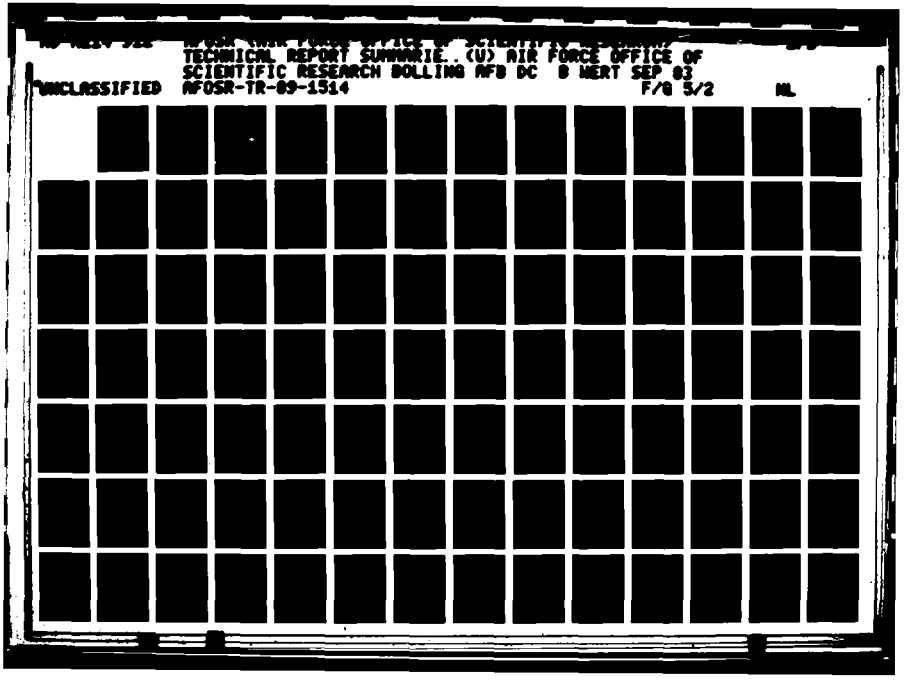
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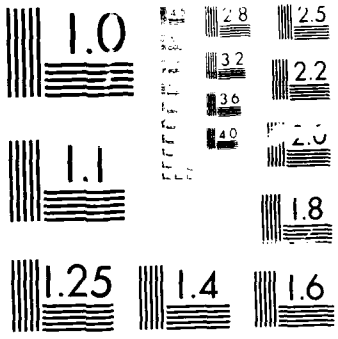
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PRINCETON COMBUSTION RESEARCH LABS INC NJ

Catalytic Combustion for Advanced Jet Engines. (U)

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ABSTRACT: A catalytic combustion system intended as a substitute for the conventional type of combustion system in a gas turbine (which involves a head-end primary hot flame followed by temperature reduction by air dilution) has to offer at least the same level of performance and, in addition, some distinct advantages. (Author) (U)
DESCRIPTORS: *Combustors, *Jet engines, *Catalysts, Gas turbines, Substrates, Platinum, Military applications, Thermodynamics, Efficiency, Performance(Engineering), Optimization, Emission control (U)
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PITTSBURGH UNIV PA DEPT OF METALLURGICAL AND MATERIALS ENGINEERING

Fundamental Research Directed to Advanced High Temperature Coating Systems Beyond the Current State-of-the-Art Systems. (U)

DESCRIPTIVE NOTE: Annual rept. no. 3, 1 Jan-31 Dec 82,
JUN 83 51P Meier,G. H. ;Pettit,F. S. ;
CONTRACT: AFOSR-80-0089
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0723

UNCLASSIFIED REPORT

ABSTRACT: The oxidation in air of nickel-silicon alloys with compositions extending from 5 to 20 weight-silicon have been studied over the temperature interval between 900 and 1100 degs C. In the case of alloys with less than 20% silicon, the silicon is not oxidized internally nevertheless the rates of oxidation are greater than those for alloys upon which alumina scales are formed. The alloy with 20% silicon exhibited oxidation rates less than those associated with alumina scales under similar conditions. The scales which developed upon the Ni-20 silicon alloy are in the process of being identified. It appears that silicon rich coatings have the potential of being used in place of present state-of-the-art MCrAlY coatings. The adherence of alumina formed on alloys of Ni-20Cr-10Al and Co-20Cr-10Al with yttrium or hafnium has been studied by using cyclic oxidation tests, acoustic emission measurements and by measuring the load required to pull scales from substrates. These studies have shown that the following parameters affect alumina scale adherence: oxygen active element type and concentration; base alloy composition (e.g. nickel-versus cobalt-base); alloy surface condition; specimen cooling rate, and exposure time of specimen to oxidation conditions. The acoustic emission technique of studying damage in alumina scales on alloys appears to provide a means of nondestructively determining the useful lives of coatings on alloys that remain after use under service conditions. (Author) (U)
DESCRIPTORS: *Coatings, *Metal coatings, Nickel (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A131 616 8/13

NORTHWESTERN UNIV EVANSTON IL

Inherent Anisotropy and Shear Strength of Assembly of Oval Cross-Sectional Rods, (U)

SEP 82 13P Konishi,Junichi ;Oda, Masanobu ;Nemat-Nasser,Siavouche ;

CONTRACT: AFOSR 80-0017, NSF-CME80-07764
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0654

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Deformation and Failure of Granular Materials, p403-412, 31 Aug-3 Sep 82.
Reprint: Inherent Anisotropy and Shear Strength of Assembly of Oval Cross-Sectional Rods.

DESCRIPTORS: *Soil models, *Microstructure, *Photoelasticity, *Anisotropy, Shear strength, Deformation, Loads(Forces), Sand, Granules, Soil mechanics, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2307C1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 615 9/2 13/8

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

Parallel Processing for Computer Vision, (U)

MAY 82 9P Delp,Edward J. ;Mudge,T. N. ;Siegel,Leah J. ;Siegel,H. J. ;

CONTRACT: AFOSR-78-3581, NSF-ECS79-09016
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0670

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Society of Photo-Optical Instrumentation Engineers, v336 7p May 82.
Reprint: Parallel Processing for Computer Vision.

DESCRIPTORS: *Robotics, *Visual perception, *Parallel processing, Automata, Industrial production, Optical processing, Algorithms, Computer programming, Reprints (U)
IDENTIFIERS: *Computer vision, PE61102F, WUAFOSR2304A2 (U)

AD-A131 610 21/2 20/4 21/5

CALIFORNIA INST OF TECH PASADENA

Linear Theory of Pressure Oscillations in Liquid-Fueled Ramjet Engines, (U)

JAN 83 16P Yang,V. ;Culick,F. E. C. ;

CONTRACT: AFOSR-80-0265
PROJ: 2308
TASK: A2
MONITOR: AFOSR TR-83-0649

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-A130 882. Pub. in Proceedings of the AIAA Aerospace Sciences Meeting (21st), p1-13, 10-13 Jan 83.
Reprint: Linear Theory of Pressure Oscillations in Liquid-Fueled Ramjet Engines.

DESCRIPTORS: *Ramjet engines, *Combustion, Pressure distribution, Oscillation, Flow fields, Combustion stability, Pressure, Steady flow, Ramjet inlets, High velocity, Diffusers, Shock waves, Acoustic waves, Interactions, Linear systems (U)
IDENTIFIERS: Dump combustors, Liquid fuel ramjets, PE61102F, WUAFOSR2308A2 (U)

AD-A131 607 7/4

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

Structure and Composition of Adsorbed Layers Formed by Sequential Exposure of Pt(100) and Pt(111) to Pairs of Compounds: Solvents and Electrolytic Substances, (U)

82 16P Katekaru,James Y. ;Garwood, Gerald A. , Jr.;Hershberger,John F. ;Hubbard, Arthur T. ;

CONTRACT: AFOSR-81-0149
PROJ: 2303
TASK: A1
MONITOR: AFOSR TR-83-0699

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Surface Science, v121 p396-410 1982.
Reprint: Structure and Composition of Adsorbed Layers Formed by Sequential Exposure of Pt(100) and Pt(111) to Pairs of Compounds: Solvents and Electrolytic Substances.

DESCRIPTORS: *Platinum, *Electrodes, *Electrochemistry, Surface reactions, Absorption, Molecular structure, Chemical reactions, Solvents, Electrolytes, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2303A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 606 11/6 20/2 20/11

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

Deformation Studies in Workable Superalloys. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 79-31 May 83,
MAY 83 118P Giamei,A. F. ;
REPT. NO. UTRC/R83-916100-1
CONTRACT: F49620-82-C-0028
PROJ: 2306
TASK: A1
MONITOR: AFOSR TR-83-0724

UNCLASSIFIED REPORT

ABSTRACT: A three year workability study of nickel-base superalloys has been completed. The objective was to study the high strain plastic flow behavior of high strength superalloys in the form of single crystals, rapidly solidified ingots and consolidated powder particles. The single crystal alloy studied was PWA 1444 (similar to Mar-M200) which had previously been well characterized at low strains. The flow characteristics of this alloy have now been documented out to 20% strain as a function of crystal orientation. The low to intermediate temperature flow stress has been measured after forming. Remarkable strain hardening has been obtained at low strains for high modulus crystals worked below the solvus temperature. Rapidly solidified and cooled ingots were made by arc melting or electron beam skull melting or induction melting and then 'drip melting' into a cold copper mold. The compositions and heat treatment were tailored to promote workability. Some of these buttons were heavily deformed in uniaxial compression under isothermal conditions below the gamma prime solvus temperature, and several were deformed in the single phase gamma region. High strains were achieved under conditions of constant displacement rate, true strain rate or energy input rate. (U)
DESCRIPTORS: *Superalloys, *Single crystals, *Plastic deformation, Strain(Mechanics), Strain rate, Plastic flow, Solidification, Quick reaction, Grain size, Grain structures(Metallurgy), Powder metallurgy, Nickel alloy inconel, Strength(Mechanics), Hardening, Dynamics, Crystallization, Heat treatment, (U)
IDENTIFIERS: WUAFOSR2306A1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 605 7/4

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF CHEMISTRY

On the Reaction Mg + N2O Yields MgO + N2, (U)

JUN 83 12P Yarkony,David R. ;
CONTRACT: AFOSR-79-0073
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0702

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n11 p6763-6772, 1 Jun 83.
Report: On the Reaction Mg N2O Yields MgO N2.

