint: Influence of Nuclear Spin on Chemical Reactions. Magnetic Isotope and Magnetic Field Effects. A Review.
AD-A136 175

*NUCLEOSIDES
Effect of Chemicals on the Cell Membrane Transport of Nucleosides.*
AD-A137 890

*NUCLEOTIDES
Reprint: Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose.
AD-A137 078

*NUMBERS
Reprint: Tightness and Strong Laws of Large Numbers in Banach Spaces.
AD-A135 097

*NUMERICAL INTEGRATION
Reprint: Accurate Multistep Methods for Smooth Stiff Problems.
AD-A135 220
Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.*
AD-A136 561

*NUMERICAL METHODS AND PROCEDURES
Estimation Techniques for Transport Equations.*
AD-A135 092
Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.*
AD-A135 093
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.*
AD-A135 109
Final Report on Grant AFOSR-82-0171.*
AD-A135 152
Applications of Non-Self-Adjoint Operator Theory to the Singularity Expansion Method (SEM) and to the Eigenmode Expansion Method (EEM) in Acoustic and Electromagnetic Problems.*
AD-A135 177
Asynchronous Discrete Control of Continuous Processes.*
AD-A135 257
Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.*
AD-A135 711
Reprint: Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface.
AD-A135 722
Reprint: Calculation of the Laplace Transform of the Length of the Busy Period for the M/G/1 Queue via Margingales.
AD-A136 053
Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.*
AD-A138 736

*NUMERICAL QUADRATURE
Convergence of Quadratic Forms in p-Stable Random Variables and Theta sub p-Radonifying Operators.*
AD-A135 314

*OLEFIN POLYMERS
Reprint: Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154

*OPERATIONAL AMPLIFIERS
Reprint: DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.
AD-A135 662

*OPERATIONS RESEARCH
Interim Scientific Report: AFOSR-81-0122.*
AD-A136 579

*OPERATORS(MATHEMATICS)
Applications of Non-Self-Adjoint Operator Theory to the Singularity Expansion Method (SEM) and to the Eigenmode Expansion Method (EEM) in Acoustic and Electromagnetic Problems.*
AD-A135 177
Optical Data Processing for Missile Guidance.*
AD-A136 216
Reprint: Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators.
AD-A136 592
Reprint: Partial Inverse of a Monotone Operator.
AD-A137 016

*OPTICAL COATINGS
Optical Thin Film Workshop.*
AD-A135 980

*OPTICAL CORRELATORS
Optical Data Processing for Missile Guidance.*
AD-A136 216

*OPTICAL DATA
Development and Applications of the Microchannel Spatial Light Modulator.*
AD-A136 132

*OPTICAL EQUIPMENT
Research on New Approaches to Optical Systems for Inertial Rotation Sensing.*
AD-A136 045
Phase Conjugate Optical Resonator.*
AD-A136 071

*OPTICAL EQUIPMENT COMPONENTS
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.*
AD-A137 103

*OPTICAL GLASS

Performance Evaluation and Control of Distributed Computer Communication Networks.*
AD-A135 121

*NETWORK FLOWS
Interim Scientific Report: AFOSR-81-0122.*
AD-A136 579

*NETWORKS
Summary of Research, 15 June 1982 to 14 June 1983, Grant AFOSR-81-0197.*
AD-A135 074

*NEUROPHYSIOLOGY
Neurophysiological Bases of Event-Related Potentials.*
AD-A135 263

*NIOBIUM COMPOUNDS
Reprint: Tunneling Properties of Single Crystal Nb/Nb205/Pb Josephson Junctions.
AD-A135 670

*NITRATION
Nitrations Conference Held at Menlo Park, California on 27-29 July 1983.*
AD-A135 822

*NITRILES
Reprint: Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154

*NITROGEN
Reprint: Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2 in Helium.
AD-A137 765

*NITROGEN OXIDES
Reprint: Infrared Chemiluminescence from Vibrationally Excited NO: Product Bracnhing in the N 02 Ion-Molecule Reaction.
AD-A136 074
Reprint: Nitric Oxide Vibrational Excitation from the N(4S)02 Reaction.
AD-A136 460

*NITROSAMINES
Reprint: In vitro Transformation of Cultured Human Diploid Fibroblasts.
AD-A135 474

*NITROSO COMPOUNDS
Reprint: In vitro Transformation of Cultured Human Diploid Fibroblasts.
AD-A135 474

*NOISE
Reprint: Identification from Real Data.
AD-A137 820

*NOISE REDUCTION
Reprint: Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.
AD-A137 024

*NOISE(ELECTRICAL AND ELECTROMAGNETIC)
Reprint: Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.
AD-A137 024

*NOISE(SOUND)
Reprint: Noise Generation by a Low-Mach-Number Jet.
AD-A138 698

*NONAQUEOUS ELECTROLYTES
High Energy Density Non-Aqueous Battery System.*
AD-A135 395

*NONLINEAR ALGEBRAIC EQUATIONS
Smoothness of Bounded Solutions of Nonlinear Evolution Equations.*
AD-A135 294

*NONLINEAR ANALYSIS
Aeroelastic Analysis Using Nonlinear Aerodynamic Methods.*
AD-A135 133
Nonlinear Systems in Infinite Dimensional State Spaces.*
AD-A136 530

*NONLINEAR DIFFERENTIAL EQUATIONS
Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.*
AD-A135 110

*NONLINEAR SYSTEMS
Linear and Nonlinear Filtering and Related Inverse Scattering Problems.*
AD-A135 175
The Nonlinear Filtering Problem for the Unbounded Case.*
AD-A136 501
Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080
Real-Time Implementation of Nonlinear Optical Processing Functions.*
AD-A138 843
Topical Meeting on Optical Bistability Held at Rochester, New York on 15-17 June 983.*
AD-A138 998

*NONPARAMETRIC STATISTICS
Aspects of Pattern Theory.*
AD-A136 506

*NUCLEAR MAGNETIC RESONANCE
Reprint: 29Si NMR of Pentacoordinate Silicon Derivatives.
AD-A136 073

*NUCLEAR SPINS

AD-A137 034
Reprint: Spectroscopy of Molecules at High Excitation Levels.
AD-A137 835

*MOLECULE MOLECULE INTERACTIONS
Reprint: Sphericalization of Nonspherical Interactions.
AD-A135 742

*MOLECULES
Reprint: Dynamics of Orientational Fluctutations of Molecules Near a Liquid-Solid Interface: A Landau Ginzburg Description.
AD-A135 148
Picosecond Laser Studies of Excited State Processes.*
AD-A136 137
Reprint: Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.
AD-A137 036
Final Technical Report of Research Performed under Grant AFOSR-80-0262.*
AD-A137 892

*MOLYBDENUM
Reprint: Competitive Rates of Reactions of Molybdenum Atoms with Arenes.
AD-A136 078

*MONOLITHIC STRUCTURES(ELECTRONICS)
Monolithic ZnO SAW (Surface Acoustic Waves) Structures.*
AD-A135 987

*MONTE CARLO METHOD
Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.*
AD-A136 237

*MOTION
Reprint: Electrophysiology and Psychophysics of Motion in Depth.
AD-A135 167

*MOTIVATION
Reprint: A Psychophysiological Theory of Reinforcement, Drive, Motivation and Attention.
AD-A135 495

*MULTICHANNEL COMMUNICATIONS
Study of Finitistic Channel Models.*
AD-A136 139

*MULTIPROCESSORS
A CRAY-Class Multiprocessor Simulator.*
AD-A136 555

*MUSCARINE
Anticholinesterase Effects on Number and Function of Brain Muscarinic Receptors and Central Cholinergic Activity: Drug Intervention.*
AD-A138 746

*N TYPE SEMICONDUCTORS
Shuttle Flight Test of an Advanced Gamma-Ray Detection System.*
AD-A136 157

*NARROW GAP SEMICONDUCTORS
Reprint: Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.
AD-A135 959

*NAVAL LOGISTICS
Reprint: Periodic Replacement When Minimal Repair Costs Vary with Time.
AD-A135 284

*NAVIER STOKES EQUATIONS
Final Report on Grant AFOSR-82-0171.*
AD-A135 152
Interim Technical Report, 1 June 1982-31 May 1983, Grant AFOSR-82-0213,*
AD-A136 158
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.*
AD-A137 022
Global PNS (Parabolized Navier-Stokes) Solutions for Laminar and Turbulent Flow.*
AD-A137 829

*NEON
Inelastic X-Ray Scattering Cross Sections of Ne.*
AD-A135 801
Reprint: Charge Transfer between Neon Ions and Metastable Helium.
AD-A136 517

*NEOPLASMS
Correlation of Mutagenic, Carcinogenic and Co-Carcinogenic Effects of Chemical Substances. Granuloma Pouch Assay.*
AD-A137 794

*NERVE CELLS
Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.*
AD-A136 507
Dynamic Models of Neural Systems: Propagated Signals, Photoreceptor Transduction, and Circadian Rhythms.*
AD-A137 826

*NERVOUS SYSTEM
Reprint: The Generation of Rhythmic Activity in a Distributed Motor System.
AD-A135 470
Reprint: Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea.
AD-A135 530
Dynamic Models of Neural Systems: Propagated Signals, Photoreceptor Transduction, and Circadian Rhythms.*
AD-A137 826

*NETWORK ANALYSIS(MANAGEMENT)

*MICROSTRUCTURE
Silicon Nitride Joining.*
AD-A136 547

*MICROWAVE BEAMS
Microwave Emission from Relativistic Electron Beams.*
AD-A137 752

*MICROWAVE EQUIPMENT
Microwave Semiconductor Research - Materials, Devices, Circuits.*
AD-A137 798

*MICROWAVES
Proceedings of Microwaves and Thermoregulation Held at New Haven, Connecticut on 26-27 October 1981.*
AD-A134 778
Reprint: Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure.
AD-A135 163

*MILLIMETER WAVES
Research on Ferroelectric Materials for Millimeter Wave Application.*
AD-A137 128
Microwave Emission from Relativistic Electron Beams.*
AD-A137 752

*MINDO MOLECULAR ORBITALS
Reprint: Development and Status of MINDO/3 and MNDO.
AD-A135 467
Reprint: Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine.
AD-A135 728

*MIRRORS
Phase Conjugate Optical Resonator.*
AD-A136 071
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser.*
AD-A138 740

*MODULES(ELECTRONICS)
Fault Isolation of Modular Equipment with Imperfect Built-in-Tests.*
AD-A137 046

*MOLECULAR IONS
Reprint: Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) HF yields OH(v-0, 1) F (-).
AD-A136 318

*MOLECULAR ORBITALS
Reprint: Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethane.
AD-A135 970
Reprint: Natural Correlation Diagrams. A Unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions.
AD-A136 003
Reprint: Orbital Symmetry Analysis of the Reaction of Silylenes with Acetylenes and the Dimerization of 1-Silacyclopropenes.
AD-A136 006

*MOLECULAR PROPERTIES
Reprint: Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique.
AD-A137 051

*MOLECULAR POTATION
Reprint: Very-Low-Energy Collision-Induced Rotational Relaxation. A Theoretical Analysis.
AD-A137 035

*MOLECULAR SPECTROSCOPY
Reprint: Spectroscopy of Molecules at High Excitation Levels.
AD-A137 835

*MOLECULAR STATES
Reprint: Very Low Energy Collision Induced Vibrational Pelaxation of (1)A sub u Glyoxal.
AD-A135 106
Reprint: Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne.
AD-A135 724

*MOLECULAR STRUCTURE
Reprint: The X-Ray Crystal Structure of Tetramesityldisilene.
AD-A135 957
Reprint: Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds.
AD-A136 005
Reprint: Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.
AD-A136 077
Reprint: The Effect of Intercalation on the Lattice Constants of Graphite.
AD-A136 081
Reprint: CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis- and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles.
AD-A137 833

*MOLECULAR VIBRATION
Reprint: Very Low Energy Collision Induced Vibrational Relaxation of (1)A sub u Glyoxal.
AD-A135 106
Reprint: Product Vibrational State Distributions in Thermal Energy Associative Detachment Reactions: F- H,D Yields HF8v), DF(v)e-.
AD-A136 049
Reprint: SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy Transfer in 1B1 Difluorodiazirine.

Study of Finitistic Channel Models.*
AD-A136 139
Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.*
AD-A136 507
Final Scientific Report: 1978 - 1983.*
AD-A136 531
Mathematical Models for Damageable Structures.*
AD-A136 574
Reprint: The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems.
AD-A137 074
Component Relevancy in Multistate Systems.*
AD-A137 727
Fractal Phase Screens.*
AD-A137 804
Dynamic Models of Neural Systems: Propagated Signals, Photoreceptor Transduction, and Circadian Rhythms.*
AD-A137 826
Reprint: Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group).
AD-A138 560
Modeling of Inhalation Administration of Vapors with Capacity Limited Clearance.*
AD-A138 847
Adaptive Hybrid Picture Coding.*
AD-A138 876

*MATRICES(MATHEMATICS)
Reprint: On the Mapping A approaches Limit of A.
AD-A135 271
Analysis of Adaptive Differential PCM (Pulse-Code Modulator) of a Stationary Gauss-Markov Input.*
AD-A136 518
Summary of Work Done on Grant AFOSR-82-0078.*
AD-A136 570
Reprint: The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems.
AD-A137 074

*MEASUREMENT
Reprint: Measurement Photon Yields.
AD-A136 148
New Techniques for Measuring Single Event Related Brain Potentials.*
AD-A138 694

*MEDICAL COMPUTER APPLICATIONS
Reprint: Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219

*MEMBRANES(BIOLOGY)
Reprint: Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport.
AD-A135 491

*MESSAGE PROCESSING
Preserving Asymmetry by Symmetric Processes and Distributed Fair Conflict Resolution.*
AD-A135 458

*METAL CARBONYLS
Reprint: Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino)bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule.
AD-A135 716

*METAL COMPLEXES
Reprint: Poly(tertiary Phosphines and Arsines). 18 Preparation and Structure of bis(u-((methylamino)bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule.
AD-A135 716
Studies of Polymer-Bound Macrocyclic Polytertiary Phosphines.*
AD-A135 718
Reprint: Interactions of Ruthenium(II) Photosensitizers with Triton X-100.
AD-A136 079
Reprint: Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2-bipyridine)ruthenium(II) to Laser Dyes.
AD-A136 203

*METALS
Reprint: Initial Oxide Growth Rate on Newly Generated Surfaces.
AD-A135 969

*METASTABLE STATE
Metastable Superconducting Pairs with Large Momentum.*
AD-A136 246

*METHANES
Reprint: Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethane.
AD-A135 970

*METHYL RADICALS
Reprint: Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane.
AD-A137 723

*MICROPROCESSORS
A Versatile Parallel Image Processor System.*
AD-A136 292

Microfabrication Techniques for VLSI Magnetic Devices.*
AD-A138 919

*MAGNETIC PROPERTIES
Reprint: Influence of Nuclear Spin on Chemical Reactions. Magnetic Isotope and Magnetic Field Effects. A Review.
AD-A136 175

*MAGNETOHYDRODYNAMIC WAVES
Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.*
AD-A138 745

*MAGNETOHYDRODYNAMICS
Kinetic Theory of Gases, Magneto-Fluid Dynamics and Their Application.*
AD-A137 082

*MAGNETOOPTICS
A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.*
AD-A138 919

*MAGNETOSPHERE
Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.*
AD-A138 745

*MAGNETRONS
Reprint: Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL).
AD-A136 014

*MAGNETS
Investigation of Optimum Magnet Geometries for Gain-Expanded Free-Electron Lasers.*
AD-A136 494

*MANPOWER UTILIZATION
Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.*
AD-A135 211

*MANUFACTURING
Manufacturing Information System.*
AD-A137 891

*MAPPING
Reprint: On the Mapping A approaches Limit of A.
AD-A135 271
Reprint: Partial Inverse of a Monotone Operator.
AD-A137 016

*MARKOV PROCESSES
Markov Texture Generation.*
AD-A136 168
Markov Processes Applied to Control, Replacement, and Signal Analysis.*
AD-A136 508
Markov Processes Applied to Control, Replacement, and Signal Analysis.*
AD-A136 524

*MASKING
Reprint: Spatial Frequency Masking and Weber's Law.
AD-A137 755

*MASS
Reprint: Apparent-Mass Coefficients for Isosceles Triangles and Cross Sections Formed by Two Circles.
AD-A138 612

*MATERIALS
Annual Scientific Report for Grant AFOSR-82-0152, 1 April 1982 - 31 March 1983.*
AD-A135 111
Computer-Based Methods for Thermodynamic Analysis of Materials Processing.*
AD-A136 085

*MATHEMATICAL ANALYSIS
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.*
AD-A135 663

*MATHEMATICAL FILTERS
Reprint: Approximations for Nonlinear Filtering.
AD-A136 135
The Nonlinear Filtering Problem for the Unbounded Case.*
AD-A136 501
Robust Procedures for Communication Data.*
AD-A136 540

*MATHEMATICAL LOGIC
Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.*
AD-A136 457

*MATHEMATICAL MODELS
Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.*
AD-A135 093
Final Scientific Report on Grant AFOSR-80-0175.*
AD-A135 117
Algorithms, Modeling and Estimation for Linear Systems.*
AD-A135 134
Reprint: Viscoelastic Fluid Flow Exhibiting Hysteritic Phase Changes.
AD-A135 411
Mathematical Simulation of the Cardiopulmonary System.*
AD-A135 460
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.*
AD-A135 570
Search with Limited Resources.*
AD-A136 122

Graphite-Potassium-Amalagam Compounds.
AD-A136 300
Reprint: Lattice-Dynamical Model for Graphite.
AD-A136 332
Reprint: Lattice-Dynamical Model for Alkali-Metal-Graphite Intercalation Compounds.
AD-A136 357
Lattice Statistics.*
AD-A136 588

*LEAD(METAL)
Reprint: Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region.
AD-A135 149

*LIGHT MODULATORS
Development and Applications of the Microchannel Spatial Light Modulator.*
AD-A136 132
Optical Data Processing for Missile Guidance.*
AD-A136 216

*LIGHT SCATTERING
Reprint: Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum.
AD-A135 999
Reprint: Guided-Wave Polaritons in Thin Films of the Layered Compound GaSe.
AD-A136 102
Reprint: Raman Scattering Mediated by Surface-Plasmon Polariton Resonance.
AD-A136 151
Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.
AD-A137 097

*LINE SPECTRA
Possible Detection of Thermal Cyclotron Lines from Small Sources within Solar Active Regions.*
AD-A136 218

*LINEAR ALGEBRAIC EQUATIONS
Reprint: Algebraic Reductions of Scalar Three-Dimensional Systems.
AD-A135 132

*LINEAR DIFFERENTIAL EQUATIONS
Reprint: One Canonical Form for Higher-Index Linear Time-Varying Singular Systems.
AD-A135 169

*LINEAR PROGRAMMING
Hidden and Embedded Structure in Linear Programs.*
AD-A137 773

*LINEAR SYSTEMS
An Algebraic Approach to Analysis and Control of Time-Scales.*
AD-A135 115
Algorithms, Modeling and Estimation for Linear Systems.*
AD-A135 134
Reprint: Stabilization of Polynomially Parametrized Families of Linear Systems. The Single-Input Case.
AD-A137 830

*LINEARITY
Reprint: Weak Convergence of Linear Forms in D(0,1).
AD-A135 424

*LIQUID CRYSTALS
Reprint: Dynamics of Orientational Fluctutations of Molecules Near a Liquid-Solid Interface: A Landau Ginzburg Description.
AD-A135 148

*LITHIUM COMPOUNDS
Reprint: Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes.
AD-A136 046

*LOGIC CIRCUITS
Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.*
AD-A136 457

*LOGIC DEVICES
Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.*
AD-A136 457

*LUBRICANTS
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.*
AD-A135 464

*MAGNESIUM
Reprint: Energetics and Mechanism of Mg(3P) Production in Mg/N2O/CO Flames.
AD-A135 356

*MAGNETIC DEVICES
A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.*
AD-A138 919

*MAGNETIC FIELDS
Reprint: Application of Weak Magnetic Fields to Influence Rates and Molecular Weight Distributions of Styrene Polymerization.
AD-A135 179
Reprint: High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*MAGNETIC MATERIALS
A Program of Research on

Laplace Transform of the Length of the Busy Period for the M/G/1 Queue via Margingales.
AD-A136 053

*LASER AMPLIFIERS
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 1.*
AD-A136 305

*LASER APPLICATIONS
Reprint: Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma.
AD-A137 026
Reprint: Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique.
AD-A137 051
Laser Chemical Vapor Deposition.*
AD-A137 827
Reprint: Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant.
AD-A137 834
Proceedings of the International Conference on Lasers '81 Held at New Orleans, Louisiana on 14-18 December 1981.*
AD-A138 498
Anomalous Laser Induced Bunch Lengthening on the ACO Storage Ring Free Electron Laser.*
AD-A138 814

*LASER BEAMS
Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080
Reprint: Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate.
AD-A137 763

*LASER CAVITIES
Reprint: Design and Operating Experience on Laser Cavity in a Vacuum of 10-10 TORR.
AD-A138 813

*LASER INDUCED FLUORESCENCE
Reprint: Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) HF yields OH(v-0, 1) F (-).
AD-A136 318
Reprint: Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.
AD-A136 319
Reprint: Nitric Oxide Vibrational Excitation from the N(4S)O2 Reaction.
AD-A136 460
Reprint: Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2 in Helium.
AD-A137 765

*LASERS
Reprint: Possibility of Isotope Separation by Selective Radiative Scattering.
AD-A135 692
Reprint: Theoretical Studies of Reactions in a Laser Field: F(2P(3/2),2P(1/2))H2eta omega(0.469 eV).
AD-A136 101
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 3.*
AD-A136 307
The Mark III Linac as a High Current Source for FEL (Free Electron Lasers) Experiments.*
AD-A136 312
Theoretical Studies on Free Electron Lasers.*
AD-A136 333
Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.
AD-A137 097
Reprint: Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154
Reprint: Storage Ring Free Electron Lasers: Experimental Progress and Future Prospects.
AD-A137 745
New Results of the ACO Storage Ring Free Electron Laser.*
AD-A137 785
Evolution of the Transverse Modes in a FEL (Free Electron Lasers), and Application to the Orsay Experiment.*
AD-A137 797
Proceedings of the International Conference on Lasers '81 Held at New Orleans, Louisiana on 14-18 December 1981.*
AD-A138 498
Progress and Problems in Storage Ring Free Electron Lasers.*
AD-A138 683
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser.*
AD-A138 740

*LATTICE DYNAMICS
Reprint: Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds.
AD-A136 010
Reprint: Observation of Superlattice-Induced Raman Modes in

in Helium.
AD-A137 765
Final Technical Report of Research Performed under Grant AFOSR-80-0262.*
AD-A137 892

*IRON
Reprint: Electrochemical Studies of Fe(II) and Fe(III) in an Aluminum Chloride-Butylpyridinium Chloride Ionic Liquid.
AD-A135 101

*IRON ORGANIC COMPOUNDS
Reprint: Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 1. Synthesis and Characterization.
AD-A135 968
Reprint: Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers.
AD-A136 059

*ISOMERS
Reprint: Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne.
AD-A135 724

*ISOTOPE EFFECT
Reprint: Comparisons between Theoretical and Experimental Deuterium Isotope Effects for Some Outer-Sphere Electrochemical Reactions.
AD-A137 098

*ISOTOPE SEPARATION
Reprint: Possibility of Isotope Separation by Selective Radiative Scattering.
AD-A135 692
Reprint: Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate.
AD-A137 763

*ITERATIONS
Reprint: A Semi-Direct Method for Modular Circuits.
AD-A135 138

*JET ENGINE FUELS
Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?*
AD-A137 735
Sublethal Effects of JP-4 on Aquatic Organisms and Communities.*
AD-A138 807

*JET FLOW
Prediction of an Apparent Flame Length in a Co-Axial Jet Diffusion Flame Combustor.*
AD-A135 088
Effects of Blowing Spanwise from the Tips of Low-Aspect Ratio Wings of Varying Taper Ratio, with Application to Improving STOL capability of Fighter Aircraft.*
AD-A135 688
Reattachment of a Three-Dimensional, Incompressible Jet to an Adjacent Axisymmetric Inclined Surface.*
AD-A136 288
Reprint: Preferred Modes and the Spreading Rates of Jets.
AD-A137 073
Reprint: Noise Generation by a Low-Mach-Number Jet.
AD-A138 698

*JET MIXING FLOW
Reprint: Thrust Augmenting Ejectors. Part 1.
AD-A135 498
Mixing of Swirling Flows and Behavior of Wet Flows.*
AD-A138 697

*JOB ANALYSIS
Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.*
AD-A135 211

*JOINT MILITARY ACTIVITIES
Joint Services Electronics Program.*
AD-A136 058

*JOSEPHSON JUNCTIONS
Reprint: Tunneling Properties of Single Crystal Nb/Nb2O5/Pb Josephson Junctions.
AD-A135 670

*KETONES
Reprint: Natural Correlation Diagrams. A Unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions.
AD-A136 003
Reprint: Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757

*LAMINAR BOUNDARY LAYER
The Hydrodynamic Stability of a Supersonic Laminar Boundary Layer over a Rough Wall.*
AD-A137 056
Three Dimensional/Boundary Layer Interaction: Laminar and Turbulent Behaviour.*
AD-A137 060

*LAMINAR FLOW
Analysis of Three-Dimensional Viscous Internal Flows.*
AD-A135 762
Global PNS (Parabolized Navier-Stokes) Solutions for Laminar and Turbulent Flow.*
AD-A137 829
Experimental Observations of Vortex Ring Interaction with the Fluid Adjacent to a Surface.*
AD-A138 999

*LAPLACE TRANSFORMATION
Reprint: Calculation of the

Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.*
AD-A135 093

*INSTRUMENTATION
Reprint: Some Aspects of Modern Electrochemical Instrumentation.
AD-A135 769

*INTEGRAL EQUATIONS
Reprint: Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface.
AD-A135 722

*INTEGRATED CIRCUITS
Reprint: A Semi-Direct Method for Modular Circuits.
AD-A135 138
Reprint: DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.
AD-A135 662

*INTEGRATED SYSTEMS
Coordinated Research in Robotics and Integrated Manufacturing.*
AD-A137 042

*INTERACTIONS
Interaction of Electromagnetic Fields with Plasma.*
AD-A135 173
An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.*
AD-A135 880

*INTERFACES
Reprint: The Structure of Charged Interfaces.
AD-A135 763
Reprint: Stochastic Effects in the Formation of Condensed Thymine Films at the Water-Mercury Interface.
AD-A135 778

*INTERFEROMETRY
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.*
AD-A135 663

*INTERPOLATION
Recursive Interpolation of Space-Limited Scenes.*
AD-A136 215
An Interpolation and Compaction Technique for Gridded Data.*
AD-A137 107

*INVERSE SCATTERING
Linear and Nonlinear Filtering and Related Inverse Scattering Problems.*
AD-A135 175
Research on the Inverse Problem of Scattering.*
AD-A136 493

*INVERSION
Reprint: The Calculations of an Inverse Potential Problem
AD-A136 067

*IODIDES
Reprint: The Anodic Behavior of Iodide at Platinum in the Presence of an Iodine Film under Potentiostatic Steady-State and Hydrodynamic Modulation Conditions.
AD-A135 113

*IODINATION
Reprint: Novel Oxidative Rearrangement of Beta, Gamma-Unsaturated Ketone Hydrazones on Iodination in Base.
AD-A135 094

*IODINE
Reprint: Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.
AD-A135 170
Reprint: The I(2P1/2)O2 Reverse Yield I(2P3/2)O2(1Delta) Equilibrium.
AD-A136 052
Reprint: Long Range Behavior of the Gerade States near the 2P3/2 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.
AD-A136 080

*ION BEAMS
Production of Negative Ions by Electron Impact.*
AD-A135 176

*ION BOMBARDMENT
Ion Beam Assisted Deposition of SiO2.*
AD-A136 247
Reprint: Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

*IONIZATION
Reprint: Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethare.
AD-A135 970
Reprint: Collisional Ionization as a Nonlocalized Process and the Breakdown of the Franck-Condon Approximation.
AD-A136 040
Reprint: Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

*IONS
Ionic Mechanisms of Carbon Formation in Flames.*
AD-A137 079
Reprint: Auger and Radiative Deexcitation of P(4) Ions.
AD-A137 747
Reprint: Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2

*PLATINUM
Reprint: Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg -I.
AD-A137 071

*POLAR REGIONS
A Study of Low Energy Electron Precipitations and Auroral Phenomena by Using the USAF Polar Orbiting Satellites.*
AD-A137 888

*POLAROGRAPHY
Reprint: Hadamard Transform Alternating Current Polarography.
AD-A135 777

*POLYATOMIC MOLECULES
Reprint: Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.
AD-A136 082

*POLYMERIZATION
Reprint: Application of Weak Magnetic Fields to Influence Rates and Molecular Weight Distributions of Styrene Polymerization.
AD-A135 179
Reprint: Stereochemistry of Photoinitiated Emulsion Polymerization.
AD-A135 193
Reprint: Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies.
AD-A137 762

*POLYMERS
The Molecular Toxicology of Chromatin.*
AD-A135 399
Studies of Polymer-Bound Macrocyclic Polytertiary Phosphines.*
AD-A135 718
Reprint: Probable Helical Conformation of Poly(ADP-ribose).
AD-A135 741
Reprint: Rigid-Ladder Polymers: Polymers Containing Anthraquinone Recurring Units.
AD-A136 012
Reprint: Phospha-s-Triazines. VI. Polymeric Systems.
AD-A136 068
Reprint: Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers.
AD-A136 349
Reprint: Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane.
AD-A136 583
Reprint: Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757
Reprint: *Diphosphatetraazacyclooctatetraenes*. III. Polymerization Studies.
AD-A137 762
Reprint: Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds.
AD-A137 764
Reprint: Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-Like Benzobisoxazole Polymers.
AD-A137 795
Reprint: CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis- and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles.
AD-A137 833

*POLYMETHYL METHACRYLATE
Reprint: Stereochemistry of Photoinitiated Emulsion Polymerization.
AD-A135 193

*POLYSTYRENE
Reprint: Application of Weak Magnetic Fields to Influence Rates and Molecular Weight Distributions of Styrene Polymerization.
AD-A135 179

*POLYSULFONES
TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.*
AD-A137 048

*POTENTIAL ENERGY
Reprint: Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F + H sub 2 Collisions.
AD-A135 180

*POTENTIAL FLOW
Analysis of Three-Dimensional Transonic Potential Flows Using Optimum Grid.*
AD-A135 744

*POWDER METALLURGY
A Fundamental Study of P/M processed Elevated Temperature Aluminum Alloys.*
AD-A136 154
The Fatigue of Powder Metallurgy Alloys.*
AD-A138 714

*PROBABILITY DISTRIBUTION FUNCTIONS
Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.*
AD-A136 561

*PROBLEM SOLVING
A Distributed Procedure to Detect and/or Deadlock.*
AD-A135 459
Interim Technical Report, 1 June 1982-31 May 1983, Grant AFOSR-82-0213,*
AD-A136 158
Return Difference Feedback Design for Robust Uncertainty Tolerance in Stochastic

Multivariable Control Systems.*
AD-A136 495
Parallel Logic Programming and ZMOB and Parallel Systems Software and Hardware.*
AD-A137 068
Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.*
AD-A137 828

*PROCESSING
Ultrastructure Processing and Environmental Stability of Advanced Structural and Electronic Materials.*
AD-A135 107
Computer-Based Methods for Thermodynamic Analysis of Materials Processing.*
AD-A136 085

*PROCESSING EQUIPMENT
Optical Processing in Radon Space.*
AD-A137 033

*PRODUCTION CONTROL
Coordinated Research in Robotics and Integrated Manufacturing.*
AD-A137 042

*PROGRAMMING LANGUAGES
Research in Programming Languages and Software Engineering.*
AD-A136 037
File Searching Problems in Logic Programming Systems.*
AD-A136 522
AdaRel: A Relational Extension of Ada.*
AD-A137 108
Programming Productivity Enhancement by the Use of Application Generators.*
AD-A137 124

*PROSTAGLANDIN
Immune Dysfunctions and Abrogation of the Inflammatory Response by Environmental Chemicals.*
AD-A137 768

*PROTEINS
Development of an in vivo Assay for Mistranslation: Inducing Activity of Pollutants and Characterization of Amino Acid Substitutions.*
AD-A137 069
Reprint: The Effect of in Vivo Treatment with Triiodothyronine on the in Vitro Synthesis of Protein-Poly(ADP)-Ribose Adducts by Isolated Cardiocyte Nuclei and the Separation of Poly(ADP)-ribosylated Proteins by Phenol Extraction and Electrophoresis.
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*PROTON REACTIONS
Reprint: Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-Like Benzobisoxazole Polymers.
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*PSYCHOLOGICAL TESTS
The Law of Comparative Judgment: Theory and Implementation.*
AD-A136 169

*PSYCHOMOTOR FUNCTION
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.*
AD-A136 268

*PSYCHOPHYSICS
Reprint: Functional Optical Invariants: A New Methodology for Aviation Research.
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The Law of Comparative Judgment: Theory and Implementation.*
AD-A136 169

*PSYCHOPHYSIOLOGY
Reprint: A Psychophysiological Theory of Reinforcement, Drive, Motivation and Attention.
AD-A135 495
Neuromagnetic Investigation of Workload and Attention.*
AD-A136 172
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.*
AD-A136 268

*PULMONARY FUNCTION
Mathematical Simulation of the Cardiopulmonary System.*
AD-A135 460

*PULSED LASERS
Reprint: Broadly Tunable Mode-Locked HgCdTe Lasers.
AD-A136 178

*PURINES
Effect of Chemicals on the Cell Membrane Transport of Nucleosides.*
AD-A137 890

*QUANTIZATION
Reprint: A Simple Class of Asymptotically Optimal Quantizers.
AD-A135 396
Interim Report, Grant AFOSR-81-0047, 1 October 1981 to 30 September 1982,*
AD-A136 520

*QUANTUM ELECTRONICS
Reprint: Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers.
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*QUANTUM THEORY
Reprint: Very-Low-Energy Collision-Induced Rotational Relaxation. A Theoretical Analysis.
AD-A137 035
Reprint: Quantum Dynamical Model

of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate.
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*QUENCHING(INHIBITION)
Reprint: Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.
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*QUEUEING THEORY
Applications of Functional Analytic and Martingale Methods to Problems in Queueing Network Theory.*
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*QUINONES
Reprint: Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.
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Research on Ferroelectric Materials for Millimeter Wave Application.*
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*RADAR ANTENNAS
High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.*
AD-A138 717

*RADAR RECEIVERS
High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.*
AD-A138 717

*RADIATION ABSORPTION
Reprint: Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate.
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UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser,*
AD-A138 740

*RADIATION EFFECTS
Proceedings of Microwaves and Thermoregulation Held at New Haven, Connecticut on 26-27 October 1981.*
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Reprint: Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure.
AD-A135 163

*RADIO ASTRONOMY
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.*
AD-A136 205

*RADIO SOURCES(ASTRONOMY)
Reprint: The Variability of the Optical Counterparts of Four Extragalactic Radio Sources.
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*RADIOFREQUENCY
Reprint: Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy.
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*RADIOFREQUENCY PULSES
Reprint: Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas.
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*RAMAN SPECTRA
Reprint: Guided-Wave Polaritons in Thin Films of the Layered Compound GaSe.
AD-A136 102
Reprint: Raman Scattering Mediated by Surface-Plasmon Polariton Resonance.
AD-A136 151
Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.
AD-A137 097

*RAMAN SPECTROSCOPY
Reprint: Model for Raman Scattering from Incompletely Graphitized Carbons.
AD-A136 458
Reprint: Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes.
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*RANDOM VARIABLES
Reprint: Complex Symmetric Stable Variables and Processes.
AD-A136 141

*RANKING
The Law of Comparative Judgment: Theory and Implementation.*
AD-A136 169

*RARE EARTH COMPOUNDS
Reprint: Multicolor Electrochromic Display Technology.
AD-A136 286

*RARE GASES
Spectroscopic Studies of the Products of the Reactions of Excited Noble-Gas Atoms.*
AD-A137 750

*RATIONAL FUNCTIONS
Reprint: On a Theorem of Hermite and Hurwitz.
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*RATIONAL NUMBERS
Reprint: Rational Approximations to Linear Forms of Exponentials and Binomials.
AD-A135 136

*RAYLEIGH SCATTERING
Reprint: Brillion and Rayleigh Studies of Urea Single Crystals.
AD-A136 142
Reprint: Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.
AD-A138 608

*REACTANTS(CHEMISTRY)
Reprint: Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes.
AD-A137 023

*REACTION KINETICS
Reprint: Competitive Rates of Reactions of Molybdenum Atoms with Arenes.
AD-A136 078
Reprint: Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154
Reprint: Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes.
AD-A137 425
Spectroscopic Studies of the Products of the Reactions of Excited Noble-Gas Atoms.*
AD-A137 750
Final Technical Report of Research Performed under Grant AFOSR-80-0262.*
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Reprint: Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism.
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*REACTION TIME
Reprint: Hemispheric Asymmetries in a Signal Detection Task.
AD-A138 806

*REAL TIME
Real-Time Implementation of Nonlinear Optical Processing Functions.*
AD-A138 843

*REASONING
Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.*
AD-A137 828

*RECURSIVE FUNCTIONS
Recursive Interpolation of Space-Limited Scenes.*
AD-A136 215

*REDUCTION(CHEMISTRY)
Electrocatalysis of Oxygen Using Water Soluble Metal Porphyrins and Chemically Modified Porphyrin Electrodes.*
AD-A136 062
Reprint: Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes.
AD-A137 425
Reprint: Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins.
AD-A138 637
Reprint: Electrochemistry of Oxygen Reduction. 4. Oxygen to Water Conversion by Iron(II) tetrakis(N-Methyl-4-Pyridyl)Porphyrin via Hydrogen Peroxide.
AD-A138 638

*REFLECTANCE
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 2.*
AD-A136 306

*REFLECTION
An Assessment of Recent Results on Pseudo-Stationary Oblique-Shock-Wave Reflections.*
AD-A135 260

*REFLECTIVITY
Reprint: Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.
AD-A136 197
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 2.*
AD-A136 306

*REGRESSION ANALYSIS
Reprint: Improving Resolution for Autoregressive Spectral Estimation by Decimation.
AD-A135 425

*REINFORCED CONCRETE
Reinforced Concrete Response to Near Field Explosions.*
AD-A135 876
The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.*
AD-A136 124

*RELATIVITY THEORY
Relativistic Broadening Near Cyclotron Resonance.*
AD-A136 224

*RELAXATION
Reprint: A Semi-Direct Method for Modular Circuits.
AD-A135 138
Rates of Relaxation in the Upper

Vibrational Levels of HF (Hydrogen Fluoride) and DF (Deuterium Fluoride).*
AD-A136 238
Reprint: Very-Low-Energy Collision-Induced Rotational Relaxation. A Theoretical Analysis.
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TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.*
AD-A137 048

*RELIABILITY
Reprint: The Reliability of K out of N Systems.
AD-A135 246
Effects of Assuming Independent Component Failure Times, if They Are Actually Dependent, in a Series System.*
AD-A136 567
Interim Scientific Report: AFOSR-81-0122.*
AD-A136 579

*REPLACEMENT
Reprint: Optimum Replacement of a System Subject to Shocks.
AD-A135 168

*REPLACEMENT THEORY
Reprint: Periodic Replacement When Minimal Repair Costs Vary with Time.
AD-A135 284
Interim Report, Grant AFOSR-80-0245.*
AD-A135 620

*REPORTS
Linear and Nonlinear Filtering and Related Inverse Scattering Problems.*
AD-A135 175
Topical Meeting on Signal Recovery and Synthesis with Incomplete Information and Partial Constraints Held at Incline Village, Nevada on January 12-14, 1983.*
AD-A135 629
Final Report on Grant AFOSR-78-3574, 1978-1983.*
AD-A136 519

*REQUIREMENTS
Reprint: Requirements Analysis - A Management Perspective.
AD-A136 106

*RESEARCH MANAGEMENT
Annual Scientific Report for Grant AFOSR-81-0205.*
AD-A135 452
Theory of Image Analysis and Recognition.*
AD-A135 453
Interim Report, Grant AFOSR-80-0245.*
AD-A135 620
Research in Programming Languages and Software Engineering.*
AD-A136 037
Interim Technical Report, 1 June 1982-31 May 1983, Grant AFOSR-82-0213,*
AD-A136 158
Research in Stochastic Processes.*
AD-A136 222
High Performance Parallel Computing.*
AD-A137 774

*RESONANCE
Final Scientific Report on Grant AFOSR-80-0175.*
AD-A135 117

*RESONATORS
Characteristics of an Integrated Optics Ring Resonator.*
AD-A135 878
Monolithic ZnO SAW (Surface Acoustic Waves) Structures.*
AD-A135 987
Phase Conjugate Optical Resonator.*
AD-A136 071
Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080

*RETRANSMISSION
On Retransmission Control Policies in Multiaccess Channels.*
AD-A136 534

*RIBONUCLEIC ACIDS
Chemical Carcinogen-Induced Changes in tRNA Metabolism in Human Cells.*
AD-A138 715

*RIBOSE
The Molecular Toxicology of Chromatin.*
AD-A135 399
Reprint: Probable Helical Conformation of Poly(ADP-ribose).
AD-A135 741
Reprint: Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose.
AD-A137 078
Reprint: The Effect of in Vivo Treatment with Triiodothyronine on the in Vitro Synthesis of Protein-Poly(ADP)-Ribose Adducts by Isolated Cardiocyte Nuclei and the Separation of Poly(ADP)-ribosylated Proteins by Phenol Extraction and Electrophoresis.
AD-A137 793

*RING LASERS
Reprint: Dewar Design for Optically Pumped Semiconductor Ring Laser.
AD-A136 041
Experimental Investigation of the Characteristics of an Ultraviolet Storage Ring Laser.*
AD-A137 751
Anomalous Laser Induced Bunch Lengthening on the ACO Storage Ring Free Electron Laser.*
AD-A138 814

*RINGS

Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080

*ROBOTICS
Coordinated Research in Robotics and Integrated Manufacturing.*
AD-A137 042

*ROBOTS
Coordinated Research in Robotics and Integrated Manufacturing.*
AD-A137 042

*RUBIDIUM
Reprint: Raman Scattering from Low-Frequency Phonos in Stage-2 Graphite-Rubidium Intercalation Compounds.
AD-A136 001
Reprint: Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds.
AD-A136 005

*RUTHENIUM COMPOUNDS
Reprint: Interactions of Ruthenium(II) Photosensitizers with Triton X-100.
AD-A136 079

*SCALAR FUNCTIONS
Reprint: Algebraic Reductions of Scalar Three-Dimensional Systems.
AD-A135 132
Orbit Connections in a Parabolic Equation.*
AD-A135 986

*SCALING FACTORS
Reprint: Scaling of the Bursting Frequency in Turbulent Boundary Layers.
AD-A134 822
An Algebraic Approach to Analysis and Control of Time-Scales.*
AD-A135 115
The Law of Comparative Judgment: Theory and Implementation.*
AD-A136 169

*SCATTERING
Reprint: A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering.
AD-A135 976
Reprint: Raman Scattering from Low-Frequency Phonos in Stage-2 Graphite-Rubidium Intercalation Compounds.
AD-A136 001

*SCATTERING CROSS SECTIONS
Inelastic X-Ray Scattering Cross Sections of Ne,*
AD-A135 801

*SCHOTTKY BARRIER DEVICES
Microwave Semiconductor Research - Materials, Devices, Circuits.*
AD-A137 798

*SCIENTIFIC LITERATURE
The Stability and Dynamics of Elastic Structures and Fluid Flows.*
AD-A137 184

*SCREENS(DISPLAYS)
Reprint: Multicolor Electrochromic Display Technology.
AD-A136 286

*SEALS(STOPPERS)
Rotordynamic Forces Developed by Labyrinth Seals.*
AD-A136 217

*SEARCH RADAR
High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.*
AD-A138 717

*SEARCHING
Search Algorithms and Their Implementation.*
AD-A135 154
The Program Complexity of Searching a Table *
AD-A135 299
Search with Limited Resources.*
AD-A136 122
File Searching Problems in Logic Programming Systems.*
AD-A136 522

*SEISMIC DATA
Body and Surface Wave Modeling of Observed Seismic Events.*
AD-A137 083

*SEISMIC WAVES
Reprint: Body Wave Amplitude and Travel Time Correlations Across North America.
AD-A136 097
Large-Scale Numerical Analysis of Seismic Waves in Basins.*
AD-A136 313
Body and Surface Wave Modeling of Observed Seismic Events.*
AD-A137 007
Body and Surface Wave Modeling of Observed Seismic Events.*
AD-A137 083
Spectral Analyses of High-Frequency Pn, Sn Phases from Very Shallow Focus Earthquakes.*
AD-A137 778

*SEMICONDUCTOR LASERS
Reprint: Dewar Design for Optically Pumped Semiconductor Ring Laser.
AD-A136 041
Reprint: Broadly Tunable Mode-Locked HgCdTe Lasers.
AD-A136 178

*SEMICONDUCTORS
Reprint: Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation.
AD-A135 181
Reprint: Mechanisms of Optical Phase Conjugation in Hg(1-

x)Cd(x)Te.
AD-A135 699
A Comparative Thermodynamic Analysis of Impurity Incorporation in Vapor Phase Epitaxial InP and GaAs.*
AD-A135 739
Reprint: The Structure of Charged Interfaces.
AD-A135 763
Reprint: Degenerate Four-Wave Mixing due to Intervalance Band Transition in rho-Type Mercury Cadmium Telluride.
AD-A135 771
Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.*
AD-A136 095
Reprint: Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.
AD-A136 197
Scientific Report on the International Conference on Metastable and Modulated Semiconductor Structures (MMSS) held at Pasadena, California on 6-10 December 1982.*
AD-A136 204
Microwave Semiconductor Research - Materials, Devices, Circuits.*
AD-A137 798
Reprint: Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant.
AD-A137 834

*SEQUENCES(MATHEMATICS)
Reprint: Comments on 'The Reconstruction of a Multidimensional Sequence from the Phase or Magnitude of Its Fourier Transform'.
AD-A136 011

*SET THEORY
On Acyclic Database Decompositions.*
AD-A135 105
The Program Complexity of Searching a Table.*
AD-A135 299

*SHEAR PROPERTIES
Understanding Transition to Turbulence in Shear Layers.*
AD-A134 796

*SHELLS(STRUCTURAL FORMS)
Efficient Finite Element Methods for Transient Nonlinear Analysis of Shells.*
AD-A136 044

*SHOCK WAVES
An Assessment of Recent Results on Pseudo-Stationary Oblique-Shock-Wave Reflections.*
AD-A135 260
Random Choice Solutions for Weak Spherical Shock-Wave Transitions of N-Waves in Air with Vibrational Excitation.*
AD-A135 903
Reprint: Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7.
AD-A137 015
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.*
AD-A137 052
Three Dimensional/Boundary Layer Interaction: Laminar and Turbulent Behaviour.*
AD-A137 060
Theoretical Investigation of Three-Dimensional Shock Wave-Turbulent Boundary Layer Interactions. Part 2.*
AD-A138 722

*SHOCK(MECHANICS)
Least Favorable Response of Inelastic Structures.*
AD-A136 289

*SIDELOBES
High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.*
AD-A138 717

*SIGNAL PROCESSING
Quantification of Interference and Detectability Properties of Visual Stimuli for Optimal Display Design.*
AD-A135 438
Topical Meeting on Signal Recovery and Synthesis with Incomplete Information and Partial Constraints Held at Incline Village, Nevada on January 12-14, 1983.*
AD-A135 629
Acousto-Optic Processing of 2-D Signals Using Temporal and Spatial Integration.*
AD-A136 086
Interim Report, Grant AFOSR-81-0047, 1 October 1981 to 30 September 1982.*
AD-A136 520
Interim Report on Grant AFOSR-81-0047, 1 October 1982 to 30 September 1983.*
AD-A136 560
Optical Processing in Radon Space.*
AD-A137 033
Study on Extremizing Adaptive Systems and Applications to Synthetic Aperture Radars.*
AD-A137 725

*SILANES
Reprint: Oxidation of Dodecamethylcyclohexasilane by m-Chloroperbenzoic Acid.
AD-A136 327
Reprint: Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane.
AD-A136 583
Reprint: Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane.
AD-A137 723

*SILICON COATINGS
Ion Beam Assisted Deposition of SiO2.*
AD-A136 247

*SILICON COMPOUNDS
Reprint: The X-Ray Crystal Structure of Tetramesityldisilene.
AD-A135 957
Reprint: Orbital Symmetry Analysis of the Reaction of Silylenes with Acetylenes and the Dimerization of 1-Silacyclopropenes.
AD-A136 006
Reprint: Electron Spin Resonance Studies of 1,4-Disilacyclohexa-2,5-Diene Free Radical Reactions.
AD-A136 072
Reprint: 29Si NMR of Pentacoordinate Silicon Derivatives.
AD-A136 073
Reprint: Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.
AD-A136 076
Reprint: Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry.
AD-A136 140
Reprint: Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?
AD-A136 149

*SILICON NITRIDES
Silicon Nitride Joining.*
AD-A136 547

*SILOXANES
Reprint: Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes.
AD-A136 046
Reprint: Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane.
AD-A136 583

*SILVER
Reprint: Angle-Resolved SIMS (secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111).
AD-A135 128
Reprint: Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region.
AD-A135 149
Reprint: Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.
AD-A135 171
Reprint: Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg -I.
AD-A137 071
Reprint: Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 179

*SIMULATORS
A CRAY-Class Multiprocessor Simulator.*
AD-A136 555

*SINGLE CRYSTALS
Reprint: Brillion and Rayleigh Studies of Urea Single Crystals.
AD-A136 142
Reprint: Critical Fluctuations at the Phase Transition in Benzil.
AD-A138 567

*SIZES(DIMENSIONS)
Reprint: Size Discrimination with Low Spatial Frequencies.
AD-A137 821

*SLEEP
Reprint: Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.
AD-A135 426

*SODIUM
Reprint: Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.
AD-A136 319

*SOLAR ACTIVITY
Possible Detection of Thermal Cyclotron Lines from Small Sources within Solar Active Regions.*
AD-A136 218

*SOLAR DISTURBANCES
Reprint: High-Resolution Observations of Solar Radio Bursts at 2, 6, 20 cm Wavelength.
AD-A136 207

*SOLID STATE ELECTRONICS
Basic Research in Electronics (JSEP) Joint Services Electronics Program.*
AD-A136 290

*SOLUTIONS(MIXTURES)
Reprint: On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water Sucrose NaCl at the Mercury Solution Interface.
AD-A135 779

*SOLVENTS
Reprint: Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System.
AD-A135 112

*SONIC BOOM
Random Choice Solutions for Weak Spherical Shock-Wave Transitions of N-Waves in Air with Vibrational Excitation.*
AD-A135 903

*SOOT

*STATISTICAL SAMPLES
Reprint: A Note on the Campbell Sampling Theorem
AD-A135 245

*STOCHASTIC CONTROL
Linear and Nonlinear Filtering and Related Inverse Scattering Problems.*
AD-A135 175

*STOCHASTIC PROCESSES
Algorithms, Modeling and Estimation for Linear Systems.*
AD-A135 134
Research in Stochastic Processes.*
AD-A136 222
Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.*
AD-A136 507
Estimation and Reconstruction for Stochastic Processes and Deterministic Functions.*
AD-A136 571
Research in Stochastic Processes.*
AD-A137 736
Reprint: Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group).
AD-A138 560

*STPATEGY
Approaches to Automatic Strategy Analysis and Synthesis.*
AD-A137 067

*STRENGTH(MECHANICS)
Durability and Failure Analyses of a Silane Treated Alpha-A1203/Polyethylene Joint in Wet Environment.*
AD-A136 089
The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.*
AD-A136 124

*STRESS(PHYSIOLOGY)
Physiological Adjustments to Hemorrhage, Altitude, and Work.*
AD-A137 781

*STRESS(PSYCHOLOGY)
Physiological Adjustments to Hemorrhage, Altitude, and Work.*
AD-A137 781

*STRESSES
Development of a Stress-Dependent Finite Element Slab Model.*
AD-A135 836

*STRIP TRANSMISSION LINES
Reprint: A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line.
AD-A135 649

*STRUCTURAL ANALYSIS
Ultrastructure Processing and Environmental Stability of Advanced Structural and Electronic Materials.*
AD-A135 107

*STRUCTURAL ENGINEERING
Identification of Damage in Hysteretic Structures.*
AD-A136 342

*STRUCTURAL RESPONSE
Mathematical Models for Damageable Structures.*
AD-A136 574

*STRUCTURES
Scientific Report on the International Conference on Metastable and Modulated Semiconductor Structures (MMSS) held at Pasadena, California on 6-10 December 1982.*
AD-A136 204
Aspects of Pattern Theory.*
AD-A136 506

*SUBLETHAL DOSAGE
Sublethal Effects of JP-4 on Aquatic Organisms and Communities.*
AD-A138 807

*SULFONES
Reprint: Polyaromatic Ether-Sulfone Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757

*SULFOXIDES
Reprint: Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.
AD-A136 076

*SUPERCONDUCTORS
Film Synthesis and New Superconductors.*
AD-A135 102
Reprint: Fast Relaxing Absorptive Nonlinear Refraction in Superlattices.
AD-A136 243
Metastable Superconducting Pairs with Large Momentum.*
AD-A136 246

*SUPERSONIC FLOW
Numerical Analysis of Dusty Supersonic Flow Past Blunt Axisymmetric Bodies.*
AD-A135 135
The Hydrodynamic Stability of a Supersonic Laminar Boundary Layer over a Rough Wall.*
AD-A137 056

*SURFACE ACOUSTIC WAVE DEVICES
Monolithic ZnO SAW (Surface Acoustic Waves) Structures.*
AD-A135 987
Optical Processing in Radon Space.*
AD-A137 033

*SURFACE ACOUSTIC WAVES
Basic Research in Electronics (JSEP) Joint Services Electronics

Ionic Mechanisms of Carbon Formation in Flames.*
AD-A137 079

*SPACECRAFT ANTENNAS
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.*
AD-A135 109

*SPECTRA
TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.*
AD-A137 048

*SPECTROMETRY
Atomic and Molecular Gas Phase Spectrometry.*
AD-A135 971
Reprint: Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.
AD-A137 024
Reprint: Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma.
AD-A137 026
Reprint: Evaluation of an Inductively Coupled Plasma with an Extended Sleeve Torch as an Atomization Cell for Laser Excited Fluorescence Spectrometry.
AD-A137 072
Reprint: Atomic Fluorescence Spectrometry with Inductively Coupled Plasma as Excitation Source and Atomization Cell.
AD-A137 076
Reprint: Pulsed Plasma Source Spectrometry in the 80-8000-eV X-Ray Region.
AD-A137 724

*SPECTROSCOPY
Reprint: SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy Transfer in 1B1 Difluorodiazirine.
AD-A137 034
Reprint: Synthesis and Spectra of Tetravinyldistibines.
AD-A137 733
Spectroscopic Studies of the Products of the Reactions of Excited Noble-Gas Atoms.*
AD-A137 750

*SPECTRUM ANALYSIS
Reprint: Improving Resolution for Autoregressive Spectral Estimation by Decimation.
AD-A135 425

*SPINAL COLUMN
Reprint: The Scanning Electron Microscopy of Compressed Spinal Units.
AD-A135 142
Reprint: Rhesus Monkey Intervertebral Disk Viscoelastic Response To Shear Stress.
AD-A135 161

*STABILITY
Harmonizable Stable Processes on Groups: Spectral, Ergodic and Interpolation Properties.*
AD-A136 504
Analysis of Adaptive Differential PCM (Pulse-Code Modulator) of a Stationary Gauss-Markov Input.*
AD-A136 518
Reprint: Stabilization of Polynomially Parametrized Families of Linear Systems. The Single-Input Case.
AD-A137 830

*STALLING
Unsteady Separated Flows: Vorticity and Turbulence.*
AD-A138 593

*STARS
Reprint: A Search for Light Variations in Barium Stars.
AD-A135 689

*STATISTICAL ANALYSIS
Effects of Assuming Independent Component Failure Times if They Are Actually Dependent, in a Series System.*
AD-A136 567
Lattice Statistics.*
AD-A136 588
Approaches to Automatic Strategy Analysis and Synthesis.*
AD-A137 067
Fractal Phase Screens.*
AD-A137 804
Reprint: Identification from Real Data.
AD-A137 820
Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.*
AD-A138 745

*STATISTICAL DATA
Statistical Data Processing, System Modeling and Reliability.*
AD-A135 208
Reprint: Identification from Real Data.
AD-A137 820

*STATISTICAL INFERENCE
Aspects of Pattern Theory.*
AD-A136 506

*STATISTICAL PROCESSES
Statistical Data Processing, System Modeling and Reliability.*
AD-A135 208
Development of Statistical Techniques to Better Utilize Data Characterized by Being Below Instrument Detection Thresholds and by Small Sample Size.*
AD-A135 408
Reprint: Complete Designs with Blocks of Maximal Multiplicity.
AD-A136 070
Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.*
AD-A138 745

Program.*
AD-A136 290

*SURFACE CHEMISTRY
Reprint: Prospects in the Analysis of Chemically Modified Electrodes.
AD-A138 639
Reprint: A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer.
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Reprint: Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy.
AD-A138 695

*SURFACE PROPERTIES
Reprint: Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation.
AD-A135 181

*SURFACE REACTIONS
Reprint: Initial Oxide Growth Rate on Newly Generated Surfaces.
AD-A135 969

*SURFACE ROUGHNESS
Rough Surface Scattering via the Smoothing Method.*
AD-A137 025
The Hydrodynamic Stability of a Supersonic Laminar Boundary Layer over a Rough Wall.*
AD-A137 056

*SURFACE WAVES
Reprint: Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum.
AD-A135 999
Body and Surface Wave Modeling of Observed Seismic Events.*
AD-A137 007
Body and Surface Wave Modeling of Observed Seismic Events.*
AD-A137 083

*SWITCHING
Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.*
AD-A137 080

*SYMPOSIA
Proceedings of Microwaves and Thermoregulation Held at New Haven, Connecticut on 26-27 October 1981.*
AD-A134 778
International Conference on Stiff Computation Held at Park City, Utah on April 12, 13 and 14, 1982.*
AD-A135 265
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 1. Objectives, Evaluation of Data, Specifications of Test Cases, Discussion, and Position Papers.*
AD-A135 569
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.*
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Topical Meeting on Signal Recovery and Synthesis with Incomplete Information and Partial Constraints Held at Incline Village, Nevada on January 12-14, 1983.*
AD-A135 629
Scientific Report on the International Conference on Metastable and Modulated Semiconductor Structures (MMSS) held at Pasadena, California on 6-10 December 1982.*
AD-A136 204
Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.*
AD-A136 457
Proceedings of the International Conference on Lasers '81 Held at New Orleans, Louisiana on 14-18 December 1981.*
AD-A138 498

*SYNAPSE
The Effects of Hydrazines and Related Compounds on Calcium Calmodulin Regulated Synaptic Processes.*
AD-A137 985

*SYNCHROTRONS
Reprint: Recent Results of the ACO Storage Ring F.E.L. Experiment.
AD-A137 803
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser,*
AD-A138 740

*SYNTHESIS(CHEMISTRY)
Reprint: Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System.
AD-A135 112
Reprint: Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino)bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule.
AD-A135 716
Reprint: Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 1. Synthesis and Characterization.
AD-A135 968
Reprint: Rigid-Ladder Polymers: Polymers Containing Anthraquinone

Recurring Units.
AD-A136 012
Reprint: Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers.
AD-A136 059
Reprint: Phospha-s-Triazines. VI. Polymeric Systems.
AD-A136 068
Reprint: A Simple High-Yield Preparation of Potassium Tris(oxalato)iridate(III) with a Novel Solvent Extraction Step.
AD-A136 245
Synthesis and Chemistry of Energetic Metallotetraazadienes.*
AD-A136 269
Reprint: Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl.
AD-A136 326
Polyphosphorus Compounds Containing Phosphorus-Nitrogen Bonds.*
AD-A137 722
Reprint: Synthesis and Spectra of Tetravinyldistibines.
AD-A137 733
Reprint: Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies.
AD-A137 762
Reprint: A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls.
AD-A137 894

*SYNTHETIC APERTURE RADAR
Study on Extremizing Adaptive Systems and Applications to Synthetic Aperture Radars.*
AD-A137 725

*SYNTHETIC MATERIALS
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.*
AD-A135 464

*SYSTEMS ANALYSIS
Control and Identification of Time Varying Systems.*
AD-A135 223
Effects of Assuming Independent Component Failure Times, if They Are Actually Dependent, in a Series System.*
AD-A136 567
Component Relevancy in Multistate Systems.*
AD-A137 727

*SYSTEMS ENGINEERING
Research in Programming Languages and Software Engineering.*
AD-A136 037
Reprint: Requirements Analysis - A Management Perspective.
AD-A136 106
Return Difference Feedback Design for Robust Uncertainty Tolerance in Stochastic Multivariable Control Systems.*
AD-A136 495

*TEMPERATURE CONTROL
Proceedings of Microwaves and Thermoregulation Held at New Haven, Connecticut on 26-27 October 1981.*
AD-A134 778
Reprint: Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure.
AD-A135 163

*TERRAIN
An Interpolation and Compaction Technique for Gridded Data.*
AD-A137 107

*TEST AND EVALUATION
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.*
AD-A137 103

*TEST METHODS
Fault Isolation of Modular Equipment with Imperfect Built-in-Tests.*
AD-A137 046
Studies of Aerodynamic Drag.*
AD-A137 740

*TEXTURE
Markov Texture Generation.*
AD-A136 168

*THEOREMS
Reprint: A Note on the Campbell Sampling Theorem.
AD-A135 245
Reprint: On a Theorem of Hermite and Hurwitz.
AD-A137 061

*THERMAL CONDUCTIVITY
Reprint: Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds.
AD-A136 010
Reprint: High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*THERMAL DEGRADATION
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.*
AD-A135 464

*THERMAL PROPERTIES
Reprint: Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry.
AD-A136 140

*THERMAL RADIATION
Possible Detection of Thermal Cyclotron Lines from Small Sources within Solar Active Regions.*

AD-A136 218

*THERMODYNAMIC PROPERTIES
Reprint: Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region.
AD-A135 149
A Comparative Thermodynamic Analysis of Impurity Incorporation in Vapor Phase Epitaxial InP and GaAs.*
AD-A135 739
Computer-Based Methods for Thermodynamic Analysis of Materials Processing.*
AD-A136 085

*THERMOPHYSICAL PROPERTIES
Reprint: Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition.
AD-A136 004

*THERMOPLASTIC RESINS
TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.*
AD-A137 048

*THICK FILMS
Reprint: Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.
AD-A135 170

*THIN FILMS
Film Synthesis and New Superconductors.*
AD-A135 102
Optical Thin Film Workshop.*
AD-A135 980
Ion Beam Assisted Deposition of SiO2.*
AD-A136 247

*THIOCYANATES
Reprint: Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes.
AD-A137 091

*THREE DIMENSIONAL FLOW
Analysis of Three-Dimensional Transonic Potential Flows Using Optimum Grid.*
AD-A135 744
Analysis of Three-Dimensional Viscous Internal Flows.*
AD-A135 762
Reattachment of a Three-Dimensional, Incompressible Jet to an Adjacent Axisymmetric Inclined Surface.*
AD-A136 288
The Generation of Three-Dimensional Body-Fitted Coordinate Systems for Viscous Flow Problems.*
AD-A136 503

*THRESHOLD EFFECTS
Reprint: Spatial Frequency Masking and Weber's Law.
AD-A137 755
Reprint: An Action Spectrum for Spatial-Frequency Adaptation.
AD-A137 758

*THROUGHPUT
A Distributed Procedure to Detect and/or Deadlock.*
AD-A135 459

*THRUST AUGMENTATION
Reprint: Thrust Augmenting Ejectors. Part 1.
AD-A135 498

*THRUST REVERSAL
Reattachment of a Three-Dimensional, Incompressible Jet to an Adjacent Axisymmetric Inclined Surface.*
AD-A136 288

*THYROID HORMONES
Effect of PFDA on Cardiac Membrane Function.*
AD-A137 729

*THYROXINE
Effect of PFDA on Cardiac Membrane Function.*
AD-A137 729

*TIME
An Algebraic Approach to Analysis and Control of Time-Scales.*
AD-A135 115

*TIME DOMAIN
Time Domain Analysis and Synthesis of Robust Controllers for Large Scale LQG (Linear Quadratic Gaussian) Regulators.*
AD-A137 760

*TIME SERIES ANALYSIS
Interim Report on Research Supported by Grant AFOSR-82-0187.*
AD-A137 086

*TITANIUM ALLOYS
Fatigue Crack Propagation in Ti-Mn Alloys: The Role of the Bauschinger Effect.*
AD-A136 036

*TOLUENES
Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?*
AD-A137 735

*TOXICITY
Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?*
AD-A137 735
Sublethal Effects of JP-4 on Aquatic Organisms and Communities.*
AD-A138 807
Modeling of Inhalation

Administration of Vapors with Capacity Limited Clearance.*
AD-A138 847

*TRACER STUDIES
Reprint: Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

*TRAILING EDGES
Measurements of the Near Wake of an Airfoil in Unsteady Flow.*
AD-A137 744

*TRANSDUCERS
Monolithic ZnO SAW (Surface Acoustic Waves) Structures.*
AD-A135 987

*TRANSFER FUNCTIONS
Reprint: Hadamard Transform Alternating Current Polarography.
AD-A135 777

*TRANSFORMATIONS(MATHEMATICS)
Reprint: Laws of Composition of Backlund Transformations and the Universal Form of Completely Integrable Systems in Dimensions Two and Three.
AD-A135 131
Reprint: Hadamard Transform Alternating Current Polarography.
AD-A135 777
Computer Program for Evaluating the Ives Transformation in Turbomachinery Cascades. Revision.*
AD-A137 064

*TRANSITION METALS
Reprint: Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes.
AD-A137 023

*TRANSONIC FLOW
Analysis of Three-Dimensional Transonic Potential Flows Using Optimum Grid.*
AD-A135 744
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.*
AD-A137 052

*TRANSPORT PROPERTIES
Reprint: Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport.
AD-A135 491

*TRAVELING WAVE ELECTRON ACCELERATORS
The Mark III Linac as a High Current Source for FEL (Free Electron Lasers) Experiments.*
AD-A136 312

*TRIAZINES
Reprint: Phospha-s-Triazines. VI. Polymeric Systems.
AD-A136 068
Reprint: Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.
AD-A136 077

*TUNABLE LASERS
Reprint: Broadly Tunable Mode-Locked HgCdTe Lasers.
AD-A136 178

*TUNING
Reprint: An Action Spectrum for Spatial-Frequency Adaptation.
AD-A137 758

*TURBINE BLADES
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.*
AD-A137 022

*TURBOMACHINERY
Rotordynamic Forces Developed by Labyrinth Seals.*
AD-A136 217

*TURBULENCE
Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 1. Experimental Data.
AD-A135 713
Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 2. Analysis of Results.
AD-A135 714
Reprint: Influence of Free-Stream Turbulence on Boundary Layer Transition in Favorable Pressure Gradients.
AD-A135 825

*TURBULENT BOUNDARY LAYER
Reprint: Scaling of the Bursting Frequency in Turbulent Boundary Layers.
AD-A134 822
Hot-Wire Measurements of Velocity and Temperature Fluctuations in a Heated Turbulent Boundary Layer.*
AD-A135 212
Three-Dimensional Turbulent Boundary Layer on a Body of Revolution at Incidence.*
AD-A135 454
Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 1. Experimental Data.
AD-A135 713
Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 2. Analysis of Results.
AD-A135 714
The Effects of Cylindrical Surface Modifications on Turbulent Boundary Layers.*
AD-A136 296
A Synthesized Model of the Near-Wall Behavior in Turbulent Boundary

Layers.*
AD-A137 029
Theoretical Investigation of Three-Dimensional Shock Wave-Turbulent Boundary Layer Interactions. Part 2.*
AD-A138 722

*TURBULENT FLOW
Understanding Transition to Turbulence in Shear Layers.*
AD-A134 796
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 1. Objectives, Evaluation of Data, Specifications of Test Cases, Discussion, and Position Papers.*
AD-A135 569
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.*
AD-A135 570
Analysis of Three-Dimensional Viscous Internal Flows.*
AD-A135 762
The 1980-81 AFOSR (Air Force Office of Scientific Research)-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 3. Comparison of Computation with Experiment, and Computors' Summary Report.*
AD-A136 034
Analytical Studies of Turbulent Flow Fields.*
AD-A137 008
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.*
AD-A137 052
An Investigation of Turbulence Mechanisms in V/STOL Upwash Flow Fields.*
AD-A137 775
Global PNS (Parabolized Navier-Stokes) Solutions for Laminar and Turbulent Flow.*
AD-A137 829

*TWO PHASE FLOW
Mixing of Swirling Flows and Behavior of Wet Flows.*
AD-A138 697

*ULTRAVIOLET LASERS
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 1.*
AD-A136 305
Experimental Investigation of the Characteristics of an Ultraviolet Storage Ring Laser.*
AD-A137 751

*ULTRAVIOLET RADIATION
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser,*
AD-A138 740

*UNSTEADY FLOW
Unsteady Boundary Layers on Thin Bodies of Revolution.*
AD-A136 257
Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.*
AD-A137 070
Measurements of the Near Wake of an Airfoil in Unsteady Flow.*
AD-A137 744
Unsteady Separated Flows: Vorticity and Turbulence.*
AD-A138 593
Visualization of Accelerating Flow around an Airfoil at High Angles of Attack.*
AD-A138 636

*UREA
Reprint: Brillion and Rayleigh Studies of Urea Single Crystals.
AD-A136 142

*VAPOR DEPOSITION
Laser Chemical Vapor Deposition.*
AD-A137 827

*VAPORS
Modeling of Inhalation Administration of Vapors with Capacity Limited Clearance.*
AD-A138 847

*VARIABLE STARS
Reprint: Photoelectric Comparison Sequences in the Fields of Four BL Lacertae Objects.
AD-A135 753
Reprint: The Optical Variability and Spectrum of PKS 2155-304.
AD-A135 826
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.*
AD-A136 205

*VIBRATION ISOLATORS
Optimization for Vibration Isolation.*
AD-A137 895

*VIBRATIONAL SPECTRA
Reprint: Infrared Chemiluminescence from Vibrationally Excited NO: Product Branching in the N 02 Ion-Molecule Reaction.
AD-A136 074
Rates of Relaxation in the Upper Vibrational Levels of HF (Hydrogen Fluoride) and DF (Deuterium Fluoride).*
AD-A136 238
Reprint: Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) HF yields OH(v-0, 1) F (-).

AD-A136 318
Reprint: Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.
AD-A136 319
Reprint: Nitric Oxide Vibrational Excitation from the N(4S)02 Reaction.
AD-A136 460

*VINYL RADICALS
Reprint: Synthesis and Spectra of Tetravinyldistibines.
AD-A137 733

*VISCOELASTICITY
Annual Scientific Report for Grant AFOSR-82-0152, 1 April 1982 - 31 March 1983,*
AD-A135 111
Reprint: Viscoelastic Fluid Flow Exhibiting Hysteritic Phase Changes.
AD-A135 411

*VISCOPLASTIC PROPERTIES
Reprint: Rhesus Monkey Intervertebral Disk Viscoelastic Response To Shear Stress.
AD-A135 161

*VISCOUS FLOW
Analysis of Three-Dimensional Viscous Internal Flows.*
AD-A135 762
Second Order Composite Velocity Solution for Large Reynolds Number Flows,*
AD-A138 926

*VISION
Reprint: Spatial Frequency Masking and Weber's Law.
AD-A137 755

*VISUAL AIDS
Visual Cues in the Simulation of Low-Level Flight.*
AD-A135 461

*VISUAL PERCEPTION
Reprint: Electrophysiology and Psychophysics of Motion in Depth.
AD-A135 167
Reprint: Functional Optical Invariants: A New Methodology for Aviation Research.
AD-A135 499
Single Trial Brain Electrical Patterns of an Audi ry and Visual Perceptuomotor Task.*
AD-A135 545
The Law of Comparative Judgment: Theory and Implementation.*
AD-A136 169
Reprint: Size Discrimination with Low Spatial Frequencies.
AD-A137 821

*VISUAL SIGNALS
Quantification of Interference and Detectability Properties of Visual Stimuli for Optimal Display Design.*
AD-A135 438

*VOLTAMMETRY
Reprint: Current-Voltage Analysis of Photoelectrochemical Cells under Mass and Light Flux Variation.
AD-A135 162
Reprint: Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism.
AD-A138 640

*VORTICES
Reprint: Acoustic Streaming in Swirling Flow and the Ranque-Hilsch (Vortex-Tube) Effect.
AD-A135 427
Reprint: Mechanisms of Inlet-Vortex Formation.
AD-A135 471
A Synthesized Model of the Near-Wall Behavior in Turbulent Boundary Layers.*
AD-A137 029
Unsteady Separated Flows: Vorticity and Turbulence.*
AD-A138 593
Energetics of Vortex Ring Formation.*
AD-A138 795
Experimental Observations of Vortex Ring Interaction with the Fluid Adjacent to a Surface.*
AD-A138 999

*WAKE
Measurements of the Near Wake of an Airfoil in Unsteady Flow.*
AD-A137 744

*WATER
Reprint: The Structure of Charged Interfaces.
AD-A135 763

*WAVE ANALYZERS
Reprint: A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line.
AD-A135 649

*WAVE EQUATIONS
Reprint: The Calculations of an Inverse Potential Problem
AD-A136 067

*WAVE PACKETS
Reprint: The Development of a Two-Dimensional Wavepacket in a Growing Boundary Layer.
AD-A135 209

*WAVE PROPAGATION
Fractal Phase Screens.*
AD-A137 804

*WAVEFORMS
New Techniques for Measuring Single Event Related Brain Potentials.*
AD-A138 694

*WAVES
An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.*

AD-A135 880

*WEAK CONVERGENCE
Reprint: Weak Convergence of Linear Forms in D(0,1).
AD-A135 424

*WEIGHTING FUNCTIONS
Reprint: Weak Convergence of Linear Forms in D(0,1).
AD-A135 424
Reprint: Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators.
AD-A136 592

*WIND
Reprint: Surface Signatures of a Dry Nocturnal Gust Front.
AD-A137 822

*WIND TUNNELS
Reprint: Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers.
AD-A135 729

*WIND VELOCITY
Reprint: Can A VHF Doppler Radar Provide Synoptic Wind Data? A comparison of 30 Days of Radar and Radiosonde Data.
AD-A135 357

*WINGS
Effects of Blowing Spanwise from the Tips of Low-Aspect Ratio Wings of Varying Taper Ratio, with Application to Improving STOL capability of Fighter Aircraft.*
AD-A135 688

*WORK FUNCTIONS
Reprint: Individual Differences in Multiple-Task Performance as a Function of Response Strategy.
AD-A135 500

*WORKLOAD
Neuromagnetic Investigation of Workload and Attention.*
AD-A136 172

*WORKSHOPS
Optical Thin Film Workshop.*
AD-A135 980

*X RAY APPARATUS
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 2.
AD-A136 306

*X RAY PHOTOELECTRON SPECTROSCOPY
Reprint: A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer.
AD-A138 641
Reprint: Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy.
AD-A138 695
Reprint: Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas.
AD-A138 749

*X RAY SCATTERING
Inelastic X-Ray Scattering Cross Sections of Ne,*
AD-A135 801

*X RAYS
Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 3.*
AD-A136 307

*ZINC OXIDES
Monolithic ZnO SAW (Surface Acoustic Waves) Structures.*
AD-A135 987

PERSONAL AUTHOR INDEX

*ABDEL-HAMEED, M.
* * *
Interim Report, Grant AFOSR-80-0245.
AD-A135 620

*ACKERMAN, B.
* * *
Surface Signatures of a Dry Nocturnal Gust Front,
AD-A137 822

*ADAIR, E. R.
* * *
Proceedings of Microwaves and Thermoregulation Held at New Haven, Connecticut on 26-27 October 1981.
AD-A134 778
* * *
Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure,
AD-A135 163

*ADAMS, B. W.
* * *
Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure,
AD-A135 163

*ADLER-GOLDEN, S.
* * *
Spectroscopy of Molecules at High Excitation Levels,
AD-A137 835

*AFSAR, M. N.
* * *
Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.
AD-A136 095

*AGGARWAL, R. L.
* * *
Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.
AD-A135 959

*AGRAWAL, P. M.
* * *
A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering,
AD-A135 976

*AHEARN, J. S.
* * *
Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds,
AD-A137 764

*AIKEN, R. C.
* * *
International Conference on Stiff Computation Held at Park City, Utah on April 12, 13 and 14, 1982.
AD-A135 265

*AIKMAN, R. E.
* * *
Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane,
AD-A137 723

*ALBERY, W. J.
* * *
Uniformly Accessible Electrodes,
AD-A135 205

*ALEX, M.
* * *
A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.
AD-A138 919

*ALLEN, D. K.
* * *
Manufacturing Information System.
AD-A137 891

*ALLEN, S. D.
* * *
Laser Chemical Vapor Deposition.
AD-A137 827

*ALLENDER, D. W.
* * *
Metastable Superconducting Pairs with Large Momentum.
AD-A136 246

*ALMEIDA, S. P.
* * *
A Comparison of Optical versus Hardware Fourier Transforms.
AD-A136 223

*ALNAIMI, I. S.
* * *
Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.
AD-A136 076
* * *
Oxidation of Dodecamethylcyclohexasilane by m-Chloroperbenzoic Acid,
AD-A136 327

*ALPERIN, M.
* * *
Thrust Augmenting Ejectors. Part 1.
AD-A135 498

*AL-JISHI, R.
* * *
Raman Scattering from Low-Frequency Phonons in Stage-2 Graphite-Rubidium Intercalation Compounds,
AD-A136 001
* * *
Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds,
AD-A136 300
* * *
Lattice-Dynamical Model for Graphite,
AD-A136 332
* * *
Lattice-Dynamical Model for Alkali-Metal-Graphite Intercalation Compounds,

AD-A136 357
* * *
Model for Raman Scattering from Incompletely Graphitized Carbons.
AD-A136 458

*ANDERSON, T. J.
* * *
A Comparative Thermodynamic Analysis of Impurity Incorporation in Vapor Phase Epitaxial InP and GaAs.
AD-A135 739

*ANDREASSI, J. L.
* * *
Hemispheric Asymmetries in a Signal Detection Task,
AD-A138 806

*ANGELAKOS, D. J.
* * *
A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line,
AD-A135 649
* * *
Joint Services Electronics Program.
AD-A136 058

*ANGELL, T. S.
* * *
Modified Green's Functions and the Third Boundary Value Problem for the Helmholtz Equation,
AD-A137 756

*ANNARELLI, D. C.
* * *
Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry,
AD-A136 140

*ANWARI, F.
* * *
Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?
AD-A136 149

*ARMSTRONG, E. S.
* * *
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.
AD-A135 109

*ARMSTRONG, R. L.
* * *
A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls,
AD-A137 894

*ASHE, A. J., III
* * *
Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl,
AD-A136 326
* * *
Synthesis and Spectra of Tetravinyldistibines,
AD-A137 733

*ATKINS, D. E.
* * *
Coordinated Research in Robotics and Integrated Manufacturing.
AD-A137 042

*ATWELL, R. J.
* * *
Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport,
AD-A135 491

*AUNON, J. I.
* * *
New Techniques for Measuring Single Event Related Brain Potentials.
AD-A138 694

*AYOUB, M. M.
* * *
Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.
AD-A135 211

*BACIS, R.
* * *
Long Range Behavior of the Gerade States near the 2P3/2 + 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.
AD-A136 080

*BAER, M.
* * *
Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F + H sub 2 Collisions,
AD-A135 180
* * *
Theoretical Studies of Reactions in a Laser Field: F(2P(3/2),2P(1/2))+H2+eta omega(0.469 eV),
AD-A136 101

*BAILEY, D. A.
* * *
Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers,
AD-A135 729

*BAILEY, W. I., JR
* * *
A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls,
AD-A137 894

*BALAKRISHNAN, A. V.
* * *
Final Scientific Report: 1978 - 1983.
AD-A136 531

*BALLANTYNE, J.

* * *
Microwave Semiconductor Research - Materials, Devices, Circuits.
AD-A137 798

*BANK, W.
* * *
Visualization of Accelerating Flow around an Airfoil at High Angles of Attack.
AD-A138 636

*BANKS, H. T.
* * *
Estimation Techniques for Transport Equations.
AD-A135 092
* * *
Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.
AD-A135 093
* * *
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.
AD-A135 109

*BARENBERG, E. J.
* * *
Development of a Stress-Dependent Finite Element Slab Model.
AD-A135 836

*BARETZ, B. Ч.
* * *
Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals,
AD-A136 114

*BARLOW, R. E
* * *
Interim Scientific Report: AFOSR-81-0122.
AD-A136 579

*BARR, S. W.
* * *
Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes,
AD-A137 023
* * *
Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes,
AD-A137 425

*BARRETT, H. H.
* * *
Optical Processing in Radon Space.
AD-A137 033

*BARZ, F.
* * *
Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes,
AD-A137 091
* * *
Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes,
AD-A137 097

*BASEHEART, T. M.
* * *
Reinforced Concrete Response to Near Field Explosions.
AD-A135 876

*BASHORE, T. R.
* * *
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.
AD-A136 268

*BASILI, V. R.
* * *
Research in Programming Languages and Software Engineering.
AD-A136 037

*BASS, M.
* * *
Laser Chemical Vapor Deposition.
AD-A137 827

*BAXTER, J. P.
* * *
Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

*BAZIN, C.
* * *
New Results of the ACO Storage Ring Free Electron Laser.
AD-A137 785
* * *
Progress and Problems in Storage Ring Free Electron Lasers.
AD-A138 683

*BECK, K. C.
* * *
Adaptation of Vascular Pressure-Flow-Volume Hysteresis in Isolated Rabbit Lungs,
AD-A135 139

*BECK, T. R.
* * *
Initial Oxide Growth Rate on Newly Generated Surfaces,
AD-A135 969

*BECLA, P.
* * *
Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe,
AD-A135 772

*BEERI, C.
* * *
On Acyclic Database Decompositions.
AD-A135 105

*BEEX, A. A. L.
* * *
Recursive Interpolation of Space-

Limited Scenes.
AD-A136 215

*BEKEFI, G.
* * *
Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL).
AD-A136 014
* * *
Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams.
AD-A137 038
* * *
Microwave Emission from Relativistic Electron Beams.
AD-A137 752

*BELYTSCHKO, T.
* * *
Efficient Finite Element Methods for Transient Nonlinear Analysis of Shells.
AD-A136 044

*BENNETT, J. C.
* * *
Hot-Wire Measurements of Velocity and Temperature Fluctuations in a Heated Turbulent Boundary Layer.
AD-A135 212

*BERAN, P.
* * *
Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine.
AD-A135 140

*BERGHER, M.
* * *
New Results of the ACO Storage Ring Free Electron Laser.
AD-A137 785
* * *
Progress and Problems in Storage Ring Free Electron Lasers.
AD-A138 883

*BERI, A. C.
* * *
Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation.
AD-A135 181

*BERKOFSKY, L.
* * *
The Behavior of the Atmosphere in the Desert Planetary Boundary Layer.
AD-A135 962

*BERNSTEIN, A. J.
* * *
Summary of Research, 15 June 1982 to 14 June 1983, Grant AFOSR-81-0197.
AD-A135 074

*BERNSTEIN, E. R.
* * *
Critical Behavior in Annealed and Unannealed Crystals of Benzil.
AD-A136 061
* * *
Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.
AD-A136 077
* * *
Brillouin and Rayleigh Studies of Urea Single Crystals.
AD-A136 142
* * *
Critical Fluctuations at the Phase Transition in Benzil.
AD-A138 567
* * *
Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.
AD-A138 608

*BERS, L.
* * *
Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.
AD-A135 110

*BETHEA, N. J.
* * *
Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.
AD-A135 211

*BEVIER, W. C.
* * *
Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.
AD-A135 426

*BHAUMIK, D.
* * *
Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers.
AD-A136 349

*BIBBER, J. W.
* * *
Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino)bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule.
AD-A135 716
* * *
Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphospine))-bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7.
AD-A135 723

*BIERBAUM, V. M.
* * *
Infrared Chemiluminescence from

Vibrationally Excited NO+: Product Branching in the N+ + O2 Ion-Molecule Reaction,
AD-A136 074

* * *

Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2+ in Helium,
AD-A137 765

*BIGOT, B.

* * *

Natural Correlation Diagrams. A unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions,
AD-A136 003

*BILLARDON, M.

* * *

New Results of the ACO Storage Ring Free Electron Laser.
AD-A137 785

* * *

Recent Results of the ACO Storage Ring F.E.L. Experiment
AD-A137 803

* * *

Progress and Problems in Storage Ring Free Electron Lasers.
AD-A138 683

* * *

d VUV Degradation of Very High ectivity Mirrors for Use in a Storage Ring Free Electron Laser,
AD-A138 740

*BILLINGS, D. F.

* * *

The Unsteady Boundary Layer on an Elliptic Cylinder Following the Impulsive Onset of Translational and Rotational Motion.
AD-A138 725

*BINDER, K.

* * *

Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.
AD-A136 237

*BINFORD, T. O.

* * *

Center of Excellence in Aerospace Manufacturing Automation.
AD-A136 477

*BING, L. Z.

* * *

Diffusion Approximation for a Class of Markov Processes Satisfying a Nonlinear Fokker-Planck Equation,
AD-A136 582

*BITTNER, A. C., JR

* * *

Individual Differences in Multiple-Task Performance as a Function of Response Strategy.
AD-A135 500

*BIXBY, R. E.

* * *

Hidden and Embedded Structure in Linear Programs.
AD-A137 773

*BLACKWELDER, R. F.

* * *

Scaling of the Bursting Frequency in Turbulent Boundary Layers,
AD-A134 822

*BLAIR, M. F.

* * *

Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 1. Experimental Data,
AD-A135 713

* * *

Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 2. Analysis of Results,
AD-A135 714

* * *

Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers,
AD-A135 729

* * *

Influence of Free-Stream Turbulence on Boundary Layer Transition in Favorable Pressure Gradients,
AD-A135 825

*BLAKENEY, W. H.

* * *

The Scanning Electron Microscopy of Compressed Spinal Units,
AD-A135 142

*BLATT, F. J.

* * *

Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition,
AD-A136 004

*BLEILER, R. J.

* * *

Angle-Resolved SIMS (Secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111),
AD-A135 128

*BLIM, L.

* * *

Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface,
AD-A135 722

*BOLAND, P. J.

* * *

Optimum Replacement of a System Subject to Shocks,
AD-A135 168

* * *

The Reliability of K out of N systems,
AD-A135 246

* * *

Periodic Replacement When Minimal Repair Costs Vary with Time,

AD-A135 284

*BOOKBINDER, J.

* * *

Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo
AD-A136 205

*BORGIA, J. F.

* * *

Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219

*BOUDJOUK, P.

* * *

Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?
AD-A136 149

*BOWEN, K. A.

* * *

Logic Programming and Knowledge Base Maintenance.
AD A137 062

*BOWMAN, D. A.

* * *

Rhesus Monkey Intervertebral Disk Viscoelastic Response to Shear Stress,
AD-A135 161

*BRESSLER, S. L.

* * *

Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.
AD-A135 545

*BRIGGS, M. M.

* * *

Effects of Blowing Spanwise from the Tips of Low-Aspect Ratio Wings of Varying Taper Ratio, with Application to Improving STOL capability of Fighter Aircraft.
AD-A135 888

*BRILEY, W. R.

* * *

Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.
AD-A137 022

*BROOKS, R.

* * *

Center of Excellence in Aerospace Manufacturing Automation.
AD-A136 477

*BROWN, F.

* * *

Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.
AD-A135 959

*BROWN, G. M.

* * *

Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino)bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule,
AD-A135 716

* * *

Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphospine))-bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7,
AD-A135 723

*BROWNE, J. C.

* * *

High Performance Parallel Computing.
AD-A137 774

*BRUCKENSTEIN, S.

* * *

The Anodic Behavior of Iodide at Platinum in the Presence of an Iodine Film under Potentiostatic Steady-State and Hydrodynamic Modulation Conditions,
AD-A135 113

* * *

Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine,
AD-A135 140

* * *

Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region,
AD-A135 149

* * *

Current-Voltage Analysis of Photoelectrochemical Cells under Mass and Light Flux Variation,
AD-A135 162

* * *

Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.
AD-A135 170

* * *

Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.
AD-A135 171

* * *

Uniformly Accessible Electrodes,
AD-A135 205

*BUIKEMA, A. L., JR

* * *

Sublethal Effects of JP-4 on Aquatic Organisms and Communities.
AD-A138 807

*BUMBY, R. T.

* * *

Stabilization of Polynomially Parametrized Families of Linear Systems. The Single-Input Case,
AD-A137 830

*BUNNELL, D. E.
* * *
Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.
AD-A135 426

*BUNTING, R. K.
* * *
Molten Salt Electrochemical Systems.
AD-A135 108

*BURKE, J. J.
* * *
Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. I. Preparation of a Large-Scale Database.
AD-A135 631

*BURNS, G.
* * *
Nonequilibrium Effects in the Energy Distribution Function,
AD-A135 192

*BUSH, R. H.
* * *
Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.
AD-A135 711

*BUTLER, J. T.
* * *
Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.
AD-A136 457

*BUTLER, W. M.
* * *
Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl,
AD-A136 328

*BUTTON, K. J.
* * *
Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.
AD-A136 095

*BYRNES, C. I.
* * *
On a Theorem of Hermite and Hurwitz,
AD-A137 061

*CAIRNS, J., JR
* * *
Sublethal Effects of JP-4 on Aquatic Organisms and Communities.
AD-A138 807

*CALCOTE, H. F.
* * *
Ionic Mechanisms of Carbon Formation in Flames.
AD-A137 079

*CALVERT, R. E.
* * *
A Digital Computer Model of the Human Circulatory System,
AD-A135 379

*CAMBANIS, S.
* * *
Convergence of Quadratic Forms in p-Stable Random Variables and Theta sub p-Radonifying Operators.
AD-A135 314
* * *
A Simple Class of Asymptotically Optimal Quantizers,
AD-A135 396
* * *
Complex Symmetric Stable Variables and Processes,
AD-A136 141
* * *
Research in Stochastic Processes.
AD-A136 222
* * *
Analysis of Adaptive Differential PCM (Pulse-Code Modulator) of a Stationary Gauss-Markov Input.
AD-A136 518
* * *
Research in Stochastic Processes.
AD-A137 736

*CAMLEY, R. E.
* * *
Surface Polaritons on Uniaxial Antiferromagnets,
AD-A135 974
* * *
Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum,
AD-A135 999

*CAMPBELL, S. L.
* * *
One Canonical Form for Higher-Index Linear Time-Varying Singular Systems.
AD-A135 169

*CANNON, R. H., JR
* * *
Center of Excellence in Aerospace Manufacturing Automation.
AD-A136 477

*CANTWELL, B. J.
* * *
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 1. Objectives, Evaluation of Data, Specifications of Test Cases, Discussion, and Position Papers.
AD-A135 569
* * *
The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.

AD-A135 570

* * *

The 1980-81 AFOSR (Air Force Office of Scientific Research)-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment Volume 3. Comparison of Computation with Experiment, and Computors' Summary Report.
AD-A136 034

*CARLSON, R. E.

* * *

Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?
AD-A137 735

*CARMACK, L.

* * *

Mathematical Simulation of the Cardiopulmonary System.
AD-A135 460

*CARRASQUILLO, R. L.

* * *

Analysis of a High-Strength Concrete Model under Biaxial Compression.
AD-A137 050

*CARROLL, R. J.

* * *

Research in Stochastic Processes.
AD-A136 222

* * *

Research in Stochastic Processes.
AD-A137 736

*CARTER, J. E.

* * *

Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.
AD-A137 052

*CASASENT, D.

* * *

Optical Data Processing for Missile Guidance.
AD-A136 216

*CASTRO, P. M.

* * *

Analysis of a High-Strength Concrete Model under Biaxial Compression.
AD-A137 050

*CEBECI, T.

* * *

Unsteady Boundary Layers on Thin Bodies of Revolution.
AD-A136 257

*CEDER, V. D.

* * *

Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219

*CELASCHI, S.

* * *

Tunneling Properties of Single Crystal Nb/Nb2O5/Pb Josephson Junctions.
AD-A135 670

*CELESTINA, M.

* * *

Second Order Composite Velocity Solution for Large Reynolds Number Flows.
AD-A138 526

*CERJAN, C.

* * *

Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach.
AD-A135 127

* * *

Very-Low-Energy Collision-Induced Rotational Relaxation. A theoretical Analysis.
AD-A137 035

*CERRA, A. W., JR

* * *

Experimental Observations of Vortex Ring Interaction with the Fluid Adjacent to a Surface.
AD-A138 999

*CHAN, Y. M.

* * *

Self Tuning Leader-Follower Games.
AD-A135 099

*CHANDRASEKARAN, B.

* * *

Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.
AD-A136 577

* * *

Distributed Knowledge Base Systems for Diagnosis and Information Retrieval
AD-A137 828

*CHANDY, K. M.

* * *

Annual Scientific Report for Grant AFOSR-81-0205.
AD-A135 452

* * *

Preserving Asymmetry by Symmetric Processes and Distributed Fair Conflict Resolution.
AD-A135 458

* * *

A Distributed Procedure to Detect and/or Deadlock.
AD-A135 459

*CHANG, C. C.

* * *

Hadamard Transform Alternating Current Polarography.
AD-A135 777

*CHANG, C. K.

* * *

Dependence of Electrocatalysis for Oxygen Reduction by Adsorbed Dicobalt Cofacial Porphyrins Upon Catalyst Structure.
AD-A136 098

*CHANG, F. C.
* * *
Least Favorable Response of Inelastic Structures.
AD-A136 289

*CHANG, W. S. C.
* * *
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.
AD-A137 103

*CHEEK, G.
* * *
Electrochemical and Spectroscopic Studies of 9, 10-Anthraquinone in a Room Temperature Molten Salt.
AD-A135 195

*CHEEK, G. T.
* * *
Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System,
AD-A135 112

*CHEN, A. B.
* * *
Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.
AD-A136 197

*CHEN, H. P.
* * *
Film Cooling on a Gas Turbine Blade Near the End Wall.
AD-A138 794

*CHEN, M. H.
* * *
Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory,
AD-A136 198
* * *
Auger and Radiative Deexcitation of P(4+) Ions.
AD-A137 747

*CHEO, B. R.
* * *
Interaction of Electromagnetic Fields with Plasma.
AD-A135 173
* * *
An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.
AD-A135 880

*CHESTER, D.
* * *
Elements of Knowledge-Based Expert Systems.
AD-A136 093

*CHILDS, D. W.
* * *
Rotordynamic Forces Developed by Labyrinth Seals.
AD-A136 217

*CHIN, I.
* * *
Durability and Failure Analyses of a Silane Treated Alpha-A1203/Polyethylene Joint in Wet Environment.
AD-A136 089

*CHOW, C. Y.
* * *
Unsteady Separated Flows: Vorticity and Turbulence.
AD-A138 593
* * *
Apparent-Mass Coefficients for Isosceles Triangles and Cross Sections Formed by Two Circles,
AD-A138 612
* * *
The Unsteady Boundary Layer on an Elliptic Cylinder Following the Impulsive Onset of Translational and Rotational Motion.
AD-A138 725

*CHUDNOVSKY, D. V.
* * *
Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.
AD-A135 110
* * *
Laws of Composition of Backlund Transformations and the Universal Form of Completely Integrable Systems in Dimensions Two and Three,
AD-A135 131
* * *
Algebraic Reductions of Scalar Three-Dimensional Systems,
AD-A135 132

*CHUDNOVSKY, G. V.
* * *
Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.
AD-A135 110
* * *
Laws of Composition of Backlund Transformations and the Universal Form of Completely Integrable Systems in Dimensions Two and Three,
AD-A135 131
* * *
Algebraic Reductions of Scalar Three-Dimensional Systems,
AD-A135 132
* * *
Rational Approximations to Linear Forms of Exponentials and Binomials,
AD-A135 136

*CHUNG, C. J.
* * *
Stereochemistry of Photoinitiated Emulsion Polymerization,
AD-A135 193

*CHURASSY, S.
* * *
Long Range Behavior of the Gerade States near the 2P3/2 + 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.

AD-A136 080

*CINLAR, E.

* * *

Markov Processes Applied to Control, Replacement, and Signal Analysis.
AD-A136 508

* * *

Markov Processes Applied to Control, Replacement, and Signal Analysis.
AD-A136 524

*CLAPMAN, R. M.

* * *

Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.
AD-A136 268

*CLARK, P. A.

* * *

Rhesus Monkey Intervertebral Disk Viscoelastic Response to Shear Stress,
AD-A135 161

*COHAN, C. S.

* * *

The Generation of Rhythmic Activity in a Distributed Motor System,
AD-A135 470

* * *

Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea,
AD-A135 530

*COHEN, L. K.

* * *

Nonequilibrium Effects in the Energy Distribution Function,
AD-A135 192

*COLEMAN, W. F.

* * *

Rates of Relaxation in the Upper Vibrational Levels of HF (Hydrogen Fluoride) and DF (Deuterium Fluoride).
AD-A136 238

*COLES, M. G. H.

* * *

The Event Related Brain Potential as an Index of Information Processing, Cognitive Activity, and Skill Acquisition: A Program of Basic Research.
AD-A137 779

*COLLINS, C. B.

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AD-A138 498

*COLLINS, R. E.

