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The Air Force Office of Scientific Research Technical Report Summaries are published quarterly as of March, June, September, and December of each calendar year. They consist of a brief summary of each AFOSR technical report received in the Technical Information Division and submitted to the Defense Technical Information Center (DTIC) for that quarter. The summaries contain two indexes for easily locating the technical reports that may be of interest to the user. These are followed by abstracts of the reports.

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Abstract - A brief summary describing the research of the report.

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Final Technical Report on Grant
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- *BLOOM, FREDERICK * * *
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IEEE (Institute of Electrical and
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IEEE (Institute of Electrical and
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Experimental and Theoretical Study of the Relaxation of Vibrationally Excited HF by NO and CO.
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AD-A213039 REPORT DATE: 21 JUL 89 FINAL REPORT

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AD-A215244 REPORT DATE: 30 JUN 81 FINAL REPORT

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AD-A214923 REPORT DATE: APR 79 FINAL REPORT

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AD-A213898 REPORT DATE: 15 AUG 89 FINAL REPORT

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AD-A214501 REPORT DATE: 15 OCT 89 FINAL REPORT

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AD-A214848 REPORT DATE: FEB 79 FINAL REPORT

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AD-A215082 REPORT DATE: MAY 84 FINAL REPORT

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AD-A215088 REPORT DATE: JUN 84 FINAL REPORT

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AD-A214796 REPORT DATE: 15 FEB 79 FINAL REPORT

Summary of Conference: Atomic Diffusion on Amorphous and Crystalline Surfaces Held in Piscataway, New Jersey on April 8-9, 1982.
AD-A215158 REPORT DATE: 21 SEP 82 FINAL REPORT

Summary of State-of-the-Art Methodology Air Force Structures, Structural Dynamics and Materials Workshop. Addendum.
AD-A215453 REPORT DATE: 03 OCT 80 FINAL REPORT

Superconducting Electronic Film Structures.
AD-A215477 REPORT DATE: 24 JUL 84 ANNUAL REPORT

Superconducting Thin Films, Composites and Junctions.
AD-A215246 REPORT DATE: APR 84 FINAL REPORT

Superconducting Thin Films, Composites and Junctions.
AD-A215334 REPORT DATE: 30 OCT 84 FINAL REPORT

Support of Purchase of a Gas Chromatograph/mass Spectrometer.
AD-A215302 REPORT DATE: 12 OCT 84 FINAL REPORT

Surface Thermometry of Energetic Materials by Laser-Induced Fluorescence.
AD-A214423 REPORT DATE: SEP 89 FINAL REPORT

Symposium on Automation, Robotics and Advanced Computing for the National Space Program (2nd) Held in Arlington, Virginia on 9-11 March 1987.
AD-A215481 REPORT DATE: 28 FEB 88 FINAL REPORT

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- Symposium on Chemical Precursors to Ceramics Held in Miami Beach, Florida on September 12, 1989.
AD-A214499 REPORT DATE: 12 SEP 89 FINAL REPORT
- Synthesis and Characterization of the First Transition Metal N(2)-Disilene Complexes.
AD-A213892 REPORT DATE: 89 ANNUAL REPORT
- Synthesis and Chemistry of Cubanes.
AD-A214661 REPORT DATE: 89 FINAL REPORT
- Synthesis and Chemistry of Homocubanes, Bishomocubanes, and Trishomocubanes.
AD-A214598 REPORT DATE: 89 FINAL REPORT
- Synthesis and Iron Carbonyl Promoted Coupling Reactions of 7-(Aryloxy)norbornadienes.
AD-A214972 REPORT DATE: 89 FINAL REPORT
- Synthesis and Study of Materials for Superconducting Electronics.
AD-A212986 REPORT DATE: 15 SEP 88 FINAL REPORT
- Synthesis of Hexacyclo(5.4.0.0(2.8).0(3.10).0(5.9).0(8.11))undecane-8-carboxylic Acid (Homopentaprismane-8-carboxylic Acid).
AD-A214973 REPORT DATE: 89 FINAL REPORT
- Synthesis, Characterization, and Complexation of an Unusual P2Si2 Bicyclobutane with Butterfly-Structure: 2,2,4,4-Tetramesityl-1,3-diphospha-2,4-disilabicyclo(1.1.0) Butane.
AD-A213897 REPORT DATE: 89 FINAL REPORT
- System Identification and Filtering of Nonlinear Controlled Markov Processes by Canonical Variate Analysis.
AD-A214873 REPORT DATE: 30 OCT 89 FINAL REPORT
- Systems of Nonlinear Hyperbolic Equations Associated with Problems of Classical Electromagnetic Theory.
AD-A214713 REPORT DATE: MAY 84 FINAL REPORT
- Techniques for Analyzing the Dynamic Response of Structural Systems Using Computer-Derived Green's Functions.
AD-A214523 REPORT DATE: 12 SEP 89 FINAL REPORT
- Theoretical and Experimental Studies of Molecular Dynamics.
AD-A215263 REPORT DATE: 24 OCT 84 FINAL REPORT
- Theoretical Studies of the Insertion Reactions of Atomic Carbon and Silicon into Methane and Silane.
AD-A215467 REPORT DATE: 89 FINAL REPORT
- Theoretical Studies of Three-Membered Ring Compounds Y(2)H(4)X (Y = C, Si; X = CH(2), NH, O, SiH(2), PH, S).
AD-A212218 REPORT DATE: 89 FINAL REPORT
- Theory and Applications of Unsteady Flows.
AD-A214825 REPORT DATE: 05 JUL 79 FINAL REPORT
- A Theory of Damage in Brittle and Cementitious Materials. Part 1.
AD-A212940 REPORT DATE: 17 JUL 89 FINAL REPORT

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Theory of Internal Gravity Wave Saturation.
AD-A215309 REPORT DATE: 89 FINAL REPORT

A Thermal Model for Asphaltic Concrete.
AD-A215306 REPORT DATE: 22 FEB 82 FINAL REPORT

Thermal Radiative Ignition of Liquid Fuels by a CO2 Laser.
AD-A215394 REPORT DATE: 30 SEP 82 FINAL REPORT

Three Stages and Two Systems of Visual Processing.
AD-A212670 REPORT DATE: 89 FINAL REPORT

Three-Dimensional Interaction Effects in High Speed Boundary Layer Flows.
AD-A215259 REPORT DATE: JAN 83 FINAL REPORT

Time Dependence in Fracture Mechanics of Adhesive Joints and Composites.
AD-A215484 REPORT DATE: SEP 82 FINAL REPORT

Time Evolution of the Electron Swarm Energy Distribution Function.
AD-A212867 REPORT DATE: 28 JUN 89 FINAL REPORT

To Construct a Linac/Storage Ring FEL Facility.
AD-A214820 REPORT DATE: AUG 89 FINAL REPORT

Topical Meetings on Excimer Laser, Optical Techniques for Remote Probing of the Atmosphere, and Meteorological Optics.
AD-A214746 REPORT DATE: 31 AUG 83 FINAL REPORT

Toward a Formal Model of the Design and Evolution of Software.
AD-A212533 REPORT DATE: 20 DEC 88 FINAL REPORT

Transient Analysis of Structures with Distinct Nonlinearities.
AD-A215031 REPORT DATE: 31 JAN 83 FINAL REPORT

Transients in Turbocompressors.
AD-A215030 REPORT DATE: 31 JUL 81 FINAL REPORT

Transonic Flow Research.
AD-A215096 REPORT DATE: DEC 82 FINAL REPORT

Transparent Silica Gel-PMMA Composites.
AD-A215682 REPORT DATE: AUG 89 FINAL REPORT

Transport Phenomena and Interfacial Kinetics in Multiphase Combustion Systems.
AD-A212932 REPORT DATE: FEB 89 FINAL REPORT

True Asymptotic Plasma-Sheath Matching with an Asymptotically Correct Collisional Presheath.
AD-A212857 REPORT DATE: 30 JUN 89 FINAL REPORT

Turbulent Boundary Layer Structure and Drag Reduction.
AD-A214846 REPORT DATE: 82 FINAL REPORT

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Turbulent Boundary Layer Structure and Drag Reduction.
AD-A215124 REPORT DATE: DEC 81 FINAL REPORT

Turbulent Boundary Layer Structure and Drag Reduction.
AD-A215086 REPORT DATE: MAR 80 FINAL REPORT

The Two-Body Problem of Classical Electrodynamics.
AD-A214744 REPORT DATE: JUN 80 FINAL REPORT

The Two-Body Problem of Classical Electrodynamics.
AD-A214872 REPORT DATE: 29 AUG 79 FINAL REPORT

Unbiased Measures of Neuronal Information Transmission and Channel Capacity.
AD-A213552 REPORT DATE: 18 JUN 89 FINAL REPORT

Uninitiates Introduction to Engineering.
AD-A214786 REPORT DATE: 29 MAY 81 FINAL REPORT

United States Air Force College Science and Engineering Program. Volume 1.
AD-A213704 REPORT DATE: DEC 88 ANNUAL REPORT

Unsteady Airloads on a Sinusoidally Oscillating Supercritical Airfoil.
AD-A214740 REPORT DATE: JUL 79 FINAL REPORT

Variation of Wave Action: Modulations of the Phase Shift for Strongly Nonlinear Dispersive Waves with Weak Dissipation.
AD-A212324 REPORT DATE: 88 FINAL REPORT

Virtual Cathode Theory and Design of a Millimeter Wave Vircator.
AD-A215483 REPORT DATE: JAN 83 ANNUAL REPORT

Vortex Cores and Vortex Breakdown.
AD-A215286 REPORT DATE: 31 AUG 89 FINAL REPORT

Wake Interaction Effects on the Transition Process on Turbine Blades.
AD-A214492 REPORT DATE: SEP 89 FINAL REPORT

The Waveform Bounding Approach to Timing Analysis of Digital MOS IC's.
AD-A215517 REPORT DATE: NOV 83 FINAL REPORT

Workshop on Problems in Chemical Toxicology.
AD-A214698 REPORT DATE: 20 JUN 80 FINAL REPORT

The 157 nm Photodissociation of OCS.
AD-A213701 REPORT DATE: 15 MAY 89 ANNUAL REPORT

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SEARCH CONTROL NO. EVIS6L

AD-B136 101L 11/4 11/9 11/2

AD-B136 022L 12/1 12/5

FOSTER-MILLER INC WALTHAM MA

CAMBRIDGE RESEARCH MA

(U) Microcomposite Processing and Applications.

(U) Investigation of an Order N Algorithm for Multibody Dynamics Simulation.

DESCRIPTIVE NOTE: Final rept. 30 Jan 87-30 Jan 89.

DESCRIPTIVE NOTE: Final rept..

JUL 89 194P

MAY 89 248P

PERSONAL AUTHORS: Kovar, Robert F.; Lusignea, Richard W.; Haghghat, Ross

PERSONAL AUTHORS: Keat, James

REPORT NO. AFB-0022-FM-8689-93

REPORT NO. CR-R-030

PROJECT NO. 3005

CONTRACT NO. F49620-88-0141

TASK NO. A1

PROJECT NO. 2302

MONITOR: AFOSR
TR-89-1223MONITOR: AFOSR
TR-89-10

UNCLASSIFIED REPORT

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Distribution: Further dissemination only as directed by Air Force Office of Scientific Research, Bolling AFB, Bld. 410 Washington, DC 20332-6448. 28 Jul 89. or higher DoD Authority.

DESCRIPTORS: (U) *POLYMERS, *POLYMERIC FILMS, *COMPOSITE MATERIALS, *FABRICATION, ADHESIVES, AIRCRAFT, BORON OXIDES, CHEMICAL AGENTS, COMPRESSION, COMPRESSIVE PROPERTIES, ETHERS, FAILURE, FILMS, GELS, GLASS, HIGH STRENGTH, KETONES, MATRIX MATERIALS, ORDER DISORDER TRANSFORMATIONS, PROCESSING, SILICA GLASS, SILICATES, SODIUM, SPACECRAFT COMPONENTS, STIFFNESS, STRENGTH(MECHANICS), STRUCTURAL COMPONENTS, TOUGHNESS, LAMINATES, AIRFRAMES, THIAZOLES, POLYPHENYLENES, BENZOXAZOLES, POLYETHERS, KETONES, FIBERS, EPOXY RESINS.

IDENTIFIERS: (U) WUAFOSR30005A1, PE85502F, PBZT(Poly-P-Phenylene Benzobisthiazole), Polyphenylene Benzobisthiazoles, PBQ(Polybenzoxazole), Polybenzoxazole, PEEK(Polyether Ether Ketone), Polyether Ether Ketone, Glass Matrix Adhesives, Epoxy Resin Adhesives, Sodium Borosilicate, Lead Borosilicate, Borosilicates, Lead Borates, *Microcomposites, Microfibrils, Sol Gel Processing, Composite Films.

AD-B136 101L

AD-B136 022L

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Distribution Authorized to U.S. Gov't. agencies only: Critical Technology: 11 Aug 89. Other requests shall be referred to Air Force Office of Scientific Research, AFOSR/NA Bld. 410 Bolling AFB, Washington, DC 20332-6448.

ABSTRACT: (U) In the multibody simulation discipline, equations of motion formulations in which the number of calculations per integration step increase only linearly with the number, n , of bodies are called Order n or $O(n)$ formulations. The development of such formulations is an area of current research because of their capability of yielding simulations which run much faster than conventional ones when n is large. This report describes a new Order n algorithm. It is applicable to systems of rigid or nonrigid bodies. It permits the bodies' interconnection joints to have an arbitrary number of degrees of freedom between 0 and 6. The system can have open chain, tree, or between the bodies. Closed topological loops are handled by the concept of cut joints. Constraint forces are calculated only at the cut joints, not at the uncut ones. The derivation of the algorithm uses a velocity transformation to eliminate the appearance of forces due to constraints at the uncut joints. The algorithm entails sequential computational

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AD-A215 682 11/4

passes--backward and forward--through the system of bodies.

CALIFORNIA UNIV LOS ANGELES DEPT OF MATERIALS SCIENCE AND ENGINEERING

DESCRIPTORS: (U) *ALGORITHMS, *N BODY PROBLEM, *CIRCUIT INTERCONNECTIONS, CHAINS, COMPUTATIONS, DYNAMICS, EQUATIONS OF MOTION, FORMULATIONS, DEGREES OF FREEDOM, LOOPS, SIMULATION, TOPOLOGY, TRANSFORMATIONS, VELOCITY.

(U) Transparent Silica Gel-PMMA Composites.

AUG 89 10P

PERSONAL AUTHORS: Pope, E. J.; Asami, M.; Mackenzi, J. D.

IDENTIFIERS: (U) PE81102F, WUAFOSR2302B1.

CONTRACT NO. AFOSR-88-0086

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1172

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Materials Research, v4 n4 p1018-1026 Jul-Aug 89.

ABSTRACT: (U) Transparent silica gel-polymer composites have been prepared by the impregnation of porous gels with organic monomer and polymerization in situ. The relative amount of each phase was adjusted by varying the porosity of the silica gel prior to impregnation. These materials constitute a new class of transparent composites. Properties, such as density, refractive index, modulus of rupture, compressive strength, abrasion rate, and Vickers hardness, have been measured over the compositional range of 100% silica to 100% polymethyl methacrylate (PMMA). Keywords: Reprints. (kr)

DESCRIPTORS: (U) *COMPOSITE MATERIALS, *GELS, *POLYMERS, ABRASION, COMPOSITION(PROPERTY), COMPRESSIVE PROPERTIES, IMPREGNATION, MONOMERS, POLYMERIZATION, POROSITY, POROUS MATERIALS, RATES, REFRACTIVE INDEX, REPRINTS, SILICA GELS, SILICON DIOXIDE, STRENGTH(MECHANICS), TRANSPARENCY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A3.

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AD-A215 679 CONTINUED

PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS
RESEARCH LAB

OXIDES, SEEDING, SEMICONDUCTORS, SILICATES, SILICON,
SILICON CARBIDES, TEMPERATURE.

(U) Crystallization of Nanocomposite Glasses made by the
SSG.

IDENTIFIERS: (U) Nanocomposite glass, Solid state
epitaxy, Cordierite glass, Xerogels, Oxycarbides, Nicalon,
SSG(Solution Sol Gel), PEG1102F, WUAFOSR2303A3.

DESCRIPTIVE NOTE: Final rept. 1 Sep 88-31 Aug 89.

OCT 89 87P

PERSONAL AUTHORS: Roy, Rustum; Komarneni, Sridhar

CONTRACT NO. F49620-88-C-0134

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1348

UNCLASSIFIED REPORT

ABSTRACT: (U) The first goal of the current research is to explore the role of solid state epitaxy in the crystallization of a very much wider range of glass compositions to make glass ceramics. The nanocomposite xerogel route is being used to attempt to make a universal glass-ceramic with controllable crystallization. Isostructural seeding of cordierite glass led to a lowering in crystallization temperature due to epitaxy just as in the nucleated crystallization of ceramics. Experiments with other systems such as LiAlSiO_4 and $\text{LiAlSi}_2\text{O}_6$ are in progress and preliminary results show that solid state epitaxy is lowering the crystallization temperatures. The second area of current research is to extend the validity of solid state epitaxy proven by the growth of alumina films on alpha Al_2O_3 single crystals is being extended to other oxides, metals and semiconductors. Epitaxial crystallization of silicon (oxycarbide glasses such as Nicalon compositions is being investigated in addition to the oxide glasses and gels. Solution Sol Gel. (edc)

DESCRIPTORS: (U) *CRYSTALLIZATION, *EPITAXIAL GROWTH, *GELS, *GLASS, ALUMINUM COMPOUNDS, ALUMINUM OXIDES, CARBIDES, CERAMIC MATERIALS, CHEMICAL COMPOSITION, CONTROL, FILMS, LITHIUM COMPOUNDS, METALS, MINERALS.

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RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF
PSYCHOLOGY

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Attention and Decision in Auditory Information
Processing.

(U) Metastable He2 and Its Autodetachment Spectra: An
Accurate Coupled-Cluster Study.

DESCRIPTIVE NOTE: Final rept. 15 Jun 81-14 Jun 83.

89 8P

MAY 84 4P

PERSONAL AUTHORS: Shaw, Marilyn L.; Mulligan, Robert M.
Adamowicz, Ludwik

CONTRACT NO. AFOSR-81-0215

CONTRACT NO. AFOSR-89-0207

PROJECT NO. 2313

PROJECT NO. 2303

TASK NO. A5

TASK NO. B3

MONITOR: AFOSR

MONITOR: AFOSR
TR-89-1320

TR-89-1803

UNCLASSIFIED REPORT

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DESCRIPTORS: (U) *ATTENTION, *INFORMATION PROCESSING,
AUDITORY SIGNALS, DETECTION, SELECTION, DECISION MAKING,
AUDIO TONES, IDENTIFICATION, AUDITORY PERCEPTION,
MONITORING, PERFORMANCE(HUMAN).

IDENTIFIERS: (U) PE81102F, WUAFOSR2313A5.

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v40 n5
p2253-2259, 1 Sep 89.

ABSTRACT: (U) The determination of the interaction
energy of two helium atoms is a very old problem in
quantum chemistry. Although most attention has been paid
to the Van der Waals region, the repulsive part has also
been investigated. Despite the small size of the He2
system quantum calculations, especially around the Van
der Waals minimum, are very challenging. This is mainly
due to the necessity of using extremely large and
carefully optimized basis sets while employing very
accurate quantum-mechanical methods. Furthermore, the
basis-set superposition error (BSSE) is known to play a
critical role in this case, and for many basis sets will
be larger than the Van der Waals depth itself. (JES)

DESCRIPTORS: (U) *HELIUM, *CHEMICAL BONDS, *SPECTRA,
*QUANTUM CHEMISTRY, ACCURACY, ATOMS, ENERGY, INTERACTIONS,
QUANTUM THEORY.

IDENTIFIERS: (U) WUAFOSR2303B3.

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SEARCH CONTROL NO. EVI56L

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

AD-A215 500 12/1

(U) The Waveform Bounding Approach to Timing Analysis of Digital MOS IC's.

CLARKSON UNIV POTSDAM NY DEPT OF MATHEMATICS AND COMPUTER SCIENCE

DESCRIPTIVE NOTE: Rept. for 31 Oct-3 Nov 83.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-31 Oct 89.

NOV 83 8P

MAY 89 81P

PERSONAL AUTHORS: Wyatt, John L., Jr.; Zukowski, Charles; Glasser, Lance A.; Bassett, Paul; Penfield, Paul, Jr

PERSONAL AUTHORS: Ablowitz, M.

REPORT NO. VLSI-M-83-148

CONTRACT NO. AFOSR-88-0073

CONTRACT NO. F29620-81-C-0054, N00014-80-C-0622

PROJECT NO. 2304

TASK NO. 83

TASK NO. A8

MONITOR: AFOSR

MONITOR: AFOSR
TR-89-1573

TR-89-1839

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by grant NSF-ECS81-18180.

ABSTRACT: (U) The waveform bounding approach to fast timing analysis of MOS VLSI circuits is discussed. The idea is to compute rigorous closed-form expressions giving upper and lower bounds for transient voltage waveforms, rather than exact values. The goal is to enable rapid computation without sacrificing user confidence in the results. (RRH)

DESCRIPTORS: (U) *BOUNDARIES, *COMPUTATIONS, *TRANSIENTS, *VOLTAGE, *WAVEFORMS, CONFIDENCE LEVEL, TIME, USER NEEDS.

IDENTIFIERS: (U) PEB1102F, WUAFOSR230583, LPN-ARPA Order-3972.

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ABSTRACT: (U) We have been pursuing a number of research problems including: 1) Development of solutions to multidimensional nonlinear evolution equations of physical significance. Prototypes are the so-called Kadomtsev-Petviashvili and Davey-Stewartson equations. The nature of the boundary value problems and solutions of the equation in the so-called strong coupling limit have recently been uncovered. 2) Solutions of discrete nonlinear evolutions. In our studies we have found the following surprising situation -- associated with the integrable nonlinear Schrodinger equations are standard numerical schemes which exhibit at intermediate levels of mesh refinement a weak form of temporal chaos. Differences schemes developed by Inverse Scattering Transform (IST) methods do not exhibit this spurious chaos. All schemes agree when the mesh is sufficiently refined. 3) Inverse problems associated with multidimensional problems. A key element in this work is the DBAR method which has been extended from the study of two dimensional inverse problems, geophysics and acoustics. 4) The principal investigator and his associates have been studying a class of cellular automata which admit solitons interaction. These systems are not reversible, which is quite a novel and interesting aspect. (edc)

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AD-A215 500 CONTINUED

DESCRIPTORS: (U) *BOUNDARY VALUE PROBLEMS, *NONLINEAR PROPAGATION ANALYSIS, *WAVE PROPAGATION, ACOUSTICS, AUTOMATA, CELLS, COUPLING(INTERACTION), EQUATIONS, EVOLUTION(GENERAL), GEOPHYSICS, INVERSE SCATTERING, INVERSION, IRREVERSIBLE PROCESSES, LIMITATIONS, MESH, NONLINEAR ALGEBRAIC EQUATIONS, NONLINEAR DIFFERENTIAL EQUATIONS, NUMERICAL ANALYSIS, REFINING, SCHRÖDINGER EQUATION, SOLITONS, SOLUTIONS(GENERAL), TRANSFORMATIONS(MATHEMATICS), TWO DIMENSIONAL.

IDENTIFIERS: (U) Multidimensional analysis, Inverse problems, Strong coupling limit, Kadomtsev-Petviashvili equations, Davey-Stewartson equations, PE61102F, WJAFOSR22304A9.

AD-A215 493 21/4

PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING

(U) Soot Formation in Diffusion Flames of Fuel/Oxygen Mixtures.

89 10P

PERSONAL AUTHORS: Hura, H. S.; Glassman, I.

CONTRACT NO. AFOSR-89-0034

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1430

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in International Symposium on Combustion (22nd) p371-378 1988.

ABSTRACT: (U) Soothing trends have been measured as a function of equivalence ratio of fuel/oxygen mixtures over the range of infinity (pure diffusion flames) to low values (double flames; an inner premixed flame and an outer diffusion flame combination). All interesting observations have been explained on the basis of changes due to oxygen addition in the fuel pyrolysis chemistry, flame structure, and interaction of double flames. This effect of oxygen addition to the fuel on soot formation has been studied in coflow and counterflow diffusion flames of ethene and propane by performing smoke height, laser light extinction, temperature, and velocity measurements. Keywords: Soot formation; Fuels; Oxygen Effect on Soot Formation; Opposed Jet Diffusion flames. (JES)

DESCRIPTORS: (U) *COMBUSTION DEPOSITS, *COMBUSTION PRODUCTS, *FUEL AIR RATIO, *SOOT, ADDITION, CHEMISTRY, DIFFUSION, EXTERNAL, EXTINCTION, FLAMES, FLOW, FUELS, HEIGHT, INTERACTIONS, INTERNAL, JET FLAMES, LASER BEAMS, MEASUREMENT, MIXING, MIXTURES, OXYGEN, PROPANE, PURITY, PYROLYSIS, RATIOS, SMOKE, VELOCITY.

IDENTIFIERS: (U) PE61102F, WJAFOSR22308A2, *Fuel Oxygen

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Ratio.
CONTINUED

AD-A215 487 1/3

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
ELECTRICAL ENGINEERING

(U) Practical Methods for Robust Multivariable Control.

DESCRIPTIVE NOTE: Final rept. 15 Jul 85-14 Jul 88,
SEP 88 20P

PERSONAL AUTHORS: Safonov, Michael G.; Jonckheere, Edmond
A.

CONTRACT NO. AFOSR-85-0256

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-89-1583

UNCLASSIFIED REPORT

ABSTRACT: (U) The design of super maneuverable fighter aircraft, high-precision space-born optical tracking systems and transatmospheric hypervelocity vehicles will pose significant challenges to modern control system design theory. The theme of the research has been 'Making modern control theory work.' The product of the research has been theory, algorithms and software applicable to multivariable feedback control problems in which there are design constraints requiring robust attainment of stability and control performance objectives in the face of both structured and unstructured uncertainty. (jes)

DESCRIPTORS: (U) *CONTROL THEORY, *FLIGHT CONTROL SYSTEMS, *HYPERSONIC FLIGHT, *TRANSONIC FLIGHT, *CONTROL SURFACES, *HYPERSONIC VEHICLES, ALGORITHMS, COMPUTER PROGRAMS, CONTROL, EXPERIMENTAL DESIGN, FEEDBACK, MULTIVARIATE ANALYSIS, SPACECRAFT.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A1,
*Transatmospheric Flight, Hypervelocity Flight.

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AD-A215 486 12/3

NORTHROP NORTRONICS ANAHEIM CALIF SYSTEMS SUPPORT DEPT
(U) Stochastic Adaptive Control and Estimation Enhancement.

DESCRIPTIVE NOTE: Annual rept. 1 Aug 88-31 Jul 89.

SEP 89 52P

PERSONAL AUTHORS: Bar-Shalom, Y.

CONTRACT NO. AFOSR-88-0202

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-89-1572

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) The investigations summarized in this report deal with a) adaptive dual control of systems with unknown parameters; b) estimation and control of hybrid stochastic systems; c) distributed estimation in systems with measurements of uncertain origin; and d) solution of continuous-time hybrid stochastic differential equations. Adaptive control systems; Stochastic control.

DESCRIPTORS: (U) *ADAPTIVE CONTROL SYSTEMS, *STOCHASTIC PROCESSES, DISTRIBUTION, ESTIMATES, HYBRID SYSTEMS, OPTIMIZATION, STOCHASTIC CONTROL.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A1.

SEARCH CONTROL NO. EVI56L

AD-A215 485 15/5

ROCHESTER UNIV NY GRADUATE SCHOOL OF MANAGEMENT

(U) Final report on Grant AFOSR-82-0032.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 82.

FEB 83 3P

PERSONAL AUTHORS: Keilson, Julian

CONTRACT NO. AFOSR-82-0032

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1817

UNCLASSIFIED REPORT

ABSTRACT: (U) The principal investigator pursued research aimed at the development of a logistical system model. The research resulted in a number of publications on topics including parts and service demand distribution generated by primary production; row-continuous Markov chains; system balance for extended logistic systems; and extrapolation of the mean lifetime of a large population from its preliminary survival history. This report summarizes the research and lists titles of publications resulting from the grant. (edc)

DESCRIPTORS: (U) *LOGISTICS, BALANCE, DISTRIBUTION, EXTRAPOLATION, HISTORY, LIFE EXPECTANCY(SERVICE LIFE), MARKOV PROCESSES, MEAN, POPULATION, PRODUCTION, SURVIVAL(GENERAL).

IDENTIFIERS: (U) Demand, PEB1102F, WUAFOSR2304A5.

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CALIFORNIA INST OF TECH PASADENA

MISSION RESEARCH CORP ALBUQUERQUE NM

(U) Time Dependence in Fracture Mechanics of Adhesive Joints and Composites.

(U) Virtual Cathode Theory and Design of a Millimeter Wave Viricator.

DESCRIPTIVE NOTE: Final rept. 1 Mar 81-15 Aug 82.

DESCRIPTIVE NOTE: Annual rept. Jan-Dec 82.

SEP 82 15P

JAN 83 103P

PERSONAL AUTHORS: Knauss, W. G.

PERSONAL AUTHORS: Sullivan, Donald J.; Voss, Donald E.; Bollen, W. M.; Jackson, Robert H.; Coutslas, Evangelos A.

CONTRACT NO. AFOSR-81-0127

CONTRACT NO. F49620-82-C-0014

PROJECT NO. 2307

PROJECT NO. 2301

TASK NO. 82

TASK NO. A8

MONITOR: AFOSR

MONITOR: AFOSR
TR-89-1517

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The research program covered in this report is concerned with understanding the time dependent effects involved in the failure of polymer based adhesive joints and in advanced composites. The emphasis is placed on: a) Examining the effect of time dependent processes that influence failure in bonded structures and in composites; b) Assessing the validity of currently used analytical techniques in predicting failure of adhesive bonds; and c) Examining means of accelerated testing which would allow one to make long-term failure predictions on the basis of the relatively short-term tests, under both monotonic and fatigue-type loading.

DESCRIPTORS: (U) *ADHESIVE BONDING, *BONDED JOINTS, *COMPOSITE MATERIALS, *FAILURE, *POLYMERS, ACCELERATED TESTING, FRACTURE(MECHANICS), LONG RANGE(TIME), PREDICTIONS, SHORT RANGE(TIME), TEST AND EVALUATION, TIME DEPENDENCE, FATIGUE TESTS(MECHANICS), LOADS(FORCES).

IDENTIFIERS: (U) PEB1102F, WUAFOSR230782.

DESCRIPTORS: (U) *ELECTRON BEAMS, *ELECTRON DENSITY, *MICROWAVE OSCILLATORS, *NONLINEAR SYSTEMS, *OSCILLATION.

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*RELAXATION OSCILLATORS, *SPACE CHARGE, *WAVE PROPAGATION, ACCURACY, APPROXIMATION(MATHEMATICS), BEAM STEERING, BEAMS(RADIATION), CYLINDRICAL BODIES, DIRECTIONAL, EFFICIENCY, ELECTRONIC STATES, EXPERIMENTAL DESIGN, GEOMETRY, GREENS FUNCTION, GROWTH(GENERAL), KLYSTRONS, LIMITATIONS, MICROWAVES, MILLIMETER WAVES, RATES, REFLEXES, STABILITY, TIME DEPENDENCE.

AMERICAN INST OF AERONAUTICS AND ASTRONAUTICS WASHINGTON DC

(U) Symposium on Automation, Robotics and Advanced Computing for the National Space Program (2nd) Held in Arlington, Virginia on 8-11 March 1987.

DESCRIPTIVE NOTE: Final rept. 1 Mar 87-23 Feb 88.

IDENTIFIERS: (U) PE81102F, WJAFOSR2301A8.

FEB 88 127P

PERSONAL AUTHORS: Myers, Dale

CONTRACT NO. AFOSR-87-0159

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-89-1606

UNCLASSIFIED REPORT

ABSTRACT: (U) The U.S. Navy has a wide spectrum of applications to which AI can be applied, including manufacturing and logistics, and operational applications in surface ships, submarines, aircraft and space applications. The Navy, through the Office of Naval Research (ONR), has supported artificial intelligence research from its earliest emergence as a discipline, and continues to be an important contributor to university-based artificial intelligence research. Increasingly the Navy is conducting applied research programs within its own laboratories with the goal of transitioning the technology into service. These programs cover a range of application areas, many of which are closely related to civilian problems, but often they exhibit a unique military flavor. Applications such as fault diagnosis, inspection, planning aids and image analysis clearly have close counterparts in the commercial world. Keywords: Spacecraft; Space vehicles; Manufacturing; Cost analysis. (jes)

DESCRIPTORS: (U) *ARTIFICIAL INTELLIGENCE, *NAVAL PLANNING, *COMPUTER AIDED MANUFACTURING, *ROBOTICS, AIRCRAFT, AUTOMATION, COMMERCE, COMPUTER APPLICATIONS, LOGISTICS PLANNING, COST ANALYSIS, DIAGNOSIS(GENERAL).

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FAULTS, FLAVOR, IMAGE PROCESSING, LOGISTICS, OCEAN
SURFACE, PLANNING, RESEARCH MANAGEMENT, SHIPS, SPACE
SCIENCES, SPACE TECHNOLOGY, SPACECRAFT, SUBMARINES,
SYMPOSIA.

SEARCH CONTROL NO. EV156L

AD-A215 479 12/3

CALIFORNIA UNIV BERKELEY DEPT OF INDUSTRIAL ENGINEERING
AND OPERATIONS RESEAR CH

(U) Stochastic Models in Reliability.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A7.

DESCRIPTIVE NOTE: Final rept. 1 Jun 88-31 Jul 89.

NOV 89 11P

PERSONAL AUTHORS: Ross, Sheldon M.

CONTRACT NO. AFOSR-86-0153

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1388

UNCLASSIFIED REPORT

ABSTRACT: (U) A variety of stochastic models in reliability were studied. Approximations in renewal theory and continuous time Markov chains were obtained by analyzing the relevant stochastic process at a gamma distributed rather than a fixed time. Some statistical problems related to software reliability were considered. Keywords: Reliability, Simulation, Continuous time markov chains, Renewal processes, Stochastic models.

DESCRIPTORS: (U) *MATHEMATICAL MODELS, *STOCHASTIC PROCESSES, COMPUTER PROGRAM RELIABILITY, MARKOV PROCESSES, RELIABILITY, SIMULATION, STATISTICS, THEORY, TIME.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A5.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI56L

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GEORGIA INST OF TECH ATLANTA

(U) Annual Meeting of the Society of Engineering Science
(17th) Held in Atlanta, Georgia on 15-17 December 1980.

DESCRIPTIVE NOTE: Final rept..

DEC 81 4P

PERSONAL AUTHORS: Raville, Milton E.

CONTRACT NO. AFOSR-80-0188

PROJECT NO. 2307

TASK NO. B

MONITOR: AFOSR
TR-89-1628

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *ENGINEERING, SYMPOSIA, LOGISTICS
SUPPORT.

IDENTIFIERS: (U) PE81102F, WUAFOSR23078.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI56L

AD-A215 477 20/2

WESTINGHOUSE RESEARCH AND DEVELOPMENT CENTER PITTSBURGH
PA

(U) Superconducting Electronic Film Structures.

DESCRIPTIVE NOTE: Semiannual rept. 1 Jan-30 Jun 84.

JUL 84 17P

PERSONAL AUTHORS: Braginski, A. I.; Gavalier, J. R.

CONTRACT NO. F49620-83-C-0035

PROJECT NO. 2306

TASK NO. C1

MONITOR: AFOSR
TR-89-1623

UNCLASSIFIED REPORT

ABSTRACT: (U) Solid state epitaxial growth of NbN single crystals have now been achieved on (1, -1, 0, 2) sapphire. Results indicate that surface preparation is the most critical factor in obtaining epitaxy. Films of V-Si and Nb-Ge have been reactively magnetron sputtered and the A15 phase has been obtained at temperatures as low as 290 C, approximately 150 C lower than with dc diode reactive sputtering. A LEED study of Nb3Ir single crystal epitaxial substrates lead to in-situ surface processing procedure and showed that surface reconstruction is caused by oxygen impurity. Epitaxial, single crystal Nb films have been prepared on sapphire and MgO substrates. A glancing angle XPS study of A1203 tunnel barriers and extremely thin amorphous Mo-Ge films demonstrated universality of significant thickness variation that affects tunnelling characteristics. (rrh)

DESCRIPTORS: (U) *EPITAXIAL GROWTH, *SAPPHIRE, *SINGLE CRYSTALS, *SUBSTRATES, DIODES, DIRECT CURRENT, ELECTRONIC EQUIPMENT, IMPURITIES, MAGNETRONS, OXYGEN, PREPARATION, PROCESSING, REACTIVITIES, SEMICONDUCTING FILMS, SPUTTERING, STRUCTURAL PROPERTIES, STRUCTURES, SURFACES, THICKNESS, VARIATIONS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2306C1.

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV158L

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AD-A215 476 11/4 20/13

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG
DEPT OF ENGINEERING SCIE NCE AND MECHANICS

(U) The Room-Temperature Shapes of Four-Layer Unsymmetric
Cross-Fly Laminates.

DESCRIPTIVE NOTE: Final rept. 1 Jun 81-31 Mar 82.

APR 82 49P

PERSONAL AUTHORS: Hyer, Michael W.

REPORT NO. VPI-E-82-12

CONTRACT NO. AFOSR-81-0195

PROJECT NO. 2307

TASK NO. D8

MONITOR: AFOSR
TR-89-1588

DESCRIPTORS: (U) *COMPOSITE MATERIALS, *LAMINATES,
APPROXIMATION(MATHEMATICS), BUCKLING, CYLINDRICAL BODIES,
GEOMETRIC FORMS, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS,
POSITION(LOCATION), RESIDUAL STRESS, ROOM TEMPERATURE,
SHAPE, SPATIAL DISTRIBUTION, SYMMETRY, THEORY, THERMAL
STRESSES.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2307D9.

UNCLASSIFIED REPORT

ABSTRACT: (U) A previous approximate theory for predicting the room-temperature shapes of unsymmetric laminates is examined in light of the assumptions regarding the inplane strains. The previous theory, which was a geometrically nonlinear extension of classical lamination theory, was felt to be restrictive and this paper develops a new theory in which these restrictions are relaxed. It is shown that despite the previous concern, there is little difference between the previous theory and this theory. This paper presents numerical results for the inplane residual strains of unsymmetric laminates which have cooled from curing into a cylindrical room-temperature shape. It is shown that the residual strains are compressive and practically independent of spatial location on the laminate. In another facet of the paper, the room-temperature shapes of all four-layer unsymmetric cross-ply laminates are predicted. There are only four unique stacking arrangements for this category of laminates and it is shown that their shapes are a strong function of their stacking arrangement. Keywords: Composite materials. Unsymmetric laminates. Thermal stresses. Thermal buckling. Residual stresses. Cross ply laminates.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV1561

AD-A215 474 6/4 12/4

AD A215 474 CONTINUED

HOUSTON UNIV TX DEPT OF PHYSICS

POSTURE(PHYSIOLOGY), SEATS, SIMULATORS, VENTILATION.

(U) Mathematical Simulation of the Cardiopulmonary System.

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A1.

DESCRIPTIVE NOTE: Final rept.,

Cardiopulmonary System.

DEC 79 102P

PERSONAL AUTHORS: Collins, R. E.; Calvert, Ray E.; Hardy, Humphrey H.

CONTRACT NO. AFOSR-78-2905

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR
TR-89-1571

UNCLASSIFIED REPORT

ABSTRACT: (U) Multi-chamber mathematical simulators of the circulatory and pulmonary systems have been developed. These are capable of examining the effects of whole-body acceleration (WBA) for any body position and a variety of breathing maneuvers. The circulatory model has been used to examine the effects of oscillatory WBA with good correspondence between simulator results and available experimental data. The pulmonary model has been used in an extensive study of effects of sustained WBA on pulmonary mechanics and ventilation and the effectiveness of altering the seat back angle in improving WBA tolerance. It was found that WBA effects on pulmonary function are markedly affected by body angle and the optimal angle is between 60 and 75 to the effective G axis. The pulmonary and circulatory models are currently being merged to produce a model of the complete circulatory-respiratory system. A bio-feedback model for each system will be incorporated to complete the simulator. Keywords: Anatomical models, Mathematical models. (kt)

DESCRIPTORS: (U) *ANATOMICAL MODELS, *HEART, *LUNG, *MATHEMATICAL MODELS, *PULMONARY FUNCTION, *RESPIRATION, *COMPUTERIZED SIMULATION, ACCELERATION, ANGLES, CIRCULATION, EXPERIMENTAL DATA, HUMAN BODY, MANEUVERS, MATHEMATICS, MECHANICS, MODELS, OPTIMIZATION.

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NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

Insertion.

(U) Theoretical Studies of the Insertion Reactions of Atomic Carbon and Silicon into Methane and Silane.

DESCRIPTIVE NOTE: Rept. for 1 Nov 88-31 Oct 89.

89 8P

PERSONAL AUTHORS: Sakai, Shogo; Deisz, John; Gordon, Mark S.

CONTRACT NO. AFOSR-87-0049

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-89-1176

UNCLASSIFIED REPORT

Availability: Document partially illegible.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v83 n5 p1888-1893 1989.

ABSTRACT: (U) The mechanisms for the insertions of atomic (1D and 3P) carbon and silicon into the C-H and Si-H bonds of methane and silane are investigated by ab initio SCF methods, many body perturbation theory, and a localized molecular orbital (LMO) analysis. The LMO analysis shows that the insertion of 1D atoms into CH₄ and SiH₄ may be classified into two types: cationic hydrogen transfer and anionic hydrogen transfer. For the triplet atoms the LMO analysis suggests two different insertion reaction mechanisms: the near abstraction and the pull-push mechanisms. Keywords: Atom atom interactions; Atomic reactions; Molecule molecule interactions. (KT)

DESCRIPTORS: (U) *CARBON, *CHEMICAL REACTIONS, *METHANE, *MOLECULE MOLECULE INTERACTIONS, *SILANES, ANIONS, ATOMS, CATIONS, HYDROGEN, INTERACTIONS, NUCLEAR REACTIONS, PERTURBATION THEORY, SILICON, THEORY, TRANSFER.

IDENTIFIERS (U) PE81102F, WUAFOSR2303B3, Chemical

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SEARCH CONTROL NO. EVI56L

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12/3

CITY COLL NEW YORK DEPT OF MATHEMATICS

(U) On the Reliability of Systems Subject to Maintenance and Repair.

DESCRIPTIVE NOTE: Final rept..

DEC 88 8P

PERSONAL AUTHORS: Brown, Mark

CONTRACT NO. AFOSR-84-0095

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-88-1304

UNCLASSIFIED REPORT

ABSTRACT: (U) Several research results concerning reliability of systems to repair were obtained. These include inequalities for distributions with increasing failure rate identifying coefficients in the spectral representation for first passage times, and obtaining error bounds for exponential approximations of geometric distributions.

DESCRIPTORS: (U) *SYSTEMS MANAGEMENT, *STATISTICAL ANALYSIS, *RELIABILITY, APPROXIMATION(MATHEMATICS), COEFFICIENTS, DISTRIBUTION, EXPONENTIAL FUNCTIONS, FAILURE, GEOMETRY, RATES, INEQUALITIES, REPAIR, SPECTRA.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5.

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COLORADO INST OF STRUCTURAL MECHANICS LITTLETON

(U) Summary of State-of-the-Art Methodology Air Force Structures, Structural Dynamics and Materials Workshop. Addendum.

DESCRIPTIVE NOTE: Final rept..

OCT 80 11P

PERSONAL AUTHORS: Harcrow, H. W.

CONTRACT NO. F49620-80-C-0042

PROJECT NO. 2307

TASK NO. B2

MONITOR: AFOSR
TR-89-1629-ADD

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Addendum to CISM-AFOSR-80-1, dated Sep 80.

ABSTRACT: (U) Topics presented include: Computational aspects of the non isothermal classical plasticity; Cladding -- Structure interaction case study for a highrise office tower; In-situ reformation electron microscopy and its application to fracture mechanics research; ARIMA (Autoregressive Integrated Moving Average) representation of longitudinal, lateral, and vertical turbulence spectra; NASSTRAN analysis of the hydrogen and oxygen power reactant storage assembly tanks; Rocket displacement errors due to thrust misalignment and mass unbalance. (edc)

DESCRIPTORS: (U) *STRUCTURAL ANALYSIS, CLADDING, COMPUTATIONS, DISPLACEMENT, DYNAMICS, ELECTRON MICROSCOPY, ERRORS, FRACTURE(MECHANICS), HYDROGEN, INTERACTIONS, MATERIALS, NUMERICAL ANALYSIS, PLASTIC PROPERTIES, ROCKETS, SPECTRA, STORAGE TANKS, STRUCTURAL PROPERTIES, STRUCTURES, THRUST, TOWERS, TURBULENCE, VERTICAL ORIENTATION, WORKSHOPS.

IDENTIFIERS: (U) Structural dynamics, PE81102F, WUAFOSR2307B2.

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AD-A215 406 12/7

HONEYWELL CORPORATE TECHNOLOGY CENTER BLOOMINGTON MN

OREGON UNIV EUGENE DEPT OF PSYCHOLOGY

(U) Nonlinear Optical Phenomena in Solids.

(U) Equipment for Computational Studies of Vision.

DESCRIPTIVE NOTE: Final rept. 9 Jan-8 Jul 84.

DESCRIPTIVE NOTE: Final rept..

AUG 84 9P

AUG 84 3P

PERSONAL AUTHORS: Kruse, Paul W.; Khan, Muhammad A.

PERSONAL AUTHORS: Beck, Jacob; Stevens, Kent A.

CONTRACT NO. F49620-81-C-0034

CONTRACT NO. AFOSR-83-0220

PROJECT NO. 2308

PROJECT NO. 2313

TASK NO. C2

TASK NO. A5

MONITOR: AFOSR
TR-89-1538MONITOR: AFOSR
TR-89-1554

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Experimental investigations have been carried out on forward mode optical phase conjugation in $Hg(1-x)Cd_xTe$ using CO_2 Q-switched and TEA lasers. The temperature dependence of the degenerate four-wave mixing signal at $10.8 \mu m$ has been studied for four n-type samples ($x=0, 211, 0.218, 0.228, 0.233$) and one p-type ($x=0, 238$) between 80K and 300K. Formation and erasure of a dynamic electron grating in an n-type $x=0, 218$ sample has been studied. Keywords: Mercury cadmium tellurides; Laser materials; Q switching; Laser pumping; TEA lasers; Carbon dioxide lasers.

DESCRIPTORS: (U) *MERCURY CADMIUM TELLURIDES. *SEMICONDUCTORS. CARBON DIOXIDE LASERS. DYNAMICS. ELECTRONS. GRATINGS(SPECTRA). LASER MATERIALS. LASER PUMPING. N TYPE SEMICONDUCTORS. NONLINEAR SYSTEMS. OPTICAL PHENOMENA. P TYPE SEMICONDUCTORS. Q SWITCHING. SAMPLING. TEA LASERS. THERMAL PROPERTIES.

IDENTIFIERS: (U) PEB1102F. WUAFOSR2308C2. *Optical Phase Conjugation. Four Wave Mixing.

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AD-A215 406

ABSTRACT: (U) The equipment provided funds for the purchase of a Symbolics 3800 Lisp Machine and associated imaging equipment. The imaging equipment consisted of a serpentine memory and frame buffer from Robotic Systems, Incorporated. The funds awarded for a color monitor, \$1,450, was originally to be supplemented by funds from AFOSR contract F49620-83-C-0093. Since the monitor could not be purchased by combining the two sources of funds, we purchased a Tektronix 990SR color monitor from the AFOSR contract and a NEC printer from this grant. The equipment has been used to investigate the visual mechanisms underlying the detection of discontinuities and structure in visual texture. Psychophysical experiments have investigated the salience of bar orientation and the effects of grouping in texture segmentation. We are examining the role of elongated receptive field mechanisms in computing local measures of texture and their possible role in texture segmentation. A more detailed exposition of our research can be found in the annual report for the AFOSR contract (RRH)

DESCRIPTORS: (U) *BUFFERS. *COLORS. *COMPUTATIONS. *DETECTION. *DISCONTINUITIES. *FRAMES. *MEMORY DEVICES. *MONITORS. *OPTICAL IMAGES. *ROBOTICS. *SEGMENTED. *TEXTURE. *VISUAL AIDS. FLUIDS. IMAGES. MONEY. PRINTING EQUIPMENT. PSYCHOPHYSICS. TEST METHODS. VISION.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI56L

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AD-A215 404 20/4

IDENTIFIERS: (U) PE81102F, WUAFOSR2313A5.

MICHIGAN STATE UNIV EAST LANSING DEPT OF MECHANICAL
ENGINEERING

(U) Experimental Study of the Turbulence Production
Mechanism in Boundary Layer Flows.

DESCRIPTIVE NOTE: Final rept.,

MAY 82 9P

PERSONAL AUTHORS: Falco, R. E.

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1553

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress has been made in experimental techniques, in data acquisition and film quality, in data reduction, in our data base of simultaneous visual and point measurements, and in our knowledge of the physics of turbulence production. We have learned how to make our laser sheets thinner than previously attained by using both mirrors and lenses. We have learned how to obtain 'almost' continuous data records up to 96 k bytes. We have changed to use of the new non-silvered base Kodak films and now can achieve a better uniformity of image in both the flood and laser sheets. The turbulent boundary layer data was run through the turbulent detection schemes of Zaric. We found that there was a close correspondence between his detection technique and the passage of pockets. The most important results of our investigations to date have been: 1) Vortices of the scale of 100 l(+) exist above pockets during their formation stage (pockets are the footprints of the turbulence production process). 2) These vortices come in pairs, having both downstream and upstream facing orientations. (edc)

DESCRIPTORS: (U) *BOUNDARY LAYER FLOW, *TURBULENCE, *VORTICES, DATA ACQUISITION, DATA BASES, DATA REDUCTION, DETECTION, EXPERIMENTAL DESIGN, LASERS, LENSES, METHODOLOGY, MIRRORS, OPTICAL IMAGES, PHOTOGRAPHIC FILM, PHYSICS, PRODUCTION, QUALITY, RECORDS, SHEETS.

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SYNCHRONISM, TURBULENT BOUNDARY LAYER.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2307A2.

AD-A215 395 7/2 11/4

CARNEGIE MELLON UNIV PITTSBURGH PA DEPT OF METALLURGICAL
ENGINEERING AND MATERIALS SCIENCE

(U) Structural and Kinetic Properties of Graphite
Intercalation Compounds.

DESCRIPTIVE NOTE: Annual technical rept. 1 Mar 81-31 May
82.

AUG 82 14P

PERSONAL AUTHORS: Chung, Deborah D.

CONTRACT NO. AFOSR-78-3538

PROJECT NO. 2308

TASK NO. D2

MONITOR: AFOSR
TR-89-1830

UNCLASSIFIED REPORT

ABSTRACT: (U) The research objective is to gain a basic understanding of (i) the process of intercalation of graphite, (ii) the process of exfoliation of intercalated graphite. Emphasis is given to the kinetic and the structural effects. The first TTT-diagram is reported for the intercalation of graphite. The TTT-curves were C-shaped. Within the temperature range where a given stage was stable, the reaction rate increased with increasing temperature at low temperatures (suggesting a diffusion-controlled mechanism) and decreased with increasing temperature at high temperatures (suggesting an interface controlled mechanism). Also reported is a TCI-diagram describing the dependence of the intercalation kinetics on the external intercalate concentration (i.e., Br₂ concentration in the Br₂-CCl₄ solution containing the sample). In-plane intercalate ordering was observed for the first time in intercalated graphite fibers. This observation was made in stage 1 and stage 2 graphite-IC1 based on Thorne P-100 graphite fibers and prepared by the two-bulb method, in which liquid IC1 was at 95 C while graphite was at 100 C for stage 1 and 130 C for stage 2. Theses. (jhd)

DESCRIPTORS: (U) *GRAPHITE, *LAYERS, *STRUCTURAL

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L

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PROPERTIES, CARBON FIBERS, EXFOLIATION, HIGH TEMPERATURE, KINETICS, RANGE(EXTREMES), RATES, THERMAL PROPERTIES, REACTION TIME, THESE.

NATIONAL BUREAU OF STANDARDS WASHINGTON DC CENTER FOR FIRE RESEARCH

(U) Thermal Radiative Ignition of Liquid Fuels by a CO2 Laser.

IDENTIFIERS: (U) *Intercalation, P-100 Graphite Fibers, PEB1102F, WUAFOSR2308D2.

DESCRIPTIVE NOTE: Final progress rept. 1 Oct 79-30 Sep 82.

SEP 82 82P

PERSONAL AUTHORS: Kashiwagi, Takashi; Ohlemiller, Thomas
U. Kashiwagi, Takao; Jones, Walter

CONT ACT NO. AFOSR-ISSA-82-00014

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1616

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes progress in the study of the ignition mechanism of a liquid fuel by a continuous wave carbon dioxide laser; the period covered is from October 1, 1979 to September 30, 1982. It describes 1) new observations of liquid fuel behavior near and at the liquid/air interface during the laser irradiation with incident fluxes from 260 to 2500 W/sq. cm., 2) new time-resolved measurements of temperature and vapor concentration distributions in the gas phase using a newly-developed, high speed, two-wavelength holographic interferometer, and 3) the development of a technique to measure infrared absorption spectra of fuel vapors at elevated temperatures. High speed photographs reveal the complex behavior of n-decane and i-decane surfaces immediately after the onset of incident CO2 laser irradiation. In time sequence one sees the formation of a radial wave, a central surface depression, bubble nucleation/growth/bursting, followed by complex surface motion and further bubbling; typically several (or many) bubble cycles proceed the whole sequence of events leading to a dominance of bubbling phenomena and decreasing the ignition delay. An increase in oxygen concentration in the surrounding gas phase decreases the distance between the liquid surface and the location of

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SEARCH CONTROL NO. EVI56L

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CONTINUED

the first appearance of visible emission. Prior to ignition there are two global chemical reaction stages in the gas phase. (AM)

DESCRIPTORS: (U) *FUELS, *IGNITION, *CARBON DIOXIDE LASERS, ADSORPTION, AIR, BUBBLES, CONCENTRATION(CHEMISTRY) . CYCLES, EMISSION, FREQUENCY, GROWTH(GENERAL), HIGH SPEED PHOTOGRAPHY, HIGH TEMPERATURE, HOLOGRAPHY, IGNITION LAG, INFRARED SPECTRA, INTERFACES, INTERFEROMETERS, IRRADIATION, LASER BEAMS, LIQUIDS, MEASUREMENT, MOTION, NUCLEATION, OXYGEN, RADIATION, SEQUENCES, SURFACES, THERMAL PROPERTIES, TIME, VAPOR PHASES, VAPORS, VISIBILITY, WAVES, CONTINUOUS WAVE LASERS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2.

AD-A215 392

20/4

NATIONAL MARITIME INST FELTHAM (ENGLAND)

(U) The Evolution and Breakdown of a Wave Packet Propagating in a Laminar Boundary Layer.

DESCRIPTIVE NOTE: Final progress rept. 1 Apr 82-31 Mar 83,

MAR 83

8P

PERSONAL AUTHORS: Gaster, Michael

CONTRACT NO. AFOSR-82-0272

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-88-1598

UNCLASSIFIED REPORT

ABSTRACT: (U) The programme of work contained in the proposal covered a number of associated topics concerned with the evolution of instability waves and associated topics concerned with the evolution of instability waves in laminar flows, their subsequent amplification and their eventual breakdown into turbulence. Initial emphasis was placed on the non-linear growth of wave packets, following the observation that marked non-linear behaviour occurred at surprisingly low signal levels. The Reynolds stresses controlling these events arise mainly from the modulation envelope of the wavetrain, and are consequently important in the types of deeply modulated wavetrain that are generated naturally by free-stream turbulence. It is intended to document this behaviour so that quantitative assessment can be made. Experiments with the addition of controlled excitation noise are in progress. The main effort on the theoretical front has been put on the question of the 'receptivity' of the laminar boundary layer to free-stream disturbances. Great Britain. (edc)

DESCRIPTORS: (U) *LAMINAR BOUNDARY LAYER, *TURBULENCE, AMPLIFICATION, BOUNDARY LAYER FLOW, CONTROL, ENVELOPE(SPACE), EVOLUTION(GENERAL), EXCITATION, FREE STREAM, GREAT BRITAIN, GROWTH(GENERAL), LAMINAR FLOW, LOW LEVEL, MODULATION, MOMENTUM TRANSFER, NOISE, NONLINEAR

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVIS6L

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SYSTEMS. SIGNALS. STABILITY. STRESSES. THEORY. WAVE
PACKETS. WAVE PROPAGATION.

IDENTIFIERS: (U) Wave trains, Instability waves,
PEB1102F, WUAFOSR2307A2.

AD A215 355 12/1

KENT STATE UNIV OH INST FOR COMPUTATIONAL MATHEMATICS

(U) Informal Scientific Report for Air Force Contract
AFOSR-80-0228.

DESCRIPTIVE NOTE: Final rept. 1 Jul 81-30 Jun 82,

SEP 82 3P

PERSONAL AUTHORS: Varga, Richard S.

CONTRACT NO. AFOSR-80-0228

PROJECT NO. 304

TASK NO. A3

MONITOR: AFOSR
TR-89-1478

UNCLASSIFIED REPORT

ABSTRACT: (U) Partial Contents: On lacunary incomplete
polynomials; Theorems of Stein-Rosenberg type. II. An
Optimal paths of relaxation in the complex plane; An
extension to rational functions of a Theorem of J. L.
Walsh on differences of interpolating polynomials;
Theorems of Stein-Rosenberg type. III. The singular case;
On the LU factorization of M-matrices. (kr)

DESCRIPTORS: (U) *AIR FORCE RESEARCH, *REPORTS,
INTERPOLATION, MATRICES(MATHEMATICS), OPTIMIZATION, PATHS,
POLYNOMIALS, RATIONAL FUNCTIONS, RELAXATION.

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L

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AD-A215 347 5/2 9/1

WRIGHT STATE UNIV DAYTON OHIO DEPT OF ENGINEERING

ROCKWELL INTERNATIONAL THOUSAND OAKS CA
MICROELECTRONICS RESEARCH AND DEVELOPMENT CENTER(U) The Structure of Flows with Unsteady Boundary
Conditions.

(U) AIN Insulator for III-V MIS Applications.

DESCRIPTIVE NOTE: Final rept. 1 Nov 80-31 Oct 81.

DESCRIPTIVE NOTE: Final rept. May 82-May 83.

FEB 82 142P

MAR 83 39P

PERSONAL AUTHORS: Viets, Hermann; Bethke, Richard J.;
Ball, Mont; Bouguine, David

PERSONAL AUTHORS: Grant, W.; Elliott, K. R.

CONTRACT NO. AFOSR-81-0025

CONTRACT NO. F49620-82-C-0034

PROJECT NO. 2307

PROJECT NO. 2306

TASK NO. A2

TASK NO. B1

MONITOR: AFOSR
TR-89-1519MONITOR: AFOSR
TR-89-1533

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: Three dimensional vortex dynamics near a wall; Acoustic structure produced by an unsteady jet in a rectangular duct; Identification of convected flow structures by decomposition techniques. Three dimensional flow; Jet flow; Unsteady flow; Massflow; Momentum transfer; Vortices. (EDC)

ABSTRACT: (U) The development of a generally useful Management Information System technology for III-V semi-conductors could be important for a number of digital and analog circuit applications. To be generally useful, the insulator in the MIS structure should have a high resistivity and a low density of traps; in addition, the insulator/III-V interface must have a low interface state density. A large majority of III-V MIS studies have utilized native oxides as insulating layers in an attempt to mimic the very successful MIS characteristics of the Si/SiO₂ interface. However, the chemical nature of native oxides which form on III-V semiconductors is more complex than SiO₂, and it is frequently observed that these oxides are poor insulators, have substantial trap concentrations, and the oxide/III-V interface state densities are unacceptably large. (JES)

DESCRIPTORS: (U) ACOUSTIC PROPERTIES, BOUNDARIES, CONVECTION, DECOMPOSITION, DUCTS, DYNAMICS, MASS FLOW, JET FLOW, MOMENTUM TRANSFER, RECTANGULAR BODIES, STRUCTURAL PROPERTIES, THREE DIMENSIONAL, THREE DIMENSIONAL FLOW, UNSTEADY FLOW, VORTICES, WALLS.

IDENTIFIERS: (U) Flow structures, WUAFOSR2307A2, PE61102F.

DESCRIPTORS: (U) ANALOG SYSTEMS, CIRCUITS, MANAGEMENT INFORMATION SYSTEMS, SEMICONDUCTORS, GROUP III COMPOUNDS, GROUP V COMPOUNDS, INSULATION, INTERFACES, LAYERS, LOW DENSITY, OXIDES, RESISTANCE, TRAPS.

IDENTIFIERS: (U) WUAFOSR2306B1, PE61102F.

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OKLAHOMA UNIV NORMAN DEPT OF COMMUNICATION

officers. PE61102F. WUAFOSR2313A3.

(U) Air Force Utilization of Social Actions Personnel

DESCRIPTIVE NOTE: Final rept..

JUL 81 151P

PERSONAL AUTHORS: Hill, L. B.; Cummings, H. W.

CONTRACT NO. F49820-79-C-0111

PROJECT NO. 2313

TASK NO. A3

MONITOR: AFOSR
TR-88-1513

UNCLASSIFIED REPORT

ABSTRACT: (U) This study proposed to determine the current perceptions of the role of the U.S. Air Force Social Actions office and personnel by persons within Social Actions and their commanding officers. The method employed was a mailed census survey of three populations: Commanding Officers directly responsible for Social Actions offices; Social Actions Non-Commissioned Officers. The return rates were excellent: 85% of the Social Actions NCOs responded. The resulting data supported several conclusions regarding current activities and directions for growth in six areas: equal opportunity and treatment, human relations education, drug and alcohol abuse, qualifications and personnel development, general Social Actions, command support, and job satisfaction. Overall, the study strongly indicated that Social Actions is highly credible and important element in the Air Force mission. (EDC)

DESCRIPTORS: (U) *SOCIAL WELFARE, *HUMAN RELATIONS, AIR FORCE, AIR FORCE OPERATIONS, ALCOHOLISM, DRUG ABUSE, EDUCATION, JOB SATISFACTION, MILITARY COMMANDERS, MISSIONS, PERCEPTION(PSYCHOLOGY), MILITARY PERSONNEL, PERSONNEL DEVELOPMENT, PERSONNEL MANAGEMENT, QUALIFICATIONS, QUESTIONNAIRES, POPULATION, SURVEYS, UTILIZATION.

IDENTIFIERS: (U) Equal opportunity, Social actions

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SEARCH CONTROL NO. EVI58L

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AD-A215 334 20/13

WASHINGTON UNIV SEATTLE DEPT OF CHEMISTRY

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) A Combined XPS-Modulated Molecular Beam Investigation of Reactions of Oxygen & Fluorine with Silicon Acet.

(U) Superconducting Thin Films, Composites and Junctions.

DESCRIPTIVE NOTE: Final rept. 1 Aug 83-30 Jul 84.

DESCRIPTIVE NOTE: Final rept. 1 Oct 83-30 Sep 84.

JUL 84 4P

OCT 84 18P

PERSONAL AUTHORS: Engel, Thomas

PERSONAL AUTHORS: Geballe, T. H.

CONTRACT NO. AFOSR-83-0327

REPORT NO. GL-3783

PROJECT NO. 2917

CONTRACT NO. F49620-83-C-0014

TASK NO. A2

MONITOR: AFOSR
TR-89-1543

MONITOR: AFOSR
TR-89-1544

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The equipment purchased with this instrumentation grant has been used to equip an ultrahigh vacuum molecular beam - surface scattering apparatus with surface spectroscopy components as well as a number of electronic and vacuum components needed to carry out the experiments. These experiments which were described in the initial proposal are currently being funded under AFOSR grant 84-NC-028. (AW)

DESCRIPTORS: (U) *SILICON, *X RAY PHOTOELECTRON SPECTROSCOPY, *SURFACE REACTIONS, *OXYGEN, *FLUORINE, MOLECULAR BEAMS, SCATTERING, SURFACES, ULTRAHIGH VACUUM, VACUUM, EXPERIMENTAL DATA.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2917A2.

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ABSTRACT: (U) The Nb-Al system has been used as a model system to study the phase transformation in metastable alloys by using the superconductivity of the A15 phase to determine the composition with the highest T_c and the lattice constant to determine the average composition. By depositing Nb-Al in a phase spread orientation onto substrates at C, the bcc structure has been extended to about 40 at % (well above the equilibrium 9%). Subsequent annealing experiments transformed the bcc phase to A15. It was found that stoichiometric Nb₃Al could be formed in the A15 phase well above the concentration of the Al at equilibrium which is 22%, when the slopes of the free energy curves of the respective phases are equal. Thus the particular shape of the (free) energy curves is important and can determine the composition of the precipitated phase. Nb-Sn-Ga alloys were prepared and studied as model systems to investigate the influence of third element additions on the normal and superconducting properties of alloyed Nb-3Sn phases. In spite of a decrease in the density of states at the Fermi level with increasing Ga content and upper critical field, B_{c2} was found to increase. B_{c2} maximized at 1 to 1.5 at % Ga for reaction temperatures at 700 C. High critical fields up to 31.5 T (at T=4.2K) have been achieved. (rrh)

DESCRIPTORS: (U) *METASTABLE ALLOYS, *PHASE TRANSFORMATIONS, *SUPERCONDUCTIVITY, *SUPERCONDUCTORS, *THIN FILMS, ADDITION, ANNEALING, CONSTANTS, CRYSTAL LATTICES, EXPERIMENTAL DATA, FERMI SURFACES, MODELS.

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RESPONSE, SUBSTRATES, TEMPERATURE.

STANFORD UNIV CA DEPT OF APPLIED MECHANICS

(U) Path-Independent Integrals and Fracture Mechanics.

DESCRIPTIVE NOTE: Final rept. 1 May 81-30 Apr 82.

APR 83 8P

PERSONAL AUTHORS: Golebiewska-Herrmann, A.; Herrmann, G

CONTRACT NO. AFOSR-80-0149

PROJECT NO. 2307

TASK NO. B2

MONITOR: AFOSR
TR-89-1811

UNCLASSIFIED REPORT

ABSTRACT: (U) The rational and economic design of aerospace structural systems and components presupposes the ability to perform a fracture mechanics analysis in an efficient and reliable manner. Such an analysis, to assure structural integrity, has to take account of complex loadings (both static and dynamic) as well as thermal and other environmental conditions to which many such systems are subjected. Using a variational principle with varying boundaries, it was shown that both physical and material conservation laws can be obtained from the same expression. The basic quantities used in these conservation laws are the physical momentum (stress) and material momentum. Two different representations were employed to study the equal importance of both of them in elastic materials and structures. In addition, by a suitable choice of the Lagrangian, the balance laws of moment of material momentum was derived directly by considering rotations in material space. This permitted then also to derive the balance law connected with similarity and establish the relation between these balance laws and path-independent integrals of fracture mechanics. Further, a suitable form of the Lagrangian was found which permits to establish conservation laws for thermoelasticity. Keywords: Crack propagation. (AW)

DESCRIPTORS: (U) *AEROSPACE CRAFT, *FRACTURE (MECHANICS), *STRUCTURAL ANALYSIS, AEROSPACE SYSTEMS, BALANCE.

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SEARCH CONTROL NO. EVI58L

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CONSERVATION, CRACK PROPAGATION, ECONOMICS, ELASTIC PROPERTIES, INTEGRALS, LAGRANGIAN FUNCTIONS, MATERIALS, MOMENTUM, PATHS, PHYSICAL PROPERTIES, QUANTITY, RELIABILITY, STRUCTURAL PROPERTIES, THERMAL PROPERTIES, THERMOELASTICITY, VARIATIONAL PRINCIPLES, STATIC LOADS, DYNAMIC LOADS.

IDENTIFIERS: (U) PE81102F, WJAFOSR230782, Conservation Laws, Balance Laws, Path Independent Integrals.

AD-A215 332 20/4 20/11

STANFORD UNIV CA DIV OF APPLIED MECHANICS

(U) Path-Independent Integrals and Fracture Mechanics.

DESCRIPTIVE NOTE: Final rept. 1 May 82-30 Apr 83.

JUN 83 11P

PERSONAL AUTHORS: Goleblewska-Herrmann, A.; Herrmann, G.

CONTRACT NO. AFOSR-80-0149

MONITOR: AFOSR
TR-89-1612

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes research activities carried out under the subject grant during the period May 1982 to April 1983. Specifically, a strength-of-material-type fracture mechanics for beams has been developed which leads, for example, to an exceedingly simple formula for the stress intensity factor of a cracked beam. Further, several aspects of conservation laws in elasticity have been clarified and extended to fluid dynamics, elucidating the classical Blasius Theorem. Moreover, conservation laws for dielectrics have been derived which will be used later to determine energy release rates. Finally, procedures to calculate upper and lower bounds of energy-release rates in elastic structural elements have been developed and will be used in the future to calculate stress intensity factors. (jes)

DESCRIPTORS: (U) *ELASTIC PROPERTIES, *ENERGY TRANSFER, *FRACTURE (MECHANICS), *CONSERVATION, CRACKS, DIELECTRICS, FLUID DYNAMICS, FORMULATIONS, INTEGRALS, INTENSITY, PATHS, RATES, STRESS CONCENTRATION, STRESSES, STRUCTURAL COMPONENTS, THEOREMS.

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ATLANTIC RESEARCH CORP ALEXANDRIA VA

(U) Fuel-Rich Solid Propellant Boron Combustion.

DESCRIPTIVE NOTE: Final rept. 1 Apr 82-31 Mar 83.

MAY 83

14P

PERSONAL AUTHORS: King, M. K.; Komar, J.; Fry, R. S.

REPORT NO. ARC-41-5032-2

CONTRACT NO. F49620-81-C-0035

MONITOR: AFOSR
TR-89-1813

UNCLASSIFIED REPORT

ABSTRACT: (U) A unified single boron particle ignition/combustion/ extinguishment model capable of treating the effects of various oxidizers. Finite-rate kinetics, and time-dependent environmental conditions has been developed and successfully checked against historical data bases. In addition, parts of this model have been combined with enthalpy and species conservation equations for analysis of boron combustion efficiency in an idealized slurry ramjet combustor (perfectly stirred reactor followed by a series of incremental plug-flow reactors with arbitrary air addition as a function of operational and design parameters. Considerable subgrade particle ignition/combustion data have been obtained over a wide range of particle sizes (5-70 Microns) in wet atmospheres with this experimental effort currently being extended to dry atmospheres. An experiment to determine the kinetics of the boron oxide-water reaction (crucial to ignition) is in progress. A laboratory apparatus for studying combustion of highly-boron-loaded solid fuel ramjet grains in hot air crossflow on a fundamental basis has been completed. Design of a well-stirred reactor for study of boron cloud and slurry combustion is complete and equipment fabrication is underway. (kt)

DESCRIPTORS: (U) *BORON, *COMBUSTION, *RAMJET ENGINES, *SUPERSONIC COMBUSTION RAMJET ENGINES, ADDITION, AIR, ATMOSPHERES, BORANES, OXIDES, CHEMICAL REACTIONS, CLOUDS, COMBUSTORS, CONSERVATION, CROSS FLOW, EFFICIENCY, ENTHALPY, EQUATIONS, FABRICATION, HIGH TEMPERATURE.

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IGNITION, LABORATORY EQUIPMENT, OPERATION, OXIDIZERS, PARAMETERS, PARTICLE SIZE, PARTICLES, RAMJET ENGINES, RANGE(EXTREMES), SLURRIES, TIME DEPENDENCE, WATER.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

AD-A215 330 12/4

PITTSBURGH UNIV PA DEPT OF MATHEMATICS AND STATISTICS
(U) Minimal Repair and Degradable Systems.

DESCRIPTIVE NOTE: Final rept. 15 May 84-14 May 88.
MAY 88 30P

PERSONAL AUTHORS: Block, Henry W.

CONTRACT NO. AFOSR-84-0113

PROJECT NO. 2304

TASK NO. AS

MONITOR: AFOSR
TR-89-1308

UNCLASSIFIED REPORT

ABSTRACT: (U) In this section we summarize our research accomplishment under this grant. Our research areas: reliability, dependence concepts, applications of dependence concepts, time series, and other research. Keywords: Mathematical modeling; Modeling; Theory. (kt)
DESCRIPTORS: (U) *MATHEMATICAL MODELS, *MODEL THEORY, DEGRADATION, RELIABILITY, REPAIR, TIME SERIES ANALYSIS.
IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5.

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SEARCH CONTROL NO. EV158L

AD-A215 329 12/3

FORD AEROSPACE AND COMMUNICATIONS CORP PALO ALTO CA
WESTERN DEVELOPMENT LABS D IV

(U) Probabilistic Methods.

DESCRIPTIVE NOTE: Final rept. 1 Jan 88-30 Apr 88.
APR 88 12P

PERSONAL AUTHORS: Lemoine, Austin J.

CONTRACT NO. F49820-88-C-0022

PROJECT NO. 2304

TASK NO. AS

MONITOR: AFOSR
TR-89-1313

UNCLASSIFIED REPORT

ABSTRACT: (U) Research concentrated on developing probabilistic and statistical methods to solve problems in stochastic networks and system reliability. Technical reports written include: On sojourn time in Jackson networks of queues; The loop elimination algorithm for inverting large sparse matrices; Waiting time and workload in queues with periodic Poisson input; and A reliability model based on the gamma process and its analytic theory. (EDC)

DESCRIPTORS: (U) *PROBABILITY, *QUEUEING THEORY, ALGORITHMS, ELIMINATION, INPUT, LOOPS, METHODOLOGY, MATHEMATICAL MODELS, NETWORKS, PERIODIC VARIATIONS, POISSON DENSITY FUNCTIONS, PROBLEM SOLVING, RELIABILITY, SPARSE MATRIX, STOCHASTIC PROCESSES, THEORY, WORKLOAD.
IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV158L

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UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
ELECTRICAL ENGINEERING

(U) An Analysis of the Anomalous High-Current Cathode
Emission in Pseudospark and Back-of-the-Cathode
Lighted Thyatron Switches.

JUN 89

9P

PERSONAL AUTHORS: Hartmann, W.; Dominic, V.; Kirkman, G.
F.; Gundersen, M. A.

CONTRACT NO. AFOSR-88-0093

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-89-1310

UNCLASSIFIED REPORT

ABSTRACT: (U) An analysis of the anomalously large cathode emission recently observed in the superdense glow of pseudospark and back-lighted thyatrons is presented. These switches are low-pressure (27 PaH2) glow-discharge pulsed-power devices. After operating at peak discharge currents of 8-8 kA and pulse durations of 0.5-1 microsec., the surface surrounding the cathode hole was found to have been homogeneously melted within a radius of approx. 4 mm indicating that the discharge is a superdense glow discharge, not an arc, with a cross-sectional area on the order of 1 sq cm. This conclusion is also supported by streak camera measurements. The current density at the cathode surface under these conditions is 5-10 kA/sq cm, several orders of magnitude larger than that of thermionic cathodes in common thyatrons. This high-current density is explained by intense cathode heating from a high-current density ion 'beam' produced in the cathode fall during the initial stage of current buildup. The surface heating resulting from this 'beam' yields a significant field-enhanced thermionic emission of electrons. Reprints. (RM)

DESCRIPTORS: (U) *CATHODES(ELECTRON TUBES), *GLOW DISCHARGES, *SURFACE TEMPERATURE, *SWITCHES, *THERMIONIC EMISSION, *THYATRONS, CATHODES, CROSS SECTIONS, CURRENT

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DENSITY, CURRENTS, ELECTRONS, HEATING, INTENSITY,
MEASUREMENT, PEAK VALUES, POWER, PULSE RATE, PULSES,
REPRINTS, STREAK CAMERAS, SURFACES, YIELD.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2301A7.

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DTIC REPORT BIBLIOGRAPHY

AD-A215 325 20/12

TACAN AEROSPACE CORP CARLSBAD CA

AD-A215 325 CONTINUED

(U) Nonlinear Optical Interactions in Semiconductors.

DESCRIPTIVE NOTE: Final rept. 10 Feb-10 Aug 84.

OCT 84 121P

PERSONAL AUTHORS: Salour, Michael M.

CONTRACT NO. F49620-83-C-0147

PROJECT NO. 2308

TASK NO. C2

MONITOR: AFOSR

TR-89-1542

UNCLASSIFIED REPORT

ABSTRACT: (U) They are in the process of completing two papers and four patents involving optical absorptions in GaAs which has led to the construction of a novel and highly sensitive optical temperature sensor. Another patent involving a liquid level sensor has become a by-product of the current research. They have studied two-photon optical pumping in semiconductors are continuing. Their attempts are focused on observing a number of new optical effects including nonlinear absorption and transmission phenomena, enhanced spontaneous and stimulated light scattering processes, etc. The construction of an external cavity semiconductor laser is completed. This will allow them to undertake a careful study of multiphoton optical pumping in semiconductors to generate IR radiation and a variety of studies involving narrow-gap semiconducting compounds outlined in their proposal. They have studied the feasibility of room temperature operation of a tunable coherent source involving multiple quantum well material. An invention disclosure has been filed with the U.S. Air Force Patent Office for work performed on multiple quantum well material under this contract. They have received the delivery of two large laser systems along with a variety of test and measurement equipment to enhance the current research under this contract. They have already utilized these lasers to explore elementary excitation in optical thin film layers of semiconductors. (rrh)

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DESCRIPTORS: (U) *ABSORPTION, *COHERENCE, *INTERACTIONS, *LASER CAVITIES, *LIGHT SCATTERING, *NARROW GAP SEMICONDUCTORS, *NONLINEAR SYSTEMS, *SEMICONDUCTOR LASERS, *SEMICONDUCTORS, *TUNING, DETECTORS, EXCITATION, EXTERNAL, INVENTIONS, LASERS, LAYERS, LIQUID LEVEL GAGES, MATERIALS, MEASURING INSTRUMENTS, OPERATION, OPTICAL DETECTORS, OPTICAL MATERIALS, OPTICAL PROPERTIES, OPTICAL PUMPING, PATENT OFFICE, PATENTS, PHOTONS, QUANTUM THEORY, ROOM TEMPERATURE, SENSITIVITY, SOURCES, STIMULATION(GENERAL), TEMPERATURE SENSITIVE ELEMENTS, THIN FILMS, TRANSMITTANCE.

IDENTIFIERS: (U) PEG1102F, WJAFOSR2308C2.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI56L

AD-A215 324 12/1

KENTUCKY UNIV LEXINGTON DEPT OF ELECTRICAL ENGINEERING

(U) Mathematical Foundations of the Singularity Expansion Method.