DESCRIPTORS: *Chemical reactions, *Electron energy, *Energy transfer, *Metal compounds, Magnesium oxides, Oxidation, Molecular energy levels, Nitrogen compounds, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2303B1 (U)

AD-A131 604 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

Infrared Multiphoton Decomposition and Energy-Dependent Absorption Cross Sections of Chloroethane-d(0), -2-d(1), and -2,2,2-d(3). (U)

MAY 83 14P Francisco,Joseph S. ; Qingshi,Zhu ;Steinfeld,J. I. ;
CONTRACT: AFOSR-78-3725
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0703

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 n9 p5339-5350 1 May 83. Reprint: Infrared Multiphoton Decomposition and Energy-Dependent Absorption Cross Sections of Chloroethane-d(0) -2-d(1), and -2,2,2-d(3).

DESCRIPTORS: *Chloroethanes, *Photochemical reactions, *Chemical dissociation, Kinetics, Infrared radiation, Excitation, Photon beams, Cross sections, Mathematical models, Reprints (U)
IDENTIFIERS: WUAFOSR2303B1, PE61102F (U)

AD-A131 601 20/8 20/6

AVCO EVERETT RESEARCH LAB INC EVERETT MA

Experimental Study of Dissociative Attachment in Optically-Pumped Lithium Molecules. (U)

DESCRIPTIVE NOTE: Final rept. 1 May 82-30 Apr 83, MAY 83 72P McGeoch,Malcolm W. ; Schlier,Robert E. ;
CONTRACT: F49620-82-C-0051
PROJ: 2301
TASK: A7
MONITOR: AFOSR TR-83-0725

UNCLASSIFIED REPORT

ABSTRACT: Details are presented of an experimental study which has as its goal the observation of lithium negative ions by the process of dissociative attachment in optically-pumped lithium dimer molecules. A description is given of a new lithium supersonic beam apparatus with a slit nozzle and gravitational recirculation of the molten lithium. The source operates up to 900 degrees C and yields a lithium density of 3/1 x 10 to the 14th power cm at 10 cm downstream from the slit. The beam density is modelled as a function of spatial coordinates. Two- and three-step photoionization of lithium dimers and lithium atoms has been performed using multiple, tunable nitrogen-pumped dye lasers. An electron density of up to 3/10 to the 10th power cm has been created in the beam. (U)

DESCRIPTORS: *Ion beams, *Optical pumping, *Lithium, *Molecules, *Dye lasers, Electron density, Attachment, Dissociation, Atoms, Melts, Spatial distribution, Nozzles (U)
IDENTIFIERS: Lithium supersonic beams, Rotational temperature, WUAFOSR2301A7, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A131 590 7/4 20/5

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

Evaluation of Diffracted Stimulated Emission as a Potential Analytical Measurement Technique. (U)

DESCRIPTIVE NOTE: Technical rept.,
83 3P Wittman,P. K. ;Winefordner, J D. ;
CONTRACT: F49620-80-C-0005
PROJ 2303
TASK A1
MONITOR: AFOSR TR-83-0704

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Spectroscopy, v37 n2 p208-209 1983.
Reprint: Evaluation of Diffracted Stimulated Emission as a Potential Analytical Measurement Technique.

DESCRIPTORS: *Emission spectra, *Diffraction, *Laser beams, Excitation, Dye lasers, Optical instruments, Chemical engineering, Measuring instruments (U)
IDENTIFIERS: Diffracted stimulated emission, PE61102F, WUAFOSR2303A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 584 7/4

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

Response to 'Comment on 'Tunneling alpha squared F (omega) as a Function of Composition in A15 NbGe', by B. R. Sood. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 2P Kihlstrom,K. E. ;Geballe, T. H. ;
REPT. NO. GL-3480
CONTRACT: F49620-78-C-0009
PROJ: 2306
TASK: C1
MONITOR: AFOSR TR-83-0638

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v27 n5 p3082, 1 Mar 83.
Reprint: Response to 'Comment on 'Tunneling alpha squared F (omega) as a Function of Composition in A15 NbGe', by B. R. Sood.

DESCRIPTORS: *Niobium compounds, *Germanium compounds, *Chemical properties, Tunneling(Electronics), Softening, Stoichiometry, Reprints (U)
IDENTIFIERS: Mode softening, PE61102F, WUAFOSR1206C1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A131 572 20/4 12/1

STANFORD UNIV CA DEPT OF MATHEMATICS

Rising Bubbles. (U)

DESCRIPTIVE NOTE: Progress rept. 16 Mar-31 Dec 82,
DEC 82 17P Keller,Joseph B. ;
CONTRACT: AFOSR-79-0134
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0676

UNCLASSIFIED REPORT

ABSTRACT: This progress report lists publications supported by AFOSR through March 16, 1982 - December 31, 1982. (U)
DESCRIPTORS: *Bubbles, *Applied mathematics, Bibliographies, Diffusion, Acoustic properties, Sound transmission, Turbulence, Viscosity, Waves, Boltzmann equation, Transformations(Mathematics), Fluid dynamics (U)
IDENTIFIERS: WUAFOSR2304A4, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 565 20/11 19/1

SRI INTERNATIONAL MENLO PARK CA POULTER LAB

Response of Cracks in Structural Materials to Short Pulse Loads, (U)

83 19P Homma,H. ;Shockey,D. A. ; Murayama,Y. ;
CONTRACT: F49620-77-C-0059
PROJ: 2306
TASK: A1
MONITOR: AFOSR TR-83-0679

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Mechanics and Physics of Solids, v31 n3 p261-279 1983. Reprint: Response of Cracks in Structural Materials to Short Pulse Loads.

DESCRIPTORS: *Cracks, *Crack propagation, *Ammunition, *Pulse trains, Loads(Forces), Fatigue(Mechanics), Stress strain relations, Pulse amplitude, Pulse amplitude modulation, Fracture(Mechanics), Structural mechanics, Finite element analysis, Reprints (U)
IDENTIFIERS: *Feed mechanisms, PE61102F, WUAFOSR2306A1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 556 7/4

OREGON UNIV EUGENE

Deexcitation of Light Li-Like Ions in the 1s2s2p State. (U)

JAN 83 6P Chen,Mau Hsiung ;Craseman, Bernd ;Mark,Hans ;
CONTRACT: AFOSR-79-0026
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0636

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v27 n1 544-547 Jan 83.
Reprint: Deexcitation of Light Li-Like Ions in the 1s2s2p State.

DESCRIPTORS: *Ions, *Atomic energy levels, *Emission spectra, Perturbation theory, Auger electrons, X ray spectra, Electron transitions, Reprints (U)
IDENTIFIERS: WUAFOSR2301A4, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 554 7/4 20/6 11/2

CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS

Characterization of Infrared Optical Properties of Transparent Materials. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Aug 78-31 Mar 83,
MAR 83 28P Braunstein,Rubin ;
CONTRACT: AFOSR-78-3665
PROJ: 2306
TASK: C2
MONITOR: AFOSR TR-83-0629

UNCLASSIFIED REPORT

ABSTRACT: Chemical and structural imperfections which occur in highly transparent insulators and semiconductors were studied by a range of electromagnetic and electronic techniques. These utilized infrared wavelength modulation, high contrast Raman and Brillouin scattering and photoinduced transients spectroscopy techniques. The spectoral distribution of the absorption in the spectral region from 2.5-12 gamma was measured by infrared wavelength modulation techniques on: CaF2, LiF, NaCl, NaF, LaF3, BaF2, MgF2, SrF2, MgO, KCl, and KBr. (Author) (U)
DESCRIPTORS: *Raman spectroscopy, *Rayleigh scattering, *Infrared optical materials, *Absorption spectra, Molecular structure, Brillouin zones, Transparencies, Frequency, Glass, Fluorides, Solids, Semiconductors, Defects(Materials), Photochemical reactions, Frequency modulation (U)
IDENTIFIERS: Rayleigh brillouin scattering, Laser windows, WUAFOSR2306C2, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 553 20/6 20/4

CALIFORNIA INST OF TECH PASADENA

Chemically Reacting Turbulent Shear Layers. (U)

DESCRIPTIVE NOTE: Interim rept.,
JAN 83 5P Koochesfahani,M. M. ;
Dimotakis,P. E. ;Broadwell,J. E. ;
CONTRACT: F49620-79-C-0159
PROJ: 2308
TASK: A2
MONITOR: AFOSR TR-83-0650

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the AIAA Aerospace Sciences Meeting (21st) 10-13 Jan 83, Reno, NV