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A Digital Computer Model of the Human Circulatory System,
AD-A135 379

* * *

Mathematical Simulation of the Cardiopulmonary System.
AD-A135 460

* * *

On the Pressure-Volume Relationship in Circulatory Elements,
AD-A135 475

*COLTON, D.

* * *

Far Field Patterns for the Impedance Boundary Value Problem in Acoustic Scattering,
AD-A135 254

*CONNERS, R. W.

* * *

The Law of Comparative Judgment: Theory and Implementation.
AD-A136 169

*CONSTANTINE, G. M.

* * *

Complete Designs with Blocks of Maximal Multiplicity,
AD-A136 070

*COOK, M. K.

* * *

Adaptive Hybrid Picture Coding.
AD-A138 876

*CORRIU, R. J. P.

* * *

29Si NMR of Pentacoordinate Silicon Derivatives,
AD-A136 073

*COUTSIAS, E. A.

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Interim Scientific Report on Virtual Cathode Oscillations.
AD-A135 120

*COVERT, E. E.

* * *

Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.
AD-A137 070

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Measurements of the Near Wake of an Airfoil in Unsteady Flow.
AD-A137 744

*COX, G. S.

* * *

Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.
AD-A136 244

*COZART, D. L.

* * *

An Interpolation and Compaction Technique for Gridded Data.
AD-A137 107

*CRASEMANN, B.

* * *

Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory,
AD-A136 198

* * *

Auger and Radiative Deexcitation of P(4+) Ions.
AD-A137 747

*CRENSHAW, D. M.
* * *
The Variability of the Spectrum of Arakelian 120.
AD-A135 796

*CROSS, L. E.
* * *
Research on Ferroelectric Materials for Millimeter Wave Application.
AD-A137 128

*CRUZ, J. B.
* * *
Self Tuning Leader-Follower Games,
AD-A135 099

*CRUZ, J. B., JR
* * *
Control Strategies for Complex Systems for Use in Aerospace Avionics.
AD-A135 072

*CUTILLO, B. A.
* * *
Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.
AD-A135 545

*DAFFER, P. Z.
* * *
Tightness and Strong Laws of Large Numbers in Banach Spaces,
AD-A135 097
* * *
Weak Convergence of Linear Forms in D(0,1).
AD-A135 424

*DALGARNO, A.
* * *
The Low-Lying 2Sigma-States of OH.
AD-A138 075

*DAMOS, D. L.
* * *
Individual Differences in Multiple-Task Performance as a Function of Response Strategy.
AD-A135 500

*DANIEL, P. L.
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Estimation Techniques for Transport Equations.
AD-A135 092
* * *
Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.
AD-A135 109

*DAVIS, G. D.
* * *
Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds,
AD-A137 764

*DAVIS, L. S.
* * *
Theory of Image Analysis and Recognition.
AD-A135 453

*DEACON, D. A. G.
* * *
Transverse Mode Dynamics in a Free Electron Laser.
AD-A137 738
* * *
Storage Ring Free Electron Lasers: Experimental Progress and Future Prospects,
AD-A137 745
* * *
New Results of the ACO Storage Ring Free Electron Laser.
AD-A137 785
* * *
Evolution of the Transverse Modes in a FEL (Free Electron Lasers), and Application to the Orsay Experiment.
AD-A137 797
* * *
Recent Results of the ACO Storage Ring F.E.L. Experiment,
AD-A137 803
* * *
Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group),
AD-A138 560
* * *
Progress and Problems in Storage Ring Free Electron Lasers.
AD-A138 683
* * *
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser,
AD-A138 740
* * *
Anomalous Laser Induced Bunch Lengthening on the ACO Storage Ring Free Electron Laser.
AD-A138 814

*DEGRAFF, B. A.
* * *
Interactions of Ruthenium(II) photosensitizers with Triton X-100.
AD-A136 079

*DEGREZ, G.
* * *
Three Dimensional/Boundary Layer Interaction: Laminar and Turbulent Behaviour.
AD-A137 060

*DE LEVIE, R.
* * *
Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport,
AD-A135 491
* * *
Some Aspects of Modern Electrochemical Instrumentation,
AD-A135 769
* * *
Hadamard Transform Alternating Current Polarography,
AD-A135 777
* * *

Stochastic Effects in the Formation of Condensed Thymine Films at the Water-Mercury Interface,
AD-A135 778

* * *

On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water + Sucrose + NaCl at the Mercury-Solution Interface,
AD-A135 779

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Final Technical Report of Research Performed under Grant AFOSR-80-0262.
AD-A137 892

*DELORENZO, R. J.

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The Effects of Hydrazines and Related Compounds on Calcium Calmodulin Regulated Synaptic Processes.
AD-A137 985

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Interactions of Ruthenium(II) photosensitizers with Triton X-100.
AD-A136 079

* * *

Measurement of Photon Yields,
AD-A136 148

* * *

Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2'-bipyridine)ruthenium(II) to Laser Dyes,
AD-A136 203

* * *

A Simple High-Yield Preparation of Potassium Tris(oxalato)iridate(III) with a Novel Solvent Extraction Step.
AD-A136 245

*DEMETRIADES, A.

* * *

The Hydrodynamic Stability of a Supersonic Laminar Boundary Layer over a Rough Wall.
AD-A137 056

*DENARDO, J. D.

* * *

Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.
AD-A135 211

*DENT, W.

* * *

Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes,
AD-A137 154

*DE SIERVI, F.

* * *

Mechanisms of Inlet-Vortex Formation,
AD-A135 471

*DEVACQUET, A.

* * *

Natural Correlation Diagrams. A unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions,
AD-A136 003

*DEVELIS, J. B.

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Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.
AD-A135 663

*DEVRIES, P. L.

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Possibility of Isotope Separation by Selective Radiative Scattering.
AD-A135 692

*DEWAR, M. J. S.

* * *

Development and Status of MINDO/3 and MNDO,
AD-A135 467

* * *

Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne,
AD-A135 724

* * *

Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine,
AD-A135 728

* * *

Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethane,
AD-A135 970

* * *

Why Life Exists?
AD-A136 069

*DIEPHOUSE, T. R.

* * *

Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl,
AD-A136 326

*DIMARCO, D. M.

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Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism,
AD-A138 640

*DISHOECK, E. F. VAN

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The Low-Lying 2Sigma-States of OH.
AD-A136 075

*DOANE, T. R.

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Sublethal Effects of JP-4 on Aquatic Organisms and Communities.
AD-A138 807

*DOLPH, C. L.

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Applications of Non-Self-Adjoint Operator Theory to the Singularity Expansion Method (SEM) and to the Eigenmode Expansion Method (EEM) in Acoustic and Electromagnetic

Problems.
AD-A135 177

*DO NASCIMENTO, A. S.
* * *
Orbit Connections in a Parabolic Equation.
AD-A135 986

*DONCHIN, E.
* * *
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.
AD-A136 268
* * *
The Event Related Brain Potential as an Index of Information Processing, Cognitive Activity, and Skill Acquisition: A Program of Basic Research.
AD-A137 779

*DONOVAN, W. J.
* * *
Neurophysiological Bases of Event-Related Potentials.
AD-A135 263

*DORNY, C. N.
* * *
High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.
AD-A138 717

*DOWELL, E. H.
* * *
Aeroelastic Analysis Using Nonlinear Aerodynamic Methods.
AD-A135 133

*DOYLE, J. C.
* * *
Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.
AD-A135 545

*DRESSELHAUS, G.
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Raman Scattering from Low-Frequency Phonons in Stage-2 Graphite-Rubicium Intercalation Compounds,
AD-A136 001
* * *
Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds,
AD-A136 005
* * *
Lattice-Dynamical Model for Graphite,
AD-A136 332
* * *
Lattice-Dynamical Model for Alkali-Metal-Graphite Intercalation Compounds,
AD-A136 357

*DRESSELHAUS, M. S.
* * *
Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds,
AD-A136 005
* * *
Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds,
AD-A136 010
* * *
The Effect of Intercalation on the Lattice Constants of Graphite.
AD-A136 081
* * *
Model for Raman Scattering from Incompletely Graphitized Carbons.
AD-A136 458
* * *
High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*DRESSLEHAUS, G.
* * *
Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds,
AD-A136 300

*DUBS, M.
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Spectroscopy of Molecules at High Excitation Levels,
AD-A137 835

*DUGUNDJI, J.
* * *
Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.
AD-A137 047

*DUNCAN, D. P.
* * *
Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry.
AD-A136 140

*DUNCAN, M. A.
* * *
Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) + HF yields OH(v-0, 1) + F (-)
AD-A136 318
* * *
Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2+ in Helium,
AD-A137 765

*DUNNING, G. J.
* * *
Phase Conjugate Optical Resonator.
AD-A136 071

*EASTMAN, C. M.
* * *
File Searching Problems in Logic Programming Systems.
AD-A136 522

*EASTMAN, L. F.

* * *
Microwave Semiconductor Research - Materials, Devices, Circuits.
AD-A137 798

*ECER, A.
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Analysis of Three-Dimensional Transonic Potential Flows Using Optimum Grid.
AD-A135 744

*EDWARDS, D. E.
* * *
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.
AD-A137 052

*EISENTHAL, K. B.
* * *
Picosecond Laser Studies of Excited State Processes.
AD-A136 137

*EKLUND, P. C.
* * *
Raman Scattering from Low-Frequency Phonons in Stage-2 Graphite-Rubidium Intercalation Compounds,
AD-A136 001

*EL GAMAL, A.
* * *
Statistical Data Processing, System Modeling and Reliability.
AD-A135 208

*ELLEAUME, P.
* * *
Transverse Mode Dynamics in a Free Electron Laser.
AD-A137 738
* * *
Evolution of the Transverse Modes in a FEL (Free Electron Lasers), and Application to the Orsay Experiment.
AD-A137 797
* * *
Recent Results of the ACO Storage Ring F.E.L. Experiment,
AD-A137 803
* * *
Progress and Problems in Storage Ring Free Electron Lasers.
AD-A138 683
* * *
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser,
AD-A138 740

*ELLISON, B. B.
* * *
Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2+ in Helium,
AD-A137 765

*ELLISON, G. B.
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Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) + HF yields OH(v-0, 1) + F (-).
AD-A136 318

*ELMAN, B. S.
* * *
Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds,
AD-A136 300

*EL-NEWEIHI, E.
* * *
Component Relevancy in Multistate Systems.
AD-A137 727

*EURELL, J. A. C.
* * *
The Scanning Electron Microscopy of Compressed Spinal Units,
AD-A135 142

*EVANS, J. E.
* * *
Neurophysiological Bases of Event-Related Potentials.
AD-A135 263

*FAGAN, J. R.
* * *
A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer,
AD-A138 641

*FELLMANN, J. D.
* * *
Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers,
AD-A136 059

*FENG, C. C.
* * *
The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.
AD-A136 124

*FIELD, J. E.
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Studies of Aerodynamic Drag.
AD-A137 740

*FIELD, R. W.
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Long Range Behavior of the Gerade States near the 2P3/2 + 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.
AD-A136 080
* * *
Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.
AD-A136 319

*FIENUP, J. R.
* * *
Comments on 'The Reconstruction of a Multidimensional Sequence from

the Phase or Magnitude of Its Fourier Transform',
AD-A136 011

* * *

Reconstruction of Objects Having Latent Reference Points,
AD-A137 044

*FINDLER, N. V.

* * *

Approaches to Automatic Strategy Analysis and Synthesis,
AD-A137 067

*FINE, M. E.

* * *

Fatigue Crack Initiation and Microcrack Propagation in X7091 Type Aluminum P/M Alloys,
AD-A135 126

* * *

Lattice Parameter Variation of Al3 (Ti,V,Zr,Hf) in Al-2 at.% (Ti,V,Zr,Hf) Alloys,
AD-A135 756

* * *

Synthesis and Properties of Elevated Temperature P/M Aluminum Alloys,
AD-A135 950

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Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino)bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule,
AD-A135 716

* * *

Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphospine))-bis(tricarbonyliron),
CH3N(P(OCH3)2)2Fe2(CO)7,
AD-A135 723

*FINK, M. J.

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The X-Ray Crystal Structure of Tetramesityldisilene,
AD-A135 957

*FISCHER, J. A.

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Development of a Stress-Dependent Finite Element Slab Model,
AD-A135 836

*FISSON, S.

* * *

Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys,
AD-A136 227

*FLYNN, C. M., JR

* * *

A Simple High-Yield Preparation of Potassium Tris(oxalato)iridate(III) with a Novel Solvent Extraction Step,
AD-A136 245

*FOLTZ, C. B.

* * *

The Variability of the Spectrum of Arakelian 120,
AD-A135 796

*FORD, G. P.

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Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne,
AD-A135 724

*FOROUHAR, S.

* * *

Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides,
AD-A137 103

*FORSHEY, P. A.

* * *

Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins,
AD-A138 637

* * *

Electrochemistry of Oxygen Reduction. 4. Oxygen to Water Conversion by Iron(II) Tetrakis(N-Methyl-4-Pyridyl)Porphyrin via Hydrogen Peroxide,
AD-A138 638

* * *

Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism,
AD-A138 640

*FORSYTH, J.

* * *

Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 2,
AD-A136 306

* * *

Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 3,
AD-A136 307

*FORSYTH, J. M.

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Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 1,
AD-A136 305

*FOWLER, D. W.

* * *

Analysis of a High-Strength Concrete Model under Biaxial Compression,
AD-A137 050

*FREYMUTH, P.
* * *
Unsteady Separated Flows: Vorticity and Turbulence.
AD-A138 593
* * *
Visualization of Accelerating Flow around an Airfoil at High Angles of Attack.
AD-A138 636

*FRIED, J. R.
* * *
TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.
AD-A137 048

*FUCHS, A.
* * *
Dewar Design for Optically Pumped Semiconductor Ring Laser,
AD-A136 041

*GALAMBOS, J.
* * *
The Role of Functional Equations in Stochastic Model Building,
AD-A137 013

*GANNON, J. D.
* * *
Research in Programming Languages and Software Engineering.
AD-A136 037

*GARMIRE, E.
* * *
Characteristics of an Integrated Optics Ring Resonator.
AD-A135 878

*GARRIS, C. A.
* * *
Energetics of Vortex Ring Formation.
AD-A138 795

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Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers,
AD-A136 059

*GASTER, M.
* * *
Estimates of the Errors Incurred in Various Asymptotic Representations of Wave Packets,
AD-A133 165
* * *
The Development of a Two-Dimensional Wavepacket in a Growing Boundary Layer.
AD-A135 209

*GEBALLE, T.
* * *
Tunneling Properties of Single Crystal Nb/Nb2O5/Pb Josephson Junctions,
AD-A135 670

*GEBALLE, T. H.
* * *
Film Synthesis and New Superconductors.
AD-A135 102

*GEORGE, T. F.
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Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F + H sub 2 Collisions,
AD-A135 180
* * *
Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation,
AD-A135 181
* * *
Possibility of Isotope Separation by Selective Radiative Scattering,
AD-A135 692
* * *
Collisional Ionization as a Nonlocalized Process and the Breakdown of the Franck-Condon Approximation,
AD-A136 040
* * *
Theoretical Studies of Reactions in a Laser Field: F(2P(3/2),2P(1/2))+H2+eta omega(0.469 eV),
AD-A136 101
* * *
Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate,
AD-A137 763
* * *
Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant,
AD-A137 834

*GERLA, M.
* * *
Performance Evaluation and Control of Distributed Computer Communication Networks.
AD-A135 121

*GERR, N. L.
* * *
A Simple Class of Asymptotically Optimal Quantizers,
AD-A135 396
* * *
Analysis of Adaptive Differential PCM (Pulse-Code Modulator) of a Stationary Gauss-Markov Input.
AD-A136 518

*GEVINS, A. S.
* * *
Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.
AD-A135 545

*GHIA, K. N.
* * *

Analysis of Three-Dimensional Viscous Internal Flows.
AD-A135 762

*GHIA, U.
* * *
Analysis of Three-Dimensional Viscous Internal Flows.
AD-A135 762

*GIBELING, H J.
* * *
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.
AD-A137 022

*GIERGIEL, J.
* * *
Raman Scattering from Low-Frequency Phonons in Stage-2 Graphite-Rubidium Intercalation Compounds
AD-A136 001

*GILBERT, B.
* * *
An Investigation of Turbulence Mechanisms in V/STOL Upwash Flow Fields.
AD-A137 775

*GINOUX, J. J.
* * *
Three Dimensional/Boundary Layer Interaction: Laminar and Turbulent Behaviour.
AD-A137 060

*GLASS, I. I.
* * *
An Assessment of Recent Results on Pseudo-Stationary Oblique-Shock-Wave Reflections.
AD-A135 260
* * *
Random Choice Solutions for Weak Spherical Shock-Wave Transitions of N-Waves in Air with Vibrational Excitation.
AD-A135 303

*GLEIT, A. S.
* * *
Development of Statistical Techniques to Better Utilize Data Characterized by Being Below Instrument Detection Thresholds and by Small Sample Size.
AD-A135 408

*GOLDBERG, M.
* * *
On the Mapping A Approaches Limit of A+,
AD-A135 271

*GOLDE, M. F.
* * *
Spectroscopic Studies of the Products of the Reactions of Excited Noble-Gas Atoms.
AD-A137 750

*GOLDSTEIN, R. J.
* * *
Film Cooling on a Gas Turbine Blade Near the End Wall.
AD-A138 794

*GOLUB, L.
* * *
Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.
AD-A136 205

*GORDON, J. G., II
* * *
Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes,
AD-A137 091
* * *
Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes,
AD-A137 097

*GORDON, M. S.
* * *
Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?
AD-A136 149

*GORDON, P. A.
* * *
The Scanning Electron Microscopy of Compressed Spinal Units.
AD-A135 142

*GOULD, I. R.
* * *
Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals,
AD-A136 114
* * *
Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes,
AD-A137 154

*GRAD, H.
* * *
Kinetic Theory of Gases, Magneto-Fluid Dynamics and Their Application.
AD-A137 082

*GRAHAM, M. H.
* * *
Notions of Dependency Satisfaction.
AD-A135 303

*GRAY, R. M.
* * *
Statistical Data Processing, System Modeling and Reliability.
AD-A135 208

*GREEN, C.
* * *
Synthesis of Efficient Structures for Concurrent Computation.
AD-A135 892

*GREENE, D. E.

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Quantification of Subjective Ratings through Conjoint Measurement Analysis.
AD-A138 810

*GREITZER, E. M.
* * *
Mechanisms of Inlet-Vortex Formation,
AD-A135 471

*GRENANDER, U.
* * *
Aspects of Pattern Theory.
AD-A136 506

*GRIES, D.
* * *
Finding Repeated Elements,
AD-A135 221

*GROSSBERG, S.
* * *
A Psychophysiological Theory of Reinforcement, Drive, Motivation and Attention,
AD-A135 495
* * *
Dynamic Models of Neural Systems: Propagated Signals, Photoreceptor Transduction, and Circadian Rhythms.
AD-A137 826

*GUERRA, M. A.
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A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls,
AD-A137 894

*GUNSHOR, R. L.
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Monolithic ZnO SAW (Surface Acoustic Waves) Structures.
AD-A135 987

*GUPTA, V. K.
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High Energy Density Non-Aqueous Battery System.
AD-A135 395

*GUPTA, Y. M.
* * *
Determining and Modeling the Response of Piezoresistance Transducers to Dynamic Loading.
AD-A137 121

*GUTMARK, E.
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Preferred Modes and the Spreading Rates of Jets,
AD-A137 073

*GUYER, D. R.
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Single Collision Ion-Molecule Reactions at Thermal Energy: Rotational and Vibrational Distributions from N+ + CO Yields N + CO+,
AD-A136 066

*GUYER, K. L.
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Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes,
AD-A137 023
* * *
Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques,
AD-A137 111

*HAFEZ, M. M.
* * *
Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.
AD-A137 052

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The Viscosity-Capillarity Criterion for Shocks and Phase Transitions,
AD-A137 003

*HALE, J. K.
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Smoothness of Bounded Solutions of Nonlinear Evolution Equations.
AD-A135 294
* * *
Orbit Connections in a Parabolic Equation.
AD-A135 983

*HALEVI, E. A.
* * *
Orbital Symmetry Analysis of the Reaction of Silylenes with Acetylenes and the Dimerization of 1-Silacyclopropenes,
AD-A136 006

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Research on Ferroelectric Materials for Millimeter Wave Application.
AD-A137 128

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The X-Ray Crystal Structure of Tetramesityldisilene,
AD-A135 957

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AD-A136 318

*HAMLET, R. G.
* * *
Research in Programming Languages and Software Engineering.
AD-A136 037

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Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.
AD-A136 177

*HARDY, W. H.
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A Digital Computer Model of the Human Circulatory System.
AD-A135 379
* * *
On the Pressure-Volume Relationship in Circulatory Elements.
AD-A135 475

*HARITONIDIS, J. H.
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Scaling of the Bursting Frequency in Turbulent Boundary Layers.
AD-A134 822

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Body and Surface Wave Modeling of Observed Seismic Events.
AD-A137 007
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Body and Surface Wave Modeling of Observed Seismic Events
AD-A137 083

*HARMAN, T. C.
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Broadly Tunable Mode-Locked HgCdTe Lasers.
AD-A136 178

*HARRADINE, D.
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Spectroscopy of Molecules at High Excitation Levels.
AD-A137 835

*HATFIELD, G. L.
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Novel Oxidative Rearrangement of Beta, Gamma-Unsaturated Ketone Hydrazones on Iodination in Base.
AD-A135 094

*HAUENSTEIN, B. L., JR
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Interactions of Ruthenium(II) photosensitizers with Triton X-100
AD-A136 079

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* * *
Why Life Exists?
AD-A136 069

*HEDAYAT, A. S.
* * *
Complete Designs with Blocks of Maximal Multiplicity.
AD-A136 070

*HEFFLEY, E. F.
* * *
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.
AD-A136 268

*HELMBERGER, D. V.
* * *
Body Wave Amplitude and Travel Time Correlations Across North America.
AD-A136 097
* * *
Body and Surface Wave Modeling of Observed Seismic Events.
AD-A137 007
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Body and Surface Wave Modeling of Observed Seismic Events.
AD-A137 083

*HELMER, B. J.
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29Si NMR of Pentacoordinate Silicon Derivatives.
AD-A136 073

*HELSTROM, C. W.
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Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.
AD-A136 561

*HENCH, L. L.
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Ultrastructure Processing and Environmental Stability of Advanced Structural and Electronic Materials.
AD-A135 107

*HENKE, B. L.
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Pulsed Plasma Source Spectrometry in the 80-8000-eV X-Ray Region.
AD-A137 724

*HEREMANS, J.
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Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition.
AD-A136 004
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Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds.
AD-A136 010
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High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*HERM, R. R.
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Nitric Oxide Vibrational Excitation from the N(4S)+O2 Reaction.
AD-A136 460

*HERMAN, T.
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A Distributed Procedure to Detect and/or Deadlock.
AD-A135 459

*HERNANDO, J.
* * *
Numerical Method and General Discussion of Integral Equations

for the Primitive Model of the Electric Interface.
AD-A135 712

*HILDEBRANDT, J.
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Adaptation of Vascular Pressure-Flow-Volume Hysteresis in Isolated Rabbit Lungs.
AD-A135 139

*HIROSE, S.
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Fatigue Crack Initiation and Microcrack Propagation in X7091 Type Aluminum P/M Alloys.
AD-A135 126

*HO, C. M.
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Preferred Modes and the Spreading Rates of Jets.
AD-A137 073

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Research on Ferroelectric Materials for Millimeter Wave Application.
AD-A137 128

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Energetics and Collision Dynamics of Electronic Transition Lasers.
AD-A135 894

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Investigation of Cold Cathode and RF Excitation for Long Life CO2 Waveguide Lasers.
AD-A136 088

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The Changing Scene in Computational Fluid Dynamics.
AD-A138 661

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Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7.
AD-A137 015

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Random Choice Solutions for Weak Spherical Shock-Wave Transitions of N-Waves in Air with Vibrational Excitation.
AD-A135 903

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Design of Office Information Systems.
AD-A136 523
* * *
AdaRel: A Relational Extension of Ada.
AD-A137 108
* * *
Programming Productivity Enhancement by the Use of Application Generators.
AD-A137 124
* * *
An Analysis of Application Generators.
AD-A137 159

*HORVATH, S. M.
* * *
Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219
* * *
Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.
AD-A135 426
* * *
Hemodynamic Responses of Runners and Water Polo Players during Exertion in Water.
AD-A135 469
* * *
Physiological Adjustments to Hemorrhage, Altitude, and Work.
AD-A137 781

*HOUSTON, P. L.
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The I(2P1/2)+O2 Reverse Yield I(2P3/2)+O2(1Delta) Equilibrium.
AD-A136 052

*HROVAT, D. A.
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Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154

*HUANG, M. K.
* * *
Apparent-Mass Coefficients for Isosceles Triangles and Cross Sections Formed by Two Circles.
AD-A138 612

*HUBBARD, A. T.
* * *
Orientation of Aromatic Compounds Adsorbed on Platinum Electrodes. The Effect of Temperature.
AD-A137 045
* * *
Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg -I.
AD-A137 071
* * *
The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds.
AD-A137 075
* * *
Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 079

*HUBBELL, S.
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A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line,
AD-A135 649

*HUEWEL, L
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Single Collision Ion-Molecule Reactions at Thermal Energy: Rotational and Vibrational Distributions from N+ + CO Yields N + CO+,
AD-A136 066

HUNT, B. R
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Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.
AD-A138 736

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Viscoelastic Fluid Flow Exhibiting Hysteritic Phase Changes,
AD-A135 411

*HUPP, J. T.
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Specific Adsorption of Halide and Pseudohalide Ions at Electrochemically Roughened Versus Smooth Silver-Aqueous Interfaces,
AD-A137 099
* * *
Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques,
AD-A137 111
* * *
The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface,
AD-A137 113

*HUTCHINSON, M.
* * *
Possibility of Isotope Separation by Selective Radiative Scattering,
AD-A135 692

*IMRE, K.
* * *
Relativistic Broadening Near Cyclotron Resonance.
AD-A136 224

*IOANNIDES, A. M.
* * *
Development of a Stress-Dependent Finite Element Slab Model.
AD-A135 836

*IRDUMSA, J. Z.
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Energetics of Vortex Ring Formation.
AD-A138 795

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Time Domain Analysis and Synthesis of Robust Controllers for Large Scale LQG (Linear Quadratic Gaussian) Regulators.
AD-A137 760

*ISENBERG, J.
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Large-Scale Numerical Analysis of Seismic Waves in Basins.
AD-A136 313

*ISSI, J. P.
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Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition,
AD-A136 004
* * *
Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds,
AD-A136 010
* * *
High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*ITO, T. I.
* * *
Phospha-s-Triazines. VI. Polymeric Systems,
AD-A136 068
* * *
Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies,
AD-A137 762

*JACKOWSKI, G.
* * *
Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose,
AD-A137 078
* * *
The Effect of in Vivo Treatment with Triiodothyronine on the in Vitro Synthesis of Protein-Poly(ADP)-Ribose Adducts by Isolated Cardiocyte Nuclei and the Separation of Poly(ADP)-ribosylated Proteins by Phenol Extraction and Electrophoresis,
AD-A137 793

*JAGANNATH, C.
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Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.
AD-A135 959

*JAIN, R. K.
* * *
Phase Conjugate Optical Resonator.
AD-A136 071

*JENSEN, R. K.
* * *
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.

AD A135 464

*JO, S

* * *

A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices
AD A138 819

*JOHANSEN, J. B

* * *

The Effects of Cylindrical Surface Modifications on Turbulent Boundary Layers
AD-A136 296

*JOHNSON, S. M

* * *

Silicon Nitride Joining
AD A136 547

*JOHNSON, T. L

* * *

Asynchronous Discrete Control of Continuous Processes
AD A135 257

*JONES, R. A

* * *

Adaptive Hybrid Picture Coding.
AD-A138 876

*JOUVET, C

* * *

Very Low Energy Collision Induced Vibrational Relaxation of (1)A sub u Glyoxal.
AD-A135 106

*JU, F

* * *

Least Favorable Response of Inelastic Structures
AD A136 289

* * *

Mathematical Models for Damageable Structures.
AD-A136 574

*JU, F. D

* * *

Identification of Damage in Hysteretic Structures
AD-A136 342

*JUNG, M. E.

* * *

Novel Oxidative Rearrangement of Beta, Gamma-Unsaturated Ketone Hydrazones on Iodination in Base.
AD-A135 094

*JUNGLING, K.

* * *

Optical Thin Film Workshop.
AD-A135 980

*KAILATH, T.

* * *

Statistical Data Processing, System Modeling and Reliability.
AD-A135 208

*KALISKI, M. E.

* * *

Asynchronous Discrete Control of Continuous Processes.
AD-A135 257

*KALLIANPUR, G.

* * *

Research in Stochastic Processes.
AD-A136 222

* * *

The Nonlinear Filtering Problem for the Unbounded Case.
AD-A136 501

* * *

Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.
AD-A136 507

* * *

Research in Stochastic Processes.
AD-A137 736

*KALMAN, R. E.

* * *

Identification from Real Data.
AD-A137 820

*KALOS, M. H.

* * *

Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.
AD-A136 237

*KAPLAN, A.

* * *

Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.
AD-A137 080

*KARANDIKAR, R. L.

* * *

The Nonlinear Filtering Problem for the Unbounded Case.
AD-A136 501

*KAREIVA, P.

* * *

Estimation Techniques for Transport Equations.
AD-A135 092

*KAREIVA, P. M.

* * *

Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.
AD-A135 093

*KARIM, K. R.

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Auger and Radiative Deexcitation of P(4+) Ions,
AD-A137 747

*KARR, A. F.

* * *

Estimation and Reconstruction for Stochastic Processes and Deterministic Functions.
AD-A136 571

*KARWACKI, E. J.

* * *

Angle-Resolved SIMS (Secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111),
AD-A135 128

*KARWEIK, D. H.
* * *
Prospects in the Analysis of Chemically Modified Electrodes,
AD-A138 639
* * *
A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer,
AD-A138 641
* * *
Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy,
AD-A138 695
* * *
Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas,
AD-A138 749

*KATZ, I. N.
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Development and Application of the P-Version of the Finite Element Method.
AD-A137 059

*KAUFMAN, L.
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Computer-Based Methods for Thermodynamic Analysis of Materials Processing.
AD-A136 085
* * *
Neuromagnetic Investigation of Workload and Attention.
AD-A136 172

*KAUL, A.
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Durability and Failure Analyses of a Silane Treated Alpha-A1203/Polyethylene Joint in Wet Environment.
AD-A136 089

*KAZAKOS, D.
* * *
On Retransmission Control Policies in Multiaccess Channels.
AD-A136 534

*KAZARIAN, L. E.
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The Scanning Electron Microscopy of Compressed Spinal Units,
AD-A135 142

*KAZOURA, S. A.
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Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes,
AD-A136 046

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AD-A137 086

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AD-A137 025
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Rhesus Monkey Intervertebral Disk Viscoelastic Response to Shear Stress,
AD-A135 161

*KEMPER, A.
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AdaRel: A Relational Extension of Ada.
AD-A137 108
* * *
An Analysis of Application Generators.
AD-A137 159

*KENNEDY, D. A.
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Unsteady Separated Flows: Vorticity and Turbulence.
AD-A138 593

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AD-A135 117

*KHAN, M. A.
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Mechanisms of Optical Phase Conjugation in Hg(1-x)Cd(x)Te,
AD-A135 699

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AD-A138 926

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AD-A135 723

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AD-A137 520

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AD-A135 468
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AD-A135 723
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Polyphosphorus Compounds Containing Phosphorus-Nitrogen Bonds.
AD-A137 722

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Synthesis of Efficient Structures for Concurrent Computation.
AD-A135 892

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AD-A137 078

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Effects of Assuming Independent Component Failure Times, if They Are Actually Dependent, in a Series System.
AD-A136 567

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Modified Green's Functions and the Third Boundary Value Problem for the Helmholtz Equation.
AD-A137 756

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AD-A138 722

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The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.
AD-A136 124

*KOBAYASHI, N.
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Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins.
AD-A138 637

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Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

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A Fundamental Study of P/M processed Elevated Temperature Aluminum Alloys.
AD-A136 154

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Control Strategies for Complex Systems for Use in Aerospace Avionics.
AD-A135 072

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Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.
AD-A135 464

*KOSINSKI, M. A
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Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.
AD-A137 024
* * *
Laser Excited Atomic and Ioric Fluorescence in an Inductively Coupled Plasma,
AD-A137 026
* * *
Evaluation of an Inductively Coupled Plasma with an Extended Sleeve Torch as an Atomization Cell for Laser Excited Fluorescence Spectrometry,
AD-A137 072
* * *
Atomic Fluorescence Spectrometry with Inductively Coupled Plasma as Excitation Source and Atomization Cell,
AD-A137 076

*KRAFFT, C. S.
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A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.
AD-A138 919

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The Effect of Intercalation on the Lattice Constants of Graphite.
AD-A136 081

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Phospha-s-Triazines. VI. Polymeric Systems,
AD-A136 068
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Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies,
AD-A137 762

*KRESKOVSKY, J. P.
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Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.
AD-A137 022

*KRIEGSMANN, G. A.
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The Calculations of an Inverse Potential Problem,
AD-A136 067

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On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water + Sucrose + NaCl at the Mercury-Solution Interface,
AD-A135 779

*KRONAUER, R.
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Quantification of Interference and Detectability Properties of Visual Stimuli for Optimal Display Design.
AD-A135 438

*KRUG, W. P.
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Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2'-bipyridine)ruthenium(II) to Laser Dyes,
AD-A136 203

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Mechanisms of Optical Phase Conjugation in Hg(1-x)Cd(x)Te,
AD-A135 699

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A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.
AD-A138 919

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The Molecular Toxicology of Chromatin.
AD-A135 399
* * *
Probable Helical Conformation of Poly(ADP-ribose),
AD-A135 741
* * *
Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose,
AD-A137 078
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The Effect of in Vivo Treatment with Triiodothyronine on the in Vitro Synthesis of Protein-Poly(ADP)-Ribose Adducts by Isolated Cardiocyte Nuclei and the Separation of Poly(ADP)-ribosylated Proteins by Phenol Extraction and Electrophoresis,
AD-A137 793

*KUO, S. P.
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Interaction of Electromagnetic Fields with Plasma.
AD-A135 173

*KUROSAKA, M.
* * *
Acoustic Streaming in Swirling Flow and the Ranque-Hilsch (Vortex-Tube) Effect.
AD-A135 427

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AD-A136 062
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Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins,
AD-A138 637
* * *
Electrochemistry of Oxygen Reduction. 4. Oxygen to Water

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AD-A138 638

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Prospects in the Analysis of Chemically Modified Electrodes.
AD-A138 639

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Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism.
AD-A138 640

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A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer.
AD-A138 641

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AD-A138 695

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AD-A138 749

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Anticholinesterase Effects on Number and Function of Brain Muscarinic Receptors and Central Cholinergic Activity: Drug Intervention.
AD-A138 746

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Rhesus Monkey Intervertebral Disk Viscoelastic Response to Shear Stress.
AD-A135 161

*LAGACE, P. A.

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Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.
AD-A137 047

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AD-A137 894

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AD-A137 723

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AD-A136 071

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AD-A136 040

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Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.
AD-A135 211

*LAMM, P. K. D.

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Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.
AD-A135 093

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A Search for Light Variations in Barium Stars.
AD-A135 689

*LANG, K. R.

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Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.
AD-A136 205

*LANGHOFF, S. R.

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The Low-Lying 2Sigma-States of OH.
AD-A136 075

*LANGLEY, A. E.

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Effect of PFDA on Cardiac Membrane Function.
AD-A137 729

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AD-A138 745

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AD-A137 111

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The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface.

AD-A137 113

*LARSEN, F. F
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Hemispheric Asymmetries in a Signal Detection Task,
AD-A138 806

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Can a VHF Doppler Radar Provide Synoptic Wind Data? A Comparison of 30 Days of Radar and Radiosonde Data,
AD-A135 357

*LAST, I.
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AD-A136 101

*LAUFER, J.
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Noise Generation by a Low-Mach-Number Jet,
AD-A138 698

*LAWLEY, A.
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A Fundamental Study of P/M processed Elevated Temperature Aluminum Alloys.
AD-A136 154

*LAY, T.
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Body Wave Amplitude and Travel Time Correlations Across North America,
AD-A136 097

*LEADBETTER, M. R.
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Research in Stochastic Processes.
AD-A136 222
* * *
Research in Stochastic Processes.
AD-A137 736

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Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface,
AD-A135 722
* * *
One-Dimensional Models of Anisotropic Fluids,
AD-A135 734
* * *
Sphericalization of Nonspherical Interactions,
AD-A135 742
* * *
Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.
AD-A136 237

*LEE, A. J.
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A Note on the Campbell Sampling Theorem,
AD-A135 245

*LEE, B. H.
* * *
Rigid-Ladder Polymers: Polymers Containing Anthraquinone Recurring Units,
AD-A136 012

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Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant,
AD-A137 834

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AD-A137 028

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AD-A136 049

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AD-A136 066
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AD-A136 074
* * *
Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2+ in Helium,
AD-A137 765

*LESPADE, P.
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Model for Raman Scattering from Incompletely Graphitized Carbons.
AD-A136 458

*LETTON, A.
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TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.
AD-A137 048

*LEVIE, R. DE
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The Structure of Charged Interfaces,
AD-A135 763

*LEVY, B.
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Linear and Nonlinear Filtering and Related Inverse Scattering Problems.

AD-A135 175

*LI, L.

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Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.
AD-A136 319

*LI, T. T.

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Comparisons between Theoretical and Experimental Deuterium Isotope Effects for Some Outer-Sphere Electrochemical Reactions,
AD-A137 098

*LI, X.

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Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.
AD-A136 244

*LIBOFF, R. L.

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AD-A136 519

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AD-A137 725

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AD-A136 034

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Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation,
AD-A135 181

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AD-A137 763

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Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites,
AD-A137 757

*LIND, R. C.

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Phase Conjugate Optical Resonator.
AD-A136 071

*LINDQUIST, A.

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Algorithms, Modeling and Estimation for Linear Systems.
AD-A135 134

*LINIGER, W.

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Accurate Multistep Methods for Smooth Stiff Problems,
AD-A135 220

*LIPKIN, M.

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Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach,
AD-A135 127

*LIU, B.

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Improving Resolution for Autoregressive Spectral Estimation by Decimation.
AD-A135 425

*LIU, H. Y.

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AD-A136 096

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The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface,
AD-A137 113

*LONG, G. L.

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Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements,
AD-A137 024

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Development of a Planar Heterojunction Bipolar Transistor for Very High Speed Logic.

AD-A136 341

*LORBER, P. F.
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Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.
AD-A137 070
* * *
Measurements of the Near Wake of an Airfoil in Unsteady Flow.
AD-A137 744

*LOU, X. C.
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An Algebraic Approach to Analysis and Control of Time-Scales.
AD-A13[illegible] 115

*LOVELAND, D. W.
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Search Algorithms and Their Implementation.
AD-A135 154

*LOWE, W. P.
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Tunneling Properties of Single Crystal Nb/Nb2O5/Pb Josephson Junctions.
AD-A135 670

*LU, R. X
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Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.
AD-A137 103

*LUDWIG, E. G., JR
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Synthesis and Spectra of Tetravinyldistibines.
AD-A137 733

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Unsteady Separated Flows: Vorticity and Turbulence.
AD-A138 593

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AD-A135 972

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AD-A138 745

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Investigation of Optimum Magnet Geometries for Gain-Expanded Free-Electron Lasers.
AD-A136 494

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AD-A137 751
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AD-A138 550
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AD-A138 814

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AD-A136 204

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Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.
AD-A135 464

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The Program Complexity of Searching a Table.
AD-A135 299

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AD-A135 822

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AD-A136 079
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Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2'-bipyridine)ruthenium(II) to Laser Dyes.
AD-A136 203

*MAR, J. W.
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Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.
AD-A137 047

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Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.
AD-A135 219

*MARGOLIN, H.
* * *
Fatigue Crack Propagation in Ti-Mn Alloys: The Role of the Bauschinger Effect.
AD-A136 036

*MARK, H.
* * *

Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory.
AD-A136 198

*MARK, J. E.
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Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers.
AD-A136 349
* * *
Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-like Benzobisoxazole Polymers.
AD-A137 795
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CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis- and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles.
AD-A137 833

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High Power Submillimeter and Infrared Radiation from Intense Relativistic Electron Beams.
AD-A136 287

*MARTIN, D. L.
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Mathematical Simulation of the Cardiopulmonary System.
AD-A135 460

*MARTIN, F.
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Long Range Behavior of the Gerade States near the 2P3/2 + 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.
AD-A136 080

*MARTIN, S.
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Phosphorus- and Arsenic Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers.
AD-A136 059

*MARVEL, C. S.
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Rigid-Ladder Polymers: Polymers Containing Anthraquinone Recurring Units.
AD-A136 012
* * *
Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.
AD-A137 757

*MAUGER, A.
* * *
Dynamics of Orientational Fluctutations of Molecules Near a Liquid-Solid Interface: A Landau-Ginzburg Description.
AD-A135 148

*MAYR, S. W.
* * *
Synthesis of Efficient Structures for Concurrent Computation.
AD-A135 892

*MAYVILLE, R.
* * *
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.
AD-A135 663

*MAZUR, P.
* * *
Inelastic Scattering of Neutrons by Surface Spin Waves on Ferromagnets.
AD-A136 336

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Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds.
AD-A136 005

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* * *
The Optical Variability and Spectrum of PKS 2155-304.
AD-A135 826

*MCCARTHY, G.
* * *
Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.
AD-A136 268

*MCCLURE, D. E.
* * *
Aspects of Pattern Theory.
AD-A136 506

*MCDONALD, H.
* * *
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.
AD-A137 022

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The Fatigue of Powder Metallurgy Alloys.
AD-A138 714

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Phase Conjugate Optical Resonator.
AD-A136 071

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New Techniques for Measuring Single Event Related Brain Potentials.
AD-A138 694

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Photoelectric Comparison Sequences in the Fields of Four BL Lacertae Objects.
AD-A135 753

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Final Report on Grant AFOSR-82-0171
AD-A135 152

*MCLICK, J.
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Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose,
AD-A137 078

*MCMURRAY, R. G.
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Hemodynamic Responses of Runners and Water Polo Players during Exertion in Water,
AD-A135 469

*MCNEIL, J. R.
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Ion Beam Assisted Deposition of SiO2.
AD-A136 247

*MCQUISTAN, R. B.
* * *
Lattice Statistics.
AD-A136 588

*MEDFORD, L. V.
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Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.
AD-A138 745

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* * *
The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.
AD-A136 124

*MEINDL, J. D.
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Center of Excellence in Aerospace Manufacturing Automation.
AD-A136 477

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Energetics and Mechanism of Mg(3P) Production in Mg/N2O/CO Flames,
AD-A135 356

*MELLOR, G. L.
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AD-A137 008

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Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.
AD-A138 745

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Notions of Dependency Satisfaction.
AD-A135 303

*MENG, C. I.
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A Study of Low Energy Electron Precipitations and Auroral Phenomena by Using the USAF Polar Orbiting Satellites.
AD-A137 888

*MERAKOS, L.
* * *
On Retransmission Control Policies in Multiaccess Channels.
AD-A136 534

*MEYER, D.
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AD-A135 739

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The X-Ray Crystal Structure of Tetramesityldisilene,
AD-A135 957

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AD-A135 356
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AD-A135 957

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Hemodynamic Responses of Runners and Water Polo Players during Exertion in Water,
AD-A135 469

*MILLER, B.
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Current-Voltage Analysis of Photoelectrochemical Cells under Mass and Light Flux Variation,
AD-A135 162

*MILLER, C. W.
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Prospects in the Analysis of Chemically Modified Electrodes,
AD-A138 639
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A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer,
AD-A138 641
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AD-A138 695
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AD-A138 749

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The Variability of the Optical Counterparts of Four Extragalactic Radio Sources.
AD-A135 752
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AD-A135 753
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The Variability of the Spectrum of Arakelian 120.
AD-A135 796
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The Optical Variability and Spectrum of PKS 2155-304.
AD-A135 826

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Dynamics of Orientational Fluctutations of Molecules Near a Liquid-Solid Interface: A Landau-Ginzburg Description.
AD-A135 148
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Surface Polaritons on Uniaxial Antiferromagnets.
AD-A135 974
* * *
Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum.
AD-A135 999
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AD-A136 336

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AD-A135 474

*MINAGA, T
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AD-A135 741
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AD-A137 078

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AD-A137 068

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AD-A135 221
* * *
Annual Scientific Report for Grant AFOSR-81-0205.
AD-A135 452
* * *
Preserving Asymmetry by Symmetric Processes and Distributed Fair Conflict Resolution.
AD-A135 458

*MITRA, S K.
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The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems.
AD-A137 074

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Linear and Nonlinear Filtering and Related Inverse Scattering Problems.
AD-A135 175
* * *
Approximations for Nonlinear Filtering.
AD-A136 135

*MIZOTA, H.
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Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region.
AD-A135 149

*MOESCHBERGER, M. L.
* * *
Effects of Assuming Independent Component Failure Times, if They Are Actually Dependent, in a Series System.
AD-A136 567

*MOON, D. W.
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Angle-Resolved SIMS (Secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111).
AD-A135 128

*MOORE, B. N.
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Theoretical Studies on Free Electron Lasers.
AD-A136 333

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* * *
Knowledge Representation and Natural-Language Semantics.
AD-A135 476

*MORAWETZ, C. S.
* * *
The Calculations of an Inverse Potential Problem.
AD-A136 067

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* * *
Statistical Data Processing, System Modeling and Reliability.
AD-A135 208

*MORKOVIN, M. V.
* * *

Understanding Transition to Turbulence in Shear Layers.
AD-A134 796

*MOSES, H. E.
* * *
Research on the Inverse Problem of Scattering.
AD-A136 493

*MOSES, J.
* * *
Research in Algebraic Manipulation.
AD-A137 742
* * *
Research in Algebraic Manipulation.
AD-A137 776

*MPITSOS, G. J.
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The Generation of Rhythmic Activity in a Distributed Motor System,
AD-A135 470
* * *
Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea,
AD-A135 530

*MULLIKIN, T. L.
* * *
Photoelectric Comparison Sequences in the Fields of Four BL Lacertae Objects.
AD-A135 753

*MUNTZ, E. P.
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Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7,
AD-A137 015

*MURPHY, W. C.
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Analysis of Laser-Enhanced Adsorption/Desorption Proce ses on Semiconductor Surfaces via Electronic Surface State Excitation,
AD-A135 181
* * *
Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant,
AD-A137 834

*MUTCHLER, D. C.
* * *
Search with Limited Resources.
AD-A136 122

*NACK, W. V.
* * *
Optimization for Vibration Isolation.
AD-A137 895

*NADLER, I.
* * *
Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.
AD-A136 082

*NANJUNDIAH, C.
* * *
Electrochemical Studies of Fe(II) and Fe(III) in an Aluminum Chloride-Butylpyridinium Chloride Ionic Liquid,
AD-A135 101
* * *
Electrochemical Studies of Cu(I) and Cu(II) in an Aluminum Chloride-N(n-Butyl) Pyridinium Chloride Ionic Liquid,
AD-A135 178

*NARASIMHAN, B.
* * *
Design of Office Information Systems.
AD-A136 523
* * *
An Analysis of Application Generators.
AD-A137 159

*NEIDERLEHNER, B. R.
* * *
Sublethal Effects of JP-4 on Aquatic Organisms and Communities.
AD-A138 807

*NEUHOFF, D. L.
* * *
Study of Finitistic Channel Models.
AD-A136 139

*NEURGAONKAR, R. R.
* * *
Research on Ferroelectric Materials for Millimeter Wave Application.
AD-A137 128

*NEVINS, B. D.
* * *
Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL),
AD-A136 014

*NEWTON, A. R.
* * *
Relaxation-Based Electrical Simulation,
AD-A136 196

*NEYNABER, R. H.
* * *
Charge Transfer between Neon Ions and Metastable Helium,
AD-A136 517

*NICHOLSON, M. M.
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Multicolor Electrochromic Display Technology,
AD-A136 286

*NICOLAIDES, R. A.
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Interim Technical Report, 1 June 1982-31 May 1983, Grant AFOSR-82-0213,
AD-A136 158

*NIEMI, E. E., JR
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Reattachment of a Three-

Dimensional, Incompressible Jet to an Adjacent Axisymmetric Inclined Surface.
AD-A136 288

*NORTON, R. J. G.
* * *
Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.
AD-A135 711

*NYE, B.
* * *
DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits,
AD-A135 662

*OATES, G. C.
* * *
Mixing of Swirling Flows and Behavior of Wet Flows.
AD-A138 697

*ODEH, F.
* * *
A Semi-Direct Method for Modular Circuits,
AD-A135 138
* * *
Accurate Multistep Methods for Smooth Stiff Problems,
AD-A135 220

*OGILVIE, R.
* * *
The Effect of Intercalation on the Lattice Constants of Graphite.
AD-A136 081

*O'LEARY, D. P.
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Summary of Work Done on Grant AFOSR-82-0078.
AD-A136 570

*OLINER, A. A.
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Basic Research in Electronics (JSEP) Joint Services Electronics Program.
AD-A136 290

*OLSEN, R. G.
* * *
Immune Dysfunctions and Abrogation of the Inflammatory Response by Environmental Chemicals.
AD-A137 768

*OLSON, D. B.
* * *
Ionic Mechanisms of Carbon Formation in Flames.
AD-A137 079

*OPEKAR, F.
* * *
Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine,
AD-A135 140

*ORBITS, D. A.
* * *
A CRAY-Class Multiprocessor Simulator.
AD-A136 555

*ORTEGA, J. M.
* * *
Recent Results of the ACO Storage Ring F.E.L. Experiment,
AD-A137 803
* * *
UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser,
AD-A138 740

*OSA, T.
* * *
Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins,
AD-A138 637

*OSTERYOUNG, R. A.
* * *
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AD-A135 101
* * *
Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System,
AD-A135 112
* * *
Electrochemical Studies of Cu(I) and Cu(II) in an Aluminum Chloride-N(n-Butyl) Pyridinium Chloride Ionic Liquid,
AD-A135 178
* * *
Electrochemical and Spectroscopic Studies of 9, 10-Anthraquinone in a Room Temperature Molten Salt,
AD-A135 195

*OWEN, D. H.
* * *
Functional Optical Invariants: A new Methodology for Aviation Research.
AD-A135 499

*PACIOREK, K. J. L.
* * *
Phospha-s-Triazines. VI. Polymeric Systems,
AD-A136 068
* * *
Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies,
AD-A137 762

*PADGETT, W. J.
* * *
Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data,
AD-A136 048

*PADWA, A.
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Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted

Azirenes,
AD-A137 154

*PAEZ, T. L.
* * *
Least Favorable Response of Inelastic Structures.
AD-A136 289
* * *
Identification of Damage in Hysteretic Structures.
AD-A136 342
* * *
Mathematical Models for Damageable Structures.
AD-A136 574

*PALMER, M.
* * *
Visualization of Accelerating Flow around an Airfoil at High Angles of Attack.
AD-A138 636

*PAPANTONI-KAZAKOS, P.
* * *
Robust Procedures for Communication Data.
AD-A136 540

*PAPPAS, D. L.
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Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.
AD-A137 520

*PARENTE, F.
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Inelastic X-Ray Scattering Cross Sections of Ne,
AD-A135 801

*PARK, J. S.
* * *
Fatigue Crack Propagation in Ti-Mn Alloys: The Role of the Bauschinger Effect.
AD-A136 036

*PATEL, V. C.
* * *
Three-Dimensional Turbulent Boundary Layer on a Body of Revolution at Incidence.
AD-A135 454

*PEARLMAN, W. A.
* * *
Simply Instrumentable and Optimal Digitization of Analog Information Sources.
AD-A135 124

*PEARSON, A. E.
* * *
Control and Identification of Time Varying Systems.
AD-A135 223

*PEARSON, T. D. L.
* * *
Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2'-bipyridine)ruthenium(II) to Laser Dyes,
AD-A136 203

*PEIRCE, D.
* * *
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.
AD-A135 663

*PERCUS, J. K.
* * *
One-Dimensional Models of Anisotropic Fluids,
AD-A135 734
* * *
Sphericalization of Nonspherical Interactions,
AD-A135 742

*PERKINS, W. R.
* * *
Control Strategies for Complex Systems for Use in Aerospace Avionics.
AD-A135 072

*PESSINE, F. B. T.
* * *
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AD-A136 013

*PETERSON, B. M.
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The Variability of the Spectrum of Arakelian 120,
AD-A135 796

*PFAB, J.
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Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.
AD-A136 082

*PHANI, M. K.
* * *
Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.
AD-A136 237

*PHILPOTT, M. R.
* * *
Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes,
AD-A137 091
* * *
Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes,
AD-A137 097

*PHOKACHAIPATANA, S.
* * *
Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals,
AD-A136 197

*PIEROLA, [illegible] F.

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Stereochemistry of Photoinitiated Emulsion Polymerization,
AD-A135 193

*PIERRET, R. F.
* * *
Monolithic ZnO SAW (Surface Acoustic Waves) Structures.
AD-A135 987

*POIRIER, M.
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29Si NMR of Pentacoordinate Silicon Derivatives,
AD-A136 073

*POLITIS, D. T.
* * *
Study on Extremizing Adaptive Systems and Applications to Synthetic Aperture Radars.
AD-A137 725

*POMMERENING, H.
* * *
Synthesis and Spectra of Tetravinyldistibines,
AD-A137 733

*POOLE, B. R.
* * *
Interaction of Electromagnetic Fields with Plasma.
AD-A135 173
* * *
An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.
AD-A135 880

*PORTER, M. D.
* * *
Prospects in the Analysis of Chemically Modified Electrodes,
AD-A138 639

*PRIBRAM, K. H.
* * *
Neurophysiological Bases of Event-Related Potentials.
AD-A135 263

*PROSCHAN, F.
* * *
Optimum Replacement of a System Subject to Shocks,
AD-A135 168
* * *
The Reliability of K out of N systems,
AD-A135 246
* * *
Component Relevancy in Multistate Systems.
AD-A137 727

*PRUD'HOMME, C.
* * *
Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane,
AD-A136 583

*PSALTIS, D.
* * *
Acousto-Optic Processing of 2-D signals Using Temporal and Spatial Integration.
AD-A136 086

*PURI, M. L.
* * *
The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems,
AD-A137 074

*PUTNAM, R. S.
* * *
Broadly Tunable Mode-Locked HgCdTe Lasers.
AD-A136 178

*QUINN, J.
* * *
Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators,
AD-A136 592

*QUINN, J. W.
* * *
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AD-A135 629
* * *
Topical Meeting on Optical Bistability Held at Rochester, New York on 15-17 June 983.
AD-A133 998

*QUIRK, M. P.
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Improving Resolution for Autoregressive Spectral Estimation by Decimation.
AD-A135 425

*RADHAKRISHNAN, G.
* * *
Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.
AD-A136 082

*RAE, W. J.
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Computer Program for Evaluating the Ives Transformation in Turbomachinery Cascades. Revision.
AD-A137 064

*RAFF, L. M.
* * *
A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering,
AD-A135 976

*RAHMAN, T. S.
* * *
Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum,
AD-A135 999

*RAICH, J. C.
* * *

Critical Behavior in Annealed and Unannealed Crystals of Benzil,
AD-A136 061

* * *

Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.
AD-A136 077

* * *

Critical Fluctuations at the Phase Transition in Benzil,
AD-A138 567

* * *

Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil,
AD-A138 608

*RAMAPRIAN, B. R.

* * *

Three-Dimensional Turbulent Boundary Layer on a Body of Revolution at Incidence.
AD-A135 454

*RAM-MOHAN, L. R.

* * *

Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.
AD-A135 959

*RAO, A. N. V.

* * *

Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data,
AD-A136 048

*RASENICK, M. M.

* * *

The Effects of Hydrazines and Related Compounds on Calcium Calmodulin Regulated Synaptic Processes.
AD-A137 985

*REBERT, C. S.

* * *

Neurophysiological Bases of Event-Related Potentials.
AD-A135 263

* * *

Hemispheric Asymmetries in a Signal Detection Task,
AD-A138 806

*REDDY, D. R.

* * *

Global PNS (Parabolized Navier-Stokes) Solutions for Laminar and Turbulent Flow.
AD-A137 829

*REEVE, J. N.

* * *

Development of an in vivo Assay for Mistranslation: Inducing Activity of Pollutants and Characterization of Amino Acid Substitutions.
AD-A137 069

*REGAN, D.

* * *

Electrophysiology and Psychophysics of Motion in Depth.
AD-A135 167

*REISLER, H.

* * *

Time Resolved Observations of NH2 and Benzyl Radicals Produced in the Infrared Multiple Photon Dissociation of Benzylamine,
AD-A136 013

* * *

Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.
AD-A136 082

*REISS, E. L.

* * *

The Stability and Dynamics of Elastic Structures and Fluid Flows.
AD-A137 184

*RESTER, A. C., JR

* * *

Shuttle Flight Test of an Advanced Gamma-Ray Detection System.
AD-A136 157

* * *

Shuttle Flight Test of an Advanced Gamma-Ray Detection System.
AD-A136 681

*REYNOLDS, C. H.

* * *

Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne,
AD-A135 724

*REYNOLDS, G. O.

* * *

Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.
AD-A135 663

*RHODE, D. L.

* * *

Rotordynamic Forces Developed by Labyrinth Seals.
AD-A136 217

*RICE, J. B.

* * *

Development of an in vivo Assay for Mistranslation: Inducing Activity of Pollutants and Characterization of Amino Acid Substitutions.
AD-A137 069

*RICE, S. A.

* * *

Very Low Energy Collision Induced Vibrational Relaxation of (1)A sub u Glyoxal,
AD-A135 106

* * *

Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach,
AD-A135 127

* * *

SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy Transfer in 1B1 Difluorodiazirine,
AD-A137 034

* * *
Very-Low-Energy Collision-Induced Rotational Relaxation. A theoretical Analysis.
AD-A137 035

* * *
Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.
AD-A137 036

*RICH, J. D.
* * *
Electron Spin Resonance Studies of 1,4-Disilacyclohexa-2,5-Diene Free Radical Reactions.
AD-A136 072

*RINALDUCCI, E. J.
* * *
Visual Cues in the Simulation of Low-Level Flight.
AD-A135 461

*ROACHE, P. J.
* * *
Adaptive Grid Generation Using Elliptic Generating Equations with Precise Coordinate Controls.
AD-A137 006

*ROBINSON, K. E.
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Recent Results of the ACO Storage Ring F.E.L. Experiment.
AD-A137 803

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Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group),
AD-A138 560

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Anomalous Laser Induced Bunch Lengthening on the ACO Storage Ring Free Electron Laser.
AD-A138 814

*ROLFE, T. J.
* * *
Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.
AD-A137 036

*ROSASCO, S. D.
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Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg -I,
AD-A137 071

* * *
Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 179

*ROSENBLUTH, M. N.
* * *
Theoretical Studies on Free Electron Lasers.
AD-A136 333

*ROSENFELD, A.
* * *
Theory of Image Analysis and Recognition.
AD-A135 453

*ROSENKRANTZ, W. A.
* * *
Calculation of the Laplace Transform of the Length of the Busy Period for the M/G/1 Quenue via Martingales,
AD-A136 053

* * *
Diffusion Approximation for a Class of Markov Processes Satisfying a Nonlinear Fokker-Planck Equation,
AD-A136 582

* * *
Applications of Functional Analytic and Martingale Methods to Problems in Queueing Network Theory.
AD-A137 748

*ROSINSKI, J.
* * *
Convergence of Quadratic Forms in p-Stable Random Variables and Theta sub p-Radonifying Operators.
AD-A135 314

*ROSS, D. S.
* * *
Nitrations Conference Held at Menlo Park, California on 27-29 July 1983.
AD-A135 822

*ROUSSOPOULOS, N.
* * *
Research in Programming Languages and Software Engineering.
AD-A136 037

*ROWCLIFFE, D. J.
* * *
Silicon Nitride Joining.
AD-A136 547

*ROYO, G.
* * *
29Si NMR of Pentacoordinate Silicon Derivatives,
AD-A136 073

*RUBIN, I.
* * *
Performance Evaluation and Control of Distributed Computer Communication Networks.
AD-A135 121

*RUBIN, S. G.
* * *
Global PNS (Parabolized Navier-Stokes) Solutions for Laminar and Turbulent Flow.
AD-A137 829

* * *
Second Order Composite Velocity Solution for Large Reynolds Number Flows,
AD-A138 926

*RUSSELL, D. L.
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Provisions of AFOSR Grant-79-0018, Nov 1, 1981 through October 31, 1982.
AD-A135 146

*RYBA, E. P.
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Studies of Polymer-Bound Macrocyclic Polytertiary Phosphines
AD-A135 718

*RZEPA, H. S.
* * *
Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine,
AD-A135 728

*SADANANI, N. D.
* * *
Novel Di-isopropylamino Derivatives of Trivalent Phosphorus.
AD-A135 468

*SAFONOV, M. G.
* * *
Return Difference Feedback Design for Robust Uncertainty Tolerance in Stochastic Multivariable Control Systems.
AD-A138 495

*SALOUR, M. M.
* * *
Dewar Design for Optically Pumped Semiconductor Ring Laser.
AD-A136 041
* * *
Broadly Tunable Mode-Locked HgCdTe Lasers.
AD-A136 178

*SANDHU, S. S.
* * *
Prediction of an Apparent Flame Length in a Co-Axial Jet Diffusion Flame Combustor.
AD-A135 088

*SANGIOVANNI-VINCENTELLI, A. L.
* * *
DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.
AD-A135 662
* * *
Relaxation-Based Electrical Simulation,
AD-A136 196

*SASAKI, Y.
* * *
Guided-Wave Polaritons in Thin Films of the Layered Compound GaSe,
AD-A136 102
* * *
Raman Scattering Mediated by Surface-Plasmon Polariton Resonance.
AD-A136 151

*SAUNDERS, D. A.
* * *
A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.
AD-A138 919

*SCHAWLOW, A. L.
* * *
Investigation of Optimum Magnet Geometries for Gain-Expanded Free-Electron Lasers.
AD-A136 494

*SCHEURLE, J.
* * *
Smoothness of Bounded Solutions of Nonlinear Evolution Equations.
AD-A135 294

*SCHIMKE, S. M.
* * *
Unsteady Boundary Layers on Thin Bodies of Revolution.
AD-A136 257

*SCHLESINGER, S. P.
* * *
High Power Submillimeter and Infrared Radiation from Intense Relativistic Electron Beams.
AD-A136 287

*SCHLINKER, R. H.
* * *
Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers,
AD-A135 729

*SCHMIT, J. L.
* * *
Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.
AD-A136 177

*SCHOWENGERDT, R. A.
* * *
Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.
AD-A138 736

*SCHWEITZER, E.
* * *
Spectroscopy of Molecules at High Excitation Levels,
AD-A137 835

*SCHWIND, R. G.
* * *
Effects of Blowing Spanwise from the Tips of Low-Aspect Ratio Wings of Varying Taper Ratio, with Application to Improving STOL capability of Fighter Aircraft.
AD-A135 688

*SCOTT, R. W.
* * *
Surface Signatures of a Dry Nocturnal Gust Front,
AD-A137 822

*SERVAES, D. A.
* * *
Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.
AD-A135 663

*SETHURAMAN, V.
* * *
Very-Low-Energy Collision-Induced Rotational Relaxation. A theoretical Analysis,
AD-A137 035

*SEYFERTH, D.
* * *
Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 1. Synthesis and Characterization,
AD-A135 968
* * *
Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers,
AD-A136 059
* * *
Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry,
AD-A136 140
* * *
Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane,
AD-A136 583

*SHAMROTH, S. J.
* * *
Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.
AD-A137 022

*SHANBHAG, R. N.
* * *
Time Domain Analysis and Synthesis of Robust Controllers for Large Scale LQG (Linear Quadratic Gaussian) Regulators.
AD-A137 760

*SHAYEGAN, M.
* * *
High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.
AD-A136 459

*SHEFER, R. E.
* * *
Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL),
AD-A136 014
* * *
Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams,
AD-A137 038

*SHER, A.
* * *
Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals,
AD-A136 197

*SHESKIN, T. J.
* * *
Fault Isolation of Modular Equipment with Imperfect Built-in-Tests.
AD-A137 046

*SHIELDS, P. C.
* * *
Study of Finitistic Channel Models.
AD-A136 139

*SHIMIZU, K.
* * *
Electrochemical Studies of Fe(II) and Fe(III) in an Aluminum Chloride-Butylpyridinium Chloride Ionic Liquid,
AD-A135 101

*SHIROUZU, M.
* * *
An Assessment of Recent Results on Pseudo-Stationary Oblique-Shock-Wave Reflections.
AD-A135 260

*SIEGEL, H. J.
* * *
A Versatile Parallel Image Processor System.
AD-A136 292

*SIEGMAN, A. E.
* * *
Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique,
AD-A137 051

*SKELL, P. S.
* * *
Competitive Rates of Reactions of Molybdenum Atoms with Arenes.
AD-A136 078

*SLEMROD, M.
* * *
Deterministic Chaos in Materials Exhibiting Phase Transitions.
AD-A135 172
* * *
Viscoelastic Fluid Flow Exhibiting Hysteritic Phase Changes,
AD-A135 411
* * *
An Admissibility Criterion for Fluids Exhibiting Phase Transitions,
AD-A136 103
* * *
Nonlinear Systems in Infinite Dimensional State Spaces.
AD-A136 530
* * *
The Viscosity-Capillarity Criterion for Shocks and Phase Transitions,
AD-A137 003
* * *
Boundary Feedback Stabilization for a Quasi-Linear Wave Equation,
AD-A137 004

*SLUD, E.
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Interim Report on Research Supported by Grant AFOSR-82-0187.
AD-A137 086

*SMART, M. J.
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AD-A137 891

*SMIST, T. E.
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AD-A135 500

*SMITH, C. R.
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The Effects of Cylindrical Surface Modifications on Turbulent Boundary Layers.
AD-A136 296
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A Synthesized Model of the Near-Wall Behavior in Turbulent Boundary Layers.
AD-A137 029
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Experimental Observations of Vortex Ring Interaction with the Fluid Adjacent to a Surface.
AD-A138 999

*SMITH, J. L.
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Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.
AD-A135 211

*SMITH, M. A
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Product Vibrational State Distributions in Thermal Energy Associative Detachment Reactions: F- + H,D Yields HF(v), DF(v) + e-,
AD-A136 049
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Infrared Chemiluminescence from Vibrationally Excited NO+: Product Branching in the N+ + O2 Ion-Molecule Reaction,
AD-A136 074

*SMITH, P. R.
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Manufacturing Information System.
AD-A137 891

*SMITH, R. A.
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Spatial Frequency Masking and Weber's Law,
AD-A137 755
* * *
An Action Spectrum for Spatial-Frequency Adaptation,
AD-A137 758

*SMITH, R. A., JR
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Size Discrimination with Low Spatial Frequencies,
AD-A137 821

*SNYDER, H. L.
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AD-A137 726

*SOFFER, B. H.
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AD-A138 843

*SONG, D.
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AD-A137 071
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Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.
AD-A137 179

*SONTAG, E. D.
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Stabilization of Polynomially Parametrized Families of Linear Systems. The Single-Input Case,
AD-A137 830

*SORIAGA, M. P.
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AD-A137 045
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The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds,
AD-A137 075
* * *
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AD-A137 179

*SPIEGEL, S. L.
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Further Development of a Computer Algorithm for the Automatic Determination of Space Vehicle Potential in Real Time.
AD-A137 041

*SPINGARN, J. E.
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Partial Inverse of a Monotone Operator,
AD-A137 016

*SPOTO, J.
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DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits,
AD-A135 662

*SRIDHARAN, R.
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Water-Mercury Interface,
AD-A135 778

*SRINVIASAN, V.
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AD-A137 425

*SRIVASTAVA, S. K.
* * *
Production of Negative Ions by Electron Impact.
AD-A135 176

*STEINFELD, J. I.
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Spectroscopy of Molecules at High Excitation Levels,
AD-A137 835

*STEWART, G. W.
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Summary of Work Done on Grant AFOSR-82-0078.
AD-A136 570

*STEWARTSON, K.
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Unsteady Boundary Layers on Thin Bodies of Revolution.
AD-A136 257

*STICKNEY, J. L.
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AD-A137 071
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AD-A138 736

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The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.
AD-A136 124

*SUGIYAMA, H.
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Numerical Analysis of Dusty Supersonic Flow Past Blunt Axisymmetric Bodies.
AD-A135 135

*SULKES, M.
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AD-A135 106

*SULLIVAN, B. J.
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AD-A136 460

*SUMMERS, P. M.
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A CRAY-Class Multiprocessor Simulator.
AD-A136 555

*SUN, T. S.
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AD-A137 764

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Novel Di-isopropylamino Derivatives of Trivalent Phosphorus.
AD-A135 468

*SUNG, C. S. P.
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AD-A136 089

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AD-A135 113
* * *
Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region,
AD-A135 149
* * *
Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.

AD-A135 170

* * *

Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.
AD-A135 171

*SWIFT, D. J.

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Spatial Frequency Masking and Weber's Law,
AD-A137 755

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An Action Spectrum for Spatial-Frequency Adaptation,
AD-A137 758

*TAN, C. S.

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Mechanisms of Inlet-Vortex Formation,
AD-A135 471

*TANAKA, T. J.

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Pulsed Plasma Source Spectrometry in the 80-8000-eV X-Ray Region,
AD-A137 724

*TANG, S. Y.

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Charge Transfer between Neon Ions and Metastable Helium,
AD-A136 517

*TANNEHILL, R. S.

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Single Trial Brair Electrical Patterns of an Auditory and Visual Perceptuomotor Task.
AD-A135 545

*TASSOULAS, J. L.

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Analysis of a High-Strength Concrete Model under Biaxial Compression.
AD-A137 050

*TAYLOR, R. L.

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Tightness and Strong Laws of Large Numbers in Banach Spaces,
AD-A135 097

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Weak Convergence of Linear Forms in D(0,1).
AD-A135 424

*THEYE, M. L.

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Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys,
AD-A136 227

*THOMAS, V.

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Modeling of Inhalation Administration of Vapors with Capacity Limited Clearance.
AD-A136 847

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Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.
AD-A135 711

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AD-A135 836

*TIMP, G.

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Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds,
AD-A136 300

*TITS, A.

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DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits,
AD-A135 662

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AD-A135 711

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AD-A137 051

*TREWYN, R. W.

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In vitro Transformation of Cultured Human Diploid Fibroblasts,
AD-A135 474

* * *

Chemical Carcinogen-Induced Changes in tRNA Metabolism in Human Cells.
AD-A138 715

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Synthesis and Chemistry of Energetic Metallotetraazadienes.
AD-A136 269

*TURRO, N. J

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Application of Weak Magnetic Fields to Influence Rates and Molecular Weight Distributions of Styrene Polymerization,
AD-A135 179

* * *

Stereochemistry of Photoinitiated Emulsion Polymerization,
AD-A135 193

* * *

Computers, Lasers Aid Carbene Chemistry,
AD-A136 002

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Natural Correlation Diagrams. A unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions,
AD-A136 003

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Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals.
AD-A136 114

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Influence of Nuclear Spin on Chemical Reactions. Magnetic Isotope and Magnetic Field Effects A Review.
AD-A136 175

* * *

Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.
AD-A136 244

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Structural and Dynamic Studies of Materials Possessing High Energy Content.
AD-A136 250

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Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.
AD-A137 154

*UCHIDA, H.

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Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma.
AD-A137 026

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Evaluation of an Inductively Coupled Plasma with an Extended Sleeve Torch as an Atomization Cell for Laser Excited Fluorescence Spectrometry.
AD-A137 072

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Atomic Fluorescence Spectrometry with Inductively Coupled Plasma as Excitation Source and Atomization Cell.
AD-A137 076

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Universal Relation Database Systems.
AD-A135 707

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AD-A135 711

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Guided-Wave Polaritons in Thin Films of the Layered Compound GaSe.
AD-A136 102

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Raman Scattering Mediated by Surface-Plasmon Polariton Resonance.
AD-A136 151

*VACZY, C. M.

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Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.
AD-A137 070

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Measurements of the Near Wake of an Airfoil in Unsteady Flow.
AD-A137 744

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Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys.
AD-A136 227

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AD-A137 034

*VARDI, M.

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On Acyclic Database Decompositions.
AD-A135 105

*VARDI, M. Y.

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Notions of Dependency Satisfaction.
AD-A135 303

*VASQUEZ-ESPINOSA, R. E.

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Markov Texture Generation.
AD-A136 168

* * *

The Law of Comparative Judgment Theory and Implementation.
AD-A136 169

*VAUGHAN, D. K.

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Large-Scale Numerical Analysis of Seismic Waves in Basins.
AD-A136 313

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AD-A137 785

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AD-A138 813

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AD-A138 560

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AD-A138 814

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AD-A137 764

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AD-A136 080

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An Algebraic Approach to Analysis and Control of Time-Scales.
AD-A135 115

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AD-A135 115

*VIGUIER, H. C.
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Mechanisms of Inlet-Vortex Formation.
AD-A135 471

*VOIGTMAN, E. G.
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Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.
AD-A137 024

*VOLZ, R. A.
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Coordinated Research in Robotics and Integrated Manufacturing.
AD-A137 042

*WAGNER, R. M.
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The Variability of the Spectrum of Arakelian 120.
AD-A135 798

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AD-A137 778

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AD-A135 111

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AD-A136 096

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Identification of Damage in Hysteretic Structures.
AD-A136 342
* * *
Mathematical Models for Damageable Structures.
AD-A136 574

*WARDE, C.
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Development and Applications of the Microchannel Spatial Light Modulator.
AD-A136 132

*WARREN, C.
* * *
Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.
AD-A137 103

*WARREN, R.
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Functional Optical Invariants: A new Methodology for Aviation Research.
AD-A135 499

*WARSI, Z. U. A.
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The Generation of Three-Dimensional Body-Fitted Coordinate Systems for Viscous Flow Problems.
AD-A136 503

*WATSON, J. G.
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AD-A137 025

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AD-A136 096
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AD-A137 023
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AD-A137 091
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AD-A137 097
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AD-A137 098
* * *
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AD-A137 099
* * *
Determination of Specific

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AD-A137 111

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The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface,
AD-A137 113

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Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes,
AD-A137 425

*WEBER, W. P.

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Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes,
AD-A136 046

* * *

Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.
AD-A136 076

* * *

Oxidation of Dodecamethylcyclohexasilane by m-Chloroperbenzoic Acid,
AD-A136 327

*WEERTMAN, J. R.

* * *

Synthesis and Properties of Elevated Temperature P/M Aluminum Alloys.
AD-A135 956

*WEISER, M.

* * *

Parallel Logic Programming and ZMOB and Parallel Systems Software and Hardware.
AD-A137 068

*WEISER, M. D.

* * *

Research in Programming Languages and Software Engineering.
AD-A136 037

*WEISMULLER, T. P.

* * *

Multicolor Electrochromic Display Technology,
AD-A136 286

*WEISSHAAR, J. C.

* * *

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AD-A136 318

*WEITZNER, H.

* * *

lativistic Broadening Near Cyclotron Resonance.
AD-A136 224

*WELSH, W. J.

* * *

Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-Like Benzobisoxazole Polymers,
AD-A137 795

* * *

CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis- and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles,
AD-A137 833

*WERON, A.

* * *

Harmonizable Stable Processes on Groups: Spectral, Ergodic and Interpolation Properties.
AD-A136 504

*WEST, B. J.

* * *

Fractal Phase Screens.
AD-A137 804

*WEST, R.

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The X-Ray Crystal Structure of Tetramesityldisilene,
AD-A135 957

* * *

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AD-A136 006

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AD-A136 072

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AD-A136 073

*WHITE, J. H.

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AD-A137 045

*WHITSON, M. E., JR

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AD-A136 460

*WICKENS, C.

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The Event Related Brain Potential as an Index of Information Processing, Cognitive Activity, and Skill Acquisition: A Program of Basic Research.
AD-A137 779

*WICKS, G.

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AD-A137 798

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AD-A137 890

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AD-A136 078

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Studies of Aerodynamic Drag.
AD-A137 740

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Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.
AD-A135 464

*WILLIAMS, E.
* * *
Assigning Processes to Processors in Distributed Systems.
AD-A135 497

*WILLIAMSON, S. J.
* * *
Neuromagnetic Investigation of Workload and Attention.
AD-A136 172

*WILLSKY, A. S.
* * *
An Algebraic Approach to Analysis and Control of Time-Scales.
AD-A135 115

*WILLSON, R. F.
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High-Resolution Observations of Solar Radio Bursts at 2, 6, and 20 cm Wavelength,
AD-A136 207
* * *
Possible Detection of Thermal Cyclotron Lines from Small Sources within Solar Active Regions.
AD-A136 218

*WINEFORDNER, J. D.
* * *
Atomic and Molecular Gas Phase Spectrometry.
AD-A135 971
* * *
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* * *
Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma,
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* * *
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AD-A137 076

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AD-A135 128
* * *
Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton *Resonance Ionization*.
AD-A137 520

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AD-A136 520
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AD-A136 583

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Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 1. Synthesis and Characterization,
AD-A135 968
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Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of *Poly((1,1'-ferrocenediyl)phenylphosphine)* Oligomers and Polymers,
AD-A136 059

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AD-A136 013
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AD-A136 082

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AD-A136 313

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AD-A138 745

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AD-A135 959

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Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.
AD-A136 507

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Theoretical Studies on Free Electron Lasers.
AD-A136 333

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Microwave Semiconductor Research - Materials, Devices, Circuits.
AD-A137 798

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Physics of High Temperature, Dense Plasmas.
AD-A138 872

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AD-A137 798

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Convergence of Quadratic Forms in p-Stable Random Variables and Theta sub p-Radonifying Operators.
AD-A135 314

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AD-A135 498

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AD-A137 724

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AD-A136 312

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AD-A137 760

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AD-A136 106

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Noise Generation by a Low-Mach-Number Jet,
AD-A138 698

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Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams,
AD-A137 038

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AD-A136 061
* * *
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AD-A136 142
* * *
Critical Fluctuations at the Phase Transition in Benzil,
AD-A138 567
* * *
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AD-A138 608

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AD-A136 052

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AD-A135 771
* * *
Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe,
AD-A135 772
* * *
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AD-A136 243

*ZABALA-MARTINEZ, I.
* * *
Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition,
AD-A136 004

*ZBINDEN, G.
* * *
Correlation of Mutagenic, Carcinogenic and Co-Carcinogenic Effects of Chemical Substances. Granuloma Pouch Assay.
AD-A137 794

*ZEDALIS, M.
* * *
Lattice Parameter Variation of Al3 (Ti,V,Zr,Hf) in Al-2 at.% (Ti,V,Zr,Hf) Alloys.
AD-A135 758

*ZEIN, D.
* * *
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AD-A135 138

*ZIMMERMAN, H.
* * *
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AD-A136 101

*ZIMMERMAN, I. H.
* * *
Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F + H sub 2 Collisions,
AD-A135 180

*ZINBO, M.
* * *
Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.
AD-A135 464

*ZWIER, T. S.
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Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) + HF yields OH(v-0, 1) + F (-).
AD-A136 318

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 999 20/4

LEHIGH UNIV BETHLEHEM PA DEPT OF MECHANICAL ENGINEERING AND MECHANICS

(U) Experimental Observations of Vortex Ring Interaction with the Fluid Adjacent to a Surface.

DESCRIPTIVE NOTE: Interim rept.,

OCT 83 189P

PERSONAL AUTHORS: Cerra,A. W. , Jr.;Smith,C. R. ;

REPORT NO. FM-4

CONTRACT NO. F49620-78-C-0071

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-84-0130

UNCLASSIFIED REPORT

ABSTRACT: (U) Experimental studies examined the breakdown of initially laminar vortex rings during impact with both solid and free surfaces in a quiescent environment, and with a solid surface beneath a developing laminar boundary layer. Flow interactions were visualized in water using dye and hydrogen-bubble techniques and recorded with a high-speed video system. When a vortex ring approaches a surface the resulting flow interaction appears to be chaotic and turbulent, but is actually a very organized viscid-inviscid process which rapidly disperses the vorticity of the vortex ring throughout the surrounding fluid. Described is the flow interaction which integrates the following phenomena: (1) generation of secondary vorticity of opposite sense to that of the vortex ring; (2) deviations in the trajectory of the vortex ring from that predicted by classical theory; and (3) the processes of organized dispersal of vorticity. The process by which vorticity dispersal occurs is dependent upon the initial Reynolds number (Re sub 0) of the vortex ring. For very weak rings, i.e. Re sub o less than 350, vorticity is dispersed by laminar diffusion. For stronger rings, vorticity dispersal occurs discretely through formation of secondary and tertiary vortex rings (SVR and TVR) via a viscous boundary layer

AD-A138 999 CONTINUED

process. Vorticity dispersal continues as a result of Biot-Savart-type interactions of the SVR and TVR with the original or primary vortex ring. During this interaction the diameter of the SVR is compressed, causing an instability in the SVR which is characterized by an azimuthal waviness.

DESCRIPTORS: (U) *Vortices, *Boundary layer, *Laminar flow, Rings, Impact, Surfaces, Interactions, Laminar boundary layer, Viscous flow, Inviscid flow, Secondary flow, Dispersing, Deformation, Circulation, Waves, Reynolds number, Water flow, Flow visualization, Dyes, Bubbles, Hydrogen, High speed photography, Water tunnels

IDENTIFIERS: (U) *Vortex ring interactions, Flow instabilities, Free surfaces, Velocity gradients, Instability, Quiescent flow, PE61102F, WUAFOSR2307A2

AD-A138 999

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 998 20/6

OPTICAL SOCIETY OF AMERICA WASHINGTON D C

(U) Topical Meeting on Optical Bistability Held at Rochester, New York on 15-17 June 983.

DESCRIPTIVE NOTE: Final rept. 1 Jun 83-31 Jan 84,

83 238P

PERSONAL AUTHORS: Quinn,J. W. ;

CONTRACT NO. AFOSR-83-0251

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0114

UNCLASSIFIED REPORT

ABSTRACT: (U) The topical meeting on optical bistability was intended to provide an international interdisciplinary forum for the exchange of knowledge on the progress of various aspects of optical bistability and optical nonlinearities. Papers in the following areas were covered: theory, experiments, devices, material properties, instabilities and chaos and coherent switching. (Author)

DESCRIPTORS: (U) *Optical properties, *Nonlinear systems, *Bistable devices, Stability, Switching, Materials, Coherence

IDENTIFIERS: (U) Optical bistability, Coherent switching, Chaos, PE61102F, WUAFOSR2301A1

AD-A138 998

AD-A138 926 20/4

CINCINNATI UNIV OH DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS

(U) Second Order Composite Velocity Solution for Large Reynolds Number Flows,

NOV 83 13P

PERSONAL AUTHORS: Rubin,S. G. ;Celestina,M. ;Khosla,P. K. ;

CONTRACT NO. AFOSR-80-0047

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-84-0116

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of AIAA Aerospace Sciences Meeting (21st) Reno, NV. Jan 84.

ABSTRACT: (U) The composite velocity procedure is applied to a reduced form of the Navier-Stokes equations where viscous effects are neglected only in the normal momentum equation. Subsonic and mildly transonic flows are considered for boattail and airfoil geometries. The composite formulation defines viscous and potential-like velocity components. These variables are coupled in a strongly implicit solution procedures (CSIP) and simulate a coupled interacting boundary layer-potential flow solver with a single system of equations. Complete second-order accurate solutions are obtained for laminar and turbulent flows where separation bubbles and weak shocks are present. The effects of inflow and outflow boundary conditions are examined and a procedure for reducing storage of the CSIP is presented. (Author)

DESCRIPTORS: (U) *Viscous flow, Transonic flow, Velocity, Reynolds number, flow separation, Airfoils, Boattail afterbodies, Navier Stokes equations

IDENTIFIERS: (U) Composite velocity, PE61102F, WUAFOSR2307A1

AD-A138 926

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 919 20/12 20/3 20/2 9/2

CARNEGIE-MELLON UNIV PITTSBURGH PA

(U) A Program of Research on Microfabrication Techniques for VLSI Magnetic Devices.

DESCRIPTIVE NOTE: Interim progress rept. 30 Sep 82-29 Sep 83,

NOV 82 20P

PERSONAL AUTHORS: Kryder,M. H. ;Krafft,C. S. ;Saunders,D. A. ;Alex,M. ;Jo,S. ;

PROJECT NO. 2305

TASK NO. C1

MONITOR: AFOSR TR-84-0106

UNCLASSIFIED REPORT

ABSTRACT: (U) New materials, new means of fabrication, and new device structures for high density magnetic bubble devices are being pursued. A large portion of the research is directed at ion implanted contiguous disk devices which offer sixteen times the bit density of permalloy devices now being sold by U.S. OEM manufacturers. The effects on ion implantation on garnet are being studied with the goal of developing improved garnet materials and fabrication techniques for submicrometer bubble size devices. The behavior of charged walls which act to propagate the bubble domains in these devices is being investigated and correlated with the ion implantation, mask pattern design, and device performance. Unique work with transmission electron microscopy in ion implanted garnets has enabled us to directly observe structural changes produced by ion implantation in patterned devices. During the past year 0.5 micrometer bubbles were propagated in ion implanted contiguous disk devices. Work is being carried out on current-access perforated-sheet technology which offers four times the bit density of presently manufactured devices and order of magnitude higher data rate. During the past year bubble logic gates were demonstrated in this technology. Finally a current-access ion-implanted device structure which offers the high density of field-access contiguous-disk technology and the high performance of current-access technology is being pursued.

AD-A138 919

AD-A138 919 CONTINUED

DESCRIPTORS: (U) *Garnet, *Magnetic materials, *Magnetic devices, *Bubble memories, *Magnetooptics, Microelectronics, Fabrication, Memory devices, Ion implantation, Magnetic disks, Integrated circuits, Logic circuits, Gates(Circuits), Electric charge, Walls, Thin films, Electron microscopy, Amorphous materials

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 876 12/1 20/8 9/2

ARKANSAS UNIV FAYETTEVILLE DEPT OF ELECTRICAL ENGINEERING

(U) Adaptive Hybrid Picture Coding.

DESCRIPTIVE NOTE: Interim rept. 1 Apr-30 Nov 83,

NOV 83 198P

PERSONAL AUTHORS: Jones,R. A. ;Cook,M. K. ;

CONTRACT NO. AFOSR-82-0351

PROJECT NO. 2305

TASK NO. B3

MONITOR: AFOSR
TR-84-0142

UNCLASSIFIED REPORT

ABSTRACT: (U) The transmission of digital imagery has become a necessity in recent times. Systems such as communications and weather satellites, facsimile, remote control, and machine intelligence can and do make use of data compression techniques to reduce bandwidth and power consumption. Research on these techniques has led to one form of image data compression which achieves good image quality for intraframe coding at low data rates. This technique is known as Adaptive Stochastic Picture Coding (ASPC) which consists of a one-dimensional unitary transform for column-wise decorrelation used in conjunction with Adaptive Differential Predictive Coding Modulation (ADPCM) for the row-wise decorrelation, followed by quantization to give the desired data compression. This system requires use of quantization techniques which limit system performance. Optimization of adaptive scalar quantizers and use of vector quantizers aid in the adaptation of the system to variations in the image statistics. This report represents a study of such quantizers in the ASPC system. By examining these quantization methods, it will be shown that it is vital that the proper quantizer be incorporated into the system to achieve a particular data rate at desired distortion levels. (Author)

DESCRIPTORS: (U) *Mathematical models, *Image processing, *Data compression, *Coding, *Pictures, *Data transmission

systems, Quantization, Low rate, Data rate, Signal processing, Adaptive systems, Hybrid systems, Computerized simulation, Electrical engineering, Histograms, Subroutines

IDENTIFIERS: (U) Image coding, ASPC(Adaptive Stochastic Picture Coding), AHPC(Adaptive Hybrid Picture Coding System), PE61102F, WUAFOSR2305B3

AD-A138 876

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 872 20/9

AD-A138 872 CONTINUED

NEW MEXICO UNIV ALBUQUERQUE DEPT OF CHEMICAL AND NUCLEAR ENGINEERING

WU\AFOSR2301A7

(U) Physics of High Temperature, Dense Plasmas.

DESCRIPTIVE NOTE: Final Rept. 1 Feb 79-30 Jun 82,

JAN 84 173P

PERSONAL AUTHORS: Woodall,D. M. ;

CONTRACT NO. AFOSR-79-0060

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-84-0124

UNCLASSIFIED REPORT

ABSTRACT: (U) The research undertaken under the AFOSR Grant included three related projects: the production and characterization of a dense plasma target for a Relativistic Electron Beam (REB)-Plasma and REB-Neutral Gas heating experiment, the development of plasma diagnostics for REB-Plasma and REB-Neutral Gas heating experiments, and finally, the development of soft x-ray diagnostic techniques of imploding liner experiments. This report has three principal sections. Section II, Characterization of a Dense Plasma Source, summarizes the results of the plasma gun research activities undertaken. That work was in the plasma target production and characterization area for planned REB-Plasma heating experiments. Section III, Intense REB-Neutral Gas Heating Experiments, details the result of diagnostic development for experiments performed in this area. Section IV, Space and Time Resolved Spectroscopy of High Energy Density Aluminum Plasmas, presents results of such measurements made on the plasma produced by the SHIVA imploding foil experiment.

DESCRIPTORS: (U) *Plasmas(Physics), *High temperature, *Dense gases, Soft x rays, X ray diagnostics, Plasma diagnostics, Electron beams, Spectroscopy, High energy, Gas heating

IDENTIFIERS: (U) Relativistic electron beams, PE61102F,

AD-A138 872

AD-A138 872

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 847 6/20

MIAMI UNIV FLA DEPT OF ANESTHESIOLOGY

(U) Modeling of Inhalation Administration of Vapors with Capacity Limited Clearance.

DESCRIPTIVE NOTE: Final scientific rept. 30 Jun 81-31 Aug 83,

AUG 83 100P

PERSONAL AUTHORS: Thomas,V. ;

CONTRACT NO. AFOSR-81-0210

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0125

UNCLASSIFIED REPORT

ABSTRACT: (U) The overall objective of the project was to design economical and informative testing of subacute and chronic toxicity of new volatile substances. The specific objectives were: (1) to prepare a mathematical model for simulation of uptake, distribution, and elimination of vapors with capacity-limited clearance; (2) to obtain experimental data supporting the model; (3) to study the factors affecting nonlinearity of clearance (concentration dependence, interference of inhalation of other vapors). The main accomplishments are: (1) A program for mathematical solution of a multi-compartmental model for simulation of uptake, distribution, and elimination of vapors having a capacity limited elimination pathway was prepared for the Apple II Plus computer and tested by simulating a variety of trichloroethylene and halothane exposures. (2) Three methods for determination of metabolic clearance were tested: (a) systemic clearance was determined from the concentration differences in inhaled air and arterial blood; (b) intrinsic clearance in organs was determined from distribution of inhaled chemicals in the body during steady state; (c) intrinsic clearance by each metabolic pathway was determined from distribution and elimination of metabolites. (3) The retention of vapors of water soluble chemicals in trachea was determined and the significance of retention of chemicals in respiratory

AD-A138 847 CONTINUED

airways is discussed.

DESCRIPTORS: (U) *Inhalation, *Toxicity, *Mathematical models, *Vapors, Metabolism, Simulation, Computerized simulation, Metabolites, Tissues(Biology), Rats

IDENTIFIERS: (U) Halothane, Isoflurane, PE61102F, WUAFOSR2312A5

AD-A138 847

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 843 20/6 9/2

HUGHES RESEARCH LABS MALIBU CA

(U) Real-Time Implementation of Nonlinear Optical Processing Functions.

DESCRIPTIVE NOTE: Annual technical rept. 15 Jun 82-15 Jun 83,

DEC 83 43P

PERSONAL AUTHORS: Soffer,B. H. ;

CONTRACT NO. F49620-81-C-0086

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR TR-84-0141

UNCLASSIFIED REPORT

ABSTRACT: (U) Optical data processing has not yet achieved its potential of increased capacity and speed compared with conventional electronic techniques, primarily for lack of a practical real-time image modulator, and because optical techniques have been almost exclusively limited to linear operations. The continuing research outlined in this report attacks these issues by studying the implementation of real-time nonlinear parallel-processing techniques. The various implementations studied in this program all employed real-time liquid-crystal light valves developed and specially modified for these tasks.

DESCRIPTORS: (U) *Optical processing, *Nonlinear systems, *Data processing, *Real time, Parallel processing, Optical data, Liquid crystals, Holography, Gratings(Spectra), Substrates, Transformations

IDENTIFIERS: (U) Light valves, *Optical data processing, VGM(Variable Grating Mode), PE61102F, WUAFOSR2305B1

AD-A138 843

AD-A138 814 20/5

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) Anomalous Laser Induced Bunch Lengthening on the ACO Storage Ring Free Electron Laser.

DESCRIPTIVE NOTE: Interim rept.,

APR 83 6P

PERSONAL AUTHORS: Robinson,K. E. ;Madey,J. M. J. ;Velghe, M. F. ;Deacon,D. A. G. ;

REPORT NO. HEPL-929

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0103

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Particle Accelerator Conference, Mar 83, Santa Fe, NM. Prepared in cooperation with Paris Univ. Orsay (France). Laboratoire de Photophysique Moleculaire and Deacon Research, Palo Alto, CA.

ABSTRACT: (U) Laser induced bunch lengthening has been measured on the ACO Storage Ring Free Electron Laser (SRFEL) in the anomalous bunch lengthening regime. The experimental results show correlations between the appearance of coherent modes in the electron bunch and anomalous behavior in the presence of the laser. Simultaneous time resolved laser induced bunch lengthening, mode strength, bunch length, and synchrotron sideband measurements were made as anomalous thresholds were traversed several times by changing the ring laser accelerating voltage. Bunch shortening, multiple time constants, and oscillatory behavior are among the phenomena which have been observed. (Author)

DESCRIPTORS: (U) *Laser applications, *Ring lasers, Coupling(Interaction), Electron beams, Anomalies, Length, Oscillation, Experimental data

AD-A138 814

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 814 CONTINUED

IDENTIFIERS: (U) Free electron lasers, Laser induced bunch lengthening, PE61102F, WUAFSOR2301A1

AD-A138 813 20/5

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) Design and Operating Experience on Laser Cavity in a Vacuum of 10-10 TORR,

FEB 83 2P

PERSONAL AUTHORS: Velghe,M. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0104

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. de Physique, Conf c1 suppl n2 v44 pc1-387 Feb 83.

Reprint: Design and Operating Experience on Laser Cavity in a Vacuum of 10-10 TORR.

DESCRIPTORS: (U) *Laser cavities, Ring lasers, Vacuum, Bellows, Mirrors, Length, Angles, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 810 1/2 1/3 5/9

TEXAS UNIV AT AUSTIN DEPT OF MECHANICAL ENGINEERING

(U) Quantification of Subjective Ratings through Conjoint Measurement Analysis.

DESCRIPTIVE NOTE: Final rept.

NOV 83 39P

PERSONAL AUTHORS: Greene,D E. ;

CONTRACT NO. AFOSR-82-0220

PROJECT NO. 2313

TASK NO. D9

MONITOR: AFOSR
TR-84-0126

UNCLASSIFIED REPORT

ABSTRACT: (U) Conjoint measurement theory is examined through a prototype example in which a fighter aircraft is subjectively rated on two factors. As a first step, a multifactor ordinal scale is developed. This ordinal scale provides a meaningful measure of aircraft quality. Interval scales of aircraft quality are produced by the basic analysis of variance model and two conjoint measurement methods: delta scaling and the computer algorithm MONANOVA. These methods produce interval scales that differ by constant factors, as guaranteed by the theorem for additive conjoint measurement. The interval scale does not appear to be an improvement over the ordinal scale in the prototype example. There is no assurance that a specific conjoint measurement model can be used to improve the data. Major changes in the interval scales are caused by small perturbations in the rating matrix. (Author)

DESCRIPTORS: (U) *Flight envelope, Quality control, Algorithms, Fighter aircraft, Pilots, Handling, Human factors engineering, Scaling factors, Ranking

IDENTIFIERS: (U) Conjoint measurement theory, WUAFOSR2313D9, PE61102F

AD-A138 810

AD A138 807 6/20 6/3 20/4

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG CENTER FOR ENVIRONMENTAL STUDIES

(U) Sublethal Effects of JP-4 on Aquatic Organisms and Communities.

DESCRIPTIVE NOTE: Annual rept. no. 2, 1 Nov 82-31 Oct 83,

JAN 84 64P

PERSONAL AUTHORS: Cairns,J. , Jr.;Buikema,A. L. , Jr.; Doane,T. R. ;Neiderlehner,B. R. ;

CONTRACT NO. AFOSR-82-0059

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0118

UNCLASSIFIED REPORT

ABSTRACT: (U) In the second year of the AFOSR grant to examine the sublethal effects of water soluble fraction (WSE) of JP-4 jet fuel we have completed most of the work on the petroleum derived JP-4. Fractionators have been built and used to generate constant concentrations of the WSE JP-4 that were used to determine the lethal and sublethal effects on bluegill sunfish (Lepomis macrochirus) and selected aquatic invertebrates. The dynamic 96 hour LC50 for the WSF JP-4 for the bluegill was determined to be 26.2%. (This is percent of the maximum soluble amount of JP-4.) The concentration of the WSE JP-4 which causes a detectable shift in the ventilatory functions (rate and amplitude) was determined to be 5.1% WSE. In the second year of research producing cultures of aquatic invertebrates were established, flow-through test systems were designed and constructed, and toxicity tests with the water soluble fraction (WSE) of petroleum JP-4 were begun with 3 invertebrates, the oligochaete, Aeolosoma headleyi, a benthic collector gatherer; the cladoceran Daphnia pulex, a planktonic filter-feeding crustacean; and, the dipteran Paratanytarsus parthogentica (Freeman) (= Tanytarsus dissimilis Joh.), a substrate associated collector gatherer.