DESCRIPTIVE NOTE: Final rept. 1 Sep 80-31 Aug 81.

JAN 82 6P

PERSONAL AUTHORS: Pearson, L. W.

CONTRACT NO. AFOSR-80-0269

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1559

UNCLASSIFIED REPORT

ABSTRACT: (U) This final report summarizes results of the meeting conducted at the University of Kentucky, 19-21 November 1980, entitled Mathematical Foundations of the Singularity Expansion Method. The proceedings of the meeting are being reported as a special issue of the Journal Electromagnetics (Vol. 1, No. 4); it should be available in the near future. Included in the final report is a list of titles and authorship which will appear in the above mentioned issue of Electromagnetics. (Kr)

DESCRIPTORS: (U) *EXPANSION, *APPLIED MATHEMATICS, KENTUCKY, ELECTROMAGNETISM, UNIVERSITIES.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A4.

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STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

(U) Real Time Statistical Signal Processing.

DESCRIPTIVE NOTE: Final rept..

JAN 82 2P

PERSONAL AUTHORS: Kailath, Thomas

CONTRACT NO. F49620-79-C-0058

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-89-1558

UNCLASSIFIED REPORT

ABSTRACT: (U) We use the phrase 'statistical signal processing' to emphasize that unlike what is traditionally called digital signal processing, the operations we perform are dictated by the application of some optimization criterion. Such an approach often suggests appropriate 'macro' building blocks for implementing the optimal solutions. Therefore, there are two major aspects of real time statistical signal processing: I: Determining optimal algorithms and II: Implementing the optimal algorithms. We should try to have some interaction between these two aspects: Implementation considerations being able to influence the form of algorithms, and the nature of the algorithms being able to suggest the form of implementation. Moreover, for real-time and adaptive operation, we need to be able to do both I and II quickly: with FAST algorithms, recursively; to easily incorporate new data, and cheaply: perhaps with special chips. (rrh)

DESCRIPTORS: (U) *ADAPTIVE SYSTEMS, *ALGORITHMS, *CHIPS(ELECTRONICS), *DIGITAL SYSTEMS, *SIGNAL PROCESSING, *STATISTICAL PROCESSES, OPERATION, OPTIMIZATION, PHRASE STRUCTURE GRAMMARS, SOLUTIONS(GENERAL).

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A8.

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AD-A215 320 12/3

MISSOURI UNIV-COLUMBIA DEPT OF STATISTICS

(U) Statistical Theory of Reliability.

DESCRIPTIVE NOTE: Final rept. Apr 87-May 89.

MAY 89 7P

PERSONAL AUTHORS: Basu, Asit P.

CONTRACT NO. AFOSR-87-0139

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1307

UNCLASSIFIED REPORT

ABSTRACT: (U) Accelerated life testing of a product is commonly used to reduce test time and costs. Accelerated testing is achieved by subjecting the test units to conditions that are more severe conditions are then extrapolated to normal conditions to obtain an estimate of life distribution under normal condition. This problem is considered when the product is a 2-component system with lifetimes following the bivariate exponential distribution of Block and Basu (1974). Here our interest is in the joint analysis of data with two failure times. (KR)

DESCRIPTORS: (U) *RELIABILITY, *STATISTICS, ACCELERATED TESTING, ADVERSE CONDITIONS, BIVARIATE ANALYSIS, DISTRIBUTION FUNCTIONS, EXPONENTIAL FUNCTIONS, FAILURE, LIFE EXPECTANCY(SERVICE LIFE), LIFE TESTS, TEST AND EVALUATION, TEST EQUIPMENT, THEORY, TIME.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5.

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SEARCH CONTROL NO. EV156L

AD-A215 319 12/2

NORTH CAROLINA UNIV AT CHAPEL HILL

(U) Dynamical Systems.

DESCRIPTIVE NOTE: Final rept. 1 Jul 88-31 Dec 87.

DEC 87 4P

PERSONAL AUTHORS: Newhouse, Sheldon E.

CONTRACT NO. AFOSR-85-0200

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1308

UNCLASSIFIED REPORT

ABSTRACT: (U) We have developed a structure theory for real analytic diffeomorphisms of compact surfaces very similar to the well known structure theory of Axiom A diffeomorphisms. This theory has strong implications for the structure of systems with two degrees of freedom. We have also found a relatively simple proof of our previously established result that there are residual subsets A of open sets of diffeomorphisms with the property that each element in A has infinitely many sinks. Another result states that many systems with two degrees of freedom have fractal basin boundaries with Hausdorff dimension two (i.e. maximal Hausdorff dimension). This leads to the frequent existence of what we call pseudo-attractors -- closed invariant sets with dense orbits whose basins have maximal dimension. (edc)

DESCRIPTORS: (U) *DYNAMICS, *MATHEMATICAL ANALYSIS, BOUNDARIES, DEGREES OF FREEDOM, FRACTALS, HIGH DENSITY, INVARIANCE, ORBITS, SET THEORY, STRUCTURAL PROPERTIES, SURFACES, THEORY.

IDENTIFIERS: (U) Diffeomorphisms, Fractal basin boundaries, Hausdorff dimensions, Pseudoeattractors, Compact surfaces, PE81102F, WUAFOSR2304A4.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI56L

AD-A215 318 12/5

AD-A215 309 20/4

OREGON GRADUATE CENTER BEAVERTON DEPT OF COMPUTER
SCIENCE AND ENGINEERING

NORTHWEST RESEARCH ASSOCIATES INC BELLEVUE WA

(U) Constructive Negotiation in Logic Programs.

(U) Theory of Internal Gravity Wave Saturation.

DESCRIPTIVE NOTE: Final rept. Feb 87-Feb 88.

89 26P

MAR 88 4P

PERSONAL AUTHORS: Dunkerton, Timothy J.

CONTRACT NO. AFOSR-87-0084

PROJECT NO. 2310

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR

TR-89-1434

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

AD-A215 310

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Pure and Applied Geophysics.
V130 nos2/3 p373-397 1989.

ABSTRACT: (U) Logic programming is declarative, but its programs can be executed relatively efficiently. This balance is a precarious one: languages with a more imperative nature are much faster in execution, but programming is more difficult; if the declarative expressiveness of the language is extended, its execution can become so slow that it is unusable. The languages typified by 'pure' PROLOG strike this balance on the side of efficiency, by fixing on SLD resolution as the execution algorithm. The Horn-clause subset of first-order logic for which SLD resolution is adequate is limited in the naturalness of its expressiveness, and the most notable omission is that negative information cannot be expressed. (jes)

DESCRIPTORS: (U) *COMPUTER LOGIC, *COMPUTER PROGRAMMING, ALGORITHMS, LOGIC.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A7, *Logic Programming.

ABSTRACT: (U) Gravity wave saturation is an important process affecting the transport and deposition of momentum, heat, and constituents in the earth's atmosphere. This paper informally discusses several saturation mechanisms and their effects, including convection, Kelvin-Helmholtz instability, vortical mode instability, parametric subharmonic instability, and mean flow interaction. Convective saturation adjustment is discussed and a few remarks are made concerning the effects of turbulence localization on the convective saturation process. Several outstanding problems in saturation theory are identified that could be addressed with observational, numerical, and laboratory studies. Keywords: Reprints; Internal gravity waves; Nonlinear instability; Transport. (JHD).

DESCRIPTORS: (U) *ATMOSPHERIC PHYSICS, *GRAVITY WAVES, *INTERNAL WAVES, *VORTICES, CONVECTION, DEPOSITION, EARTH ATMOSPHERE, HARMONICS, INTERACTIONS, LABORATORY TESTS, MOMENTUM, NONLINEAR SYSTEMS, PARAMETRIC INSTABILITY, REPRINTS, SATURATION, STABILITY, TURBULENCE

IDENTIFIERS: (U) Kelvin Helmholtz Instability, PE81102F, WJAFOSR2310A1.

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AD-A215 308 21/5

MICHIGAN UNIV ANN ARBOR DEPT OF AEROSPACE ENGINEERING
(U) Structure and Mixing Properties of Pressure-Atomized
Sprays.

JUL 89 9P

PERSONAL AUTHORS: Ruff, G. A.; Sagar, A. D.; Faeth, G. M.
PROJECT NO. 2308
TASK NO. A2
MONITOR: AFOSR
TR-89-1432

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in AIAA Journal, v27 n7 p901-908
Jul 89.

ABSTRACT: (U) A theoretical and experimental study of the dense-spray region of pressure-atomized non-evaporating sprays is described, emphasizing flows in the wind-induced and atomization breakup regimes. Mean and fluctuating velocities at the injector exit, mean liquid volume fraction distributions, and entrainment rates were measured for large-scale (9.5 and 19.1 mm injector diameters) water jets in still air at atmospheric pressure. It was found that mixing was strongly influenced by the degree of flow development at the injector exit and the breakup regime: fully developed injector flow and atomization breakup yielded the fastest mixing rates. Predictions based on the locally homogeneous flow approximation, where relative velocities between the phases were neglected, gave encouraging predictions of dense-spray properties in the near-injector region for atomization breakup, including representation of flow development effects at the injector exit. Internal combustion engines, Reprints. (UES)

DESCRIPTORS: (U) *INTERNAL COMBUSTION ENGINES, AIR, ATOMIZATION, BAROMETRIC PRESSURE, ENTRAINMENT, EXITS, FLOW, HOMOGENEITY, INJECTORS, MIXING, RATES, VELOCITY, WATER JETS

IDENTIFIERS (U) PEG1102F, WUAFOSR2308A2.
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SEARCH CONTROL NO. EVI56L

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FLOW INDUSTRIES INC KENT WA

(U) Nonpremixed Reaction in Homogeneous Turbulence: Direct Numerical Simulations.

DESCRIPTIVE NOTE: Technical paper Jun-Aug 87.

JUN 88 5P

PERSONAL AUTHORS: Givi, Peyman; McMurtry, Patrick A.
CONTRACT NO. F49620-85-C-0087

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1431

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Aiche Jnl. v34 n6 p1039-1042
Jun 88.

ABSTRACT: (U) Toor's hypothesis (1982, 1989, 1975) provides a closure for the modeling of the concentration fluctuations in non-premixed homogeneous turbulent flows. In this paper, Toor's hypothesis is revised. This revision is generalized and is validated by means of means of Direct Numerical Simulations (DNS) keywords Reaction kinetics; Reprints. (EDC)

DESCRIPTORS: (U) *TURBULENT FLOW, CLOSURES, HOMOGENEITY, HYPOTHESES, MATHEMATICAL MODELS, NUMERICAL ANALYSIS, REACTION KINETICS, REPRINTS, TURBULENCE.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2308A2.

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AD A215 305 12/3

CLARKSON COLL OF TECHNOLOGY POTSDAM NY

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA
DEPT OF SYSTEMS ENGINEE RING

(U) A Thermal Model for Asphaltic Concrete.

(U) Statistical Techniques for Signal Processing.

DESCRIPTIVE NOTE: Final rept. 1 Jul 80-31 Dec 81.

DESCRIPTIVE NOTE: Final rept. 1 Nov 80-31 Oct 81.

FEB 82 17P

DEC 81 6P

PERSONAL AUTHORS: Highter, William H.; Carlson, Frederick

PERSONAL AUTHORS: Kassam, Saleem A.

CONTRACT NO. AFOSR-80-0234

CONTRACT NO. AFOSR-77-3154

PROJECT NO. 2307

PROJECT NO. 2304

TASK NO. D1

TASK NO. A5

MONITOR: AFOSR
TR-89-1837

MONITOR: AFOSR
TR-89-1821

UNCLASSIFIED REPORT

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ABSTRACT: (U) During calendar year 1981 the research effort of this grant was devoted primarily to three areas: (a) measurement of thermal properties of asphaltic concrete in the laboratory; (b) field tests performed to compare the results of the measured temporal and spatial temperature field induced in an asphaltic concrete pavement by a known energy input to those predicted by heat transfer theory using the thermal properties measured in the laboratory results; and, (c) a sensitivity analysis which indicated the influence of thermal properties of the asphalt and the heat source on the predicted temporal and spatial temperature field.

DESCRIPTORS: (U) *CONCRETE, ASPHALT, ENERGY, FIELD TESTS, HEAT, HEAT TRANSFER, INPUT, LABORATORIES, MODELS, PAVEMENTS, SOURCES, SPATIAL DISTRIBUTION, TEMPERATURE, THEORY, THERMAL PROPERTIES.

IDENTIFIERS: (U) PE81102F, WUAFOSR2307D1.

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ABSTRACT: (U) The report summarizes results of the fifth and final year of the grant. Result obtained include development of nonparametric detectors for operation on dependent inputs; optimum quantization for use in envelope detection of narrowband signals; quantization techniques, including the problem of the optimum piecewise-constant representation of the Wiener filter frequency response; and an extension to the author's initial result on robust filters for correlated signals and noise. The report also lists publications which stemmed from the research. (RRH)

DESCRIPTORS: (U) *DETECTION, *FREQUENCY RESPONSE, *MATHEMATICAL FILTERS, *QUANTIZATION, *SIGNAL PROCESSING, *STATISTICAL PROCESSES, ENVELOPE(SPACE), OPTIMIZATION.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5.

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SEARCH CONTROL NO. EVI58L

AD-A215 304 9/1

MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY

AD-A215 303 12/3

FLORIDA STATE UNIV TALLAHASSEE RELIABILITY CENTER
(U) Statistical Aspects of Reliability, Maintainability, and Availability.

DESCRIPTIVE NOTE: Final rept. 1 May-30 Sep 81.

DESCRIPTIVE NOTE: Annual rept. 1 Oct 82-30 Sep 83.
MAY 82 SP

PERSONAL AUTHORS: Dragt, Alex J.

CONTRACT NO. F49620-81-C-0060

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR

TR-89-1638

UNCLASSIFIED REPORT

ABSTRACT: (U) In the past year, the University of Maryland has monitored and arranged for the convening of 10 Research Evaluation Groups or Panels to review and evaluate various aspects of the Physical Sciences Program, AFOSR, ranging over such diverse disciplines as high power microwave technology, electromagnetic radiation, laser physics, seismic detection, photo acoustics, infrasonics, thin films, flight dynamics, environmental toxicology, and biomedical sciences. These reviews and evaluations involved approximately 539 person-days of effort by independent scientists selected from Universities and Industry for their expert knowledge and experience in the requisite fields. (JES)

DESCRIPTORS: (U) *ELECTROMAGNETIC RADIATION, ACOUSTICS, BIOMEDICINE, DYNAMICS, ENVIRONMENTS, FLIGHT, HIGH POWER, INDUSTRIES, INFRASONIC RADIATION, LASERS, MICROWAVE EQUIPMENT, PHOTOGRAPHS, PHYSICAL SCIENCES, PHYSICS, RADIOFREQUENCY POWER, SCIENTISTS, SEISMIC DETECTION, THIN FILMS, TOXICOLOGY, UNIVERSITIES.

IDENTIFIERS: (U) PEB2714E, WUAFOSR2308A1.

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ABSTRACT: (U) During the past year, a total of 16 research reports were issued, 22 papers were published in scientific journals and books, 32 papers are in press or accepted for publication, and 5 books are in preparation. A list of topics under study is given in Section F; the list is by no means complete. Reliability Center activities during the past year included: (a) consulting for Eglin Air Force Base under an annual contract; (b) interaction with visitors to initiate and carry on reliability research; (c) continuation into the 12th year of the weekly Reliability Club Colloquia Series; and (d) responding to requests for advice from the AFOSR. (KR)

DESCRIPTORS: (U) *STATISTICAL ANALYSIS, AIR FORCE FACILITIES, CONTRACTS, MAINTAINABILITY, PERIODICALS, RELIABILITY, AVAILABILITY.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A5.

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SEARCH CONTROL NO. EVI56L

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WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Support of Purchase of a Gas Chromatographmass Spectrometer.

DESCRIPTIVE NOTE: Final rept.,

OCT 84

3P

PERSONAL AUTHORS: West, Robert

CONTRACT NO. AFOSR-83-0248

PROJECT NO. 2917

TASK NO. A2

MONITOR: AFOSR
TR-89-1805

UNCLASSIFIED REPORT

ABSTRACT: (U) This grant was used to purchase a Kratos Model MS-25 High Sensitivity GC-MS (Gas-Chromatograph-Mass Spectrometer) System. The computer system which is required to control the spectrometer and analyze the data was provided by the University of Wisconsin. The system was installed about seven (7) months ago and has been in heavy and constant use since its installation. The system is used primarily by graduate students for high resolution GC-Mass Spectroscopy studies. A majority of the students using the spectrometer are doing their graduate research under the direction of Professor Robert C. West. (JES)

DESCRIPTORS: (U) *SPECTROMETERS, *TEST METHODS, COMPUTERS, PROCUREMENT, STUDENTS.

IDENTIFIERS: (U) PE811102F, WJAFOSR2917A2.

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STATE UNIV OF NEW YORK AT BUFFALO AMHERST

(U) Squeezing of Cavity Fields in Cascade Multiphoton Processes,

OCT 89 8P

PERSONAL AUTHORS: Li, Fu-11; Li, Xiao-shen; Lin, D. L.; George, Thomas F.

CONTRACT NO. F49620-86-C-0009

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-89-1581

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physics B: Atomic, Molecular and Optical Physics, v22 n19 p2977-2983, 14 Oct 89.

ABSTRACT: (U) For a system of a multilevel atom interacting with a single-mode cavity field, squeezing of the field is studied numerically. It is found that the squeezing effect becomes stronger when the atomic level number increases, but tends to saturates when the number exceeds twenty. Keywords: Multilevel atom; Cavity field; Single mode; Squeezing; Cascade multiphoton processes; Saturation; Reprints. (JHD)

DESCRIPTORS: (U) *CASCADES(FLUID DYNAMICS), ATOMIC ENERGY LEVELS, ATOMIC PROPERTIES, ATOMS, CAVITIES, REPRINTS, LASER CAVITIES, POWER LEVELS.

IDENTIFIERS: (U) Multiphoton Processes, PE81102F, WJAFOSR2303B31303.

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI56L

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OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) Computational Studies of Heterogeneous Reactions of SiH₂ on Reconstructed Si(111)-(7x7) and Si(111)-(1x1) Surfaces.

DCT 89 10P

PERSONAL AUTHORS: Agrawal, Paras M.; Thompson, Donald L.; Raff, Lionel M.

CONTRACT NO. AFOSR-88-0043

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-89-1582

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v91
n8 p5021-5029, 15 Oct 89.

ABSTRACT: (U) The dynamics of chemisorption and decomposition of Cyclosilane on Silicon (111)-(1x1) and reconstructed Si(111)-(7x7) surfaces have been investigated using classical trajectories on a previously described potential-energy surface modified to yield the experimental bending frequencies for chemisorbed hydrogen atoms and to incorporate the results of ab initio calculations of the repulsive interaction between SiH₂ and closed-shell lattice atoms. The Binnig et al. model is employed for the (7x7) reconstruction. The major mode of surface decomposition on the (7x7) surface is by direct molecular elimination of H₂ into the gas phase. Hydrogen atom dissociation to adjacent lattice sites is a much slower process and the chemisorbed hydrogen atoms thus formed exhibit very short lifetimes on the order of (1.13-10.8)x10⁻¹³ s to the -13th power. The rate coefficients for the decomposition modes are calculated. The rates on the (1x1) surface are faster due to the increased exothermicity released by the formation of two tetrahedral Si-Si bonds upon chemisorption compared to a single Si-Si bond on the (7x7) surfaces. Molecular beam deposition/decomposition experiments of Silane on Si(111)-(7x7) surfaces that chemisorbed hydrogen atoms are not

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formed in the SiH₄ decomposition process whereas the present calculations suggest that such a reaction, although slow, does occur subsequent to SiH₂ chemisorption. Reprints. (aw)

DESCRIPTORS: (U) *CHEMISORPTION, *ELIMINATION REACTIONS, *HYDROGEN, *SILANES, *REACTION KINETICS, ATOMS, BENDING, COEFFICIENTS, COMPUTATIONS, DECOMPOSITION, DISSOCIATION, DYNAMICS, FREQUENCY, HETEROGENEITY, MOLECULES, RATES, REPRINTS, SHORT RANGE(TIME), SILICON, SURFACES, TRAJECTORIES, VAPOR PHASES, EXOTHERMIC REACTIONS.

IDENTIFIERS: (U) PE8112F, WJAFDSR2303B3, *Cyclosilanes, Potential Energy Surfaces, Reconstruction, Repulsion, Lifetime.

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PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE
ENGINEERING

PRINCETON UNIV NJ DEPT OF PHYSICS

(U) Physical Models for Supersonic Turbulent Boundary
Layer Structure.

(U) Experiments on Large Single Crystals of the
Superconducting Oxides $YBa(2)Cu(3)O(7)$, $La(2-x)Ba(x)$
 $CuO(4)$, and $BiCa-Sr-Cu-O$.

DESCRIPTIVE NOTE: Final rept. 15 Feb 88-14 Jun 89.

DESCRIPTIVE NOTE: Final rept. 2 Oct 88-28 Feb 89.

OCT 89 32P

OCT 89 4P

PERSONAL AUTHORS: Smits, Alexander J.

PERSONAL AUTHORS: Ong, N. P.

CONTRACT NO. AFOSR-88-0120

CONTRACT NO. AFOSR-89-0022

PROJECT NO. 2307

PROJECT NO. 2308

TASK NO. A2

TASK NO. C1

MONITOR: AFOSR
TR-89-1580

MONITOR: AFOSR
TR-89-1574

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) An experimental program was carried out to study the detailed structure of supersonic turbulent boundary layers. The experiments were designed to elucidate physical models and mechanisms that are particular to compressible turbulence, such as the effects of compressibility on the nature of the large-scale motions, the scaling laws for high Reynolds number supersonic turbulent flows, direct compressibility effects that cause the exchange of turbulence energy among the vorticity, entropy and sound modes, and the transport of heat and momentum by compressible turbulent motions. A description of the new optical experimental tools that were developed is included. (EDC)

DESCRIPTORS: (U) *COMPRESSIBLE FLOW, *ENERGY TRANSFER, *SUPERSONIC FLOW, *TURBULENT BOUNDARY LAYER, COMPRESSIVE PROPERTIES, ENTROPY, EXCHANGE, HEAT TRANSFER, MODELS, MOMENTUM TRANSFER, MOTION, OPTICAL INSTRUMENTS, PHYSICAL PROPERTIES, REYNOLDS NUMBER, SCALING FACTOR, SOUND, STRUCTURAL PROPERTIES, TRANSPORT, TURBULENCE, VORTICES.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2307A2.

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ABSTRACT: (U) The growth and characterization of single crystals of the high temperature superconductors was investigated. High temperature, high pressure annealing of crystals of YBCO was carried out and found to be ineffective in further raising the T_c of the crystals beyond 93 K. Torque magnetometry measurements on YBCO crystals showed that the coherence length anisotropy is 5, independent of temperature in the range 80 to 90 K. The growth of the '40 K' system based on $LaCuO$ doped with Ba, was attempted. Large crystals were obtained, but the Ba content (x approx. 0.5) was too high to sustain high temperature superconductivity. Keywords: Yttrium barium copper oxides, Lanthanum copper oxides, Bismuth calcium strontium copper oxides. (AM)

DESCRIPTORS: (U) *OXIDES, *SINGLE CRYSTALS, *SUPERCONDUCTORS, *METAL COMPOUNDS, ANISOTROPY, ANNEALING, BARIUM OXIDES, COHERENCE, COPPER, CRYSTALS, HIGH PRESSURE, HIGH TEMPERATURE, LANTHANUM, LENGTH, MAGNETOMETRY, MEASUREMENT, SUPERCONDUCTIVITY, TEMPERATURE TORQUE, YTTRIUM OXIDES, BISMUTH, STRONTIUM, CALCIUM, CRYSTAL GROWTH, DOPING.

IDENTIFIERS: (U) PEB1102F, WJAFORS2308C1, *Yttrium Barium Copper Oxides, *Lanthanum Barium Copper Oxides.

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*Bismuth Calcium Strontium Copper Oxides, Copper Oxides.

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL
ENGINEERING

(U) Basic Instability Mechanisms in Chemically Reacting
Subsonic and Supersonic Flows.

DESCRIPTIVE NOTE: Final rept. 30 Sep 81-29 Sep 82.

SEP 82 18P

PERSONAL AUTHORS: Toong, T. Y.

CONTRACT NO. AFOSR-78-3662

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-88-1608

UNCLASSIFIED REPORT

ABSTRACT: (U) Examination of low-frequency instability in ramjet dump combustors shows that the oscillations are triggered and sustained by interactions between non-uniform entropy zones and pressure waves. Pressure waves are produced as entropy waves convected through a choked nozzle and entropy waves are generated as the pressure waves perturb the combustion zone. A linearized stability theory is developed for the case of near blow-off which corresponds to maximum rumble. Both oscillation frequencies and amplification rates are obtained. The theory is used to analyze the effects of combustor configurations (including combustor-to-inlet area ratio, nozzle-to-combustor area ratio, combustor diameter, presence of flameholder and mode of fuel injection), inlet stagnation temperature, and fuel-air ratio on stability. Both predicted frequencies and stability characteristics agree well with the experimental observations. One possible mechanism of turbulence-combustion interactions has been examined by studying the development of Tollmien-Schlichting waves in a reacting shear layer. Analysis shows that the growth rates of these waves depend on the order, the thermocity, and the activation energy of the Arrhenius-type chemical reaction as well as the disturbance wavelengths and Damkohler's similarity parameters. (AW)

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KANSAS UNIV LAWRENCE DEPT OF PSYCHOLOGY

DESCRIPTORS: (U) *COMBUSTORS, *SUBSONIC COMBUSTION, *SUPERSONIC COMBUSTION, *RAMJET ENGINES, *COMBUSTION, STABILITY, ACTIVATION ENERGY, AMPLIFICATION, BLOWOFF, COMBUSTION, CONFIGURATIONS, DIAMETERS, ENTROPY, FLAME HOLDERS, FREQUENCY, FUEL INJECTION, GROWTH(GENERAL), INTERACTIONS, LAYERS, LINEARITY, NONUNIFORM, OSCILLATION, PRESSURE, RATES, SHEAR PROPERTIES, THEORY, WAVES, SUPERSONIC COMBUSTION RAMJET ENGINES, NOZZLE GAS FLOW, SUPERSONIC FLOW, SUBSONIC FLOW, FUEL AIR RATIO, TURBULENCE, CHEMICAL REACTIONS.

(U) Measuring Learning Ability by Dynamic Testing.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-31 Jul 89.

SEP 89 185P

PERSONAL AUTHORS: Embretson, Susan

CONTRACT NO. AFOSR-88-0242

PROJECT NO. 2313

TASK NO. A7

MONITOR: AFOSR
TR-89-1511

IDENTIFIERS: (U) PE81102F, WUAFOSR2308A2, Combustion Instability, *Dump Combustors.

UNCLASSIFIED REPORT

ABSTRACT: (U) A criticism of traditional ability tests is that they are static, rather than dynamic, measures of intelligence. That is, they measure what the person has learned, but not necessarily the capacity to learn. This project developed two tests of learning ability, spatial learning ability and mathematical learning ability, based on cognitive theory. In these tests which consist of a pretest and two posttests, learning ability is the modifiability of a person's performance under conditions that change the cognitive load of the task, such as strategy training or cues. To solve some psychometric problems in measuring change (i.e., the inequivalencies of raw change at different initial performance levels and the unreliability of change scores), the multidimensional Rasch model for learning and change (Embretson, 1987; 1989a; 1989b) was used to estimate learning abilities. Further, the tests were counterbalanced for the stimulus features that influence processing difficulty to assure cognitive equivalency and to observe the impact of strategy training and cues on the mental models used in the tasks. Three goals were accomplished for each test: 1) large sample data was obtained to calibrate the tests by the multidimensional Rasch model for learning and change, 2) the construct validity of the learning ability measurements was examined and 3) the cognitive theory underlying the tasks in each test was extended. Although the results on mathematical learning ability were not

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particularity strong, the measurement of spatial learning ability was strongly supported. (SDW)

WISCONSIN UNIV-MILWAUKEE DEPT OF CHEMISTRY

DESCRIPTORS: (U) *APTITUDE TESTS, COGNITION, DYNAMIC TESTS, IMPACT, LEARNING, MATHEMATICS, MEASUREMENT, MENTAL ABILITY, MODELS, MODIFICATION, PROCESSING, PSYCHOMETRICS, SKILLS, SPACE PERCEPTION, STRATEGY, THEORY, TRAINING.

(U) Chemistry and Physics of Solid Surfaces 5.

APR 84 579P

PERSONAL AUTHORS: Howe, Vanselow R.

IDENTIFIERS: (U) PEG1102F, WJAFOSR2313A7.

CONTRACT NO. AFOSR-MIPR-83-00031

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-88-1508

UNCLASSIFIED REPORT

Availability: Springer-Verlag, 175 Fifth Ave., New York, NY 10010 HC \$89.00. No copies furnished by DTIC/NTIS.

ABSTRACT: (U) Partial Contents: The Molecular Surface Science of Heterogeneous Catalysis: History and Perspective; Fourier-Transform Infrared Spectroscopy in Heterogeneous Catalysis; Magnetic Resonance in Surface Science; Mossbauer Spectroscopy: Applications to Surface and Catalytic Phenomena; Heterogeneous Photocatalysis with Semiconductor Particulate Systems; Laser Studies of Surface Chemical Reactions; Surface Compositional Changes by Particle Bombardment; Structure Determination of Small Metal Particles by Electron Microscopy; Reconstruction of Metal Surfaces; Surface Crystallography by Means of SEXAFS and NEXAFS; Determination of Surface Structure Using Atomic Diffraction; An Atomic View of Crystal Growth; Ising Model Simulations of Crystal Growth; Phase Transitions on Surface; Finite Size Effects. Surface Steps, and Phase Transitions; Recent Developments in the Theory of Epitaxy; Angle-Resolved Secondary Ion Mass Spectrometry; Determination by Ion Scattering of Atomic Positions at Surfaces and Interfaces; Surface Phonon Dispersion; Intrinsic and Extrinsic Surface Electronic States of Semiconductors; Work Function and Band Bending at Semiconductor Surfaces. (aw)

DESCRIPTORS: (U) *CRYSTALLOGRAPHY, *SEMICONDUCTORS, *SURFACE CHEMISTRY, *SOLID STATE PHYSICS, CATALYSIS, COMPOSITION(PROPERTY), CRYSTAL GROWTH, DETERMINATION.

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DISPERSING. ELECTRON MICROSCOPY. EPITAXIAL GROWTH. FERROMAGNETIC MATERIALS. FOURIER TRANSFORMATION. HETEROGENEITY. INFRARED SPECTROSCOPY. IONS. LASERS. MAGNETIC RESONANCE. METALS. MODELS. MOLECULES. MOSSBAUER EFFECT. PARTICLE SIZE. PARTICULATES. PHASE TRANSFORMATIONS. PHONONS. PHOTOCHEMICAL REACTIONS. PHYSICS. SCATTERING. SIMULATION. SIZES(DIMENSIONS). SPECTROSCOPY. SURFACE REACTIONS. SURFACES. THEORY. WORK FUNCTIONS. PHYSICAL CHEMISTRY.

MARYLAND UNIV COLLEGE PARK DEPT OF MATHEMATICS

(U) Interim Report for Grant AFOSR-81-0217 (Maryland University).

DESCRIPTIVE NOTE: Rept. for 1 Oct 82-30 Sep 83.

OCT 83 4P

PERSONAL AUTHORS: Yorke, James A.

CONTRACT NO. AFOSR-81-0217

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1589

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ABSTRACT: (U) Topics studied include: the question of the reason for the existence of period doubling cascades. Other areas include: predictability and fractal basin boundaries; a new scaling effect concerning the way strange attractors are destroyed; and work in which quasiperiodic motions are to be expected in nature. This report summarizes the progress made and lists reports and papers resulting from the research performed during this period. (EDC)

DESCRIPTORS: (U) *MATHEMATICS, MATHEMATICAL PREDICTION, FRACTALS, CASCADE STRUCTURES, MARYLAND, SCALING FACTOR, UNIVERSITIES.

IDENTIFIERS: (U) WUAFOSR2304A4, PE81102F.

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MASSACHUSETTS UNIV AMHERST DEPT OF MATHEMATICS AND STATISTICS

(U) Vortex Cores and Vortex Breakdown.

DESCRIPTIVE NOTE: Final rept. 1 Mar 87-31 Aug 89.

AUG 89 5P

PERSONAL AUTHORS: Berger, Melvyn S.

CONTRACT NO. AFOSR-87-0170

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-88-1587

UNCLASSIFIED REPORT

ABSTRACT: (U) A number of fundamental discoveries were made concerning vortex cores and vortex breakdown. Bifurcation processes of a mathematical nature are fundamental in understanding the two kinds of vortex breakdown -- of bubble type and of spiral type. Additional mathematical procedure were used for the calculus of variations, to analysis axisymmetric vortex motion with swirl and helical vortex motion. The work on helical motion is described, and the work on axisymmetric vortices with swirl is given in preliminary form. (jhd)

DESCRIPTORS: (U) *VORTICES, AXISYMMETRIC, BUBBLES, CALCULUS OF VARIATIONS, CORES, HELICES, MATHEMATICAL ANALYSIS, MOTION, BIFURCATION(MATHEMATICS).

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A8, Swirling, Vortex Breakdown.

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MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MATHEMATICS

(U) Nonlinear Wave Phenomena in Hydrodynamics.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-31 Jul 89.

JUL 89 2P

PERSONAL AUTHORS: Benney, David J.

CONTRACT NO. AFOSR-88-0192

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1586

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *WAVES, HYDRODYNAMICS, FLOW, MEAN, DISTORTION, SHEAR PROPERTIES, THEORY, NONLINEAR ANALYSIS, HARMONICS, THREE DIMENSIONAL FLOW, LAYERS, CRITICALITY(GENERAL).

IDENTIFIERS: (U) *Shear flow, Instability, Nonlinear instability, Mean flow, First harmonic theory, Singularities, Critical layer singularity, WUAFOSR2304A4, PE81102F.

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CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

(U) Light Scattering Spectroscopy of Semiconductors.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 82.

DEC 82

5P

PERSONAL AUTHORS: Ushioda, S.

CONTRACT NO. AFOSR-82-0086

PROJECT NO. 2308

TASK NO. C2

MONITOR: AFOSR
TR-89-1594

UNCLASSIFIED REPORT

ABSTRACT: (U) The main objective of this project was to investigate the properties of technically important semiconductors in terms of the elementary excitations that determine their optical and electrical characteristics. Raman spectra of guide wave polarization and surface polarizations were studied in thin films of GaSe, GaP, and GaAs. Surface plasmons in Ag films were also investigated. (RRH)

DESCRIPTORS: (U) *LIGHT SCATTERING, *PLASMONS, *RAMAN SPECTRA, *SEMICONDUCTORS, *SPECTROSCOPY, *THIN FILMS, ELECTRICAL PROPERTIES, OPTICAL PROPERTIES, POLARIZATION, SURFACES.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2308C2.

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CHICAGO UNIV IL DEPT OF CHEMISTRY

(U) Theoretical and Experimental Studies of Molecular Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-30 Sep 84.

OCT 84

6P

PERSONAL AUTHORS: Rice, Stuart

CONTRACT NO. F49620-83-C-0002

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1598

UNCLASSIFIED REPORT

ABSTRACT: (U) We describe a single-sideband frequency demodulation scheme with large dynamic range which gives linear response and is capable of shot-noise-limited performance when used with time-resolved pump and probe, polarization, and three- and four-wave mixing spectroscopies. An extensive examination of the vibrational state dependence of fluorescence lifetimes in supersonic jet-cooled 182u benzene, and the inferred vibrational state dependence of the non-radiative rate constants, are reported. The qualitative features of our results agree with those obtained from previous investigations using room temperature vapor phase samples. The spectral simplification achieved in the supersonic jet expansion has, however, allowed measurement of the fluorescence lifetimes of a number of 182u vibrational levels not previously studied. Molecular physics. (JES)

DESCRIPTORS: (U) *DYNAMICS, *MOLECULE MOLECULE INTERACTIONS, *BENZENE, *FLUORESCENCE, *MOLECULAR PROPERTIES, *MOLECULAR STRUCTURE, CONSTANTS, DEMODULATION, DYNAMIC RANGE, EXPANSION, EXPERIMENTAL DATA, FLUORESCENCE, FREQUENCY, LIFE SPAN(BIOLOGY), LINEARITY, POLARIZATION, PUMPS, RATES, RESPONSE, SIMPLIFICATION, SINGLE SIDEBAND COMMUNICATIONS, SPECTRA, SUPERSONIC AIRCRAFT, THEORY, TIME, VIBRATION.

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IDENTIFIERS: (U) PE81102F, WJAFOSR230381.

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ACCREDITATION BOARD FOR ENGINEERING AND TECHNOLOGY NEW YORK

(U) Research Apprenticeships for Disadvantaged High Schooler (RADMS).

DESCRIPTIVE NOTE: Final rept. for period ending 30 Jun 81.

JUN 81 18P

PERSONAL AUTHORS: Cow'n, Roy B.

CONTRACT NO. F49820-81-C-0081

PROJECT NO. 2313

TASK NO. D3

MONITOR: AFOSR
TR-89-1528

UNCLASSIFIED REPORT

ABSTRACT: (U) The Research Apprenticeships for Disadvantaged High Schooler (RADMS) program was initiated in 1980 at the suggestion of Frank Press, Science Advisor to the President. The objectives are to stimulate broader interest in minority communities in careers in science and engineering and to establish individual working relationships of students with active researchers who may become helpful mentors when students need advice on college and careers and need letters of recommendations. This initial report lists the mentors - their academic qualifications and specialties 0, who will serve in the AFOSR sponsored 1982 RADMS program directed by ABET.

DESCRIPTORS: (U) *MINORITIES, *APPRENTICESHIP, *STUDENTS, ADVISORY ACTIVITIES, CAREERS, COMMUNITIES, SCIENTISTS.

IDENTIFIERS: (U) WJAFOSR2313D3, PE81102F, 'Disadvantaged students.

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ACCREDITATION BOARD FOR ENGINEERING AND TECHNOLOGY NEW YORK

CHICAGO UNIV IL JAMES FRANCK INST

(U) Research Apprenticeships for Disadvantaged High Schoolers (RADHS).

(U) Experimental and Theoretical Studies of Molecular Dynamics.

DESCRIPTIVE NOTE: Final rept. for period ending 30 Jun 82.

DESCRIPTIVE NOTE: Final rept. 1 Oct 80-30 Sep 82.

JUL 82 70P

SEP 82 12P

PERSONAL AUTHORS: Cowin, Roy B.

PERSONAL AUTHORS: Rice, Stuart A.

CONTRACT NO. F49620-81-C-0081

CONTRACT NO. AFOSR-81-0029

PROJECT NO. 2313

PROJECT NO. 2303

TASK NO. D3

TASK NO. B1

MONITOR: AFOSR

MONITOR: AFOSR
TR-89-1551

TR-89-1524

UNCLASSIFIED REPORT

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ABSTRACT: (U) The Research Apprenticeships for Disadvantaged High Schoolers (RADHS) program was initiated in 1980 at the suggestion of Frank Press, Science Advisor to the President. The objectives are to stimulate broader interest in minority communities in careers in science and engineering and to establish individual working relationships of students with active researchers who may become helpful mentors when students need advice on college and careers and need letters of recommendations. This interim report covers the projects, and personnel participating in the AFOSR sponsored 1982 RADHS program directed by ABET.

DESCRIPTORS: (U) *APPRENTICESHIP, *MINORITIES, *STUDENTS, *ADVISORY ACTIVITIES, CAREERS, COMMUNITIES, SCIENTISTS.

IDENTIFIERS: (U) WUAFOSR231303, PE61102F, *Disadvantaged students.

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ABSTRACT: (U) During the period to which this report refers, significant progress was made in both experimental and theoretical studies of intramolecular and intermolecular dynamics. A more detailed description of the work accomplished will be found in the abstracts of the papers listed. The highlights of our work include: Completion of combined experimental and theoretical studies of very low energy collision induced vibrational relaxation; Further development of the relationship between large amplitude motion and the onset of chaos; and Definitive testing and verification of the interpretation of nonexponential time evolution of an excited state of a molecule with intermediate case level structure, including a demonstration of the role of rotational states in defining the rate of the radiationless process. In addition, useful results were obtained in our studies of radiationless processes and of room temperature collision induced vibrational relaxation of electronically excited polyatomic molecules. (aw)

DESCRIPTORS: (U) *MOLECULAR PROPERTIES, *POLYATOMIC MOLECULES, AMPLITUDE, DYNAMICS, EVOLUTION(GENERAL), EXPERIMENTAL DATA, MOLECULE MOLECULE INTERACTIONS, MOTION, RADIATION, THEORY, TIME, MOLECULAR ROTATION, MOLECULAR VIBRATION, MOLECULAR ENERGY LEVELS, EXCITATION, RELAXATION, COLLISIONS.

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IDENTIFIERS: (U) WUAFOSR230381, PE61102F, *Molecular Dynamics, Intramolecular Dynamics, Intermolecular Dynamics, Molecular Relaxation, Nonexponential Time, Chaos, Radiationless Processes.

COLORADO UNIV AT BOULDER DEPT OF AEROSPACE ENGINEERING SCIENCES

(U) Three-Dimensional Interaction Effects in High Speed Boundary Layer Flows.

DESCRIPTIVE NOTE: Final rept. 1 Dec 81-30 Nov 82.

JAN 83 8P

PERSONAL AUTHORS: Inger, G. R.

CONTRACT NO. AFOSR-82-0056

PROJECT NO. 2307

TASK NO. K1

MONITOR: AFOSR
TR-89-1561

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ABSTRACT: (U) The objective of this research is the basic theoretical investigation of three-dimensional pressure, skin friction and heat transfer disturbances in both laminar and turbulent boundary layer flows including viscous-inviscid interaction effects, separation and reattachment. A sound understanding of these phenomena is required in modern aerodynamic design analyses of high-speed flight vehicles. This need led to a systematic basic research effort treating in parallel the twin problems of: 1) viscous-inviscid interaction with flow separation and/or attachment; and 2) three-dimensional effects (including those due to streamwise vortices) in high-speed laminar and turbulent boundary layer flows. (EDC)

DESCRIPTORS: (U) *BOUNDARY LAYER FLOW, *LAMINAR BOUNDARY LAYER, AERODYNAMICS, ATTACHMENT, FLIGHT, FLOW SEPARATION, HEAT TRANSFER, HIGH VELOCITY, INTERACTIONS, INVISCID FLOW, PRESSURE, SKIN FRICTION, THEORY, THREE DIMENSIONAL, TURBULENT BOUNDARY LAYER, TURBULENT FLOW, VISCOUS FLOW, VORTICES.

IDENTIFIERS: (U) Reattached flow, WUAFOSR2307K1, PE61102F.

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HARVARD UNIV CAMBRIDGE MASS DEPT OF CHEMISTRY

(U) Spectroscopic Determination of Intermolecular Potentials of Gas Laser Components and of Major Atmospheric Constituents.

IDENTIFIERS: (U) WUAFOSR2303B1, PE61102F

DESCRIPTIVE NOTE: Final rept..

JAN 83 5P

PERSONAL AUTHORS: Klemperer, William

CONTRACT NO. AFOSR-82-0038

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1552

UNCLASSIFIED REPORT

ABSTRACT: (U) We have completed the detailed structural study of a number of complexes of carbon dioxide. The structure of molecular complexes of carbon dioxide may be of considerable importance in developing a better complete understanding of energy transfer processes in the important carbon dioxide laser and especially in our understanding of the earth's (and other planetary) atmosphere. Earlier research emphasized complexes of hydrogen fluoride. The present research which initiates studies of complexes with water shows that the structural and dynamical behaviour of these two species HF and H2O can be quite different. In this sense our early optimism that studies of HF binding would likely be adequate for understanding H2O binding is certainly unwarranted. It is clear that the H2O systems require much spectroscopic research to place them in a securely understood position. Complete manuscripts on these two problems, CO2 HCN and CO2 H2O are in process of preparation. (aw)

DESCRIPTORS: (U) *CARBON DIOXIDE, *MOLECULAR COMPLEXES, *MOLECULE MOLECULE INTERACTIONS, *WATER, *ATMOSPHERIC CHEMISTRY, CARBON DIOXIDE LASERS, DETERMINATION, DOCUMENTS, DYNAMICS, ENERGY TRANSFER, GAS LASERS, HYDROGEN FLUORIDE, LASER COMPONENTS, OPTIMIZATION, SPECTROSCOPY, MOLECULAR STRUCTURE, HYDROGEN CYANIDE.

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TEXAS UNIV MEDICAL BRANCH AT GALVESTON

NERVOUS SYSTEM, ACTIVATION, ADULTS, ANIMALS, CIRCULATION, EPINEPHRINE, EXPOSURE(PHYSIOLOGY), HEAD(ANATOMY), HEART, HIGH RATE, INTENSITY, LESIONS, MINIATURIZATION, MYOCARDIUM, NERVOUS SYSTEM, NOREPINEPHRINE, OUTPUT, PHYSIOLOGICAL EFFECTS, PLASMAS(PHYSICS), RESPONSE(BIOLOGY), STRESSES, SWINE, WOUNDS AND INJURIES.

(U) The Effect of High Gz Forces on Sympathetic Nervous Activity.

DESCRIPTIVE NOTE: Final rept. 1 Apr 78-31 Mar 79.

MAR 79 289

PERSONAL AUTHORS: Ziegler, Michael G.

CONTRACT NO. AFOSR-78-3601

MONITOR: AFOSR
TR-89-1064

UNCLASSIFIED REPORT

ABSTRACT: (U) Plasma epinephrine, norepinephrine and dopamine-beta-hydroxylase were used to quantitate the degree of sympathetic activation undergone by miniature swine and by men. Swine exposed to high Gz forces have massive output of norepinephrine which falls off rapidly during return to 1 G. Repeated exposures are characterized by a further increase of norepinephrine demonstrating large reserve stores and increased norepinephrine to prolonged stress. These animals also had a massive adrenomedullary output of epinephrine during the stress of high Gz and epinephrine output was even greater after repeated stresses. High Gz exposed swine increased circulating levels of dopamine-beta-hydroxylase and greatly increased levels after five exposures to high Gz. Dopamine-beta-hydroxylase levels, unlike those of norepinephrine and epinephrine, may provide a measure of sympathetic nervous stress that occurred minutes or hours in the past. Human subjects exposed to high Gz forces had basal norepinephrine levels and norepinephrine levels after the termination of high Gz similar to miniature swine. People who have severe head injuries have increased circulating norepinephrine and are subject to development of myocardial lesions. It is possible for men to develop cardiac lesions similar to those previously noted in the adult miniature swine, and these lesions may be caused by the release of endogenous catecholamines. Keywords: Response biology; Physiological effects; Acceleration tolerance; Stress physiology. (kt)

DESCRIPTORS (U) *ACCELERATION TOLERANCE, *SYMPATHETIC

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RHODE ISLAND UNIV KINGSTON DEPT OF INDUSTRIAL
ENGINEERING

(U) Hierarchical Architectural Considerations in
Econometric Modeling of Manufacturing Systems.

DESCRIPTIVE NOTE: Final rept. Mar 80-Jun 81.

JUN 81 121P

PERSONAL AUTHORS: Odrey, Nicholas G.

CONTRACT NO. AFOSR-80-0123

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1527

UNCLASSIFIED REPORT

ABSTRACT: (U) An input-output econometric model was constructed for the Integrated Computer Aided Manufacturing (ICAM) program of the US Air Force. The model generated is a combined model consisting mainly of classical input-output model, flowgraph theory, and econometric models distinct from input-output models. Major outputs of the model consist of a Transaction Table, and optimal dynamic system models. The optimal dynamic system models consist of a dynamic (multi-period) input-output model and a production system models. A literature review was accomplished to aid in the definition of the context and construction of the overall model and to identify various existing analytical techniques which can be applied within the model. The input-output econometric model as constructed and defined exhibits the flexibility and feasibility necessary for use in an interactive decision support system. (jes)

DESCRIPTORS: (U) *COMPUTER AIDED MANUFACTURING, AIR FORCE, DECISION MAKING, DYNAMICS, ECONOMETRICS, ECONOMIC MODELS, INPUT OUTPUT MODELS, INTEGRATED SYSTEMS, INTERACTIONS, LITERATURE SURVEYS, MANUFACTURING, MODELS, OPTIMIZATION, OUTPUT, PRODUCTION MODELS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

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STANFORD UNIV CA DEPT OF APPLIED PHYSICS

(U) Superconducting Thin Films, Composites and Junctions.

DESCRIPTIVE NOTE: Final rept. 1 Oct 83-31 Mar 84.

APR 84 8P

PERSONAL AUTHORS: Geballe, T. H.

CONTRACT NO. F49620-82-C-0014

PROJECT NO. 2306

TASK NO. C1

MONITOR: AFOSR
TR-89-1374

UNCLASSIFIED REPORT

ABSTRACT: (U) The first specific heat measurements on artificially layered superconducting composite structures have been made. Small sample calorimetry has been used to measure the specific heat of Nb2r multilayers with a bilayer period varying from 32 A to 429 A (to a sample thickness of 1.5 um) over the temperature range from 1.5 to 20. The normal state parameters agree with the presence of an interface of an niobium zirconium alloy in agreement with earlier X-ray results. The behavior of the thermally measured transition into the superconducting state and the magnitude of the associated specific heat increase also agree with the Tri-layer model. (aw)

DESCRIPTORS: (U) *SUPERCONDUCTORS, *THIN FILMS, *NIOBIUM ALLOYS, *ZIRCONIUM, COMPOSITE STRUCTURES, LAYERS, MEASUREMENT, PARAMETERS, RANGE(EXTREMES), SPECIFIC HEAT, TEMPERATURE, X RAYS, ZIRCONIUM ALLOYS, JUNCTIONS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306C1, Superconductor Junctions.

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CASE WESTERN RESERVE UNIV CLEVELAND OH DEPT OF
MACROMOLECULAR SCIENCE

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(U) Controlled Structure Adhesive Interphase.
DESCRIPTIVE NOTE: Final rept.,

SEQUENCES, STRUCTURAL PROPERTIES, STRUCTURES, SUBSTRATES,
VOIDS, WATER, X RAY DIFFRACTION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A2, WUAFOSR2303A3,
*Coupling Agents.

NOV 80 15P

PERSONAL AUTHORS: Lando, J. B.; Rogers, C. E.; O'Brien, K.
; Rahmenfueher, E.

CONTRACT NO. AFOSR-78-3692

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-89-1387

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this study was to determine adhesion-related properties of monolayers and multilayers of coupling agents formed with known and controlled compositions and structural packing configurations upon well-characterized glass, pyrolytic graphite, and resin substrates. The effects of exposure to water on interphase structure and properties were to be related to performance characteristics. Variations in the composition of the coupling agent and its mixtures and in the technique of layer deposition could be employed to introduce specific layer sequence structures and defect/void regions in the interphase. The interphase was to be characterized by electron microscopy, an unique micromechanical tensile test, single fiber-matrix deformation studies, and other techniques (e.g., argon ion laser Raman and Fourier Transform infrared spectroscopies, and electron and x-ray diffraction) as deemed appropriate to establish the nature and perfection of interphase structures and component interactions. (aw)

DESCRIPTORS: (U) *CHEMICAL AGENTS, *COUPLING(INTERACTION), *ADHESION, ADHESIVE BONDING, CONFIGURATIONS, CONTROL, DEFORMATION, DEPOSITION, ELECTRON MICROSCOPY, ELECTRONS, FIBERS, GLASS, INTERACTIONS, LAYERS, MATRIX MATERIALS, PHASE STUDIES, POLYMERS, PYROLYTIC GRAPHITE, REGIONS.

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IOWA STATE UNIV AMES DEPT OF STATISTICS

(U) Final Scientific Report for Grant AFOSR-76-3037.

DESCRIPTIVE NOTE: Final rept. 1 Jul 80-30 Jun 81.

JUN 81 4P

PERSONAL AUTHORS: Harville, David A.

CONTRACT NO. AFOSR-76-3037

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1373

UNCLASSIFIED REPORT

ABSTRACT: (U) This report lists the papers and journal articles produced under the grant. Keywords: Statistical analysis; Mathematical prediction/models/estimates. (EDC)

DESCRIPTORS: (U) *STATISTICAL ANALYSIS, ESTIMATES. MATHEMATICAL MODELS, MATHEMATICAL PREDICTION.

IDENTIFIERS: (U) PE81102F, MUAFOSR2304A5.

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CHICAGO UNIV IL DEPT OF CHEMISTRY

(U) Experimental and Theoretical Studies of Intramolecular and Intermolecular Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Sep 76-30 Sep 79.

NOV 79 13P

PERSONAL AUTHORS: Rice, Stuart A.

CONTRACT NO. F49620-76-C-0017

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1372

UNCLASSIFIED REPORT

ABSTRACT: (U) The following papers were published or submitted for publication: Large Amplitude Vibrational Motion in a One Dimensional Chain-Coherent State Representation; Spectroscopic Properties of Polyenes III-1, 3, 5, 7-Octatetraene; On Vibrational Population Relaxation in Solution; Internal Energy Transfer in Isolated Molecules; Ergodic and Nonergodic Behavior-In Proceedings of a Symposium on Advances in Laser Chemistry; The Influence of Nonrandom Sequential Coupling on Radiationless Relaxation Processes; Rotational Effects in Radiationless Processes in Polyatomic Molecules; Single Vibronic Level Fluorescence from Aniline; Collision Induced Intramolecular Vibrational Energy Transfer in 182 Aniline; A Numerical Study of Large Amplitude Motion on a Chain of Coupled Nonlinear Oscillators; Angular Momentum Constraints in Radiationless Processes; The Symmetric Top Molecule; Low Energy Collisional Relaxation of H_2 in He; Evidence for Resonance Enhanced Vibrational Deactivation; Dynamics of Radiationless Processes Studied in Pulsed Supersonic Free Jets; Some Naphthalene Lifetimes; Collision Induced Intramolecular Energy Transfer in Electronically Excited Polyatomic Molecules; Quantum Effects in Intramolecular Energy Transfer The Influence of Rotational Motion on Intersystem Crossing in Isolated molecules. (aw)

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DESCRIPTORS: (U) *MOLECULAR PROPERTIES, *POLYATOMIC MOLECULES, AMPLITUDE, ANGULAR MOMENTUM, CHEMISTRY, COLLISIONS, COUPLING(INTERACTION), DEACTIVATION, DYNAMICS, ENERGY TRANSFER, EXPERIMENTAL DATA, FLUORESCENCE, INTERNAL, ISOLATION, LASERS, LOW ENERGY, MOLECULE, MOLECULE INTERACTIONS, MOLECULES, MOTION, NAPHTHALENES, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS, OSCILLATORS, QUANTUM THEORY, RADIATION, RELAXATION, MOLECULAR ROTATION, SEQUENCES, SPECTROSCOPY, SYMPOSIA, THEORY, MOLECULAR VIBRATION, ANILINES, HELIUM, ENERGY LEVELS.

IDENTIFIERS: (U) PEB1102F, WJAFDSR2303B1, *Molecular Dynamics, Intramolecular Dynamics, Intermolecular Dynamics, Polyenes, Octatetraenes, Radiationless Processes, Molecular Relaxation, Supersonic free jets.

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MARQUETTE UNIV MILWAUKEE WI DEPT OF ELECTRICAL ENGINEERING

(U) The Enhancement of Speech Intelligibility in Wideband Noise.

DESCRIPTIVE NOTE: Final rept. 1 Jun 78-31 Nov 79,

JAN 80 17P

PERSONAL AUTHORS: Niederjohn, Russell J.

CONTRACT NO. AFOSR-78-3800

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-89-1454

UNCLASSIFIED REPORT

ABSTRACT: (U) This report details the results of two studies involving speech mixed with additive white noise. The first study concerns the effects of high-pass and low-pass filtering upon the intelligibility of speech in noise. This study provided basic perceptual data concerning the speech in noise situation. The second study concerns the development of a method for processing speech mixed with noise to result in an enhancement of its intelligibility. While several processing methods were implemented, the method explored in greatest detail was based upon a combination of a spectral subtraction method and a pitch tracking method. The final intelligibility results obtained using the method did not show that it resulted in an intelligibility enhancement over unprocessed speech in noise. However, the results are very enlightening regarding this speech in noise problem. In addition, it is the author's belief that the basic processing method has significant potential for enhancing the intelligibility of speech in noise. (EDC)

DESCRIPTORS: (U) *SPEECH ANALYSIS, *SIGNAL PROCESSING, *INTELLIGIBILITY, BROADBAND, LOW PASS FILTERS, METHODOLOGY, NOISE, OPTIMIZATION, PERCEPTION(PSYCHOLOGY), SOUND PITCH, SPECTRA, SPEECH, TRACKING, WHITE NOISE.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV1561

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IDENTIFIERS: (U) PE81102F. WUAFOSR2304AG.

MARQUETTE UNIV MILWAUKEE WI DRPT OF CIVIL ENGINEERING

(U) Analysis of Rapid Runway Repairs Subjected to Large Magnitude Dynamic Loads

DESCRIPTIVE NOTE: Final rept Jun 80-Feb 81.

FEB 81 50P

PERSONAL AUTHORS: Woeifl, Gerald A.

CONTRACT NO. AFOSR-80-0193

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-89-1525

UNCLASSIFIED REPORT

ABSTRACT: (U) Conclusions, based on laboratory testing and computer analyses conducted for this investigation, include: 1) Design and analysis of rapid runway repairs subjected to large magnitude dynamic loads require that dynamic material properties be determined. Laboratory testing for dynamic material properties must be conducted at frequencies and load rates corresponding to aircraft speeds at which large magnitude loads are anticipated. Equations developed in this report can be used to calculate the frequency and duration of loading which correspond to an aircraft speed for a particular type of aircraft and pavement system. 2) The modulus of rupture of polymer concrete increases with rate of loading; the increase is within the range of increases for Portland Cement Concrete. For the fatigue life of polymer concrete, there is a high correlation between experimental results and an equation developed in this study which relates probability of survival with stress level and the number of cycles to failure. 3) Because of the high modulus of rupture of polymer concrete, all of the aircraft-pavement systems analyzed in this report are more than adequate for flexural fatigue failure criteria. and 4) Design of sulfur concrete repairs must be based on the maximum dynamic load. (EDC)

DESCRIPTORS: (U) *DYNAMIC LOADS. *PAVEMENTS. *REPAIR.

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*RUNWAYS, AIRCRAFT, CEMENTS, CONCRETE, DYNAMICS, EQUATIONS, FAILURE, FATIGUE(MECHANICS), FATIGUE, LIFE, FLEXURAL PROPERTIES, LABORATORY TESTS, MATHEMATICAL PREDICTION, POLYMERS, RATES, RUPTURE, STRESSES, SULFUR, SURVIVABILITY, TIME, VELOCITY.

IDENTIFIERS: (U) Modulus of rupture, Polymer concrete, MUAFOSR2307D9, PE61102F.

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1/3.12

WAYNE STATE UNIV DETROIT MICH DEPT OF INDUSTRIAL
ENGINEERING AND OPERATIONS RESEARCH

(U) Evaluation of Life Sciences Research.

DESCRIPTIVE NOTE: Final rept. 1 May 78-30 Apr 79.

JUN 79 14P

PERSONAL AUTHORS: Christensen, Julian M.

CONTRACT NO. F49620-78-C-0075

PROJECT NO. 2313

TASK NO. A3

MONITOR: AFOSR
TR-89-1500

UNCLASSIFIED REPORT

ABSTRACT: (U) Evaluations in the behavioral and biomedical sciences were conducted for the Life Sciences Directorate, Air Force Office of Scientific Research. The following tasks were performed on this project a) an investigation of the human operator in advanced aerospace systems (HOAS), b) organization of four AFOSR/NL program reviews one on environmental and acceleration physiology, another on visual processes and human operator control, the third on environmental protection and toxic hazards, and the fourth on flight and technical sciences. (aw)

DESCRIPTORS: (U) *BEHAVIORAL SCIENCES, *BIOMEDICINE, *ENVIRONMENTAL PROTECTION, *MAN MACHINE SYSTEMS, *STRESS(PHYSIOLOGY), *TOXICOLOGY, ACCELERATION, AEROSPACE SYSTEMS, CONTROL, FLIGHT, LIFE SCIENCES, OPERATORS(PERSONNEL), OPTICAL IMAGES, PHYSIOLOGY, TOXIC HAZARDS, ACCELERATION TOLERANCE, VISION.

IDENTIFIERS: (U) PE61102F, MUAFOSR2313A3.

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SEARCH CONTROL NO EVI56L

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12/3

SOUTHERN METHODIST UNIV DALLAS TX DEPT OF STATISTICAL
SCIENCE

(U) Biased Estimation in Regression.

DESCRIPTIVE NOTE: Final rept.

79

3P

PERSONAL AUTHORS: Gunst, Richard F.

CONTRACT NO. AFOSR-75-2871

PROJECT NO. 1304

TASK NO. A5

MONITOR: AFOSR
TR-89-1505

UNCLASSIFIED REPORT

ABSTRACT: (U) Important theoretical advances were obtained for the latent root, principal component, and ridge estimators of the parameters of multiple linear regression models. Specifically, theoretical comparisons among these estimators and the classical least squares estimator revealed that the biased estimators offer great potential for more accurate estimation than least squares when predictor variables are multicollinear. Among the biased estimators, all three compete favorably over a wide range of model configurations with each being able to estimate more accurately than the others for certain types of model configurations. Special emphasis has been directed toward the investigation of the latent root regression estimator. Its theoretical efficacy and asymptotic properties have been developed and its potential for improvement over other biased estimators has been shown. (KR)

DESCRIPTORS: (U) *ESTIMATES, *LINEAR REGRESSION ANALYSIS, *MATHEMATICAL MODELS, ACCURACY, ASYMPTOTIC SERIES, BIAS, CONFIGURATIONS, PARAMETRIC ANALYSIS, LEAST SQUARES METHOD, PREDICTIONS, RANGE(EXTREMES), VARIABLES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304AS.

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20/5

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF CHEMISTRY

(U) Rotationally Inelastic Collisions of a Molecule in a
(1)Delta Electronic State: NH(a(1)Delta)

DESCRIPTIVE NOTE: Journal article.

89

10P

PERSONAL AUTHORS: Sauder, Deborah G.; Patel-Misra, Dipti;
Dagdigian, Paul J.

CONTRACT NO. F49620-88-C-0058

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1575

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v91
n9 p5316-5323, 1 Nov 89.

ABSTRACT: (U) The general theory for inelastic scattering of molecules in 1 Delta electronic states is outlined and applied to the specific case of 1 Delta states arising from a pi-sq electron occupancy, e.g. NH(a 1 Delta). Integral cross sections for rotational transitions out of the lowest rotational level (J=2) of NH(a 1 Delta) nu=0 are reported for several targets. A pulsed beam of rotationally cold NH(a 1 Delta) was produced by 193 nm photolysis of a dilute mixture of hydrazoic acid in nitrogen seed gas at the tip of a nozzle. The target beam was also prepared as a pulsed supersonic beam. The final rotational state distribution was measured in the collision zone by laser fluorescence excitation. The state-to-state cross sections were found to decrease significantly with increasing final rotational quantum number J'. The magnitude of the J=2 to J'=3 cross sections were compared for the different targets. Isotopic scrambling in NH(a 1 Delta)-D2 collisions was also searched for but not observed. Keywords: Inelastic collisions; Rotational transitions; Electronic state; Imidogen; Reprints. (Jnd)

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DESCRIPTORS: (U) *ELECTRONIC STATES, *LASER INDUCED FLUORESCENCE, *NITROGEN COMPOUNDS, CODING, PARTICLE COLLISIONS, CROSS SECTIONS, DILUTION, ELASTIC PROPERTIES, EXCITATION, HYDRAZOID ACID, INELASTIC SCATTERING, ISOTOPIES, MIXTURES, PHOTOLYSIS, LIGHT PULSES, REPRINTS, MOLECULAR ROTATION, SUPERSONIC CHARACTERISTICS, THEORY, TRANSITIONS.

AD-A215 222 7/6 11/10 7/4

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) Rubber-Like Elasticity.

DESCRIPTIVE NOTE: Journal article.

89 14P

IDENTIFIERS: (U) PE61102F, WJAFOSR230381, Imidogen.

PERSONAL AUTHORS: Erman, B.; Mark, J. E.

CONTRACT NO. AFOSR-83-0027

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1578

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Annual Review of Physical Chemistry, v40 p351-374 1989.

ABSTRACT: (U) The area of rubber-like elasticity has had one of the longest and most distinguished histories in all of polymer science. For example, quantitative measurements of the mechanical and thermodynamic properties of natural rubber and other elastomers go back to 1805, and some of the earliest studies have been carried out by such luminaries as Joule and Maxwell. Also, the earliest molecular theories for polymer properties of any kind were, in fact, addressed to the phenomenon of rubber-like elasticity. Although much has been accomplished in the area of rubberlike elasticity, much also remains to be done. Among the most important topics are a) improved understanding of dependence of Glass transition Temperature and Mean Temperature on polymer structure, b) preparation and characterization of high-performance elastomers, c) new cross-linking techniques, d) improved understanding of network topology, e) more experimental results for deformations other than elongation and swelling, f) better characterization of segmental orientation, g) more detailed understanding of critical phenomena and gel collapse, h) additional molecular characterization by using NMR spectroscopy and various scattering techniques, i) study of possibly novel properties of bioelastomers, and j) improved molecular

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understanding of reinforcing effects of filler particles
in elastomers. Reprints. (av)

STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

DESCRIPTORS: (U) *ELASTIC PROPERTIES, *RUBBER,
*MOLECULAR PROPERTIES, COLLAPSE, CROSSLINKING(CHEMISTRY),
DEFORMATION, ELASTOMERS, ELONGATION, FILLERS, GELS, MEAN,
MEASUREMENT, MECHANICAL PROPERTIES, MOLECULES, NATURAL
RUBBER, NETWORKS, PARTICLES, PERFORMANCE(ENGINEERING),
POLYMERS, REINFORCING MATERIALS, REPRINTS, SCATTERING,
SPECTROSCOPY, SYNTHETIC RUBBER, TEMPERATURE, THEORY,
THERMODYNAMIC PROPERTIES, TOPOLOGY, TRANSITION
TEMPERATURE, MOLECULAR STRUCTURE, EXPANSION.

(U) Rational Approximations with Hankel-Norm Criterion.

DESCRIPTIVE NOTE: Final rept.

80 3P

PERSONAL AUTHORS: Genin, Y.; Kung, S.

CONTRACT NO. F49620-79-C-0058, DAAG28-79-C-0215

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-89-1809

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, Biogelastomers,
Swelling.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the IEEE, n.d.
Sponsored in part by grants NSF-ENG73-08673 and NSF-ENG78-
10003.

ABSTRACT: (U) A two-variable approach to the model
reduction problem with Hankel-norm criterion is discussed
in this reprint. The problem is proved to be reducible to
obtain a two-variable all-pass rational function.
Interpolating a set of parametric values at specified
points inside the unit circle. A polynomial formulation
and the properties of the optimal Hankel norm
approximations are then shown to result directly from the
general form of the solution of the interpolation problem
considered. As a consequence, the recursive Nevanlinna
algorithm can be employed and the essential stability
properties of the solution can be established with the
help of the Nevanlinna matrix (8). This short paper is
meant to briefly summarize the work in the full paper (8),
where the reader is referred to for more details.
Reprints. (KR)

DESCRIPTORS: (U) *APPROXIMATION(MATHEMATICS),
*INTERPOLATION, ALGORITHMS, CIRCLES, FORMULATIONS,
PARAMETRIC ANALYSIS, POLYNOMIALS, REDUCTION, REPRINTS,
STABILITY, VALUE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A8, Hankel Norm

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Criterion.

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COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Dynamics of Intermolecular Electronic Energy Transfer
at an Air/Liquid Interface,

MAR 88 3P

PERSONAL AUTHORS: Sitzmann, E. V.; Eisenthal, K. B.

CONTRACT NO. AFOSR-88-0014

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-88-1577

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics. v90
n5 p2831-2832, 1 Mar 1989.

ABSTRACT: (U) Picosecond time resolved studies of
intermolecular electronic energy transfer between
molecules at the air/liquid interface have been done.
Reprints. (JHD)

DESCRIPTORS: (U) *HYDROGEN BONDS, *WATER, *ENERGY
TRANSFER, *MOLECULE MOLECULE INTERACTIONS, AIR,
INTERFACES, LIQUIDS, MOLECULAR PROPERTIES, ENERGETIC
PROPERTIES, VAPORS, REPRINTS.

IDENTIFIERS: (U) PEB1102F, WUAFOSR230382.

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COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) The Energetics of Orientation at the Liquid-Vapor Interface of Water.

89

5P

PERSONAL AUTHORS: Goh, M. C.; Eisenthal, Kenneth B.

CONTRACT NO. AFOSR-88-0014

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-88-1578

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,
v157 n1,2 p101-104, 28 Apr 89.

ABSTRACT: (U) To study the energetics of orientation of water molecules at the neat liquid vapor interface of water, the temperature dependence of the second harmonic signal is examined. With the use of a simple model, an energy of orientation at the neat liquid vapor interface is estimated to be about 1/2 at room temperature. We discuss the role of hydrogen bonding and the permanent moments of water on its molecular orientation at the interface. Reprints. (JHD)

DESCRIPTORS: (U) *HYDROGEN BONDS, *INTERFACES, *THERMAL PROPERTIES, ENERGETIC PROPERTIES, ENERGY, HARMONICS, LIQUIDS, MOLECULAR PROPERTIES, ORIENTATION(DIRECTION), REPRINTS, SIGNALS, VAPORS, WATER.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B2.

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AD A215 214 7/4 7/3

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) The Role of Translational Friction in Isomerization Reactions.

FEB 89

4P

PERSONAL AUTHORS: Bowman, Robert M.; Eisenthal, Kenneth B.

CONTRACT NO. AFOSR-88-0014

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-88-1578

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,
v155 n1 p99-101, 17 Feb 89.

ABSTRACT: (U) The hydrodynamic friction used in many comparisons of isomerization reactions with Kramers' theory is shown to be related to the translational friction. The fractional viscosity dependence of the translational friction of naphthalene is shown to account for the failure of hydrodynamic models for 1,1'-binaphthyl in alkanes. The success of the reorientational model of friction is also discussed. Finally, an idea developed by Zwanzig and Harrison is used in rationalizing the fractional dependences. In this study, the connection between the isomerization friction experienced in crossing the barrier and the translational friction of the freely diffusing molecule is demonstrated. This relationship suggests that measuring macroscopic diffusion coefficients would be helpful in elucidating the proper friction to use in the Kramers model or any other Markovian model. Finally, it appears that the naphthalene translational motion and 1,1'-BN rotational motion experience similar frictional forces in alkanes; neither of which obey traditional hydrodynamics. We find that one way to understand these fractional exponents in the context of hydrodynamics is to allow for the solute-solvent coupling to change as one progresses along the solvent series. Reprints. (aw)

UNCLASSIFIED

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DESCRIPTORS: (U) *ALKANES, *FRICTION, *HYDRODYNAMICS, *ISOMERIZATION, *NAPHTHALENES, FAILURE, MARKOV PROCESSES, MATHEMATICAL MODELS, ORIENTATION(DIRECTION), REPRINTS, SOLVENTS, VISCOSITY, HYDRODYNAMIC CODES, DIFFUSION COEFFICIENT, DIFFUSION, MOLECULAR ROTATION, ORGANIC SOLUTES, COUPLING(INTERACTION).

NORTHWESTERN UNIV EVANSTON IL DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCI ENCE

(U) Inversion of Band Matrices.

DESCRIPTIVE NOTE: Final rept..

IDENTIFIERS: (U) PEG1102F, WUAFOSR230382, Translational Friction, Kramers Theory.

79 3P

PERSONAL AUTHORS: Ikebe, Yasuhiko

CONTRACT NO. AFOSR-77-3183

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-89-1392

UNCLASSIFIED REPORT

ABSTRACT: (U) This is the summary report for the project entitled Matrix methods for special functions arising in applications. An extremely simple and efficient method for computing the zeros (possibly complex) of Bessel functions $J(Z)$ (sub m) of any real order and of their derivatives was developed and tested. For the complex zeros (the case $m < -1$) the numerical experiment shows that the method computes the zeros in the increasing order of distance from the origin. The method developed in this project is the first known systematic method for computing the complex zeros of Bessel functions of order less than -1 . The method consists of writing the well-known three-term recurrence relations in matrix form, thus reformulating the problem of finding the zeros as eigenvalue problem for infinite matrices. A very complete analysis for the rate of convergence has been obtained for the zeros of Bessel functions of real order greater than -1 .

DESCRIPTORS: (U) *BESSEL FUNCTIONS, *SOLUTIONS(GENERAL), *MATRIX THEORY, CONVERGENCE, EFFICIENCY, EIGENVALUES, NUMERICAL ANALYSIS, RANGE(DISTANCE), RATES, SPECIAL FUNCTIONS(MATHEMATICAL).

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A3.

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NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

UNIVERSITY OF SOUTH FLORIDA TAMPA DEPT OF STATISTICS

(U) Structure of Rh(1) Complex of a Bis(2,3-quinolino)-annulated cis,syn,cis-Tricyclo(6.3.0.0(3,7) Undecane.

(U) The Development of Some Stochastic Models of Mathematical Sciences.

89 8P

DESCRIPTIVE NOTE: Final rept..

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante; Marchand, Alan D.; Annapurna, Pendra

MAY 80 4P

PERSONAL AUTHORS: Tsokos, Chris P.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

CONTRACT NO. F49620-79-C-0133

TASK NO. B2

PROJECT NO. 2304

MONITOR: AFOSR TR-88-1296

MONITOR: AFOSR TR-89-1493

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, C45 p856-859 1989.

ABSTRACT: (U) The research accomplishments under the present contract fall in three areas of mathematical sciences: nonparametric probability estimation, environmental problems, and reliability modelings. Utilizing the theory of sample characteristic functions and the Fourier representation of the kernel estimator, we have derived rates of convergence for kernel estimators in a large class of Hilbert spaces. Preliminary results have been obtained on two unresolved problems in the area of penalized maximum-likelihood estimators. The first problem we dealt with is developing the consistency conditions of such estimators. The second accomplishment was the development of an objective criterion for choosing a smoothness parameter. (kr)

ABSTRACT: (U) The structure of Rh(cod)(Bqtu)+ BF4- (IUPAC name of ligand bqtu: 5b, 5c, 12a, 13, 13a, 14-hexahydro-12H-cyclopenta(1, 2:4, 5;4, 3:4'5')dicyclopenta(1, 2:8;1', 2'-8')diquinoline) has been determined by single crystal X-ray crystallographic methods. Keywords: Fused ring compounds, Strain energies, Intramolecular interactions, Cyclic compounds, Rhodium, Metal complexes, Cations, Molecular cleft, Undecanes, Reprints. (aw)

DESCRIPTORS: (U) *CYCLIC COMPOUNDS, *METAL COMPLEXES, *RHODIUM, *DECANES, CATIONS, REPRINTS, MOLECULAR STRUCTURE, LIGANDS, HYDROGEN, QUINOLINES, X RAYS, CRYSTALLOGRAPHY.

DESCRIPTORS: (U) *MATHEMATICAL MODELS, *STOCHASTIC PROCESSES, CONSISTENCY, CONTRACTS, ENVIRONMENTS, ESTIMATES, FOURIER ANALYSIS, HILBERT SPACE, KERNEL FUNCTIONS, MATHEMATICS, NONPARAMETRIC STATISTICS, PROBABILITY, RELIABILITY.

IDENTIFIERS: (U) PE81102F, WJAFOSR230382, *Undecanes, Molecular Cleft, Intramolecular Interactions.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A5.

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NEW YORK UNIV N Y

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(U) Methods for Computing the Pattern of Compressible
Fluid Flow in Nozzles or Past Bodies.

PROCESSING, ITERATIONS, NONLINEAR ANALYSIS, OPTIMIZATION,
PARTIAL DIFFERENTIAL EQUATIONS, SHOCK, STRENGTH(GENERAL),
STRUCTURES, NOZZLE GAS FLOW, TIME DEPENDENCE.

DESCRIPTIVE NOTE: Final rept..

IDENTIFIERS: (U) Computational Fluid Dynamics, PE61102F,
WJAFDSR2304A3.

79

7P

PERSONAL AUTHORS: Morawetz, Cathleen S.

CONTRACT NO. F44820-74-C-0082

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-89-1501

UNCLASSIFIED REPORT

ABSTRACT: (U) The method of relaxation was used for a transonic type mixed equation corresponding to transitions from subsonic to supersonic flows. This technique was applied to obtain convergent iteration schemes for an equation of Tricomi type in a rectangle. Research on the method of artificial compression consisted of two parts: 1) Development and analysis of the scheme; 2) Applications to computation fluid dynamics and in particular, to flows with chemically reacting fluids. A study was made on the feasibility of replacing shock fitting techniques for computations of chemically reacting fluids by (i) artificial compression type methods and (ii) image enhancement methods. When computing chemically reacting flows it is extremely important to have a monotone and sharp front. Boundary conditions for time-dependent problems with an artificial boundary. Singular non-linear elliptic problems were studied by the finite element method. In studying the strength of elastic structures a great deal of use has been made of the finite element method to approximate the partial differential equations which govern the equilibria (jhd)

DESCRIPTORS: (U) COMPRESSIBLE FLOW, TRANSONIC FLOW,
CONVERGENCE, ELASTIC PROPERTIES, ELLIPSES, FINITE ELEMENT
ANALYSIS, FITTINGS, FLUID DYNAMICS, FLUID FLOW, IMAGE

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MICHIGAN STATE UNIV EAST LANSING

(U) A Statistical Model for Hydrogen Halide Product Distributions Using Information Theory.

ANALYSIS, VIBRATION, REACTION KINETICS, ISOTOPES, DEUTERIUM, FLUORIDES, CHLORIDES, BROMIDES

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B1

DESCRIPTIVE NOTE: Final rept.,

JAN 80 42P

PERSONAL AUTHORS: Stone, D. H.; Kerber, R. L.