ABSTRACT: An experimental investigation of entrainment, mixing and chemical reactions in a plane shear layer has been performed using laser induced fluorescence techniques. Results indicate that the reactants mix on a molecular level and react at a composition that is nearly uniform across the width of the layer. The composition of the mixed fluid is found to be asymmetric, with an excess of high speed fluid, suggesting that entrainment into the shear layer is asymmetric. These results are at variance with predictions of models based on gradient transport and eddy diffusivity. (Author) (U)

DESCRIPTORS: *Laser induced fluorescence, *Chemical reactions, *Layers, *Turbulent flow, Shear properties, Flow visualization, Gradients, Eddies(Fluid Mechanics), Fluids, Mixing (U)

IDENTIFIERS: Plane shear layer, Mixing entrainment, Gradient transport, Eddy diffusivity, WUAFOSR2308A2, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 546 20/8

LITTON SYSTEMS INC WOODLAND HILLS CA GUIDANCE AND CONTROL SYSTEMS DIV

Nuclear Moment Alignment, Relaxation and Detection Mechanisms. (U)

DESCRIPTIVE NOTE: Final technical rept. Mar 82-Feb 83,
MAR 83 95P Nicol,Ann T. ;Lam,Leo ;
Boley,W. ;
REPT. NO. 404720
CONTRACT: F49620-82-C-0047
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0622

UNCLASSIFIED REPORT

ABSTRACT: The reported physics research is part of an overall program to develop a nuclear magnetic resonance gyro that makes use of an optically pumped alkali metal vapor both to align the magnetic moments of the noble gas nuclei and to detect the weak magnetic fields that are generated by these precessing nuclear moments. A model for the distribution of polorization of optically pumped rubidium across a sample cell is developed. Results of the computer modeling are presented graphically for various cells as a function of cell size, incident light intensity, wall type and gas fill. A study of the effect of direct nuclear dipole-dipole interaction on surface relaxation of 129Xe is reported. Results indicate that the mechanism for 129Xe nuclear relaxation on surfaces studied is not the direct dipolar interaction and must be attributed to an electron-nucleus interaction. Studies of 129Xe relaxation on several surface types show an order of magnitude more efficient than silicone treated surfaces for relaxing xenon nuclear spins. (U)

DESCRIPTORS: *Gyroscopes, *Nuclear magnetic resonance, *Nuclear moments, *Alignment, Optical pumping, Rubidium, Mathematical models, Theory, Relaxation, Frequency shift, Rare gases, Alkali metals (U)

IDENTIFIERS: PE61102F, WUAFOSR2301A4 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 531 5/7 9/2

DELAWARE UNIV NEWARK DEPT OF COMPUTER AND INFORMATION SCIENCES

Mapping between Semantic Representations Using Horn Clauses. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 83 10P Weischedel,Ralph M. ;
CONTRACT AFOSR 80 0190
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0686

UNCLASSIFIED REPORT

ABSTRAC Even after a unambiguous semantic interpretation has been computed for a sentence in context, there are at least three reasons that a system may map the semantic representation R into another from S: (1) The terms of R, while reflecting the user view, many require deeper understanding, e.g. may require a version S where metaphors have been analyzed; (2) Transformations of S may be more appropriate for the underlying application system, e.g. S may be a more nearly optimal form (These transformations may not be linguistically motivated); (3) Some transformations may depend on non-structural context. Design considerations may favor factoring the processing into two stages, for reasons of understandability or for easier transportability of the components. This paper describes the use of Horn clauses for the three classes of transformations listed above. The transformations are part of a system that converts the English description of a software module into a formal specification, i.e. an abstract data type. (U)
DESCRIPTORS: *Semantics, Computer programs, Text processing, Natural language, Transformations, Mapping(Transformations) (U)
IDENTIFIERS: Semantic representation, Horn clauses, PE61102F, WUAFOSR2304A2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 530 20/14 20/6 7/4

SPECTRON DEVELOPMENT LABS INC SEATTLE WA SEATTLE LAB

Investigation of the Rayleigh Critical Angle Phenomenon for the Characterization of Surface Properties. (U)

DESCRIPTIVE NOTE: Final rept. Nov 82-Feb 83 on Phase 2.
APR 83 59P Hildebrand,B. P. ;
Fitzpatrick,G. L. ;Boland,A. J. ;
REPT. NO. SDL-83-2188-14F
CONTRACT: F49620-81-C-0040, ARPA Order-4109
PROJ: 2306
MONITOR: AFOSR TR-83-0678

UNCLASSIFIED REPORT

ABSTRACT: Rayleigh type acoustic critical angle experiments on a variety of samples ranging from single crystals to polycrystalline alloy and glasses have been performed. Two conclusions can be drawn from this work: (1) simple linear equations of motion, which include anisotropy, suffice for an approximate description of the observations; (2) certain observations at and near the critical angle, involving the production of anomalous harmonics, imply that the nonlinear characteristics of the water, and possibly the solid, cannot be ignored and need further study. Moreover, the new measuring apparatus, using an acoustic lens, has the following desirable features: (a) it allows local measurements of the solid properties to be made, and (b) except for problems associated with phase measurements of the reflected waves, experimental results are essentially consistent with the work of others who used a different experimental approach. We conclude that our goal of using a device in practical flaw imaging work is reasonable and holds promise of being a quantitative flaw imaging technique. (U)
DESCRIPTORS: *Rayleigh waves, *Rayleigh scattering, *Angles, *Surface properties, Crystals, Alloys, Glass, Anisotropy, Harmonic analysis, Defects(Materials), Elastic properties, Nonlinear analysis (U)
IDENTIFIERS: Critical angles, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 523 12/1

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

Likelihood Ratio Tests on Covariance Matrices and Mean Vectors of Complex Multivariate Normal Populations and Their Applications in Time Series. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 83 68P Krishnaian,P. R ;Lee,J. C. ;Chang,T. C. ;
CONTRACT: F49629-82-K 0001
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83 0692

UNCLASSIFIED REPORT

ABSTRACT: In this paper, the authors reviewed the literature on computational aspects of the distributions of the likelihood ratio statistics for testing various hypotheses on the covariance matrices and mean vectors of complex multivariate normal populations. Applications of some of these test procedures in the area of inference on multiple time series in the frequency domain are also discussed. In the Appendix, the authors give tables which are useful in implementation of various likelihood ratio test statistics discussed in this paper. (U)
DESCRIPTORS: *Probability, *Ratios, *Multivariate analysis, *Population(Mathematics), Covariance, Normal distribution, Vector analysis, Time series analysis, Matrices(Mathematics), Statistical analysis, Tables(Data), Mean (U)
IDENTIFIERS: Likelihood ratio tests, Covariance matrices, Mean vectors, Complex multivariate analysis, Normal populations, Mean vectors, WUAFOSR2304A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 516 20/12 7/4 20/6

GEORGIA INST OF TECH ATLANTA SCHOOL OF PHYSICS

Correlation and Collective Modes in Narrow Band Materials. (U)

DESCRIPTIVE NOTE: Interim rept. 1 Oct 81-30 Sep 82, MAY 83 28P Ribarsky,Martin W. ;
CONTRACT: AFOSR-80-0023
PROJ: 2301
TASK: A8
MONITOR: AFOSR TR-83-0631

UNCLASSIFIED REPORT

ABSTRACT: Correlation and collective modes have been studied for systems with quite localized valence or conduction bands. In particular this research has been concerned with localized electron-hole states and how they contribute with other excitations to the dynamical response of the system. Important aspects studied have been the effects of exciton or exciton-like states on superconducting properties electron energy loss spectra and optical spectra. Initially the system studied has been CuCl for which a tight-binding model was used. The results show that strong effects due to localized excitations of b-band electrons greatly affect the dynamical response and the effective electron interaction. The exciton resonance in the dynamical response is necessary to obtain the appropriate attractive effective electron interaction for superconductivity. The strong localization effects also will affect the loss spectra and optical spectra. Further calculations are planned for CuCl and also for CdS and Cu2O. (Author) (U)
DESCRIPTORS: *Narrowband, *Materials, *Transition metals, Excitons, Excitation, Holes(Electron deficiencies), Copper compounds, Energy bands, Dielectrics, Dynamics, Optical properties (U)
IDENTIFIERS: Collective modes, WUAFOSR2301A8, PE61102F (U)

AD-A131 514 11/2 13/8 12/1

BATTELLE COLUMBUS LABS OH

Hot Isostatic Pressing of Ceramic Powder Compacts. (U)

DESCRIPTIVE NOTE: Annual rept. no. 1, Jun 82-Jun 83,
JUN 83 97P Willis, R. R. ;McCoy, J. K. ;Markworth, A. J. ;McCoy, T. G. ; Mullert, L. E. ;
CONTRACT: AFOSR-82-0233
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-[illegible]

UNCLASSIFIED REPORT

ABSTRACT: Several mechanisms contribute to the densification of [illegible] during HIP. These [illegible] [illegible] be related to the kinetics of [illegible] by the use of [illegible] maps and a [illegible] methodology [illegible] for determining [illegible] selection during HIP. The constitutive [illegible] for final stage densification have been [illegible] in terms of their underlying [illegible] [illegible] of changes in pore size, [illegible] temperature, pressure, diffusion [illegible] density and the presence of residual gas [illegible]. A [illegible] algorithm for calculating and [illegible] mechanism maps has been derived. This [illegible] reduces the number of data points needed to construct a complete map by a factor of 30. Initial experiments performed at 1100 C and 102 MPa (15,000 psi) showed that a very small amount of grain growth occurred. Correlation of the experimental data with the theoretical predictions is quite good; if it is assumed that 1% residual porosity is a result of entrapped gases then excellent agreement between theory and experiment exists. Although the constitutive equations are supposed to be most applicable during the latter stages of densification, good agreement exists throughout the whole densification range. (U)