AD-A138 807

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 807 CONTINUED

DESCRIPTORS: (U) *Toxicity, *Jet engine fuels, *Sublethal dosage, *Aquatic organisms, Fishes, Invertebrates, Lethality, Ventilation, Rates, Concentration(Chemistry), Exposure(General), Response(Biology), Detection, Blood, Osmosis, Histology, Metabolism, Liver, Test methods, Microorganisms

IDENTIFIERS: (U) Lepomis macrochirus, WUAFOSR2312A5, PE61102F

AD-A138 806 5/10

BERNARD M BARUCH COLL NEW YORK DEPT OF PSYCHOLOGY

(U) Hemispheric Asymmetries in a Signal Detection Task,

83 9P

PERSONAL AUTHORS: Andreassi,J. L. ;Rebert,C. S. ;Larsen,F. F. ;

CONTRACT NO. F49620-80-C-0013, PHS-NS12591

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-84-0128

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub in Perceptual and Motor Skills, v57 p923-929 1983.

Reprint: Hemispheric Asymmetries in a Signal Detection Task.

DESCRIPTORS: (U) *Performance(Human), *Perception(Psychology), *Cues(Stimuli), *Reaction time, Response, Reaction(Psychology), Visual perception, Signal processing, Psychophysiology, Reprints

IDENTIFIERS: (U) Neurophysiology, Signal detection, WUAFOSR2313A4, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 795 20/4

GEORGE WASHINGTON UNIV WASHINGTON D C SCHOOL OF ENGINEERING

(U) Energetics of Vortex Ring formation.

DESCRIPTIVE NOTE: Interim rept.,

NOV 83 7P

PERSONAL AUTHORS: Irdumsa,J. Z. ;Garris,C. A ;

CONTRACT NO. F49620-80-C-0043

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-84-0110

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper presents an experimental investigation comparing the mass and energy content of fully formed laminar vortex rings in air with that of the original pulse which generated them for a variety of initial and boundary conditions. In particular, the fractional entrainment of mass and the partition of initial energy between kinetic energy of translation and kinetic energy of rotation is studied. It is found that a large degree of control can be exercised for the determination of the vortex energetics, as well as its final configuration. A technique is presented which enables calculation of kinetic energy of rotation from movie sequences. The ratio of characteristic translational speed to characteristic rotational speed is shown to be a useful parameter for correlation of data. Data on vortex size and speed are presented using this correlation and it is seen that all data, regardless of initial and boundary conditions, fall on a single curve. A theoretical curve is derived and it is seen that the data compare well with it. (Author)

DESCRIPTORS: (U) *Vortices, Laminar flow, Rings, Energy transfer, Mass, Entrainment, Air flow, Rotation, Energetic properties, Kinetic energy, Pulses, Mathematical models, Boundary value problems, Correlation, Chimneys, Thrust augmentation, Air ejectors, Motion pictures

AD-A138 795

AD-A138 795 CONTINUED

IDENTIFIERS: (U) Vortex ring formation, Laminar vortex rings, Translational kinetic energy, WUAFOSR2307A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 794 21/5 20/13

MINNESOTA UNIV MINNEAPOLIS DEPT OF MECHANICAL ENGINEERING

(U) Film Cooling on a Gas Turbine Blade Near the End Wall.

DESCRIPTIVE NOTE: Interim rept.,

MAY 83 10P

PERSONAL AUTHORS: Goldstein,R. J. ;Chen,H. P. ;

CONTRACT NO. F49620-83-C-0062

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-84-0109

UNCLASSIFIED REPORT

ABSTRACT: (U) Local film cooling effectiveness on a gas turbine blade with a row of discrete cooling jets was measured using a mass transfer technique. Emphasis is placed on phenomena near the end wall of the blade. This region contains a horseshoe vortex system modified by a passage vortex. On the concave (pressure) surface the film cooling performance is not greatly altered by the presence of the end wall. On the convex surface of the blade the film cooling is essentially absent in a triangular region extending from near the region of peak curvature on the blade to its trailing edge. This unprotected region closely corresponds to location of the passage vortex as indicated by flow visualization. The passage vortex sweeps away the injected coolant flow from the surface. Upstream of the unprotected area the injected flow is skewed toward the middle span of the blade. End wall influence extends about one-half cord length up from the end wall in the present experiments.

DESCRIPTORS: (U) *Film cooling, *Gas turbine blades, Walls, Vortices, Heat transfer, Surfaces, Curved profiles, Coolants, Injection, Jet flow, Internal

IDENTIFIERS: (U) End walls, Impingement heat transfer, Passage vortices, Concave surfaces, Convex surfaces, WUAFOSR2307A4, PE61102F

AD-A138 749 7/4 20/9

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examina[illegible] Tokai Glassy Carbon Surfaces Subjected to [illegible] requency Plasmas,

DEC 81 7P

PERSONAL AUTHORS: Miller,C. W. ;Karweik,D. H. ;Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0134

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Analytical Chemistry, v53 n14 p2319-2323 Dec 81.

Reprint: Scanning Electron Microscopic and X-Ray Photoelectron Spectroscopic Examination of Tokai Glassy Carbon Surfaces Subjected to Radio Frequency Plasmas.

DESCRIPTORS: (U) *Electron microscopy, *X ray photoelectron spectroscopy, *Glassy carbon, *Radiofrequency pulses, *Plasmas(Physics), Electrodes, Plasma generators, Surfaces, Erosion, Damage, Oxidation, Electrochemistry, Surface finishing, Surface chemistry, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 746 6/15 6/20

ISTITUTO DI RICERCHE FARMACOLOGICHE MARIO NEGRI MILAN (ITALY)

(U) Anticholinesterase Effects on Number and Function of Brain Muscarinic Receptors and Central Cholinergic Activity: Drug Intervention.

DESCRIPTIVE NOTE: Interim annual scientific rept. no. 1, 1 Aug 82-31 Jul 83.

SEP 83 28P

PERSONAL AUTHORS: Ladinsky,H. ;

CONTRACT NO. AFOSR-82-0306

PROJECT NO. 2312

TASK NO. A3

MONITOR: AFOSR TR-84-0122

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Review of Air Force Sponsored Basic Research in Biomedical Sciences, 26-28 Jul 83, Irvine, CA.

ABSTRACT: (U) This study endeavors to elucidate the acute mechanisms adapted by the body to reduce cholinergic in order to fend off the toxic effects of anticholinesterase poisons. The effect of DDVP on rat brain acetylcholine content was characterized. The drug increased ACh in hemispheric structures (striatum, hippocampus, cortex) but not in cerebellum or midbrain-hindbrain. Pretreatments with atropine or reserp ne only partially prevented the DDVP-induced increases. These and other experiments suggest that DDVP acted through a feedback mechanism secondarily to muscarinic receptor stimulation by the protected synaptic ACh. The feedback activation mediated by a monoamine leads to intraneuronal storage of ACh. Another fraction, perhaps smaller, accumulates extraneuronally and likely is responsible for the toxicity.

DESCRIPTORS: (U) *Acetylcholine, *Cholinesterase inhibitors, *Muscarine, *Organic phosphorus compounds, Brain, Chemoreceptors, Central nervous system,

AD-A138 746

AD-A138 746 CONTINUED

Stimulation(Physiology), Toxicity, Rats, Atropine, Reserpine

IDENTIFIERS: (U) *Dichlorovos, PE61102F, WUAFOSR2312A3

AD-A138 746

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 745 12/1 20/9 4/1

NEW YORK CITY TECHNICAL COLL BROOKLYN

(U) Dependence of Hydromagnetic Energy Spectra on Interplanetary Parameters.

DESCRIPTIVE NOTE: Final rept. 1 Sep 78-30 Sep 83,

NOV 83 7P

PERSONAL AUTHORS: Wolfe,A. ;Lanzerotti,L. J. ;Maclennan,C. G. ;Medford,L. V. ;Meloni,A. ;

CONTRACT NO. AFOSR-78-3707

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-84-0123

UNCLASSIFIED REPORT

ABSTRACT: (U) Ground-based magnetometer data, recorded at AT&T Bell Laboratories' stations located at low to mid-latitudes (L=2-4) and AFGL station (L=2-3), have been analyzed to search for associations between dayside Pc3-5 pulsations (15-240 second periods) and solar wind parameters measured by instrumentation on board the IMPJ spacecraft. The statistical analysis techniques used in the work (power spectral analysis, correlation analysis, multiple linear regression methods) have led to the discovery and quantification of relationships between hydromagnetic waves in the magnetosphere as manifested by magnetic pulsations and interplanetary parameters. Multiple linear regression (MLR) analyses showed that the most important interplanetary parameter controlling ground hourly magnetic energy (in the period range 60-240 seconds) was the solar wind speed. MLR analyses further showed that hourly magnetic energy in the 15-60 second period range was also controlled by the solar wind speed but more so by the interplanetary magnetic field direction.

DESCRIPTORS: (U) *Statistical analysis, *Statistical processes, *Magnetohydrodynamic waves, *Magnetosphere, Magnetometers, Magnetic fields, Solar wind, Parameters, Spacecraft

AD-A138 745

AD-A138 745 CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2311A1

AD-A138 745

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 740 20/6 20/5 20/7

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) UV and VUV Degradation of Very High Reflectivity Mirrors for Use in a Storage Ring Free Electron Laser.

MAY 83 7P

PERSONAL AUTHORS: Elleaume,P. ;Deacon,D. A. G. ;Billardon, M. ;Ortega,J. M. ;

REPORT NO. HEPL-922

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0105

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Paris Univ. Orsay (France).

ABSTRACT: (U) TiO2/SiO2 multilayer dielectric mirrors centered around 630 mm have shown reflectivity degradation from 99.99% down to 99.0% due to UV synchrotron radiation emitted by a beam of 240 MeV electrons during a storage ring free electron laser experiment.

DESCRIPTORS: (U) *Mirrors, *Lasers, *Radiation damage, *Ultraviolet radiation, *Synchrotrons, Titanium oxides, Silicon dioxide, Dielectric properties, Reflectivity, Degradation, Ultraviolet equipment, Electron beams, Free electrons, Storage, Ring, Test methods

IDENTIFIERS: (U) Free electron lasers, PE61102F, WUAFOSR2301A1

AD-A138 740

AD-A138 736 20/6 12/1

ARIZONA UNIV TUCSON

(U) Feasibility Studies of Optical Processing of Image Bandwidth Compression Schemes.

DESCRIPTIVE NOTE: Annual rept.,

MAY 83 70P

PERSONAL AUTHORS: Hunt,B. R. ;Strickland,R. N. ; Schowengerdt,R. A. ;

CONTRACT NO. AFOSR-81-0170

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR TR-84-0143

UNCLASSIFIED REPORT

ABSTRACT: (U) This research focuses on these three areas: (a) formulation of alternative architectural concepts for image bandwidth compression, i.e., the formulation of components and schematic diagrams which differ from conventional digital bandwidth compression schemes by being implemented by various optical computation methods; (b) simulation of optical processing concepts for image bandwidth compression, so as to gain insight into typical performance parameters and elements of system performance sensitivity; and (c) maturation of optical processing for image bandwidth compression until the overall state of optical methods in image compression becomes equal to that of digital image compression. (Author)

DESCRIPTORS: (U) *Optical processing, *Images, *Data compression, *Numerical methods and procedures, *Feasibility studies, Stationary, Bandwidth, Multispectral, Sampling, Schematic diagrams, Interpolation, Tomography, Convolution

IDENTIFIERS: (U) *Image bandwidth compression, PE61102F, WUAFOSR2305B1

AD-A138 736

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 725 20/4 1/3

COLORADO UNIV AT BOULDER DEPT OF AEROSPACE ENGINEERING SCIENCES

(U) The Unsteady Boundary Layer on an Elliptic Cylinder Following the Impulsive Onset of Translational and Rotational Motion.

DESCRIPTIVE NOTE: Interim rept.,

JAN 83 10P

PERSONAL AUTHORS: Billings,D. F. ;Chow,C. Y. ;

CONTRACT NO. AFOSR-81-0037

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-84-0043

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the AIAA Aerospace Sciences Meeting (21st), 10-13 Jan 83, Reno, NV.

ABSTRACT: (U) The fluid motion about an elliptic cylinder impulsively set into translational and rotational motion is obtained by the method of matched asymptotic expansions for small time and large Reynolds number. The constraint of the perturbation model is that the boundary layer thickness and the distance of travel are of the same asymptotic order. It is found that pitch-up motion or rotation accompanying translation at an angle of attack is indeed capable of preventing the early formation of a leading edge separation bubble. Even before evident in the streamline pattern, the incipient separation bubble is accompanied by a characteristic vorticity signature in the vicinity of the leading edge that is quite different from that with rotation. Further, the onset of an adverse pressure gradient is displaced rearward from its location for pure translation. The pre-Kutta condition lift evidently arises with the local acceleration that is a consequence of the displacement effect of the growing boundary layer. (Author)

DESCRIPTORS: (U) *Boundary layer flow, Cylindrical bodies, Rotation, Motion, Unsteady flow, Angle of attack,

Airfoils, Flow separation, Perturbation theory

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A2

AD-A138 725

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 722 20/4

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MECHANICAL INDUSTRIAL AND AEROSPACE ENGINEERING

(U) Theoretical Investigation of Three-Dimensional Shock Wave-Turbulent Boundary Layer Interactions. Part 2.

DESCRIPTIVE NOTE: Annual interim rept. 1 Oct 82-30 Sep 83,

DEC 83 71P

PERSONAL AUTHORS: Knight,D. D. ;

REPORT NO. RU-TR-160-MAE-F

CONTRACT NO. AFOSR-82-0040

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-84-0113

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-A127 118.

ABSTRACT: (U) The focus of the research effort is the understanding of three-dimensional shock wave-turbulent boundary layer interactions. The approach uses the full mean compressible Navier-Stokes equations with turbulence incorporated through the algebraic turbulent eddy viscosity model of Baldwin and Lomax. During the present year of the research effort, the three-dimensional shock boundary layer interaction generated by a 10 deg sharp fin has been computed at Mach 3 for a Reynolds number 280000. These results, together with previous computations of the same configuration at Reynolds number = 930000, are compared with experimental data for pitot pressure and yaw angle. The agreement with the experimental data is good, and the theory accurately predicts the recovery of the boundary layer downstream of the interaction of Reynolds number = 280000. The computed flowfield is employed to analyze the structure of the 3-D interaction through contour plots of flow variables. Also, during the present year, the investigation of the 2-D turbulent supersonic compression corner at Mach 3 was completed. The relaxation modification to the Baldwin-Lomax model was found to yield reasonably accurate

AD-A138 722

AD-A138 722 CONTINUED

predictions of the upstream propagation of the surface for the Reynolds number range investigated. An additional computation at Mach 2 was performed, and the results were in general in agreement with the previous conclusions. (Author)

DESCRIPTORS: (U) *Turbulent boundary layer, *Shock waves, Three dimensional flow, Interactions, Navier Stokes equations, Flow fields, Thickness, Reynolds number, Supersonic flow

IDENTIFIERS: (U) Baldwin-Lomax model, PE61102F, WUAFOSR2307A1

AD-A138 722

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 717 17/9 20/14

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA
VALLEY FORGE RESEARCH CENTER

(U) High Angular Resolution Microwave Sensing with Large, Sparse, Random Arrays.

DESCRIPTIVE NOTE: Final scientific rept. 1 Oct 81-30 Sep 83,

NOV 83 235P

PERSONAL AUTHORS: Dorny,C. N. ;

REPORT NO. UP-VFRC-33-83

CONTRACT NO. AFOSR-82-0012

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR
TR-84-0140

UNCLASSIFIED REPORT

ABSTRACT: (U) This document describes progress toward development of a general capability for high resolution microwave surveillance and imaging using large, sparse, self-cohering arrays. During the last five years progress has been made in the following areas: understanding of the unique advantages of large, sel-cohering arrays; development of advances system concepts, including the air-borne radio camera; enhanced self-cohering capability and experimental demonstration of that capability; and development of techniques for improving microwave image quality, including handling of the high sidelobes associated with very sparse arrays. A number of other practical issues associated with large self-cohering arrays have also been examined.

DESCRIPTORS: (U) *Radar antennas, *Search radar, *Sidelobes, *Radar receivers, Antenna apertures, Microwave equipment, Test and evaluation, Radio equipment, Sparse matrix, High resolution, Test methods, L band, Microwaves, Augmentation, Images, Spaceborne, Arrays, Surveillance, Quality, Airborne

IDENTIFIERS: (U) Self cohering arrays, Sparse arrays,

AD-A138 717 CONTINUED

Random arrays, Large arrays, Angular resolution, PE61102F, WUAFOSR2305B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 715 6/1

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Chemical Carcinogen-Induced Changes in tRNA Metabolism in Human Cells.

DESCRIPTIVE NOTE: Interim technical rept. 1 Oct 82-30 Sep 83,

NOV 83 75P

PERSONAL AUTHORS: Trewyn,R. W. ;

CONTRACT NO. AFOSR-80-0283

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0117

UNCLASSIFIED REPORT

ABSTRACT: (U) It is hypothesized that transfer RNAs mediate endogenous promotion of carcinogenesis subsequent to chemical carcinogen initiation, and that without the appropriate changes in tRNA metabolism, the ultimate expression of the neoplastic state will not be attained. Current studies are concentrating on tRNA ribosyltransferas modification reactions which are considered to be the pivotal molecular aberrations in this process. A normal human cell culture model system responsive to phorbol ester tumor promoters was developed which allows the evaluation of the role of tRNA in promotion of carcinogenesis. Chronic exposure to the tumor promoters induces a transient 5 to 10-fold increase in the saturation density of human cells if the treatment is initiated at early population doublings in culture in medium supplemented with elevated levels of specific amino acids. A significant decrease in queuine modification in the anticodon of cellular tRNAs precedes the transient 5 to 10-fold increase saturation density, and queuine modification increases prior to the subsequent decrease in saturation density. The increase in queuine modification correlates to the induction of an endogenous queuine salvage pathway. Most importantly, the addition of excess exogenous queuine inhibits the transient increase in saturation density induced by the tumor promoters, i.e., it blocks the expression of a

AD-A138 715 CONTINUED

transformed phenotype.

DESCRIPTORS: (U) *Ribonucleic acids, *Carcinogens, Metabolism, Cells(Biology), Humans

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5, LPN-OSURF-762404/713292

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 714 11/6 20/11

CONNECTICUT UNIV STORRS INST OF MATERIALS SCIENCE

(U) The Fatigue of Powder Metallurgy Alloys.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Dec 82-30 Nov 83.

JAN 84 44P

PERSONAL AUTHORS: McEvily,A. J. ;

CONTRACT NO. AFOSR-81-0046

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR TR-84-0111

UNCLASSIFIED REPORT

ABSTRACT: (U) Experimental work on the fatigue crack growth characteristics of high strength P/M (Powder Metallurgy) aluminum alloys has been extended, with particular attention given to crack closure in the near threshold region as a function of R. It has been conclusively shown that the R-dependence of the threshold level is directly related to closure. In the absence of closure as in ultra-fine grained material the threshold level is independent of the R-ratio. Experimental work has been initiated on the growth of fatigue cracks under variable amplitude loading conditions. An approach to deal with topics such as the anomalous growth of short cracks, the non-propagation of cracks from notches, fatigue notch sensitivity, and the notch size-effect in fatigue has been developed. A comparison of the fatigue behavior of powder metallurgy and ingot metallurgy products has been initiated. Thus far out work indicates that P/M products can be produced which are free from manufacturing defects which might degrade fatigue properties of these high strength aluminum alloys. The fatigue properties are responsive to grain size, fracture toughness, and the degree of closure developed.

DESCRIPTORS: (U) *Aluminum alloys, *Powder metallurgy, *Fatigue(Mechanics), *Crack propagation, Microstructure, Stress corrosion, Surface properties, Threshold effects, Residual stress, Mechanical properties, Chemical

composition, Powder alloys, Fractography, Loads(Forces), High strength alloys

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 698 20/1 14/2 20/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF AEROSPACE ENGINEERING

(U) Noise Generation by a Low-Mach-Number Jet,

83 29P

PERSONAL AUTHORS: Laufer,J. ;Yen,T. C. ;

CONTRACT NO. F49620-82-K-0019

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-84-0107

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluid Mechanics, v134 p1-31 1983.

Reprint: Noise Generation by a Low-Mach-Number Jet.

DESCRIPTORS: (U) *Jet flow, *Noise(Sound), *Acoustic measurement, Sources, Acoustic waves, Flow fields, Shear properties, Harmonics, Excitation, Radiated noise, Coherence, Directional, Time dependence, Subsonic flow, Sound transmission, Intensity, Far field, Saturation, Turbulence, Reprints

IDENTIFIERS: (U) Aeroacoustics, Jet noise, Shear layers, Flow instability, Noise generation, PE61102F, WUAFOSR2307A2

AD-A138 697 20/4 21/5

WASHINGTON UNIV SEATTLE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Mixing of Swirling Flows and Behavior of Wet Flows.

DESCRIPTIVE NOTE: Annual rept. 1 May 82-30 Apr 83,

NOV 83 7P

PERSONAL AUTHORS: Oates,G. C. ;

CONTRACT NO. AFOSR-80-0186

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-84-0108

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes progress into research on the interaction of droplets with shock waves, the mixing of co-axial jets in the near region, the influence of nearby solid boundaries on multihole probes, and the behavior of shock trains in ramjet inlets. The study of the mixing of coaxial jets has been completed with the submission of a PhD dissertation. Appropriate software for laser velocimetry data reduction has been prepared for use with the droplet-shock wave study, and a computer program for the description of droplet shock wave interaction has been generated. Preliminary measurements of solid boundary influence on five hole probe readings have been taken, and optical data for shock trains in ramjet inlets have been obtained from both a water analogy rig and a supersonic wind tunnel.

DESCRIPTORS: (U) *Jet mixing flow, *Two phase flow, Drops, Shock waves, Interactions, Ramjet inlets, Boundaries, Solids, Optical data, Laser velocimeters, Probes

IDENTIFIERS: (U) Swirling flow, Coaxial jets, Multihole probes, PE61102F, WUAFOSR2307A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 695 7/4

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy,

82 18P

PERSONAL AUTHORS: Miller,C. W. ;Karweik,D. H. ;Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0139

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Recent Advances in Analytical Spectroscopy, p233-247 1982.

Reprint: Radio Frequency Plasma Introduction of Surface Functionalities onto Carbon and Surface Characterization by X-Ray Photoelectron Spectroscopy.

DESCRIPTORS: (U) *Surface chemistry, *Electrochemistry, *Radiofrequency, *Plasmas(Physics), *X ray photoelectron spectroscopy, Glassy carbon, Electrodes, Surfaces, Electrocatalysts, Catalysis, Impurities, Removal, Surface analysis, Oxidation reduction reactions, Cobalt, Porphyrins, Electron transfer, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A138 695

AD-A138 694 12/1 6/16

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

(U) New Techniques for Measuring Single Event Related Brain Potentials.

DESCRIPTIVE NOTE: Final rept.,

OCT 83 86P

PERSONAL AUTHORS: McGillem,C. D. ;Aunon,J. I. ;

CONTRACT NO. AFOSR-80-0152

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-84-0127

UNCLASSIFIED REPORT

ABSTRACT: (U) Methods for selecting features of evoked patented (EP) waveforms to improve classification accuracy are described. It is found that use of an exhaustive search procedure gives moderate improvement over forward sequential feature selection and stepwise linear discriminant analysis procedures. A new procedure for classification using a combination of temporal and spectral representations of the data is described. Experimental results are presented illustrating the effectiveness of time-varying filters for processing EP waveforms. It is shown by means of computer simulations that much greater noise reduction is obtained with time-varying filters than is possible by any of the more conventional procedures that utilize time-invariant filters. At the same time the underlying waveforms are preserved by the filtering process. Modifications of a computer controlled display system to give precise timing measurements are described. Data showing the reduction in latency variance of EP components are presented. Reductions in the standard deviations of about 20% were obtained. Experimental measurements of EP waveforms using a Sternberg paradigm are described. Preliminary analysis of the results shows an apparent substructure in the P300 and a significant correlation of certain of the P300 components and reaction time. (Author)

DESCRIPTORS: (U) *Algorithms, *Electroencephalography,

AD-A138 694

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 694 CONTINUED

*Waveforms, *Measurement, *Brain, Pattern recognition, Parameters, Classification, Selection, Noise reduction, Linearity, Charts, Tables(Data), Methodology, Discriminate analysis

IDENTIFIERS: (U) Evoked potential, Visual evoked potential, PE61102F, WUAFOSR2313A4

AD-A138 683 20/5

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) Progress and Problems in Storage Ring Free Electron Lasers.

DESCRIPTIVE NOTE: Interim rept.,

FEB 83 6P

PERSONAL AUTHORS: Bazin,C. ;Bergher,M. ;Billardon,M. ; Deacon,D. A. G. ;Elleaume,P. ;

REPORT NO. HEPL-923

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0101

UNCLASSIFIED REPORT

ABSTRACT: (U) This document discusses current problems in storage ring laser development: optics degradation, and the low gain available on unoptimized existing electron sources. The authors introduce the field with experimental data, and conclude with the most recent results. (Author)

DESCRIPTORS: (U) *Lasers, Optics, Degradation, Electron beams, Experimental data, Kinetic energy, Rings, Coupling(Interaction), Klystrons

IDENTIFIERS: (U) *Free electron lasers, *Storage ring lasers, Electron sources, PE61102F, WUAFOSR2301A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 661 20/4 12/1

AD-A138 661 CONTINUED

CALIFORNIA UNIV BERKELEY DEPT OF MECHANICAL ENGINEERING

WUAFOSR2307A4, PE61102F

(U) The Changing Scene in Computational Fluid Dynamics.

DESCRIPTIVE NOTE Interim rept.,

AUG 83 19P

PERSONAL AUTHORS: Holt,M. ;

CONTRACT NO. AFOSR-80-0230

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-84-0115

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Computational Techniques Conference, 28-31 Aug 83, Sydney (New South Wales).

ABSTRACT (U) The evolution of numerical techniques for solving problems in Fluid Dynamics is followed, in outline, from the days when Digital Computers were first available, at the end of the Second World War, to the present time, when the Computer Aerodynamic Simulator is being assembled. In this period the range of numerical methods has been broadened five fold, while the speed and capacity of computers have increased by several orders of magnitude. Two areas close to the author's interests are selected to illustrate these changes. The first concerns the extension of the Method of Integral Relations to apply to laminar and turbulent boundary layer problems, including internal flows, separated flows and turbulent mixing flows. The second area deals with unsteady inviscid compressible flow in one or more dimensions and a discussion is given of the relative merits of Godunov and Glimm techniques. (Author)

DESCRIPTORS: (U) *Fluid dynamics, Computations, Laminar boundary layer, Turbulent boundary layer, Flow fields, Flow separation, Equations of motion, Internal waves, Integral equations

IDENTIFIERS: (U) Method of internal relations,

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 641 7/4 14/2

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer,

81 15P

PERSONAL AUTHORS: Miller,C. W. ;Fagan,J. R. ;Karweik,D. H. ;Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672, NSF-CHE76-81591

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0136

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. Pub. in Applications of Surface Science, n9 p214-226 1981.

Reprint: A Versatile Sample Isolation, Chemical Modification and Introduction System Designed for a Physical Electronics Model 548 Electron Spectrometer.

DESCRIPTORS: (U) *X ray photoelectron spectroscopy, *Analytical chemistry, *Surface chemistry, *Electrochemistry, Chemical composition, Surfaces, Glassy carbon, Atomic properties, Radiofrequency, Plasmas(Physics), Chemical analysis, Sampling, Oxygen, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A138 640 7/4

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism,

81 30P

PERSONAL AUTHORS: Dimarco,D. M. ;Forshey,P. A. ;Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672, PHS-19181

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0133

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: *Pub. in ACS Symposium Series, n192* p71-97 1982.

Reprint: Simulation of the Cyclic Voltammetric Characteristics of a Second Order EC Catalytic Mechanism.

DESCRIPTORS: (U) *Electrochemistry, *Electrodes, *Catalysis, *Reaction kinetics, *Voltammetry, Electrocatalysts, Surfaces, Oxidation reduction reactions, Oxygen, Iron, Porphyrins, Electron transfer, Diagnostic equipment, Constants, Computerized simulation, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 639 7/4 9/1

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Prospects in the Analysis of Chemically Modified Electrodes,

82 33P

PERSONAL AUTHORS: Karweik,D. H. ;Miller,C. W. ;Porter,M. D. ;Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0138

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in ACS Symposium Series, n199 p89-119 1982.

Reprint: Prospects in the Analysis of Chemically Modified Electrodes.

DESCRIPTORS: (U) *Electrodes, *Electrochemistry, *Surface chemistry, Chemical analysis, Surface analysis, Atomic properties, Molecular properties, Catalysis, Electrocatalysts, Topography, Surfaces, Structural analysis, Chemical bonds, Electron transfer, Test methods, Reprints

IDENTIFIERS: (U) CME(Chemically Modified Electrodes), PE61102F, WUAFOSR2303A1

AD-A138 639

AD-A138 638 7/4

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Electrochemistry of Oxygen Reduction. 4. Oxygen to Water Conversion by Iron(II) Tetrakis(N-Methyl-4-Pyridyl)Porphyrin via Hydrogen Peroxide,

83 11P

PERSONAL AUTHORS: Forshey,P. A. ;Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0137

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v22 n5 p699-707 1983. Includes errata sheet dated 9 Apr 83.

Reprint: Electrochemistry of Oxygen Reduction. 4. Oxygen to Water Conversion by Iron(II) Tetrakis(N-Methyl-4-Pyridyl)Porphyrin via Hydrogen Peroxide.

DESCRIPTORS: (U) *Electrochemistry, *Oxygen, *Reduction(Chemistry), Water, Iron compounds, Porphyrins, Hydrogen peroxide, Glassy carbon, Electrodes, Electrocatalysts, Catalysis, Oxidation reduction reactions, Coulometers, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A138 638

AD-A138 637 7/4

OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY

(U) Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins,

82 26P

PERSONAL AUTHORS: Forshey,P. A. ;Kuwana,T. ;Kobayashi,N. ; Osa,T. ;

CONTRACT NO. AFOSR-78-3672

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-84-0135

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Advances in Chemistry Series, v201 p601-624 1982.

Reprint: Electrocatalytic Reduction of Molecular Oxygen Using Water-Soluble and Immobilized Iron and Cobalt Porphyrins.

DESCRIPTORS: (U) *Electrochemistry, *Electrocatalysts, *Reduction(Chemistry), *Oxygen, Molecules, Iron compounds, Cobalt compounds, Porphyrins, Water soluble materials, Catalysis, Oxidation reduction reactions, Electron transfer, Electrodes, Computerized simulation, Electric current, Voltammetry, Hydrogen peroxide, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A138 636 20/4

COLORADO UNIV AT BOULDER DEPT OF AEROSPACE ENGINEERING SCIENCES

(U) Visualization of Accelerating Flow around an Airfoil at High Angles of Attack.

DESCRIPTIVE NOTE: Interim rept.,

OCT 82 17P

PERSONAL AUTHORS: Freymuth,P. ;Bank,W. ;Palmer,M. ;

CONTRACT NO. AFOSR-81-0037

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-84-0121

UNCLASSIFIED REPORT

Availability: Document partially illegible.

SUPPLEMENTARY NOTE: Summary in German.

ABSTRACT: (U) Accelerating flow around an airfoil was visualized using smoke techniques. The flow started from rest and acceleration was kept constant for 5 seconds. Movies and single-frame photographs of the developing flow were taken for various angles of attack. The developing vortex patterns are interpreted as the elaborate initiation of an unsteady turbulent vortex street. (Author)

DESCRIPTORS: (U) *Unsteady flow, *Flow visualization, Airfoils, Acceleration, Vortices, Smoke, Angle of attack, High angles, Turbulent flow

IDENTIFIERS: (U) Acceleration flow, Vortex streets, PE61102F, WUAFOSR2307A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 612 12/1 20/4

COLORADO UNIV AT BOULDER DEPT OF AEROSPACE ENGINEERING SCIENCES

(U) Apparent-Mass Coefficients for Isosceles Triangles and Cross Sections Formed by Two Circles.

SEP 83 10P

PERSONAL AUTHORS: Huang,M. K. ;Chow,C. Y. ;

CONTRACT NO. F49620-83-K-0009. AFOSR-82-0037

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-84-0112

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Aircraft, v20 n9 p810-816 Sep 83.

Reprint: Apparent-Mass Coefficients for Isosceles Triangles and Cross Sections Formed by Two Circles.

DESCRIPTORS: (U) *Conformal mapping, *Mass, *Aerodynamic forces, Wing body configurations, Fuselages, Triangles, Moments, Cross sections, Coefficients, Lift, Fluid mechanics, Approximation(Mathematics), Slender bodies, Theory, Reprints

IDENTIFIERS: (U) Apparent mass, Isosceles triangles, Slender body theory, Side forces, Arcs(Mathematics), PE61102F, WUAFOSR2307A2

AD-A138 612

AD-A138 608 7/4 20/2

COLORADO STATE UNIV FORT COLLINS DEPT OF CHEMISTRY

(U) Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil,

JUL 83 15P

PERSONAL AUTHORS: Yoshihara,A. ;Bernstein,E. R. ;Raich,J. C. ;

CONTRACT NO. AFOSR-82-0122

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR TR-84-0132

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n1 p445-458, 1 Jul 83.

Reprint: Brillouin and Rayleigh Scattering Studies of the Phase Transition in Chloranil.

DESCRIPTORS: (U) *Chlorine compounds, *Quinones, *Brillouin zones, *Rayleigh scattering, *Phase transformations, Phase studies, Rotation, Symmetry, Light scattering, Boundaries, Phonons, Propagation, Anomalies, Temperature, Stress relaxation, Relaxation time, Radiant intensity, Elastic properties, Ferroelectricity, Reprints

IDENTIFIERS: (U) *Chloranil, WUAFOSR2303A3, PE61102F

AD-A138 608

AD-A138 593 20/4

COLORADO UNIV AT BOULDER DEPT OF AEROSPACE ENGINEERING SCIENCES

(U) Unsteady Separated Flows: Vorticity and Turbulence.

DESCRIPTIVE NOTE: Final progress rept. 1 Nov 80-31 Oct 82,

OCT 82 67P

PERSONAL AUTHORS: Luttges,M. W. ;Chow,C. Y. ;Kennedy,D. A. ;Freymuth,P. ;

CONTRACT NO. F49620-83-K-0009, AFOSR-81-0037

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-84-0120

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) Recent research progress on this multi-investigator program in unsteady seperated flows is summarized. Specific projects reviewed include: (a) oscillating airfoil dynamic stall; (b) vortex entrapment and stability analysis; and (c) natural flight lift mechanisms. Research is continued under AFOSR contract F49620-83-K-0009. (Author)

DESCRIPTORS: (U) *Airfoils, *Unsteady flow, *Flow separation, *Stalling, *Vortices, Lift, Aerodynamics, Shear properties, Flat plate models, Oscillation, Turbulent flow, Stability, Dynamics, Flow visualization, Wings, Birds, Insects

IDENTIFIERS: (U) Vortex entrapment, Dynamic stalling, Unsteady aerodynamics, Shear flow, PE61102F, WUAFOSR2307A2

AD-A138 567 7/3 20/2 7/4

COLORADO STATE UNIV FORT COLLINS DEPT OF CHEMISTRY

(U) Critical Fluctuations at the Phase Transition in Benzil,

SEP 83 12P

PERSONAL AUTHORS: Yoshihara,A. ;Bernstein,E. R. ;Raich,J. C. ;

CONTRACT NO. AFOSR-82-0122

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR TR-84-0131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n6 p2504-2514, 15 Sep 83.

Reprint: Critical Fluctuations at the Phase Transition in Benzil.

DESCRIPTORS: (U) *Benzoin, *Single crystals, *Phase transformations, Brillouin zones, Scattering, Rayleigh scattering, Acoustic properties, Optical properties, Boundaries, Elastic properties, Constants, Anomalies, Width, Temperature, Symmetry(Crystallography), Theory, Phonons, Reprints

IDENTIFIERS: (U) *Benzil, WUAFOSR2303A3, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A138 560 12/1

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group),

FEB 83 4P

PERSONAL AUTHORS: Robinson,K. E. ;Deacon,D. A. G. ;Velghe, M. F. ;Madey,J. M. J. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0102

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. de Physique, Conf c1 suppl n2 v44 pc1-379 - c1 -381 Feb 83. Abstract in French.

Reprint: Additional Bunch Lengthening Results on the ACO SRFEL (Stanford Free Electron Laser Group).

DESCRIPTORS: (U) *Mathematical models, *Stochastic processes, *Heating, Laser applications, Klystrons, Reprints

IDENTIFIERS: (U) Bunch lengthening, PE61102F, WUAFOSR2301A1

AD-A138 560

AD-A138 498 20/5 5/1

SOCIETY FOR OPTICAL AND QUANTUM ELECTRONICS MCLEAN VA

(U) Proceedings of the International Conference on Lasers '81 Held at New Orleans, Louisiana on 14-18 December 1981.

DESCRIPTIVE NOTE: Final rept. Dec 81-Dec 82,

DEC 81 1173P

PERSONAL AUTHORS: Collins,C. B. ;

CONTRACT NO. AFOSR-82-0072

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-83-0835

UNCLASSIFIED REPORT

Availability: Society for Optical and Quantum Electronics, P.O. Box 245, McLean, VA 22101 HC $95.00 (No copies furnished by DTIC/NTIS).

ABSTRACT: (U) The International Conference on Lasers '81 was held in New Orleans, Louisiana, December 14-18, 1981. Over 600 scientists participated in this meeting. More than 150 papers and posters were presented in a wide range of topical fields related to laser development and laser applications. (Author)

DESCRIPTORS: (U) *Lasers, *Laser applications, *Symposia, Reports, Excimers, Spectroscopy, Medicine, X rays, Gamma rays, Excitons, Tunable lasers, Infrared lasers, Polarization, Laser cavities, Molecular lasers, Solid state lasers, Geodesy

IDENTIFIERS: (U) Free electron lasers, Nuclear pumped lasers, High energy lasers, Metal vapor lasers, PE61102F, WUAFOSR2301A1

AD-A138 498

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 985 6/16 6/1

YALE UNIV NEW HAVEN CT DEPT OF NEUROLOGY

(U) The Effects of Hydrazines and Related Compounds on Calcium Calmodulin Regulated Synaptic Processes.

DESCRIPTIVE NOTE: Final scientific rept. 1 Jun 82-1 Jul 83,

JUL 83 19P

PERSONAL AUTHORS: DeLorenzo,R. J. ;Rasenick,M. M. ;

CONTRACT NO. AFOSR-82-0284

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-34-0025

UNCLASSIFIED REPORT

ABSTRACT: (U) This research effort studied the effects of hydrazines and organophosphates on various synaptic processes. The cyclic nucleotide related portions of this study included an examination of the effects of hydrazines upon synaptic membrane adenylate cyclase, cyclic nucleotides and any dynamic membrane events which might be related to the above processes. We were able to show distinct effects of hydrazines upon both catalytic moiety and catalytic moiety-G unit regulated adenylate cyclase. The calcium calmodulin kinase studies in this project investigated the effects of hydrazines and organophosphates on isolated membrane fractions and intact synaptosome preparations. We found that hydrazines and organophosphates have effects on the incorporation of 32 p-phosphate into several specific synaptic proteins and attempted to probe the molecular mechinism mediating the effects of these compounds. These studies provide an insight into the toxic effects of hydrazines and organophosphates on neuronal tissue and may help develop effective methods to prevent and treat these effects in man.

DESCRIPTORS: (U) *Hydrazines, *Synapse, Organophosphates, Adenyl cyclase, Nucleotides, Cyclic compounds, Proteins, Toxicity

AD-A137 985 CONTINUED

IDENTIFIERS: (U) Calcium calmodulin, PE61102F, WUAFOSR2312A5

AD-A137 985

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 895 12/1 13/9

EMBRY-RIDDLE AERONAUTICAL LAB DAYTONA BEACH FL

(U) Optimization for Vibration Isolation.

DESCRIPTIVE NOTE: Final rept. 30 Jun 81-29 Jun 83,

AUG 83 30P

PERSONAL AUTHORS: Nack,W. V. ;

CONTRACT NO. AFOSR-81-0266

PROJECT NO. 2307

TASK NO. B1

MONITOR: AFOSR
TR-84-0012

UNCLASSIFIED REPORT

ABSTRACT: (U) An almost linear optimization problem of importance in vibration isolation has been identified and algorithms were developed to minimize the forced vibrational response of structural systems. The constraints can be either displacements of accelerations. These algorithms have been studied for transient response, frequency response and stationary random using the direct dynamic solution. Multiple response points and loading conditions may be used. (Author)

DESCRIPTORS: (U) *Algorithms, *Vibration isolators, *Optimization, Matrices(Mathematics), Damping, Finite element analysis, Structural response, Displacement, Acceleration, Airframes, Spacecraft, Dynamic response

IDENTIFIERS: (U) PE61102F, WUAFOSR2307B1

AD-A137 895

AD-A137 894 7/3 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls,

83 7P

PERSONAL AUTHORS: Guerra,M. A. ;Armstrong,R. L. ;Bailey,W. I. , Jr.;Lagow,R. J.;

CONTRACT NO. AFOSR-82-0197

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0074

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organometallic Chemistry, v254 p53-58 1983.

Reprint: A New Synthesis for Methyl/Trifluoromethyl Organometallic Compounds by Low Temperature Cocondensation of Trifluoromethyl Radicals and Main Group Methyl Alkyls.

DESCRIPTORS: (U) *Synthesis(Chemistry), *Organometallic compounds, *Condensation, Methyl radicals, Fluorine, Low temperature, Alkyl radicals, Glow discharges, Ethanes, Phosphine, Tin, Mercury, Bismuth, Lead(Metal), Physical properties, Metal vapors, Surfaces, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A137 894

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 892 7/4

GEORGETOWN UNIV WASHINGTON D C

(U) Final Technical Report of Research Performed under Grant AFOSR-80-0262.

DESCRIPTIVE NOTE: Final rept. Sep 80-Oct 83,

83 7P

PERSONAL AUTHORS: DE Levie,R. ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-84-0092

UNCLASSIFIED REPORT

ABSTRACT: (U) The original objective of this project was, first, to study the effect of adsorbed ions on the electrosorption of organic molecules and vice versa and, secondly, to study the kinetics of formation of condensed films. The first objective was achieved, although the results obtained were rather unexpected; the second objective was met far beyond our original hope, as it proved possible to develop an entirely new approach to the general problem of nucleation and growth. This work is continuing.

DESCRIPTORS: (U) *Adsorption, *Ions, *Molecules, *Reaction kinetics, *Electrochemistry, Condensation, Films, Nucleation, Growth(General), Organic compounds, Interfaces, Electric charge, Electrodes, Interfacial tension, Thermodynamic properties, Electrolytes, Polarography

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A137 892

AD-A137 891 13/8 9/2 13/9

BRIGHAM YOUNG UNIV PROVO UT COMPUTER AIDED MFG LAB

(U) Manufacturing Information System.

DESCRIPTIVE NOTE: Interim rept. no 2, 1 Jul-31 Oct 83,

DEC 83 117P

PERSONAL AUTHORS: Allen,D. K. ;Smith,P. R. ;Smart,M. J. ;

CONTRACT NO. AFOSR-82-0253

PROJECT NO. 2305

TASK NO. K1

MONITOR: AFOSR
TR-84-0031

UNCLASSIFIED REPORT

ABSTRACT: (U) The size and cost of manufacturing equipment has made it extremely difficult to perform realistic modeling and simulation of the manufacturing process in university research laboratories. Likewise the size and cost factors, coupled with many uncontrolled variables of the production situation has even made it difficult to perform adequate manufacturing research in the industrial setting. Only the largest companies can afford manufacturing research laboratories; research results are often held proprietary and seldom find their way into the university classroom to aid in education and training of new manufacturing engineers. It is the purpose for this research to continue the development of miniature prototype equipment suitable for use in an integrated CAD/CAM Laboratory. The equipment being developed is capable of actually performing production operations (e.g. drilling, milling turning, punching, etc.) on metallic and non-metallic workpieces. The integrated CAD/CAM Mini-Lab is integrating high resolution, computer graphics, parametric design, parametric N/C parts programmings, CNC machine control, automated storage and retrieval, with robotics materials handling. The availability of miniature CAD/CAM laboratory equipment will provide the basis for intensive laboratory research on manufacturing information systems.

DESCRIPTORS: (U) *Manufacturing, *Computer applications, *Industrial engineering, Information systems, Computer

AD-A137 891

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 891 CONTINUED

aided design, Machine shop practice, Laboratories, Universities, Industrial production, Models, Drilling, Milling machines, Robotics, Materials handling, Machine tools, Miniaturization, Control systems, Computer graphics, Technology transfer

IDENTIFIERS: (U) Computer aided manufacturing, Manufacturing information systems, Numerical control, PE61102F, WUAFOSR2305K1

AD-A137 890 6/1

TENNESSEE UNIV MEMORIAL RESEARCH CENTER KNOXVILLE DEPT OF MEDICAL BIOLOGY

(U) Effect of Chemicals on the Cell Membrane Transport of Nucleosides.

DESCRIPTIVE NOTE: Final scientific rept. 1 Aug 82-31 Jul 83,

AUG 83 35P

PERSONAL AUTHORS: Wigler,P. W. ;

CONTRACT NO. AFOSR-82-0261

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR TR-84-0026

UNCLASSIFIED REPORT

ABSTRACT: (U) An apparatus and methodology for a high speed kinetic assay of purine efflux has been developed. The procedure is based on a flow system with a membrane filter to remove preloaded L5178Y cells and a sensitive rapid detector of the fluorescence emission of a buffer that contains a transport substrate, 2-aminopurine (AP). Two other purines interact rapidly with the AP carrier, hypoxanthine and uric acid. The rate of AP efflux from preloaded cells is increased by hypoxanthine in the external buffer and the efflux rate is decreased by uric acid in the buffer. Perfluorodecanoic acid (PFDA), adenine, or xanthine in the external buffer have no direct effect on the rate of AP efflux, in comparison with the controls. L5178Y cells were given a prior incubation with 200 microgram/ml PFDA at 30 C for 24 hr. These cells were preloaded with 100 micromolar AP and the excess substrate was removed by rinsing the cells with cold buffer. The prior incubation of the cells with PFDA produces a total inhibition of the efflux of AP. On the other hand, a prior incubation of the cells with PFDA plus 50 microunit/ml bovine insulin produces approximately 40% inhibition in comparison with controls. These findings suggest that purine carrier exists in an active and an inactive form; PFDA treatment inhibits formation of active carrier. Insulin appears to stabilize

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 890 CONTINUED

the active carrier and protect against the effects of PFDA.

DESCRIPTORS: (U) *Nucleosides, *Purines, Cells(Biology) Transport properties, Bioassay, Test methods, Fluorescence

IDENTIFIERS: (U) Aminopurine, Hypoxanthine, PE61102F, WUAFOSR2312A5

AD-A137 890

AD-A137 888 4/1 8/6

JOHNS HOPKINS UNIV LAUREL MD APPLIED PHYSICS LAB

(U) A Study of Low Energy Electron Precipitations and Auroral Phenomena by Using the USAF Polar Orbiting Satellites.

DESCRIPTIVE NOTE: Final Scientific r... Oct 78-30 Sep 83,

SEP 83 55P

PERSONAL AUTHORS: Meng,C. I. ;

CONTRACT NO. AFOSR-79-0010

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR TR-84-0060

UNCLASSIFIED REPORT

ABSTRACT: (U) The main objective of this research project is to study the low energy electron precipitation and auroral phenomena over polar regions. The research is based on using various types of measurements from several USAF satellites at both low altitude polar orbits and high altitude geosynchronous orbits. These are focused on: (1) to investigate the different kinds of polar electron precipitations such as various auroral displays, the polar cusp region, conjugate photoelectrons, polar rain over the polar cap; (2) to determine precipitation characteristics for various kinds of magnetospheric and geophysical phenomena; (3) to investigate the physics and configuration of the polar cusp region and the polar cap region; and (4) to understand the morphology of magnetospheric particle population. The results of these studies can lead us to a better understanding of the interaction between the solar-wind and the geomagnetic field and also the coupling between the magnetosphere and the ionosphere.

DESCRIPTORS: (U) *Atmospheric precipitation, *Electrons, *Aurorae, *Polar regions, Geodetic satellites, Low altitude, High altitude, Photoelectrons, Polar cap, Magnetosphere, Synchronous satellites, Ionosphere, Low energy, Solar wind, Geomagnetism, Coupling(Interaction)

AD-A137 888

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 888 CONTINUED

IDENTIFIERS: (U) *Electron precipitation, PE61102F, WUAFOSR2311A1

AD-A137 838 5/2 12/1

STANFORD UNIV CA DEPT OF MATHEMATICS

(U) Progress Report, Grant AFOSR-79-0134, January 1, 1983 - September 30, 1983,

SEP 83 12P

PERSONAL AUTHORS: Keller,J. B. ;

CONTRACT NO. AFOSR-79-0134

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-84-0033

UNCLASSIFIED REPORT

ABSTRACT: (U) The research activities of the Applied Mathematics Group during the first nine months of 1983 are described in this report. A brief outline of the research is presented. This is followed by a list of publication status of the work, and the abstracts of papers submitted for publication during this period. (Author)

DESCRIPTORS: (U) *Bibliographies, *Abstracts, *Applied mathematics, Computations, Elastic properties, Rigidity, Spheres, Viscosity, Viscous flow, Eigenvalues, Slender bodies, Cavities, Inverse scattering

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 835 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Spectroscopy of Molecules at High Excitation Levels,

83 28P

PERSONAL AUTHORS: Steinfeld,J. I. ;Dubs,M. ;Harradine,D. ; Adler-Golden,S. ;Schweitzer,E. ;

CONTRACT NO. F19628-80-C-0028, AFOSR-83-0007

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-84-0067

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Advances in Laser Spectroscopy, v2 p45-71 1983.

Reprint: Spectroscopy of Molecules at High Excitation Levels.

DESCRIPTORS: (U) *Molecular spectroscopy, *Molecular vibration, Molecules, Excitation, Infrared spectroscopy, Resonance, Optical analysis, Ultraviolet spectroscopy, Absorption, Laser induced fluorescence, Emission spectroscopy, Raman spectroscopy, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A137 834 20/12 7/5 20/5

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant,

MAY 83 5P

PERSONAL AUTHORS: Murphy,W. C. ;Lee,K. T. ;George,T. F. ;

CONTRACT NO. AFOSR-82-0046

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-84-0061

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface Science, v127 n3 pL156-L158, 1 May 83.

Reprint: Reply to Comments on 'Laser Excitation of Surface Electronic States for a One-Dimensional Semiconductor' by G. W. Bryant.

DESCRIPTORS: (U) *Semiconductors, *Laser applications, *Electronic states, *Electron transfer, Surfaces, Phase, Excitation, Electrons, Wave functions, Vector analysis, Crystal lattices, Momentum, Band spectra, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 833 11/9 7/3

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis-and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles.

83 10P

PERSONAL AUTHORS: Welsh,W. J. ;Mark,J. E. ;

CONTRACT NO. AFOSR-83-0027

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR TR-84-0062

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Materials Science, v18 p1119-1124 1983.

Reprint: CNDO (Complete Neglect of Differential Overlap) Studies on Nonplanar Conformations in Some Cis-and Trans-Polybenzobisoxazoles and Polybenzobisthiazoles.

DESCRIPTORS: (U) *Azoles, *Molecular structure, *Polymers, Rigidity, Rods, Polymers, Crystallization, Conformity, Aromatic compounds, Heterocyclic compounds, Molecular rotation, Molecular orbitals, Flexible materials, Quantum chemistry, Reprints

IDENTIFIERS: (U) CNDO(Complete Neglect of Differential Overlap), Polybenzobisoxazoles, Polybezobisthiazoles, PE61102F, WUAFOSR2303A3

AD-A137 833

AD-A137 830 12/1

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MATHEMATICS

(U) Stabilization of Polynomially Parametrized Families of Linear Systems. The Single-Input Case.

NOV 83 6P

PERSONAL AUTHORS: Bumby,R. T. ;Sontag,E. D. ;

CONTRACT NO. AFOSR-80-0196

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-84-0035

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Systems & Control Letters, v3 p251-254 Nov 83.

Reprint: Stabilization of Polynomially Parametrized Families of Linear Systems. The Single-Input Case.

DESCRIPTORS: (U) *Linear systems, *Stability, Polynomials, Parameters, Reprints

AD-A137 830

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 829 20/4 12/1

CINCINNATI UNIV OH DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS

(U) Global PNS (Parabolized Navier-Stokes) Solutions for Laminar and Turbulent Flow.

DESCRIPTIVE NOTE: Interim rept.,

JUL 83 13P

PERSONAL AUTHORS: Rubin,S. G. ;Reddy,D. R. ;

CONTRACT NO AFOSR-80-0047

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-84 0028

UNCLASSIFIED REPORT

ABSTRACT: (U) A multi-sweep relaxation procedure is applied for inviscid and parabolized (pressure-elliptic) Navier-Stokes (PNS) equations. Boattail, finite flat plate and NASA 0012 airfoil geometries are considered for incompressible and subsonic inviscid, laminar and turbulent flow. The equations are written in a conformal body-fitted coordinate frame and differenced on a staggered grid in order to give second-order accuracy for the inviscid flow and somewhere between first and second-order accuracy for the PNS solutions. A full second-order scheme is also discussed. Separation, trailing edge and stagnation point flow are evaluated. The effects of normal pressure gradients for laminar and turbulent flows are compared. A multi-grid procedure is applied in order to speed convergence rates for fine meshes and/or large computational domains. (Author)

DESCRIPTORS: (U) *Laminar flow, *Turbulent flow, *Navier stokes equations, Relaxation, Computations, Incompressible flow, Inviscid flow, Pressure gradients, Viscous flow, Flow separation, Stagnation point, Difference equations, Airfoils, Boattail afterbodies, Trailing edges, Grids, Convergence

IDENTIFIERS: (U) PNS(Parabolized Navier Stokes), Thin layers, PE61102F, WUAFOSR2307A1

AD-A137 829

AD-A137 828 9/4 5/10 9/2 5/2

OHIO STATE UNIV COLUMBUS DEPT OF COMPUTER AND INFORMATION SCIENCE

(U) Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 82-30 Jul 83,

NOV 83 116P

PERSONAL AUTHORS: Chandrasekaran,B. ;

CONTRACT NO. AFOSR-82-0255

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0039

UNCLASSIFIED REPORT

ABSTRACT: (U) During the year, progress was made in a number of directions: A better understanding of different types of problem solving that underlie expert reasoning was obtained; Advances in representing design knowledge as plans in design specialists were made. CRSL, the language for diagnostic expert system building that was designed in the author's laboratory, was applied to the implementation of a diagnostic system for the fuel system of an automobile and directions for new constructs for the language were obtained; A representation for functional understanding of how a device works was obtained, and methods of automatically generating diagnostic expert systems from this representation of a device were also obtained; and An analysis of how techniques and tasks can be matched in expert design was undertaken.

DESCRIPTORS: (U) *Reasoning, *Problem solving, *Computer aided diagnosis, *Information systems, High level languages, Information theory, Artificial intelligence, Operation, Functions, Information retrieval, Computer aided design, Parts, Data bases, Distribution

IDENTIFIERS: (U) Knowledge based systems, *Expert systems, Deep knowledge representation, CSRL programming language, Distributed knowledge bases, PE61102F,

AD-A137 828

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 828 CONTINUED

WUAFOSR2304A7, LPN-OSURF-763180/714659

AD-A137 828

AD-A137 827 20/5 13/8 20/12

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES CENTER FOR LASER STUDIES

(U) Laser Chemical Vapor Deposition.

DESCRIPTIVE NOTE: Final scientific rept.,

DEC 83 84P

PERSONAL AUTHORS: Allen,S. D. ;Bass,M. ;

CONTRACT NO. AFOSR-79-0135

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0052

UNCLASSIFIED REPORT

ABSTRACT: (U) Metal, dielectric and semiconductor films have been deposited by laser chemical vapor deposition (LCVD) using both pulsed and cw laser sources on a variety of substrates. For LCVD on substrates such as quartz, the deposition was monitored optically in both transmission and reflection using a collinear visible laser and the depositing CO2 laser. Deposition initiation and rate were correlated with irradiation conditions, the laser generated surface temperature, and the changing optical properties of the film/substrate during deposition. Single crystallites of W greater than 100 micrometers tall were deposited using a Kr laser on Si substrates. (Author)

DESCRIPTORS: (U) *Laser applications, *Vapor deposition, *Films, Substrates, Quartz, Monitoring, Optics, Transmittance, Reflection, Continuous wave lasers, Visible spectra, Carbon dioxide lasers, Crystals, Krypton, Silicon, Metals, Dielectric films, Semiconducting films, Helium neon lasers

IDENTIFIERS: (U) LCVD(Laser Chemical Vapor Deposition), Wolfram, PE61102F, WUAFOSR2301A1

AD-A137 827

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 826 6/16 6/15

BOSTON UNIV MA DEPT OF MATHEMATICS

(U) Dynamic Models of Neural Systems: Propagated Signals, Photoreceptor Transduction, and Circadian Rhythms.

DESCRIPTIVE NOTE: Final scientific rept.,

NOV 83 97P

PERSONAL AUTHORS: Grossberg,S. ;

CONTRACT NO. AFOSR-82-0148

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-84-0022

UNCLASSIFIED REPORT

ABSTRACT: (U) Three concepts are used to illustrate how a small number of simple mechanisms can generate a wide diversity of complex biological phenomena, as well as parametric experimental tests of the models that simulate these phenomena. One is the classifical concept that a membrane equation can model fast electrical responses in cells. The second is the concept that mass action processes can be coupled to the membrane equation as conductance terms. The third is the concept that gating processes can be used to model the mass action dynamics of chemical transmitters.

DESCRIPTORS: (U) *Nervous system, *Nerve cells, *Mathematical models, Equations, Signals, Patterns, Classification, Photoreceptors, Circadian rhythms, Electrical properties, Drugs

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5

AD-A137 823 5/2 12/1

STANFORD UNIV CA DEPT OF MATHEMATICS

(U) Progress Report, Grant AFOSR-79-0134, September 1, 1982 - April 30, 1983,

APR 83 15P

PERSONAL AUTHORS: Keller,J. B. ;

CONTRACT NO. AFOSR-79-0134

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-84-0034

UNCLASSIFIED REPORT

ABSTRACT: (U) This document includes a bibliography and abstracts of eleven papers pertaining to applied mathematics.

DESCRIPTORS: (U) *Bibliographies, *Abstracts, *Applied mathematics, Chemical reactions, Rings, Equations, Diffusion, Acoustic waves, Wave propagation, Resonance scattering, Solids, Elastic properties, Viscous flow

IDENTIFIERS (U) PE61102F, WUAFOSR2304A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 822 4/2

ILLINOIS STATE WATER SURVEY DIV URBANA

(U) Surface Signatures of a Dry Nocturnal Gust Front,

JAN 83 9P

PERSONAL AUTHORS: Scott,R. W. ;Ackerman,B. ;

CONTRACT NO. AFOSR-ISSA-80-00029, NSF-ATM78-08865

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR
TR-84-0073

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Monthly Weather Review, v111 n1 p197-204 Jan 83.

Reprint: Surface Signatures of a Dry Nocturnal Gust Front.

DESCRIPTORS: (U) *Wind, Illinois, Thunderstorms, Gusts, Fronts(Meteorology), Night, Reprints

IDENTIFIERS: (U) VIN Project, PE61102F, WUAFOSR2310A1

AD-A137 822

AD-A137 821 20/6

NEW HAMPSHIRE UNIV DURHAM VISION RESEARCH LAB

(U) Size Discrimination with Low Spatial Frequencies,

82 16P

PERSONAL AUTHORS: Smith,R. A. , Jr;

CONTRACT NO. AFOSR-80-0045, PHS-EY-01475

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-84-0014

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Perception, v11 p707-720 1982.

Reprint: Size Discrimination with Low Spatial Frequencies.

DESCRIPTORS: (U) *Visual perception, *Sizes(Dimensions), Luminance, Channels, Fourier transformation, Discrimination, Low frequency, Reprints

IDENTIFIERS: (U) Spatial frequency, PE61102F, WUAFOSR2313A5

AD-A137 821

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 820 12/1

FLORIDA UNIV GAINESVILLE DEPT OF MATHEMATICS

(U) Identification from Real Data,

82 37P

PERSONAL AUTHORS: Kalman,R. E. ;

CONTRACT NO. AFOSR-81-0238

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0045

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Current Developments in the Interface: Economics, Econometrics, Mathematics, p161-196 1982.

Reprint: Identification from Real Data.

DESCRIPTORS: (U) *Statistical analysis, *Statistical data, *Noise, Mathematical models, Variables, Linearity, Reprints

IDENTIFIERS: (U) Noisy data, PE61102F, WUAFOSR2304A6

AD-A137 820

AD-A137 804 12/1 20/14

LA JOLLA INST CA CENTER FOR THE STUDY OF NONLINEAR DYNAMICS

(U) Fractal Phase Screens.

DESCRIPTIVE NOTE: Final rept. 1 May 82-30 Apr 83,

JUN 83 34P

PERSONAL AUTHORS: West,B. J. ;

REPORT NO. LJI-R-83-236

CONTRACT NO. F49620-82-C-0058

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR
TR-84-0053

UNCLASSIFIED REPORT

ABSTRACT: (U) A plane wave emergent from a scattering layer is modeled as a boundary value problem. The wave if specified at z = 0(+) by a unit amplitude and a phase prescribed by a homogeneous isotropic random function with a power law spectrum and Gaussian statistics. It is shown that the statistics of the wave propagating in free space away from the boundary cannot be Gaussian, except perhaps in the far field region where the scattering is saturated. It is also shown that the amplitude and intensity spectra of this wave each satisfy specific scaling relations. Such a wave has been called a diffractal by Berry and herein this paper further develops some of his ideas on diffractals, in particular extending his discussion from two or three spatial dimensions. A study of the scintillation index indicates that a diffractal is not an unreasonable model of a radio wave passing through the ionosphere, as it does in satellite communication. (Author)

DESCRIPTORS: (U) *Mathematical models, *Boundary value problems, *Plane waves, *Wave propagation, *Statistical analysis, Radio waves, Satellite communications, Ionospheric scintillations, Three dimensional, Scattering, Wave equations, Homogeneity, Isotropism

AD-A137 804

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 804 CONTINUED

IDENTIFIERS: (U) Diffractals, PE61102F, WUAFOSR2310A2

AD-A137 803 20/7

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) Recent Results of the ACO Storage Ring F.E.L. Experiment,

FEB 83 45P

PERSONAL AUTHORS: Billardon,M. ;Deacon,D. A. G. ;Elleaume, P. ;Ortega,J. M. ;Robinson,K. E. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0095

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. de Physique, Colloque C1, Supplement au n2, Tome 44, pC1-29-C1-71, Feb 83. Supersedes AD-B071 033.

Reprint: Recent Results of the ACO Storage Ring F.E.L. Experiment.

DESCRIPTORS: (U) *Permanent magnet generators, *Synchrotrons, Magnetic induction, Mirrors, Reprints

IDENTIFIERS: (U) Magnet undulator, Optical cavity, PE61102F, WUAFOSR2301A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 798 20/12 9/5 9/1

CORNELL UNIV ITHACA NY

(U) Microwave Semiconductor Research - Materials, Devices, Circuits.

DESCRIPTIVE NOTE: Annual technical rept. 1 May 81-30 Apr 82,

APR 82 62P

PERSONAL AUTHORS: Eastman,L. F. ;Woodard,D. W. ;Wood,C. E. C. ;Wicks,G. ;Ballantyne,J. ;

CONTRACT NO. F49620-77-C-0069

PROJECT NO. 2305

TASK NO. A9

MONITOR: AFOSR
TR-84-0056

UNCLASSIFIED REPORT

ABSTRACT: (U) This program covers the growth and assessment of Gallium Arsenide, and related compounds and alloys, for use in microwave, millimeter, and optical devices. It also covers the processing of the material into devices, and the testing of the devices. Both molecular beam epitaxy (MBE) and organo-metallic vapor phase epitaxy (OMVPE) are used for growth. Modulation doped heterostructures and very short gate field effect transistors are two areas covered.

DESCRIPTORS: (U) *Schottky barrier devices, *Microwave equipment, *Semiconductors, *Gates(Circuits), *Field effect transistors, *Gallium arsenides, Electric fields, Epitaxial growth, Composition(Property), Liquid phases, High rate, Silicon nitrides, N type semiconductors, Doping, Silicon, Processing, Chromium, Physical properties, Test and evaluation, Optical equipment, Molecular beams, Low noise amplifiers, Organometallic compounds, Gunn effect, Power equipment, Indium phosphides, Growth(General), Materials

IDENTIFIERS: (U) Hole trapping, DLTS(Deep Level Transient Spectroscopy), MBE(Molecular Beam Epitaxy), Buffer layers, OMVPE(Organo Metallic Vapor Phase Epitaxy), PE61102F, WUAFOSR2305A9

AD-A137 798

AD-A137 797 12/1

STANFORD UNIV CA

(U) Evolution of the Transverse Modes in a FEL (Free Electron Lasers), and Application to the Orsay Experiment.

DESCRIPTIVE NOTE: Interim rept.,

AUG 83 8P

PERSONAL AUTHORS: Elleaume,P. ;Deacon,D. A. G. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0099

UNCLASSIFIED REPORT

ABSTRACT: (U) The authors derive the most general equations of motion for the electrons and the electromagnetic field including the effects of diffraction and pulse propagation. The field evolution is expressed in terms of the amplitudes and phases of a complete set of transverse modes. The analytic solution is given in the small signal regime, where the theory is shown to be in excellent agreement with a recent experiment. (Author)

DESCRIPTORS: (U) *Equations of motion, *Lasers, Free electrons, Electromagnetic fields, Mathematical analysis, Diffraction, Pulses, Transverse, Wave equations

IDENTIFIERS: (U) *Free electron lasers, PE61102F, WUAFOSR2301A1

AD-A137 797

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 795 7/4 7/3

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-Like Benzobisoxazole Polymers.

83 6P

PERSONAL AUTHORS: Welsh,W. J. ;Mark,J. E. ;

CONTRACT NO. AFOSR-83-0027

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR TR-84-0063

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Polymer Engineering and Science, v23 n3 p140-143 Feb 83.

Reprint: Effects of Protonation on the Conformational Characteristics and Geometry of the Rod-Like Benzobisoxazole Polymers.

DESCRIPTORS: (U) *Proton reactions, *Azoles, *Polymers, Rigidity, Rods, Liquids, Crystallization, Dissolving, Acids, Solvents, Ions, Geometry, Aromatic compounds, Heterocyclic compounds, Molecular structure, Phenyl radicals, Chemical bonds, Rotation, Strength(General), Reprints

IDENTIFIERS: (U) *Protonation, Benzobisoxzole, Polybenzobisthiazole, PE61102F, WUAFOSR2303A3

AD-A137 795

AD-A137 794 6/20 6/5

EIDGENOESSISCHE TECHNISCHE HOCHSCHULE AND ZURICH UNIV SCHWERZENBACH (SWITZERLAND) INST OF TOXICOLOGY

(U) Correlation of Mutagenic, Carcinogenic and Co-Carcinogenic Effects of Chemical Substances. Granuloma Pouch Assay.

DESCRIPTIVE NOTE: Interim scientific rept. 1 Sep 82-31 Aug 83,

OCT 83 15P

PERSONAL AUTHORS: Zbinden,G. ;

CONTRACT NO. AFOSR-82-0338

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR TR-84-0017

UNCLASSIFIED REPORT

ABSTRACT: (U) The research project is concerned with the detection of premalignant and malignant cells induced in vivo in a novel assay system the granuloma pouch assay. Cells exposed to carcinogens in vivo can be studies for DNA damage, chromosomal aberrations, specific locus mutations and cell transformations. Various assays were developed to investigate the growth characteristics of normal, carcinogen-exposed and transformed granuloma pouch cells.

DESCRIPTORS: (U) *Carcinogenesis, *Granuloma, *Neoplasms, Bioassay, In vivo analysis, Carcinogens, Cells(Biology), Chromosomes, Culture media, Rats, Mice

IDENTIFIERS: (U) Malignancy, PE61102F, WUAFOSR2312A5

AD-A137 794

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 793 6/1

CALIFORNIA UNIV SAN FRANCISCO

(U) The Effect of in Vivo Treatment with Triiodothyronine on the in Vitro Synthesis of Protein-Poly(ADP)-Ribose Adducts by Isolated Cardiocyte Nuclei and the Separation of Poly(ADP)-ribosylated Proteins by Phenol Extraction and Electrophoresis,

OCT 83 9P

PERSONAL AUTHORS: Jackowski,G. ;Kun,E. ;

CONTRACT NO. F49620-81-C-0007, PHS-HL-27317

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0013

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Biological Chemistry, v258 n20 p12587-12593, 25 Oct 83.

Reprint: The Effect of in Vivo Treatment with Triiodothyronine on the in Vitro Synthesis of Protein-Poly(ADP)-Ribose Adducts by Isolated Cardiocyte Nuclei and the Separation of Poly(ADP)-ribosylated Proteins by Phenol Extraction and Electrophoresis.

DESCRIPTORS: (U) *Proteins, *Ribose, Polymers, Extraction, Electrophoresis, Rats, Reprints

IDENTIFIERS: (U) Triiodothyronine, PE61102F, WUAFOSR2312A5

AD-A137 785 20/5

STANFORD UNIV CA HIGH ENERGY PHYSICS LAB

(U) New Results of the ACO Storage Ring Free Electron Laser.

DESCRIPTIVE NOTE: Interim rept.,

APR 83 9P

PERSONAL AUTHORS: Velghe,M. ;Bergher,M. ;Bazin,C. ; Billardon,M. ;Deacon,D. A. G. ;

REPORT NO. HEPL-925

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0096

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Paris Univ.-Sud, Orsay (France). Presented at International Conference on Lasers '82, New Orleans, LA, 13-17 Dec 82.

ABSTRACT: (U) To improve the gain in the Orsay storage ring free electron laser experiment, the seventeen periods permanent magnet undulator was modified into an optical klystron. The author report the laser induced bunch lengthening and the gain measurement on the optical klystron and compare these to the undulator case. (Author)

DESCRIPTORS: (U) *Lasers, *Free electrons, *Gain, Feasibility studies, Modification, Klystrons, Permanent magnets, Optics, Argon lasers, Superconductivity

IDENTIFIERS: (U) *Free electron lasers, Permanent magnet undulators, *Storage ring free electron lasers, PE61102F, WUAFOSR2301A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 781 6/19

CALIFORNIA UNIV SANTA BARBARA INST OF ENVIRONMENTAL STRESS

(U) Physiological Adjustments to Hemorrhage, Altitude, and Work.

DESCRIPTIVE NOTE: Final scientific rept. 1 Dec 77-31 Aug 83,

OCT 83 16P

PERSONAL AUTHORS: Horvath,S. M. ;

CONTRACT NO. AFOSR-78-3534

PROJECT NO. 2312

TASK NO. AI

MONITOR: AFOSR TR-84-0019

UNCLASSIFIED REPORT

ABSTRACT: (U) This research program has been concerned with evaluating the influence of various stressors, physiological and psychological, on man and subsequently determining the capacity of the individual to successfully adapt to these environmental influences. In the process of these investigations some 42 peer-reviewed manuscripts were published. They have dealt with the responses to exercise, cold and hot environments, hypoxia, toxicological substances, sleep and psychological stresses. The subjects for these studies have included both sexes. In general while some facets of man's adaptability have been resolved, it is clear that numerous problems remain to be investigated.

DESCRIPTORS: (U) *Adaptation(Physiology), *Stress(Physiology), *Stress(Psychology), Altitude, Work, Exercise(Physiology), Low temperature, Hypoxia, Sleep, Cardiovascular system, Heart rate, Heat, Response(Biology)

IDENTIFIERS: (U) PE61102F, WUAFOSR2312AI

AD-A137 781

AD-A137 779 5/10

ILLINOIS UNIV CHAMPAIGN COGNITIVE PSYCHOPHYSIOLOGY LAB

(U) The Event Related Brain Potential as an Index of Information Processing, Cognitive Activity, and Skill Acquisition: A Program of Basic Research.

DESCRIPTIVE NOTE: Final progress rept. 1 Sep 79-31 Aug 83,

OCT 83 139P

PERSONAL AUTHORS: Donchin,E. ;Wickens,C. ;Coles,M. G. H. ;

REPORT NO. CPL83-4

CONTRACT NO. F49620-79-C-0233

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-84-0051

UNCLASSIFIED REPORT

ABSTRACT: (U) The materials assembled in this report represent work conducted with AFOSR support at the Cognitive Psychophysiology Laboratory during the reporting period. Appendix A of the report contains abstracts and papers that have been presented at various scientific meetings. In the text we present a brief review of these studies. For studies not included in Appendix A, a longer review is given. Appendix B gives a list of items that are either final versions of materials that were presented in previous progress reports or review chapters.

DESCRIPTORS: (U) *Information processing, *Perception(Psychology), Brain, Skills, Acquisition, Psychophysiology, Reaction time, Tracking, Predictions, Performance tests

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A4

AD-A137 779

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 778 8/11

HAWAII INST OF GEOPHYSICS HONOLULU

(U) Spectral Analyses of High-Frequency Pn, Sn Phases from Very Shallow Focus Earthquakes.

DESCRIPTIVE NOTE: Final technical rept.,

SEP 83 180P

PERSONAL AUTHORS: Walker,D. A. ;

CONTRACT NO. F49620-81-C-0065

PROJECT NO. 2309

TASK NO. A1

MONITOR: AFOSR TR-84-0059

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: Spectra of nuclear explosions, earthquakes, and noise from Wake Island bottom hydrophones; Spectral characteristics of high-frequency Pn, Sn phases in the Western Pacific; Oceanic Pn/Sn: a qualitative expanation and reinterpretation of the T-phase; A Preliminary Informal Comparison of Signal/Noise Capabilities Between the Wake Bottom Hydrophone Array, the Ocean Sub-Bottom Seismometer, and Ocean Bottom Seismometers; Po/So Phases: Propagation Velocity and Attenuation Across a 1600 km Long Deep Ocean Hydrophone Array; The Continuous Digital Data Collection System for the Wake Island Hydrophones; List of Events Processed by the Wake Digital Data Collection System.

DESCRIPTORS: (U) *Seismic waves, North Pacific Ocean, Ocean bottom, Hydrophones, Acoustic arrays, Seismometers, Phase, Signal processing, Data acquisition, Digital systems

IDENTIFIERS: (U) Wake Island, PE61102F, WUAFOSR2309A1

AD-A137 778

AD-A137 776 12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR COMPUTER SCIENCE

(U) Research in Algebraic Manipulation.

DESCRIPTIVE NOTE: Interim rept. 1 Jul 82-30 Jun 83,

DEC 83 11P

PERSONAL AUTHORS: Moses,J ;

CONTRACT NO. AFOSR-80-0250

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-84-0037

UNCLASSIFIED REPORT

ABSTRACT: (U) Professor Shunro Watanabe of Japan has been visiting our group since March, 1982. In the past year he has been able, with the support of our group, to develop a major new program for solving in closed from a wide variety of ordinary differential equations. The MACSYMA system uses two large packages for solving ODES. Professor Watanabe's approach is to convert most second order ODEs into instances of the so-called P-function. These functions, originally due to Riemann, have been extensively studied by the Japanese mathematician Fukuhara (also spelled Hukuhara). For the past year, Watanabe has implemented a package that transforms a large class of equations into P-functions. He has used Kamke's table as a test bed. Several examples from Kamke using this package, are given in Appendix I.

DESCRIPTORS: (U) *Algebraic functions, Numerical integration, Algorithms, Computations, Differential equations

IDENTIFIERS: (U) Algebraic integration, PE61102F, WUAFOSR2304A4

AD-A137 776

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 775 20/4 14/2 1/2

GRUMMAN AEROSPACE CORP BETHPAGE NY RESEARCH AND DEVELOPMENT CENTER

(U) An Investigation of Turbulence Mechanisms in V/STOL Upwash Flow Fields.

DESCRIPTIVE NOTE: Annual rept. no. 1, Mar 82-Mar 83,

MAY 83 36P

PERSONAL AUTHORS: Gilbert,B. ;

REPORT NO. RE-667

CONTRACT NO. F49620-82-C-0025

PROJECT NO. 2307

TASK NO. K2

MONITOR: AFOSR TR-84-0087

UNCLASSIFIED REPORT

ABSTRACT: (U) The results of the first year of an experimental investigation of the abnormally high turbulence level and mixing layer growth rate characteristics found in the upwash regions of V/STOL flows in ground effect are presented. The overall objectives of this program were to examine the origin of the increased fluctuations, to systematically characterize the development and structure of the upwash, and to determine the parameters that influence these characteristics. The approach adopted was to investigate the fundamental turbulent V/STOL upwash mechanisms in increasingly more complex flow configurations. In the first year's effort, a two-dimensional upwash was formed by the collision of opposed two-dimensional wall jets. Extensive measurements were made in the two-dimensional wall jet to establish the starting conditions of the upwash. Evaluation of these measurements have shown classical wall jet behavior, and by the time the wall jet reaches the collision zone, both the mean and turbulence profiles are fully developed. A unique set of velocity profiles was obtained at six locations in the upwash. By using an X-probe anemometer, two components of the velocity were found simultaneously. This baseline set of two component velocity profiles has never been reported

before. While the turbulence levels and mixing layer growth rates were larger than those found in a free two-dimensional jet, these values were less than those reported by previous investigators.

DESCRIPTORS: (U) *Turbulent flow, *Ground effect, Vertical takeoff aircraft, Short takeoff aircraft, Interactions, Flow fields, Velocity, Experimental design, Anemometers, Jet flow, Cross flow, Measurement, Walls, Jet mixing flow, Rates, Layers, Two dimensional flow

IDENTIFIERS: (U) *Upwash, X probe anemometers, Mixing layers(Jet flow), PE61102F, WUAFOSR2307K2

AD-A137 775

AD-A13' 774 9/2 5/1

TEXA; UNIV AT AUSTIN DEPT OF COMPUTER SCIENCES

(U) High Performance Parallel Computing.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 82,

DEC 82 13P

PERSONAL AUTHORS: Browne,J. C. ;

CONTRACT NO. AFOSR-82-0091

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0042

UNCLASSIFIED REPORT

ABSTRACT: (U) The three major research areas have been parallel structuring of computations, basic software for support of parallel computations and parallel architectures and supporting hardware. The work on parallel structuring of computations falls into three categories. First of these is parallel structuring of complete programs or applications. The example to be discussed below is a Monte Carlo simulation of particle movement. The second category is parallel formulation of specific numerical algorithms. The third topic is parallel formulations of non-numeric algorithms, in particular radix sorting. Design, development and analysis of basic software for parallel computing has received major emphasis. Basic software for support of parallel computations on reconfigurable network architectures is an almost entirely unstudied problem area. The third major area is continuing development of parallel architectures and hardware support for parallel architectures in the context of the Texas Reconfigurable Array Computer.

DESCRIPTORS: (U) *Parallel processing, *Research management, Computations, Computer programs, Computer architecture, Algorithms, Monte Carlo method, Photons, Transport

IDENTIFIERS: (U) TRAC(Texas Reconfigurable Array Computer), PE61102F, WUAFOSR2304A3

AD-A137 774

AD-A137 773 9/2 5/1

NORTHWESTERN UNIV EVANSTON IL DEPT OF INDUSTRIAL ENGINEERING AND MANAGEMENT SCIENCES

(U) Hidden and Embedded Structure in Linear Programs.

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 83,

SEP 83 9P

PERSONAL AUTHORS: Bixby,R. E. ;

CONTRACT NO. AFOSR-82-0004

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0046

UNCLASSIFIED REPORT

ABSTRACT: (U) This report is a summary of work completed on AFOSR Grant AFOSR-82-0004. The summary begins with a listing of papers written followed by further descriptions of work completed as well as work in progress. Contents includes: A Simple Theorem on 3-Connectivity; A Composition for Perfect Graphs; The partial Order of a Polymatroid Extreme Point; Algorithms for Two Versions of Graph Realization and an Applicaton to Linear Programming (1983); A Note on Recognizing Path Matrices; and Packing and Covering by Integral Feasible Flows in Integral Supply-Demand Networks.

DESCRIPTORS: (U) *Linear programming, Research management, Contracts, Algebra, Graphs, Algorithms

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A6

AD-A137 773

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 768 6/5

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Immune Dysfunctions and Abrogation of the Inflammatory Response by Environmental Chemicals.

DESCRIPTIVE NOTE: Final rept. 1 Jul 82-30 Jun 83,

AUG 83 17P

PERSONAL AUTHORS: Olsen,R. G. ;

CONTRACT NO. F49620-79-C-0163

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0018

UNCLASSIFIED REPORT

ABSTRACT: (U) Exposure of immune cells to UDMH induces immune cell dysfunction suggestive of impairment of the immunoregulatory component of the immune system. We found that UDMH does not alter the suppressor cell/helper cell ratio nor does it overtly alter the Ia receptors on immune cells. UDMH does significantly change prostaglandin E2 synthesis. This chemical mediator is known to play a keynote in regulating immune cells.

DESCRIPTORS: (U) *Immunity, *Dimethylhydrazines, *Prostaglandin, Dysfunction, Antigens, Adenosine phosphates, Lymphocytes, Cells(Biology), Response(Biology)

IDENTIFIERS: (U) Interleukin, LPN-OSURF-761657/712019, PE61102F, WUAFOSR2312A5

AD-A137 768

AD-A137 765 7/5 7/2

COLORADO UNIV AT BOULDER DEPT OF CHEMISTRY

(U) Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2+ in Helium.

DEC 83 11P

PERSONAL AUTHORS: Duncan,M. A. ;Bierbaum,V. M. ;Ellison,B. B ;Leone,S. R. ;

CONTRACT NO. F49620-83-C-0013

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-84-0076

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Joint Inst. for Lab. Astrophysics, Boulder, CO. Pub. in Jnl. of Chemical Physics, v79 n11 p5448-5456, 1 Dec 83.

Reprint: Laser-Induced Fluorescence Studies of Ion Collisional Excitation in a Drift Field: Rotational Excitation of N2 in Helium.

DESCRIPTORS: (U) *Laser induced fluorescence, *Ions, *Nitrogen, Photochemical reactions, Drift, Tubes, Electric fields, Molecular ions, Mobility, Collisions, Excitation, Helium, Molecular states, Electron transitions, Molecular rotation, Distribution, Molecules, Reaction kinetics, Energy transfer, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A137 765

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 764 11/6 11/3 11/9 20/11

MARTIN MARIETTA LABS BALTIMORE MD

(U) Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds,

83 21P

PERSONAL AUTHORS: Ahearn,J. S. ;Davis,G. D. ;Sun,T. S. ; Venables,J. D. ;

CONTRACT NO. F49620-78-C-0097

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-84-0077

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Adhesion Aspects of Polymeric Coatings, p281-299 1983.

Reprint: Correlation of Surface Chemistry and Durability of Aluminum/Polymer Bonds.

DESCRIPTORS: (U) *Aluminum alloys, *Polymers, *Anodic coatings, Mechanical properties, Endurance(General), Stability, Moisture, Oxides, Adhesive bonding, Absorption, Microstructure, X ray spectroscopy, Layers, Porous materials

IDENTIFIERS: (U) Monolayers, PE61102F, WUAFOSR2303A2

AD-A137 764

AD-A137 763 18/2 20/10

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate,

APR 83 15P

PERSONAL AUTHORS: Lin,J. T. ;George,T. F. ;

REPORT NO. TR-19

CONTRACT NO. AFOSR-82-0046

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-84-0079

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n8 p5197-5209, 15 Apr 83.

Reprint: Quantum Dynamical Model of Laser-Stimulated Isotope Separation of Adsorbed Species: Role of Anharmonicity, Coupling Strength and Energy Feedback from the Heated Substrate

DESCRIPTORS: (U) *Isotope separation, *Radiation absorption, *Laser beams, *Quantum theory, *Coupling(Interaction), Energy transfer, Dynamics, Strength(General), Thermal diffusion, Excitation, Relaxation, Steady state, Heterogeneity, Substrates, Harmonics, Surfaces, Phonons, Relaxation, Stability, Mathematical models, Hamiltonian functions, Equations of motion, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A2

AD-A137 763

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 762 7/3 7/4

ULTRASYSTEMS INC IRVINE CA

(U) Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies.

83 8P

PERSONAL AUTHORS: Paciorek,K. J. L. ;Ito,T. I. ;Kratzer,R. H. ;

REPORT NO. SN-8340-P3

CONTRACT NO. F49620-79-C-0037

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-84-0078

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluorine Chemistry, v22 p385-391 1983. See also report dated 28 May 80, AD-AC93 366.

Reprint: Diphosphatetraazacyclooctatetraenes. III. Polymerization Studies.

DESCRIPTORS: (U) *Polymerization, *Polymers, *Heterocyclic compounds, *Synthesis(Chemistry), Thermal stability, Oxidation, Monomers, Amidines, Chlorides, Triazines, Phosphorus compounds, Reaction kinetics, Degradation, Residues, Reprints

IDENTIFIERS: (U) Tetraenes/diphosphatetraazacycloocta, Polyimidoylamidine, Trichloride/imido-tetraphenyl-diphosphonic acid, PE61102F, WUAFOSR2303B2

AD-A137 762

AD-A137 760 12/1 14/2 9/2

STEVENS INST OF TECH HOBOKEN N J DEPT OF MECHANICAL ENGINEERING

(U) Time Domain Analysis and Synthesis of Robust Controllers for Large Scale LQG (Linear Quadratic Gaussian) Regulators.

DESCRIPTIVE NOTE: Final rept. 1 Sep 82-31 Aug 83,

AUG 83 56P

PERSONAL AUTHORS: Yedavalli,R. K. ;Shanbhag,R. N. ; Irudayasamy,J. ;

CONTRACT NO. AFOSR-83-0139

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-84-0040

UNCLASSIFIED REPORT

ABSTRACT: (U) The aspect of Robustness for linear multivariable systems is analyzed in time domain. Both Stability Robustness and Performance Robustness are combinedly considered to meet stability and performance requirements. First a stability robustness condition in time domain (in terms of eigenvalues) is presented and examples are given which indicate that the proposed robustness condition is less conservative then the corresponding frequency domain condition as well as another recently proposed time domain condition, both given in terms of singular values. Next a technique is presented to further reduce the conservatism of the proposed condition. A design algorithm that incorporates both stability robustness and performance robustness into the design procedure suggested in the summer faculty program report, is modified with the help of new definitions of robustness indices. Computer software to implement the algorithm is presented along with simple examples to illustrate the concepts. Based on the experience gained by the minigrant research, areas of future research are recommended. (Author)

DESCRIPTORS: (U) *Algorithms, *Control systems, *Time domain, Control theory, Computer programs, Closed loop

AD-A137 760

AD-A137 760 CONTINUED

systems, Open loop systems, Eigenvalues, Matrices(Mathematics), Symmetry, Computations

IDENTIFIERS: (U) Robust procedures, LSLIB(Library for Control and Estimation of Linear Uncertain Systems), LQG(Linear Quadratic Gaussian), LQG regulators, PE61102F, WUAFOSR2304A6

AD-A137 758 20/6 5/10

NEW HAMPSHIRE UNIV DURHAM VISION RESEARCH LAB

(U) An Action Spectrum for Spatial-Frequency Adaptation,

82 12P

PERSONAL AUTHORS: Swift,D. J. ;Smith,R. A.

CONTRACT NO. AFOSR-80-0045, PHS-EY-01475

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR TR-84-0015

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Vision Research, v22 p235-246 1982.

Reprint: An Action Spectrum for Spatial-Frequency Adaptation.

DESCRIPTORS: (U) *Frequency modulation, *Tuning, *Threshold effects, Vision, Gratings(Spectra), Sensitivity, Bandwidth, Potentiometers, Reprints

IDENTIFIERS: (U) *Spatial frequency, PE61102F, WUAFOSR2313A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 757 7/3 11/9

ARIZONA UNIV TUCSON DEPT OF CHEMISTRY

(U) Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites,

83 9P

PERSONAL AUTHORS: Lin,S. ;Marvel,C. S. ;

CONTRACT NO. AFOSR-82-0007

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-84-0054

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Polymer Science, v21 p1151-1157 1983.

Reprint: Polyaromatic Ether-Sulfone-Ketones with Fluoro-Substituted p-Cyclophane Units as Crosslinking Sites.

DESCRIPTORS: (U) *Polymers, *Aromatic compounds, *Ethers, *Sulfones, *Ketones, *Crosslinking(Chemistry), Chemical radicals, Synthesis(Chemistry), Chlorides, Phenyl radicals, Fluorine, Friedel crafts reactions, Polymerization, Curing, Solubility, Viscosity, Laminates, Glass, Fibers, Thermal stability, Reprints

IDENTIFIERS: (U) Cyclophanes, PE61102F, WUAFOSR2303B2

AD-A137 757

AD-A137 756 12/1

DELAWARE UNIV NEWARK APPLIED MATHEMATICS INST

(U) Modified Green's Functions and the Third Boundary Value Problem for the Helmholtz Equation,

NOV 83 16P

PERSONAL AUTHORS: Angell,T. S. ;Kleinman,R. E. ;

REPORT NO. TR-119A

CONTRACT NO. AFOSR-81-0156

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-84-0044

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Mathematical Analysis and Applications, v97 n1 p81-94 Nov 83.

Reprint: Modified Green's Functions and the Third Boundary Value Problem for the Helmholtz Equation.

DESCRIPTORS: (U) *Boundary value problems, Greens function, Dirichlet integral, Reprints

IDENTIFIERS: (U) Helmholtz equation, Robin boundary value problem, Third boundary value problem, PE61102F, WUAFOSR2304A4

AD-A137 756

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 755 20/6 5/10

NEW HAMPSHIRE UNIV DURHAM VISION RESEARCH LAB

(U) Spatial Frequency Masking and Weber's Law,

83 13P

PERSONAL AUTHORS: Swift,D. J. ;Smith,R. A. ;

CONTRACT NO. AFOSR-80-0045, PHS-EY-01475

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-84-0016

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Vision Research, v23 n5 p495-505 1983.

Reprint: Spatial Frequency Masking and Weber's Law.

DESCRIPTORS: (U) *Vision, *Masking, *Threshold effects, Gratings(Spectra), Psychophysics, Signal to noise ratio, Reprints

IDENTIFIERS: (U) *Spatial frequency, Webers law, PE61102F, WUAFOSR2313A5

AD-A137 752 20/8 20/14

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

(U) Microwave Emission from Relativistic Electron Beams.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-31 Oct 83,

DEC 83 39P

PERSONAL AUTHORS: Bekefi,G. ;

CONTRACT NO. F49620-83-C-0008

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0027

UNCLASSIFIED REPORT

ABSTRACT: (U) During the past year microwave and millimeter wave emission experiments on three systems were carried out. System one is a Rippled-Field Magnetron and represents a hybrid between a conventional magnetron and a free electron laser. System two is a Circular Free Electron Laser in which a rotating ring of relativistic electrons is subjected to an azimuthally periodic magnetic field. The third system concerns an inverted Relativistic Magnetron.

DESCRIPTORS: (U) *Electron emission, *Microwave beams, *Millimeter waves, Relativity theory, Magnetrons, Inversion, Azimuth, Magnetic fields, Electric fields, Electromagnetic radiation

IDENTIFIERS: (U) *Microwave emission, *Millimeter wave emission, Free electron lasers, PE61102F, WUAFOSR2301A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 751 20/5

STANFORD UNIV CALIF W W HANSEN LABS OF PHYSICS

(U) Experimental Investigation of the Characteristics of an Ultraviolet Storage Ring Laser.

DESCRIPTIVE NOTE: Final technical rept. 1 Jun 82-31 Mar 83.

MAR 83 15P

PERSONAL AUTHORS: Madey,J. M. J. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0094

UNCLASSIFIED REPORT

ABSTRACT: (U) Making use of newly installed experimental hardware and instrumentation, the author has continued his investigation of lase-induced bunch lengthening, gain, diffraction effects, and subthreshold behavior in a ACO storage ring free electron laser. (Author)

DESCRIPTORS: (U) *Ultraviolet lasers, *Ring lasers, Interactions, Optics, Electrons, Klystrons, Mirrors, Experimental data, Gain, Diffraction, Threshold effects

IDENTIFIERS: (U) *Free electron lasers, Storage ring lasers, PE61102F, WUAFOSR2301A1

AD-A137 751

AD-A137 750 7/4 7/2

PITTSBURGH UNIV PA DEPT OF CHEMISTRY

(U) Spectroscopic Studies of the Products of the Reactions of Excited Noble-Gas Atoms.

DESCRIPTIVE NOTE: Final scientific rept. 15 Mar 79-14 May 83.

JUN 83 56P

PERSONAL AUTHORS: Golde,M. F. ;

REPORT NO. PR81-00615

CONTRACT NO. AFOSR-79-0089

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-84-0064

UNCLASSIFIED REPORT

ABSTRACT: (U) The products of the very rapid reactions of electronically-excited Ar, Kr and Xe atoms with several oxygen-, hydrogen- and halogen-containing compounds have been investigated using the saturation ion-current technique and emission and atomic resonance fluorescence spectroscopy in discharge-flow systems. New insight has been obtained into the mechanisms of the channels leading to chemiionization and noble-gas halide formation. Energy transfer leading to molecular dissociation is the major and often the dominant channel, with one or more atoms being eliminated in strong preference to elimination of molecular or electronically-excited fragments. For the excited noble gas atoms, the high quenching efficiency and dominance of dissociation and ionization channels are associated with the availability of accessible acceptor states of the quenching molecule, as revealed by its absorption spectrum. It is proposed that these efficient reactions occur by energy transfer at relatively long range with no major prior distortion of the quenching molecule. It is expected that this model should be directly applicable to the reactions of certain other excited species, which exhibit a similar correlation of quenching rate constants with the availability of acceptor states at the

AD-A137 750

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 750 CONTINUED

appropriate energy. (Author)

DESCRIPTORS: (U) *Spectroscopy, *Reaction kinetics, *Atoms, *Rare gases, Excitation, Energy transfer, Electronic states, Quick reaction, Resonance, Ionization, Argon, Xenon, Krypton, Oxygen compounds, Hydrogen compounds, Halogen compounds, Saturation, Ionic current, Emission spectroscopy, Atomic spectroscopy, Quenching, Dissociation

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A137 749 12/1 5/2

STANFORD UNIV CA DEPT OF MATHEMATICS

(U) Progress Report, Grant AFOSR-79-0134, September 1, 1981 - August 31, 1982,

AUG 82 23P

PERSONAL AUTHORS: Keller,J. B. ;

CONTRACT NO. AFOSR-79-0134

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-84-0032

UNCLASSIFIED REPORT

ABSTRACT: (U) This is a progress report of the Applied Mathematics Group in the Mathematics Department, Stanford University. The various research activities of the members of this group are indicated by the list of publications contained in Section II. Abstracts of these publications are contained in Section III. A description of some of the research activities which have been completed but not yet submitted for publication, or which are still in progress, is contained in Section IV.

DESCRIPTORS: (U) *Applied mathematics, *Bibliographies, Abstracts, Fluid mechanics, Acoustics, Equations

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 748 12/2 5/2 17/2

MASSACHUSETTS UNIV AMHERST DEPT OF MATHEMATICS AND STATISTICS

(U) Applications of Functional Analytic and Martingale Methods to Problems in Queueing Network Theory.

DESCRIPTIVE NOTE: Annual scientific rept. 15 May 82-14 May 83,

MAY 83 5P

PERSONAL AUTHORS: Rosenkrantz,W. A. ;

CONTRACT NO. AFOSR-82-0167

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0030

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes results and lists publications emerging from this research period in the area of performance analysis of random access communications systems. (Author)

DESCRIPTORS: (U) *Queueing theory, *Bibliographies, *Communications networks, Research management, Problem solving

IDENTIFIERS: (U) Martingales, PE61102F, WUAFOSR2304A5

AD-A137 748

AD-A137 747 7/4 7/2

OREGON UNIV EUGENE DEPT OF PHYSICS

(U) Auger and Radiative Deexcitation of P(4+) Ions.

DEC 83 11P

PERSONAL AUTHORS: Karim,K. R. ;Chen,M. H. ;Crasemann,B. ;

CONTRACT NO. F49620-83-K-0020

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-84-0057

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v28 n6 p3355-3364 Dec 83.

Reprint: Auger and Radiative Deexcitation of P(4) Ions.

DESCRIPTORS: (U) *Phosphorus, *Ions, *Electronic states, Excitation, Electron transitions, Auger electron spectroscopy, X ray spectra, Configurations, Coupling(Interaction), Energy, Decay, Rates, Spectral lines, Atoms, Collisions, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A4

AD-A137 747

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 745 20/5

STANFORD UNIV CA

(U) Storage Ring Free Electron Lasers: Experimental Progress and Future Prospects.

83 8P

PERSONAL AUTHORS: Deacon,D. A. G. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-84-0098

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Nuclear Instruments and Methods, v208 p171-176 1983.