CONTRACT NO. AFOSR-75-2842, NSF-ENG78-00733

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1490

UNCLASSIFIED REPORT

ABSTRACT: (U) Chemical laser modeling is dependent on the reaction rate coefficients available from both experiment and theory. A statistical model has been developed to correlate the relative rate coefficients for the laser pumping reactions: (I) $F + H_2$ yields $HF(v, J) + H$, (II) $F + D_2$ yields $DF(v, J) + D$, (III) $H + F_2$ yields $HF(v, J) + F$, (IV) $D + F_2$ yields $DF(v, J) + F$, (V) $H + Cl_2$ yields $HCl(v, J) + Cl$, (VI) $D + Cl_2$ yields $DCl(v, J) + Cl$, (VII) $H + Br_2$ yields $HBr(v, J) + Br$, and (VIII) $D + Br_2$ yields $DBr(v, J) + Br$. The detailed product distributions for Reactions (IV) and (VIII) are generated by the model. The model uses surprisal analysis to relate the product rotational distributions for each reaction by considering each vibrational level separately. The model results coupled with the observed vibrational distributions favorably reproduce the rotational distributions for Reactions (III) and (VII). Assuming an isotopic independence for some parameters between Reactions (III) and (IV) and between (VII) and (VIII), the model can generate the full vibrational distributions for (IV) and (VIII) from a small set of input parameters. (aw)

DESCRIPTORS: (U) *CHEMICAL LASERS, *HYDROGEN COMPOUNDS, *LASER PUMPING, *HALIDES, COEFFICIENTS, DISTRIBUTION, INFORMATION THEORY, INPUT, ENERGY LEVELS, MATHEMATICAL MODELS, PARAMETERS, REACTION TIME, ROTATION, STATISTICAL

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MICHIGAN UNIV ANN ARBOR DEPT OF MATHEMATICS

(U) The Singularity Expansion Method and Complex Singularities of Exterior Scalar and Vector Scattering in Acoustics and Electromagnetic Theory.

DESCRIPTIVE NOTE: Final rept. 1 Jun 78-31 May 79.

79 77P

PERSONAL AUTHORS: Dolph, Charles L.

CONTRACT NO. AFOSR-77-3358

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1588

UNCLASSIFIED REPORT

ABSTRACT: (U) An examination of the relationship between the scattering matrix (the Fourier transform of the scattering operator) and the integral equations used in the Singularity Expansion Method (SEM) established that only the complex poles off the axis are intrinsically associated with the scatterer. While it has been known in special cases that those on the axis do not contribute to the field, this appears to be the first time this relationship has been clearly exhibited. Since the scattering matrix can be shown to be analytic in a half-plane containing the axis, any integral equation should exhibit the same properties for this region. The relationship between the eigenvalues of the integral equations of SEM and the complex eigenvalues of the associated partial differential equations -- whether scalar or vector. In particular, the integral equations of SEM have at most two eigenvalues $+$ or $-$ and these are functions of the at most denumerable number of complex eigenvalues of the associated differential equations. The theory of non-self-adjoint operators in Hilbert space could have significant implications for that part of the electrical engineering formalism known as the Eigenmode Expansion Method (EEM) particularly in relevance to the use of this formalism in developing equivalent circuits. (Jhd)

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DESCRIPTORS: (U) *ACOUSTIC SCATTERING, *ELECTROMAGNETIC SCATTERING, ACOUSTICS, DIFFERENTIAL EQUATIONS, EIGENVALUES, COMPLEX VARIABLES, ELECTRICAL ENGINEERING, ELECTROMAGNETISM, EQUIVALENT CIRCUITS, EXPANSION, FOURIER TRANSFORMATION, HILBERT SPACE, INTEGRAL EQUATIONS, OPERATORS(MATHEMATICS), PARTIAL DIFFERENTIAL EQUATIONS, SCALAR FUNCTIONS, VECTOR ANALYSIS.

IDENTIFIERS: (U) SEM(Singularity Expansion Method), EEM(Eigenmode Expansion Method), PE81102F, WUAFOSR2304A4.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV156L

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NORTHWESTERN UNIV EVANSTON IL DEPT OF INDUSTRIAL
ENGINEERING AND MANAGEMENT SCIENCES

EQUILIBRIUM(GENERAL), OPTIMIZATION, PARAMETRIC
PROGRAMMING, SUPPLIES, THEORY

(U) Generalized Geometric Programming with Applications.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304AB, *Geometric
programming.

DESCRIPTIVE NOTE: Final rept. 1 Oct 78-31 Mar 79.

79 7P

PERSONAL AUTHORS: Peterson, Elmor L.

CONTRACT NO. AFOSR-77-3134

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-89-1503

UNCLASSIFIED REPORT

ABSTRACT: (U) During the grant period the author's research efforts has been concentrated in five major directions: (1) the effective formulation and study of two important optimization problems and two important equilibrium problems (as generalized geometric programming problems), (2) an investigation of the relations between suboptimization and parameter deletion, including the relations between ordinary duality, geometric duality, and Rockafellar duality, (3) an investigation of the relations between the fixed point problem and the geometric complementarity problem (a generalization of the ordinary complementarity problem), (4) an extension of the classical existence theorems for both the fixed point problem and the variational inequality problem, to deal with the geometric complementarity problem, (5) the preparation of a book that unifies and contrasts ordinary programming theory, geometric programming theory, parametric programming theory, ordinary complementarity theory, geometric complementarity theory, fixed point theory, and variational inequality theory; while showing how each of these theories supplies different insights into various important optimization problems and equilibrium problems. (KR)

DESCRIPTORS: (U) *GEOMETRY, *MATHEMATICAL PROGRAMMING.

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV156L

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STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

(U) Computational Complexity, Efficiency and
Accountability in Large Scale Teleprocessing Systems.

DESCRIPTIVE NOTE: Final rept. 1 May 78-30 Apr 79.

79

5P

PERSONAL AUTHORS: Gill, John T.; Hellman, Martin E.

CONTRACT NO. F49620-78-C-0086

MONITOR: AFOSR
TR-89-1504

UNCLASSIFIED REPORT

ABSTRACT: (U) We have developed a digital signature system whose security rests primarily on the existence of a one-way function. Since many one-way functions are known, and since their existence is essential to even conventional authentication systems, the security of the new system is at least as good as in conventional authentication. The security of previously known digital signature systems depends on the difficulty of factoring and related problems and is open to more question. There is a penalty paid for this security in the increased time required to compute a signature, but recent modifications reduced this penalty to an acceptable level. The signature system uses a form of tree authentication, coupled with a one-way hash function to compress a large authentication file into a single number of approximately 100 bits. A patent disclosure has been filed and a paper will be submitted for publication. (KR)

DESCRIPTORS: (U) ACCOUNTABILITY, COMPUTATIONS, DIGITAL SYSTEMS, FUNCTIONS, PATENTS, PENALTIES, SIGNATURES, TELECOMMUNICATIONS.

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GORDON RESEARCH CONFERENCES INC KINGSTON RI

(U) Gordon Research Conference on Plasma Chemistry (10th).
Held in Tilton, New Hampshire on August 15-19, 1988.

DESCRIPTIVE NOTE: Final rept. 1 Jul 88-30 Jun 89,

OCT 89 27P

PERSONAL AUTHORS: Garscadden, Alan

CONTRACT NO. AFOSR-88-0208

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-89-1502

UNCLASSIFIED REPORT

ABSTRACT: (U) The 1988 Gordon Research Conference on Plasma Chemistry was divided into nine sessions. Eight had two or three invited talks and two or three discussion papers with the total never exceeding five. The ninth session was a poster session which had 45 presentations. Two sessions dealt with the latest findings in low pressure, non-equilibrium plasma chemistry, covering the topics of plasmas in device technology, and plasma enhanced processing including diamond thin films and microwave plasma etching. One high pressure, thermal plasma session covered plasma processing for metallurgical applications and surface-plasma interactions. Six joint sessions included sessions on future plasma chemistry, nucleation and growth, plasma modeling, one each on diagnostics and new techniques in plasma synthesis/processing and the poster session. All the sessions were very well attended and generated much interest. (aw)

DESCRIPTORS: (U) PLASMAS(PHYSICS), CHEMICAL ENGINEERING, CHEMISTRY, DIAMONDS, ETCHING, HIGH PRESSURE, LOW PRESSURE, METALLURGY, MICROWAVES, MODELS, NEW HAMPSHIRE, NONEQUILIBRIUM FLOW, NUCLEATION, PROCESSING, SYNTHESIS, THERMAL PROPERTIES, THIN FILMS, PLASMA DIAGNOSTICS, PLASMA DEVICES, SYMPOSIA.

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SEARCH CONTROL NO EV156L

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IDENTIFIERS: (U) PE61102F, WJAFOSR2301A4

CASE WESTERN RESERVE UNIV CLEVELAND OH DEPT OF COMPUTER
ENGINEERING AND SCIEN CE

(U) Probabilistic Analysis of Algorithms for NP-Complete
Problems

DESCRIPTIVE NOTE: Final rept. 1 Sep 82-30 Aug 83.

SEP 83 3P

PERSONAL AUTHORS: Franco, John

CONTRACT NO. AFOSR-82-0331

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-89-1475

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period the investigator produced papers with titles, Duality, finite improvement and efficiently solved optimization problems. Sensitivity of probabilistic results on algorithm for NP-complete problems to input distribution, and a third, being written now, Probabilistic analysis of algorithms for the satisfiability problem. The first shows that it is highly unlikely that an NP-complete problem can be solved by any of a certain broad class of algorithms. The second shows that favorable results on a certain set of problems are misleading. That is if another input distribution is used the algorithms perform badly in the probabilistic sense. The main result in the third is that the satisfiability problem, an NP-complete problem, can be solved efficiently in the probabilistic sense under a distribution which causes no misleading results. The report summarizes results of research conducted under the grant during the inclusive dates. (KR)

DESCRIPTORS: (U) *ALGORITHMS. *PROBABILITY, DISTRIBUTION.
INPUT, OPTIMIZATION.

IDENTIFIERS: (U) PE61102F, WJAFOSR2304A2

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV156L

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LOWELL UNIV MA CENTER FOR ATMOSPHERIC RESEARCH

(U) Research on the Inverse Problem of Scattering.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-30 Sep 83.

OCT 83 GP

PERSONAL AUTHORS: Mosses, Harry E.

CONTRACT NO. AFDSR-81-0253

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1474

UNCLASSIFIED REPORT

ABSTRACT: (U) Interest continues in the linear filter. This equation, sometimes called the Kalman filter equation, is identical to the Gelfand-Levitan equation of inverse scattering theory. The filter equation can be solved in terms of a comparison filter and given group-like relations between filters. A paper reporting the results has been accepted for publication. A second area of interest is the phase retrieval problem. The solution of this problem is important in imaging problems associated with speckle interferometry, tomography and other areas. A much simpler algorithm was obtained. Unlike most previous algorithms it can be extended readily to two dimensions. (JMD)

DESCRIPTORS: (U) *INVERSE SCATTERING, *KALMAN FILTERING, *LINEAR FILTERING, ALGORITHMS, COMPARISON, IMAGES, TWO DIMENSIONAL, INTERFEROMETRY, PHASE, SCATTERING, SPECULAR REFLECTION, TOMOGRAPHY.

IDENTIFIERS: (U) PEG1102F, MUAFOSR2304A4, Gelfand Levitan Equations.

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RUTGERS - THE STATE UNIV PISCATAWAY NJ

(U) Summary of Conference: Atomic Diffusion on Amorphous and Crystalline Surfaces Held in Piscataway, New Jersey on April 8-9, 1982.

DESCRIPTIVE NOTE: Final rept. 8 Apr-7 Oct 82.

SEP 82 SP

PERSONAL AUTHORS: Garofalini, S. M.

CONTRACT NO. AFOSR-82-0109

PROJECT NO. 2308

TASK NO. B1

MONITOR: AFOSR
TR-89-1489

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *ADATOMS, *DIFFUSION, CRYSTAL STRUCTURE, SURFACE PROPERTIES, METALS, SAPPHIRE, ADSORPTION, ELECTRON MICROSCOPY, SYMPOSIA, REPORTS.

UNCLASSIFIED

AD-A215 157 20/5 21/2 DITC REPORT BIBLIOGRAPHY SEARCH CONTINUED NO EV156L
CALIFORNIA UNIV BERKELEY DEPT OF MECHANICAL ENGINEERING
(U) Investigation of Laser Induced Fluorescence Spectroscopy for Making In-Situ Species Concentration Measurements in Turbulent Combustion Flows
IDENTIFIERS (U) Turbulent Combustion, Pfn1102F, WUAFOSR2308A1

DESCRIPTIVE NOTE: Final rept. May 77-Apr 81.

NOV 81 6P

PERSONAL AUTHORS: Daily, John W.

CONTRACT NO. AFOSR-77-3357

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-88-1498

UNCLASSIFIED REPORT

ABSTRACT: (U) The application is made for Laser Induced Fluorescence Spectroscopy (LIFS) to measurement of species concentrations and temperatures in flame adds. Abstracts: Pulsed Resonance Spectroscopy Applied to Turbulent Combustion Flows; Saturation Effects in Laser Induced Fluorescence Spectroscopy; Use of Rate Equations to Describe Laser Excitation in Flames; Laser Induced Fluorescence Measurement of Sodium in Flames; Saturation of Fluorescence in Flames with A Gaussian Laser Beam; Detectability Limit and Uncertainty Considerations for Laser Induced Fluorescence Spectroscopy in Flames; Coherent Optical Transient Spectroscopy in Flames; Near Resonant Rayleigh Scattering and Atomic Flame Fluorescence Spectroscopy; Laser Excitation Dynamics of OH in Flames; and Measurement of Temperature in Flames Using Laser Induced Fluorescence Spectroscopy of OH. (JHD)

DESCRIPTORS: (U) *FLAMES, *HYDROXYL RADICALS, *LASER INDUCED FLUORESCENCE, *MEASUREMENT, *EMISSION SPECTROSCOPY, *TEMPERATURE, ATOMIC SPECTROSCOPY, COHERENCE, COMBUSTION, DETECTION, GAUSSIAN NOISE, LASER BEAMS, LIMITATIONS, OPTICAL PROPERTIES, PULSES, RAYLEIGH SCATTERING, RESONANCE, SATURATION, SODIUM, TRANSIENTS, TURBULENT FLOW.

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AD-A215 156 12/1

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF
MATHEMATICS

(U) Distributional Weight Functions and Orthogonal
Polynomials.

DESCRIPTIVE NOTE: Final rept. 1 Nov 78-31 Oct 79.

OCT 79 4P

PERSONAL AUTHORS: Krall, Allan M.

CONTRACT NO. AFOSR-78-3508

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1494

UNCLASSIFIED REPORT

ABSTRACT: (U) It was proposed to 1) Examine the Cauchy representation of the Jacobi polynomial weight function to see what happens as the contour over which it is integrated approaches the interval $-1, 1$ on the real axis. ($\alpha < -1$, $\beta < -1$). 2) Do the same thing for the Laguerre polynomials after the Cauchy representation has been found ($\alpha < -1$). 3) Examine the Pollaczek polynomials. 4) Examine other polynomial sets. (kr)

DESCRIPTORS: (U) . CAUCHY PROBLEM, FUNCTIONS, INTEGRATED SYSTEMS, LAGUERRE FUNCTIONS, ORTHOGONALITY, POLYNOMIALS, WEIGHT, WEIGHTING FUNCTIONS.

IDENTIFIERS: (U) PE61102F, WJAFOSR2304A4.

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HAYSTACK OBSERVATORY WESTFORD MA

(U) Multi-Radar Mapping of Auroral Convection.

89 10P

PERSONAL AUTHORS: Foster, J. C.; Turunen, T.; Pollari, P.;
Kohl, H.; Wickwar, V. B.

CONTRACT NO. WAFOSR-88-0023

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR
TR-89-1328

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Advances in Space Research,
v9 n5 p1519-(5)27 1989.

ABSTRACT: (U) Simultaneous radar azimuth scans with the Millstone Hill, Sondrestrom, and EISCAT incoherent scatter radars produce maps of the ionospheric convection electric field at high latitudes which span 10 hours of magnetic local time. A series of convection 'snapshots' made during an interval of increasing geomagnetic activity indicate that the large-scale convection pattern maintains a two-cell character during substorm onset and that average convection models derived from radar data provide a reasonable representation of the large-scale convection pattern during dynamically varying conditions. Keywords: Radar mapping. Reprints. (EDC)

DESCRIPTORS: (U) *AUORAE, *RADAR MAPPING, AZIMUTH, CONVECTION, ELECTRIC FIELDS, GEOMAGNETISM, HIGH LATITUDES, INCOHERENCE, IONOSPHERE, IONOSPHERIC MODELS, MAGNETIC FIELDS, MAGNETIC STORMS, MODELS, PATTERNS, RADAR, REPRINTS, RADAR SCANNING, ELECTROMAGNETIC SCATTERING, SYNCHRONISM, TIME.

IDENTIFIERS: (U) PE61102F, WJAFOSR2310A2.

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CALIFORNIA UNIV DAVIS INTERCOLLEGE DIV OF STATISTICS

WISCONSIN UNIV MADISON DEPT OF COMPUTER SCIENCES

(U) Nonparametric Estimation of Reliability and Related Functions.

(U) Large-Scale Optimization Via Distributed Systems.

DESCRIPTIVE NOTE: Final rept. 1 Jul 85-30 Jun 89.

DESCRIPTIVE NOTE: Final rept. Jul 86-Jun 89.

JUL 89

16P

NOV 89

9P

PERSONAL AUTHORS: Wang, Jane-Ling

PERSONAL AUTHORS: Meyer, Robert R.

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A8

MONITOR: AFOSR
TR-89-1584

MONITOR: AFOSR
TR-89-1585

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This project deals with several nonparametric inference problems including two-sample tests, linear regression and estimation of distribution and related functions such as density and hazard rate functions. Estimators with desired aging properties were constructed for IFRA and NBU distribution functions respectively based on randomly censored data and shown to be raised to the one half power equivalent to the product-limit estimator. Nonparametric maximum likelihood estimator and its strong consistency were also derived for an IFR distribution for unidentifiable cause-of-failure data. Local asymptotic properties (strong consistency, asymptotic normality and mean squared error) of the kernel density and hazard rate estimators were obtained via a recent i.i.d. representation of the product-limit estimator. The results on kernel estimates were applied to obtain point and interval estimates of the change-point of a hazard rate function. Several median type two-sample test procedures which allows early termination of the study were constructed. (kr)

DESCRIPTORS: (U) *STATISTICAL INFERENCE, *NONPARAMETRIC STATISTICS, STATISTICAL SAMPLES, ASYMPTOTIC NORMALITY, ASYMPTOTIC SERIES, DENSITY, DISTRIBUTION, DISTRIBUTION FUNCTIONS, ESTIMATES, HAZARDS, INTERVALS, LINEAR REGRESSION ANALYSIS, POWER, RATES, RELIABILITY.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A5.

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ABSTRACT: (U) Most large-scale network optimization problems exhibit structures that allow the possibility of attack via algorithms that exhibit a high degree of parallelism. Such structure include quasi-independent blocks of constraints for different commodities or time periods, and geographically disjoint components in approximating solutions. The emphases of our research have been the development of new parallel optimization techniques that utilize these and related features in order to take advantage of distributed computing environments. We have also undertaken a comparison of the relative efficiencies of approaches based on different computer architectures such as message-passing multicomputers and shared-memory multiprocessors. The parallel algorithms that we have implemented have made possible the solution of extremely large linear networks (with more than 1 million variables) and nonlinear network optimization problems with as many as 400,000 variables or relatively modest parallel computing systems, and have displayed excellent speedups relative to the corresponding single-processor programs. (kr)

DESCRIPTORS: (U) ALGORITHMS, COMMODITIES, COMPUTER ARCHITECTURE, DISTRIBUTED DATA PROCESSING, DISTRIBUTION, EFFICIENCY, ENVIRONMENTS, LINEAR SYSTEMS, NETWORKS, NONLINEAR SYSTEMS, OPTIMIZATION, PARALLEL ORIENTATION, PARALLEL PROCESSING, TIME INTERVALS.

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A8.

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SEARCH CONTROL NO. EVI58L

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SALFORD UNIV (ENGLAND) DEPT OF PURE AND APPLIED PHYSICS

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS
AND ASTRONAUTICS(U) Microanalysis of Atomic Clustering in Electromagnetic
Materials.

(U) Turbulent Boundary Layer Structure and Drag Reduction.

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 82.

DESCRIPTIVE NOTE: Final rept. 1 Nov 80-31 Oct 81.

SEP 82 11P

DEC 81 8P

PERSONAL AUTHORS: Tebble, R. S.

PERSONAL AUTHORS: Landahl, M. T.; Widnall, S. E.

CONTRACT NO. AFOSR-80-0005

CONTRACT NO. AFOSR-81-0031

PROJECT NO. 2308

PROJECT NO. 2307

TASK NO. C3

TASK NO. A2

MONITOR: AFOSR
TR-89-1834MONITOR: AFOSR
TR-89-1835

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Possible clustering mechanism have been studies in two systems (i) intermetallic spin glass compound Co (x) Ga (1-x) and (ii) amorphous magnetic ribbons of general composition (Fe,Co) (1-x) (B,Si)(x). In the CoGa system evidence for vacancy clustering has been found following bombardment by Ar⁺ ions, this gives rise to dislocation dipoles up to 0.5 microns in length. Annealing or magnetic annealing of the amorphous ribbons may produce ordering of interstitial boron, phosphorus or silicon atoms or clustering of separate amorphous phases; in either case uniaxial anisotropy is linked to be induced. Ion, proton and electron irradiation of amorphous materials can produce similar effects. Annealing above the crystallization temperature results in precipitation of second crystalline phases. (UHD)

DESCRIPTORS: (U) *AMORPHOUS MATERIALS, *COBALT ALLOYS, *ANNEALING, *MICROANALYSIS, ANISOTROPY, BORON, PHOSPHORUS, CLUSTERING, CRYSTALLIZATION, CRYSTALS, ELECTROMAGNETIC PROPERTIES, CRYSTAL DEFECTS, ELECTRON IRRADIATION, MAGNETIC FIELDS, PHASE, PHOSPHORUS, PRECIPITATION, SILICON, TEMPERATURE

IDENTIFIERS: (U) *Spin Glass, PE81102F, WUAFOSR2306C3.

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ABSTRACT: (U) Research work has progressed along the following lines: 1) Completion of the work on the evolution of a localized eddy in a parallel inviscid shear flow; 2) development of theory for coherent structures in wall-bounded turbulence; 3) Experimental studies of natural and artificially-generated transition in plane channel flow; 4) Work on the development of a generalized theory for propagation of waves with small dissipation through homogeneous or non-homogeneous media with application to wave trains or wave packets in shear flows. Eddies fluid mechanics.

DESCRIPTORS: (U) *CHANNEL FLOW, *EDDIES (FLUID MECHANICS), *TURBULENT BOUNDARY LAYER, COHERENCE, DISSIPATION, DRAG REDUCTION, EXPERIMENTAL DATA, INVISCID FLOW, PARALLEL ORIENTATION, SHEAR PROPERTIES, WAVE PACKETS, WAVE PROPAGATION.

IDENTIFIERS: (U) Wave Trains, PE81102F, WUAFOSR2307A2.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI561

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GENERAL RESEARCH CORP MCLEAN VA

(U) Development of a Generalized Explanatory Base
Operating Support (GEBOS) Model.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A3, *GEBOS.

DESCRIPTIVE NOTE: Final rept. Jun-Dec 79.

JAN 80 340P

PERSONAL AUTHORS: Schmitz, Edward J.; Alberts, Henry C.;
Johnson, W. R.; Somers, Richard L.; Vassar, Thomas B.

CONTRACT NO. F49620-79-C-0148

PROJECT NO. 2313

TASK NO. A3

MONITOR: AFOSR
TR-89-1570

UNCLASSIFIED REPORT

ABSTRACT: (U) This study describes the development of the Generalized Explanatory Base Operating Support (GEBOS) model. GEBOS is an interactive computer model that enables Air Staff-level manpower planners to determine the impact of a variety of changes to BOS manpower or aggregate workload. The model uses linear programming techniques to solve relationships between BOS functional categories and aggregate workload indicators. The report covers data collection, the statistical analysis of manpower and workload, a description of the linear programming methodology developed, examples of how results may be used, and GEBOS model documentation. Included in the research effort is an investigation of the relationships between primary mission activities and BOS workload indicators. A prototype mission model was developed showing the feasibility of extending the model to include mission relationships. A plan for implementation of GEBOS Air Force wide and inclusion of primary mission activities in the model is also provided.

DESCRIPTORS: (U) *COMPUTERIZED SIMULATION, *MANPOWER UTILIZATION, *MANPOWER, *MODELS, AIR FORCE, DATA ACQUISITION, INDICATORS, LINEAR PROGRAMMING, MAN COMPUTER INTERFACE, METHODOLOGY, MISSIONS, PROTOTYPES, STATISTICAL ANALYSIS, WORKLOAD.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI58L

AD-A215 098 20/4

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF CHEMISTRY
(U) Insertion of Ethylene Into Zr-Si and Hf-Si Bonds.
88 4P

PERSONAL AUTHORS: Arnold, J.; Engeler, M. P.; Elsher, F.
M.; Meyn, R. H.; Tilley, T. D.

CONTRACT NO. DAAL03-87-G-0071, SAFOSR-88-0273

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1319

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v8 n8 p2284-2286 1989.

ABSTRACT: (U) The zirconium and hafnium silyl derivatives Cp*₂SiMe₃ and Cp*₂Zr(SiMe₃)₂ (M = Zr, Hf; Cp* = n⁵-CSiMe₅; Cp = n⁵-CSiH₅) undergo clean insertion reactions with ethylene to give the beta-silylalkyl complexes (Cp*₂SiMe₃CH₂Si(SiMe₃)₂ (1a), Cp*₂ZrCH₂Si(SiMe₃)₂ (1b), and Cp*₂HfCH₂Si(SiMe₃)₂ (1c)), respectively. These reactions are photochemically and thermally induced. Complex 1a is dimeric in both the solution and solid states, whereas 1b is monomeric in solution. The quantum yield for formation of 2 gamma = 380-470 nm, benzene-d₆) in the presence of excess ethylene is 2.5, implying a radical chain mechanism initiated by homolytic cleavage of a M-Si bond. Keywords: Reprints; Chemical bonds; Transition metal silicon bonds; Synthesis chemistry. (kt)

DESCRIPTORS: (U) *CHEMICAL BONDS, *CLEAVAGE, *ETHYLENE, *BONDING, *HOMOGENEITY, *HAFNIUM COMPOUNDS, *SILICON COMPOUNDS, *QUANTUM THEORY, *REPRINTS, *SILICON SYNTHESIS(CHEMISTRY), *TRANSITION METALS, *YIELD, *ZIRCONIUM.

IDENTIFIERS: (U) PE81102F, WUAFOSR230382.

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ARIZONA UNIV TUCSON DEPT OF AEROSPACE AND MECHANICAL ENGINEERING

(U) Transonic Flow Research.

DESCRIPTIVE NOTE: Final rept. 1 Feb 81-30 Jun 82, DEC 82 6P

PERSONAL AUTHORS: Fung, K. Y.

CONTRACT NO. AFOSR-81-0107

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-89-1548

UNCLASSIFIED REPORT

ABSTRACT: (U) Topics study include Fictitious gas designed method; Conical flow; Unsteady transonic flow computations with input pressure distributions; Unsteady wind tunnel interference; and inviscid flow with shock induced vorticity. (edc)

DESCRIPTORS: (U) *TRANSONIC FLOW, *COMPUTATIONS, *FLOW INPUT, *INTERFERENCE, *INVISID FLOW, *PRESSURE DISTRIBUTION, *SHOCK, *UNSTEADY FLOW, *VORTICES, *WIND TUNNEL TESTS.

IDENTIFIERS: (U) Conical flow, PE81102F, WUAFOSR2307A1.

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AD-A215 092 CONTINUED

PRINCETON COMBUSTION RESEARCH LABS INC MONMOUTH JUNCTION NJ

(edc)

(U) Space Propulsion by Intermittent Combustion.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-31 Jul 83.

OCT 84 64P

PERSONAL AUTHORS: Summerfield, Martin; Bruno, Claudio; Ben-Reuven, Moshe; Tseng, Hsing

REPORT NO. PCRL-FR-84-003

CONTRACT NO. F49620-82-C-0042

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1802

UNCLASSIFIED REPORT

ABSTRACT: (U) A critical aspect of space platform maneuverability is the performance of rapid orbital changes. The standard type of steady-state chemical rocket, optimized for firing in the vacuum of space, is regarded as the base-line type of propulsion engine against which any new concept should be measured. In the present study of intermittently firing chemical rocket-type engines, such standard type rockets are taken as the reference. There are still open questions as to whether the specific impulse or propellant flow economy of a chemical propulsion rocket-like system might be improved by some modification of the combustion-and-outflow cycle. The concept of intermittent combustion-and-outflow represents an interesting alternative. The terminology used to describe such an intermittent process has been confusing in the past, with terms like detonative propulsion, explosive propulsion and pulsejet propulsion all having been used. One of the tasks of this project is necessarily to clarify the differences implied in these terms. This final report contains solutions to sample problems addressing combustion and outflow in chemical rockets (quasi-steady analysis), and a recommended approach for non-steady optimization of thruster geometry.

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DESCRIPTORS: (U) *COMBUSTION, *ROCKET PROPULSION, *SPACE PROPULSION, BASE LINES, CHEMICALS, ROCKET ENGINES, GEOMETRY, MANEUVERABILITY, MODIFICATION, OPTIMIZATION, ORBITS, OUTPUT, PROPULSION SYSTEMS, PULSEJET ENGINES, PULSES, ROCKET PROPELLANTS, SPACE STATIONS, SPECIFIC IMPULSE, STEADY STATE, THRUST, THRUSTERS, TRANSFER TRAJECTORIES.

IDENTIFIERS: (U) Chemical propulsion, *Intermittent combustion, Detonative propulsion, Explosive propulsion, Pulsejet propulsion, Outflow, Chemical rockets, PEB1102F, WJAFOSR2308A1.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI58L

AD-A215 089 12/3

AD A215 088 12/3

HONEYWELL INC MINNEAPOLIS MINN SYSTEMS AND RESEARCH DIV

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

(U) Robust Control of Multivariable and Large Scale Systems.

(U) International Symposium on Multivariate Analysis (6th). Held in Pittsburgh, PA on 25-29 Jul 83.

DESCRIPTIVE NOTE: Interim rept. 1 Nov 83-1 May 84.

DESCRIPTIVE NOTE: Final rept. 1 Apr 83-31 Mar 84.

MAY 84 3P

JUN 84 6P

PERSONAL AUTHORS: Wall, J. E.

PERSONAL AUTHORS: Krishnaiah, P. R.

REPORT NO. F0877-SR5, F0877-SR8

CONTRACT NO. AFOSR-83-0153

CONTRACT NO. F49620-82-C-0090

PROJECT NO. 2304

MONITOR: AFOSR
TR-89-1477

TASK NO. A5

MONITOR: AFOSR
TR-89-1478

UNCLASSIFIED REPORT

ABSTRACT: (U) This document is the fifth and sixth quarterly progress reports for the period indicated. The research focus during this time has been on computational issues associated with the new L/H control synthesis theory and on examples illustrating application of the theory. Keywords: Air Force research. (KR)

DESCRIPTORS: (U) *MULTIVARIATE ANALYSIS. AIR FORCE RESEARCH. THEORY. CONTROL.

UNCLASSIFIED REPORT

ABSTRACT: (U) The Sixth International Symposium on Multivariate Analysis was held at the University of Pittsburgh during the period of July 25-29, 1983. The topics covered at the symposium include multivariate analysis of variance, repeated measurement designs, scaling methods, pattern recognition, spline functions, classification, filtering and stochastic processes, asymptotic theory and large deviations, structural equations and modeling, graphical techniques, estimation, econometrics and time series, anthropology and human genetics, extreme value theory, large dimensional random matrices, estimation and decomposition of test statistics, iterative procedures, quality control and reliability, estimation and structure of models, and nonparametric methods and distribution theory. (KR)

DESCRIPTORS: (U) *MULTIVARIATE ANALYSIS. ANALYSIS OF VARIANCE. ANTHROPOLOGY. ASYMPTOTIC SERIES. DECOMPOSITION. DISTRIBUTION THEORY. ECONOMETRICS. EQUATIONS. FUNCTIONS(MATHEMATICS). GENETICS. GRAPHICS. HUMANS. INTERNATIONAL. ITERATIONS. MODELS. NONPARAMETRIC STATISTICS. PATTERN RECOGNITION. QUALITY CONTROL. RELIABILITY. SCALING FACTOR. SPLINES(GEOMETRY). STATISTICAL TESTS. STOCHASTIC PROCESSES. STRUCTURAL PROPERTIES. SYMPOSIA. THEORY. TIME SERIES ANALYSIS.

AD A215 089

AD A215 088

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AD-A215 086 20/4

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5.

MASSACHUSETTS INST OF TECH (CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS)

(U) Turbulent Boundary Layer Structure and Drag Reduction.

DESCRIPTIVE NOTE: Final rept.

MAR 80

12P

PERSONAL AUTHORS: Landahl, M. T.; Widnall, S. E.

CONTRACT NO. AFOSR-79-0006

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1436

UNCLASSIFIED REPORT

ABSTRACT: (U) During the grant period the research work has progressed along the following lines: 1) Development of a localized three-dimensional disturbance in a shear flow; 2) Exploration of new instability modes for inviscid and viscous shear flows; 3) Analysis of polymer drag reduction mechanisms; and 4) Experiment to study spanwise growth of transition spots in a plane Poiseuille flow. (edc)

DESCRIPTORS: (U) *DRAG REDUCTION, *TURBULENT BOUNDARY LAYER, FLOW, INVISCID FLOW, POISEUILLE FLOW, POLYMERS, SHEAR PROPERTIES, STABILITY, THREE DIMENSIONAL FLOW, VISCOUS FLOW.

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A2.

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AD-A215 086

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV158L

AD-A215 085 20/11 11/8.1 11/9

AD-A215 084 5/8

GEORGE WASHINGTON UNIV WASHINGTON DC SCHOOL OF
ENGINEERING AND APPLIED SCIENC E

ARIZONA UNIV TUCSON DEPT OF PSYCHOLOGY

(U) Fracture and Fatigue Characterization of Aircraft
Structural Materials under Biaxial Loading.

(U) Measures of Subjective Variables in Visual Cognition.

DESCRIPTIVE NOTE: Final rept. Oct 78-Dec 79,

DEC 79 38P

SEP 89 120P

PERSONAL AUTHORS: Jones, D. L.; Eftis, J.

PERSONAL AUTHORS: Peterson, Mary A.

CONTRACT NO. AFOSR-76-3099

CONTRACT NO. AFOSR-89-0075

PROJECT NO. 2308

PROJECT NO. 2313

TASK NO. B2

TASK NO. A4

MONITOR: AFOSR

MONITOR: AFOSR

TR-89-1462

TR-89-1489

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Although many components of aircraft and aerospace structures are subjected to biaxial applied loads, the effects on the fracture process of loads applied parallel to an existing crack have not yet been fully appreciated. This report summarizes the study results of Fracture and Fatigue of Aircraft Structural Materials Under Biaxial Loading, which was initiated for the purpose of examining both the theoretical and experimental aspects of this problem. Analytical work addressed various implications of biaxially applied loads on the crack-tip stress field, the stress intensity factor, the angle of initial crack extension, and the critical or fracture loads. Several different geometries were examined including center cracks aligned with and at an angle to the load axes, shear panels, double and multiple cracked bodies. Keywords: Aluminum alloys; Plexiglass. (kt)

DESCRIPTORS: (U) *AIRFRAMES, *FRACTURE (MECHANICS), *FATIGUE (MECHANICS), *BIAXIAL STRESSES, AEROSPACE CRAFT, AIRCRAFT, ALUMINUM ALLOYS, AXES, CONSTRUCTION MATERIALS, CRACKS, PANELS, SHEAR PROPERTIES, STRESS CONCENTRATION.

IDENTIFIERS: (U) PEB11021, WUAFOSR2308B2

AD-A215 085

AD-A215 084

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ABSTRACT: (U) A series of 10 experiments examined the subjective variables involved in the perceptual organization of shapes and objects; in particular, the role played by (1) perceptual intentions, (2) structural knowledge, and (3) spatial attention. A series of experiments identified functional consequences of structural knowledge in both perception and imagery and functional differences between the two types of perceptual selectivity we examined. We found that (1) prototypical shapes are perceived faster than quasitypical shapes (the goodness of the set between structural representations and these two types of shapes was assumed to differ), (2) structural knowledge regarding shape components is a necessary requirement for imagery reversal, (3) perceptual intentions are more effective when directed to prototypical rather than nonprototypical shapes, implicating structural knowledge as a mechanism through which perceptual intentions operate, and (4) spatial attention can be directed to parts of objects whereas perceptual intentions may operate holistically. In addition, the experiments provided some evidence that multiple shape representations are activated prior to shape recognition, and led to a new model of figure-ground organization. Keywords: Visual cognition, Visual perception, Attention, Elective set, Figure-ground organization, Reversible figures, Imagery. (kt)

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AD-A215 084 CONTINUED

SEARCH CONTROL NO EV156L

AD A215 083 12/5

DESCRIPTORS: (U) *COGNITION, *OPTICAL IMAGES, *PATTERN
RECOGNITION, *VISUAL PERCEPTION, ATTENTION, MODELS,
PERCEPTION, REVERSIBLE, SHAPE, SPATIAL DISTRIBUTION,
VARIABLES.

ARIZONA UNIV TUCSON DEPT OF COMPUTER SCIENCE

(U) The Saguaro Distributed Operating System.

DESCRIPTIVE NOTE: Final rept. 1 Mar 88-28 Feb 89.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2313A4.

MAY 89 6P

PERSONAL AUTHORS: Andrews, Gregory R.; Schlichting,
Richard D.

CONTRACT NO. AFOSR-88-0147

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-89-1488

UNCLASSIFIED REPORT

ABSTRACT: (U) The progress achieved over the final year of the Saguaro distributed operating system project is presented. The primary achievements were in related research, including SR distributed programming language, the MLP system for constructing distributed mixed-language programs, the Psync Interprocess communication mechanism, a configurable operating system kernel call the x-kernal, and the development of language mechanisms for performing failure handling in distributed programming languages. (KR)

DESCRIPTORS: (U) *COMPUTER PROGRAMS, COMMUNICATION AND RADIO SYSTEMS, DISTRIBUTION, FAILURE, HANDLING, LANGUAGE, PROGRAMMING LANGUAGES.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A2, *Operating systems(computers).

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV158L

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SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND
STATISTICS

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A4.

(U) Interim Scientific Report Grant AFOSR-81-0171, 15 May
1981-14 May 1982.

DESCRIPTIVE NOTE: Interim rept. 15 May 81-14 May 82.

MAY 84 5P

PERSONAL AUTHORS: Bloom, Frederick

CONTRACT NO. AFOSR-81-0171

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1483

UNCLASSIFIED REPORT

ABSTRACT: (U) The work focused on and produced papers with the following titles: On a damped nonlinear evolution equation. Nonexistence of smooth electromagnetic fields in nonlinear dielectrics. I Infinite cylindrical dielectrics, and Nonexistence of smooth electromagnetic fields in nonlinear dielectrics. II shock development in a half space. The focus was the damped nonlinear evolution equation $w_{sub} \{t = \text{signal}(w) \text{ sub } xx - \gamma w \text{ sub } t, \text{ an equation which arises in several areas of applied mathematics and, in particular, in studies of shearing flows in a nonlinear viscoelastic fluid. A summary of results obtained on existence and nonexistence of solutions for initial-boundary value problems associated with this equation is given. Work continued with a study of shock formulation for intense plane electromagnetic waves propagating into infinite cylindrical dielectrics and nonlinear dielectric half-spaces. (jhd)$

DESCRIPTORS: (U) *DAMPING, *ELECTROMAGNETIC FIELDS, *ELECTROMAGNETIC WAVE PROPAGATION, *VISCOELASTICITY, APPLIED MATHEMATICS, BOUNDARY VALUE PROBLEMS, CYLINDRICAL BODIES, DIELECTRICS, ELECTROMAGNETIC RADIATION, INTENSITY, NONLINEAR SYSTEMS, PLANE WAVES, SHOCK

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AD-A215 050 20/4 21/2 20/9 AD-A215 050 CONTINUED

STANFORD UNIV CA

(U) Advanced Diagnostics for Reacting Flows.
DESCRIPTIVE NOTE: Annual rept. 1 Oct 88-30 Sep 89.
OCT 89

PERSONAL AUTHORS: Hanson, R. K.

CONTRACT NO. AFOSR-89-0067

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR
TR-89-1433

IDENTIFIERS: (U) PLIF(Planar Laser Induced Fluorescence),
Reacting flows, Optical diagnostics.

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress is reported for an interdisciplinary program aimed at establishing advanced optical diagnostic techniques applicable to combustion and plasma flows. The primary effort is on digital flowfield imaging techniques, which offer significant potential for a wide range of spatially resolved 2-d and 3-d measurements. The imaging is accomplished by recording light scattered from a planar laser-illuminated region using a modern solid-state camera. The scattering process is generally laser-induced fluorescence, though Mie, Rayleigh and Raman scattering may also be used. Activities reported include: 1) Image processing of PLIF data; 2) PLIF imaging in nonequilibrium shock tube flows; 3) temperature and velocity imaging in supersonic flows; 4) concept for simultaneous measurement of multiple parameters; 5) digital camera for high-speed imaging; 6) plasma diagnostics; 7) laser photolysis shock tube; and 8) cv UV laser absorption diagnostics. PLIF (Planar Laser Induced Fluorescence); Flow visualization; Plasma diagnostics. (edc)

DESCRIPTORS: (U) *COMBUSTION, *DIAGNOSIS(GENERAL), *FLOW VISUALIZATION, *IMAGE PROCESSING, *PLASMAS(PHYSICS), HIGH SPEED CAMERAS, CONTINUOUS WAVE LASERS, DIGITAL SYSTEMS, FLOW FIELDS, ILLUMINATION, IMAGES, LASER INDUCED FLUORESCENCE, ULTRAVIOLET LASERS, LIGHT, LIGHT SCATTERING, MEASUREMENT, METHODOLOGY, MULTIPLE OPERATION.

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AD-A215 042 21/9.2

BRIGHAM YOUNG UNIV PROVO UT DEPT OF CHEMICAL ENGINEERING

(U) Solid Propellant Combustion Phenomena.

DESCRIPTIVE NOTE: Final rept. 1 May 79-31 Dec 82.

JUN 83

PERSONAL AUTHORS: Beckstead, Merrill W.

CONTRACT NO. AFOSR-79-0100

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1583

UNCLASSIFIED REPORT

ABSTRACT: (U) This final scientific report reviews the progress from May 1979 to December 1982 on a program to study various aspects of solid propellant combustion phenomena. The original program included three specific areas of study: Diffusion flame analysis; Kinetic mechanisms of double base propellants; Interaction effects of distributed particle combustion in acoustic environments. The diffusion flame is the controlling mechanism in the combustion of composite propellants. Therefore, a thorough understanding of diffusion flames is prerequisite to understanding solid propellant combustion, and was the objective of one task of the program. The second task of the program was motivated by the desire to better understand transient combustion such as occurs in DDT and combustion instability. Double base propellant combustion is dominated by the flame kinetics which appear to be more easily studied than those of composite propellants. The final task of the program was aimed at understanding the effect of stability additives on combustion instability. During the final year of the contract, work on the first two tasks was discontinued and all work was concentrated on the third task. Interim reports covering the initial work have been published in December 1980 and February 1982. This report summarizes the work performed during the final phase of the contract covering the time from October 1981 through December 1982. Keywords: Solid rocket propellants. (kt)

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DESCRIPTORS: (U) *COMBUSTION, *COMBUSTION STABILITY, *COMPOSITE PROPELLANTS, *SOLID ROCKET PROPELLANTS, ACOUSTICS, ADDITIVES, DDT, DIFFUSION, DISTRIBUTION, DOUBLE BASE PROPELLANTS, ENVIRONMENTS, FLAMES, INTERACTIONS, KINETICS, PARTICLES, PROPELLANTS, SOLID PROPELLANTS, STABILITY, TRANSIENTS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2308A1.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV156L

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MASSACHUSETTS UNIV AMHERST MATERIALS RESEARCH LAB

(U) Physical Properties of Polymers (Ultrastructure Processing of Polymers)

DESCRIPTIVE NOTE: Final rept. 1 Jan 80-30 Sep 82.
SEP 82

PERSONAL AUTHORS: Karasz, Frank E.

CONTRACT NO. AFOSR-80-0101

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1562

UNCLASSIFIED REPORT

ABSTRACT: (U) The research undertaken was an extension of earlier AFOSR supported endeavors dealing mainly with 'the physical properties of polymer blends', the 'plasticization of epoxy and other network polymers by water' and the 'characterization of stiff chain macromolecules by quasi-elastic light scattering'. In the polymer blend research substantial progress was achieved in elucidating thermodynamic and structural factors underlying the phenomenon of miscibility in binary polymer systems. The effects of chemical structure, tacticity, molecular weight, temperature, and their components were investigated by a number of techniques including calorimetry, vapor absorption, inverse gas chromatography and by the establishment of binary or ternary phase diagrams for appropriate systems. The study of the plasticization of network polymers was prompted by an earlier study of the effect on water on epoxy resins. It was established that, contrary to some earlier suppositions, the relatively large depression in the glass transitions of epoxies by small amounts of absorbed water, could be accounted for by purely thermodynamic analysis and did not require, in particular, the concept of specific polymer-sorbate interactions. (KT)

DESCRIPTORS: (U) *EPOXY RESINS, *MIXTURES, *MOLECULAR STRUCTURE, *POLYMERS, *THERMOCHEMISTRY, *PERMEABILITY,

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ABSORPTION, CALORIMETRY, CHAINS, EPOXY COMPOUNDS, GAS CHROMATOGRAPHY, GLASS, INVERSION, MACROMOLECULES, MIXING, MOLECULAR WEIGHT, NETWORKS, PHASE DIAGRAMS, PHYSICAL PROPERTIES, PLASTICIZERS, STIFFNESS, TERNARY COMPOUNDS, THERMODYNAMICS, TRANSITIONS, VAPORS, WATER, LIGHT SCATTERING, BINARY COMPOUNDS, TRANSITION TEMPERATURE, POLYMERIZATION

IDENTIFIERS: (U) PE60012F, WUAFOSR2303A3

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MASSACHUSETTS INST OF TECH CAMBRIDGE CENTER FOR SPACE RESEARCH AD-A215 035 CONTINUED

(U) Center of Excellence in Theoretical Geoplasma Research. IDENTIFIERS: (U) PE81103D, WUAF0SR3484A2, Polar Wind, Counterstreaming Electrons, Ion Conics, Auroral Kilometric Radiation.

DESCRIPTIVE NOTE: Final rept. 1 Oct 88-30 Sep 89.

NOV 89

PERSONAL AUTHORS: Chang, Tom

CONTRACT NO. F49620-86-C-0128

PROJECT NO. 3484

TASK NO. A2

MONITOR: AFOSR
TR-89-1512

UNCLASSIFIED REPORT

ABSTRACT: (U) Partial Contents: Transverse Acceleration and Heating of Ionospheric Ions and the Formation of Ion Conics; Transverse Heating of Ionospheric Ions Along Auroral Field Lines; Acceleration of Ionospheric Ions by Lower Hybrid Waves in the Discrete Auroral Region; Two Dimensional Particle-in-cell Plasma Simulation of High-Latitude Lower Hybrid Turbulence and Charged Particle Acceleration; Studies of Inhomogeneous Plasma Turbulence in the Auroral Region; A Kinetic Treatment of the Nonclassical Polar Wind; Double Layer Formation and Ion Hole Theory along Auroral Field Lines; Flux Transfer Events and Ionosphere-Magnetosphere Coupling; Auroral Kilometric Radiation and Relativistic Magnetized Anisotropic Plasmas; Plasma Radiations in the Low Altitude Ionosphere due to Moving Conducting Objects; Gyroresonance Generated Ion Conic Populations; Low-altitude Transverse Ion Acceleration; and Counterstreaming Electrons. (jhd)

DESCRIPTORS: (U) *IONOSPHERIC DISTURBANCES. *AURORAE. ACCELERATION, ANISOTROPY, CHARGED PARTICLES, COUPLING(INTERACTION), ELECTROMAGNETIC RADIATION, FLUX(RATE), HEATING, HIGH LATITUDES, IONOSPHERE, IONS, KINETICS, LAYERS, LOW ALTITUDE, MAGNETIZATION, MAGNETOSPHERE, PLASMAS(PHYSICS), POLAR REGIONS, TRANSVERSE, TURBULENCE.

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CLARKSON UNIV POTSDAM NY DIV OF RESEARCH

(U) Transient Analysis of Structures with Distinct Nonlinearities.

IDENTIFIERS: (U) PE61102F, WUAFOSR230/D9

DESCRIPTIVE NOTE: Final rept. 1 Jul 82-31 Jan 83.

JAN 83

PERSONAL AUTHORS: Minnetyan, Levon

CONTRACT NO. AFOSR-82-0216

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-89-1591

UNCLASSIFIED REPORT

ABSTRACT: (U) A hybrid method based on standard nonlinear and linear numerical procedures was implemented for the complete simulation of structural response for vehicles taxing over an irregular surface. Time history integrations of the equations of motion were used to determine the nonlinear suspension forces on the basis of a small number of model coordinates. The time history results were used as inputs to a second stage linear analysis by which means the more detailed vehicle elastic response was computed. The current capabilities of the method were demonstrated by its application to a simple beam vehicle model and also by the transient simulation of a typical fighter aircraft, taxing over and irregular runway. The results were compared with test data and direct time history analysis. Numerical problems in the computer implementation of the hybrid method were examined and feasibility for future modification and improvement of the solution procedure were indicated.

DESCRIPTORS: (U) *FIGHTER AIRCRAFT, *RUNWAYS, COORDINATES, ELASTIC PROPERTIES, EQUATIONS, EXPERIMENTAL DATA, HISTORY, HYBRID SYSTEMS, INTEGRATION, LINEAR SYSTEMS, MATHEMATICAL ANALYSIS, MODELS, NUMERICAL ANALYSIS, RESPONSE, SIMULATION, SOLUTIONS(GENERAL), STRUCTURAL RESPONSE, TIME, TIME SERIES ANALYSIS, TRANSIENTS, VEHICLES.

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NORTH CAROLINA STATE UNIV AT RALEIGH SCHOOL OF
ENGINEERING

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4

(U) Transients in Turbocompressors.

DESCRIPTIVE NOTE: Final rept. Feb 76-Jun 81.

JUL 81

PERSONAL AUTHORS: Griffith, W. C.; Hall, W. H.; Lee, L. G.
; Perkins, J. N.

CONTRACT NO. F44620-76-C-0055

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-89-1624

UNCLASSIFIED REPORT

ABSTRACT: (U) Designers of axial flow jet engine compressors have achieved substantial gains in both pressure rise per stage and in reducing irreversible losses through years of analysis and development testing under nearly steady flow conditions. Non-steady inlet flow conditions produced by a number of aircraft operations have, however, continued to challenge the industry with problems of transient flows for which basic understanding is largely absent. In particular the phenomenon of transient rotating stall within individual compressor stages remains an unsolved problem. Observations indicate that distorted inlet flows generate transient instabilities that at least produce losses and may grow to significant compressor stall. It is important to decrease sensitivity to the effects of inlet distortion without reducing performance during steady operation. Dual goals are, therefore, to design engines having reduced likelihood of incurring transient stall and also the ability to rapidly clear any stall that arises and then return to normal operation. (kt)

DESCRIPTORS: (U) *COMPRESSORS, *JET ENGINES, *PRESSURE GRADIENTS, AIRCRAFT, DISTORTION, FLOW, INDUSTRIES, INLETS, IRREVERSIBLE PROCESSES, LOSSES, OPERATION, ROTATION, STALLING, STEADY FLOW, STEADY STATE, TRANSIENTS.

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TEXAS TECH UNIV LUBBOCK DEPT OF ELECTRICAL ENGINEERING

(U) IEEE (Institute of Electrical and Electronics Engineers) International Pulsed Power Conference on (2nd) Held in Lubbock, Texas on 12-14 June 1979 (Digest of Technical Papers).

alternating with the well-known Modulator Symposium (rrh)

DESCRIPTORS: (U) ELECTRICAL ENGINEERING, ELECTRONICS, ENGINEERS, INFORMATION EXCHANGE, INTERNATIONAL, MODULATORS, POWER, PULSES, SYMPOSIA.

DESCRIPTIVE NOTE: Final rept..

IDENTIFIERS: (U) PEB1102F, WUAFDSR2301A7.

FEB 80

PERSONAL AUTHORS: Guenther, A. H.; Kristiansen, M.

CONTRACT NO. AFOSR-79-0077

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-89-1508

UNCLASSIFIED REPORT

ABSTRACT: (U) Pulsed power in all its varied meanings is showing no sign of abatement in activity. It is becoming a technology of increasing importance in numerous new and novel applications, growing from its well-established base in energy and defense related research and development. One indication of its vitality is this Digest of Technical Papers for the 2nd IEEE International Pulsed Power Conference. The organizers were counseled by many that there would not be enough material that could be covered at this meeting nor would there be a sufficient diversity of interest. However, from our first such conference during November 1976, held in Lubbock as well, we have recorded a fifty percent increase in attendance to almost 300, with well over 100 invited and contributed presentations. There were twenty-five attendees from 10 foreign countries. As a result of this growth and with the realization that this conference serves as the principal forum for the exchange of information in the highly specialized and unique field of pulsed power technology, several actions and events have taken place. First the present technical program committee have been designated a permanent standing committee to organize and maintain this conference series. Secondly, we have agreed to hold this meeting biennially.

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SEARCH CONTROL NO EVI561

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MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL
ENGINEERING

(U) Basic Instability Mechanisms in Chemically Reacting
Subsonic and Supersonic Flows

REACTIONS, FLAMES, FLOW, GAS DYNAMICS, GROWTH (GENERAL),
HIGH FREQUENCY INTERACTIONS, LENGTH, LOW FREQUENCY,
NONUNIFORM, NOZZLES, OSCILLATION, PLANAR STRUCTURES,
PRESSURE, RAREFACTION, RATES, RESPONSE, SHEAR PROPERTIES,
SHORT WAVELENGTHS, STABILITY, TRANSVERSE WAVES, TWO
DIMENSIONAL, WIDTH

DESCRIPTIVE NOTE: Final rept. 30 Sep 80-29 Sep 81.

SEP 81

IDENTIFIERS: (U) Instability, Tollmien-Schlichting waves,
PG61102F

PERSONAL AUTHORS: Toong, T. Y.; Abouseif, G. E.

CONTRACT NO. AFOSR-78-3882

PROJECT NO. 2308

MONITOR: AFOSR
TR-89-1521

UNCLASSIFIED REPORT

ABSTRACT: (U) The structure, sustenance and stability of gaseous detonations are believed to be the result of complex interactions between chemical kinetics and gas dynamics. Recent studies on two-dimensional detonations further show the initiation and the sustenance of a transverse wave structure through such interactions. In channels of large widths (in terms of characteristic reaction lengths), transverse waves develop rapidly in initially planar detonations undergoing longitudinal oscillations. For very narrow channels, however, only longitudinal waves are observed, because waves of short wave lengths or high frequencies are attenuated. Analysis of the observed low-frequency instability in dump combustors shows that the oscillations are triggered and sustained by interactions between non-uniform entropy zones and pressure waves. Rarefaction waves incident on the flame zone cause the flame to stretch and separate, forming a zone of low entropy. The non-uniform entropy zones then generate compression and rarefaction waves, as they are convected with the flow through the choked nozzle. Development of instability in a shear flow was examined. Exothermic reaction tends to augment the growth rate of the accompanying Tollmien-Schlichting waves (edc)

DESCRIPTORS: (U) *REACTION KINETICS, *SUBSONIC FLOW, *SUPERSONIC FLOW, *DETONATION WAVES, ATTENUATION, CHANNELS, COMBUSTORS, DETONATIONS, ENTROPY, EXOTHERMIC

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AD-A215 022 7/4 12/2 AD-A215 022 CONTINUED

CALIFORNIA INST OF TECH PASADENA DIV OF CHEMISTRY AND
CHEMICAL ENGINEERING

IDENTIFIERS: (U) WUAFOSR230381, PE61102F, *Elementary
Chemical Reactions

(U) The Quantum Dynamics of Chemical Reactions.

DESCRIPTIVE NOTE: Final rept. 1 Jul 81-30 Jun 82.

MAR 81

PERSONAL AUTHORS: Kuppermann, Aron

CONTRACT NO. F49620-79-C-0187

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1522

UNCLASSIFIED REPORT

ABSTRACT: (U) The aim of the proposed research is the performance of quantum mechanical calculations of an exact and approximate nature of the cross sections and rate constants of elementary chemical reactions. These calculations are of importance for the fundamental understanding of the nature of chemical reactions and for advanced technologies of interest to the United States Air Force, such as high-energy chemical lasers, plume radiation, and the chemical effects of high-energy three atoms, such as exchange reactions, collision-induced dissociation, three-body recombination, electronic branching ratios, tunneling, and vibrational quenching by reaction. The goal of this work is to develop a detailed understanding of such processes and to generate benchmark results which can serve as a basis for testing the validity of approximate methods. Keywords: Chemical reactions; Reaction kinetics. (KT)

DESCRIPTORS: (U) *CHEMICAL REACTIONS, *DYNAMICS, *QUANTUM THEORY, *REACTION KINETICS, AIR FORCE, APPROXIMATION(MATHEMATICS), ATOMS, CHEMICAL LASERS, CHEMICALS, CONSTANTS, CROSS SECTIONS, EXCHANGE REACTIONS, HIGH ENERGY, PLUMES, QUANTUM STATISTICS, QUENCHING, RADIATION, RATES, RESPONSE, VALIDATION, VIBRATION.

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AD-A215 021 CONTINUED

MASSACHUSETTS UNIV AMHERST DEPT OF CHEMICAL ENGINEERING

TENNESSEE

(U) Gordon Research Conference on Liquid Crystal Polymers
Held in New Lond, New Hampshire on 9-13 July 1984

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, +Thermotropic
polymers.

DESCRIPTIVE NOTE: Final rept. 1 Jul-31 Dec 84.

SEP 84

PERSONAL AUTHORS: Lenz, Robert W.

CONTRACT NO. AFOSR-84-0150

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1531

UNCLASSIFIED REPORT

ABSTRACT: (U) The field of liquid crystal, LC, polymers is now almost thirty years old if it can be considered to have begun in 1956 with the theories of Flory on solutions of rigid-rod polymers and the observation of the lyotropic behavior of concentrated solutions of poly(benzyl-L-glutamate) in the laboratories of Courtaulds Ltd. in the same year. The observations of lyotropic behavior of solutions of aromatic polyamides in the du Pont laboratories in the late 1960s, which led to the development of the Kevlar fiber, undoubtedly provided the greatest stimulus to this field. While thermotropic aromatic polyesters were prepared in the laboratories of the ICI Company at about the same time, the potential for their application in fibers was probably not recognized until the early 1970s. At about that time, investigations on the application of aromatic polyesters for molded plastics, which were liquid crystalline in the melt state, were also begun at the Carborundum Co. and the Tennessee Eastman Co. Hence, the field of thermotropic polymers is only about ten years old, but in the last five years or so there has been an explosion in interest and the activity on such polymers. (KR)

DESCRIPTORS: (U) *AROMATIC COMPOUNDS, *LIQUID CRYSTALS, *POLYMERS, EXPLOSIONS, MELTS, MOLDINGS, PLASTICS, POLYAMIDE PLASTICS, POLYESTER FIBERS, SOLUTIONS(MIXTURES).

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AD-A215 020 20/10

UTAH UNIV SALT LAKE CITY DEPT OF PHYSICS

(U) Effects of Boundaries and Collisions in the Theory of Soliton and Quantum Solitons and Strange Solutions in Many-Body Problems.

DESCRIPTIVE NOTE: Final rept. 1 Jun 80-31 May 81, MAY 81

PERSONAL AUTHORS: Mattis, D. C.

CONTRACT NO. AFOSR-80-0257

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR TR-89-1523

UNCLASSIFIED REPORT

ABSTRACT: (U) This research in mathematical physics concerned the fundamental structure of two-dimensional quantum field theory, dealt with the interactions of a particle with a field (the magnetic polaron), with application to the production of spin-polarized particles from this foils. Finally, new work on an exactly soluble antiferromagnet: an exact quantum mechanical ground state and two phases identified one with long range order and the other, a quantum liquid. Other work in mathematical physics included renormalization group studies of certain magnetic systems. (jhd)

DESCRIPTORS: (U) *SOLITONS, *MAGNETIC DEVICES, *N BODY PROBLEM, *QUANTUM THEORY, FIELD THEORY, GROUND STATE, LIQUIDS, ANTIFERROMAGNETISM, PARTICLES, PRODUCTION, SOLUTIONS(GENERAL), TWO DIMENSIONAL.

IDENTIFIERS: (U) Magnetic Liquids, PE81102F, WUAFOSR2304A4.

AD-A215 020

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SEARCH CONTROL NO. EVISBL

AD A215 019 20/11 1/3

MISSOURI UNIV-COLUMBIA COLL OF ENGINEERING

(U) Corrosion on Fatigue and Fatigue Crack Growth in Aircraft Structural Materials.

DESCRIPTIVE NOTE: Final rept. Nov 78-Nov 78, JUN 79

PERSONAL AUTHORS: Hoepfner, David W.

CONTRACT NO. AFOSR-77-3178

PROJECT NO. 2307

TASK NO. B2

MONITOR: AFOSR TR-89-1510

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *FATIGUE(MECHANICS), *AIRCRAFT EQUIPMENT, CRACKING(FRACTURING), CORROSION, GROWTH(GENERAL), CRACK PROPAGATION.

IDENTIFIERS: (U) PE81102F, WUAFOSR2307B2.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO EV156L

AD-A215 012 20/5 20/6

STATE UNIV OF NEW YORK AT BUFFALO AMHERST

(U) Ab Initio Calculation of Polarizability and Second Hyperpolarizability in Benzene Including Electron Correlation Treated by Moller-Plesset Theory.

QCT 89

AD-A215 012 CONTINUED

DESCRIPTORS: (U) *BENZENE, *POLARIZATION, COMPUTATIONS, CONSISTENCY, CORRELATION, ELECTRIC FIELDS, ELECTRICAL PROPERTIES, ELECTRONS, FIELD INTENSITY, MICROSCOPY, MIXING, MOLECULES, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, POLYNOMIALS, REPRINTS, RESPONSE, STRUCTURAL PROPERTIES, WAVES.

PERSONAL AUTHORS: Perrin, E.; Prasad, P. N

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1389

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303A3.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v91
n8 p4728-4732, 15 Oct 89.

ABSTRACT: (U) We present an ab initio calculation of polarizability and second hyperpolarizability for the benzene molecule including electron-electron correlation. The finite field method is used. For each selected strength of the applied electric field the energy of the benzene molecule is calculated using the self-consistent field method (SCF) as well as with its Moller-Plesset correction in the second order (MP-2). Then the microscopic optical nonlinear responses are calculated by fitting both the SCF energy and the MP-2 energy to a polynomial in the field strength. We find that electron correlation significantly enhances the second hyperpolarizability. For the polarizability, our computed value shows an excellent agreement with the experimentally measured value. For the second hyperpolarizability, the computed value using MP-2 energy shows a reasonable agreement with that reported by value using MP-2 energy shows a reasonable agreement with that reported by the electrical field induced second harmonic (EFISH) generation but a poor agreement with the result of degenerate four wave mixing (DFWM). Finally, we also compare our ab initio results with those previously reported using semiempirical methods. Keywords: Optical properties; Electrical properties; Structural properties; Reprints. (kt)

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SEARCH CONTROL NO EV158L

PITTSBURGH UNIV PA DEPT OF MATERIALS SCIENCE AND
ENGINEERING

AD-A214 989 CONTINUED

(U) Program to Study the Oxidation of Carbon-Carbon
Composites and Coatings on These Materials.

MICROSCOPY, ELECTRONIC SCANNERS, ISOTHERMS, LOW RATE,
OPTICAL ANALYSIS, OXIDATION, OXYGEN, RATES, STATE OF THE
ART, TEMPERATURE, TIME INTERVALS, WATER VAPOR.

DESCRIPTIVE NOTE: Final rept. 15 Jul 86-13 Jul 89,
SEP 89

IDENTIFIERS: (U) PEB1102F, WUAFOSR2308A2.

PERSONAL AUTHORS: Cullinan, J.; Schaeffer, J.; Gulbransen,
E. A.; Meier, G. H.; Pettit, F. S.

CONTRACT NO. AFOSR-86-0251

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1643

UNCLASSIFIED REPORT

ABSTRACT: (U) The oxidation of carbon-carbon composites and coatings on these composites in oxygen at temperatures between 300 to 1400 C has been investigated. State-of-the-art systems have been characterized prior to the oxidation studies by using optical and scanning electron microscopy. It has been determined that uncoated carbon-carbon composites cannot be used at temperatures above about 400 C for extended periods of time because of oxidation. Oxidation does occur at temperatures below 400 C but at very low rates. Boron has not been found to be an effective inhibitor for carbon-carbon oxidation. Water vapor increased the oxidation rate of these uncoated composites at temperatures below about 600 C. Oxidation products involving boron were removed from these composites at temperatures above 800 C when water vapor was present in the gas. Coatings were useful in protecting carbon-carbon composites from oxidation under isothermal test conditions but these coatings failed under cyclic conditions. The factors leading to the failure of coatings on carbon-carbon composites are described.

DESCRIPTORS: (U) CARBON CARBON COMPOSITES, BORON, COATINGS, COMPOSITE MATERIALS, CYCLES, ELECTRON

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AD-A214 979 20/11

AD-A214 974 1/1 12/4 12/6

MARYLAND UNIV COLLEGE PARK DEPT OF AEROSPACE
ENGINEERING

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS
PHILADELPHIA PA

(U) Hybrid Finite Element Analysis of Free Edge Effect in
Symmetric Composite Laminates

(U) Society for Industrial and Applied Mathematics (SIAM)
1983 Fall Meeting Held at Norfolk, Virginia. Final
Technical Report on Grant AFOSR-83-0276.

DESCRIPTIVE NOTE: Final rept. 30 Jun 81-30 Sep 82.

DESCRIPTIVE NOTE: Rept. for 7 Jan 83-30 Apr 84.

JUN 83

AUG 84

PERSONAL AUTHORS: Lee, S. W.; Rhiu, J. J.; Wong, S. C.

PERSONAL AUTHORS: Block, I. E.

CONTRACT NO. AFOSR-81-0203

CONTRACT NO. AFOSR-83-0276

PROJECT NO. 2307

PROJECT NO. 2304

TASK NO. 82

TASK NO. A2

MONITOR: AFOSR
TR-89-1607

MONITOR: AFOSR
TR-89-1537

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The analytical study of the nature of
interlaminar stresses near stress free edges has been the
subject of substantial research interest. Such studies
are significant because the high interlaminar stresses or
stress singularities near stress-free edges may cause
delamination failure as shown by experimental
investigations. Also the accurate prediction of these
stresses may be useful in the design of test specimens
for investigation of laminate strength. One of the first
analytical studies on interlaminar stresses near stress-
free edges was published by Pipes and Pagano. In their
study, finite difference technique was applied to a
symmetric finite-width composite laminate subjected to
uniform uniaxial strain. Subsequently other techniques
were used to solve similar problems.

DESCRIPTORS: (U) *FAILURE, *FINITE DIFFERENCE THEORY,
ACCURACY, COMPOSITE MATERIALS, DELAMINATION, EDGES,
FINITE ELEMENT ANALYSIS, HYBRID SYSTEMS, LAMINATES, PIPES,
PREDICTIONS, STRENGTH(GENERAL), STRESSES, SYMMETRY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2307B2.

AD-A214 979

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ABSTRACT: (U) The SIAM 1983 Fall Meeting held at the
Omni Hotel, Norfolk, Virginia, focused on three themes---
computational aerodynamics; control, stabilization and
optimization in distributed parameter systems; and
parallel processing. Well known researchers were ten
minisymposia which enhanced the major themes. The
conference attracted a large, enthusiastic group of
attendees with well over 100 contributed papers in
addition to those presented in the minisymposia. (kr)

DESCRIPTORS: (U) *AERODYNAMICS, *COMPUTER APPLICATIONS,
*APPLIED MATHEMATICS, COMPUTATIONS, SYMPOSIA,
DISTRIBUTION, INDUSTRIES, OPTIMIZATION, PARALLEL
PROCESSING, PARAMETERS, VIRGINIA.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A3

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI58L

AD-A214 973 CONTINUED

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

FURANS, HYDROGEN COMPOUNDS

(U) Synthesis of Hexacyclo(5.4.0.0(2,8).0(3,10).0(5,9).0(18,11)undecane-8-carboxylic Acid (Homopentaprismane-8-carboxylic Acid).

IDENTIFIERS: (U) PE81102F, WUAFDSR230382, Undecanes, Prismanes, Hexacyclic Compounds, Diones, Diols, Sodium Hydride.

89

PERSONAL AUTHORS: Marchand, Alan P.; Deshpande, Mahendra N.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-88-1300

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, V54 n/3 p3228-3229 1989.

ABSTRACT: (U) The title compound was synthesized in nine steps from pentacyclo[5.4.0.02,8.03,10.05,9]-undecane-8,11-dione monoethylene ketal (2) in 23% overall yield. Thus, reaction of 2 with ethyl (diethoxyphosphoryl) acetate in the presence of NaH provided the corresponding 8-carboethoxymethylene derivative (3, 93%). The corresponding endo-11-carboethoxy-methylene derivative (4, 100%) was prepared via catalytic hydrogenation of 3. Hydrolysis of the ester and ketal groups in 4 with aqueous acid gave 5 (80%). The corresponding substituted 1,3-dishomopentaprismane (6, 91%) was synthesized by subsequent reaction of 5 with NaH/DMF-THF. Reaction of 6 with MeLi/THF gave 7 (80%), which, upon oxidation with CF3CO3H followed by workup with aqueous base afforded the corresponding 1,3-bishomo-pentaprismanediol (8, 60%). Organic chemistry.

DESCRIPTORS: (U) *CARBOXYLIC ACIDS, *SYNTHESIS(CHEMISTRY) *CYCLIC COMPOUNDS, ESTERS, HYDROLYSIS, ORGANIC CHEMISTRY, OXIDATION, WATER, DECANES, SODIUM COMPOUNDS, HYDRIDES, ETHYLENE, KETONES, ETHYL RADICALS, OXYGEN, PHOSPHINE, ACETATES, METHYLENES, CHEMICAL DERIVATIVES, CATALYSIS, HYDROGENATION, FORMAMIDES, METHYL RADICALS.

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AD-A214 971 7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) Synthesis and Iron Carbonyl Promoted Coupling Reactions of 7-(Aryloxy)norbornadienes.

(U) Reaction of 1,exo-5-Dimethyl-3-oxo-exo-6-Carbomethoxy-tricyclo(5.2.1.0(2.6)dec-8-ene with Ethanedithiol in the Presence of Boron Trifluoride Etherate. A Novel Fragmentation Process.

89

PERSONAL AUTHORS: Marchand, Alan P.; Dave, Paritosh R.

89

CONTRACT NO. AFOSR-88-0132

PERSONAL AUTHORS: Marchand, Alan P.; Vidyasagar, V.; Suri, Suresh C.; Thomas, Ruthanne D.; Ellington, Donald H.

PROJECT NO. 2303

CONTRACT NO. AFOSR-88-0132

TASK NO. 82

PROJECT NO. 2303

MONITOR: AFOSR
TR-89-1303

TASK NO. 82

UNCLASSIFIED REPORT

MONITOR: AFOSR

TR-89-1301

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, V54 n11 p2775-2777 1989.

UNCLASSIFIED REPORT

ABSTRACT: (U) Mitsunobu reactions of 3-hydroxyquadracyclane (1) with phenol and with p-cyanophenol produced the corresponding 3-aryloxyquadracyclanes (2a (72%) and 2b (39%), respectively). Palladium(II) promoted valence isomerization of 2a and 2b afforded the corresponding 7-aryloxynorbornadienes (3a (84%) and 3b (80%), respectively). The thermal reactions of 3a and of 3b with Fe(CO)₅ and with Fe₂(CO)₉ were studied. With the exception of the thermal reaction of 3b with Fe(CO)₅, each reaction afforded a cage dimer (4a and 4b, respectively) and a dimer ketone (5a and 5b, respectively) in low to moderate yields. Thermal reaction of 3b with Fe(CO)₅ gave only traces of 4b and no dimer ketone. Instead, the major reaction product was p-cyanophenol (3b). A control experiment established that the p-cyanophenol probably was formed unreacted 3b during oxidative workup of the reaction mixture with ferric chloride-acetone solution. Organic chemistry. (jes)

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, CHEMICAL REACTIONS, CONTROL, DIMERS, IRON, KETONES, MIXTURES, PHENOLS, SYNTHESIS.

IDENTIFIERS: (U) PE81102F, WUAFOSR230382.

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SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, V54 n15 p3751-3754 1989.

ABSTRACT: (U) Reaction of the title compound, 1, with ethanedithiol in the presence of boron trifluoride etherate at -78 C is complete within five minutes. A single product, 2, was isolated from this reaction. The structure of 2 was established by careful analysis of its proton and carbon-13 NMR spectra. Proton and carbon-13 NMR chemical shift assignments are given along with ¹³C(1H) NQE values and spin-lattice relaxation times for all carbon atoms in 2. The formation of 2 in this reaction is rationalized in terms of a concerted reaction in which BF₃-promoted cleavage of the C(1)-C(2) alpha-bond in the substrate occurs with concomitant stereospecific exo attack by ethanedithiol upon C(8) in the substrate. Organic chemistry. (jes)

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, ATOMS, BORON COMPOUNDS, CARBON, CHEMICAL SHIFTS, ETHERS, FLUORIDES, FRAGMENTATION, SUBSTRATES.

IDENTIFIERS: (U) PE81102F, WUAFOSR230382.

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SEARCH CONTROL NO EVI56L

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AD A214 969 7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Structures of Two Diastereoisomeric Saturated Polycyclic C₂₂H₂₄O Ketones.

(U) Study of Anisotropy of Acoustic Wave Propagation in Stretched Poly(vinylidene difluoride) Film Using the Picosecond Transient Grating Technique.

89

89

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante; Marchand, Alan P.; Deshpande, Mahendra N.

PERSONAL AUTHORS: Burzynski, Ryszard; Pang, Yang; Rao, D. N.; Prasad, Paras N.

CONTRACT NO. AFOSR-88-0132

CONTRACT NO. F49620-87-C-0042

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. A3

MONITOR: AFOSR TR-89-1302

MONITOR: AFOSR TR-89-1314

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Cryst., VC45 p1339-1342 1989.

SUPPLEMENTARY NOTE: Pub. in Polymer, V30 p1247-1250 Jul 89.

ABSTRACT: (U) The two diastereoisomers consist of a cage composed of six fused five-membered rings containing a ketone moiety bonded to a cage composed of four fused five-membered rings and a four-membered ring. Both of these cages contain a norbornane fragment. The diastereoisomers crystalline in the triclinic space group. There are no short inter- or intra-molecular interactions and the melting points of the two C₂₂ compounds are relatively low. While there are no significant inter- or intra-molecular interactions, several chemically equivalent bonds and angles in the two structures differ from each other by more than 3 alpha. Organic chemistry (jes)

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, INTERACTIONS, INTERNAL, MELTING POINT, MOLECULAR PROPERTIES, STRUCTURES.

IDENTIFIERS: (U) PI61102F, WUAFOSR2303B2.

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DESCRIPTORS: (U) *ACOUSTIC VELOCITY, *ORGANIC CHEMISTRY, ACOUSTIC WAVES, AGREEMENTS, ANISOTROPY, EQUATIONS, FILMS, FLUORIDES, GRATINGS(SPECTRA), LIQUID NITROGEN, METHODOLOGY, MODULUS OF ELASTICITY, ORIENTATION(DIRECTION), PHONONS, SHEAR PROPERTIES, TEMPERATURE, TRANSIENTS, VINYL PLASTICS, WAVE PROPAGATION.

IDENTIFIERS: (U) PE31102F, WUAFOSR2303A3.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVISGL

AD-A214 968 9/3 20/6 1

AD-A214 967 7/2

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Stimulated Amplification of a Broad-Band Optical Signal Through a Benzene-Core Fiber System Pumped by Ultra-Short Laser Pulses.

(U) Dissociative Chemisorption of NF₃ at Si(100) Surfaces.

AUG 89

89

PERSONAL AUTHORS: He, G. S.; Xu, G. C.; Burzynski, R. Prasad, P. N.

PERSONAL AUTHORS: Shorter, J. A.; Langan, J. G.; Steinfeld, J. I.

CONTRACT NO. F49620-87-C-0042

CONTRACT NO. F49620-86-C-0003

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. A3

TASK NO. B1

MONITOR: AFOSR TR-89-1316

MONITOR: AFOSR TR-89-1315

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Optics Communication, v72 n6 p397-400, 15 Aug 89.

SUPPLEMENTARY NOTE: Pub. in Surface Science, v219 pL560-L564 1989.

ABSTRACT: (U) This paper presents a novel approach to amplify a broad-band optical signal by using stimulated Rayleigh-Kerr scattering in a hollow core fiber system filled with liquid benzene. Using 4 ps dye laser pulses as the pump source, stimulated amplification of the accompanying approx. 550 per cm broad spontaneous emission is achieved with an amplification factor reaching 23,000. Reprints. (rrh)

DESCRIPTORS: (U) *AMPLIFICATION, *BENZENE, *CORES, *DYE LASERS, *FIBERS, *LIQUIDS, *PUMPS, *SCATTERING, *BROADBAND, *EMISSION, *LIGHT PULSES, *OPTICS, *REPRINTS, *SHORT PULSES, *SIGNALS, *SOURCES, *STIMULATION(GENERAL).

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3.

DESCRIPTORS: (U) *CHEMISORPTION, *SURFACE REACTIONS, *FLUORIDES, *NITROGEN COMPOUNDS, *SILICON, *CARBON, *DISSOCIATION, *DRY MATERIALS, *EFFLUENTS, *ETCHING, *EXCIMER.

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DTIC REPORT BIBLIOGRAPHY

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FLUORINATED HYDROCARBONS, FLUORINATION, FLUORINE, GASES, LASERS, LAYERS, MEASUREMENT, NITROGEN, PLASMAS (PHYSICS), RATES, RATIOS, REPRINTS, RESPONSE, SURFACES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1, *Nitrogen Trifluoride.

SEARCH CONTROL NO. EV158L

AD-A214 968 20/5 20/10 12/1 12/3
TECHNISCHE HOCHSCHULE MUNICH (GERMANY F R) INST FUER ANGEWANDTE BOTANIK

(U) Relativistic Radiationless Transition Probabilities for Atomic K- and L-Shells.