DESCRIPTORS: *Ceramic materials, *Isostatic pressing, *Packing density, Powders, Hot pressing, Porosity, Grain size, Diffusion coefficient, Physical properties, Mechanical properties, Theory, Algorithms, Mathematical models (U)

IDENTIFIERS: HIP(Hot Isostatic Pressing), Densification, Alumina, WUAFOSR2306A2, (U)

AD-A131 514

AD-A131 510 12/1 9/1

ALPHATECH INC BURLINGTON MA

Sensor Correlation and Data Fusion Theory. (U)

DESCRIPTIVE NOTE: Final rept. 1 May 80-31 Apr 83,
JUN 83 74P Sandell, Nils R., Jr;
REPT. NO. TR-167
CONTRACT: F49620-81-C-0015
PROJ: 2304
TASK: A6
MONITOR: AFOSR TR-83-0671

UNCLASSIFIED REPORT

ABSTRACT: This report describes the results obtained during the second year of a program of continuing research in the mathematical problems associated with the analysis and design of Air Force sensor correlation and data fusion systems. These systems play a vital role in the command and control process, but there presently exists no systematic and quantitative methodology for their analysis and design. In the first year of research, ALPHATECH investigated an important subproblem, the distributed detection problem associated with determining the presence or absence of targets from a collection of distributed sensors. In the second year of research, ALPHATECH has obtained novel, exact expressions for the probability density functions of the local log likelihood rations, and has used these expressions to generate an extensive set of design curves. In the third year of research, which is presently on-going, being investigated is another important class of problems, namely, sequential distributed detection problems. (Author) (U)

DESCRIPTORS: *Numerical methods and procedures, *Detection, *Signal processing, *Waveforms, Target detection, Gaussian noise, Command and control systems, Air force research, Surveillance, Stochastic processes, Signal to noise ratio, Correlation, Probability distribution functions, White noise (U)

IDENTIFIERS: WUAFOSR2304A6, PE61102F (U)

AD-A131 510

AD-A131 505 20/9 12/1

BOSTON COLL CHESTNUT HILL MA

Plasma Response Functions, Fluctuation-Dissipation Relations and the Velocity-Average-Approximation, (U)

OCT 82 21P Golden,K. I. ;Kalman,G. ;
CONTRACT: AFOSR-81-0091, AFOSR-76-2960
PROJ: 2301
TASK: A8
MONITOR: AFOSR TR-83-0731

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Annals of Physics, v143 n1 p160-178, 1 Oct 82.
Reprint: Plasma Response Functions, Fluctuation-Dissipation Relations and the Velocity-Average-Approximation.

DESCRIPTORS: *Plasmas(Physics), *Response, *Functions(Mathematics), Dielectrics, Distribution functions, Correlation, Variations, Dissipation, Velocity, Reprints (U)
IDENTIFIERS: WUAFOSR2301A8, PE61102F (U)

AD-A131 498 12/1 17/5

LOUISIANA STATE UNIV BATON ROUGE REMOTE SENSING AND IMAGE PROCESSING LAB

A Study of Texture Analysis Algorithms. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Mar 79-31 Aug 82,
FEB 83 76P Harlow,Charles A. ;Conners, Richard W. ;
CONTRACT: AFOSR-81-0112
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0626

UNCLASSIFIED REPORT

ABSTRACT: This is the final report for the Air Force Office of Scientific Research grant entitled 'A Study of Texture Analysis Algorithms'. As such this report attempts to provide an overview of the research that was performed and to provide a chronology of the events which precipitated the various studies conducted. The research described ranges from developing a theoretical comparison method for evaluating the innate abilities of texture analysis algorithms to a formal mathematical method for defining texture measures. The desire was to develop improved texture analysis methods through a systematic theoretical development process. the goal was to create a texture analysis algorithm which could match a level of human perception. The studies described include a comparison of some texture analysis algorithms, the development of a structural texture analyzer based on statistical methods, the examination of texture pairs which are counter examples to the Julesz conjecture, the development of an image segmentation method based on texture analysis methods, the development of a target recognition strategy based on texture methods, and finally a formal mathematical procedure for defining texture measures. (Author) (U)

DESCRIPTORS: *Algorithms, *Feasibility studies, *Target recognition, *Texture, Human factors engineering, Mathematical analysis, Measurement, Methodology, Theory, Perception, Image processing, Target detection, Visual perception (U)
IDENTIFIERS: Texture analysis, Julesz conjecture, Human perception, PE61102F, (U)
AD-A131 498

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 497 15/5 5/1

ROCHESTER UNIV NY GRADUATE SCHOOL OF MANAGEMENT

Parts and Service Demand Distribution Generated by Primary Production. (U)

DESCRIPTIVE NOTE: Technical rept.,
OCT 82 25P Keilson,Julian ;Kubat,Peter ;
REPT. NO. WP-QM8216
CONTRACT: AFOSR-79-0043
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0672

UNCLASSIFIED REPORT

ABSTRACT: Most commercial and military systems subject to failure have an initial period of growth with uncertain time dependent growth rate. Prediction of spare parts demand and service personnel demand is correspondingly uncertain and existant statistical tools are inadequate for the adaptive ad hoc planning needed. In our model, systems subject to failure enter into use at the epochs of a time-inhomogeneous Poisson process of rate lambda (t). A component or module of each system in use has constant failure rate microns and generates demand for parts and service. The distribution of the cumulative failures N(t) is obtained. Numerical methods and the asymptotic distribution for large t are described. (Author) (U)
DESCRIPTORS: *Spare parts, *Inventory control, *Mathematical models, *Military equipment, *Commercial equipment, Military planning, Industrial production, Resource management, Logistics support, Operational effectiveness, Mathematical prediction, Poisson equation, Numerical methods and procedures, Statistical processes, Statistical data (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 495 9/2 5/2

CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF COMPUTER SCIENCE

Flexible Parsing. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Jul 81-30 Jun 82,
OCT 82 16P Hayes,Philip J. ;
CONTRACT: F49620-79-C-0143
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0667

UNCLASSIFIED REPORT

ABSTRACT: When people use language spontaneously, they often do not adhere strictly to commonly accepted standards of grammaticality. The primary objective of this project is to develop flexible computer parsing techniques which can deal with the various kinds of ungrammaticalities that arise, both on the lexical and the phrase level. (Author) (U)
DESCRIPTORS: *Computer programs, *Parsers, *Natural language, *Grammars, Information processing, Interfaces, Strategy, Standards, Lexicography, Test and evaluation (U)
IDENTIFIERS: Natural language processing, Computer parsing, Bottom up parsing, Specific parsing, Grammaticality, Lexical dictionary, PE61102F, WUAFOSR2304A2 (U)

AD-A131 481 9/2

FLORIDA A AND M UNIV TALLAHASSEE DEPT OF DATA PROCESSING

Development of a Text-Editor Based Relational Data Base Management System. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jun-31 Aug 81,
AUG 81 39P Mason,Thomas W. ;
CONTRACT: AFOSR-81-0131
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0665

UNCLASSIFIED REPORT

ABSTRACT: Database management systems have historically been the domain of large mainframes. However, the popularity of mini and micro-computers has spurred the development of database systems appropriate for those devices. Concurrently, database systems design is turning away from traditional hierarchic and CODASYL models to embrace the conceptually simpler relational database approach (1,2,3,4,). The relational database approach views data as being in tables. The entries form the rows and are called tuples. The columns are called attributes. Simple selection commands are provided to search for entries with attributes of a given value. Other commands allow the extraction of a subset of entries (found by the selection commands) and the incorporation of that subset with others. This approach is not as efficient as the traditional model in its implementation but offers far greater flexibility in the incorporation of data and the ability to 'explore' the data base. This report documents the attempt the develop a relational database management system for the Harris Minicomputer at Florida A&M University. (U)
DESCRIPTORS: *Data bases, *Minicomputers, Systems engineering, Tables(Data), Data processing, Information retrieval, Data storage systems, Information systems, Man computer interface, Searching, Selection (U)
IDENTIFIERS: Data base management systems, Relational data base management systems, Text editing, PE61102F, WUAFOSR2304A2 (U)

AD-A131 480 9/1 20/8

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES

Computation of Counting Distributions Arising from a Single-Stage Multiplicative Process. (U)

DESCRIPTIVE NOTE: Interim rept.,
MAY 83 54P Helstrom,Carl W. ;Rice, Stephen O. ;
CONTRACT: AFOSR-82-0343
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0677

UNCLASSIFIED REPORT

ABSTRACT: The cumulative distribution of the number of secondary electrons in a single-stage photomultiplier is calculated by numerically integrating the inversion integral for its probability generating function along a suitably chosen contour. A residue series applicable in certain cases is also presented. Saddlepoint approximations to the contour integral are described, which are the more accurate, the greater the numbers of secondaries. Recurrent relations are developed for computing values of the distribution for purposes of comparison. Computation of the Neyman Type-A distribution is treated as a limiting case. (Author) (U)
DESCRIPTORS: *Photomultiplier tubes, *Electrons, *Secondary, *Counting methods, Distribution functions, Computations, Integrals, Approximation(Mathematics), Accuracy, Value, Comparison, Probability (U)
IDENTIFIERS: Cumulative distribution, Saddlepoints, Type A distribution, PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 479 9/2 5/2