Reprint: Storage Ring Free Electron Lasers: Experimental Progress and Future Prospects.

DESCRIPTORS: (U) *Lasers, *Free electrons, Coherent electromagnetic radiation, Electron beams, Computations Reprints

IDENTIFIERS: (U) *Free electron lasers, PE61102F, WUAFOSR2301A1

AD-A137 745

AD-A137 744 20/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Measurements of the Near Wake of an Airfoil in Unsteady Flow.

DESCRIPTIVE NOTE: Interim rept.,

JAN 83 13P

PERSONAL AUTHORS: Covert,E. E. ;Lorber,P. F. ;Vaczy,C. M. ;

CONTRACT NO. AFOSR-80-0282

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-84-0029

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at Proceedings of the Aerospace Sciences Meeting (21st), 10-13 Jan 83, Reno, NV.

ABSTRACT: (U) A series of measurements has been made of the velocities in the near wake of an airfoil in an unsteady flow generated by rotating an elliptic cylinder near the trailing edge. Ensemble averages of the tangential and normal velocity components and of 3 Reynolds stresses were determined for reduced frequencies based on semichord up to 6.4, angles of attack of 0 and 10 degrees, Reynolds numbers of 700,000 and 1,450,000, and chordwise positions 1.025 x/c 1.2. In this region the airfoil wake is distinct from the wake of the elliptic cylinder. The mean and unsteady velocities and Reynolds stresses diffuse rapidly so that the distinction between the contributions due to the two boundary layers on the airfoil surfaces, apparent at x/c=1.025, has largely disappeared by x/c=1.20. (Author)

DESCRIPTORS: (U) *Wake, *Trailing edges, *Unsteady flow, Turbulent boundary layer, Airfoils, Cylindrical bodies, Rotation, Ellipses, Turbulent flow, Velocity, Near field, Hot wire anemometers, Wind tunnel tests, Reynolds number

IDENTIFIERS: (U) Near wake, PE61102F, WUAFOSR2307A2

AD-A137 744

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 742 12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR COMPUTER SCIENCE

(U) Research in Algebraic Manipulation.

DESCRIPTIVE NOTE: Interim rept. 1 Jul 81-30 Jun 82,

JUN 83 5P

PERSONAL AUTHORS: Moses,J. ;

CONTRACT NO. AFOSR-80-0250

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-84-0036

UNCLASSIFIED REPORT

ABSTRACT: (U) This document indicates that research on the integration of algebraic functions was phased down and a new line of research on the solution of ordinary differential equations in closed form begun.

DESCRIPTORS: (U) *Algebraic functions, *Differential equations, Research management, Integrals

IDENTIFIERS: (U) WUAFOSR2304A4, PE61102F

AD-A137 742

AD-A137 740 20/4 14/2

CAMBRIDGE UNIV (ENGLAND) CAVENDISH LAB

(U) Studies of Aerodynamic Drag.

DESCRIPTIVE NOTE: Final rept. 1 Apr 79-30 Sep 82,

DEC 82 270P

PERSONAL AUTHORS: Wilby,W. A. ;Field,J. E. ;

CONTRACT NO. AFOSR-79-0057

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-84-0071

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates; All DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U) Earlier workers reported that the viscosity of gases can be changed appreciably by radioactive irradiation, offering a possible means of achieving drag reduction in flight. A precision skin friction drag balance and torsion disc viscometer were developed to investigate this effect. It is shown that, with practical radiation levels, irradiation has a negligibly small effect on viscosity and skin friction drag (both laminar and turbulent). This agrees with theoretical estimates of the change in viscosity due to ionisation. It has also been reported that turbulent gas flows align polar or polarisable molecules whose motion then gives rise to detectable electromagnetic radiation. A study was made of this phenomenon with a view to applications in monitoring the structure of turbulent gas flows during drag reduction experiments. It is concluded that the previous interpretation was erroneous and that the probes used were responding to vibration rather than to electromagnetic radiation. Calculations suggests that any electromagnetic signal will be at least 120 dB below the background noise level. The equipment and electronics developed in the course of the research can be used for accurate, relative measurements of skin friction drag and viscosity. The operation of the viscometer is particularly simple, with the logarithmic decrement being

AD-A137 740

AD-A137 740 CONTINUED

determined automatically. The relative viscosity is calculated using a simple formula, derived from earlier theoretical work.

DESCRIPTORS: (U) *Aerodynamic drag, *Gas flow, *Test methods, Viscosity, Irradiation, Radioactivity, Drag reduction, Balances, Skin friction, Instrumentation, Viscosimeters, Torsion, Disks, Laminar flow, Turbulent flow, Measurement, Molecules, Polarization, Electromagnetic radiation, Molecular properties, Background noise, Theory, Experimental design, Great Britain

IDENTIFIERS: (U) Molecular aerodynamics, Torsion disk viscometers, Drag balances, WUAFOSR2307A2, PE61102F

AD-A137 738 20/5 12/1

STANFORD UNIV CA

(U) Transverse Mode Dynamics in a Free Electron Laser.

DESCRIPTIVE NOTE: Interim rept.,

AUG 83 32P

PERSONAL AUTHORS: Elleaume,P. ;Deacon,D. A. G. ;

CONTRACT NO. F49620-80-C-0068

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0097

UNCLASSIFIED REPORT

ABSTRACT: (U) The most general equations of motion for the electrons and the electromagnetic field in a free electron laser including the effects of diffraction and pulse propagation. The field evolution is expressed in terms of the amplitudes and phases of a complete set of transverse modes is derived. The analytic solution is given in the small signal regime, where the theory is shown to be in excellent agreement with a recent experiment at Orsay.

DESCRIPTORS: (U) *Electrical lasers, *Free electrons, *Dynamics, *Equations of motion, Electrons, Electromagnetic fields, Diffraction, Pulses, Propagation, Evolution, Amplitude, Transverse, Electromagnetic wave propagation, Laser beams, Theory, Matrices(Mathematics), Frequency, Gain

IDENTIFIERS: (U) WUAFOSR2301A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 736 12/1 5/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Research in Stochastic Processes.

DESCRIPTIVE NOTE: Interim rept. 1 Nov 82-31 Oct 83,

OCT 83 62P

PERSONAL AUTHORS: Cambanis,S. ;Carroll,R. J. ;Kallianpur, G. ;Leadbetter,M. R. ;

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-84-0011

UNCLASSIFIED REPORT

ABSTRACT: (U) This document addressed the following topics: (1) nonlinear systems with random inputs; (2) non-Gaussian signal processing; (3) digital processing of analog signals; (4) finitely additive nonlinear filtering; (5) Feynman integrals; (6) multiple stochastic integrals; (7) Dousker's delta functional; (8) extremal theory under high local dependence; (9) high level exceedances by stationary point processes; and (10) estimation for stochastic processes. Robust estimation for linear models was also discussed.

DESCRIPTORS: (U) *Stochastic processes, *Air Force research, Analog signals, Nonlinear systems, Mathematical models, Linearity, Stationary, Digital systems, Mathematical filters, Gaussian noise, Signal processing

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

AD-A137 735 6/6 6/20

KENT STATE UNIV OH DEPT OF BIOLOGICAL SCIENCES

(U) Can the Short-Term Toxicity of Water-Soluble Jet Fuel Hydrocarbons Produce Long-Lasting Effects in Lake Plankton Communities?

DESCRIPTIVE NOTE: Final technical rept. 3 Jan 82-28 Feb 83,

SEP 83 32P

PERSONAL AUTHORS: Carlson,R. E. ;

CONTRACT NO. AFOSR-82-0120

PROJECT NO. 2312

TASK NO. D9

MONITOR: AFOSR TR-84-0023

UNCLASSIFIED REPORT

ABSTRACT: (U) The intent of the research was to explore, using modified algal bioassays, the possibility that algal communities in natural situations may be affected to a greater extent than would be predicted by the short residence time of toluene in water and by the bioassays that have been conducted to date. Algal cells killed or inactivated by toluene do not return nutrients to the medium. In lakes, these cells may sink out of the upper waters, removing the nutrients necessary for community recovery. Recovery may be a function of the rate of nutrient re-supply rather than of the rate of hydrocarbon volatilization. The degree of nutrient limitation and indeed the limiting nutrient involved may modify the response of the community to toluene. A nutrient-limited community may be more affected by toluene than a non-nutrient-limited one. In a nitrogen-limited community, algal growth may be stimulated. Differential toxicity may affect the outcome of species competition for nutrients. The species that is least susceptible to toluene may obtain a numerical advantage, at least temporarily, while the other species are inhibited. The duration of this advantage may depend on the rate to which nutrients are returned into the medium.

DESCRIPTORS: (U) *Toxicity, *Jet engine fuels,

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 735 CONTINUED

*Hydrocarbons, *Algae, *Toluenes, Bioassay, Nutrients, Interactions, Inactivation, Lakes

IDENTIFIERS: (U) WUAFOSR2312D9, PE61102F

AD-A137 733 7/3 7/4

MICHIGAN UNIV ANN ARBOR DEPT OF CHEMISTRY

(U) Synthesis and Spectra of Tetravinyldistibines,

83 6P

PERSONAL AUTHORS: Ashe,A. J. , III ;Ludwig,E. G. , Jr.; Pommerening,H. ;

CONTRACT NO. AFOSR-81-0099

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-84-0075

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v2 n11 p1573-1577 1983.

Reprint: Synthesis and Spectra of Tetravinyldistibines.

DESCRIPTORS: (U) *Antimony compounds, *Hydrides, *Vinyl radicals, *Synthesis(Chemistry), *Spectroscopy, Chemical reactions, Propenes, Methyl radicals, Liquid ammonia, Ethanes, Chlorine, Liquid phases, Freezing, Solid phases, Nuclear magnetic resonance, Raman spectra, Ultraviolet spectra, Mass spectra, Reprints

IDENTIFIERS: (U) Tetravinyldistibines, Stibines, WUAFORS2303B2, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 729 6/20 6/15

WRIGHT STATE UNIV DAYTON OH DEPT OF PHARMACOLOGY

(U) Effect of PFDA on Cardiac Membrane Function.

DESCRIPTIVE NOTE: Annual rept. 1 May 82-30 Apr 83,

MAR 83 9P

PERSONAL AUTHORS: Langley,A. E. ;

CONTRACT NO. AFOSR-82-0264

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0020

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at SOT Meeting, Las Vegas, NV, Mar 83.

ABSTRACT: (U) The in vivo and in vitro heart rates of rats treated with 75 mg/kg PFDA was significantly lower than the in vivo and in vitro heart rates of pair-fed controls 6 to 8 days following treatment. In addition, the rate response of isolated hearts sympathetic nerve stimulation was greater in the PFDA hearts Beta receptor binding assays were done on homogenates of hearts from PFDA and pair-fed controls 8 days following a single 75 mg/kg dose of PFDA. PFDA treatment resulted in a significant decrease in the number of cardiac beta receptors. Radioimmunoassays of serum levels of T3 and T4 indicate that PFDA produced a significant fall in the levels of both of these thyroid hormones. It is concluded that PFDA produces an alteration of the normal function of cardiac membranes. This effect may be either direct or indirect via changes in thyroid hormonal levels.

DESCRIPTORS: (U) *Thyroid hormones, *Thyroxine, Heart, Membranes(Biology), Heart rate, Physiological effects, Rats, Response(Biology), Blood analysis

IDENTIFIERS: (U) PFDA compound, PE61102F, WUAFOSR2312A5

AD-A137 729

AD-A137 727 12/1 5/1

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Component Relevancy in Multistate Systems.

DESCRIPTIVE NOTE: Technical rept.,

SEP 83 12P

PERSONAL AUTHORS: El-Neweihi E. ;Proschan,F. ;

REPORT NO. FSU-STATISTICS-M670

CONTRACT NO. F49620-82-K-0007

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0048

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Illinois Univ. at Chicago Circle. Dept. of Mathematics, Statistics and Computer Science under Grant AFOSR-80-0170.

ABSTRACT: (U) The authors define a hierarchy of six successively weaker conditions for component relevancy in a multistate structure of M+1 performance levels. They show that the six conditions are distinct except for M=1, 2. Presented are basic structural properties corresponding to the six conditions: (a) the definition and properties of the dual structure, (b) redundancy at a lower level is preferable to redundancy at a higher level, and (c) the definition and properties of the structural importance of components. (Author)

DESCRIPTORS: (U) *Mathematical models, *Systems analysis, Structural response, Reliability, Redundancy, Coherence, Vector analysis

IDENTIFIERS: (U) Multistate systems, PE61102F, WUAFOSR2304A5

AD-A137 727

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVF

AD-A137 726 14/5

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG HUMAN FACTORS LAB

(U) Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. 8. Interim Report.

DESCRIPTIVE NOTE: Rept. for 1 Aug 78-30 Jun 83.

JUN 83 94P

PERSONAL AUTHORS: Snyder,H. L.

REPORT NO. VPI-HFL-83-1

CONTRACT(S): F49620-78-C-0055

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-84-0055

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also 1, AD-A135 631.

ABSTRACT: (U) This report summarizes a five-year research program on the subject of quality evaluation of digitally derived imagery. High-resolution aerial photography was used to create digitized images with unclassified content comparable to that employed in military photointerpretation operations. The digitized imagery was used in several hard-copy and soft-copy interpretation experiments to assess the affects of image blur and image noise on both perceived image quality and the ability to extract information from the images. The soft-copy experiments included both nonprocessed and processed imagery. Finally, quality metrics of image quality were obtained for both hard-copy and soft-copy images and related directly to both information extraction performance and subjective quality scaling.

DESCRIPTORS: (U) *Image processing, Photographic images, Digital systems, Aerial photographs, Hard copy, Photointerpretability

IDENTIFIERS: (U) Soft copy, Image quality, PE61102F, WUAFOSR2313A4

AD-A137 726

AD-A137 725 17/9 6/4

ENVIRONMENTAL RESEARCH INST OF MICHIGAN ANN ARBOR RADAR DIV

(U) Study on Extremizing Adaptive Systems and Applications to Synthetic Aperture Radars.

DESCRIPTIVE NOTE: Annual technical rept. 10 Sep 82-9 Sep 83.

OCT 83 77P

PERSONAL AUTHORS: Politis,D. T.; Licata,W. H.;

REPORT NO. ERIM-163800-2-T

CONTRACT NO. F49620-82-C-0097

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-84-0024

UNCLASSIFIED REPORT

ABSTRACT: (U) For this study the application of Artificial Intelligence methods in synthetic aperture radars (SAR) is investigated. It was found that the neuron-like ASE-ACE adaptive algorithm developed by Bartis, operating in the extremizing mode suggested by Klopf, can be used in a wide class of engineering problems requiring that some performance function be minimized. One such suggested application is to correct for quadratic phase errors in SAR signal processing. (Author)

DESCRIPTORS: (U) *Synthetic aperture radar, *Adaptive systems, *Artificial intelligence, *Bionics, *Signal processing, Nerve cells, Computerized simulation, Feedback, Performance(Engineering), Neural nets, Sampling, Radar, Weighting functions, Models, Quadratic equations, Functions, Errors, Engineering

IDENTIFIERS: (U) ACE(Adaptive Circuit Element), ASE(Associative Search Element), Phase errors, Nearing networks, Autofocusing, PE61102F, WUAFOSR2312A1

AD-A137 725

DTIC REPORT BIBLIOGRAPHY

AD A137 724 14/2 20/9

HAWAII UNIV HONOLULU DEPT OF PHYSICS AND ASTRONOMY

(U) Pulsed Plasma Source Spectrometry in the 80-8000-eV X-Ray Region.

83 22P

PERSONAL AUTHORS: Henke,B. L. ;Yamada,H. T. ;Tanaka,T. J.

CONTRACT NO. AFOSR 79 0027

PROJECT NO. 2301

TASK NO. A5

MONITOR: AFO
TR-84-0058

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Review of Scientific Instruments, v54 n10 p1311-1330 Oct 83.

Reprint: *Pulsed Plasma Source Spectrometry in the 80-8000-eV X-Ray Region.*

DESCRIPTORS: (U) *Spectrometry, *Plasmas(Physics), Spectrographs, X rays, Reprints

IDENTIFIERS: (U) *Crystal analyzers, Pulsed plasma sources, PE61102F, WUAFOSR2301A5

AD A137 724

SEARCH CONTROL NO. EVP02F

AD-A137 723 7/2 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane,

82 4P

PERSONAL AUTHORS: Aikman,R. E. ;Lagow,R. J. ;

CONTRACT NO. AFOSR-78-3658

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0068

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v21 n2 p524-526 1982.

Reprint: Direct Fluorination of Hexamethyldigermane and Hexamethyldisilane.

DESCRIPTORS: (U) *Fluorination, *Germanium compounds, *Hydrides, *Silanes, *Methyl radicals, Low temperature, Cleavage, Metal metal bonds, Fluorine, Fluorides, Nuclear magnetic resonance, Infrared spectroscopy, Gas chromatography, Reprints

IDENTIFIERS: (U) Hexamethyldigermane, Hexamethyldisilane, PE61102F, WUAFOSR2303B2

AD-A137 723

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 722 7/3

GEORGIA UNIV ATHENS DEPT OF CHEMISTRY

(U) Polyphosphorus Compounds Containing Phosphorus-Nitrogen Bonds

DESCRIPTIVE NOTE: Final rept. 1 Jan 81-31 Dec 83,

JAN 84 15P

PERSONAL AUTHORS: King,R. B. ;

CONTRACT NO. AFOSR-81-0051

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0091

UNCLASSIFIED REPORT

ABSTRACT: (U) The original scientific objective of this basic research program was the understanding of the synthesis and chemical reactivity of organic compounds consisting of a carbon backbone containing several bis(dialkylamino) phosphino substituents, (R2N2)P. This class of organophosphorus compounds, which has received very little attention, is of potential importance as intermediates in the manufacture of materials of possible value to the Air Force in diverse applications including antioxidants, lubricity agents, elastomers, flame retardants, and fuel cell catalysts. The development of methods for the synthesis of organic compounds bearing several (R2N2)P substituents requires the availability of important dialklaminosphorus building blocks. In this connection major effects of the size of the dialkylamino group on the resulting dialkylaminophosphorus chemistry were documented for the first time.

DESCRIPTORS: (U) *Organic phosphorus compounds, *Synthesis(Chemistry), Polymers, Phosphine, Cyclic compounds, Nitrogen, Hydrogen, Chemical bonds, Metal complexes, Carbonyl compounds, Alkyl radicals, Catalysis

IDENTIFIERS: (U) Phosphorus/Dialkylamino, PE61102F, WUAFOSR2303B2

AD-A137 520 7/4

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF CHEMISTRY

(U) Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.

DESCRIPTIVE NOTE: Technical rept.,

JAN 84 11P

PERSONAL AUTHORS: Kimock,F. M. ;Baxter,J. P. ;Kobrin,P. H. ;Pappas,D. L. ;Winograd,N. ;

REPORT NO. TR-1

CONTRACT NO. N00014-83-K-0052, AFOSR-82-0057

MONITOR: AFOSR
TR-84-0222

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SPIE, v426 p24-31 1983.

Reprint: Trace Analysis of Solid Surfaces by Combination of Energetic Ion Bombardment and Multiphoton Resonance Ionization.

DESCRIPTORS: (U) *Tracer studies, *Photons, *Ionization, *Ion bombardment, Solids, Surfaces, Surface analysis, Ion beams, Probes, Ionic current, Sputtering, Yield, Particles, Ejection, Detection, Efficiency, Reprints

IDENTIFIERS: (U) MPRI(MultiPhoton Resonance Ionization)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 425 7/4

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes,

82 8P

PERSONAL AUTHORS: Srinvasan,V. ;Barr,S. W. ;Weaver,M. J. ;

CONTRACT NO AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1290

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v21 p3154-3159 1982.

Reprint: Reduction Kinetics of Pentaamminecobalt(III) Complexes Containing 4,4'-Bipyridine and Related Ligands at Mercury, Platinum, and Gold Electrodes.

DESCRIPTORS: (U) *Reduction(Chemistry), *Reaction kinetics, *Cobalt, *Amines, *Electrodes, Electrochemistry, Heterocyclic compounds, Pyridines, Ligands, Mercury, Platinum, Gold, Ethanes, Ethylene, Interfaces, Electron transfer, Surfaces, Reactivities, Adsorption, Reprints

IDENTIFIERS: (U) Pentaamminecobalt, Bipyridines, Pyridyl ethanes, Pyridyl ethylenes, PE61102F, WUAFOSR2303A1

AD-A137 425

AD-A137 184 5/2 20/4 20/12

NORTHWESTERN UNIV EVANSTON IL DEPT OF ENGINEERING SCIENCE AND APPLIED MATHEMATICS

(U) The Stability and Dynamics of Elastic Structures and Fluid Flows.

DESCRIPTIVE NOTE: Interim rept. 1 Oct 81-30 Oct 82,

APR 83 9P

PERSONAL AUTHORS: Reiss,E. L. ;

CONTRACT NO. AFOSR-80-0016

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-1348

UNCLASSIFIED REPORT

ABSTRACT: (U) The main thrust of this research program has been the development and applications of asymptotic and perturbation for analyzing the stability and dynamics of elastic structures and fluid flows. The work is summarized in the papers listed in this report which have been published, accepted for publication, submitted for publication, or are in preparation for publication. (Author)

DESCRIPTORS: (U) *Scientific literature, *Bibliographies, *Abstracts, Fluid flow, Elastic properties, Stability, Fluid dynamics, Perturbations, Research management

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4

AD-A137 184

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 179 7/4

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.

DESCRIPTIVE NOTE: Technical rept.,

83 24P

PERSONAL AUTHORS: Stickney,J. L. ;Rosasco,S. D. ;Song,D. ; Soriaga,M. P. ;Hubbard,A. T. ;

CONTRACT NO. AFOSR-81-0149

PROJECT NO 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1326

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface Science, v130 p326-347 1983.

Reprint: Superlattices Formed by Electrodeposition of Silver on Iodine-Pretreated Pt(111); Studies by Leed, Auger Spectroscopy and Electrochemistry.

DESCRIPTORS: (U) *Electrochemistry, *Electrodeposition, *Silver, *Electrodes, *Crystal lattices, Single crystals, Platinum, Adsorption, Thinness, Layers, Electron spectroscopy, Surfaces, Iodine, Voltammetry, Reprints

IDENTIFIERS: (U) Auger spectroscopy, LEED spectroscopy, LEED(Low Energy Electron Diffraction), PE61102F, WUAFOSR2303A1

AD-A137 179

AD-A137 159 9/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF COMPUTER SCIENCE

(U) An Analysis of Application Generators.

DESCRIPTIVE NOTE: Technical rept.,

MAR 83 36P

PERSONAL AUTHORS: Horowitz,E. ;Kemper,A. ;Narasimhan,B. ;

REPORT NO. TR-83-208

CONTRACT NO. AFOSR-82-0232

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1310

UNCLASSIFIED REPORT

ABSTRACT: (U) The continuing development of higher order programming languages has not yielded major productivity improvements in the software development process. One often mentioned mechanism for achieving significant orders of improvement are application generators, such as RAMIS, NOMAD, and FOCUS. These systems have been applied to data intensive business applications with phenomenal success. The purpose of this paper is to present the basic components of application generators and show why they yield such large productivity increases in the edp environment. The authors investigate the meaning of nonprocedural programming and show how it exists in current application generators. Then they analyze the possibility of extending application generators so that ..., may be used for non-edp type applications. (Author)

DESCRIPTORS: (U) *Generators, *Computer programming, *Compilers, Computer programs, Programming languages, High level languages, Systems engineering, Data management, Data bases, Assemblers, Interpreters, Translators

IDENTIFIERS: (U) *Application generators, Software engineering, Routines, PE61102F, WUAFOSR2304A2

AD-A137 159

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 154 7/4 7/5

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes,

83 3P

PERSONAL AUTHORS: Turro,N. J. ;Hrovat,D. A. ;Gould,I. R. ; Padwa,A. ;Dent,W. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1294

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Angewandte Chemie International Edition, v22 n8 p624-625 1983.

Reprint: Kinetics of the Reaction of Electron Deficient Olefins with Nitrile Ylides Generated by Laser Flash Photolysis of Substituted Azirenes.

DESCRIPTORS: (U) *Reaction kinetics, *Olefin polymers, *Nitriles, *Lasers, *Photolysis, Photochemical reactions, Phenyl radicals, Carbenes, Flashes, Transients, Absorption, Substitution reactions, Quenching, Rates, Constants, Acrylonitrile polymers, Arrhenius equation, Activation, Entropy, Reprints

IDENTIFIERS: (U) Nitrile ylides, Ylides, Azirines, Azirenes, Fumaronitrile, WUAFOSR230382, P'61102F

AD-A137 154

AD-A137 128 20/3 20/2 20/14 17/9

ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER

(U) Research on Ferroelectric Materials for Millimeter Wave Application.

DESCRIPTIVE NOTE: Final rept. 5 Aug 81-4 Dec 82,

AUG 83 42P

PERSONAL AUTHORS: Neurgaonkar,R. R. ;Cross,L. E. ;Hall,W. F. ;Ho,W. W. ;

REPORT NO. SC5344.7FR

CONTRACT NO. F49620-81-C-0090, DARPA Order-4240

PROJECT NO. 2306

TASK NO. B2

MONITOR: AFOSR TR-83-1299

UNCLASSIFIED REPORT

ABSTRACT: (U) The largest and highest quality single crystals of the tungsten bronze family ferroelectric compositions of the strontium - barium niobate family reported to date were prepared by Czochralski growth techniques. Low frequency dielectric properties show low loss and high permittivity as expected. Accurate high frequency dielectric measurements for several compositions were made in a waveguide geometry from 30 to 100 GHz and the electric field sensitivity of the microwave refractive index, dn/dE, was evaluated by a modulation technique in the same waveguide geometry. Although high values of dn/dE wer observed, an unexpectedly high dielectric loss, which does not fit accepted models for dielectric properties, was observed. This fact, coupled with a high sample-to-sample variability, suggests a commonly occuring extrinsic factor such as growth defects or sample impurities as the key element limiting the use of these materials for phase control applications in millimeter wave radar systems. Similar dielectric measurements were made on a variety of ceramic ferroelectrics. In general the losses were substantially higher in these materials. (Author)

DESCRIPTORS: (U) *Ferroelectric materials, *Millimeter

AD-A137 128

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 128 CONTINUED

waves, *Radar, Ferroelectric crystals, Single crystals, Tungsten, Bronze, Strontium, Barium, Niobates, Czochralski crystals, Crystal growth, Dielectric properties, Electric fields, Sensitivity, Microwaves, Refractive index, Defects(Materials), Impurities, Ceramic materials, Losses, Measurement

IDENTIFIERS: (U) PE61102F, WUAFOSR2306B2

AD-A137 124 9/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF COMPUTER SCIENCE

(U) Programming Productivity Enhancement by the Use of Application Generators.

DESCRIPTIVE NOTE: Interim rept. 1 Jun-1 Nov 83,

NOV 83 6P

PERSONAL AUTHORS: Horowitz,E. ;

CONTRACT NO. AFOSR-82-0232

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1331

UNCLASSIFIED REPORT

ABSTRACT: (U) This research was initiated in June 1982. The early work began with an investigation of commercially available application generators. This was undertaken because of a belief that such systems provide a major increase in programming productivity, at least for a narrow range of 'edp' applications. The plan called for investigating systems such as RAMIS, NOMAD and FOCUS with the goal of determining what features contributed to this improvement. The investigators were successful in that they isolated what they believe to be the major features that contribute to increased programming productivity, namely an application generator's built-in interface to a database management system, its non-procedural programming language constructs, and the high-level operators for specific operations. The main activity during the previous nine months has been to see if the investigators could design these features into a general purpose programming language. They decided to use Ada as the starting point. They needed to design an extension of Ada that permits the language to interface with a database management system. They concluded that this interface should not merely be a set of remote procedure calls, but a true extension of the language. This implied that they had to extend the type facility and provide new operators, while preserving the design principles of the language. This is the logical first

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 124 CONTINUED

step towards their goal of incorporating true application generator features into a conventional programming language. This report summarizes the work in this area during this period.

DESCRIPTORS: (U) *Programming languages, *Computer programming, Interfaces, Data bases, Management, Systems engineering, Information processing, Data processing

IDENTIFIERS: (U) Application generators, Database management system, PE61102F, WUAFOSR2304A2

AD-A137 124

AD-A137 121 9/5 14/2

WASHINGTON STATE UNIV PULLMAN DEPT OF PHYSICS

(U) Determining and Modeling the Response of Piezoresistance Transducers to Dynamic Loading.

DESCRIPTIVE NOTE: Annual rept. 29 May 82-30 Jun 83,

JUN 83 8P

PERSONAL AUTHORS: Gupta,Y. M. ;

CONTRACT NO. AFOSR-82-0132

PROJECT NO. 2307

TASK NO. C1

MONITOR: AFOSR
TR-83-1286

UNCLASSIFIED REPORT

ABSTRACT: (U) The work of the past year has concentrated on experimental measurements and their analyses. The response of Ytterbium (Yb) foils, oriented parallel and perpendicular to the shock front, was obtained for well defined loading and unloading. The foils were embedded in a PMMA matrix and the longitudinal stress ranged between 0.1 and 2.0 GPa. Results have provided an empirical calibration for Yb under shock wave uniaxial strain loading. An important result from these experiments is the verification of an elastic-plastic inclusion analysis. The results of the 1.9 GPa experiment suggest that under certain conditions a dynamic inclusion analysis will be necessary. Another important aspect of this year's effort was the development of an experimental method to perform low strain-rate tensile experiments on gauge foils.

DESCRIPTORS: (U) *Piezoelectric transducers, *Piezoelectric gages, *Dynamic response, *Dynamic loads, Foils(Materials), Ytterbium, Calibration, Stresses, Static loads, Shock wave;

IDENTIFIERS: (U) PE61102F, WUAFOSR2307C1

IAC NO. NT-028589

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

AD-A137 121

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 121 CONTINUED

IAC SUBJECT TERMS: N--(U)YTTERBIUM, GAGES, STRESSES, LOADING, FOIL, PIEZORESISTANCE, SHOCK(MECHANICS), CALIBRATION, ANALYSIS, MEASUREMENT, TRANSDUCERS, DYNAMIC TESTS, STATIC LOADING, TENSILE TESTS;

AD-A137 113 7/4

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface,

82 11P

PERSONAL AUTHORS: Hupp,J. T. ;Larkin,D. ;Liu,H. Y. ; Weaver,M. J. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1302

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytical Chemistry, v131 p299-307 1982.

Reprint: The Influence of Lead Underpotential Deposition on the Capacitance of the Silver-Aqueous Interface.

DESCRIPTORS: (U) *Electrochemistry, *Electrodeposition, *Capacitance, *Electrodes, Silver, Electrolytes, Interfaces, Lead(Metal), Polycrystalline, Substrates, Solutions(General), Sodium compounds, Perchlorates, Surfaces, Atoms, Layers, Films, Interfacial tension, Reprints

IDENTIFIERS: (U) Underpotential deposition, PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 111 7/4

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques.

82 25P

PERSONAL AUTHORS: Larkin,D. ;Guyer,K. L. ;Hupp,J. T. ; Weaver,M. J. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1303

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: *Pub. in Jnl. of Electroanalytical Chemistry, v138 p401-423 1982.*

Reprint: Determination of Specific Adsorption of Some Simple Anions at a Polycrystalline Silver-Aqueous Interface Using Differential Capacitance and Kinetic Probe Techniques.

DESCRIPTORS: (U) *Adsorption, *Anions, *Electrodes, *Electrochemistry, Silver, Solutions(General), Electrolytes, Capacitance, Reaction kinetics, Chlorides, Bromides, Iodides, Azides, Thiocyanates, Polycrystalline, Interfaces, Surfaces, Concentration(Chemistry), Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A137 111

AD-A137 108 9/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF COMPUTER SCIENCE

(U) AdaRel: A Relational Extension of Ada.

DESCRIPTIVE NOTE: Technical rept.,

83 30P

PERSONAL AUTHORS: Horowitz,E. ;Kemper,A. ;

CONTRACT NO. AFOSR-82-0232

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1309

UNCLASSIFIED REPORT

ABSTRACT: (U) In this paper the authors extend Ada to facilitate the programming of data-intensive applications. The language extensions are based upon the relational data model. The system is interfaced to a relational database management system via a new Ada type relation. The language includes basic operations on relations, commonly available in database query languages, like retrieval of data, update of tuples as well as high-level operators to combine relations to form new ones. The authors show how Ada exception handling is naturally extended to allow integrity control of the relations. In addition the authors discuss language features that enable the sharing of data among several users. Concluding the paper the authors give an extensive example application to demonstrate the power of their proposed language extensions. (Author)

DESCRIPTORS: (U) *Programming languages, *High level languages, Data management, Interfaces, Data bases, Integrated systems, Computer operators, Subroutines, Data processing

IDENTIFIERS: (U) ADA programming language, ADA, Adarel, PE61102F, WUAFOSR2304A2

AD-A137 108

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 107 12/1 8/6

CITADEL CHARLESTON SC DEPT OF MATHEMATICS AND COMPUTER SCIENCE

(U) An Interpolation and Compaction Technique for Gridded Data.

DESCRIPTIVE NOTE: Final rept 1 Jun 82-31 May 83,

JUN 83 35P

PERSONAL AUTHORS: Cozart, L. ;

CONTRACT NO. AFOSR-82-0166

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-1333

UNCLASSIFIED REPORT

ABSTRACT: (U) An interpolation technique is implemented which is applicable to terrain data defined on a rectangular grid. The technique also allows for data compaction, i.e., effectively representing the given data using less space than required by the raw data. The technique involves finding bicubic polynomials which represent the terrain surface over small subgrids. These surfaces are then pieced together to form a global surface which is both continuous and smooth over the entire region. (Author)

DESCRIPTORS: (U) *Interpolation, *Data compression, *Grids, *Terrain, Compacting, Tables(Data), Polynomials, Global, Surfaces, Approximation(Mathematics), Value, Least squares method, Scaling factors, Error analysis

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3

AD-A137 107

AD-A137 103 20/6 14/2

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES

(U) Fabrication and Evaluation of Chirped Grating Lenses in Lithium Niobate Waveguides.

DESCRIPTIVE NOTE: Interim rept. 1 Jun 82-31 Sep 83,

OCT 83 162P

PERSONAL AUTHORS: Forouhar,S. ;Warren,C. ;Lu,R. X ;Chang, W. S. C. ;

CONTRACT NO. AFOSR-80-0037

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR
TR-83-1314

UNCLASSIFIED REPORT

ABSTRACT: (U) Theoretical methods have been formulated for the design and analysis of chirped grating lenses on planar optical waveguides. Various fabrication techniques such as deposition of high index titanium dioxide films and reactive ion milling of LiNbO3 have been developed to create low-loss phase shift pads on Ti-indifussed LiNbO3 waveguides.

DESCRIPTORS: (U) *Optical lenses, *Optical equipment components, *Experimental design, *Fabrication, *Optical waveguides, *Test and evaluation, Lithium niobates, Grooving, Dielectric waveguides, Perturbations, Computations, Methodology

IDENTIFIERS: (U) *Chirped grating lenses, PE61102F, WUAFOSR2305B1

AD-A137 103

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 099 7/4

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Specific Adsorption of Halide and Pseudohalide Ions at Electrochemically Roughened Versus Smooth Silver-Aqueous Interfaces.

83 25P

PERSONAL AUTHORS: Hupp,J. T. ;Larkin,D. ;Weaver,M. J. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1307

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface Sciences, v125 p429-451 1983.

Reprint: Specific Adsorption of Halide and Pseudohalide Ions at Electrochemically Roughened Versus Smooth Silver-Aqueous Interfaces.

DESCRIPTORS: (U) *Adsorption, *Halides, *Electrodes, *Electrochemistry, Anions, Surfaces, Light scattering, Raman spectra, Raman spectroscopy, Silver, Electrolytes, Perchlorates, Surface roughness, Capacitance, Concentration(Chemistry), Interfaces, Polycrystalline, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A137 099

AD-A137 098 7/4 18/2

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Comparisons between Theoretical and Experimental Deuterium Isotope Effects for Some Outer-Sphere Electrochemical Reactions.

83 7P

PERSONAL AUTHORS: Weaver,M. J. ;Li,T. T. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1300

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 p1153-1157 1983.

Reprint: Comparisons between Theoretical and Experimental Deuterium Isotope Effects for Some Outer-Sphere Electrochemical Reactions.

DESCRIPTORS: (U) *Deuterium, *Isotope effect, *Electrochemistry, Exchange reactions, Nuclear reactions, Tunneling, Vibration, Rates, Ratios, Metals, Ligands, Hydrogen bonds, Solvents, Molecules, Dielectrics, Reprints

IDENTIFIERS: (U) Aquo complexes, Ammine complexes, PE61102F, WUAFOSR2303A1

AD-A137 098

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 097 7/4 7/5 20/5

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes,

SEP 82 7P

PERSONAL AUTHORS: Barz,F. ;Gordon,J. G. , II ;Philpott,M. R. ;Weaver,M. J. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1306

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v91 n4 p291-295, 17 Sep 82.

Reprint: Effect of Laser Illumination during Oxidation-Reduction Cycles upon Surface-Enhanced Raman Scattering from Silver Electrodes.

DESCRIPTORS: (U) *Light scattering, *Raman spectra, *Electrodes, *Oxidation reduction reactions, *Lasers, *Illumination, Raman spectroscopy, Thiocyanates, Chlorides, Adsorption, Silver, Photochemical reactions, Surfaces, Vibration, Frequency, Laser beams, Clustering, Atoms, Films, Reprints

IDENTIFIERS: (U) Raman scattering, PE61102F, WUAFOSR2303A1

AD-A137 097

AD-A137 091 7/4

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes,

83 21P

PERSONAL AUTHORS: Weaver,M. J. ;Barz,F. ;Gordon,J. G. , II ;Philpott,M. R. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1305

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface Science, v125 n2 p409-428 1983.

Reprint: Surface-Enhanced Raman Spectroscopy of Electrochemically Characterized Interfaces; Potential Dependence of Raman Spectra for Thiocyanate at Silver Electrodes.

DESCRIPTORS: (U) *Raman spectroscopy, *Electrochemistry, *Thiocyanates, *Electrodes, Raman spectra, Anions, Silver, Oxidation reduction reactions, Electrolytes, Composition(Property), Adsorption, Capacitance, Spectrographs, Optical equipment, Analyzers, Spectrometers, Concentration(Chemistry), Surfaces, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A137 091

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD A137 086 12/1

MARYLAND UNIV COLLEGE PARK DEPT OF MATHEMATICS

(U) Interim Report on Research Supported by Grant AFOSR-82-0187.

DESCRIPTIVE NOTE: Rept. for 1 Jun 82-31 Mar 83,

JUL 83 9P

PERSONAL AUTHORS: Kedem,B. ;Slud,E. ;

CONTRACT NO. AFOSR-82-0187

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1289

UNCLASSIFIED REPORT

ABSTRACT: (U) This research focused on higher order crossings of time series and their application in spectral analysis, and on the various point processes obtained from stationary processes and their relations to reliability models. The higher order crossings theorem was extended to two dimensions, and the one-dimensional version was used to determine the connection between axis crossings and the frequency content of a stationary process. Considerable progress was made in calculating the asymptotic variance-covariance matrix for the vector of higher order crossing counts, and time series analysis of highly nonlinear and chaotic stationary processes was carried out. The report summarizes progress in these areas. (Author)

DESCRIPTORS: (U) *Time series analysis, Crossings, Statistical processes, Stationary, Reliability, Spectrum analysis, Mathematical models

IDENTIFIERS: (U) Higher order crossings theorem, WUAFOSR2304A5, PE61102F

AD-A137 086

AD-A137 083 8/11 18/3

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

(U) Body and Surface Wave Modeling of Observed Seismic Events.

DESCRIPTIVE NOTE: Final rept. 1 May-31 Oct 82,

OCT 82 113P

PERSONAL AUTHORS: Harkrider,D. G. ;Helmberger,D. V. ;

CONTRACT NO. F49620-81-C-0008, ARPA Order-3291

PROJECT NO. 2309

TASK NO. A1

MONITOR: AFOSR
TR-83-1297

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: A Generalized Reflection - Transmission Coefficient Matrix and Discrete Wavenumber Method for Synthetic Seismograms; Body Wave Amplitude and Travel Time Correlations across North America; and Evidence of Tectonic Release from Underground Nuclear Explosions in Long-period P-waves.

DESCRIPTORS: (U) *Seismic waves, *Surface waves, *Seismic data, Wave propagation, Amplitude, Anomalies, North America, Primary waves(Seismic waves), Travel time, Synthesis, Near field, Long wavelengths, Reflection, Transmittance, Coefficients, Correlation, Mathematical models, Underground explosions, Nuclear explosion testing, Nevada, Tectonics, Release

IDENTIFIERS: (U) Body waves(Seismic waves), Near field synthetics, Nevada test site, PE61102F, WUAFOSR2309A1

AD-A137 083

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 082 20/9 20/4 12/1

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) Kinetic Theory of Gases, Magneto-Fluid Dynamics and Their Application.

DESCRIPTIVE NOTE: Interim 1 Dec 81-30 Nov 82,

JAN 83 24P

PERSONAL AUTHORS: Grad,H. ;

CONTRACT NO. AFOSR-81-0020

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-1347

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper describes research results and cites progress resulting from work performed during this period of the grant. The areas covered in this report are (1) mathematical theory of turbulent fluctuations of a plasma near thermal equilibrium, (2) the theory of non-linear thermal and diffusive waves in finite mass and reacting media, (3) the development of algorithms for the Helmholtz equation, (4) progress in the development of theory for Queer Differential Equations, and (5) spectral theory of non-elliptic operators. (Author)

DESCRIPTORS: (U) *Magnetohydrodynamics, Kinetic theory, Gases, Plasma control, Plasma oscillations, Thermal stability, Algorithms, Differential equations

IDENTIFIERS: (U) Helmholtz equation, Magneto-fluid dynamics, Queer differential equations, Thermal equilibrium, WUAFOSR2304A4, PE61102F

AD-A137 082

AD-A137 080 20/6 17/7 20/5 20/12
20/10

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

(U) Large Enhancement of the Sagnac Effect Based on Nonlinearly Induced Nonreciprocity.

DESCRIPTIVE NOTE: Final rept. 1 Apr 82-31 Mar 83,

MAY 83 19P

PERSONAL AUTHORS: Kaplan,A. ;

CONTRACT NO. AFOSR-82-0126

PROJECT NO. 2305

TASK NO. B2

MONITOR: AFOSR
TR-83-1295

UNCLASSIFIED REPORT

ABSTRACT: (U) A substantial enhancement (by orders of magnitude) of the Sagnac effect in a passive ring resonator can be attained by using a nonreciprocal feedback. This feedback is based on the nonreciprocal element controlled by the signal proportional to the difference between intensities of counterpropagating waves, and is an opto-electronic analog of nonlinear nonreciprocity proposed by us early. Under some critical conditions, this system can exhibit directional bistability and directional switching of the counterpropagating waves. (Author)

DESCRIPTORS: (U) *Resonators, *Rings, *Switching, *Nonlinear systems, *Gyroscopes, *Laser beams, *Charge carriers, Passive systems, Relativity theory, Propagation, Feedback, Binary notation, Waves, Semiconductors, Augmentation, Electrons, Electrooptics, Rotation, Analog systems

IDENTIFIERS: (U) Interfaces(Nonlinear), Ring resonators, Bistable cyclotron, Relativistic electrons, Spectroscopy(Nonreciprocal), Directional bistability, Nonreciprocal feedback, Sagnac effect, Nonlinear optics, Integrated optics, Cyclotron hysteresis, Resonance, Switching(Directional), Optical switching, WUAFOSR2305B2, PE61102F

AD-A137 080

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 079 21/2

AEROCHEM RESEARCH LABS INC PRINCETON NJ

(U) Ionic Mechanisms of Carbon Formation in Flames.

DESCRIPTIVE NOTE: Annual rept. 1 Apr 81-31 Mar 82,

JAN 83 58P

PERSONAL AUTHORS: Calcote,H. F. ;Olson,D. B. ;

REPORT NO. AEROCHEM-TP-427

CONTRACT NO. F49620-81-C-0030

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-83-1298

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) The chemi-ion ion-molecule mechanism of soot formation has gained further support by detailed studies of ion profiles through sooting flames. Langmuir probes have been used to obtain absolute ion concentrations in premixed acetylene-oxygen flames over a range of equivalence ratios extending from nonsooting to sooting flames. These data have been used in a preliminary calibration of the mass spectrometer. The effect of initial temperature on the tendency of several flames to soot has been measured. For a given premixed flame the tendency to soot decreases with increasing temperature but for a series of fuels with increasing tendency to soot, the temperature at which soot occurs increases with the tendency to soot. Ion concentrations will be measured in this set of flames. Calculations of particle electronics and coagulation rates have been initiated to determine whether the large molecular ions observed in sooting flames are the cause or effect of soot formation and in preparation for quantitative modeling of soot formation. (Author)

DESCRIPTORS: (U) *Carbon, *Soot, *Flames, *Ions, Molecules, Molecular ions, Interactions, Combustion, Coagulation, Rates, Nucleation, Concentration(Chemistry),

AD-A137 079

AD-A137 079 CONTINUED

Acetylene, Oxygen, Langmuir probes, Mass spectrometers, Calibration, Temperature, Mixing, Particles, Molecular structure, Hydrocarbons, Fuels

IDENTIFIERS: (U) WUAFOSR2308A2, PE61102F

AD-A137 079

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 078 6/1

CALIFORNIA UNIV SAN FRANCISCO

(U) Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose,

83 25P

PERSONAL AUTHORS: Kun,E. ;Minaga,T. ;Kirsten,E. ; Jackowski,G. ;McLick,J. ;

CONTRACT NO. F49620-81-C-0007, F49620-81-C-0085

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR TR-83-1308

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Regulation by Poly (ADP-RIBOSE) p177-199.

Reprint: Biochemical Basis of the Regulatory Role of Polyadenosine Diphosphoribose.

DESCRIPTORS: (U) *Adenosine, *Adenine, *Ribose, *Nucleotides, Polymers, Organic phosphorus compounds, Metabolism

IDENTIFIERS: (U) WUAFOSR2312A5, PE61102F

AD-A137 078

AD-A137 076 7/4 20/3

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Atomic Fluorescence Spectrometry with Inductively Coupled Plasma as Excitation Source and Atomization Cell,

APR 83 7P

PERSONAL AUTHORS: Kosinski,M. A. ;Uchida,H. ;Winefordner, J. D. ;

CONTRACT NO. F49620-80-C-0005

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1312

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Analytical Chemistry, v55 n4 p688-692 Apr 83.

Reprint: Atomic Fluorescence Spectrometry with Inductively Coupled Plasma as Excitation Source and Atomization Cell.

DESCRIPTORS: (U) *Spectrometry, *Plasma diagnostics, Inductance, Coupling(Interaction), Excitation, Atomization, Cells, Fluorescence, Emission, Growth(General), Curves(Geometry), Distribution, Zinc, Atoms, Calcium, Ions, Intensity, Detection, Interference, Reprints

IDENTIFIERS: (U) *Atomic Fluorescence spectrometry, Inductively coupled plasmas, WUAFOSR2303A1, PE61102F

AD-A137 076

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 075 7/4 7/3

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds,

83 13P

PERSONAL AUTHORS: Soriaga,M. P. ;Stickney,J. L. ;Hubbard, A. T. ,

CONTRACT NO. AFOSR-81-0149

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1325

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Molecular Catalysis, v21 p211-221 1983.

Reprint: The Effect of Orientation of Adsorbed Intermediates on the Electrochemical Oxidation of Aromatic Compounds.

DESCRIPTORS: (U) *Electrochemistry, *Oxidation, *Aromatic compounds, Adsorption, Orientation(Direction), Molecules, Solutes, Concentration(Chemistry), Platinum, Electrodes, Thinness, Layers, Polycrystalline, Metals, Catalysis, Reprints

AD-A137 075

AD-A137 074 12/1 9/1

INDIANA UNIV AT BLOOMINGTON DEPT OF MATHEMATICS

(U) The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems,

83 19P

PERSONAL AUTHORS: Mitra,S. K. ;Puri,M. L. ;

CONTRACT NO. AFOSR-76-2927

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1338

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applicable Analysis, v14 p241-258 1983.

Reprint: The Fundamental Bordered Matrix of Linear Estimation and the Duffin-Morley General Linear Electromechanical Systems.

DESCRIPTORS: (U) *Mathematical models, *Matrices(Mathematics), *Electromechanical devices, Linear systems, Equations, Reprints

IDENTIFIERS: (U) Duffin Morley Electromechanical System, WUAFOSR2304A5, PE61102F

AD-A137 074

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 073 20/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF AEROSPACE ENGINEERING

(U) Preferred Modes and the Spreading Rates of Jets,

OCT 83 8P

PERSONAL AUTHORS: Gutmark,E. ;Ho,C. M. ;

CONTRACT NO. F49620-82-K-0019

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-1269

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Fluids, v26 n10 p2932-2938 Oct 83.

Reprint: Preferred Modes and the Spreading Rates of Jets.

DESCRIPTORS: (U) *Jet flow, Shear properties, Turbulence, Rates, Reprints

IDENTIFIERS: (U) Shear flow, Spreading, Laminar shear layers, Flow instabilities, WUAFOSR2307A2, PE61102F

AD-A137 072 20/9 7/4

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Evaluation of an Inductively Coupled Plasma with an Extended Sleeve Torch as an Atomization Cell for Laser Excited Fluorescence Spectrometry,

83 8P

PERSONAL AUTHORS: Kosinski,M. A. ;Uchida,H. ;Winefordner, J. D. ;

CONTRACT NO. F49620-80-C-0005

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1293

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Talanta, v30 n5 p339-345 1983.

Reprint: Evaluation of an Inductively Coupled Plasma with an Extended Sleeve Torch as an Atomization Cell for Laser Excited Fluorescence Spectrometry.

DESCRIPTORS: (U) *Plasma diagnostics, *Spectrometry, Inductance, Coupling(Interaction), Sleeves, Torches, Atomization, Cells, Lasers, Excitation, Fluorescence, Detection, Limitations, Interference, Reprints

IDENTIFIERS: (U) Fluorescence spectroscopy, Inductively coupled plasmas, WUAFOSR2303A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 071 7/4

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19.1 deg - I.

83 18P

PERSONAL AUTHORS: Hubbard,A. T. ;Stickney,J. L. ;Rosasco, S. D. ;Soriaga,M. P. ;Song,D. ;

CONTRACT NO. AFOSR-81-0149

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1327

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytical Chemistry, v150 p165-180 1983.

Reprint: Electrodeposition on a Well-Defined Surface: Silver on Pt(111) Square Root of 7 x Square Root of 7 R19. 1 deg -I.

DESCRIPTORS: (U) *Electrodeposition, *Silver, *Platinum, *Electrodes, Electrochemistry, Surfaces, Layers, Crystal lattices, Polycrystalline, Auger electron spectroscopy, Coulometers, Packing density, Iodine, Solutes, Electrolytes, Reprints

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F

AD-A137 071

AD-A137 070 20/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Some Unsteady Aerodynamic Characteristics of Separated and Attached Flow.

DESCRIPTIVE NOTE: Annual rept. 1 Sep 82-31 Sep 83,

AUG 83 59P

PERSONAL AUTHORS: Covert,E. E. ;Lorber,P. F. ;Vaczy,C. M. ;

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-1344

UNCLASSIFIED REPORT

ABSTRACT: (U) Aerodynamic characteristics of separated and attached unsteady flow about a NACA 0012 airfoil have been measured for reduced frequency from 0 to 0.4 and angles of attack up to 18 deg. Results from boundary layer and near wake ensemble averaged velocity, Reynolds stress and surface pressure distributions are presented. The flow was determined to be locally two-dimensional away from the separation point (if present), within + or - 1/4 span of the airfoil centerline. A convected component of the unsteady separated pressure field was identified, and the dependence on reduced frequency, angle of attack, Reynolds number and form of transition is discussed. A geometric similarity model is suggested to explain the presence of a periodic component measured for the ensemble averaged Reynolds stresses. Finally, studies of the relative importance of acoustic and upwash velocity components of the excitation are summarized. (Author)

DESCRIPTORS: (U) *Unsteady flow, *Boundary layer flow, *Airfoils, *Flow separation, Aerodynamic characteristics, Pressure distribution, Surfaces, Wake, Angle of attack, Attachment, Boundary layer transition, Stresses, Acoustic velocity, Two dimensional flow, Convection Trailing edges, Shear properties, Measurement, Mathematical models

IDENTIFIERS: (U) Upwash, Near wake, Surface pressure, WUAFOSR2307A2, PE61102F

AD-A137 070

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 069 6/13 6/1

OHIO STATE UNIV COLUMBUS DEPT OF MICROBIOLOGY

(U) Development of an in vivo Assay for Mistranslation: Inducing Activity of Pollutants and Characterization of Amino Acid Substitutions.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Aug 82-31 Jul 83,

NOV 83 68P

PERSONAL AUTHORS: Reeve,J. N. ;Rice,J. B. ;

CONTRACT NO. AFOSR-81-0087

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR TR-83-1350

UNCLASSIFIED REPORT

ABSTRACT: (U) In experiments directed toward development of a simple, quantitative in vivo assay for mistranslation-inducing activity of pollutants, we have established the natural level of cysteine misincorporation into the bacteriophage T7 encoded 0.3 protein. We have also shown that this level can be increased by altering the environment of the translation machinery. This can be accomplished either by growing cells in the presence of mistranslation-inducing antibiotics or by inducing mutations which cause defective ribosomal proteins into the cells being studied. The above results were obtained using purified 0.3 protein. Additional experiments directed toward the first objective have led to a second procedure for quantitating cysteine misincorporation into 0.3 protein. A radioimmune precipitation (RIP) assay was developed which used polyclonal antibodies to 0.3 protein, SDS-polyacrylamide gel electrophoresis (SDS-PAGE), and scanning densitometry. We are currently preparing monoclonal antibody to 0.3 protein to obviate the need for SDS-PAGE and scanning densitometry. Experiments directed toward the second overall objective have provided interesting preliminary results. Trypsinization of cysteine-labeled 0.3 protein analysis of fragments by SDS-PAGE have shown that new peptide fragments are produced.

AD-A137 069

AD-A137 069 CONTINUED

DESCRIPTORS: (U) *Proteins, *Cysteine, In vivo analysis, Molecules, Antibodies, Ribosomes, Radioimmunoassay, Precipitation, Mutations

IDENTIFIERS: (U) WUAFOSR2312A5, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 068 9/2

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

(U) Parallel Logic Programming and ZMOB and Parallel Systems Software and Hardware.

DESCRIPTIVE NOTE: Interim rept. 1 Jun 82-15 Sep 83,

SEP 83 11P

PERSONAL AUTHORS: Minker,J. ;Weiser,M. ;

CONTRACT NO. AFOSR-82-0303

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-84-0004

UNCLASSIFIED REPORT

Availability: Document partially illegible..

ABSTRACT: (U) The purpose of this letter is to discuss our research into parallel systems software and hardware, and parallel problem solving. Under the current grant, a detailed design and partial implementation of a parallel problem solving system, PRISM (parallel inference system), based on logic was achieved. The PRISM requires that the ZMOB parallel processor be available for use. In addition, systems software and hardware have been developed. It is estimated that ZMOB will become available for use during the Fall of 1983. Hence, a full test and debugging of PRISM cannot be achieved under the current grant. At the end of the current grant we expect to have accomplished, as a minimum, all of the objectives proposed. That is, in the area of parallel problem solving, the initial PRISM has been fully designed; individual programs have been implemented and tested in a non-parallel environment; and investigations have been made into extensions to the initial design.

DESCRIPTORS: (U) *Computer programming, *Computer logic, *Parallel processors, *Problem solving, Systems engineering, Man computer interface, Data bases, Computer architecture, Computer communications

IDENTIFIERS: (U) Logic programming, PRISM(Parallel

AD-A137 068

AD-A137 068 CONTINUED

Inference System), WUAFOSR2304A2, PE61102F

AD-A137 068

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 067 12/1 9/2

ARIZONA STATE UNIV TEMPE DEPT OF COMPUTER SCIENCE

(U) Approaches to Automatic Strategy Analysis and Synthesis.

DESCRIPTIVE NOTE: Final rept. 1 Sep 82-31 Aug 83 on Phase 2,

SEP 83 10P

PERSONAL AUTHORS: Findler,N. V. ;

CONTRACT NO. AFOSR-82-0340

PROJECT NO. 2304

TASK NO. K1

MONITOR: AFOSR TR-83-1346

UNCLASSIFIED REPORT

ABSTRACT: (U) The efforts of the Group for Computer Studies of Strategies centered on five long-term projects: (a) The Generalized Production Rules System (GPRS) is a program which can support decision-making for a variety of expert systems in need of estimates of hidden variables. Hidden variables are such that their values can be identified only at certain times, either intermittently or periodically. In contrast, open variables are readily measureable at any time. The estimation is based on stochastic, causal relations between hidden and open variables. (b) The Quasi-Optimizer System (QO) is a program which observes and measures adversaries' behavior in confrontations, infers their strategies, and constructs a descriptive theory, i. e., a model, of each. It then identifies the components of the strategies, evaluates their effectiveness and combines the most satisfactory ones into a normative theory which is an optimum strategy in the statistical sense. (c) The advice Taker/Inquirer (AT/I) is a program which can be taught strategies by a human Advisor. The Advisor provides principles and high-level examples of actions in different situations. The system applies the strategy to test, verify and optimize the strategy. (d) The Interactive Environment for Planning and Decision Making uses two graphics screens, one displaying features of the current world, the other those of an extrapolated

AD-A137 067 CONTINUED

world with the estimated consequences of tentative decisions. (e) The Integrated System of Strategy Analysis and Synthesis for Air Traffic Control will be useful in teaching and evaluating Air Traffic Control Trainees. (Author)

DESCRIPTORS: (U) *Statistical analysis, *Decision making, *Computer applications, *Automatic, *Strategy, Variables, Optimization, Observation, Test and evaluation, Theory, Parts, Normality, Measurement, Fault tree analysis, Estimates, Models, Acquisition

IDENTIFIERS: (U) Normative theory, Decision trees, Descriptive theory, Computer studies, PE61102F, WUAFOSR2304K1

AD-A137 067

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 064 9/2 12/1 20/4

CALSPAN ADVANCED TECHNOLOGY CENTER BUFFALO NY

(U) Computer Program for Evaluating the Ives Transformation in Turbomachinery Cascades. Revision.

DESCRIPTIVE NOTE: Scientific rept.,

JUL 83 84P

PERSONAL AUTHORS: Rae,W. J. ;

REPORT NO. CALSPAN-7177-A-1

CONTRACT NO. F49620-83-C-0096

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1284

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Supersedes Rept. no. AFOSR-TR-81-0154 dated Nov 80, AD-A096 416.

ABSTRACT: (U) This report contains the description of a computer program for evaluating the Ives transformation, which maps a cascade of turbine or compressor blades conformally into a rectangle. (Author)

DESCRIPTORS: (U) *Boundary value problems, *Computer programming, *Transformations(Mathematics), Fluid dynamics, Turbomachinery, Cascade structures, Compressor blades, Algorithms

IDENTIFIERS: (U) Ives transformation, PE61102F, WUAFOSR2307A4

AD-A137 064

AD-A137 062 8/4 9/2

SYRACUSE UNIV NY SCHOOL OF COMPUTER AND INFORMATION SCIENCE

(U) Logic Programming and Knowledge Base Maintenance.

DESCRIPTIVE NOTE: Annual rept. 1 Sep 82-31 Aug 83,

NOV 83 7P

PERSONAL AUTHORS: Bowen,K. A. ;

CONTRACT NO. AFOSR-82-0292

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR TR-84-0005

UNCLASSIFIED REPORT

ABSTRACT: (U) The work conducted this year followed the projections set forth in the grant proposal rather closely. On the theoretical side, the investigators have continued to explore questions of the logical status of some of the standard data structures involved in various artificial intelligence applications involving knowledge bases. The greatest attention has been focused on frames. Exploration of the axiomatization and representation of semantic nets by similar methods has been carried out. The nodes of the net are treated by methods similar to frames. Most of the attention here has focused on the work of Woods and Brachman and the KLONE formalism. The investigators have conducted a number of explorations with their existing experimental metaProlog simulator. This simulation was coded in Edinburgh Prolog and run on Syracuse University's DEC-10 computer. Progress in these areas is discussed in greater detail in this interim report. (Author)

DESCRIPTORS: (U) *Artificial intelligence, *Computer programming, *Computer logic, Logic circuits, Information processing, Input output processing, Systems analysis, Systems engineering, Data management, Frames

IDENTIFIERS: (U) *Logic programming, Expert systems, Knowledge bases, Data structures, PE61102F, WUAFOSR2304A7

AD-A137 062

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVP02F

AD-A137 061 12/1

HARVARD UNIV CAMBRIDGE MA

(U) On a Theorem of Hermite and Hurwitz.

83 42P

PERSONAL AUTHORS: Byrnes,C. I. ;

CONTRACT NO. AFOSR-81-0054, NSF-MEG79-09459

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-83-1334

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Linear Algebra and Its Applications, v50 p61-101 1983.

Reprint: On a Theorem of Hermite and Hurwitz.

DESCRIPTORS: (U) *Theorems, *Computations, *Rational functions Matrices(Mathematics), Signatures, Reprints

IDENTIFIERS: (U) Hermite Hurwitz Theorem, Hankel matrix, PE61102F, WUAFOSR2304A6

AD-A137 061

AD-A137 060 20/4 14/2

VON KARMAN INST FOR FLUID DYNAMICS RHODE-SAINT-GENESE (BELGIUM)

(U) Three Dimensional/Boundary Layer Interaction: Laminar and Turbulent Behaviour.

DESCRIPTIVE NOTE: Final scientific rept. 1 Dec 81-30 Nov 82.

DEC 82 65P

PERSONAL AUTHORS: Ginoux,J. J. ;Degrez,G. ;

REPORT NO. VKI-CR-1983-05

CONTRACT NO. AFOSR-82-0051

PROJECT NO. 2307

TASK NO. K1

MONITOR: AFOSR
TR-83-1321

UNCLASSIFIED REPORT

ABSTRACT: (U) An experimental study of a 3D skewed shock wave laminar boundary layer interaction has been carried out. The test configuration was a flat/finned plat arrangement with sharp leading edge fins having 4, 6 and 8 deg incidence relative to the free stream. The flat plate laminar boundary layer had thickness between 1.1 and 2.2 mm depending on test conditions. The unit Reynolds numbers used were 1.2 million and 2.4 million. Experimental surface data represented as surface flow visualizations and pressure distributions are presented for all test conditions. All tests were carried out at a nominal free stream Mach number of 2.25 and under approximately adiabatic wall conditions. The experimental results indicate that extended separation occurs even for the smallest wedge incidence, i.e., for a pressure ratio of 1.27 and that the extent of upstream influence is much larger in this 3D interaction than in comparable 2D interactions. Preliminary theoretical investigations show that an integral method is not suited for the study of the present interaction. The new implicit corrected viscosity method for solving the compressible Navier-Stokes equations can yield convergence speeds of order unity under suitable chosen conditions. (Author)

AD-A137 060

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 060 CONTINUED

DESCRIPTORS: (U) *Laminar boundary layer, *Shock waves, *Flow separation, Mathematical models, Model tests, Interactions, Supersonic flow, Three dimensional, Skewness, Turbulent flow, Free stream, Wedges, Flat plate models, Leading edges, Fins, Walls, Surfaces, Navier Stokes equations, Compressible flow, Pressure distribution, Flow visualization, Reynolds number, Wind tunnel tests, Belgium

IDENTIFIERS: (U) Skewed shock waves, PE61102F, WUAFOSR2307K1

AD-A137 060

AD-A137 059 12/1

WASHINGTON UNIV ST LOUIS MO DEPT OF SYSTEMS SCIENCE AND MATHEMATICS

(U) Development and Application of the P-Version of the Finite Element Method.

DESCRIPTIVE NOTE: Interim rept. 30 Sep 82-29 Aug 83.

AUG 83 9P

PERSONAL AUTHORS: Katz,I. N. ;

CONTRACT NO. AFOSR-82-0315

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-84-0006

UNCLASSIFIED REPORT

ABSTRACT: (U) Two approaches to finite element analysis are now widely recognized in the engineering and mathematical communities. In both approaches the domain omega is divided into simple convex subdomains (usually triangles or rectangles in two dimensions, and tetrahedera or bricks in three dimensions) and over each sub-domain the unknown (displacement field) is approximated by a (local) basis function (usually a polynomial of degree p). Basis functions are required to join continuously at boundaries of the subdomains in the case of planar or 3 dimensional elasticity, or smoothly in the case of plate bending. The difference between the two approaches lies in the manner in which convergence is achieved. The p-version of the finite element method is a new, important, computationally efficient approach to finite element analysis. It is more robust than the conventional h-version and its rate of convergence, for domains with corners and for other singularity problems, is twice that of the h-version.

DESCRIPTORS: (U) *Finite element analysis, Numerical methods and procedures, Convergence, Polynomials, Convex sets, Bibliographies

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3

AD-A137 059

AD-A137 056 20/4

MONTANA STATE UNIV BOZEMAN DEPT OF MECHANICAL ENGINEERING

(U) The Hydrodynamic Stability of a Supersonic Laminar Boundary Layer over a Rough Wall.

DESCRIPTIVE NOTE: Annual rept. 1 Oct 82-30 Sep 83.

OCT 83 14P

PERSONAL AUTHORS: Demetriades,A. ;

CONTRACT NO. AFOSR-80-0267

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-1287

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this research is to see how surface roughness affects the hydrodynamic stability of a supersonic laminar boundary layer. The outcome of the first year of the program had been: (1) to demonstrate the great resistance of the supersonic flow to destabilization and tripping by roughness; (2) to choose a final roughness capable of such destabilization and tripping; and (3) to complete boundary layer surveys on an axisymmetric body so roughened as a prerequisite to the stability measurements. In the present report period the geometry was changed to a planar (flat plate) one to correct deficiencies found in the axisymmetric flow which, however, uses the same roughness geometry as before. The flow field measurements on this model have been completed, as have about 30% of the final stability measurements.

DESCRIPTORS: (U) *Boundary layer transition, *Supersonic flow, *Laminar boundary layer, *Surface roughness, Stability, Walls, Threshold effects, Stability, Resistance, Flow fields, Measurement, Stagnation pressure, Reynolds number, Turbulence

IDENTIFIERS: (U) Boundary layer tripping, Boundary layer destabilization, PE61102F, WUAFOSR2307A2

AD-A137 056

AD-A137 052 20/4

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) Analysis of Transonic Shock Induced Separated Flow Including Normal Pressure Gradients.

DESCRIPTIVE NOTE: Final rept. Apr 82-31 Aug 83.

OCT 83 108P

PERSONAL AUTHORS: Carter,J. E. ;Edwards,D. E. ;Hafez,M. M. ;

REPORT NO. UTRC/R83-915712-2

CONTRACT NO. F49620-81-C-0041

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-83-1283

UNCLASSIFIED REPORT

ABSTRACT: (U) An analysis based on a two-layer interaction model is presented for the prediction of transonic shock-wave, boundary-layer interaction with emphasis on turbulent separated flow. In this analysis finite difference techniques are used to solve the viscous layer equations, expressed in a defect form, and the stream function-vorticity representation of the inviscid flow. A global technique is used to iteratively solve these coupled sets of equations. Normal pressure gradients and imbedded shock effects are included in the analysis. Two major conclusions can be drawn from the present work: First, favorable comparisons obtained with the separated data of Kooi (Mach no. = 1.4) demonstrate that the present analysis is capable of accurately resolving many of the transonic shock-wave, boundary-layer interaction. Second, these results show that, for transonic shock induced separation, the effect of displacement thickness interaction dominates over that produced by imbedded shock effects and normal pressure gradients. Calculations made with a modified algebraic turbulence model demonstrate that for separated cases the computed results are more sensitive to the turbulence model than to whether or not normal pressure gradients are included.

AD-A137 052

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 052 CONTINUED

DESCRIPTORS: (U) *Boundary layer *Transonic flow, *Flow separation, *Turbulent flow, *Shock waves, Interactions, Mathematical prediction, Vortices, Inviscid flow, Viscous flow, Finite difference theory, Rotation, Theory, Flow fields, Pressure gradients, Displacement, Thickness

IDENTIFIERS: (U) Two layer interaction flow, Viscous inviscid interactions, IBLT(Interacting Boundary Layer Theory), Shock jump, PE61102F, WUAFOSR2307A1

AD-A137 052

AD-A137 051 11/3 7/5 7/3

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique,

OCT 83 7P

PERSONAL AUTHORS: Trebino,R. ;Siegman,A. E. ;

REPORT NO. GL-3599

CONTRACT NO. F49620-82-K-0015

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-83-1342

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n8 p3621-3626, 15 Oct 83.

Reprint: Subpicosecond Relaxation Study of Malachite Green Using a Three-Laser Frequency-Domain Technique.

DESCRIPTORS: (U) *Dyes, *Atomic properties, *Molecular properties, *Laser applications, Relaxation, Green(Color), Ground state, Recovery, Water, Tunable lasers, Dye lasers, Frequency, Gratings(Spectra), Methodology Excitation, Laser beams, Spectroscopy, Phenyl radicals, Methane, Neodymium lasers, Yag lasers, Reprints

IDENTIFIERS: (U) Malachite green, PE61102F, WUAFOSR2301A1

AD-A137 051

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 050 13/3 20/12 20/11

TEXAS UNIV AT AUSTIN DEPT OF CIVIL ENGINEERING

(U) Analysis of a High-Strength Concrete Model under Biaxial Compression.

DESCRIPTIVE NOTE: Annual research rept. (Final),

MAY 83 146P

PERSONAL AUTHORS: Castro,P. M. ;Tassoulas,J. L. ; Carrasquillo,R. L. ;Fowler,D. W. ;

CONTRACT NO. AFOSR-81-0202

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR TR-83-1341

UNCLASSIFIED REPORT

ABSTRACT: (U) The behavior of a model of high-strength concrete consisting of nine coarse aggregate circular inclusions in a square mortar matrix is studied under biaxial compressive loads. Constitutive equations are developed following the theory of plasticity in order to describe the behavior of mortar in biaxial compression. The bond between mortar and aggregates is simulated by an interface element. A comparison of analytical and experimental results shows good agreement. (Author)

DESCRIPTORS: (U) *Concrete, *High strength, *Biaxial stresses, Compression, Loads(Forces), Mortars(Material), Finite element analysis, Elastic properties, Behavior, Strength(Mechanics), Tensile properties, Shear properties, Stress strain relations, Plastic properties

IDENTIFIERS: (U) Biaxial compression, PE61102F, WUAFOSR2307C2

AD-A137 050

AD-A137 048 11/9 11/4

CINCINNATI UNIV OH

(U) TICA (Torsion Impregnated Cloth Analysis) Study of High-Temperature Thermoplastics.

DESCRIPTIVE NOTE: Final rept. 25 Aug 82-24 Aug 83,

DEC 83 19P

PERSONAL AUTHORS: Fried,J. R. ;Letton,A. ;

CONTRACT NO. AFOSR-82-0301

PROJECT NO. 2303

TASK NO. D9

MONITOR: AFOSR TR-83-1311

UNCLASSIFIED REPORT

ABSTRACT: (U) Methods have been developed to obtain relaxation spectra for highly filled cloth composites by application of torsion impregnated cloth analysis (TICA) techniques. Comparison of spectra for filled and unfilled polysulfone samples suggest that polymer-filler interactions result in substantial broadening of the relaxation time distribution although there is little change in shift parameters, glass transition temperatures, or Arrhenius activation energies. In addition, TICA loss modulus measurements suggest the presence of a previously reported weak relaxational process (liquid-liquid transition) above the glass transition temperature. Dynamic mechanical measurements of polysulfone torsion bars indicate the presence of two secondary relaxations below the glass transition temperature. These include a strong gamma peak near - 100 deg C and weak beta peak near 60 deg C. Annealing or slow cooling results in a suppression of the beta peak and intensifications of the high temperature side of the gamma peak which appears to correlate with a small decrease in impact strength. Preliminary quantum mechanical calculations suggest that the gamma relaxation may represent contributions from methyl group rotations and swivel motions of isopropylidene and diphenyl sulfone moieties while more energetic diphenyl ether swivels may be responsible for the beta relaxation. No effect of thermal conditioning in the region of the liquid-liquid transition has been

AD-A137 048

AD-A137 048 CONTINUED

observed.

DESCRIPTORS: (U) *Thermoplastic resins, *Polysulfones, *Composite materials, *Relaxation, *Spectra, Test methods, Fillers, Fabrics, Interactions, Relaxation time, Distribution, High temperature, Annealing, Cooling, Impact strength, Liquids, Transitions, Glass, Transition temperature, Torsion bars, Dynamics, Mechanical properties, Measurement, Quantum theory

IDENTIFIERS: (U) TICA(Torsion Impregnated Cloth Analysis), Cloth, PE61102F, WUAFOSR2303D9

AD-A137 047 11/4 20/11

MASSACHUSETTS INST OF TECH CAMBRIDGE TECHNOLOGY LAB FOR ADVANCED COMPOSITES

(U) Fracture, Longevity (Fatigue), Dynamics, and Aeroelasticity of Composite Structures.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 82,

JUN 83 151P

PERSONAL AUTHORS: Lagace,P. A. ;Mar,J. W. ;Dugundji,J. ;

REPORT NO. TELAC-83-11

CONTRACT NO. AFOSR-82-0071

PROJECT NO. 2307

TASK NO. B1

MONITOR: AFOSR TR-84-0001

UNCLASSIFIED REPORT

ABSTRACT: (U) The results of several investigations into the fracture, longevity (fatigue), dynamics, and aeroelasticity of composite materials are reported. The experimental work was conducted using Hercules graphite/epoxy prepreg in two forms: AS1/3501-6 unidirectional tape and A370-5H/3501-6 fabric. The topics discussed include unnotched tensile fracture, sensitivity to notches under tensile loading, nonlinear stress-strain behavior, compression specimen development, damage growth under cyclic load, and the flutter and divergence of graphite/epoxy wings. (Author)

DESCRIPTORS: (U) *Composite structures, *Fracture(Mechanics), *Fatigue(Mechanics), *Dynamics, *Aeroelasticity, Composite materials, Graphite, Epoxy composites, Fabrics, Notch sensitivity, Stress strain relations, Tensile properties, Compressive properties, Damage, Cyclic tests, Loads(Forces), Flutter, Convergence, Fatigue tests(Mechanics)

IDENTIFIERS: (U) PE61102F, WUAFOSR230781

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 046 14/2 9/3

CLEVELAND STATE UNIV OH DEPT OF INDUSTRIAL ENGINEERING

(U) Fault Isolation of Modular Equipment with Imperfect Built-in-Tests.

DESCRIPTIVE NOTE: Final rept.,

79 49P

PERSONAL AUTHORS: Sheskin,T. J. ;

CONTRACT NO. AFOSR-78-3496

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-80-0187

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this research is to derive a minimum cost sequence of automatic built-in-tests (BITs) which will partition modular equipment into mutually exclusive groups of modules. Following an equipment malfunction, one of these groups will be identified by the BIT diagnostic subsystem as the group which contains the faulty module. The BITs will not detect all of the possible errors in the modules, and they may also generate false alarms by calling out a group of modules which does not contain the faulty unit. Both the cost of a BIT and the probability that a BIT will pass or fail are functions of the modules which are tested. A recursive algorithm is developed which consists of a backward computational process followed by a forward computational process. The recursive algorithm generates a sequence of BITs with a minimum cost. The algorithm is applied to a four-module sample problem to produce a numerical solution. (Author)

DESCRIPTORS: (U) *Test methods, *Modules(Electronics), Life cycle costs, Failure(Electronics), Malfunctions, Algorithms, Diagnostic equipment

IDENTIFIERS: (U) BIT(Built-In-Tests), PE61102F, WUAFOSR2304A6

AD-A137 045 7/4

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Orientation of Aromatic Compounds Adsorbed on Platinum Electrodes. The Effect of Temperature,

83 7P

PERSONAL AUTHORS: Soriaga,M. P. ;White,J. H. ;Hubbard,A. T. ;

CONTRACT NO. AFOSR-81-0149

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1324

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n16 p3048-3054 1983.

Reprint: Orientation of Aromatic Compounds Adsorbed on Platinum Electrodes. The Effect of Temperature.

DESCRIPTORS: (U) *Electrochemistry, *Aromatic compounds, *Adsorption, Electrodes, Polycrystalline, Platinum, Solutions(General), Solutes, Concentration(Chemistry), Thinness, Layers, Cells, Temperature, Isotherms, Transitions, Packing density, Orientation(Direction), Molecular structure, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 044 12/1 14/5

ENVIRONMENTAL RESEARCH INST OF MICHIGAN ANN ARBOR

(U) Reconstruction of Objects Having Latent Reference Points.

NOV 83 7P

PERSONAL AUTHORS: Fienup,J. R. ;

REPORT NO. ERIM-161900-4-J

CONTRACT NO. F49620-82-K-0018

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR TR-83-1131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America, v73 n11 p1421-1426 Nov 83.

Reprint: Reconstruction of Objects Having Latent Reference Points.

DESCRIPTORS: (U) *Algorithms, *Image processing, *Holography, Autocorrelation, Fourier transformation, Reprints

IDENTIFIERS: (U) Objects, PE61102F, WUAFOSR2311A1

AD-A137 044

AD-A137 042 13/8 5/8

MICHIGAN UNIV ANN ARBOR ROBOT SYSTEMS DIV

(U) Coordinated Research in Robotics and Integrated Manufacturing.

DESCRIPTIVE NOTE: Annual rept. no. 1, 1 Aug 82-31 Jul 83,

JUL 83 135P

PERSONAL AUTHORS: Atkins,D. E. ;Volz,R. A. ;

REPORT NO. RSD-TR-17-83

CONTRACT NO. F49620-82-C-0089

PROJECT NO. 2306

TASK NO. A3

MONITOR: AFOSR TR-83-1340

UNCLASSIFIED REPORT

ABSTRACT: (U) The research procured under this contract is oriented toward the understanding and development of the flexible robot based manufacturing cells or islands which will increasingly become a basic blocks for the building of modern parts production and assembly facilities. Present work spans a hierarchy of sub-systems oriented toward the development and integration of high performance manipulators into flexible manufacturing cells. These subsystems may be divided into several levels of abstraction: Level 1: The mechanical structure and low-level (small time-constant) control of high-performance manipulators; The sensor sub-systems (force, tactile, thermal, and vision); Computer architecture and languages which form the basis of robot systems and manufacturing cells; Level 2: Integration of mechanical structure, computer system and sensor to form flexible robot systems; Level 3: The integration of systems with production and assembly machines and information contained in the manufacturer's computer-aided design database; and Level 4: Integration of the factory-wide distributed database which is central to the design, production and business functions of manufacturing.

DESCRIPTORS: (U) *Robots, *Robotics, *Integrated systems, *Production control, Manufacturing, Repair, Spare parts,

AD-A137 042

AD-A137 042 CONTINUED

Replacement, Computer aided design, Machine tools

IDENTIFIERS: (U) Manufacturing science, Integrated manufacturing, PE61102F, WUAFOSR2306A3

AD-A137 041 12/1 9/2 20/3 22/2

LOWELL UNIV RESEARCH FOUNDATION MA

(U) Further Development of a Computer Algorithm for the Automatic Determination of Space Vehicle Potential in Real Time.

DESCRIPTIVE NOTE: Final rept. 1 Aug 82-30 Sep 83,

DEC 83 33P

PERSONAL AUTHORS: *Spiegel,S. L. ;*

CONTRACT NO. AFOSR-82-0147

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-1323

UNCLASSIFIED REPORT

ABSTRACT: (U) The performance of two related computer algorithms for the purpose of critical potential detection has been analyzed. These algorithms employ positive ion spectra from onboard electrostatic analyzers to determine whether a critical potential has been reached or exceeded. The day to day performances have been examined and individual ion count spectra have been checked in cases of algorithm failure to see what algorithm modifications might lead to improved performance. Additionally, it has been considered whether reliable charge detection could be obtained using a rapid response Electrostatic Analyzer with many fewer energy channels that the 64 channel SC9 experiment of the P78-2 spacecraft. This has led to development of a goodness-of-fit test based on an onboard model of the distribution function profile in the absence of charging. Preliminary tests of this algorithm suggest that it may be useful as a rapid response detection algorithm on its own or as a preliminary test to screen for suspected cases of charging to be further analyzed by one of the other algorithms. (Author)

DESCRIPTORS: (U) *Algorithms, Spacecraft components, Ionization potentials, Determination, Electric charge, Space charge, Charged particles, Real time, Data bases, Computer applications

AD-A137 042

AD-A137 041

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 041 CONTINUED

IDENTIFIERS: (U) Spacecraft charging, PE61102F, WUAFOSR2311A1

AD-A137 038 20/7

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

(U) Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams,

NOV 83 7P

PERSONAL AUTHORS: Shefer,R. E. ;Yin,Y. Z. ;Bekefi,G. ;

CONTRACT NO. F49620-83-C-0008

MONITOR: AFOSR TR-83-1322

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physics, v54 n11 p6154-6159 Nov 83.

Reprint: Velocity Diagnostics of Mildly Relativistic, High Current Electron Beams.

DESCRIPTORS: (U) *Electron beams, *Diagnostic equipment, Velocity, Measurement, Capacitance, Cyclotrons, Experimental data, Reprints

DTIC REPORT BIBLIOGRAPHY

AD-A137 036 7/4

CHICAGO UNIV IL JAMES FRANCK INST

(U) Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions,

NOV 83 16P

PERSONAL AUTHORS: Rolfe,T. J. ;Rice,S. A. ;

CONTRACT NO. F49620-83-C-0002, NSF-CHE80-24645

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1330

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemistry and Physics, v79 n10 p4863-4876, 15 Nov 83.

Reprint: Classical Trajectory Studies of Energy Transfer in Ar-Difluorodiazirine Collisions.

DESCRIPTORS: (U) *Energy transfer, *Collisions, *Molecules, *Atoms, Argon, Cyclic compounds, Fluorine, Excitation, Vibration, Relaxation, Trajectories, Computerized simulation, Interactions, Surfaces, Potential energy, Rotation, Reprints

IDENTIFIERS: (U) Difluorodiazirine, PE61102F, WUAFOSR2303B1

SEARCH CONTROL NO. EVP02F

AD-A137 035 7/4 20/10

CHICAGO UNIV IL JAMES FRANCK INST

(U) Very-Low-Energy Collision-Induced Rotational Relaxation. A Theoretical Analysis,

83 7P

PERSONAL AUTHORS: Sethuraman,V. ;Cerjan,C. ;Rice,S. A. ;

CONTRACT NO. F49620-83-C-0002

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1329

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n12 p2021-2025 1983.

Reprint: Very-Low-Energy Collision-Induced Rotational Relaxation. A Theoretical Analysis.

DESCRIPTORS: (U) *Molecular rotation, *Relaxation, *Quantum theory, Collisions, Low energy, Excitation, Scattering, Resonance, Coupling(Interaction), Surfaces, Cross sections, Morse potential, Iodine, Helium, Atoms, Molecular association, Molecular vibration, Dissociation, Reprints

IDENTIFIERS: (U) Vander Waals forces, PE61102F, WUAFOSR2303B1

DTIC REPORT BIBLIOGRAPHY

AD-A137 034 7/3 7/4

CHICAGO UNIV IL JAMES FRANCK INST

(U) SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy Transfer in 1B1 Difluorodiazirine,

NOV 83 20P

PERSONAL AUTHORS: Vandersall,M. ;Rice,S. A. ;

CONTRACT NO. F49620-83-C-0002

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1328

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n10 p4845-4862, 15 Nov 83.

Reprint: SVL (Single Vibronic Level) Fluorescence Spectroscopy and Collision-Induced Intramolecular Vibrational Energy Transfer in 1B1 Difluorodiazirine.

DESCRIPTORS: (U) *Cyclic compounds, *Spectroscopy, *Molecular vibration, *Energy transfer, Fluorine, Fluorescence, Collisions, Excitation, Vibrational spectra, Cross sections, Argon, Molecule molecule interactions, Decay, Lasers, Electron transitions, Relaxation, Reprints

IDENTIFIERS: (U) Difluorodiazirine, Single vibronic level fluorescence spectroscopy, PE61102F, WUAFOSR2303B1

AD-A137 034

SEARCH CONTROL NO. EVP02F

AD-A137 033 20/6 12/1

ARIZONA UNIV TUCSON OPTICAL SCIENCES CENTER

(U) Optical Processing in Radon Space.

DESCRIPTIVE NOTE: Annual rept. Jul 82-Jul 83,

OCT 83 16P

PERSONAL AUTHORS: Barrett,H. H. ;

CONTRACT NO. AFOSR-82-0249

PROJECT NO. 2503

TASK NO. B2

MONITOR: AFOSR TR-84-0002

UNCLASSIFIED REPORT

ABSTRACT: (U) The Radon transform is the mathematical basis of computed tomography. The two-dimensional (2D) Radon transform consists of a series of 1D projections of a 2D function, obtained by integrating the function along lines, while the 3D Radon transform consists of 1D projections of a 3D function, obtained by integrating over planes. In both cases, the transform serves to reduce the dimensionality of a function from 2D or 3D to 1D. For signal-processing applications, this dimensionality reduction is very useful because of the availability of sophisticated processing devices, such as SAW and CCD filters, for 1D time signals. The Radon transform permits the use of these devices with 2D and 3D data sets. The operations that can be performed with the help of the Radon transform include: convolution, correlation, Fourier analysis, bandwidth compression, space-variant filtering, adaptive filtering, calculation of the Wigner distribution and ambiguity function, and calculation of moments of an image. In all of these cases, the operations can be carried out on a 2D or 3D data set by first performing a Radon transform, then doing a sequence of 1D operations, and finally performing an inverse Radon transform.

DESCRIPTORS: (U) *Optical processing, *Processing equipment, *Signal processing, *Surface acoustic wave devices, *Filters, *Charge coupled devices, Adaptive systems, Compression, Laser beams, Tomography, Functions,

AD-A137 033

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 033 CONTINUED

Pulse generators, Moments, Ambiguity, Fourier analysis, Three dimensional, Images, Computations, Two dimensional, Bandwidth, One dimensional

IDENTIFIERS: (U) Radon transform, Ramp generators, Downchirpers, Optical data processing, Chirp filters, Optical convolvers, Optical correlators, Upchirpers, Bandwidth compression, Image moments, Space variant filtering, Wigner distributions, Transparencies, PE61102F, WUAFOSR2503B2

AD-A137 033

AD-A137 029 20/4 14/2

LEHIGH UNIV BETHLEHEM PA DEPT OF MECHANICAL ENGINEERING AND MECHANICS

(U) A Synthesized Model of the Near-Wall Behavior in Turbulent Boundary Layers.

DESCRIPTIVE NOTE: Interim rept.,

84 28P

PERSONAL AUTHORS: Smith,C. R. ;

CONTRACT NO. F49620-78-C-0071

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-1336

UNCLASSIFIED REPORT

ABSTRACT: (U) A model of the near-wall behavior of turbulent boundary layers is presented. Based on an extensive series of primarily visualization experiments, which are described in overview, the model proposes a sequence of events which give rise to the bursting behavior responsible for turbulence production in the near-wall region. The model illustrates how hairpin vortex flow structures, generated during low-speed streak break down and ejection, are also reponsible for the streak regeneration process, thus defining a clear cycle of turbulence generation for the near-wall region. (Author)

DESCRIPTORS: (U) *Turbulent boundary layer, *Boundary layer transition, *Vortices, *Flow visualization, Walls, Fluid mechanics, Coherence, Structural properties, Turbulent flow, Models, Screens(Displays), Video recording, Probes, Bubbles, Hydrogen, Ejection, Statistical analysis

IDENTIFIERS: (U) Near wall flow, Flow structures, Hairpin vortices, Bursting flow, Split screens, Bubble wire probes, PE61102F, WUAFOSR2307A2

AD-A137 029

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 028 20/6 9/2 12/1

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES

(U) Optical Analog & Hybrid Computer Solution of Partial Differential Equations.

DESCRIPTIVE NOTE: Final rept. 1 Jan-15 Dec 82,

OCT 83 36P

PERSONAL AUTHORS: Lee,S. H. ;

CONTRACT NO. F49620-83-K-0022

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR TR-83-1296

UNCLASSIFIED REPORT

ABSTRACT: (U) The hybrid optical/electronic processing research at UCSD involves several approaches: (i) Applying digital statistical pattern recognition theory to optical system via the use of computer generated holograms for optical statistical pattern recognition. (ii) Incorporting image amplifier into an optical feedback system for solving partial differential equations and performing matrix inversion. (iii) Producing nonlinear optical devices using silicon and PLZT for nonlinear image processing. (iv) Demonstrating the feasibility of hybrid computing using integrated optical and integrated electronic circuits.

DESCRIPTORS: (U) *Optical processing, *Hybrid computers, *Partial differential equations, *Image processing, Analog computers, Nonlinear systems, Computations, Pattern recognition, Parallel processing, Optical equipment, Matrices(Mathematics), Image intensifiers(Electronics), Holograms, Problem solving, Hybrid circuits, Optics, Feedback, Statistics, Silicon, Computers, Inversion, Equations, Digital computers, High velocity

IDENTIFIERS: (U) Optical computers, Computing(High Speed), Karhunen Loeve transform, Coherent processors, Parallel logic, PDP-11/23 computers, Integrated optics, Image

compression, Light valves, Iterative processing, Optical storage, PE61102F, WUAFOSR2305B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 026 20/5 20/9 7/4

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma.

83 11P

PERSONAL AUTHORS: Uchida,H. ;Kosinski,M. A. ;Winefordner, J. D. ;

CONTRACT NO. F49620-80-C-0005

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1291

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Spectrochimica Acta, v38B n1/2 p5-13 1983.

Reprint: Laser Excited Atomic and Ionic Fluorescence in an Inductively Coupled Plasma.

DESCRIPTORS: (U) *Laser applications, *Plasma diagnostics, *Spectrometry, Lasers, Excitation, Fluorescence, Inductance, Coupling(Interaction), Plasmas(Physics), Emission, Atoms, Ions, Distribution, Yttrium, Calcium, Atomization, Ionization, Cells, Flames, Reprints

IDENTIFIERS: (U) *Atomic Fluorescence spectrometry, Inductively coupled plasmas, PE61102F, WUAFOSR2303A1

AD-A137 025 20/1 12/1

STANFORD UNIV CA

(U) Rough Surface Scattering via the Smoothing Method.

DESCRIPTIVE NOTE: Technical rept.,

NOV 83 7P

PERSONAL AUTHORS: Watson,J. G. ;Keller,J. B. ;

CONTRACT NO. AFOSR-79-0134

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-1316

UNCLASSIFIED REPORT

ABSTRACT: (U) The smoothing method is used to find the *first two moments*, i.e., the *mean* and the two-point two-time correlation function, of the field scattered by a rough surface. The results are expressed in terms of a reflection coefficient and a differential scattering coefficient. They are compared with those found by several other methods. (Author)

DESCRIPTORS: (U) *Acoustic waves, *Surface roughness, *Acoustic scattering, Integral equations, Acoustic velocity, Wave equations, Potential scattering, Correlation techniques

IDENTIFIERS: (U) Smoothing method, PE61102F, WUAFOSR2304A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 024 7/4 20/9 20/1

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.

JUL 83 5P

PERSONAL AUTHORS: Long,G. L. ;Voigtman,E. G. ;Kosinski,M. A. ;Winefordner,J. D. ;

CONTRACT NO. F49620-80-C-0005

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1313

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub in Analytical Chemistry, v55 n8 p1432-1434 Jul 83.

Reprint: Reduction of Electronic Noise in Inductively Coupled Plasma Atomic Emission and Fluorescence Spectrometric Measurements.

DESCRIPTORS: (U) *Spectrometry, *Plasma diagnostics, *Noise reduction, *Noise(Electrical and electromagnetic), Inductance, Coupling(Interaction), Atomic spectroscopy, Fluorescence, Radiofrequency filters, Transmission lines, Detection, Reprints

IDENTIFIERS: (U) Atomic emission spectrometry, Fluorescence spectrometry, Plasma spectrometry, Inductively coupled plasmas, PE61102F, WUAFOSR2303A1

AD-A137 024

AD-A137 023 7/4 7/2

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes.

82 9P

PERSONAL AUTHORS: Guyer,K. L. ;Barr,S. W. ;Weaver,M. J. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the Symposium on Electrocatalysis, p377-388 1982.

Reprint: Inner-Sphere Reactivity at Solid Metal Surfaces: Adsorbed Transition-Metal Reactants at Silver, Platinum, and Gold Electrodes.

DESCRIPTORS: (U) *Adsorption, *Reactants(Chemistry), *Transition metals, *Electrodes, Electrochemistry, Reactivities, Surfaces, Cobalt, Chromium, Reduction(Chemistry), Ligands, Platinum, Gold, Silver, Interfaces, Reaction kinetics, Constants, Voltammetry, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A137 023

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 022 13/1 20/4

SCIENTIFIC RESEARCH ASSOCIATES INC GLASTONBURY CT

(U) Computation of Discrete Slanted Hole Film Cooling Flow Using the Navier-Stokes Equations.

DESCRIPTIVE NOTE: Final rept. 1 Apr 78-31 Aug 83,

SEP 83 63P

PERSONAL AUTHORS: Gibeling,H. J. ;Briley,W. R. ; Kreskovsky,J. P. ;Shamroth,S. J. ;McDonald,H. ;

REPORT NO. R83-910002-F

CONTRACT NO. F49620-78-C-0038

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1288

UNCLASSIFIED REPORT

ABSTRACT: (U) An Analysis and computational procedure have been developed for predicting the flow and heat transfer which results from coolant injection through a single row of round holes oriented at an angle to a flat surface with the injection and freestream velocity vectors coplanar. This method solves the compressible Navier-Stokes equations and utilizes 'zone embedding', surface-oriented coordinates, interactive boundary conditions, and an efficient, split LBI scheme. The approach treats the near-hole flow region where the complex film cooling flow is initially established. The initial studies considered only laminar flow in order to develop the computational procedure without the added complications of turbulence modeling. Calculations were performed on a coarse mesh at a blowing rate of 0.1 for both normal injection and injection at 45 degrees through a circular hole with the computational domain extending into the coolant hole. The results obtained were qualitatively reasonable and demonstrated the capability of the procedure for treating film cooling injection flows without simplifying assumptions in the near-hole flow region. The procedure was extended to turbulent flows and a calculation was performed for an injection angle of 35 degrees with a lateral hole spacing of three

AD-A137 022 CONTINUED

diameters. The results for this case display the expected large secondary flow development as a result of the interaction between the main stream flow and the injected fluid. Also, the temperature distribution predictions exhibit good qualitative agreement with experimental data with the quantitative discrepancies apparently due to either the turbulence model or inadequate grid resolution.

DESCRIPTORS: (U) *Film cooling, *Navier Stokes equations, *Turbine blades, *Compressible flow, Boundaries, Heat transfer, Mathematical prediction, Computations, Holes(Openings), Turbulent flow, Injection, Coolants, Experimental data, Comparison, Free stream, Velocity, Turbines, Embedding, Interactions, Kinetic energy

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4

AD-A137 022

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 016 12/1

GEORGIA INST OF TECH ATLANTA SCHOOL OF MATHEMATICS

(U) Partial Inverse of a Monotone Operator,

83 20P

PERSONAL AUTHORS: Spingarn,J. E. ;

CONTRACT NO. AFOSR-80-0195

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-83-1349

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Mathematics and Optimization, v10 p247-265 1983.

Reprint: Partial Inverse of a Monotone Operator.

DESCRIPTORS: (U) *Operators(Mathematics), *Mapping, Inversion, Hilbert space, Algorithms, Problem solving, Reprints

AD-A137 016

AD-A137 015 20/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES SCHOOL OF ENGINEERING

(U) Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7,

SEP 83 14P

PERSONAL AUTHORS: Holtz,T. ;Muntz,E. P. ;

CONTRACT NO. AFOSR-72-2169

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-83-1285

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physics Fluids, v26 n9 p2425-2436 Sep 83.

Reprint: Molecular Velocity Distribution Functions in an Argon Normal Shock Wave at Mach Number 7.

DESCRIPTORS: (U) *Shock waves, *Gas dynamics, *Hypersonic flow, Argon, Molecular properties, Fluorescence, Electron beams, Distribution functions, Nonequilibrium flow, Monte Carlo method, Reprints

IDENTIFIERS: (U) Molecular velocity distribution functions, PE61102F, WUAFOSR2307A2

AD-A137 015

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 013 12/1

TEMPLE UNIV PHILADELPHIA PA DEPT OF MATHEMATICS

(U) The Role of Functional Equations in Stochastic Model Building.

82 23P

PERSONAL AUTHORS: Galambos,J. ;

CONTRACT NO. AFOSR-78-3504

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1339

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Aequationes Mathematicae, v25 p21-41 1982.

Reprint: The Role of Functional Equations in Stochastic Model Building.

DESCRIPTORS: (U) *Distribution functions, *Equations, Mathematical models, Cauchy problem, Reprints

IDENTIFIERS: (U) *Functional equations, PE61102F, WUAFOSR2304A5

AD-A137 008 20/4 12/1

WISCONSIN UNIV-MADISON DEPT OF MATHEMATICS

(U) Analytical Studies of Turbulent Flow Fields.