JUL 79

PERSONAL AUTHORS: Chen, Mau H.; Crasemann, Bernd; Mark, Hans

CONTRACT NO. AFOSR-79-0028

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-89-1688

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Atomic Data and Nuclear Data Tables, v24 n1 p13-37 Jul 79.

ABSTRACT: (U) Auger and Coster-Kroening transition probabilities have been calculated ab initio relativistically from perturbation theory, for frozen orbitals, in the Dirac-Hartree-Slater approach. Results in the j-j coupling scheme are tabulated for 22 elements with atomic numbers $18 < \text{or} = 96$. (RH)

DESCRIPTORS: (U) *PERTURBATION THEORY, *PROBABILITY, *RADIATION, *TRANSITIONS, AUGERS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A4.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV1561
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COLORADO UNIV AT BOULDER

Reprints. (kt)

(U) The Effects of Chronic Oxotremorine Treatment on
Spatial Learning and Tolerance Development in Mice.

DESCRIPTORS: (U) *CHEMOTHERAPEUTIC AGENTS. *LEARNING.
*SPACE PERCEPTION. BODY TEMPERATURE. BRAIN. DEFICIENCIES.
HIPPOCAMPUS. PHYSIOLOGICAL EFFECTS. HYPOTHALAMUS. LOSSES.
MEASUREMENT. MICE. MUSCARINE. PROBES. RECEPTION. REGIONS.
REPRINTS. SITES. SPATIAL DISTRIBUTION. TOLERANCE.
TRAINING.

PERSONAL AUTHORS: Wehner, Jeanne M.; Upchurch, Margaret

CONTRACT NO. AFOSR-85-0369

IDENTIFIERS: (U) PEG1102F, WUAFOSR2312A2, *Oxotremorine.

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR
TR-89-1358

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Pharmacology Biochemistry and
Behavior, v32 p543-551 1989.

ABSTRACT: (U) C57BL mice were treated with 0.5 mg/kg/hr
oxotremorine through an implanted subcutaneous cannula
for 8 days. Tolerance to oxotremorine was evaluated after
treatment by constructing cumulative dose-response curves
and measuring body temperatures and rotarod performance.
At 2 hr after removal, mice exhibited a 15-fold tolerance
as measured by body temperature and a 4-fold tolerance as
measured by rotarod performance. This tolerance as
measured by body temperature was lost by two days after
removal from treatment. Immediately after treatment, 3H-
QNB binding was reduced in cortex, hippocampus, midbrain,
hindbrain, and hypothalamus. Receptors returned to normal
within 4 to 8 days after cessation of treatment depending
on the brain region. Spatial learning was examined using
the Morris water task. Mice that began their training in
this task 1 day after they were removed from oxotremorine
treatment were impaired in their spatial ability as
evidenced by a lack of preference for the trained site
during a probe trial. Mice that began their training 2
days after cessation of oxotremorine treatment showed no
evidence of impairment in spatial learning. These results
suggest that a loss of muscarinic receptors after
oxotremorine treatment can be dissociated from tolerance
loss and spatial learning deficits. Keywords: Spatial
learning; Muscarinic receptors; Tolerance development;

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AD-A214 983 3/2

GEORGETOWN UNIV WASHINGTON DC DEPT OF CHEMISTRY

SMITHSONIAN ASTROPHYSICAL OBSERVATORY CAMBRIDGE MA

(U) Evaluation of Chemical and Atmospheric Sciences Research.

(U) High Resolution Astrophysical Observations Using Speckle Imaging.

DESCRIPTIVE NOTE: Final rept. 10 Sep 81-9 Sep 84.

DESCRIPTIVE NOTE: Annual rept. (Final) 1 Jan-31 Dec 81.

SEP 84

DEC 81 38P

PERSONAL AUTHORS: Earley, Joseph E.

PERSONAL AUTHORS: Noyes, Robert W.; Nisenson, Peter; Stachnik, Robert V.

CONTRACT NO. F49620-81-C-0085

CONTRACT NO. AFOSR-81-0055

PROJECT NO. 2303

PROJECT NO. 2311

TASK NO. A1

TASK NO. A1

MONITOR: AFOSR TR-89-1555

MONITOR: AFOSR TR-89-1528

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) During the period covered by this report, six plenary meetings of the Chemistry Research-evaluation Panel for AFOSR have been held. The sixty-third chemistry research evaluation meeting for AFOSR was held at the U.S. Air Force Academy, Colorado on November 12 and 13, 1981; thirty-nine proposals were considered at that meeting, and relative rankings for scientific quality were determined. An interim technical report specifying that rank-order has been submitted and is appended as Appendix I. The sixty-fourth chemistry research-evaluation meeting for AFOSR was held at Alexandria, Virginia, on May 13 and 14, 1982; fifty proposals were considered at that meeting, and relative rankings for scientific quality were determined. An interim technical report specifying that rank-order has been submitted and is appended as Appendix II. Keywords: Atmospheric chemistry. (kr)

DESCRIPTORS: (U) *ATMOSPHERIC CHEMISTRY, *RESEARCH MANAGEMENT, AERONOMY, ATMOSPHERES, COLORADO, QUALITY, SYMPOSIA, UNITED STATES AIR FORCE ACADEMY, VIRGINIA.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A1.

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ABSTRACT: (U) The reconstruction of complex solar surface features to a factor of ten finer than could normally be studied under prevailing seeing conditions has been demonstrated previously, successful examples of speckle image reconstruction were limited to uncomplicated objects showing very high contrast structure. The ability to retrieve complex and low contrast image detail is a result of recognizing the need for high quality sensors capable of recording subtle intensity modulations in the data frames. Keywords: Photon counting cameras; Image processing algorithms; Fourier transformations. (EDC)

DESCRIPTORS: (U) *IMAGE PROCESSING, *SUN, ALGORITHMS, ASTROPHYSICS, ASTRONOMICAL CAMERAS, CONTRAST, COUNTING METHODS, DETECTORS, FOURIER TRANSFORMATION, FRAMES, HIGH RESOLUTION, IMAGES, INTENSITY, MODULATION, PHOTONS, QUALITY, SPECULAR REFLECTION, SURFACE PROPERTIES.

IDENTIFIERS: (U) Speckle imaging, Image reconstruction, Photon counting cameras, Solar surface, PE61102F, WUAFOSR2311A1.

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UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES CENTER FOR LASER STUDIES

COLORADO STATE UNIV FORT COLLINS DEPT OF ELECTRICAL ENGINEERING

(U) Coherent Propagation and Sum Frequency Generation into the Vacuum Ultra Violet.

(U) CW Ultraviolet Laser Excited with an Electron Beam.

DESCRIPTIVE NOTE: Final rept. 1 Nov 80-31 Oct 81.

DESCRIPTIVE NOTE: Final rept. 1 Jul 87 30 Jun 89.

OCT 81

OCT 89

PERSONAL AUTHORS: Diels, Jean C.

PERSONAL AUTHORS: Rocca, Jorge J

CONTRACT NO. AFOSR-81-0019

CONTRACT NO. AFOSR-87-0290

PROJECT NO. 2301

PROJECT NO. 2301

TASK NO. A1

TASK NO. A1

MONITOR: AFOSR TR-89-1627

MONITOR: AFOSR TR-89-1422

UNCLASSIFIED REPORT

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ABSTRACT: (U) The goal of this program is to demonstrate coherent sum frequency generation into the U.V., with energy conversion efficiencies of the order of several per cent. A facility was developed needed to perform these measurements. The source consists in a synchronously pumped dye laser oscillator tunable to the various two-photon transitions of lithium followed by a 3 stage Nd:Yag ((frequency doubled)) pumped dye laser amplifier.

ABSTRACT: (U) Laser oscillation was obtained in the 318 nm transition of AgII. excitation of the laser upper level occurs by charge transfer collisions between ground state neon ions created by electron beam ionization and silver atoms. CW laser oscillation was also obtained in the 478.8 line of AgII. (RRH)

DESCRIPTORS: (U) *DYE LASERS, COHERENCE, EFFICIENCY, ENERGY CONVERSION, FREQUENCY, LASER AMPLIFIERS, LASER PUMPING, LITHIUM, OSCILLATORS, PHOTONS, PROPAGATION, TRANSITIONS, ULTRAVIOLET RADIATION, VACUUM, YTTRIUM ALUMINUM GARNET.

DESCRIPTORS: (U) *ATOMS, *CHARGE TRANSFER, *COLLISIONS, *CONTINUOUS WAVE LASERS, *ELECTRON BEAMS, *IONIZATION, *IONS, *NEON, *SILVER, *ULTRAVIOLET LASERS, GROUND STATE, LASERS, OSCILLATION.

IDENTIFIERS: (U) WUAFOSR2301A1, PEB1102F.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2301A1.

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TRINITY UNIV SAN ANTONIO TX LAB OF CELLULAR PHYSIOLOGY

(U) Investigations into the Genetic Basis of the
Biodegradation of Phenolic Wastes in Selected Strains
of *Pseudomonas*.

DESCRIPTIVE NOTE: Final rept. 1 Jul 77-30 Jun 79.

79

29P

PERSONAL AUTHORS: Cobb, Howell D.; Olive, William E., Jr.
; Egan, John W.

CONTRACT NO. AFOSR-78-2875

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-89-1420

UNCLASSIFIED REPORT

ABSTRACT: (U) The past decade has seen a literal explosion in the application of microbial metabolism to waste management problems, and a parallel growth of interest in the genetic mechanisms which underlie such capacities. This laboratory, under the auspices of the AFOSR and, for a time, the AF Systems Command, was responsible for engineering an artificial ecosystem of organisms capable of handling concentrated phenolic wastes at extremely high efficiencies. Simultaneously, studies were also undertaken to develop an understanding of the genetic mechanisms characteristic of organisms adapted for use in phenolics biodegradation tasks. Two species of bacteria, *Pseudomonas aeruginosa* and *Pseudomonas putida* have been studied to determine induction controls governing the membrane-bound hydroxylases and oxygenases responsible for cresol degradation. Interrupted mating, oxygen probe and spectrophotometric enzyme studies suggest a late chromosomal location for information controlling the expression of the 2.3 oxygenase for 4 methyl and 3 methyl catechol. *P. aeruginosa* JPT3-4 plasmid DNA transforms *P. putida* AC137 TOL+ to cresol competency at low frequency. Such transformation is apparently linked to a plasmid incompatible with TOL. The exact type of information

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transferred is not yet known. It is hoped that these studies on genetic mechanisms will lead to a strain of bacteria with greater cresol degrading abilities. (KT)

DESCRIPTORS: (U) *BIODETERIORATION, *WASTE DISPOSAL, *WASTE TREATMENT, *PHENOLIC PLASTICS, *PSEUDOMONAS AERUGINOSA, *WASTE MANAGEMENT, BACTERIA, CHROMOSOMES, CONTROL, ECOSYSTEMS, EFFICIENCY, ENZYMES, GENETICS, GROWTH(PHYSIOLOGY), HANDLING, INDUCTION SYSTEMS, LOW FREQUENCY, METABOLISM, MICROORGANISMS, OXIDOREDUCTASES, OXYGEN, PARALLEL ORIENTATION, PHENOLS, POSITION(LOCATION), PROBES, SPECTROPHOTOMETRY, WASTES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

AD-A214 926 6/5 6/4 5/2

NEW YORK ACADEMY OF SCIENCES NY

(U) Advances in Oculomotor and Vestibular Physiology.

DESCRIPTIVE NOTE: Final rept..

NOV 80

PERSONAL AUTHORS: Cohen, Bernard

CONTRACT NO. AFOSR-80-0277

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR
TR-89-1421

UNCLASSIFIED REPORT

ABSTRACT: (U) The Barany Society-New York Academy of Science Conference on Advances in Oculomotor and Vestibular Physiology was held on September 22-25, 1980 at the Barbizon Plaza Hotel in New York City. 75 Speakers presented material on both basic and clinical aspects of vestibular and oculomotor system organization. The meeting was supported by the Air Force Office of Scientific Research, the National Aeronautics and Space Administration, the National Institute of Neurological and Communicative Disorders and Stroke, and the Pfizer Corporation. Several major issues were addressed at the conference. These included: 1) Receptor potential generation in vestibular hair cells; 2) Production of eye movements by the otolith organs; 3) Organization of the central vestibular and oculomotor systems; 4) Visual inputs to the vestibulo-cerebellum; 5) Mechanisms for interactions and visual-vestibular interactions in clinical disorders. Keywords: Symposia. (KT)

DESCRIPTORS: (U) *EYE MOVEMENTS. *OCULOMOTOR NERVE. *SYMPOSIA. *VESTIBULAR APPARATUS. *VISUAL ACUITY. CELLS. CEREBELLUM, HAIR, INTERACTIONS, NEW YORK(NEW YORK). ORGANIZATIONS, PHYSIOLOGY, PRODUCTION, SENSE ORGANS. SYSTEMS APPROACH.

IDENTIFIERS: (U) PE01102F, WUAFOSR2312A1. *Vestibular System, Oculomotor System.

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WASHINGTON UNIV SEATTLE

(U) Fluid Mechanical Refracting Gas Prism And Aerodynamics of E-Beam Sustained Discharge in Supersonic Flow. Both Applicable to Laser Technology.

DESCRIPTIVE NOTE: Final rept. 1 Jan 74-31 Oct 78.

APR 79

PERSONAL AUTHORS: Bogdanoff, D. W.; Christiansen, W. H.

CONTRACT NO. AFOSR-74-2650

PROJECT NO. 2307

TASK NO. A3

MONITOR: AFOSR
TR-89-1427

UNCLASSIFIED REPORT

ABSTRACT: (U) In many high power laser systems, the interaction of either electromagnetic radiation or an electric discharge with a flow system has proved an important phenomenon. Knowledge of the interaction of laser radiation and flow is required to understand the performance of aerodynamic windows and the nonlinear effects of thermal blooming, which involves significant effects caused by small energy losses of the beam. The small losses usually associated with simple refraction of light in gases may be useful and have motivated us to develop and study a unique fluid mechanical device for possible manipulation and storage of laser radiation. A low power beam of light can be deflected continuously through large angles along a curved path using the flow from a convergent-divergent nozzle sector whose throat lies on an arc of a circle. The flow devices that have been built and studied, based on this concept, have been dubbed Venus machines because of the similarity to the optical conditions predicted to exist in the atmosphere of Venus. New and more accurate transmission data is presented wherein transmission measurements in excess of 99.5% are detailed. This data permits detailed analysis of the light well and a more accurate assessment of the optimum operating conditions of the Venus Machine. (Jhd)

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SEARCH CONTROL NO. EVI58L

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DESCRIPTORS: (U) *LASER BEAMS, *WINDOWS, ACCURACY, AERODYNAMICS, ANGLES, CONVERGENT DIVERGENT NOZZLES, CURVATURE, ELECTRIC DISCHARGES, ELECTROMAGNETIC RADIATION, ELECTRON BEAMS, ENERGY, FLUID MECHANICS, GASES, HIGH POWER, INTERACTIONS, LOSSES, LOW POWER, MACHINES, MEASUREMENT, RADIATION ATTENUATION, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, PATHS, REFRACTION, STORAGE, SUPERSONIC FLOW, THERMAL BLOWING, NOZZLE THROATS, TRANSMITTANCE.

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY
(U) Raman Study of Solid State Reactions.

DESCRIPTIVE NOTE: Final rept. 1 Sep 78-31 Aug 79,
AUG 79

PERSONAL AUTHORS: Prasad, Paras N.

IDENTIFIERS: (U) *Aerodynamic Windows, WUAFOSR2307A3,
PE81102F.

CONTRACT NO. AFOSR-78-3876

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1398

UNCLASSIFIED REPORT

ABSTRACT: (U) A considerable amount of work was done towards understanding the nature of reactions in solids. The first step in the investigation of the solid state reactions was the synthesis and the characterization of the materials. Methyl-p-dimethylaminobenzenesulfonate, p-trimethylammoniumbenzene sulfonate, tri-o-thymotide were synthesized and characterized by the Raman spectra. Other compounds proposed for study were, trans-cinnamic acid and p-nitrophenol, the phonon spectra and the internal vibration spectra of which in two crystalline modifications were studied. Another matrix which we proposed for study was cyclodextrin whose Raman spectra were also studied. Solid state photodimerization of two modifications of trans-cinnamic acids in pure crystals was investigated. The Raman spectra of both the phonon region and the internal vibration region were studied as a function of photodimerization. The Raman spectra was shown in phonon region of the trans-cinnamic acids and their respective dimers. This photodimerization investigated using the phonon spectra, the mechanism of the product lattice formation, i.e. whether the reaction proceeds by a homogeneous mechanism with the formation of a solid solution between the reactant the product or by a heterogeneous reaction where the product forms its own lattice. (jhd)

DESCRIPTORS: (U) *RAMAN SPECTRA, *REACTION KINETICS.

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*SOLID SOLUTIONS. *SOLID STATE PHYSICS. CRYSTALS.
HETEROGENEITY. HOMOGENEITY. MODIFICATION. SULFONATES.
DIMERS. PHONONS. PURITY. BENZENE COMPOUNDS. CINNAMIC ACID.
PHOTOCHEMICAL REACTIONS. SYNTHESIS(CHEMISTRY). MOLECULAR
VIBRATION. VIBRATIONAL SPECTRA.

JET PROPULSION LAB PASADENA CA

(U) Plasma Accelerator and Energy Conversion Research.

DESCRIPTIVE NOTE: Final rept. 4 May 82-31 Oct 82.

IDENTIFIERS: (U) Photodimerization. PE61102F.
WJAFOSR2303A3.

OCT 82

PERSONAL AUTHORS: Pawlik, Eugene V.

CONTRACT NO. AFOSR-ISSA-82-00044

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1599

UNCLASSIFIED REPORT

ABSTRACT: (U) The tasks were: 1. To construct by magnetron sputter deposition three AMTEC porous electrodes of 1-3 micron thickness, one of LaB6 on a beta'-alumina solid electrolyte tube, and two of molybdenum-titanium alloy, one of which shall be in the range of 0.2% - 0.5% titanium and the other in the range of 0.5% - 5% titanium. 2. To characterize the morphology and composition of the deposited electrodes before and after high temperature operation and sodium electrolysis by scanning electron microscopy and ion microprobe chemical analysis. 3. To investigate the electrochemical performance and measure sodium vapor transport properties of the deposited electrodes by determining current-voltage characteristics and by current interrupt measurements. A current interrupt test circuit was to be designed and assembled for this purpose. 4. To analyze electrode performance in terms of chemical and morphological characteristics and the relation of these characteristics to electrochemical processes at the beta'-alumina interface and sodium flow characteristics. (jhd)

DESCRIPTORS: (U) *PLASMA DEVICES. *SOLID ELECTROLYTES.
*PLASMAS(PHYSICS). CHEMICAL ANALYSIS. DEPOSITION.
ELECTRIC CURRENT. ELECTROCHEMISTRY. ELECTRODES.
ELECTROLYSIS. ELECTRON MICROSCOPY. ELECTRONIC SCANNERS.
ENERGY CONVERSION. HIGH TEMPERATURE. MAGNETRONS.
MORPHOLOGY. ALUMINUM OXIDES. TITANIUM ALLOYS. MOLYBDENUM

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ALLOYS, POROUS MATERIALS, SODIUM, SPUTTERING, TEST EQUIPMENT, VOLTAGE.

JOHNS HOPKINS UNIV LAUREL MD APPLIED PHYSICS LAB

IDENTIFIERS: (U) *Plasma Accelerators. PE81102F.
WUAFOSR2308A1.

(U) Combustor/Inlet Interactions and Modeling of Hypersonic Dual Combustion Ramjet Engines.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-30 Sep 83.

MAY 83

PERSONAL AUTHORS: Waltrup, Paul J.

CONTRACT NO. AFOSR-MIPR-83-00005

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1801

UNCLASSIFIED REPORT

ABSTRACT: (U) Two distinct but related basic research efforts are being investigated under the joint sponsorship of the U.S. Air Force Office of Scientific Research (AFOSR) and the U.S. Naval Sea Systems Command (NAVSEA). The first effort is to experimentally characterize the flowfields at the entrance of supersonic combustors in hypersonic dual-combustion ramjet engines and the second is to develop the component and engine cycle analysis required to predict the internal flowfields and performance of these engines. Both are basic to the successful development of advanced, hypersonic airbreathing engines. Progress to date includes the development of a simplified axisymmetric mixing and combustion analysis and a concomitant wall boundary layer analysis which describe the major flow phenomena within the main supersonic combustor of a dual combustion ramjet engine. The experimental hardware for the combustor/inlet interaction tests is also complete and initial testing has begun. Currently, refinements to the combustion and wall boundary layer analysis with particular emphasis on the base flow/mixing region, are being pursued and testing with the combustor/inlet interaction hardware continue. (kt)

DESCRIPTORS: (U) *RAMJET ENGINES. *SUPERSONIC CHARACTERISTICS. *SUPERSONIC COMBUSTION. AIR BREATHING

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ENGINES, AXISYMMETRIC, BASE FLOW, BOUNDARY LAYER,
COMBUSTION, COMBUSTORS, CYCLES, ENGINES, FLOW, FLOW
FIELDS, HYPERSONIC FLIGHT, HYPERSONIC VEHICLES, INLETS,
INTERACTIONS, INTERNAL, MIXING, REGIONS, SIMPLIFICATION,
TEST AND EVALUATION, WALLS

IDAHO UNIV MOSCOW DEPT OF GEOGRAPHY

(U) Leisure Time Problems and Livability.

DESCRIPTIVE NOTE: Final rept. 1 Jul 78-30 Jun 79.

IDENTIFIERS: (U) PE81102F, WUAFOSR2308A2.

SEP 79

PERSONAL AUTHORS: Caldwell, Harry H.

CONTRACT NO. AFOSR-78-3848

PROJECT NO. 2307

TASK NO. 09

MONITOR: AFOSR
TR-89-1397

UNCLASSIFIED REPORT

ABSTRACT: (U) The Air Force also has a long record of concern with certain aspects of livability in regard to work, housing and leisure time. These are reflected in regulations, guidelines, facilities and services provided, the use of advisory councils, recognition programs, subsidized educational opportunities and feedback mechanisms to insure progress in this direction. The term livability is still popularly perceived as a subjective, highly personalized value system somewhat identified with quality of life. For some it implies a rationale of more benefits for us but not necessarily for others or as a convenient buzz word to be used to help achieve current or future gains in terms of more leisure time options, better housing, less work and fewer responsibilities. Selective changes in orientation, policy and operations can improve livability but changes should be carefully examined in advance to note their short and long impact on efficiency productivity, readiness and mission effectiveness. Once mainly the concern of philosophers, livability and the quality of life are now studied by ecologists, social scientists, perception and behavior specialists. The varied findings reflect each approach and also indicate diverse social, cultural, environmental and urban viewpoints.

DESCRIPTORS: (U) *SOCIAL SCIENCES, AIR FORCE, BEHAVIOR, EDUCATION, EFFICIENCY, FEEDBACK, IMPACT, LIVING STANDARDS.

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MISSIONS, PERCEPTION, PHILOSOPHY, PRODUCTIVITY, QUALITY,
RECOGNITION, SCIENTISTS, SHORT RANGE(TIME), SPECIALISTS,
TIME.

MARYLAND UNIV BALTIMORE COUNTY CATONSVILLE DEPT OF
MATHEMATICS AND STATISTICS

(U) Nonlinear Heat Transfer and Wave Motion.

IDENTIFIERS: (U) WUAFOSR230709, PE81102F.

DESCRIPTIVE NOTE: Final rept. 1 Feb 87-31 Aug 89.

AUG 89

PERSONAL AUTHORS: Greenberg, James M.

CONTRACT NO. AFOSR-87-0112

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-89-1487

UNCLASSIFIED REPORT

ABSTRACT: (U) This research focused on properties of discrete Velocity Models on the Boltzmann equation. For transport processes, Topics include: 1. Continuum Limits of discrete gases; 2. Hyperbolic Heat Transfer Problems with Phase Transitions, in Nonlinear Hyperbolic Equations - Theory, Computations Methods, and Applications; 3. Surging Glacial flows; 4. Decay Theorems for the Broadwell Equations; and 5. Collisionless Solutions to the Broadwell Equations. (jhd)

DESCRIPTORS: (U) *BOLTZMANN EQUATION, *HEAT TRANSFER, COMPUTATIONS, DECAY SCHEMES, FLOW, GASES, GLACIERS, HYPERBOLAS, LIMITATIONS, MODELS, NONLINEAR ALGEBRAIC EQUATIONS, PHASE TRANSFORMATIONS, THEOREMS, TRANSPORT PROPERTIES, VELOCITY.

IDENTIFIERS: (U) Broadwell Equations, Collisionless Solutions, PE81102F, WUAFOSR2304A9.

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COMPUTATIONAL ENGINEERING INC LAUREL MD

(U) System Identification and Filtering of Nonlinear Controlled Markov Processes by Canonical Variate Analysis.

DESCRIPTIVE NOTE: Final rept. Aug 88-May 89.

OC 89

PERSONAL AUTHORS: Larimore, Wallace E.

CONTRACT NO. F49620-88-C-0093

PROJECT NO. 3005

TASK NO. A1

MONITOR: AFOSR
TR-89-1423

UNCLASSIFIED REPORT

ABSTRACT: (U) In this Phase I SBIR study, new methods are developed for the system identification and stochastic filtering of nonlinear controlled Markov processes. Currently available methods are restricted to very special forms or provide poor approximations to optimal procedures. The feasibility of using state space Markov process models and canonical variate analysis (CVA) for obtaining optimal nonlinear procedures for system identification and stochastic filtering is demonstrated. The theory of nonlinear CVA of Markov processes is developed in terms of a Hilbert space of nonlinear functions, and the multivariate nonlinear CVA is reduced to a sequential selection problem involving a univariate nonlinear CVA - the maximal correlation problem. The theory of maximal correlation, previously developed for Hilbert spaces of nonlinear functions, guarantees the existence of solutions to the multivariate CVA problem. A state space innovations representation for the Markov process is developed in terms of the canonical variable states. Extensions to the selection of a minimal rank state and interpretation of the canonical variable in terms of optimal normalizing transformations is developed. Computational algorithms are developed for determination of the canonical variable states, state space model fitting, and construction of nonlinear stochastic filters.

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DESCRIPTORS: (U) *MATHEMATICAL FILTERS, *NONLINEAR ANALYSIS, *MARKOV PROCESSES, ADAPTERS, ALGORITHMS, APPROXIMATION(MATHEMATICS), COMPUTATIONS, CONTROL, CORRELATION, FILTERS, FITTINGS, FUNCTIONS(MATHEMATICS), GUARANTEES, HILBERT SPACE, IDENTIFICATION, MATHEMATICAL MODELS, NONLINEAR SYSTEMS, OPTIMIZATION, RANK ORDER STATISTICS, SELECTION, SEQUENCES, STOCHASTIC PROCESSES.

IDENTIFIERS: (U) WUAFOSR3005A1, PE65502F.

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COLORADO UNIV AT BOULDER

(U) Heterosis and Resistance to DFP Effects on Spatial Learning in C57BL x DBA Hybrids.

88

neurochemical system influencing spatial learning from their DBA parents or that the DFP treatment did not disrupt cholinergic function to a sufficient degree to impair the superior learning abilities of the F1 hybrids. Reprints. (aw)

PERSONAL AUTHORS: Upchurch, Margaret; Pounder, June I.; Wehrer, Jeanne M.

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR
TR-89-1841

DESCRIPTORS: (U) *CHOLINERGIC NERVES, *GENES, *LEARNING, *ORGANOPHOSPHATES, *CHEMICAL AGENT SIMULANTS, *TOXIC TOLERANCES, LABORATORY ANIMALS, ESCAPE SYSTEMS, FUNCTIONS, MICE, OPACITY, PLATFORMS, REPRINTS, SKILLS, SPACE PERCEPTION, SPATIAL DISTRIBUTION, VISIBILITY, WATER, FLUORINE COMPOUNDS, PROPYL RADICALS, TOXICITY, CUES(STIMULI), HYBRIDIZATION, RESISTANCE(BIOLOGY), SWIMMING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A2, *Heterosis, Hybrids, Morris Water Task, DFP(Diisopropyl Fluorophosphate), Phosphate/Diisopropyl Fluoro.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Brain Research Bulletin, v21 p499-503 1988.

ABSTRACT: (U) THE Morris water task is an escape task that can be designed to provide a measure of nonspatial (cue) learning and spatial (place) learning. In the nonspatial form of the task, animals are required to swim to a visible platform in a pool of opaque water. In the spatial form of the task, the platform is submerged and its position is therefore hidden, so that the animal must locate the platform by using the distal cues in the room. The inbred mouse strains C57BL/6J and DBA/2J differ in their ability to exhibit spatial learning in the Morris water task. C57BL mice learn the task well and show impairment of spatial learning following disruption of cholinergic function. DBA mice show rudimentary spatial learning ability, and are not further impaired when cholinergic function is decreased. These mice may carry genes regulating a noncholinergic spatial learning system. First generation (F1) hybrids between DBA and C57BL mice were tested for spatial learning in the Morris water task. The hybrids performed better than either parental strain, suggesting that both parents contributed genes for spatial learning ability. Chronic treatment with diisopropylfluorophosphate (DFP), which abolished spatial learning ability in C57BL mice, produced only minor impairments in the hybrids. The results suggest either that the hybrids inherited a noncholinergic

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LEHIGH UNIV BETHLEHEM PA INST OF FRACTURE AND SOLID MECHANICS

TULANE UNIV NEW ORLEANS LA DEPT OF CIVIL ENGINEERING

(U) Mechanical Response of Materials with Physical Defects.
Part 2. Combined Modeling of Material Damage and Crack
Propagation for Center Cracked Panel.

(U) Application of a Near-Field Water Quality Model.

DESCRIPTIVE NOTE: Final rept

JUL 79

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 81.

JAN 82

PERSONAL AUTHORS: Benedict, Barry A.

PERSONAL AUTHORS: Sih, G. C.; Matic, P.

CONTRACT NO. F49620-81-K-0005

CONTRACT NO. AFOSR-77-3302

PROJECT NO. 2307

PROJECT NO. 2312

TASK NO. 81

TASK NO. D9

MONITOR: AFOSR
TR-89-1466

MONITOR: AFOSR
TR-89-1410

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) This is the second part of an investigation dealing with the global load-displacement behavior of a center cracked panel. Energy dissipating mechanisms of microcrack formation and macrocrack propagation are modeled separately and in combination in accordance with a predetermined criterion providing the limits for each mechanism. Nonlinear global behavior of the cracked panel is exhibited on the load-displacement curve developed by incremental loading and macrocrack growth with or without microcrack damage. (jes)

DESCRIPTORS: (U) *CRACK PROPAGATION, *MICROCRACKING, *CRACKS, *DAMAGE, *DEFECTS(MATERIALS), *MATERIALS, *MECHANICAL PROPERTIES, *MODELS, *NONLINEAR SYSTEMS, *PANELS, *PHYSICAL PROPERTIES.

IDENTIFIERS: (U) PE81102F, WUAFOSR230781.

IDENTIFIERS: (U) WUAFOSR2312D9, PE81102F, *Environmental Impact Assessment.

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SEARCH CONTROL NO. EVI56L

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FLORIDA UNIV GAINESVILLE DEPT OF MATERIALS SCIENCE AND ENGINEERING

(U) First International Conference on Ultrastructure Processing of Ceramics Glasses and Composites.

DESCRIPTIVE NOTE: Final rept. 1 Aug 82-31 Jul 83.

MAR 84

PERSONAL AUTHORS: Hench, L.

CONTRACT NO. AFOSR-82-0293

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1468

UNCLASSIFIED REPORT

ABSTRACT: (U) Conference Objectives were to establish the scientific foundation for a new era in the manufacture and behavior of ceramics, glasses, and composites for structural, heat engine and electronic applications. The Conference Plan was to bring together the leading researchers world-wide who are attempting to understand the phenomena associated with processing, especially those who understand the significance of surface chemistry and surface physics in this field. Two general subdivisions of ultrastructure processing have been identified and will be used as the primary subdivision of the Conference and the field, i.e., Transformation Processing and Micromorphology Processing. The former includes various types of sol-gel and organometallic precursor processing as well as changes in phase state, such as in the refractory alumina-zirconia system. Micromorphology processing is the term used to describe the preparation and special manipulation of ultrafine particulates, especially the new spherical powders. Our effort will be to establish both the commonality and uniqueness of these new aspects of processing and their scientific basis. The Conference proceedings will be published by John Wiley & Sons as an edited type-set volume in their ceramic science series. L. Hench and D.R. Ulrich will serve as co-editors. All

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Full registrants will receive a copy of the proceedings.
Keywords: Phase transformations, Symposia.

DESCRIPTORS: (U) *CERAMIC MATERIALS, *GLASS, BEHAVIOR, ELECTRONICS, HEAT ENGINES, INTERNATIONAL, ORGANOMETALLIC COMPOUNDS, PARTICULATES, PHASE TRANSFORMATIONS, PHYSICS, PLANNING, PRECURSORS, PROCESSING, SURFACE CHEMISTRY, SURFACES, SYMPOSIA, TRANSFORMATIONS, ULTRAFINES.

IDENTIFIERS: (U) WJAFOSR2303A3, PE81102F.

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DTIC REPORT BIBL IDENTIFIY

SEARCH CONTROL NO EV1561

AD-A214 860

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TEXAS A AND M UNIV COLLEGE STATION DEPT OF MATHEMATICS

(U) Contact and Fracture Problems in Power Law
Viscoelastic Material.

DESCRIPTIVE NOTE: Final rept. 1 Apr 79-31 Mar 80.

MAR 80

PERSONAL AUTHORS: Walton, Jay R.

CONTRACT NO. AFOSR-77-3290

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1489

UNCLASSIFIED REPORT

ABSTRACT: (U) An investigation was completed on an analysis of an elastic interface edge crack. Specifically, for an edge crack along the interface between two elastic wedges of different opening angles and dissimilar elastic properties, and that is subjected to point loads at the apex, a relation is derived among the length of the crack, the energy release rate of the crack, the applied loads, the wedge angles and the material parameters. The analysis exploits properties of the M-Conservation integral, thereby obviating a consideration of the very complicated associated mixed boundary value problem (jes)

DESCRIPTORS: (U) *CRACKS. *EDGES. *FRACTURE(MECHANICS). *VISCOELASTICITY, BOUNDARY VALUE PROBLEMS, ELASTIC PROPERTIES, ENERGY TRANSFER, INTERFACES, LENGTH, OPENING(PROCESS), PARAMETERS, RATES.

IDENTIFIERS: (U) WUAFOSR2304A4, PEB1102F.

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CINCINNATI UNIV OH DEPT OF ENGINEERING SCIENCE

(U) Blast and Penetration Resistant Tactical Shelters.

DESCRIPTIVE NOTE: Final rept. 1 Jun 78-31 May 79.

JUL 79

PERSONAL AUTHORS: Strauss, Alvin M

CONTRACT NO. AFOSR-78-3588

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-89-1414

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of the research was to investigate the Air Force's tactical shelter designs and determine the extent to which blast and penetration resistance could be incorporated into the design. This was to be done within existing weight, cost and other constraints specified in the relevant Military Specifications. We deal here with the standard 8x8x13 ft rectangular parallel piped, although the work here is applicable to the 8x8x20 ft shelter. This shelter must be capable of efficient transport by plane, ship, helicopter, rail, or truck without damage to the structure. The shelter should be capable of withstanding a 7.25 psi overpressure (peak pressure). (jes)

DESCRIPTORS: (U) *BLAST RESISTANT SHELTERS, AIR FORCE, BLAST, COSTS, DAMAGE, EFFICIENCY, HELICOPTERS, AIR TRANSPORTABLE EQUIPMENT, MILITARY REQUIREMENTS, OVERPRESSURE, PEAK VALUES, PENETRATION, PRESSURE, RESISTANCE, SHELTERS, SPECIFICATIONS, TRANSPORT.

IDENTIFIERS: (U) WUAFOSR2307D9, PEB1102F.

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OTIC REPORT BIBLIOGRAPHY

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TEXAS ENGINEERING EXPERIMENT STATION COLLEGE STATION

(U) The Effect of an Impressed Electric Field on the Metal Working of Aircraft Structural Materials.

DESCRIPTIVE NOTE: Final rept. 1 Nov 78-31 Jan 79.

MAR 79

PERSONAL AUTHORS: Cornwell, L. R.

CONTRACT NO. AFOSR-77-3193

PROJECT NO. 2307

TASK NO. 82

MONITOR: AFOSR
TR-89-1428

UNCLASSIFIED REPORT

ABSTRACT: (U) That an interaction exists between conduction electrons in metals and moving dislocations has long been known. Provided a large amount of electrical energy is passed through a metal undergoing plastic deformation either a load drop or increased plasticity is observed. This work confirms that this so called electroplastic effect is strain rate dependent; it becomes negligible at higher strain rates. Thus, it seems unlikely that electroplasticity can be useful in high strain rate metal working operations. However, it might be useful in forming small parts at low strain rates and the required currents do not become excessive. Tensile tests on polycrystalline and single crystal show load drops which become smaller as the strain rate increases. (jes)

DESCRIPTORS: (U) *DISLOCATIONS, *ELECTRIC CURRENT, *PLASTIC DEFORMATION, AIRFRAMES, DROPS, ELECTRIC FIELDS, ELECTRICAL CONDUCTIVITY, ELECTRONS, HIGH RATE, LOW RATE, METALS, METALWORKING, MOTION, PLASTIC PROPERTIES, SINGLE CRYSTALS, STRAIN RATE, TENSILE PROPERTIES, TEST AND EVALUATION.

IDENTIFIERS: (U) Electroplasticity, PB61102F, WUAFOSR230782.

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SEARCH CONTROL NO EV156L

AD A214 848 13/7

YALE UNIV NEW HAVEN CT DEPT OF ENGINEERING AND APPLIED SCIENCE 20/4 9/3 14/2

(U) Influence of Variation of Aspect Ratio on the Pressure Recovery in Super Sonic Diffusers.

DESCRIPTIVE NOTE: Final rept. no. 8, 1 Jan 77-31 Dec 78, FEB 79

PERSONAL AUTHORS: Wu, Benjamin J.

CONTRACT NO. F49620-77-C-0088

PROJECT NO. 2307

TASK NO. A3

MONITOR: AFOSR
TR-89-1401

UNCLASSIFIED REPORT

ABSTRACT: (U) A systematic investigation was made of the gasdynamics of supersonic diffusers, in particular, lasers. The main conclusion was that almost all the research on supersonic diffusers was performed with specific application, namely a specific wind tunnel installation or an engine, in mind. Systematic studies on the gasdynamics of diffusers even of simple geometries were scarce, making it difficult, if not impossible, to extend existing work to other configurations. Despite the fact that some of the high Mach number wind tunnels operated with known unequilibrated internal modes, there was no research on nonequilibrium flow effects in diffusers in the literature consulted. Moreover, in most conventional wind tunnels, the cross-section of the test section is either circular or square. Consequently, most diffuser studies were concerned with circular, square, or rectangular cross-sections with comparable widths and heights, characterized by an aspect ratio, defined as the width to height ratio, of unity or close to unity. (jhd)

DESCRIPTORS: (U) *ASPECT RATIO, *GAS DYNAMICS, *GAS DYNAMIC LASERS, *SUPERSONIC DIFFUSERS, HEIGHT, INSTALLATION, INTERNAL, NONEQUILIBRIUM FLOW, PRESSURE.

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RECOVERY, SUPERSONIC FLOW, SUPERSONIC WIND TUNNELS

VIRGINIA POLYTECHNIC INST BLACKSBURG DEPT OF CHEMISTRY

IDENTIFIERS: (U) WUAFOSR2307A3, PE61102F

(U) Studies in Singlet Delta Oxygen in Support of Coil

DESCRIPTIVE NOTE: Final rept. 14 May 14 Aug 82.

JUN 83

PERSONAL AUTHORS: McGee, Henry A., Jr

CONTRACT NO. AFOSR-82-0199

PROJECT NO. 2303

TASK NO. D9

MONITOR: AFOSR
TR-89-1396

UNCLASSIFIED REPORT

ABSTRACT: (U) In significant measure, COIL is an exercise in chemical engineering. The traditional chemical concerns of chemical reaction with simultaneous heat, mass, and momentum transport processes are evident in the optical cavity as well as in the upstream manufacture of O2(1 Delta). The ultimate product of COIL is coherent radiation while much more usually, the chemical engineer is concerned with the production of some chemical compound, say penicillin, as a product. But the scientific issues are very similar. This Laboratory is concerned with all of the chemistry of COIL. Although it is a highly reactive and dangerous species, Chlorine Oxide is potentially more than twice as effective in reducing Peroxide to Oxygen (1 Delta) than is Chlorine. It has been conveniently and routinely synthesized from the reaction of C12 with Sodium Carbonate in a fluidized bed reactor configuration. Conversions are of the order of 80 percent, and a typical rate in our facility of 6 cc/sec of C12 yields 0.5 gm/min of C12O. The now convenient production, handling, and analysis of C12O was preliminary to our study of its efficacy in producing O2(1 Delta). Keywords: Chemical oxygen iodine laser, law

DESCRIPTORS: (U) *CHEMICAL ENGINEERING, *CHEMICAL LASERS, *CHLORINE COMPOUNDS, *OXIDES, LASER CAVITIES, CHEMICAL COMPOUNDS, CHEMICAL REACTIONS, CHEMICALS, CHEMISTRY, COHERENT RADIATION, CONFIGURATIONS, FLUIDIZED BED

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PROCESSORS, HEAT, IODINE, MOMENTUM TRANSFER, OPTICS, OXYGEN, PENICILLINS, PEROXIDES, PRODUCTION, SODIUM CARBONATES, SYNCHRONISM, TRANSPORT PROPERTIES.

IDENTIFIERS: (U) WJAFOSR2303D9, PE61102F, *Oxygen Iodine Lasers, COIL (Chemical Oxygen Iodine Laser).

AD-A214 846 20/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Turbulent Boundary Layer Structure and Drag Reduction.
DESCRIPTIVE NOTE: Final rept.,

82

PERSONAL AUTHORS: Landahl, M. T.; Widnall, S. E.

CONTRACT NO. AFOSR-82-0048

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1402

UNCLASSIFIED REPORT

ABSTRACT: (U) Work progressed along the following lines:
i) completion of the development of kinematic wave theory for propagation of waves for wave trains or wave packets with small dissipation through homogeneous or non-homogeneous media; ii) development of a simplified model for the influence of a large eddy breakup device on turbulent boundary layer eddies; iii) completion of experimental and theoretical studies of transition of in a plane channel flow; iv) preparation of transition spots research on flat-plate laminar and turbulent boundary layers. (UHQ)

DESCRIPTORS: (U) *DRAG REDUCTION, *EDDIES/FLUID MECHANICS, *TURBULENT BOUNDARY LAYER, CHANNEL FLOW, DISSIPATION, HETEROGENEITY, FLAT PLATE MODELS, HOMOGENEITY, KINEMATICS, MEDIA, MODELS, SIMPLIFICATION, WAVE PACKETS, WAVE PROPAGATION, WAVES.

IDENTIFIERS: (U) Wave Trains, WJAFOSR2307A2, PE61102F.

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MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS
AND ASTRONAUTICS

SIBLEY SCHOOL OF MECHANICAL AND AEROSPACE ENGINEERING
ITHACA NY

(U) Algorithms for Computational Fluid Dynamics.

(U) Theory and Applications of Unsteady Flows.

DESCRIPTIVE NOTE: Final rept. 1 Sep 80-31 May 81.

DESCRIPTIVE NOTE: Final rept. 1 Jan 74-28 Feb 79.

OCT 81

JUL 79

PERSONAL AUTHORS: Abarbanel, Saul

PERSONAL AUTHORS: Shen, S F.

CONTRACT NO. AFOSR-80-0249

CONTRACT NO. AFOSR-74-2659

PROJECT NO. 2307

PROJECT NO. 2307

TASK NO. A1

TASK NO. A4

MONITOR: AFOSR
TR-89-1538

MONITOR: AFOSR
TR-89-1391

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DESCRIPTORS: (U) *FLUID DYNAMICS, ALGORITHMS, BOUNDARY
VALUE PROBLEMS, TWO DIMENSIONAL FLOW, STABILITY.

DESCRIPTORS: (U) *UNSTEADY FLOW, *PROPELLER NOISE, *FLOW
NOISE, BOUNDARY LAYER FLOW, FLOW SEPARATION,
TURBOMACHINERY, FLUTTER, FINITE ELEMENT ANALYSIS.

IDENTIFIERS: (U) Computational Fluid Dynamics, PE81102F,
WJAFOSR2307A1.

IDENTIFIERS: (U) PE81102F, WJAFOSR2307A4.

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WASHINGTON STATE UNIV PULLMAN SOCIAL RESEARCH CENTER
AD-A214 813 CONTINUED
IDENTIFIERS: (U) PE61102F

(U) The Effects of Integrating Women into Previously All Male Air Force Units: A Longitudinal Study of the Air Force Academy's Integration Process.

DESCRIPTIVE NOTE: Final rept. Jun 78-May 79.
JUL 79

PERSONAL AUTHORS: DeFleur, Lois B.

CONTRACT NO. AFOSR-78-3627

MONITOR: AFOSR
TR-89-1370

UNCLASSIFIED REPORT

ABSTRACT: (U) This project is a continuation of the longitudinal study of sex-integration at the Air Force Academy. Extensive data files from male and female cadets have been developed and data is still being collected. A questionnaire was constructed which asked about problems of sex-integration attitudes toward career, marriage, family as well as issues concerning masculine and feminine roles. An article was prepared and published in Youth and Society Dec. 1978. It discussed ambiguities, sex-linked differences and changes in cadet beliefs concerning squadron life, attitudes toward sex roles and interactions during six months of integration. Females did not believe they were accepted and males expressed more traditional orientations toward women's roles which affected their interaction with female cadets. The paper focused on career, marriage and family perceptions, and expectations. Data indicated that males preferred a traditional career, marriage and family, but about half were planning specifically for marriage and children and a limited Air Force Career. Others wanted to wait before marrying and planned on having dual-career marriages with carefully timed children and limited interruption of careers. (SDM)

DESCRIPTORS: (U) *CAREERS, *ROLES(BEHAVIOR), *SEX, *UNITED STATES AIR FORCE ACADEMY, AIR FORCE, CADETS, CHILDREN, DATA BASES, FEMALES, FILES(RECORDS), HUMANS, INTEGRATION, INTERRUPTION, MALES, MARRIAGE, YOUTH.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L
MORGAN STATE UNIV BALTIMORE MD DEPT OF BUSINESS
ADMINISTRATION AD-A214 812 CONTINUED
theory.

(U) An Investigation of One and Three Parameter Item
Response Models in a Field Setting. With Implications
for Computerized Adaptive Testing.

DESCRIPTIVE NOTE: Final rept..

MAY 81

PERSONAL AUTHORS: Welchel, Broneel R.

CONTRACT NO. AFOSR-80-0181

PROJECT NO. 2313

TASK NO. D9

MONITOR: AFOSR
TR-89-1403

UNCLASSIFIED REPORT

ABSTRACT: (U) The general objective of computer driver adaptive testing is to accurately estimate an individual's position on the underlying trait the test purports to measure. Conventional paper-and-pencil test administration typically suffers from several sources of error in the measurement of an individual's ability. Conventional peaked tests are designed to discriminate most effectively at a single ability level and thus assume that most individuals taking the test fall into this category. The results of this lower precision of measurement is lower overall reliability, and lower validity as well. Two recent developments have enabled the psychometrician to more accurately assess the status of individuals on measurable traits: adaptive testing and latent trait test theory. Adaptive testing enables adapting each test to fit characteristics of each individual tested.

DESCRIPTORS: (U) *COMPUTER APPLICATIONS. *TEST METHODS. *PSYCHOLOGICAL TESTS. ERRORS. MEASUREMENT. PRECISION. RELIABILITY. SKILLS. SOURCES. TEST AND EVALUATION. THEORY. VALIDATION.

IDENTIFIERS: (U) PE81102F, WUAFOSR231309, *Latent trait
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AD A214 808 21/2

STATE UNIV OF NEW YORK COLL AT ONEONTA DEPT OF CHEMISTRY

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF MECHANICAL ENGINEERING

(U) The Chemistry of Antioxidant in Solid Rocket Propellants.

(U) Propagation Characteristics of Laser Supported Combustion Waves in Flowing Media.

DESCRIPTIVE NOTE: Final rept.,

DESCRIPTIVE NOTE: Final rept. 30 Sep 81-10 Oct 82.

MAR 83

JAN 83

PERSONAL AUTHORS: Chiang, Joseph

PERSONAL AUTHORS: Merkle, Charles L.

CONTRACT NO. AFOSR-81-0085

CONTRACT NO. AFOSR-81-0083

PROJECT NO. 2303

PROJECT NO. 2308

TASK NO. 82

TASK NO. A1

MONITOR: AFOSR TR-89-1478

MONITOR: AFOSR TR-89-1480

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ABSTRACT: (U) In this mini grant, the project director has focused his effort on the study of the propellant UPP. The composition of UPP is listed as follows: CTBN-Carboxy-terminated butadieneacrylonitrile, PTECA- C(COOH)4 prime HX-888- Methylaziridine phthalate, TMETN-Trimethyloethane trinitrate, MMA- N-nitroso-N-methyl-p-nitroaniline, HMX- Cyclooctamethylene tetranitramine, AP-Amonium Perchlorate, Al-Aluminum. First attempt was to extract (MMA) from UPP by various solvents: benzene, carbon tetrachloride, methylene chloride, chloroform and dichloro-ethyl ether. At various experimental stages, we tried the above-mentioned solvents at different concentrations: 95-99%. As compared with the previous studies of N-methyl-p-aniline (MNA), MMA did not produce a peak due to the N-H at the methyl carbon in MNA by Fourier transformation infrared spectra. (kt)

DESCRIPTORS: (U) *ANTIOXIDANTS, *SOLID ROCKET PROPELLANTS, AMMONIUM PERCHLORATE, BENZENE, CARBON, CARBON TETRACHLORIDE, CHEMISTRY, CHLORIDES, CHLOROFORM, FOURIER TRANSFORMATION, HMX, INFRARED SPECTRA, METHYL RADICALS, METHYLENES, PROPELLANTS, SOLVENTS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303B, UPP Propellant.

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ABSTRACT: (U) The basic research objectives are: 1. Perform stability analyses of LSC waves in which molecular absorption is the primary absorption mechanism. 2. Investigate the feasibility of using circumferentially uniform radiation to sustain an LSC wave. 3. Look for absorptivity characteristics and energy deposition patterns which will yield improved wall cooling characteristics, increased radiation trapping and resultant reductions in energy losses. 4. Identify important parameters in ignition transients and assess this effect on a propulsive system, and 5. Assess the general effects of variations in the wavelength of laser radiation (from 10.6 microns) on the above and related parameters. As an initial step in understanding the behavior of laser supported plasmas in pure hydrogen, a computer code has been written to determine the high temperature properties of equilibrium hydrogen. Specific properties which are computed include the absorptivity, equilibrium concentrations, enthalpy, internal energy, viscosity and thermal conductivity. Some one-dimensional laser supported plasma calculations are being performed using these property variations. (jhd)

DESCRIPTORS: (U) *ABSORPTION COEFFICIENTS, *COMBUSTION, *LASER APPLICATIONS, *MOLECULAR PROPERTIES, COMPUTER

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV1561

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PROGRAMS, DEPOSITION, ENERGY, ENTHALPY,
EQUILIBRIUM(GENERAL), HIGH TEMPERATURE,
IGNITION, INTERNAL, LASER BEAMS, LOSSES, PATTERNS,
PLASMAS(PHYSICS), PROPULSION SYSTEMS, PURITY, RADIATION,
STABILITY, THERMAL CONDUCTIVITY, TRANSIENTS, VISCOSITY,
WAVES.

NEW YORK UNIV N Y

(U) Mathematics of Wave Propagation in Random Media.

DESCRIPTIVE NOTE. Final rpt. 30 Sep 78-30 Sep 79.

SEP 79

IDENTIFIERS: (U) *Laser Produced Plasmas. PE61102F.
WUAFOSR2308A1

PERSONAL AUTHORS: Keller, Joseph B.

CONTRACT NO. AFOSR-76-2884

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-89-1481

UNCLASSIFIED REPORT

ABSTRACT: (U) One-dimensional, nonlinear wave motion in an infinitely conducting, electrically neutral, incompressible elastic medium in the presence of a magnetic field is studied; A survey of the theory of elastic waveguides is presented; With special emphasis on guides of general cross-section; Flows of incompressible inviscid heavy fluids with free or rigid boundary surfaces are considered, and the development of the theory of linear wave propagation is described after a brief sketch of what wave propagation is (rrh)

DESCRIPTORS: (U) *INCOMPRESSIBILITY, *MAGNETIC FIELDS, *MATHEMATICS, *MEDIA, *NONLINEAR SYSTEMS, *WAVE PROPAGATION, BOUNDARIES, ELASTIC PROPERTIES, FLUIDS INVISCID FLO, LINEARITY, MOTION, PROPAGATION, RIGIDITY, SURFACES, WAVEGUIDES, WAVES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A4.

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AD-A214 806

12/3

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Statistical Aspects of Reliability, Maintainability and Availability.

DESCRIPTIVE NOTE: Final rept. Sep 78-Sep 80.

OCT 80

PERSONAL AUTHORS: Hollander, Myles; Proschan, Frank

CONTRACT NO. AFOSR-78-3878

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1482

UNCLASSIFIED REPORT

ABSTRACT: (U) The main thrust of the research performed under the grant is the development of methods and concepts in reliability, availability, and maintainability, presently applicable and potentially applicable to the programs of the U.S. Air Force in particular and the Department of Defense in general. In addition, because of the general nature of the mathematical and statistical research performed, the results obtained are of value in a variety of other applied areas, and in mathematical and statistical theory. A partial list of topics treated may give some idea of the scope of the research performed under the Grant: Accelerated life testing; Reliability growth models; Inference for the exponential life distribution; Crack size and fatigue life of gun barrels; Competing risk theory. (kr)

DESCRIPTORS: (U) *STATISTICAL ANALYSIS, ACCELERATED TESTING, AIR FORCE, CRACKS, DEPARTMENT OF DEFENSE, DISTRIBUTION FUNCTIONS, EXPONENTIAL FUNCTIONS, FATIGUE LIFE, GROWTH(GENERAL), GUN BARRELS, AVAILABILITY, LIFE TESTS, MAINTAINABILITY, MATHEMATICS, MODELS, RELIABILITY, RISK, SIZES(DIMENSIONS), STATISTICS, THEORY.

IDENTIFIERS: (U) PEG1102F, WUAF01H/104A5

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n/7

OKLAHOMA UNIV HEALTH SCIENCES CENTER OKLAHOMA CITY DEPT OF PHYSIOLOGY AND BIO PHYSICS

(U) Effect of Exposure to Microwaves on the Neuroendocrine Status of the Rat.

DESCRIPTIVE NOTE: Final rept. 1 Jan 79-30 Jun 80.

AUG 80

PERSONAL AUTHORS: Stith, Rex D.

CONTRACT NO. AFOSR-79-0041

PROJECT NO. 2312

TASK NO. D9

MONITOR: AFOSR
TR-89-1485

UNCLASSIFIED REPORT

ABSTRACT: (U) Male Sprague-Dawley rats were restrained individually in a polyethylene box and placed in the far field of 1.2 CH₃, parallel to the electric field. Rats were irradiated for 30 minutes with either no power, continuous wave, or pulsed wave radiation of 5 or 15 mW/cm², average density. Groups of rats were also employed which had been subjected to stress or external heating in place of microwave radiation. At the end of the exposure period, rats were sacrificed by guillotine and hypothalamus, brain stem, and blood samples obtained. Tissues were quick-frozen and stored at -20 C until analyses. Brain tissues were assayed for tyrosine hydroxylase activity (TH) and norepinephrine (NE) and dopamine (DA) concentrations. Results reveal that hypothalamic TH and DA, but not NE were depressed after exposure to microwaves. Brainstem TH and DA were also depressed, but not to as great a degree as in hypothalamus, and mainly to 15 mW/cm² (CW or PW) rather than 5 mW/cm². Brainstem NE was unaffected. These data reveal that effects of acute microwave exposure on the brain can be detected. The changes observed were apparently not due to elevated adrenal corticoid levels on to heating of the animals. Further investigation is suggested to clarify this phenomenon and its relationship to the physiology of the organism. Keywords: Radiation

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO EV1561

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effects: Exposure physiology (kt)

DESCRIPTORS: (U) *ENDOCRINE GLANDS, *NEUROBIOLOGY, *NEUROPHYSIOLOGY, *MICROWAVES, *RADIATION EFFECTS, ANIMALS, BLOOD, BOXES, BRAIN, CONTINUOUS WAVES, DOPAMINE, ELECTRIC FIELDS, EXPOSURE (PHYSIOLOGY), EXTERNAL, FAR FIELD, HEATING, HYPOTHALAMUS, MALES, NOREPINEPHRINE, PHYSIOLOGY, POLYETHYLENE, PULSES, RADIATION, RATS, SAMPLING, TISSUES (BIOLOGY), WAVES.

IDENTIFIERS: (U) PE61102F, WUAFOSR231209,
*Neuroendocrine System.

PENNSYLVANIA UNIV PHILADELPHIA DEPT OF SOCIAL SYSTEMS
SCIENCE

(U) Optimization by the Analytic Hierarchy Process.

DESCRIPTIVE NOTE: Final rept.

79

PERSONAL AUTHORS: Saaty, Thomas L.

CONTRACT NO: AFOSR-77-3386

PROJECT NO: 2304

TASK NO: A5

MONITOR: AFOSR
TR-89-1465

UNCLASSIFIED REPORT

ABSTRACT: (U) The Analytic Hierarchy Process serves as a framework for people to structure their own problems and provide their own judgements based on knowledge, reason or feelings, to derive a set of priorities for activities to which they, for example, wish to allocate effort or resources. In this process transitivity of preference is studied through a new approach to consistency - which need not always strictly hold for the results to be acceptable. Also since hierarchic structures may not be complete, not all alternatives need to be directly comparable. It is necessary to construct a pairwise comparison matrix of the relative contribution or impact of each element on each governing objective or criterion in the adjacent upper level. In such a matrix of the elements by the elements, the elements are compared in a pairwise manner with respect to a criterion in the next level. In comparing the i, j elements, people prefer to give a judgement which indicates the dominance as an integer. Thus, if the dominance does not occur in the i, j position while comparing the i th element with the j th element then it is given in the j, i position as a_{ji} and its reciprocal is automatically assigned to a_{ij} ($a_{ji} = 1/a_{ij}$).

DESCRIPTORS: (U) *PROBLEM SOLVING, CONSISTENCY, HIERARCHIES, JUDGEMENT (PSYCHOLOGY), OPTIMIZATION

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IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5

ARIZONA UNIV TUCSON DEPT OF PHYSICS

(U) Study of Solar Oscillations.

DESCRIPTIVE NOTE: Final rept. 1 Apr 80-31 Mar 81.

JUN 81 12P

PERSONAL AUTHORS: Hill, Henry A.

CONTRACT NO. AFOSR-80-0049

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-89-1369

UNCLASSIFIED REPORT

ABSTRACT: (U) Recent observational evidence on solar oscillations is reviewed; this evidence strongly favors the global interpretation for much of the observed spectrum. Implications of these observations for the study of the solar interior and atmosphere are discussed. An observational program and supporting theoretical program are described in which the oscillations are detected via solar diameter measurements at Santa Catalina Lab. for Experimental Relativity by Astrometry. The main goal of these programs is the classification of the observed modes of oscillation. Results will be used to infer information about the internal rotation of the sun, the depth of the convection zone, and other properties of the internal structure of the sun. Keywords: Solar physics; Solar atmosphere. (edc)

DESCRIPTORS: (U) *OSCILLATION, *SOLAR PHYSICS, CONVECTION, DEPTH, DIAMETERS, INTERNAL, MEASUREMENT, RELATIVITY THEORY, ROTATION, SOLAR ATMOSPHERE, SPHERICAL ASTRONOMY, SUN.

IDENTIFIERS: (U) Astrometry, Solar oscillations, Solar interior, PE81102F, WUAFOSR2311A1.

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AD A214 800 7/4 4/1

BRANDEIS UNIV WALTHAM MA DEPT OF CHEMISTRY

(U) Ion-Molecule Reactions Involving Atmospheric Cluster Ions.

DESCRIPTIVE NOTE: Final rept..

JUL 81

PERSONAL AUTHORS: Henchman, Michael

CONTRACT NO. AFOSR-80-0116

PROJECT NO. 2303

TASK NO. D9

MONITOR: AFOSR
TR-89-1368

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) During the one-year period of this grant work was conducted on five topics; 1) A Unified Treatment of Proton Transfer and Hydrogen Exchange; 2) The synthesis of H₃O⁺ (-); 3) Deuterium-Labeling Studies of the reactions MH⁺ M (M = H₂O, NH₃ and CH₄) in the temperature range 80-500 K; 4) Calculation of reaction energies for isotopic exchange reactions from estimated zero-point energies; and 5) The isotope exchange reactions H⁺ + D₂ = HD + D⁺ and D⁺ + H₂ = HD + H⁺ in the temperature range 200-300 K.

DESCRIPTORS: (U) *ATMOSPHERIC CHEMISTRY, *CHARGE TRANSFER, *EXCHANGE REACTIONS, CHEMICAL REACTIONS, CLUSTERING, COMPUTATIONS, HYDROGEN, IONS, MOLECULES, PROTONS.

IDENTIFIERS: (U) *Ion Molecule Interactions, Hydronium Ions, PEB1102F, WUAFOSR230308.

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MICHIGAN UNIV ANN ARBOR DEPT OF AEROSPACE ENGINEERING
(U) Optimum Supersonic Cruise.

DESCRIPTIVE NOTE: Final rept..

JUN 79

PERSONAL AUTHORS: Lin, Ching F.; Vinh, Nguyen X.; Chern, Jeng S.

CONTRACT NO. AFOSR-78-3555

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-89-1362

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper presented the analysis of optimum cruise at constant altitude of a typical high thrust-to-weight ratio fighter aircraft. A mathematical modeling of aerodynamic and engine characteristics was given and it facilitated the application of optimum control theory to analyze different cruise programs of practical interest. For the example cruise programs of found that in the problem of maximum range, there exist two optimum altitudes for cruise, one in the troposphere and one in the stratosphere. The corresponding optimum Mach number in the troposphere is subsonic and in the stratosphere is supersonic. (jes)

DESCRIPTORS: (U) *AERODYNAMIC CHARACTERISTICS, ALTITUDE, AIRCRAFT, CONTROL THEORY, JET ENGINES, JET FIGHTERS, LEVEL FLIGHT, MACH NUMBER, MATHEMATICAL MODELS, OPTIMIZATION, STRATOSPHERE, SUBSONIC FLIGHT, SUPERSONIC FLIGHT, THRUST, TROPOSPHERE.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A1.

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SEARCH CONTROL NO. EVI56L

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

AD-A214 797 CONTINUED

(U) Numerical Studies in Computer-Aided Design.

be incorporated in an improved sparse matrix algorithm which has asymptotic speeds approximately four times that of the previously developed code. (kr)

DESCRIPTIVE NOTE: Interim rept. 1 Apr 78-31 Mar 79.

DESCRIPTORS: (U) *COMPUTER AIDED DESIGN. *NUMERICAL ANALYSIS. AERODYNAMICS. ALGORITHMS. CODING. DATA PROCESSING. FLOW. FLUID FLOW. FORTRAN. LINEAR ALGEBRA. MODELS. SIMULATION. SPARSE MATRIX. TIME.

APR 79

PERSONAL AUTHORS: Calahan, D. A.

IDENTIFIERS: (U) PE61102F. WUAFQSR2304A3.

CONTRACT NO. AFOSR-75-2812

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-89-1408

UNCLASSIFIED REPORT

ABSTRACT: (U) Two study objectives were supported by this grant. 1) Study of vectorizability of aerodynamic fluid flow codes (AFFDL): An explicit 3-D aerodynamic simulation code (exercised in 2-D) was vectorized in Fortran and coded in CRAY-1 assembly language. The latter was greatly assisted by use of a CRAY-1 simulator and a cross-assembler developed under grant sponsorship. Major subalgorithms from these codes were benchmarked and reported in a previous report. The complete code has also been vectorized in Fortran and assembly coded and is planned for final benchmarking this spring. Speedups on the order of 100 are indicated viz-a-viz the CDC 8600. 2) Study of the development of linear algebra codes and sparse matrix algorithms for the CRAY-1 (AFOSR/AFFDL): A study of the relatively poor performance of a sparse matrix code developed without the aid of simulation indicated the importance of data flow considerations in addition to vectorization in the development of linear algebra algorithms for a memory-hierarchical, functionally-concurrent processor of the CRAY-1 class. Equation-solving kernels (full solvers, band solvers, tridiagonal solvers) were developed and timing models produced using simulation. Speedups of 1.5:1 to 2:1 viz-a-viz LASL-prepared assembly language codes were obtained. These kernels will be made into an equation-solving library for the CRAY-1 for use in the public domain. They will also

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SEARCH CONTROL NO FV158L

AD-A214 796

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MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) A Study of Some Electromagnetic Problems Relating to EMP Technology

DESCRIPTIVE NOTE: Interim rept. 30 Sep 77-28 Feb 79.

FEB 79

PERSONAL AUTHORS: Tai, Chen-To

CONTRACT NO. AFOSR-77-3485

PROJECT NO. 2301

TASK NO. A3

MONITOR: AFOSR
TR-89-1363

UNCLASSIFIED REPORT

ABSTRACT: (U) For the equivalent circuit problem the development and the testing of a numerical technique for rotational functions have been accomplished. A network modelling leading to a canonical ladder configuration was formulated. Finally the equivalent circuit representation of a thin biconical antenna is constructed based on these methods. The research shows that transfer functions involved in radiating and scattering problems can be represented by such an equivalent circuit representation. In contrast to the equivalent circuit representation suggested the method does not require explicit knowledge of the poles these transfer functions. (JHD)

DESCRIPTORS: (U) *BICONICAL ANTENNAS, *ELECTROMAGNETIC PULSES, CONFIGURATIONS, ELECTROMAGNETIC PROPERTIES, EQUIVALENT CIRCUITS, NUMERICAL METHODS AND PROCEDURES, ROTATION, SCATTERING, THINNESS, TRANSFER FUNCTIONS

IDENTIFIERS: (U) PE81102F, WUAFOSR2301A3.

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20/4

9/3

STANFORD UNIV CA HIGH TEMPERATURE GASDYNAMICS LAB

(U) Advanced Diagnostics for Reacting Flows.

DESCRIPTIVE NOTE: Annual rept. 1 Oct 88-30 Sep 89.

OCT 89

PERSONAL AUTHORS: Hanson, R. K.

CONTRACT NO. AFOSR 89-0067

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR
TR-89-1409

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress is reported for an interdisciplinary program aimed at establishing advanced optical diagnostic techniques applicable to combustion and plasma flows. The primary effort is on digital flowfield imaging techniques, which offer significant potential for a wide range of spatially resolved 2-d and 3-d measurements. The imaging is accomplished by recording light scattered from a planar laser-illuminated region using a modern solid-state camera. The scattering process is generally laser-induced fluorescence, though Mie, Rayleigh and Raman scattering may also be used. Activities reported include: 1) image processing of PLIF data; 2) PLIF imaging in nonequilibrium shock tube flows; 3) temperature and velocity imaging in supersonic flows; 4) concept for simultaneous measurement of multiple parameters; 5) digital camera for high-speed imaging; 6) plasma diagnostics; 7) laser photolysis shock tube; and 8) cw UV laser absorption diagnostics. Keywords: Two-dimensional three-dimensional flow; Laser applications; Light scattering; PLIF (Planar Laser-Induced Fluorescence); Continuous-wave ultraviolet laser absorption; Optical measurements data; High temperature gas dynamics. (EDC)

DESCRIPTORS: (U) *COMBUSTION, *DIAGNOSIS (GENERAL), *FLOW FIELDS, *PLASMA DIAGNOSTICS, ABSORPTION, CAMERAS, CONTINUOUS WAVE LASERS, DIGITAL SYSTEMS, FLOW VISUALIZATION, GAS DYNAMICS, HIGH TEMPERATURE, HOT GASES.

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ILLUMINATION, IMAGE PROCESSING, IMAGES, LASER APPLICATIONS, LASER INDUCED FLUORESCENCE, LASERS, LIGHT, LIGHT SCATTERING, MEASUREMENT, METHODOLOGY, NONEQUILIBRIUM FLOW, OPTICAL DATA, OPTICAL DETECTION, OPTICAL PROPERTIES, OPTICS, PARAMETERS, PHOTOLYSIS, PLASMAS(PHYSICS), RAMAN SPECTRA, RANGE(EXTREMES), RAYLEIGH SCATTERING, RECORDING SYSTEMS, SHOCK TUBES, SOLID STATE ELECTRONICS, SUPERSONIC FLOW, SYNCHRONISM, TEMPERATURE, THREE DIMENSIONAL FLOW, TUBES, TWO DIMENSIONAL FLOW, ULTRAVIOLET LASERS, VELOCITY.

CALIFORNIA UNIV SAN FRANCISCO

(U) Development of an Assay for the Early Detection of Organ Specific Carcinogenesis by the Determination and Turnover of NAD(+) and Polyadenosine Diphosphoribose.

DESCRIPTIVE NOTE: Final rept. 19 Sep 78-30 Sep 80.

OCT 80

PERSONAL AUTHORS: Kun, Ernest

CONTRACT NO. AFOSR-78-3698

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-89-1364

IDENTIFIERS: (U) PLIF(Planar Laser Induced Fluorescence), Digital Images, Optical diagnostic techniques, Reacting flows, PE81102F, WUAFOSR2308A3.

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) A hypothesis was proposed that predicts the possibility of developing a specific biochemical methodology capable of detecting early and specific signals in chromatin proteins that precede cellular toxicity or malignant transformation, caused by toxic agents or by other environmental factors (e.g., radiation). This long-range aim has been approached through identification of covalent modification of chromatin proteins by a specific enzymatic process of ADP-ribosylations and poly (ADP)-ribosylation to be the most probable biochemical area that can signal toxic effects leading to either cellular damage or malignant transformation. The experimental basis of this hypothesis is: a.) the immunochemical and more recently chemical localization and determination of chromosomal non-histone proteins as specific nuclear acceptors of ADP-ribose and of its polymers; b.) by the detection of specific perturbations in ADP-ribosylations of non-histone proteins during early carcinogenesis, development and hormonal influences, biological areas that are recognized to express differentiated cellular processes. Since the signals obtained during early carcinogenesis, development and hormone actions are clearly distinguishable, there is

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a predictably high probability that highly specific macromolecular mechanisms will become identifiable during subsequent research. Keywords: Actin, Biosynthesis, Hormones, Aldosterone, Enzyme inhibitors, Hypophysectomy, Adrenalectomy. (aw)

DESCRIPTORS: (U) *BIOCHEMISTRY, ALDOSTERONE, BIOLOGY, BIOSYNTHESIS, CANCER, CARCINOGENESIS, CELLS, CHROMATIN, COVALENT BONDS, CYTOLOGY, DAMAGE, DETECTION, ENVIRONMENTS, ENZYME INHIBITORS, ENZYMES, HORMONES, HYPOTHESES, MACROMOLECULES, METHODOLOGY, MODIFICATION, MUSCLE, PROTEINS, ORGANS(ANATOMY), PERTURBATIONS, PITUITARY GLAND, POLYMERS, PROBABILITY, PROTEINS, SIGNALS, SURGERY, TOXIC AGENTS, TOXICITY, TRANSFORMATIONS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2313AS.

AD-A214 786 12/7 12/6 12/1

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

(U) Fault Tolerant Parallel Implementations of Iterative Algorithms for Optimal Control Problems.

DESCRIPTIVE NOTE: Final rept. 1 Jan 85-31 Dec 87.

JAN 88

PERSONAL AUTHORS: Meyer, Gerard G.; Weinert, Howard L.

CONTRACT NO. AFOSR-85-0097

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-89-1387

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) The principal focus of our research is a new systematic approach to design optimal control algorithms that may be implemented on parallel machines. This approach is based on a two-level parametrization of first-order optimality conditions. The first level of parametrization is concerned with the decrease of the overall amount of operations, and the second level is concerned with parallelism. By introducing parametrization matrices in the first level and then factoring those matrices to exhibit the amount of parallelism desired in the second level as a function of the number of processing elements to be used, the resulting optimality conditions may be tailored to the computing network on which the computations are to be performed. Algorithm, Parallelism, Optimal control, Computer systems, Fault tolerant. (jes)

DESCRIPTORS: (U) *ALGORITHMS, *COMPUTERS, *ITERATIONS, *PARALLEL PROCESSORS, *PROCESSING EQUIPMENT, COMPUTATIONS, CONTROL, OPTIMIZATION.

IDENTIFIERS: (U) WUAFOSR2304A1, PE61102F

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MASSACHUSETTS UNIV AMHERST LAB OF PSYCHOMETRIC AND
EVALUATIVE RESEARCH

TEST AND EVALUATION

(U) A Comparison of the Fit of Empirical Data to Two
Latent Trait Models.

IDENTIFIERS: (U) *Latent trait theory.

DESCRIPTIVE NOTE: Final technical rept. 1 Feb 78-30 Apr
79.

APR 79

PERSONAL AUTHORS: Mutton, Leah R.

CONTRACT NO. F49620-78-C-0039

MONITOR: AFOSR
TR-89-1855

UNCLASSIFIED REPORT

ABSTRACT: (U) Few guidelines exist for selecting from the one and three-parameter logistic latent trait models. This study explored fit of empirical data to these two models in terms of degree of violation of model assumptions. Specifically, unidimensionality, guessing, and equality of item discrimination indices were examined. Additionally, fit statistics were explored for data which varied in both sample size and test length. Chi square statistics were used to compare fit of distributions of observed number-right scores to number right scores predicted from latent trait theory. Using the mean of the conditional distribution of number-right scores for a given ability level as the criterion, the Rasch (one-parameter) model was generally found to be superior in fit to data than the three-parameter model for the five data sets utilized in the study. Fit of data to both models improved as the number of items or persons increased. When short tests were constructed from the data such that item discriminations displayed a broad range, better fit was found for the three-parameter model. Improvement in fit for both models was found for data fulfilling the assumption of unidimensionality. Keywords: Latent trait theory, Cognition, Mathematical models, Psychological tests, Aptitude tests. (SDM)

DESCRIPTORS (U) *PSYCHOLOGICAL TESTS, *APTITUDE TESTS, *COGNITION, *DATA BASES, *DISCRIMINATION, *INDEXES, *LENGTH, *MATHEMATICAL MODELS, *SCORING, *SHORT RANGE(TIME), *SKILLS.

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MONTANA STATE UNIV BOZEMAN SUPERSONIC WIND TUNNEL LAB

(U) Progress in Predicting the Development and Transition Onset in Free Shear Layers.

DESCRIPTIVE NOTE: Final rept..

OCT 80

PERSONAL AUTHORS: Demetriades, Anthony

REPORT NO. MSU/SWT-IN-80-4

CONTRACT NO. F49620-79-C-0210

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1451

UNCLASSIFIED REPORT

ABSTRACT: (U) During this reporting period, the problem of transition in the arbitrary two-dimensional free shear layer was resolved within the context of the predictive approach based on the dissipation criterion. A formula for the transition Reynolds number was derived showing explicitly its increase with speed ratio, fast-side Mach number and total temperature ratio for the two streams. Comparison with data shows that qualitative and approximate quantitative predictions with this formula can be made. The theory for the arbitrarily asymmetric wake was also worked out, both for application to the non-equilibrium shear layer transition problem and for practical use in fluid-laser geometries. In the limit of the symmetric wake close to the trailing edge, the results are in excellent agreement with Goldstein's earlier theory. Application of this theory may assist in improving the design of high-energy fluid lasers. One of the many basic fluid mechanical problems inherent in these devices is the prediction of laminar-turbulent transition along the shear layer separating two co-flowing streams; initially laminar flow in this layer is expected due to the small size of the working fluid and additive-injectant nozzles. In this period the theory addressed homogeneous (same chemistry) mixing across a

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two-dimensional laminar shear layer of arbitrary 'jump' conditions. A predictive formula was derived and was satisfactorily tested against the available data. (edc)

DESCRIPTORS: (U) *LASERS, ASYMMETRY, DISSIPATION, FLUID MECHANICS, FLUIDS, HIGH ENERGY, LAMINAR FLOW, LAYERS, MACH NUMBER, MATHEMATICAL PREDICTION, PROBLEM SOLVING, RATIOS, REYNOLDS NUMBER, SHEAR PROPERTIES, STREAMS, SYMMETRY, TEMPERATURE, THEORY, TRAILING EDGES, TRANSITIONS, TURBULENT FLOW, TWO DIMENSIONAL, VELOCITY, WAKE.

IDENTIFIERS: (U) Coflowing streams, Free shear layers, Fluid lasers, WJAFOSR2307A2, PEB1102F.

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MACKAY SCHOOL OF MINES REMO NV

STATE UNIV OF NEW YORK COLL AT ONEONTA DEPT OF
MATHEMATICAL SCIENCES

(U) Attenuation in the Western Great Basin.

DESCRIPTIVE NOTE: Quarterly research and development
status rept. no. 5, 1 Oct-31 Dec 83.

FEB 84

FEB 80

PERSONAL AUTHORS: Priestley, Keith F.; Ryall, Alan S.

PERSONAL AUTHORS: Bachan, Ram

CONTRACT NO. F49620-83-C-0012, SARPA Order-4397

CONTRACT NO. AFOSR-78-3615

PROJECT NO. A043

PROJECT NO. 2304

TASK NO. 97

TASK NO. A6

MONITOR: AFOSR
TR-89-1446

MONITOR: AFOSR
TR-89-1383

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress during the reporting period: 1) Installed relay-link for Mina digital station on Mt Ferguson; 2) Prepared digital station for installation at Bodie; 3) Designed fourth station for installation south of MTS for S (c) study. Keywords: Seismological stations; Seismic wave attenuation; Nevada. (EDC)

ABSTRACT: (U) The objectives to be pursued under this grant were to conduct analytical and applicational oriented (especially to aircraft industry) study of D-optimal design. The analytical study was aimed, partly, at answering questions such as: How does D-optimal design fare with respect to such properties as the uniqueness and orthogonality of the design, confounding of effects, interactions between the variables for linear and quadratic responses? The purpose of the application of the oriented effort was to demonstrate the application of the analytical results obtained to a typical Ground Attack Mission Profile and, independently, to a three-dimensional design space to select input conditions for an aircraft sizing program. The computer-aided D-optimal Design Program was supplied to the Design Group at Flight Dynamics Laboratory, Wright-Patterson Air Force Base, with the request to run the program and obtain the simulated values of the various responses so that further statistical analysis and a sensitivity analysis on the performance functions in a region of aircraft designs encompassing the optimum combinations of engine/airframe variables could be carried out and the validity of the theoretical results could be verified and confirmed. (KR)

DESCRIPTORS: (U) *SEISMIC WAVES, *SEISMOLOGICAL STATIONS, ATTENUATION, BASINS(GEOGRAPHIC), DIGITAL SYSTEMS, NEVADA.