DELAWARE UNIV NEWARK DEPT OF COMPUTER AND INFORMATION SCIENCES

Design of a System That Understands Informal Specifications. (U)

DESCRIPTIVE NOTE: Interim technical rept., APR 83 17P Weischedel,Ralph M. ; Chester,Daniel L. ;
CONTRACT: AFOSR-80-0190
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0675

UNCLASSIFIED REPORT

ABSTRACT: This paper investigates an artificial intelligence to combining the advantages of both formal and natural languages. The long-term goal is a system which could take as input an English definition of a module, and generate an equivalent formal specification. In addition, the system should generate an English paraphrase of its understanding of the input, so that the user may easily check the system's understanding. The remainder of the paper describes the design decisions made in implementing a prototype to understand English texts defining data structures. Section 2 enumerates some of the reasons we feel are most important for using natural language. Section 3 defines the target specification language and the motivation in selecting it. Section 4 relates our experience in using a parser for texts defining data structures. Section 5 deals with semantic issues such as interpreting spatial metaphors and selecting precise translations of vague English terms. Related work and our conclusions are presented in sections 6 and 7. (U)

DESCRIPTORS: *Computer programs, *Natural language, *Specifications, *Information processing, Language translation, Motivation, Text processing, Word organized storage, Words(Language), Modules(Electronics), Semantics, Syntax (U)

IDENTIFIERS: Horn clauses, Formal languages, Semantic analysis, Syntactical analysis, PE61102F, WUAFOSR2304A2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 478 12/1 20/9

CORNELL UNIV ITHACA NY

Unified Theory of Plasma Correlations. (U)

DESCRIPTIVE NOTE: Interim rept., JUN 83 35P Guillen,Michael A. ;Liboff, Richard L. ;
REPT. NO. TR-R-4-83
CONTRACT: AFOSR-78-3574
PROJ: 2301
TASK: A3
MONITOR: AFOSR TR-83-0664

UNCLASSIFIED REPORT

ABSTRACT: A unified approach to the theory of correlations in a plasma is presented, based on the BBKGY hierarchy. The theory is applied to a one-component plasma with the Coulomb interaction modified to include effects of the background. Closed integro-differential equations in space and time are obtained for the two-particle correlation function in both the strong and weak coupling limits. In the weak-coupling domain, gamma <<1, the time-independent analysis returns the well-known linearized Debye-Huckle result, where gamma is the plasma parameter. In the strong-coupling domain gamma >1, the resulting two-particle total correlation function exhibits decaying oscillatory behavior for particle separation of the order of the effective interparticle range. (Author) (U)

DESCRIPTORS: *Correlation techniques, *Plasmas(Physics), *Coupling(Interaction), Parameters, Integral equations, Differential equations, Perturbations, Particles, Oscillation (U)

IDENTIFIERS: PE61102F, WUAFOSR2301A3 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 448 20/14 8/14

EMMANUEL COLL BOSTON MA

Geomagnetic Pulsations-Production/ Interpretation. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Sep 78-30 Sep 81,
SEP 82 59P Maple,Elwood ;
CONTRACT: AFOSR-77-3467
PROJ: 3211
TASK: A1
MONITOR: AFOSR TR-83-0632

UNCLASSIF REPORT

ABSTRACT: Work has been devoted to experimental studies of middle-latitude geomagnetic pulsations in the period range 0.2 to 50 minutes. The principal effort has been on the resonant periods of the pulsations which arise from hydromagnetic resonances in the magnetosphere. The resonant periods appear as peaks in the period distributions and frequency spectra of the pulsations. The present work utilizes polarization traces which provide continuous displays of the polarization of the pulsations in selected period bands. This analysis technique was conceived some time ago. The early studies established that hydromagnetic (HM) waves were frequently observed throughout the 0.2 to 50 minute period range and that waves of several different periods were often observed simultaneously during both magnetically quiet and disturbed intervals. That effort was terminated before the potentialities of the technique had been exploited, and the early results were not widely disseminated. Some of the original data have been resurrected for the initial work under this grant, and the analysis technique has been extended. (U)

DESCRIPTORS: *Geomagnetism, *Pulses, *Magnetohydrodynamics, Magnetosphere, Magnetic resonance, Standing waves, Polarization, Bandpass filters, Waveforms, Harmonics, Magnetometers, Plasmasphere (U)

IDENTIFIERS: *Geomagnetic pulsations, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 403 9/2 6/5 6/14

OHIO STATE UNIV COLUMBUS DEPT OF COMPUTER AND INFORMATION SCIENCE

CSRL (Conceptual Structures Representation Language): A Language for Expert Systems Diagnosis. (U)

DESCRIPTIVE NOTE: Technical rept.,
83 6P Bylander,Tom ;Mittal,Sanjay ;Chandrasekaran,B. ;
CONTRACT: AFOSR-82-0255
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0659

UNCLASSIFIED REPORT

ABSTRACT: We present CSRL(Conceptual Structures Representation Language) as a language to facilitate the development of expert diagnosis systems based on a paradigm of cooperating diagnostic specialists. MDX, the medical diagnosis system that has been developed in our laboratory over the past few years is based on this paradigm. In our approach, diagnostic reasoning is one of several generic tasks, each of which calls for a particular organizational and problem solving structure. A diagnostic structure is composed of a collection of specialists, each of which corresponds to a node or concept in a diagnostic hierarchy, e.g., a classification of diseases. A top-down strategy called establish-refine is used in which either a specialist establishes and then refines itself, or the specialist rejects itself, pruning the hierarchy that it heads. CSRL is a language for representing the concepts of a diagnostic hierarchy and for implementing the establish-refine process. The body of a concept specifies how it will respond to different messages from its super concept. The knowledge to establish or reject a concept is factored into knowledge groups, which corresponds to specific decisions in the diagnosis. (Author) (U)

DESCRIPTORS: *Artificial intelligence, *Medical computer applications, *Diagnosis(Medicine), *Programming languages, Structural analysis, Systems engineering, Reasoning, Hierarchies, Computer logic, High level languages, Problem solving (U)

IDENTIFIERS: *CSRL(Conceptual Structures (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 396 20/4 14/2

PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING

Wind Tunnel Wall Interference. (U)

DESCRIPTIVE NOTE: Final rept. 1 Apr 77-31 Mar 82,
APR 83 20P Bliss,D. B. ;
CONTRACT: AFOSR-77-3337
PROJ: 2307
TASK: A1
MONITOR: AFOSR TR-83-0655

UNCLASSIFIED REPORT

ABSTRACT: The aerodynamic behavior of an isolated finite length slender slot in a wind tunnel wall was analyzed. Numerical and analytical solutions were obtained relating the pressure differential to the average flow rate through the slot as a function of slot geometry for subsonic and supersonic flow. These solutions apply to the cases of linear and quadratic behavior corresponding to small and large slot flow rates. The analysis was extended to include the effect of an imposed pressure gradient along was extended to include the effect of an imposed pressure gradient along the slot. The results obtained are applicable to low aspect ratio holes as well as slots, and thus provide insight into the behavior of both slotted and perforated walls. The pressure gradient effect on holes was found to introduce a pressure tunnel walls. The effect of aerodynamic interference between holes in a perforated wall was studied for two- and three-dimensional configuration using a wavy wall model problem. It was found that the interference effect between wall elements is relatively local over a wide range of parameters, thereby allowing it to be represented by an additional term in the average wall boundary condition. The interference effect takes the form of a streamline curvature term. The concept of a compliant wall wind tunnel was explored by analysis of a model problem to demonstrate a particular flexible wall concept. In the area of adaptive wall winds tunnels, a method was developed which shows how control adjustments should be made to converge very rapidly to interference-free conditions. (U)
DESCRIPTORS: *Wind tunnels, *Subsonic flow, (U)
*Supersonic flow, *Walls, Interference, Slots,

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 390 7/3 7/4

DELAWARE UNIV NEWARK DEPT OF PHYSICS

Heat Capacity and Magnetic Studies of Graphite Intercalated with FeCl3 and NiCi(+2), (U)

MAR 82 4P Onn,David G. ;Alexander,M. Grayson ;Ritsko,J. J. ;Flandrois,S. ;
CONTRACT: AFOSR-77-3393
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0641

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physics, v53 n3 p2751-2753 Mar 82.
Reprint: Heat Capacity and Magnetic Studies of Graphite Intercalated with FeCl3 and NiCl(2).