DESCRIPTIVE NOTE: Final rept. 1 Sep 79-31 Mar 83,

DEC 83 6P

PERSONAL AUTHORS: Mellor,G. L. ;

CONTRACT NO. AFOSR-79-0018

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-1282

UNCLASSIFIED REPORT

ABSTRACT: (U) Studies focused on second moment turbulence modeling. The emphasis was on separating flows using a fully elliptical numerical algorithm. A new closure in two-point correlation space was investigated; it is used to account for several properties of decaying isotropic turbulence.

DESCRIPTORS: (U) *Turbulent flow, Boundary layer, Numerical analysis, Flow fields, Algorithms, Flow separation, Incompressible flow, Mathematical models

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 007 8/11

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

(U) Body and Surface Wave Modeling of Observed Seismic Events.

DESCRIPTIVE NOTE: Final rept. 1 Nov 80-30 Apr 82,

APR 82 90P

PERSONAL AUTHORS: Harkrider,D. G. ;Helmberger,D. V. ;

CONTRACT NO. F49620-81-C-0008, ARPA Order-3291

PROJECT NO. 2309

TASK NO. A1

MONITOR: AFOSR
TR-83-1315

UNCLASSIFIED REPORT

ABSTRACT: (U) Coupling of surface waves in laterally inhomogeneous source regions to teleseismic propagation paths was studied. Dimensions of the cylindrical source region and its linear gradient transition zone were varied in order to determine their effect on generation teleseismic Rayleigh waves. By comparing amplitudes from a source region with sharp boundaries at the sides and bottom with those from a region bounded by various combinations of sharp and transition boundaries, it was determined that, for these source dimensions at the periods of interest, the more the body wave energy that leaves the source region as downgoing waves, the larger the fundamental mode Rayleigh wave. A review on the theory and application of synthetic seismograms was conducted. Emphasis was on body phase wave forms at teleseismic, regional, and local epicentral distances. At teleseismic distances, it was shown that long period body phases from shallow earthquakes are coherent at neighboring stations and that the observed waveform could be decomposed in a manner that allows determination of faulting parameters. By modeling both long and short period body waveforms using distributed point sources it is found that most earthquakes are indeed complex and that high frequency strong motions appear to be more strongly controlled by the jumps in the source time history than by the overall duration.

DESCRIPTORS: (U) *Seismic waves, *Surface waves, Wave propagation, Directional, Long range(Distance), Heterogeneity, Coupling(Interaction), Algorithms, Seismic data, Synthesis, Travel time, Rayleigh waves, Amplitude, Anomalies, Boundaries, Transitions, Near field, Waveforms, Phase, Long wavelengths, Earthquakes, Shallow depth, Epicenters, Faults(Geology), Sources, North America, Tectonics

IDENTIFIERS: (U) Teleseismic waves, Body waves(Seismic waves), Synthetic seismograms, Tectonic release, Nevada Test Site, PE61102F, WUAFOSR2309A1

AD-A137 007

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 006 12/1

ECODYNAMICS RESEARCH ASSOCIATES INC ALBUQUERQUE NM

(U) Adaptive Grid Generation Using Elliptic Generating Equations with Precise Coordinate Controls.

DESCRIPTIVE NOTE: Interim rept.,

JUN 83 6P

PERSONAL AUTHORS: Roache,P. J. ; .

CONTRACT NO. F49620-82-C-0064

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-1319

UNCLASSIFIED REPORT

ABSTRACT: (U) The author's results previously reported have now been verified in a double precision code which removes any confusion due to machine round-off error. The results conclusively show no loss of order of accuracy from highly stretched grids, even with stretching parameters in an exponential-of-exponential stretch large enough to increase the size of the error by 6 orders of magnitude.

DESCRIPTORS: (U) *Grids(Coordinates), Adaptive systems, Equations, Errors, Control, Algorithms

IDENTIFIERS: (U) Elliptic equations, PE61102F, WUAFOSR2304A3

AD-A137 004 12/1

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF MATHEMATICAL SCIENCES

(U) Boundary Feedback Stabilization for a Quasi-Linear Wave Equation,

83 14P

PERSONAL AUTHORS: Slemrod,M. ;

CONTRACT NO. AFOSR-81-0172

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-83-1332

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Lecture Notes in Control and Information Sciences, v54 p221-237 1983.

Reprint: Boundary Feedback Stabilization for a Quasi-Linear Wave Equation.

DESCRIPTORS: (U) *Control theory, Feedback, Wave equations, Theorems, Reprints

IDENTIFIERS: (U) Large space structures, PE61102F, WUAFOSR2304A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A137 003 12/1 20/4

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF MATHEMATICAL SCIENCES

(U) The Viscosity-Capillarity Criterion for Shocks and Phase Transitions.

83 30P

PERSONAL AUTHORS: Hagan,R. ;Slemrod,M. ;

CONTRACT NO. AFOSR-81-0172

PROJECT NO. 2304

TASK NO. A1

MONITOR AFOSR TR-83-1317

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Archive for Rational Mechanics and Analysis, v83 n4 p333-361 1983.

Reprint: The Viscosity-Capillarity Criterion for Shocks and Phase Transitions.

DESCRIPTORS: (U) *Computations, *Phase transformations, *Fluid flow, Viscosity, Capillarity, Compressible flow, Thermoelasticity, Shock, Reprints

IDENTIFIERS: (U) Nonlinear conservation laws, Kortewegs, PE61102F, WUAFOSR2304A1

AD-A136 681 20/8 22/2 18/6

FLORIDA UNIV GAINESVILLE SPACE ASTRONOMY LAB

(U) Shuttle Flight Test of an Advanced Gamma-Ray Detection System.

DESCRIPTIVE NOTE: Final scientific rept. 1 Oct 82-31 Mar 83,

NOV 83 20P

PERSONAL AUTHORS: Rester,A. C. , Jr;

CONTRACT NO. AFOSR-83-0116

PROJECT NO. 2309

TASK NO. A1

MONITOR: AFOSR TR-83-1201

UNCLASSIFIED REPORT

ABSTRACT: (U) The Space Astronomy Laboratory plans to fly an advanced gamma-ray spectrometer aboard a future Shuttle flight. The 'GRAD' spectrometer employs a new bismuth germanate (BGO) anticompton shield and n-type high purity germanium detector. BGO, because of its high atomic number, requires only 1/12 the volume and 1/6 the weight of an equally sensitive sodium iodide crystal. The n-type germanium detector is at least 25 times more resistant to neutron radiation damage than a conventional detector and has a very broad spectral response of 5 keV to 10 MeV. Neither of these materials has been subjected to the space environment as working components of a detector system. The radioactivation of the new detector materials by cosmic rays and fast neutrons, as well as other effects of launching, landing and operation in the space environment on the detector system will be monitored and calibrated. Early information on gamma-ray background from activation of the shuttle itself will also be obtained. In addition to the technological information derived from the experiment, high energy-resolution spectra of the sun and the galactic center will be taken. (Author)

DESCRIPTORS: (U) *Gamma spectrometers, Gamma ray spectroscopy, Gamma ray cross sections, Space shuttles, Neutrons, Radiation hardening, Radiation shielding, Space

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 681 CONTINUED

environments, Spacecraft components, Space stations, Radiation damage, Bismuth compounds, Germanates

IDENTIFIERS: (U) Bismuth germanium detectors, BGO(Bismuth Germanate), WUAFOSR2309A1, PE61102F

AD-A136 592 12/1

NORTH CAROLINA UNIV AT CHARLOTTE DEPT OF MATHEMATICS

(U) Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators,

82 15P

PERSONAL AUTHORS: Quinn,J. ;

CONTRACT NO. AFOSR-80-0245

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1250

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Houston Jnl. of Mathematics, v8 n4 p575-586 1982.

Reprint: Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators.

DESCRIPTORS: (U) *Operators(Mathematics), *Weighting functions, Transformations(Mathematics), Probability, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 588 12/1 20/2

WISCONSIN UNIV-MILWAUKEE DEPT OF PHYSICS

(U) Lattice Statistics.

DESCRIPTIVE NOTE: Interim scientific rept. 1 Jul 82-30 Jun 83,

JUN 83 12P

PERSONAL AUTHORS: McQuistan,R. B. ;

CONTRACT NO. AFOSR-81-0192

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1233

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this research is to develop the mathematical formalism necessary to treat correlative statistics for lattice spaces. Toward that goal the investigators are considering (1) the composite kth neighbor degeneracy problem for indistinguishable particles distributed on one dimensional rectangular lattice space; (2) the occupational degeneracy for dumbbells and lambda-bell particles on saturated and unsaturated, rectangular lattice spaces of higher dimensionality here they are considering dumbbells that may have either indistinguishable or distinguishable ends; (3) the nearest neighbor degeneracy problem for simple, indistinguishable particles distributed on rectangular lattice spaces of higher dimensionality. A secondary objective is to exploit the results of the foregoing research by investigating the consequences of this formalism to chemical and physical systems. Most notably they are considering adsorption processes. The investigators have developed set theoretic arguments that hold the promise of treating successfully a number of problems concerning correlative statistics for lattice spaces. Utilizing this technique they have been able to describe exactly the occupational degeneracy for correlated particles such as dumbbells and lambda-bell particles distributed on lattice spaces of two and three dimensions. The investigators have also utilized these set theoretic arguments to obtain recursion relations

that yield exactly the composite nearest, next nearest and third nearest neighbor degeneracies for simple particles distributed on rectangular lattice spaces of higher dimensionality. (Author)

DESCRIPTORS: (U) *Lattice dynamics, *Statistical analysis, Crystal lattices, Particles

IDENTIFIERS: (U) *Lattice statistics, Lattice space, Lambda-bell particles, PE61102F, WUAFOSR2304A5

AD-A136 588

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 583 7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane.

83 7P

PERSONAL AUTHORS: Seyferth,D. ;Prud'homme,C. ;Wiseman,G. H. ;

CONTRACT NO. AFOSR-83-0003, PHS-RR-00317

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1221

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v22 n15 p2163-2167 1983.

Reprint: Cyclic Polysiloxanes from the Hydrolysis of Dichlorosilane.

DESCRIPTORS: (U) *Silanes, *Siloxanes, *Polymers, *Hydrolysis, Chemical reactions, Cyclic compounds, Spectrum analysis, Molecular weight, Reprints

IDENTIFIERS: (U) Dichlorosilane

AD-A136 582 12/1

MASSACHUSETTS UNIV AMHERST DEPT OF MATHEMATICS AND STATISTICS

(U) Diffusion Approximation for a Class of Markov Processes Satisfying a Nonlinear Fokker-Planck Equation.

83 13P

PERSONAL AUTHORS: Rosenkrantz,W. A. ;Bing,L. Z. ;

CONTRACT NO. AFOSR-82-0167

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1236

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Nonlinear Analysis, Theory, Methods & Applications, v7 n10 p1089-1099 1983.

Reprint: Diffusion Approximation for a Class of Markov Processes Satisfying a Nonlinear Fokker-Planck Equation.

DESCRIPTORS: (U) *Approximation(Mathematics), *Diffusion, Markov processes, Nonlinear differential equations, Reprints

IDENTIFIERS: (U) Fokker Planck equations, PE61102F, WUAFOSR2304A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 579 12/2 14/4

CALIFORNIA UNIV BERKELEY OPERATIONS RESEARCH CENTER

(U) Interim Scientific Report: AFOSR-81-0122.

DESCRIPTIVE NOTE: Rept. for 1 Jun 82-31 May 83,

MAY 83 16P

PERSONAL AUTHORS: Barlow,R. E. ;

CONTRACT NO. AFOSR-81-0122

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1244

UNCLASSIFIED REPORT

ABSTRACT: (U) Three researchers and one visitor were supported by this grant during this period. Most of the research was in various aspects of reliability, including network reliability, a generalized model of continuous reliability growth, a software reliability model combining the results of several independent inspectors, and a model in which the failure rates for components depend on the working set. Other investigations included Bayesian methods for combining expert opinion, enriched prior distributions for the multinormal distribution, and a new approach to using simulation to estimate first-passage time distributions for Markov chains. Eleven research papers and one Ph.D dissertation were produced during this period. This report summarizes research results and lists publications generated during this period. (Author)

DESCRIPTORS: (U) *Reliability, *Operations research, *Network flows, Stochastic processes, Monte Carlo methods

IDENTIFIERS: (U) *Network reliability, PE61102F, WUAFOSR2304A5

AD-A136 579

AD-A136 577 5/2

OHIO STATE UNIV COLUMBUS DEPT OF COMPUTER AND INFORMATION SCIENCE

(U) Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.

DESCRIPTIVE NOTE: Interim rept. 1 Jul 82-30 Jun 83,

NOV 83 6P

PERSONAL AUTHORS: Chandrasekaran,B. ;

CONTRACT NO. AFOSR-82-0255

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR TR-83-1242

UNCLASSIFIED REPORT

ABSTRACT: (U) In the original proposal the investigators had outlined a long term program for conducting research in knowledge based systems. In particular they proposed to study issues in diagnostic reasoning and in knowledge-directed information retrieval. During the first year most of the progress came in the area of diagnostic reasoning and in the conceptual foundations of knowledge-based systems in general. The investigators also developed an approach to a new type of task: design of mechanical parts. This report summarizes specific progress made in these areas. (Author)

DESCRIPTORS: (U) *Data bases, Information retrieval, Diagnosis(General), Reasoning, Mechanical components

IDENTIFIERS: (U) Expert systems, Knowledge representation, PE61102F, WUAFOSR2304A7

AD-A136 577

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 574 12/1 13/13 9/2

NEW MEXICO UNIV ALBUQUERQUE BUREAU OF ENGINEERING RESEARCH

(U) Mathematical Models for Damageable Structures.

DESCRIPTIVE NOTE: Interim rept.,

MAR 83 91P

PERSONAL AUTHORS: Wang,M. L. ;Paez,T. L. ;Ju,F. ;

REPORT NO. CE-64(83)AFOSR-993-1

CONTRACT NO. AFOSR-81-0086

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR
TR-83-1256

UNCLASSIFIED REPORT

ABSTRACT: (U) The reliability of a structural system at a particular time depends on the damage level in the system. When the damage level exceeds a critical value, then failure occurs. Therefore, it is important to track the damage in a structure. In the present investigation some basic models are proposed for the study of damageable structure response. The models are: a higher order linear differential equation with constant coefficients, and a second order linear differential equation with time varying coefficients. Using a digital computer a blast is simulated, and the response of an inelastic structure is computed. Noise signals are added to these and the results are used to simulate measured input and response. Next, using the simulated input and response, the parameters of the linear models are identified and the linear structure responses are computed. Measures of these responses, including peak displacement and energy dissipated are compared to the simulated response. It is shown that the models accurately simulate inelastic structure response. Moreover, the results of some experiments are included. The experiments show that the energy dissipated in a material specimen is related to the damage level. (Author)

DESCRIPTORS: (U) *Mathematical models, *Damage

AD-A136 574

AD-A136 574 CONTINUED

assessment, *Structural response, *Computerized simulation, Structures, Structural analysis, Linear differential equations, Coefficients, Digital computers, Linearity, Elastic properties, Parameters, Noise, Signals, Reliability, Input, Blast, Displacement, Vibration, Shock

IDENTIFIERS: (U) PE61102F, WUAFOSR2307C2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 571 12/1

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MATHEMATICAL SCIENCES

(U) Estimation and Reconstruction for Stochastic Processes and Deterministic Functions.

DESCRIPTIVE NOTE: Interim rept. 1 Jan-31 Dec 82,

FEB 83 14P

PERSONAL AUTHORS: Karr,A. F. ;

CONTRACT NO. AFOSR-82-0029

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1239

UNCLASSIFIED REPORT

ABSTRACT: (U) Method for statistical estimation of parameters of partially observed stochastic processes and for minimum mean squared error reconstruction of unobserved portions of sample paths (state estimation) were developed. Some of these methods apply to models of random distributions of particles in space or events in time; others apply to Markov processes. Statistical estimators are asymptotically exact even though certain of the unknown parameters are infinite-dimensional. For several classes of processes the problem of simultaneously performing parameter estimation and state estimation was solved. Refined techniques for reconstructing a deterministic signal from hard-limited data were devised. (Author)

DESCRIPTORS: (U) *Stochastic processes, *Determinants(Mathematics), Statistical inference, Estimates, Statistical samples, Paths, Points(Mathematics), Nonparametric statistics

IDENTIFIERS: (U) *Deterministic functions, PE61102F, WUAFOSR2304A5

AD-A136 571

AD-A136 570 12/1 9/2

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

(U) Summary of Work Done on Grant AFOSR-82-0078.

DESCRIPTIVE NOTE: Interim rept. 1 Jan 82-15 Mar 83,

MAR 83 7P

PERSONAL AUTHORS: O'Leary,D. P. ;Stewart,G. W. ;

CONTRACT NO. AFOSR-82-0078

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-83-1243

UNCLASSIFIED REPORT

ABSTRACT: (U) This is a summary of work accomplished under the grant. The purpose of this effort is to develop realistic algorithms for matrix computations on parallel computers. The research is proceeding in three stages. First, decide on a suitable way of connecting and synchronizing processors for parallel matrix computations. Second, design and build a communications system to realize this network on the ZMOB. Third, code matrix algorithms for the system, and experiment with them. In addition, the investigators must install and test the floating-point processors which were requested as part of the initial grant period. (Author)

DESCRIPTORS: (U) *Algorithms, *Matrices(Mathematics), *Computations, Parallel processing, Arrays, Floating point operation, Communication and radio systems, Coding

IDENTIFIERS: (U) Parallel matrix algorithms, PE61102F, WUAFOSR2304A?

AD-A136 570

AD-A136 567 12/1 5/1

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Effects of Assuming Independent Component Failure Times, if They Are Actually Dependent, in a Series System.

DESCRIPTIVE NOTE: Annual rept. 1 Sep 82-30 Sep 83.

OCT 83 91P

PERSONAL AUTHORS: Moeschberger,M. L. ;Klein,J. P. ;

CONTRACT NO. AFOSR-82-0307

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1278

UNCLASSIFIED REPORT

ABSTRACT: (U) The overall objective of this proposal is to investigate the robustness to departures from independence of methods currently in use in reliability studies when competing failure modes or competing causes of failure associated with a single mode are present in a series system. The first specific aim is to examine the error one makes in modeling a series system by a model which assumes statistically independent component lifetimes when in fact the component lifetimes follow some multivariate distribution. The second specific aim is to assess the effects of the independence assumption on the error in estimating component parameters from life tests on series systems. In both cases, estimates of such errors will be determined via mathematical analysis. A graphical display of the errors for representative distributions will be made available to researchers who wish to assess the possible erroneous assumption of independent competing risks. A third aim is to tighten the bounds on estimates of component reliability when the risks belong to a general dependence class of distributions (for example, positive quadrant dependence, positive regression dependence, etc.). Major decisions involving reliability studies, based on competing risk methodology, have been made in the past and will continue to be made in the future. This study will provide the user of such techniques with a clearer understanding of

the robustness of the analyses to departures from independent risks, an assumption commonly made by the methods currently in use. (Author)

DESCRIPTORS: (U) *Statistical analysis, *Systems analysis, *Parts, *Reliability, Failure, Mathematical analysis, Life expectancy(Service Life), Distribution, Multivariate analysis, Life tests, Parametric analysis, Nonparametric statistics, Risk, Bivariate analysis, Exponential functions

IDENTIFIERS: (U) *Series systems, PE61102F, WUAFOSR2304A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 561 12/1 17/2 20/6

AD-A136 561 CONTINUED

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES

WUAFOSR2304A5

(U) Calculation of Cumulative Distributions and Detection Probabilities in Communications and Optics.

DESCRIPTIVE NOTE: Annual rept. 10 Jan 82-30 Sep 83,

OCT 83 42P

PERSONAL AUTHORS: Helstrom,C. W. ;

CONTRACT NO. AFOSR-82-0343

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1237

UNCLASSIFIED REPORT

ABSTRACT: (U) Methods were investigated for evaluating cumulative distributions of continuous random variables of known moment-generating function by numerical quadrature of a contour integral in the complex plane whose integrand involves that function. Applications so far treated were to the detection of radar signals, both fading and unfading, in receivers with constant threshold or with a variable threshold determined by a measurement of the ambient noise (constant-false-alarm-rate receivers) , and to the distribution of the average power of a Gaussian random process. Similar methods were studied for finding the cumulative distributions of positive-integral valued random variables by a numerical contour integration involving their probability generating functions, with application to evaluating the distribution of the number of electrons at the output of a photomultiplier. (Author)

DESCRIPTORS: (U) *Numerical integration, *Computations, *Probability distribution functions, *Communication and radio systems, *Optics, Random variables, Radar signals, Detection, Ambient noise, Photoelectrons, Photomultiplier tubes, Numerical quadrature, Signal processing, Numerical methods and procedures

IDENTIFIERS: (U) Probability of detection, PE61102F,

AD-A136 561

AD-A136 561

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 560 9/4 17/2

TEXAS UNIV AT AUSTIN DEPT OF ELECTRICAL ENGINEERING

(U) Interim Report on Grant AFOSR-81-0047, 1 October 1982 to 30 September 1983,

NOV 83 14P

PERSONAL AUTHORS: Wise,G. L. ;

CONTRACT NO. AFOSR-81-0047

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1238

UNCLASSIFIED REPORT

ABSTRACT: (U) The research topics investigated were primarily in the areas of quantization and detection in signal processing. The existence of optimal quantizers was established under very general conditions and convergence properties of sequences of quantizers to optimal quantizers were investigated. A simple and straightforward technique was presented for constructing minimum mean-squared error symmetric uniform scalar quantizers for some common input distributions. THe Lloyd-Max algorithm was modified to give a very fast design algorithm for scalar minimum mean-squared error quantization. In the area of detection, a continuous time filter was designed for a discrete time problem and outperformed the corresponding discrete time detector. Detection problems were investigated when both signal and noise were modelled as phi-mixing random processes. Several situations were investigated in which asymptotic relative efficiency is an inappropriate measure of efficiency. In a different area of research, the effects of a form of nonlinear distortion on spectral properties of random processes were invest gated. (Author)

DESCRIPTORS: (U) *Signal processing, *Information theory, Quantization, Algorithms, Detection, Optimization

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

IAC NO. GC-840201

AD-A136 560

AD-A136 560 CONTINUED

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)Signal processing, Quantization, Algorithms, Data reduction, Detection, Analog to digital converters, Convergence, Mathematics, Communication theory.;

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 555 9/2

MICHIGAN UNIV ANN ARBOR SUPERCOMPUTER ALGORITHM RESEARCH LAB

(U) A CRAY-Class Multiprocessor Simulator.

DESCRIPTIVE NOTE: Technical rept.,

SEP 83 130P

PERSONAL AUTHORS: Summers,P. M. ;Orbits,D. A. ;

REPORT NO. SARL-1

CONTRACT NO. AFOSR-80-0158

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-1246

UNCLASSIFIED REPORT

ABSTRACT: (U) A logical-timing instruction-level simulator is described for a hypothetical multiprocessor consisting of CRAY-1's connected to a common memory. It is useful for gaining insight into the design of multiprocessor algorithms and for developing high performance algorithms for CRAY processors with instruction sets similar to the CRAY-1. (Author)

DESCRIPTORS: (U) *Multiprocessors, *Parallel processors, *Simulators, Subroutines, Performance(Engineering), Systems analysis, Computer programs, Debugging(Computers), Algorithms, Computer architecture, Simulation, Input output processing, User manuals

IDENTIFIERS: (U) Vector processors, WUAFOSR2304A3, PE61102F

AD-A136 555

AD-A136 547 11/2 20/11

SRI INTERNATIONAL MENLO PARK CA

(U) Silicon Nitride Joining.

DESCRIPTIVE NOTE: Annual rept. 31 Jan 82-31 Jan 83,

MAR 83 44P

PERSONAL AUTHORS: Johnson,S. M. ;Rowcliffe,D. J. ;

CONTRACT NO. F49620-81-K-0001

PROJECT NO. 2306

TASK NO. A2

MONITOR: AFOSR
TR-83-1145

UNCLASSIFIED REPORT

ABSTRACT: (U) Silicon nitride can be joined using an oxide glass which reacts to form a phase similar to the grain boundary phase found in hot pressed Si3N4. The microstructure and interfacial reactions were studied by scanning transmission electron microscopy and X-ray diffraction. Silicon nitride dissolves in the glass and silicon oxynitride crystals precipitate. The glass also penetrates the Si3N4 and is present as enlarged glass pockets in the bulk ceramic away from the joint. The optimal joining conditions were determined to be 1575-1650 C and 30 to 60 minutes. The maximum strengths at room temperature determined by 4 point bend tests of bars joined under these conditions were approximately 460 MPa, regardless of the specific conditions. The strength is related to the joint thickness, reaching a maximum for joint thicknesses of approximately 25 to 35 micrometers. Two fracture mechanisms were identified by SEM. Silicon oxynitride crystals grow across thin joints and the resulting microstructure is strong if few pores are present. Thermal expansion mismatch cracks are present in thicker joints and there are multiple fracture origins. Preliminary attempts to heat treat joints to promote crystallization resulted in vaporization of the glass and a low strength.

DESCRIPTORS: (U) *Silicon nitrides, *Bonded joints, *Microstructure, Joining, Oxides, Oxynitrides, Glass, Strength(Mechanics), Electron microscopy, X ray

AD-A136 547

AD-A136 547 CONTINUED

diffraction, Fracture(Mechanics), Crystallization

IDENTIFIERS: (U) LPN-SRI-PYU-2527, WUAFOSR2306A2, PE61102F

AD-A136 540 12/1 17/2

CONNECTICUT UNIV STORRS DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

(U) Robust Procedures for Communication Data.

DESCRIPTIVE NOTE: Final rept. 1 Jul 82-31 Aug 83,

AUG 83 9P

PERSONAL AUTHORS: Papantoni-Kazakos,P. ;

CONTRACT NO. AFOSR-78-3695

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1273

UNCLASSIFIED REPORT

ABSTRACT: (U) This document summarizes work on robust procedures for communication data.

DESCRIPTORS: (U) *Mathematical filters, *Communication and radio systems, Game theory, Stochastic processes, Mathematical prediction, Interpolation, Vector analysis, Stationary, Multiple access

IDENTIFIERS: (U) *Robust procedures, PE61102F, WUAFOSR2304A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 534 12/1 9/4 17/2.1

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF ELECTRICAL ENGINEERING

(U) On Retransmission Control Policies in Multiaccess Channels.

DESCRIPTIVE NOTE: Technical rept.,

DEC 82 38P

PERSONAL AUTHORS: Kazakos,D. ;Merakos,L. ;

REPORT NO. UVA/525634/EE82/107

CONTRACT NO. AFOSR-82-0030, NSF-ECS81-19885

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1241

UNCLASSIFIED REPORT

ABSTRACT: (U) Aloha-type retransmission control policies have been proposed recently by Hajek and Van loon which can be implemented on a random access channel with ternary or binary feedback. They have shown that such schemes achieve a stable throughput of 1/e = .3678 for an infinite-population Poisson arrival model, by using simple first-order recursive retransmission policies. We drive measures of the speed of convergence and steady state accuracy for the local 'model' of these policies. Using these measures, we compare two first-transmission policies, namely IFT and DFT. We extend the policies to cover the Success/Failure binary feedback case, which is not covered in the work cited. Finally, we study the effects of channel errors on the performance of the random access system.

DESCRIPTORS: (U) *Retransmission, Control theory, Satellite communications, Throughput, Burst transmission, Algorithms, Scheduling, Feedback, Multiple access, Wave packets, Switching, Multichannel communications, Communications traffic, Random variables, Arrival, Delay, Errors, Recursive functions, Convergence, Statistical distributions, Policies

AD-A136 534

AD-A136 534 CONTINUED

IDENTIFIERS: (U) Packet switching, Random access communications, Binary feedback, Ternary feedback, IFT(Immediate First Transmission), DFT(Delayed First Transmission), PE61102F, WUAFOSR2304A5

AD-A136 534

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 531 12/1

CALIFORNIA UNIV LOS ANGELES DEPT OF SYSTEM SCIENCE

(U) Final Scientific Report: 1978 - 1983.

DESCRIPTIVE NOTE: Rept. for 2 Jan 82-31 Mar 83,

MAR 83 16P

PERSONAL AUTHORS: Balakrishnan,A. V. ;

CONTRACT NO. AFOSR-78-3550

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-1240

UNCLASSIFIED REPORT

ABSTRACT: (U) During the period of this grant, topics investigated included: nonlinear white noise theory; stabilization of distributed parameter systems by boundary feedback; system modeling and identification; control of flexible flight vehicles; random fields--filtering and estimation; control of randomly varying systems; and control of large space structures. Thirty technical papers were produced with titles including: Active control of airfoils in unsteady aerodynamics; Identification of aircraft parameters in turbulence with nonrational spectra; Aircraft performance modelling--Theory and some preliminary results; and Active control of large flexible space structures.

DESCRIPTORS: (U) *Mathematical models, Abstracts, Bibliographies, White noise, Control systems, Feedback, Aerodynamic stability, Control theory, Aerodynamic control surfaces, Mathematical filters, Random variables

IDENTIFIERS: (U) Random fields, PE61102F, WUAFOSR2304A4

AD-A136 530 12/1

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF MATHEMATICAL SCIENCES

(U) Nonlinear Systems in Infinite Dimensional State Spaces.

DESCRIPTIVE NOTE: Interim technical progress rept. for period ending 14 Jun 83,

JUL 83 9P

PERSONAL AUTHORS: Slemrod,M. ;

CONTRACT NO. AFOSR-81-0172

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-83-1258

UNCLASSIFIED REPORT

ABSTRACT: (U) During the period of research, efforts were made in the areas of (1) controllability of infinite dimensional bilinear control systems; (2) singular perturbations approach to optimization problems with non-convex cost; (3) nonlinear continuum mechanics and phase transitions; and (4) optimal control of a problem arising in robotics. Results were obtained in all areas using various methods of nonlinear analysis. (Author)

DESCRIPTORS: (U) *Nonlinear analysis, Equations, Control systems, Perturbations, Optimization, Continuum mechanics, Phase transformations, Robotics, Problem solving

IDENTIFIERS: (U) PE61102, WUAFOSR2304A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 524 12/1

NORTHWESTERN UNIV EVANSTON IL

(U) Markov Processes Applied to Control, Replacement, and Signal Analysis.

DESCRIPTIVE NOTE: Interim progress rept. 1 Jun-31 Dec 82,

DEC 82 5P

PERSONAL AUTHORS: Cinlar,E. ;

CONTRACT NO. AFOSR-82-0189

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1276

UNCLASSIFIED REPORT

ABSTRACT: (U) Research efforts during this period concentrated on the following topics: (a) Deformation of Solids - work on the topic has progressed to the point where the physical mechanisms of creep can be brought in. (b) Excursions of Markov Processes - Two papers by Salminer are completed in this area. (c) Stochastic Differential Geometry - Starting with a Brownian motion on a Riemannian manifold, the exit time from a ball is considered. The distribution of the exit time is used to investigate the geometric structure of the manifold. This report summarizes the progress made and lists completed publications resulting from the research. (Author)

DESCRIPTORS: (U) *Markov processes, Control, Control theory, Signals, Brownian motion, Inversion, Queueing theory, Integrals, Stochastic processes, Replacement theory, Solids, Deformation

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

AD-A136 523 5/1 9/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF COMPUTER SCIENCE

(U) Design of Office Information Systems.

DESCRIPTIVE NOTE: Technical rept.,

NOV 83 33P

PERSONAL AUTHORS: Horowitz,E. ;Narasimhan,B. ;

CONTRACT NO. AFOSR-82-0232

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1253

UNCLASSIFIED REPORT

ABSTRACT: (U) We outline the essential components of a truly integrated OIS. Then we critically examine four of the existing prototype systems and another suggested design. These systems have the common characteristic of providing a form-based user interface. Then we present a set of requirements for such an OIS.

DESCRIPTORS: (U) *Information systems, *Data processing, Office personnel, Operation, Documents, Information processing, Automation, Data processing equipment

IDENTIFIERS: (U) Clerical operations, Office procedure, OIS(Office Information System), Office information systems, PE61102F, WUAFOSR2304A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 522 9/2

FLORIDA STATE UNIV TALLAHASSEE DEPT OF MATHEMATICS AND COMPUTER SCIENCE

(U) File Searching Problems in Logic Programming Systems.

DESCRIPTIVE NOTE: Final rept. 1 Mar 81-28 Feb 82,

FEB 83 39P

PERSONAL AUTHORS: Eastman,C. M. ;

CONTRACT NO. AFOSR-81-0110

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-1252

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period, the investigator intended to investigate alternative approaches for improving searching performance in logic programming systems to a level that would be acceptable in a production system by conducting experiments in the LOGLISP system. Due to incompatibilities between the DEC 10 source computer and the CDC CYBER 760 running under NOS, which was available at Florida State University, as well as the differences between the UCI LISP on the DEC 10 and the ALISP available on the CYBER, it was impossible to bring the LOGLISP system to fully operational status and perform the experiments. (Author)

DESCRIPTORS: (U) *Programming languages, *Searching, *Computer files, Data bases, Information retrieval, Dialects

IDENTIFIERS: (U) Knowledge representation, PROLOG programming language, LISP programming language, LOGLISP programming language, PE61102F, WUAFOSR2304A2

AD-A136 520 12/1 9/4

TEXAS UNIV AT AUSTIN

(U) Interim Report, Grant AFOSR-81-0047, 1 October 1981 to 30 September 1982,

NOV 82 12P

PERSONAL AUTHORS: Wise,G. L. ;

CONTRACT NO. AFOSR-81-0047

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1247

UNCLASSIFIED REPORT

ABSTRACT: (U) Much of our work during the previous grant year was concerned with quantization theory. Quantization forms the heart of analog to digital conversion and it is a key element in virtually all of digital signal processing. Although quantization theory has been a subject of interest for many years, much remains to be done in this area. The difficulty in this area is compounded by the fact that some of the commonly held beliefs are actually misconceptions. For example, it has often been assumed in the literature that in the scalar case a minimum mean squared error optimum quantizer for a symmetrically distributed random variable will be symmetric (i.e. the quantization levels will be symmetrically distributed about the origin).

DESCRIPTORS: (U) *Quantization, *Signal processing, Analog to digital converters, Scalar functions, Electrical engineering, Applied mathematics

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 519 5/2 20/9 20/5

CORNELL UNIV ITHACA NY

(U) Final Report on Grant AFOSR-78-3574, 1978-1983.

DESCRIPTIVE NOTE: Technical rept.,

JUL 83 13P

PERSONAL AUTHORS: Liboff,R. L. ;

REPORT NO. R-5-83

CONTRACT NO. AFOSR-78-3574

PROJECT NO. 2301

TASK NO. A3

MONITOR: AFOSR
TR-83-1257

UNCLASSIFIED REPORT

ABSTRACT: (U) This document presents abstracts of Technical Reports titled: First-Order Estimate of the Saha Equation for a Helium Plasma; Exact Solutions for Interacting Finite Potential Wells; Dual Propagation and Absorption in a Warm Plasma Half Space; Electrostatics in the Plane; Electron Density Profile in a Recombining Plasma; Review of Fundamental Processes for Matter-Radiation Interaction II; Properties of a One-Dimensional Coulomb Gas; Kinetic Theory for a Short-Wavelength Lasing Plasma; Exciton-Laser Amplifier; Induced Decay of Positronium and Grasers; Study of a Nuclear Gamma-Ray Laser; Unified Theory of Plasma Correlations.

DESCRIPTORS: (U) *Physics, *Reports, *Abstracts, Research management, Plasmas(Physics), Electrostatics, Electron density, Kinetic theory, Excitons, Laser amplifiers, Decay, Positronium, Helium, Gamma rays

IDENTIFIERS: (U) WUAFOSR2301A3, PE61102F

AD-A136 519

AD-A136 518 20/14 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL INST OF STATISTICS

(U) Analysis of Adaptive Differential PCM (Pulse-Code Modulator) of a Stationary Gauss-Markov Input.

DESCRIPTIVE NOTE: Technical rept.,

JUN 83 37P

PERSONAL AUTHORS: Gerr,N. L. ;Cambanis,S. ;

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-1272

UNCLASSIFIED REPORT

ABSTRACT: (U) An Adaptive Matched Differential Pulse-Code Modulator (AMDPCM) is analyzed. The adaptation of the symmetric uniform quantizer parameter delta sub n is performed by fixed multipliers assigned to the quantizer output levels. The input is stationary first-order Gauss-Markov. The correlation of the samples is used as the leakage parameter in the matched integrator, with the predictive reconstruction similarly matched.

DESCRIPTORS: (U) *Matrices(Mathematics), *Convex sets, *Stability, Partial differential equations, Iterations, Theorems, Value

AD-A136 518

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 517 7/4

LA JOLLA INST CA

(U) Charge Transfer between Neon Ions and Metastable Helium.

SEP 83 5P

PERSONAL AUTHORS: Neynaber,R. H. ;Tang,S. Y. ;

CONTRACT NO. F49620-82-K-0023

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR TR-83-1254

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v100 n4 p316-319, 16 Sep 83.

Reprint: Charge Transfer between Neon Ions and Metastable Helium.

DESCRIPTORS: (U) *Neon, *Helium, *Charge transfer, Ions, Metastable state, Cross sections, Reprints

IDENTIFIERS: (U) WUAFOSR2301A4, PE61102F

AD-A136 508 12/1

NORTHWESTERN UNIV EVANSTON IL

(U) Markov Processes Applied to Control, Replacement, and Signal Analysis.

DESCRIPTIVE NOTE: Interim rept. 1 Jun 82-31 May 83,

AUG 83 9P

PERSONAL AUTHORS: Cinlar,E. ;

CONTRACT NO. AFOSR-82-0189

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1277

UNCLASSIFIED REPORT

ABSTRACT: (U) Research efforts during this period concentrated on the following topics: (a) Deformation of Solids; (b) Markov and Semimarkov Models of Deterioration; (c) Regenerative Systems and Markov Additive Processes; (d) Excursions of Markov Processes; and (e) Brownian Motion on Riemannian Manifolds.

DESCRIPTORS: (U) *Markov processes, Solids, Deformation, Semimarkov processes, Mathematical models, Deterioration, Brownian motion

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 507 12/1 6/16

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PRECESSES

(U) Infinite Dimensional Stochastic Differential Equation Models for Spatially Distributed Neurons.

DESCRIPTIVE NOTE: Technical rept.,

MAY 83 65P

PERSONAL AUTHORS: Kallianpur,G. ;Wolpert,R. ;

REPORT NO. TR-31

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1280

UNCLASSIFIED REPORT

ABSTRACT: (U) The membrane potential of spatially distributed neurons is modelled as a random field driven by a generalized Poisson process. Approximation to an Ornstein-Uhlenbeck type process is established in the sense of weak convergence of the induced measures in Skorokhod space. (Author)

DESCRIPTORS: (U) *Mathematical models, *Stochastic processes, *Differential equations, *Nerve cells, Membranes(Biology), Potential theory, Motor neurons, Physiology, Voltage, Hilbert space, Weak convergence

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

AD-A136 507

AD-A136 506 12/1 9/2

BROWN UNIV PROVIDENCE RI DIV OF APPLIED MATHEMATICS

(U) Aspects of Pattern Theory.

DESCRIPTIVE NOTE: Final rept. 1 Oct 77-30 Nov 81,

NOV 81 25P

PERSONAL AUTHORS: Grenander,U. ;McClure,D. E. ;

CONTRACT NO. AFOSR-78-3514

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1249

UNCLASSIFIED REPORT

ABSTRACT: (U) The research in this project is motivated by pattern analysis, the study of regular structures in natural and man-made phenomena. Problems of inferring structural representations of observed patterns raise new problems of nonparametric statistical inference. The method of sieves has been developed as a general approach for adapting classical techniques of inference, such as maximum likelihood for estimation, to nonparametric settings. To develop the basic probabilistic models that form the foundation for statistical inference of patterns, characterization results have been obtained that prescribe the kinds of probability models generated by the regularity constraints of pattern theory. The mathematical questions have been studied both by analytical and computational methods. The computer experiments have led to the development of a substantial library of APL programs for mathematical experimentation. Numerous applications are described in the publications from the project. (Author)

DESCRIPTORS: (U) *Statistical inference, *Patterns, *Structures, *Nonparametric statistics, *Computer programs, Libraries, Probability, Mathematical models, Maximum likelihood estimation, Least squares method, Stochastic processes, Manmade, Bibliographies, Abstracts

IDENTIFIERS: (U) *Pattern theory, Sieves, WUAFOSR2304A5, PE61102F

AD-A136 506

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 504 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PRECESSES

(U) Harmonizable Stable Processes on Groups: Spectral, Ergodic and Interpolation Properties.

DESCRIPTIVE NOTE: Technical rept.,

JUN 83 37P

PERSONAL AUTHORS: Weron,A. ;

REPORT NO. TR-32

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1270

UNCLASSIFIED REPORT

ABSTRACT: (U) This work extends to symmetric alpha-stable (S alpha S) processes, 1 < alpha < 2, which are Fourier transforms of independently scattered random measures on locally compact Abelian groups, some of the basic results known for processes with finite second moments and for Gaussian processes. Analytic conditions for subordination of left (right) stationarily related processes and a weak law of large numbers are obtained. The main results deal with the interpolation problem. Characterization of minimal and interpolable processes on discrete groups are derived. Also formulas for the interpolator and the corresponding interpolation error are given. This yields a solution of the interpolation problem for the considered class of stable processes in this general setting. (Author)

DESCRIPTORS: (U) *Groups(Mathematics), *Stability, Symmetry, Interpolation, Errors, Fourier transformation, Ergodic processes, Spectra, Statistical processes, Stochastic processes

IDENTIFIERS: (U) Abelian groups, WUAFOSR2304A5, PE61102F

AD-A136 503 20/4 1/3

MISSISSIPPI STATE UNIV MISSISSIPPI STATE DEPT OF AEROPHYSICS AND AEROSPACE ENGINEERING

(U) The Generation of Three-Dimensional Body-Fitted Coordinate Systems for Viscous Flow Problems.

DESCRIPTIVE NOTE: Interim rept. May 82-Apr 83,

JUL 83 15P

PERSONAL AUTHORS: Warsi,Z. U. A. ;

REPORT NO. AASE-83-256

CONTRACT NO. AFOSR-80-0185

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-83-1274

UNCLASSIFIED REPORT

ABSTRACT: (U) An analytical model for the generation and redistribution of surface coordinates which is to be used along with the full 3D code, has been developed. This essentially completes the development of spatial coordinates generation around multibodies and particularly around a wing-body combination in the 3D space. Numerical results for some multibody problems have been obtained. (Author)

DESCRIPTORS: (U) *Three dimensional flow, Viscous flow, Grids(Coordinates), Wing body configurations, Numerical methods and procedures, Mathematical models

IDENTIFIERS: (U) WUAFOSR2304A3, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 501 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PRECESSES

(U) The Nonlinear Filtering Problem for the Unbounded Case.

DESCRIPTIVE NOTE: Technical rept.,

JUN 83 15P

PERSONAL AUTHORS: Kallianpur,G. ;Karandikar,R. L. ;

REPORT NO. TR-33

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1271

UNCLASSIFIED REPORT

ABSTRACT: (U) The finitely additive nonlinear filtering problem for the model y sub t = h sub t (X sub t) + e sub t is solved when the function h is unbounded and satisfies no growth conditions whatever. (Author)

DESCRIPTORS: (U) *Mathematical filters, *Nonlinear systems, Problem solving, Gaussian noise, White noise, Bayes theorem, Optimization, Brownian motion, Functions(Mathematics), Partial differential equations

IDENTIFIERS: (U) *Nonlinear filtering, WUAFOSR2304A5, PE61102F

AD-A136 501

AD-A136 495 12/2 9/3 22/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Return Difference Feedback Design for Robust Uncertainty Tolerance in Stochastic Multivariable Control Systems.

DESCRIPTIVE NOTE: Interim rept. 1 Oct 81-30 Sep 82,

NOV 82 28P

PERSONAL AUTHORS: Safonov,M. G. ;

CONTRACT NO. AFOSR-80-0013

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-1251

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of the research has been to develop engineering methodologies applicable, but not limited, to aerospace automatic control design problems in which there are performance specifications requiring precise control of system behavior in the presence of stochastic disturbances (e.g., wind gusts) and large-but-bounded uncertainties in the dynamical response of the system (e.g., parameter uncertainty, unmodeled nonlinearities, and so forth). A cohesive body of theory has been developed that enagles engineers to relate the ability of feedback control systems to meet such specifications directly and quantitatively to the return difference matrix associated with the system's feedback loops. Now results enabling L infinity optimization of returned difference signular value Bode plots promise to be of great value in robust multivariable feedback controller synthesis. Continuing research is cujrrently being aimed at further tightening the links between this theory and the most recent developments of modern stochastic linear optimal control synthesis thoery, and extending the results to admit more practical problems, so that this theory may be used more effectively by engineers to efficiently and systematically design the feedback gains that determine a feedback system's return difference matrix. Such results substantially reduce the

AD-A136 495

AD-A136 495 CONTINUED

dependence of control engineers on intuition, simulation, and luck and provide the know-how to successfully and efficiently solve the increasingly complex and demanding aerospace control problems of the coming decades.

DESCRIPTORS: (U) *Systems engineering, *Control systems, *Problem solving, *Aerospace systems, Automatic, Specifications, Feedback, Multivariate analysis, Stochastic processes, Aircraft, Spacecraft, Loops, Optimization, Dynamic response, Research management

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1

AD-A136 494 20/5 20/8 9/5

STANFORD UNIV CALIF W W HANSEN LABS OF PHYSICS

(U) Investigation of Optimum Magnet Geometries for Gain-Expanded Free-Electron Lasers.

DESCRIPTIVE NOTE: Final rept. 15 Aug 81-31 Dec 82,

NOV 83 75P

PERSONAL AUTHORS: Schawlow,A. L. ;Madey,J. M. ;

CONTRACT NO. F49620-81-C-0098

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-83-1255

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this research was the identification of the critical magnet and storage ring parameters for optimization of the efficiency, power output and gain of gain-expanded storage ring free electron lasers. While previous research had identified the basic properties of these devices, the approximations and simplifications employed in these efforts for solution of the equations of motion had led to some ambiguities which were not readily resolvable within the framework of the model employed. To resolve these ambiguities, a model was developed for the FEL wiggler magnet which permits an exact solution of the equations of motion. Using this model numerical techniques have been employed to identify the dependence of the laser power output, gain, and efficiency on the magnet parameters. (Author)

DESCRIPTORS: (U) *Electrical lasers, *Electron beams, *Magnets, *Free electrons, Rings, Gain, Power levels, Storage, Approximation(Mathematics), Parameters, Optimization, Geometry, Power, Efficiency, Model theory, Output, Lasers

IDENTIFIERS: (U) FEL(Free Electron Lasers), Storage rings, Wiggler magnets, PE61102F, WUAFOSR2301A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 493 12/1

LOWELL UNIV MA CENTER FOR ATMOSPHERIC RESEARCH

(U) Research on the Inverse Problem of Scattering.

DESCRIPTIVE NOTE: Interim rept. 1 Oct 81-30 Sep 82,

OCT 82 6P

PERSONAL AUTHORS: Moses,H. E. ;

CONTRACT NO. AFOSR-81-0253

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-1275

UNCLASSIFIED REPORT

ABSTRACT: (U) The activities done under the grant for the fiscal year 1982 are summarized. Primary emphasis has been the expansion of the applications of the Gelfand-Levitan formalism to provide examples of potentials for which the Schroedinger equation has unusual spectral properties and thereby generalize the kinds of spectral representation which one can have. The investigators were partially successful in considering a case in which the potential is associated with a non-analytic reflection coefficient and a case in which the impulse response is a square pulse. The latter case may be of interest in providing passive means of convoluting a signal with a square pulse.

DESCRIPTORS: (U) *Inverse scattering, Acoustic reflection, Schrodinger equation

IDENTIFIERS: (U) Soliton theory, PE61102F, WUAFOSR2304A4

AD-A136 477 13/8 15/3 22/2

STANFORD UNIV CA

(U) Center of Excellence in Aerospace Manufacturing Automation.

DESCRIPTIVE NOTE: Annual rept. no. 1, Aug 82-Sep 83,

NOV 83 117P

PERSONAL AUTHORS: Cannon,R. H. , Jr.;Binford,T. O. ; Meindl,J. D. ;Brooks,R. ;

REPORT NO. SPO-13649-01-00

CONTRACT NO. F49620-82-C-0092

PROJECT NO. 2306

TASK NO. A3

MONITOR: AFOSR
TR-83-1203

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U) Air Force support of a Center of Excellence at Stanford University has provided the impetus and core for a major new entity, the Center for Automation and Manufacturing Science (CAMS). The new center draws from two well-known research groups at Stanford: the Robotics Group of Stanford's Artificial Intelligence Laboratory and the Automatic Control Group of Stanford's Department of Aeronautics and Astronautics. Ten professors and some 50 graduate students are participating in CAMS activities. CAMS in turn is the first of a new complex of centers at Stanford involved in the manufacturing enterprise: the Stanford Institute for Manufacturing and Automation (SIMA). Strong industrial interaction is a primary objective of SIMA. In our Air Force program we are focusing on robotic aspects of automation. Our goal is to make fundamental contributions to the underlying set of technologies that will enable the next generation of industrial robots to be far more capable than today's - will enable them to be lightweight, limber, deft, facile, quick, friendly, low-powered, seeing, sensing, thinking machines that can reason and

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 477 CONTINUED

strategize- can carry out tasks assigned at a high conceptual level. Specifically, our research focus is on fast, precise control of lightweight (flexible) manipulators, sensing, especially optical and tactile sensing, intelligent systems for robot task management, and computer vision for robot management. We are addressing the question of how to provide manipulator control so good that a whole new generation of manipulators can be developed-manipulators that are much lighter and far more facile than anything today's control systems could stably manage.

DESCRIPTORS: (U) *Air Force research, *Automation, *Aerospace systems, Manufacturing, Robots, Touch, Robotics, Assembly, Vision, Manipulators, Optical detection, Lightweight, Inspection, Control systems

IDENTIFIERS: (U) CAMS(Center for Automation and Manufacturing Science), Computer vision, PE61102F, WUAFOSR2306A3

AD-A136 460 7/5 7/4

AEROSPACE CORP LOS ANGELES CA CHEMISTRY AND PHYSICS LAB

(U) Nitric Oxide Vibrational Excitation from the N(4S)+02 Reaction.

DESCRIPTIVE NOTE: Technical rept.,

SEP 83 13P

PERSONAL AUTHORS: Herm,R. R. ;Sullivan,B. J. ;Whitson,M. E., Jr;

CONTRACT NO. F04701-81-C-0082, AFOSR-77-3348

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1213

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n5 p2221-2230, 1 Sep 83.

Reprint: Nitric Oxide Vibrational Excitation from the N(4S)02 Reaction.

DESCRIPTORS: (U) *Nitrogen oxides, *Laser induced fluorescence, *Vibrational spectra, Molecular states, Excitation, Kinetics, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 459 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.

DESCRIPTIVE NOTE: Technical rept.,

SEP 82 10P

PERSONAL AUTHORS: Heremans,J. ;Shayegan,M. ;Dresselhaus,M. S. ;Issi,J. P. ;

CONTRACT NO. F49620-83-C-0011, F49620-81-C-0006

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1207

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v26 n6 p3338-3346, 15 Sep 82.

Reprint: High-Magnetic-Field Thermal-Conductivity Measurements in Graphite Intercalation Compounds.

DESCRIPTORS: (U) *Graphite, *Thermal conductivity, *Magnetic fields, Temperature, Charge carriers, Lattice dynamics, Reprints

IDENTIFIERS: (U) GIC(Graphite Intercalation Compounds), PE61102F, WUAFOSR2306C3

AD-A136 459

AD-A136 458 7/3 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Model for Raman Scattering from Incompletely Graphitized Carbons.

DESCRIPTIVE NOTE: Technical rept.,

82 6P

PERSONAL AUTHORS: Lespade,P. ;Al-Jishi,R. ;Dresselhaus,M. S. ;

CONTRACT NO. F49620-83-C-0011, F49620-81-C-0006

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1209

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Carbon, v20 n5 p427-431 1982.

Reprint: Model for Raman Scattering from Incompletely Graphitized Carbons.

DESCRIPTORS: (U) *Carbon compounds, *Graphited materials, *Raman spectroscopy, Models, Scattering, Vibrational spectra, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2306C3

AD-A136 458

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 457 12/1 9/5 9/2 5/2

NORTHWESTERN UNIV EVANSTON IL

(U) Proceedings of the International Symposium on Multiple-Valued Logic (13th) Held at Kyoto, Japan on May 23-25, 1983.

DESCRIPTIVE NOTE: Final rept.,

MAY 83 431P

PERSONAL AUTHORS: Butler,J. T. ;

CONTRACT NO. AFOSR-83-0018

PROJECT NO. 2305

TASK NO. B3

MONITOR: AFOSR
TR-83-0836

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: For sales information of individual items see AD-P002 325 - AD-P002 381.

ABSTRACT: (U) The 1983 International Symposium on Multiple-Valued Logic is the thirteenth meeting in a series of annual symposia devoted exclusively to multiple-valued logic. Ten of the past meetings were held in North America, the other two in Europe. The ISMVL-83 in Kyoto, Japan, is the first symposium to be held in Asia. It is dedicated to the investigation of multiple-valued logic to narrow the gap between theory and practice. Because there are many researchers in Japan and neighboring countries, this symposium offers a unique opportunity for a large number of multiple-valued logic researchers to meet. An Asian conference will encourage the technological development of mainland China, where there are 3000 mathematicians engaged in the study of fuzzy logic. In addition to many speakers, from Japan, we have several newcomers from Thailand, China, and Nigeria.

DESCRIPTORS: (U) *Mathematical logic, *Computer logic, *Symposia, *Logic devices, *Logic circuits, Memory devices, Information systems, Value engineering, Multiple operation, Binary processors, International, Networks, Value, North America, Philosophy, Nigeria, Europe, Thailand, Logic, Asia, China, Japan

AD-A136 457

AD-A136 457 CONTINUED

IDENTIFIERS: (U) Compilation Reports, Multiple valued logic, Fuzzy logic, Logic design, PE61102F, WUAFOSR2305B3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 357 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Lattice-Dynamical Model for Alkali-Metal-Graphite Intercalation Compounds.

OCT 82 17P

PERSONAL AUTHORS: Al-Jishi,R. ;Dresselhaus,G. ;

CONTRACT NO. F49620-83-C-0011, F49620-81-C-0006

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1205

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v26 n8 p4523-4538, 15 Oct 82.

Reprint: Lattice-Dynamical Model for Alkali-Metal-Graphite Intercalation Compounds.

DESCRIPTORS: (U) *Graphite, *Lattice dynamics, Potassium, Rubidium, Cesium, Phonons, Raman spectra, Scattering, Reprints

IDENTIFIERS: (U) GIC(Graphite Intercalation Compounds), PE61102F, WUAFOSR2306C3

AD-A136 357

AD-A136 349 20/12 7/4

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers,

83 10P

PERSONAL AUTHORS: Bhaumik,D. ;Mark,J. E. ;

CONTRACT NO. AFOSR-83-0027

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR TR-83-1223

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Polymer Science: Polymer Physics Edition, v21 p1111-1118 1983.

Reprint: Calculation of Electronic Band Structures for Some Rigid Benzobisoxazole and Benzobisthiazole Polymers.

DESCRIPTORS: (U) *Polymers, *Quantum electronics, *Energy gaps, Azoles, Energy bands, Electrical properties, Reprints

IDENTIFIERS: (U) PBO(Polybenzobisoxazole), PBT(Polybenzobisthiazole), PE61102F, WUAOSR2303A3

AD-A136 349

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 342 13/13 20/11

NEW MEXICO UNIV ALBUQUERQUE DEPT OF CIVIL ENGINEERING

(U) Identification of Damage in Hysteretic Structures.

DESCRIPTIVE NOTE: Annual rept. 1 Feb 82-28 Feb 83,

JUL 83 209P

PERSONAL AUTHORS: Wang,M. L. ;Paez,T. L. ;Ju,F. D. ;

CONTRACT NO. AFOSR-81-0086

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR
TR-83-1230

UNCLASSIFIED REPORT

ABSTRACT: (U) In structural engineering it is imperative to design each system to survive the inputs anticipated over the design life of the structure. Strong motion inputs cause systems to execute nonlinear responses, and during the strong motion responses, structures accumulate damage. Therefore, the capability to model nonlinear responses and to assess the damage level in a structure is essential for optimal design. Techniques for the diagnosis of damage in inelastic structures have been developed. The dissipated energy in mechanical systems is taken as a measure of damage accumulation. Two models for the simulation of damaged structural response have been developed. Both the single-degree-of-freedom and multi-degree-of-freedom systems were included in the analysis. The objective of this study is to use these models to estimate the amount of energy dissipated due to a strong motion input. The results show that structural damage can be predicted, even in the presence of measurement noise. (Author)

DESCRIPTORS: (U) *Structural engineering, Structures, Structural response, Dynamic loads, Blast loads, Earthquakes, Mathematical models, Damage assessment, Dynamic response, Identification

IDENTIFIERS: (U) Hysteretic structures, PE61102F, WUAFOSR2307C2

AD-A136 342

AD-A136 341 9/1 9/5

CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) Development of a Planar Heterojunction Bipolar Transistor for Very High Speed Logic.

DESCRIPTIVE NOTE: Annual technical rept. 1 Oct 82-30 Sep 83,

DEC 83 21P

PERSONAL AUTHORS: Long,S. I. ;

CONTRACT NO. AFOSR-82-0344

PROJECT NO. 2305

TASK NO. C1

MONITOR: AFOSR
TR-83-1214

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this project was to fabricate multiple heterostructure bipolar transistors in semi-insulating GaAs substrates. During the first year of effort, molecular beam epitaxial growth of doped aluminum-gallium arsenide (AlGaAs) gallium arsenide (GaAs) heterojunctions was carried out. GaAs layers were doped n-type with silicon from the background (1E16) up to 2E18 and p-type with beryllium up to 1E19. N-type AlGaAs was grown up to 30% aluminum composition and doped with silicon to 1.5E18. Tools were developed for lateral structuring of transistors such as beryllium ion implantation, reactive sputtering and thermal annealing. Single devices were grown, fabricated by mesa etching and tested. Current-voltage characteristics shows evidence of excess recombination current. (Author)

DESCRIPTORS: (U) *Bipolar transistors, Logic devices, Substrates, Gallium arsenides, Epitaxial growth, Planar structures, Heterojunctions, N type semiconductors, P type semiconductors, Doping

IDENTIFIERS: (U) Very high speed logic, PE61102F, WUAFOSR2305C1

AD-A136 341

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 336 20/3 7/4

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Inelastic Scattering of Neutrons by Surface Spin Waves on Ferromagnets.

NOV 82 14P

PERSONAL AUTHORS: Mazur,P. ;Mills,D. L. ;

CONTRACT NO. F49620-78-C-0019

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1039

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v26 n9 p5175-5186, 1 Nov 82.

Reprint: *Inelastic Scattering of Neutrons by Surface Spin Waves on Ferromagnets.*

DESCRIPTORS: (U) *Ferromagnetic materials, *Inelastic scattering, Neutron scattering, Spin states, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2306C2

AD-A136 336

AD-A136 333 20/5

AUSTIN RESEARCH ASSOCIATES INC TX

(U) Theoretical Studies on Free Electron Lasers.

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 82-30 Sep 83,

NOV 83 129P

PERSONAL AUTHORS: Rosenbluth,M. N. ;Wong,H. V. ;Moore,B. N. ;

REPORT NO. I-ARA-83-U-62, ARA-502

CONTRACT NO. F49620-81-C-0077, ARPA Order-3923

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-83-1204

UNCLASSIFIED REPORT

ABSTRACT: (U) The subject of this investigation has been the Free Electron Laser (FEL), a device which is capable of converting the kinetic energy of a relativistic electron beam into coherent electromagnetic radiation. The investigation focused on two main topics: (1) The FEL operated as an oscillator and an amplifier using variable parameter wigglers. (2) The FEL oscillator operated in conjunction with a storage ring using gain-expanded and phase area displacement wigglers. A summary and details of progress for the period October 1, 1982 - September 30, 1983 are presented.

DESCRIPTORS: (U) *Lasers, Free electrons, Kinetic energy, Energy conversion, Coherent electromagnetic radiation, Electron beams, Relativity theory, Oscillators, Laser amplifiers, Electromagnetic pulses, Sidebands, Gain

IDENTIFIERS: (U) *FEL(Free Electron Lasers), *Free electron lasers, Wigglers, WUAFOSR2301A1, PE61102F

AD-A136 333

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 332 7/4 20/2

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Lattice-Dynamical Model for Graphite,

OCT 82 10P

PERSONAL AUTHORS: Al-Jishi,R. ;Dresselhaus,G. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR. AFOSR
TR-83-1206

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v26 n8 p4514-4522, 15 Oct 82.

Reprint: Lattice-Dynamical Model for Graphite.

DESCRIPTORS: (U) *Graphite, *Lattice dynamics, Models, Molecular structure, Raman spectra, Scattering, Reprints

IDENTIFIERS: (U) WUAFOSR2306C3, PE61102F

AD-A136 327 7/3 7/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY

(U) Oxidation of Dodecamethylcyclohexasilane by m-Chloroperbenzoic Acid,

83 4P

PERSONAL AUTHORS: Alnaimi,I. S. ;Weber,W. P. ;

CONTRACT NO. AFOSR-80-0006

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1222

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v2 n7 p903-905 1983.

Reprint: Oxidation of Dodecamethylcyclohexasilane by m-Chloroperbenzoic Acid.

DESCRIPTORS: (U) *Silanes, *Oxidation, Chemical reactions, Benzoic acids, Cyclic compounds, Chemical bonds, Molecular structure, Reprints

IDENTIFIERS: (U) Silane/Dodecamethylcydohexa, Chloroperbenzoic acid, WUAFOSR2303B2, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 326 7/4 20/2

MICHIGAN UNIV ANN ARBOR DEPT OF CHEMISTRY

(U) Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl,

83 5P

PERSONAL AUTHORS: Ashe A. J. , III ;Butler,W. M. ; Diephouse,T. R. ;

CONTRACT NO. AFOSR-81-0099

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1212

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v2 n8 p1005-1008 1983.

Reprint: Synthesis and Molecular and Crystal Structure of 2,2',5,5'-Tetramethylbiarsolyl.

DESCRIPTORS: (U) *Organometallic compounds, *Synthesis(Chemistry), *Crystal structure, Lithium compounds, Arsines, Molecular structure, Chemical bonds, Structural analysis, Crystallography, Reprints

IDENTIFIERS: (U) Arsolyl/Tetramethylbi, WUAFOSR230382, PE61102F

AD-A136 326

AD-A136 319 7/4 7/5

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.

DESCRIPTIVE NOTE: Technical rept.,

83 4P

PERSONAL AUTHORS: Li,L. ;Field,R. W. ;

CONTRACT NO. F49620-83-C-0010

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1090

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n16 p3020-3022 1983.

Reprint: Direct Observation of High-Lying 3PIg States of the Na2 Molecule by Optical-Optical Double Resonance.

DESCRIPTORS: (U) *Sodium, *Laser induced fluorescence, *Vibrational spectra, Excitation, Electronic states, Spectroscopy, Resonance, Diatomic molecules, Reprints

IDENTIFIERS: (U) OODR(Optical - Optical Double Resonance), PE61102F, WUAFOSR2303B1

AD-A136 319

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 318 7/4 7/5

COLORADO UNIV AT BOULDER

(U) Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) + HF yields OH(v-0, 1) + F (-).

DESCRIPTIVE NOTE: Technical rept.,

JAN 83 7P

PERSONAL AUTHORS: Hamilton,C. E. ;Duncan,M. A. ;Zwier,T. S. ;Weisshaar,J. C. ;Ellison,G. B. ;

CONTRACT NO. AFOSR-78-3565

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1086

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v94 n1 p4-9, 7 Jan 83.

Reprint: Product Vibrational Analysis of Ion-Molecule Reactions by Laser-Induced Fluorescence in a Flowing Afterglow. O (-) HF yields OH(v-0, 1) F (-).

DESCRIPTORS: (U) *Molecular ions, *Laser induced fluorescence, *Vibrational spectra, Ions, Afterglows, Energy levels, Hydroxyl radicals, Chemical reactions, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 318

AD-A136 313 8/11

WEIDLINGER ASSOCIATES MENLO PARK CA

(U) Large-Scale Numerical Analysis of Seismic Waves in Basins.

DESCRIPTIVE NOTE: Interim rept. 1 Oct 81-30 Sep 82,

SEP 82 67P

PERSONAL AUTHORS: Wojcik,G. L. ;Isenberg,J. ;Vaughan,D. K. ;Wolf,R. E. ;

REPORT NO. R-8241

CONTRACT NO. F49620-82-C-0002

PROJECT NO. 2309

TASK NO. A1

MONITOR: AFOSR TR-83-1229

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the application of a large-scale numerical wave solver to the time domain study of seismic wave phenomena in basins typical of the Basin and Range province. The solver uses an explicit finite element algorithm designed for fully vectorized execution on the CRAY-1. Calculations were performed to study the effects of basin edge geometry on reflection and transmission of body and surface waves. Normal and tangential surface traction sources were applied on the model centerline. From the resulting full wave field solution, synthetic seismograms were generated and used to quantify principal phases. In addition, the body and surface wave interaction of two basins separated by a mountain was studied. This model required 120,000 elements and demonstrated that large-scale full wave field calculations are practical on the CRAY-1.

DESCRIPTORS: (U) *Seismic waves, *Basins(Geographic), Mountains, Wave propagation, Velocity, Mathematical models, Computerized simulation, Finite element analysis

IDENTIFIERS: (U) Wave-fields, CRAY-1 computers, PE61102F, WUAFOSR2309A1

AD-A136 313

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 312 20/7 14/2 20/5

STANFORD UNIV CALIF W W HANSEN LABS OF PHYSICS

(U) The Mark III Linac as a High Current Source for FEL (Free Electron Lasers) Experiments.

DESCRIPTIVE NOTE: Final technical rept. 31 Mar 82-30 Mar 83,

NOV 83 37P

PERSONAL AUTHORS: Yearian,M. R. ;

CONTRACT NO. F49620-82-K-0022

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-83-1235

UNCLASSIFIED REPORT

ABSTRACT: (U) The basic objective of this research was to determine the feasibility of the conversion of the Stanford Mark III linac to high-gradient operation to serve as an injector or driver for storage ring and single pass free electron laser experiments. The Mark III single section tests have been generally successful. In particular, it has been observed that the Mark III accelerator sections are capable of operating reliably and stably at high gradient if an appropriate vacuum is maintained in the structure, and if appropriate steps are taken to bake out the adsorbed contamination on the cavity walls. Electrons have also been accelerated in the test section to an energy in excess of 40 MeV.

DESCRIPTORS: (U) *Traveling wave electron accelerators, *Feasibility studies, *Lasers, Injectors, Klystrons, Vacuum, Storage, Rings, High power, Gradients, Test equipment, Pumping

IDENTIFIERS: (U) Free electron lasers, Mark-3 computers, PE61102F, WUAFOSR2301A1

AD-A136 312

AD-A136 307 20/8 20/5

ROCHESTER UNIV N Y LAB FOR LASER ENERGETICS

(U) Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 3.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Jan-31 Dec 82,

FEB 83 203P

PERSONAL AUTHORS: Forsyth,J. ;

CONTRACT NO. AFOSR-81-0059

MONITOR: AFOSR TR-83-1136-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A136 305.

ABSTRACT: (U) In this document the authors summarize our investigation of the reflecting properties of x-ray multilayers. The breadth of this investigation indicates the utility of the difference equation formalism in the analysis of such structure. The formalism is particularly useful in analyzing multilayers whose structure is not a simple periodic bilayer. The complexity in structure can be either intentional, as in multilayers made by in-situ reflectance monitoring, or it can be a consequence of a degradation mechanism, such as random thickness errors or interlayer diffusion. Both the analysis of thickness errors and the analysis of interlayer diffusion are conceptually simple, effectively one-dimensional problems that are straightforwared to pose. In the authors analysis of in-situ reflectance monitoring, they provide a quantitative understanding of an experimentally successful process that has not previously been treated theoretically. As x-ray multilayers come into wider use, there will undoubtedly be an increasing need for a more precise understanding of their reflecting properties. Thus, it is expected that in the future more detailed modeling will be undertaken of less easily specified structures than those above. The authors believe that their formalism will continue to prove useful in the modeling of these more complex structures. One such structure that may be of interest is that of a multilayer degraded by interfacial roughness.

AD-A136 307

AD-A136 307 CONTINUED

DESCRIPTORS: (U) *X rays, *Lasers, Difference equations, Reflectance, Cavity resonators, Roughness, Interfaces, Errors, Thickness

IDENTIFIERS: (U) *X ray multilayers

AD-A136 306 14/2 20/6 12/1

ROCHESTER UNIV N Y LAB FOR LASER ENERGETICS

(U) Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 2.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Jan-31 Dec 82,

FEB 83 217P

PERSONAL AUTHORS: Forsyth,J. ;

CONTRACT NO. AFOSR-81-0059

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-83-1136-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A136 307.

ABSTRACT: (U) A two part study of soft x-ray laser media is presented. Experimental observation of significant population inversion on the Balmer alpha transition in hydrogen-like flourine at 81 A in a line-focus laser plasma is reported. An analysis of the expected performance of soft x-ray multilayer reflects is presented. This volume discusses reflecting properties of X-ray multilayer devices.

DESCRIPTORS: (U) *X ray apparatus, *Reflectance, *Reflectivity, Difference equations, Lasers, Cavity resonators, Crystals, Diffraction, Thin films, Thickness, Errors, Coatings, Mirrors

IDENTIFIERS: (U) *X ray multilayer devices, PE61102F, WUAFOSR2301A8

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 305 20/5 20/9 9/2

ROCHESTER UNIV N Y LAB FOR LASER ENERGETICS

(U) Development of X-Ray Laser Media. Measurement of Gain and Development of Cavity Resonators for Wavelengths near 130 Angstroms. Volume 1.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Jan-31 Dec 82,

FEB 83 164P

PERSONAL AUTHORS: Forsyth,J. M. ;

CONTRACT NO. AFOSR-81-0059

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-83-1136-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A136 306. Doctoral thesis.

ABSTRACT: (U) A two part study of soft x-ray laser media is presented. Experimental observation of significant population inversion on the Balmer alpha transition in hydrogen-like flourine at 81 A in a line-focus laser plasma is reported. An analysis of the expected performance of soft x-ray multilayer reflects is presented. This volume discusses the development of an XUV (extreme ultraviolet) amplifier.

DESCRIPTORS: (U) *Laser amplifiers, *Ultraviolet lasers, Plasmas(Physics), *Computer programs, Cavity resonators, Inversion, Glass lasers, Recombination reactions, Instrumentation, Experimental data, Hydrogenation

IDENTIFIERS: (U) XUV amplifiers, XUV(Extreme Ultraviolet), X ray lasers, CYLINE computer program, PE61102F, WUAFOSR2301A8

AD-A136 305

AD-A136 300 7/4 20/2

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds,

82 6P

PERSONAL AUTHORS: Timp,G. ;Elman,B. S. ;Al-Jishi,R. ; Dresselhaus,G. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR
TR-83-1210

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Solid State Communications, v44 n7 p987-991 1982.

Reprint: Observation of Superlattice-Induced Raman Modes in Graphite-Potassium-Amalagam Compounds.

DESCRIPTORS: (U) *Graphite, *Lattice dynamics, Raman spectroscopy, Potassium, Molecular structure, Planar structures, X ray diffraction, Reprints

IDENTIFIERS: (U) Superlattices, WUAFOSR230C3, PE61102F

AD-A136 300

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 296 20/4

LEHIGH UNIV BETHLEHEM PA DEPT OF MECHANICAL ENGINEERING AND MECHANICS

(U) The Effects of Cylindrical Surface Modifications on Turbulent Boundary Layers.

DESCRIPTIVE NOTE: Interim rept.,

APR 83 146P

PERSONAL AUTHORS: Johansen,J. B. ;Smith,C. R. ;

CONTRACT NO. F49620-78-C-0071

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-1217

UNCLASSIFIED REPORT

ABSTRACT: (U) A study employing a combination of hydrogen bubble-wire flow visualization and hot-film anemometry measurements has been conducted to determine the effects sublayer scale streamwise surface modifications on the structure and flow characteristics of turbulent boundary layers. The surface modifications were created using very fine monofilament fishing line of an approximate non-dimensional height of h + = 4. Spanwise line spacings of 60 < s (+) < 160 were examined for a Reynolds number range 800 < Re sub theta < 1650. The hydrogen bubble-wire studies indicate that the lines appear to act as nucleation sites for low-speed streaks, but the influence of the lines on streak stabilization rapidly diminishes for y (+) > 10. Streak spacing distributions and statistics were developed from the visualization data for both modified and unmodified surfaces. These results clearly indicate that the surface modifications did affect the streak spacing characteristics, with the greatest effect of the lines on mean streak spacing distributions and statistics occurring for s (+) < 100. However the visualizations indicate that for y (+) > 10 the determined streak spacing distributions and statistics, of an unmodified surface.

DESCRIPTORS: (U) *Turbulent boundary layer, *Flow fields,

AD-A136 296

AD-A136 296 CONTINUED

Turbulent flow, Walls, Modification, Data reduction, Surfaces, Flow visualization

IDENTIFIERS: (U) WUAFOSR2307A2, PE61102F

AD-A136 296

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 292 9/2

PURDUE UNIV LAFAYETTE IN DEPT OF ELECTRICAL ENGINEERING

(U) A Versatile Parallel Image Processor System.

DESCRIPTIVE NOTE: Final rept. 1 Mar 78-31 Dec 82,

OCT 83 32P

PERSONAL AUTHORS: Siegel,H. J. ;

CONTRACT NO. AFOSR-78-3581

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-1231

UNCLASSIFIED REPORT

ABSTRACT: (U) PASM, a large-scale multimicroprocessor system being designed at Purdue University for image processing and pattern recognition, is described. This system can be dynamically reconfigured to operate as one or more independent SIMD and/or MIMD machines. PASM consists of a parallel computation unit, which contains N processors, N memories, and an interconnection network; Q micro controllers, each of which controls N/Q processors; N/Q parallel secondary storage devices; a distributed memory management system; and a system control unit, to coordinate the other system components. Possible values for N and Q are 1024 and 16, respectively. The interconnection network, control schemes, and memory management in PASM are described. Examples of how PASM can be used to perform image processing tasks are given. In addition, there is a list of 53 publications that describe in detail the research that has been supported by this grant. (Author)

DESCRIPTORS: (U) *Image processing, *Pattern recognition, *Microprocessors, *Parallel processors, Multiple operation, Parallel orientation, Computations, Control systems, Memory devices, Distribution, Management, Parts, Network flows

IDENTIFIERS: (U) MIMD machines, SIMD machines, Partitionable computers, WUAFOSR2304A2, PE61102F

AD-A136 292

AD-A136 290 9/5 9/3 20/3 20/12
20/1

POLYTECHNIC INST OF NEW YORK BROOKLYN MICROWAVE RESEARCH INST

(U) Basic Research in Electronics (JSEP) Joint Services Electronics Program.

DESCRIPTIVE NOTE: Annual rept. 1 Apr 82-31 Mar 83,

SEP 83 255P

PERSONAL AUTHORS: Oliner,A. A. ;

REPORT NO. POLY-MRI-1432-83

CONTRACT NO. F49620-82-C-0084

MONITOR: AFOSR
TR-83-1132

UNCLASSIFIED REPORT

ABSTRACT: (U) This Annual Report presents a summary of the scientific progress and accomplishments on research projects funded by the Joint Services Electronics Program (JSEP) for the contract period from 1 April 1982 through 31 March 1983. It does not contain information regarding accomplishments on research projects funded in other ways. The Joint Services Electronics Program at the Polytechnic is the core of interdisciplinary research in electronics encompassing programs in the Departments of Electrical Engineering and Physics under the aegis of the Microwave Research Institute. The research encompassed by this program is grouped under three broad categories: Electromagnetics, Solid State Electronics and Information Electronics.

DESCRIPTORS: (U) *Electronics, *Solid state electronics, *Electrical engineering, *Surface acoustic waves, Millimeter waves, Antenna arrays, Dielectric waveguides, Research management, Joint military activities, Thin films, Surface properties, Magnetic properties, Universities, Industries, Physics, Microwaves, Antennas, Chemistry, Electronics

IDENTIFIERS: (U) Image restoration, JSEP(Joint Services Electronics Program), PE61102F

AD-A136 290

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 289 20/11 13/13

NEW MEXICO UNIV ALBUQUERQUE BUREAU OF ENGINEERING RESEARCH

(U) Least Favorable Response of Inelastic Structures.

DESCRIPTIVE NOTE: Interim rept.,

MAR 83 58P

PERSONAL AUTHORS: Chang,F. C. ;Paez,T. L. ;Ju,F. ;

REPORT NO. CE-63(83)AFOSR-993-1

CONTRACT NO. AFOSR-81-0086

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR
TR-83-1226

UNCLASSIFIED REPORT

ABSTRACT: (U) In the design of a structural system, a test input in sought to conservatively represent an ensemble of measured field inputs. When a structure survives the test input, it is assumed that it would survive the field inputs. The method of shock response spectra is a technique for specifying conservative test inputs, but it has some disadvantages. In this investigation a technique is developed for the specification of test inputs. It is based on the method of least favorable response, and it overcomes some of the shortcomings of the method of shock response spectra. Numerical examples show that the present technique can be used in practical applications. (Author)

DESCRIPTORS: (U) *Shock(Mechanics), Vibration, Structural response, Shock spectra, Dynamic loads, Structural engineering, Dynamic response, Elastic properties

IDENTIFIERS: (U) PE61102F, WUAFOSR2307C2

AD-A136 289

AD-A136 288 20/4

LOWELL UNIV RESEARCH FOUNDATION MA

(U) Reattachment of a Three Dimensional, Incompressible Jet to an Adjacent Axisymmetric Inclined Surface.

DESCRIPTIVE NOTE: Final rept. 15 Apr 82-31 Jan 83,

MAR 83 44P

PERSONAL AUTHORS: Niemi,E. E., Jr;

CONTRACT NO. AFOSR-82-0215

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-83-1225

UNCLASSIFIED REPORT

ABSTRACT: (U) A study was made of the fluid mechanics of a thrust reverser jet reattaching to an aircraft nozzle afterbody. The problem basically involves the Coanda effect flow of a three-dimensional, incompressible jet to an adjacent axisymmetric, inclined surface. The equations were derived in integral form and programmed for numerical solution for the case of an exhaust flow with no opposing free stream flow. Test data are reported for a scale model of a nozzle afterbody exhausting against a target-type thrust reverser. Data are presented for surface pressure coefficient at various points along the model.

DESCRIPTORS: (U) *Thrust reversal, *Coanda effect, *Three dimensional flow, *Jet flow, Attachment, Incompressible flow, Numerical analysis, Computer programs, Exhaust gases, Afterbodies, Fuselages, Experimental data, FORTRAN, Pressure, Surfaces, Coefficients, Slope, Density, Velocity, Jet fighters, Transonic flight, Aircraft landings

IDENTIFIERS: (U) Reattached flow, Thrust reversers, Flow attachment, FORTRAN-4 programming language, PE61102F, WUAFOSR2307D9

AD-A136 288

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 287 20/5 20/14

COLUMBIA UNIV NEW YORK DEPT OF APPLIED PHYSICS AND NUCLEAR ENGINEERING

(U) High Power Submillimeter and Infrared Radiation from Intense Relativistic Electron Beams.

DESCRIPTIVE NOTE: Final rept. 1 Jan 80-31 Dec 82,

DEC 82 37P

PERSONAL AUTHORS: Marshall,T. C. ;Schlesinger,S. P. ;

CONTRACT NO. AFOSR 80-0018

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-83-1135

UNCLASSIFIED REPORT

ABSTRACT: (U) Free-electron lasers are investigated for obtaining coherent radiation in the submillimeter and infrared portions of the spectrum. (Author)

DESCRIPTORS: (U) *Electrical lasers, *Electron beams, *Coherent electromagnetic radiation, Infrared radiation, Submillimeter waves, High power, Raman spectra, Backscattering, Free electrons, Air Force research, Research management

IDENTIFIERS: (U) *Free electron lasers, PE61102F, WUAFOSR2301A1

AD-A136 287

AD-A136 286 7/5 1/4

ROCKWELL INTERNATIONAL ANAHEIM CA DEFENSE ELECTRONICS OPERATIONS

(U) Multicolor Electrochromic Display Technology.

MAY 83 9P

PERSONAL AUTHORS: Nicholson,M. M. ;Weismuller,T. P. ;

REPORT NO. SC5383.1PP

CONTRACT NO. F49620-83-C-0088

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1218

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the IEEE 1983 National Aerospace and Electronics Conference, v1 p368-374 May 83.

Reprint: Multicolor Electrochromic Display Technology.

DESCRIPTORS: (U) *Rare earth compounds, *Cyanine dyes, *Screens(Displays), Electrochemistry, Electrocoloration, Reprints

IDENTIFIERS: (U) Diphthalocyanines, PE61102F, WUAFOSR2303B2

AD-A136 286

AD-A136 269 7/3

NORTHWESTERN UNIV EVANSTON IL DEPT OF CHEMISTRY

(U) Synthesis and Chemistry of Energetic Metallotetraazadienes.

DESCRIPTIVE NOTE: Final rept. 1 Dec 82-30 Sep 83,

SEP 83 5P

PERSONAL AUTHORS: Trogler,W. C. ;

CONTRACT NO. AFOSR-83-0021

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1224

UNCLASSIFIED REPORT

ABSTRACT: (U) New approaches to the synthesis of metallotetraazadienes are described. These include reactions between organic azides and transition metal carbonyl complexes, as well as reactions between metal halide complexes and dilithiated tetrazenes. Attempts to prepare disubstituted tetrazenes by the oxidation of unsymmetrical blocked hydrazines is described. The preparation of super reduced metallotetraazadienes has also been achieved. (Author)

DESCRIPTORS: (U) *Synthesis(Chemistry), *Organometallic compounds, Chemical reactions, Azides, Transition metals, Carbonyl compounds, Metal compounds, Halides, Tetrazenes, Oxidation, Hydrazines, Reduction(Chemistry), Reactivities, Energetic properties

IDENTIFIERS: (U) *Metallote traazadienes, PE61102F, WUAFOSR230382

AD-A136 269

AD-A136 268 5/10

ILLINOIS UNIV AT URBANA DEPT OF PSYCHOLOGY

(U) Is Handwriting Posture Associated with Differences in Motor Control? An Analysis of Asymmetries in the Readiness Potential.

DESCRIPTIVE NOTE: Interim rept.,

82 50P

PERSONAL AUTHORS: Bashore,T. R. ;McCarthy,G. ;Heffley,E. F. ;Clapman,R. M. ;Donchin,E. ;

CONTRACT NO. F49620-79-C-0233

PROJECT NO. 2312

TASK NO. A4

MONITOR: AFOSR TR-83-1037

UNCLASSIFIED REPORT

ABSTRACT: (U) Levy and Reid's hypothesis that persons who write using the inverted posture have ipsilateral control of distal limb movements, particularly those involved in handwriting, was tested in three experiments in which asymmetries in the readiness potential (RP) were measured. In the first experiment, each subject executed a self-paced repetitive squeeze. Contralaterally larger RPs were recorded from all subjects, irrespective of handwriting posture. In two other experiments, subjects peformed the self-paced squeeze in one condition and wrote a single word repetitively in an analogous condition. Larger RPs were recorded over the contralateral cerebral hemisphere in most inverted-writing subjects in both conditions. Ipsilaterally larger RPs were recorded, however, from some left-handers while writing. These findings suggest that, although control of certain movements may originate from the ipsilateral motor cortex in a small proportion of left-handers, handwriting posture does not index this difference.

DESCRIPTORS: (U) *Psychomotor function, *Psychophysiology, *Performance(Human), Handwriting, Cerebral cortex, Hemispheres, Predictions, Response, Behavior, Laboratory tests, Electroencephalography

AD-A136 268

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 268 CONTINUED

IDENTIFIERS: (U) Neurophysiology, Movement, Neuropsychology, Inverted posture, Ipsilateral control, Readiness potential, Contralateral, Handwriting posture, Handedness, PE61102F, WUAFOSR2312A4

AD-A136 257 20/4

MCDONNELL DOUGLAS CORP LONG BEACH CA

(U) Unsteady Boundary Layers on Thin Bodies of Revolution.

DESCRIPTIVE NOTE: Technical rept.,

AUG 83 38P

PERSONAL AUTHORS: Cebeci,T. ;Stewartson,K. ;Schimke,S. M. ;

CONTRACT NO. F49620-82-C-0055, NSF-MEA80-18565

PROJECT NO. 2307

TASK NO. K1

MONITOR: AFOSR TR-83-1211

UNCLASSIFIED REPORT

ABSTRACT: (U) The evolution of unsteady boundary layers on the line of symmetry of a thin prolate spheroid in uniform motion at constant angle of attack after an impulsive start is studied for a prescribed pressure distribution and results have been obtained for angles of attack ranging from 30 degrees to 50 degrees. The unsteady boundary layer is initially unseparated but develops a region of reversed flow after a finite time. A short time later, the streamwise displacement thickness develops a pronounced peak and leads to a singularity of the same type as that observed by van Dommelen and Shen on a circular cylinder started impulsively from rest.

DESCRIPTORS: (U) *Boundary layer, *Unsteady flow, Flow separation, Bodies of revolution, Angle of attack, Airfoils

IDENTIFIERS: (U) Thin bodies, PE61102F, WUAFOSR2307K1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 250 7/5 7/4

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Structural and Dynamic Studies of Materials Possessing High Energy Content.

DESCRIPTIVE NOTE: Final technical rept. 1 Nov 80-31 Oct 83,

OCT 83 13P

PERSONAL AUTHORS: Turro,N. J. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1216

UNCLASSIFIED REPORT

ABSTRACT: (U) This final report updates and summarizes the research accomplished under this grant during the period of November 1, 1980 through October 31, 1983. We have emphasized investigations in the following areas: photochemical mechanisms through the use of time-resolved laser flash spectroscopy; Carbenes, radical pairs, ylides, singlet molecular oxygen and other high energy species; Detailed and systematic determination of the absolute rate constants for the addition of carbenes to ethylenes; Application of weak magnetic fields for controlling the reactivity of radical pairs in colloidal systems; Ability of weak magnetic fields to dramatically influence the rate and molecular weights in emulsion polymerization.

DESCRIPTORS: (U) *Chemiluminescence, *High energy, *Photochemical reactions, Polymers, Carbenes, Chemical radicals, Oxygen, Energetic properties, Reaction kinetics, Dynamics, Molecular properties, Spectroscopy

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F

AD-A136 247 20/7 11/3

NEW MEXICO UNIV ALBUQUERQUE INST FOR MODERN OPTICS

(U) Ion Beam Assisted Deposition of SiO2.

DESCRIPTIVE NOTE: Final rept. 1 Apr-31 Dec 82, 83 33P

PERSONAL AUTHORS: McNeil,J. R. ;

CONTRACT NO. AFOSR-82-0165

PROJECT NO. 2306

TASK NO. D9

MONITOR: AFOSR TR-83-1220

UNCLASSIFIED REPORT

ABSTRACT: (U) A Kaufman ion source was modified to produce a low energy (30 eV) high current density (3 mA/sq cm) O(+) and O2(+) (O(+)/2(+)) ion beam at an optical surface being coated with SiO2. Films of SiO2 were deposited with O(+)/O2(+) ion bombardment at low energy (30 eV) and at high energy (500 eV). Application of the ion-assist technique has the following features: (1) Durable coatings can be produced at low substrate temperature; (2) Film stoichiometry is improved, particularly for low energy bombardment; (3) Hydrogen content of the film is reduced under certain conditions of bombardment; and (4) Stress and structure of SiO2 films are not greatly affected by ion bombardment. (Author)

DESCRIPTORS: (U) *Ion bombardment, *Deposition, *Silicon coatings, *Thin films, Silicon dioxide, Ion sources, Ion beams, Low energy, High energy, Experimental data, Low temperature, Substrates, Stoichiometry, Hydrogen, Charts, Graphs, Light transmission, Optical properties

IDENTIFIERS: (U) WUAFOSR2306D9, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 246 20/3

KENT STATE UNIV OHIO

(U) Metastable Superconducting Pairs with Large Momentum.

DESCRIPTIVE NOTE: Final scientific rept. 15 Feb 82-15 Jan 83.

JUN 83 9P

PERSONAL AUTHORS: Allender,D. W. ;

CONTRACT NO. AFOSR-82-0105

PROJECT NO. 2301

TASK NO. D9

MONITOR: AFOSR TR-83-1227

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical study of the possibility of finite momentum pairing in one- and two-dimensional superconductors was carried out. When the effects of zero momentum pairing, finite momentum pairing, and a charge density wave were simultaneously considered for a one-dimensional system, it was found that the relative phases of the complex gap parameters for each of the three types of order were important. The resulting energy gap was obtained, and the nature of the ground state was examined and found to depend on the values of the effective interaction coupling constants. For the two-dimensional system, it was shown that analogous to previously known results in one dimension, the binding energy of electron pairs, as a function of momentum, has a relative maximum at momentum greater than twice the Fermi momentum. (Author)

DESCRIPTORS: (U) *Superconductors, *Metastable state, Superconductivity, Momentum, Two dimensional, One dimensional, Charge density, Energy gaps, Ground state, Fermi surfaces

IDENTIFIERS: (U) WUAFOSR2301D9, PE61102F

AD-A136 246

AD-A136 245 7/2 7/3

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) A Simple High-Yield Preparation of Potassium Tris(oxalato)iridate(III) with a Novel Solvent Extraction Step.

DESCRIPTIVE NOTE: Technical rept.,

82 3P

PERSONAL AUTHORS: Flynn,C. M. , Jr.;Demas,J. N. ;

CONTRACT NO. AFOSR-78-3590, NSF-CHE77-20379

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1130

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganica Chimica Acta, v65 pL163-L164 1982.

Reprint: A Simple High-Yield Preparation of Potassium Tris(oxalato)iridate(III) with a Novel Solvent Extraction Step.

DESCRIPTORS: (U) *Organometallic compounds, *Synthesis(Chemistry), Potassium compounds, Iridium compounds, Preparation, Solvent extraction, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 245

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 244 7/5 6/1

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.

DESCRIPTIVE NOTE: Technical rept.,

83 6P

PERSONAL AUTHORS: Turro,N. J. ;Cox,G. S. ;Li,X. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1189

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Photochemistry and Photobiology, v37 n2 p149-153 1983.

Reprint: Remarkable Inhibition of Oxygen Quenching of Phosphorescence by Complexation with Cyclodextrins.

DESCRIPTORS: (U) *Phosphorescence, *Quenching(Inhibition), Decay, Oxygen, Dextrins, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 243 20/12 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

(U) Fast Relaxing Absorptive Nonlinear Refraction in Superlattices.

DESCRIPTIVE NOTE: Technical rept.,

NOV 83 4P

PERSONAL AUTHORS: Yuen,S. Y. ;

CONTRACT NO. F49620-80-C-0008, NSF-DMR82-11416

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1169

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v43 n9 p813-815, 1 Nov 83.

Reprint: Fast Relaxing Absorptive Nonlinear Refraction in Superlattices.

DESCRIPTORS: (U) *Superconductors, *Electrooptics, Free electrons, Lattice dynamics, Optical properties, Relaxation, Refraction, Absorption, Reprints

IDENTIFIERS: (U) PE61102, WUAFSOR2306C2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 238 20/5 7/4

NEW MEXICO UNIV ALBUQUERQUE DEPT OF CHEMISTRY

(U) Rates of Relaxation in the Upper Vibrational Levels of HF (Hydrogen Fluoride) and DF (Deuterium Fluoride).

DESCRIPTIVE NOTE: Final scientific rept. 30 Sep 80-31 Aug 82.

AUG 82 12P

PERSONAL AUTHORS: Coleman,W. F. ;

CONTRACT NO. AFOSR-79-0086

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-83-1106

UNCLASSIFIED REPORT

ABSTRACT: (U) This program has the aim of measuring various relaxation processes from highly excited vibrational levels of HF and/or DF. These rates are important for complete understanding of the HF and DF chemical laser. (Author)

DESCRIPTORS: (U) *Hydrogen fluoride lasers, *Chemical lasers, *Vibrational spectra, *Relaxation, Excitation, Energy levels, Deuterium compounds, Rates

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A1

AD-A136 237 12/1 20/13 11/6

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MATHEMATICS

(U) Monte Carlo Study of the Phase Diagrams of Binary Alloys with Face-Centered Cubic Lattice Structure.

DESCRIPTIVE NOTE: Interim technical rept.,

82 42P

PERSONAL AUTHORS: Binder,K ;Lebowitz,J. L. ;Phani,M. K. ; Kalos,M. H. ;

CONTRACT NO. AFOSR-78-3522, DE-AC02-76ER03077

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-83-1017

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: *Prepared in cooperation with New York Univ., N.Y. Courant Inst. of Mathematical Science and Kernforschungsanlage Juelich, Germany, F.R. Institut fuer Festkoerperforschung.

ABSTRACT: (U) The authors describe the results of Monte Carlo computations of the coherent phase diagram (in the temperature-composition plane) of ordering binary alloys on a face-centered cubic lattice. Results on long- and short-range order parameters as well as ordering energies are also given. They consider the system with nearest neighbor interaction in the grand-canonical ensemble (equivalent to an Ising antiferromagnet in a magnetic field) as well as in the canonical ensemble (fixed composition. Results with next-nearest neighbor interaction are also given, and for both models a comparison with other available predictions is made, particularly with the cluster-variation method. While the latter is found to be quite accurate at stoichiometric composition, it appears to do less well in the more general case. The tetrahedral approximation of the cluster variation method predicts a topology of the phase diagram, in the case of nearest-neighbor interaction different from the computer simulations. Some consequences for the interpretation of the behavior of

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 237 CONTINUED

copper-gold alloys are indicated. (Author)

DESCRIPTORS: (U) *Monte Carlo method, *Computations, *Phase diagrams, *Binary alloys, Simple cubic lattices, Charts, Computerized simulation, Interactions, Magnetic fields, Copper alloys, Gold alloys, Stoichiometry

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A8

AD-A136 227 20/12 7/4

PARIS-6 UNIV (FRANCE) LABORATOIRE D'OPTIQUE DES SOLIDES

(U) Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys.

AUG 82 21P

PERSONAL AUTHORS: Theye,M. L. ;Van,V. N. ;Fisson,S. ;

CONTRACT NO. AFOSR-78-3701

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1200

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Philosophical Magazine B, v47 n1 p31-50 1983.

Reprint: Validity of the Free-Electron Model for Ag-Ge and Au-Ge Amorphous Metallic Alloys.

DESCRIPTORS: (U) *Germanium alloys, *Free electrons, Silver, Gold, Models, Electrical resistance, Optical properties, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2306C3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 224 20/7 20/9 20/10 12/1

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) Relativistic Broadening Near Cyclotron Resonance.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 45P

PERSONAL AUTHORS: Imre,K. ;Weitzner,H. ;

REPORT NO. MF-101

CONTRACT NO. DE-AC02-76ER03077, AFOSR-81-0020

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR,DOE/ER
TR-83-0992,03077-198

UNCLASSIFIED REPORT

ABSTRACT: (U) Relativistic broadening of absorption (or emission) lines near cyclotron resonance in a warm plasma is investigated using the linearized relativistic Vlasov-Maxwell system. The unperturbed state is assumed to be isotropic, but not necessarily Maxwellian. The expansion parameter is eta = v sub e/c, v sub e being the electron thermal speed. It is assumed that the wave frequency, plasma frequency, and cyclotron frequency are all comparable in magnitude, and the refractive index n = O(1) . The parameter alpha = eta/n is of arbitrary order, thus the results are uniformly valid for all values of oblique propagation angles, although the relativistic effects are negligible for alpha <<1. The dielectric tensor is reordered, and the dispersion relation appropriate for this problem is derived to the lowest significant order in eta. The results are expressed in terms of the readily calculable (generalized) plasma dispersion function Z. In the Maxwellian case the results are alegbraic in Z, and unlike the previously published results, they do not involve infinite integrals or series imposed on Z, thus leading to simple and efficient evaluations. The case of perpendicular propagation is obtained by taking the large alpha limit. Some inconsistencies in the literature dealing with the extraordinary mode are resolved. (Author)

DESCRIPTORS: (U) *Cyclotron resonance, *Plasmas(Physics),

AD-A136 224 CONTINUED

*Relativity theory, Absorption spectra, Emission spectra, Dispersion relations, Line spectra, Isotropism, Dielectrics, Tensors, Maxwells equations, Refractive index, Harmonic analysis

IDENTIFIERS: (U) Relativistic broadening, WUAFOSR2304A4, PE61102F

AD-A136 224

AD-A136 223 12/1 20/6

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF PHYSICS

(U) A Comparison of Optical versus Hardware Fourier Transforms.