IDENTIFIERS: (U) Great Basin(United States), PE81101E, WUAFDSRAO4397.

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DESCRIPTORS: (U) *AERONAUTICAL ENGINEERING, *COMPUTER AIDED DESIGN, AIRCRAFT, AIRCRAFT INDUSTRY, AIRFRAMES.

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ATTACK, ENGINES, FUNCTIONS, GROUND LEVEL, INPUT, MISSION
PROFILES, OPTIMIZATION, ORTHOGONALITY, QUADRATIC
EQUATIONS, REGIONS, RESPONSE, SIMULATION, STATISTICAL
ANALYSIS, VALUE, VARIABLES.

AD-A214 771 11/3 9/3 22/2 22/5

PHYSICAL SCIENCES INC ANDOVER MA

(U) Liquid Film for Spacecraft Survivability to Laser
Radiation.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A6.

DESCRIPTIVE NOTE: Final rept. 15 Sep 83-14 Mar 84,

APR 84

PERSONAL AUTHORS: Frish, M.; Gelb, A.; Legner, H.; Cowles,
L.

CONTRACT NO. F49620-83-C-0155

PROJECT NO. 3005

TASK NO. A1

MONITOR: AFOSR
TR-89-1858

UNCLASSIFIED REPORT

ABSTRACT: (U) The thin liquid film mediated laser
interaction concept has been investigated in a joint-
experimental theoretical effort. The experimental portion
of the program has demonstrated the laser hardening
capability of thin liquid films for graphitic substrates.
Measurements of film stability and optical reflectivity
of coated graphite samples were made under simulated r.w.
laser heating in an electron beam apparatus. The results
were that the films remained intact at temperatures of
3300 K and for high rates of substrate vaporization.
Measured surface emissivities were maintained at low
values throughout the heating period. Values of Q_r the
laser energy per gram of carbon vaporized, were increased
by factors of 3-4 over that for graphite and 2-3 over
that for TBR materials. Heats of vaporization were
measured and found similar to uncoated graphite. (aw)

DESCRIPTORS: (U) *PROTECTIVE COATINGS, *LASER BEAMS,
*RADIATION HARDENING, *SPACECRAFT, *THIN FILMS, ELECTRON
BEAMS, ELECTRONIC EQUIPMENT, EMISSIVITY, ENERGY, GRAPHITE,
HEATING, HIGH RATE, INTERACTIONS, LASERS, LIQUIDS,
OPTICAL PROPERTIES, REFLECTIVITY, SAMPLING, STABILITY,
SUBSTRATES, SURFACES, SURVIVABILITY, VAPORIZATION, CARBON,
HEAT OF VAPORIZATION, CONTINUOUS WAVE LASERS.

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ACCREDITATION BOARD FOR ENGINEERING AND TECHNOLOGY NEW YORK

(U) Uninitiates Introduction to Engineering.

DESCRIPTIVE NOTE: Final rept..

MAY 81

PERSONAL AUTHORS: Gavin, Roy B.; O'Bryant, David C.

CONTRACT NO. F49620-78-C-0120

PROJECT NO. 2313

TASK NO. D3

MONITOR: AFOSR
TR-89-1381

UNCLASSIFIED REPORT

ABSTRACT: (U) The UNITE (Uninitiates Introduction to Engineering) program was conducted on four different college campuses during the summers of 1978, 1979, and 1980. To date five hundred minority students (371 male, 229 female) participated in a two-week introduction to the field of engineering and learned of opportunities to minorities with engineering backgrounds in the Air Force. The response rates to a survey initiated approximately six months following the program were low; this may be attributed to the fact that the participants most likely are targets bombarded with numerous questionnaires, invitations, and announcements. 10% of the 1978 and '79 participants are considering AFOTC. (KR)

DESCRIPTORS: (U) *ENGINEERING, *STUDENTS, AIR FORCE, MINORITIES, QUESTIONNAIRES, RATES, RESPONSE.

IDENTIFIERS: (U) UNITE(Uninitiates Introduction to Engineering).

SEARCH CONTROL NO. EV156L

AD-A214 762 20/3 10/2

CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS

(U) Simulation of Ionospheric EM-Plasma Interaction in a Large Laboratory Device.

DESCRIPTIVE NOTE: Final rept..

NOV 79

PERSONAL AUTHORS: Wong, A. Y.; Eggleston, Dennis

CONTRACT NO. F49620-78-C-0011

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-89-1450

UNCLASSIFIED REPORT

ABSTRACT: (U) The evolution of cavitons in two-dimensions is studied by measuring the space and time development of the caviton electric field. For low power drivers the caviton is found to have an Airy function type shape which is stable in time. When a high power driving electric field is used, however, the caviton shape becomes chaotic due to nonlinear modification of the density profile. In two-dimensions, the caviton electric field is seen to develop a component in the direction perpendicular to the driving field; the initial azimuthal symmetry of the caviton is also destroyed. (jhd)

DESCRIPTORS: (U) *IONOSPHERIC MODELS, *SIMULATORS, AZIMUTH, DENSITY, ELECTRIC FIELDS, LABORATORY EQUIPMENT, MODIFICATION, NONLINEAR SYSTEMS, PROFILES, SYMMETRY.

IDENTIFIERS: (U) *Cavitons, Airy functions, PE61102F, WUA0SR2301A7.

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AD-A214 761 17/10

MACKAY SCHOOL OF MINES RENO NV

(U) Attenuation in the Western Great Basin.

DESCRIPTIVE NOTE: Quarterly research and development status rept. no. 3, 1 Apr-30 Jun 83.

FEB 84

PERSONAL AUTHORS: Priestley, Deith F.; Ryall, Alan S.

CONTRACT NO. F49620-83-C-0012, \$SARPA Order-4397

PROJECT NO. A043

TASK NO. 97

MONITOR: AFOSR
TR-89-1448

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress made during report period: 1) Read additional times for teleseismic data from CNTA array, used USGS inversion program to interpret data; 2) Installed digital station at Washie City site; 3) Additional software developed for processing digital data. Keywords: Seismic wave attenuation; Seismic arrays; Nevada; Seismological stations; Seismic data. (edc)

DESCRIPTORS: (U) *SEISMIC DATA, *SEISMIC WAVES, ATTENUATION, BASINS(GEOGRAPHIC), COMPUTER PROGRAMS, DATA BASES, DIGITAL SYSTEMS, INVERSION, LONG RANGE(DISTANCE), NEVADA, DATA PROCESSING, SEISMIC ARRAYS, SEISMOLOGICAL STATIONS, SITES, UNITED STATES, WEST(DIRECTION).

IDENTIFIERS: (U) Great Basin, PE61101E, WUAFOSRAO4397.

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MACKAY SCHOOL OF MINES RENO NV

(U) Attenuation in the Western Great Basin

DESCRIPTIVE NOTE: Quarterly research and development status rept. no. 4, 1 Jul-30 Sep 83.

FEB 84

PERSONAL AUTHORS: Priestley, Deith F.; Ryall, Alan S.

CONTRACT NO. F49620-83-C-0012, \$SARPA Order-4397

PROJECT NO. A043

TASK NO. 97

MONITOR: AFOSR
TR-89-1447

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress during the reporting period: Brought SRO data for events recorded in Hot Creek Valley from Scripp's Prime to Seismology Laboratory. Because of difficulties in reading prime tape format on the PDP 11/70, it was decided to analyze data the prime; Reanalyzed regional data across NTS. Keywords: Seismic data; Seismological stations; Seismic wave attenuation; Nevada. (EDC)

DESCRIPTORS: (U) *SEISMIC DATA, ATTENUATION, BASINS(GEOGRAPHIC), FORMATS, LABORATORIES, NEVADA, READING, SEISMIC WAVES, SEISMOLOGICAL STATIONS, SEISMOLOGY, TAPES.

IDENTIFIERS: (U) Great Basin(United States), PE61101E, WUAFOSRAO4397.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L
OPTICAL SOCIETY OF AMERICA WASHINGTON D C
AD-A214 746 CONTINUED

(U) Topical Meetings on Excimer Laser, Optical Techniques
for Remote Probing of the Atmosphere, and
Meteorological Optics.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Aug 83.
AUG 83

PERSONAL AUTHORS: Quinn, Jarus W.

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-88-1458

UNCLASSIFIED REPORT

ABSTRACT: (U) The meeting on excimer lasers is primarily devoted to ultraviolet excimer laser systems and their applications. Specific areas of topical interest are: excimer laser system development, linewidth, frequency, and pulse duration control of excimer systems, spectroscopy in the VUV and XUV, nonlinear processes including short wavelength generation via harmonic generation, sum frequency mixing and Raman scattering with excimer systems, photochemistry conducted with excimer laser systems, excimer pumped laser systems, diagnostics and processing of solid materials, laser produced plasmas and molecular biology. The meeting on optical techniques for remote probing of the atmosphere focussed on advanced optical techniques and data processing for remote sensing at UV, visible and infrared wavelengths with factors common to all techniques highlighted. Techniques for probing chemical species or atmospheric parameters such as temperature, humidity, turbulence and wind using passive or active sources, and coherent or incoherent detection were presented. Topics included: atmospheric optical propagation effects, laser remote sensing techniques, passive/spectrometric remote sensing techniques, and systems analysis. The meeting on meteorological optics was devoted to all aspects of meteorological optics that are visible to all aspects of or with the use of binoculars or polarizing filters. (EDC)

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DESCRIPTORS: (U) *EXCIMER, *METEOROLOGY, *OPTICS, *ULTRAVIOLET LASERS, EARTH ATMOSPHERE, BINOCULARS, ATMOSPHERIC CHEMISTRY, ATMOSPHERIC TEMPERATURE, CONTROL, DATA PROCESSING, DETECTION, FREQUENCY, COHERENCE, GENERATORS, HUMIDITY, INCOHERENCE, INFRARED RADIATION, LASER APPLICATIONS, LASER PUMPING, LASERS, LIGHT SCATTERING, LIGHT TRANSMISSION, METHODOLOGY, MIXING, MOLECULAR BIOLOGY, NONLINEAR SYSTEMS, PASSIVE SYSTEMS, PHOTOCHEMICAL REACTIONS, PLASMAS(PHYSICS), POLARIZING FILTERS, PROCESSING, PULSE RATE, RAMAN SPECTRA, REMOTE DETECTORS, SHORT WAVELENGTHS, SOLIDS, SOURCES, SPECTROMETRY, SPECTROSCOPY, SYMPOSIA, SYSTEMS ANALYSIS, TURBULENCE, VACUUM ULTRAVIOLET RADIATION, WAVE PROPAGATION, WAVEFORMS, WIND.

IDENTIFIERS: (U) Excimer lasers, Meteorological optics, Remote detection, PE61102F, WUAFOSR2301A1.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO EV1561

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AD A214 744 20/3 12/2

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

RHODE ISLAND UNIV KINGSTON DEPT OF MATHEMATICS

(U) An Experimental and Analytical Study of Boundary Layers in Highly Turbulent Free-streams.

(U) The Two-Body Problem of Classical Electrodynamics.

DESCRIPTIVE NOTE: Final rept. 1 Jun 79-31 Mar 81.

DESCRIPTIVE NOTE: Final rept 1 Jul 78-30 Jun 80.

MAR 81

JUN 80

PERSONAL AUTHORS: Blair, M. F.

PERSONAL AUTHORS: Driver, Rodney D.

REPORT NO. UTRC/R81-914388-18

CONTRACT NO. F49620-79-C-0129

CONTRACT NO. F49620-78-C-0084

PROJECT NO. 2304

PROJECT NO. 2307

TASK NO. A4

TASK NO. A4

MONITOR: AFOSR

TR-89-1480

MONITOR: AFOSR
TR-89-1459

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Research was conducted to examine two aspects of boundary layer flow: 1) the influence of free-stream turbulence on zero pressure gradient, full turbulent boundary layer flow; and 2) the combined effects of free-stream turbulence and favorable streamwise pressure gradients on transitional boundary layer flow. Keywords: Convective heat transfer coefficients; Boundary layer transition; Gas turbine airfoils; Boundary layer mean velocity; Experimental data. (edc)

ABSTRACT: (U) A new uniqueness theorem for ordinary differential equations was proved. This theorem was then applied to solve an old problem of electrodynamics. The mathematical model involves in charged particles moving on the x-axis, each being influenced by the retarded fields of all the others. Given appropriate past histories of the trajectories, it is now proved that unique solutions will exist as long as no two particles collide. (JHD)

DESCRIPTORS: (U) *TURBULENT BOUNDARY LAYER, *BOUNDARY LAYER FLOW, AIRFOILS, BOUNDARY LAYER, BOUNDARY LAYER TRANSITION, CONVECTION/HEAT TRANSFER, EXPERIMENTAL DATA, FREE STREAM, GAS TURBINES, HEAT TRANSFER COEFFICIENTS, MEAN, PRESSURE GRADIENTS, TURBULENCE, VELOCITY.

DESCRIPTORS: (U) *ELECTRODYNAMICS, CHARGED PARTICLES, DIFFERENTIAL EQUATIONS, MATHEMATICAL MODELS, RETARDATION, N BODY PROBLEM.

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4.

IDENTIFIERS: (U) *Two Body Problems, Uniqueness Theorems, PE61102F, WUAFOSR2304A4.

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SEARCH CONTROL NO EVIS6L

AD-A214 743 20/5

NORTHWESTERN UNIV EVANSTON IL DEPT OF APPLIED
MATHEMATICS

(U) Markov Processes Applied to Control, Replacement, and
Signal Analysis.

DESCRIPTIVE NOTE: Final rept.,

MAY 80

PERSONAL AUTHORS: Cinlar, Erhan

CONTRACT NO. F49620-78-C-0080

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1481

UNCLASSIFIED REPORT

ABSTRACT: (U) On regenerative systems and Markov
additive processes, the completed work has been reported.
MAISONNEUVE shows how to use the theory of regenerative
systems in order to study increasing Levy processes. Levy
processes as well-known objects in probability, and their
probabilistic laws as well as their stochastic structures
have been known for some time. Hence, when working on
strictly regenerative systems, it used to be advantageous
to first characterize the regeneration set as the image
of an increasing Levy process, and then use the known
results on the latter to study the former. Molecular
physics. (JES)

DESCRIPTORS: (U) *MOLECULAR STRUCTURE, ADDITIVES,
CONTROL, MARKOV PROCESSES, REGENERATION(ENGINEERING),
SIGNALS, STOCHASTIC PROCESSES, STRUCTURES, THEORY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5.

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AD-A214 742 9/1

ROCKWELL INTERNATIONAL THOUSAND OAKS CA
MICROELECTRONICS RESEARCH AND DEVELOPMENT CENTER

(U) Research on Electroluminescence in Thin Film Yttria
Oxysulfide.

DESCRIPTIVE NOTE: Final rept. 1 Jun 81-31 May 82.

SEP 82

PERSONAL AUTHORS: Ketchpel, R. D.

REPORT NO. MRDC41080.1AR

CONTRACT NO. F49620-81-C-0089

PROJECT NO. 2306

TASK NO. B1

MONITOR: AFOSR
TR-89-1456

UNCLASSIFIED REPORT

ABSTRACT: (U) Thin films of a rare-earth oxysulfide
phosphor (Y2O5:Eu) were evaluated for use in a thin
film electroluminescent emitter (TEL). For the first time,
emission typical of the rare earth activator was observed
in a rare earth host TEL emitter. The films were
characterized for optical spectrum, brightness-voltage
characteristic, photoluminescence, crystal structure, and
compared to efficient cathodoluminescent power phosphors
(Y2O5:Eu) as well as high efficiency TEL emitters of
ZnS:Mn. The present low intensity red emission (fractions
of a ft-L) is limited by annealing induced cracks in the
emitter structure. (JES)

DESCRIPTORS: (U) *ANNEALING, *ELECTROLUMINESCENCE, *THIN
FILMS, *YTRIUM OXIDES, ACTIVATION, CATHODOLUMINESCENCE,
CRACKS, CRYSTAL STRUCTURE, EFFICIENCY, EMISSION, EMITTERS,
HIGH RATE, LOW INTENSITY, PHOSPHORS, PHOTOLUMINESCENCE,
POWER, RARE EARTH COMPOUNDS, RARE EARTH ELEMENTS,
RED(COLOR), VISIBLE SPECTRA.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306B1, *Yttrium
Oxysulfide.

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NATIONAL AEROSPACE LAB AMSTERDAM (NETHERLANDS)

FLOW, WIND TUNNEL TESTS.

(U) Unsteady Airloads on a Sinusoidally Oscillating Supercritical Airfoil.

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A1.

DESCRIPTIVE NOTE: Final rept. 1 Apr 77-31 Dec 78.

JUL 79

PERSONAL AUTHORS: Tijdeman, H.

REPORT NO. NRL-M-AE-79-015

CONTRACT NO. AFOSR-77-32-3297

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-89-1379

UNCLASSIFIED REPORT

ABSTRACT: (U) The aim of the proposed investigation was to generate a set of theoretical and experimental unsteady aerodynamic data for an advanced type airfoil. This set of data should serve as a standard for the comparison and the evaluation of computational methods for two-dimensional unsteady transonic flow. For this purpose it was intended to complement the results of the wind tunnel tests conducted at NLR on the supercritical NLR 7301 airfoil with theoretical results. The statement of work of the intended investigation was: NLR provides the contour data of the 'shock free' NLR 7301 airfoil section, together with the hodograph solution for the design condition; and NLR provides the measured steady and unsteady pressure distributions in three characteristic flow conditions: subsonic flow, transonic flow with a well developed supercritical region terminated by a shock wave and the 'shock free' design condition. (sob)

DESCRIPTORS: (U) *SUPERCRITICAL FLOW, *UNSTEADY FLOW, AIRFOILS, CONTOURS, FLOW, NUMERICAL METHODS AND PROCEDURES, OSCILLATION, PRESSURE DISTRIBUTION, REGIONS, SHOCK, SHOCK WAVES, STEADY STATE, SUBSONIC FLOW, SUPERCRITICAL AIRFOILS, TRANSONIC FLOW, TWO DIMENSIONAL

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20/4

NAPLES UNIV (ITALY) IST DI AERODINAMICA

(U) Application of Functional Analysis in Fluid Mechanics.
DESCRIPTIVE NOTE: Final rept..

MAR 80

PERSONAL AUTHORS: Napolitano, L. G.

REPORT NO. IA-270

CONTRACT NO. AFOSR-78-3484

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-89-1380

UNCLASSIFIED REPORT

ABSTRACT: (U) This work was concerned with the application of functional analysis to fluid mechanics. The specific subject dealt with is that of closed splines which were introduced by the principal investigator as the appropriate splines to solve interpolation problems connected with the flow fields around airfoils. Partial contents: A new characterization of closed splines -- Relevant results from abstract-space theory. Characterization of splines. Correspondence between classical and closed splines, and examples of application of the new formulation. Normal splines, Hermite splines, and Closed smoothing splines -- Normal closed smoothing splines. Smoothing spline theory in abstract space (Arbitrary Hilbert spaces and finite space Z); and Normal closed smoothing splines (Existence, uniqueness and characterization). Italy (edc)

DESCRIPTORS: (U) *FLUID MECHANICS, *FUNCTIONAL ANALYSIS, AIRFOILS, FLOW FIELDS, FORMULAS(MATHEMATICS), HILBERT SPACE, INTERPOLATION, ITALY, SPECIAL FUNCTIONS(MATHEMATICAL), SPLINES, THEORY.

IDENTIFIERS: (U) PRA12102F, WUAFOSR2307A1

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IOWA STATE UNIV AMES DEPT OF MECHANICAL ENGINEERING

(U) Investigation of Liquid Sloshing in Spin Stabilized Satellites.

DESCRIPTIVE NOTE: Final rept. Jan 88-Aug 89.

AUG 89

PERSONAL AUTHORS: Baumgarten, Joseph R.; Flugrad, Donald R.; Prusa, Joseph M.

REPORT NO. ISU-ERI-AMES-90401

CONTRACT NO. AFOSR-86-0080

PROJECT NO. 2302

TASK NO. B1

MONITOR: AFOSR
TR-89-1312

UNCLASSIFIED REPORT

ABSTRACT: (U) Launching of several Star 48 communications satellites from the space shuttle has consistently resulted in a nutating of the spacecraft. Sloshing fluid stores were suspected as the source of this dynamic instability. A mathematical model of the sloshing fluid motion coupled with the satellite dynamics was developed and the launch phase simulated. The flight simulation shows similar behavior when compared to the teleentered flight data. Additionally, a control law was developed using an equivalent mechanical model of the fluid motion which results in a stable dynamic system. The control law may also be used for pointing maneuvers and is implemented by sensing only the main body angular rates and attitude. An experimental satellite-simulator test rig was designed and built to study the interaction of the sloshing fluid and spinning structure. The test rig was instrumented to monitor the motion of several rotating configurations. A mathematical model of the simulator was developed and is presented. Simulation of experimental results has been achieved. The computational fluid dynamic analysis has now developed a primitive variables numerical algorithm for a two-dimensional and three dimensional sloshing problem. The key feature of

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the formulation is use of a coordinate transformation that maps the fluid body into the fixed geometric shape of the containing rectangle or sphere. The formulation removes an initial singularity from the governing equations that would otherwise cause the numerical method to diverge. Satellite coning. (EDC)

DESCRIPTORS: (U) *SLOSHING, AIMING, ALGORITHMS, ANGULAR MOTION, COMMUNICATION SATELLITES, COMPUTATIONS, CONFIGURATIONS, CONTAINERS, CONTROL THEORY, COORDINATES, DYNAMICS, EQUATIONS, FLIGHT, FLIGHT SIMULATION, FLUID DYNAMICS, FLUIDS, GEOMETRIC FORMS, INSTRUMENTATION, LAUNCHING, LIQUIDS, MANEUVERING SATELLITES, MANEUVERS, MATHEMATICAL MODELS, MECHANICAL COMPONENTS, MODELS, MONITORS, MOTION, NUMERICAL METHODS AND PROCEDURES, ROTATION, SATELLITE ATTITUDE, SIMULATION, SPACE SHUTTLES, SPHERES, SPACE LAUNCHED, SPIN STABILIZATION, THREE SPINNING(MOTION), STABILITY, TEST EQUIPMENT, TWO DIMENSIONAL, TRANSFORMATIONS(MATHEMATICS), TWO DIMENSIONAL, VARIABLES.

IDENTIFIERS: (U) Pointing maneuvers, Satellite coning, Coning motion, Nutation, Computational fluid dynamics, PE61102F, WUAFOSR230281

CATHOLIC UNIV OF AMERICA WASHINGTON DC DEPT OF MECHANICAL ENGINEERING

(U) MHD (Magnetohydrodynamic) Slow Shocks in Coronal and Interplanetary Space.

DESCRIPTIVE NOTE: Final rept. 1 Jun 88-31 May 89,

AUG 89

PERSONAL AUTHORS: Whang, Yun C.

CONTRACT NO. AFOSR-86-0180

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR TR-89-1350

UNCLASSIFIED REPORT

ABSTRACT: (U) The overall objective of this project is to study shock waves of the solar terrestrial medium in coronal and interplanetary space. This research will enhance our understanding on the propagation of large amplitude disturbances from the solar corona through the interplanetary space. Work accomplished during the past three years includes: 1) a demonstrating example showing the formation of slow shock pairs associated with CMEs in a coronal environment; 2) a parametric study of slow shocks in the entire domain of a three-dimensional parameter space, the A, theta, Beta-space; 3) the large scale geometry of traveling interplanetary shocks; 4) the transition of slow shocks to fast shocks in the inner solar wind; and 5) the evolution of CME associated shocks and their interplanetary manifestations. Keywords: CME (Coronal mass ejections); Solar corona. (edc)

DESCRIPTORS: (U) *MAGNETOHYDRODYNAMICS, *SHOCK WAVES, *SOLAR CORONA, AMPLITUDE, EJECTION, GEOMETRY, INTERNAL, INTERPLANETARY SPACE, PARAMETRIC ANALYSIS, PROPAGATION, SHOCK, SOLAR DISTURBANCES, SOLAR WIND, THREE DIMENSIONAL.

IDENTIFIERS: (U) CME(Coronal Mass Ejections), PE61102F, WUAFOSR2311A1

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WASHINGTON UNIV SEATTLE DEPT OF OCEANOGRAPHY

WUAFOSR2307A2.

(U) Fluctuations in Geophysical and Boundary Layer Flows.

DESCRIPTIVE NOTE: Final rept. 1 Aug 78-31 Jul 79.

OCT 79

PERSONAL AUTHORS: Criminale, William O., Jr

CONTRACT NO. AFOSR-78-3655

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1483

UNCLASSIFIED REPORT

ABSTRACT: (U) The question of the stability of a stratified shear flow is addressed through the investigation of the initial-value problem defined for a two-layer fluid of infinite extent with uniform velocity and density in each layer. Solutions of this problem have application to the generations of unstable motions in the atmosphere. Concentration continues on the analysis of perturbations in a turbulent Ekman layer. Steady viscous incompressible flow is considered over a semi-infinite flat plate under the influence of either internal or external time-dependent perturbations. Experimentally, an internal perturbation may be realized by a vibrating ribbon and an external perturbation corresponds to small fluctuations superimposed on a uniform freestream. Attention is focused on both the importance and the complexity of the nonlinear processes which take the place after the first appearance of a turbulent spot in a boundary layer. (jhd)

DESCRIPTORS: (U) *BOUNDARY LAYER FLOW, *STRATIFICATION, BOUNDARY LAYER, BOUNDARY VALUE PROBLEMS, EXTERNAL, FREE STREAM, GEOPHYSICS, INCOMPRESSIBLE FLOW, INTERNAL, LAYERS, MOTION, NONLINEAR SYSTEMS, PERTURBATIONS, FLAT PLATE MODELS, SHEAR PROPERTIES, STEADY FLOW, TIME DEPENDENCE, TURBULENCE, VARIATIONS, VELOCITY, VIBRATION, VISCOUS FLOW.

IDENTIFIERS: (U) Initial Value Problems, PEG1102F.

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PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF
CHEMISTRY

CYCLIC COMPOUNDS, BUTADIENES, ALUMINUM, METAL METAL BONDS,
RHODIUM, CATALYSTS, COPPER COMPOUNDS, SUCCINIMIDES,
CHEMICAL RADICALS.

(U) Properties of Reactive Atomic Species Generated at
High Temperatures and Their Low Temperature Reactions
to Form Novel Substances.

IDENTIFIERS: (U) PEG1102F, WUAFOSR230382, Atom Molecule
Interactions.

DESCRIPTIVE NOTE: Final rept. 1 Jun 78-31 Aug 79.

79

PERSONAL AUTHORS: Skell, Philip S.

CONTRACT NO. AFOSR-78-3634

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1484

UNCLASSIFIED REPORT

ABSTRACT: (U) A number of subjects are ready for write-up, or are already in manuscript form. The following is a summary of these activities: Atom EMF Series - Electron transfer properties of atoms are correlated with a new Electromotive force series called the atom EMF series. Reaction of Metal Atoms with Water; Low Sticking Coefficients of Metals; Reactions of Magnesium Atoms with Acetone; Reactions of Metal Atoms with Carbon Dioxide; Bis-Arene Transition Metal Complexes; Reactions of Mo and W with Non-Aromatic Carbocycles; Reactions of Bis-Arene Ti, Zr, with Cyclooctatetraenes; Reactions of Bis-Arene Fe, Co, Ni; Reactions of Nickel Atoms with Butadiene; Identification of Al-Al Bonded Structures; Monoatomic Rhodium Supported Catalysts; Metathesis Polymerization; Structures of Tris-butadiene Molybdenum and Tungsten; Infrared Studies; Organocopper Compounds; Succinimidy Radical. (aw)

DESCRIPTORS: (U) *ATOMS, *CHEMICAL REACTIONS, *METALS, *ORGANIC COMPOUNDS, ACETONES, CARBON DIOXIDE, COEFFICIENTS, ELECTRON TRANSFER, HIGH TEMPERATURE, INFRARED RADIATION, LOW TEMPERATURE, MAGNESIUM, NICKEL, POLYMERIZATION, TUNGSTEN, VOLTAGE, WATER, METAL COMPLEXES, ORGANOMETALLIC COMPOUNDS, MOLYBDENUM, AROMATIC COMPOUNDS,

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MASSACHUSETTS UNIV AMHERST LAB OF PSYCHOMETRIC AND
EVALUATIVE RESEARCH

THEORY, ESTIMATES, PERFORMANCE TESTS, RELIABILITY,
SCORING, STATISTICS, TEST AND EVALUATION, THEORY.

(U) Applications of Latent Trait Theory to the Development
and Use of Criterion-Referenced Tests.

IDENTIFIERS: (U) *Latent trait theory.

DESCRIPTIVE NOTE: Final technical rept., 1 Feb 78-30 Apr
79.

MAR 79

PERSONAL AUTHORS: Hambleton, Ronald K.

REPORT NO. RR-91

CONTRACT NO. F49620-78-C-0039

MONITOR: AFOSR
TR-1847

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at an AERA-NCME Symposium
entitled, 'Psychometric Approaches to Domain-Referenced
Testing,' San Francisco, CA, Apr 78.

ABSTRACT: (U) The success of criterion-referenced
testing programs depends to a considerable extent upon
how effectively tests are constructed, and test scores
used to assign examinees to mastery states and/or to
estimate examinee domain scores. Methodologies such as
decision theory, Bayesian statistics, and
generalizability theory have been used successfully to
address a variety of technical matters (for example,
reliability estimation and domain score estimation). The
purpose of this paper were to consider latent trait
theory as a framework for resolving some of the technical
aspects associated with criterion-referenced tests.
Specifically, advantages and disadvantages of latent
trait theoretic concepts were considered; a discussion of
past applications to test development and test score
usage were provided; and directions for future research
and development were offered. Keywords: Latent trait
theory, Cognition, Mathematical models, Psychological
tests, Aptitude tests. (SDW)

DESCRIPTORS: (U) *MATHEMATICAL MODELS, *PSYCHOLOGICAL
TESTS, APPTITUDE TESTS, BAYES THEOREM, COGNITION, DECISION

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SEARCH CONTROL NO EV1581

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AD-A214 716 CONTINUED

MASSACHUSETTS UNIV AMHERST LAB OF PSYCHOMETRIC AND
EVALUATIVE RESEARCH

(U) A Comparative Study of Item Selection Methods
Utilizing Latent Trait Theoretic Models and Concepts

DESCRIPTORS: (U) 'PSYCHOLOGICAL TESTS, APTITUDE TESTS,
FUNCTIONS, LOGISTICS, MATHEMATICAL MODELS, PARAMETERS,
SELECTION, STANDARDIZATION, TEST AND EVALUATION, TEST
METHODS, THREE DIMENSIONAL.

DESCRIPTIVE NOTE: Final technical rept. 1 Feb 78-30 Apr
79.

IDENTIFIERS: (U) 'Latent trait theory.

MAR 79

PERSONAL AUTHORS: Cook, Linda L.; Hambleton, Ronald K.

REPORT NO. RR-88

CONTRACT NO. F49620-78-C-0039

MONITOR: AFOSR
TR-89-1848

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Annual Meeting of
NCME, San Francisco, Ca., Apr 79.

ABSTRACT: (U) Latent trait theory provides the
practitioner interested in developing tests with a far
more powerful method of item selection than that provided
by standard testing technology. This method involves the
use of information curves as item selection criteria and
allows the test developer to determine the contribution
of each item to the test without knowledge of other items
in the test. One problem that currently exists is that no
well developed methodology has been established for the
use of information functions in the test development
process. The purposes of this investigation were as
follows: 1) Provide some background on information curves
for items and tests; 2) Develop several item selection
methods and using a typical item pool (where items are
described by parameters in the three-parameter logistic
model), compare the score information curves resulting
from application of these methodologies; and 3) Develop
and compare several item selection methods for producing
a scholarship exam and a test to optimally separate
examinees into three ability categories. Keywords: Latent
trait theory, Psychological tests, Mathematical models,
Aptitude tests. (SDW)

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SEARCH CONTROL NO. EVIS6L

CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY AND
BIOCHEMISTRY

AD-A214 715 CONTINUED

(U) Reactions and Relaxation of Vibrationally Excited
Hydrogen.

EMPLACEMENT, INTENSITY, LITHIUM FLUORIDES, LOSSES,
PHOTOMULTIPLIER TUBES, RATES, REDUCTION, SIGNALS, SOURCES,
SPECTRA, ULTRAVIOLET DETECTORS, VACUUM ULTRAVIOLET
RADIATION, WINDOWS.

DESCRIPTIVE NOTE: Final rept. 15 Apr 78-30 Jun 80.
JAN 81

IDENTIFIERS: (U) PEB1102F, WJAFOSR2303B1.

PERSONAL AUTHORS: Kasper, Jerome V.

CONTRACT NO. F49620-79-C-0154

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1845

UNCLASSIFIED REPORT

ABSTRACT: (U) An EMR vacuum UV photomultiplier tube was acquired and installed. This tube has a lithium fluoride window and is solar blind. The tube performed as expected and permitted us to obtain spectra of hydrogen in a modified experimental configuration. A serious problem in the past was degradation of the lithium fluoride cell windows due to color center formation. The magnitude of the degradation was sufficient to give us a signal loss of 5% per minute for over 4 orders of magnitude loss. Placement of the cell after the monochromator markedly reduced this degradation. In fact, after a rapid initial degradation of approximately 20-30%, the continued degradation is less than 1% per hour. The reduced degradation was possible because this one window is positioned immediately adjacent to the entrance slit and is over 25 cm from the source discharge. The marked decrease in degradation rate was achieved. The marked of signal intensity. In fact, replacement of the sodium salicylate/visible photo-multiplier detector with the new vacuum UV detector gave a substantial increase in signal. (KT)

DESCRIPTORS: (U) *MOLECULE MOLECULE INTERACTIONS,
*MOLECULAR VIBRATION, *HYDROGEN, CELLS, COLOR CENTERS,
CONFIGURATIONS, DEGRADATION, MOLECULAR PROPERTIES.

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

AD-A214 714 CONTINUED

TECHNICAL RESEARCH ASSOCIATES INC SALT LAKE CITY UT

(U) New Metallophilic Colloidal Ceramics.

DESCRIPTIVE NOTE: Final rept. 30 Sep 83-31 Mar 84.

APR 84

PERSONAL AUTHORS: Alexander, Guy B.; Weeks, J. K., Jr

CONTRACT NO. F49620-83-C-0182

PROJECT NO. 3005

TASK NO. A1

MONITOR: AFOSR
TR-89-1644

UNCLASSIFIED REPORT

ABSTRACT: (U) In this study, TRA has examined the possibility of using alumina and/or thorium for dispersion hardening of aluminum base alloys. Thorium apparently is not wetted by the aluminum alloy, and hence does not appear to be a candidate for the intended use. On the other hand, alumina is wetted and has been dispersed in a submicron state. The opportunity to produce aluminum alloys with superior high temperature strength is real. The conditions for wetting submicron alumina into a molten alloy of aluminum-copper-magnesium have been demonstrated. This was accomplished by adding copper-alumina master mix slugs to molten aluminum-magnesium. The alloy containing the dispersed oxide was cast and the resulting metal analysed by electron microscopy and hardness after working followed by annealing. Hardness showed retention of properties of annealing. The micrographs showed alumina dispersed uniformly throughout the cast structure at an interparticle (IPS) spacing in the range of 150-200 millimicrons. This is even smaller than the spacing of particles in TD Nickel. Control of IPS at any level from 100 millimicrons and up has been demonstrated. The new alloy, called oxide dispersion strengthened aluminum or ODS aluminum, is expected to have useful metallurgical strength, at 500-550 C, and thus increase the useful temperature range of aluminum base alloys by at least 200 centigrade degrees (AW)

DESCRIPTORS: (U) *ALUMINUM ALLOYS, *ALUMINUM OXIDES, *CERAMIC MATERIALS, *DISPERSION HARDENING, *THORIUM DIOXIDE, *WETTING, ALUMINUM, ANNEALING, CASTINGS, COLLOIDS, DISPERSING, ELECTRON MICROSCOPY, HIGH STRENGTH, HIGH TEMPERATURE, METALLURGY, NICKEL, OXIDES, PARTICLES, RANGE(EXTREMES), HIGH STRENGTH ALLOYS, STRENGTH(MECHANICS), TEMPERATURE, COPPER, MAGNESIUM.

IDENTIFIERS: (U) PE85502F, WUAF0SR3005A1, Oxide Dispersion Strengthening.

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SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

MASSACHUSETTS UNIV AMHERST LAB OF PSYCHOMETRIC AND EVALUATIVE RESEARCH

(U) Systems of Nonlinear Hyperbolic Equations Associated with Problems of Classical Electromagnetic Theory.

(U) Effects of Test Length and Sample Size on the Estimates of Precision of Latent Ability Scores.

DESCRIPTIVE NOTE: Final rept. 15 May 82-14 May 83.

DESCRIPTIVE NOTE: Final technical rept. 1 Feb 78-30 Apr 79.

MAY 84

PERSONAL AUTHORS: Bloom, Frederick

MAR 79

CONTRACT NO. AFOSR-81-0171

PERSONAL AUTHORS: Cook, Linda L.; Hambleton, Ronald K.

PROJECT NO. 2304

REPORT NO. RR-87

TASK NO. A4

CONTRACT NO. F49620-78-C-0039

MONITOR: AFOSR TR-89-1849

MONITOR: AFOSR TR-89-1853

UNCLASSIFIED REPORT

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ABSTRACT: (U) The investigator focused on and produced papers in the following areas of research 'Systems of nonlinear hyperbolic equations associated with problems of classical electromagnetic theory,' 'Shock formation in inhomogeneous quasilinear systems associated with nonlinear electromagnetic models,' and 'Shock wave formation for inhomogeneous hyperbolic systems associated with nonlinear transmission line problems.' Details on this research are contained in the report. (rrh)

SUPPLEMENTARY NOTE: Presented at an AERA-NCME Symposium entitled 'Explorations of Latent Trait Models as a Means of Solving Practical Measurement Problems, San Francisco, CA Apr 79.

DESCRIPTORS: (U) *ELECTROMAGNETISM, *NONLINEAR ALGEBRAIC EQUATIONS, HYPERBOLAS, SHOCK WAVES.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A4.

ABSTRACT: (U) One of the most important advantages that accrue from the application of latent trait models is the possibility of specifying a target information curve and then selecting items from an item pool to produce a test with the features characterized by this curve. By proceeding in this manner, it is possible to develop a test that provides a pre-specified level of precision (Standard Error of Ability Estimate) at selected ability levels. One problem with this paradigm is that little is known about the precision of the standard error of ability estimates (SEE) under varying circumstances. The purpose of the research reported in this paper was to address three practical questions of importance and interest to test developers: 1) What are the effects of examinee sample size and test length on the precision of SEE Curves, 2) What effects do the statistical characteristics of an item pool have on the precision of SEE Curves, and 3) What is the relationship between test length and SEE Curves in typical item pools? Keywords: Latent trait theory, Psychological tests, Aptitude tests, Mathematical models (SDW)

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SEARCH CONTROL NO EVI56L

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DESCRIPTORS: (U) *PSYCHOLOGICAL TESTS, APTITUDE TESTS, DORMANCY, ERRORS, ESTIMATES, GRAPHS, LENGTH, MATHEMATICAL MODELS, SCORING, SKILLS, STATISTICS, TARGETS, TEST AND EVALUATION.

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Algorithms for Computational Fluid Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 82.

IDENTIFIERS: (U) *Latent trait theory.

SEP 82

PERSONAL AUTHORS: Abarbanel, Saul

CONTRACT NO. AFOSR-82-0039

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-89-1663

UNCLASSIFIED REPORT

ABSTRACT: (U) During the period covered by the Grants attention has been focused on three areas, all of them of importance in the successful application of implicit algorithms to Computational Fluid Dynamics (CFD): 1) The role of boundary conditions for implicit hyperbolic schemes; 2) The stability of hyperbolic Approximate Factorization schemes in three space dimensions; and 3) The rate of convergence to steady state of ADI methods. This report delineates the progress in each of the above enumerated areas. The details of the research will be found in reports and papers as referenced below for each of the tasks. (KR)

DESCRIPTORS: (U) *ALGORITHMS, *FLUID DYNAMICS, ATTENTION, BOUNDARIES, COMPUTATIONS, GRANTS, HYPERBOLAS, STEADY STATE.

IDENTIFIERS: (U) PE81102F, WUAFOSR2307A1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

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STANFORD UNIV CA DEPT OF CHEMISTRY

(U) The State Identification of Reaction Products.

DESCRIPTIVE NOTE: Final rept..

OCT 80

PERSONAL AUTHORS: Zare, Richard N.

CONTRACT NO: AFOSR-77-3363

PROJECT NO: 2303

TASK NO: 81

MONITOR: AFOSR
TR-89-1651

UNCLASSIFIED REPORT

ABSTRACT: (U) We have continued in our efforts to understand chemical reaction dynamics through state identification of reaction products. Excellent progress has been made toward this goal. In addition, we have sought to control or select the reagent states responsible for the observed product state distributions. Such state-to-state kinetic data have greatly aided our understanding of the detailed balance sheet of energy conservation. Moreover, by selecting the orientation of reagent species, and examining that of the products, we have sought to understand the balance sheet of angular momentum conservation. These advances have been most timely. Similar and related studies are rapidly assuming a central position in the field of chemical kinetics. A large number of groups are currently pursuing kinetic investigations at this level. In most cases, commercially available intense lasers are being married with the tried and tested techniques of molecular beam scattering. We have continued to use lasers to determine reaction product state distributions using the technique of laser induced fluorescence (LIF). Reagent state selection has been achieved in a number of ways. For the reactions of Calcium and Strontium with Hydrogen Fluoride and Deuterium Fluoride, the reactant vibrational energy was selected using a pulsed HF/DF laser as an excitation source. Keywords: Collisions, Ionization energy, Electronic states, Electron energy, Rotation, Excitation.

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Exothermic reactions, Endothermic reactions (AW)

DESCRIPTORS: (U) *CHEMICAL AGENTS, *REACTANTS(CHEMISTRY), ANGULAR MOMENTUM, BALANCE, BEAMS(RADIATION), CALCIUM, CHEMICAL LASERS, CHEMICAL REACTIONS, CONSERVATION, DEUTERIUM COMPOUNDS, DISTRIBUTION, DYNAMICS, ELECTRON ENERGY, ELECTRONIC STATES, ENDOTHERMIC REACTIONS, ENERGY, ENERGY CONSERVATION, EXCITATION, EXOTHERMIC REACTIONS, FLUORIDES, HYDROGEN FLUORIDE, HYDROGEN FLUORIDE LASERS, IDENTIFICATION, INTENSITY, IONIZATION, KINETICS, LASER INDUCED FLUORESCENCE, LASERS, MOLECULAR BEAMS, ORIENTATION(DIRECTION), POSITION(LOCATION), PULSED LASERS, REACTION KINETICS, SCATTERING, SELECTION, SHEETS, SOURCES, STRONTIUM, VIBRATION.

IDENTIFIERS: (U) PE81102F, WUAFOSR 230381.

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AD-A214 707 20/5 9/3

ARKANSAS UNIV FAYETTEVILLE DEPT OF CHEMISTRY

(U) Spectroscopic Investigation of Lead Monofluoride.

DESCRIPTIVE NOTE: Final rept..

MAY 81

PERSONAL AUTHORS: Green, Robert B.

CONTRACT NO. AFOSR-80-0019

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1052

UNCLASSIFIED REPORT

ABSTRACT: (U) The study of the state structure, lifetime and quenching of lead monofluoride produced in a flame of lead vapor and molecular by laser-induced fluorescence. Keywords: Nitrogen laser. (KT)

DESCRIPTORS: (U) *FLAMES, *LEAD COMPOUNDS, *FLUORIDES, *NITROGEN LASERS, *SPECTROSCOPY, LASER INDUCED FLUORESCENCE, MOLECULES, VAPORS, COMBUSTION STABILITY.

IDENTIFIERS: (U) PE811C2F, WUAFOSR2303B1, *Lead Monofluoride.

AD-A214 706 12/4

GEORGIA INST OF TECH ATLANTA SCHOOL OF INDUSTRIAL AND SYSTEMS ENGINEERING

(U) Mathematical Programming with and without Differentiability.

DESCRIPTIVE NOTE: Final rept..

AUG 80

PERSONAL AUTHORS: Bazaraa, M. S.; Spingarn, J.

CONTRACT NO. F49820-79-C-0120

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-89-1670

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: Quasi-Newton Algorithms for Constrained Nonlinear Programming; Generic Optimality Conditions and Nondifferentiable Optimization. Keywords: Quadratic approximation methods, Quadratic programming, Lagrangian multipliers. (KR)

DESCRIPTORS: (U) *MATHEMATICAL PROGRAMMING, APPROXIMATION (MATHEMATICS), NONLINEAR PROGRAMMING, OPTIMIZATION, QUADRATIC EQUATIONS, QUADRATIC PROGRAMMING.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A6.

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AD-A214 705 20/4

NEW YORK UNIV WESTBURY ANTONIO FERRI LABS

(U) Investigation of the Fluctuation Mechanism in Turbulent Flow.

DESCRIPTIVE NOTE: Final rept..

NOV 79

PERSONAL AUTHORS: Zakkay, Victor; Barra, Vincent

CONTRACT NO. AFOSR-78-2497

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1869

UNCLASSIFIED REPORT

ABSTRACT: (U) This report consists primarily of two papers. The first -- Measurements of the coherent structure of boundary layer turbulence at a high subsonic speed -- describes in some detail the level of sophistication that has been achieved thus far in terms of instrumentation and data analysis for our investigation. The second paper -- Turbulent boundary layers (Experiments, theory, and modelling) -- summarizes the major results and conclusions which have been deduced from our measurements. This paper includes our first results from measurements of the coherent structure in the lateral direction. (edc)

DESCRIPTORS: (U) *TURBULENT FLOW, COHERENCE, DATA PROCESSING, INSTRUMENTATION, SUBSONIC CHARACTERISTICS, SUBSONIC FLOW, TURBULENT BOUNDARY LAYER, VARIATIONS.

IDENTIFIERS: (U) Fluctuating flow mechanisms. PE61102F.
WUAFOSR2307A2.

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MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Fracture and Fatigue of Bi-Materials.

DESCRIPTIVE NOTE: Final rept. 1 Dec 73-30 Sep 78,

79

PERSONAL AUTHORS: Mar, James W.

CONTRACT NO. F4820-74-C-0023

PROJECT NO. 2307

TASK NO. B1

MONITOR: AFOSR
TR-89-1429

UNCLASSIFIED REPORT

ABSTRACT: (U) This research is directed toward a fundamental understanding of the failure mechanisms of the filamentary composites such as boron/aluminum and graphite/epoxy which are technologically the most important examples of bi-materials. The penultimate objectives of this research are the theoretical foundations and the experimental justifications for a structural design methodology to be used for the design of filamentary composite materials to meet USAF damage tolerance and durability requirements. On a macroscopic scale, the stress analysis of cracks in orthotropic materials and on a microscopic scale, the stress singularity and stress distributions of a crack lying at the interface of a bi-material have been studied. The experimental work has encompassed the compression-compression fatigue of graphite/epoxy laminates with holes, the tensile fracture of uni-directional laminates with circular discontinuities, and the tensile fracture of crossplied laminates with various geometric configurations of discontinuities. (aw)

DESCRIPTORS: (U) *COMPOSITE MATERIALS, *CRACKS, *EPOXY LAMINATES, *FRACTURE(MECHANICS), *GRAPHITE EPOXY COMPOSITES, *STRESS ANALYSIS, CIRCULAR, DAMAGE, DISCONTINUITIES, DISTRIBUTION, FILAMENTS, METHODOLOGY, MICROSCOPY, SCALE, STRESSES, STRUCTURAL ENGINEERING.

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TENSILE PROPERTIES, TOLERANCE, UNIDIRECTIONAL.

CONNECTICUT UNIV STORRS

IDENTIFIERS: (U) PEB1102F, WUAFOSR2307B1, *Fatigue strength.

(U) Workshop on Problems in Chemical Toxicology.

DESCRIPTIVE NOTE: Final rept. 19-20 Jun 80.

JUN 80

PERSONAL AUTHORS: Lindstrom, Richard E.

CONTRACT NO. AFOSR-80-0248

PROJECT NO. 2307

TASK NO. D6

MONITOR: AFOSR
TR-89-1428

UNCLASSIFIED REPORT

ABSTRACT: (U) The bulk of the material in this report was transcribed from the proceedings of a two-day conference on biological aspects of chemical defense. In the meeting, six representatives from the Department of Defense exchanged views on the subjects with an equal number of civilian scientists whose scholarly interests touch on various aspects of the overall chemical problem. Keywords: Symposia; Chemical warfare; Defense systems; Response biology; Physiological effects; Neuropharmacology. (KT)

DESCRIPTORS: (U) *CHEMICAL WARFARE, *NEUROLOGY, *PHARMACOLOGY, *PHYSIOLOGICAL EFFECTS, *SYMPOSIA, BULK MATERIALS, CHEMICALS, DEFENSE SYSTEMS, DEPARTMENT OF DEFENSE, RESPONSE(BIOLOGY), SCIENTISTS, TOXICOLOGY, WORKSHOPS.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2307D6.

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CINCINNATI UNIV OH DEPT OF ENGINEERING SCIENCE

(U) Blast and Penetration Resistant Tactical Shelters.

IDENTIFIERS: (U) PE61102F, WUAFOSR2307D9.

DESCRIPTIVE NOTE: Final rept. 1 Jun 78-31 May 79.

JUL 79

PERSONAL AUTHORS: Strauss, Alvin M.

CONTRACT NO. AFOSR-78-3588

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-89-1414

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of the research was to investigate the Air Force's tactical shelter designs and determine the extent to which blast and penetration resistance could be incorporated into the design. This was to be done within existing weight, cost and other constraints specified in the relevant Military Specifications. The standard 8x8x13 ft rectangular parallel piped, although the work here is applicable to the 8x8x20 ft shelter. This shelter must be capable of efficient transport by plane, ship, helicopter, rail, or truck without damage to the structure. An objective of this study was to design a material for the shelter that would be capable of withstanding small arms fire. It was determined that protection could not be guaranteed against 7.62 mm ball rounds with the weight constraints imposed. To accomplish this one would need a structure equivalent to an armored personnel carrier. It should be pointed out that protection against 7.62 mm ball can be provided using kevlar composites, but the weight of the shelter must be substantially, but not excessively, increased. Keywords: Blast resistant shelters. (SDW)

DESCRIPTORS: (U) *BLAST RESISTANT SHELTERS, AIR FORCE, ARMORED PERSONNEL CARRIERS, BLAST, COSTS, DAMAGE, EFFICIENCY, GUNFIRE, HELICOPTERS, MILITARY REQUIREMENTS, PENETRATION, RESISTANCE, SHELTERS, SMALL ARMS, SPECIFICATIONS, TRANSPORT, WEIGHT.

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PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSICS

AD-A214 694 20/4
PRINCETON UNIV NJ

(U) Inverse Scattering: Ionospheric Structure Determination.

(U) Analytical Studies of Turbulent Flow Fields.

DESCRIPTIVE NOTE: Final rept. 1 Jul 78-30 Jun 79.

DESCRIPTIVE NOTE: Final rept. 1 Sep 74-31 Aug 79.
79

JUL 79

PERSONAL AUTHORS: Cohen, Jeffrey M.

PERSONAL AUTHORS: Mellor, George L.

CONTRACT NO. AFOSR-78-3608

CONTRACT NO. AFOSR-75-2756

PROJECT NO. 2304

PROJECT NO. 2307

TASK NO. A4

TASK NO. A2

MONITOR: AFOSR
TR-89-1413

MONITOR: AFOSR
TR-89-1453

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Document partially illegible.

DESCRIPTORS: (U) *IONOSPHERIC MODELS. ELECTROMAGNETIC WAVE PROPAGATION, INTEGRAL EQUATIONS.

IDENTIFIERS: (U) Exact Fall Wave Theory, Hilbert transformations, Gelfand leviitan equations, PE81102F, WJAFOSR2304A4.

ABSTRACT: (U) Much of the effort has been in the development of numerical simulations of unsteady, separated flow using one version of a Rotta-Kolmogorov, second moment, turbulent closure model. This has been a somewhat risky undertaking with many problems to be solved between inception of the research and success. A very good turbulent closure model has been developed to resolve important numerical problems. The turbulent Reynolds stress equations require explicit viscous terms where, indeed, the coefficient of viscosity may be set at a much lower level than the equivalent artificial viscosity introduced by the upwind scheme. Since the turbulent diffusion term that must be modeled in the Reynolds stress equations, the additional diffusion required by numerical stability seems quite tolerable. The vorticity transport equation requires no additional diffusion terms for numerical stability in which case the flow is unsteady. (Jhd)

DESCRIPTORS: (U) *FLOW SEPARATION, *SHEAR STRESSES, *UNSTEADY FLOW, *TURBULENT FLOW, CLOSURES, COEFFICIENTS, DIFFUSION, DIGITAL SIMULATION, FLOW FIELDS, LOW LEVEL, MODELS, MOMENTS, MOMENTUM TRANSFER, NUMERICAL ANALYSIS, STABILITY, TRANSPORT PROPERTIES, TURBULENCE, VISCOSITY, VORTICES.

IDENTIFIERS: (U) Turbulent Closure Model, Reynolds

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SEARCH CONTROL NO. EVI56L

AD-A214 894 CONTINUED

Stress. PE61102F, WUAFOSR2307A2.

AD-A214 893 21/2 21/5

SHEFFIELD UNIV (ENGLAND)

(U) Fundamental Modelling of Kinetics, Mixing and
Evaporating in Combustors.

DESCRIPTIVE NOTE: Final rept. Mar 74-Feb 78.

79

PERSONAL AUTHORS: Swithenbank, J.

CONTRACT NO. AFOSR-74-2882

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1377

UNCLASSIFIED REPORT

ABSTRACT: (U) An extensive and ambitious study was made with the objective of relating all relevant aspects of current fundamental knowledge of combustion with the performance of actual combustors used in propulsion systems. The results of such a study contributes to establishing realistic design criteria for efficient, stable and low pollution combustors. In particular, an understanding of the fundamental combustion, science and technology limitations permit systems to be optimized at an early stage in the design procedure. Keywords: Gas turbine engines; Scramjet engines; Gas turbine combustors. (KT)

DESCRIPTORS: (U) *COMBUSTION, *COMBUSTORS, *RAMJET ENGINES, *SUPERSONIC COMBUSTION, ENGINES, GAS TURBINES, LIMITATIONS, FUEL SPRAYS, REACTION KINETICS, POLLUTION, PROPULSION SYSTEMS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI5G1

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STATE UNIV OF NEW YORK AT ALBANY SPACE ASTRONOMY LAB

IDENTIFIERS (U) Interplanetary dust, PEG1102F,
WUAFOSR2311A1

(U) Background Sky Brightness Measurements for Application
to Space Surveillance Systems

DESCRIPTIVE NOTE: Final rept. 1 Oct 79-30 Sep 80.

MAY 81 64P

PERSONAL AUTHORS: Weinberg, J L.; Schuerman, D W

CONTRACT NO. AFOSR-80-0043

PROJECT NO. 2311

MONITOR: AFOSR
TR-89-1378

UNCLASSIFIED REPORT

ABSTRACT: (U) The scattering of sunlight by interplanetary dust gives rise to the zodiacal light, a ubiquitous feature of the night sky which is the limiting background for most infrared observations. This changing (with wavelength, look direction, and distance from the sun) background can be understood only in the larger context of the physics of interplanetary dust. We have observationally separated the zodiacal light from other astronomical sources, devised a mathematical inversion to extract the maximum amount of information about the dust from space observations, observationally proved that the dust complex is neither homogeneous nor simply distributed through the solar system, and predicted that the dust may tend to accumulate in enormous arcs which span the solar system. The inversion technique is the most promising method to extract from visual and near IR observations the parameters necessary to model the infrared emission of interplanetary grains. Near infrared radiation visible spectra. (EDC)

DESCRIPTORS: (U) *DUST, *SKY BRIGHTNESS, *ZODIACAL LIGHT, ASTRONOMY, BACKGROUND RADIATION, EMISSION, NEAR INFRARED RADIATION, INFRARED SPECTRA, INTERPLANETARY SPACE, INVERSION, LIMITATIONS, MEASUREMENT, NIGHT SKY, OBSERVATION, PHYSICS, LIGHT SCATTERING, SOLAR SYSTEM, LIGHT SOURCES, SPACE SURVEILLANCE SYSTEMS, SUN, SUNLIGHT, VISIBLE SPECTRA.

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AD-A214 888 18/4.1 17/7.3

AD-A214 887 20/4 21/5

NEW ORLEANS UNIV LA DEPT OF MATHEMATICS

IOWA STATE UNIV AMES ENGINEERING RESEARCH INST

(U) Nonlinear Guidance of Air-to-Air Missiles.

(U) Multistage Axial-Flow Turbomachine Wake Production Transport and Interaction.

DESCRIPTIVE NOTE: Final rept.,

DESCRIPTIVE NOTE: Final rept. 1 Sep 75-31 Dec 78.

JUN 79

FEB 79

PERSONAL AUTHORS: Andrus, Jan F.

PERSONAL AUTHORS: Okishi, Theodore H.

CONTRACT NO. AFOSR-78-3841

CONTRACT NO. AFOSR-76-2918

PROJECT NO. 2304

PROJECT NO. 2307

TASK NO. A1

TASK NO. A4

MONITOR: AFOSR
TR-89-1361

MONITOR: AFOSR
TR-89-1405

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) In earlier work the necessary conditions of optimality were derived for a problem of minimum miss distance guidance of air-to-air missiles. The model was based upon nonlinear translational equations of motion. The solution of the necessary conditions requires a solution of a two-point boundary-condition problem. Two methods proposed for the latter solution, an elliptic integral method and a series technique, were studied and both methods were rejected in favor of a procedure based upon the quasilinearization method. The latter requires fewer assumptions and exhibits excellent convergence properties. In order to remove the numerical integration problem and to simplify the linear two-point boundary-condition problem associated with quasilinearization, the regular methods was modified, three alternative techniques being derived, and a technical report was written which discusses the convergence properties and accuracy of the three modified quasilinearization methods applied to two-point boundary-condition problems in general. (SDW)

DESCRIPTORS: (U) *AIR TO AIR MISSILES, *GUIDANCE, ACCURACY, CONVERGENCE, ELLIPSES, MISS DISTANCE, NONLINEAR SYSTEMS, NUMERICAL INTEGRATION.

IDENTIFIERS: (U) Elliptic Integral Method, PEB1102F, WUAFOSR2304A1

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ABSTRACT: (U) Procedures and instrumentation for acquiring time-average (slow response average of continuously sampled data) and periodic-average (electronic and arithmetic average of periodically sampled data) flow field data between blade rows of a research turbomachine were developed. Slow and fast-response total pressure probes at a hot-wire anemometry were involved. A special 5 microsec sampling and holding circuit that could be phase locked to reference rotor blade position was designed and built. Two-dimensional time-average and three-dimensional periodic-average velocity vector information was obtained. Observed time-average flow patterns involved appreciable circumferential variations behind both rotors and stators and they could be changed significantly by circumferentially shifting upstream stationary blades. Observed periodic-average flow patterns showed that rotor and stator flow fields are 3-dimensional as well as periodically unsteady. A simple wake chopping transport and interaction model based on experimental data proved to be an excellent means for organizing and explaining data trends. Variations of periodic-average flow patterns with rotor sampling position could be understood in terms of the wake chopping, transport and interaction model proposed. Compressor inlet noise measurements indicated that blade-passing frequency noise level could be changed

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Substantially with appropriate stationary blade row circumferential positioning when the same number of blades was present in each stationary blade row and when the spinning blade interaction pattern speed was above the cut-off amount. (EDC)

AD-A214 686 15/5

WRIGHT STATE UNIV DAYTON OH DEPT OF MANAGEMENT

(U) Studies of Scheduling and Resource Allocation Techniques for Repairable Item Inventory Systems.

DESCRIPTORS: (U) *TURBINE BLADES, *FLOW FIELDS, *TURBOMACHINERY, *WAKE, ARITHMETIC, AXIAL FLOW TURBINES, COMPRESSORS, DATA ACQUISITION, ELECTRONICS, EXPERIMENTAL DATA, HOT WIRE ANEMOMETERS, INLETS, INTERACTIONS, MEASUREMENT, MODELS, NOISE, PATTERNS, PHASE LOCKED SYSTEMS, POSITION(LOCATION), PRESSURE MEASUREMENT, PROBES, QUICK REACTION RESPONSE, ROTOR BLADES, ROTORS, SAMPLING, SHIFTING STATIONARY, STATORS, THREE DIMENSIONAL FLOW, TRANSPORT, UNSTEADY FLOW, VELOCITY.

DESCRIPTIVE NOTE: Final rept., MAR 80

PERSONAL AUTHORS: Demmy, W. S.

CONTRACT NO. AFOSR-76-3011

PROJECT NO. 2304

IDENTIFIERS: (U) Wake chopping, PE61102F, WUAFOSR2307A4.

TASK NO. AS

MONITOR: AFOSR TR-89-1441

UNCLASSIFIED REPORT

ABSTRACT: (U) This document marks the completion of our research efforts for Studies of Scheduling and Resource Allocation Techniques for Repairable Item Inventory Systems funded by AFOSR Grant 76-3011. Since beginning these efforts, we have conducted a number of investigations to develop and evaluate improved procedures for the planning and control of Air Force repairable item inventories. These studies have ranged from the development and testing of large-scale optimization techniques for depot repair planning to the development and evaluation of multi-location inventory system distribution rules. The complete results of our efforts are documented in a series of thirty-two Working Papers. In several cases, these results were also presented at national meetings of technical societies or published in appropriate journals. A list of the working papers and publications funded by this grant is attached (kr)

DESCRIPTORS: (U) *INVENTORY CONTROL, *RESOURCE MANAGEMENT, ALLOCATIONS, INVENTORY, OPTIMIZATION, PLANNING, REPAIR, AIR FORCE RESEARCH, SCHEDULING, SOCIETIES, SUPPLY DEPOTS, SYMPOSIA.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

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OTIC REPORT BIBLIOGRAPHY

AD-A214 685

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BOSTON UNIV MA DEPT OF ELECTRICAL COMPUTER AND SYSTEMS
ENGINEERING

(U) Dynamical-Chemical Coupling in the Mesosphere and
Lower Thermosphere

DESCRIPTIVE NOTE: Final rept. 1 Feb 81-31 Jan 84.

84

PERSONAL AUTHORS: Forbes, Jeffrey M.

CONTRACT NO. AFOSR-81-0080

PROJECT NO. 2310

TASK NO. A2

MONITOR: AFOSR
TR-89-1445

UNCLASSIFIED REPORT

ABSTRACT: (U) The primary research goal of this grant was to improve our understanding and modelling capabilities of dynamical/chemical coupling processes in the mesosphere and thermosphere. Topics examined were: 1) Diurnal tide, theoretical, development and modelling; 2) Development of finite element simulation code (FESC) for modelling dynamical-chemical coupling processes; and 3) Investigation of specific dynamical-chemical coupling phenomena. Keywords: Atmospheric physics; Atmospheric chemistry. (edc)

DESCRIPTORS: (U) *ATMOSPHERIC CHEMISTRY, *ATMOSPHERIC PHYSICS, ATMOSPHERE MODELS, CHEMICAL REACTIONS, CODING, COUPLING(INTERACTION), DIURNAL VARIATIONS, DYNAMICS, FINITE ELEMENT ANALYSIS, MESOSPHERE, SIMULATION, THERMOSPHERE, ATMOSPHERIC TIDES.

IDENTIFIERS: (U) PEB1102F, WJAFOSR2310A2.

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SEARCH CONTROL NO. EV158L

AD-A214 881 20/3

NORTHWESTERN UNIV EVANSTON IL DEPT OF PHYSICS AND
ASTRONOMY

(U) Electronically Induced Phase Transformations

DESCRIPTIVE NOTE: Final rept. 1 Oct 75-30 Sep 80.

DEC 80

PERSONAL AUTHORS: Freeman, Arthur J.

CONTRACT NO. AFOSR-78-2948

PROJECT NO. 9767

TASK NO. 04

MONITOR: AFOSR
TR-89-1667

UNCLASSIFIED REPORT

ABSTRACT: (U) The electronic interactions responsible for the observed electronically induced phase transformations in several important classes of materials were investigated theoretically in close collaboration with experimental programs at other institutions. These include destruction of superconductivity and onset of a normal magnetic state at low temperatures in ternary rare-earth superconducting compounds and the possible occurrence of a new mixed phase, the origin of the phase transition to the superconducting phase in the Chevrel compounds, the possibility of cationic superconductivity in CuCl, the origin of photoinduced superconductivity in JKD.

DESCRIPTORS: (U) *PHASE TRANSFORMATIONS, *SUPERCONDUCTIVITY, *SUPERCONDUCTORS, CHLORIDES, COPPER COMPOUNDS, DESTRUCTION, ELECTRONIC STATES, EXCITONS, INTERACTIONS, LOW TEMPERATURE, MAGNETIC FIELDS, MIXING, PHONONS, RARE EARTH COMPOUNDS, TERNARY COMPOUNDS.

IDENTIFIERS: (U) Copper chlorides, PEB1102F, WJAFOSR976704.

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SEARCH CONTROL NO EV156L

AD-A214 872 20/3

AD-A214 881 7/3

RHODE ISLAND UNIV KINGSTON DEPT OF MATHEMATICS

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) The Two-Body Problem of Classical Electrodynamics.

(U) Synthesis and Chemistry of Cubanes.

DESCRIPTIVE NOTE: Final rept. 1 Jun 78-31 May 79.

89

AUG 79

PERSONAL AUTHORS: Driver, Rodney D.

PERSONAL AUTHORS: Griffin, Gary W.; Marchand, Alan P.

CONTRACT NO. AFOSR-77-3397

CONTRACT NO. AFOSR 88 0132

MONITOR: AFOSR

PROJECT NO. 2303

TR-89-1411

TASK NO. 82

MONITOR: AFOSR
TR-89-1294

UNCLASSIFIED REPORT

ABSTRACT: (U) Various competing mathematical models are used in classical electrodynamics. To test, and possibly eliminate, some of these models one can apply them to the two body problem and see whether reasonable results are obtained. In one model it is assumed that each particle is influenced by both the past and future behavior of the other. The special case of two electrons moving symmetrically in one dimension was considered; and it was found that this curious model does make sense mathematically provided the two electrons never get too close together. Further studies under this grant led to a simple method for analyzing the asymptotic behavior of solutions problem of certain linear delay differential equations. This is useful in a one-body problem of electrodynamics with radiation reaction. In problems of control theory with time lags, in the telegraph equation, and other applications. Currently work in progress is aimed at understanding the simplest n-body problem of electrodynamics with interactions occurring only through retarded fields. (JMD)

DESCRIPTORS: (U) *ELECTRODYNAMICS, *N BODY PROBLEM, ASYMPTOTIC SERIES, CONTROL THEORY, LINEAR DIFFERENTIAL EQUATIONS, MATHEMATICAL MODELS, PARTICLES, SOLUTIONS(GENERAL).

IDENTIFIERS: (U) Two Body Problem, PE81102F, WJAFOSR2307D9.

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UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Reviews, v89 n5 p997-1010 1989.

ABSTRACT: (U) A primary source of aesthetic appeal of cubane lies in its symmetry (Oh point group). In addition, the bond deformations that are required to place eight, formally sp-hybridized methine carbon atoms at the vertices of a cube would reasonably be expected to introduce considerable strain into the cubane molecule. This expectation is borne out by experiment: the standard heat of formation of cubane is 144.5 kcal/mol, which corresponds to a total strain energy of 166 kcal/mol for this molecule. Despite the considerable degree of strain in cubane (ca. 14 kcal/mol per carbon-carbon bond), this molecule is extraordinarily stable, surviving essentially unchanged at temperature up to ca. 200 C. (UES)

DESCRIPTORS: (U) *CYCLIC COMPOUNDS, BONDING, CARBON CARBON COMPOSITES, CHEMISTRY, DEFORMATION, HEAT, HYDROCARBONS, MOLECULES, OCTYL RADICALS, SYNTHESIS.

IDENTIFIERS: (U) PE81102F, WJAFOSR2303B2.

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AD-A214 657 7/3 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO CVI56L
NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY
(U) A Diels-Alder Cycloadduct of Methylcyclopentadiene
with 2,6-Dimethyl-p-Benzquinone and the
Intramolecular Photocyclization Product of this
Cycloadduct.

AD A214 657 CONTINUED

PHOTOCHEMICAL REACTIONS, REF. JFS.
IDENTIFIERS: (U) WJAFOSR230382

88

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante;
Kashyap, Ram P.; Marchand, Alan P.; Zhao, Dalian

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-89-1291

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, VC45
p1342-1346 1989.

ABSTRACT: (U) The structures of 3,4a,6-trimethyl-1,4,4a,8a-tetrahydro-1,4-methanonaphthalene-5,8-dione and of 1,2,10-trimethylpentacyclo[5.4.0.0(2,6).0(3,10).0(5,9)]undecane-8,11-dione have been determined by single crystal X-ray structural analysis. Structure (Ib) contains a norbornene moiety fused to a cyclohexenedione ring. The two sets of C atoms which are joined in the photochemical reaction to form the four-membered ring in (2) are separated by 3.671 (3) and 3.685 (5) Å. Compound (2) contains a norbornane system fused to two five membered rings and a four-membered ring. Two bonds in the structure are elongated to 1.585 (3) and 1.591 (3) Å. The two keto C atoms pointing away from each other. The heats of formation of (Ib) and (2) are estimated by molecular mechanics calculations to be -163.5 and -250.7 kJ/mol with strain energies of 85.1 and 138.5 kJ/mol, respectively. Keywords: Diels-Alder adduct, Intramolecular photocycloaddition, Cage compounds, Reprints (AM)

DESCRIPTORS (U) ORGANIC CHEMISTRY, ATOMS, BONDING,
CLATHRATE COMPOUNDS, COMPUTATIONS, MECHANICS, MOLECULES,

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AD-A214 635 12/5 12/7

ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

(U) Studies of Optical Matrix Multiplication and Reconfigurable Optical Interconnect Concepts.

(U) Parallel Logic Programming and Parallel Systems Software and Hardware.

DESCRIPTIVE NOTE: Final rept. 1 Nov 86 30 Apr 89.

DESCRIPTIVE NOTE: Progress rept. (Final) 1 Apr 88-31 Mar 89.

JUL 89

JUL 89

PERSONAL AUTHORS: Yeh, Pochi

PERSONAL AUTHORS: Minker, Jack

REPORT NO. SC5502.FR

CONTRACT NO. F49620-87-C-0015

CONTRACT NO. AFOSR-88-0152

MONITOR: AFOSR

TR-89-1290

TASK NO. A7

UNCLASSIFIED REPORT

MONITOR: AFOSR
TR-89-1309

ABSTRACT: (U) This contract studies unique optical computing concepts which use nonlinear optical phenomena to perform matrix multiplication and to provide reconfigurable optical interconnection. The study focuses on the use of real-time holography in nonlinear media such as photorefractive crystals for optical computing. By incorporating the parallel nature of optics in nonlinear media, it is possible to perform parallel matrix multiplication using four-wave mixing. In addition, the dynamic holography in nonlinear optical media provides a natural candidate for the configurable interconnection. The general problem in this program is to generate and investigate new concepts which use these nonlinear optical phenomena for optical computing. Specifically, this program investigates experimentally and theoretically the multiplication of matrices using optical four-wave mixing in nonlinear media, and the possibility of using such matrix multiplication and wave mixing for reconfigurable interconnection. (kr)

DESCRIPTORS: (U) *MATRIX DISPLAYS, *OPTICAL PROCESSING, CIRCUIT INTERCONNECTIONS, COMPUTATIONS, CONTRASTS, DYNAMICS, HOLOGRAPHY, MEDIA, MIXING, NONLINEAR SYSTEMS, OPTICAL MATERIALS, OPTICAL PHENOMENA, OPTICAL PROPERTIES, OPTICS, REAL TIME, WAVES

IDENTIFIERS: (U) PEB1102F

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ABSTRACT: (U) This progress report summarizes work performed under AFOSR-88-0152 on parallel logic programming, problem solving, and deductive databases. A parallel problem solving system, PRISM (Parallel Inference System), that was implemented on McMOB was ported to the BBN Butterfly machine. Two versions of PRISM were developed and are operational on the Butterfly: a message passing ring structure system and a shared-memory system. Experimental testing of PRISM on McMOB continued, while experiments were also conducted on the Butterfly systems. Three enhancements were made and completed during the grant period. These are: a capability to handle negated queries and a capability to assert and retract statements. In addition to the above, work continued in the area of informative answers to queries in deductive data bases. A thesis was completed on the subject. An interpreter was developed and is running, that can take restricted natural language as input and can respond with a cooperative natural language output. In the area of parallel software development, the following were accomplished. Theoretical work on slicing/splicing was completed. Tools were provided for software development using artificial intelligence techniques. AI software for massively parallel architectures was started (kr)

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NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

DESCRIPTORS: (U) *COMPUTER LOGIC, *COMPUTER PROGRAMMING, *PARALLEL PROCESSING, COMPUTER ARCHITECTURE, ARTIFICIAL INTELLIGENCE, COMPUTER PROGRAMS, DATA BASES, INTERROGATION, LIMITATIONS, NATURAL LANGUAGE, OUTPUT, PARALLEL ORIENTATION, PROBLEM SOLVING, RINGS, THEORY.

(U) Regiospecific Formation of a Methyl Pentacyclo[5.4.0.0(2,6).0(3,10).0(5,9)]undecane-8,11-dione-9-carboxylate Monoketal.

89

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A7, PRISM(Parallel Inference System).

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante; Marchand, Alan P.; Reddy, G. M.; Reddy, S. P.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1298

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, VC45
p659-661 1989.

ABSTRACT: (U) The title compound is composed of a four-membered ring fused on three sides to three five-membered rings. The three five-membered rings are then fused to a fourth five-membered ring resulting in a norbornane moiety. The resulting structure may be described as a cage with one open end. In the parent diketone the two unconnected carbon atoms forming the open end are carbonyl moieties, and the carbon p-orbitals of these pi-systems are collinear. In the title compound one of the ketones is replaced by a ketal functionality removing any potential p-orbital interactions. The two C-C distances one bond removed from the unconnected carbon atoms are the longest bonds in the title compound, however, they are significantly shorter than the calculated and observed distances in the parent diketone. This is consistent with a loss of coupling of the sp² carbon atoms in the parent diketone. Organic chemistry.

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, KETONES, METHYL RADICALS, SYNTHESIS(CHEMISTRY).

IDENTIFIERS: (U) PE61102F, WUAFOSR230382.

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NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Structure of a 3-Methylpentacyclo(5.4.0.0(2.6).0(3.10).0(5.9)undecane-8,11-dione Monoethylene Ketal.

(U) Statistical Aspects of Reliability, Maintainability, and Availability

89

DESCRIPTIVE NOTE: Annual rept. (Final) 30 Sep 79-29 Sep 80.

PERSONAL AUTHORS: Flippen-Anderson, Judith L.; Giliardi, Richard; George, Clifford; Marchand, Alan P.; Reddy, G. M.

CONTRACT NO. AFOSR-88-0132

PERSONAL AUTHORS: Hollander, Myles; Proschan, F.

PROJECT NO. 2303

CONTRACT NO. AFOSR-78-3678

TASK NO. 82

PROJECT NO. 2304

MONITOR: AFOSR
TR-89-1297

TASK NO. A5

MONITOR: AFOSR
TR-89-1382

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, VC45
p661-663 1989.

UNCLASSIFIED REPORT

ABSTRACT: (U) As part of a program that involves the synthesis and chemistry of novel, substituted pentacyclo undecanes (Marchand, 1989), we recently studied the acid-catalyzed reaction of 3-methylpentacyclo undecane-8,11-dione, synthesized via the procedure described in Marchand, Suri, Earlywine, Powell & van der Helm (1984) with excess ethylene glycol. Since the parent pentacyclo undecane-8,11-dione is known to react with ethylene glycol under these conditions to afford exclusively the corresponding monoethylene ketal (Eaton, Cassar, Hudson & Huang, 1978), it was anticipated that it might react similarly to afford one (or both) of the two possible monoethylene ketals. Organic chemistry. (jes)

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, CHEMISTRY, ETHYLENE GLYCOL, SYNTHESIS.

ABSTRACT: (U) Contents: 1) List of Publications; 2) Papers Published; 3) Papers in Press or Accepted for Publication; 4) Reports in Preparation. (kr)

DESCRIPTORS: (U) *STATISTICS, AVAILABILITY, MAINTAINABILITY, RELIABILITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2.

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COLORADO STATE UNIV FORT COLLINS DEPT OF STATISTICS

(U) Multivariable Problems of Statistics and Information Theory.

IDENTIFIERS: (U) PEB11027, WUAFOSR2304A5.

DESCRIPTIVE NOTE: Final rept. 15 Apr 82-14 Apr 83.
JUN 83

PERSONAL AUTHORS: Srivastava, Jaua

CONTRACT NO. AFOSR-82-0156

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-89-1384

UNCLASSIFIED REPORT

ABSTRACT: (U) During the year 1982-83, a great deal of work, both in quantity and quality, in volume as well as in depth, was accomplished. Three papers were written and two more were revised. Besides these five papers, there is one half-written paper which was presented at the Nashville meetings of the Institute of Mathematical Statistics in March, 1983. Its title is, On the probability of correct search for search designs of resolution $2l+1$, plus one I. The two papers, recently revised on the lines suggested by referees, are entitled, On a decision rule using dichotomies for identifying the nonnegligible parameter in certain linear models, joint with Mailerby, and Theory of symmetrical factorial designs of the parallel flats type I. The coefficient matrix, joint with Anderson and Mardkian, respectively identifies a single nonnegligible parameter, which achieves the lower information-theoretic bound on the number of observations. The second one constitutes a very major development in the theory of experimental design, and connects this field with the theory of cyclotomic fields, and Galois Theory. (kr)

DESCRIPTORS (U) *INFORMATION THEORY, *MULTIVARIATE ANALYSIS, DECISION THEORY, EXPERIMENTAL DESIGN, LINEARITY, MATHEMATICAL MODELS, STATISTICS, THEORY

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SEARCH CONTROL NO EVI56L

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NORTHWESTERN UNIV EVANSTON IL DEPT OF ELECTRICAL
ENGINEERING AND COMPUTER SCI ENCE

(U) Graph Theory and Combinatorics with Applications to
Digital Systems and Networks.