DESCRIPTORS: *Graphite, *Physical properties, *Carbon compounds, Iron organic compounds, *Nickel compounds, Chlorine compounds, Magnetic properties, Thermal properties, Specific heat, Glassy carbon, Reprints (U)
IDENTIFIERS: *Graphite intercalation compounds, WUAFOSR2306C3, PE61102F (U)

AD A131 385 9/2

OHIO STATE UNIV COLUMBUS DEPT OF COMPUTER AND INFORMATION SCIENCE

Expert Systems: Matching Techniques to Tasks. (U)

DESCRIPTIVE NOTE: Technical rept., MAY 83 20P Chandrasekaran,B. ;
CONTRACT: AFOSR-82-0255
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0660

UNCLASSIFIED REPORT

ABSTRACT: The major line of argument that we will pursue in this paper can be outlined as follows. In Sec. II, we briefly trace the development of the idea of knowledge-based systems in AI. Sec. III is devoted to discussing the increasing need for symbolic content to expert reasoning as the size and demands of the task domain increase; i.e., we will analyze why a complete mathematical model of the situation, even if available, will not meet many of the demands placed on expert reasoning. In Sec. IV, we discuss the several distinct senses and roles that the notion of rules can play and have played in expert systems, and how a failure to keep these separate can cause a great deal of confusion. In Sec. V, we will argue that further organizational constructs, such as concepts and types of problem solving, are needed both to construct more powerful expert systems, and to characterize their capabilities. We will also provide two examples of generic problem-solving types, and show how each type of problem-solving induces an organization of knowledge in the form of a cooperating community of specialists engaged in that problem solving type. The overall flow of the discussion is in the direction of the evolution of expert systems from numerical programs to highly organized symbolic structures engaged in distinct types of problem-solving and communicating with one another. (U)
DESCRIPTORS: *Artificial intelligence, *Computer applications, Computers, Methodology, Utilization, Man computer interface, Problem solving, Data processing, User needs, Commercial equipment, Computer programs, Computer logic, Reasoning, (U)
IDENTIFIERS: Expert systems, PE61102F, (U)

AD-A131 382 6/4 5/2

ILLINOIS UNIV AT URBANA COORDINATED SCIENCE LAB

Artificial Intelligence Implications for Information Retrieval. (U)

DESCRIPTIVE NOTE: Technical rept., APR 83 17P DeJong,Gerald ;
CONTRACT: F49620-82-K-0009
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0658

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Annual International ACM SIGIR Conference (6th), 6-8 Jun 83, Washington, DC.
ABSTRACT: The field of information retrieval is already more aware than many other fields of the relevance of artificial intelligence. Nonetheless there remain exciting applications of artificial intelligence that have been so far overlooked. In this paper we will point out some of the ways artificial intelligence might influence the field of information retrieval. We will then examine one application in more detail to discover the kind of technical problems involved in its fruitful exploitation. (U)
DESCRIPTORS: *Artificial intelligence, *Information retrieval, *Technology forecasting, Computer applications, Memory devices, Man computer interface, Machine aided indexing, Data processing, Data management, Data bases, User needs, Input output processing, Management information systems, Research management (U)
IDENTIFIERS: WUAFOSR2304A2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVN35A

AD-A131 376 8/13 14/2

CALIFORNIA UNIV DAVIS DEPT OF CIVIL ENGINEERING

In Situ Characterization of Saturated Sands and Silts for the Prediction of Dynamic Shear Modulus and Shear Wave Velocity. (U)

DESCRIPTIVE NOTE: Annual rept. Aug 81-Aug 82, NOV 82 28P Arulanandan,K. ;Arulmoli,K. ;Dafalias,Y. F. ;Herrman,L. R. ;
CONTRACT: AFOSR-81-0216
PROJ: 2307
TASK: CI
MONITOR: AFOSR TR-83-0652

UNCLASSIFIED REPORT

ABSTRACT: An electrical method of characterizing coarse-grained soils is described. A nondestructive method of determining dynamic properties of coarse-grained soils is developed based on this fundamental characterization of soils. Correlations are established relating k sub 2 max, coefficient required to obtain dynamic shear modulus to the appropriate electrical parameters. This laboratory correlation was verified by field measurements. A comparison is made between predicted and measured shear wave velocities. (Author) (U)
DESCRIPTORS: *Soil mechanics, *Nondestructive testing, Sand, Silt, Shear properties, Dynamics, Velocity, Electrical properties, Coefficients, Comparison, Measurement, Mathematical prediction (U)
IDENTIFIERS: WUAFOSR2307CI, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 366 8/13 20/14 12/1 20/11

TEXAS UNIV AT AUSTIN GEOTECHNICAL ENGINEERING CENTER

Effects of Rigid Inclusions on Wave Propagation. (U)

DESCRIPTIVE NOTE: Interim rept., MAR 83 111P Suddhiprakarn,Chairat ; Roesset,Jose M. ;Stokoe,Kenneth H. , II ;
REPT. NO. GR83-3
CONTRACT: AFOSR-80-0031
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0656

UNCLASSIFIED REPORT

ABSTRACT: The effect of rigid inclusions on the characteristics (amplitude and time of arrival) of shear and P-waves is investigated using a finite element model to discretize the region of interest and an explicit integration scheme. The effect of boundary conditions, type of excitation (point load versus distributed load) and wave length (or frequency of the excitation) are investigated and discussed. (Author) (U)
DESCRIPTORS: *Soil mechanics, *Wave propagation, *Stress waves, *Finite element analysis, Soil classification, Mechanical properties, Dynamics, Homogeneity, Accelerometers, Stiffness, Measurement, Excitation, Velocity, Boundaries, Loads(Forces), Distribution, Geophysics, Engineering geology, Mathematical models (U)
IDENTIFIERS: S-waves, P-waves, Shear waves, WUAFOSR2307C1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 362 20/13 7/2

DELAWARE UNIV NEWARK DEPT OF PHYSICS

Low-Temperature Specific Heat of the Graphite Intercalation Compounds KC8, CsC8, RbC8, and Their Parent Highly Oriented Pyrolytic Graphite, (U)

NOV 80 9P Alexander,M. Grayson ; Goshorn,David P. ;Onn,D. G. ;

CONTRACT: AFOSR-77-3393
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0639

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v22 n10 p4535-4542, 15 Nov 80.
Reprint: Low-Temperature Specific Heat of the Graphite Intercalation Compoundss KC8, CsC8, RbC8, and Their Parent Highly Oriented Pyrolytic Graphite.

DESCRIPTORS: *Specific heat, *Low temperature, *Pyrolytic graphite, Carbides, Electronic states, Electrons, Phonons, Crystal lattices, Pyrolysis, Physical properties, Theory, Experimental data, Reprints (U)
IDENTIFIERS: Intercalation, Metallic intercalated graphite, Cesium carbides, Potassium carbides, Rubidium carbides, PE61102F, WUAFOSR2306C3 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 361 20/13 7/2

DELAWARE UNIV NEWARK DEPT OF PHYSICS

The Specific Heat, 0.4K to 90K, of C8Cs, C8Rb and Their Parent HOPG (Highly Oriented Pyrolitic Graphite), (U)

79 3P Alexander,M. Grayson ; Goshorn,David P. ;Onn,David G. ;

CONTRACT: AFOSR-77-3393
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0640

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Biennial Conference on Carbon (14th) p274-275 1979.
The Specific Heat, 0.4K to 90K, of C8K, C8Cs, C8Rb and Their Parent HOPG (Highly Oriented Pyrolitic Graphite).

DESCRIPTORS: *Specific heat, *Low temperature, *Carbides, *Pyrolytic graphite, Electronic states, Electrons, Phonons, Crystal lattices, Pyrolysis, Thermal expansion, Relaxation, Physical properties, Theory, Experimental data, Reprints (U)
IDENTIFIERS: Intercalation, Metal graphite intercalation, HOPG(Highly Oriented Pyrolytic Graphite), Cesium carbides, Potassium carbides, Rubidium carbides, PE61102F, WUAFOSR2306C3 (U)

AD-A131 360 21/5 20/4

IOWA STATE UNIV AMES ENGINEERING RESEARCH INST

Aerodynamics of Advanced Axial-Flow Turbomachinery. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 80-30 Nov 82,
FEB 83 73P Scrovy,George K. ;Kavanagh, Patrick ; Kiishi,Theodore H. ;
REPT. NO. ISU-ERI-AMES-83234, TCRL-23
CONTRACT: AFOSR-81-0004
PROJ: 2307
TASK: A4
MONITOR: AFOSR TR-83-0651

UNCLASSIFIED REPORT

ABSTRACT: A multi task research program on the aerodynamics of advanced axial-flow turbomachinery was completed at Iowa State University. Program components were intended to result in direct contributions to the improvement of axial-flow fan, compressor, and turbine design procedures. A detailed experimental investigation of intrapassage flow in a large-scale, curved, rectangular cross-section channel representative of turbomachinery passages was carried out. The use of stator geometry modification to improve stage performance through better secondary flow control was investigated via laboratory tests of baseline and modified version of a two-stage compressor. Aerodynamic variables which influence surface boundary layer development in compressor and turbine airfoil cascades were restudied in order to determine sources of differences between linear cascade performance and performance of equivalent cascade geometries in multistage turbomachine blade rows. (U)

DESCRIPTORS: *Axial flow turbines, *Axial flow compressors, *Aerodynamics, Axial flow compressor blades, Axial flow fans, Aerodynamic characteristics, Cascades(Fluid dynamics), Boundary layer flow, Geometry, Computations (U)
IDENTIFIERS: PE61102F, WUAFOSR2307A4 (U)