DESCRIPTIVE NOTE: Final rept. 1 Jul-31 Oct 83,

OCT 83 29P

PERSONAL AUTHORS: Almeida,S. P. ;

CONTRACT NO. AFOSR-83-0200

PROJECT NO. 2305

TASK NO. D9

MONITOR: AFOSR
TR-83-1077

UNCLASSIFIED REPORT

ABSTRACT: (U) A comparison of the optical transform versus the hardware Fourier transform was made for two input functions: a rectangular aperture and a six-pointed star design. The optical transforms were modified using sharp and smooth lowpass as well as highpass filters. The results were compared against those obtained using the array processor hardware at the Brooks Air Force Base, School of Aerospace Medicine. The ringing observed in the lowpass filtered results of the array processor was simulated by the optical methods. However, certain asymmetric in the hardware ringing data were not observed optically. A discussion of the ringing and how to eliminate it is also presented. (Author)

DESCRIPTORS: (U) *Fourier transformation, *Optical processing, *Comparison, Input, Low pass filters, High pass filters, Apertures, Mathematical filters, Experimental data, Spatial filtering

IDENTIFIERS: (U) *Optical Fourier transforms, Hardware Fourier transforms, Array processors, WUAFOSR2305D9, PE61102F

AD-A136 223

AD-A136 222 12/1 5/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Research in Stochastic Processes.

DESCRIPTIVE NOTE: Interim rept. 1 Nov 81-31 Oct 82,

OCT 82 72P

PERSONAL AUTHORS: Cambanis,S. ;Carroll,R. J. ;Kallianpur, G. ;Leadbetter,M. R. ;

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1234

UNCLASSIFIED REPORT

ABSTRACT: (U) Research was conducted and directed in the area of stochastic processes by three Principal Investigators and their associates, and in estimation in statistical models. The main areas of research activity for each Principal Investigator and co-workers are as follows: (1) Asymptotic optimal quantizers, complex symmetric stable variables and processes, prediction and representation of stable processes, nonparametric spectral density estimation for stable processes, delayed delta and pulse code modulation; (2) Feynman integrals, stochastic nonlinear filtering, stationary random fields, stochastic differential equations and diffusion approximation models for neuron activity, white noise and generalized Brownian functionals, stochastic Radon transforms, splicing of measures; and (3) Extreme values of stationary stochastic sequences and processes, dependence structure of stochastic processes, extremes of non-stationary normal sequences, estimation of point process intensities.

DESCRIPTORS: (U) *Stochastic processes, *Research management, Mathematical models, Statistical analysis, Nonparametric statistics, Pulse code modulation, Complex variables, Sequences, Stability

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

AD-A136 222

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 218 3/2

TUFTS UNIV MEDFORD MA DEPT OF PHYSICS

(U) Possible Detection of Thermal Cyclotron Lines from Small Sources within Solar Active Regions.

DESCRIPTIVE NOTE: Interim rept.,

JUL 83 25P

PERSONAL AUTHORS: Willson,R. F. ;

CONTRACT NO. AFOSR-83-0019

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-1138

UNCLASSIFIED REPORT

ABSTRACT: (U) Theoretical spectra of thermal cyclotron line emission from solar active regions are presented for two frequency bands available at the Very Large Array (VLA). VLA synthesis maps of three active regions at 1380, 1540 and 1705 MHz are then presented. The maps of two of these regions show significant changes in the brightness temperature within these narrow frequency ranges. We show that these changes may be attributed to thermal cyclotron line emission in small regions (theta = 10 ins to 30 ins) where the magnetic field is relatively constant with H = 125-180 Gauss. An alternative interpretation, involving height-dependent variations in the physical conditions may also explain the changes in one of these regions. The potential to study coronal magnetic fields using VLA observations of cyclotron lines is also discussed.

DESCRIPTORS: (U) *Solar activity, *Cyclotrons, *Thermal radiation, *Line spectra, Emission spectra, Frequency bands, Magnetic fields, Spectrum analysis, Brightness, Temperature

IDENTIFIERS: (U) WUAFOSR2311A1, PE61102F

AD-A136 218

AD-A136 217 20/4

TEXAS A AND M UNIV COLLEGE STATION TURBOMACHINERY LABS

(U) Rotordynamic Forces Developed by Labyrinth Seals.

DESCRIPTIVE NOTE: Annual rept. 1 Sep 82-31 Aug 83,

OCT 83 43P

PERSONAL AUTHORS: Childs,D. W. ;Rhode D. L. ;

CONTRACT NO. F49620-82-K-0083

PROJECT NO. 2307

TASK NO. B1

MONITOR: AFOSR
TR-83-1133

UNCLASSIFIED REPORT

ABSTRACT: (U) Numerous tasks have been completed in developing measurement and prediction techniques for accurately determining the fluid-structure-interaction forces on labyrinth seal rotors. The best facility has been designed, fabricated, and assembled; the drive mechanism and instrumentation system have been tested. Further, various improvements to the test apparatus have been implemented. Also, the development of two basic computational approaches for predicting seal rotor forces has been successfully completed. These consist of an improved but approximate analytical model and an extensive computer program incorporating the complete Reynolds-averaged Navier-Stokes equations. The latter model solves finite difference equations in predicting the two-dimensional (axisymmetric) compressible flow in a concentric-rotor labyrinth seal cavity. Details of a corresponding incompressible flow prediction are presented and discussed. The final numerical model will allow prediction of the desired three-dimensional, eccentric-rotor flow field and the associated rotordynamic forces.

DESCRIPTORS: (U) *Turbomachinery, *Seals(Stoppers), *Fluid dynamics, *Force(Mechanics), Pressure, Rotors, HOusings, Computations, Incompressible flow, Compressible flow, Predictions, Numerical analysis

IDENTIFIERS: (U) WUAFOSR2307B1, PE61102F

AD-A136 217

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 216 17/7 20/6 16/4.1 12/1
20/1

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF ELECTRICAL ENGINEERING

(U) Optical Data Processing for Missile Guidance.

DESCRIPTIVE NOTE: Interim rept. Sep 82-Sep 83,

SEP 83 117P

PERSONAL AUTHORS: Casasent,D. ;

CONTRACT NO. AFOSR-79-0091

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR
TR-83-1103

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress on real-time 1-D and 2-D spatial light modulators, optical systolic array processors, optical image processing, and distortion-invariant pattern recognition are reported. Our real-time spatial light modulator research concerns the Soviet PRIZ device and bulk acoustic-optic transducers. Novel features detailed for the Soviet device include: uniform and directional spatial filtering and static image suppression or change detection. Systolic array processor research includes a new frequency-multiplexed architecture, realization of singular value decomposition and matrix decomposition algorithms. Optical image processing and pattern recognition research received major attention. A new class of nonlinear local operators including the Sobel operator were described and demonstrated. New optical feature generation techniques for distortion-invariant pattern recognition were developed. These include the generalized optical chord transformation. Our primary distortion-invariant pattern recognition research addressed synthetic discriminant functions with attention to two new efficient calculation techniques. The performance of synthetic discriminant functions for multi-class distortion-invariant pattern recognition, and initial noise performance of this optical pattern recognition algorithm. (Author)

AD-A136 216

AD-A136 216 CONTINUED

DESCRIPTORS: (U) *Autonomous navigation, *Optical correlators, *Operators(Mathematics), *Guided missiles, *Optical processing, *Data processing, *Light modulators, Foreign technology, High pass filters, High resolution, Matched filters, Change detection, Mathematical filters, Terminal homing, Pattern recognition, Real time, Kalman filtering, Images, Pattern recognition, Edges, Air to air missiles, Solutions(General), Acoustooptics, Optics, Algorithms, Data bases, Holography, USSR

IDENTIFIERS: (U) Sobel operators, Systolic arrays, Chord transformations, Feature extraction, Matrix inversions, PRIZ project, Nonlinear operators, Local operators, Matrix decompositions, Bulk transducers, Directional fields, Systolic processors, Optical arrays, Optical algorithms, Optical transformation, Russian equipment, WUAFOSR2305B1, PE61102F

IAC NO. GC-840159

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)Dat. processing, Optical systems, Missile guidance, Guidance systems, Guidance, Pattern recognition, Image processing, Arrays, Optical imaging, Processors, Acoustooptics, Transducers Spatial filtering, Optical correlators, Matrix methods, Algorithms, Soviet equipment, Real time, Modulators, Optical processors, Images, Correlation, Feature extraction, Signal processing, Optics, Errors, Computation.;

AD-A136 216

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 215 12/1 17/5

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF ELECTRICAL ENGINEERING

(U) Recursive Interpolation of Space-Limited Scenes.

DESCRIPTIVE NOTE: Final rept. 16 Jun 82-15 Jun 83,

JUL 83 54P

PERSONAL AUTHORS: Beex,A. A. L. ;

CONTRACT NO. AFOSR-82-0234

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-1125

UNCLASSIFIED REPORT

ABSTRACT: (U) The problem of extrapolation of scene-limited functions was investigated with an eye towards accommodating noisy measurements, and incorporating all available a priori information. An iterative projection approach was introduced, aimed specifically at removing a priori information and constraint incompatibility due to noisy measurements. Soft frequency domain measurement constraints and soft scene domain limitation constraints were proposed, and can alleviate convergence problems that occur when the imposed information is not compatible. The soft frequency domain measurement constraint specifically allows the algorithm iterate to deviate from the noisy measurements, in recognition of the fact that the measurements were noisy, and they should therefore not be imposed as an absolute or hard constraint. The resulting alternating projection algorithm was shown to correspond to a non-expansive operator so that many solutions exist, all of which satisfy the a priori information and constraints. (Author)

DESCRIPTORS: (U) *Recursive functions, *Interpolation, *Infrared detectors, Iterations, Algorithms, Convergence, Problem solving, Noise, Measurement, Subroutines

IDENTIFIERS: (U) Noisy data, Iterative deconvolution algorithm, Robust procedures, Scene analysis, WUAFOSR2304A2, PE61102F

AD-A136 215

AD-A136 207 3/2

TUFTS UNIV MEDFORD MA DEPT OF PHYSICS

(U) High-Resolution Observations of Solar Radio Bursts at 2, 6, and 20 cm Wavelength,

83 21P

PERSONAL AUTHORS: Willson,R. F. ;

CONTRACT NO. AFOSR-83-0019

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-1139

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Solar Physics, v83 p285-303 1983.

Reprint: High-Resolution Observations of Solar Radio Bursts at 2, 6, 20 cm Wavelength.

DESCRIPTORS: (U) *Solar disturbances, Radio astronomy, High resolution, Superhigh frequency, Ultrahigh frequency, Solar radio maps, Brightness, Temperature, Polarization, Radio telescopes, Netherlands, Reprints

IDENTIFIERS: (U) Westerbork synthesis radio telescope, Very large array, Solar radio bursts, PE61102F, WUAFOSR2311A1

AD-A136 207

DTIC REPORT BIBLIOGRAPH. SEARCH CONTROL NO. EVP02F

AD-A136 205 3/2 20/9

TUFTS UNIV MEDFORD MA DEPT OF PHYSICS

(U) Bright, Rapid, Highly Polarized Radio Spikes from the M Dwarf and Leo.

DESCRIPTIVE NOTE: Interim rept .

MAY 83 15P

PERSONAL AUTHORS: Lang,K. R. ;Bookbinder,J. ;Golub,L. ;

CONTRACT NO. AFOSR-83-0019

PROJECT NO 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-1140

UNCLASSIFIED REPORT

ABSTRACT: (U) We have observed a radio burst from the main sequence (dM4.5e) star AD Leo at 1400 MHz from 0536 to 0556 UT on 1983 February 1 at the Arecibo Observatory. A rapid sequence of highly polarized spikes was observed during the gradual rise of a longer lasting, unpolarized event. The maximum flux density of the spikes was S(max) = 130 mJy, and they had rise times less than or approx. 200 ms. The spikes were all 100% left hand circularly polarized with an instrumental uncertainty of 5%. The rise times provide an upper limit to the linear size L less than or approx. 6 x 10 to the 9th power cm for the emitter. Provided that the source is symmetric, it has an area that is less than three hundredths of the star's surface area. In this case, the lower limit to the brightness temperature of the spikes is TB greater than or approx. 10 to the 13th power K. The high brightness temperatures and high degrees of circular polarization are explained in terms of electron-cyclotron maser emission at the second harmonic of the gyrofrequency in longitudinal magnetic fields of strength HI approx. 250 gauss. The unpolarized gradual component did not exhibit any rapid fluctuations, and it was entirely analogous to the thermal emission of solar bursts. (Author)

DESCRIPTORS: (U) *Radio astronomy, *Cyclotron resonance, *Variable stars, *Harmonic generators, *Astrophysics, *Plasmas(Physics), Solar flares, Area coverage, Coherent

AD-A136 205 CONTINUED

radiation, Pulse rate, Dwarf stars, Burst transmission, Loops, Magnetic fields, Disks, Flux density, Solar radiation, Brightness, Very high frequency, Polarization, High temperature, Photosphere, Sequences, Thermal radiation, High rate, Emission, Spikes

IDENTIFIERS: (U) Bright spikes, STARS(Main Sequence), Rapid spikes, Arecibo observatory, Polarized spike, Circular polarization, Late type stars, Rise times, Gryofrequency, Caronae, Hot plasmas, AD leo, Coronal loops, Type M stars, Intense fields, Decimeter waves, Spots, PE61102F, WUAFOSR2311A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 204 20/12 9/1 20/5

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF MATERIALS SCIENCE

(U) Scientific Report on the International Conference on Metastable and Modulated Semiconductor Structures (MMSS) Held at Pasadena, California on 6-10 December 1982.

DESCRIPTIVE NOTE: Final rept.,

OCT 83 28P

PERSONAL AUTHORS: Madhukar,A. ;

CONTRACT NO. AFOSR-82-0211

PROJECT NO. 2306

TASK NO. B1

MONITOR: AFOSR
TR-83-1075

UNCLASSIFIED REPORT

ABSTRACT: (U) A brief summary of the highlights of the International Conference on Metastable and Modulated Semiconductor Structures is provided. The report emphasizes (i) the theme of conference and the systematic coverage of related topics (ii) a technical discussion of the papers presented, their inter-relationship and future prospects. (Author)

DESCRIPTORS: (U) *Semiconductors, *Structures, *Symposia, *Epitaxial growth, Mobility, Thin films, Transistors, Heterojunctions, Molecular beams, Semiconductor lasers, Deposition, Liquid phases, Silicon, Calcium compounds, Strontium compounds, Silicides, Fluorides, International

IDENTIFIERS: (U) MMSS(Metastable and Modulated Semiconductor Structures), Quantum wells, Modulated structures, Metastable structures, Multiple wells, Doping profiles, Rutherford scattering, Metal-organic vapors, PE61102F, WUAFOSR2306B1

AD-A136 204

AD-A136 203 7/5

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2'-bipyridine)ruthenium(II) to Laser Dyes.

83 8P

PERSONAL AUTHORS: Mandal,K. ;Pearson,T. D. L. ;Krug,W. P. ;Demas,J. N. ;

CONTRACT NO. AFOSR-78-3590

MONITOR: AFOSR
TR-83-1141

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v105 p701-707 1983.

Reprint: Singlet Energy Transfer from the Charge-Transfer Excited State of Tris(2,2-bipyridine)ruthenium(II) to Laser Dyes.

DESCRIPTORS: (U) *Metal complexes, *Photochemical reactions, Ruthenium compounds, Excitation, Energy transfer, Charge transfer, Dye lasers, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 203

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD A136 198 7/4

OREGON UNIV EUGENE

(U) Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory,

JUN 83 7P

PERSONAL AUTHORS: Chen,M. H. ;Crasemann,B. ;Mark,H. ;

CONTRACT NO. F49620-83-K-0020, AFOSR-79-0026

PROJECT NO 2301

TASK NO. A4

MONITOR: AFOSR
TR-83-1228

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v27 n6 p2989-2994 Jun 83.

Reprint: Radiationless Transitions to Atomic M 1,2,3 Shells: Results of Relativistic Theory.

DESCRIPTORS: (U) *Atomic energy levels, *Electron transitions, Auger electrons, Fluorescence, Relativity theory, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A4

AD-A136 197 20/12 20/6 12/1

AUBURN UNIV AL

(U) Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals,

JUL 83 5P

PERSONAL AUTHORS: Chen,A. B. ;Phokachaipatana,S. ;Sher,A. ;

CONTRACT NO. F49620-81-K-0012

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR
TR-83-1109

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v28 n2 p1121-1123, 15 Jul 83.

Reprint: Calculation of Optical Properties of Semiconductors with the Use of Simple Orbitals.

DESCRIPTORS: (U) *Semiconductors, *Optical properties, *Atomic orbitals, *Reflectivity, *Computations, Gallium arsenides, Photons, Gallium phosphides, Energy, Indium phosphides, Band theory of solids, Momentum, Reprints

IDENTIFIERS: (U) Reflectivity spectra, Kane chadi pseudopotentials, Photon energy, Hamiltonian matrices, Koster slater hamiltionians, Kramer's kronig analysis, Bloch states, Gaussian orbitals, Angular momentum, PE61102F, WUAFOSR2306C2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 196 9/5 9/2

CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

(U) Relaxation-Based Electrical Simulation,

SEP 83 26P

PERSONAL AUTHORS: Newton,A. R. ;Sangiovanni-Vincentelli,A. L. ;

CONTRACT NO. F49620 79 C-0178, DAAG29-81-K-0021

PROJECT NO. 2305

TASK NO. A9

MONITOR: AFOSR TR-83-1219

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Electron Devices, ved-30 n9 p1184-1207 Sep 83.

Reprint: Relaxation-Based Electrical Simulation.

DESCRIPTORS: (U) Circuit analysis, *Computerized simulation, *Computer aided design, *Integrated circuits, Nonlinear systems, Transients, Algorithms, Reprints

IDENTIFIERS: (U) Circuit simulators, Gauss seidel method, Relaxation methods, Sparse matrices, Linear relaxation, Iterated analysis, PE61102F, WUAFOSR2305A9

AD-A136 196

AD-A136 178 20/5

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

(U) Broadly Tunable Mode-Locked HgCdTe Lasers.

DESCRIPTIVE NOTE: Technical rept.,

SEP 83 4P

PERSONAL AUTHORS: Putnam,R. S. ;Salour,M. M. ;Harman,T. C. ;

CONTRACT NO. F49620-83-C-0147

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1102

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v43 n5 p408-409, 1 Sep 83.

Reprint: Broadly Tunable Mode-Locked HgCdTe Lasers.

DESCRIPTORS: (U) *Tunable lasers, *Semiconductor lasers, *Pulsed lasers, Epitaxial growth, Q switching, Neodymium lasers, Yag lasers, Gain, Reprints

IDENTIFIERS: (U) Mercury cadmium telluride, Mode locking, Synchronous lasers, Etalons, PE61102F, WUAFOSR2306C2

AD-A136 178

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 177 20/12 7/4

HONEYWELL CORPORATE TECHNOLOGY CENTER BLOOMINGTON MN

(U) Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.

DESCRIPTIVE NOTE: Technical rept.,

MAR 83 3P

PERSONAL AUTHORS: Hansen,G. L. ;Schmit,J. L. ;

CONTRACT NO. F49620-77-C-0028

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-0937

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physics, v54 n3 p1639-1640 Mar 83.

Reprint: Calculation of Intrinsic Carrier Concentration in Hg1-xCdxTe.

DESCRIPTORS: (U) *Cadmium tellurides, *Charge carriers, *Concentration(Chemistry), Mercury compounds, Temperature, Energy gaps, Mathematical models, Reprints

IDENTIFIERS: (U) Mercury cadmium tellurides, PE61102F, WUAFOSR2306C2

AD-A136 175 7/4 20/8

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Influence of Nuclear Spin on Chemical Reactions. Magnetic Isotope and Magnetic Field Effects. A Review.

DESCRIPTIVE NOTE: Technical rept.,

JAN 83 15P

PERSONAL AUTHORS: Turro,N. J. ;

CONTRACT NO. AFOSR-81-0013, DE-AC02-79ER10362

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1188

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the National Academy of Science, USA, v80 p609-621 Jan 83.

Reprint: Influence of Nuclear Spin on Chemical Reactions. Magnetic Isotope and Magnetic Field Effects. A Review.

DESCRIPTORS: (U) *Chemical reactions, *Nuclear spins, *Magnetic properties, Photochemical reactions, Dynamics, Isotopes, Chemical radicals, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 172 5/10

NEW YORK UNIV N Y

(U) Neuromagnetic Investigation of Workload and Attention.

DESCRIPTIVE NOTE: Interim technical rept. 1 Jan-31 Dec 82,

APR 83 5P

PERSONAL AUTHORS: Kaufman,L. ;Williamson,S. J. ;

CONTRACT NO. F49620-82-K-0014

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR
TR-83-0901

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *Psychophysiology, *Workload, *Attention, *Performance(Human), Electroencephalography, Measurement, Stimuli, Cognition, Brain, Mapping, Response

IDENTIFIERS: (U) *Neuromagnetism, Magscan, Field patterns, P300 complex, PE61102F, WUAFOSR2313A4

AD-A136 172

AD-A136 169 5/10 12/1 6/16

LOUISIANA STATE UNIV BATON ROUGE REMOTE SENSING AND IMAGE PROCESSING LAB

(U) The Law of Comparative Judgment: Theory and Implementation.

DESCRIPTIVE NOTE: Technical rept.,

OCT 82 61P

PERSONAL AUTHORS: Vasquez-Espinosa,R. E. ;Conners,R. W. ;

REPORT NO. RSIP/TR-403.82

CONTRACT NO. AFOSR-81-0112

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-1152

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical method for defining texture measures was defined by Conners and Vasquez. The use of this method requires a perceptual ranking which can be used to rank the relative visual differences among a set of texture pairs. This report describes the theoretical development and an implementation of such a perceptual ranking. This perceptual ranking is called the law of comparative judgement. It was developed by Thurstone. It allows n things to be ranked (scaled) based on pairwise responses obtained over all possible combination of n things taken two at a time.

DESCRIPTORS: (U) *Psychological tests, *Ranking, *Scaling factors, *Visual perception, *Psychophysics, Judgement(Psychology), Experimental data, Response, Texture, Measurement, Equations, Comparison, Subroutines, Random variables

IDENTIFIERS: (U) Comparative judgement law, PE61102F, WUAFOSR2304A2

AD-A136 169

AD-A136 168 9/2 12/1 20/6

LOUISIANA STATE UNIV BATON ROUGE REMOTE SENSING AND IMAGE PROCESSING LAB

(U) Markov Texture Generation.

DESCRIPTIVE NOTE: Technical rept.,

NOV 82 36P

PERSONAL AUTHORS: Vasquez-Espinosa,R. E. ;

REPORT NO. RSIP/TR-404.82

CONTRACT NO. AFOSR-81-0112

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-1153

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical method for defining texture measurements was defined in previous works. To implement this method, it is necessary to have the ability to generate textures. Two texture generation precedures are proposed: first, a modified Gagalowicz generation procedure and second, a Markov texture generation procedure. The objective of this report is to describe the implementation of the latter of these generation procedures.

DESCRIPTORS: (U) *Computer programs, *Markov processes, *Texture, *Image processing, Subroutines, Input output processing, Methodology, Matrices(Mathematics), Random number generators, Statistical analysis

IDENTIFIERS: (U) Markov texture generation program, Markov chains, Texture generation, PE61102F, WUAFOSR2304A2

AD-A136 168

AD-A136 158 20/4 12/1 5/1

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF MATHEMATICS

(U) Interim Technical Report, 1 June 1982-31 May 1983, Grant AFOSR-82-0213,

MAY 83 10P

PERSONAL AUTHORS: Nicolaides,R. A. ;

CONTRACT NO. AFOSR-82-0213

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-1092

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period, research continued in the area of numerical solution of the incompressible Navier-Stokes equations. In particular, the following topics have been addressed: (1) The question of achieving stable discretizations of the imcompressibility constraint; (2) The problem of obtaining accurate solutions in the limit of large Reynolds numbers; and (3) Devising efficient numerical solution algorithms for solving the nonlinear algebraic systems of equations arisings from the discretization step. A necessary condition for convergence of the discrete approximation was obtained. A major result achieved has been to show that many often used low order element pairs are, in fact, unstable in the sense of this criterion. In addition, new simple low order element pairs were introduced and proved to be stable. Concerning the second topic noted above, the investigator has taken an approach based on the idea that h (the discretization parameter) needs to be small only in certain locations, namely in boundary layers. Finally, solving the algebraic systems which arise from the discretization remains a major difficulty. Two new approaches have been developed, one dependent on time marching to the steady state limit, and the other based on an adaptation of a method used in structural mechanics to the fluids case. Four new scientific papers have been generated in the report period, to be published in the referred literature. (Author)

DESCRIPTORS: (U) *Navier Stokes equations, *Problem

AD-A136 158

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 158 CONTINUED

solving, *Research management, Boundary layer, Incompressibility, Reynolds number, Algorithms, Nonlinear systems, Algebra

IDENTIFIERS: (U) WUAFOSR2304A3, PE61102F

AD-A136 157 9/5 3/2 18/4

FLORIDA UNIV GAINESVILLE SPACE ASTRONOMY LAB

(U) Shuttle Flight Test of an Advanced Gamma-Ray Detection System.

DESCRIPTIVE NOTE: Final scientific rept. 1 Jan 82-31 Mar 83,

NOV 83 11P

PERSONAL AUTHORS: Rester,A. C. , Jr;

CONTRACT NO. AFOSR-82-0060

PROJECT NO. 2309

TASK NO. A1

MONITOR: AFOSR
TR-83-1199

UNCLASSIFIED REPORT

ABSTRACT: (U) A detector system consisting of an n-type, high-purity germanium detector in a bismuth germanate anticompton shield has been developed for flight on a space shuttle mission. The BGO shield consists of six trapezoidal segments, each one being 14.6 cm long by 2.74 cm thick, mounted in a hexagonal shape about the axis of the germanium detector can. (Author)

DESCRIPTORS: (U) *Gamma spectrometers, *Germanium, *N type semiconductors, Detectors, Spaceborne, Gamma rays, Gamma counters, Photomultiplier tubes, Bismuth compounds, Germanates, Radiation shielding, Compton scattering, Gamma ray spectra, Sun, Radiation belts

IDENTIFIERS: (U) *Gamma ray detectors, Bismuth germanate, GRAD(Gamma Ray Advanced Detectors), Anticompton shielding, UWAFOSR2309A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 154 11/6 20/11

OREXEL UNIV PHILADELPHIA PA DEPT OF MATERIALS ENGINEERING

(U) A Fundamental Study of P/M Processed Elevated Temperature Aluminum Alloys.

DESCRIPTIVE NOTE: Annual technical rept. 1 Oct 81-30 Sep 82,

MAR 83 25P

PERSONAL AUTHORS: Lawley,A. ;Koczak,M. J. ;

CONTRACT NO. AFOSR-82-0010

PROJECT NO. 2306

TACK NO. A1

MONITOR: AFOSR
TR-83-1144

UNCLASSIFIED REPORT

ABSTRACT: (U) Aluminum alloys exhibiting high strength and improved creep resistance at elevated temperatures offer the potential for lower weight and reduced cost in aerospace components. Powder processing, involving controlled atomization and hot consolidation, provides a means for fabricating candidate alloys; the microstructure consists of a stable fine-scale uniform dispersion of intermetallics in the aluminum marix. Retention of elevated temperature strength has been demonstrated in a P/M Al-Fe-Ni alloy. Atomized powder is characterized by a duplex microstructure of fine and coarse regions of FeNiAl9 (Vf approximately = 0.3) in the aluminum matrix. The fine microstructure is harder than the coarse microstructure and is table up to approximately 350 C, above which its hardness decreases rapidly. There is a gradual coarsening and decrease in hardness of the initially coarse regions with increasing temperature. The duplex microstructure is carried over into the hot pressed and extruded material. Changes in microstructure and hardness of the extruded material during elevated temperature exposure are similar to those occurring in the powder form. Hot tenisle test data (up to 400 C) indicate that the extruded material retains approximately 60% of its ambient strength up to approximately 250 C with ductility approaching 10%. This

AD-A136 154 CONTINUED

reflects a promising level of structural stability. These results and observations can be explained in terms of particle cooling rate, precipitation of aluminides, and aluminide coarsening during powder processing; powder consolidation temperatures should be kept as low as possible. (Author)

DESCRIPTORS: (U) *Aluminum alloys, *Powder metallurgy, *Physical properties, Microstructure, Heat resistant alloys, Creep strength, High strength, Stability, Mechanical properties, Iron alloys, Nickel alloys

IDENTIFIERS: (U) WUAFOSR2306A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 151 20/6

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Raman Scattering Mediated by Surface-Plasmon Polariton Resonance.

DESCRIPTIVE NOTE: Rept. for 1 Jan-31 Dec 82,

JAN 83 5P

PERSONAL AUTHORS: Ushioda,S. ;Sasaki,Y. ;

CONTRACT NO. AFOSR-82-0086, NAG3-322

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR
TR-83-1104

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n2 p1401-1404, 15 Jan 83.

Reprint: Raman Scattering Mediated by Surface-Plasmon Polariton Resonance.

DESCRIPTORS: (U) *Raman spectra, *Light scattering, Plasmons, Resonance, Surface waves, Electromagnetic radiation, Glass, Silver, Alcohols, Reprints

AD-A136 151

AD-A136 149 7/3

NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

(U) Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?

83 6P

PERSONAL AUTHORS: Gordon,M. S. ;Boudjouk,P. ;Anwari,F. ;

CONTRACT NO. AFOSR-80-0239

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1050

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemial Society, v105 n15 p4972-4976 1983.

Reprint: Are the Silacyclopentadienyl Anion and the Silacyclopropenyl Cation Aromatic?

DESCRIPTORS: (U) *Silicon compounds, *Aromatic compounds, Cations, Anions, Cyclic compounds, Reprints

IDENTIFIERS: (U) Pentadienyl/Silacyclo, Propenyl/ Siliacyclo, PE61102F, WUAFOSR2303B2

AD-A136 149

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 148 7/4 14/2

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Measurement of Photon Yields,

82 55P

PERSONAL AUTHORS: Demas,J. N. ;

CONTRACT NO. AFOSR-78-3590

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1129

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Optical Radiation Measurements v3 p195-248 1982.

Reprint: Measurement Photon Yields.

DESCRIPTORS: (U) *Photoluminescence, *Photons, *Measurement, Measuring instruments, Methodology, Quantum counters, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 142 7/3 7/4

COLORADO STATE UNIV FORT COLLINS DEPT OF CHEMISTRY

(U) Brillouin and Rayleigh Studies of Urea Single Crystals,

DEC 82 9P

PERSONAL AUTHORS: Yoshihara,A. ;Bernstein,E. R. ;

CONTRACT NO. AFOSR-82-0122

PROJECT NO. 2312

TASK NO. K1

MONITOR: AFOSR
TR-83-1160

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v77 n11 p5319-5326, 1 Dec 82.

Reprint: Brillion and Rayleigh Studies of Urea Single Crystals.

DESCRIPTORS: (U) *Urea, *Single crystals, *Rayleigh scattering, Temperature, Elastic properties, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312K1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 141 12/1

WEIDLINGER ASSOCIATES MENLO PARK CA

(U) Complex Symmetric Stable Variables and Processes,

83 19P

PERSONAL AUTHORS: Cambanis,S. ;

CONTRACT NO. F49620-80-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR. AFOSR
TR-83-1115

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Contributions to Statistics: Essays in Honour of Norman L. Johnson,

Reprint: Complex Symmetric Stable Variables and Processes.

DESCRIPTORS: (U) *Random variables, Symmetry, Stability, Covariance, Regression analysis, Stochastic processes, Integrals, Reprints

IDENTIFIERS: (U) Spectral methods, PE61102F, WUAFOSR2304A5

AD-A136 141

AD-A136 140 7/4 7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry,

82 9P

PERSONAL AUTHORS: Seyferth,D. ;Annarelli,D. C. ;Duncan,D. P. ;

CONTRACT NO. AFOSR-79-0007

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1182

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v1 p1288-1294 1982.

Reprint: Hexaethylsilirane. 3. Dimethylsilylene-Transfer Chemistry.

DESCRIPTORS: (U) *Silicon compounds, *Organic compounds, *Thermal properties, Chemical bonds, Olefin polymers, Heterocyclic compounds, Reprints

IDENTIFIERS: (U) Silirane/hexamethyl, PE61102F, WUAFOSR2303B2

AD-A136 140

AD-A136 139 12/1 17/2

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) Study of Finitistic Channel Models.

DESCRIPTIVE NOTE: Final scientific rept.,

AUG 83 12P

PERSONAL AUTHORS: Neuhoff,D. L. ;Shields,P. C. ;

CONTRACT NO. AFOSR-80-0054

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-83-1110

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Toledo Univ. OH. Dept. of Mathematics.

ABSTRACT: (U) The modeling of discrete-time stationary communication channels with memory was investigated. The approach was to develop distance measures to quantify the degree to which one channel or model approximate another and then to characterize the class of channels that can be well approximated by various types of models. A variety of channel distances were investigated. The results provide characterizations of the classes of channels approximable by finite memory models, primitive models, and finite state indecomposable models. The concept of channel entropy, which is the minimum amount of randomness needed to simulate a channel, was discovered. The results apply to both discrete and continuous alphabet channels. (Author)

DESCRIPTORS: (U) *Mathematical models *Multichannel communications, Stationary, Alphabets, Entropy, Approximation(Mathematics), Range(Distance)

IDENTIFIERS: (U) Channel models, PE61102F, WUAFOSR2304A6

AD-A136 139

AD-A136 137 7/4 7/5

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Picosecond Laser Studies of Excited State Processes.

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 80-30 Sep 83,

NOV 83 10P

PERSONAL AUTHORS: Eisenthal,K. B. ;

CONTRACT NO. AFOSR-81-0009

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1096

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress is reported in studies of key chemical and physical processes by which molecules in excited electronic states dissipate their excess energy. Many of these energy relaxing mechanisms and related molecular motions are so extremely rapid, especially in liquids, that they require special techniques for their study. To this end sophisticated picosecond laser systems were constructed which enable detection of transient absorption, emission and scattering events on the picosecond time scale. Spectroscopic methods are used to address two important classes of chemical problems. One is the key role played by excited state intramolecular charge transfer processes in opening up new pathways for chemical change, energy transfer and decay in molecular systems. The second area is aimed at the key aspect of chemical reactions, namely the identification and study of the properties of the short-lived chemical intermediates occurring in chemical reactions.

DESCRIPTORS: (U) *Molecules, *Electronic states, *Photodissociation, Kinetics, Lasers, Microsecond time, Excitation, Charge transfer, Energy transfer, Chemical reactions

IDENTIFIERS: (U) PE61102F, WUAFSOR2303B2

AD-A136 13[illegible]

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 135 12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

(U) Approximations for Nonlinear Filtering.

83 8P

PERSONAL AUTHORS: Mitter,S. K. ;

CONTRACT NO. AFOSR-82-0135

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-1113

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Nonlinear Stochastic Problems, p339-345 1983.

Reprint: Approximations for Nonlinear Filtering.

DESCRIPTORS: (U) *Mathematical filters, Nonlinear systems, Approximation(Mathematics), Equations, Optimization, Stochastic processes, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1

AD-A136 135

AD-A136 132 20/5 5/2

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

(U) Development and Applications of the Microchannel Spatial Light Modulator.

DESCRIPTIVE NOTE: Final rept. 30 Sep 81-31 Dec 82,

JUN 83 69P

PERSONAL AUTHORS: Warde,C. ;

CONTRACT NO. AFOSR-77-3328

PROJECT NO. 2305

TASK NO. B2

MONITOR: AFOSR TR-83-1107

UNCLASSIFIED REPORT

ABSTRACT: (U) The optically-addressed microchannel spatial light modulator (MSLM) is a versatile, real-time optical signal- and image-processing device that exhibits high optical sensitivity and high framing speed. It consists of a photocathode and a microchannel plate in proximity focus with an electro-optic crystal plate. A planar electron acceleration grid is often placed between the MCP and the electro-optic plate. The electro-optic plate carries a high-resistivity dielectric mirror on one side and a transparent conducting electrode on the other. The fundamental operating characteristics and materia's limitations of the device are discussed. The role of secondary electron emission in the operation of the device is stressed and some of the write, cycling, and readout modes and their limitations are described. In addition, the limitations of the inherent space-domain image-processing operations of the device are discussed. In the final section, the report summarizes some of the key results on the application of the MSLM to the problem of high resolution, all-optical, adaptive wavefront phase compensation for communication and imaging through the earth's atmosphere. (Author)

DESCRIPTORS: (U) *Light modulators, *Information processing, *Optical data, Signal processing, Adaptive systems, Real time, Low light levels, Image processing,

AD-A136 132

AD-A136 132 CONTINUED

Photocathodes, Microchannel plates, Electrooptics, Dielectrics, Mirrors

IDENTIFIERS: (U) PE61102F, WUAFOSR2305B2

AD-A136 124 13/3 20/11

COLORADO UNIV AT BOULDER DEPT OF CIVIL ENVIRONMENTAL AND ARCHITECTURAL ENGINEERING

(U) The Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.

DESCRIPTIVE NOTE: Interim rept.,

MAY 83 358P

PERSONAL AUTHORS: Meier,R. W. ;Ko,H. Y. ;Sture,S. ;Feng,C. C. ;

CONTRACT NO. AFOSR-81-0072

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR TR-83-0974

UNCLASSIFIED REPORT

ABSTRACT: (U) The addition of steel fibers to concrete-type materials has been shown to improve many of the engineering properties of those materials. Notable among them is an enhancement in the tensile strength of an otherwise weak and brittle material. Although much is known about the tensile strength of steel-fiber reinforced concrete (SFRC) under one-dimensional state of stress, little is known with regard to the strength behavior under multi-dimensional tension-compression loading. This is attributed to a lack of suitable equipment for simultaneously applying tensile and compressive stresses. The research program described herein is focused on developing such equipment to study the behavior of SFRC under combined loadings. A review of the state-of-the-art research on the tensile strength of SFRC is given and a review of various methods of applying tensile stresses to concrete specimens is presented. The problem is to be overcome in applying a pure principal tensile stress are discussed.

DESCRIPTORS: (U) *Reinforced concrete, *Fiber reinforcement, *Strength(Mechanics), Steel, Behavior, Loads(Forces), Tensile stress, Tensile strength, Stress strain relations, Failure(Mechanics), Deformation

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 124 CONTINUED

IDENTIFIERS: (U) SFRC(Steel Fiber Reinforced Concrete), Biaxial tension compression, Biaxial compression, PE61102F, WUAFOSR2307C2

AD-A136 124

AD-A136 122 12/1

DUKE UNIV DURHAM NC DEPT OF COMPUTER SCIENCE

(U) Search with Limited Resources.

DESCRIPTIVE NOTE: Technical rept.,

FEB 83 55P

PERSONAL AUTHORS: Mutchler,D. C. ;

REPORT NO. CS-1983-1

CONTRACT NO. AFOSR-81-0221

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1154

UNCLASSIFIED REPORT

ABSTRACT: (U) Most game-playing programs make each move after conducting only a partial search of the game tree and applying a static evaluation function at the terminal nodes of that partial search. Given limited resources, what is the optimal partial search to perform? This report presents a model for investigating this question. Results (including the answer to the above question) are obtained for a restricted case of the model. (Author)

DESCRIPTORS: (U) *Game theory, *Searching, *Mathematical models, Decision making, Strategy, Methodology, Nodes, Trees

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A2

AD-A136 122

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 114 7/5

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals,

83 3P

PERSONAL AUTHORS: Turro,N. J. ;Gould,I. R. ;Baretz,B. H. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1190

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 p531-532 1983.

Reprint: Absolute Rate Constants for Decarbonylation of Phenylacetyl and Related Radicals.

DESCRIPTORS: (U) *Phenyl radicals, *Photolysis, Carbonyl compounds, Reaction kinetics Reprints

IDENTIFIERS: (U) Phenylacetyl, Decarbonylation, PE61102F, WUAFOSR2303B2

AD-A136 106 9/2

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

(U) Requirements Analysis - A Management Perspective,

82 8P

PERSONAL AUTHORS: Yeh,R. T. ;

CONTRACT NO. F49620-80-C-0001

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1128

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in COMPSAC 82, v8-12 p1-7 1982.

Reprint: Requirements Analysis - A Management Perspective.

DESCRIPTORS: (U) *Computer programs, *Systems engineering, *Requirements, Computer program documentation, Management, Models, Performance(Engineering), Computer program reliability, Computer program verification, Data processing security, Maintenance, Cost analysis, Life cycles, Reprints

IDENTIFIERS: (U) *Software engineering, WUAFOSR2304A2, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP0[illegible]

AD-A136 103 12/1 20/4

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF MATHEMATICAL SCIENCES

(U) An Admissibility Criterion for Fluids Exhibiting Phase Transitions,

83 11P

PERSONAL AUTHORS: Slemrod,M. ;

CONTRACT NO. AFOSR-81-0172

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-1078

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Systems of Nonlinear Partial Differential Equations, p423-432 1983.

Reprint: An Admissibility Criterion for Fluids Exhibiting Phase Transitions.

DESCRIPTORS: (U) *Equations, *Compressible flow, *Fluid flow, Capillarity, Liquid phases, Vapor phases, Reprints

IDENTIFIERS: (U) Kortewegs theory, WUAFOSR2304A1, PE61102F

AD-A136 103

AD-A136 102 20/6

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Guided-Wave Polaritons in Thin Films of the Layered Compound GaSe,

JAN 83 15P

PERSONAL AUTHORS: Sasaki,Y. ;Ushioda,S. ;

CONTRACT NO. AFOSR-82-0086

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1105

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n2 p1122-1135, 15 Jan 83.

Reprint: Guided-Wave Polaritons in Thin Films of the Layered Compound GaSe.

DESCRIPTORS: (U) *Raman spectra, *Light scattering, Thin films, Gallium compounds, Selenium compounds, Reprints

IDENTIFIERS: (U) *Guided wave polaritons, WUAFOSR2306C2, PE61102F

AD-A136 102

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 101 20/5

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Theoretical Studies of Reactions in a Laser Field: F(2P(3/2),2P(1/2))+H2+eta omega(0.469 eV),

OCT 83 4P

PERSONAL AUTHORS: Last,I. ;Baer,M. ;Zimmerman,H. ;George, T. F. ;

CONTRACT NO. AFOSR-82-0046, NSF-CHE80-22874

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-83-1095

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v101 n2 p163-166, 14 Oct 83.

Reprint: Theoretical Studies of Reactions in a Laser Field: F(2P(3/2),2P(1/2))H2eta omega(0.469 eV).

DESCRIPTORS: (U) *Lasers, Electron transitions, Probability, High energy, Reprints

IDENTIFIERS: (U) *Laser fields, WUAFOSR2303A2, PE61102F

AD-A136 097 8/11

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

(U) Body Wave Amplitude and Travel Time Correlations Across North America,

AUG 83 16P

PERSONAL AUTHORS: Lay,T. ;Helmberger,D. V. ;

CONTRACT NO. F49620-81-C-0008

PROJECT NO. 3291

TASK NO. 40

MONITOR: AFOSR TR-83-1120

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Bulletin of the Seismological Society of America, v73 n4 p1063-1076 Aug 83.

Reprint: Body Wave Amplitude and Travel Time Correlations Across North America.

DESCRIPTORS: (U) *Seismic waves, Attenuation, Amplitude, Variations, Travel time, Corrections, North America, Geographical distribution, Coastal regions, Mountains, Primary waves(Seismic waves), Seismological stations, United States, Canada, Anomalies, Correlation, Reprints

IDENTIFIERS: (U) Body waves(Seismic waves), WUAFOSR329140, PE62714E

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 098 7/4

MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY

(U) Dependence of Electrocatalysis for Oxygen Reduction by Adsorbed Dicobalt Cofacial Porphyrins Upon Catalyst Structure.

DESCRIPTIVE NOTE: Journal publication,

83 11P

PERSONAL AUTHORS: Liu,H. Y. ;Weaver,M. J. ;Wang C. B. ; Chang,C. K. ;

CONTRACT NO. AFOSR-80-0271

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1157

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalysis Chemistry, V145 p439-447 1983.

Reprint: Dependence of Electrocatalysis for Oxygen Reduction by Adsorbed Dicobalt Cofacial Porphyrins Upon Catalyst Structure.

DESCRIPTORS: (U) *Electrocatalysts, *Cobalt compounds, Oxygen, Reduction(Chemistry), Porphyrins, Surface reactions, Catalysis, Reprints

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F

AD-A136 096

AD-A136 095 20/12 20/2

MASSACHUSETTS INST OF TECH CAMBRIDGE FRANCIS BITTER NATIONAL MAGNET LAB

(U) Impurity and Defect Characterization in Epitaxial GaAs, InP and the Ternary and Quaternary Compound Semiconductors.

DESCRIPTIVE NOTE: Interim technical rept. 1 Sep 81-31 Aug 82,

NOV 82 9P

PERSONAL AUTHORS: Button,K. J. ;Afsar,M. N. ;

CONTRACT NO. AFOSR-78-3708

PROJECT NO. 2306

TASK NO. B1

MONITOR: AFOSR TR-83-1142

UNCLASSIFIED REPORT

ABSTRACT: (U) The splitting of the spin doublet of the 1s 2p (m=+1) transition of the hydrogen-like silicon donor in n-GaAs has been observed as a function of applied magnetic field at low temperature. The splitting of the spin doublet increased with increasing magnetic field intensity. The dependence of the splitting on magnetic field intensity was not only larger than linear but was also larger than quadratic dependence in agreement with theory.

DESCRIPTORS: (U) *Semiconductors, *Epitaxial growth, *Defects(Materials), Gallium arsenides, Indium phosphides, Ternary compounds, Quaternary compounds, Impurities, Magnetic fields

IDENTIFIERS: (U) WUAFOSR2306131, PE61102F

AD-A136 095

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 093 6/4 9/2

DELAWARE UNIV NEWARK DEPT OF COMPUTER AND INFORMATION SCIENCES

(U) Elements of Knowledge-Based Expert Systems.

DESCRIPTIVE NOTE: Interim technical rept.,

MAR 82 23P

PERSONAL AUTHORS: Chester,D. ;

CONTRACT NO. AFOSR-80-0190

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1143

UNCLASSIFIED REPORT

ABSTRACT: (U) Expert systems are built to solve problems in application areas for which 'good' algorithms are not known. These systems consist of a global data base of assertions, a set of rules that represent small bits of an expert's knowledge, and a control strategy for applying the rules to the assertions. Agendas are used to make the control strategy more efficient. Efficiency can be further increased by indexing the rules and assertions in various ways, one of which is frames. A system for deriving formal specifications from natural language requirements is presented as an example. (Author)

DESCRIPTORS: (U) *Artificial intelligence, Problem solving, Natural language, Computer programming, Heuristic methods, Semantics, Reasoning, Memory devices, Information processing, Systems analysis, Requirements, Specifications, Algorithms

IDENTIFIERS: (U) *Expert systems, Knowledge representation, Forward chaining, Backward chaining, Control Strategy, WUAFOSR2304A2, PE61102F

AD-A136 093

AD-A136 089 11/1 20/11

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) Durability and Failure Analyses of a Silane Treated Alpha-A1203/Polyethylene Joint in Wet Environment.

DESCRIPTIVE NOTE: Final rept.,

JUN 83 31P

PERSONAL AUTHORS: Kaul,A. ;Sung,N. H. ;Chin,I. ;Sung,C. S. P ;

CONTRACT NO. F49620-79-C-0085

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR,ARO TR-83-1173,16355.5-MS

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Tufts Univ., Medford, MA. Dept. of Chemical Engineering.

ABSTRACT: (U) Investigated is the durability of the joints (Alpha-A1203/Gamma-APS/PE) in wet environment as a function of the gamma-APS thickness, dehydration of gamma-APS prior to joint formation and redrying the joint after a certain exposure. The joint strength measured by peel strength is found to decrease with exposure time in wet environment more rapidly in water than in 100% RH. With exposure time, the debonded area increases from the edges toward the central area of the joint. Relatively thin gamma-APS treatment on alpha-A1203 appear to provide more durable joint than thicker gamma-APS treatment resulting in an optimal thickness in the range of 0.3 approx.1% gamma-APS concentration level. Dehydration of gamma-APS lead to more durable joint with an optimal condition found between 1 approx. 2 days of dehydration at 100 deg C in vacuum. Regardless of the gamma-APS thickness and dehydration history, the failure in debonded area seems to occur by the hydrolysis of gamma-APS near alpha-A1203 side and by the deformation of polyethylene (cohesive failure) in the peeled area, as characterized by SEM and ESCA. The debonded area in the dried joint recovers little strength but in the bonded central areas, the

AD-A136 089

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 089 CONTINUED

strength is largely recovered, characterized ny the extensive deformation of polyethylene. Diffusion of water in gamma-APS near alpha-A1203 side rather than PE side can explain at least qualitatively most of the observed trends. Comparisons are made for the effects of gamma-APS thickness and dehydration on the durability in wet environment and adhesion promotion in dry environment as well as on their respective failure mode.

DESCRIPTORS: (U) *Adhesive bonding, *Bonded joints, *Strength(Mechanics), Aluminum oxides, Polyethylene, Silanes, Peel strength, Failure(Mechanics), Adhesion, Wet strength

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A2

AD-A136 089

AD-A136 088 20/5 9/1

MARYLAND UNIV COLLEGE PARK DEPT OF ELECTRICAL ENGINEERING

(U) Investigation of Cold Cathode and RF Excitation for Long Life CO2 Waveguide Lasers.

DESCRIPTIVE NOTE: Final rept. May 82-May 83,

MAR 83 28P

PERSONAL AUTHORS: Hochuli,U. ;

CONTRACT NO. N00014-79-C-0312, AFOSR-82-0058

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1134

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U) Document describes a Ag-Li compound cathode for the longitudinally d.c. excited, low power, CO2 waveguide laser. Discharge tube results with this cathode produced an acceptable gas composition over a period of 1000 hours. The sputtering rate was quite low and, most importantly, the sputtering products did adhere quite well in the form of a thin film on the closest, cooler surfaces. A laser, using two of these cathodes, still produced 72% of its initial power output after 9200 hours of continuous service. Failure analysis indicated internal mirror damage on one of the mirrors, most likely due to improper selection of the dielectric top layer. Considerably more sputtering took place in the laser than in the discharge tube due to a laser cathode temperature that was too low. In parallel with these efforts we have started to investigate the life potential of the transversely r.f. excited waveguide laser. Preliminary results are quite encouraging. These tests were carried out over periods close to 3000 hours and indicate that proper selection of electrode materials is quite important. A wave guide laser with one of the waveguide sides made from a platinum alloy still yields 74% of its initial 2.85W after 5200 hours of continuous operations.

AD-A136 088

DTIC REPOR" BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 088 CONTINUED

DESCRIPTORS: (U) *Carbon dioxide lasers, *Cold cathode tubes, Long life, Excitation, Waveguides, Silver, Lithium compounds, Direct current, Low power, Sputtering, Thin films, Gas discharges

IDENTIFIERS: (U) *Waveguide lasers, PE61102F, WUAFOSR2303A1

AD-A136 086 20/6 9/3

CALIFORNIA INST OF TECH PASADENA

(U) Acousto-Optic Processing of 2-D Signals Using Temporal and Spatial Integration.

DESCRIPTIVE NOTE: Annual rept. 1 Apr 82-31 May 83,

MAY 83 89P

PERSONAL AUTHORS: Psaltis,D. ;

CONTRACT NO. AFOSR-82-0128

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR TR-83-1100

UNCLASSIFIED REPORT

ABSTRACT: (U) Documents includes data on: Architectures; Coherence Properties of Pulsed Laser Diodes; Acousto-optic device data; Dynamic Range Issues; Image correlation; Synthetic aperture radar; 2-D Fourier transform; and Moments.

DESCRIPTORS: (U) *Signal processing, *Acoustooptics, *Optical processing, Image processing, Two dimensional, Integration, Architecture, Pulsed lasers, Semiconductor diodes, Synthetic aperture radar, Fourier transformation, Research management, Optical correlators, Charge coupled devices

IDENTIFIERS: (U) Laser diodes, PE61102F, WUAFORS2305B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EYPO2F

AD-A136 085 9/2 13/8 7/4

MANLABS INC CAMBRIDGE MASS

(U) Computer-Based Methods for Thermodynamic Analysis of Materials Processing.

DESCRIPTIVE NOTE: Final rept. 1 Oct 79-30 Sep 83,

NOV 83 158P

PERSONAL AUTHORS: Kaufman,L. ;

CONTRACT NO. F49620-80-C-0020

PROJECT NO. 2306

TASK NO. A2

MONITOR: AFOSR
TR-83-1099

UNCLASSIFIED REPORT

ABSTRACT: (U) The data base previously developed for multicomponent Sialon Ceramic phase diagrams has been expanded to cover Ce2O3, BeO and Y2O3 additions. Isothermal sections in the MgO-Si3N4-SiO2, Y2O3-SiO2-SiN4 and Ce2O3-SiO2-Si3N4 system near 2000 K were computed and compared with limited experimental data. The trajectory of ordering temperatures for A2/B2 and B2/DO3 reactions has been computed along the Fe3Si-Fe3Al composition path in the BCC of the Fe-Al-Si system and compared with experiment. The two phase (fcc & bcc) fields for ordered phases in the iron-aluminum-nickel, iron-aluminum-manganese, and the iron-nickel-manganese system between 700 C and 1200 C. Construction of a data base for fluoride systems consisting of systems containing ZrF4 which are employed tp synthesize fluoride glasses has been initiated and used to calculate the composition of maximum liquid stability in the ZrF4-LaF3-BaF2 and the ZrF4-BaF2-NaF systems where glass formation has been observed. The calculations have been extended to consider the effects of AlF3 additions on the glass compositions with good results. An analysis of the titanium-carbon-nitrogen system coupling the thermochemical and phase diagram data was performed to calculate the ternary phase diagram and thermochemical properties over a range of temperature.

DESCRIPTORS: (U) *Computer applications, *Thermodynamic properties, *Materials, *Processing, Thermochemistry, Synthesis(Chemistry), Data bases, Ceramic materials, Alloys, Phase diagrams, Chemical reactions

IDENTIFIERS: (U) Sialon ceramics, PE61102F, WUAFOSR2306A2

AD-A136 085

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVP02F

AD-A136 082 7/4 7/5

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY

(U) Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.

DESCRIPTIVE NOTE: Technical rept.,

AUG 83 4P

PERSONAL AUTHORS: Nadler,I. ;Pfab,J. ;Radhakrishnan,G. ; Reisler,H. ;Wittig,C. ;

CONTRACT NO AFOSR-83-0022

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1167

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n4 p2088-2090, 15 Aug 83.

Reprint: Simultaneous One- and Two-Photon Processes in the Photodissociation of NCNO Using a Tunable Dye Laser.

DESCRIPTORS: (U) *Polyatomic molecules, *Photodissociation, Dye lasers, Excitation, Nitroso compounds, Electronic states, Spectroscopy, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR230381

AD A136 081 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) The Effect of Intercalation on the Lattice Constants of Graphite.

DESCRIPTIVE NOTE: Technical rept.,

82 8P

PERSONAL AUTHORS: Krapchev,T. ;Ogilvie,R. ;Dresselhaus,M. S. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1194

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Carbon, v20 n4 p331-337 1982.

Reprint: The Effect of Intercalation on the Lattice Constants of Graphite.

DESCRIPTORS: (U) *Graphite, *Molecular structure, Lattice dynamics, Chemical reactions, Chemical bonds, Expansion, Raman spectra, X ray diagnostics, Reprints

IDENTIFIERS: (U) Graphite intercalation compounds, PE61102F, WUAFOSR2306C3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 080 7/5 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Long Range Behavior of the Gerade States near the 2P3/2 + 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 15P

PERSONAL AUTHORS: Martin,F. ;Churassy,S. ;Bacis,R. ;Field, R. W. ;Verges,J. ;

CONTRACT NO. F49620-83-C-0010

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1165

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 nº p3725-3737, 15 Oct 83.

Reprint: Long Range Behavior of the Gerade States near the 2P3/2 2P3/2 Iodine Dissociation Limit by Laser-Induced-Fluorescence Fourier-Transform Spectroscopy.

DESCRIPTORS: (U) *Iodine, *Photodissociation, *Electronic states, Molecular energy levels, Laser induced fluorescence, Perturbations, Spectroscopy, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 080

AD-A136 079 7/5 7/4

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Interactions of Ruthenium(II) Photosensitizers with Triton X-100.

DESCRIPTIVE NOTE: Technical rept.,

71 5P

PERSONAL AUTHORS: Mandal,K ;Hauenstein,B. L. , Jr ;Demas, J N. ;DeGraff,B. A. ,

CONTRACT NO. AFOSR-78-3590, NSF CHE82-06279

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1155

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n2 p328-331 1983.

Reprint: Interactions of Ruthenium(II) Photosensitizers with Triton X-100.

DESCRIPTORS: (U) *Ruthenium compounds, *Metal complexes, *Photochemical reactions, Photosensitivity, Chemical properties, Hydrophobic properties, Ethanols, Reprints

IDENTIFIERS: (U) Surfactants, Polyethoxyethanol/ octylphenoxy, PE61102F, WUAFOSR2303B2

AD-A136 079

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 078 7/4 7/3

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF CHEMISTRY

(U) Competitive Rates of Reactions of Molybdenum Atoms with Arenes.

DESCRIPTIVE NOTE: Technical rept.,

82 7P

PERSONAL AUTHORS: Wilburn,B. E. ;Skell,P. S. ;

CONTRACT NO. AFOSR-79-0063, NSF-CHE78-16193

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1180

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v104 p6989-6994 1982.

Reprint: Competitive Rates of Reactions of Molybdenum Atoms with Arenes.

DESCRIPTORS: (U) *Molybdenum, *Aromatic compounds, *Reaction kinetics, Metal complexes, Activation energy, Low temperature, Chemical reactions, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 077 7/4 12/1

COLORADO STATE UNIV FORT COLLINS

(U) Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.

DESCRIPTIVE NOTE: Technical rept.,

82 6P

PERSONAL AUTHORS: Raich,J. C. ;Bernstein,E. R. ;

CONTRACT NO. AFOSR-82-0122

PROJECT NO. 2312

TASK NO. K1

MONITOR: AFOSR TR-83-1158

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physics C. Solid State Physics, v15 pL283-L286 1982.

Reprint: Comment on the Quasi-Harmonic Treatment of the Structural Phase Change in s-Triazine.

DESCRIPTORS: (U) *Triazines, *Molecular structure, *Approximation(Mathematics), Harmonic analysis, Lattice dynamics, Phase transformations, Free energy, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312K1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 076 7/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY

(U) Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.

DESCRIPTIVE NOTE: Technical rept.,

83 6P

PERSONAL AUTHORS: Alnaimi,I. S. ;Weber,W. P. ;

CONTRACT NO. AFOSR-82-0333

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1186

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: *Pub. in Jnl. of Organometallic* Chemistry, v24 p171-175 1983.

Reprint: Deoxygenation of Dialkyl Sulfoxides by Dimethylsilylene. Steric Requirements.

DESCRIPTORS: (U) *Sulfoxides, *Photochemical reactions, *Silicon compounds, Organic compounds, Deoxygenation, Molecular structure, Reprints

IDENTIFIERS: (U) Dimethylsilylene, Steric hindevance, PE61102F, WUAFOSR2303B2

AD-A136 076

AD-A136 075 7/4

HARVARD COLL OBSERVATORY CAMBRIDGE MA

(U) The Low-Lying 2Sigma-States of OH.

DESCRIPTIVE NOTE: Technical rept.,

APR 83 12P

PERSONAL AUTHORS: Dishoeck,E. F. van ;Langhoff,S. R. ; Dalgarno,A. ;

CONTRACT NO. AFOSR-78-3677, NSG-7421

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1163

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n7 p4552-4561, 1 Apr 83.

Reprint: The Low-Lying 2Sigma-States of OH.

DESCRIPTORS: (U) *Hydroxyl radicals, *Electronic states, Potential energy, Energy levels, Electron transitions, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 075

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 074 7/4

JOINT INST FOR LAB ASTROPHYSICS BOULDER CO

(U) Infrared Chemiluminescence from Vibrationally Excited NO+: Product Branching in the N+ + O2 Ion-Molecule Reaction,

JAN 83 7P

PERSONAL AUTHORS: Smith,M. A. ;Bierbaum,V. M. ;Leone,S. R. ;

CONTRACT NO. AFOSR-78-3565

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1085

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v94 n4 p398-403, 28 Jan 83.

Reprint: Infrared Chemiluminescence from Vibrationally Excited NO: Product Bracnhing in the N O2 Ion-Molecule Reaction.

DESCRIPTORS: (U) *Chemiluminescence, *Nitrogen oxides, *Vibrational spectra, Excitation, Infrared spectra, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 073 7/3 7/4

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) 29Si NMR of Pentacoordinate Silicon Derivatives,

83 5P

PERSONAL AUTHORS: Helmer,B. J. ;West,R. ;Corriu,R. J. P. ; Poirier,M. ;Royo,G. ;

CONTRACT NO. AFOSR-78-3570

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1082

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organometalic Chemistry, v251 p295-298 1983.

Reprint: 29Si NMR of Pentacoordinate Silicon Derivatives.

DESCRIPTORS: (U) *Silicon compounds, *Nuclear magnetic resonance, Silanes, Electron acceptors, Electric power, Molecular structure, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 072 7/3 7/5

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Electron Spin Resonance Studies of 1,4-Disilacyclohexa-2,5-Diene Free Radical Reactions,

83 6P

PERSONAL AUTHORS: Rich,J. D. ;West,R. ;

CONTRACT NO. AFOSR-82-0067

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1084

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of American Chemical Society, v105 n16 p5211-5215 1983.

Reprint: Electron Spin Resonance Studies of 1,4-Disilacyclohexa-2,5-Diene Free Radical Reactions.

DESCRIPTORS: (U) *Silicon compounds, *Photochemical reactions, *Electron spin resonance, Molecular structure, Chemical bonds, Free radicals, Silanes, Photolysis, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2343B2

AD-A136 072

AD-A136 071 20/6 20/5

HUGHES RESEARCH LABS MALIBU CA

(U) Phase Conjugate Optical Resonator.

DESCRIPTIVE NOTE: Final rept. 15 Jan 80-14 Apr 83,

NOV 83 72P

PERSONAL AUTHORS: McFarlane,R. A. ;Lind,R. C. ;Dunning,G. J. ;Jain,R. K. ;Lam,J. F. ;

CONTRACT NO. F49620-80-C-0041

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-83-1093

UNCLASSIFIED REPORT

ABSTRACT: (U) This is the Final report on a program to study the properties of phase conjugate optical resonators. Laser oscillation was achieved using both atomic sodium and photorefractive BaTiO3 in four-wave mixing geometry as a phase conjugate resonator. Spectral and transverse mode characteristics were measured. A self-pumped phase conjugate mirror was also used in an oscillator and a computer code developed to model power output and transverse mode profile. Aberration correction was demonstrated. (Author)

DESCRIPTORS: (U) *Resonators, *Optical equipment, *Mirrors, Oscillation, Laser pumping, Distortion, Corrections, Continuous wave lasers, Reflectivity, Bandwidth, Barium oxides, Titanium oxides, Detuning, Wavefronts

IDENTIFIERS: (U) *Optical resonators, Computer codes, Phase conjugation, Photorefractive crystals, Four wave mixing, PE61102F, WUAFOSR2301A1

AD-A136 071

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 070 12/1

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS

(U) Complete Designs with Blocks of Maximal Multiplicity.

83 7P

PERSONAL AUTHORS: Constantine,G. M. ;Hedayat,A. S. ;

CONTRACT NO. AFOSR-80-0170, NSF-MCS81-01727

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-1146

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Statistical Planning and Inference, v7 p289-294 1983.

Reprint: Complete Designs with Blocks of Maximal Multiplicity.

DESCRIPTORS: (U) *Blocking, *Statistical processes, Parameters, Reprints

IDENTIFIERS: (U) *Block design, PE61102F, WUAFOSR2304A5

AD-A136 069 7/3 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Why Life Exists?

82 7P

PERSONAL AUTHORS: Dewar,M. J. S. ;Healy,E. ;

CONTRACT NO. AFOSR-79-0008

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1183

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v1 n12 p1705-1708 1982.

Reprint: Why Life Exists?

DESCRIPTORS: (U) *Carbon, *Atomic orbitals, Silicon, Chemical bonds, Energy levels, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 068 7/3

ULTRASYSTEMS INC IRVINE CA

(U) Phospha-s-Triazines. VI. Polymeric Systems,

82 16P

PERSONAL AUTHORS: Paciorek,K. J. L. ;Kratzer,R. H. ;Ito,T. I. ;

CONTRACT NO. F49620-79-C-0037

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1187

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluorine Chemistry, v21 p479-493 1982.

Reprint: Phospha-s-Triazines. VI. Polymeric Systems.

DESCRIPTORS: (U) *Polymers, *Triazines, *Synthesis(Chemistry), Organic phosphorus compounds, Fluorinated hydrocarbons, Polymerization, Chemical properties, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 068

AD-A136 067 12/1

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) The Calculations of an Inverse Potential Problem,

AUG 83 12P

PERSONAL AUTHORS: Morawetz,C. S. ;Kriegsmann,G. A. ;

CONTRACT NO. F496620-79-C-0193, N00014-76-C-0439

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-83-1091

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SIAM Jnl. of Applied Mathematics, v43 n4 p844-854 Aug 83.

Reprint: The Calculations of an Inverse Potential Problem

DESCRIPTORS: (U) *Computations, *Wave equations, *Inversion, Potential theory, Problem solving, One dimensional, Iterations, Reprints

AD-A136 067

AD-A136 066 7/4

JOINT INST FOR LAB ASTROPHYSICS BOULDER CO

(U) Single Collision Ion-Molecule Reactions at Thermal Energy: Rotational and Vibrational Distributions from N+ + CO Yields N + CO+.

AUG 83 15P

PERSONAL AUTHORS: Guyer,D. R. ;Huewel,L. ;Leone,S. R. ;

CONTRACT NO. AFOSR-78-3565

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-0968

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n3 p1259-1271, 1 Aug 83.

Reprint: Single Collision Ion-Molecule Reactions at Thermal Energy: Rotational and Vibrational Distributions from N CO Yields N CO.

DESCRIPTORS: (U) *Particle collisions, *Electronic states, Vibrational spectra, Energy levels, Carbon monoxide, Laser induced fluorescence, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 066

AD-A136 062 7/2 7/4

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Electrocatalysis of Oxygen Using Water Soluble Metal Porphyrins and Chemically Modified Porphyrin Electrodes.

DESCRIPTIVE NOTE: Final rept. 1 Sep 78-31 Mar 83,

NOV 83 16P

PERSONAL AUTHORS: Kuwana,T. ;

CONTRACT NO. AFOSR-78-3672

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1097

UNCLASSIFIED REPORT

ABSTRACT: (U) Primary effort was devoted to the study of oxygen reduction using wateroluble iron and cobalt porphyrins, namely, iron and cobalt tetrakis (N-methyl-4-pyridyl)porphyrin. These porphyrins with the metal in the +3 oxidation state can be electrochemically reduced to the divalent state which can then reacted with oxygen. In the case of the iron containing porphyrin, oxygen was reduced at a bimolecular rate of ca. 1 x 10 to the minus 7th power 1/m/s to hydrogen perioxide which was then reduced rapidly to water. A mechanistic scheme was postulated for the reduction and using experimentally determined parameters, current-potential curves were simulated. Good agreement between the experimental and computer calculated current-potential curves supported the proposed scheme. Cross-correlation between optical, electrochemical and magnetic circular dichroism results have provided axial ligation, dimerization and spin state information of the ferric and ferrous tetrakis (n-methyl-4-pyridyl)porphyrins. Glassy or graphitic carbon electrodes were rendered catalytic by the incorporation of iron porphyrin derivatives infinity e.g. iron tetra-(o-amino-phenyl)porphyrin and iron tetra-(N(2-hydroxyethyl) pyridyl)porphyrin summation in thin polymeric films adhering to the carbon. The extent of oxygen reduction to hydrogen peroxide and water depended on the amount of iron porphyin.

AD-A136 062

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 062 CONTINUED

DESCRIPTORS: (U) *Oxygen, *Reduction(Chemistry), *Electrocatalysts, Water soluble materials, Electrochemistry, Porphyrins, Iron, Platinum, Carbon, Electrodes, Surface reactions

IDENTIFIERS: (U) LPN-OSURF-761254/711380, PE61102F, WU/FOSR2303A1

AD-A136 062

AD-A136 061 7/4 7/3 20/2

COLORADO STATE UNIV FORT COLLINS

(U) Critical Behavior in Annealed and Unannealed Crystals of Benzil,

SEP 82 12P

PERSONAL AUTHORS: Yoshihara,A. ;Bernstein,E R. ;Raich,J. C. ;

CONTRACT NO. AFOSR-82-0122

PROJECT NO. 2312

TASK NO. K1

MONITOR: AFOSR TR-83-1159

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v77 n6 p2768-2778, 15 Sep 82.

Reprint: Critical Behavior in annealed and Unannealed Crystals of Benzil.

DESCRIPTORS: (U) *Benzene compounds, *Crystallography, Annealing, Molecular structure, Scattering, Raman spectroscopy, Symmetry, Reprints

IDENTIFIERS: (U) Benzil, WUAFOSR2312K1, PE61102F

AD-A136 061

DTIC REPORT BIBLIOGRAPHY

AD-A136 059 7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl)phenylphosphine) Oligomers and Polymers.

82 8P

PERSONAL AUTHORS: Seyferth,D. ;Withers,H. P. , Jr.; Fellmann,J. D. ;Garrov,P. E. ;Martin,S. ;

CONTRACT NO. AFOSR-79-0007

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1181

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v1 n10 p1283-1288 1982.

Reprint: Phosphorus- and Arsenic-Bridged (1) Ferrocenophanes. 2. Synthesis of Poly((1,1'-ferrocenediyl) phenylphosphine) Oligomers and Polymers.

DESCRIPTORS: (U) *Iron organic compounds, *Synthesis(Chemistry), Bridges, Phosphorus, Arsenic, Polymerization, Ferrocenes, Reprints

IDENTIFIERS: (U) WUAFOSR2303BL, PE61102F

SEARCH CONTROL NO. EVP02F

AD-A136 058 9/5

CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

(U) Joint Services Electronics Program.

DESCRIPTIVE NOTE: Annual progress rept. 1 Sep 82-31 Aug 83,

SEP 83 160P

PERSONAL AUTHORS: Angelakos,D. J. ;

REPORT NO. UCB/ERL-83/1

CONTRACT NO. F49620-79-C-0178

PROJECT NO. 2305

TASK NO. A9

MONITOR: AFOSR TR-83-1076

UNCLASSIFIED REPORT

ABSTRACT: (U) An annual report of the JSEP (Joint Services Electronics Program) in Electromagnetics, Solid State Electronics, Materials and Devices, Quantum Electronics and Information Sciences is presented. In addition, results of the research to date are summarized and significant accomplishments are indicated.

DESCRIPTORS: (U) *Electronics, *Joint military activities, Information sciences, Quantum electronics, Solid state electronics, Control systems, Millimeter waves, Semiconductor lasers, Photolithography, Nonlinear systems

IDENTIFIERS: (U) Electronic materials, WUAFOSR2305A9, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 053 12/1

MASSACHUSETTS UNIV AMHERST DEPT OF MATHEMATICS AND STATISTICS

(U) Calculation of the Laplace Transform of the Length of the Busy Period for the M/G/1 Quenue via Martingales,

83 3P

PERSONAL AUTHORS: Rosenkrantz,W. A. ;

CONTRACT NO. AFOSR-82-0168

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1116

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Annals of Probability, v11 n3 p817-818 1983.

Reprint: Calculation of the Laplace Transform of the Length of the Busy Period for the M/G/1 Quenue via Margingales.

DESCRIPTORS: (U) *Laplace transformation, *Numerical methods and procedures, Queueing theory, Formulas(Mathematics), Reprints

IDENTIFIERS: (U) Martingales, PE61102F, WUAFOSR2304A5

AD-A136 053

AD-A136 052 7/5

CORNELL UNIV ITHACA NY DEPT OF CHEMISTRY

(U) The I(2P1/2)+02 Reverse Yield I(2P3/2)+02(1Delta) Equilibrium.

DESCRIPTIVE NOTE: Rept. for 1 Nov 80-31 Oct 81,

MAR 83 11P

PERSONAL AUTHORS: Young,A. T. ;Houston,P. L ;

CONTRACT NO. AFOSR-78-3513

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1156

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n5 p2317-2326, 1 Mar 83.

Reprint: The I(2P1/2)02 Reverse Yield I(2P3/2)02(1Delta) Equilibrium.

DESCRIPTORS: (U) *Oxygen, *Iodine, *Photochemical reactions, Excitation, Atomic energy levels, Concentration(Chemistry), Pulsed lasers, Photolysis, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 052

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 049 7/4

JOINT INST FOR LAB ASTROPHYSICS BOULDER CO

(U) Product Vibrational State Distributions in Thermal Energy Associative Detachment Reactions: F- + H,D Yields HF(v), DF(v) + e-.

83 12P

PERSONAL AUTHORS: Smith,M. A. ;Leone,S. R.;

CONTRACT NO. AFOSR-78-3565

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1080

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n3 p1325-1334, 1 Feb 83.

Reprint: Product Vibrational State Distributions in Thermal Energy Associative Detachment Reactions: F- H,D Yields HF8v), DF(v)e-.

DESCRIPTORS: (U) *Chemiluminescence, *Molecular vibration, *Infrared spectra, Chemical reactions, Hydrogen, Fluorine, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A136 048 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

(U) Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data,

83 19P

PERSONAL AUTHORS: Padgett,W. J. ;Rao,A. N. V. ;

CONTRACT NO. AFOSR-81-0166

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-1114

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Mathematica, v23

Reprint: Bayes Estimation of a Mixing or Prior Distribution from Randomly Right-Censored Data.

DESCRIPTORS: (U) *Distribution functions, *Bayes theorem, *Estimates, Nonparametric statistics, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 046 7/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY

(U) Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes.

83 10P

PERSONAL AUTHORS: Kazmura,S. A. ;Weber,W. P. ;

CONTRACT NO. AFOSR-80-0008

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1185

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organometallic Chemistry, v243 p149-156 1983.

Reprint: Selectivity in the Reactions of Alkyllithium Reagents with Alpha, Omega-Dichloropermethylsiloxanes.

DESCRIPTORS: (U) *Lithium compounds, *Siloxanes, *Chemical reactions, Organometallic compounds, Chemical bonds, Low temperature, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A136 046

AD-A136 045 17/7 17/8 20/6 20/5

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) Research on New Approaches to Optical Systems for Inertial Rotation Sensing.

DESCRIPTIVE NOTE: Final rept. 1 May 82-30 Jun 83.

JUN 83 77P

REPORT NO. GL-3622

CONTRACT NO. F49620-82-K-0029

PROJECT NO. 2305

TASK NO. B2

MONITOR: AFOSR
TR-83-0884

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes further progress in the development of fiber optic Sagnac loops for inertial rotation sensing (i.e., fiber gyros). The report consists mainly of two sections. The first section describes work on developing a bidirectional optical amplifier for use in fiber optic sensing loops while the second section deals with limits on rotation sensitivity due to fiber scattering and noise statistics of optical sources.

DESCRIPTORS: (U) *Optical equipment, *Amplifiers, *Inertial systems, Research management, Gyroscopes, Fiber optics, Rotation, Loops, Backscattering, Configurations, Yag lasers, Neodymium lasers

IDENTIFIERS: (U) Inertial rotation sensing, Optical amplifiers, Sagnac loops, PRS(Passive Reentrant Sagnac System), Reentrant systems, PE61102F, WUAFOSR2305B2

IAC NO. GC-840177

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)Optical systems, Sagnac effect, Gyroscopes, Interferometers, Fiber optics, Amplifiers, Inertial sensors, Scattering, Noise, Rotation, Sensitivity, Rayleigh scattering, Backscattering, Neodymium lasers, Optical equipment, Yag lasers.;

AD-A136 045

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVPO2F

AD-A136 044 13/13 20/11

NORTHWESTERN UNIV EVANSTON IL DEPT OF CIVIL ENGINEERING

(U) Efficient Finite Element Methods for Transient Nonlinear Analysis of Shells.

DESCRIPTIVE NOTE: Annual rept. 1 Feb 82-31 Jan 83.

AUG 83 175P

PERSONAL AUTHORS: Belytschko,T. ;

CONTRACT NO. F49620-82-K-0013

PROJECT NO. 2307

TASK NO. B1

MONITOR: AFOSR TR-83-1062

UNCLASSIFIED REPORT

ABSTRACT: (U) A finite element formulation and algorithm for the nonlinear analysis of the large deflection, materially nonlinear response of impulsively loaded shells is presented. A unique feature of this algorithm is the use of a bilinear four node quadrilateral element with single point quadrature and a simple hourglass control which is orthogonal to rigid body modes on an element level and does not compromise the consistency of the equations. The geometric nonlinearities are treated by using a corotational description wherein a coordinate system that rotates with the material is embedded at the integration point; thus the algorithm is directly applicable to anisotropic materials without any corrections for frame invariance of material property tensors. This algorithm can treat about 200 element-time-steps per CPU second on a CYBER 170/730 computer in the explicit time integration mode. Numerous results are presented for both elastic and elastic-plastic problems with large strains that show that the method in most cases is comparable in accuracy with an earlier version of this algorithm employing a cubic triangular plate-shell element, but substantially faster. (Author)

DESCRIPTORS: (U) *Shells(Structural forms), Impulse loading, Algorithms, Finite element analysis, Deflection, Nonlinear analysis, Computer applications, Structural response

AD-A136 044

AD-A136 044 CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2307B1

AD-A136 044

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 041 20/5 13/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF ELECTRICAL ENGINEERING

(U) Dewar Design for Optically Pumped Semiconductor Ring Laser.

SEP 83 4P

PERSONAL AUTHORS: Fuchs,A. ;Salour,M. M. ;

CONTRACT NO. F49620-83-C-0147

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1098

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Review of Scientific Onstruments, v54 n9 p1143-1144, 9 Sep 83.

Reprint: Dewar Design for Optically Pumped Semiconductor Ring Laser.

DESCRIPTORS: (U) *Ring lasers, *Semiconductor lasers, *Dewar flasks, Laser cavities, Optical pumping, Liquid nitrogen, Laser beams, Reprints

IDENTIFIERS: (U) WUAFOSR2306C2, PE61102F

AD-A136 040 7/4 12/1

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Collisional Ionization as a Nonlocalized Process and the Breakdown of the Franck-Condon Approximation,

83 6P

PERSONAL AUTHORS: Lam,K. S. ;George,T. F. ;

REPORT NO. 27

CONTRACT NO. AFOSR-82-0046

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-83-1112

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n15 p2799-2803 1983.

Reprint: Collisional Ionization as a Nonlocalized Process and the Breakdown of the Franck-Condon Approximation.

DESCRIPTORS: (U) *Particle collisions, *Ionization, *Approximation(Mathematics), Chemical reactions, Energy levels, Mathematical models, Reprints

IDENTIFIERS: (U) WUAFOSR2303A2, PE61102F

AD-A136 037 9/2 5/1

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

(U) Research in Programming Languages and Software Engineering

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 82,

MAR 83 9P

PERSONAL AUTHORS: Basili,V. R. ;Gannon,J. D. ;Hamlet,R. G. ;Roussopoulos,N. ;Weiser,M. D. ;

CONTRACT NO. F49620-80-C-0001

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1150

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper describes work in progress in the following topics: Program Metrics; Program Testing - Experimental Investigations, Step-wise Testing, Testing of Concurrent Specifications, and Testing-theory Critique, Theoretical Issues in Software Engineering; Debugging with Slices; PLACES; Programming Environments; Concurrent, Distributed Systems; and Graphical Design and Documentation. The paper also lists other papers and articles arising from this research effort.

DESCRIPTORS: (U) *Computer programs, *Programming languages, *Research management, *Systems engineering, Computer program reliability, Computer program verification, Computer program documentation, Debugging(Computers), Specifications, Requirements, Clustering, Regression analysis

IDENTIFIERS: (U) *Software engineering, WUAFSOR2304A2, PE61102F

AD-A136 036 11/6 20/11

POLYTECHNIC INST OF NEW YORK BROOKLYN

(U) Fatigue Crack Propagation in Ti-Mn Alloys: The Role of the Bauschinger Effect.

DESCRIPTIVE NOTE: Final technical rept.,

MAR 83 30P

PERSONAL AUTHORS: Margolin,H. ;Park,J. S. ;

CONTRACT NO. AFOSR-79-0028

PROJECT NO. 2036

TASK NO. A1

MONITOR: AFOSR TR-83-1198

UNCLASSIFIED REPORT

ABSTRACT: (U) The work on this program consisted of three parts: study of fatigue crack propagation behavior of alpha-beta Ti-Mn alloys; rationalization of the role of microstructure in the fracture toughness of the alpha-beta alloy Ti-5.25Al-5.5V-0.9//Fe-0.5Cu; and n examination of slip transfer from alpha - beta. A summary of the achievements in each of these areas and pertinent additional information will be given in the following presentation.

DESCRIPTORS: (U) *Titanium alloys, *Fatigue(Mechanics), *Crack propagation, Manganese alloys, Microstructure, Toughness

IDENTIFIERS: (U) Bauschinger effect, WUAFOSR2036A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 034 20/4

STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING

(U) The 1980-81 AFOSR (Air Force Office of Scientific Research)-HTTM (Heat Transfer and Turbulence Mechanics) -Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 3. Comparison of Computation with Experiment, and Computors' Summary Report.

DESCRIPTIVE NOTE. Interim rept.,

SEP 81 413P

PERSONAL AUTHORS: Kline,S. J. ;Cantwell,B. J. ;Lilley,G. M. ;

CONTRACT NO. F49620-80-C-0027

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-83-1003

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A135 570.

ABSTRACT: (U) Volumes II and III together give an overview of the state of the art in Computing Complex Turbulent Flows in 1981 using the data base established for this purpose in Volume I. The materials are intended to be complete in the sense of providing all elements necessary for understanding the state of the art. Thus, Volumes II and III include: (i) taxonomies that organize the flows, methods of modeling, numerics; (ii) comments by non-computors (the reporters) on results for each class of flows; (iii) discussions carried through to closure and carefully edited; (iv) samples of recent high-level research computations that are currently beginning to provide information of aid to turbulence modelers; (v) an overall evaluation of the state of the art by a distinguished committee of nine workers in the field; (vi) an opinion by the leading editor on the question of 'universality' of turbulence models, potential roads toward further progress, and discussion thereof by others (vii) all computer output compared with data, case by case; (viii) comments by computer groups on experiences

and problems; (ix) several cross indexes to aid readers. (Author)

DESCRIPTORS: (U) *Turbulent flow, Symposia, Comparison, Computations, Two dimensional flow, Three dimensional flow, Experimental data, Models, Fluid mechanics

IDENTIFIERS: (U) Complex turbulent flow

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 014 9/1 20/5 20/7

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL).

DEC 82 14P

PERSONAL AUTHORS: Bekefi,G. ;Shefer,R. E. ;Nevins,B. D. ;

CONTRACT NO. F49620-83-C-0008

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR TR-83-1171

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the International Conference on Lasers, p136-148, 13-17 Dec 82.

Reprint: Radiation Measurements from a Rippled-Field Magnetron (Crossed-Field FEL).

DESCRIPTORS: (U) *Magnetrons, *Electric lasers, *Crossed field devices, Electric fields, Magnetic fields, Free electrons, Hybrid systems, Orthogonality, Millimeter waves, Gratings(Spectra), Permanent magnets, Reprints

IDENTIFIERS: (U) FEL(Free Electron Lasers), Solid state lines, Rippled fields, Dispersive lines, Smooth bore magnetrons, Interaction space, Fields(Periodic) Grating spectrometers, Periodic structures, PE61102F, WUAFOSR2301A1

AD-A136 013 7/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY

(U) Time Resolved Observations of NH2 and Benzyl Radicals Produced in the Infrared Multiple Photon Dissociation of Benzylamine,

AUG 83 7P

PERSONAL AUTHORS: Reisler,H. ;Pessine,F. B. T. ;Wittig,C. ;

CONTRACT NO. AFOSR-83-0022

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1166

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v99 n5, 6 p388-393, 19 Aug 83.

Reprint: Time Resolved Observations of NH2 and Benzyl Radicals Produced in the Infrared Multiple Photon Dissociation of Benzylamine.

DESCRIPTORS: (U) *Benzene compounds, *Chemical dissociation, Benzyl radicals, Amines, Laser induced fluorescence, Excitation, Energy levels, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 012 7/3

ARIZONA UNIV TUCSON DEPT OF CHEMISTRY

(U) Rigid-Ladder Polymers: Polymers Containing Anthraquinone Recurring Units.

83 5P

PERSONAL AUTHORS: Lee,B. H. ;Marvel,C. S. ;

CONTRACT NO. AFOSR-82-0007

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1175

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Polymer Science: Polymer Chemistry Edition, v21 p83-87 1983.

ABSTRACT: (U) The synthesis and chemical reactions of a thermally stable rigid ladder polymer with recurring anthraquinone unit are described. (LS-PL).

DESCRIPTORS: (U) *Polymers, *Anthraquinones, *Synthesis(Chemistry), Molecular structure, Chemical reactions, Reprints

IAC NO. PL-045749

IAC DOCUMENT TYPE: PLASTC - MICROFICHE --

IAC SUBJECT TERMS: P--(U)Polymer research, Ladder polymers, PPQ, Anthraquinone, Quinones, Polyquinones, Molecular structure effects, Chemical reactions, Thermal stability, ZZ Unlimited.;

AD-A136 012

AD-A136 011 12/1

ENVIRONMENTAL RESEARCH INST OF MICHIGAN ANN ARBOR

(U) Comments on 'The Reconstruction of a Multidimensional Sequence from the Phase or Magnitude of Its Fourier Transform',

JUN 83 3P

PERSONAL AUTHORS: Fienup,J R. ;

REPORT NO. ERIM-161900-1-J

CONTRACT NO. F49620-82-K-0018

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR TR-83-1118

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-31 n3 p738-739 Jun 83.

Reprint: Comments on 'The Reconstruction of a Multidimensional Sequence from the Phase or Magnitude of Its Fourier Transform'.

DESCRIPTORS: (U) *Sequences(Mathematics), *Fourier transformation, Two dimensional, Iterations, Algorithms, Reprints

IDENTIFIERS: (U) *PE61102F, WUAFOSR2311A1

AD-A136 011

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 010 7/3 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds,

JAN 83 17P

PERSONAL AUTHORS: Issi,J. P. ;Heremans,J. ;Dresselhaus,M. S. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1193

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n2 p1333-1347, 15 Jan 83.

Reprint: Electronic and Lattice Contributions to the Thermal Conductivity of Graphite Intercalation Compounds.

DESCRIPTORS: (U) *Graphite, *Lattice dynamics, *Thermal conductivity, Electronic states, Iron compounds, Chemical reactions, Reprints

IDENTIFIERS: (U) Graphite intercalation compounds, PE61102F, WUAFOSR2306C3

AD-A136 006 7/3

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Orbital Symmetry Analysis of the Reaction of Silylenes with Acetylenes and the Dimerization of 1-Silacyclopropenes,

82 14P

PERSONAL AUTHORS: Halevi,E. A. ;West,R. ;

CONTRACT NO. AFOSR-78-3570

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1177

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organometallic Chemistry, v240 p129-141 1982.

Reprint: Orbital Symmetry Analysis of the Reaction of Silylenes with Acetylenes and the Dimerization of 1-Silacyclopropenes.

DESCRIPTORS: (U) *Silicon compounds, *Organic compounds, *Molecular orbitals, Symmetry, Chemical reactions, Acetylenes, Propenes, Dimers, Reprints

IDENTIFIERS: (U) WUAFOSR2303132, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 005 7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds,

82 6P

PERSONAL AUTHORS: Mazurek,H. ;Dresselhaus,M. S. ; Dresselhaus,G. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1196

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Carbon, v20 n4 p297-301 1982.

Reprint: Scanning Transmission Electron Microscopy of Multiphases in Graphite-Alkali Mental Intercalation Compounds.

DESCRIPTORS: (U) *Graphite, *Rubidium, *Molecular structure, Alkali metals, Stoichiometry, Electron microscopy, Reprints

IDENTIFIERS: (U) WUAFOSR2306C3, PE61102F

AD-A136 005

AD-A136 004 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition,

FEB 83 5P

PERSONAL AUTHORS: Blatt,F. J. ;Zabala-Martinez,I. ; Heremans,J. ;Issi,J. P. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1197

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n4 p2558-2561, 15 Feb 83.

Reprint: Anomalies in the Thermal Conductivity and Thermopower in CoCl2-Intercalated Graphite at the Magnetic Phase Transition.

DESCRIPTORS: (U) *Graphite, *Cobalt compounds, *Thermophysical properties, Thermal conductivity, Thermal conductivity, Thermoelectricity, Magnetic anomalies, Reprints

IDENTIFIERS: (U) Graphite intercalation compound, WUAFOSR2306C3, PE61102F

AD-A136 004

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 003 7/4 7/5

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Natural Correlation Diagrams. A Unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions,

81 8P

PERSONAL AUTHORS: Bigot,B. ;Devacquet,A. ;Turro,N. J. ;

CONTRACT NO. AFOSR-78-3502

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1161

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v103 n1 p6-12 1981.

Reprint: Natural Correlation Diagrams. A Unifying Theoretical Basis for Analysis of n Orbital Initiated Ketone Photoreactions.

DESCRIPTORS: (U) *Ketones, *Molecular orbitals, *Photochemical reactions, Hydrogen, Atoms, Addition reactions, Cleavage, Electron transfer, Correlation techniques, Diagrams, Reprints

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F

AD-A136 002 7/3

COLUMBIA UNIV NEW YORK

(U) Computers, Lasers Aid Carbene Chemistry,

SEP 83 3P

PERSONAL AUTHORS: Turro,N. J. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1162

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical and Engineering News, p32-33, 12 Sep 83.

Reprint: Computers, Lasers Aid Carbene Chemistry.

DESCRIPTORS: (U) *Carbenes, *Chemical analysis, Computer aided diagnosis, Lasers, Photolysis, Chemical reactions, Reprints

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A136 001 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Raman Scattering from Low-Frequency Phonons in Stage-2 Graphite-Rubidium Intercalation Compounds,

DEC 82 8P

PERSONAL AUTHORS: Giergiel,J. ;Eklund,P. C. ;Al-Jishi,R. ; Dresselhaus,G. ;

CONTRACT NO. F49620-83-C-0011

PROJECT NO. 2306

TASK NO. C3

MONITOR: AFOSR TR-83-1195

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v26 n12 p6881-6887, 15 Dec 82.

Reprint: Raman Scattering from Low-Frequency Phonos in Stage-2 Graphite-Rubidium Intercalation Compounds.

DESCRIPTORS: (U) *Graphite, *Rubidium, *Phonons, *Scattering, Low frequency, Raman spectra, Alkali metal compounds, Reprints

IDENTIFIERS: (U) WUAFOSR2306C3, PE61102F

AD-A136 001

AD-A135 999 20/6 12/1

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum,

JAN 83 18P

PERSONAL AUTHORS: Camley,R. E. ;Rahman,T. S. ;Mills,D. L. ;

CONTRACT NO. F49620-78-C-0019

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1191

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n1 p261-277, 1 Jan 83.

Reprint: Magnetic Excitations in Layered Media: Spin Waves and the Light-Scattering Spectrum.

DESCRIPTORS: (U) *Light scattering, *Surface waves, *Computations, Ferromagnetism, Films, Excitation, Brillouin zones, Backscattering, Reprints

IDENTIFIERS: (U) *Spin waves, Magentic excitations, WUAFOSR2306C2, PE61102F

AD-A135 999

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 987 9/5 20/1 3/1

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

(U) Monolithic ZnO SAW (Surface Acoustic Waves) Structures.

DESCRIPTIVE NOTE: Interim scientific rept. 1 May 82-30 Apr 83,

JUL 83 62P

PERSONAL AUTHORS: Gunshor,R. L. ;Pierret,R. F. ;

CONTRACT NO. AFOSR-81-0214

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR TR-83-1172

UNCLASSIFIED REPORT

ABSTRACT: (U) ZnO-on-silicon surface acoustic wave devices have been fabricated and tested. Electronic erasure of a stored correlator reference was demonstrated, the effect of laser annealing on propagation loss was examined, preliminary ageing studies were performed, and a conceptually new mode conversion resonator configuration was reported. (Author)

DESCRIPTORS: (U) *Surface acoustic wave devices, *Zinc oxides, *Resonators, *Transducers, *Monolithic structures(Electronics), Surface acoustic waves, Transmission loss, Annealing, Electronics, Piezoelectric transducers, Laser applications, Erasure, Low temperature, Deposition, Silicon, Microwaves, Junctions, High frequency, Structures

IDENTIFIERS: (U) Electroacoustic convolvers, Aluminum nitrides, Microwave acoustics, Wave correlators, Analog processing, WUAFOSR2305B1, PE61102F

AD-A135 987

AD-A135 986 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Orbit Connections in a Parabolic Equation.

DESCRIPTIVE NOTE: Technical rept.,

APR 83 18P

PERSONAL AUTHORS: Hale,J. K. ;do Nascimento,A. S. ;

REPORT NO. LCDS-83-9

CONTRACT NO. DAAG29-79-C-0161, AFOSR-81-0198

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-1147

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grant NSF-MCS82-05355.

ABSTRACT: (U) For all solutions of a particular scalar parabolic equation in one bounded space dimension, the authors discuss the global dynamics on the maximal compact invariant set and especially the orbits connecting equilibrium points.

DESCRIPTORS: (U) *Equations, *Scalar functions, *Orbits, Joining, Solutions(General), Equilibrium(General), Global, Dynamics, Invariance

IDENTIFIERS: (U) *Parabolic equations, WUAFOSR2304A4, PE61102F

AD-A135 986

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 980 20/6 11/3

NEW MEXICO UNIV ALBUQUERQUE BUREAU OF ENGINEERING RESEARCH

(U) Optical Thin Film Workshop.

DESCRIPTIVE NOTE: Final rept. 21-23 Apr 82,

APR 82 65P

PERSONAL AUTHORS: Jungling,K. ;

REPORT NO. EECE-276(83)AFOSR-0241

CONTRACT NO. AFOSR-82-0163

PROJECT NO. 2306

TASK NO. B2

MONITOR: AFOSR
TR-83-1126

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this workshop on optical thin films was to generate a list of basic research efforts which should be pursued in thin film processing techniques and thin film diagnostics which would lead to the development of more damage resistant, more predictable and repeatable thin film coatings which would exhibit long life and stable performance. A group of invited papers covering laser damage, surface preparation, film microstructure, deposition techniques and diagnostics were presented. Discussion of the research needs to advance basic understanding and improvement of optical thin films is summarized, and a prioritized research program which has been generated by the Workshop Advisory Committee is given.

DESCRIPTORS: (U) *Thin films, *Optical coatings, *Workshops, Research management, Antireflection coatings, Optical equipment, Air Force research, Laser damage, Deposition, Microstructure, Long life, Stability, Diagnosis(General)

IDENTIFIERS: (U) *Optical thin films, *Thin film coatings, PE61102F, WUAFOSR2306B2

AD-A135 980

AD-A135 976 7/4

OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering,

OCT 82 9P

PERSONAL AUTHORS: Agrawal, P. M. ;Raff,L. M. ;

CONTRACT NO. AFOSR-82-0311

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1179

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v77 n8 p3946-3952, 15 Oct 82.

Reprint: A Semiclassical Wave Packet Model for the Investigation of Elastic and Inelastic Gas-Surface Scattering.

DESCRIPTORS: (U) *Gas dynamics, *Gas surface interactions, *Scattering, Quantum chemistry, Wave packets, Elastic scattering, Inelastic scattering, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A135 976

AD-A135 974 20/3

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Surface Polaritons on Uniaxial Antiferromagnets,

AUG 82 9P

PERSONAL AUTHORS: Camley,R. E. ;Mills,D. L. ;

CONTRACT NO. F49620-78-C-0019

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR
TR-83-1192

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v26 n3 p1280-1287, 1 Aug 82.

Reprint: Surface Polaritons on *Uniaxial Antiferromagnets*.

DESCRIPTORS: (U) *Antiferromagnetism, Polartrons, Dispersion relations, Reprints

IDENTIFIERS: (U) Surface polaritons, Uniaxial ferromagnets, PE61102F, WUAFOSR2306C2

AD-A135 972 20/12 20/3

RENSSELAER POLYTECHNIC INST TROY N Y DIV OF MATERIALS ENGINEERING

(U) Excitonic Solids.

DESCRIPTIVE NOTE: Final rept.,

NOV 83 58P

PERSONAL AUTHORS: MacCrone,R. K. ;

CONTRACT NO. AFOSR-79-0126

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-83-0997

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) The investigators have made experimental measurements of the diamagnetism of CdS and have attempted to understand the anomolous effects by theoretical analysis. These studies have contributed to understanding the contribution of impurities to the anomalous diamagnetism in CdS.

DESCRIPTORS: (U) *Cadmium sulfides, *Diamagnetism, Doping, Chlorine, Concentration(Chemistry), Magnetic properties, Electrical properties, Photoconductivity, Optical analysis, N type semiconductors

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A8

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 971 21/2 7/4

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Atomic and Molecular Gas Phase Spectrometry.

DESCRIPTIVE NOTE: Final scientific rept. 1 Oct 79-30 Sep 83.