DESCRIPTIVE NOTE: Final rept..

OCT 79

PERSONAL AUTHORS: Hakimi, S. L.

CONTRACT NO. AFOSR-78-3017

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-89-1385

UNCLASSIFIED REPORT

ABSTRACT: (U) The research activities supported by the
grant AFOSR-78-3017 can be broadly classified into the
following areas: (1) Communication Networks; (2) Variable
Length Codes; (3) Digital Systems and Computer Algorithms;
and (4) Topics in Pure and Applied Graph Theory. (kr)

DESCRIPTORS: (U) *COMBINATORIAL ANALYSIS.
*COMMUNICATIONS NETWORKS. *GRAPHS. CODING. COMPUTER
PROGRAMS. DIGITAL SYSTEMS. LENGTH. PURITY. THEORY.
VARIABLES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A6.

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EMORY UNIV ATLANTA GA DEPT OF BIOLOGY

(U) Combustion of Hydrogen and Hydrocarbons in Fluorine.

DESCRIPTIVE NOTE: Final rept. 1 Aug 84-31 Jul 89.

SEP 89

PERSONAL AUTHORS: Kaufman, Myron

CONTRACT NO. AFOSR-84-0196

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1330

UNCLASSIFIED REPORT

ABSTRACT: (U) Our program is directed towards increasing
understanding of combustion processes in general, as well
as advancing the application of fluorine-supported
combustion in areas such as propulsion and chemical
lasers. Since fluorine is monovalent, combustion in
fluorine is chemically much simpler than combustion in
oxygen. However, in fluorine-based combustion most of the
energy is initially deposited into vibration (of HF), and
transfer of energy from vibrationally excited species
must be considered. Experiments in H₂-F₂ flames to which
very small amounts of Methane have been added are
particularly revealing and indicate that the most likely
mechanism for explaining luminescence from CH and CH₂
radicals in these flames is vibration-to-electronic
energy transfer from highly vibrationally excited HF. C₂
emission probably results from the CH + CH yields C₂ +
H₂ reaction. These conclusions suggest that the ratio
I(CH)/(ICH₂)^{1/2} is a useful diagnostic for vibrationally
excited HF in H₂-F₂ propulsion and laser systems.
Ionization is not intrinsic to fluorine-hydrocarbon
combustion, but often results from oxygen impurity in
fluorine. Fluorine combustion systems show a variety of
nonsteady behaviors, which are postulated to be due to
changes in concentrations of vibrationally excited
species in the system. The method of kinetic titrations
has been developed to obtain stoichiometric, kinetic and
mechanistic information about chemical reactions (aw)

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV158L

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AD-A214 820 20/7 9/3

DESCRIPTORS: (U) *CHEMICAL REACTIONS, *COMBUSTION, *FLUORINE, *HYDROCARBONS, *HYDROGEN, CHEMICAL LASERS, ENERGY TRANSFER, FLAMES, IMPURITIES, IONIZATION, KINETICS, LASERS, LUMINESCENCE, METHANE, OXYGEN, VIBRATION, VOLUMETRIC ANALYSIS, THERMOCHEMISTRY, THERMOCHEMICAL PROPULSION, FUELS, VIBRATIONAL SPECTRA, EXCITATION, HYDROGEN FLUORIDE, COMBUSTION STABILITY, REACTION KINETICS, STOICHIOMETRY.

STANFORD UNIV CA DEPT OF ELECTRICAL ENGINEERING

(U) To Construct a Linac/Storage Ring FEL Facility.

DESCRIPTIVE NOTE: Final rept. 15 Dec 83-14 Jul 88.

AUG 89

PERSONAL AUTHORS: Madey, John M.

CONTRACT NO. F49620-84-C-0012

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-89-1511

UNCLASSIFIED REPORT

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A1.

ABSTRACT: (U) Components of a 1GeV electronic storage ring and linac injector were designed, studied, and evaluated. The principal objective was to the development of a high brightness storage ring and linac injector for use in advanced XUV FEL and synchrotron radiation research and as a source of high brightness electron beams for the development of other advanced short wavelength radiation sources. The list of components developed with AF-12 support include: 1. a high brightness microwave gun for the linac injector; 2. a long pulse high power modulator for the linac injector; 3. a short pulse high power modulator for the linac; 4. the control chassis for the long and short pulse modulators; 5. a high power pressurized waveguide feed system for the SLAC-type S-Band accelerator sections; 6. quadrupole lenses for the linac; 7. mechanical supports and alignment fixtures for the linac's accelerator sections; 8. the dipole, quadrupole, and sextupole magnets for the ring; 9. the water-cooled vacuum chambers for the arcs of the ring; and 10. the beam position monitors for the arcs of the ring.

DESCRIPTORS: (U) *ELECTRON BEAMS, *INJECTORS, *LINEAR ACCELERATORS, *RINGS, *STORAGE, BEAM STEERING, BRIGHTNESS, CHASSIS, CONTROL, FAR ULTRAVIOLET RADIATION, GUNS, HIGH RATE, LENSES, MAGNETS, MECHANICAL COMPONENTS, MICROWAVES, MONITORS, PULSE MODULATION, QUADRUPOLE MOMENT, SHORT

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AD A214 617 7/3

PULSES, SUPPORTS, SYNCHROTRON RADIATION, VACUUM CHAMBERS,
WATER COOLING.

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

IDENTIFIERS: (U) PEB1102F, WUAFORS2301A1.

(U) The Chemistry of Pentacyclo[5.4.0.0(2.6).0(3.10).0(5.9)]
Undecane (PCUD) and Related Systems.

89

PERSONAL AUTHORS: Marchand, Alan P.

CONTRACT NO. AFOSR-88-0132, \$AFOSR-84-0085

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1295

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Advances in Theoretically
Interesting Molecules, v1 p357-399 1989.

ABSTRACT: (U) This article is a review of the synthesis
and chemistry of Pentacyclo[5.4.0.0(2.6).0(3.10).0(5.9)]
undecane (PCUD) and related systems. Partial contents of
this report include: Functionalized PCUD's; Structural
Studies of PCUD Derivatives; Substituted PCUD-8,11-diones
as Intermediates in Natural Product Synthesis; Synthesis
of Trishomocubane Derivatives via Rearrangement of
Substituted PCUDs; Substituted PCUD-8,11-diones as
Intermediates in the Synthesis of Novel
Polynitropolycyclic Compounds; Substituted PCUD-8,11-
diones as Intermediates in the Synthesis of Novel
Carbocyclic and Heterocyclic Cage Compounds. Reprints
(aw)

DESCRIPTORS: (U) *SYNTHESIS(CHEMISTRY), *DECANES,
*CYCLIC COMPOUNDS, CLATHRATE COMPOUNDS, HETEROCYCLIC
COMPOUNDS, PRODUCTION, REPRINTS, MOLECULAR STRUCTURE,
CHEMICAL DERIVATIVES, SUBSTITUTION REACTIONS, POLYCYCLIC
COMPOUNDS, NITRO RADICALS.

IDENTIFIERS: (U) PEB1102F, WUAFORS2303B2.

*Pentacycloundecanes, Undecanes, Undecane/Pentacyclo[5.4.
0(2-6)-0(3-10)-0(5-9)], Diones, Chemical Intermediates,
Trishomocubanes, Cubanes, Polynitropolycyclic Compounds,
Carbocyclic Compounds, Cage Compounds.

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AD-A214 816 8/4

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

AD-A214 609 23/2 23/3

(U) Higher Order Mechanisms of Color Vision.

SMITH-KETTLEWELL EYE RESEARCH FOUNDATION SAN FRANCISCO CA

DESCRIPTIVE NOTE: Progress rept. (Final) 15 Sep 86-14 Mar 89.

(U) Motion Interference in Speed Discrimination.

MAY 89

JUL 89

PERSONAL AUTHORS: Krauskopf, John

PERSONAL AUTHORS: Bourne, Samuel F.; McKee, Suzanne P.; Glaser, Donald A.

CONTRACT NO. AFOSR-86-0334

CONTRACT NO. AFOSR-89-0035

PROJECT NO. 2313

PROJECT NO. 2313

TASK NO. A5

TASK NO. A5

MONITOR: AFOSR TR-89-1329

MONITOR: AFOSR TR-89-1318

UNCLASSIFIED REPORT

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ABSTRACT: (U) This report covers our activities since September 15, 19 86. The main accomplishments have been: 1) a comprehensive study of the effects of chromatic content, blur and contrast of targets on vernier acuity and on stereo acuity; 2) the use of a new method of measuring chromatic discrimination under conditions of constant adaptation; 3) continuation of the study of the chromatic properties of single cells in the monkey cortex; and 4) experiments on the significance of color in the perception of motion. Keywords: Vision; Psychophysics; Color; Discrimination; Thresholds; Isoluminance. (kt)

DESCRIPTORS: (U) *VISUAL CORTEX, *CHROMATICITY, *COLOR VISION, ACUITY, ADAPTATION, CELLS, CONTRAST, DISCRIMINATION, MEASUREMENT, MONKEYS, MOTION, PERCEPTION, PSYCHOPHYSICS, VISION.

IDENTIFIERS: (U) PE01102F, WUAFOSR2313A5.

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AD-A214 609

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America A, v6 n7 p1112-1121 Jul 89.

ABSTRACT: (U) Human speed discrimination can be degraded by additional stimuli in close spatial and temporal proximity to the designated test target. In these experiments, observers judged the relative asynchrony between a pair of briefly flashed dots; speed discrimination for two-dot apparent motion. The addition of two irrelevant (interfering) flashed dots to the stimulus, which produces accelerating apparent motion, impaired speed discrimination. This impairment is called motion interference; adjacent stimuli are not processed independently by the motion system. Motion interference is time selective; interfering dots simultaneous with the target dots do not impair speed discrimination, nor do interfering dots that precede or follow the target by 200 msec or more. Motion interference was observed even when the interfering dots were as far away as 1 deg from the test pair. Similar effects were observed with a smoothly moving test target and with interfering stimuli composed only of high spatial frequencies. A multiple-independent-channel model containing several parallel motion-energy detectors with different receptive-field sizes is considered and rejected. Speed discrimination depends on a time-selective combination of local motion signals from many detectors. These aggregate detectors combine

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AD-A214 609 CONTINUED

Information from local subunits, degrading information about acceleration. Keywords: Human motion perception; Velocity; Speed acceleration; Computational models. (JHD)

DESCRIPTORS: (U) *MOTION, *VISUAL PERCEPTION, *STIMULI, ACCELERATION, DETECTORS, DISCRIMINATION, COMPUTATIONS, INTERFERENCE, MATHEMATICAL MODELS, MOVING TARGETS, SPATIAL DISTRIBUTION, TEST AND EVALUATION, VELOCITY

IDENTIFIERS: (U) PE61102F, WUAFOSR2313AS.

AD-A214 608 7/3 20/5 7/4

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY
(U) A Coupled Anharmonic Oscillator Model for Optical Nonlinearities of Conjugated Organic Structures.

AUG 89

PERSONAL AUTHORS: Prasad, Paras N.; Perrin, Eric; Samoc, Marek

CONTRACT NO. F49620-87-C-0042

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1317

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v91
n4 p2360-2365, 15 Aug 89.

ABSTRACT: (U) A simple model is presented for coupled locally a harmonic oscillators which can be used to describe the optical nonlinearities in conjugated organic monomeric, oligomeric, and polymeric structures. The method can very readily be used to explain the dependence of the band gap, the polarizability alpha, and the second hyperpolarizability gamma on the number of repeat units of conjugated chain compounds by adjusting two parameters: the local anharmonicity term and the oscillator coupling constant. To illustrate the usefulness of this model, we have calculated the dependence of the band gap, the polarizability alpha, and the second hyperpolarizability gamma, as the function of the number of repeat units for the oligomers of thiophene and benzene. The results is good agreement with those of the experimental studies on thiophene and benzene oligomers recently reported by our group. In addition, the predicted power dependences of orientationally averaged alpha and gamma on the number of repeat units are compared with those predicted by a free electron model, PPP method, sum-over states method, and ab initio calculations. Reprints.

DESCRIPTORS: (U) *AN-HARMONIC OSCILLATORS, *BENZENE.

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*MOLECULAR STRUCTURE, *THIOPHENES, *MATHEMATICAL MODELS, CHAINS, COUPLING(INTERACTION), EXPERIMENTAL DATA, FREE ELECTRONS, HARMONIC GENERATORS, MODELS, NONLINEAR SYSTEMS, OLIGOMERS, OPTICAL PROPERTIES, OSCILLATORS, PARAMETERS, POLARIZATION, POLYMERS, REPRINTS, QUANTUM CHEMISTRY, MONOMERS, REPETITION RATE.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A3, Optical Nonlinearity, Band Gaps, Hyperpolarization, Ab Initio Calculations.

AD-A214 607 7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) Structure of the Product Formed via Regiospecific Cyclopropanation of exo-6-Methoxycarbonyltricyclo[5.2.1.0(2.6)]deca-4,8-dien-3-one with Dimethylsulfoxonium Methylide (Corey's Reagent).

89

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante; Marchand, Alan P.; Reddy, G. M.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1293

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Cryst., VC45 p834-835 1989.

ABSTRACT: (U) The product of methyl 3-oxotricyclo[6.2.1.0(2.6)]deca-4,8-diene-exo-6-carboxylate with $\text{Me}_3\text{Si}^+\text{I}^- = \text{O}$, NaH , $\text{Me}_2\text{S} = \text{O}$ was shown to be methyl 3-oxotetracyclo[6.2.1.0(2.7).0(4.6)]undec-9-ene-exo-7-carboxylate by single crystal X-ray structural analysis. Methyl 3-oxotetracyclo[6.2.1.0(2.7).0(4.6)]undec-9-ene-7-carboxylate, $\text{C}_{13}\text{H}_{14}\text{O}_3$ is composed of three fused five-membered rings and a three-membered ring. Molecular mechanics calculations indicate the system has about 268 kJ/mol of strain energy. Although substitution of the norbornene moiety is asymmetric, the bond lengths across the ring system are statistically equivalent. The cyclopropane bond lengths range from 1.479 (2) to 1.512 (3) Å. The double-bond system of the norbornene moiety is folded along the C(9)-C(10) bond and deviates from planarity by 9 (2) degs. The H atoms are bent away from the methylene bridge. Reprints. (AW)

DESCRIPTORS: (U) *CYCLOPROPANES, BONDING, BRIDGES, CHEMICAL AGENTS, COMPUTATIONS, LENGTH, MECHANICS, METHYLENES, MOLECULES, REPRINTS, RINGS.

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IDENTIFIERS: (U) PEB1102F, WUAFOSR2303B2

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) Structure of a Cage Dimer (I) and a Dimer Ketone (II) Formed via Thermal Reaction of Ethyl 3-Phenyl-2-Norbornadienecarboxylate with Pentacarbonyliron.

89

PERSONAL AUTHORS: Flippen-Anderson, Judith L.; Gilardi, Richard; George, Clifford; Marchand, Alan P.; Dave, Paritosh R.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1292

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Cryst., VC45 p1171-1174 1989.

ABSTRACT: (U) The structures of diethyl 1,14-diphenylheptacyclo(6.8.0.0(2.8).0(3.13).0(4.11).0(5.9).0(10.14)-tetradecane-2,10-dicarboxylate(I) and of diethyl 9-oxo-2(Beta), 7(Beta)-diphenyl-1(Beta),2,3,4(Beta), 4a(b), 4b(Beta),5(Alpha)-6,7,8(Alpha), 8a(Beta), 9a(Alpha)-dodecahydro-1,4:5,8-dimethanofluorene-3(Beta), 6(Beta)-dicarboxylate(II) have been determined by single crystal X-ray structural analysis. In (I) the cyclotetradecane cage formation occurred such that the two phenyl groups are on adjacent C atoms and all the substituents are cis with respect to one another (C-C-C torsion angles are -1.7 and 1.6 deg for the phenyl-ethoxycarbonyl neighbors and -28.9 degs. for the phenyl-phenyl system). In (II) the phenyl groups are cis with respect to their adjacent ethoxycarbonyl neighbors (C-C-C torsions are -4.6 and -7.1) but are on opposite sides of the fused ring system. Keywords: Norbornadienes, Stereochemistry, Dimers, Ferrocenes, Iron oxides, Iron ranta carbonyl, Cycloolimerization, Substituted heptacyclotetradecanes, Coupling interaction, Reprints. (AM)

DESCRIPTORS: (U) *DIMERS, *KETONES, *MOLECULAR STRUCTURE.

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ATOMS, COUPLING(INTERACTION), FERROCENES, HEAT, IRON, IRON OXIDES, PHENOLS, REACTION KINETICS, REPRINTS, STEREOCHEMISTRY, THERMOCHEMISTRY, CARBORANYL RADICALS, ETHYL RADICALS, PHENYL RADICALS, DIENES, METAL CARBONYLS, IRON COMPOUNDS, FLUORENES, METHANE, DECANES, ETHYL RADICALS, OXYGEN.

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY
(U) Synthesis and Chemistry of Homocubanes, Bishomocubanes, and Trishomocubanes.

89

IDENTIFIERS: (U) PE61102F, WJAFOSR230382, *Cage Compounds, Carboxylate/Ethyl-3-Phenyl-2-Norbornadiene, Pentacarbonyliron, *Carboxylates, Cyclootetradecane, Ethoxy Radicals.

PERSONAL AUTHORS: Marchand, Alan P.

CONTRACT NO. AFOSR-88-0132

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-89-1299

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Reviews, v89 p1011-1033 1989.

ABSTRACT: (U) In recent years, saturated polycyclic cage molecules have held a special fascination for organic chemists. With the exception of adamantane, most saturated cage molecules contain considerable strain energy as evidenced by the fact that they (i) contain unusually long framework carbon-carbon sigma-bonds, (ii) contain unusual C-C-C bond angles that deviate significantly from 109.5, (iii) possess unusually negative heats of combustion, and (iv) possess unusually positive heats of formation when compared with non strained systems. Frequently, the strain energy contained within cage molecules also expresses itself through unusual patterns of chemical reactivity. Additionally, the thermodynamic instability that this strain energy confers upon cage systems is a potential problem that synthetic organic chemists must learn to deal with constructively. Organic chemistry. (jes)

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, ADAMANTANES, CHEMICAL REACTIONS, CHEMISTRY, CHEMISTS, COMBUSTION, PATTERNS, REACTIVITIES, STABILITY, SYNTHESIS, THERMODYNAMICS.

IDENTIFIERS: (U) PE61102F, WJAFOSR230382.

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STANFORD UNIV CA

(U) Reliability Evaluation of Computer Systems.
DESCRIPTIVE NOTE: Scientific rept. (Final).

APR 79

PERSONAL AUTHORS: McCluskey, Edward J.; Beaudry, M. D.

CONTRACT NO. AFOSR-77-3325

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-89-1384

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes research conducted at the Center for Reliable Computing with the support of the Air Force Office of Scientific Research from 1 April 1977 to 30 April 1979. Results and current work in various aspects of computer system reliability evaluation are described. Partial Contents: Reliability Evaluation of Fault-Resistant Computer Systems; System Level Reliability Analysis; Component Level Reliability Analysis. (kt)

DESCRIPTORS: (U) *COMPUTERS, *RELIABILITY, SYSTEMS ANALYSIS, TEST AND EVALUATION, COMPUTER PROGRAM RELIABILITY, FAULT TOLERANT COMPUTING.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A8.

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SEARCH CONTROL NO. EV156L

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RICE UNIV HOUSTON TEX DEPT OF ELECTRICAL ENGINEERING
(U) Optimization Techniques for Feature Extraction in Automatic Pattern Recognition.

DESCRIPTIVE NOTE: Final rept.

OCT 79

PERSONAL AUTHORS: De Figueiredo, Rui J.

REPORT NO. EE-TR-7910

CONTRACT NO. AFOSR-75-2777

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-89-1399

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: Statistical Feature Extraction; Adaptive Estimator of Probability Density Functions; Computationally Efficient Estimators of Bayes Risk; Structure Preserving Dimensionality Reduction; Oil Spill Identification; Digital Image Processing. Keywords: Psychovisual modeling, Image restoration, Adaptive kalman filtering, Variable length Chain coding, Contours, Signal processing. (KR)

DESCRIPTORS: (U) *OPTIMIZATION, *PATTERN RECOGNITION, ADAPTIVE FILTERS, ADAPTIVE SYSTEMS, AUTOMATIC, BAYES THEOREM, CHAINS, CODING, DIGITAL SYSTEMS, ESTIMATES, IDENTIFICATION, IMAGE PROCESSING, IMAGE RESTORATION, KALMAN FILTERING, LENGTH, MODELS, OIL SPILLS, PROBABILITY DENSITY FUNCTIONS, PSYCHOPHYSIOLOGY, RISK, SIGNAL PROCESSING, VARIABLES, VISUAL PERCEPTION.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A2

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PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS
RESEARCH LAB

PHYSICS, SOLUTIONS(MIXTURES), TEMPERATURE.

IDENTIFIERS: (U) Solid state epitaxy, SSG(Solution Sol
Gel), Nanocomposite glasses, Xerogels, Controllable
crystallization, Cordierite glass, Lithium aluminum
silicates, Disilicates, Nicalon glass.

(U) Crystallization of Nanocomposite Glasses Made by the
SSG Process.

DESCRIPTIVE NOTE: Rept. for 1 Sep 88-31 Aug 89.

AUG 89

PERSONAL AUTHORS: Roy, Rustum; Komarneni, Sridhar

CONTRACT NO. F49620-88-C-0134

MONITOR: AFOSR
TR-89-1348

UNCLASSIFIED REPORT

ABSTRACT: (U) The present research builds in two
different directions on the major discovery made under
the AFOSR support of the phenomenon of solid state
epitaxy. The first goal of the current research is to
explore the role of solid state epitaxy in the
crystallization of a very much wider range of glass
composition to make glass ceramics. The nanocomposite
xerogel route is being utilized to attempt to make a
universal glass-ceramic with controllable crystallization.
Isostructural seeding of cordierite glass led to a
lowering in crystallization temperature due to epitaxy
just as in the nucleated crystallization of ceramics.
Experiments with other system such as Lithium Aluminum
Silicate and Lithium Aluminum Disilicate are in progress
and preliminary results show that solid state epitaxy is
lowering the crystallization temperatures. The second
area of current research is to extend the validity of
solid state epitaxy proven by the growth of alumina films
of alpha AL2O3 single crystals is being extended to other
oxides, metals and semiconductors. Epitaxial
crystallization of silicon (oxy)carbide glasses such as
Nicalon compositions is being investigated in addition to
the oxide glasses and gels. Keywords: Silica glass. (AW)

DESCRIPTORS: (U) *CERAMIC MATERIALS, *CRYSTALLIZATION,
*EPITAXIAL GROWTH, *GLASS, ALUMINUM COMPOUNDS, ALUMINUM
OXIDES, CARBIDES, FILMS, GELS, LITHIUM, METALS, MINERALS,
OXIDES, SEEDING, SEMICONDUCTORS, SILICA GLASS, SILICATES,
SILICON, SILICON CARBIDES, SINGLE CRYSTALS, SOLID STATE

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GEORGIA INST OF TECH ATLANTA SCHOOL OF ELECTRICAL
ENGINEERING

PROCESSES, MATHEMATICAL MODELS, NONLINEAR SYSTEMS, PULSES,
STABILIZATION SYSTEMS, SWITCHING, TRACKING, VEHICLES.

(U) Estimation and Control of Nonlinear and Hybrid Systems
with Applications to Air-to-Air Guidance.

IDENTIFIERS: (U) Uncertainty

DESCRIPTIVE NOTE: Final rept. 1 Aug 87-31 Mar 89.

MAR 89

PERSONAL AUTHORS: Haddad, A. H.

CONTRACT NO. AFOSR-87-0308

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-89-1338

UNCLASSIFIED REPORT

ABSTRACT: (U) The research covered several aspects of the basic issues that are needed to develop and implement nonlinear and hybrid systems schemes for the filtering, tracking, and control of maneuvering vehicles in an uncertain and nonlinear geometry. It is based on the approximation of the original nonlinear problem by a switched Markov linear models which in turn lead to hybrid model formulation or to piecewise linear approximations. Four aspects are considered: 1) Approaches to handling hybrid systems models; 2) Fast and slow decomposition for piecewise linear systems; 3) Estimation in the presence of impulsive inputs that can serve as either models for the switching behavior or the changes in maneuvers; 4) Modeling, parameterization, and realization issues for hybrid systems. Applications to nonlinear filtering and tracking schemes and their implementation is also addressed. Keywords: Nonlinear tracking algorithms; Control and stabilization; Flight maneuvers. (EDC)

DESCRIPTORS: (U) *CONTROL SYSTEMS, *GUIDANCE, AIR TO AIR, ALGORITHMS, APPROXIMATION(MATHEMATICS), DECOMPOSITION, ESTIMATES, MATHEMATICAL FILTERS, FLIGHT MANEUVERS, FORMULAS(MATHEMATICS), GEOMETRY, HANDLING, HYBRID SYSTEMS, INPUT, LINEAR SYSTEMS, LINEARITY, MANEUVERABILITY, MARKOV

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MINNESOTA UNIV MINNEAPOLIS DEPT OF ELECTRICAL
ENGINEERING

FLOW, PARTICLE COLLISIONS, PARTICLES, PHOTONS, PHYSICS,
POSITRONS, PRESSURE, RADIOFREQUENCY, SILANES, SYMPOSIA,
THERMAL PROPERTIES, TRAPS, WORKSHOPS.

(U) Annual Gaseous Electronics Conference (41st) Held in
Minneapolis, Minnesota on 18-21 October 1988.

IDENTIFIERS: (U) Gaseous electronics.

DESCRIPTIVE NOTE: Final rept. 1 Jul 88-30 Jun 89.

SEP 89

PERSONAL AUTHORS: Ernie, Douglas W.

CONTRACT NO. AFOSR-88-0207

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-89-1333

UNCLASSIFIED REPORT

ABSTRACT: (U) Session Topics include: Electron-atom
collisions; Charged particle distributions and electric
fields; Thermal and high pressure plasma processes;
Electron and photon interactions; Workshop on the design,
calibration, and modeling of research RF plasma
processing systems; Posters -- Gaseous electronics;
Models and diagnostics of lighting discharges; Electron
collisions, including excited states; Lasers; Plasma-
surface phenomena; Silane plasmas; Beam-plasma
interactions; Non-equilibrium electron transport; Neutral
particle distributions; Heavy particle interactions; RF
glow discharge modeling; Breakdown and switching; Physics
in a positron trap; Low-pressure discharges; Experimental
-- Electron-molecule collisions; Follow-up to the
Workshop on the Design, Calibration, and Modeling of
Research RF Plasma Processing Systems. (EDC)

DESCRIPTORS: (U) *ELECTRONICS, *GASES, *PLASMAS(PHYSICS),
ATOMS, BEAMS(RADIATION), BREAKDOWN(ELECTRONIC THRESHOLD),
CALIBRATION, CHARGED PARTICLES, DIAGNOSIS(GENERAL),
DISTRIBUTION, ELECTRIC FIELDS, ELECTRON TRANSPORT,
ELECTRONIC SWITCHING, ELECTRONS, EXCITATION, GLOW
DISCHARGES, HIGH PRESSURE, INTERACTIONS, LASERS,
LIGHTNING, LOW PRESSURE, MODELS, NEUTRAL, NONEQUILIBRIUM

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AD-A214 536 12/3

NEW YORK UNIV N Y

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Brain Peeling: Viewing the Inside of a Laminar 3 Dimensional Solid.

(U) Basic Research in Reliability for Real Systems.

AUG 88

DESCRIPTIVE NOTE: Annual technical rept 1 Aug 88-31 Jul 89.

PERSONAL AUTHORS: Schwartz, Eric

SEP 89

CONTRACT NO. AFOSR-85-0341

PERSONAL AUTHORS: Li, Victor O.

PROJECT NO. 2313

CONTRACT NO. AFOSR-88-0259

TASK NO. A5

PROJECT NO. 2304

MONITOR: AFOSR

TASK NO. A5

UNCLASSIFIED REPORT

MONITOR: AFOSR

TR-89-0972

TR-89-1352

ABSTRACT: (U) A 3-dimensional surface tracking algorithm is described which is used to detect the interior laminar surfaces of a solid shell. Each of these surfaces is called a peel. Successive peels may be generated, thus representing the solid shell by its tangential layers. This algorithm is based on voxel surface tracking methods, and solves the problems associated with transforming a surface tracking algorithm into a brain peeler. Also discussed is the properties of the voxel surfaces produced by this algorithm. Using the connectivity properties of these objects, we are able to convert voxel representations into polyhedral representations without human interaction. This work is illustrated with a high resolution reconstruction of a monkey visual cortex. Additional application domains of this work are in areas in which there is a natural laminar structure to a three dimensional solid, such as geophysics (earth strata). (Jhd)

DESCRIPTORS: (U) *TOMOGRAPHY, *LAMINATES, *VISUAL PERCEPTION, *VISUAL CORTEX, ALGORITHMS, BRAIN, GEOPHYSICS, INTERACTIONS, LAYERS, METHODOLOGY, MONKEYS, SURFACES, TANGENTS, THREE DIMENSIONAL, TRACKING, SELF OPERATION.

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ABSTRACT: (U) The goal of our research is to develop practical models and efficient algorithms to analyze and evaluate the reliability/availability/maintainability of complex systems in which component failures are statistically dependent and each component is subject to degradations before complete failure. We have developed the Event-Based Reliability Model (EBRM) for the reliability modeling and analysis of real systems in which component failures are statistically dependent. Most existing reliability models assume that system component failures are statistically independent. This assumption, though it greatly simplifies the problem, is often not valid, and the result is usually an overestimation of network reliability. We have also developed a model to approximate the reliability of systems with multimode components. Previous research on reliability has been focused on models which assume that each component may be in one of two modes, namely, operative or failed. In real life, a component may undergo degradations in performance before a complete outage, and will therefore operate in more than two modes. More recently, we have developed the Cause-based Multimode Model (CBMM), which allows one to consider failure dependencies of components which are subject to degradations. (KR)

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AEDAR CORP NEW CARROLLTON MD

DESCRIPTORS: (U) *SYSTEMS ANALYSIS, *STATISTICAL TESTS, ALGORITHMS, AVAILABILITY, DEGRADATION, EFFICIENCY, FAILURE, MAINTAINABILITY, MATHEMATICAL MODELS, MULTIMODE, NETWORKS, RELIABILITY.

(U) Techniques for Analyzing the Dynamic Response of Structural Systems Using Computer-Derived Green's Functions.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A5.

DESCRIPTIVE NOTE: Final technical rept. 1 May 88-31 Jul 89.

SEP 89

PERSONAL AUTHORS: Fabunmi, James A.

REPORT NO. AEDAR-ATR-89-2

PROJECT NO. 2302

TASK NO. B1

MONITOR: AFOSR
TR-89-1288

UNCLASSIFIED REPORT

ABSTRACT: (U) This research has focussed on the development of feasible approaches to the utilization of computer algebra to derive the Green's function of interconnected structural systems. The key objectives of the effort were to: (1) develop MACSYMA-based routines for analyzing the Green's functions of structural systems consisting of uniform beams supported at discrete locations of linear springs; and (2) extend these techniques to include attachments of linear spring-mass-damper substructures to uniform beams. Both of these objectives were met. This final report summarizes the methodologies that were developed, including appendices which present the MACSYMA routines illustrating the application of these methodologies, as well as paper which was presented in Singapore at the International Noise and Vibration '89 Conference. Keywords: Structural dynamics. (kr)

DESCRIPTORS: (U) *COMPUTER AIDED DIAGNOSIS, *DYNAMIC RESPONSE, *STRUCTURES, ALGEBRA, CIRCUIT INTERCONNECTIONS, COMPUTER APPLICATIONS, COMPUTER PROGRAMS, DYNAMICS, GREENS FUNCTION, INTERNATIONAL, NOISE, POSITION (LOCATION), SINGAPORE, SPRINGS, STRUCTURAL PROPERTIES.

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IDENTIFIERS: (U) WUAFOSR230281, PE81102F

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Chemically Induced Dynamic Nuclear Polarization in
Systems Containing Large Hyperfine Coupling Constants.

JUL 89

PERSONAL AUTHORS: Roth, H.; Hutton, R. S.; Hwang, K. C.;
Turro, N. J.; Welsh, K. M.

CONTRACT NO. AFOSR-88-0043

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1344

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry.
v93 p5697-5701 1989.

ABSTRACT: (U) Nuclear spin polarization effects induced
in radical pairs with one or more strong (13-C) hyperfine
coupling constants have been evaluated. The pairs were
generated by photoinduced alpha-cleavage or hydrogen
abstraction reactions of carbonyl compounds. Several
examples illustrate how changes in the magnetic field
strength (H0) and the g-factor difference (delta g) bear
out an earlier caveat concerning the qualitative
interpretation of CIDNP effects observed for multiplets.
Keywords: Photolysis. Reprints. (AM)

DESCRIPTORS: (U) *CARBONYL COMPOUNDS, *HYPERFINE
STRUCTURE, *NUCLEAR SPINS, *POLARIZATION, *CHEMICAL
RADICALS, CONSTANTS, COUPLING(INTERACTION), FIELD
INTENSITY, HYDROGEN, MAGNETIC FIELDS, PHOTOLYSIS,
REPRINTS, SPIN STATES, CLEAVAGE, EXTRACTION, QUALITATIVE
ANALYSIS.

IDENTIFIERS: (U) *Nuclear Spin Polarization, Coupling
Constants, Radical Pairs, Magnetic Field Strength.

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Ab Initio Calculations of Polarizabilities and Second Hyperpolarizabilities of Organic Molecules with Extended Pi-Electron Conjugation.

89

PERSONAL AUTHORS: Chopra, Pratibha; Carlucci, Louis; King, Harry; Prasad, Paras N.

CONTRACT NO. F49620-87-Ck-0042

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1335

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v93 p7120-7130 1989/

ABSTRACT: (U) Static polarizability and second hyperpolarizability tensors are computed for a series of polyenes, polynynes, and cumulenes by ab initio SCF theory. Numerically stable finite field (FF) calculations can be achieved by using polynomial fits of either energy or induced dipole moment as a function of field strength. The nonlinear expansion coefficients from these fits correspond to the microscopic nonlinear optical property. Our results from fully coupled (FF) ab initio calculations for polarizability are in good agreement with those derived from uncoupled (sum-over-states) ab initio methods. The hyperpolarizabilities do not compare as well. A qualitative description of the chain length dependence of polarizability and hyperpolarizability for moderately long chains is discussed in terms of an empirical function. Diffuse orbital basis functions are required for qualitatively correct hyperpolarizabilities of small conjugated pi systems or for that matter any small molecule. For example, the average second hyperpolarizability, gamma, of ethylene is computed to be -13, 1.7, and 728 au with STO-3G, 6-31G, and augmented 3-21G basis sets, respectively. We also describe the use of a corresponding orbital analysis to aid in the

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interpretation of ab initio results obtained by either FF or analytic derivative methods. Reprints. (aw)

DESCRIPTORS: (U) *POLARIZATION, CHAINS, COEFFICIENTS, COMPUTATIONS, DIPOLE MOMENTS, ETHYLENE, EXPANSION, FIELD INTENSITY, FUNCTIONS, LENGTH, MICROSCOPY, MOLECULES, NONLINEAR SYSTEMS, NUMERICAL METHODS AND PROCEDURES, OPTICAL PROPERTIES, ORBITS, ORGANIC COMPOUNDS, POLYNOMIALS, REPRINTS, STABILITY, STATICS.

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SAN FRANCISCO STATE UNIV CA

transformation; Reprints. (KT)

(U) Benzamide Prevention of Ultraviolet Radiation-Induced Transformation as Measured by Anchorage-Independent Growth and Absence of Correlation with Thymidine Dimer Formation and DNA Repair.

89

PERSONAL AUTHORS: Milo, George E.; d'Ambrosio, Steven; Kun, Ernest

CONTRACT NO. AFOSR-89-0231

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-89-1334

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Teratogenesis, Carcinogenesis, and Mutagenesis, v8 p167-176 1989.

ABSTRACT: (U) Synchronized human fibroblasts were exposed in early S phase to increasing doses of ultraviolet (UV) irradiation in the presence and absence of an antitransforming drug, benzamide. Cellular survival, initial thymidine dimer formation and its repair, and cellular phenotypic transformation were simultaneously monitored in the presence and absence of 1 mM externally added benzamide that reaches 8 to 15 microns intracellular levels. Cellular transformation as measured by an expression of anchorage-independent growth was inhibited by nontoxic doses of benzamide. Antitransforming action of benzamide is confined to low intracellular drug concentrations, which in the case of benzamide is in the 4-9 microns range. Because of the lack of effect of benzamide of the formation of UV-induced thymidine dimers and the specific repair of these dimers, these results suggest that the processes of thymidine dimer formation and its repair are not involved in the mode of action of benzamide that influences the expression of a transformed phenotype with low malignant vigor. Keywords: Fibroblasts UV irradiation; Antitransforming drugs; Cell transformation; Human cell

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DESCRIPTORS: (U) *AMIDES, *CELLS(BIOLOGY), *DEOXYRIBONUCLEIC ACIDS, *DIMERS, *RADIATION EFFECTS, *RADIATION EFFECTS, *TRANSFORMATIONS, *ULTRAVIOLET RADIATION, BENZENE, CELLS, CONCENTRATION(CHEMISTRY), CONCENTRATION(COMPOSITION), DOSAGE, DRUGS, FIBROBLASTS, HUMANS, IRRADIATION, LOW LEVEL, PREVENTION, REPAIR, REPRINTS, SURVIVAL(GENERAL), SYNCHRONISM, THYMIDINES.

IDENTIFIERS: (U) PEG1102F, WJAFOSR2312A5, *Antitransforming Drugs, *Benzamide.

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MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

THERMOCHEMISTRY, VAPOR DEPOSITION.

(U) Reactions of Photogenerated Free Radicals at Surfaces
of Electronic Materials

IDENTIFIERS: (U) PEB1102F, WUAFOSR230381

89

PERSONAL AUTHORS: Steinfeld, Jeffrey I.

CONTRACT NO. F49620-88-C-0003

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1341

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Reviews v89 n6 p1291-
1301 1989.

ABSTRACT: (U) The reactions of laser-generated free radicals at semiconductor surfaces are reviewed. The reactivities of fluorocarbon-derived and other fluorinating species can be explained by means of a simple thermochemical model which takes account only of chemical bonds made and broken at the surface of the materials. The photochemical processes which take place in surface films directly exposed to laser irradiation remain to be established. In addition to providing a better understanding of the chemical reactions involved in processes such as reactive etching and vapor deposition, the laser techniques may be directly applicable to advance fabrication methods. As more complex processing methods are developed, particularly involving mixtures of reactive gas-phase species, a full understanding of the free-radical reactions and surface chemistry will be required in order to optimize such processes and develop new ones. Reprints. (AW)

DESCRIPTORS: (U) *CHEMICAL BONDS, CHEMICAL REACTIONS, ELECTRONIC EQUIPMENT, ETCHING, EXPOSURE (GENERAL), FABRICATION, FILMS, FLUORINATION, FREE RADICALS, IRRADIATION, LASER BEAMS, LASERS, MATERIALS, METHODOLOGY, PHOTOCHEMICAL REACTIONS, PROCESSING, REACTIVITIES, REPRINTS, SEMICONDUCTORS, SURFACE CHEMISTRY, SURFACES.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI561

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COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Pressure-Induced Diastereoselectivity in Photoinduced
Diels-Alder Reactions.

89

PERSONAL AUTHORS: Chung, Wen-Sheng; Turro, Nicholas J.

CONTRACT NO. AFOSR-88-0043

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1357

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry,
v54 p4881-4887 1989.

ABSTRACT: (U) The product distributions for the photochemical electron transfer and triplet-triplet energy-transfer-induced dimerization of 1,3-cyclohexadiene (CHD) were determined as a function of pressure and solvent in the range of 0.1-203 MPa. In the case of the photochemically (dicyanonaphthalene sensitized) induced electron-transfer dimerization, differences in activation volumes for the formation of endo-1 and exo-2 adduct are small and positive in acetonitrile (ca. +1 to +2 cu. cm/mol) but are negative and unusually large (ca. -9 to -12 cu. cm/mol) in benzene. The results are consistent with the involvement of different types of solvated ion pairs in the two solvents. Although the product distribution does not change for any of the sensitizers and pressures used in the triplet-sensitized reaction, the efficiency of dimerization was surprisingly both pressure and solvent dependent. The activation volumes for efficiency of dimerization of CHD by triplet-energy transfer fall in the range -22 to +2.1 cu. cm/mol and depend on both the triplet energy of the sensitizer and the solvent used. Reprints. (aw)

DESCRIPTORS: (U) *DIMERS, *ELECTRON TRANSFER,
*PHOTOCHEMICAL REACTIONS, *DIENES, *HEXYL RADICALS,
*CYCLIC COMPOUNDS, *STEREOCHEMISTRY, ACETONITRILE.

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SAN DIEGO STATE UNIV CA DEPT OF ELECTRICAL AND COMPUTER
ENGINEERING

(U) Stimulated Rayleigh-Kerr Scattering in a CS₂ Liquid-
Core Fiber System.

89

PERSONAL AUTHORS: He, Guang S.; Prasad, Paras N.

CONTRACT NO. F49620-87-C-0042

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1336

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Optics Communications, v73 n1
p181-184, 15 Sep 89.

ABSTRACT: (U) The carbon disulfide liquid is a medium often used for the studies of simulated scattering, spectral broadening and optical Kerr effect (OKE). There were two features in the previously reported results of spectral broadening in CS₂: (i) the broadening occurred on the both sides of a pump laser line or a stimulated Raman scattering (SRS) line, (ii) there was a periodic modulation spectrum over the broadening range. Two explanations were suggested. One was the difference-frequency modulation mechanism of induced refractive-index change. Another is the self-phase-modulation mechanism in self-focusing process. A superbroadening $> 700/\text{cm}$ stimulated scattering added to the pump line has been studied in a CS₂ liquid-core hollow fiber system with a long gain-length (2.5 m). A photon-scattering model of optical Kerr (induced reorientation) effect and quantum description of Rayleigh-Kerr scattering process are suggested. The salient features of our experimental results can be explained by the suggested theoretical approach. In order to achieve a higher pump intensity and a longer interaction length, a liquid-filled multi-mode hollow quartz glass fiber has been used. Reprints. (AW)

DESCRIPTORS: (U) CARBON DISULFIDE, LIGHT SCATTERING,

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LIQUIDS, FIBER OPTICS, GLASS FIBERS, SPECTRAL LINES, DIFFERENCE FREQUENCY, FOCUSING, INTENSITY, INTERACTIONS, KERR MAGNETOOPTICAL EFFECT, LASER PUMPING, LENGTH, METHODOLOGY, FREQUENCY MODULATION, OPTICAL PROPERTIES, QUANTUM THEORY, RAMAN SPECTRA, REFRACTIVE INDEX, REPRINTS, SCATTERING, SELF OPERATION, SIMULATION, STIMULATION(GENERAL).

IDENTIFIERS: (U) PE61102F, WJAFOSR2303A3, Kerr Scattering, Carbon Disulfide, Spectral Broadening, Self Phase Modulation, Self Focusing.

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SAN DIEGO STATE UNIV CA DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

Reprints. (aw)

(U) Dissociative Electron Attachment to Some Chlorine-Containing Molecules.

DESCRIPTORS: (U) *ATTACHMENT, *CHEMICAL DISSOCIATION, *ELECTRONS, *GAS DISCHARGES, *CHLORIDES, *ETHYL RADICALS, *METHYL RADICALS, *VINYL RADICALS, ARGON, CONSTANTS, DICHLORODIFLUOROMETHANE, DIELECTRICS, DISTRIBUTION ELECTRIC FIELDS, ELECTRON ENERGY, ETCHING, EXPERIMENTAL DATA, GAS BREAKDOWN, GASES, IONOSPHERIC CHEMISTRY, REACTION KINETICS, LASERS, MODELS, MOLECULES, NITROGEN, PARAMETERS, PLASMAS(PHYSICS), RATES, REDUCTION, REPRINTS, SPACE CHARGE, THIONYL CHLORIDE, ELECTRONIC STATES

MAR 89

PERSONAL AUTHORS: Petrovic, Z. L.; Wang, W. C.; Lee, L. C.

CONTRACT NO. AFOSR-86-0205

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-89-1347

IDENTIFIERS: (U) PEG1102F, WUAFOSR2301A7, *Electron Attachment, *Methyl Chloride, *Ethyl Chloride, *Vinyl Chloride.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90 n6 p3145-3152, 15 Mar 89.

ABSTRACT: (U) Dissociative electron attachment to chlorine-containing molecules in gas discharges is of importance for many applications, such as excimer (XeCl) lasers, plasma etching, ionospheric chemistry, gaseous dielectrics, and optically controlled diffuse discharge switches. Modeling of discharges requires a large number of parameters, and data for the most important processes are lacking. Electron attachment data are needed for the study of dissociation processes, space charge, and field distribution as well as electron kinetics leading to gas breakdown and discharge formation. The experimental data for the electron attachment rate constants of CH3Cl(methylchloride), C2H5Cl(ethylchloride), and C2H3Cl(vinylchloride) diluted in argon and/or nitrogen are presented in this paper. The electron-attachment rate constants of CH3Cl, C2H5Cl, and C2H3Cl in Nitrogen and Argon were measured as a function of reduced electric field (E/N). These data and the previous data of Thionyl Chloride and dichlorodifluoromethane were converted to the electron-attachment cross sections as a function of electron energy. The present results are compared with existing fragmentary data. The dissociative electron-attachment processes of the studied molecules are discussed. Keywords: Lasers; Molecules; Plasma etching.

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Electron Energy Levels in a Quantum Well within an In-Plane Magnetic Field.

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by the quantum well. The energy levels higher than the potential height of the quantum well and the energy levels lower than the potential height of the quantum well show quite different behaviors. These are explained with the properties of the combined potential and the wave function inherent to the system. Reprints. (av)

PERSONAL AUTHORS: Lee, H. R.; Oh, H. G.; George, Thomas F.; Um, C. I.

DESCRIPTORS: (U) *ELECTRONS, *ENERGY LEVELS, *QUANTUM THEORY, *HETEROJUNCTIONS, CYCLOTRONS, ELECTRIC FIELDS, ELECTRON ENERGY, EXTERNAL, GROUND STATE, HALL EFFECT, HAMILTONIAN FUNCTIONS, HEIGHT, MAGNETIC FIELDS, NUMERICAL ANALYSIS, OPTICAL PROPERTIES, ATOMIC ORBITALS, OSCILLATIONS, QUANTIZATION, REPRINTS, SEMICONDUCTORS, SOLUTIONS(GENERAL), TRANSITIONS, TWO DIMENSIONAL, WAVE FUNCTIONS, ELECTRONIC STATES.

REPORT NO. UBUFFALO/DC/89-TR-107

CONTRACT NO. F49620-86-C-0009

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR
TR-89-1346

IDENTIFIERS: (U) PEG1102F, WJAFOSR230383, *Electron Energy Levels, *quantum Wells, Landau Levels, Shubnikov De Haas Oscillations, Subbands, Eigenenergy, Barrier Height.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pup. in Jnl. of Applied Physics, v66 n6 p2442-2445, 15 Sep 89.

ABSTRACT: (U) The properties of electrons confined in semiconductor heterostructures have been studied for different situations. The carriers in two-dimensional systems subjected to a magnetic field perpendicular to the layers are completely quantized into Landau levels, which have been extensively studied with respect to the quantized Hall effect and Shubnikov-de Haas oscillations. In this case, since the magnetic field is in the same direction as the confining electric field, the Hamiltonian can be separated into an electric part leading to subbands and a magnetic part leading to Landau levels. For any other orientation, this separation is not possible any more. Thus, in an external magnetic field parallel to the interface, the situation becomes more complicated. By studying the effects of magnetic field on the optical transitions, we may obtain the details of the subband structure. The exact eigen energy spectrum of an electron is calculated in a quantum well within an inplane magnetic field. The numerical solutions for the excited energy states as well as the ground-state energy are found for various quantum-well widths and barrier heights. The cyclotron orbits are considerably affected

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STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Squeezing of Atomic Variables in the One-Photon and Two-Photon Jaynes-Cummings Model.

SEP 89

PERSONAL AUTHORS: LI, Xiao-Shen; Lin, D. L.; George, Thomas F.

REPORT NO. UBUFFALO/DC/89-TR-105

CONTRACT NO. F49620-86-C-0009

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR
TR-89-1345

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v40 n5
p2504-2507, 1 Sep 89.

ABSTRACT: (U) It is by now well known that Squeezed light has potential applications in low-noise communications and high-precision measurements involving light. The Jaynes-Cummings (JC) model, is one of the possible nonlinear optical models capable of creating squeezed states. In the standard JC model, the maximum field squeezing was found to be 20%, but in a recent paper it was argued that this squeezing could be 100%. When the initial coherent state of the field is replaced by the vacuum state, the maximum squeezing is increased to 25%. More squeezing is found in many other cases of the generalized JC model. Squeezing of the atomic dipole moment in the one-photon and two-photon Jaynes-Cummings model is investigated with different initial conditions. Almost perfect squeezing is found in certain cases. Reprints. (av)

DESCRIPTORS: (U) *MATHEMATICAL MODELS, *ATOMIC PROPERTIES, *DIPOLE MOMENTS, *PHOTONS, *LIGHT, COHERENCE, OPTICAL COMMUNICATIONS, LOW NOISE, MEASUREMENT, NONLINEAR SYSTEMS, OPTICAL EQUIPMENT, PRECISION, REPRINTS, VACUUM.

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IDENTIFIERS: (U) PCB11027, WUAFOSR2303B2, *Atomic Variables, *Squeezed Light, Squeezing, Jaynes Cummings Models, Nonlinear Optics, Squeezed States.

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 MISSISSIPPI UNIV MEDICAL CENTER JACKSON AD-A214 508 CONTINUED
 (U) Mechanism of Lethal Interaction of Hazardous Chemicals
 at Subtoxic Doses. TISSUES(BIOLOGY), TOXIC AGENTS.
 IDENTIFIERS: (U) WUAFOSR2313A5, PE81102F, *Chlordecone,
 Haloalkanes, *Hepatotoxicity, Trichloromethane,
 Trichlorobromomethane.

DESCRIPTIVE NOTE: Annual technical rept.,

OCT 88

PERSONAL AUTHORS: Mehandale, H. M.

CONTRACT NO. AFOSR-88-0009

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
 TR-89-1321

UNCLASSIFIED REPORT

ABSTRACT: (U) The primary objective is to investigate the possible mechanism(s) of chlordecone (CD) potentiation on haloalkane, CC14, CHCl3, and BrCC73 hepatotoxicity. The working hypothesis is that exposure to CD sensitizes the liver tissue to greatly amplify perturbation of the haloalkane-induced hepatocellular Ca2+ homeostasis. The effect is suppressed hepatocellular repair regeneration, accomplished by progression of uncontrolled hepatocellular toxicity and death. Doses of CHCl3 resulted in greater stimulation of hepatic regeneration in CD pretreated animals, compensation for greater hepatocellular necrosis associated with this treatment. Phenobarbital added to diet with haloalkane seems to induce cytosolic cytoprotective mechanisms, thus mitigating increased hepatocellular cytotoxicity by haloalkanes. The most extensive ultrastructural changes (necrosis, balloon cells, etc.) were observed in BrCC13+CD treatment. Keywords: Hepatotoxicity; Haloalkanes; CC14; Chlordecone; Carbon tetrachloride; Trichloromethane; Trichlorobromomethane. (KT)

DESCRIPTORS: (U) *TOXICITY, *PATHOLOGY, *HALOGENATED HYDROCARBONS, ANIMALS, BALLOONS, BARBITURATES, CARBON TETRACHLORIDE, CELLS, CHEMICALS, DEATH, DIET, DOSAGE, HAZARDS, HYPOTHESES, INTERACTIONS, LETHALITY, LIVER, NECROSIS, REGENERATION(PIVYSIOLOGY), STIMULATION(GENERAL).

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SEARCH CONTROL NO EV158L

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AD-A214 503 6/11

NORTHEASTERN UNIV BOSTON MA DEPT OF PSYCHOLOGY

GEORGIA UNIV ATHENS DEPT OF PHARMACOLOGY AND TOXICOLOGY

(U) A Model for Visual Attention.

(U) Bioavailability of Volatile Organics and Other Hydrocarbons from Environmental Media: Ingestion in Drinking Water.

DESCRIPTIVE NOTE: Final technical rept. 31 JUL 88-31 JUL 89.

DESCRIPTIVE NOTE: Annual rept no. 1, 15 Sep 88-14 Sep 89.

OCT 89

OCT 89

PERSONAL AUTHORS: Reeves, Adam

PERSONAL AUTHORS: Bruckner, J. V.; Manning, R. D.; Gallo, J. M.; Dallas, C. E.

CONTRACT NO. AFOSR-87-0172

PROJECT NO. 2313

CONTRACT NO. AFOSR-88-0277

TASK NO. A5

PROJECT NO. 2312

MONITOR: AFOSR
TR-89-1322

MONITOR: AFOSR
TR-89-1332

UNCLASSIFIED REPORT

ABSTRACT: (U) Research has been undertaken in three areas concerning human visual attention: the AGM model for attention shifting, iconic memory and visual imagery. Keywords: Vision; Attention. (KT)

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *ATTENTION, *VISION, *MATHEMATICAL MODELS, HUMANS, OPTICAL IMAGES, SHIFTING.

IDENTIFIERS: (U) WUAFOSR2313A5, PEG1102F.

ABSTRACT: (U) The primary objectives of this project are to: a) assess the roles of hepatic and organic compounds (VOCs) found in drinking water supplies; b) investigate gastrointestinal (GI) absorption pathways for VOCs; c) characterize the influence of oil dosage vehicles on the absorption, pharmacokinetics (PK) and toxicity of VOCs, with emphasis on potential mechanisms by which corn oil acts. Substantial progress has been made during the first year of the grant towards achieving each of these objectives. Studies in unanesthetized, freely-moving rats, contrasting the PK of equal doses of VOCs given orally as a single bolus and by constant intragastric (ig) infusion for 2 hours, revealed significantly lower peak blood levels and bioavailability in the ig groups. Blood concentrations of two well metabolized VOCs, trichloroethylene and 1,1-dichloroethylene, were so low that they were hardly detectable at low dosage levels in the ig animals. As gastric infusion approximates the repetitive pattern of ingestion of water, these findings indicate that the liver and lungs may be able to remove virtually all of the trace amounts of VOCs that are usually found in drinking water. As anticipated, the toxicity of a potent hepatotoxin, carbon tetrachloride (CCl₄), was considerably lower when the chemical was

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given to rats by gastric infusion than when given as an oral bolus. (av)

DESCRIPTORS: (U) *TOXICITY, ABSORPTION, ANIMALS, BLOOD, BLOOD VOLUME, CARBON TETRACHLORIDE, CONCENTRATION(CHEMISTRY), CORN, DOSAGE, DRINKING WATER, ENVIRONMENTS, HYDROCARBONS, INFUSIONS, LEVEL(QUANTITY), LIVER, LOW LEVEL, LUNG, MEDIA, OILS, ORGANIC COMPOUNDS, ORGANIC MATERIALS, PEAK VALUES, PHARMACOKINETICS, POTENCY, RATS, STOMACH, TOXINS AND ANTITOXINS, VEHICLES, VOLATILITY, WATER, WATER SUPPLIES.

IDENTIFIERS: (U) PE81102F, WJAFOSR2312A4.

AD-A214 502 9/5 12/6 14/1

CALIFORNIA UNIV SAN DIEGO LA JOLLA

(U) Hybrid (Optical/Electronic) Computing and Digital Optical Computing.

DESCRIPTIVE NOTE: Final rept. 1 Sep 85-31 Aug 88.

AUG 88

PERSONAL AUTHORS: Lee, Sing H.

CONTRACT NO. AFOSR-85-0371

PROJECT NO. 2305

TASK NO. 81

MONITOR: AFOSR
TR-89-1324

UNCLASSIFIED REPORT

ABSTRACT: (U) Hybrid optical-analog/electronic computing is performed for optical image processing. Optical pattern recognition and optical solution of partial differential equations. For example, image processing designed and fabricated space variant filters to optically implement numerous space-variant transformation (e.g., Hough transform for detection of high-order parametric curves, coordinate transforms to detect rotation and scale invariant features of images, etc.). For spike removal from noisy images, one can develop a new parallel algorithm suitable for optical/analog/electronic hybrid implementation. This parallel algorithm is space-variant and performs better than the space-invariant low-pass filter and the time-consuming median filter. In digital optical computing research, develops nonlinear optical devices and studies their uses in parallel architectures for implementation of parallel algorithms. The nonlinear optical devices are based on integrating silicon with PLZT. LPCVD techniques to deposit polycrystalline Si onto the electro-optic PLZT substrate and then recrystallizing the polysilicon using an Ar+ laser are used to produce single crystal silicon grains, to fabricated and test a 12 x 12 electrically addressed spatial light modulator (SLM) array and a 16 x 16 optically addressed SLM array. Optical parallel computing architectures, is investigated by different

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AD-A214 502 CONTINUED

Interconnection topologies and holographic optical elements are generated to implement fully interconnected and hypercube interconnected topologies. (Jhd)

DESCRIPTORS: (U) *COMPUTER ARCHITECTURE, *OPTICAL PROCESSING, ALGORITHMS, LOW PASS FILTERS, ANALOG TO DIGITAL CONVERTERS, CIRCUIT INTERCONNECTIONS, COMPUTATIONS, CURVES(GEOMETRY), DETECTION, DIGITAL COMPUTERS, ELECTRONICS, HOLOGRAPHY, HYBRID SYSTEMS, IMAGE PROCESSING, LASERS, LIGHT MODULATORS, NONLINEAR SYSTEMS, OPTICAL EQUIPMENT, OPTICAL EQUIPMENT COMPONENTS, OPTICAL IMAGES, OPTICAL PROPERTIES, PARALLEL ORIENTATION, PARALLEL PROCESSING, PARAMETRIC ANALYSIS, PARTIAL DIFFERENTIAL EQUATIONS, PATTERN RECOGNITION, SOLUTIONS(GENERAL), SPATIAL DISTRIBUTION, TOPOLOGY.

IDENTIFIERS: (U) PEB1102F, WUAF0SR2305B1, *Optical Computers, Hough Transformations, Hypercubes, Argon Ion Lasers.

AD-A214 501 6/11 11/11

WASHINGTON STATE UNIV PULLMAN COLL OF PHARMACY

(U) Importance of Dichloroacetate and Trichloroacetate to the Hepatocarcinogenic Response to Trichloroethylene in B6C3F1 Mice.

DESCRIPTIVE NOTE: Final rept. 15 Sep 88-14 Sep 89.

OCT 89

PERSONAL AUTHORS: Bull, Richard J.

CONTRACT NO. AFOSR-86-0284

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-89-1325

UNCLASSIFIED REPORT

ABSTRACT: (U) Trichloroethylene (TCE) is one of the most ubiquitous environmental contaminants. Its widespread commercial use in degreasing operations and as a solvent has lead, through improper disposal, to its being the most common synthetic organic chemical contaminant of groundwater. This project was aimed at determining the extent of which the metabolism of trichloroethylene (TCE) to trichloroacetate (TCA) and dichloroacetate (DCA) was responsible for its hepatotoxic and hepatocarcinogenic effects in B6C3F1 mice. These effects were observed consistently only at high doses and were transitory, suggesting the modification to be non-specific. The project shifted to determining whether DCA and TCA could account for the hepatotoxic and hepatocarcinogenic effects of TCE in quantitative terms. It was established that both DCA and TCA were capable of inducing tumors at much lower doses with a shorter latency than TCE. DCA was very hepatotoxic, and tumorigenic response appeared to be dependent upon these effects. The tumorigenic effects of TCA were closely associated with the accumulation of lipofuscin and the induction of single strand breaks in hepatic DNA in vivo. Evidence suggests that DCA acts primarily by increasing growth of hyperplastic nodules whereas TCA appears to accelerate progression of tumors. Data suggest that TCA probably primarily was responsible

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for the hepatocarcinogenic effects of TCE. The cytotoxic effects of DCA-treatment may well contribute significantly to carcinogenic responses at very high doses of TCE. Keywords: Trichloroethylene; Trichloroacetate; Dichloroacetate; Hepatotoxicity; Carcinogenicity; B6C3F1 mice. (kt)

DESCRIPTORS: (U) *CARCINOGENS, *CLEANING COMPOUNDS, *CONTAMINANTS, *SOLVENTS, *HAZARDOUS MATERIALS, *GROUND WATER, *ACETATES, *COMMERCE, DEOXYRIBONUCLEIC ACIDS, WASTE DISPOSAL, DOSAGE, ENVIRONMENTS, GREASES, IN VIVO ANALYSIS, LIVER, METABOLISM, NEOPLASMS, RESPONSE, TOXIC AGENTS, TRICHLOROETHYLENE.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5, *Dichloroacetate, Trichloroacetate, *Hepatocarcinogens.

SEARCH CONTROL NO. EV156L

AD-A214 499 11/2

AMERICAN CHEMICAL SOCIETY WASHINGTON DC

(U) Symposium on Chemical Precursors to Ceramics Held in Miami Beach, Florida on September 12, 1989.

DESCRIPTIVE NOTE: Final rept.,

SEP 89

PERSONAL AUTHORS: Tebbe, Fred N.; Chowdhry, Uma; Bolt, John D.

CONTRACT NO. AFOSR-89-0448

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1355

UNCLASSIFIED REPORT

ABSTRACT: (U) It was the purpose of the Symposium on Chemical Precursors to Ceramics to promote exchange of information among chemists and materials scientists engaged in studies related to the chemistry of materials. Participants were chosen to represent perspectives of industrial, academic, and national laboratories. Molecular Growth Pathways in Silica Sol-Gel Processing, topics addressed included sol-gel processing and organometallic precursors. (JES)

DESCRIPTORS: (U) *CERAMIC MATERIALS, BEACHES, CHEMICALS, CHEMISTRY, CHEMISTS, FLORIDA, GROWTH(GENERAL), INFORMATION EXCHANGE, MATERIALS, MOLECULES, ORGANOMETALLIC COMPOUNDS, PRECURSORS, SCIENTISTS, SYMPOSIA.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3.

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CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY AND
BIOCHEMISTRY

(U) Chemical-Like Behavior of Electrons and Holes in
Polymeric Conductors.

DESCRIPTIVE NOTE: Final rept. 1 May86-30 Apr 88.

SEP 89

PERSONAL AUTHORS: Reiss, Howard

CONTRACT NO. F49620-88-C-0060

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-89-1289

UNCLASSIFIED REPORT

ABSTRACT: (U) Research is reported on the use of thermodynamically reversible dopant solubilities (and electro-solubilities), in conducting polymers, for the study of ionization mechanisms, band structures, and carrier species. Both theory and experiment is accomplished. Much work is focused on iodine in polythiophene and protons in emeraldine. Studies of conducting polymer film as gas selective as gas selective membranes are performed. The results are dramatic; conducting polymers appear to be exceptionally good gas selective membranes. (JES)

DESCRIPTORS: (U) *POLYMERS, ELECTRIC CONDUCTORS, IONIZATION, POLYMERIC FILMS, PROTONS, THIOPHENES.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A3.

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SEARCH CONTROL NO. EVI56L

AD A214 495 21/2 14/2

CALIFORNIA UNIV DAVIS

(U) Acquisition of Analytical Instruments for Combustion Research.

DESCRIPTIVE NOTE: Final rept. 1986-1989.

SEP 89

PERSONAL AUTHORS: Law, C. K.

CONTRACT NO. AFOSR-86-0228

PROJECT NO. 2917

TASK NO. A1

MONITOR: AFOSR
TR-89-1287

UNCLASSIFIED REPORT

ABSTRACT: (U) A set of thermal analytical instruments and a quadrupole mass spectrometer have been acquired for the determination of variations in concentration and chemical composition in reactive systems as well as the identification of key heat-release mechanism and the energetics of new fuel, propellant formulation. The specific instruments acquired are listed. Keywords: Combustion. (AW)

DESCRIPTORS: (U) *COMBUSTION, ACQUISITION, CHEMICAL COMPOSITION, ENERGETIC PROPERTIES, FORMULATIONS(CHEMISTRY), FUELS, HEAT, INSTRUMENTATION, MASS SPECTROMETERS, PROPELLANTS, REACTIVITIES, RELEASE, THERMAL ANALYSIS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2917A1.

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AD-A214 494 6/4

SEARCH CONTROL NO. EVI56L

FLORIDA UNIV GAINESVILLE DEPT OF PSYCHOLOGY

AD-A214 494 CONTINUED

(U) Auditory Pattern Memory.

PREDICTIONS, SEQUENCES, SOURCES, TEST AND EVALUATION,
TIME COMPRESSION, VARIATIONS

DESCRIPTIVE NOTE: Annual rept. 1 Oct 88-31 Oct 89,
OCT 89

IDENTIFIERS: (U) PE81102F, WUAFOSR2313A6, Tempora)
Pattern Perception, Auditory Sequence Discrimination

PERSONAL AUTHORS: Sorkin, Robert D.

CONTRACT NO. AFOSR-89-0021

PROJECT NO. 2313

TASK NO. A8

MONITOR: AFOSR
TR-89-1349

UNCLASSIFIED REPORT

ABSTRACT: (U) A series of experiments testing the discrimination of random temporal patterns (single frequency tone sequences) was performed. The observer's task was to discriminate whether two sequences of tones contained the same or different patterns of temporal gaps. Half of the experimental trials contained gap sequences that were perfectly correlated across the two sequences (e.g. the temporal patterns were identical), and half the trials contained gap sequences that were partially correlated (the correlation was controlled by adding the outputs of two normal deviate generators). A model of discrimination, based on computation of the sample correlation between the gaps, and limited by a fixed source of internal (independent) temporal noise, allowed good prediction of observer performance. Some additional sources of variance were due to encoding or memory limitations. The correlation model makes specific predictions about the consequences of sequence time compression and expansion on performance; experiments are under way to evaluate the effects of these transformations. Keywords: Auditory perception; Auditory sequence discrimination; Temporal pattern perception. (KT)

DESCRIPTORS: (U) *AUDITORY PERCEPTION,
*MEMORY (PSYCHOLOGY), *MODELS, AUDIO TONES, AUDITORY
SIGNALS, COMPUTATIONS, CORRELATION, DISCRIMINATION,
EXPANSION, LIMITATIONS, MEMORY DEVICES, OBSERVERS.

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OXFORD UNIV (ENGLAND) DEPT OF ENGINEERING SCIENCE

PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING

(U) Wake Interaction Effects on the Transition Process on Turbine Blades.

(U) Development and Application of Oxygen Flow Tagging for Velocity Measurements and Flow Visualization in Turbulent Three-Dimensional Supersonic Flows.

DESCRIPTIVE NOTE: Final rept. 1 Sep 85-31 Dec 88.

SEP 89

DESCRIPTIVE NOTE: Final technical rept 1 Jun 86-31 May 89.

PERSONAL AUTHORS: Ainsworth, R. W.; LaGraff, J. E.

CONTRACT NO. AFOSR-85-0295

PROJECT NO. 2307

TASK NO. A4

PERSONAL AUTHORS: Miles, Richard B

CONTRACT NO. AFOSR-86-0191

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR TR-89-1342

UNCLASSIFIED REPORT

ABSTRACT: (U) The unsteady behavior of a 2-d gas turbine rotor blade boundary layer was observed using wide bandwidth surface heat transfer thin film gauges. The tests were conducted in a compression heated short duration wind tunnel cascade at realistic gas turbine aero/thermo-dynamic conditions. Wake passage effects were generated using a rotating set of upstream bars. The unsteadiness of the wake and shock interactions were observed through the effects on temporally and spatially accurate heat transfer measurements. Keywords: Gas turbine rotor blades; Thin film gauges; Wind tunnel tests; Two dimensional; Cascade structures; Gas turbine heat transfer; Boundary layer transition; Unsteady wake interactions; Great Britain. (EDC)

DESCRIPTORS: (U) *BOUNDARY LAYER TRANSITION, *GAS TURBINE BLADES, *UNSTEADY FLOW, *WAKE, ACCURACY, AEROTHERMODYNAMICS, BOUNDARY LAYER FLOW, CASCADE STRUCTURES, GAGES, GAS TURBINES, GREAT BRITAIN, HEAT TRANSFER, INTERACTIONS, MEASUREMENT, RODS, ROTATION, ROTOR BLADES, TURBOMACHINERY, SHOCK, THIN FILMS, TRANSITIONS, TWO DIMENSIONAL FLOW, WIND TUNNEL TESTS.

IDENTIFIERS: (U) PE81102F, WUAFO5R2307A4.

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UNCLASSIFIED REPORT

ABSTRACT: (U) Flow tagging by Raman Excitation plus Laser-Induced Electronic Fluorescence (RELIEF) and ultraviolet Rayleigh scattering have been developed to measure instantaneous velocity profiles, temperatures, and density cross sections in air. Experiments have been undertaken in supersonic free jets and supersonic boundary layers. In these experiments lines have been written into air to give the first direct images of velocity structure in supersonic free shear layers, and UV Rayleigh scattering has been used to achieve the first measurements of instantaneous two-dimensional density cross sections in free jets and in supersonic boundary layers. Keywords: Supersonic flow; Turbulence; Flow visualization; Three-dimensional compressible turbulent flow. (EDC)

DESCRIPTORS: (U) *FLOW VISUALIZATION, *SUPERSONIC FLOW, *TURBULENT FLOW, BOUNDARY LAYER, COMPRESSIBLE FLOW, CROSS SECTIONS, DENSITY, EXCITATION, IMAGES, JET FLOW, LASER INDUCED FLUORESCENCE, LAYERS, MEASUREMENT, MEASURING INSTRUMENTS, OXYGEN, PROFILES, RAMAN SPECTRA, RAYLEIGH SCATTERING, SHEAR PROPERTIES, SUPERSONIC CHARACTERISTICS, TEMPERATURE, THREE DIMENSIONAL FLOW, TURBULENCE.

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ULTRAVIOLET RADIATION. VELOCITY.

STANFORD UNIV CA INFORMATION SYSTEMS LAB

IDENTIFIERS: (U) RELIEF(Raman Excitation Laser Induced Electronic Fluorescence), Flow tagging, Flow measurement, Raman excitation, PE81102F, WUAFOSR2307A2.

(U) Studies in Statistical Signal Processing.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 88-30 Jun 89.

AUG 89

PERSONAL AUTHORS: Kallath, Thomas

CONTRACT NO. AFOSR-88-0327

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-89-1353

UNCLASSIFIED REPORT

ABSTRACT: (U) The primary objective of our research is to develop efficient and numerically stable algorithms for nonstationary signal processing problems by understanding and exploiting special structures, both deterministic and stochastic, in the problems. We also strive to establish and broaden links with related disciplines, such as cascades filter synthesis, scattering theory, numerical linear algebra, and mathematical operator theory for the purpose of cross fertilization of ideas and techniques. These explorations have led to new results both in estimation theory and in these other fields, e.g., to new algorithms for triangular and QR factorization of structured matrices, new techniques for root location and stability testing, and new recursions for orthogonal polynomials on the unit circle and the real line as well as on other curves. (KR)

DESCRIPTORS: (U) *SIGNAL PROCESSING, *STATISTICAL PROCESSES, ALGORITHMS, CASCADE STRUCTURES, CIRCLES, ESTIMATES, FILTERS, LINEAR ALGEBRA, MATHEMATICS, NUMERICAL ANALYSIS, ORTHOGONALITY, POLYNOMIALS, POSITION(LOCATION), SCATTERING, STABILITY, SYNTHESIS, TEST AND EVALUATION, THEORY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A6.

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WASHINGTON UNIV SEATTLE DEPT OF MATHEMATICS

(U) Piecewise Linear-Quadratic Programming and Its Applications

PROCEDURES, OPTIMIZATION PATTERNS, RANDOM VARIABLES, SOLUTIONS(GENERAL), STAGING, TIME

IDENTIFIERS: (U) PE61102F, WUAFOSR2304AH

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-30 Oct 88.

DEC 88

PERSONAL AUTHORS: Rockafellar, R. T.

CONTRACT NO. AFOSR-87-0281

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-88-1354

UNCLASSIFIED REPORT

ABSTRACT: (U) Piecewise linear-quadratic programming problems are a fundamental class of optimization problems in the mathematical modeling of multistage decision-making and large-scale dynamic systems, with or without the presence of uncertainty. Patterns of mathematical structure in such problems have been identified that cover wide areas of application and are conducive to the development of solution methodology. Work has gone forward on utilizing this structure in new numerical procedures, which include finite-envelope methods and a double conjugate gradient method, as well as a simplex-like algorithm for solving small scale subproblems. Preliminary tests have been made of these procedures on problems of modest size. To pave the way for experiments with larger examples, programs modules for handling discrete-time dynamics have been coded in part. For decision problems involving scenarios, a progressive hedging algorithm have been devised. This provides a systematic approach to optimization in cases where uncertainty cannot be modeled in terms of standard random variables. (KR)

DESCRIPTORS: (U) *LINEAR PROGRAMMING, *QUADRATIC PROGRAMMING, ALGORITHMS, COMPUTER PROGRAMMING, DECISION MAKING, DISCRETE DISTRIBUTION, DYNAMICS, GRADIENTS, MATHEMATICAL MODELS, METHODOLOGY, NUMERICAL METHODS AND

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MASSACHUSETTS INST OF TECH CAMBRIDGE

PHYSICAL SCIENCES INC ANDOVER MA

(U) Plasma Transport through the Dayside Cleft: A Source of Ionization Patches in the Polar Cap.

(U) Rotational Energy Transfer in Metastable States of Heteronuclear Molecules.

89

DESCRIPTIVE NOTE: Final draft rept. 1 Jun 85-31 Aug 89.

PERSONAL AUTHORS: Foster, John C.

OCT 89

CONTRACT NO. AFOSR-88-0023

PERSONAL AUTHORS: Davis, Steven J.; Holtzclaw, Karl; Piper, L. G.

PROJECT NO. 2310

REPORT NO. PSI-1008/TR-976

TASK NO. A2

PROJECT NO. 2303

MONITOR: AFOSR TR-89-1326

TASK NO. B1

UNCLASSIFIED REPORT

MONITOR: AFOSR

TR-89-1340

SUPPLEMENTARY NOTE: Pub. in Electromagnetic Coupling in the Polar Clefts and Caps, p343-354 1989.

UNCLASSIFIED REPORT

ABSTRACT: (U) Rapid sunward convection from the post-noon ionosphere carries high-density solar-produced F region plasma through the dayside cleft and into the polar cap. This plasma is swept through the nighttime cleft and enters the polar cap as a tongue of ionization which delineates the convection trajectory and its dynamics and provides the source for enhanced F region plasmas and their effects which are observed at high polar latitudes away from noon. Keywords: Ionosphere; Radar; Convection; Reprints. (jhd)

DESCRIPTORS: (U) *F REGION, *IONIZATION, CONVECTION, HIGH LATITUDES, IONOSPHERE, PLASMA(SPHYSICS), POLAR CAP, RADAR, REPRINTS, SOURCES, PARTICLE TRAJECTORIES.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2310A2.

ABSTRACT: (U) The objective of this program was to measure and interpret state-to-state R-T transfer rate coefficients for selected interhalogen molecules. Spectrally resolved CW laser-induced fluorescence was the experimental method used. A CW dye laser excites pure quantum states. The resolved fluorescence of the laser-excited level and the collisionally populated J' levels are analyzed. We have determined nearly 1000 state-to-state rate coefficients for R-T transfer in IF(B). Collision partners include He, Ne, Ar, Kr, Xe, N2, and CF4. Rate coefficients have also been determined for several initially excited J': 13, 27, 35 and 72. We have also investigated R-T transfer during vibrationally inelastic collisions for both I2 and IF. In addition, we have measured R-T rate coefficients in IC1(B) (jes)

DESCRIPTORS: (U) *MOLECULES, *QUANTUM ELECTRONICS, COEFFICIENTS, COLLISIONS, CONTINUOUS WAVE LASERS, DYE LASERS, ELASTIC PROPERTIES, ENERGY TRANSFER, EXCITATION, FLUORESCENCE, HALOGEN COMPOUNDS, LASER BEAMS, METASTABLE STATE, PURITY, RATES, ROTATION.

IDENTIFIERS: (U) PEG1102F, WUAFOSR2303B1.

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CARNEGIE MELLON UNIV PITTSBURGH PA DEPT OF METALLURGICAL
ENGINEERING AND MATERIALS SCIENCE

RESOLUTION, TITANIUM ALLOYS, VARIABLES

(U) Fundamental Studies of Beta Phase Decomposition Modes
in Titanium Alloys.

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1

DESCRIPTIVE NOTE: Final rept. 1 Oct 88-30 Sep 89.

OCT 89

PERSONAL AUTHORS: Aaronson, Hubert I.

CONTRACT NO. AFOSR-84-0303

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1358

UNCLASSIFIED REPORT

ABSTRACT: (U) An experimental investigation of the interfacial structure of the broad faces of windanstaten alpha plates and of grain boundary alpha allotriomorphs formed in a Ti-7.15 W/O (6.62 A/O) Cr alloy has been completed. A supporting modeling study was also made of the structure of these BCC HCP interfaces, using both a computer modeling technique and the Bollmann O-lattice method. No misfit dislocations were found at any of the interfaces examined on either morphology. Instead, C- or (C+)-type misfit-compensating ledges of variable height eliminated the need for one set of misfit dislocations; structural ledges removed the requirement for the other set. The former ledges were readily imaged with conventional TEM; they are straight and uniformly spaced. Direct observation of structural ledges required the use of atomic resolution TEM. Hot-stage TEM confirmed the mobility of growth ledges and the immobility of C-type ledges. Alloys, Phase transformations, Beta phase decomposition. (Jes)

DESCRIPTORS: (U) ALLOYS, ATOMIC PROPERTIES, COMPUTER APPLICATIONS, COMPUTERIZED SIMULATION, CRYSTAL SUBSTRUCTURE, DECOMPOSITION, DISLOCATIONS, GRAIN BOUNDARIES, GROWTH (GENERAL), HEIGHT, INTERFACES, MOBILITY, MODELS, OBSERVATION, PHASE TRANSFORMATIONS, PLATES.

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SYSTEMS RESEARCH LABS INC DAYTON OH

PROPERTIES. TWO DIMENSIONAL. YAG LASERS. YTTRIUM ALUMINUM GARNET.