AD-A131 351 12/1 9/2

ARIZONA STATE UNIV TEMPE DEPT OF COMPUTER SCIENCE

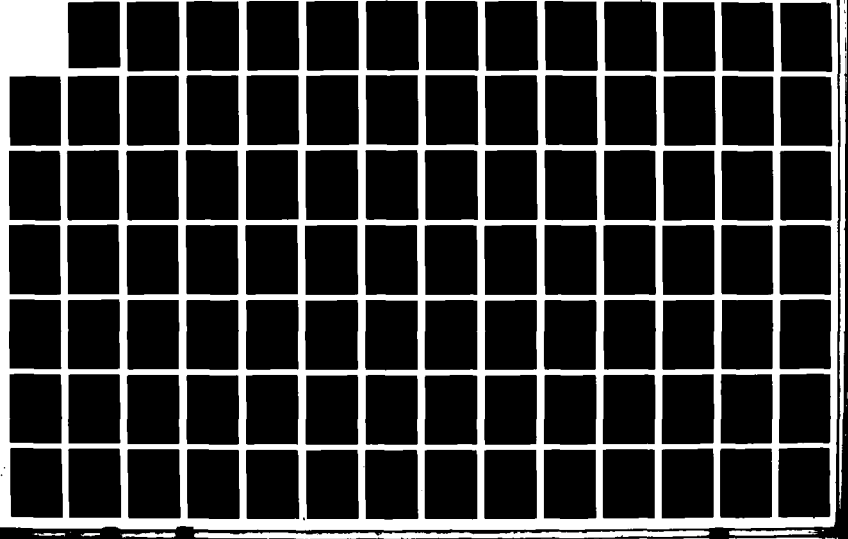
On a Computer-Based Theory of Strategies. (U)

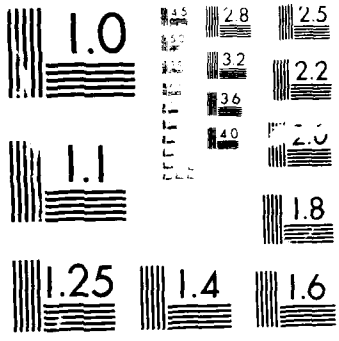
DESCRIPTIVE NOTE: Technical rept.,
83 11P Findler,Nicholas V. ;
CONTRACT: AFOSR-82-0340
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0662

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Kybernetes, v12 p89-97 1983.
Reprint: On a Computer-Based Theory of Strategies.

DESCRIPTORS: *Strategy, *Theory, *Computer applications, Game theory, Artificial intelligence, Decision theory, Operations research, Reprints (U)

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RENSSELAER POLYTECHNIC INST TROY NY DEPT OF ELECTRICAL COMPUTER AND SYSTEMS ENGINEERING

Semiconductor Surface Characterization Using Transverse Acoustoelectric Voltage versus Voltage Measurements. (U)

DESCRIPTIVE NOTE: Annual rept. 1 Aug 81-31 Oct 83, OCT 82 9P Davari,B. ;Das,Pankaj K. ;
CONTRACT: AFOSR-77-3426
PROJ: 2306
TASK: B2
MONITOR: AFOSR TR-83-0646

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Continuation of Grant AFOSR-82-0281.
ABSTRACT: An alternative to Capacitance-Voltage (C-V) measurement is experimentally demonstrated. This technique measures the Transverse Acoustoelectric Voltage (TAV) as a function of applied D.C. voltage across the semiconductor. The technique is nondestructive and is applied to uniformly doped Si samples. Surface properties such as the flat band voltage, oxide charge and the zero bias surface condition are determined. P.S. An annual interim report is being accepted as the Final report for AFOSR-77-3426. The technical effort is being continued for one year under AFOSR-82-0281. The Final report for this continuation will contain more overall detail and should be considered as the final report for the entire technical effort. (Author) (U)
DESCRIPTORS: *Semiconductors, *Surface properties, *Surface acoustic wave devices, Surfaces, Measurement, Voltage, Capacitance, Silicon, Oxides, Bias, Direct current, Doping (U)
IDENTIFIERS: Acoustoelectric voltage, Surface states, Transverse voltage, Interface states, TAV(Transverse Acoustoelectric Voltage), Bulk properties, Surface conductivity, PE61102F, WUAFOSR2306B2 (U)

AD-A131 340 9/2

OHIO STATE UNIV COLUMBUS DEPT OF COMPUTER AND INFORMATION SCIENCE

An Approach to Expert Systems for Mechanical Design. (U)

DESCRIPTIVE NOTE: Technical rept., MAY 83 21P Brown,David C. ; Chandrasekaran,B. ;
CONTRACT: AFOSR-82-0255
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0657

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the IEEE Computer Society, Trends & Applications Conference, May 83, Gaithersburg, MD.
ABSTRACT: We present an approach to expert systems for mechanical design called Design Refinement, which addresses a subset of design activity by using a hierarchy of conceptual specialists that solve the design problem in a disturbed manner, top-down, choosing from sets of design plans and refining the design at each level of the hierarchy. (U)
DESCRIPTORS: *Distributed data processing, *Computer programs, *Computer architecture, *Experimental design, *Economic analysis, Systems engineering, Problem solving, Management planning and control, Specifications, Computer graphics, Data bases, Room temperature, Human factors engineering, Computer aided design, Management information systems (U)
IDENTIFIERS: Mechanical design, Expert systems, Design refinement, Top down approach, Design goals, Computer substructure, WUAFOSR2304A2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 333 20/6

ADVANCED INFORMATION AND DECISION SYSTEMS MOUNTAIN VIEW CA

Three-Dimensional Feature Extraction. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 83 5P Kuan,Darwin ;
CONTRACT: F49620-82-C-0071
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0663

UNCLASSIFIED REPORT

ABSTRACT: Range images offer a significant advantages over passive reflectance images because they preserve the 3-D information of the scene viewed from the sensor. Therefore, range data is becoming an increasingly important source of information for a variety of applications including 3-D target classification, autonomous vehicles, and robot vision. This research is part of an effort to develop a 3-d object recognition system for vehicle objects in air-to-ground laser range imagery. The full system includes image feature extraction, object modeling, model-driven prediction, and feature to model matching. This paper presents several three-dimensional feature extraction techniques for use on laser range imagery. These include object-ground segmentation, projection image generation from range data, and 3-D physical edge detection. We emphasize extracting 3-D physical features of the object from 3-D range data without restricting ourselves in a sensor-centered range image format. The object-ground segmentation and projection image generation techniques extract global object features from range data, and are useful for object orientation estimation and major structures identification. The 3-d physical edge detector directly calculates the physical angle of the object surface. It is not only useful for physical edge (convex, concave, occluding) detection, but also provides useful information for extracting planar and curved surfaces. (U)

DESCRIPTORS: *Algorithms, *Image processing, *Extraction, Methodology, Lasers, Images, Three dimensional, Edges, Detection, Computations, Surfaces (U)
IDENTIFIERS: *Feature extraction, Laser range (U)
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UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 324 11/6 20/11 12/1

CALIFORNIA UNIV BERKELEY DEPT OF MATERIALS SCIENCE AND MINERAL ENGINEERING

Fatigue Behavior of Long and Short Cracks in Wrought and Powder Aluminum Alloys. (U)

DESCRIPTIVE NOTE: Annual rept. no. 1, 15 Apr 82-14 Apr 83,
MAY 83 97P Ritchie,Robert O. ;
REPT. NO. UCB/RP/IE/A1013
CONTRACT: AFOSR-82-0181
PROJ: 2306
TASK: A1
MONITOR: AFOSR TR-83-0616

UNCLASSIFIED REPORT

ABSTRACT: The fatigue behavior of short cracks, which are small compared to the scale of the microstructure, small compared to the scale of local plasticity or simply physically small (i.e., approximately < 1 mm), must be considered as one of the major factors limiting the application of defect-tolerant fatigue design for airframe and engine components. Accordingly, this program is aimed at identifying factors which govern the growth of such short cracks in a series of commercial aluminum alloys, with specific reference to behavior at near-threshold levels. In this report, the fundamental basis for the study is described in terms of i) a detailed review of the factors which lead to differences in long and short crack behavior, and ii) a theoretical analysis of the influence of crack deflection and closure mechanisms on long and short crack behavior. It is concluded that many anomalies in the behavior of short fatigue cracks can be traced primarily to closure and deflection mechanisms, and accordingly an experimental program is prepresented with the objective of isolating these effects. (Author) (U)

DESCRIPTORS: *Aluminum alloys, *Fatigue(Mechanics), *Cracks, *Crack propagation, Factor analysis, Defects(Materials), Failure(Mechanics), Mechanical properties, Tolerances(Mechanics), Morphology, Aging(Materials), Microstructure, Plastic properties, Stresses, Airframes, Aircraft engines, Experimental data (U)
IDENTIFIERS: PE61102F, WUAFOSR2306A1 (U)
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FITTSBURGH UNIV PA DEPT OF ELECTRICAL ENGINEERING

Approximation Methods in Multidimensional Filter Design and Related Problems Encountered in Multidimensional System Design. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jan 78-31 Jan 83,
MAR 83 34P Bose,N. K. ;
CONTRACT: AFOSR-78-3542
PROJ: 2304
TASK: A6
MONITOR: AFOSR TR-83-0661

UNCLASSIFIED REPORT

ABSTRACT: The research conducted contributes towards the development of a theory to analyze and design linear shift-invariant multivariable multidimensional discrete and continuous systems. Recursive schemes to compute rational approximants to a power series in two variables having constant matrices for coefficients are developed. Approximants to special matrix power series are investigated and the properties of these approximants are delineated in a strictly mathematical setting and their implications are interpreted via physical reasonings. Algebraic procedures to tet thee approximants for stability are provided, and criteria for guaranteeing the invariance of properties like positivity and stability under parameter changes or perturbation are advanced. Attention is directed throughout towards the reduction of algebraic computational complexity. In the important problem of filter stabilization without appreciable change in the magnitude of the frequency response, recent results on multiplicative computational complexity theory is exploited to demonstrate the feasibility of implementing efficiently a 2-D discrete Hilbert transform. Criteria for 2-D rational approximants to be maximally flat are obtained. (U)

DESCRIPTORS: *Mathematical filters, *Approximation(Mathematics), Algebra, Computations, Bibliographies, Matrices(Mathematics), Digital filters, Two dimensional, Stability, Stabilization, Polynomials (U)

IDENTIFIERS: Robust procedures, PE61102F, WUAFOSR2304A6 (U)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 311 20/6 20/5

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

Large-Signal Results for Degenerate Four-Wave Mixing and Phase Conjugate Resonators, (U)

83 - 10P Jian-quan,Yao ;Guosheng,Zhou ;Siegman,A. E. ;
REPT. NO. GL-3440
CONTRACT: F49620-82-K-0015
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0634

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Aplied Physics B, v30 p11-18 1983.
Reprint: Large-Signal Results for Degenerate Four-Wave Mixing and Phase Conjugate Resonators.