SEP 83 53P

PERSONAL AUTHORS: Winefordner,J. D. ;

CONTRACT NO. F49620-80-C-0005

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1101

UNCLASSIFIED REPORT

ABSTRACT: (U) The major goals of this research have been to develop diagnostical spectroscopic methods for measuring spatial/temporal temperatures of combustion flames and plasmas and to develop sensitive, selective, precise, reliable, rapid spectrometric methods of trace analysis of elements present in jet engine lubricating oils, matellurgical samples, biological materials, and automobile and other engine exhausts. The diagnostical approaches have been based upon the measurement of pulsed laser excited fluorescence of seeds, such as In, Tl, Pb, etc., introduced into the flames, plasmas, or hot gases or in the case of flames, the measurement of natural flame species as OH. Because of the excellent fluorescence signal to noise ratios, it has been possible to measure temperatures of combustion flames for volumes smaller than 1 cu mm and for single laser pulses of a few nanoseconds. The technique with the most promise for use in combustion flames and in reactors is based upon thermally assisted fluorescence of an externally introduced seed as Tl and In or of an internal species as OH. By exciting the species with a dye laser and measuring the fluorescence from energy levels thermally excited form the laser excited state, the flame (plasma) temperature can be readily measured (+ or - 10 C) for a volume < 1 mm 3 and for a single laser pulse.

DESCRIPTORS: (U) *Flames, *Plasmas(Physics),

AD-A135 971 CONTINUED

*Spectrometry, Temperature measuring instruments, Exhaust gases, Diagnostic equipment, Gas analysis, Laser induced fluorescence, Atomic spectroscopy, Molecular spectroscopy

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A135 971

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 970 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethane.

82 4P

PERSONAL AUTHORS: Dewar,M. J. S. ;

CONTRACT NO. AFOSR-79-0008

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1176

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v104 p1447-1449 1982.

Reprint: Ionization Energies of p-Quinodimethane and 2,5-Dimethyl-p-Quinodimethane.

DESCRIPTORS: (U) *Methanes, *Ionization, *Molecular orbitals, *Energy levels, Photoelectron spectra, Energy bands, Reprints

IDENTIFIERS: (U) Methane/P-quinodi, Methane/2,5 dimethyl-p-quinodi, PE61102F, WUAFOSR2303B2

AD-A135 969 7/4

ELECTROCHEMICAL TECHNOLOGY CORP SEATTLE WA

(U) Initial Oxide Growth Rate on Newly Generated Surfaces,

NOV 82 3P

PERSONAL AUTHORS: Beck,T. R. ;

CONTRACT NO. F44620-76-C-0001

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1174

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Electrochemical Society, v129 n11 p2500-2501 Nov 82.

Reprint: Initial Oxide Growth Rate on Newly Generated Surfaces.

DESCRIPTORS: (U) *Metals, *Surface reactions, *Oxidation, *Current density, Electrochemistry, Passivity, Kinetics, Aluminum, Titanium, Zirconium Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 968 7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Phosphorus- and Arsenic-Bridged (1)Ferrocenophanes. 1. Synthesis and Characterization,

82 9P

PERSONAL AUTHORS: Seyferth,D. ;Withers,H. P. , Jr;

CONTRACT NO. AFOSR-79-0007

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1178

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v1 n10 p1275-1282 1982.

Reprint: Phosphorus- and Arsenic-Bridged (1) Ferrocenophanes. 1. Synthesis and Characterization.

DESCRIPTORS: (U) *Iron organic compounds, *Synthesis(Chemistry), Bridges, Phosphorus, Arsenic, Lithium compounds, Chemical reactions, Reprints

IDENTIFIERS: (U) Ferrocenophanes, PE61102F, WUAFOSR2303B2

AD-A135 968

AD-A135 962 4/1

BEN-GURION UNIV OF THE NEGEV SEDE BOQER (ISRAEL) JACOB BLAUSTEIN INST FOR DESERT RESEARCH

(U) The Behavior of the Atmosphere in the Desert Planetary Boundary Layer.

DESCRIPTIVE NOTE: Final scientific rept. 1 Jul 82-30 Jun 83,

JUN 83 36P

PERSONAL AUTHORS: Berkofsky,L. ;

CONTRACT NO. AFOSR-82-0285

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR
TR-83-1119

UNCLASSIFIED REPORT

ABSTRACT: (U) A general system of vertically integrated equations, including a dust concentration equation, has been derived. The boundary layer is divided into a constant flux layer, a transition layer, and an inversion layer. A novel feature of the model is the inclusion of equations to predict temperature and moisture lapse rates. The inversion height is also a function of time. A simplified version of the model has been tested with respect to its ability to predict the evolution of the inversion height and of the dust concentration. The results show very reasonable evolutions. The inversion height is lowest in the early morning, reaching a maximum in the late afternoon. The dust concentration near the ground is highest in the early morning, when the air is most stable, and lowest in mid-afternoon, when the atmosphere is least stable. These results, obtained for various particle sizes, are highly dependent upon the form of the mesoscale vertical velocity at the base of the inversion. (Author)

DESCRIPTORS: (U) *Dust, *Deserts, Mathematical prediction, Boundary layer, Concentration(Composition), Inversion, Atmospheres, Mathematical models, Integral equations

AD-A135 962

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 959 20/12

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

(U) Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.

DESCRIPTIVE NOTE: Progress rept.,

JAN 83 4P

PERSONAL AUTHORS: Wolff,P. A. ;Aggarwal,R. L. ;Brown,F. ; Jagannath,C. ;Ram-Mohan,L. R. ;

CONTRACT NO. F49620-80-C-0008

PROJECT NO. 2306

TASK NO. 02

MONITOR: AFOSR TR-83-1170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in RLE Progress Report Number 125, Research Laboratory of Electronics, Section 10, p53-54 Jan 83.

Reprint: Infrared Nonlinear Optics, Infrared Nonlinear Processes in Semiconductors.

DESCRIPTORS: (U) *Narrow gap semiconductors, Nonlinear systems, Plasma waves, Laser beams, Interactions, Reprints

IDENTIFIERS: (U) Infrared nonlinear processes, PE61102F, WUAFOSR230602

AD-A135 957 7/4 20/2

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) The X-Ray Crystal Structure of Tetramesityldisilene,

83 3P

PERSONAL AUTHORS: Fink,M. J. ;Michalczyk,M. J. ;Haller,K. J. ;West,R. ;Michl,J. ;

CONTRACT NO. AFOSR-82-0067

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1164

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Utah Univ., Salt Lake City. Dept. of Chemistry. Pub. in Jnl. of the Chemical Society, Chemical Communications, p1010-1011 1983.

Reprint: The X-Ray Crystal Structure of Tetramesityldisilene.

DESCRIPTORS: (U) *Silicon compounds, *Molecular structure, *Crystal structure, Chemical bonds, Configurations, Single crystals, Reprints

IDENTIFIERS: (U) *Disilene tetramesityl, PE61102F, WUAFOSR2303B2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 956 11/6

NORTHWESTERN UNIV EVANSTON IL DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) Synthesis and Properties of Elevated Temperature P/M Aluminum Alloys.

DESCRIPTIVE NOTE: Annual technical rept. 1 Oct 82-30 Sep 83.

NOV 83 47P

PERSONAL AUTHORS: Fine,M. E. ;Weertman,J. R. ;

CONTRACT NO. AFOSR-82-0005

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR TR-83-1202

UNCLASSIFIED REPORT

ABSTRACT: (U) High temperature alloys in order to maintain thier strength during long time exposure at high temperatures must have stable microstructures. The dispersed phase coarsening rates in the Al-7.5Fe-3.5Ce and Al-10Fe-1.5Mo-1V alloys, developed for high temperature applications, were compared at 475 and 575 C. To the extent that the average intercept length cubed, L3, is a linear function of time during isothermal aging, after an initial transient, the particle coarsening obeys the Lifshitz-Slyozov-Wagner theory. The interfacial energies estimated from the coarsening rates using the theory of particle coarsening show that the interfaces between the particles and matrix are high energy incoherent interfaces. The dispersed particles in the Al-10Fe-1.5Mo-1V alloy coarsen faster at both temperatures than the particles in the Al-7.5Fe-3.5Ce showing that the latter alloy is more stable at these temperatures. Since the diffusion in diffusion controlled coarsening usually occurs by a vacancy mechanism, plastic deformation should increase the rate of particle coarsening since plastic deformation increases the vacancy concentration. This has been confirmed in combined creep and coarsening studies with the Al-7.5Fe-3.5Ce alloy.

DESCRIPTORS: (U) *Aluminum alloys, *Heat resistant

alloys, *Physical properties, Powder metallurgy, Thermal stability, Microstructure, Iron alloys, Cerium alloys, Vanadium alloys, Molybdenum alloys, Plastic deformation, Mechanical properties

AD-A135 903 20/1

TORONTO UNIV DOWNSVIEW (ONTARIO) INST FOR AEROSPACE STUDIES

(U) Random Choice Solutions for Weak Spherical Shock-Wave Transitions of N-Waves in Air with Vibrational Excitation.

DESCRIPTIVE NOTE: Interim technical rept.,

JUL 83 114P

PERSONAL AUTHORS: Honma,H. ;Glass,I. I. ;

REPORT NO. UTIAS-253

CONTRACT NO. AFOSR-82-0097

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-83-1041

UNCLASSIFIED REPORT

ABSTRACT: (U) In order to clarify the effects of vibrational excitation on shock-wave transitions of weak, spherical N-waves, which were generated by using sparks and exploding wires as sources, the compressible Navier-Stokes equations were solved numerically, including a one-mode vibrational-relaxation equation. A small pressurized air-sphere explosion was used to simulate the N-waves generated from the actual sources. By employing the random-choice method (RCM) with an operator-splitting technique, the effects of artificial viscosity appearing in finite-difference schemes were eliminated and accurate profiles of the shock transitions were obtained. However, a slight randomness in the variation of the shock thickness remains. It is shown that a computer simulation is possible by using a proper choice of initial parameters to obtain the variations of the N-wave overpressure and half-duration with distance from the source. The calculated rise times are also shown to simulate both spark and exploding-wire data. It was found that, in addition to the vibrational-relaxation time of oxygen, both the duration and the attenuation rate of a spherical N-wave are important factors controlling its rise time. The effects of the duration and the

AD-A135 903

AD-A135 903 CONTINUED

attenuation rate of a spherical N-wave on its rise time, which are designated as the N-wave effect and the nonstationary effect, respectively, are discussed in more detail pertaining to Lighthill's analytical solutions and the RCM solutions for nonstationary plane waves and spherical N-waves. (Author)

DESCRIPTORS: (U) *Shock waves, *Sonic boom, Transitions, Wave equations, Atmospheric disturbances, Vibration, Excitation, Exploding wires, Overpressure

IDENTIFIERS: (U) Vibrational excitation, N-waves, PE61102F, WUAFOSR2307A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 894 20/5 7/4

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) Energetics and Collision Dynamics of Electronic Transition Lasers.

DESCRIPTIVE NOTE: Final rept. 1 Aug 81-31 Jul 83,

OCT 83 43P

PERSONAL AUTHORS: Michels,H. H. ;Hobbs,R. H. ;

REPORT NO. UTRC/R82-925832

CONTRACT NO. F49620-81-C-0097

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1054

UNCLASSIFIED REPORT

ABSTRACT: (U) Quantum mechanical studies, including both ab initio configuration-interaction expansions and density functional calculations, have been carried out to examine the electronic structure, radiative lifetimes and collisional branching ratios for molecules of importance in studies of electronic transition lasers. These studies have included an analysis of the energetics of Mg/MgO excitation transfer reactions, the spectroscopy of the low-lying electronic states of the I2 and I3 molecules and the mechanisms of the I2/02 1 Delta g dissociation kinetics. In addition, a study of the electronic structure of the NaMg system was carried out to evaluate its potential as a excimer laser.

DESCRIPTORS: (U) *Chemical lasers, *Electronic states, *Electron transitions, Particle collisions, Reaction kinetics, Quantum theory, Energetic properties, Molecular energy levels, Potential energy, Iodine, Sodium, Magnesium, Spectroscopy

IDENTIFIERS: (U) *Electronic transition lasers, Ab initio calculations, PE61102F, WUAFOSR2303B1

AD-A135 894

AD-A135 892 9/2

KESTREL INST PALO ALTO CA

(U) Synthesis of Efficient Structures for Concurrent Computation.

DESCRIPTIVE NOTE: Final interim rept. 1 Oct 82-30 Sep 83,

OCT 83 22P

PERSONAL AUTHORS: King,R. M. ;Mayr,E. W. ;Green,C. ;

REPORT NO. KES-U-83-6

CONTRACT NO. F49620-82-C-0007

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-1060

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Stanford Univ., CA. Dept. of Computer Science.

ABSTRACT: (U) The object of this research is the development of programming knowledge for the synthesis of concurrent programs. In this final report the authors describe techniques for synthesizing efficient parallel structures from high level specifications of a problem. These structures contain collections of trees interconnected in various ways. They examine an apparently diverse group of problems and show that they all have properties in common that allow these syntheses to be performed using only a few synthesis rules. Also explored are some alternative syntheses for some structures. Some of the synthesis paths use transformation rules designed to produce parallel structures containing multidimensional lattices. These lattices are then transformed into structures containing trees in some cases. In other cases the lattice structure is better and is retained. In yet other cases the lattice structure is modified to make a better lattice structure. (Author)

DESCRIPTORS: (U) *Parallel processing, *Computer programming, Computations, High level languages, Computer

AD-A135 892

AD-A135 892 CONTINUED

architecture, Methodology, Trees, Synthesis, Classification, Structures, Efficiency, Transformations, Specifications

IDENTIFIERS: (U) TRANSCONS(TRANSformational CONcurrency Synthesizer), TRANSCONS computer program, PE61102F, WUAFOSR2304A2

AD-A135 892

AD-A135 880 20/3 20/9

POLYTECHNIC INST OF NEW YORK FARMINGDALE DEPT OF ELECTRICAL ENGINEERING

(U) An Investigation of RF Currents in a Magnetized Plasma Using a Slow Wave Structure.

DESCRIPTIVE NOTE: Final scientific rept. 1 Oct 78-31 Dec 82,

OCT 83 126P

PERSONAL AUTHORS: Poole,B. R. ;Cheo,B. R. ;

REPORT NO. POLY-EE-83-004

CONTRACT NO. AFOSR-79-0009

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR TR-83-1057

UNCLASSIFIED REPORT

ABSTRACT: (U) An investigation of the interaction of electrostatic waves launched by a slow wave structure with a magnetized plasma is made. The characteristics of the electrostatic waves and the electron dynamics are studied experimentally. Of primary experimental interest is the measurement of the electron energy distribution and the rf-induced electron flux along the background magnetic field. This interest is motivated by a need for a more complete understanding of interaction of plasma with a slow wave electrostatic field which is of importance for rf-heating and rf dc current drive in plasmas.

DESCRIPTORS: (U) *Electrostatics, *Waves, *Plasmas(Physics), *Interactions, Electron energy, Electron flux, Magnetization, Background, Magnetic fields, Electrodynamics, Radiofrequency, Currents, Plasma diagnostics, Experimental data, Measurement, Numerical methods and procedures

IDENTIFIERS: (U) *Electrostatic waves, *Slow waves, PE61102F, WUAFOSR2301A8

AD-A135 880

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 878 20/6 9/1

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES CENTER FOR LASER STUDIES

(U) Characteristics of an Integrated Optics Ring Resonator.

DESCRIPTIVE NOTE: Final rept. May 79-Jan 83,

AUG 83 86P

PERSONAL AUTHORS: Garmire,E. ;

CONTRACT NO. AFOSR-82-0098

PROJECT NO. 2305

TASK NO. B2

MONITOR: AFOSR
TR-83-1048

UNCLASSIFIED REPORT

ABSTRACT: (U) A ring resonator 4 cm in diameter was fabricated and tested for sensing applications. A finesse of four was measured, and agreed with measured coupling efficiency and losses. Techniques have been developed to reduce the loss and from our measurements we predict that a finesse of more than 20 should be easily achievable in an interferometer 4 cm in diameter. This device has a wide variety of applications from temperature and wavelength sensing to inertial rotation sensing. Further refinements which will produce a high finesse resonator are the fabrication of a single mode ring and using specially prepared optical glass substrates. Operation at wavelengths longer than 0.63 micron will also improve the performance. (Author)

DESCRIPTORS: (U) *Resonators, *Optical glass, *Optical waveguides, Integrated systems, Fabrication, Test and evaluation, Losses, Optical waveguides, Depolarization, Measurement, Walls, Waveguide couplers, Refractive index, Rings

IDENTIFIERS: (U) *Ring resonators, PE61102F, WUAFOSR2305B2

AD-A135 878

AD-A135 876 19/4 19/1 13/13

CINCINNATI UNIV OH DEPT OF CIVIL AND ENVIONNMENTAL ENGINEERING

(U) Reinforced Concrete Response to Near Field Explosions.

DESCRIPTIVE NOTE: Final rept. 1 Jul 81-30 Jun 82,

JUN 83 49P

PERSONAL AUTHORS: Baseheart,T. M. ;

CONTRACT NO. AFOSR-81-0167

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-83-1064

UNCLASSIFIED REPORT

ABSTRACT: (U) From a review of experimental test results for concrete slabs subjected to conventional blast loading, various failure mechanisms and their relationship to scaled breach distance are documented. Analytical studies demonstrate the failure of membrane action when included with the rigid flexural analysis of structural response. For more intense blast pressure intensities, procedures available in the literature are described. (Author)

DESCRIPTORS: (U) *High explosives, *Explosion effects, *Reinforced concrete, Hardened structures, Structural response, Dynamic response, Overpressure, Shock waves, Near field, Blast loads

AD-A135 876

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 836 13/2 20/11 9/2

ILLINOIS UNIV AT URBANA DEPT OF CIVIL ENGINEERING

(U) Development of a Stress-Dependent Finite Element Slab Model.

DESCRIPTIVE NOTE: Annual rept. 6 Jan 82-30 Apr 83,

MAY 83 182P

PERSONAL AUTHORS: Thompson,M. R. ;Barenberg,E. J. ; Ioannides,A. M. ;Fischer,J. A. ;

CONTRACT NO. AFOSR-82-0143

PROJECT NO. 2307

TASK NO. C1

MONITOR: AFOSR
TR-83-1061

UNCLASSIFIED REPORT

ABSTRACT: (U) The concept of the Resilient Modulus of Subgrade Reaction, K sub R, developed to account for the stress dependent behavior of typical fine-grained subgrade soils. This new subgrade support parameter is defined as plate pressure/resilient deflection in an impulse plate load test simulated using finite element program ILLI-PAVE. The resilient modulus of subgrade reaction, K sub R, is expressed in the same units as the standard static modulus of subgrade reaction, K, but the value of the former is significantly higher. This indicates increased stiffness in response to rapidly moving loads. The finite element model presented in this report is a modified and expanded version of ILLI-SLAB, developed in 1977 for the study of jointed, slab-on-grade pavements. A number of modifications to the original code are described. The most important of these is the incorporation, through an iterative procedure, of the deflection dependent Resilient Modulus of Subgrade Reaction (K sub R). This parameter is considered more appropriate in modeling nonlinear subgrade response to rapidly moving loads. Other changes include: generation of contour plots of system response; introduction of specification of loaded areas in terms of global coordinates; and, free-form input capability. To illustrate the impact of these innovations, results from several demonstration runs are summarized. The major

effect of the proposed model is due to the higher values of K sub R, compared to the commonly used static k.

DESCRIPTORS: (U) *Pavements, *Pavement bases, *Stresses, *Computerized simulation, Finite element analysis, Models, Stress strain relations, Pressure, Loads(Forces), Load distribution, Response, Behavior, Resilience, Viscoelasticity, Predictions, Structural analysis, Nondestructive testing

IDENTIFIERS: (U) *Pavement slabs, *Pavement analysis, Slab models, Resilient modulus of subgrade reaction, PE61102F, WUAFOSR2307C1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 826 3/2

GEORGIA STATE UNIV ATLANTA DEPT OF PHYSICS AND ASTRONOMY

(U) The Optical Variability and Spectrum of PKS 2155-304.

SEP 83 4P

PERSONAL AUTHORS: Miller,H. R. ;McAlister,H. A. ;

CONTRACT NO. AFOSR-81-0161

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-1068

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Astrophysical Jnl. v272 p26-28, 1 Sep 83.

Reprint: The Optical Variability and Spectrum of PKS 2155-304.

DESCRIPTORS: (U) *Variable stars, Color temperature, Photometry, Polarization, Spectroscopy, Reprints

IDENTIFIERS: (U) BL Lacertae object, WUAFOSR2311A1, PE61102F

AD-A135 826

AD-A135 825 20/4 20/13

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT GAS TURBINE TECHNOLOGY GROUP

(U) Influence of Free-Stream Turbulence on Boundary Layer Transition in Favorable Pressure Gradients,

OCT 82 10P

PERSONAL AUTHORS: Blair,M. F. ;

CONTRACT NO. F49620-78-C-0064

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-83-1036

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Engineering for Power, v104 p743-750 Oct 82.

Reprint: Influence of Free-Stream Turbulence on Boundary Layer Transition in Favorable Pressure Gradients.

DESCRIPTORS: (U) *Turbulence, *Boundary layer transition, *Heat transfer, Free stream, Pressure gradients, Intensity, Two dimensional flow, Incompressible flow, Turbulent boundary layer, Surface temperature, Velocity, Profiles, Walls, Heating, Reprints

IDENTIFIERS: (U) WUAFOSR2307A4, PE61102F

AD-A135 825

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 822 7/3 5/2

SRI INTERNATIONAL MENLO PARK CA

(U) Nitrations Conference Held at Menlo Park, California on 27-29 July 1983.

DESCRIPTIVE NOTE: Final rept.,

SEP 83 106P

PERSONAL AUTHORS: Ross,D. S. ;Malhotra,R. ;

CONTRACT NO. F49620-83-C-0089

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-83-1049

UNCLASSIFIED REPORT

ABSTRACT: (U) In July, 1983, a 2 1/2 day meeting on nitration chemistry was held at SRI International in Menlo Park, CA. The sponsors of the meeting were ARO and AFOSR, and 24 papers on the various aspects of nitration were presented. The 71 attendees heard presentations on the mechanism of aromatic nitration, including discussions of the possible participation of electron transfer, and advanced studies in ipso nitration. Also included were presentations of polynitroaromatics and polynitropolyhedranes. (Author)

DESCRIPTORS: (U) *Nitration, Symposia, Aromatic compounds, Charge transfer, Chemical radicals, Cations, Electron transfer, Nitrogen oxides, Selection, Heat, Hazards, Reaction kinetics, Acids, Mixtures, Ethers, Polyethers, Amines, Nitrates, Electrochemistry, Polymers, Nitro radicals, Pyrolysis, Reports

IDENTIFIERS: (U) LPN-SRI-PYU-5865, LPN-SRI-PYU-5384, PE61102F, WUAFOSR2303B2

AD-A135 801 7/4

OREGON UNIV EUGENE DEPT OF PHYSICS

(U) Inelastic X-Ray Scattering Cross Sections of Ne,

83 16P

PERSONAL AUTHORS: Parente,F. ;

CONTRACT NO. F49620-83-K-0020, AFOSR-79-0026

MONITOR: AFOSR
TR-83-1056

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physics B: Atomic and Molecular Physics, v16 p3487-3501 1983.

DESCRIPTORS: (U) *Neon, *X ray scattering, *Scattering cross sections, Atomic structure, Approximation(Mathematics), Comparison, Inelastic scattering

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 796 3/1

GEORGIA STATE UNIV ATLANTA DEPT OF PHYSICS AND ASTRONOMY

(U) The Variability of the Spectrum of Arakelian 120.

JUL 83 9P

PERSONAL AUTHORS: Peterson,B. M. ;Foltz,C. B. ;Miller,H. R. ;Wagner,R. M. ;Crenshaw,D. M. ;

CONTRACT NO. AFOSR-81-0161, NSF-AST80-19025

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR TR-83-1065

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Astronomical Jnl., v88 n7 p926-933 Jul 83.

Reprint: The Variability of the Spectrum of Arakelian 120.

DESCRIPTORS: (U) *Galaxies, Spectrophotometers, Emission spectra, Radio sources(Astronomy), Variable stars, Reprints

IDENTIFIERS: (U) Arakelian 120, Seyfert 1 galaxy, PE61102F, WUAFOSR2311A1

AD-A135 779 7/4

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water + Sucrose + NaCl at the Mercury-Solution Interface.

82 18P

PERSONAL AUTHORS: Krishnan M. ;de Levie,R. ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-1070

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub in Jnl. of Electroanalytical Chemistry, v131 p97-112 1982.

Reprint: On Mutual Interactions of Adsorbed Molecules and Ions: Sucrose and Chloride in the Ternary System Water Sucrose NaCl at the Mercury Solution Interface.

DESCRIPTORS: (U) *Anodes(Electrolytic cell), *Adsorption, *Solutions(Mixtures), Saline solution, Mercury, Sucrose, Interfaces, Ionic current, Electrochemistry, Reprints

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 778 7/4

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) Stochastic Effects in the Formation of Condensed Thymine Films at the Water-Mercury Interface.

82 3P

PERSONAL AUTHORS: Sridharan,R. ;de Levie,R. ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1071

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v86 p4489-4490 1982.

Reprint: Stochastic Effects in the Formation of Condensed Thymine Films at the Water-Mercury Interface.

DESCRIPTORS: (U) *Anodes(Electrolytic cell), *Interfaces, *Organic solutes, Mercury, Stochastic processes, Nucleation, Films, Capacitance, Reprints

IDENTIFIERS: (U) Thymine, WUAFORS2303A1, PE61102F

AD-A135 777 12/1 7/4

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) Hadamard Transform Alternating Current Polarography,

FEB 83 5P

PERSONAL AUTHORS: Chang,C. C. ,de Levie,R. ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1069

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. Pub. in Analytical Chemistry, v55 n2 p356-359 Feb 83.

Reprint: Hadamard Transform Alternating Current Polarography.

DESCRIPTORS: (U) *Transformations(Mathematics), *Transfer functions, *Polarography, Alternating current, Microprocessors, Electrochemistry, Reprints

IDENTIFIERS: (U) Hadamard transform, WUAFOSR2303A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 772 20/12 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE FRANCIS BITTER NATIONAL MAGNET LAB

(U) Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe.

JUL 83 6P

PERSONAL AUTHORS: Yuen,S. Y. ;Becla,P. ;

CONTRACT NO. F49620-80-C-0008

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1029

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Optics Letters, v8 n7 p356-358 Jul 83.

Reprint: Saturation of Band-Gap Resonant Optical Phase Conjugation in HgCdTe.

DESCRIPTORS: (U) *Cadmium tellurides, *Energy bands, *Optical properties, Mercury compounds, Semiconductors, Energy gaps, Phase(Electronics), Resonant frequency, Reprints

IDENTIFIERS: (U) Optical phase conjugation, WUAFOSR2306C2, PE61102F

AD-A135 772

AD-A135 771 20/12

MASSACHUSETTS INST OF TECH CAMBRIDGE FRANCIS BITTER NATIONAL MAGNET LAB

(U) Degenerate Four-Wave Mixing due to Intervalance Band Transition in rho-Type Mercury Cadmium Telluride.

SEP 83 4P

PERSONAL AUTHORS: Yuen,S. Y. ;

CONTRACT NO. F49620-80-C-0008

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR TR-83-1030

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v43 n5 p479-481, 1 Sep 83.

Reprint: Degenerate Four-Wave Mixing due to Intervalance Band Transition in rho-Type Mercury Cadmium Telluride.

DESCRIPTORS: (U) *Semiconductors, *P type semiconductors, Band spectra, Valence bands, Phase transformations, Mercury compounds, Cadmium tellurides, Carbon dioxide lasers, Reprints

IDENTIFIERS: (U) DFWM(Degenerate Four Wave Mixing), WUAFOSR2306C2, PE61102F

AD-A135 771

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 769 7/4

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) Some Aspects of Modern Electrochemical Instrumentation,

81 13P

PERSONAL AUTHORS: DE Levie,R. ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1072

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Futuristic Aspects of Electrochemical Science and Technology, p109-119 1981.

Reprint: Some Aspects of Modern Electrochemical Instrumentation.

DESCRIPTORS: (U) *Electrochemistry, *Computer applications, *Instrumentation, Measurement, Transients, Interfacial tension, Polarography, Reprints

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F

AD-A135 763 20/12 7/4

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) The Structure of Charged Interfaces,

81 14P

PERSONAL AUTHORS: Levie,R. de ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-1073

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Sensors and Actuators, v1 p97-109 1981.

Reprint: The Structure of Charged Interfaces.

DESCRIPTORS: (U) *Semiconductors, *Interfaces, *Water, *Dielectrics, Electrochemistry, Space charge, Dipoles, Reprints

IDENTIFIERS: (U) WUAF...S2303A1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 762 20/4 12/1

CINCINNATI UNIV OH DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS

(U) Analysis of Three-Dimensional Viscous Internal Flows.

DESCRIPTIVE NOTE: Annual rept. 1 Mar 82-28 Feb 83.

AUG 83 38P

PERSONAL AUTHORS: Ghia,K. N. ;Ghia,U. ;

REPORT NO. AFL-83-8-67

CONTRACT NO. AFOSR-80-0160

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-83-1053

UNCLASSIFIED REPORT

ABSTRACT: (U) In the first research category, two different areas were studied: Analysis of laminar duct flows, and study of laminar and turbulent separated flows. These studies were aimed at acquiring a better understanding of isolated physical phenomena significant to turbomachinery applications via the use of appropriate model problems. The second research category is aimed at obtaining flow-dependent computational grids efficiently so that critical regions can be accurately modeled. The final research category includes the analysis of numerical methods, with the goal of improving the efficiency and accuracy of the various methods developed and implemented. Preliminary fine-grid marching solutions were obtained in the entrance region of the duct for eight different duct configurations. Streamwise separation was examined, using the model problem of laminar flow through a constricted asymmetric channel. True transient results were obtained for several flow configurations with extremely fine grids, so as to provide benchmark solutions which can permit assessment of other solutions obtained using approximate methods. Turbulence modeling was pursued, with the wall region being described by low-remodeling. Although the wall region can be modeled more accurately by this method, the fine grids required retard the convergence rate of the approximate factorization method used. Flow-dependent grids were generated for a 1-D nonlinear viscous Burgers' equation. For the first time, accurate results were computed using totally central-difference schemes for Re up to 10,000. Finally, in the last category, in the area of semi-implicit methods, a multi-grid method was developed to provide fine-grid solutions for the Neumann problem.

DESCRIPTORS: (U) *Viscous flow, *Three dimensional flow, *Laminar flow, *Turbulent flow, *Flow separation, Incompressible flow, Secondary flow, Turbulence, Mathematical models, Problem solving, Computations, Ducts, Walls, Grids, Navier Stokes equations, Numerical methods and procedures, Reynolds number, Turbomachinery

IDENTIFIERS: (U) *Internal flow, *Duct flow, Burgers equation, WUAFOSR2307A4, PE61102F

AD-A135 762

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 756 11/6

NORTHWESTERN UNIV EVANSTON IL DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) Lattice Parameter Variation of Al3 (Ti,V,Zr,Hf) in Al-2 at.% (Ti,V,Zr,Hf) Alloys.

DESCRIPTIVE NOTE: Technical rept.,

83 6P

PERSONAL AUTHORS: Zedalis,M. ;Fine,M. E. ;

CONTRACT NO. AFOSR-78-3732, NSF-DMR79-23573

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR TR-83-1055

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Scripta Metallurgica, v17 n10 p1247-1251 1983.

Reprint: Lattice Parameter Variation of Al3 (Ti,V,Zr,Hf) in Al-2 at.% (Ti,V,Zr,Hf) Alloys.

DESCRIPTORS: (U) *Aluminum alloys, Crystal lattices, Comparison, Parameters, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1

IAC NO. MCIC-121417

IAC DOCUMENT TYPE: MCIC - HARD COPY --

IAC SUBJECT TERMS: M--(U)Aluminum Alloys, Titanium Addition, Vanadium Addition, Zirconium Addition, Hafnium Addition, Intermetallic Compounds, Lattice Parameters, Dispersion Hardening, Crystallography, Phase Diagrams, Solid Solutions.;

AD-A135 753 3/2

GEORGIA STATE UNIV ATLANTA DEPT OF PHYSICS AND ASTRONOMY

(U) Photoelectric Comparison Sequences in the Fields of Four BL Lacertae Objects.

DESCRIPTIVE NOTE: Technical rept.,

SEP 83 4P

PERSONAL AUTHORS: Miller,H. R. ;Mullikin,T. L. ;McGimsey, B. Q. ;

CONTRACT NO. AFOSR-81-0161

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR TR-83-1067

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in the Astronomical Jnl., v88 n9 p1301-1303 Sep 83

Reprint: Photoelectric Comparison Sequences in the Fields of Four BL Lacertae Objects.

DESCRIPTORS: (U) *Variable stars, Photoelectric emission, Photometry, Optical interferometers, Calibration, Reprints

IDENTIFIERS: (U) BL Lacertae object, PE61102F, WUAFOSR2311A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 752 3/1

GEORGIA STATE UNIV ATLANTA DEPT OF PHYSICS AND ASTRONOMY

(U) The Variability of the Optical Counterparts of Four Extragalactic Radio Sources.

DESCRIPTIVE NOTE: Technical rept.,

MAY 83 4P

PERSONAL AUTHORS: Miller,H. R. ;

CONTRACT NO. AFOSR-81-0161

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-1066

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Astronomy & Astrophysics Supplement Series, v52 p289-291 1983.

Reprint: The Variability of the Optical Counterparts of Four Extragalactic Radio Sources.

DESCRIPTORS: (U) *Radio sources(Astronomy), Galaxies, Photometry, Reprints

IDENTIFIERS: (U) Optical variability, PE61102F, WUAFOSR2311A1

AD-A135 752

AD-A135 744 20/4 1/3

INDIANA UNIV-PURDUE UNIV AT INDIANAPOLIS SCHOOL OF ENGINEERING AND TECHNOLOGY

(U) Analysis of Three-Dimensional Transonic Potential Flows Using Optimum Grid.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 82,

DEC 82 105P

PERSONAL AUTHORS: Ecer,A. ;

CONTRACT NO. AFOSR-80-0258

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-83-1052

UNCLASSIFIED REPORT

ABSTRACT: (U) A three-dimensional finite element procedure is developed for the analysis of three-dimensional transonic flows and applied to the analysis of wing-body combinations. A finite element grid generation scheme for three-dimensional bodies with complex geometries is presented. The design of efficient, body-fitted computational grids with isoparametric mappings, as well as the application of higher-order finite elements in analyzing transonic potential flows are investigated. Two different computational grids were designed and studied with a numerical scheme based on the density upwinding in the supersonic regions. A pseudo-unsteady type formulation is employed in determining a steady-state solution. It is concluded that the grid generation scheme is quite flexible and efficient for generating solution adaptive grids and providing local refinements in the sensitive flow regions. Also, it is shown that the employed numerical scheme with higher-order elements at flow regions of high gradients produced results which compare favorable with experimental data. (Author)

DESCRIPTORS: (U) *Three dimensional flow, *Transonic flow, *Potential flow, Grids, Finite element analysis, Wing body configurations, Flow fields, Wings, Airfoils

AD-A135 744

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 744 CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A1

AD-A135 742 12/1 20/4

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MATHEMATICS

(U) Sphericalization of Nonspherical Interactions,

JUL 83 3P

PERSONAL AUTHORS: Lebowitz,J. L. ;Percus,J. K. ;

CONTRACT NO. AFOSR-82-0016

PROJECT NO. 2301

TASK NO. A3

MONITOR: AFOSR TR-83-1063

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v79 n1 p443-444, 1 Jul 83.

Reprint: Sphericalization of Nonspherical Interactions.

DESCRIPTORS: (U) *Equations of state, *Molecule molecule interactions, Fluid mechanics, Interactions, Computations, Reprints

IDENTIFIERS: (U) *Nonspherical molecules, PE61102F, WUAFOSR2301A3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 741 6/1

CALIFORNIA UNIV SAN FRANCISCO

(U) Probable Helical Conformation of Poly(ADP-ribose),

MAY 83 7P

PERSONAL AUTHORS: Kun,E. ;Minaga,T. ;

CONTRACT NO. F49620-81-C-0007, PHS-HL-27317

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-83-1012

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Biological Chemistry, v258 n9 p5726-5730, 10 May 83.

Reprint: Probable Helical Conformation of Poly(ADP-ribose)

DESCRIPTORS: (U) *Ribose, *Adenosine, *Polymers, Temperature, Molecular structure, Ions, Sodium chloride, Magnesium, Calcium, Interactions, PH factor, Reprints

IDENTIFIERS: (U) Helical compounds, PE61102F, WUAFOSR2312A5

AD-A135 741

AD-A135 739 20/12 7/4 20/2

FLORIDA UNIV GAINESVILLE DEPT OF CHEMICAL ENGINEERING

(U) A Comparative Thermodynamic Analysis of Impurity Incorporation in Vapor Phase Epitaxial InP and GaAs.

DESCRIPTIVE NOTE: Final scientific rept. 15 Mar 81-14 Aug 82,

OCT 83 219P

PERSONAL AUTHORS: Anderson,T. J. ;Meyer,D. ;

CONTRACT NO. AFOSR-81-0164

PROJECT NO. 2306

TASK NO. D9

MONITOR: AFOSR
TR-83-1108

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at National AIChE Conference, Orlando, FL, Mar 82 and Am. Vac. Sci. Conference, Anaheim, CA, Apr 83.

ABSTRACT: (U) The maximum extent of unintentional Si incorporation has been defined for deposition of GaAs and InP by both the chloride and hydride processes. The extents were determined on the basis of constrained chemical equilibrium be.ng achieved in the CVD reactor. The input species consisted of the input gas components and excess condensed phases of the group III source material and quartz reactor wall. The work performed included incorporation of a novel psuedo-steady state constraint for the liquid source, identifying vapor species not included before, and establishing the vapor composition relation to the point defect structure. The results ind.cate that Si incorporation levels can be significant. In general, the activity of Si was less in the hydride system and with the compound source in the chloride system. Furthermore, the activity of Si decreased significantly with temperature, small additions of H20, HC1 or VC13 to the mixing zone, and replacing the H2 carrier gas by an inert in the chloride system. However, the activity of Si displayed a maximum with system pressure and was somewhat insensitive to input composition. Reviews of the literature are included for

AD-A135 739

AD-A135 739 CONTINUED

the thermochemical properties employed and unintentional doping in experimental GaAs and InP VPE films. Algorithms for computing complex chemical equilibrium using both stoichiometric and non-stoichiometric approaches were generated.

DESCRIPTORS: (U) *Semiconductors, *Epitaxial growth, *Impurities, *Thermodynamic properties, Vapor deposition, Chemical equilibrium, Gallium arsenides, Indium phosphides, Silicon, Thermochemistry

IDENTIFIERS: (U) PE61102F, WUAFOSR2306D9

AD-A135 734 20/4 12/1

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MATHEMATICS

(U) One-Dimensional Models of Anisotropic Fluids,

83 10P

PERSONAL AUTHORS: Lebowitz,J. L. ;Percus,J. K. ;

CONTRACT NO. DE-AC02-76ER03077, AFOSR-82-0016

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-83-1047

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Annals New York Academy of Sciences, p351-359 1983.

Reprint: One-Dimensional Models of Anisotropic Fluids.

DESCRIPTORS: (U) *Fluid flow, Confinement(General), Channel flow, One dimensional, Anisotropy, Equations of state, Matrices(Mathematics), Mathematical models, Equilibrium(General), Phase transformations, Reprints

IDENTIFIERS: (U) Transfer matrices, Narrow channel flow, Molecular fluids, Anisotropic fluids, PE61102F, WUAFOSR2301A8

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 729 14/2 20/4 21/5

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers,

OCT 81 12P

PERSONAL AUTHORS: Blair,M. F. ;Bailey,D. A. ;Schlinker,R. H. ;

CONTRACT NO. F49620-78-C-0064

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1059

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Engineering for Power, v103 p678-687 Oct 81.

Reprint: Development of a Large-Scale Wind Tunnel for the Simulation of Turbomachinery Airfoil Boundary Layers.

DESCRIPTORS: (U) *Wind tunnels, *Boundary layer flow, Airfoils, Turbomachinery, Free stream, Turbulence, Heat transfer, Surface temperature, Closed cycle systems, Two dimensional flow, Pressure gradients, Boundary layer transition, Gas turbine blades, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4

AD-A135 729

AD-A135 728 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine,

83 15P

PERSONAL AUTHORS: Dewar,M. J. S. ;Rzepa,H. S. ;

CONTRACT NO. F49620-83-C-0024, AFOSR-75-2749

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1042

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Computational Chemistry, v4 n2 p158-169 1983. See also AD-A011 757.

Reprint: Ground States of Molecules. 53. MNDO Calculations for Molecules Containing Chlorine.

DESCRIPTORS: (U) *Mindo molecular orbitals, *Ground state, *Chlorine compounds, Heat of formation, Ionization potentials, Dipole moments, Chemical bonds, Computations, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A135 728

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 724 7/3 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne,

83 9P

PERSONAL AUTHORS: Dewar,M. J. S. ;Ford,G. P. ;Reynolds,C. H. ;

CONTRACT NO. F49620-83-0024

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1040

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Society, v105 n10 p3162-3167 1983,

Reprint: Ground States of Molecules. 61. Relative Stabilities of o-, m-, and p-Benzyne.

DESCRIPTORS: (U) *Benzene compounds, *Isomers, *Molecular states, Stability, Chemical bonds, Molecular structure, Reprints

IDENTIFIERS: (U) Benzyne, PE61102F, WUAFOSR2303B2

AD-A135 723 7/2 7/4

GEORGIA UNIV ATHENS

(U) Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphospine))-bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7,

82 7P

PERSONAL AUTHORS: Brown,G. M. ;Finholt,J. E. ;King,R. B. ; Bibber,J. W. ;Kim,J. H. ;

CONTRACT NO. AFOSR-75-2869

PROJECT NO. 2304

TASK NO. B2

MONITOR: AFOSR TR-84-0144

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v21 p3790-3794 1982.

Reprint: Poly(tertiary phosphines and arsines). 20. Some Reactions of (methylamino)bis(dimethoxyphosphine) and Crystal Structure of (microns-Carbonyl)(microns-(methylamino)bis(dimethoxyphosphine))bis(tricarbonyliron), CH3N(P(OCH3)2)2Fe2(CO)7.

DESCRIPTORS: (U) *Organometallic compounds, *Chelate compounds, *Crystal structure, Phosphine, Arsines, Metal carbonyls, Molecular structure, Chemical bonds, X ray spectroscopy, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 722 12/1 7/4

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MATHEMATICS

(U) Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface.

83 10P

PERSONAL AUTHORS: Blum,L. ;Hernando,J. ;Lebowitz,J. L. ;

CONTRACT NO. AFOSR-82-0016

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR TR-83-1046

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n15 p2825-2832 1983.

Reprint: Numerical Method and General Discussion of Integral Equations for the Primitive Model of the Electric Interface.

DESCRIPTORS: (U) *Numerical methods and procedures, *Algorithms, *Integral equations, Electrodes, Electricity, Interfaces, Electrolytes

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A8

AD-A135 722

AD-A135 718 7/3

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Studies of Polymer-Bound Macrocyclic Polytertiary Phosphines.

DESCRIPTIVE NOTE: Final rept. 1 Feb 79-31 Jul 83,

JUL 83 12P

PERSONAL AUTHORS: Ryba,E. P. ;

CONTRACT NO. AFOSR-79-0090

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1074

UNCLASSIFIED REPORT

ABSTRACT: (U) The research objectives of this work were to synthesize functionalized macrocyclic polyphosphines (MPP) and to use the functional group to attach the MPP to a functionalized polymer support (PS). The PS-MPP species were to be studies for their ability to coordinate transition metals, and to compare the behavior of PS-MPP-metal complexes with that of non-PS-MPP analogs.

DESCRIPTORS: (U) *Polymers, *Phosphine, *Metal complexes, Synthesis(Chemistry), Cyclic compounds, Transition metals, Metal carbonyls, Chemical reactions

IDENTIFIERS: (U) Polyphosphines, WUAFOSR2303B2, PE61102F

AD-A135 718

AD-A135 716 7/2

GEORGIA UNIV ATHENS DEPT OF CHEMISTRY

(U) Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino) bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule.

82 9P

PERSONAL AUTHORS: Brown,G. M. ;Finholt,J. E. ;King,F. B. ; Bibber,J. W. ;

CONTRACT NO. AFOSR-75-2869

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1038

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v21 n6 p2139-2145 1982. See also AD-A065 710.

Reprint: Poly(tertiary Phosphines and Arsines). 18. Preparation and Structure of bis(u-((methylamino) bis(dimethoxyphosphine)))-bis(dicarbonylcobalt), a Binuclear Complex with Approximate Square-Pyramidal and Trigonal-Bipyramidal Coordination of Cobalt Atoms in the Same Molecule.

DESCRIPTORS: (U) *Metal complexes, *Metal carbonyls, *Synthesis(Chemistry), Cobalt compounds, Molecular structure, Ligands, Phosphine, Reprints

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F

AD-A135 714 20/4 20/13

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT GAS TURBINE TECHNOLOGY GROUP

(U) Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 2. Analysis of Results,

FEB 83 9P

PERSONAL AUTHORS: Blair,M. F. ;

CONTRACT NO. F49620-78-C-0064

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1044

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Heat Transfer, v105 p41-47 Feb 83. See also Part 1, AD-A135 713.

Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 2. Analysis of Results.

DESCRIPTORS: (U) *Turbulence, *Heat transfer, *Turbulent boundary layer, Momentum, Thickness, Free stream, Intensity, Reynolds number, Correlation, Skin friction, Profiles, Coefficients, Reprints

IDENTIFIERS: (U) Free stream turbulence, WUAFOSR2307A4, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 713 20/4 20/13

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT GAS TURBINE TECHNOLOGY GROUP

(U) Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 1. Experimental Data,

FEB 83 10P

PERSONAL AUTHORS: Blair,M. F. ;

CONTRACT NO. F49620-78-C-0064

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1043

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Heat Transfer, v105 p33-40 Feb 83. See also Part 2, AD-A135 714.

Reprint: Influence of Free-Stream Turbulence on Turbulent Boundary Layer Heat Transfer and Mean Profile Development. Part 1. Experimental Data.

DESCRIPTORS: (U) *Turbulence, *Heat transfer, *Turbulent boundary layer, Flat plate models, Free stream, Boundary layer flow, Two dimensional flow, Skin friction, Walls, Experimental data, Coefficients, Correlation, Reprints

IDENTIFIERS: (U) Free stream turbulence, WUAFOSR2307A4, PE61102F

AD-A135 713

AD-A135 711 20/4 12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Solution Procedures for Accurate Numerical Simulations of Flow in Turbomachinery Cascades.

DESCRIPTIVE NOTE: Interim rept.,

JAN 83 17P

PERSONAL AUTHORS: Thompkins,W. T. , Jr.;Tong,S. S. ;Bush, R. H. ;Usab,W. J. , Jr.;Norton,R. J. G. ;

CONTRACT NO. F49620-82-K-0002

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1022

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the AIAA Aerospace Sciences Meeting (21st) 10-13 Jan 83, Reno, NV.

ABSTRACT: (U) For several years the authors have been evaluating and developing numerical simulation schemes for compressible, two dimensional inviscid or viscous flows in turbomachinery cascades. Numerical schemes considered, all originally classified as time-marching schemes, include: 1) implicit approximate factorization schemes; 2) explicit schemes due to MacCormack; 3) explicit central difference schemes; and 4) the mult-grid scheme of Ni. As we develop these schemes we came to believe that the accuracy of computational results is relatively insensitive to the numerical algorithm chosen but highly sensitive to implementation details such as boundary conditions, consistent flux balancing, grid resolution and numerical smoothing. To illustrate our viewpoint, we present an examination of the relationship between a flux balancing interpretation of the control volume conservation laws and various finite difference formulations and comparisons of the performance of these schemes on three test problems: Ni's bump in a channel, a supersonic nozzle, and flow in a supercritical compressor cascade.

AD-A135 711

AD-A135 711 CONTINUED

DESCRIPTORS: (U) *Cascades(Fluid dynamics), *Computerized simulation, *Numerical methods and procedures, Turbomachinery, Compressible flow, Supercritical flow, Algorithms, Mathematical prediction, Sensitivity, Data processing, Problem solving, Boundaries, Grids(Coordinates), Resolution, Stagnation pressure, Finite difference theory, Operators(Mathematics), Inviscid flow, Solutions(General), Steady state, Cascade structures, Internal, Supersonic nozzles, Nozzle gas flow

IDENTIFIERS: (U) Internal flow, Time marching methods, Data smoothing, Flux balancing, WUAFOSR2307A4, PE61102F

AD-A135 707 5/2 9/2

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) Universal Relation Database Systems.

DESCRIPTIVE NOTE: Annual rept. 1 Sep 82-31 Aug 83,

AUG 83 7P

PERSONAL AUTHORS: Ullman,J. D. ;

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0962

UNCLASSIFIED REPORT

ABSTRACT: (U) The query facility for their universal relation database system is now working. The fundamental paper unifying ideas on what a UR system can and should be has been published. A paper surveying developments in the field of universal relation systems was invited for the triennial IFIP Congress and was delivered in September. Some initial results on logical theories applied to the problem of updating views have been obtained. There have been a number of developments concerning inference of inclusion dependencies and on the complexity of deciding certain properties of data base schemes. Some interesting results on the difficulty of obtaining hash functions that work well for particular sets of data have been obtained and won an award. (Author)

DESCRIPTORS: (U) *Data management, *Data bases, Computer logic, Semantics, Parsers, Systems engineering, Information retrieval, Operational effectiveness, Research management, Reports

IDENTIFIERS: (U) UR(Universal Relation), Updates, Universal relation systems, Query, WUAFOSR2304A2, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 699 20/12 20/6

HONEYWELL CORPORATE TECHNOLOGY CENTER BLOOMINGTON MN

(U) Mechanisms of Optical Phase Conjugation in Hg(1-x)Cd(x) Te.

DEC 82 22P

PERSONAL AUTHORS: Kruse,P. W. ;Khan,M. A. ;

CONTRACT NO F49620-81-C-0034, F49620-77-C-0028

PROJECT NO. 2306

TASK NO. C2

MONITOR: AFOSR
TR-83-1031

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the International Conference on Lasers, p14-34, 13-17 Dec 82.

Reprint: Mechanisms of Optical Phase Conjugation in Hg(1-x)Cd(x)Te.

DESCRIPTORS: (U) *Semiconductors, *Cadmium tellurides, *Optical properties, Mercury compounds, Bulk semiconductors, Temperature, Phase(Electronics), Reprints

IDENTIFIERS: (U) Mercury cadmium tellurides, WUAFOSR2306C2, PE61102F

AD-A135 699

AD-A135 692 18/2 7/5 20/5

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Possibility of Isotope Separation by Selective Radiative Scattering,

JUL 83 4P

PERSONAL AUTHORS: Hutchinson,M. ;George,T. F. ;DeVries,P. L. ;

REPORT NO. 24

CONTRACT NO. AFOSR-82-0046, NSF-CHE80-22874

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-83-1021

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v28 n1 p490-492 Jul 83.

Reprint: Possibility of Isotope Separation by Selective Radiative Scattering.

DESCRIPTORS: (U) *Isotope separation, *Lasers, *Electron scattering, Collisions, Excitation, Laser beams, Low temperature, Elastic scattering, Dissociation, Photons, Emission, Molecules, Vibration, Rotation, Kinetic energy, Electronic states, Scattering cross sections, Xenon, Fluorides, Quantum chemistry, Reprints

IDENTIFIERS: (U) Radiative scattering, WUAFOSR2303A2, PE61102F

AD-A135 692

AD-A135 689 3/2

LOUISIANA STATE UNIV BATON ROUGE DEPT OF PHYSICS AND ASTRONOMY

(U) A Search for Light Variations in Barium Stars,

SEP 83 6P

PERSONAL AUTHORS: Landolt,A U. ;

CONTRACT NO. AFOSR-82-0192

PROJECT NO 2311

TASK NO. A1

MONITOR: AFOSR
TR-83-0996

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Astronomical Society of the Pacific, v95 n571 p644-647 Sep 83.

Reprint: A Search for Light Variations in Barium Stars.

DESCRIPTORS: (U) *Stars, Classification, Line spectra, Reprints

IDENTIFIERS: (U) Barium stars, WUAFOSR2311A1, PE61102F

AD-A135 689

AD-A135 688 20/4 1/2

NIELSEN ENGINEERING AND RESEARCH INC MOUNTAIN VIEW CA

(U) Effects of Blowing Spanwise from the Tips of Low-Aspect Ratio Wings of Varying Taper Ratio, with Application to Improving STOL Capability of Fighter Aircraft.

DESCRIPTIVE NOTE: Final rept. 1 Apr 82-30 Sep 82,

FEB 83 93P

PERSONAL AUTHORS: Schwind,R. G. ;Briggs,M. M. ;

REPORT NO. NEAR-TR-294

CONTRACT NO. F49620-82-C-0061

PROJECT NO 2307

TASK NO. A1

MONITOR: AFOSR
TR-83-1045

UNCLASSIFIED REPORT

ABSTRACT: (U) Parametric low-speed wind tunnel testing of several low aspect ratio half-span wings featuring outboard-blowing wing-tip jets has been accomplished. This effort was performed to extend the existing information base regarding lift augmentation of low aspect ratio wings to encompass tapered wings suitable for application to high-performance fighter aircraft. At an angle of attack typical for fighter aircraft takeoff, operation of the wing-tip jets was found to augment the lift coefficient of aspect ratio two wings by 25% to 35%, depending upon the value of the jet momentum coefficient and the wing taper ratio. At low angles of attack, the wing lift coefficients were augmented by as much as 120%, but the amount of lift augmentation decreased in inverse proportion to wing angle of attack. The worth of blowing outboard from the wing tips of fighter aircraft as a means of enhancing STOL performance was assessed. Diverting 70% of the engine bypass airflow to the wing tips reduced predicted takeoff and landing distances by 15%. Differential left-wing-tip-to-right-wing-tip modulation of the jet momentum can immediately produce up to 15,000 ft-lbs of additional roll control torque during low-speed landing approaches. (Author)

AD-A135 688

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 688 CONTINUED

DESCRIPTORS: (U) *Wings, *Jet flow, *High lift, Wing tips, Jet fighters, Augmentation, Coefficients, Momentum, Short takeoff aircraft, Angle of attack, Aspect ratio, Taper, Ratios, Modulation, Roll, Torque, Aircraft landings, Takeoff, Wind tunnel tests, Data bases, Lift to drag ratio

IDENTIFIERS: (U) Low aspect ratio wings, Lift augmentation, Tapered wings, Wing tip jet blowing, Virtual wings, Roll control, PE61102F, WUAFOSR2307A1

AD-A135 670 20/12 20/2

STANFORD UNIV CA DEPT OF APPLIED PHYSICS

(U) Tunneling Properties of Single Crystal Nb/Nb205/Pb Josephson Junctions,

OCT 83 4P

PERSONAL AUTHORS: Celaschi,S. ;Geballe,T. ;Lowe,W. P. ;

CONTRACT NO. F49620-83-C-0014

PROJECT NO. 2306

TASK NO. C1

MONITOR: AFOSR TR-83-1032

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v43 n8 p749-796, 15 Oct 83.

Reprint: Tunneling Properties of Single Crystal Nb/Nb205/ Pb Josephson Junctions.

DESCRIPTORS: (U) *Niobium compounds, *Josephson junctions, Fabrication, Single crystals, Tunneling(Electronics), Superconductors, Oxidation, Reprints

IDENTIFIERS: (U) WUAFOSR2306C1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD A135 663 14/5 20/6 12/1

HONEYWELL ELECTRO OPTICS DIV LEXINGTON MA

(U) Holographic FLI (Fringe Linearization Interferometry) for Detection of Defects.

DESCRIPTIVE NOTE: Interim rept. 15 Jan-15 Aug 83,

OCT 83 73P .

PERSONAL AUTHORS: Reynolds,G. J. ;Servaes,D. A. ;DeVelis, J. B. ;Peirce,D. ;Mayville,R. .

REPORT NO. 8309-38

CONTRACT NO. F49620-82-C-0001

PROJECT NO. 2306

TASK NO. A2

MONITOR: AFOSR TR-83-1058

UNCLASSIFIED REPORT

ABSTRACT: (U) This interim report describes the work performed during the first half of Phase II on the Two Step Holographic Fringe Linearization Interferometry Study. The FLI process consists of deflecting the object beam between holographic exposures to create linear fringes and spatial filtering of the image reconstructed from the hologram about the linear fringe carrier frequency. This filtering is meant to discriminate between subsurface defects and random fringe noise. During this phase a loading limitation for the FLI process (of one quarter wave/linear fringe period for the out-of-plane deformations) was demonstrated. To circumvent this limitation two modifications to the FLI process were investigated: Four-Exposure FLI - a Moire technique and Laser Pulse separation control with dynamic loading. With the former method Linear fringes have been recovered from the random noise in a simulated laboratory experiment. Experiments to demonstrate the fringe shifts at defect locations with differential loading are still in progress. Preliminary experiments performed on the NADC holographic system indicate that it should be adequate, albeit cumbersome, to demonstrate the Laser Pulse Control Method. The finite element analysis is predicting the experimental fringe patterns obtained with static loading and the modeling effort for the dynamic loading experiments is discussed. Plans for the work to be done during the remainder of Phase II are given. (Author)

DESCRIPTORS: (U) *Interferometry, *Holography, *Defect analysis, *Mathematical analysis, Finite element analysis Nondestructive testing, Moire effects, Pulsed lasers, Spatial filtering, Cracks, Linearity, Static loads, Dynamic loads, Image processing, Carrier frequencies, Noise, Subsurface, Deformation

IDENTIFIERS: (U) FLI(Fringe Linearization Interferometry) , PE61102F, WUAFOSR2306A2

IAC NO. NT-028552

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

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UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD A135 662 9/5 9/2 9/1

CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

(U) DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.

MAY 83 8P

PERSONAL AUTHORS: Nye,B. ;Sangiovanni-Vincentelli,A. L. ; Spoto,J. ;Tits,A. ;

CONTRACT NO. F49620-79-C 0178

PROJECT NO. 2305

TASK NO. A9

MONITOR: AFOSR TR-83-1033

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Proceedings of the Custom Integrated Circuits Conference, p233-238 May 83.

Reprint: DELIGHT SPICE: An Optimization-Based System for the Design of Integrated Circuits.

DESCRIPTORS: (U) *Integrated circuits, *Computer aided design, *Operational amplifiers, *Field effect transistors, *Bipolar transistors, Response, Frequency response, Analog systems, Digital systems, Automation, Algorithms, Optimization, Reprints

IDENTIFIERS: (U) DELIGHT computer program, SPICE computer program, Digital circuits, Analog circuits, Gain bandwidth product, Settling time, Pulse response, PE61102F, WUAFOSR2305A9

AD-A135 662

AD A135 649 14/2 9/1 20/3

CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

(U) A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line.

AUG 83 3P

PERSONAL AUTHORS: Hubbell,S. ;Angelakos,D. J. ;

CONTRACT NO. F49620-79-C-0178

PROJECT NO. 2305

TASK NO. A9

MONITOR: AFOSR TR-83-1034

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-31 n8 p687-688 Aug 83.

Reprint: A Technique for Measuring the Effective Dielectric Constant of a Microstrip Line.

DESCRIPTORS: (U) *Wave analyzers, *Dielectric properties, *Strip transmission lines, Air, Dielectrics, Insertion loss, Capacitance, Constants, Reprints

IDENTIFIERS: (U) Wavelength analyzers, SAM(Suspended Air Microstrip), Effective dielectric constant, Metal strips, Characteristic impedance, Microstrip lines, Layered media, Ground planes, Metal strips, PE61102F, WUAFOSR2305A9

AD-A135 649

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 631 5/2 14/5 20/6

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG HUMAN FACTORS LAB

(U) Quality Metrics of Digitally Derived Imagery and Their Relation to Interpreter Performance. I. Preparation of a Large-Scale Database.

DESCRIPTIVE NOTE: Final technical rept. 1 Jun 78-30 Sep 83.

APR 82 104P

PERSONAL AUTHORS: Burke,J. J. ;Strickland,R. N. ;

REPORT NO. VPI-HFL-81-1

CONTRACT NO. F49620-78-C-0055

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-83-0995

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Arizona Univ., Tucson. Optical Sciences Center.

ABSTRACT: (U) This report describes the preparation of an imagery data base containing 250 transparencies, consisting of 25 degraded versions of each of 10 digitized images. The 25 degraded versions consist of 5 blur levels combined with 5 noise levels. Each image is 86 mm square and represents 4096 x 4096 8-bit pixels. These images have corresponding ground truth, and the blur and noise levels are verified and quantitatively known. Subsequent stages of the research program will use these images in experiments to compare image quality with measured photointerpreter performance. An overview of the research program is also provided. (Author)

DESCRIPTORS: (U) *Data bases, *Image processing, *Photointerpretability, Digital systems, Noise, Transparencies, Photographic contrast, Hard copy, Research management, Air Force research

IDENTIFIERS: (U) Pixels, PE61102F, WUAFOSR2313A4

AD-A135 631

AD-A135 629 20/6 5/2

OPTICAL SOCIETY OF AMERICA WASHINGTON D C

(U) Topical Meeting on Signal Recovery and Synthesis with Incomplete Information and Partial Constraints Held at Incline Village, Nevada on January 12-14, 1983.

DESCRIPTIVE NOTE: Final rept. 1 Dec 82-31 Aug 83,

AUG 83 244P

PERSONAL AUTHORS: Quinn,J. W. ;

CONTRACT NO. AFOSR-83-0026

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR TR-83-1094

UNCLASSIFIED REPORT

ABSTRACT: (U) The Topical Meeting on Signal Recovery and Synthesis with Incomplete Information and Partial Constraints was held in Lake Tahoe, Nevada on January 12-14, 1983. The meeting was open to all interested scientists and engineers and was interdisciplinary in scope. The program consisted of both invited fields and contributed papers. The two and one-half day meeting dealt with such diverse as image processing, crystallography, astronomy, geophysical signal processing, electron microscopy, optical information processing, and remote sensing having encountered the problem of image formation with missing information or unknown (or only partially known) measurement system parameters. Specific examples include phase retrieval from intensity measurements, tomographic reconstruction with missing projections, blind deconvolution, and multidimensional spectral extrapolation and interpolation. A related set of problems occurs in multidimensional signal processing when system constraints are only partially specified. Examples include computer holography and pupil synthesis for incoherent optical processing. A common mathematical structure is shared by all these application areas. The purpose of this meeting was to bring together specialists with interests in these diverse areas and to stimulate interchange of ideas. (Author)

AD-A135 629

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 629 CONTINUED

DESCRIPTORS: (U) *Optical processing, *Signal processing, *Symposia, *Reports, Extrapolation, Image restoration, Spectrum analysis, Estimates, Intensity, Synthesis, Interpolation, Tomography, Electron microscopy, Image processing, Measurement, Mathematical models, Optical processing, Optical data

IDENTIFIERS: (U) Signal recovery, Signal synthesis, PE61102F, WUAFOSR2305B1

AD-A135 629

AD-A135 620 12/1 15/5

NORTH CAROLINA UNIV AT CHARLOTTE DEPT OF MATHEMATICS

(U) Interim Report, Grant AFOSR-80-0245.

DESCRIPTIVE NOTE: Rept. for 1 Jul 82-30 Jun 83,

AUG 83 10P

PERSONAL AUTHORS: Abdel-Hameed,M. ;

CONTRACT NO. AFOSR-80-0245

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-0818

UNCLASSIFIED REPORT

ABSTRACT: (U) The Principal Investigator and the Co-investigator attended four conferences giving papers at two of them. The Principal Investigator organized a Conference on Stochastic Failure Models, Replacement and Maintenance Policies, Accelerated Life Testing. He continued his research on shock models, wear processes, replacement and maintenance policies; revised the paper Life Distribution Properties of Devices Subject to a Levy Wear Process, wrote the paper Pure Jump Damage Processes. He also wrote Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators. The Co-investigator presented a paper on Approximate Optimal Replacement Policies and Their Stability.

DESCRIPTORS: (U) *Replacement theory, *Research management, Wear, Iterations, Optimization, Damage, Shock, Stability, Problem solving

IDENTIFIERS: (U) Pure jump damage processes, PE61102F, WUAFOSR2304A5

AD-A135 620

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 570 20/4 12/1

STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING

(U) The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 2. Taxonomies, Reporters' Summaries, Evaluation, and Conclusions.

DESCRIPTIVE NOTE: Interim rept.,

SEP 81 441P

PERSONAL AUTHORS: Kline,S. J. ;Cantwell,B. J. ;Lilley,G. M. ;

CONTRACT NO. F49620-80-C-0027

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-83-1002

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A135 569. Proceedings of the Conference held at Stanford University, Stanford, CA, 14-18 Sep 81.

ABSTRACT: (U) Volumes II and III together give an overview of the state of the art in computing complex turbulent flows in 1981 using the data base established for this purpose in Volume I. The materials are intended to be complete in the sense of providing all elements necessary for understanding the state of the art. Thus, Volumes II and III include: (1) Taxonomies that organize the flows, methods of modeling, numerics; (2) Comments by non-computers (the reporters) on results for each class of flows; (3) Discussions carried through to closure; and carefully edited (see Discussion Procedures in Volume I); (4) Samples of recent high-level research computations that are currently beginning to provide information of aid to turbulence modelers; (5) An overall evaluation of the state of the art; (6) An opinion on the question of universality of turbulence models; (7) All computer output compared with data, case by case; and (8) Comments by the computer groups on experience and problems.

AD-A135 570 CONTINUED

DESCRIPTORS: (U) *Fluid dynamics, *Turbulent flow, *Symposia, *Mathematical models, *Boundary layer, State of the art, Experimental data, Data bases, Computations, Taxonomy, Numerical methods and procedures, Computerized simulation, User needs, Compressible flow, Incompressible flow, Flow separation, Supersonic flow, Walls, Transonic flow, Stress strain relations

IDENTIFIERS: (U) *Complex turbulent flow, HTTM(Heat Transfer and Turbulence Mechanics), *Computational fluid dynamics, Backward facing steps

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 569 20/4 12/1

STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING

(U) The 1980-81 AFOSR-HTTM (Heat Transfer and Turbulence Mechanics)-Stanford Conference on Complex Turbulent Flows: Comparison of Computation and Experiment. Volume 1. Objectives, Evaluation of Data, Specifications of Test Cases, Discussion, and Position Papers.

DESCRIPTIVE NOTE: Interim rept.,

SEP 80 679P

PERSONAL AUTHORS: Kline,S. J. ;Cantwell,B. J. ;Lilley,G. M. ;

CONTRACT NO. F49620-80-C-0027

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-83-1001

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A135 570. Proceedings of the conference held at Stanford University, Stanford, CA, 3-6 Sep 80.

ABSTRACT: (U) The Conference includes two meetings. The first, had the goal of establishing a data base of test cases for comparison with computations. This volume contains a record of the proceedings of the 1980 meeting and a display of the test cases used in the 1981 meeting for comparison with computations. The main sections of the volume include: (1) Pictorial summary charts providing a compact picture of the nature of the test cases. (2) Three position papers covering: (a) Data needs for computational fluid dynamics; (b) Some improvements to the theory of uncertainty analysis and the use of that theory for the present Conference; and (c) Description of Data Library. (3) Description of test cases including: Specifications for computations; and Output plots for the test cases. (4) Reports of ad-hoc committees on topics of general interest; and (5) Index to Flow Cases.

DESCRIPTORS: (U) *Fluid dynamics, *Turbulent flow,

AD-A135 539 CONTINUED

*Symposia, *Boundary layer, Mathematical models, Validation, Case studies, Experimental data, Data bases, Comparison, User needs, Computations, Turbulent boundary layer, Wake, Two dimensional flow, Three dimensional flow, Walls, Free stream, Attachment, Flow separation, Suction, Shear properties, Curved profiles, Secondary flow, Compressible flow, Incompressible flow, Diffusers

IDENTIFIERS: (U) *Complex turbulent flow, HTTM(Heat Transfer and Turbulence Mechanics), Corner flow, *Computational fluid dynamics, Backward facing steps, PE61102A, WUAFOSR2307A1

AD-A135 569

AD-A135 545 6/16

EEG SYSTEMS LAB SAN FRANCISCO CA

(U) Single Trial Brain Electrical Patterns of an Auditory and Visual Perceptuomotor Task.

DESCRIPTIVE NOTE: Interim progress rept. 22 Feb 82-1 Jun 83.

JUN 83 91P

PERSONAL AUTHORS: Gevins,A. S. ;Bressler,S. L. ;Cutillo,B. A. ;Doyle,J. C. ;Tannehill,R. S. ;

CONTRACT NO. F49620-82-K-0006

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-83-1014

UNCLASSIFIED REPORT

ABSTRACT: (U) This past year the proposed auditory-visual preceptuomotor paradigm was designed and implemented, and 12 twenty-one channel pilot recordings were conducted. The objective was to compare spatiotemporal brain-potential patterns associated with: (1) the preparation to receive auditory or visual numeric stimuli, and (2) the processing of auditory and visual numeric stimuli. A bimodal paradigm sufficiently controlled for the application of a 49 channel Neurocognitive Pattern (NCP) Analysis has been finalized and participant screening sessions have begun. Sections III and IV of this Interim Progress Report are comprised of publihsed (Science, 220:97-99, 1983) and in preparation papers describing our recent visuospatial move/no-move study. The results of further signal processing studies on that data are described in Sections V and VI.

DESCRIPTORS: (U) *Brain, *Auditory perception, *Visual perception, Patterns, Electroencephalography, Bioelectricity, Patterns, Motor reactions

IDENTIFIERS: (U) WUAFOSR2313A4, PE61102F

AD-A135 530 6/16

OREGON HEALTH SCIENCES UNIV PORTLAND

(U) Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea.

83 17P

PERSONAL AUTHORS: Cohan,C. S. ;Mpitsos,G. J. ;

CONTRACT NO. AFOSR-82-0043, NSF-BNS76-8123

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-83-1009

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Experimental Biology, v102 p43-57 1983.

Reprint: Selective Recruitment of Interganglionic Interneurones during Different Motor Patterns in Pleurobranchaea.

DESCRIPTORS: (U) *Brain, *Nervous system, *Biological rhythms, Ganglia, Motor reactions, Nerve impulses, Patterns, Output, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1

DTIC REPORT BIBLIOGRAPHY

AD-A135 500 5/9 5/10

STATE UNIV OF NEW YORK AT ALBANY

(U) Individual Differences in Multiple-Task Performance as a Function of Response Strategy.

DESCRIPTIVE NOTE: Technical rept.,

83 13P

PERSONAL AUTHORS: Damos,D. L. ;Smist,T. E. ;Bittner,A. C. , Jr;

CONTRACT NO. AFOSR-79-0014

PROJECT NO. 2313

TASK NO. A2

MONITOR: AFOSR TR-83-1010

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Human Factors, v25 n2 p215-226 1983.

Reprint: Individual Differences in Multiple-Task Performance as a Function of Response Strategy.

DESCRIPTORS: (U) *Performance(Human), *Work functions, *Attention, Information processing, Response, Skills, Time sharing, Memory(Psychology), Response, Comparison, Data acquisition, Variables, Reprints

IDENTIFIERS: (U) Task analysis, PE61102F, WUAFOSR2313A2

SEARCH CONTROL NO. EVP02F

AD-A135 499 5/10

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Functional Optical Invariants: A New Methodology for Aviation Research.

DESCRIPTIVE NOTE: Technical rept.,

82 9P

PERSONAL AUTHORS: Warren,R. ;Owen,D. H. ;

CONTRACT NO. AFOSR-81-0108

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR TR-83-1013

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Aviation, Space, and Environmental Medicine, v53 n10 p977-983 1982.

Reprint: Functional Optical Invariants: A New Methodology for Aviation Research.

DESCRIPTORS: (U) *Visual perception, *Psychophysics, Optical processing, Flight simulation, Pilots, Flight maneuvers, Performance(Human), Data displays, Invariance, Test methods, Operational effectiveness, Variables, Degrees of freedom, Flight simulators, Man machine systems, Ecology, Statistical analysis, Experimental data, Reprints

IDENTIFIERS: (U) Aviation psychology, PE61102F, WUAFOSR2313A5

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVP02F

AD-A135 498 20/4

FLIGHT DYNAMICS RESEARCH CORP VAN NUYS CALIF

(U) Thrust Augmenting Ejectors. Part 1.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 12P

PERSONAL AUTHORS: Alperin,M. ;Wu,J. J. ;

CONTRACT NO F49620-81-C-0043

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-83-1023

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in AIAA Jnl., v21 n10 p1428-1436 Oct 83.

Reprint: Thrust Augmenting Ejectors. Part 1.

DESCRIPTORS: (U) *Jet mixing flow, *Thrust augmentation, *Ejectors, *Compressible flow, Optimization, Jet engine inlets, Gas generating systems, Mixing, Reprints

IDENTIFIERS: (U) Supersonic ejectors, Thrust augmenting ejectors, PE61102F, WUAFOSR2307A1

AD-A135 497 9/2

TEXAS UNIV AT AUSTIN DEPT OF COMPUTER SCIENCES

(U) Assigning Processes to Processors in Distributed Systems.

DESCRIPTIVE NOTE: Technical rept.,

AUG 83 5P

PERSONAL AUTHORS: Williams,E. ;

CONTRACT NO. AFOSR-81-0205

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0991

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of International Conference on Parallel Processing (1983), Bellaire, MI., 23-26 Aug 83.

Reprint: Assigning Processes to Processors in Distributed Systems.

DESCRIPTORS: (U) *Parallel processing, *Delay, Distributed data processing, Message processing, Parallel processors, Systems analysis, Requirements, Algorithms, Compilers, Simulators, Reprints

IDENTIFIERS: (U) Load balancing, PE61102F, WUAFOSR2304A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 495 5/10

BOSTON UNIV MA CENTER FOR ADAPTIVE SYSTEMS

(U) A Psychophysiological Theory of Reinforcement, Drive, Motivation and Attention,

82 86P

PERSONAL AUTHORS: Grossberg,S. ;

CONTRACT NO. AFOSR-82-0148, NSF-IST80-00257

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR TR-83-0994

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Theoretical Neurobiology, v1 p286-369 1982.

Reprint: *A Psychophysiological Theory of Reinforcement, Drive, Motivation and Attention.*

DESCRIPTORS: (U) *Psychophysiology, *Behavior, *Motivation, Response, Cognition, Learning, Performance(Human), Memory(Psychology), Long range(Time), Short range(Time), Physiology, Pharmacology, Hypothalamus, Reprints

IDENTIFIERS: (U) Reinforcement(Psychology), Drive, Incentive motivation, Habit, Adaptive behavior, Resonance, Expectancy, PE61102F, WUAFOSR2313A5

AD-A135 495

AD-A135 491 6/1

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

(U) Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport,

83 4P

PERSONAL AUTHORS: Atwell,R. J. ;de Levie,R. ;

CONTRACT NO. AFOSR-80-0262

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-1000

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanal. Chem., v148 p305-306 1983.

Reprint: Closoborane Anion Adsorbs onto Lipid Bilayer Membranes and Affects Ion Transport.

DESCRIPTORS: (U) *Anions, *Membranes(Biology), *Transport properties, Boranes, Adsorption, Lipids, Ions, Transport, Reprints

IDENTIFIERS: (U) Closoborane, PE61102F, WUAFOSR2303B1

AD-A135 491

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 476 6/4 9/2

SRI INTERNATIONAL MENLO PARK CA ARTIFICIAL INTELLIGENCE CENTER

(U) Knowledge Representation and Natural-Language Semantics.

DESCRIPTIVE NOTE: Annual technical rept. no. 1, 1 Jun 82-30 May 83,

JUL 83 9P

PERSONAL AUTHORS: Moore,R. C. ;

CONTRACT NO. F49620-82-K-0031

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-0969

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes the first year of research on a project to produce formalisms, suitable for manipulation by computer, for the representation of specific concepts that are important for natural-language semantics, and to give an independent account of the meaning of such representations using the tools of formal logic. The major technical achievement of this effort has been the development of a logic which characterizes systems which represent and reason with information about their own beliefs. Other problems worked on include the development of semantic representations for comparative constructions in English and the analysis of deductive methods for commonsense reasoning. (Author)

DESCRIPTORS: (U) *Artificial intelligence, *Computer logic, Reasoning, Semantics, Natural language, Logic, Information processing, Problem solving, Decision making, Pattern recognition

IDENTIFIERS: (U) *Knowledge representation, *Nonmonotonic logic, PE61102F, WUAFOSR2304A2, LPN-SRI-4488

AD-A135 475 6/16

TEXAS UNIV AT AUSTIN

(U) On the Pressure-Volume Relationship in Circulatory Elements,

SEP 82 7P

PERSONAL AUTHORS: Hardy,H. H. ;Collins,R. E. ;

CONTRACT NO. AFOSR-79-0123

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-83-1007

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Medical & Biological Engineering & Computing, v20 p565-570 Sep 82.

Reprint: On the Pressure-Volume Relationship in Circulatory Elements.

DESCRIPTORS: (U) *Blood circulation, Equations, Constants, Blood pressure, Blood volume, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 474 6/5

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) In vitro Transformation of Cultured Human Diploid Fibroblasts.

82 12P

PERSONAL AUTHORS: Milo,G. E. ;Trewyn,R. W. ;

CONTRACT NO. AFOSR-80-0283

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR TR-83-1008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Banbury Report 12: Nitrosamines and Human Cancer, p3-13 1982.

Reprint: In vitro Transformation of Cultured Human Diploid Fibroblasts.

DESCRIPTORS: (U) *Fibroblasts, *Nitrosamines, *Nitroso compounds, *Carcinogenesis, In vitro analysis, Response(Biology), Cytotoxin, Dosage, Neoplasms, Mice, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5

AD-A135 474

AD-A135 471 20/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Mechanisms of Inlet-Vortex Formation,

MAY 82 36P

PERSONAL AUTHORS: De Siervi,F. ;Viguier,H. C. ;Greitzer,E. M. ;Tan,C. S. ;

CONTRACT NO. F49620-82-K-0002

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-1004

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluid Mechanics, v124 p173-207 May 82.

Reprint: Mechanisms of Inlet-Vortex Formation.

DESCRIPTORS: (U) *Vortices, *Flow, Inlets, Distortion, Secondary flow, Crosswinds, Ground level, Gas turbines, Mathematical models, Three dimensional, Velocity, Ratios, Ingestion(Engines), Jet engine inlets, Bubbles, Flow visualization, Water tunnels, Reprints

IDENTIFIERS: (U) Shear flow, Inlet flow distortion, Ground vortices, Inlet vortex formation, Vortex filaments, Panel method(Mathematics), PE61102F, WUAFOSR2307A4

AD-A135 471

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 470 6/16

OREGON HEALTH SCIENCES UNIV PORTLAND

(U) The Generation of Rhythmic Activity in a Distributed Motor System.

83 20P

PERSONAL AUTHORS: Cohan,C. S. ;Mpitsos,G. J. ;

CONTRACT NO. AFOSR-82-0043, NSF-BNS76-8123

PROJECT NO. 2313

TASK NO. A1

MONITOR: AFOSR TR-83-1011

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Experimental Biology, v102 p25-42 1983.

Reprint: The Generation of Rhythmic Activity in a Distributed Motor System.

DESCRIPTORS: (U) *Nervous system, *Brain, *Biological rhythms, Stimulation(Physiology), Motor reactions, Patterns, Nerve impulses, Identification, Input, Output, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR

AD-A135 469 6/19

CALIFORNIA UNIV SANTA BARBARA INST OF ENVIRONMENTAL STRESS

(U) Hemodynamic Responses of Runners and Water Polo Players during Exertion in Water.

83 13P

PERSONAL AUTHORS: McMurray,R. G. ;Horvath,S. M. ;Miles,D. S. ;

CONTRACT NO. AFOSR-78-3534

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-83-0985

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in European Jnl. of Applied Physiology, v51 p163-173 1983.

Reprint: Hemodynamic Responses of Runners and Water Polo Players during Exertion in Water.

DESCRIPTORS: (U) *Exercise(Physiology), Metabolism, Rates, Oxygen consumption, Swimmers, Swimming, Heart rate, Water, Low temperature, Reprints

IDENTIFIERS: (U) Runners, Running, PE61102F, WUAFOSR2312A1

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 468 7/3

GEORGIA UNIV ATHENS DEPT OF CHEMISTRY

(U) Novel Di-isopropylamino Derivatives of Trivalent Phosphorus

83 4P

PERSONAL AUTHORS: King,R. B. ;Sadanani,N. D. ;Sundaram,P. M. ;

CONTRACT NO. AFOSR-81-0051

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1027

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society Chemical Communications, p477-478 1983.

Reprint: Novel Di-isopropylamino Derivatives of Trivalent Phosphorus.

DESCRIPTORS: (U) *Organic phosphorus compounds, Chemical reactions, Phosphine, Chemical bonds, Reduction(Chemistry), Reprints

AD-A135 468

AD-A135 467 7/4 9/2

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Development and Status of MINDO/3 and MNDO.

83 12P

PERSONAL AUTHORS: Dewar,M. J. S. ;

CONTRACT NO. F49620-83-C-0024

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-1026

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Molecular Structure, v100 p41-50 1983.

Reprint: Development and Status of MINDO/3 and MNDO.

DESCRIPTORS: (U) *Mindo molecular orbitals, Molecular energy levels, Chemical reactions, Computer programs, State of the art, Computations, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2

AD-A135 467

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 464 11/8 7/3 7/4

FORD MOTOR CO DEARBORN MICH RESEARCH STAFF

(U) Time-Temperature Studies of High Temperature Deterioration Phenomena in Lubricant Systems: Synthetic Ester Lubricants.

DESCRIPTIVE NOTE: Final rept 1 May 80-30 Apr 83,

SEP 83 214P

PERSONAL AUTHORS: Korcek,S ;Mahoney,L. R. ;Jensen,R. K. ; Zinbo,M ;Willermet,P. A

CONTRACT NO F49620-80-C-0061

PROJECT NO 2307

TASK NO A2

MONITOR: AFOSR TR-83-0997

UNCLASSIFIED REPORT

ABSTRACT: (U) Kinetic and mechanistic investigations of the effects of oxygen pressure on liquid phase autoxidation reactions in model lubricants at elevated temperatures were carried out with n-hexadecane at 160 to 190 C and at oxygen pressures from 4 to 120 kPa. Resultes of these investigations showed that intramolecular alpha, gamma and alpha, delta hydrogen abstraction reactions of peroxy radicals are highly reversible and that the intermediate hydroperoxyalkyl radicals formed from these abstractions, besides addition of oxygen and reverse intramolecular hydrogen abstraction (isomerization) reactions, undergo cyclization reactions leading to formation of cyclic ether products. A general reaction scheme for autoxidation of any system containing alkyl chains with carbon number greater than four is proposed. Absolute rate constants for formation, isomerization, and cyclization of hydroperoxyalkyl radicals have been determined for the first time for liquid-phase autoxidation and the corresponding Arrhenius parameters have been derived. Their values are in general agreement with those previously determined or estimated in gas phase combustion studies. Results of kinetic analysis of cleavage product formation are consistent with two modes of their formation in the entire range of oxygen pressures studied. The first mode involves decomposition

AD-A135 464

AD-A135 464 CONTINUED

of alpha, gamma hydroperoxyketone species and the second reactions of alkoxy radicals.

DESCRIPTORS: (U) *Lubricants *Esters, *Synthetic materials, *Thermal degradation, *Oxidation, Oxygen, Pressure, Liquid phases, High temperature, Hexadecane, Hydrogen, Antioxidants, Hydrogen peroxide, Reversible, Alkyl radicals, Isomerization, Cyclic compounds, Ethers, Reaction kinetics, Constants, Wear, Inhibition, Thermal stability, Test reactors, Numerical analysis

IDENTIFIERS: (U) Autoxidation, Pentaerythrityl, Tetraheptanoate, PE61102F, WUAFOSR2303A2

AD-A135 464

DTIC REPORT BIBLIOGRAPHY

AD-A135 461 5/8 5/9 5/10 5/5

GEORGIA INST OF TECH ATLANTA SCHOOL OF PSYCHOLOGY

(U) Visual Cues in the Simulation of Low-Level Flight.

DESCRIPTIVE NOTE: Final rept. 1 Apr 82-31 Mar 83,

MAY 83 31P

PERSONAL AUTHORS: Rinalducci,E. J. ;

CONTRACT NO. ..OSR-82-0144

PROJECT NO 2313

TASK NO. D9

MONITOR: AFOSR
TR-83-1016

UNCLASSIFIED REPORT

ABSTRACT: (U) The research described in this report was directed towards a continued examination of visual cues used by pilots to maintain altitude in low level flight simulation. The first study investigated the use of a psychophysical technique to provide a quick, low-cost evaluation of altitude cues provided by five visual display system conditions in which terrain features were varied in detail, density, and vertical development. Both pilot and non-pilot observers were employed. A second study examined three visual display environments (i.e., a valley floor, a valley floor with walls, and a valley floor with walls and inverted pyramids) using different display modes (i.e., slides, static video, and dynamic video). Differences between pilot and non-pilot subjects were obtained for the accuracy of altitude estimation.

DESCRIPTORS: (U) *Visual aids, *Cues(Stimuli), *Flight simulation, *Display systems, Vision, Flight simulators, Low level, Altitude, Maintenance, Pilots, Psychophysics, Terrain, Topography, Density, Vertical orientation, Statics, Dynamics, Observation, Accuracy, Estimates, Visual perception, Flight training, Operational effectiveness, Low costs

IDENTIFIERS: (U) WUAFORS2313D9, PE61102F

AD A135 461

SEARCH CONTROL NO. EVP02F

AD-A135 460 12/1 9/2 6/16

TEXAS UNIV AT AUSTIN

(U) Mathematical Simulation of the Cardiopulmonary System.

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-31 Aug 83,

AUG 83 64P

PERSONAL AUTHORS: Collins,R. E. ;Carmack,L. ;Martin,D. L. ;

CONTRACT NO. AFOSR-79-0123

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR
TR-83-0999

UNCLASSIFIED REPORT

ABSTRACT: (U) Multi-chamber, lumped parameter models of the pulmonary and circulatory systems have been developed which incorporate effects of whole-body accelerations (WBA) for any body orientation and a variety of breathing maneuvers. The pulmonary model has been used in an extensive study of effects of sustained WBA on pulmonary mechanics and ventilation. This study investigated the effectiveness of altering seat back angle to increase G-tolerance. The development and testing of the separate pulmonary and circulatory models has been reported in previous reports, as well as the above described WBA study. This final report describes latest efforts to incorporate feedback and control mechanisms in the circulatory mdoel to simulate the baroreceptor and chemoreceptor actions regulating blood flow and blood pressure in the human body. This work is not yet complete. Also described is a partially completed study using the pulmonary model to test and implement a non-invasive technique for diagnosing ventilation distribution dysfunctions. (Author)

DESCRIPTORS: (U) *Mathematical models, *Computerized simulation, *Cardiovascular system, *Pulmonary function, Digital computers, Ventilation, Acceleration, Heart, Lung, Air breathing, Feedback, Blood pressure, Blood circulation, Astronauts, Pilots, Aircraft seats, Spacecraft seats, Angles

AD-A135 460

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 460 CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1

AD-A135 459 9/2

TEXAS UNIV AT AUSTIN DEPT OF COMPUTER SCIENCES

(U) A Distributed Procedure to Detect and/or Deadlock.

DESCRIPTIVE NOTE: Interim rept.,

JAN 83 38P

PERSONAL AUTHORS: Herman,T. ;Chandy,K. M. ;

CONTRACT NO. AFOSR-81-0205

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0989

UNCLASSIFIED REPORT

ABSTRACT: (U) The authors present a procedure to detect deadlock in a distributed system. The procedure is dynamic and distributed. Deadlock will be correctly detected for general resource requests of the form: 'Lock file A and file B at NY or lock file A and file B at LA'. The contribution of this paper is that it presents a distributed solution to the deadlock detection problem when requests have AND/OR form.

DESCRIPTORS: (U) *Data management, *Computer communications, *Throughput, *Problem solving, Communications networks, Resource management, Computer files, Detection, Communications traffic, Data bases, Distributed data processing

IDENTIFIERS: (U) *Distributed data bases, *Deadlock detection, Transactions, Computer models, PE61102F, WUAFOSR2304A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 458 9/2 12/2

TEXAS UNIV AT AUSTIN DEPT OF COMPUTER SCIENCES

(U) Preserving Asymmetry by Symmetric Processes and Distributed Fair Conflict Resolution.

DESCRIPTIVE NOTE: Interim rept.

APR 83 13P

PERSONAL AUTHORS: Chandy,K. M. ;Misra,J. ;

CONTRACT NO. AFOSR-81-0205

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR 83-0990

UNCLASSIFIED REPORT

ABSTRACT: (U) Conflicts arising in distributed systems, as in contentions for shared resources, are resolved either by a central process or by resorting to probabilistic decision making by individual processes or by assigning a static global priority to each process. All known non-probabilistic solutions to the conflict resolution problem are asymmetric in the sense that they distinguish between processes by ordering process ids of by having some processes carry out special functions. We propose ar efficient, fair, symmetric solution for this problem asymmetry is present initially by judicious placement of shared resources and asymmtery is preserved in a fair manner by our solutions. To provide a concrete framework for our discussion of conflict resolution we couch our discussion in terms of a generalization of the classical dining philospher's problem.

DESCRIPTORS: (U) *Distributed data processing, *Message processing, *Decision theory, Probability, Problem solving, Conflict, Resolution, Mathematical models, Algorithms, Asymmetry, Symmetry, Computer logic

IDENTIFIERS: (U) *Symmetric processes, Resource sharing, PE61102F, WUAFOSR2304A2

AD-A135 458

AD-A135 454 20/4 12/1

IOWA INST OF HYDRAULIC RESEARCH IOWA CITY

(U) Three-Dimensional Turbulent Boundary Layer on a Body of Revolution at Incidence.

DESCRIPTIVE NOTE: Final rept. 1 May 80-31 Jul 83,

AUG 83 29P

PERSONAL AUTHORS: Patel,V. C. ;Ramaprian,B. R. ;

REPORT NO. IIHR-LD-REPORT-113

CONTRACT NO. AFOSR-80-0148

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-83-1024

UNCLASSIFIED REPORT

ABSTRACT: (U) An experimental and theoretical study of three-dimensional boundary layers on bodies of revolution at incidence was conducted during the period May 1980-July 1983. This final report summarizes the technical accomplishments. Reference is made to previous reports and papers resulting from the study and some recent experimental results on the boundary layer in the plane of symmetry and the vortex formation region are presented. One of the primary objectives of this study was to develop instrumentation for the measurement of the mean flow and the Reynolds stresses in three-dimensional turbulent boundary layers, and to use these to supplement the mean-flow measurements made earlier by Ramaprian, Patel and Choi on the combination body at an incidence of 15 degrees.

DESCRIPTORS: (U) *Turbulent boundary layer, *Bodies of revolution, Computations, Mathematical prediction, Three dimensional, Reynolds number, Stresses, Vortices, Wake, Experimental data

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A1

AD-A135 454

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD A135 453 5/2 20/6 5/1

MARYLAND UNIV COLLEGE PARK COMPUTER SCIENCE CENTER

(U) Theory of Image Analysis and Recognition.

DESCRIPTIVE NOTE: Final scientific rept. 1 May 77-31 Dec 8.

JAN 83 12P

PERSONAL AUTHORS: Rosenfeld,A. ;Davis,L. S. ;

CONTRACT NO. AFOSR-77-3271

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0983

UNCLASSIFIED REPORT

ABSTRACT: (U) The research conducted under the grant was concerned with three theoretical aspects of image analysis: (1) statistical image modeling and texture analysis; (2) digital geometry (geometrical properties of subsets of digital images); and (3) parallel image processing (including formal models for parallel image recognition). During the period 1 May 77-31 Dec 82, 116 technical reports were issued on the grant. Nearly all of these have been published or in process of acceptance for publication. A bibliography of these reports is given. Seven students wrote Ph.D dissertations with the support of the grant. (Author)

DESCRIPTORS: (U) *Bibliographies, *Image processing, *Research management, Mathematical models, Theory, Recognition, Digital systems, Geometry, Parallel processing

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A2

IAC NO. GC-840170

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)Image processing, Scene analysis, Recognition, Mathematical models, Models, Texture, Digital techniques, Bibliographies, Computation, Images.;

AD-A135 453

AD-A135 452 5/2 5/1 9/2

TEXAS UNIV AT AUSTIN DEPT OF COMPUTER SCIENCES

(U) Annual Scientific Report for Grant AFOSR-81-0205.

DESCRIPTIVE NOTE: Rept. for 15 Jun 82-14 Jun 83,

SEP 83 16P

PERSONAL AUTHORS: Chandy,K. M. ;Misra,J. ;

CONTRACT NO. AFOSR-81-0205

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0993

UNCLASSIFIED REPORT

ABSTRACT: (U) In the last several years, the investigators have developed a number of important, practical distributed algorithms for problems such as distributed simulation, termination and deadlock detection, computing networkwide functions in a distributed manner, etc. Interest in distributed systems has spurred publications of many distributed algorithms by other researchers. The major thrust in the past year has been directed towards developing unifying frameworks, i.e., paradigms - which consolidate the known results. They have developed a theory for detecting all system properties that are stable, i.e., properties that continue to hold once they begin to hold. Examples of stable properties are termination, deadlock, etc. The work subsumes a large body of literature on termination and deadlock detection. They have similarly developed a theory of conflict resolution and an algorithm based on this theory; this algorithm subsumes all known nonprobabilistic algorithms for mutual exclusion, resource sharing, dining philosophers' problem, etc. In addition, they have continued work on models of distributed systems, their verification and performance analysis. (Author)

DESCRIPTORS: (U) *Algorithms, *Information systems, *Research management, Reports, Problem solving, Computer communications, Distributed data processing, Scientific literature

AD-A135 452

AD-A135 452 CONTINUED

IDENTIFIERS: (U) Deadlock detection, PE61102F, WUAFOSR2304A2

AD-A135 438 20/6

HARVARD UNIV CAMBRIDGE MA DIV OF APPLIED SCIENCES

(U) Quantification of Interference and Detectability Properties of Visual Stimuli for Optimal Display Design.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Apr 82-31 Mar 83,

MAY 83 27P

PERSONAL AUTHORS: Kronauer,R. ;

CONTRACT NO. F49620-81-K-0016

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR TR-83-1015

UNCLASSIFIED REPORT

ABSTRACT: (U) The author's objective is the quantitative characterization of visual spatio-temporal chaneling of information. The immediate approach of this study is to measure the detectability of a visual test stimulus which is a moving sinusoidalgrating pattern, in the presence of a masking visual stimulus, which can be represented in spatio-temporal frequency space as band-limited two-dimensional dynamic visual noise. He has performed coherent masking studies in which the mask is a high-contrast traveling wave grating and have discovered that the masking function is very asymmetrical in spatial frequency when the mask and test gratings are matched in velocity. It was also discovered that band limited two-dimensional visual noise can be simulated by discrete (punctate) spectral components lying within the desired band and that as few as six components can give a representation indistinguishable from continuous-spectrum noise. To perform these band-limited visual noise studies the author created a unique computer-controlled system for image generation.

DESCRIPTORS: (U) *Visual signals, *Signal processing, *Display systems, Optimization, Traveling waves, Information transfer, Masking, Continuous spectra, Noise, Gratings(Spectra), Contrast

AD-A135 438 CONTINUED

IDENTIFIERS: (U) WUAFOSR2313A5, PE61102F

AD-A135 427 20/4 20/1

TENNESSEE UNIV SPACE INST TULLAHOMA DEPT OF AEROSPACE AND MECHANICAL ENGINEERING

(U) Acoustic Streaming in Swirling Flow and the Ranque-Hilsch (Vortex-Tube) Effect.

DESCRIPTIVE NOTE: Technical rept.,

MAR 82 35P

PERSONAL AUTHORS: Kurosaka,M. ;

CONTRACT NO. AFOSR-83-0049

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-83-1006

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluid Mechanics, v124 p139-172 Mar 82.

Reprint: Acoustic Streaming in Swirling Flow and the Ranque-Hilsch (Vortex-Tube) Effect.

DESCRIPTORS: (U) *Vortices, *Gas flow, Temperature, Separation, Acoustic properties, Hilsch tubes, Audio tones, Flow fields, Perturbations, Radius(Measure), Spatial distribution, Mathematical models, Experimental design, Reprints

IDENTIFIERS: (U) *Swirling flow, *Vortex whistles, Ranque Hilsch effect, Acoustic streaming, Temperature distribution, Forced vortices. PE61102F, WUAFOSR2307A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 426 6/19 6/16

CALIFORNIA UNIV SANTA BARBARA INST OF ENVIRONMENTAL STRESS

(U) Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.

DESCRIPTIVE NOTE: Technical rept.,

83 6P

PERSONAL AUTHORS: Bunnell,D. E. ;Bevier,W. C. ;Horvath,S. M. ;

CONTRACT NO. AFOSR-78-3534, PHS-RR-07099

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-83-1005

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Electroencephalography and Clinical Neurophysiology, v56 p186-189 1983.

Reprint: Nocturnal Sleep, Cardiovascular Function, and Adrenal Activity Following Maximum-Capacity Exercise.