(U) Surface Thermometry of Energetic Materials by Laser-Induced Fluorescence.

IDENTIFIERS: (U) PEG1102F, WUAFQSR2308A3.

DESCRIPTIVE NOTE: Final technical rept. Feb 87-Aug 89.

SEP 89

PERSONAL AUTHORS: Post, Michael E.; Goss, Larry P.

REPORT NO. SRL-5510-F

CONTRACT NO. F49620-87-C-0040

PROJECT NO. 2308

TASK NO. A3

MONITOR: AFOSR
TR-89-1351

UNCLASSIFIED REPORT

ABSTRACT: (U) The laser-induced fluorescence from Dy:YAG has been employed for the measurement of temperature on reacting and nonreacting surfaces. Point, line, and two-dimensional mapping of the surface temperature has been demonstrated utilizing the tripled output (355 nm) of a Nd:YAG laser. The temporal and spatial distribution of the temperature was recorded with a two-dimensional intensified imaging system. The technique has also been utilized for the measurement of the thermal depth profile of a plastic material undergoing rapid heating by a CO₂ laser. A fiber-optic temperature probe was developed. Fluorescent crystals bonded to the fiber-optic tip with a ceramic adhesive provide a 300 - 1100 K temperature range for the probe. Surface temperature measurement, Laser-induced fluorescence, Solid-fuel propellants, Rare-earth ions, Nonintrusive evaluation, Optical diagnostics. (jes)

DESCRIPTORS: (U) *LASER INDUCED FLUORESCENCE, ADHESIVES, CERAMIC MATERIALS, CRYSTALS, DEPTH, DIAGNOSIS(GENERAL), ENERGETIC PROPERTIES, FIBER OPTICS, FLUORESCENCE, HEATING, HIGH RATE, IMAGES, IONS, MAPPING, MATERIALS, MEASUREMENT, OPTICAL ANALYSIS, PLASTICS, PROBES, PROFILES, PROPELLANTS, RARE EARTH ELEMENTS, SOLID FUELS, SURFACE TEMPERATURE, TEMPERATURE, TEMPERATURE MEASURING INSTRUMENTS, THERMAL

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NEW MEXICO UNIV ALBUQUERQUE CENTER FOR HIGH TECHNOLOGY MATERIALS

(U) NO2 Photodissociation Dynamics.

DESCRIPTIVE NOTE: Final rept. 1 Nov 86-30 Sep 89.

(U) Laser-Material Interactions.

DESCRIPTIVE NOTE: Final technical rept. 1 Apr 88-31 Mar 89.

PERSONAL AUTHORS: Slinger, Tom G.

SEP 89

CONTRACT NO. F49620-87-K-0004

PERSONAL AUTHORS: Brueck, S. R.

PROJECT NO. 2303

CONTRACT NO. AFOSR-86-0120

TASK NO. B1

PROJECT NO. 2301

MONITOR: AFOSR

TASK NO. A1

TR-89-1338

MONITOR: AFOSR

TR-89-1337

UNCLASSIFIED REPORT

ABSTRACT: (U) The studies carried out under the present contract have all involved investigations of the photophysics and photochemistry of two nitrogen oxide molecules, NO and NO2. As well as being intrinsically interesting, these molecules are important from the point of view of atmospheric chemistry, and the NO2 molecule is a leading candidate as the emitting molecule that has been observed in the space shuttle glow. Major findings of these studies include the following observations: (1) Multiphoton dissociation of NO2 by green light produces highly excited products, specifically, highly vibrationally excited O2 and NO, and O(S). (2) Two-photon absorption of 268-280 nm radiation by NO results in production of the first excited state of the N-atom, N(2D), an atmospherically important species that is difficult to produce by any other photodissociative technique. Photodissociation, Spacecraft glow, Photophysics, Photochemistry, Space shuttle glow. (jes)

DESCRIPTORS: (U) *PHOTODISSOCIATION, ATMOSPHERIC CHEMISTRY, DISSOCIATION, EMISSION, GREEN/COLOR, LIGHT, MOLECULES, NITROGEN OXIDES, PHOTOCHEMICAL REACTIONS, PHOTONS, PRODUCTION.

IDENTIFIERS: (U) LPN-SRI-PYU-2891, LPN-SRI-MP-187, PEO1102F, WUAFOSR2303B1.

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ABSTRACT: (U) The Laser-Materials Interaction Laboratory at the Center for High Technology Materials of the University of New Mexico is devoted to the study of a broad range of laser spectroscopic probes of semiconductor and nonlinear materials, fabrication processes and optoelectronic devices. Much of this work is being carried out in conjunction with the Optoelectronics Research Center Program at CHTM which is also partially funded by the Air Force Office of Scientific Research. Significant progress has been made in this reporting period in a number of areas including: laser-induced photo-degradation of the GaAs surface, studies of grating coupling into surface-plasma modes at a metal-dielectric interface, electro-optic and nonlinear optical effects in PLZT thin films, and resonant-periodic-gain surface-emitting semiconductor lasers. Brief synopses of this work are presented here. More details are provided in the attached reprints and preprints. (jes)

DESCRIPTORS: (U) *DIELECTRICS, *LASERS, ELECTROOPTICS, FABRICATION, GALLIUM ARSENIDES, INTERACTIONS, INTERFACES, LABORATORIES, MATERIALS, METALS, NEW MEXICO, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, PROBES, REPRINTS, RESEARCH FACILITIES, SPECTROSCOPY, SURFACES, THIN FILMS

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IDENTIFIERS: (U) PEB1102F, WJAFOSR2301A1

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MASSACHUSETTS INST OF TECH CAMBRIDGE PLASMA FUSION
CENTER

(U) Propulsion Research on the Hybrid Plume Rocket.
DESCRIPTIVE NOTE: Final technical rept. 1 Sep 88-31 Aug
89.

OCT 89

PERSONAL AUTHORS: Chang-Diaz, F. R.; Yang, T. F.
REPORT NO. PFC/RR-89-15

CONTRACT NO. AFOSR-84-0180

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1343

UNCLASSIFIED REPORT

ABSTRACT: (U) This report discusses the construction of a tandem mirror plasma propulsion facility, the numerical modelling of the hybrid plume exhaust, and rf heating of the plasma. A preliminary experiment of the ICRH (Ion Cyclotron Resonance Heating) heating of plasma ions was carried out. For 2.0 kW ECRH (Electron Cyclotron Resonance Heating) power injected into the central cell and 10 kW ICRH power into the end cell, the results obtained from the probe in the central cell are: $n(e) = 2 \times 10^{10}$ to the 16th power/cm³ and $T(e) = 80$ eV (928,000 K) in the central cell. The estimated values in the end cell are: $n(e) = 1.25 \times 10^{10}$ to the 17th power/cm³ and $T(e) = 500$ eV (5,797,000 K). The power conversion efficiency was about 80%. The results from time dependent 3-D three fluid numerical modeling indicate that a boundary layer can be formed. The formation of this layer is strongly dependent on neutral jet geometry and injection angle. The ICRH heating of plasma was modeled numerically and power absorption efficiency is about 50%. Analytical analyses was done on slab geometry. (AW)

DESCRIPTORS: (U) 'HYBRID ROCKET ENGINES, 'EXHAUST PLUMES, 'ROCKET EXHAUST, 'PLASMA ENGINES, ABSORPTION, ANGLES.
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BOUNDARY LAYER, CELLS, ENERGY CONVERSION, CYCLOTRON
RESONANCE, EFFICIENCY, ELECTRON ENERGY ESTIMATES,
GEOMETRY, HEATING, HYBRID SYSTEMS, INJECTION, IONS,
MATHEMATICAL MODELS, PLASMAS(PHYSICS), POWER, PROPULSION
SYSTEMS, RADIOFREQUENCY POWER, VALUE, ROCKET PROPULSION.

MISSOURI UNIV-COLUMBIA DEPT OF MATHEMATICS

(U) Bifurcation of Critical Periods for Plane Vector
Fields.

APR 89

IDENTIFIERS: (U) PE61102F, WJAFQSR2308A1, ICRH(Ion
Cyclotron Resonance Heating), ECRH(Electron Cyclotron
Resonance Heating), Power Injection.

PERSONAL AUTHORS: Chilcone, Carmen; Jacobs, Marc

CONTRACT NO. AFOSR-89-0078

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-89-1271

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Transactions of the American
Mathematical Society, v312 n2 p433-486 Apr 89.

ABSTRACT: (U) A bifurcation problem in families of plane
analytic vector fields which have a nondegenerate center
at the origin for all values of a parameter λ is
studied. In particular, for such a family, the period
function is defined which assigns the minimum period to
each member of the continuous band of periodic orbits
surrounding the origin. The bifurcation problem is to
determine the critical points of this function near the
center with λ as bifurcation parameter. Aside from
their intrinsic interest, monotonicity properties of the
period function are important in the question of
existence and uniqueness of autonomous boundary value
problems, in the study of subharmonic bifurcation of
periodic oscillations, and in the analysis of the problem
of linearization. In this regard it is shown that a
Hamiltonian system with a polynomial potential of degree
larger than two cannot be linearized. However, while
these topics are the subject of a large literature, the
spirit of this paper is more akin to that of N. Bautin's
treatment of the multiple Hopf bifurcation for quadratic
systems and the work on various forms of the weakened
Hilbert's 18th problem first posed by V. Arnold. Reprints
(Jhd).

DESCRIPTORS: (U) *VECTOR ANALYSIS, BOUNDARY VALUE

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PROBLEMS. HAMILTONIAN FUNCTIONS. LINEARITY. MONOTONE
FUNCTIONS. OSCILLATION. PERIODIC VARIATIONS. POLYNOMIALS.
QUADRATIC EQUATIONS. REPRINTS.

STANFORD UNIV CA DEPT OF CHEMISTRY

IDENTIFIERS: (U) *Bifurcation Theory. PE81102F.
WUAFOSR23049.
(U) High Resolution Angle- and Energy-Resolved
Photoelectron Spectroscopy of NO: Partial Wave
Decomposition of the Ionization Continuum.

AUG 89

PERSONAL AUTHORS: Allendorf, Sarah W.; Leahy, David J.;
Jacobs, Dennis C.; Zare, Richard N.

CONTRACT NO. F49620-88-C-0018

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1288

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v31
n4 p2216-2234, 15 Aug 89.

ABSTRACT: (U) This reprint reports a two-color high-
resolution energy- and angle-resolved study of the
photoelectrons produced in the (1+1) REMPI of NO via
rotational levels of the A 2 sigma (+) nu=0 state.
Markedly different photoelectron angular distributions
arise from production of ions in different rotational
states (Delta N = 0, + or - 1, + or - 2 transitions in
the ionization step). We also observe that Delta N = + or
- 2 angular distributions are very sensitive to the
intermediate state alignment. A model is put forward in
which experimental observables (angle- and energy-
resolved photoelectron spectra) are used to determine the
attributes (relative amplitudes and phase shifts) of a
small number of interfering continuum channels that
contribute to the ionization step as well as the fraction
of parallel character of the ionization step. Nearly 70%
of the ejected photoelectrons are associated with the
Delta N = 0 ionization transition; the partial wave
composition of these electrons is dominated by p
character. The less important Delta N = + or - 1 peaks
have both s- and d-wave character. The Delta N = + or - 2
photoelectron peaks exhibit far more f-wave than p-wave
character because destructive interference nearly removes

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the p-wave contribution to the angular distribution. The partial wave decomposition is used to predict angular distributions resulting from excitation of the intermediate state by different rotational branch transitions; these predictions are in excellent agreement with the measured distributions. (jnd)

DESCRIPTORS: (U) *PHASE SHIFT, *PHOTOELECTRON SPECTRA, ALIGNMENT, AMPLITUDE, ANGLES, CHANNELS, COLORS, DECOMPOSITION, DESTRUCTION, DISTRIBUTION, ELECTRONS, ENERGY, HIGH ANGLES, HIGH RESOLUTION, INTERFERENCE, IONIZATION, IONS, PARALLEL ORIENTATION, PHOTOELECTRONS, PRODUCTION, REPRINTS, MOLECULAR ROTATION.

IDENTIFIERS: (U) Two Color Images.

WISCONSIN UNIV MADISON DEPT OF CHEMISTRY

(U) Synthesis, Characterization, and Complexation of an Unusual P2Si2 Bicyclobutane with Butterfly Structure: 2,2,4,4-Tetramesityl-1,3-diphospha-2,4-disilabicyclo[1,1,0] Butane.

89

PERSONAL AUTHORS: Ories, Matthias; Fanta, Alan D.; Powell, Douglas R.; West, Robert

CONTRACT NO. F49620-86-C-0010

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1257

UNCLASSIFIED REPORT

ABSTRACT: (U) The novel disiladiphosphane 1 having a butterfly-like bicyclobutane structure is formed by reaction of tetramesityldisilene with white phosphorus at +25 C. The bridged phosphorus atoms of 1 serve as donors in the formation of complexes with W(CO)5 fragments; the crystal structures of W(CO)52 was determined. Reaction of 1 with (Ph3P)2Pt (C2H4)2 produced a complex for which the novel propellane structure 4 is proposed. Keywords: Organic chemistry. (JES)

DESCRIPTORS: (U) *CYCLOBUTANES, *SYNTHESIS (CHEMISTRY), *CHEMICAL ANALYSIS, ORGANIC CHEMISTRY, COMPLEX COMPOUNDS, MOLECULAR STRUCTURE, SILICON, WHITE PHOSPHORUS.

IDENTIFIERS: (U) PE81102F, WJAFPSR230382, *Bicyclobutanes, Butane/2-2-4-4-Tetramesityl-1-3-Diphospha-2-4-Disilabicyclo[1-1-0].

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NORTH STAR RESEARCH CORP ALBUQUERQUE NM

Accelerators.

(U) Pulse Power Formulary.

DESCRIPTIVE NOTE: Final rept. Nov 88-Sep 89.

SEP 89

PERSONAL AUTHORS: Adler, Richard J.

CONTRACT NO. F49620-89-C-0005

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-89-1285

UNCLASSIFIED REPORT

ABSTRACT: (U) In this study, a 39 page long list of pulse power formulae was prepared for use by workers in the pulse power field. The categories of formulas and data presented includes: fundamental constants, unit conversions, model circuit results, marx generator circuits, capacitor charging circuits, transformer circuits, magnetic switching, transmission line circuits, field enhancement factors, solid, liquid and gaseous dielectric properties, intense electron and ion beam physics, electron beam-matter interaction, high power microwaves, railguns, diagnostics, and mechanical data. Vest pocket sized versions of this formulary are being widely distributed. Keywords: Pulse power; Accelerators; Microwaves. (JHD)

DESCRIPTORS: (U) *CIRCUITS, *ELECTRIC POWER, CAPACITORS, CONSTANTS, CONVERSION, DEPTH, DIELECTRIC PROPERTIES, ELECTRON BEAMS, FORMULAS(MATHEMATICS), GASES, GEOMETRIC FORMS, HIGH POWER, HYPERVELOCITY GUNS, INTENSITY, INTERACTIONS, ION BEAMS, LIQUIDS, MAGNETIC PROPERTIES, MECHANICAL PROPERTIES, MICROWAVES, MATHEMATICAL MODELS, OPTIMIZATION, PHYSICS, POWER, PULSE GENERATORS, PULSES, RAILS, SOLIDS, TABLES(DATA), SWITCHING, TRANSFORMERS, TRANSMISSION LINES

IDENTIFIERS: (U) *Pulse power, PE81102F, WUAFOSR2301A7.

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UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

metals, Niobium alloys. (jes)

(U) Dispersion Strengthening of High Temperature Niobium Alloys.

DESCRIPTORS: (U) *NIOBIUM ALLOYS, ALLOYS, CREEP STRENGTH, DISPERSING, DISPERSION HARDENING, DISPERSIONS, EXPOSURE(GENERAL), FOILS(MATERIALS), GAS TURBINES, HEAT RESISTANT ALLOYS, HIGH STRENGTH, HIGH TEMPERATURE, MATERIALS, MEASUREMENT, MEDICAL EXAMINATION, METALLURGY, MICROHARDNESS, MICROSCOPY, NICKEL ALLOYS, NIOBIUM, OPTICAL PROPERTIES, PARTICLES, PRECIPITATES, QUENCHING, QUICK REACTION, REFRACTORY METALS, SENSITIVITY, SOLIDIFICATION, SPRAYS, STABILITY, STRAIN RATE, STRENGTH(MECHANICS), SUPERALLOYS, TEMPERATURE, TENSILE PROPERTIES, TEST AND EVALUATION, TEST METHODS, THERMODYNAMICS, THINNESS.

DESCRIPTIVE NOTE: Final rept. May 88-Apr 89.

JUL 89

REPORT NO. UTRC-R89-917437-3

CONTRACT NO. F49620-86-C-0053

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1287

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A1.

UNCLASSIFIED REPORT

ABSTRACT: (U) Niobium base alloys are very attractive as high temperature materials for advanced gas turbine applications. After many conventional metallurgical approaches, a high temperature creep resistant alloy has yet to be identified which will replace nickel base superalloys. The best chance for obtaining high temperature creep resistance in these alloys is through dispersion strengthening with a stable precipitate that is introduced through rapid solidification. This would result in a very fine dispersion of non-shearable precipitates that would not coarsen upon long term exposure at temperatures in excess of 1200 C. A study has been conducted here to identify such a stable dispersion, fabricate alloys through solidification approach and characterize the coarsening of the resulting precipitates. A thermodynamic argument is presented to select candidate dispersions for evaluation. Arc melted and splat quenched alloys were fabricated and evaluated through micro-hardness measurements. An indirect assessment of particle stability is introduced which resulted in a coarsening parameter determined for each candidate precipitate at 1400 C. Microscopic examination of the more stable alloys were made via optical and thin foil TEM analyses. Tensile and strain-rate sensitivity tests were run on these alloys at 1400 C. Niobium. Dispersion strengthening. High temperature strength. Particle coarsening. Refractory

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OPTICAL SOCIETY OF AMERICA WASHINGTON D C

RHODE ISLAND UNIV KINGSTON

(U) Nonlinear Optical Properties of Materials. 1988
Technical Digest Series. Volume 9.

(U) Gordon Research Conferences on Point and Line Defects.

DESCRIPTIVE NOTE: Final rept. 1 Jun 88-27 Sep 89.

DESCRIPTIVE NOTE: Final project rept. 20-24 Jul 87.

SEP 89

JUL 87

PERSONAL AUTHORS: Quinn, Jarus W.

PERSONAL AUTHORS: Cruickshank, Alexander M.

CONTRACT NO. DAAL03-88-G-0040, AFOSR-88-0172

CONTRACT NO. AFOSR-87-0326

MONITOR: ARO, AFOSR
26262.1-MA-CF, TR-89-1359

MONITOR: AFOSR
TR-89-1277

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson
Place, N.W., Washington, DC 20036. PC \$82.00. No copies
furnished by DTIC/NTIS.

ABSTRACT: (U) This grant provided essential financial
support for the Gordon Research Conference on Point and
Line Defects which was held July 20-24, 1987 at Plymouth
State College in Plymouth, New Hampshire.

SUPPLEMENTARY NOTE: Includes Postdeadline papers.

DESCRIPTORS: (U) *POINT DEFECTS, SYMPOSIA, REPORTS.

ABSTRACT: (U) The topical meeting was organized to bring
together researchers to present and discuss new results
on nonlinear optical properties of materials with an
emphasis upon materials science and fabrication. It is
intended to bring together physicists, materials
scientists, chemists, and engineers to discuss problems
in nonlinear optical properties of materials for
application to light-control-by-light, fast optical
response and relaxation times, harmonic generation, phase
conjugation, quantum nondemolition and squeezed states of
light, etc. Partial Contents: Organic Molecules;
Photorefractivity; Carrier Transport Nonlinearities;
Semiconductor Nonlinearities; Ultrafast Nonlinearities;
Polymers; Theory or Composite Materials; Crystals for
Harmonic Generation; and Nonlinear Waveguides. Symposia.
(Jhd)

IDENTIFIERS: (U) Line Defects.

DESCRIPTORS: (U) *NONLINEAR SYSTEMS, *OPTICAL PROPERTIES,
*SEMICONDUCTORS, CHARGE CARRIERS, COMPOSITE MATERIALS,
CRYSTALS, HARMONIC GENERATORS, HIGH RATE, MATERIALS,
MOLECULES, ORGANIC COMPOUNDS, POLYMERS, QUICK REACTION,
RELAXATION, SYMPOSIA, TRANSPORT PROPERTIES, WAVEGUIDES.

IDENTIFIERS (U) *Nonlinear Optics.

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 CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL
 AND COMPUTER ENGINEERING G

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SOUTHERN METHODIST UNIV DALLAS TEX DEPT OF ELECTRICAL
 ENGINEERING

(U) Research on Materials and Components for Opto-
 Electronic Signal Processing and Computing

(U) Spread Spectrum Mobile Radio Communications.

DESCRIPTIVE NOTE: Final scientific rept. 1 Oct 84-30 Nov
 88.

DESCRIPTIVE NOTE: Final rept. 1 Sep 82-31 Aug 89.

SEP 89

JUL 89

PERSONAL AUTHORS: Gupta, S. C.

PERSONAL AUTHORS: Chang, William S.; Van Eck, Timothy;
 Niki, Shigeru; Williams, Andrew; Kellner, Albert L.

CONTRACT NO. AFOSR-82-0309

CONTRACT NO. AFOSR-84-0389

PROJECT NO. 2305

PROJECT NO. 2305

TASK NO. 83

TASK NO. 81

MONITOR: AFOSR
 TR-89-1286

MONITOR: AFOSR
 TR-89-1150

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Electro-absorption and electro-refraction
 properties of heterostructures and multiple quantum-well
 structures in GaInAs/GaAs were demonstrated and optimized
 for spatial light modulation applications. Techniques to
 generate and to confine dislocations near the substrate
 interface to grow a large number of strained quantum
 wells have been developed. Modulation at 1.08 micron
 wavelength were observed using strained layer quantum
 wells. Optical optical interaction in a multiple quantum
 well detector modulator pair has been demonstrated. A new
 device, the gate controlled photo-diode has been
 conceived and demonstrated. (RRH)

DESCRIPTORS: (U) *ELECTROOPTICS, *GATES(CIRCUITS),
 *MODULATION, *PHOTODIODES, *QUANTUM ELECTRONICS, *SIGNAL
 PROCESSING, CONTROL, DISLOCATIONS, INTERACTIONS,
 INTERFACES, LAYERS, LIGHT MATERIALS, OPTICAL PROPERTIES,
 SPATIAL DISTRIBUTION, SUBSTRATES.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2305B1.

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ABSTRACT: (U) In this report, two problems are studied.
 The first is concerned with evaluating the performance of
 a class of bandwidth efficient modulation schemes in a
 frequency reuse mobile radio channel. The second problem
 is concerned with formulating and evaluating the
 performance of a class of known delay multipath diversity
 receivers for indoor wireless communication. Several
 partial response (PRCPM) schemes such as TFM, GMSK and
 3RC are compared with regard to their performance in the
 presence of Adjacent Channel Interference (ACI) and
 CoChannel Interference (CCI). The performance criteria
 chosen were average probability of bit error and mean-
 square cross talk ratio. A comparison of three receiver
 filters with regard to their ability to reject ACI is
 also provided. Results indicate that receiver filter
 length is very important parameter for good performance.
 The performance of PRCPM schemes is analyzed by
 considering the combined effects of ACI, CCI and Rayleigh
 fading. The analysis is extended to the case when space
 diversity is employed. Results indicate that by using
 space diversity and maximal Ratio Combining significant
 performance gains can be achieved. (RRH)

DESCRIPTORS: (U) *ELECTROMAGNETIC INTERFERENCE,
 *FADING(ELECTROMAGNETIC WAVES), *MULTIPATH TRANSMISSION,
 *RAYLEIGH WAVES, *RECEIVERS, *SPACE DIVERSITY

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 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L
 AD A213 707 25/2
 UNIVERSAL ENERGY SYSTEMS INC DAYTON OH
 (U) High School Apprenticeship Program. Volume 3.
 DESCRIPTIVE NOTE: Annual rept.,
 DEC 88

PERSONAL AUTHORS: Darrah, Rodney C.
 CONTRACT NO. F49620-88-C-0053
 PROJECT NO. 3396
 TASK NO. D5
 MONITOR: AFOSR
 TR-89-1282

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A213 705.
 ABSTRACT: (U) The ionosphere changes the amplitude, phase, and frequency of radio waves, as well as slowing them down. This effect is called scintillation. We hope to find a method of predicting how much scintillation will occur at a given time and place. This would provide an alternative method of reading radio signals instead of the current expensive and complicated method of reading two radio signals of widely separated frequency transmitted simultaneously and figuring out how much the signal was changed by comparing the two signals. In order to be able to predict the scintillation patterns, people have performed many experiments. (jes)

DESCRIPTORS: (U) APPRENTICESHIP, *COMMUNICATION AND RADIO SYSTEMS, FREQUENCY, IONOSPHERE, PATTERNS, RADIO SIGNALS, RADIO WAVES, READING, SCHOOLS, SCINTILLATION, SECONDARY, SEPARATION, SIGNALS.

IDENTIFIERS: (U) WUAFOSR3396D5, PE61102F.

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AD-A213 706 19/1 21/9 1 21/9.2 21/2

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) High School Apprenticeship Program. Volume 2

DESCRIPTIVE NOTE: Annual rept.

DEC 88

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49620-88-C-0053

PROJECT NO. 3396

TASK NO. D5

MONITOR: AFOSR
TR-88-1261

UNCLASSIFIED REPORT

Availability: Document partially illegible.

SUPPLEMENTARY NOTE: See also Volume 3, AD-A213 707.

ABSTRACT: (U) Ballistic modifiers are chemicals, that when added to a propellant, alter the magnitude of the burn rate and the rate of burn over a series of pressures (slope). Often very little, less than one tenth of one percent, needs to be added to the propellant formulation to accomplish this. Limited studies of how and why ballistic modifiers work have been previously conducted. Certain chemicals were known to have certain effects. For the purpose of this study, two hypotheses were evolved and investigated--either cation charge or cation size caused the changes in the burn rate and slope of a propellant. The results of this study will be used in an upcoming project at the Astronautics Laboratory. (JES)

DESCRIPTORS: (U) *BURNING RATE, *PROPELLANTS, *ADDITIVES, APPRENTICESHIP, ASTRONAUTICS, CATIONS, CHEMICALS, HYPOTHESES, LABORATORIES, PRESSURE, SCHOOLS, SECONDARY, SIZES(DIMENSIONS).

IDENTIFIERS: (U) WUAFOSR3396D5, PE81102F, *Ballistic Modifiers, *Propellant Additives

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UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) High School Apprenticeship Program. Volume 1.

DESCRIPTIVE NOTE: Annual rept.

DEC 88

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49620-88-C-0053

PROJECT NO. 3396

TASK NO. D5

MONITOR: AFOSR
TR-89-1260

UNCLASSIFIED REPORT

Availability: Document partially illegible.

SUPPLEMENTARY NOTE: See also Volume 2, AD-A213 706.

ABSTRACT: (U) As part of the Special Studies section of the Summer Faculty Research Program, UES initiated a College Science and Engineering Program for the Astronautics Laboratory in 1988. The CSEP was sponsored by the Air Force Astronautics Laboratory through the Air Force Office of Scientific Research (AFOSR) and conducted by Universal Energy Systems, Inc. (UES). It provides research opportunities for qualified college students from U.S. universities or technical institutions. These opportunities consist of an eleven week research appointment with the Astronautics Laboratory, located at Edwards Air Force Base, California. The students were selected from such fields as Analytical Chemistry, Chemical Physics, Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Aeronautical Engineering, Electrical Engineering, Mechanical Engineering, Nuclear Engineering, Material Science and Physics. The program objectives on the College Science and Engineering Program are as follows: 1) To simulate among college students broader interest in careers in science and engineering specialties if interest to the Air Force; 2) To establish individual working relationships between students and active researchers; and 3) To strengthen the nation's

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efforts to recruit and sustain careers in science and engineering. (KR)

AD-A213 704 5/2

DESCRIPTORS: (U) *APPRENTICESHIP, *STUDENTS,

AERONAUTICAL ENGINEERING, AIR FORCE, AIR FORCE FACILITIES, ANALYTICAL CHEMISTRY, ASTRONAUTICS, CALIFORNIA, CAREERS, CHEMICALS, ELECTRICAL ENGINEERING, ENGINEERING, INORGANIC CHEMISTRY, INSTRUCTORS, LABORATORIES, MATERIALS, MECHANICAL ENGINEERING, NUCLEAR ENGINEERING, ORGANIC CHEMISTRY, PHYSICAL CHEMISTRY, PHYSICS, SCHOOLS, SECONDARY, SUMMER, UNIVERSITIES.

IDENTIFIERS: (U) WUAFOSR3396D5, PE81102F.

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force College Science and Engineering Program. Volume 1.

DESCRIPTIVE NOTE: Annual rept., DEC 88

PERSONAL AUTHORS: Darrah, Rodney C.

CONTRACT NO. F49820-88-C-0053

PROJECT NO. 3396

TASK NO. DS

MONITOR: AFOSR TR-89-1263

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *MILITARY RESEARCH, *INTERNS, *RESEARCH MANAGEMENT, ROCKET NOZZLES, ARTIFICIAL INTELLIGENCE, THERMONUCLEAR REACTIONS, SOLID PROPELLANT ROCKET ENGINES, NUCLEAR PROPULSION, CARBON CARBON COMPOSITES.

IDENTIFIERS: (U) Kinetic Kill Vehicles, WUAFOSR3396D5, PE81102F.

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CORNELL UNIV ITHACA NY DEPT OF CHEMISTRY

CINCINNATI UNIV OH DEPT OF CHEMISTRY

(U) The 157 nm Photodissociation of OCS.

(U) Molecular Theories of Rubberlike Elasticity and Some Recent Results on Model Networks and Unusual Fillers.

MAY 89

89

PERSONAL AUTHORS: Strauss, C. E.; McBane, G. C.; Houston, P. L.; Burak, I.; Hepburn, J. W.

PERSONAL AUTHORS: Mark, J. E.

CONTRACT NO. AFOSR-86-0017

CONTRACT NO. DAAL03-86-K-0032. \$AFOSR-83-0027

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B1

TASK NO. A3

MONITOR: AFOSR
TR-89-1284MONITOR: AFOSR
TR-89-1269

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90
n10 p5364-5372, 15 May 89.SUPPLEMENTARY NOTE: Pub. in Kautschuk Gummi Kunststoffe,
v42 n3 p191-193 1989.

ABSTRACT: (U) The dynamics of molecular photodissociation have been investigated intensively during the past decade, in part because laser-based techniques have made it possible to dissociate the parent molecules and to probe the fragments with energy and state resolution and in part because the dissociative event, which begins from a restricted range of geometries, is simpler to model than a collisional event, where it is very difficult to control the impact parameter and orientation of the colliding fragments. Studies of the dissociation of triatomic molecules have been particularly fruitful. A formal theory of such photodissociations have been developed, and both theoretical and experimental studies have probed several important systems. Recent developments concerning the correlation between vector properties in the dissociation promise to provide even more detail than had previously been realized. (Jes)

DESCRIPTORS: (U) *LASER PUMPING, *PHOTODISSOCIATION, EXPERIMENTAL DATA, IMPACT, LASER APPLICATIONS, LIMITATIONS, PARAMETERS, POLYATOMIC MOLECULES, RESOLUTION, THEORY, VECTOR ANALYSIS

IDENTIFIERS: (U) PE81102F, WUAFOSR230381

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compounds which can be hydrolyzed (silicates, titanates), thermolyzed (metal carbonyls) or photolyzed. Other techniques generate glassy particles by in-situ polymerization or use polymers with functional groups reacting with the filler surface. Reprints. (AW)

DESCRIPTORS: (U) *ELASTIC PROPERTIES, *ELASTOMERS, *FILLERS, *MODEL THEORY, *MOLECULAR PROPERTIES, CHAINS, CHEMICAL AGENTS, DEFORMATION, DUAL MODE, GLASS, INTERACTIONS, JUNCTIONS, MAGNETIC FIELDS, METAL CARBONYLS, MODELS, MOLECULE MOLECULE INTERACTIONS, MOLECULES, NETWORKS, ORGANOMETALLIC COMPOUNDS, PARTICLES, POLYMERIZATION, POLYMERS, REACTIVITIES, REINFORCING MATERIALS, REPRINTS, RUBBER, SILICATES, STRESS STRAIN RELATIONS, SURFACES, SYNTHETIC RUBBER, TEST AND EVALUATION, TITANATES, HYDROLYSIS, PYROLYSIS, PHOTOLYSIS, CHEMICAL BONDS, MODULUS OF ELASTICITY, FREE ENERGY, EXPANSION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, *Molecular Theory, Helmholtz Equations, Constrained Junction Theory, Mooney Rivlin Equations, End Linking, Swelling.

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF PHYSICS AND ASTRONOMY

(U) Density of States in a Resonant Tunneling Structure.

SEP 89

PERSONAL AUTHORS: Trzeciakowski, W.; Sahu, D.; George, Thomas F.

CONTRACT NO. F49620-86-C-0009, \$NSF-CHE86-20274

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR
TR-89-1259

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v40 n9 p40-44, 15 Sep 89.

ABSTRACT: (U) The change in the density of states $\delta\epsilon_n(E)$ brought about by the double-barrier structure is calculated. The positions and widths of narrow resonances coincide with those obtained from transmission $T(E)$, but in many cases $\delta\epsilon_n(E)$ is a better quantity for characterizing the resonances than $T(E)$. Reprints. (rrh)

DESCRIPTORS: (U) *BARRIERS, *RESONANCE, *TUNNELING, REPRINTS, TRANSMITTANCE, WIDTH.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B3.

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AD-A213 679

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WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Synthesis and Characterization of the First Transition Metal Ni(2)-Disilene Complexes.

89

PERSONAL AUTHORS: Pham, Eric K.; West, Robert

CONTRACT NO. F49620-88-C-0010, NSF-CHE83-18810

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1258

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v111 p7667-7670 1989.

ABSTRACT: (U) The isolation of disilenes has historically depended on the use of sterically demanding substituents to impart protection and hence stability to the Silicon double bond. Disilenes with relatively smaller substituents have been observed at low temperatures or inferred from trapping studies. Alternatively, such reactive organosilicon species can be isolated in the coordination sphere of an unsaturated transition-metal fragment, as evidenced by the recent report of stable silene complexed of ruthenium. By analogy, bonding of reactive disilenes to transition-metal substrates may also be expected to stabilize them. Reprints. (Jes)

DESCRIPTORS: (U) BONDING, ISOLATION, LOW TEMPERATURE, ORGANIC COMPOUNDS, REACTIVITIES, REPRINTS, RUTHENIUM, SILICON, SILICON COMPOUNDS, SPHERES, SUBSTRATES, SYNTHESIS(CHEMISTRY), TRANSITION METALS.

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MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS

(U) Physical Process in MPD Plasmas.

DESCRIPTIVE NOTE: Final rept. 1 May 88-31 Apr 89.

JUL 89

PERSONAL AUTHORS: Hastings, Daniel

CONTRACT NO. AFOSR-88-0119

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1275

UNCLASSIFIED REPORT

ABSTRACT: (U) Magnetoplasmadynamic, or MPD, thrusters are a promising method of propulsion for a variety of different space missions. This research develops and analyzes a numerical simulation of a quasi one dimensional model for an MPD thruster. A finite difference scheme is used to integrate the fluid equations for each species and a magnetic field equation derived from Maxwell's laws. The model includes separate electron and heavy species temperatures, varying conductivity, varying ionization fraction, collisional energy transfer between heavy particles and electrons, averaged viscosity and ambipolar diffusion, and electron heat conduction. Both constant area and variable area channels are examined. The applied current in the cases studied ranges from 79.8 kAmp/meter depth to 159 kAmp/meter depth for an inlet mass flow of 0.5 kg/sqm sec. It is shown that thermal equilibrium is not a valid assumption in a typical thruster. It is also found that viscosity plays a significant role in determining thruster performance. Area variation is also found to have a significant effect on performance. (UHD)

DESCRIPTORS: (U) THRUSTERS, PLASMA ENGINES, MAGNETOHYDRODYNAMICS, CHANNELS, COLLISIONS, DEPTH, ELECTRONS, ENERGY TRANSFER, FINITE DIFFERENCE THEORY, INLETS, MAGNETIC FIELDS, MASS FLOW, MATHEMATICAL MODELS.

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MEASURING INSTRUMENTS, NUMERICAL ANALYSIS, ONE
DIMENSIONAL, PARTIAL DIFFERENTIAL EQUATIONS,
PERFORMANCE(ENGINEERING), SPACE MISSIONS, TEMPERATURE,
THERMAL CONDUCTIVITY, THERMAL STABILITY, VARIATIONS,
VISCOSITY.

MICHIGAN UNIV ANN ARBOR DEPT OF AEROSPACE ENGINEERING
(U) Dense-Spray Properties: Structure and Turbulence
Modulation.

IDENTIFIERS: (U) PEB1102F, WU2308A1,
Magnetoplasmdynamics.

DESCRIPTIVE NOTE: Final rept. 15 Jul 85-14 Jul 89,

AUG 89

PERSONAL AUTHORS: Ruff, G. A.; Parthasarathy, R. N.;
Faeth, G. M.

CONTRACT NO. AFOSR-85-0244

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1284

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical and experimental study of aspects of dense sprays is described, considering: the structure and mixing properties of the near-injector, dense-spray region of pressure-atomized sprays; and the direct effect of particle (drop) motion on the turbulence properties of multiphase flows (which is often called turbulence modulation). The structure of dense sprays was studied using large-scale (9.5 and 19.1 mm jet exit diameters) water sprays in still air. Measurements included: flow visualization using flash photography; liquid volume fractions using gamma-ray absorption; streamwise mean and fluctuating velocities at the injector exit, and entrainment velocities, using laser velocimetry; and dispersed-phase properties using single and double-flash holography. Predictions based on the locally-homogeneous flow (LHF) approximation of multiphase flow theory were evaluated using the measurements. Measurements showed that mixing was strongly influenced by the degree of flow development at the injector exit and the breakup regime: fully-developed flow and atomization breakup yielded the fastest mixing rates. Turbulence modulation was studied by considering nearly monodisperse spherical glass particles falling in a stagnant water bath, where effects of turbulence modulation were responsible for the entire turbulence

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field. Measurements included phase velocities, as well as the temporal and spatial correlations of continuous phase velocities. using a two-point phase-discriminating laser velocimeter; and calibration of particle motion properties using motion-picture shadowgraphs. (JHD)

DESCRIPTORS: (U) *ATOMIZATION, *PHOTOGRAPHIC ANALYSIS, *FLOW VISUALIZATION, *MULTIPHASE FLOW, *SPRAYS, *TURBULENCE, AIR, BATHS, CALIBRATION, ENTRAINMENT, EXITS, FLASHES, SPARK SHADOWGRAPH PHOTOGRAPHY, GAMMA RAY ABSORPTION COEFFICIENTS, GLASS, HIGH DENSITY, INJECTORS, LASER VELOCIMETERS, LIQUIDS, MEAN, MIXING, MODULATION, MOTION, PHASE, PHOTOGRAPHY, RATES, SPHERES, HOLOGRAPHY, STAGNATION, THEORY, VELOCITY, WATER.

IDENTIFIERS: (U) Turbulence Modulation, PEG110ZF, WUAFOSR2308A2.

AD A213 656 9/1 12/5

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL AND COMPUTER ENGINEERING G

(U) Computer Aided Design of Monolithic Microwave and Millimeter Wave Integrated Circuits and Subsystems.

DESCRIPTIVE NOTE: Final rept. 1 Sep 88-30 Nov 88.

MAY 89

PERSONAL AUTHORS: Ku, Walter H.

CONTRACT NO. AFOSR-86-0339

PROJECT NO. 2305

TASK NO. C1

MONITOR: AFOSR
TR-89-1266

UNCLASSIFIED REPORT

ABSTRACT: (U) The objectives of this research are to develop analytical and computer-aided design techniques for monolithic microwave and millimeter-wave integrated circuits (MMIC & MIMIC) and subsystems and to design and fabricate those ICs. Emphasis was placed on heterojunction-based devices, especially the High Electron Mobility Transition (HEMT), for both low-noise and medium-power microwave and millimeter-wave applications. Circuits to be considered include monolithic low-noise amplifiers, power amplifiers, and distributed and feedback amplifiers. Interactive computer aided design programs have been developed, which include large-signal models of InP MISFETs and InGaAs HEMTs. Further, a new unconstrained optimization algorithm-POSM has been developed and implemented in the general-purpose Analysis and Design program for Integrated Circuit (ADIC) for assistance in the design of large-signal non-linear circuits. (RRH)

DESCRIPTORS: (U) *COMPUTER AIDED DESIGN, *INTEGRATED CIRCUITS, *MILLIMETER WAVES, DISTRIBUTED AMPLIFIERS, ELECTRON MOBILITY, ELECTRON TRANSITIONS, FEEDBACK AMPLIFIERS, HIGH RATE, POWER AMPLIFIERS.

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MASSACHUSETTS INST OF TECH CAMBRIDGE

MICHIGAN UNIV ANN ARBOR DEPT OF CIVIL ENGINEERING

(U) Instrumentation for a Facility for the Test, Analysis and Active Control of Spacecraft Truss Structures.

(U) Bond Mechanisms in Fiber Reinforced Cement-Based Composites.

DESCRIPTIVE NOTE: Final rept. 1 Oct 87-31 Dec 88.

DESCRIPTIVE NOTE: Final rept. 1 Jul 87-30 Aug 89.

AUG 89

AUG 89

PERSONAL AUTHORS: Von Flotow, Andreas H.

PERSONAL AUTHORS: Naaman, A. E.; Namur, G.; Najm, Husam; Alwan, Jamil

CONTRACT NO. AFOSR-87-0031

PROJECT NO. 2917

REPORT NO. UMCE-89-9

TASK NO. A1

CONTRACT NO. F49620-87-C-0083

PROJECT NO. 2302

MONITOR: AFOSR
TR-89-1285

UNCLASSIFIED REPORT

MONITOR: AFOSR
TR-89-1278

ABSTRACT: (U) The report lists in detail the equipment purchased with this instrumentation grant (granted under the DoD-URIP program). Also summarized is the impact this equipment has had upon the work and the reputation of the affected group at MIT. The appendix includes numerous theses and papers which have benefited from the availability of this equipment. (KR)

DESCRIPTORS: (U) *SPACECRAFT COMPONENTS, *TRUSSES, CONTROL, THESES.
IDENTIFIERS: (U) PE61102F, WUAFOSR2917A1, *Structural components.

AD-A213 855

IDENTIFIERS: (U) PE61102F, WUAFOSR2302C2.

AD A213 837

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UNCLASSIFIED REPORT

ABSTRACT: (U) This report presents a comprehensive investigation of the mechanisms of bond in steel fiber reinforced cement based composites. Following a state-of-the-art review on bond in reinforced and prestressed concrete as well as fiber reinforced concrete, the results of an experimental and an analytical program are described. The experimental program focuses primarily on the behavior of fibers under pull-out conditions. Pull-out load versus end slip behavior and bond shear stress versus slip relationship are studied extensively. Keywords: Fiber concrete; Cement composites; SIFCON; Bond; Interfaces; Mathematical modeling; Constitutive modeling; Pull-out test; Friction; Latex; Fly ash; Microsilica; Shear. (JES)

DESCRIPTORS: (U) *FIBER REINFORCED COMPOSITES, BEHAVIOR, BONDING, CEMENTS, COMPOSITE MATERIALS, CONCRETE, FIBER REINFORCEMENT, FIBERS, FLY ASH, FRICTION, LATEX, MATHEMATICAL ANALYSIS, MATHEMATICAL MODELS, METAL FIBERS, PRESTRESSED CONCRETE, REINFORCED CONCRETE, SHEAR STRESSES, STATE OF THE ART, STEEL.

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WISCONSIN UNIV-MADISON CENTER FOR MATHEMATICAL SCIENCES

(U) Interdisciplinary Research in Viscoelasticity and Rheology.

INJECTION MOLDING, LUBRICANTS, MATERIALS, NONLINEAR ANALYSIS, NONLINEAR SYSTEMS, PARTIAL DIFFERENTIAL EQUATIONS, POLYMERS, SOLUTIONS(GENERAL), SPINNING(MOTION), STRUCTURAL PROPERTIES, SYNTHETIC FIBERS, TOOLS, VISCOELASTICITY.

DESCRIPTIVE NOTE: Final rept. May 87-May 89.

AUG 89

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A9

PERSONAL AUTHORS: Malkus, David S.; Nohel, John A.

CONTRACT NO. AFOSR-87-0191

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-89-1272

UNCLASSIFIED REPORT

ABSTRACT: (U) A deep understanding of viscoelasticity and rheology is crucial to advanced materials engineering and process design. Examples of such advanced materials are high-strength polymers and additives for lubricants; process design problems include spinning of synthetic fibers and injection molding. The materials involved in these technologies are often highly elastic and very viscous. As a consequence, they often display behavior intermediate between that of a solid and that of a fluid. Our goal is to understand the predictions of equations of motion coupled with various constitutive assumptions for advanced, complex materials and to put this knowledge to use in modeling, the design of algorithms, and the computational solution of practical problems. To achieve our goals, our interdisciplinary program has adapted and extended tools in nonlinear analysis of partial differential equations, analytical and computational techniques for hyperbolic conservation laws, and computational techniques from nonlinear structural dynamics. (jes)

DESCRIPTORS: (U) *RHEOLOGY, ADDITIVES, ALGORITHMS, BEHAVIOR, COMPUTATIONS, CONSERVATION, DISPLAY SYSTEMS, DYNAMIC RESPONSE, DYNAMICS, ELASTIC PROPERTIES, ENGINEERING, EQUATIONS, HIGH STRENGTH, HYPERBOLAS.

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MARYLAND UNIV COLLEGE PARK DEPT OF MATHEMATICS

(U) Nonlinear Continuum Mechanics and Applied Analysis

IDENTIFIERS: (U) *Strings, Schur Functions, PE61102F,
WUAFOSR2304A9.

DESCRIPTIVE NOTE: Final rept. 1 Jun 88-31 May 89.

JUN 89

PERSONAL AUTHORS: Nachman, Aric; Maddocks, J. H.

CONTRACT NO. AFOSR-88-0087

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-89-1278

UNCLASSIFIED REPORT

ABSTRACT: (U) Ropes in Equilibrium is concerned with the equilibria of ropes or strings that are lying on surfaces or intertwined with other strings. Stability and folds; A Model for Disclinations in Nematic Liquid Crystals; On the Maneuvering of Vehicles addressed here is the kinematics governing the motion of vehicles that move on rolling wheels. Restricted Quadratic Forms, Inertia Theorems, and the Schur Complement; On the Kinematics of Wheeled Mobile Robots; On second-order conditions in constrained variational principles; Optimal Design of Columns Against Buckling; Director theories of rods reduces the equilibrium conditions for a uniform isotropic rod to a phase-plane for the curvature of the centerline of the rod; and 'The Stability of Relative Equilibria. Many important Hamiltonian systems have periodic solutions that are associated with symmetries of the equations. The equations governing the rotation of heavy rigid bodies comprise one such system in which the special solutions are known as permanent rotations. (Jhd)

DESCRIPTORS: (U) *CONTINUUM MECHANICS, *ROPE, *ROBOTS, EQUILIBRIUM(GENERAL), HAMILTONIAN FUNCTIONS, INERTIA, ISOTROPISM, KINEMATICS, LIQUID CRYSTALS, MANEUVERABILITY, MOBILITY, MOTION, NONLINEAR SYSTEMS, OPTIMIZATION, PERIODIC FUNCTIONS, RIGIDITY, RODS, ROLL, ROTATION, SOLUTIONS(GENERAL), SYMMETRY, THEOREMS, VARIATIONAL PRINCIPLES, VEHICLES, WHEELS.

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SOUTHERN ILLINOIS UNIV AT CARBONDALE

MISSOURI UNIV-COLUMBIA DEPT OF PSYCHOLOGY

(U) Necessary Conditions at the Boundary for Minimizers in Finite Elasticity.

(U) Numerical Facility: Convergence of Cognitive and Factor Analytic Models.

AUG 89

DESCRIPTIVE NOTE: Final scientific rept. 1 Aug 88-31 Jul 89.

PERSONAL AUTHORS: Spector, Scott J.; Simpson, Henry C.

CONTRACT NO. AFDSR-86-0184

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFDSR
TR-88-1272

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Archive for National Mechanics and Analysis, v107 n2 p105-125 1989.

ABSTRACT: (U) This project analyzed mathematical conditions that are needed to predict the onset of surface instabilities such as surface wrinkling. It was shown that certain well known conditions due to Legendre, Hadamard, and Agmon, as well as a newly discovered condition are needed in order to obtain a theoretical prediction of such an instability. Such instabilities have been observed by others in aluminum alloy tubes and may be responsible for the ultimate failure of these tubes. Reprints. (JHD)

DESCRIPTORS: (U) *ALUMINUM ALLOYS, *ELASTIC PROPERTIES, *DEFORMATION, *FAILURE(MECHANICS), *TUBES, BOUNDARIES, MATHEMATICAL PREDICTION, REPRINTS, THEORY.

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SEP 89

PERSONAL AUTHORS: Geary, David C.

CONTRACT NO. AFDSR-88-0239

PROJECT NO. 2313

TASK NO. A7

MONITOR: AFDSR
TR-89-1273

UNCLASSIFIED REPORT

ABSTRACT: (U) Results are reported for a study comparing the pattern of convergent and discriminant validity in relating information processing variables which represent basic numerical operations, an index of the facility of performing these operations within working memory, and ability measures defining Numerical Facility, Perceptual Speed, General Reasoning, and Memory Span. Analyses supported theoretically expected patterns of convergent and discriminant validity in relating process variables to individual differences measures. The data also indicated that the relationship between distinct ability factors was due to common underlying operations. Different sets of ability factors, however, were found to correlate for different reasons, and not because of a pervasive general ability spanning all cognitive domains. Finally, implications for the nature of individual differences in human abilities were discussed. Keywords: Individual differences; Information processing; Intelligence. (JHD)

DESCRIPTORS: (U) *COGNITION, *PERCEPTION(PSYCHOLOGY), *SKILLS, DISCRIMINATE ANALYSIS, FACTOR ANALYSIS, HUMANS, INDEXES, INFORMATION PROCESSING, MATHEMATICAL MODELS, MEMORY DEVICES, NUMERICAL ANALYSIS, REASONING TIME, VALIDATION, VARIABLES.

AD-A213 627

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

AD-A213 627 CONTINUED

AD-A213 597 12/9 12/4 15/5

IDENTIFIERS: (U) PE61102F, WJAFOSR2313A7.

CARNEGIE-MELLON UNIV PITTSBURGH PA ROBOTICS INST

(U) Constraint-Based Scheduling in an Intelligent Logistics Support System: An Artificial Intelligence Approach.

DESCRIPTIVE NOTE: Final rept. 15 Mar 85-14 Mar 86.

JAN 87

PERSONAL AUTHORS: Smith, Stephen F.

CONTRACT NO. F49620-85-C-0054

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-89-1282

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes the research that was performed under AFOSR Contract Number F49620-85-C-0054 titled Constraint-Based Scheduling in an Intelligent Logistics Support System: An Artificial Intelligence Approach, provided by the Electronics and Material Sciences Departments of the Air Force. The overall goal of this research has been the development of a computational theory of constraint-directed scheduling for application to the problem of job shop production scheduling. Research performed under this contract has focused on the investigation of issues relating to the reactive management of job shop schedules in response to the dynamics of factory operation. An experimental knowledge-based system called OPIS (Opportunistic Intelligent Scheduler) has been developed that provides a scheduling system architecture for reactive control and a testbed for exploring different reactive scheduling methodologies. We provide an overview of this work and highlight the major accomplishments. (KR)

DESCRIPTORS: (U) *SYSTEMS APPROACH, *ARTIFICIAL INTELLIGENCE, *JOB SHOP SCHEDULING, *LOGISTICS SUPPORT, AIR FORCE, ARCHITECTURE, COMPUTATIONS, CONTROL, DYNAMICS, ELECTRONICS, INDUSTRIAL PLANTS, MANAGEMENT, MATERIALS, METHODOLOGY, OPERATION, PRODUCTION, REACTIVITIES, TEST

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

AD-A213 597 CONTINUED
BEDS, THEORY.

AD-A213 552 6/4 6/1

NATIONAL INSTITUTES OF HEALTH BETHESDA MD

IDENTIFIERS: (U) WUAFOSR2304A7, PE81102F.

(U) Unbiased Measures of Neuronal Information Transmission
and Channel Capacity.

DESCRIPTIVE NOTE: Final rept. Jul-Aug 88.

JUN 89

PERSONAL AUTHORS: Optican, Lance M.; Gawne, Timothy J.;
Richmond, Barry J.; Joseph, Pinchas J.

CONTRACT NO. AFOSR-ISSA-88-0073

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-89-1279

UNCLASSIFIED REPORT

ABSTRACT: (U) The response activity of nerve cells in the mammalian visual system was analysed for information bearing properties. Primary findings include: support the multiplex filter hypothesis (nerve fibers encode multidimensional inputs by modulating the amplitudes of a few linearly independent temporal patterns summed to produce an output); the nature of encoding may permit recovery of an image's pattern regardless of its intensity or duration; in higher brain centers, encoded information becomes more evenly distributed among the temporal patterns of a nerve cell; higher brain centers appear to affect the responses of lower centers through feedback; with sequentially changing visual inputs, independent responses can occur with images separated by about 30 msec. Keywords: Nerve transmission. (KT)

DESCRIPTORS: (U) *VISION, *NERVE CELLS, *NERVE FIBERS, *NERVE TRANSMISSION, *OPTICAL IMAGES, BRAIN, CAPACITY(QUANTITY), CHANNELS, CODING, DATA TRANSMISSION SYSTEMS, FILTERS, HYPOTHESES, IMAGES, MAMMALS, MULTIPLEXING, PATTERNS, RESPONSE(BIOLOGY)

IDENTIFIERS: (U) PE81102F, WUAFOSR231A5.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L

AD-A213 551

20/2

MINNESOTA UNIV MINNEAPOLIS

(U) Epitaxial Iron Films.

DESCRIPTIVE NOTE: Final rept. 15 Jul 86-15 Jul 89.

SEP 89

PERSONAL AUTHORS: Dahlberg, E. D.; Cohen, P. I.

CONTRACT NO. AFOSR-86-0201

PROJECT NO. 2308

TASK NO. C1

MONITOR: AFOSR
TR-89-1280

UNCLASSIFIED REPORT

ABSTRACT: (U) The research program focused on the growth and the magnetic properties of epitaxial iron films grown on GaAs/InAs alloy substrates. Pseudomorphic growth of magnetic films on semiconductor substrates provides the potential for tuning of the magnetic properties of thin film magnets by varying the lattice constant and the morphology of the growth surface; this type of research has both device and fundamental research applications. Our studies of Fe films grown on GaAs have revealed a number of interesting phenomena including a dynamic Fe-FeO coupling, and a correlation between surface morphology and the coercivity of the films. In the growth studies reflection high energy electron diffraction determines the quality of the material (surfaces and interfaces) and the growth mechanisms of the metal films. The magnetic studies relied on the transport properties of the films supplemented by magnetization measurements. (JES)

DESCRIPTORS: (U) *CRYSTAL LATTICES, ALLOYS, COERCIVE FORCE, CONSTANTS, EPITAXIAL GROWTH, FILMS, GALLIUM ARSENIDES, GROWTH(GENERAL), IRON, MAGNETIC FIELDS, MAGNETIC MATERIALS, MAGNETIC PROPERTIES, MAGNETIZATION, MAGNETS, MATERIALS, MEASUREMENT, METAL FILMS, MORPHOLOGY, QUALITY, SEMICONDUCTORS, SUBSTRATES, SURFACE PROPERTIES, SURFACES, THIN FILMS, TRANSPORT PROPERTIES, TUNING.

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AD-A213 225 7/3 7/4

STANFORD UNIV CA

BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

(U) Exact Non-Reflecting Boundary Conditions.

(U) Chemistry of Polynuclear Metal Complexes with Bridging Carbene or Carbyne Ligands. Part 87. Dicosahedral Carbaborane (alkylidyne) Tungsten Complexes.

DESCRIPTIVE NOTE: Rept. for 29 Jun 88-1 May 89.

MAY 89 22P

89 13P

PERSONAL AUTHORS: Keller, Joseph B.; Givoli, Dan

PERSONAL AUTHORS: Crenell, S. J.; Devore, D. D.; Henderson, S. J.; Howard, J. A.; Stone, F. G.

CONTRACT NO. AFOSR-88-0053

CONTRACT NO. AFOSR-86-0125

PROJECT NO. 2304

PROJECT NO. 2303

TASK NO. A4

TASK NO. B2

MONITOR: AFOSR
TR-89-1177MONITOR: AFOSR
TR-89-1154

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Computational Physics, v82 n1 p172-192 May 89.

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society, Dalton Transactions p1363-1374 1989.

ABSTRACT: (U) An exact non-reflecting boundary condition is devised for use in solving the reduced wave equation in an infinite domain. The domain is made finite by the introduction of an artificial boundary on which this exact condition is imposed. In the finite domain a finite element method is employed. Although the boundary condition is non-local, that does not affect the efficiency of the computational scheme. Numerical examples are presented which show that the use of the exact non-local boundary condition yields results which are much more accurate than those obtained with various approximate local conditions. The method can also be used to solve problems in large finite domains by reducing them to smaller domains, and it can be adapted to other differential equations. Reprints. (Jhd)

DESCRIPTORS: (U) *BOUNDARY VALUE PROBLEMS, *NONREFLECTING COATINGS, *WAVE EQUATIONS, COMPUTATIONS, DIFFERENTIAL EQUATIONS, FINITE ELEMENT ANALYSIS, REDUCTION, REPRINTS.

IDENTIFIERS: (U) PEB1102F, WUAFDSR2304A4.

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reagents for preparing polynuclear metal compounds. These salts contain the thirteen-vertex dicosahedral C2810W framework, rather than the twelve-vertex icosahedral C289W group involved in earlier work. A preliminary account has been given of the results described in this paper. Keywords: Reprints; tungsten; iron; Carbaborne; Alkylidyne. (KT)

DESCRIPTORS: (U) *CARBENES, *CHEMISTRY, *LIGANDS, *METAL COMPLEXES, ANIONS, BONDED JOINTS, BONDING, BRIDGES, CORES, HYDROGEN, IRON, LOSSES, METAL COMPOUNDS, MOLECULAR STRUCTURE, MOLECULES, REPRINTS, SALTS, STRUCTURES, SYNTHESIS, TUNGSTEN CARBIDES, TUNGSTEN COMPOUNDS.

IDENTIFIERS: (U) PE81102F, WJAFOSR230382, *Carbynes.

AD-A213 220 5/7

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

(U) Spatial-Frequency Bands in Complex Visual Stimuli: American Sign Language.

APR 88 12P

PERSONAL AUTHORS: Riedl, Thomas R.; Sperling, George

CONTRACT NO. AFOSR-88-0140

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-89-1135

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America, v5 n4 p606-616 Apr 88.

ABSTRACT: (U) Dynamic images of individual signs of American Sign Language (ASL) with a resolution of 96×64 pixels were bandpass filtered in adjacent frequency bands. Intelligibility was determined by testing deaf subjects fluent in ASL. The following results were obtained. (1) By iteratively varying the center frequencies and bandwidths of the spatial bandpass filters, it was possible to divide the original signal into four different component bands of high intelligibility. (2) The measured temporal-frequency spectrum was approximately the same in all bands. (3) The masking of signals in band i by noise in band j was found to be inversely proportional to log signal to noise ratio. At constant performance, the ratio of root-mean-square signal amplitude to noise amplitude, s/n , was the same for bands 2, 3, and 4 and higher for band 1. (4) When weak signals i and j were added linearly, there was a slight intelligibility advantage for signals in the same band ($i = j$) compared with signals in adjacent bands and for signals in adjacent bands compared with signals in distant bands. Keywords: Reprints. (KR)

DESCRIPTORS: (U) *SOCIAL COMMUNICATION, *DEAFNESS, *COMPUTER GRAPHICS, AMPLITUDE, BANDPASS FILTERS, BANDWIDTH, DYNAMICS, FREQUENCY, FREQUENCY BANDS, IMAGES.

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INTELLIGIBILITY, MASKING, SIGNAL TO NOISE RATIO, REPRINTS,
SIGNALS, SPATIAL FILTERING, STIMULI, VISUAL PERCEPTION.

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH BOLLING AFB DC

IDENTIFIERS: (U) PEB1102F, WJAFOSR2313A5, *Sign language,
ASL(American Sign Language).

(U) AFOSR Technical Report Summaries.

DESCRIPTIVE NOTE: Quarterly rept. Apr-Jun 89.

JUN 89 409P

PERSONAL AUTHORS: Tyrrell, Debra L.

MONITOR: AFOSR
TR-89-1238

UNCLASSIFIED REPORT

ABSTRACT: (U) The Air Force Office of Scientific Research Technical Report Summaries are published quarterly as of March, June, September, and December of each calendar year. They consist of a brief summary of each AFOSR technical report received in the Technical Information Division and submitted to the Defense Technical Information Center (DTIC) for that quarter. The summaries contain two indexes (Subject Index and Personal Author Index) for easily locating the technical reports that may be of interest to the user. These are followed by abstracts of the reports. The purpose of this report is to inform Air Force Laboratories about the science that the Air Force Office of Scientific Research is supporting. (aw)

DESCRIPTORS: (U) *ABSTRACTS, *INDEXES, *REPORTS
*TECHNICAL INFORMATION CENTERS, AIR FORCE FACILITIES,
DEPARTMENT OF DEFENSE, LABORATORIES, SUBJECT INDEXING,
AIR FORCE RESEARCH, INFORMATION PROCESSING, MILITARY
PUBLICATIONS.

IDENTIFIERS: (U) *Technical Report Summaries, Technical Reports.

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STATE UNIV OF NEW YORK AT BUFFALO AMHERST AD-A213 079 CONTINUED
WUAFOSR2303B3

(U) Dynamics of an M-Level Atom Interacting with Cavity Fields: Effects of the Level Number on Quantum Collapse and Revival.

AUG 89 9P

PERSONAL AUTHORS: LI, Fu-Li; LIN, D. L.; George, Thomas F.
; LI, Xiao-Shen

CONTRACT NO. F49620-88-C-0009

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-89-1251

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v40 n3
p1394-1401, 1 Aug 89.

ABSTRACT: (U) A quantum mechanical theory is developed to treat the interaction of a multilevel atom with cavity fields of arbitrary detunings. The Hilbert space spanned by the energy eigenvectors is divided into subspaces specified by eigenvalues of the total excitation number, which is a constant of motion. Since the total Hamiltonian does not connect states in different subspaces, it can be diagonalized in each subspace independently. The time evolutions of the level occupation probabilities and the mean photon number are investigated numerically, and their variations with the atomic level number and the initial photon number are discussed. Their relation with the field squeezing is also discussed. Keywords: Cavity fields; Level number; Quantum collapse; Field squeezing; Reprints. (JHD)

DESCRIPTORS: (U) *ATOMIC SPECTROSCOPY, *QUANTUM THEORY, ATOMIC ENERGY LEVELS, ATOMIC PROPERTIES, ATOMS, CAVITIES, COLLAPSE, DYNAMICS, EIGENVALUES, EIGENVECTORS, EXCITATION, HAMILTONIAN FUNCTIONS, HILBERT SPACE, MEAN, PHOTONS, PROBABILITY, REPRINTS.

IDENTIFIERS: (U) Field Squeezing, PE81102F.

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COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY AD A213 064 CONTINUED

(U) Dynamics of Radical Pairs and Biradicals Adsorbed on Zeolites. 'Aluminosilicates, 'Zeolite, Radical Pairs, Biradicals

89 3P

PERSONAL AUTHORS: Turro, Nicholas J.

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-89-1249

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Polymer Preprints, v30 p565-568 1989.

ABSTRACT: (U) Zeolites are robust, crystalline, porous aluminosilicates possessing an enormous internal surface area capable of adsorbing large quantities of guest molecules whose structures allow them to pass from the external to the internal zeolitic surface. The framework composition, the presence of cations associated with the framework, and the topology of the void space internal to the zeolite control the diffusional and rotational dynamics of adsorbed guest molecules and imbue these inorganic polymeric materials with the special properties that contribute to their widespread use as catalysts, ion exchange materials and molecular sieves. The use of simple photochemical probes to yield information on the structure of these zeolites and how intracrystalline diffusional and rotational dynamics can determine the products of the photoreactions will be discussed. Reprints.

DESCRIPTORS: (U) *ALUMINUM COMPOUNDS, *PHOTOCHEMICAL REACTIONS, *POLYMERS, *SILICATES, *ADSORPTION, *MOLECULAR STRUCTURE, *CHEMICAL RADICALS, CATALYSTS, CATIONS, DYNAMICS, INORGANIC MATERIALS, INTERNAL, ION EXCHANGE, MATERIALS, MOLECULAR SIEVES, MOLECULES, POROUS MATERIALS, PROBES, ROTATION, SURFACES, TOPOLOGY, DIFFUSION, MOLECULAR ROTATION.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2303B2,

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI58L

AD-A213 056 13/8 11/2 20/8 11/4
GELTECH INC ALACHUA FL

AD-A213 056 CONTINUED
on Reliability. (AW)

(U) Sol-Gel Processing Science Using a Sol-Gel Optics
Research Facility (SGORF).

DESCRIPTIVE NOTE: Final rept. 1 Sep 88-30 Sep 88.

SEP 88 117P

PERSONAL AUTHORS: Nogue, Jean-Luc R.

CONTRACT NO. F49020-86-C-0120

PROJECT NO. D812

TASK NO. J1

MONITOR: AFOSR
TR-88-1248

UNCLASSIFIED REPORT

ABSTRACT: (U) The major challenge facing sol-gel processing of advanced materials, and in fact the entire field of chemically derived ceramics, is to relate processing variables to final properties. In order to develop fundamental processing-properties relationships it is essential to characterize the material after each step of the process: mixing, aging, drying, stabilization and densification. Fundamental studies of sol-gel processing science have led to two major accomplishments: 1) Development of a generic sol-gel process for producing fully dense silica monoliths (termed GELSIL), and 2) Identification of the need for a broad range of characterization methods to apply to processing steps. In order to achieve the production of reliable and reproducible sol-gel monoliths, a series of seven tasks have been identified. These tasks and a summary of results to date are given below: Sol-Gel Processing Science for Continuous Optics; Processing; Fabrication Science for Net Shape Precision Optics; Effects of Ultrastructure on Thermal and Mechanical Properties of Sol-Gel Optics; Effects of Ultrastructure on the Optical Properties and Optical Homogeneity of Gelsil; Radiation and Severe Environment Sensitivity of Gelsil; Multicomponent and Gel Derived composites; Effects of Multicomponent Species and Multiphase on Processing-Properties Relationships, and Effect of Sample dimensions

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DESCRIPTORS: (U) *OPTICS, *CERAMIC MATERIALS, DENSITY, DRYING, ENVIRONMENTS, FABRICATION, HIGH RATE, HOMOGENEITY, INTENSITY, MECHANICAL PROPERTIES, NETS, OPTICAL PROPERTIES, PRECISION, PROCESSING, PRODUCTION, RELIABILITY, SENSITIVITY, SHAPE, VARIABLES.

IDENTIFIERS: (U) PEG1102F, WUAFOSR0812J1, *Sol gel processing.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

AD-A213 039 CONTINUED

AD-A213 039 7/4

CALIFORNIA INST OF TECH PASADENA ARTHUR AMOS NOYES LAB
OF CHEMICAL PHYSICS

(U) Femtosecond Real-Time Alignment in Chemical Reactions.

JUL 89 9P

PERSONAL AUTHORS: Dantus, M.; Bommann, R. M.; Baskin, J.
S.; Zewail, A. H.

CONTRACT NO. AFOSR-87-0071

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1238

ANALYSIS. QUANTUM CHEMISTRY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B1, 'Femtosecond
Transition State Spectroscopy, Molecular Dynamics,
FTS(Femtosecond Transition State Spectroscopy), Vector
Dynamics.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,
v159 n5.6 p407-412, 21 Jul 89.

ABSTRACT: (U) In probing the femtosecond (and picosecond) dynamics of reactions the major focus thus far has been on studies of the (scalar) recoil of fragments along the reaction coordinate. More recently, an elementary theoretical description has been made that addresses the time evolution of (vector) alignment and the angular momentum of the fragments. Using femtosecond transition-state spectroscopy (FTS) but with polarized pulses, the alignment during dissociation can be measured and then related directly to the final rotational distribution of the fragments. Femtosecond real-time alignment is dissociation reactions is observed experimentally for Mercury Iodide and Iodine Cyanide. The results are accounted for by the classical theory outlined here. This study adds a new dimension to femtosecond transition-state spectroscopy (FTS), namely the probing of the 'vector dynamics' of reactions. Reprints. (aw)

DESCRIPTORS: (U) *CYANIDES, *CHEMICAL DISSOCIATION,
*FRAGMENTS, *IODIDES, *IODINE, *MERCURY COMPOUNDS,
*SPECTROSCOPY, ALIGNMENT, ANGULAR MOMENTUM, CHEMICAL
REACTIONS, COORDINATES, DISTRIBUTION, DYNAMICS, TIME,
EVOLUTION(GENERAL), POLARIZATION, PULSES, REAL TIME,
RECOIL, REPRINTS, ROTATION, TIME, TRANSITIONS, VECTOR

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AD-A213 033 SEARCH CONTROL NO. EV158L

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AD-A213 033 CONTINUED

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF CHEMISTRY

(U) On the Quenching of Helium (2 3S): Potential Energy Curves for, and Nonadiabatic, Relativistic, and Radiative Couplings Between, the $a^3 \Sigma_g^-(u)$, $A^1 \Sigma_g^+(u)$, $b^3 \Pi_g(g)$, $B^1 \Pi_g(g)$, $C^3 \Sigma_g^-(g)$, and $C^1 \Sigma_g^-(g)$ States of He2.

JUN 89 14P

PERSONAL AUTHORS: Yarkony, David R.

CONTRACT NO. AFOSR-86-0110

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR
TR-89-1250

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90
n12 p7184-7179, 15 Jun 89.

ABSTRACT: (U) This work considers the possible role of nonadiabatic effects in the collisional quenching of Helium (23S). The electronic structure aspects of nonadiabatic-radiative decay mechanism are analyzed. In this mechanism the $a^3 \Sigma_g^-(u)$ state is coupled by relativistic, rotational, and radiative interactions to the $A^1 \Sigma_g^+(u)$ state which serves as a gateway to the $X^1 \Sigma_g^-(g)$ state (electronically quenched) state of He2 through the spin-allowed dipole-allowed bound-free transition $A^1 \Sigma_g^+(u) \rightarrow X^1 \Sigma_g^-(g)$. State averaged MCSCF/second-order CI wave functions for the ground $X^1 \Sigma_g^-(g)$ state and the excited, $a^3 \Sigma_g^-(u)$, $A^1 \Sigma_g^+(u)$, $b^3 \Pi_g(g)$, $B^1 \Pi_g(g)$, $C^3 \Sigma_g^-(g)$, and $C^1 \Sigma_g^-(g)$ states (referred to here as the primary space) of He were determined. Using these wave functions interstate matrix elements were determined. In the nonrotating molecule these interactions give rise to the spin-forbidden dipole-allowed radiative transitions $b^3 \Pi_g(g) \rightarrow C^3 \Sigma_g^-(g)$ and $C^3 \Sigma_g^-(g) \rightarrow A^1 \Sigma_g^+(u)$. A complete description of these radiative decay processes requires consideration of interactions originating outside the primary space. The

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spin-forbidden, dipole-allowed perpendicular transition moments were determined using quasidegenerate perturbation theory. Keywords: Quantum chemistry, Spin orbit interaction, Dipolar spin spin interactions, Angular momentum, Dipole moment, Breit Pauli Approximation, Molecular orbitals, Reprints. (aw)

DESCRIPTORS: (U) *COUPLING(INTERACTION), *ELECTRONIC STATES, *HELIUM, *QUANTUM CHEMISTRY, *QUENCHING, *POTENTIAL ENERGY, ANGULAR MOMENTUM, COLLISIONS, DIPOLE MOMENTS, DIPOLES, INTERACTIONS, MOLECULAR ORBITALS, PERTURBATION THEORY, RADIATION, RADIOACTIVE DECAY, REPRINTS, SPIN STATES, ELECTRON TRANSITIONS, MOLECULAR ROTATION, WAVE FUNCTIONS, RELATIVITY THEORY.

IDENTIFIERS: (U) WJAFDSR2303B3, PES1102F, *Radiative Decay, Nonadiabatic Effects, Potential Energy Curves, Transition Moments, Quasidegenerate Perturbation Theory, Spin Spin Interactions, Spin Orbit Interactions, Breit Pauli Approximation.

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STATE UNIV OF NEW YORK AT BUFFALO AMHERST

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG UNIV
CENTER FOR ENVIRON- MENTAL/HAZARDOUS MATERIALS STUDIES(U) Photoabsorption of Molecules at Corrugated Thin Metal
Films.

(U) Adaptation and Resistance of Ecosystems to Stress.

JUN 89 7P

DESCRIPTIVE NOTE: Annual technical rept. no 1. 1 Aug 88-
1 Aug 89.PERSONAL AUTHORS: Leung, P. T.; Kim, Young S.; George,
Thomas F.

AUG 89 42P

REPORT NO. 100

PERSONAL AUTHORS: Cairns, John, Jr.; Niederlehner, B. R.

CONTRACT NO. F49620-86-C-0009

CONTRACT NO. AFOSR-88-0263

PROJECT NO. 2303

PROJECT NO. 2312

TASK NO. 83

TASK NO. A5

MONITOR: AFOSR
TR-89-0924MONITOR: AFOSR
TR-89-1244

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v90
n12 p7472-7277, 15 Jun 89.

ABSTRACT: (U) A phenomenological study has been carried out for the photoabsorption of molecules in the vicinity of a corrugated thin metal film. In particular, perturbative results for a grating silver film have been obtained to first order in the corrugation parameter, where the effect of the incident field coupled with the long-range surface plasmon is observed. Based on the different coupling nature between the radiations from the incident plane wave and from the molecular dipole to the substrate film, it is proposed that through control of the various parameters of the film, enhanced selective photoabsorption may be achieved. Keywords: Photochemical reactions. Reprints. (AM)

DESCRIPTORS: (U) *ABSORPTION, *METAL FILMS, *PHOTOCHEMICAL REACTIONS, *SILVER, *THIN FILMS, CORRUGATING, GRATINGS(SPECTRA), LIGHT, LONG RANGE(DISTANCE), MOLECULES, PARAMETERS, PLANE WAVES, PLASMONS, REPRINTS, SURFACES.

IDENTIFIERS: (U) PE81102F, WUAFOSR230383,
*Photoabsorption.

AD-A213 017

AD-A212 999

UNCLASSIFIED

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ABSTRACT: (U) This research employs naturally-derived, microbial microcosms to evaluate the ability of aquatic communities to adapt to stress. A series of laboratory toxicity tests have been conducted examining structural and functional responses of microbial communities to a sequence of stresses. Tentative conclusions from early research suggest that there is no detectable acclimation at the community level after low level cadmium exposure. More severe stress appears to be necessary to produce detectable increases in tolerance to subsequent stress. Acclimation was observed for net daily metabolism of communities developed in zinc and subsequently exposed to zinc, for gross primary production and respiration in communities colonized in zinc and then exposed to cadmium, and for species richness of communities colonized in zinc and then exposed to acidic pH. (AM)

DESCRIPTORS: (U) *ECOSYSTEMS, *MICROORGANISMS, *TOXIC TOLERANCES, ACCLIMATIZATION, ACIDS, CADMIUM, COMMUNITIES, DAILY OCCURRENCE, EXPOSURE(PHYSIOLOGY), HIGH RATE, INTENSITY, LABORATORY TESTS, LOW LEVEL, METABOLISM, NETS, PH FACTOR, PRODUCTION, RESPIRATION, SEQUENCES, STRESS(PHYSIOLOGY), TEST METHODS, TOXICITY, WATER, ZINC, RESISTANCE(BIOLOGY), ADAPTATION(PHYSIOLOGY), AQUATIC ORGANISMS.

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI56L

AD-A212 999 CONTINUED

AD-A212 973 15/3.1

IDENTIFIERS: (U) WJAFOSR2312A5, PE81102F, Microcosms.
SYSTEMS ENGINEERING INC GREENBELT MD
(U) Algorithm Development for SDI Weapons System Allocation.

DESCRIPTIVE NOTE: Final rept. Dec 87-May 89.

JUN 89 80P

PERSONAL AUTHORS: Blankenship, Gilmer L.; Bennett, William

CONTRACT NO. F49620-88-C-0028

PROJECT NO. D822

TASK NO. F1

MONITOR: AFOSR
TR-89-1255

UNCLASSIFIED REPORT

ABSTRACT: (U) While several SDI weapons systems can provide adequate defense in a one-on-one basis, a coordinated attack by several enemy missiles launched over a substantial volume will be difficult to resist without an efficient command and control system for warfare coordination. Our study of weapons allocation - coordination algorithms, is based on dynamical models for the missile/decoy systems including noise effects and uncertainties in the model parameters. Performance of the weapons targeting system may be measured in terms of the expected number of targets eliminated in a given interval (phase of operations) or the expected time to eliminate all the targets in a given region. Scheduling weapons deployment is a problem of constrained optimal (weapons) and state variables. The selection of weapons deployment tactics is based on solution of a complex optimization problem. We have conducted an investigation of advanced modeling, stochastic control, and scheduling methodologies for aspects of the SDI weapons allocation problem - several platforms with assets of different character defending against a diverse collection of targets. The models for such scenarios lead to stochastic scheduling problems which can not be handled by conventional analytical methods. We describe several different analytical approaches which have the potential

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI56L

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AD-A212 967 20/9

for synthesis of effective engagement algorithms.
Keywords: Weapons allocation; Stochastic sequencing;
Scheduling index rules. (JHD)

MISSION RESEARCH CORP SANTA BARBARA CA

(U) Time Evolution of the Electron Swarm Energy
Distribution Function.

DESCRIPTORS: (U) *STRATEGIC DEFENSE INITIATIVE.
*ALLOCATIONS. *COMMAND AND CONTROL SYSTEMS. *MULTIPLE
TARGETS. *TARGETING. *WEAPON CONTROL. ALGORITHMS.
COLLECTION. DECOYS. DEPLOYMENT. DYNAMICS. EFFICIENCY.
GUIDED MISSILES. METHODOLOGY. MILITARY TACTICS.
OPTIMIZATION. PARAMETERS. SCENARIOS. SCHEDULING.
SOLUTIONS(GENERAL). STOCHASTIC CONTROL. STOCHASTIC
PROCESSES. SYNTHESIS. VARIABLES.

