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1. AGENCY USE ONLY (leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED FINAL/01 JUN 91 TO 31 MAY 94
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4. TITLE AND SUBTITLE LOCALIZATION PHENOMENON IN SOME RANDOM CLASSICAL SYSTEMS (U)	5. FUNDING NUMBERS
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6. AUTHOR(S) Professor Alexander Figotin	2304/A4 AFOSR-91-0243
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Department of Mathematics Univ of North Carolina Charlotte, NC 28223	8. PERFORMING ORGANIZATION REPORT NUMBER AFOSR-TR-93-0207
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9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) AFOSR/NM 110 DUNCAN AVE, SUITE B115 BOLLING AFB DC 20332-0001	10. SPONSORING/MONITORING AGENCY REPORT NUMBER AFOSR-91-0243
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11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE: DISTRIBUTION IS UNLIMITED	12b. DISTRIBUTION CODE UL
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13. ABSTRACT (Maximum 200 words)

For the reported period the researchers focused on several problems on the propagation of electromagnetic and acoustic waves in periodic and disordered media. (1) Localization properties of some discrete models for light. (2) Existence of gaps and exponential localization for the Anderson type models for periodic and disordered acoustic dielectric media and (3) Band-gap structure for periodic two component dielectric and acoustic media.

19950403 052

14. SUBJECT TERMS	15. NUMBER OF PAGES
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	16. PRICE CODE
18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	20. LIMITATION OF ABSTRACT SAR (SAME AS REPORT)
19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	

AFOSR-91-0243

FINAL TECHNICAL REPORT
on the research project
"Localization Phenomenon in Some
Random Classical Systems"

A. Figotin

July 20, 1994

For the reported period I focused on several problems on the propagation of electromagnetic and acoustic waves in periodic and disordered media.

- Localization properties of some discrete models for light, [1,2]
- Existence of gaps and exponential localization for the Anderson type models for periodic and disordered acoustic and dielectric media, [3,6,7]
- Band-gap structure for periodic two component dielectric and acoustic media, [4,5,8]

The detailed information on the work done was presented in the annual reports as well as copies of the papers and preprints which have been already sent to the Air Force Office of Scientific Research.

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Unannounced	<input type="checkbox"/>
Justification:	
By _____	
Distribution/_____	
Availability Codes	
Dist	Avail and/or Special
A-1	

Papers Published and Submitted

- [1] *The Localization Properties of a Random Steady Flow on a Lattice*, Journal of Statistical Physics, **66**, 1599-1612, 1992
- [2] *One Model of a Nonhomogeneous Medium Conducting Light*, Journal of Statistical Physics, **69**, 969-993, 1992.
- [3] *Existence of Gaps in the Spectrum of Periodic Structures on a Lattice*, Journal of Statistical Physics, **73**, 571-585, 1993.
- [4] *Band-Gap Structure of the Spectrum of Periodic Maxwell Operator*, Journal of Statistical Physics, **74**, 447-455, 1994 (with P. Kuchment)
- [5] *Photonic Pseudogaps for Periodic Dielectric Structures*, Journal of Statistical Physics, **74**, 433-446, 1994
- [6] *Localization Phenomenon in Gaps of the Spectrum of Random Lattice Operators*, Journal of Statistical Physics, **75**, 997-1021, 1994 (with A. Klein)
- [7] *Localization of Electromagnetic and Acoustic Waves in Random Media. Lattice Model*, Journal of Statistical Physics, **76**, 885-1003, 1994 (with A. Klein)
- [8] *Band-Gap Structure of the Spectrum of Periodic Dielectric and Acoustic Media. I. Scalar model*, (submitted), 1994 (with P. Kuchment)