DESCRIPTORS: (U) *Sleep, *Exercise(Physiology), Oxygen consumption, Energy consumption, Rates, Cardiovascular system, Respiration, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1

AD-A135 426

AD-A135 425 12/1

PRINCETON UNIV NJ DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

(U) Improving Resolution for Autoregressive Spectral Estimation by Decimation.

DESCRIPTIVE NOTE: Technical rept.,

JUN 83 9P

PERSONAL AUTHORS: Quirk,M. P. ;Liu,B. ;

CONTRACT NO. AFOSR-81-0186

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-83-0986

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-31 n3 p630-636 Jun 83.

Reprint: Improving Resolution for Autoregressive Spectral Estimation by Decimation.

DESCRIPTORS: (U) *Algorithms, *Regression analysis, *Spectrum analysis, Estimates, Resolution, White noise, Signal to noise ratio, Reprints

IDENTIFIERS: (U) *Autoregressive processes, *Autoregressive spectral estimation, Decimation, PE61102F, WUAFOSR2304A6

AD-A135 425

AD-A135 424 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

(U) Weak Convergence of Linear Forms in D(0,1).

DESCRIPTIVE NOTE: Techni rept.,

JUN 83 10P

PERSONAL AUTHORS: Daffer,P. Z. ;Taylor,R. L. ;

CONTRACT NO. F49620-79-C-0140, AFOSR-81-0166

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-0977

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Multivariate Analysis, v13 n2 p366-374 Jun 83

Reprint: Weak Convergence of Linear Forms in D(0,1).

DESCRIPTORS: (U) *Weighting functions, *Linearity, *Weak convergence, Random variables, Banach space, Value, Reprints

IDENTIFIERS: (U) *Linear forms, PE61102F, WUAFOSR2304A5

AD-A135 411 12/1 20/4

COLORADO STATE UNIV FORT COLLINS DEPT OF MATHEMATICS

(U) Viscoelastic Fluid Flow Exhibiting Hysteritic Phase Changes,

SEP 83 8P

PERSONAL AUTHORS: Hunter,J. K. ;Slemrod,M. ;

CONTRACT NO. DAAG29-80-C-0041, AFOSR-81-0172

MONITOR: ARO,AFOSR
16415.322-MA,TR-83-1320

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physics of Fluids, v26 n9 p2345-2351 Sep 83.

Reprint: Viscoelastic Fluid Flow Exhibiting Hysteritic Phase Changes.

DESCRIPTORS: (U) *Mathematical models, *Fluid flow, *Viscoelasticity, Boundary value problems, Steady flow, Shear stresses, Reprints

DTIC REPORT BIBLIOGRAPHY

AD-A135 408 12/1

VERSAR INC SPRINGFIELD VA

(U) Development of Statistical Techniques to Better *Utilize Data Characterized by Being Below Instrument* Detection Thresholds and by Small Sample Size.

DESCRIPTIVE NOTE: Final rept. 1 Jul 82-31 Aug 83,

OCT 83 76P

PERSONAL AUTHORS: Gleit,A. S.

REPORT NO. 784

CONTRACT NO. F49620-82-C-0079

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-0951

UNCLASSIFIED REPORT

ABSTRACT: (U) Estimation of parametric families for small data sets where a significant portion of the data lay below fixed instrument detection thresholds was investigated. Thus the number of data points was random (an example of Type I censoring). Both analytic and simulation procedures were utilized. In particular, maximum likelihood techniques, order statistic techniques, truncation techniques, fill-in with constants, and fill-in with expected values of the missing points were investigated. For exponential data, truncation seemed most appropriate while for normal and log-normal data, fill-in with expected values (modified to correct for conditioning on the number of data points) was best. The criteria for selection was the total square error. (Author)

DESCRIPTORS: (U) *Statistical processes, *Data management, Experimental data, Statistical data, Air Force research, Data bases, Maximum likelihood estimation, Estimates, Order statistics, Threshold effects, Truncation

IDENTIFIERS: (U) *Detection limits, PE61102F, WUAFOSR2304A5

AD-A135 408

SEARCH CONTROL NO. EVP02F

AD-A135 399 6/1

CALIFORNIA UNIV SAN FRANCISCO DEPT OF PHARMACOLOGY

(U) The Molecular Toxicology of Chromatin.

DESCRIPTIVE NOTE: Annual rept. 1 Oct 82-30 Sep 83,

SEP 83 29P

PERSONAL AUTHORS: Kun,E. ;

CONTRACT NO. F49620-81-C-0007

PROJECT NO. 2312

TASK NO. A-5

MONITOR: AFOSR TR-83-0998

UNCLASSIFIED REPORT

ABSTRACT: (U) The chemical (macromolecular) structure and biological function of the eukaryotic cell specific nuclear polymer; polyadenosine diphosphoribose has been investigated in specific cell nuclei isolated from animals (rats) and from human fibroblast cultures. This polymer is formed enzymatically from NAD in eukaryotic nuclei. The polymer was identified for the first time, as a unique nucleic acid structure which can form helix-helix type non-covalent association between long chain polymers that are on one end covalently bound to non histone proteins, comprising a supramolecular DNA structure associated network system. The influence of differentiation determined by assays in different cell types within one organ and effects of developmental hormones in animals on polyadenosine diphosphoribosylation and the role of the polymer in cell transformation in cell cultures has been studied by focusing on the quantitative and qualitative changes of non histone protein-polyadenosine diphosphoribose adducts in chromatin under controlled experimental conditions. A positive correlation was found between changes (inhibition) in rates of polyadenosine diphosphoribosylation and cellular hypertrophy of cells incapable of DNA synthesis indicating a physiologic control function of the polymer-protein network system in DNA template activity in these cells.

DESCRIPTORS: (U) *Chromatin, *Adenosine, *Polymers,

AD-A135 399

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 399 CONTINUED

*Ribose, Toxicology, Molecules, Molecular structure, Chemical reactions, Models

IDENTIFIERS: (U) Polyadenosine diphosphoribose, WUAFOSR2312A5, PE6110[illegible]

AD-A135 396 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) A Simple Class of Asymptotically Optimal Quantizers,

SEP 83 14P

PERSONAL AUTHORS: Cambanis,S. ;Gerr,N. L. ;

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR AFOSR TR-83-0973

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Information Theory, vIT-29 n5 p664-676 Sep 83.

Reprint: A Simple Class of Asymptotically Optimal Quantizers.

DESCRIPTORS: (U) *Quantization, Asymptotic normality, Optimization, Random variables, Probability density functions, Reprints

IDENTIFIERS: (U) *Quantizers

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 395 10/3 7/2

CENTRAL STATE UNIV WILBERFORCE OH DEPT OF CHEMISTRY

(U) High Energy Density Non-Aqueous Battery System.

DESCRIPTIVE NOTE: Final rept. Apr 82-Mar 83,

MAY 83 7P

PERSONAL AUTHORS: Gupta,V. K. ;

REPORT NO. 8686-1982-83

CONTRACT NO. AFOSR-82-0111

PROJECT NO. 2303

TASK NO. D9

MONITOR: AFOSR
TR-83-0889

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Electrochemical Society (16th), Oct 82, Detroit, MI.

DESCRIPTORS: (U) *Electric batteries, *Nonaqueous electrolytes, *Corrosion, Anodes(Electrolytic cell), Calcium, Lithium chloride, Thionyl chloride, Electrochemistry, Reprints

IDENTIFIERS: (U) WUAFOSR2303D9, PE61102F

AD-A135 379 6/19 6/16

TEXAS UNIV AT AUSTIN

(U) A Digital Computer Model of the Human Circulatory System,

SEP 82 16P

PERSONAL AUTHORS: Hardy,H. H. ;Collins,R. E. ;Calvert,R. E. ,

CONTRACT NO. AFOSR-79-0123

PROJECT NO. 2313

TASK NO. A1

MONITOR: AFOSR
TR-83-0984

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Medical and Biological Engineering and Computing, v20 p550-564 Sep 82.

Reprint: A Digital Computer Model of the Human Circulatory System.

DESCRIPTORS: (U) *Blood circulation, Human body, Anatomical models, Digital computers, Computerized simulation, Hydrostatics, Acceleration, Fluid flow, Gas exchange(Biology), Transport properties, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 357 17/9 4/2

CORNELL UNIV ITHACA NY SCHOOL OF ELECTRICAL ENGINEERING

(U) Can a VHF Doppler Radar Provide Synoptic Wind Data? A Comparison of 30 Days of Radar and Radiosonde Data.

APR 83 10P

PERSONAL AUTHORS: Larsen,M. F. ;

CONTRACT NO. AFOSR-80-0020

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR
TR-83-1018

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Symposium on Meteorological Observations and Instrumentation (5th), p183-190 Apr 83.

Reprint: Can A VHF Doppler Radar Provide Synoptic Wind Data? A Comparison of 30 Days of Radar and Radiosonde Data.

DESCRIPTORS: (U) *Doppler radar, *Wind velocity, Refractive index, Atmospheric refraction, Very high frequency, Alaska, Reprints

IDENTIFIERS: (U) Synoptic data, Power flat, Rawinsonde winds, Profileometers, WUAFOSR2310A1, PE61102f

AD-A135 356 21/2 7/4

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) Energetics and Mechanism of Mg(3P) Production in Mg/N2O/CO Flames.

JUN 83 7P

PERSONAL AUTHORS: Michels,H. H. ;Meinzer,R. A. ;

REPORT NO. UTRC-925832-2

CONTRACT NO. F49620-81-C-0097, F29601-80-C-0020

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-83-1019

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v98 n1 p6-11, 10 Jun 83.

Reprint: Energetics and Mechanism of Mg(3P) Production in Mg/N2O/CO Flames.

DESCRIPTORS: (U) *Flames, *Magnesium, *Atomic energy levels, Atoms, Chemical reactions, Energetic properties, Emission spectra, Reprints

IDENTIFIERS: (U) WUAFOSR2303B1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 314 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Convergence of Quadratic Forms in p-Stable Random Variables and Theta sub p-Radonifying Operators.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 22P

PERSONAL AUTHORS: Cambanis,S. ;Rosinski,J. ;Woyczynski,W. A ;

REPORT NO. TR-41

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-0975

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Case Western Reserve Univ., Cleveland, OH.

ABSTRACT: (U) Necessary and sufficient conditions are given for the almost sure convergence of a quadratic form where (M sub j) is a sequence of i.i.d. p-stable random variables. A connection is established between the convergence of the quadratic form and a radonifying property of the infinite matrix operator (f sub kj). (Author)

DESCRIPTORS: (U) *Numerical quadrature, *Convergence, Random variables, Operators(Mathematics), Radon, Matrices(Mathematics), Sequences(Mathematics)

IDENTIFIERS: (U) *Quadratic forms, Martingale transforms, PE61102F, WUAFOSR2304A5

AD-A135 314

AD-A135 303 9/2

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) Notions of Dependency Satisfaction.

DESCRIPTIVE NOTE: Technical rept.,

AUG 83 38P

PERSONAL AUTHORS: Graham,M. H. ;Mendelzon,A. O. ;Vardi,M. Y. ;

REPORT NO. STAN-CS-83-979

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-0961

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Georgia Inst. of Tech., Atlanta. School of Information and Computer Science and Toronto Univ. (Ontario). Computer Systems Research Group.

ABSTRACT: (U) Two notions of dependency satisfaction, consistency and completeness, are introduced. Consistency is the natural generalization of weak-instance satisfaction and seems appropriate when only equality-generating dependencies are given, but disagrees with the standard notion in the presence of tuple-generating dependencies. Completeness is based on the intuitive semantics of tuple-generating dependencies but differs from the standard notion for equality-generating dependencies. It is argued that neither approach is the correct one, but rather that they correspond to different policies on constraint enforcement, and each one is appropriate in different circumstances. Consistency and completeness of a state are characterized in terms of the tableau associated with the state and in terms of logical properties of a set of first-order sentences associated with the state. A close relation between the problems of testing for consistency and completeness and of testing implication of dependencies is established, leading to lower and upper bounds for the complexity of consistency

AD-A135 303

AD-A135 303 CONTINUED

and completeness. The possibility of formalizing dependency satisfaction without using a universal relation scheme is examined. (Author)

DESCRIPTORS: (U) *Data bases, Test and evaluation, Consistency, Theorems, Test methods, Embedding, Programming languages

IDENTIFIERS: (U) Dependency satisfaction, PE61102F, WUAFOSR2304A2

AD-A135 303

AD-A135 299 12/1 9/2

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) The Program Complexity of Searching a Table.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 17P

PERSONAL AUTHORS: Mairson,H. G. ;

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0960

UNCLASSIFIED REPORT

ABSTRACT: (U) Given a fixed set S of n keys, we would like to store them so that queries of the form 'Does the point X belong to the set S?' can be answered quickly. A commonly employed scheme to solve this problem uses a table to store the keys, and a special purpose program depending on S which probes the table. We analyze the tradeoff between the maximum number of probes allowable to answer a query, and the information-theoretic complexity of the program to do so. Perfect hashing (where the query must be answered in one probe) has a program complexity of n times the log e to the base e (1+O(1)) bits, and this lower bound can be achieved. Under a model combining perfect hashing and binary search methods, it is shown that for k probes to the table nk/2 to the k+1 power (1+O(1)) bits are necessary and sufficient to describe a table searching algorithm. This model gives some information-theoretic bounds on the complexity of searching an external memory. Finally, we prove some lower bounds on the worst case performance of hash functions described by bounded Boolean circuits, and worst case performance of universal classes of hash functions.

DESCRIPTORS: (U) *Information retrieval, *Searching, *Set theory, Memory devices, Problem solving, Theorems

IDENTIFIERS: (U) Search theory, PE61102F, WUAFOSR2304A2

AD-A135 299

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 294 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Smoothness of Bounded Solutions of Nonlinear Evolution Equations.

DESCRIPTIVE NOTE: Technical rept.,

MAY 83 39P

PERSONAL AUTHORS: Hale,J. K. ;Scheurle,J. ;

REPORT NO. LCDS-83-12

CONTRACT NO. DAAG29-79-C-0161, AFOSR-81-0198

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-0905

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grant NSF-MCS82-05355.

ABSTRACT: (U) It is shown, that in many cases globally defined, bounded solutions of evolution equations are as smooth (in time) as the corresponding operator, even if a general solution of the initial value problem is much less smooth; i.e., initial values for bounded solutions are selected in such a way that optimal smoothness is attained. In particular, solutions which bifurcate from certain steady states such as periodic orbits, almost-periodic orbits and also homo- and heteroclinic orbits have this property. As examples a neutral functional differential equation, a slightly damped non-linear wave equation, and a heat equation are considered. In the latter case the space variable is included into the discussion of smoothness. Finally, generalized Hopf bifurcation in infinite dimensions is considered. Here this document discusses smoothness of the bifurcation function and generalize known results on the order of a focus. (Author)

DESCRIPTORS: (U) *Nonlinear algebraic equations, Wave equations, Solutions(General), Value, Global, Banach

space, Boundary value problems, Bifurcation(Mathematics), Operators(Mathematics), Orbits

IDENTIFIERS: (U) *Evolution equations, PE61102F, WUAFOSR2304A4

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 284 15/5 5/1

FLORIDA STATE UNIV TALLAHASSEE

(U) Periodic Replacement When Minimal Repair Costs Vary with Time,

DEC 82 9P

PERSONAL AUTHORS: Boland,P. J. ;

CONTRACT NO. F49620-82-K-0007

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-0964

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Naval Research Logistics Quarterly, v29 n4 p541-546 Dec 82.

Reprint: Periodic Replacement When Minimal Repair Costs Vary with Time.

DESCRIPTORS: (U) *Naval logistics, *Replacement theory, Logistics planning, Life expectancy(Service life), Repair, Cost estimates, Reprints

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

AD-A135 271 12/1

CALIFORNIA UNIV SANTA BARBARA INST FOR THE INTERDISCIPLINARY APPLICATIONS OF ALGEBRA AND COMBINATORICS

(U) On the Mapping A Approaches Limit of A+,

83 7P

PERSONAL AUTHORS: Goldberg,M. ;

CONTRACT NO. AFOSR-83-0150

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-83-0976

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Linear and Multilinear Algebra, v12 p285-289 1983.

Reprint: On the Mapping A Approaches Limit of A.

DESCRIPTORS: (U) *Matrices(Mathematics), *Mapping, Invariance, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 265 5/2 9/2 12/1

UTAH UNIV SALT LAKE CITY DEPT OF CHEMICAL ENGINEERING

(U) International Conference on Stiff Computation Held at Park City, Utah on April 12, 13 and 14, 1982.

DESCRIPTIVE NOTE: Final technical rept. 15 Nov 81-31 May 83,

MAY 83 57P

PERSONAL AUTHORS: Aiken,R. C. ;

CONTRACT NO. AFOSR-82-0038

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-0971

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of the meeting was to examine state-of-the-art software development and theory for the numerical solution of stiff ordinary differential equations as it relates to application demands of today and tomorrow.

DESCRIPTORS: (U) *Symposia, *Computer programs, *Differential equations, Stiffness, Questionnaires, Computations, State of the art

IDENTIFIERS: (U) *Stiff computation, *Stiff equations, PE61102F, WUAFOSR2304A3

AD-A135 265

AD-A135 263 6/16

SRI INTERNATIONAL MENLO PARK CA LIFE SCIENCES DIV

(U) Neurophysiological Bases of Event-Related Potentials.

DESCRIPTIVE NOTE: Annual rept. no. 1, 1 May 82-30 Apr 83,

JUN 83 81P

PERSONAL AUTHORS: Rebert,C. S. ;Donovan,W. J. ;Pribram,K. H. ;Evans,J. E. ;

CONTRACT NO. F49620-82-K-0016

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR
TR-83-0902

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Stanford Univ. CA.

ABSTRACT: (U) In order to more fully understand the physiological and psychological significance of event-related potentials, cortical and subcortical recordings are being obtained form monkeys performing in operant-conditioning tasks, Six animals were trained on initial phases of the cued reaction-time task at SRI International and were subsequently implanted with electrodes capable of recording transient and sustained evoked potentials and massed-unit activity. Two monkeys were trained on initial phases of an 'oddball' task at Stanford University, and electrodes are being prepared so that the subcortical generators of the P300 wave can be assessed in these animals. An LSI-11/23 computer system was installed at SRI to implement the cued reaction-time task and to collect event-related potentials. Preliminary recordings of slow potentials and massed-unit activity were collected from the lateral geniculate nucleus of one cat to evaluate the performance of modified amplifiers, and transient (P300) and sustained (contingent negative variation) evoked potentials were recorded from the scalps of human subjects to confirm appropriate performance of the laboratory system. (Author)

DESCRIPTORS: (U) *Neurophysiology, Brain, Monkeys,

AD-A135 263

AD-A135 263 CONTINUED

Electrophysiology, Computer programs, Reaction time

IDENTIFIERS: (U) LPN-SRI-LSU-4373, PE61102F, WUAFOSR2313A4

AD-A135 260 20/4

TORONTO UNIV DOWNSVIEW (ONTARIO) INST FOR AEROSPACE STUDIES

(U) An Assessment of Recent Results on Pseudo-Stationary Oblique-Shock-Wave Reflections.

DESCRIPTIVE NOTE: Interim rept.,

NOV 82 72P

PERSONAL AUTHORS: Shirouzu,M. ;Glass,I. I. ;

REPORT NO. UTIAS-264

CONTRACT NO. AFOSR-82-0096

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-83-0924

UNCLASSIFIED REPORT

ABSTRACT: (U) The assumptions and criteria used in existing analyses in determining the regions and transition lines of pseudo-stationary oblique-shock-wave reflections were re-examined in order to improve the agreement between experiments and computed data for regular (RR), single-Mach (SMR), complex-Mach (CMR) and double-Mach reflection (DMR). It is shown that the relaxation lengths for vibration and dissociation determine whether frozen or equilibrium gas transition lines are applicable. The available experimental data in N2, CO2 and air, which are based on the criterion (consistent with relaxation lengths) of the angle delta, between the incident and reflected shock wave, do not conclusively support the frozen or equilibrium gas calculations for N2 and air. It does support CO2 as an equilibrium gas contrary to a previous conclusion of agreement with gamma = 1.29. A new additional and necessary criterion for the transition from single to complex Mach reflection improves the agreement between analysis and experiment and is consistent with the requirements of the relaxation length and the angle delta. However, it now appears that a more accurate criterion is required for the boundary line between CMR and DMR. More detailed examination of the boundary-layer-displacement

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 260 CONTINUED

slope at the point of regular reflection appears to eliminate the 'von Neumann paradox'; and explains the persisterce of regular reflection below the transition line for the occurrence of Mach reflection.

DESCRIPTORS: (U) *Shock waves, *Reflection, *Gas flow, Numerical analysis, Dissociation, Air, Nitrogen, Carbon dioxide, Oxygen, Argon, Shock tubes, Supersonic flow, Angles, Transitions, Relaxation, Length, Boundary layer, Interferograms, Experimental data, Mathematical models, Flow visualization, Canada

IDENTIFIERS: (U) *Mach reflection, *Oblique shock wave reflections, Pseudostationary flow, Mach stem, Triple point trajectory angle, Wedge angles, PE61102F, WUAFOSR2307A1

AD-A135 257 9/3 12/1

NORTHEASTERN UNIV BOSTON MA

(U) Asynchronous Discrete Control of Continuous Processes.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 82-30 Jun 83,

JUL 83 99P

PERSONAL AUTHORS: Kaliski,M. E. ;Johnson,T. L. ;

CONTRACT NO. F49620-82-C-0080

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-0877

UNCLASSIFIED REPORT

ABSTRACT: (U) This research concerns the analysis and synthesis of asynchronous discrete-state or hybrid-state feedback compensators for continuous or hybrid-state processes. New realization theories for asynchronous discrete systems, based on automata and semigroup theory, have been derived. These theories suggest new architecture for asynchronous systems. (Author)

DESCRIPTORS: (U) *Asynchronous systems, *Control theory, *Numerical methods and procedures, Continuous processing, Coding, Feedback, Hybrid systems, Compensators, Switching, Stochastic control, Architecture

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 254 20/1 12/1

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

(U) Far Field Patterns for the Impedance Boundary Value Problem in Acoustic Scattering,

83 10P

PERSONAL AUTHORS: Colton,D. ;

CONTRACT NO. AFOSR-81-0103

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0948

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applicable Analysis, v16 p131-139 1983.

Reprint: Far Field Patterns for the Impedance Boundary Value Problem in Acoustic Scattering.

DESCRIPTORS: (U) *Acoustic scattering, *Acoustic waves, Far field, Patterns, Boundary value problems, Problem solving

IDENTIFIERS: (U) Helmholtz equation, WUAFOSR2304A4, PE61102F

AD-A135 246 12/1

FLORIDA STATE UNIV TALLAHASSEE

(U) The Reliability of K out of N Systems,

83 6P

PERSONAL AUTHORS: Bolanci,P. J. ;Proschan,F. ;

CONTRACT NO. F49620-82-K-0007

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-0963

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Annals of Probability, v11 n3 p760-764 1983.

Reprint: The Reliability of K out of N Systems.

DESCRIPTORS: (U) *Functions(Mathematics), *Reliability, Systems analysis, Bernoulli distribution, Probability, Reprints

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 245 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) A Note on the Campbell Sampling Theorem.

DEC 81 6P

PERSONAL AUTHORS: Lee,A. J. ;

CONTRACT NO. AFOSR-75-2796

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-0965

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SIAM Jnl. of Applied Mathematics, v41 n3 p553-557 Dec 81.

Reprint: A Note on the Campbell Sampling Theorem.

DESCRIPTORS: (U) *Statistical samples, *Theorems, Sampling, Fourier transformation, Truncation, Errors, Reprints

IDENTIFIERS: (U) Campbells sampling theorem, WUAFOSR2304A5, PE61102F

AD-A135 245

AD-A135 223 5/1 9/2

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Control and Identification of Time Varying Systems.

DESCRIPTIVE NOTE: Annual progress rept. 1 Jul 82-29 Jun 83,

JUN 83 7P

PERSONAL AUTHORS: Pearson,A. E. ;

CONTRACT NO. AFOSR-82-0230

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-83-0936

UNCLASSIFIED REPORT

ABSTRACT: (U) Research results are summarized for system parameter identification utilizing time limited input-output data. The results stem from two fundamentally different approaches, one of which st;ems from a projected integral equation error formulation and the other from a modulating function formulation for converting differential equations to functional equations. Applications include the parameter identification of differential-delay systems, delay estimation in received signals, identification of time varying systems, and estimating target acceleration in pursuit-evasion problems. (Author)

DESCRIPTORS: (U) *Systems analysis, *Input output processing, Parameters, Identification, Research management, Signal processing, Targets, Acceleration

IDENTIFIERS: (U) *Time varying systems, PE61102F, WUAFOSR2304A1

AD-A135 223

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 221 9/2 12/1

TEXAS UNIV AT AUSTIN DEPT OF COMPUTER SCIENCES

(U) Finding Repeated Elements,

82 12P

PERSONAL AUTHORS: Misra,J. ;Gries,D. ;

CONTRACT NO. AFOSR-81-0205, NSF-MCS81-03605

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0942

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Science of Computer Programming, v2 p143-152 1982.

Reprint: Finding Repeated Elements.

DESCRIPTORS: (U) *Computer programming, *Algorithms, Logic elements, Repetition rate, Systems analysis, Variables, Loops, Decision making, Reprints

IDENTIFIERS: (U) *Computer algorithms, Decision trees, PE61102F, WUAFOSR2304A2

AD-A135 220 12/1

IBM THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS NY

(U) Accurate Multistep Methods for Smooth Stiff Problems,

82 17P

PERSONAL AUTHORS: Liniger,W. ;Odeh,F. ;

CONTRACT NO. F49620-77-C-0088

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-0940

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Computational and Asymptotice Methods for Boundary and Interior Layers, p53-67 1982.

Reprint: Accurate Multistep Methods for Smooth Stiff Problems.

DESCRIPTORS: (U) *Differential equations, *Numerical integration, Boundary value problems, Stiffness, Reprints

IDENTIFIERS: (U) Smoothing(Mathematics), PE61102F, WUAFOSR2304A3

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 219 9/2 6/12 6/5

CALIFORNIA UNIV SANTA BARBARA INST OF ENVIRONMENTAL STRESS

(U) Computerization of a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.

DEC 82 9P

PERSONAL AUTHORS: Marcus,R. R. ;Ceder,V. D. ;Borgia,J. F. ;Horvath,S. M. ;

CONTRACT NO. AFOSR-78-3534

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-83-0887

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the Digital Equipment Computer Users Society, Anaheim, CA, p203-209 Dec 82.

Reprint: Computerization o a Cardiac Catheterization Lab Using a PDP-11/60 with an LPA-11.

DESCRIPTORS: (U) *Medical computer applications, *Cardiology, *Catheters, Laboratory equipment, Medical laboratories, Data processing, Archives, Data displays, Real time, Ventricles, Aorta, Blood pressure, Electrocardiography, Heart rate, Monitors, Respiration, Sampling, Plotting, Data acquisition, Reprints

IDENTIFIERS: (U) Catheterization, *Cardiac catheterization, PE61102F, WUAFOSR2312A1

AD-A135 219

AD-A135 212 14/2 20/4

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT GAS TURBINE TECHNOLOGY GROUP

(U) Hot-Wire Measurements of Velocity and Temperature Fluctuations in a Heated Turbulent Boundary Layer.

DESCRIPTIVE NOTE: Interim rept.,

83 34P

PERSONAL AUTHORS: Bennett,J. C. ;

CONTRACT NO. F49620-81-C-0053

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR TR-83-0923

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper describes the development of a multi-element hot-wire anemometry system designed to measure a wide variety of fluctuating velocity and temperature quantities in non-isothermal boundary layer flows. Descriptions of the design and evaluation of the multi-element probes and the analog-digital data recording and analysis system are included. Special features of this system were: (1) that the hot-wire probes employed sensors of reasonably practical size (2.5 microns dia.); and (2) that only standard, commercially available constant-temperature anemometers were utilized. Sample data, including Reynolds stress and turbulent Prandtl number distributions, demonstrate that boundary layer turbulence statistics were measured accurately with this system. (Author)

DESCRIPTORS: (U) *Turbulent boundary layer, *Hot wire anemometers, Reynolds number, Heat, Variations, Velocity, Stresses, Experimental data, Analog to digital converters, Statistical analysis, Prandtl number, Convection(Heat transfer), Temperature measuring instruments

IDENTIFIERS: (U) Multielement hot wire anemometers, WUAFOSR2307H4, PE61102F

AD-A135 212

AD-A135 211 6/14 5/9

TEXAS TECH UNIV LUBBOCK INST FOR ERGONOMICS RESEARCH

(U) Establishing Physical Criteria for Assigning Personnel to Air Force Jobs.

DESCRIPTIVE NOTE: Final rept. 1 Oct 78-30 Sep 82,

SEP 82 254P

PERSONAL AUTHORS: Ayoub,M. M. ;Denardo,J. D. ;Smith,J. L. ;Bethea,N. J. ;Lambert,B. K. ;

CONTRACT NO. F49620-79-C-0006

PROJECT NO. 2313

TASK NO. A4

MONITOR: AFOSR TR-83-0941

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this project was to develop and validate a criterion with which the Air Force could reliably evaluate the compatibility of an individual's physical capacities with the physical demands of the various Air Force Specialty Codes (AFSCs). The benefits derived by the Air Force from this capability are a reduction in early discharges due to the inability of the individual to physically qualify for an AFSC after enlistment; a corresponding decrease in training costs, both initial and cross-training, due to a lower probability of an individual's eventual failure in the AFSC, a reduction in injury related costs due to a fewer number of individuals performing physical work at levels near or exceeding their maximum safe capability to work; and a reduction in operating costs by improving the work force capacity relevant to the physical demands of the task.

DESCRIPTORS: (U) *Ergonomics, *Air Force personnel, *Manpower utilization, *Job analysis, Personnel selection, Physical fitness, Stress(Physiology), Strength(Physiology), Workload, Aptitudes, Performance(Human), Scoring, Questionnaires, Feedback, Tables(Data)

IDENTIFIERS: (U) Task analysis, Stamina(Physiology), Physical demands, WUAFOSR2313A4, PE61102F

AD-A135 211

AD-A135 209 20/4

NATIONAL MARITIME INST TEDDINGTON (ENGLAND)

(U) The Development of a Two-Dimensional Wavepacket in a Growing Boundary Layer.

DESCRIPTIVE NOTE: Interim rept.,

82 17P

PERSONAL AUTHORS: Gaster,M. ;

CONTRACT NO. AFOSR-82-0177, AFOSR-80-0272

PROJECT NO 2307

TASK NO. A2

MONITOR: AFOSR TR-83-0925

UNCLASSIFIED REPORT

Reprint: The Development of a Two-Dimensional Wavepacket in a Growing Boundary Layer.

DESCRIPTORS: (U) *Wave packets, Two dimensional, Boundary layer flow, Turbulent flow, Waveforms, Wave propagation, Reprints

IDENTIFIERS: (U) WUAFOSR2307A2, PE61102F

AD-A135 209

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 208 9/2 12/1

STANFORD UNIV CA

(U) Statistical Data Processing, System Modeling and Reliability.

DESCRIPTIVE NOTE: Final rept. 1 May 79-30 Jun 83,

JUN 83 29P

PERSONAL AUTHORS: Kailath,T. ;Gray,R. M. ;El Gamal,A. ; Morf,M. ;

CONTRACT NO. F49620-79-C-0058

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-83-0935

UNCLASSIFIED REPORT

ABSTRACT: (U) The aim of research described herein was explore several fundamental problems in statistical data processing and system modeling, with particular aspects: analysis of Nonstationary Signal Processes; Algorithms for Data Compression; Reliable VLSI Computing Structures; and Algorithms and Architectures for Statistical and Data Processing.

DESCRIPTORS: (U) *Data processing, *Statistical data, *Statistical processes, Systems analysis, Models, Reliability, Signal processing, Algorithms, Data compression, Computer architecture

IDENTIFIERS: (U) VLSI(Very large Scale Integration), WUAFOSR2304A6, PE61102F

AD-A135 208

AD-A135 205 7/4 9/1

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Uniformly Accessible Electrodes,

83 9P

PERSONAL AUTHORS: Albery,W. J. ;Bruckenstein,S. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0892

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanaly*ical Chemistry, v144 p105-112 1983.

Reprint: Uniformly Accessible Electrodes.

DESCRIPTORS: (U) *Electrodes, *Electric current, Mathematical analysis, Convection, Diffusion, Disks, Tubes, Reprints

IDENTIFIERS: (U) Rotating disk electrode, Wall tube electrode, WUAFOSR2303A1, PE61102F

AD-A135 205

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVP02F

AD-A135 195 7/3 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Electrochemical and Spectroscopic Studies of 9, 10 Anthraquinone in a Room Temperature Molten Salt.

NOV 82 11P

PERSONAL AUTHORS: Cheek,G. ;Osteryoung,R. A. ;

CONTRACT NO. AFOSR-81-0007

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0911

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electrochemical Society, v129 n11 p2488-2496 Nov 82.

Reprint: Electrochemical and Spectroscopic Studies of 9, 10-Anthraquinone in a Room Temperature Molten Salt.

DESCRIPTORS: (U) *Anthraquinones, *Electrochemistry, *Infrared spectroscopy, Voltammetry, Salts, Melts, Chemical analysis, Reprints

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F

AD-A135 195

AD A135 193 7/3

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Stereochemistry of Photoinitiated Emulsion Polymerization.

83 14P

PERSONAL AUTHORS: Turro,N. J. ;Pierola,I. F. ;Chung,C. J. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-0917

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Polymer Science, v21 p1085-1096 1983.

Reprint: Stereochemistry of Photoinitiated Emulsion Polymerization.

DESCRIPTORS: (U) *Polymethyl methacrylate, *Polymerization, *Emulsions, Photochemical reactions, Magnetic fields, Stereochemistry, Ketones, Reprints

IDENTIFIERS: (U) Photoinitiation, PE61102F, WUAFOSR2303B2

AD-A135 193

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 192 7/4

TORONTO UNIV (ONTARIO) LASH MILLER CHEMICAL LABS

(U) Nonequilibrium Effects in the Energy Distribution Function,

MAR 83 10P

PERSONAL AUTHORS: Burns,G. ;Cohen,L. K. ;

CONTRACT NO. AFOSR-81-0028

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-83-0908

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n6 Pt1 p3245-3252, 15 Mar 83.

Reprint: Nonequilibrium Effects in the Energy Distribution Function.

DESCRIPTORS: (U) *Chemical reactions, *Energy levels, *Distribution functions, Nonequilibrium flow, Steady state, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

AD-A135 192

AD-A135 181 20/12 7/4

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation,

83 12P

PERSONAL AUTHORS: Murphy,W. C. ;Beri,A. C. ;George,T. F. ; Lin,J. T. ;

REPORT NO. 21

CONTRACT NO. AFOSR-82-0046

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-83-0915

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Materials Research Society Symposium Proceedings, v17 p273-282 1983.

Reprint: Analysis of Laser-Enhanced Adsorption/Desorption Processes on Semiconductor Surfaces via Electronic Surface State Excitation.

DESCRIPTORS: (U) *Semiconductors, *Surface properties, *Photoactivation analysis, Lasers, Excitation, Phonons, Electronic states

IDENTIFIERS: (U) WUAFOSR2303A2, PE61102F

AD-A135 181

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 180 7/4

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F + H sub 2 Collisions,

83 3P

PERSONAL AUTHORS: Zimmerman,I. H. ;Baer,M. ;George,T. F. ;

REPORT NO. 20

CONTRACT NO. AFOSR-82-0046

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-83-0914

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v87 n9 p1478-1479 1983.

Reprint: Quantal Study of Laser-Induced Transitions between Electronic Potential Energy Surfaces in Reactive F H sub 2 Collisions.

DESCRIPTORS: (U) *Particle collisions, *Electron transitions, *Potential energy, Lasers, Excitation, Surface reactions, Fluorine, Hydrogen, Energy levels, Reprints

IDENTIFIERS: (U) WUAFOSR2303A2, PE61102F

AD-A135 179 11/9 7/4 20/3

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Application of Weak Magnetic Fields to Influence Rates and Molecular Weight Distributions of Styrene Polymerization,

83 7P

PERSONAL AUTHORS: Turro,N. J. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-0916

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Industrial and Engineering Chemistry Product Research Development, v22 n2 p272-276 1983.

Reprint: Application of Weak Magnetic Fields to Influence Rates and Molecular Weight Distributions of Styrene Polymerization.

DESCRIPTORS: (U) *Polystyrene, *Polymerization, *Magnetic fields, Reaction kinetics, Molecular weight, Distribution, Emulsions, Photolysis, Excitation, Ketones, Catalysts, Chemical radicals, Molecular states, Magnetic properties, Reprints

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 178 7/4 7/2

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Electrochemical Studies of Cu(I) and Cu(II) in an Aluminum Chloride-N(n-Butyl) Pyridinium Chloride Ionic Liquid.

JUN 83 9P

PERSONAL AUTHORS: Nanjundiah,C. ;Osteryoung,R. A. ;

CONTRACT NO. AFOSR-81-0007

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0909

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electrochemical Society, v130 n6 p1312-1318 Jun 83.

Reprint: Electrochemical Studies of Cu(I) and Cu(II) in an Aluminum Chloride-N(n-Butyl) Pyridinium Chloride Ionic Liquid.

DESCRIPTORS: (U) *Copper, *Electrochemistry, Ions, Aluminum compounds, Chlorides, Measurement, Oxidation, Reaction kinetics, Diffusion, Stability, Reprints, Constants

IDENTIFIERS: (U) Butylpyridinium chloride, WUAFOSR2303A1, PE61102F

AD-A135 178

AD-A135 177 12/1 20/3 20/1

MICHIGAN UNIV ANN ARBOR DEPT OF MATHEMATICS

(U) Applications of Non-Self-Adjoint Operator Theory to the Singularity Expansion Method (SEM) and to the Eigenmode Expansion Method (EEM) in Acoustic and Electromagnetic Problems.

DESCRIPTIVE NOTE: Final rept. 1 Jun 80-31 May 83,

JUL 83 6P

PERSONAL AUTHORS: Dolph,C. L. ;

CONTRACT NO. AFOSR-80-0204

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0934

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Jul 80, AD-A088 747.

ABSTRACT: (U) This document contains six papers entitled: 1) On some mathematical aspects of SEM(Singularity Expansion Method), EEM(Eigenmode Expansion Method) and scattering; 2) On the singularity and eigenmode expansion methods; 3) Mathematical foundations of the singularity and eigenmode expansion methods; 4) Convergence of the T-matrix approach to scattering theory; 5) Convergence of the T-matrix approach in scattering theory, II; and 6) Variational principles for resonances, II.

DESCRIPTORS: (U) *Numerical methods and procedures, *Operators(Mathematics), *Electromagnetic properties, *Acoustic properties, Scattering, Greens function, Convergence, Matrices(Mathematics), Integral equations, Banach space

IDENTIFIERS: (U) Singularity expansion method, Eigenmode expansion method, T matrix, Fredholm theorem, PE61102F, WUAFOSR2304A4

AD-A135 177

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 176 20/8 7/4

JET PROPULSION LAB PASADENA CA

(U) Production of Negative Ions by Electron Impact.

DESCRIPTIVE NOTE: Final rept. 1 May 81-31 Oct 82,

OCT 82 60P

PERSONAL AUTHORS: Srivastava,S. K. ;

CONTRACT NO. AFOSR-ISSA-82-00009

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-83-0880

UNCLASSIFIED REPORT

ABSTRACT: (U) Proposed future space-based beam weapons systems will most probably require an intense neutral particle beam for effective operation across geomagnetic field lines. Such neutral beams can most efficiently be obtained by stripping excess electrons from negative ion beams. The objective of this work is to study the process of dissociative attachment of electrons. Specifically, to measure the cross sections for polar dissociation and dissociative attachment for production of H(-). It is suspected that these dissociative attachment cross sections for the production of H(-) from alkali hydrides are large. The insight gained from this study will be extremely helpful in the fabrication of high current density H(-) beam sources for use in the production of intense neutral hydrogen beams. A selection of alkali hydride molecules will be investigated in order to determine the largest cross sections for the production of H(-) by electron impact. The angular distribution of the H(-) ions will be measured. An optimal vapor pressure for the efficient production of H(-) will be found. The feasibility of extending the proposed research to the deuterium bearing molecule will be determined.

DESCRIPTORS: (U) *Ion beams, *Anions, *Chemical dissociation, Particle beams, Electrons, Attachment, Stripped atoms, Methodology, Cross sections, Electron impact spectra, Instrumentation

AD-A135 176 CONTINUED

IDENTIFIERS: (U) PE61102A, WUAFOSR2301A7

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 175 9/4 5/2 12/2

MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INFORMATION AND DECISION SYSTEMS

(U) Linear and Nonlinear Filtering and Related Inverse Scattering Problems.

DESCRIPTIVE NOTE: Interim technical rept. 15 Mar 82-14 Mar 83,

MAY 83 18P

PERSONAL AUTHORS: Mitter,S. K. ;Levy,B. ;

CONTRACT NO. AFOSR-82-0135

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-0982

UNCLASSIFIED REPORT

ABSTRACT: (U) This report discusses progress made on linear and non-linear filtering theory during the grant period. The two aspects of research included: Stochastic Control Interpretation of Non-linear filtering and its implication on approximate non-linear filtering, especially a rigorous analysis of the Extended kalman filter; and Scattering and Inverse Scattering Interpretation of Linear Estimation and development of new algorithms for linear estimation.

DESCRIPTORS: (U) *Information theory, *Nonlinear systems, *Stochastic control, *Inverse scattering, *Reports, Contracts, Parameters, Bayes theorem, Theory, Kalman filtering, Linearity, Estimates, Research management

IDENTIFIERS: (U) *Nonlinear filtering, PE61102F, WUAFOSR2304A1

AD-A135 175

AD-A135 173 20/9 20/3

POLYTECHNIC INST OF NEW YORK FARMINGDALE DEPT OF ELECTRICAL ENGINEERING

(U) Interaction of Electromagnetic Fields with Plasma.

DESCRIPTIVE NOTE: Final rept. 1 Oct 78-31 Dec 82,

AUG 83 46P

PERSONAL AUTHORS: Cheo,B. R. ;Kuo,S. P. ;Poole,B. R. ;

REPORT NO. POLY-EE-83-003

CONTRACT NO. AFOSR-79-0009

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR TR-83-0879

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated 1 Sep 80, AD-A105 027.

ABSTRACT: (U) Essentially five topics were studied during this time period; three are essentially experimental investigations, and the other two are theoretical in nature. The five topics include: 1) Propagation of microwaves along a plasma column and harmonic generation of electrostatic ion cyclotron waves, 2) Imploding tube experiment, 3) RF Generated Current in a Magnetized Plasma Using a Slow Wave Structure, 4) Wave-Particle interaction at cyclotron resonances, and 5) Turbulent interaction between waves and charged particles.

DESCRIPTORS: (U) *Plasma diagnostics, *Electromagnetic fields, *Interactions, Plasma devices, Microwaves, Wave propagation, Charged particles, Cyclotron waves, Electrostatics, Heating, Cyclotron resonance, Equations of motion, Harmonic generators, Turbulence, Implosions

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A8

AD-A135 173

AD-A135 172 20/13

MINNESOTA UNIV MINNEAPOLIS

(U) Deterministic Chaos in Materials Exhibiting Phase Transitions.

DESCRIPTIVE NOTE: Final rept.,

JUN 83 9P

PERSONAL AUTHORS: Slemrod,M. ;

CONTRACT NO. AFOSR-82-0246

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-0929

UNCLASSIFIED REPORT

ABSTRACT: (U) The author spent one half of the Spring 1983 semester at the Institute for Mathematics and its Applications. During that time he interacted with colleagues, engaged in research, and gave two public lectures at the Institute: Chaos in Phase Transitions, and Dynamics of Phase Transitions. The main thrust of his research was in two areas, specifically: Deterministic chaos in materials exhibiting phase transitions, and Admissibility criteria for weak solutions of the non-hyperbolic conservation laws which describe dynamic phase transitions.

DESCRIPTORS: (U) *Phase transformations, Dynamics, Isotherms, Compressible flow, Fluid flow, Perturbations

IDENTIFIERS: (U) Deterministic chaos, Conservation laws, PE61102F, WUAFOSR2304A4

AD-A135 171 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.

DESCRIPTIVE NOTE: Technical rept.,

83 21P

PERSONAL AUTHORS: Swathirajan,S. ;Bruckenstein,S. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-0891

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytical Chemistry, v146 p137-155 1983.

Reprint: Interpretation of the Potentiodynamic Response during the Underpotential Deposition of Silver on Polycrystalline Gold.

DESCRIPTORS: (U) *Silver, *Deposition, *Electrochemistry, Polycrystalline, Gold, Potential flow, Voltammetry, Reprints

IDENTIFIERS: (U) UPD(Underpotential Deposition), PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 170 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.

DESCRIPTIVE NOTE: Technical rept.,

81 11P

PERSONAL AUTHORS: Swathirajan,S. ;Bruckenstein,S. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-0893

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytical Chemistry, v125 p63-17 1981.

Reprint: Ring-Disk Electrode Studies of the Open-Circuit Dissolution of Iodine Films Formed during the Anodic Oxidation of Iodide on Platinum.

DESCRIPTORS: (U) *Iodine, *Thick films, *Electrochemistry, Circuit analysis, Oxidation, Anodes(Electrolytic cell), Platinum, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A135 170

AD-A135 169 12/1

NORTH CAROLINA STATE UNIV RALEIGH DEPT OF MATHEMATICS

(U) One Canonical Form for Higher-Index Linear Time-Varying Singular Systems.

DESCRIPTIVE NOTE: Technical rept.,

83 17P

PERSONAL AUTHORS: Campbell,S. L. ;

REPORT NO. TR-23

CONTRACT NO. AFOSR-81-0052

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-83-0946

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Circuits Systems & Signal Processing, v2 n3 p311-326 1983.

Reprint: One Canonical Form for Higher-Index Linear Time-Varying Singular Systems.

DESCRIPTORS: (U) *Linear differential equations, Perturbations, Solutions(General), Matrices(Mathematics), Reprints

IDENTIFIERS: (U) Singular systems, Time variance singular systems, P61102F, WUAFOSR2304A6

AD-A135 169

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 168 12/2

FLORIDA STATE UNIV TALLAHASSEE

(U) Optimum Replacement of a System Subject to Shocks,

83 9P

PERSONAL AUTHORS: Proschan,F. ;Boland,P. J. ;

CONTRACT NO. F49620-82-K-0007

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-83-0979

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Operations Research, v31 n4 p697-704 Jul-Aug 83.

Reprint: Optimum Replacement of a System Subject to Shocks.

DESCRIPTORS: (U) *Replacement, Optimization, Reliability, Shock, Stochastic processes, Scheduling, Operations research, Failure, Cost analysis, Reprints

IDENTIFIERS: (U) Replacement theory, Poisson processes, PE61102F, WUAFOSR2304A5

AD-A135 167 5/10

DALHOUSIE UNIV HALIFAX (NOVA SCOTIA) DEPT OF PHYSIOLOGY AND BIOPHYSICS

(U) Electrophysiology and Psychophysics of Motion in Depth.

DESCRIPTIVE NOTE: Technical rept.,

83 13P

PERSONAL AUTHORS: Regan,D. ;

CONTRACT NO. AFOSR-78-3711

PROJECT NO. 2313

TASK NO. A2

MONITOR: AFOSR
TR-82-0737

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Documenta Ophthalmologica, Proceedings Series, v27 p271-281 1981.

Reprint: Electrophysiology and Psychophysics of Motion in Depth.

DESCRIPTORS: (U) *Visual perception, *Motion, Electrophysiology, Psychophysiology, Images, Patterns, Sizes(Dimensions), Threshold effects, Stimuli, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 165 20/4 12/1

NATIONAL MARITIME INST TEDDINGTON (ENGLAND)

(U) Estimates of the Errors Incurred in Various Asymptotic Representations of Wave Packets.

82 14P

PERSONAL AUTHORS: Gaster,M. ;

CONTRACT NO. AFOSR-82-0177, AFOSR-80-0272

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-83-0904

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluid Mechanics, v121 p365-377 1982.

Reprint: Estimates of the Errors Incurred in Various Asymptotic Representations of Wave Packets.

DESCRIPTORS: (U) *Boundary layer transition, Asymptotic series, Turbulent flow, Approximation(Mathematics), Steepest descent method, Errors, Estimates, Boundary layer flow, Perturbations, Reprints, Great Britain

IDENTIFIERS: (U) Wave packets, Transition flow, Gaussian approximation, Stability theory, Forced disturbances, PE61102F, WUAFOSR2307A2

AD-A135 165

AD-A135 163 6/18

JOHN B PIERCE FOUNDATION LAB NEW HAVEN CONN

(U) Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure.

83 15P

PERSONAL AUTHORS: Adair,E. R. ;Adams,B. W. ;

CONTRACT NO. AFOSR-77-3420

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR TR-83-0883

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Behavioral Neuroscience, v97 n1 p49-61 1983.

Reprint: Behavioral Thermoregulation in the Squirrel Monkey: Adaptation Processes during Prolonged Microwave Exposure.

DESCRIPTORS: (U) *Radiation effects, *Microwaves, *Temperature control, Squirrel monkeys, Body temperature, Exposure(Physiology), Threshold effects, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2313A5

AD-A135 163

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 162 20/12 7/5

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Current-Voltage Analysis of Photoelectrochemical Cells under Mass and Light Flux Variation,

SEP 82 9P

PERSONAL AUTHORS: Bruckenstein,S. ;Miller,B. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-0897

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Electrochemical Society, v129 n9 p2029-2034 Sep 82.

Reprint: Current-Voltage Analysis of Photoelectrochemical Cells under Mass and Light Flux Variation.

DESCRIPTORS: (U) *Photoelectric cells(Semiconductor), *Voltammetry, Photochemical reactions, Flux density, Electrochemistry, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

AD-A135 161 6/19

KENTUCKY UNIV LEXINGTON WENNER-GREN RESEARCH LAB

(U) Rhesus Monkey Intervertebral Disk Viscoelastic Response to Shear Stress,

FEB 83 6P

PERSONAL AUTHORS: Kelley,B. S. ;Lafferty,J. F. ;Bowman,D. A. ;Clark,P. A. ;

CONTRACT NO. AFOSR-78-3488

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR
TR-83-0882

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Biomechanicl Engineering, v105 p51-54 Feb 83.

Reprint: Rhesus Monkey Intervertebral Disk Viscoelastic Response To Shear Stress.

DESCRIPTORS: (U) *Disks, *Spinal column, *Viscoplastic properties, Biomechanics, Rhesus monkeys, Anatomical models, Shear stresses, Predictions, Stress relaxation, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 154 12/1

DUKE UNIV DURHAM NC DEPT OF COMPUTER SCIENCE

(U) Search Algorithms and Their Implementation.

DESCRIPTIVE NOTE: Annual rept. 30 Jun 82-29 Jun 83,

AUG 83 16P

PERSONAL AUTHORS: Loveland,D. W. ;

CONTRACT NO. AFOSR-81-0221

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0932

UNCLASSIFIED REPORT

ABSTRACT: (U) Research that has resulted in completed papers includes perfect information games of chance, non-minimax search strategies, limited resource search and knowledge evaluation in expert systems. Preliminary results have been obtained in areas including parallel search algorithms, test-and-treatment problems and search using expectation. Other investigations are in progress. (Author)

DESCRIPTORS: (U) *Algorithms, *Searching, Strategy, Problem solving, Decision making, Game theory, Trees

IDENTIFIERS: (U) Expert systems, PE61102F, WUAFOSR2304A2

AD-A135 152 20/4 12/1

FLORIDA UNIV GAINESVILLE DEPT OF MATHEMATICS

(U) Final Report on Grant AFOSR-82-0171.

DESCRIPTIVE NOTE: Final rept. 1 May 82-30 Apr 83,

JUN 83 54P

PERSONAL AUTHORS: McKenna,P. J. ;

CONTRACT NO. AFOSR-82-0171

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-83-0928

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period the principal investigator has considered the effect of the artificial far field boundary on a finite different approximation of the Navier-Stokes equations for a compressible fluid considered for two dimensional boundary conditions for the far-field boundary can results in some of the following phenomena: (1) reflecting boundary conditions, in which the disturbances in the physical variables represented by the difference between the steady state flow and the initial conditions are not allowed to exit through the far-field boundary but instead continue echoing up and down the grid; (2) under-specified boundary conditions, in which the converged steady state solution may depend on the initial conditions; and (3) over-specified boundary conditions in which large errors are introduced before convergence takes place. The following conclusions may be drawn from the numerical experiments conducted as a part of the research effort: There are four distinct artificial nonreflecting boundaries containing free-stream information, these being the inflow, outflow, top-sidewall and bottom-sidewall. Each of these boundaries must be treated differentially, or errors are introduced into the system.

DESCRIPTORS: (U) *Navier Stokes equations, *Compressible flow, *Fluid flow, *Numerical methods and procedures, Gas dynamics, Two dimensional flow, Far field, Boundaries, Linearity, Steady state, Nonlinear systems, Free stream,

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 152 CONTINUED

Flight simulation

IDENTIFIERS: (U) Steady state flow, Obstacles, PE61102F, WUAFOSR2304A3

AD-A135 149 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region.

82 8P

PERSONAL AUTHORS: Swathirajan,S. ;Mizota,H. ;Bruckenstein, S. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0890

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v86 n13 p2480-2485 1982.

Reprint: Thermodynamic Properties of Monolayers of Silver and Lead Deposited on Polycrystalline Gold in the Underpotential Region.

DESCRIPTORS: (U) *Silver, *Lead(Metal), *Thermodynamic properties, Deposition, Gold, Crystals, Ions, Substrates, Valence, Chemical equilibrium, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A2

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 148 20/2

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Dynamics of Orientational Fluctutations of Molecules Near a Liquid-Solid Interface: A Landau-Ginzburg Description.

JUN 83 25P

PERSONAL AUTHORS: Mauger,A. ;Mills,D. L. ;

CONTRACT NO. F49620-78-C-0019

PROJECT NO. 2306

TASK NO C2

MONITOR: AFOSR TR-83-0815

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n12 p7736-7758, 15 Jun 83.

Reprint: Dynamics of Orientational Fluctutations of Molecules Near a Liquid-Solid Interface: A Landau Ginzburg Description.

DESCRIPTORS: (U) *Molecules, *Liquid crystals, Interfaces, Liquids, Solids, Equations, Models, Reprints

IDENTIFIERS: (U) Landau Ginzburg Equations, PE61102F, WUAFOSR2306C2

AD-A135 148

AD-A135 146 14/2 12/1

WISCONSIN UNIV-MADISON DEPT OF MATHEMATICS

(U) Final Report on Scient fic Activities Pursuant to the Provisions of AFOSR Grant-79-0018, Nov 1, 1981 through October 31, 1982.

DESCRIPTIVE NOTE: Final rept.,

JUL 83 52P

PERSONAL AUTHORS: Russell,D. L. ;

CONTRACT NO. AFOSR-79-0018

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-0881

UNCLASSIFIED REPORT

ABSTRACT: (U) The author review various aspects of the control theory of hyperbolic systems, including controllability, stabilization, control canonical form theory, etc. To allow a unified and not excessively technical treatment, attention is restricted to the case of a single space variable; the multi-dimensional case is treated in another work. The paper concludes with a short discussion of the newly developed procedure of canonical augmentation. (Author)

DESCRIPTORS: (U) *Control theory, *Control systems, *Partial differential equations, Parametric analysis, Wave equations, Hilbert space, Eigenvalues, Input, Boundary value problems, Research management

IDENTIFIERS: (U) Hyperbolic systems, Carleson method theorem, PE61102F, WUAFOSR2304A1

AD-A135 146

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVP02F

AD-A135 142 6/19

FLORIDA UNIV GAINESVILLE COLL OF VETERINARY MEDICINE

(U) The Scanning Electron Microscopy of Compressed Spinal Units.

83 8P

PERSONAL AUTHORS: Eurell,J. A. C. ;Kazarian,L. E. ;Gordon, P. A. ;Blakeney,W. H. ;

CONTRACT NO. AFOSR 80-0130

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR TR-83-0933

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Anatomia Clinica, v5 p35-40 1983.

Reprint: The Scanning Electron Microscopy of Compressed Spinal Units.

DESCRIPTORS: (U) *Spinal column, Disks, Histology, Electron microscopy, Rhesus monkeys, Compression, Damage, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A2

AD-A135 140 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine.

82 6P

PERSONAL AUTHORS: Beran,P. ;Opekar,F. ;Bruckenstein,S. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0894

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Analytica Chimica Acta, v136 p389-393 1982.

Reprint: Pneumatoamperometric Determination of Various Oxidants and Total Dissolved Chlorine.

DESCRIPTORS: (U) *Oxides, *Chemical analysis, Microanalysis, Chlorine, Iodine, Quantitative analysis, Reprints

IDENTIFIERS: (U) Pneumatoamperometry, PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 139 6/16

WASHINGTON UNIV SEATTLE DEPT OF PHYSIOLOGY AND BIOPHYSICS

(U) Adaptation of Vascular Pressure-Flow-Volume Hysteresis in Isolated Rabbit Lungs.

83 11P

PERSONAL AUTHORS: Beck,K. C. ;Hildebrandt,J. ;

CONTRACT NO. F49620-78-C-0058

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR TR-83-0885

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physiology, Respiratory, Environmental, Exercise Physiology, v54 n3 p671-679 1983.

Reprint: Adaptation of Vascular Pressure-Flow-Volume Hysteresis in Isolated Rabbit Lungs.

DESCRIPTORS: (U) *Hysteresis, *Adaptation(Physiology), Blood pressure, Blood volume, Fluid flow, Pulmonary arteries, Lung, Pulmonary veins, Rabbits, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A1

AD-A135 139

AD-A135 138 9/3 12/1

IBM THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS NY

(U) A Semi-Direct Method for Modular Circuits,

MAY 83 5P

PERSONAL AUTHORS: Odeh,F. ;Zein,D. ;

CONTRACT NO. F49620-77-C-0088

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-83-0939

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE International Symposium on Circuits and Systems Proceedings, p226-229 May 83.

Reprint: A Semi-Direct Method for Modular Circuits.

DESCRIPTORS: (U) *Circuit analysis, *Integrated circuits, *Iterations, *Relaxation, Gates(Circuits), Metal oxide semiconductors, Transistors, Algorithms, Models, Reprints

IDENTIFIERS: (U) Gauss seidel iterations, Bipolar circuits, Decomposition techniques, Partitioned circuits, Tearing techniques, WR(Waveform Relaxation), Run time, Convergence, PE61102F, WUAFOSR2304A3

AD-A135 138

AD-A135 136 12/1

COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS

(U) Rational Approximations to Linear Forms of Exponentials and Binomials.

MAY 83 5P

PERSONAL AUTHORS: Chudnovsky,G. V. ;

CONTRACT NO. AFOSR 81-0190

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0958

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the National Academy of Sciences of the United States of America, v80 p3138-3141 May 83.

Reprint: Rational Approximations to Linear Forms of Exponentials and Binomials.

DESCRIPTORS: (U) *Approximation(Mathematics), *Rational numbers, Exponential functions, Binomials, Linear algebra, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4

AD-A135 135 20/4

TORONTO UNIV DOWNSVIEW (ONTARIO) INST FOR AEROSPACE STUDIES

(U) Numerical Analysis of Dusty Supersonic Flow Past Blunt Axisymmetric Bodies.

DESCRIPTIVE NOTE: Interim rept.,

AUG 83 83P

PERSONAL AUTHORS: Sugiyama,H. ;

REPORT NO. UTIAS-267

CONTRACT NO. AFOSR-82-0096

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR TR-83-0922

UNCLASSIFIED REPORT

ABSTRACT: (U) An inverse method was developed for treating gas-particle supersonic flow past axisymmetric blunt bodies. This method is based on two transformations (von Mises and an additional one), which are convenient for determining the shock-layer flow fields and the body shapes. In using the present method, the pure gas flow fields around spheres were first solved numerically for the freestream Mach numbers = 10, 6, 4, 3, 2 and 1.5. These were found to be in very good agreement with the available results of Van Dyke and Gordon. Then the gas-solid-particle flow in the shock layer around blunt bodies (nearly spheres) were solved for the freestream Mach numbers = 10 and 1.5, with freesteam loading ratios = 0, 0.2, 0.5 and 1.0 and particle diameters 1, 2, 5 and 10 micrometers respectively.

DESCRIPTORS: (U) *Supersonic flow, *Blunt bodies, *Dust, Numerical analysis, Transformations(Mathematics), Inversion, Numerical methods and procedures, Gas flow, Two phase flow, Axisymmetric, Shock, Standoff, Density, Stagnation point, Aerothermodynamics, Pitot tubes, Spheres, Particle size, Hypersonic flow, Canada

IDENTIFIERS: (U) Von Mises transformation, Pitot tube

AD-A135 135

AD-A135 135 CONTINUED

flow, Inverse method, Shock layers, PE61102F, WUAFOSR2307A1

AD-A135 134 12/1

KENTUCKY UNIV LEXINGTON DEPT OF MATHEMATICS

(U) Algorithms, Modeling and Estimation for Linear Systems.

DESCRIPTIVE NOTE: Final technical rept. 1 Apr 79-31 May 83.

MAY 83 27P

PERSONAL AUTHORS: Lindquist,A. ;

CONTRACT NO. AFOSR-78-3519

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR TR-83-0878

UNCLASSIFIED REPORT

ABSTRACT: (U) Modeling of linear stochastic systems leads to the stochastic realization problem. In this project the author develops a comprehensive theory of stochastic realization. Such a theory should be the center-piece of stochastic systems theory. First he studies the problem from a coordinate-dependent point of view. Secondly, he develops a geometric theory of Markovian representation, which also accomodates infinite-dimensional systems. In this framework a unified theory of smoothing is provided, the basic idea being to embed the given stochastic system in a class of similar systems all having the same output process and the same Kalman-Bucy filter. This approach provides stochastic interpretations of many important smoothing procedures. The factorizations of the matrix Riccati equation underlying fast (non-Riccati) algorithms are analized in the context of Hamiltonian systems, and certain aspects of the algebraic Riccati equation are studied, as is the concept of invariant directions of the matrix Riccati equation. A unified approach to the partial realization problem is taken, incorporating ideas from numerical linear algebra. Also studied are questions of stability of partial realizations. Finally, a statistical approach to stochastic optimization is presented, and convergence results for algorithms based on stationary data are obtained.

AD-A135 134 CONTINUED

DESCRIPTORS: (U) *Linear systems, *Stochastic processes, *Mathematical models, Algorithms, Estimates, Matrices(Mathematics), Riccati equation, Optimization, Stochastic control, Ka.man filtering, Hamiltonian functions, Linear algebra, Stability, Statistical processes

IDENTIFIERS: (U) Stochastic realization theory, Smoothing(Mathematics), Partial realization problem, PE61102F, WUAFOSR2304A3

AD-A135 133 20/4 12/1

PRINCETON UNIV NJ

(U) Aeroelastic Analysis Using Nonlinear Aerodynamic Methods.

DESCRIPTIVE NOTE: Final scientific rept.,

AUG 83 4P

PERSONAL AUTHORS: Dowell,E. H. ;

CONTRACT NO. AFOSR-81-0213

PROJECT NO. 2307

TASK NO. B1

MONITOR: AFOSR TR-83-0896

UNCLASSIFIED REPORT

ABSTRACT: (U) During the grant year several studies have been undertaken. These are reported fully in References 1, 2, and 3. A summary of the technical highlights follows. An extended nonlinear indicial approach to modeling nonlinear aerodynamic forces for aeroelastic analyses has been developed. The basic approach is based upon describing function ideas. (Author)

DESCRIPTORS: (U) *Aeroelasticity, *Nonlinear analysis, *Aerodynamic forces, Mathematical models, Approach, Numerical methods and procedures, Flutter, Boundaries, Amplitude, Functions(Mathematics), Transonic flow, Predictions

IDENTIFIERS: (U) PE61102F, WUAFOSR2307B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 132 12/1

COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS

(U) Algebraic Reductions of Scalar Three-Dimensional Systems,

FEB 83 5P

PERSONAL AUTHORS: Chudnovsky,D. V. ;Chudnovsky,G. V. ;

CONTRACT NO. AFOSR-81-0190

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0957

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physics Letters, v93A n8 p371-374, 7 Feb 83.

Reprint: Algebraic Reductions of Scalar Three-Dimensional Systems.

DESCRIPTORS: (U) *Linear algebraic equations, *Scalar functions, Three dimensional, Reduction, Hamiltonian functions, Operators(Mathematics), Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4

AD-A135 132

AD-A135 131 12/1

COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS

(U) Laws of Composition of Backlund Transformations and the Universal Form of Completely Integrable Systems in Dimensions Two and Three,

MAR 83 6P

PERSONAL AUTHORS: Chudnovsky,D. V. ;Chudnovsky,G. V. ;

CONTRACT NO. AFOSR-81-0190

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0956

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the National Academy of Sciences of the United States of America, Mathematics, v80 p1774-1777 Mar 83.

Reprint: Laws of Composition of Backlund Transformations and the Universal Form of Completely Integrable Systems in Dimensions Two and Three.

DESCRIPTORS: (U) *Transformations(Mathematics), Boundary value problems, Iterations, Reprints

IDENTIFIERS: (U) Backlund transformations, Deformation equations, PE61102F, WUAFOSR2304A4

AD-A135 131

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 128 7/4

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DAVEY LAB

(U) Angle-Resolved SIMS (Secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111),

83 4P

PERSONAL AUTHORS: Moon,D. W. ;Bleiler,R. J. ;Karwacki,E. J. ;Winograd,N. ;

CONTRACT NO. AFOSR-82-0057

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0918

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v105 p2916-2917 1983.

Reprint: Angle-Resolved SIMS (Secondary Ion Mass Spectrometry) Studies of Organic Monolayers on Ag(111).

DESCRIPTORS: (U) *Organic compounds, *Silver, *Desorption, Mass spectrometry, Ions, Layers, Reprints

IDENTIFIERS: (U) SIMS(Secondary Ion Mass Spectrometry), PE61102F, WUAFOSR2303A1

AD-A135 127 7/4

CHICAGO UNIV IL JAMES FRANCK INST

(U) Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach,

APR 83 10P

PERSONAL AUTHORS: Cerjan,C. ;Lipkin,M. ;Rice,S. A. ;

CONTRACT NO. AFOSR-81-0029

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR TR-83-0898

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n8 p4929-4937, 15 Apr 83.

Reprint: Atom-Molecule Collisions at Very Low Energies: A Correlation Function Approach.

DESCRIPTORS: (U) *Particle collisions, *Energy transfer, Atoms, Molecules, Scattering, Vibration, Models, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 126 11/6 20/11

NORTHWESTERN UNIV EVANSTON IL DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) Fatigue Crack Initiation and Microcrack Propagation in X7091 Type Aluminum P/M Alloys,

JUN 83 11P

PERSONAL AUTHORS: Hirose,S. ;Fine,M. E. ;

CONTRACT NO. AFOSR-78 3732

PROJECT NO. 2306

TASK NO. A1

MONITOR: AFOSR TR-83-0888

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Metallurgical Transactions, v14A p1189-1197 Jun 83.

Reprint: Fatigue Crack Initiation and Microcrack Propagation in X7091 Type Aluminum P/M Alloys.

DESCRIPTORS: (U) *Aluminum alloys, *Fatigue(Mechanics), Powder metallurgy, Crack propagation, Microanalysis, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1

AD-A135 126

AD-A135 124 9/4

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF ELECTRICAL COMPUTER AND SYSTEMS ENGINEERING

(U) Simply Instrumentable and Optimal Digitization of Analog Information Sources.

DESCRIPTIVE NOTE: Annual rept. 30 Jun 82-29 Jun 83,

JUN 83 13P

PERSONAL AUTHORS: Pearlman,W. A. ;

CONTRACT NO. AFOSR-81-0188

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-83-0967

UNCLASSIFIED REPORT

ABSTRACT: (U) This document reports progress on Simply Instrumentable and Optimal Digitization of Analog Information Sources. New techniques for encoding sources with and without memory are described in Section 1 and the papers, presentations, and theses supported by the research are listed in Section 2. Three new optimal coding methods, generalizing previous ones, have been discovered for stationary Gaussian sources and the squared-error distortion measure. These methods, which store codewords on trees and trellises and utilize systematic search algorithms, are being applied to actual speech and image data. Also, the code storage requirements are not large, as this research has shown that small code letter alphabets give nearly optimal results. (Authors)

DESCRIPTORS: (U) *Coding, *Information systems, *Analog systems, Optimization, Memory devices, Algorithms, Searching, Images, Trees, Requirements, Speech, Data processing

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A6

AD-A135 124

AD-A135 121 5/1 17/2 9/2

CALIFORNIA UNIV LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Performance Evaluation and Control of Distributed Computer Communication Networks.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 82-30 Jun 83,

JUN 83 25P

PERSONAL AUTHORS: Rubin,I. ;Gerla,M. ;

REPORT NO. UCLA-ENG-83-47

CONTRACT NO. AFOSR-82-0304

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-83-0952

UNCLASSIFIED REPORT

ABSTRACT: (U) During the 1982/83 first year performance-period under this Grant, research investigations have been carried out leading to significant results, of both theoretical and practical importance. A large multitude of computer communication network architectures, models and control schemes have been developed, analyzed and evaluated. In particular, results have been obtained in the following areas: priority-based Time Division Multiple Access schemes; dynamic random-access procedures, with applications to local area networks and to local distribution and packet-radio networks; hybrid multiple-access schemes; polling, adaptive polling and probing access-control techniques; buffer capacity constrained multi-access systems; network topological analysis; local area network topological analysis; local area network protocols; integrated packet and circuit networks; integrated routing and flow control.

DESCRIPTORS: (U) *Network analysis(Management), *Computer communications, *Communications networks, Test and evaluation, Algorithms, Access, Multiple access, Communications traffic, Computer architecture, Topology, Hybrid systems, Buffer storage, Survivability, Data rate, Routing

AD-A135 121

AD-A135 121 CONTINUED

IDENTIFIERS: (U) *Computer networks, PE61102F, WUAFOSR2304A6

AD-A135 121

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 120 20/7 20/9

NEW MEXICO UNIV ALBUQUERQUE DEPT OF MATHEMATICS AND STATISTICS

(U) Interim Scientific Report on Virtual Cathode Oscillations.

DESCRIPTIVE NOTE: Rept. for 1 Jul 82-30 Jun 83,

JUN 83 5P

PERSONAL AUTHORS: Coutsias,E. A. ;

CONTRACT NO. AFOSR-82-0277

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-0945

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period, the single investigator produced two papers with titles, Effects of Thermal Spread on the Space Charge Limit of an Electron Beam, and The Aging of Nuclei in a Binary Mixture. In progress is a paper dealing with the cascade of bifurcations due to delay effects related to the two stream model for virtual cathode formation in its simplest form. A paper, Kapitza-Dirac Scattering, is being written for publication. This report summarizes progress made under the grant during the specified period. (Author)

DESCRIPTORS: (U) *Electron beams, *Plasma oscillations, Cathodes, One dimensional, Geometry, Mathematical models, Streams, Equations of motion

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4

AD-A135 120

AD-A135 117 12/1

WASHINGTON UNIV SEATTLE

(U) Final Scientific Report on Grant AFOSR-80-0175.

DESCRIPTIVE NOTE: Final rept. 16 Jul 82-15 Jul 83,

AUG 83 7P

PERSONAL AUTHORS: Kevorkian,J. ;

CONTRACT NO. AFOSR-80-0175

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-83-0944

UNCLASSIFIED REPORT

ABSTRACT: (U) During the period of this grant the investigators addressed nonlinear resonance and interactions involving systems of nonlinear ordinary differential equations with slowly varying coefficients. More specifically, they investigated passage through resonance, sustained resonance as in roll resonance, particle accelerators or free electron lasers, global adiabatic invariants and weakly nonlinear wave interactions. Approaches used included matching asymptotic expansions, multiple scale expansions, higher order averaging, the Melnikov method and near identity canonical transformations to obtain global adiabatic invariants. (Author)

DESCRIPTORS: (U) *Mathematical models, *Resonance, Nonlinear differential equations, Coefficients, Electron beams, Magnetic fields, Particle accelerators

IDENTIFIERS: (U) Nonlinear resonance, Free electron lasers, PE61102F, WUAFOSR2304A4

AD-A135 117

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 115 12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INFORMATION AND DECISION SYSTEMS

(U) An Algebraic Approach to Analysis and Control of Time-Scales.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 15P

PERSONAL AUTHORS: Lou,X. C. ;Verghese,G. C. ;Willsky,A. S. ;Vidyasagar,M. ;

REPORT NO. LIDS-P-1335

CONTRACT NO. AFOSR-82-0258

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-0954

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Waterloo Univ. (Ontario). Dept. of Electrical Engineering.

ABSTRACT: (U) The structure of time-scales in systems of the form x = A(epsilon)x is related to the invariant factors of A(epsilon) when this matrix is over the ring of functions analytic at 0. This relationship motivates the study of invariant factor assignment in the matrix A(epsilon) + B(epsilon) K(epsilon) by choice of K(epsilon) . Results on this problem have implications for assignment of timescales by state feedback in systems of the form x = A(epsilon)x + B(epsilon)u. Work in this direction is presented. (Author)

DESCRIPTORS: (U) *Scaling factors, *Time, *Linear systems, *Algebra, Approach, Matrices(Mathematics), Perturbations, Invariance, Feedback, Transformations(Mathematics), Decomposition

IDENTIFIERS: (U) *Time scales, PE61102F, WUAFOSR2304A1

AD-A135 113 7/4 7/2

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) The Anodic Behavior of Iodide at Platinum in the Presence of an Iodine Film under Potentiostatic Steady-State and Hydrodynamic Modulation Conditions,

83 14P

PERSONAL AUTHORS: Swathirajan,S. ;Bruckenstein,S. ;

CONTRACT NO. AFOSR-78-3621

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0895

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytical Chemistry, v143 p167-178 1983.

Reprint: The Anodic Behavior of Iodide at Platinum in the Presence of an Iodine Film under Potentiostatic Steady-State and Hydrodynamic Modulation Conditions.

DESCRIPTORS: (U) *Iodides, *Oxidation, Films, Electrodes, Reaction kinetics, Diffusion, Coefficients, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 112 7/2 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System,

82 5P

PERSONAL AUTHORS: Cheek,G. T. ;Osteryoung,R. A. ;

CONTRACT NO. AFOSR-81-0007

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0913

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v21 n10 p3581-3584 1982.

Reprint: Preparation and Characterization of a Substituted Alkylpyridinium Chloroaluminate Molten Salt System.

DESCRIPTORS: (U) *Fused salts, *Solvents, *Synthesis(Chemistry), *Chemical properties, Electrochemistry, Pyridines, Aluminates, Reprints

IDENTIFIERS: (U) Alkylpyridinium chloraluminate, PE61102F, WUAFOSR2303A1

AD-A135 112

AD-A135 111 11/9 20/11

TEXAS A AND M UNIV COLLEGE STATION DEPT OF MATHEMATICS

(U) Annual Scientific Report for Grant AFOSR-82-0152, 1 April 1982 - 31 March 1983,

APR 83 4P

PERSONAL AUTHORS: Walton,J. R. ;

CONTRACT NO. AFOSR-82-0152

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0949

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes progress on certain theoretical questions arising in the study of dynamic and quasi-static fracture and contact problems for linearly viscoelastic material. Specifically, results for two classes of problems are described: Determining the angular dependence of the stress field in front of a dynamically propagating Mode III semi-infinite crack in an infinite general linearly viscoelastic body; Determining the stresses, displacements and friction coefficient for the quasi-static problem of a rigid indentor sliding with Coulomb friction over the surface of a power-law inhomogeneous linearly viscoelastic half-plane. (Author)

DESCRIPTORS: (U) *Viscoelasticity, *Materials, Friction, Stresses, Fracture(Mechanics), Crack propagation, Dynamics, Linearity, Reports

IDENTIFIERS: (U) WUAFOSR2304A4, PE61102F

AD-A135 111

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVP02F

AD-A135 110 12/1

COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS

(U) Nonlinear Partial Differential Equations and Related Problems of Pade Approximations.

DESCRIPTIVE NOTE: Interim rept. 30 Jun 82-29 Jun 83,

OCT 83 7P

PERSONAL AUTHORS: Bers,L. ;Chudnovsky,D. V. ;Chudnovsky,G. V. ;

CONTRACT NO. AFOSR-81-0190

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-83-0955

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) During this period the two investigators produced seven papers with titles including, Painleve Property and Multicomponent Isospectral Deformation Equations, Algebraic Reductions of Scalar Three-Dimensional Systems, Topological and Algebraic Structure of Linear Problems Associated With Completely Integrable Systems, and Laws of Composition of Backlund Transformations and the Universal Form of Completely Integrable Systems in Dimensions Two and Three. This report summarizes progress in these areas during this period supported by the grant. (Author)

DESCRIPTORS: (U) *Nonlinear differential equations, *Partial differential equations, *Approximation(Mathematics), Algebra, Integrated systems, Sequences, Numerical analysis

IDENTIFIERS: (U) Pade approximations, WUAFOSR2304A4, PE61102F

AD-A135 109 12/1 22/2 9/5

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Spline-Based Estimation Techniques for Parameters in Elliptic Distributed Systems.

DESCRIPTIVE NOTE: Technical rept.,

JUN 83 19P

PERSONAL AUTHORS: Banks,H. T. ;Daniel,P. L. ;Armstrong,E. S. ;

REPORT NO. LCDS-83-22

CONTRACT NO. AFOSR-81-0198

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-0926

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Southern Methodist Univ., Dallas, TX. Dept. of Mathematics.

ABSTRACT: (U) Parameter and state estimation techniques are discussed for an elliptic system arising in a developmental model for the antenna surface in the Maypole Hoop/Column antenna. A computational algorithm based on spline approximations for the state and elastic parameters is given and numerical results obtained using this algorithm are summarized. (Author)

DESCRIPTORS: (U) *Algorithms, *Numerical methods and procedures, *Estimates, *Spacecraft antennas, Parameters, Splines, Computations, Approximation(Mathematics), Ellipses, Partial differential equations

IDENTIFIERS: (U) Maypole Hoop Column antennas, *Space antennas, Space structures, WUAFOSR2304A1, PE61102F

DTIC REPORT BIBLIOGRAPHY *SEARCH CONTROL NO. EVP02F*

AD-A135 108 7/2 7/4

ILLINOIS STATE UNIV NORMAL DEPT OF CHEMISTRY

(U) Molten Salt Electrochemical Systems.

DESCRIPTIVE NOTE: Rept. no. 3 (Final), 1 Jun 80-31 Mar 83,

MAY 83 14P

PERSONAL AUTHORS: Bunting,R. K. ;

CONTRACT NO. AFOSR-80-0173

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-83-0900

UNCLASSIFIED REPORT

ABSTRACT: (U) Thermal properties are reported for a variety of materials that have been investigated for their potential application as components of molten sodium tetrachloroaluminate electrolytes, notably fluoroarsenates, fluoroborates and closochloroborates. Effects of catron structure on the stability and spectroscopic properties of tetrachlorocobaltate are also reported (Author)

DESCRIPTORS: (U) *Fused salts, *Electrochemistry, Electrolytes, Thermal properties, Phase diagrams, Sodium, Aluminates, Arsenates, Borates, Stability, Molecular structure, Spectroscopy

IDENTIFIERS: (U) WUAFOSR2303A1, PE61102F

AD-A135 108

AD-A135 107 11/2 11/4 20/11

FLORIDA UNIV GAINESVILLE DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) Ultrastructure Processing and Environmental Stability of Advanced Structural and Electronic Materials.

DESCRIPTIVE NOTE: Final rept. 1 Mar 80-31 Mar 83,

MAR 83 324P

PERSONAL AUTHORS: Hench,L. L. ;

CONTRACT NO. F49620-80-C-0047

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-83-0921

UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of this Multi-Investigator Research Program (MIRP) is to achieve an understanding of the science of ultrastructure processing. Ultrastructure processing refers to the manipulation and control of surfaces and interfaces to attain a new generation of high performance materials with predictable properties and environmental insensitivity. Problem areas that may benefit from the use of ultrastructure processing include: behavior of particulate solids, adhesion of fillers and reinforcers in composites, corrosion of glasses and glass-ceramics, fatigue of brittle materials, grain boundary attack of ceramics, effects of energetic particle beams, lifetime of non-oxide ceramics, electronic behavior of high band gap semiconductors, multiphase electronic components.

DESCRIPTORS: (U) *Ceramic materials, *Composite materials, *Processing, *Structural analysis, Structures, Fabrication, Mechanical properties, Stability, Performance(Engineering)

IDENTIFIERS: (U) Ultrastructure, WUAFOSR2303A3, PE61102F

AD-A135 107

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

D6 7/4 7/3

UNIV IL JAMES FRANCK INST

Low Energy Collision Induced Vibrational
xation of (1)A sub u Glyoxal.

9P

AUTHORS: Jouvet,C. ;Sulkes,M. ;Rice,S. A. ;

NO. AFOSR-81-0029

O. 2303

B1

AFOSR
TR-83-0899

UNCLASSIFIED REPORT

NTARY NOTE: Pub. in Jnl. of Chemical Physics, v78
p3935-3541, 15 Mar 83.

t: Very Low Energy Collision Induced Vibrational
tion of (1)A sub u Glyoxal.

)RS: (U) *Molecular vibration, *Molecular states,
y transfer, Low energy, Collisions, Vibrational
a, Relaxation, Cross sections, Helium, Atoms,
onic states, Resonance, Molecular orbitals,
ts

ERS: (U) Glyoxal, WUAFOSR2303B1, PE61102F

AD-A135 105 9/2 12/1

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) On Acyclic Database Decompositions.

DESCRIPTIVE NOTE: Technical rept.,

JUL 83 13P

PERSONAL AUTHORS: Beeri,C. ;Vardi,M. ;

REPORT NO. STAN-CS-83-976

CONTPACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-83-0959

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Harvard Univ., Cambridge, MA. Aiken Computation Lab.

ABSTRACT: (U) Given a universal relation scheme, presented as a set of attributes and a set of dependencies, it may be advantageous ot decompose it into a collection of schemes, each with its own sets of attributes and dependencies, which has some desired properties. A basic requirement for such a decomposition to be useful is that the corresponding decomposition map on universal relations be injective. A central problem in database theory is to find the reconstruction map, i.e., the inverse map of an injective decomposition map. We prove here that when the decomposition, viewed as a hypergraph, is acrylic and the given dependencies are full implicational dependencies, then the reconstruction map is the natural join. Based on this, we show that there is a polynomial time algorithm to test for injectiveness of decompositions.

DESCRIPTORS: (U) *Data bases, *Set theory, Mapping, Decomposition, Functions(Mathematics), Joining, Logic, Polynomials, Algorithms, Finite element analysis, Quadratic equations, Permutations, Theorems, Normality, Injection

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 105 CONTINUED

IDENTIFIERS: (U) Acyclic data bases, Relational databases, Hypergraphs, WUAFOSR2304A2, PE61102F

AD-A135 102 20/3 20/12

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) Film Synthesis and New Superconductors.

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 77-15 May 83,

MAY 83 42P

PERSONAL AUTHORS: Geballe,T. H. ;

REPORT NO. GL-3566

CONTRACT NO. F49620-78-C-0009

PROJECT NO. 2506

TASK NO. C1

MONITOR: AFOSR TR-83-0907

UNCLASSIFIED REPORT

ABSTRACT: (U) This research has been concerned with films that are metastable compounds or multilayered composites which are quenched from the vapor phase. They have been stabilized by a number of methods which aid in the quench or by growing upon especially prepared surfaces upon which epitaxial growth can take place. The occurrence of superconductivity in the metastable films has been investigated. Newly developed methods of heat capacity and tunneling techniques have been used to study the superconducting interactions and to provide the increased understanding of the mechanisms of superconductivity necessary to reach higher transition temperatures.

DESCRIPTORS: (U) *Superconductors, *Thin films, *Fabrication, Processing, Vapor phases, Metastable state, Quenching, Epitaxial growth, Transition temperature, Tunneling(Electronics)

IDENTIFIERS: (U) WUAFOSR2506C1, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 097 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

(U) Tightness and Strong Laws of Large Numbers in Banach Spaces.

SEP 82 15P

PERSONAL AUTHORS: Daffer,P. Z. ;Taylor,R. L. ;

CONTRACT NO. F49620-79-C-0140

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR TR-83-0980

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Bulletin of the Institute of Mathematics, Academia Sinica, v10 n3 p251-263 Sep 82.

Reprint: Tightness and Strong Laws of Large Numbers in Banach Spaces.

DESCRIPTORS: (U) *Numbers, *Banach space, Tightness, China, Reprints

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

AD-A135 094 7/3

CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY AND BIOCHEMISTRY

(U) Novel Oxidative Rearrangement of Beta, Gamma-Unsaturated Ketone Hydrazones on Iodination in Base.

82 5P

PERSONAL AUTHORS: Jung,M. E. ;Hatfield,G. L. ;

CONTRACT NO. AFOSR-81-0185

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR TR-83-0171

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Tetrahedron Letters, v23 n39 p3991-3994 1982.

Reprint: Novel Oxidative Rearrangement of Beta, Gamma-Unsaturated Ketone Hydrazones on Iodination in Base.

DESCRIPTORS: (U) *Iodination, *Hydrazones, Oxidation, Molecular structure, Ketones, Cyclic compounds, Vinyl radicals, Iodides, Aromatic compounds, Nucleophilic reactions, Transformations, Reprints

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 101 7/4 7/2

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Electrochemical Studies of Fe(II) and Fe(III) in an Aluminum Chloride-Butylpyridinium Chloride Ionic Liquid,

NOV 82 9P

PERSONAL AUTHORS: Nanjundiah,C. ;Shimizu,K. ;Osteryoung,R. A. ;

CONTRACT NO. AFOSR-81-0007

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR TR-83-0912

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electrochemical Society, v129 n11 p2474-2480 Nov 82.

Reprint: Electrochemical Studies of Fe(II) and Fe(III) in an Aluminum Chloride-Butylpyridinium Chloride Ionic Liquid.

DESCRIPTORS: (U) *Iron, *Electrochemistry, Aluminum compounds, Chlorides, Ions, Electrodes, Measurement, Diffusion, Coefficients, Reprints

IDENTIFIERS: (U) Butylpyridinium chloride, WUAFOSR2303A1, PE61102F

AD-A135 099 12/1

ILLINOIS UNIV AT URBANA COORDINATED SCIENCE LAB

(U) Self Tuning Leader-Follower Games,

83 11P

PERSONAL AUTHORS: Chan,Y. M. ;Cruz,J. B. ;

CONTRACT NO. AFOSR-78-3633

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR TR-83-0903

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Automatica, v19 n3 p237-245 1983.

Reprint: Self Tuning Leader-Follower Games.

DESCRIPTORS: (U) *Game theory, Adaptive control systems, Decision making, Stochastic processes, Steady state, Reprints

IDENTIFIERS: (U) Self-tuning leader, Dual control, WUAFOSR2304A6, PE61102F

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 093 12/1 6/3

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Estimation of Temporally and Spatially Varying Coefficients in Models for Insect Dispersal.

DESCRIPTIVE NOTE: Technical rept.,

JUN 83 30P

PERSONAL AUTHORS: Banks,H. T. ;Lamm,P. K. D. ;Kareiva,P. M. ;

REPORT NO. LCDS-83-14

CONTRACT NO. AFOSR-81-0198, NSF-MCS82-05335

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-0927

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grants NSF-MCS82-00883 and NSF-DEB82-07117.

ABSTRACT: (U) The authors describe techniques for estimating temporally and spatially dependent parameters (including coefficients) that appear in general transport models. Convergence properties of the resulting algorithms are given and sample computational findings with test examples are presented. The authors conclude with a summary of their use of the methods analyzing experiments on the movements of marked flea beetles in cultivated arrays of the cole crop, collards (Brassica oleraceae). (Author)

DESCRIPTORS: (U) *Numerical methods and procedures, *Mathematical models, *Estimates, *Insects, Algorithms, Convergence, Parameters, Coefficients, Computations, Dispersing, Coleoptera, Siphonaptera, Splines

IDENTIFIERS: (U) *Transport models, Transport equations, PE61102F, WUAFOSR2304A1

AD-A135 093

AD-A135 092 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

(U) Estimation Techniques for Transport Equations.

DESCRIPTIVE NOTE: Technical rept.,

JUL 83 14P

PERSONAL AUTHORS: Banks,H. T. ;Daniel,P. L. ;Kareiva,P. ;

REPORT NO. LCDS-83-23

CONTRACT NO. AFOSR-81-0198, NSF-MCS82-05335

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR TR-83-0906

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grants NSF-MCS82-00883 and NSF-DEB82-07117.

ABSTRACT: (U) The authors present convergence arguments for algorithms developed to estimate spatially and/or time dependent coefficients and boundary parameters in general transport (diffusion, advection, sink/source) models in a bounded domain Omega C R sub 2. A brief summary of numerical results obtained using the algorithms is given. (Author)

DESCRIPTORS: (U) *Algorithms, *Numerical methods and procedures, *Estimates, Equations, Convergence, Boundaries, Parameters, Computations

IDENTIFIERS: (U) *Transport equations, PE61102F, WUAFOSR2304A1

AD-A135 092

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 088 21/2 20/4

DAYTON UNIV OH DEPT OF CHEMICAL ENGINEERING

(U) Prediction of an Apparent Flame Length in a Co-Axial Jet Diffusion Flame Combustor.

DESCRIPTIVE NOTE: Final rept. 1 Aug 82-31 May 83,

APR 83 16P

PERSONAL AUTHORS: Sandhu,S. S. ;

REPORT NO. UDR-TR-83-38

CONTRACT NO. AFOSR-82-0295

PROJECT NO. 2308

TASK NO. D9

MONITOR: AFOSR
TR-83-0873

UNCLASSIFIED REPORT

ABSTRACT: (U) This report is comprised of two parts. In Part I a predictive model for an apparent flame length in a co-axial jet diffusion flame combustor is described. According to this model a diffusion flame is considered as thin cylindrical reactive zone composed of chemically active and dead regions. Fuel consumption by surface oxidation is assumed. Mass transport of oxygen to the reactive surface is considered to control the overall combustion process. Overall mass transfer coefficient, evaluated from an empirically developed correlation, is employed to predict total flame length. Comparison of the experimental and predicted data on total flame length shows a reasonable agreement within sixteen percent over the investigated air and fuel flow rate ranges of 1-2kg/s and 5-11kg/hr, respectively. In Part II a scheme to predict an apparent flame length is described for the circumstances when a recirculation region established immediately downstream of a center-body in a co-axial jet combustor is penetrated by a central fuel jet. A turbulent jet flow theory has been coupled with the theory given in Part I of the report.

DESCRIPTORS: (U) *Flames, *Combustion, *Jet flow, Length, Diffusion, Turbulent flow, Kinetics, Mass transfer, Mathematical models, Fuel consumption

AD-A135 088

AD-A135 088 CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2308D9

AD-A135 088

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A135 074 9/2 17/2

STATE UNIV OF NEW YORK AT STONY BROOK DEPT OF COMPUTER SCIENCE

(U) Summary of Research, 15 June 1982 to 14 June 1983, Grant AFOSR-81-0197.

DESCRIPTIVE NOTE: Interim rept.,

JUL 83 7P

PERSONAL AUTHORS: Bernstein,A. J. ;

CONTRACT NO. AFOSR-81-0197

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-83-0930

UNCLASSIFIED REPORT

ABSTRACT: (U) The research performed under this grant centers on the concept of a network computer. By this the authors mean a network of computers (no shared memory) which can be programmed as if it were a single virtual machine using a high level distributed language. Work during this past year can be divided into three areas: Distributed Algorithms; Distributed Languages; and An Implementation of Multicasting on a Network Computer. This report summarizes progress achieved during the past year. (Author)

DESCRIPTORS: (U) *Computers, *Networks, *Computer communications, Systems engineering, Programming languages, Kernel functions, Data management, High level languages, Distributed data processing, Computer architecture, Network analysis(Management), Integrated systems, Algorithms, Research management

IDENTIFIERS: (U) *Computer networks, *Distributed systems, WUAFOSR2304A2, PE61102F

AD-A135 074

AD-A135 072 9/3 1/3

ILLINOIS UNIV AT URBANA DECISION AND CONTROL LAB

(U) Control Strategies for Complex Systems for Use in Aerospace Avionics.

DESCRIPTIVE NOTE: Final scientific rept. 1 Jul 78-30 Jun 83,

AUG 83 29P

PERSONAL AUTHORS: Cruz,J. B. , Jr.;Kokotovic,P. V. ; Perkins,W. R. ;

REPORT NO. DC-63, T-129

CONTRACT NO. AFOSR-78-3633

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR *TR-83-0981*

UNCLASSIFIED REPORT

ABSTRACT: (U) The research program was focused on investigating new methods of analysis, synthesis, and optimization of control systems, particularly those which contain disturbance inputs, uncertain parameters, and other modeling uncertainties. The general objective was to develop new methods to improve the performance of control systems by counteracting the effects of these modeling uncertainties and disturbance inputs. The new methods can be classified into several general categories; multivariate feedback design in the frequency domain based on the comparison sensitivity matrix and robustness concepts, adaptive observers and adaptive control, multiple time-scale and singular perturbations, chained aggregation methods, and incentive controllers for hierarchical systems. (Author)

DESCRIPTORS: (U) *Control systems, *Avionics, *Performance(Engineering), Aerospace systems, Research management, Strategy, Optimization, Feedback, Multivariate analysis, Sensitivity, Stability, Compensators, Perturbations

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A6

AD-A135 072

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A134 822 20/7 14/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF AEROSPACE ENGINEERING

(U) Scaling of the Bursting Frequency in Turbulent Boundary Layers,

83 18P

PERSONAL AUTHORS: Blackwelder,R. F. ;Haritonidis,J. H. ;

CONTRACT NO. DAAG29-79-C-0137, F49620-78-C-0060

MONITOR: ARO,AFOSR
16651.4-EG,TR-83-1345

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluid Mechanics, v132 p87-103 1983.

Reprint: Scaling of the Bursting Frequency in Turbulent Boundary Layers.

DESCRIPTORS: (U) *Turbulent boundary layer, *Scaling factors, Wind tunnel tests, Reynolds number, Resolution, Algorithms, Viscous flow, Frequency, Detectors, Sizes(Dimensions), Walls, Boundary layer, Vortices, Flow fields, Interfaces, Shear properties, Reprints

IDENTIFIERS: (U) Bursting frequency scales, Viscous length scales, Spatial resolution

AD-A134 822

AD-A134 796 20/4

ILLINOIS INST OF TECH CHICAGO DEPT OF MECHANICS MECHANICAL AND AEROSPACE ENGINEERING

(U) Understanding Transition to Turbulence in Shear Layers.

DESCRIPTIVE NOTE: Final rept. 1 Oct 76-31 Dec 82,

MAY 83 140P

PERSONAL AUTHORS: Morkovin,M. V. ;

CONTRACT NO. F49620-77-C-0013

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-83-0931

UNCLASSIFIED REPORT

ABSTRACT: (U) Critical examination of experimental, analytical and numerical research on shear-flow instabilities evolving into turbulence led to a conceptual framework consistent with reliable observations. Mechanically driven shear layers fall into four classes: boundary layers, confined duct flows, free shear layers, and flows in annuli between cylinders driven by the rotation of the inner cylinder. These classes correspond to distinct, initially rather homogeneous vorticity distributions. Each instability restructures these distributions; it dehomogenizes them spatially, while the very slow viscous effects smooth the largest gradients. The restructuring continues even after the shear layers become turbulent.

DESCRIPTORS: (U) *Turbulent flow, *Shear properties, Layers, Reynolds number, Transitions, Unsteady flow, Bifurcation(Mathematics), Boundary layer, Turbulent boundary layer, Vortices, Navier Stokes equations, Laminar boundary layer, Homogeneity

IDENTIFIERS: (U) *Shear layers, *Shear flow instabilities, Shear turbulence, PE61102F, WUAFOSR2307A4

AD-A134 796

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVP02F

AD-A134 778 6/18 6/19

JOHN B PIERCE FOUNDATION LAB NEW HAVEN CONN

(U) Proceedings of Microwaves and Thermoregulation Held at New Haven, Connecticut on 26-27 October 1981.

DESCRIPTIVE NOTE: Final rept.,

81 503P

PERSONAL AUTHORS: Adair,E. R. ;

CONTRACT NO. AFOSR-81-0211

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-83-0829

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: For sales information of individual items see AD-P002 079 - AD-P002 099.

ABSTRACT: (U) This volume is the proceedings of a symposium hosted by the John B. Pierce Foundation and held at Yale University, New Haven, Connecticut, on October 26-27, 1981. The goal of the symposium was to bring together engineers, physical scientists, physiologists, andpsychologists to discuss how nonionizing electromagnetic radiation deposits thermnalizing energy in biological tissues and the means by which this energy may be detected and effectively managed by the conscious organism.

DESCRIPTORS: (U) *Microwaves, *Temperature control, *Symposia, *Radiation effects, History, Stimuli, Heating, Therapy, Electromagnetic radiation, Infrared radiation, Body temperature, Central nervous system, Physiological effects, Irradiation, Radiofrequency, Acclimatization, Rhesus monkeys, Human body, Mice, Rats

IDENTIFIERS: (U) Compilation reports, PE61102F, WUAFOSR2312A5

AD-A134 778