DESCRIPTIVE NOTE: Final rept. 1 Jan 88-30 Apr 89.

JUN 89 67P

PERSONAL AUTHORS: Carron, N. J.

REPORT NO. MRC-R-1240

IDENTIFIERS: (U) WUAFOSR0822F1, PE63221C.

CONTRACT NO. F49620-86-C-0019

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-89-1234

UNCLASSIFIED REPORT

ABSTRACT: (U) The approximate theory of the Boltzmann Equation for the energy distribution function of swarm electrons is reviewed. The L, M approximation (essentially the Fokker-Planck approximation) is developed, being valid when average fractional energy loss per energy transfer collision is small, as is approximately the case in N2 and O2. A summary comparison with N2 and O2 swarm transport coefficients is presented showing excellent agreement over more than four orders of magnitude in the reduced electric field E.No The spread of energy loss rate about the mean in determining the spectrum is shown. The physical reason for the deficiency of the Continuous Slowing Down Approximation (CSDA) is clarified. It is further shown that the CSDA violates detailed balance. The physical meaning of the function forms is made clear by showing its relation to ordinary diffusion convection theory. The time dependent Boltzmann Equation in the L, M approximation is solved numerically for illustrative cases, demonstrating spectral time lag effects when the electric field varies on a time scale comparable with the swarm energy transfer collision frequency. Keywords: Plasmas; Kinetic theory. Distribution function; Energy spectrum; Boltzman equation; Swarm theory. (JHD)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV156L

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AD-A212 966 20/12 20/2 9/1

DESCRIPTORS: (U) *ELECTRON BEAMS, *DISTRIBUTION
FUNCTIONS, *PLASMAS(PHYSICS), APPROXIMATION(MATHEMATICS),
BOLTZMANN EQUATION, COEFFICIENTS, COLLISIONS, CONVECTION,
DIFFUSION THEORY, ELECTRIC FIELDS, ELECTRON ENERGY,
ENERGY TRANSFER, EVOLUTION(GENERAL), FOKKER PLANCK
EQUATIONS, KINETIC THEORY, LOSSES, RATES, THEORY, TIME
DEPENDENCE, TIME LAG THEORY, TRANSPORT PROPERTIES.

MASSACHUSETTS INST OF TECH CAMBRIDGE

(U) Synthesis and Study of Materials for Superconducting
Electronics.

DESCRIPTIVE NOTE: Final rept. 15 Oct 87-14 Oct 88.

SEP 88 7P

IDENTIFIERS: (U) Electron Swarms, PE81102F,
WUAFOSR2301A8.

PERSONAL AUTHORS: Tedrow, P. M.

CONTRACT NO. AFOSR-88-0035

PROJECT NO. 2306

TASK NO. C1

MONITOR: AFOSR
TR-89-1241

UNCLASSIFIED REPORT

ABSTRACT: (U) Thin films of BiSrCaCuO superconductor
have been made by rf magnetron sputtering onto sapphire
and MgO substrates. The use of MgO substrates produced
better films. Good tunnel junctions were fabricated using
YBa2Cu3O7 films with Pb counterelectrodes. No gap was
seen for the YBCO film. Critical field anisotropy was
studied in single crystals of YBCO and NdBa2Cu3O7.
Measurements of the Fermi-liquid effects in Ga and V were
completed. (RH)

DESCRIPTORS: (U) *ELECTRONICS, *JUNCTIONS, *SINGLE
CRYSTALS, *SPUTTERING, *SUBSTRATES, *SUPERCONDUCTIVITY,
*SUPERCONDUCTORS, *TUNNELING(ELECTRONICS), MAGNETRONS,
MATERIALS, RADIOFREQUENCY, SAPPHIRE, SYNTHESIS, THIN
FILMS.

IDENTIFIERS: (U) PE81102F, WUAFOSR2306C1.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI56L

AD-A212 959

7/3

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) On the Chemistry of Pyrrole in Room-Temperature Chloroaluminate Melts.

88 8P

PERSONAL AUTHORS: Zawodzinski, Thomas A., Jr.; Janiszewska, L., Osteryoung, R. A.

CONTRACT NO. AFOSR-87-0088

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-89-1074

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalysis Chemistry, v255 p111-117 1988.

ABSTRACT: (U) The chemistry of pyrrole in room-temperature molten salts composed of mixtures of AlCl₃ with 1-methyl-3-ethylimidazolium chloride has been studied by ¹H- and ¹³C-NMR spectroscopy. The spectra indicate that an adduct is formed between pyrrole and AlCl₃ in melts containing an excess of AlCl₃; no adduct formation occurs in melts containing excess organic chloride. The structure of the adduct is deduced and used to explain the previously observed inability to polymerize pyrrole electrochemically in acidic melts.

Keywords: Polypyrrole; Chloroaluminates; NMR spectroscopy; Adduct formation, Reprints. (JES)

DESCRIPTORS: (U) *ORGANIC CHEMISTRY, ACIDS, ALUMINATES, CHEMISTRY, CHLORIDES, CHLORINE COMPOUNDS, MELTS, MOLTEN SALTS, PYRROLES, ROOM TEMPERATURE, SPECTROSCOPY.

IDENTIFIERS: (U) WUAFOSR230382, PE61102F.

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ENDOCRINICS VANCOUVER WA

(U) A Theory of Damage in Brittle and Cementitious Materials. Part 1.

DESCRIPTIVE NOTE: Final rept. 15 Jan 88-15 May 89.

JUL 89 137P

PERSONAL AUTHORS: Valanis, K. C.; Khan, Khalid

REPORT NO. ENDIC-007-AFOSR-1989

CONTRACT NO. F49620-88-C-0038

PROJECT NO. 2302

TASK NO. C2

MONITOR: AFOSR
TR-89-1212

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of the present study was to develop a local three-dimensional continuum theory of damage. Two materials were investigated: grey cast iron and plane concrete. The basic concepts (such as the form of the free energy in the presence of damage) were tested on cast iron, which is a brittle substantially elastic material. This approach was very fruitful. The free energy representation proved correct in view of the excellent agreement between the calculated and experimental results in elastic domains with a sharp geometric discontinuity (a crack). Since in endochronic plasticity the free energy is the basis for the derivation of the constitutive equation, this result was instrumental in the development of a damage sensitive constitutive theory for concrete where the interaction between plasticity and damage posed complex questions. Damage theory, Brittle fracture, Micromechanics, Softening, Concrete, Cast iron. (Jes)

DESCRIPTORS: (U) *CEMENTS, *CONCRETE, BRITTLENESS, CASTINGS, DAMAGE, DISCONTINUITIES, ELASTIC PROPERTIES, EQUATIONS, FRACTURE (MECHANICS), FREE ENERGY, GEOMETRY, IRON, MATERIALS, MECHANICS, PLASTIC PROPERTIES, SHARPNESS, THEORY, THREE DIMENSIONAL.

AD-A212 940

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI56L

AD-A212 940 CONTINUED

AD-A212 934 6/4

SRI INTERNATIONAL MENLO PARK CA

IDENTIFIERS: (U) PEG1102F, WUAFOSR2302C2.

(U) Spatiotemporal Characteristics of Visual Localization.
Phase 2.

DESCRIPTIVE NOTE: Annual rept. Aug 88-Aug 89.

AUG 89 165P

PERSONAL AUTHORS: Burbeck, Christina A.; Bouman, Duane K.;
Yap, Yen L.

CONTRACT NO. F49620-88-K-0008

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-89-1248

UNCLASSIFIED REPORT

ABSTRACT: (U) We have conducted psychophysical experiments to determine (1) the contribution of local spatial filters to separation discrimination and (2) the properties of mechanisms that enter into subsequent stages of spatial processing i.e., separation discriminators. The separation, eccentricity, spatial extent, exposure duration, and proximity of the targets to other objects were manipulated. The extent of the target was more important for discrimination of relatively small (rather than large) separations at any given eccentricity, supporting the idea that an additional stage beyond the local spatial filters is necessary to explain performance of separation discrimination. The proximity of other spatial features was found to affect thresholds only for briefly exposed targets, implying that subsequent mechanisms can select the frequency content of the information carried by the local spatial filters. Separation discrimination appeared to be performed by two different types of separation discriminators one largely separation-dependent, and the other separation-independent but strongly eccentricity-dependent. Unlike the local spatial filters the separation discriminator processes information serially, with each separation taking at least 100 ms to encode.
Keywords: Human vision; Visual psychophysics; Visual

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AD-A212 933 6/15 6/3

spatial localization. (JHD)

MISSOURI UNIV-KANSAS CITY

DESCRIPTORS: (U) *PSYCHOPHYSICS, *SEPARATION, *VISUAL PERCEPTION, DISCRIMINATION, DISCRIMINATORS, ECCENTRICITY, EXPOSURE(GENERAL), HUMANS, OPTICAL IMAGES, SPATIAL FILTERING, TARGETS, TEST METHODS, TIME, VISION.

(U) Performance Modification Following Alteration of Molecular Mechanisms of Thermoregulation

DESCRIPTIVE NOTE: Final rept. 15 Jun 87-14 Jul 89.

IDENTIFIERS: (U) WUAFOSR2313A5, PE81102F, LPN-SRI-6616.

AUG 89 24P

PERSONAL AUTHORS: Simpson, C. W.; Resch, Garth E.

CONTRACT NO. AFOSR-87-0297

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR
TR-89-1233

UNCLASSIFIED REPORT

ABSTRACT: (U) The neuropharmacology of behavior related to cued discrimination tasks studied following temperature stress was the focus of this work. Prostaglandin E2 (PGE2) micro injected into the medial anterior hypothalamus/ preoptic area (MAHPOA) heat gain sites of rats that were at a normal core temperature resulted in an improvement in task performance by a decrease in error rate. The PGE2 response changes that define changes in motivation, that were elicited by changes in core temperature. This differential response was defined as a change in an additional factor. Further studies would be required to determine the exact nature of this response and its robustness. Keywords: Pharmacokinetics; Neurophysiology; Thermoregulation; Body temperature. (KT)

DESCRIPTORS: (U) *PROSTAGLANDIN, *PHARMACOKINETICS, *NEUROPHYSIOLOGY, *TEMPERATURE CONTROL, BEHAVIOR, BODY TEMPERATURE, CORES, ERRORS, GAIN, HEAT, JOBS, MOLECULAR PROPERTIES, MOTIVATION, NEUROLOGY, NORMALITY, PERFORMANCE(HUMAN), PHARMACOLOGY, RATES, RATS, RESPONSE(BIOLOGY), SITES, TEMPERATURE, THERMAL STRESSES

IDENTIFIERS: (U) WUAFOSR2312A2, PE81102F.
*Neurophysiology.

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AD-A212 932 21/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV158L

YALE UNIV NEW HAVEN CT HIGH TEMPERATURE CHEMICAL
REACTION ENGINEERING LAB

(U) Transport Phenomena and Interfacial Kinetics in
Multiphase Combustion Systems.

DESCRIPTIVE NOTE: Final rept. 1 Dec 83-31 Dec 88,
FEB 89 15P

PERSONAL AUTHORS: Rosner, Daniel E.

CONTRACT NO. AFOSR-84-0034

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1240

UNCLASSIFIED REPORT

ABSTRACT: (U) This final report summarizes Yale High Temperature Chemical Reaction Engineering Laboratory research methods/results (Grant AFOSR 84-0034) for the ca. five year period ending 12/31/88. Our techniques and results are outlined in the areas of (1) laser-based real-time optical techniques for measuring soot particle thermophoretic diffusivities in combustion gases, (2) role of thermophoresis and photophoresis in the capture of soot particles, (3) boundary layer computational methods and correlations for vapor and small particle transports, including the effects of particle size 'polydispersity', high mass loading and dopant redistribution, and (4) use of microwave-induced plasma emission spectroscopic (MIPES) methods to follow boron surface gasification kinetics in gaseous streams containing D8080(g). Presentations and archive publications describing these techniques and findings are documented, along with examples of impact of our results on research programs elsewhere. Keywords: Aerosols, Convective diffusion, Chemical vapor deposition, Energy transfer, Catalysis, Fouling, Soot. (JES)

DESCRIPTORS: (U) *COMBUSTION PRODUCTS, *ENERGY CONVERSION, AEROSOLS, ARCHIVES, BORON, BOUNDARY LAYER, CATALYSIS, CHEMICAL REACTIONS, COMBUSTION, CONVECTION.

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DIFFUSION, DOCUMENTS, ENERGY TRANSFER, FOULING, GASES, INTERFACES, KINETICS, LASER APPLICATIONS, MASS, MEASUREMENT, METHODOLOGY, NUMERICAL METHODS AND PROCEDURES, OPTICS, PARTICLE SIZE, PARTICLES, PHASE, REACTION KINETICS, REAL TIME, RESEARCH MANAGEMENT, SOOT, STREAMS, SURFACES, TRANSPORT PROPERTIES, VAPOR DEPOSITION.

IDENTIFIERS: (U) WUAFOSR2308A2, PEB1102F.

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AD-A212 925 21/4 21/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L
AD-A212 925 CONTINUED

UNITED TECHNOLOGIES OF NEW MEXICO INC EAST HARTFORD CT

(U) Investigation of Fuel Additive Effects on Sooting
Flames.

DESCRIPTIVE NOTE: Final rept. 1 Jun 86-31 May 89.

JUL 89 140P

PERSONAL AUTHORS: Bonczyk, Paul A.

REPORT NO. UTRC/R89-957484-F

CONTRACT NO. F49620-86-C-0054

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-89-1247

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates. All
DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U) Research was conducted to clarify the
mechanisms responsible for the suppression of soot in
flames by selected fuel additives. Measurements were
limited to well-defined prevaporized liquid- and gaseous-
fueled hydrocarbon/air flames. Emphasis was given to
ferrocene in a diffusion flame fueled by prevaporized iso-
octane, as well as to alkali and alkaline-earth additives
in premixed ethylene/air flames. Nonperturbing laser
optical diagnostic techniques were used to measure flame
temperature, as well as to relate changes in soot
particulate size, number density, and volume fraction to
additive type and concentration. Quartz probe sampling
and gas chromatography were used to determine the
additive's effect on soot precursor hydrocarbon and other
species. For the diffusion flame, the time of the first
appearance of soot is shortened when ferrocene is present.
Following its appearance, the particulate's size and
number density are perturbed by ferrocene. Ferrocene
accelerates acetylene oxidation. Ferrocene is very
effective at late stages, appearing to enhance soot
burnout. Attempts were not successful to find iron

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occluded by soot as a possible mechanism of enhanced soot
oxidation. Alkali metals were effective. Keywords:
Ionization potential. (AW)

DESCRIPTORS: (U) *FLAMES, *FUEL ADDITIVES, *SOOT,
*EMISSION CONTROL, ACETYLENE, FUEL AIR RATIO, ALKALI
METALS, ALKALINE EARTH METALS, BURNOUT, DENSITY,
DIAGNOSIS(GENERAL), DIFFUSION, ETHYLENE, FERROCENES, GAS
CHROMATOGRAPHY, HYDROCARBONS, IONIZATION POTENTIALS, IRON,
LASER APPLICATIONS, METHODOLOGY, MIXING, OPTICS,
OXIDATION, PARTICLE SIZE, PARTICULATES, PERTURBATIONS,
PRECURSORS, PROBES, QUARTZ, SAMPLING, SIZES(DIMENSIONS),
SUPPRESSION, TEMPERATURE.

IDENTIFIERS: (U) PE81102F, WUAFOSR2308A2.

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DTIC REPORT BIBLIOGRAPHY

AD-A212 921 8/3

UNITED TECHNOLOGIES OPTICAL SYSTEMS INC WEST PALM BEACH
FL

(U) Experimental and Theoretical Study of CO(2) Staggered
Hollow-Bore Array Lasers.

DESCRIPTIVE NOTE: Final rept. 1 Jan 88-30 Jun 89.

AUG 89 57p

PERSONAL AUTHORS: Park, D.; Hart, R. A.; Newman, L. A.

CONTRACT NO. F49620-88-C-0031, F49620-85-C-0109

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-89-1232

UNCLASSIFIED REPORT

ABSTRACT: (U) Experimental and theoretical investigation of CO2 staggered hollow-bore (SHB) arrays were conducted with the main objective of gaining a better understanding of the device. By focussing on the effects of a mirror tilt on the output power, the near field and pairwise far field patterns, we have deduced that the effective cavity length variations, manifested primarily through mode mismatch loss, are responsible for many of the observed features or phase-locked SHB arrays. We also found that by making one of the elements very lossy, we can effectively shut down the entire array, which could have a potential application as a novel amplitude modulation technique. Keywords: Arrays; Waveguide; Laser; Optical; Staggered; Hollow bore. (JES)

DESCRIPTORS: (U) *LASERS, AMPLITUDE MODULATION, BORES, FAR FIELD, LOSSES, NEAR FIELD, OPTICAL PROPERTIES, OUTPUT, PATTERNS, POWER, THEORY.

IDENTIFIERS: (U) PEG1102F, NMAFOSR2301A4.

AD-A212 921

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SEARCH CONTROL NO. EV156L

AD A212 916 8/11

ALASKA UNIV FAIRBANKS

(U) Crustal Structure Studies Utilizing Earthquake Sequences.

DESCRIPTIVE NOTE: Final rept. 1 Sep 85-31 Aug 88.

AUG 88 106p

PERSONAL AUTHORS: Gedhey, Larry D.; Stone, David B.; Davies, John N.

CONTRACT NO. AFDSR-85-0288

PROJECT NO. 2309

TASK NO. A2

MONITOR: AFOSR
TR-89-1231

UNCLASSIFIED REPORT

ABSTRACT: (U) The original goal was to use the Dall City earthquake sequence of Feb-Mar '85 to investigate the crustal structure of north-central Alaska. The scope was later modified to include studies of some earthquakes just north of the Alaska Range, the Gold King earthquakes and later still to include data gathered from chemical explosions detonated by USGS as part of their Trans-Alaska Crustal Transect (TACT) program. The work divided roughly into Dall City events, Gold King events, Yukon Flats Experiment, permanent network/explosion data, and Barter Island - Fairbanks refraction. The models used in this study were applied to most of Alaska, and thus large differences were expected. In general the models for the areas north of Fairbanks are reasonably similar which is consistent with the fact that relocations of events which these different models don't produce any clear preference and south is expectedly much more complex, given young accreted terranes with an underthrusting Pacific plate. (SDW)

DESCRIPTORS: (U) *EARTH CRUST, *EARTHQUAKES, ALASKA, BARTER ISLAND, CHEMICAL REACTIONS, EXPLOSIONS, FAIRBANKS(ALASKA), NETWORKS, NORTH(DIRECTION), REFRACTION, SEQUENCES, URBAN AREAS.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVI56L

AD-A212 916 CONTINUED

IDENTIFIERS: (U) PEB1102F, WUAFOSR2309A2

AD-A212 858 12/5 20/9

JAYCOR SAN DIEGO CA

(U) NTRFACE for MAGIC.

DESCRIPTIVE NOTE: Final rept. 1 Jul 87-31 Jul 89.

JUL 89 39P

PERSONAL AUTHORS: Gladd, N. T.

CONTRACT NO. F49620-87-C-0062

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-89-1235

UNCLASSIFIED REPORT

ABSTRACT: (U) The NTRFACE system was developed to demonstrate the utility of contemporary computing technologies for facilitating the operation of highly complex, but more traditional scientific computational models. To this end, NTRFACE makes use of the user friendliness of personal computers, the flexibility and expressiveness of modern languages such as LISP and C, the power and extensibility of object-oriented programming and also borrows some techniques from concrete by applying it to a specific application- a mature, highly complex plasma physics particle in cell simulation code name MAGIC. This document is intended to be the user manual for the beta test version of NTRFACE for MAGIC. It is not intended to be a finished product. Indeed, the purpose of this release is to distribute NTRFACE for MAGIC to various MAGIC users who will field test it. It is anticipated that bugs, oversights, and conceptual errors will be discovered and any comments and constructive criticism will be most welcome. (jhd)

DESCRIPTORS: (U) *ARTIFICIAL INTELLIGENCE, *PROBLEM SOLVING, *COMPUTER APPLICATIONS, CELLS, CODING, COMPUTER PROGRAMMING, ERRORS, FIELD TESTS, MATHEMATICAL MODELS, MICROCOMPUTERS, PLASMAS(PHYSICS), SIMULATION, TEST AND EVALUATION, USER MANUALS.

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AD-A212 858

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DTIC REPORT BIBLIOGRAPHY

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SEARCH CONTROL NO. EV156L

AD-A212 857 20/9

IDENTIFIERS: (U) NTRFACE Computing, LISP Programming Language, C Programming Language, WUAFOSR2301A8, PEB1102F.

GEORGIA INST OF TECH ATLANTA SCHOOL OF MECHANICAL ENGINEERING

(U) True Asymptotic Plasma-Sheath Matching with an Asymptotically Correct Collisional Presheath.

DESCRIPTIVE NOTE: Final rept. 1 Sep 85-31 Oct 88.

JUN 88 134P

PERSONAL AUTHORS: Main, Geoffrey L.

CONTRACT NO. AFOSR-85-0375

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-89-1237

UNCLASSIFIED REPORT

ABSTRACT: (U) The work on plasma presheaths, which form a transition region between the collisionless electrode sheaths and the plasma, is directed toward the problems of the Thermionic Energy Converter (TEC). A schematic of a TEC is shown in a reactor core for space power applications and the basic physics. Cesium is put the gap between the emitter and collector for two purposes: First, to ionize and neutralize the space charge so that a useful electron current density can pass (10 - 100 amps/square cm), and second to reduce the electrode work functions by adsorption to cesium. Of the plasma physics interactions are the most significant part because these regions form boundary conditions which control the plasma density and temperatures of the entire gap. Thus the research under this grant has been directed toward the study of collisional presheaths which form the layer adjacent to an electrode on the order of one ion mean free path thick. However, the research pursued under this grant is not limited in applicability to TECs but is on interest to plasma-surface interactions in general. Other applications include electric propulsion where electrode erosion is a problem and not fully understood and more generally any plasma-surface interaction. This report included the asymptotic presheath theory developed, and

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AD-A212 857

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI56L

AD-A212 857 CONTINUED

is preceded by the basic theory of the Thermionic Energy Converter (TEC) and is followed by the application of the theory to a time dependent model of the TEC in the program called TEC. As shown in the TEC results, the agreement with experiment is good except in the low current regime of the TEC where an unexplained disagreement remains. This is still a puzzle. (JHD)

DESCRIPTORS: (U) *ELECTRODES, *SPACE CHARGE, *THERMIONIC CONVERTERS, *WORK FUNCTIONS, *PLASMA SHEATHS, CESIUM, DENSITY, ELECTRIC CURRENT, ELECTRIC PROPULSION, ELECTRON DENSITY, ELECTRONS, ENERGY CONVERSION, EROSION, PLASMAS(PHYSICS), SPACE SYSTEMS, SPACE TECHNOLOGY, TIME DEPENDENCE, TRANSITIONS.

IDENTIFIERS: (U) WJAFOSR2308A1, PE81102F.

AD-A212 853 7/6

MASSACHUSETTS UNIV AMHERST DEPT OF POLYMER SCIENCE AND ENGINEERING

(U) A Center for Advanced Electrical and Structural Polymers.

DESCRIPTIVE NOTE: Final rept. 1 Dec 86-31 Oct 88.

OCT 88 47P

PERSONAL AUTHORS: Karasz, Frank E.

CONTRACT NO. F49620-87-C-0027

PROJECT NO. 3404

TASK NO. A2

MONITOR: AFOSR
TR-89-1239

UNCLASSIFIED REPORT

ABSTRACT: (U) Electrical and optical properties have been investigated in which the main focus of attention has been the conjugated macromolecule, poly-p-phenylene vinylene, its analogues, derivatives, copolymers and blends. The potential of PPV as a conducting polymer has been amply demonstrated and more recently it has been shown that this polymer has relatively high third order non-linear optical characteristics and, of equal importance, can be fabricated into oriented films and into blends with silica glass which have optical transmittances commensurate with device fabrication. New advanced ultrastructural polymer blends have been developed. (JES)

DESCRIPTORS: (U) *POLYMERS, ATTENTION, COPOLYMERS, ELECTRICAL PROPERTIES, FILMS, MACROMOLECULES, MIXTURES, OPTICAL PROPERTIES, SILICA GLASS, STRUCTURAL PROPERTIES, TRANSMITTANCE.

IDENTIFIERS: (U) WJAFOSR2404A2, PE81103F.

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DTIC REPORT BIBLIOGRAPHY

AD-A212 851 20/4 12/5
INDIANA UNIV-PURDUE UNIV AT INDIANAPOLIS SCHOOL OF
ENGINEERING AND TECHNOLOGY

(U) Block-Structured Solution of Three-Dimensional
Transonic Flows Using Parallel Processing.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-31 May 89.

AUG 89 20P

PERSONAL AUTHORS: Ecker, Akin

CONTRACT NO. AFOSR-87-0184

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-89-1256

UNCLASSIFIED REPORT

ABSTRACT: (U) The main objective of the program has been to implement and test the three-dimensional, block-structured Euler solver on computers with multiple processors. The developed scheme involves the partitioning of a large aerodynamics problem into several smaller problems where each represents a particular flow region. Each of these problems are Intel-IPSC computer with sixteen processors and IBM 3090 computer with four processors. In the case of IPSC, the memory is distributed between sixteen processors (4.5 megabytes each). In the case of IBM 3090, all four processors share the same large memory. Several test cases have been run on these computers and basic considerations for analyzing large problems on parallel computers have been investigated. Keywords: Transonic flows; Zonal methods; Euler equations; Parallel processing. (JHD)

DESCRIPTORS: (U) *AERODYNAMICS, *PROBLEM SOLVING, *MULTIPROCESSORS, *PARALLEL PROCESSING, DIFFERENTIAL EQUATIONS, MEMORY DEVICES, THREE DIMENSIONAL FLOW, TRANSONIC FLOW.

IDENTIFIERS: (U) Block Structures(Engineering), Zonal Methods, Euler Equations, WUAFOSR2307A1, PEB1102F.

AD-A212 851

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SEARCH CONTROL NO. EV156L

AD-A212 849 17/9 20/4 4/2 20/14

CONTROL DATA CORP MINNEAPOLIS MN METEOROLOGY RESEARCH CENTER

(U) The Interaction and Variation of Waves and Turbulence from MST Radar Data.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-31 Jul 89.

AUG 89 109P

PERSONAL AUTHORS: Peterson, Miriam R.

CONTRACT NO. F49820-88-C-0027

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR
TR-89-1242

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes research results on the interactions of gravity waves, small-scale turbulence, and the background weather conditions obtained using data from clear-air Doppler profilers (also called MST radars), and from aircraft and balloons. The major results from these studies are as follows: (1) It was found from analysis of a set of aircraft data taken near the tropopause and from MST radar taken in Alaska and Colorado that there is enhanced mesoscale variability over mountains compared to over plains or oceans. These observational results were compared with predictions from the theory of stratified turbulence and theory of Doppler-shifted gravity waves, and it was found that neither theory predicts all of the observed features. (2) Modeling of the refractivity turbulence structure constant (cn2) showed that small-scale shears of the horizontal wind are about twice as large over the mountainous regions of Colorado compared to over the plains of Illinois, presumably due to terrain differences. (3) It was found that gravity wave activity is enhanced near fronts, jet streams, and convective elements. (4) The flatland MST radar was used to monitor tropopause folding events under a variety of background conditions and a preliminary climatology of the occurrence of folds was developed. (5) The spectrum of vertical motions at

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV156L

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CONTINUED

Flatland was analyzed and was found to closely match predictions for a spectrum of Doppler-shifted gravity waves. (8) Temporal mean vertical velocities measured by the radar reflect the large-scale flow when weather systems are changing slowly enough that the radar sample is representative of a large area. (RH)

DESCRIPTORS: (U) *DOPPLER EFFECT, *FLOW, *GRAVITY WAVES, *JET STREAMS, *REFRACTION, *WAVES, *WEATHER, *WIND, AIRCRAFT, ALASKA, BACKGROUND, BALLOONS, CLIMATOLOGY, COLORADO, CONVECTION, FOLDING, HORIZONTAL ORIENTATION, ILLINOIS, MOTION, MOUNTAINS, OCEANS, RADAR, REGIONS, SPECTRA, STRATIFICATION, TERRAIN, THEORY, TROPopause, TURBULENCE, VARIATIONS, VERTICAL ORIENTATION.

IDENTIFIERS: (U) WUAFOSR2310A1, PE81102F.

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12/4

MISSOURI UNIV-COLUMBIA

(U) Iterative Methods for Linear Complementary and Related Problems.

DESCRIPTIVE NOTE: Final rept. 15 May 86-14 May 89.

MAY 89 26P

PERSONAL AUTHORS: Shiau, Tzong H.

CONTRACT NO AFOSR-86-0124

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-89-1254

UNCLASSIFIED REPORT

ABSTRACT: (U) A sparsity preserving LP-based SOR method for solving classes of linear complementary problems including the case where the given matrix is positive semidefinite is proposed. The LP subproblems need be solved only approximately by a SOR method. Heuristic enhancement is discussed. Numerical results for a special class of problems are presented, which show that the heuristic enhancement is very effective and the resulting program can solve problems of more than 100 variables in a few seconds even on a personal computer. Keywords: Linear; Programming; Successive overrelaxation method. (JHD)

DESCRIPTORS: (U) *LINEAR PROGRAMMING, *MATRIX THEORY, HEURISTIC METHODS, ITERATIONS, LINEARITY, MICROCOMPUTERS, NUMERICAL ANALYSIS, OPTIMIZATION, RELAXATION.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A8, Overrelaxation, Space Matrix.

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AD-A212 717 7/4 20/10

INSTITUTE FOR COMPUTER APPLICATIONS IN SCIENCE AND
ENGINEERING HAMPTON VA

STATE UNIV OF NEW YORK AT BUFFALO AMHERST

(U) Analysis of the SOR Iteration for the 9-Point
Laplacian.

(U) Quantum Mechanics of a Molecular System Adsorbed on a
Dielectric Surface.

JUL 89

DESCRIPTIVE NOTE: Final rept. 1 Jun 85-31 Aug 87.

DEC 86

PERSONAL AUTHORS: Oh, H. G.; Lee, H. R.; George, Thomas F.
; Um, C. I.; Choi, Y. M.

PERSONAL AUTHORS: Adams, Loyce M.; LeVeque, Randall J.;
Young, David M.

REPORT NO. 101

REPORT NO. ICASE-88-81

CONTRACT NO. F49620-88-C-0009

CONTRACT NO. AFOSR-85-0189, NAS1-18107

PROJECT NO. 2303

PROJECT NO. 2304

TASK NO. B3

TASK NO. A3

MONITOR: AFOSR
TR-89-1017

MONITOR: AFOSR, NASA

TR-89-1032, 178212

UNCLASSIFIED REPORT

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ABSTRACT: (U) This effort supported the research
activities of 20 researchers during their visit to ICASE.
as a result, 10 papers have appeared on issues related to
parallel computation including such titles as Reordering
computations for parallel execution, Multiprocessor L/U
decomposition with controlled fill-in, and Analysis of a
parallelized nonlinear elliptic boundary value problems
solver with applications to reacting flows. Keywords:
Laplacian equations; Matrices; SOR (Successive
Overrelaxation); Numerical analysis. (kr)

DESCRIPTORS: (U) *ITERATIONS, COMPUTATIONS, EQUATIONS.
NUMERICAL ANALYSIS, PARALLEL ORIENTATION.

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A3, SOR(Successive
Overrelaxation), Laplacian equations.

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v40 n1 p45-
53, 1 Jul 89.

ABSTRACT: (U) The study of time-dependent oscillator
systems has received a great deal of attention both in
classical and quantum-mechanical studies. In the usual
quantum mechanical treatment of these systems, a time
independent Hamiltonian is assumed, which must be
obtained through the Legendre transformation of the
Lagrangian function which describes the equation of
motion for the system. In this context, it is unlikely
that all physical oscillator systems have conserved
Hamiltonians. A molecular system adsorbed on a dielectric
surface is modeled as a damped harmonic oscillator driven
by a sinusoidal external force. The exact propagator and
wave function through the Feynman path-integral method
are obtained. The second quantization of this system is
carried out. Expectation values of several physical
quantities are evaluated. The amplitude for transitions
between harmonic-oscillator states and damped driven
oscillator states are obtained explicitly, and the result
is applied to a two-level system. Reprints. (AW)

DESCRIPTORS: (U) *QUANTUM THEORY, *QUANTUM CHEMISTRY,
*MOLECULAR PROPERTIES, *ADSORPTION, DAMPING, DIELECTRICS.

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EQUATIONS OF MOTION, HAMILTONIAN FUNCTIONS, HARMONIC GENERATORS, LAGRANGIAN FUNCTIONS, MOLECULAR STRUCTURE, OSCILLATORS, PHYSICAL PROPERTIES, QUANTITY, QUANTIZATION, REPRINTS, SURFACES, TIME, TIME DEPENDENCE, WAVE FUNCTIONS, SURFACE CHEMISTRY, INTEGRALS.

NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

(U) Potential Energy Surfaces for the Reaction $Si + H_2O$.

DESCRIPTIVE NOTE: Final rept. 1 Nov 86-31 Oct 89.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303B3, Time dependent oscillator Systems, Time independent Hamiltonian function, Legendre transformations, Sinusoidal external force, Feynman path Integral method.

88

PERSONAL AUTHORS: Sakai, Shogo; Gordon, Mark S.; Jordan, Kenneth D.

CONTRACT NO. AFOSR-87-0049

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-89-1169

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v92 n25 p7053-7057 1989.

ABSTRACT: (U) The potential energy surfaces for the reactions of silicon atom (1D and 3P) with the water molecule were calculated by abinitio self-consistent field (SCF) methods. The transition states for the insertion of silicon atom into the O-H bond of water were also calculated by the multiconfigurational SCF method. It is found that the crossing point of the singlet and triplet surfaces along the insertion reaction paths is near the transition state for the triplet rearrangement from the $Si:OH_2$ complex to $HSiOH$. The potential energy surfaces for the 1,2-hydrogen migration $HSiOH H_2SiO$ in the singlet and triplet states and the hydrogen (H_2) elimination from $HSiOH$ and H_2SiO were also investigated. Keywords: Chemical reactions; Surface reactions; Reaction kinetics; Molecule interactions; Reprints. (KT)

DESCRIPTORS: (U) *CHEMICAL REACTIONS, ATOMS, CONSISTENCY, CROSSINGS, HYDROGEN, INTERACTIONS, MOLECULES, POTENTIAL ENERGY, REACTION KINETICS, REPRINTS, SILICON, SURFACE REACTIONS, SURFACES, TRANSITIONS, WATER.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303B3.

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AD-A212 697 23/3

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INFORMATION THEORY SOCIETY (IEEE) PASADENA CA

(U) IEEE (Institute of Electrical and Electronic Engineers)
Conference on Neural Information Processing Systems -
Natural and Synthetic Held in Denver, Colorado on
November 8-12, 1987. Abstracts of Papers.

Information processing roles for the diverse currents
found the Hippocampal neurons; A computer simulation of
cerebral neocortex: Computational capabilities of
nonlinear networks; An adaptive and heterodyne filtering
procedure for the imaging of moving objects; Phase
transitions in neural networks. (Jhd)

DESCRIPTIVE NOTE: Rept. for 1 Nov 87-31 Oct 88.

JUN 89

PERSONAL AUTHORS: Posner, E. C.

CONTRACT NO. AFOSR-88-0007

PROJECT NO. 2305

TASK NO. 84

MONITOR: AFOSR
TR881061

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: Bifurcation analysis of a
network model of a rabbit olfactory bulb with periodic
attractors stored by a sequence learning algorithm; Model
of the cerebellum as an array of adjustable pattern
generators; Spontaneous and information-triggered
segments of series of human brain electric field maps;
Towards an organizing principle for perception: The role
of Hebbian synapses in the emergence of feature-analyzing
function; Synchronization in neural nets; New neural
algorithms for associative memory; A neural network
classifier based on coding theory; A trellis-structured
neural network; Minkowski-r back-propagation: Learning in
connectionist models with non-euclidian error signals;
Generalization of back-propagation to recurrent and high-
order networks; Partitioning of sensory data by a
cortical network; The generation of efficient
representations in neural net architectures using high
order correlations; Learning representations by
recirculation; Strategies for teaching layered networks
classification tasks; Stochastic learning networks and
their electronic implementation; Speech stabilization and
robots front ends for neural networks; Genetic database
analysis with neural nets; Dynamical neural networks and
their application to robot control; Simulations suggest

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DESCRIPTORS: (U) *COMPUTERIZED SIMULATION, *INFORMATION
PROCESSING, *NERVOUS SYSTEM, *NEURAL NETS, *RABBITS,
*SMELL, ADAPTIVE FILTERS, ALGORITHMS, COMPUTER
ARCHITECTURE, ASSOCIATIVE PROCESSING, CEREBELLUM,
CLASSIFICATION, CODING, COMPUTATIONS, CONTROL,
CORRELATION, CURRENTS, DATA BASES, DYNAMICS, EFFICIENCY,
ELECTRICAL PROPERTIES, FILTERS, FRONT ENDS AND SURFACES,
GENERATORS, GENETICS, HETERODYNING, HIPPOCAMPUS, IMAGES,
LEARNING, MODELS, MOVING TARGETS, NERVE CELLS, NETWORKS,
NONLINEAR SYSTEMS, PATTERNS, PERCEPTION, PHASE
TRANSFORMATIONS, RECIRCULATION, ROBOTS, SENSES(PHYSIOLOGY)
SEQUENCES, SPEECH, STABILIZATION, STOCHASTIC PROCESSES,
SYNAPSE, THEORY.

IDENTIFIERS: (U) PE61102F, WUAFOSR2305B4.

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AD-A212 677 9/3 14/5 14/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO FV156L
STANFORD UNIV CA CONTINUED
WUAFOSR3484A6

(U) Advanced Source Development and Applications. Laser-Produced Plasmas: A Compact Soft X-Ray Source with High Peak Brightness.

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 86-30 Sep 88.

JUL 89

PERSONAL AUTHORS: Byer, Robert L.

CONTRACT NO F49620-86-K-0019

PROJECT NO. 3484

TASK NO. A6

MONITOR: AFOSR
TR-89-1245

UNCLASSIFIED REPORT

ABSTRACT: (U) The development of high average power pulsed solid-state lasers and the application of these lasers to the generation of laser produced plasmas for soft-x-ray generation is described. A 44-W average power moving slab neodymium glass laser was demonstrated. In a separate experiment, injection seeding of this laser to produce 500-MW 11-ps pulses was attained. Soft-x-ray generation has been investigated with the moving slab laser, a fix slab laser, and commercial rod-geometry lasers. The techniques that were demonstrated show the feasibility of scaling the operation of slab lasers to the kilowatt level. The rapid development of diode-laser pumping techniques suggests the potential for remarkable efficient, compact and economical laser systems for short wavelength lithography and microscopy applications. (JHD)

DESCRIPTORS: (U) *SOLID STATE LASERS, *X RAY APPARATUS, *PLASMA DEVICES, BRIGHTNESS, FEASIBILITY STUDIES, HIGH RATE, INJECTION, LITHOGRAPHY, MICROSCOPY, MOTION, OPERATION, PEAK VALUES, PLASMAS(PHYSICS), SCALING FACTOR, NEODYMIUM LASERS, GLASS LASERS, SEEDING, SHORT WAVELENGTHS, SOFT X RAYS.

IDENTIFIERS: (U) *Laser Produced Plasmas. PE811030.

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AD-A212 070 20/6

AD-A212 670 CONTINUED

NEW YORK UNIV N Y DEPT OF PSYCHOLOGY

IDENTIFIERS: (U) WUAFOSR2313A5, PEG1102F

(U) Three Stages and Two Systems of Visual Processing.

89

PERSONAL AUTHORS: Sperling, George

CONTRACT NO. AFDSR-88-0140

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-89-1131

UNCLASSIFIED REPORT

ABSTRACT: (U) Three stages of visual processing determine how internal noise appears to an external observer: light adaptation, contrast gain control, and a postsensory/decision stage. Dark noise occurs prior to adaptation, determines dark-adapted absolute thresholds, and mimics stationary external noise. Sensory noise occurs after dark adaptation, determines contrast thresholds for sine gratings and similar stimuli, and mimics external noise that increases with mean luminance. Postsensory noise incorporates perceptual, decision, and mnemonic process. It occurs after contrast-gain control and mimics external noise that increases with stimulus contrast (i.e., multiplicative noise). Dark noise and sensory noise are frequently specific and primarily affect weak signals. Only postsensory noise significantly affects strong signals, and it has constant power over a wide spatial frequency range in which sensory noise varies enormously. Optics, Reprints. (Jes)

DESCRIPTORS: (U) *OPTICS, ADAPTATION(PHYSIOLOGY), BROADBAND, CONTRAST, CONTROL, DARK ADAPTATION, DARKNESS, DECISION MAKING, EXTERNAL, FREQUENCY, GAIN, GRATINGS(SPECTRA), IMAGE PROCESSING, INTERNAL, LOW STRENGTH, LUMINANCE, MEAN, MNEMONICS, MULTIPLICATION FACTOR, NOISE, OBSERVERS, POWER, RANGE(EXTREMES), REPRINTS, SENSES(PHYSIOLOGY), SIGNALS, SINE WAVES, SPATIAL DISTRIBUTION, STATIONARY, STIMULI, VISION, VISUAL PERCEPTION

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AD-A212 645 7/3

AD-A212 644 20 5

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF CHEMISTRY

CORNELL UNIV ITHACA NY LAB OF ATOMIC AND SOLID STATE PHYSICS

(U) Organometallic and Bioactive Cyclophosphazenes, and the Relationship to Inorganic Macromolecules.

(U) Ion-Surface Interaction Potentials from Alkali-Ion-Metal Scattering below 500 eV.

89

JUN 89

PERSONAL AUTHORS: Allcock, Harry R.

PERSONAL AUTHORS: Goodstein, D. M.; McEachern, R. L.; Cooper, B. H.

CONTRACT NO. AFOSR-84-C147

CONTRACT NO. AFOSR-88-0069

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. A2

MONITOR: AFOSR TR-89-1188

MONITOR: AFOSR TR-89-1160

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Phosphorus, Sulfur, and Silicon, v41 p119-133 1989.

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v39 n18 p13 129-13 138, 15 Jun 89-11.

ABSTRACT: (U) Cyclophosphazenes have two relationships to linear high polymers: first, they may function as 'monomers' for polymerization to high polymers; and second, they serve as small molecular reaction and structural models for the high polymers. These principles are illustrated by the behavior of cyclophosphazenes that bear organometallic side groups, and by species that have side units that are of biomedical interest. Some emerging applications of this chemistry are also mentioned. Organometallic, Phosphazenes, Polymer, Synthesis, Bioactive, Biomedical. (Jes)

DESCRIPTORS: (U) *ORGANOMETALLIC COMPOUNDS, *PHOSPHAZENE, *POLYMERS, CHEMISTRY, INORGANIC MATERIALS, LINEAR SYSTEMS, MACROMOLECULES, MODELS, MOLECULES, MONOMERS, POLYMERIZATION, RESPONSE, SIDES, STRUCTURAL PROPERTIES, SYNTHESIS(CHEMISTRY).

IDENTIFIERS: (U) PE81102F, WUAFOSR2303B2, Cyclophosphazenes, Phosphazene compounds.

ABSTRACT: (U) Classical-trajectory calculations using an ion-surface potential which is represented as a sum of ion-atom pair potentials plus an attractive imagelike potential are compared to experimental results for the scattering of Na⁺ and K⁺ from Cu(110) in the energy range 100 eV < or = E0 < or = 400 eV. The strong focusing of ion trajectories on this surface greatly enhances the sensitivity of the scattering to the form of the ion-surface interaction potential. We achieve very good agreement between calculated and experimental spectra using pair potentials computed within the Hartree-Fock approximation. Reprint, Ion, Ion Interactions. (Jes)

DESCRIPTORS: (U) *ION ION INTERACTIONS, FOCUSING, HARTREE FOCK APPROXIMATION, IONS, PARTICLE TRAJECTORIES, REPRINTS, SCATTERING, SENSITIVITY, SPECTRA.

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A2

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV156L

AD-A212 643

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CORNELL UNIV ITHACA NY LAB OF ATOMIC AND SOLID STATE PHYSICS

(U) Low-Energy Alkali Ion Scattering as a Probe of Resonant Charge Exchange on Cesium Cu(110).

JUN 89

PERSONAL AUTHORS: Kimmel, G. A.; Goodstein, D. M.; Cooper, B. H.

CONTRACT NO. AFOSR-88-0089

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR TR-89-1145

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Vacuum Science and Technology, A, V7 n3 p2186-2190 May/Jun 89.

ABSTRACT: (U) Intensities of Potassium cations and Lithium cations scattered from cesium-covered Copper (110) surfaces are measured as a function of cesium-induced work function shifts (Delta (Phi)) for (Delta (Phi)) up to approx. 2eV from the clean surface value. Various scattering geometries are used with beam energies ranging from 100eV to 1keV. Scattered K(+) energy spectra indicate that the adsorbate-induced changes in intensity are uniform for all scattered K(+) energies. Energy-integrated scattered K(+) intensities are measured as a function of the work function phi for different beam energies and scattering geometries. The intensity decrease with decreasing phi is attributed to an increase in the resonant electron transfer rate from the surface to the scattered particles. The work function dependence and the velocity dependence of the intensity decrease cannot be reproduced with a model of resonant charge transfer that treats the effect of the adsorbate layer as a uniform shift in the work function. To explain the observed charge transfer rates, both local and collective effects from the presence of low-coverage cesium adsorbates must be considered. Reprints. (AW)

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DESCRIPTORS: (U) *CATIONS, *CHARGE TRANSFER, *SCATTERING, *COPPER, *SURFACE REACTIONS, ALKALI METAL COMPOUNDS, ELECTRON TRANSFER, ENERGY, INTENSITY, IONS, LITHIUM, LOW ENERGY, PARTICLES, POTASSIUM, RATES, REPRINTS, RESONANCE, SHIFTING, SURFACES, VELOCITY, WORK FUNCTIONS, CESIUM, CRYSTALS, ADSORBATES.

IDENTIFIERS: (U) F581102F, WUAFOSR2303A2, *Ion Scattering, Resonant Charge Exchange, Energy Spectra, Beam Energy.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO (U) 533

AD-A212 533

12/5

KESTREL INST PALO ALTO CA

(U) Toward a Formal Model of the Design and Evolution of Software.

DESCRIPTIVE NOTE: Final rept. 1 Dec 87-31 May 89.

DEC 88

PERSONAL AUTHORS: Green, Cordell; Smith, Douglas R.

CONTRACT NO. F49620-88-C-0033

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-89-1253

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes recent activities on the development of a formal model of the design and evolution of software. The model is intended to be both descriptive and prescriptive. It is descriptive in that we are attempting to capture known design processes in the model. The model is also intended to be prescriptive in the sense that it provides the conceptual basis for the sophisticated knowledge-based software design environments of the future. It should have the flexibility to support a variety of design methodologies. be comprehensive enough to encompass the gamut of software lifecycle activities, and be precise enough to provide the conceptual foundations for an open yet rigorous development environment. We also present recent work on the structure and design of a class of algorithms called global search. The design tactic for global search algorithms provides a rich example of the kind of design process that the abstract model is intended to capture. We present a tactic for designing global search algorithms and illustrate it with the derivation of an algorithm for enumerating cyclic difference sets - a rare kind of set that bear some similarities to the prime numbers. The design tactic has been implemented and used to derivation dozens of global search algorithms including one for enumerating cyclic difference sets (kr)

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SEARCH CONTROL NO. EVI56L

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AD-A212 450 12/9

MINNESOTA UNIV MINNEAPOLIS

(U) Studies of Gas Turbine Heat Transfer Airfoil Surfaces and End-Wall Cooling Effects.

DESCRIPTIVE NOTE: Final rept. 1 Mar 86-28 Feb 89.

JUL 88

PERSONAL AUTHORS: Eckert, E. R.; Goldstein, R. J.; Patanker, S. V.; Simon, T. W.

CONTRACT NO. F49620-85-C-0049

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-89-1225

UNCLASSIFIED REPORT

ABSTRACT: (U) Understanding and prediction of the heat transfer in a turbine is dependent first on understanding the complex three dimensional flow that occurs around a blade. In a turbine passage there are complex (interacting) vortices, significant variation in surface curvature, flow separation, transition from laminar to turbulent flow and perhaps relaminarization, and the influence of high turbulence level in the free stream flow. Heat or mass transfer measurements, aside from providing the needed design information, can also tell us a great deal about the flow. The transport of heat or mass has been used to detect characteristics of flow which were not readily detectable by other means. Modeling for computation of the flow and heat transfer, also, require knowledge of the flow as well as transport data to check the validity of models and their accuracy (JES)

DESCRIPTORS: (U) *TURBINES, ACCURACY, COOLING, CURVATURE, FLOW, FLOW SEPARATION, FREE STREAM, HEAT, HEAT TRANSFER, LAMINAR FLOW, MASS TRANSFER, MEASUREMENT, MODELS, SURFACES, THREE DIMENSIONAL FLOW, TRANSPORT, TURBULENCE, TURBULENT FLOW, VALIDATION, VORTICES, WALLS.

IDENTIFIERS (U) PEG1102F, WUAFOSR2307A4.

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PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

(U) An Application of Tensor Theory to 3-D Shape Analysis.

DESCRIPTIVE NOTE: Final rept. 1 Jan 86-31 Dec 89.

DEC 89

PERSONAL AUTHORS: Ansari, Mirvan; Delp, Edward J.

CONTRACT NO. F49620-86-K-0008

MONITOR: AFOSR
TR-89-1214

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Annual Allerton Conference on Communication, Control and Computing, Monticello, IL 1-3 Oct 86.

ABSTRACT: (U) This paper presents two new approaches to address the shape recognition problem. The first concept is an extension of 2-D landmark-based shape analysis to the 3-D case. Secondly, it extends the work of Cyganski and Orr to rigid non-planar objects. Both approaches will be mathematically formulated, however no experimental results will be shown in this paper. (Jhd)

DESCRIPTORS: (U) *SHAPE, *PATTERN RECOGNITION, NONPLANAR, RIGIDITY, TENSORS, THEORY.

IDENTIFIERS: (U) PEG1102F.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EV1561

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UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES LOKER
HYDROCARBON RESEARCH INST

(U) Addition of Difluorocarbene to Poly(1,1-dimethyl-1-sila-cis-pent-3-ene) and Poly(1,1-dimethyl-1-sila-cis (and -trans)-pent-3-ene). Characterization of Microstructures by ¹H, ¹³C, ¹⁹F, and ²⁹Si NMR Spectroscopies.

89

PERSONAL AUTHORS: Zhou, Qingshan; Weber, William P.

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-89-1219

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Macromolecules. v22 n7 p2987-2994.

ABSTRACT: (U) Difluorocarbene, generated by the sodium iodide catalyzed decomposition of (trifluoromethyl) phenylmercury, adds stereospecifically to the carbon-carbon double bonds of poly(1,1-dimethyl-1-sila-cis-pent-3-ene) (I) as well as to those of poly(1,1-dimethyl-1-silacis- (and -trans)-pent-3-ene) (II) to yield product polymers of increased molecular weight. The microstructures of these difluorocarbene adduct polymers were characterized by ¹H, ¹³C, ¹⁹F, and ²⁹Si NMR spectroscopy. Their thermal stabilities were determined by thermogravimetric analysis. They were considerably less stable than the starting polymers I or II. Their molecular weight distributions were determined by gel permeation chromatography. Keywords: Differential scanning calorimetry. Reprints. (av)

DESCRIPTORS: (U) *MICROSTRUCTURE, *POLYMERS, *CARBENES, *FLUORINE COMPOUNDS, *METHYLENES, *ADDITION REACTIONS, CHEMICAL BONDS, CALORIMETRY, CARBON, DECOMPOSITION, DISTRIBUTION, GEL PERMEATION CHROMATOGRAPHY, IODIDES, MOLECULAR WEIGHT, REPRINTS, SCANNING, SODIUM, SPECTROSCOPY, THERMAL STABILITY, THERMOGRAVIMETRIC ANALYSIS, YIELD, METHYL RADICALS, SILICON COMPOUNDS.

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NUCLEAR MAGNETIC RESONANCE

IDENTIFIERS: (U) PEG1102F, WUAFOSR230382, *Pentenenes, Polypentenenes, Difluorocarbene, Trifluoromethyl phenylmercury, Mercury/trifluoromethyl phenyl, Nuclear magnetic resonance spectroscopy, Gel permeation chromatography, Differential scanning calorimetry, Carbon carbon bonds.

UNCLASSIFIED

AD-A212 446 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV158L

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AD A212 446 CONTINUED

TENNESSEE UNIV MEMPHIS DEPT OF ANATOMY AND NEUROBIOLOGY

(U) Changes in Premovement Activity in Primary Somatosensory Cortex Differ when Monkeys Make Hand Movements in Response to Visual versus Vibratory Cues.

89

IDENTIFIERS: (U) PE61102F, WWHFOSR 2312AZ,
Somatosensory Cortex, Visual Cues, Vibratory Cues.

PERSONAL AUTHORS: Nelson, R. J.; Douglas, V. D.

CONTRACT NO. AFOSR-88-0179

PROJECT NO. 2312

TASK NO. A2

MONITOR: AFOSR
TR-89-1220

UNCLASSIFIED REPORT

ABSTRACT: (U) Rhesus monkeys were taught to make identical wrist flexion and extension movements in response to higher a visual cue or to vibratory cues. Changes in firing rates that were not stimulus-associated but preceded the movements were measured for each primary somatosensory cortical neuron recorded under the two stimulus cued conditions. The onset of the premovement activity changes and the magnitude of these changes differed when visually cued trials were compared with vibratory cued trials that resulted in the same behavioral response. In general, the magnitudes of premovement activity changes were less and the onset of these changes occurred earlier for vibratory cued trials than for the corresponding trials triggered by the visual stimulus. These findings support the hypothesis that centrally generated modulatory influences arriving at primary somatosensory cortical neurons prior to movement onset may differ, depending upon the modality of the stimulus which signals that a movement may be initiated. **Keywords:** Nerve transmission; Reprints; Nerve impulses. (KT)

DESCRIPTORS: (U) *BEHAVIOR, *NERVE TRANSMISSION, *RESPONSE (BIOLOGY), FIRING RATES, HYPOTHESES, MONKEYS, CUES (STIMULI), NERVE IMPULSES, REPRINTS, RHESUS MONKEYS, STIMULI, VISUAL PERCEPTION, WRIST.

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MATERIALS RESEARCH SOCIETY PITTSBURGH PA

NEW ORLEANS UNIV LA DEPT OF CHEMISTRY

(U) New Materials Approaches to Tribology: Theory and Applications. Volume 140. Materials Research Society Symposium Proceedings.

(U) Analysis of Different Computational Treatments of Highly Strained Molecules.

JUN 89

DESCRIPTIVE NOTE: Final rept. 1 Jun 88-31 May 89.

PERSONAL AUTHORS: Pope, Larry E.; Fehrenbacher, Larry L.; Winer, Ward O.

PERSONAL AUTHORS: Seminario, Jorge M.; Politzer, P.

AUG 89

CONTRACT NO. DAAL03-88-G-0027, AFOSR-88-0210

CONTRACT NO. AFOSR-88-0068

MONITOR: ARO, AFOSR 28078.1-MS-CF, TR-89-1283

PROJECT NO. 2303

TASK NO. 83

TASK NO. 83

MONITOR: AFOSR

MONITOR: AFOSR TR-89-1198

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Materials Research Society, 9800 McKnight Rd., Suite 327, Pittsburgh, PA 15237. HC \$52.00. No copies furnished by DTIC/NTIS.

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v159 n1 p27-31, 30 Jun 89.

ABSTRACT: (U) The symposium emphasized the tribology of solid surfaces in extreme environments. The primary purpose of the Materials Research Society sponsoring this symposium was to provide opportunity for tribologists and other materials scientists to interact. The symposium topics covered a broad range of tribological issues, from atomic and molecular scale calculations to experimental procedures for measuring tribological parameters in extreme environments. Sessions were held that emphasized coatings, solid film lubricants, ceramics, lubricious oxides, and the effects of ion and laser processing. Two sessions on ion and laser modified surfaces were held jointly with the symposium on 'Processing and Characterization of Materials Using Ion Beams.' Keywords: Ion beams. (AW)

DESCRIPTORS: (U) *CERAMIC MATERIALS, *COATINGS, *SOLID FILM LUBRICANTS, *SYMPOSIA, *TRIBOLOGY, COMPUTATIONS, ENVIRONMENTS, ION BEAMS, LASERS, MATERIALS, MOLECULES, OXIDES, PROCESSING, RANGE(EXTREMES), SCALE, SCIENTISTS, SOCIETIES, SOLID BODIES, SURFACES, ATOMIC PROPERTIES.

DESCRIPTORS: (U) *ORGANIC NITROGEN COMPOUNDS, *MOLECULAR STRUCTURE, *VIBRATIONAL SPECTRA, *QUANTUM CHEMISTRY, CHEMICAL BONDS, CHEMICAL DERIVATIVES, COMPUTATIONS, CONSISTENCY, FREQUENCY, MOLECULES, NITRO RADICALS, REPRINTS, VIBRATION, MOLECULAR PROPERTIES, PERTURBATION THEORY.

IDENTIFIERS: (U) PE81102F, WJAFOSR2303B3, Bond order.

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*Tetrahedrane. *Highly strained molecules. Hedranes. Aza radicals. Moller plesset perturbation theory.

AD-A212 324 12/2 20/14

SOUTHERN METHODIST UNIV DALLAS TX DEPT OF MATHEMATICS

(U) Variation of Wave Action: Modulations of the Phase Shift for Strongly Nonlinear Dispersive Waves with Weak Dissipation.

DESCRIPTIVE NOTE: Rept. for 4 Aug 87-29 Mar 88.

88

PERSONAL AUTHORS: Haberman, Richard; Bourland, F. J.

CONTRACT NO. AFOSR-87-0134

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-89-1189

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physica D, v32 p72-82 1088.

ABSTRACT: (U) Strongly nonlinear dispersive wave described by a general Klein-Gordon equation with slowly varying coefficients and a dissipative perturbation are analyzed using the method of multiple scales. We use the exact equation of wave action. The spatial and temporal modulations of the phase shift are shown to be governed by a new equation, which results from linearization of the wave action, its flux, and its dissipation due to perturbations of the slow parameters: frequency and wave number (vector). This result extends to nonlinear partial differential equations, the quite recent work by the authors on nonlinear oscillations governed by ordinary equations. Reprints. Keywords: Wave equations; Reprints. (UHD)

DESCRIPTORS: (U) *WAVE EQUATIONS, COEFFICIENTS, DISPERSIONS, DISSIPATION, FREQUENCY, LINEARITY, LOW STRENGTH, NONLINEAR DIFFERENTIAL EQUATIONS, OSCILLATION, PARAMETERS, PERTURBATIONS, PHASE SHIFT, REPRINTS, SCALE, VARIATIONS, PARTIAL DIFFERENTIAL EQUATIONS.

IDENTIFIERS: (U) Klein Gordon equations. PE61102F.
WUAFOSR2304A9.

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SEARCH CONTROL NO EVI56L

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MICHIGAN UNIV ANN ARBOR

(U) Stochastic Process Models in Device Physics.

DESCRIPTIVE NOTE: Final rept. Jun 88-Aug 89.

AUG 89

PERSONAL AUTHORS: Hoppe, Fred M.

CONTRACT NO. AFOSR-88-0047

PROJECT NO. 2304

TASK NO. AS

MONITOR: AFOSR
TR-89-1252

UNCLASSIFIED REPORT

ABSTRACT: (U) The aim of this project was to undertake a statistical study of Monte Carlo methods in device physics using tools from the modern theory of probability and stochastic processes. The Monte Carlo approach has been used to obtain numerical estimates of parameters by simulating the physical process on a computer rather than attempting to solve the integrodifferential equations which arise. Thus this method estimates averages and can be applied to any quantity expressible as such but may require an enormous number of simulations before statistically reliable results are obtained, especially if the quantity of interest is subject of very low probability of occurrence. A probabilistic study was undertaken of the behaviour of individual electrons, complementing the Monte-Carlo approach. The methodology required the formulation of some novel stochastic processes and suggested new types of conditions for ergodicity of Markov processes. (JHD)

DESCRIPTORS: (U) *ERGODIC PROCESSES, *TOOLS, *STOCHASTIC PROCESSES, DIFFERENTIAL EQUATIONS, ELECTRONS, ESTIMATES, INTEGRAL EQUATIONS, LOW RATE, MARKOV PROCESSES, MATHEMATICAL MODELS, MEAN, MONTE CARLO METHOD, NUMERICAL ANALYSIS, PARAMETERS, PHYSICAL PROPERTIES, PROBABILITY, RELIABILITY, SIMULATION, STATISTICAL ANALYSIS, THEORY.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304AS.

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WISCONSIN UNIV-MADISON

(U) Experimental and Theoretical Study of the Relaxation of Vibrationally Excited HF by NO and CO.

AUG 89

PERSONAL AUTHORS: Rensberger, K. J.; Blair, J. T.; Weinhold, F.; Crim, F. F.

CONTRACT NO. AFOSR-89-0028

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-89-1209

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v91 n3 p1688-1696, 1 Aug 89.

ABSTRACT: (U) We employ laser double resonance techniques to measure the rates of gas-phase collisional deactivation of vibrationally excited hydrogen fluoride by nitric oxide molecules, in order to compare the relaxation efficiency of this free radical species with carbon monoxide and other closed shell molecules whose vibrational dynamics are well known. Although the near-resonant energy gaps for hydrogen fluoride collisional energy transfer are less favorable for Nitric oxide than for Carbon monoxide, we find that Nitric oxide is as much as an order of magnitude more efficient than Carbon monoxide in relaxation hydrogen vibrations. Since the nitric oxide and carbon monoxide collision partners have rather similar dipole moments (0.153 vs 0.112 D), rotational constants (1.17 vs 1.93/cm), and molecular weights, the disparity in vibrational relaxation efficiency may come from chemical factors, particularly the open vs closed shell electronic character, associated with long range interactions. Ab initio calculations and natural bond orbital (NBO) analysis of the structure and energetics of NO-HF and CO-HF complexes indicate that the NO monomer is better able to form effective π yields sigma* donor-acceptor H bonds to HF over a wide range of nonlinear acceptance angles. Compared to CO, NO presents

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a significantly attractive potential to HF over an appreciably wider range of collision orientations, leading to structures in which HF stretching couples to other internal modes of the transient complex and vibrational excitation is efficiently quenched. Reprints. (AM)

DESCRIPTORS: (U) *CARBON MONOXIDE, *HYDROGEN FLUORIDE, *NITROGEN OXIDES, *RELAXATION, *MOLECULAR VIBRATION, *MOLECULE MOLECULE INTERACTIONS, ANGLES, CHEMICAL BONDS, CHEMICAL PROPERTIES, COLLISIONS, CONSTANTS, DIPOLE MOMENTS, DYNAMICS, EFFICIENCY, ELECTRONIC STATES, ENERGETIC PROPERTIES, ENERGY GAPS, EXCITATION, FREE RADICALS, HYDROGEN INTERNAL LASERS, MOLECULAR WEIGHT, MOLECULES, NONLINEAR SYSTEMS, ORIENTATION(DIRECTION), REPRINTS, RESONANCE, MOLECULAR ROTATION, TRANSIENTS, MOLECULAR ENERGY LEVELS, ENERGY TRANSFER, QUENCHING, HYDROGEN BONDS, MOLECULAR COMPLEXES, VAPOR PHASES.

IDENTIFIERS: (U) WUAFOSR230381, PE61102F, Molecular Collisions, *Molecular Relaxation, Nitric Oxide, Ab Initio Calculations, NBO(Natural Bond Orbital), Closed Shell Molecules.

DELAWARE UNIV NEWARK
(U) Continuous Finite Elements in Space and Time for the Heat Equation.

DESCRIPTIVE NOTE: Rept. for 8 Apr 87-28 Apr 88.

APR 89

PERSONAL AUTHORS: Aziz, A. K.; Monk, Peter

CONTRACT NO. AFOSR-86-0087

PROJECT NO. 2304

TASK NO. A9

MONITOR: AFOSR
TR-89-1197

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Mathews
v52 n186 p255-274 Apr 89. Computation.

ABSTRACT: (U) This reprint analyzes a new variational method for approximating the heat equation using continuous finite elements in space and time. In the special case of linear elements in time the method reduces to the Crank-Nicolson Galerkin method with time-averaged data. Using higher-order finite elements in time, we obtain a new class of time stepping methods related to collocation the standard spatial Galerkin differential equations in time at the Gauss-Legendre points. Again the data enters via suitable time averages. We present error estimates and the results of some numerical experiments. (JHD)

DESCRIPTORS: (U) *FINITE ELEMENT ANALYSIS, *HEAT TRANSFER, DIFFERENTIAL EQUATIONS, ERROR ANALYSIS, VARIATIONAL METHOD, ESTIMATES, LINEAR SYSTEMS, NUMERICAL METHODS AND PROCEDURES, REPRINTS.

IDENTIFIERS: (U) Crank Nicolson Galerkin Method, Galerkin Method, Gauss Legendre Points, WUAFOSR2304A9, PE61102F.

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SOUTHERN METHODIST UNIV DALLAS TX DEPT OF MATHEMATICS

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES

(U) The Modulated Phase Shift for Strongly Nonlinear, Slowly Varying and Weakly Damped Oscillators.

(U) Addition of Dichlorocarbene to cis-1,4-poly(2-Trimethylsilylmethyl 1,3-Butadiene) Fluoride Catalyzed Elimination of Trimethylchlorosilane from cis-1,4-poly(2,3-Dichloromethylene-2-Trimethylsilylmethyl-1,3-Butadiene)

DESCRIPTIVE NOTE: Rept. for 8 Jun 87-4 Aug 88,

AUG 88

89

PERSONAL AUTHORS: Bourland, F. J.; Haberman, Richard

PERSONAL AUTHORS: Jiang, Wan; Ding, Yi-Xiang; Weber, William P.

CONTRACT NO. AFOSR-87-0134

PROJECT NO. 2304

CONTRACT NO. AFOSR-89-0007

TASK NO. A9

PROJECT NO. 2303

MONITOR: AFOSR TR-89-1198

MONITOR: AFOSR TR-89-121

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SIAM Jnl. of Applied Mathematics, v48 n4 p737-748 Aug 88.

SUPPLEMENTARY NOTE: Pub. in Polymer Bulletin, v21 p541-547 1989.

ABSTRACT: (U) The phase shift and corresponding small frequency modulation for weakly dissipated nonlinear oscillators with slowly varying coefficients is calculated for the first time. This extends and corrects earlier work by Kuzmak, Luke, and Dobrokhotov and Maslov. Keywords: Nonlinear oscillator, Slowly varying oscillator, Reprints. (RRH)

ABSTRACT: (U) Copolymers made up of 1,4-(2,3-dichloromethylene 2-trimethylsilylmethyl-1,3-butadiene) (I) and 1,5-(3-chloro-2-methylene-pent-3-en-1-yl) units (II) have been prepared by potassium fluoride elimination of trimethylchlorosilane from cis-1,4-poly(2,3-dichloromethylene-2-trimethylsilylmethyl-1,3-butadiene) (III). III was prepared by the addition of dichlorocarbene to 1,4-poly(2-trimethylsilylmethyl-1,3-butadiene) (cis/trans = 9/1) (IV). Polymer III was characterized by ¹H, ¹³C and ²⁹Si NMR as well as by elemental analysis. The copolymer was characterized by ¹H, ¹³C, and ²⁹Si NMR spectroscopy. The ratio of I and II units in the copolymer were determined by ¹H NMR and elemental analysis. Keywords: Dichlorocarbene, Fluoride elimination, 1,4-poly(2-trimethylsilylmethyl-1,3-butadiene) Reprints. (AW)

DESCRIPTORS: (U) *DAMPING, *FREQUENCY MODULATION, *NONLINEAR SYSTEMS, *OSCILLATORS, *PHASE SHIFT, COEFFICIENTS, MODULATION, REPRINTS.

DESCRIPTORS: (U) *CHLOROSILANES, *COPOLYMERS, *ELIMINATION REACTIONS, *POLYBUTADIENE, FLUORIDES, METHYL RADICALS, POTASSIUM, RATIOS, REPRINTS, SPECTROSCOPY, CATALYSIS, ADDITION REACTIONS, SYNTHESIS/CHEMISTRY.

IDENTIFIERS: (U) WUAFOFSR2304A9, PE81102F.

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NEW ORLEANS UNIV LA DEPT OF CHEMISTRY

IDENTIFIERS: (U) Dichlorocarbene, Fluoride/Cis-1-4-Poly(2-Trimethylsilylmethyl-1-3-Butadiene), Trimethylchlorosilane, Butadiene/Cis-1-4-Poly(2-3-Dichloromethylene-2-Trimethylsilylmethyl-1-3), Chloromethylene Pentenes, Nuclear Magnetic Resonance Spectroscopy, Pentenes.

(U) Relative Bond Strengths in Tetrahedrane, Prismane, and Some of Their Aza Analogs, 89

PERSONAL AUTHORS: Politzer, Peter; Seminario, Jorge

CONTRACT NO. AFOSR-88-0088

PROJECT NO. 2303

TASK NO. 83

MONITOR: AFOSR
TR-89-1194

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Struct. Chem., v1 p29-32 1989.

ABSTRACT: (U) Ab initio molecular orbital calculations at the 3-21G level have been employed to explore structures, bond order, and bond deviation indices for a series of aza- and diazatetrahedranes and aza-, diaza-, triaza-, and tetraazaprismanes as well as their hydrocarbon analogs. The introduction of nitrogens has the effect of strengthening C-C and some of the N-C bonds, while the presence of N-N bonds introduces a decrease in relative thermodynamic stability in the azaprismane series. Keywords: Carbon; Organic nitrogen compounds; Ab initio; Self consistent field calculations; Bond strain; Nitrogen; Gaussian procedure. (AW)

DESCRIPTORS: (U) *HYDROCARBONS, *MOLECULAR ORBITALS, *ORGANIC NITROGEN COMPOUNDS, *CHEMICAL BONDS, *QUANTUM CHEMISTRY, *CHEMICAL ANALOGS, *CARBON, *COMPUTATIONS, *CONSISTENCY, *INDEXES, *NITROGEN, *STABILITY, *STRENGTH(GENERAL), *THERMODYNAMICS, *MOLECULAR ENERGY LEVELS, *STATISTICAL PROCESSES.

IDENTIFIERS: (U) *Bond Strength, *Tetrahedranes, *Prismanes, *Aza Radicals, *Hedranes, Bond Order, Ab Initio Molecular Orbital Calculations, Azatetrahedranes, Diazatetrahedranes, Azatetraprismanes, Diazatetraprismanes, Triazatetraprismanes, Azaprismanes, Bond Strain, Self Consistent Field Calculations, Gaussian

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NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

(U) Theoretical Studies of Three-Membered Ring Compounds
Y(2)H(4)X (Y = C, Si; X = CH(2), NH, O, SiH(2), PH, S).

89

PERSONAL AUTHORS: Boatz, Jerry A.; Gordon, Mark S.

CONTRACT NO. AFOSR-87-0049

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-89-1168

UNCLASSIFIED REPORT

Availability: Document partially illegible.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry,
v93 n8 p3025-3029 1989.

ABSTRACT: (U) The heats of formation of the three-membered ring compounds Y2 H4X (Y = C, Si; X = CH2, NH, O, SiH2, Ph, S) and the thermodynamics of the insertion reactions X + YH = YH2 yields (C)-Y2H4X are predicted by using MP2/6-31G(d) energies at the 6-31G(d) geometries. Bent bond lengths are calculated by tracing the path of maximum electron density connecting two nuclei with the 6-31 G (2d) basis set at the 6-31 G (d) structures. The short Si-Si internuclear distances in Si2H4X (X = CH2, NH, O, PH,S) apparently are the result of severe bond bending rather than significant p character in the Si-Si bonds. Reprints. (AW)

DESCRIPTORS: (U) *CYCLIC COMPOUNDS. *HEAT OF FORMATION. *THERMOCHEMISTRY, BENDING, CHEMICAL BONDS, HIGH RATE, INTENSITY, LENGTH, REPRINTS, THEORY, THERMODYNAMICS, ELECTRON DENSITY, MOLECULAR STRUCTURE, CARBON, SILICON, HYDROCARBONS, AMINES, OXYGEN, SILANES, PHOSPHORUS, SULFUR.

IDENTIFIERS: (U) PE81102F, WJAFOSR2303B3, Ring Compounds, Insertion Reactions, Bond Length, Internuclear Distance, Silicon Silicon Bonds.

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SEARCH CONTROL NO. EVI58L

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WISCONSIN UNIV-MADISON DEPT OF PHYSICS

(U) Self-Consistent Kinetic Model of the Cathode Fall of a Glow Discharge.

JUN 89

REPRINTS, SIMULATION, SOLUTIONS(GENERAL), SPATIAL DISTRIBUTION, VARIABLES, GREENS FUNCTION.

IDENTIFIERS: (U) Self consistent models. PEG1102F. WUAFOSR2301A7.

PERSONAL AUTHORS: Sommerer, T. J.; Hitchon, W. N.; Lawler, J. E.

CONTRACT NO. AFOSR-84-0328

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-89-1218

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v39 n12
p6356-6366, 15 Jun 89.

ABSTRACT: (U) The electrons in the cathode-fall (CF) region of a helium dc glow discharge have been modeled at the kinetic level with a self-consistent electric field using a convective scheme (CS) (propagator or Green's-function) solution method. The CS is both straight forward to implement and numerically efficient. CS electron calculations using one spatial and two velocity variables are shown to match Monte Carlo simulations of swarms in uniform E/N and in the CF. The CS predictions are also shown to match experimental swarm results. A self-consistent CF solution is obtained through a slow relaxation of the electric field to that indicated by Poisson's equation. The electric field configuration as predicted by the CS agrees well with optogalvanic measurements. The discussion emphasizes both the physical nature of, and the difficulties associated with, a self-consistent-field calculation. Keywords: Electrons; Helium dc glow discharge; Cathode fall; Convective scheme; Reprints. (JHD)

DESCRIPTORS: (U) *CATHODES, *GLOW DISCHARGES, CONFIGURATIONS, CONSISTENCY, CONVECTION, DIRECT CURRENT, ELECTRIC FIELDS, ELECTRONS, HELIUM, KINETICS, MODELS, MONTE CARLO METHOD, POISSON EQUATION, RELAXATION.

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PERTURBATIONS, PRESSURE GRADIENTS, SOLIDS, STALLING, SURFACES, WEDGES.

IDENTIFIERS: (U) Reattached flow, Forcing frequencies, PEG1102F, WUAFOSR2307A2.

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TEL-AVIV UNIV (ISRAEL)

(U) The Delay of Turbulent Boundary Layer Separation by Oscillatory Active Control.

DESCRIPTIVE NOTE: Final rept. Aug 87-Oct 88.

APR 89

PERSONAL AUTHORS: Katz, Y.; Nishri, B.; Wagnanski, I.

CONTRACT NO. AFOSR-86-0323

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-89-1228

UNCLASSIFIED REPORT

ABSTRACT: (U) Flow over a solid wedge from which a fully developed, turbulent boundary layer separates naturally, was investigated experimentally. The flow, which separates at the geometric discontinuity, turns into a free mixing layer downstream of it. However the flow can be forced to reattach by introduction of two-dimensional, harmonic, and small-amplitude perturbations at the apex of the wedge. The temporally-averaged characteristics of the reattached boundary layer are typical to flows at less severe pressure gradients, with the exception of the spanwise coherence near the solid surface which has been notably enhanced by the imposed perturbations. Phase-locked and ensemble-averaged results indicate that the subharmonic frequency dominates the flow at large distances from the apex at all forcing frequencies considered thus far. The preliminary results which are presented indicate that this might be an effective way to delay separation of turbulent as well as laminar boundary layers. Keywords: Boundary layer flow; Flow separation; Boundary layer control; Stalling; Israel. (EDC)

DESCRIPTORS: (U) *BOUNDARY LAYER CONTROL, *FLOW SEPARATION, *TURBULENT BOUNDARY LAYER, BOUNDARY LAYER FLOW, COHERENCE, DELAY, DISCONTINUITIES, TWO DIMENSIONAL FLOW, FREQUENCY, HARMONICS, ISRAEL, LAMINAR BOUNDARY LAYER, LAYERS, RANGE(DISTANCE), MIXING, OSCILLATION.

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REMSELAER POLYTECHNIC INST TROY NY DEPT OF CIVIL
ENGINEERING

(U) Micromechanical Behavior and Modelling of Granular
Soil.

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UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of this study was to develop a constitutive law for granular soil based on the particulate nature of the material. This is accomplished by a systematic, mostly analytical approach to the problem, starting from the response of the contact between two elastic rough spheres subjected to arbitrary normal and tangential forces, and continuing with the response of regular and random arrays of spheres. The following tasks were completed: a) study and compilation of the differential stress-strain relationships of several regular arrays of identical quartz spheres; b) use of the Self Consistent and Nonlinear Finite Element methods to calculate the small strain, monotonic and cyclic stress-strain behavior of random/regular arrays of identical quartz spheres loaded isotropically and anisotropically, including wave velocity predictions; and c) use of Nonlinear Distinct Element simulations of two-dimensional random arrays of quartz spheres to determine their small and large strain response, including the initial position and subsequent translation and distortion of yield surfaces. The main features of a proposed constitutive law for granular media are discussed. The law is basically the stress-strain equivalent of the force-deformation model for the contact between two spheres, enhanced to incorporate dilation and

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the distortion of yield surfaces due to prestrain which has been observed in granular media. The proposed stress-strain law includes an infinite number of yield surfaces of conical shape initially parallel to each other. (edc)

DESCRIPTORS: (U) *QUARTZ, *SOIL MECHANICS, *FINE GRAINED MATERIALS, *STRESS STRAIN RELATIONS, ARRAYS, CONICAL BODIES, CYCLES, DISTORTION, ELASTIC PROPERTIES, PREDICTIONS, RESPONSE, ROUGHNESS, SHAPE, SPHERES, SURFACES, TWO DIMENSIONAL, VELOCITY, WAVES, YIELD.

IDENTIFIERS: (U) PC61102F, WUAFOSR2302C1, *Granular soils, *Micromechanics.