DESCRIPTORS: *Resonators, *Mirrors, *Compensators, *Lasers, Refractive index, Nonlinear systems, Kerr magnetooptical effect, Laser pumping, Gain, Losses, Distortion, Reprints (U)

IDENTIFIERS: Four wave mixing, DFWM(Degenerate Four Wave Mixing), Degenerate mixing, Chase conjugate resonators, Distributed losses, Large signals, Phase distortion, Nonlinear optics, PE61102F, WUAFOSR2301A1 (U)

AD-A131 297 20/6

ROCHESTER UNIV NY INST OF OPTICS

Optical Systems and Statistical Optics. (U)

DESCRIPTIVE NOTE: Annual rept. 1 Oct 81-1 Mar 83,
MAY 83 52P George,Nicholas ;
CONTRACT: AFOSR-77-3434
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0644

UNCLASSIFIED REPORT

ABSTRACT: Theoretical and experimental research is being conducted in the field of opto-electronic systems. The goal is to contribute solutions to problems of basic research importance which also have an underlying significance in practical applications that involve automatic pattern recognition and remote sensing. White light processing systems are described both for matched filtering and for diffraction pattern sampling. Also excellent progress is reported on our related studies of broadband holographic optical elements and an off-axis Fourier transform achromat. With coherent illumination we report a means for automatic image quality evaluation. The scattering of light by dielectric and conducting cylinders has been studied theoretically and experimentally with an emphasis on remote optical metrology. (Author) (U)
DESCRIPTORS: *Optical processing, *Holography, Illumination, Electrooptics, Metrology, Light scattering, Pattern recognition, Remote detectors, White light, Matched filters, Diffraction analysis, Broadband, Fourier transformation (U)
IDENTIFIERS: Statistical optics, PE61102F, WUAFOSR2305B1 (U)

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APPLIED RESEARCH ASSOCIATES INC ALBUQUERQUE NM

Fundamental Properties of Soils for Complex Dynamic Loadings: Dynamic Constitutive Modeling of Sandy Soils. (U)

DESCRIPTIVE NOTE: Annual Technicl rept. no. 2, 1 Aug 81-31 Jul 82,
APR 83 118P Dass,William C. ;Merkle, Douglas H. ;Bratton,Jimmie L. ;
CONTRACT: F49620-80-C-0088
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0053

UNCLASSIFIED REPORT

ABSTRACT: Constitutive modeling of cohesionless soil for both standard static test conditions and insitu impulsive dynamic load conditions is discussed in this annual report. Predicted laboratory response for several different types of models is evaluated using data from a coordinated testing program. The modeling of insitu soil response to explosive events (CIST and DISC Test) is considered, and the laboratory-derived models are tested for their convenience and accuracy in predicting ground motions. Several important laboratory and insitu phenomena which were not reflected by the model exercises are discussed. Based on the conclusions from this study, testing and modeling requirements for dynamic loading situations are proposed (U)
DESCRIPTORS: *Soil mechanics, *Sand, Dynamic loads, Soil models, Computer programs, Computerized simulation, Loads(Forces), Interactions, Stresses, Models (U)
IDENTIFIERS: PE61102F, WUAFOSR2307C1 (U)

AD-A131 283 7/4 20/7 20/8

PENNSYLVANIA UNIV PHILADELPHIA DEPT OF CHEMISTRY

Theoretical Aspects of Cluster Formation by keV Bombardment of Rare-Gas Solids. (U)

DESCRIPTIVE NOTE: Technical rept., MAY 83 9P Garrison,B. J. ;Winograd, N. ;
REPT. NO. TR-13
CONTRACT: N00014-80-C-0491, AFOSR-82-0057
PROJ: 2303
TASK: A1
MONITOR: AFOSR TR-83-0709

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v97 n4,5 p381-386, 27 May 83. Reprint: Theoretical Aspects of Cluster Formation by keV Bombardment of Rare-Gas Solids.

DESCRIPTORS: *Mass spectroscopy, *Ion beams, *Molecular properties, *Clustering, Rare gases, Solids, Ion bombardment, Reprints (U)
IDENTIFIERS: SIMS(Secondary Ion Mass Spectra), SIMS(Secondary Ion Mass Spectroscopy), WUNR051744, PE61102F, WUAFOSR2303SA1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 279 12/1

SCIENCE APPLICATIONS INC PLEASANTON CALIF

Moving Finite Elements in 2-D. (U)

DESCRIPTIVE NOTE: Annual rept. no. 2, 8 Jun 82-7 Jun 83, MAY 83 28P Gelinas,Robert J. ;
REPT. NO. SAI-PL/MFE-2D-2-83
CONTRACT: F49620-81-C-0073
PROJ: 2304
TASK: A3
MONITOR: AFOSR TR-83-0623

UNCLASSIFIED REPORT

ABSTRACT: In this second year of effort, truly large-scale computing aspects of PDE's (partial differential equations) have been addressed. MFE (moving finite element) node movement properties of highly sheared fluid flows and shocks were studied. The following results were obtained: (1) extremely large nodal savings were obtained by the MFE method in highly sheared shock examples; (2) such ODE solvers as the Gear method require significant restructuring of their internal code logic in order to achieve improved time step and error-controlling policies in PDE applications; (3) iterative linear solvers are required in order to accommodate large MFE grid meshes; (4) a new iterative solver of linear systems was developed in order to attain large convergence rates in advection-diffusion equations with highly inhomogeneous mesh spacings, which cannot be solved satisfactorily with other existing linear solvers; (5) first-generation regularization schemes resolved highly sheared flows; and, although large grid aspect ratios were resolved successfully, new regularization functions which homogenize MFE grid cells should be developed in future work; and (6) singularities which are frequently troublesome in cylindrical and spherical co-ordinates are eliminated naturally in MFE inner product formulations. (Author) (U)

DESCRIPTORS: *Finite element analysis, *Two dimensional, Computations, Partial differential equations, Problem solving, Fluid flow, Gradients, Iterations, Moving targets, Linear systems, Grids, Mesh (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A3 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 264 7/4 20/12 20/2

VARIAN ASSOCIATES INC PALO ALTO CA SOLID STATE LAB

Electrical and Optical Properties of InP Grown by Molecular Beam Epitaxy Using Cracked Phosphine. (U)

FEB 83 4P Chow,Robert ;Chai,Young G. ;

CONTRACT: F49620-81-C-0068
PROJ: 2305
TASK: CL
MONITOR: AFOSR TR-83-0645

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v42 n4 p383-385, 15 Feb 83. Reprint: Electrical and Optical Properties of InP Grown by Molecular Beam Epitaxy Using Cracked Phosphine.

DESCRIPTORS: *Indium phosphides, *Crystal growth, *Electrical properties, *Optical properties, Molecular beams, Epitaxial growth, Phosphine, Catalytic cracking, Doping, Photoluminescence, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2305CL (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 238 12/1 20/8

MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY

New Method in Elementary Particle Detection. (U)

DESCRIPTIVE NOTE: Final rept., 1 Jan 81-31 Dec 82,
FEB 83 41P Weber,J. ;
CONTRACT: F49620-81-C-0024, ARPA Order-4099
MONITOR: AFOSR TR-83-0681

UNCLASSIFIED REPORT

ABSTRACT: A general theory of coherent scattering is presented. Applications for very low energy involving the neutral current interactions are considered in detail, together with results of experimental checks. (Author) (U)
DESCRIPTORS: *Numerical methods and procedures, *Coherent scattering, *Theory, *Elementary particles, *Detection, Low energy, Scattering cross sections, Neutrinos, Currents, Interactions, Current density, Charts (U)

AD-A131 223 11/6 6/13

NATIONAL BUREAU OF STANDARDS WASHINGTON DC NATIONAL MEASUREMENT LAB

The Mechanism of Anaerobic (Microbial) Corrosion. (U)

DESCRIPTIVE NOTE: Technical summary rept. no. 1, 1 Jun-31 Dec 82,
DEC 82 40P Iverson,Warren P. ;Olson, Gregory J. ;
CONTRACT: N00014-82-F-0086, AFOSR-82-0709
PROJ: 2303
TASK: A1
MONITOR: AFOSR TR-83-0709

UNCLASSIFIED REPORT

ABSTRACT: This report in the form of three papers describes research into the role of bacteria in anaerobic corrosion processes. During the year we have given more evidence for a novel mechanism of anaerobic corrosion in which a volatile, highly reactive phosporous compound is produced as a result of the activities of sulfate-reducing bacteria (Desulfovibio desuluricans). The corrosion product is an amorphous type of iron phosphide which can be detected by the formation of phosphine upon its acidification. Phosphine (in addition to H2S) has been detected from all the cases of suspected anaerobic corrosion (including tubercles from the inside of water pipes) examined so far. In examining the headspace over growing cultures of Desulfovibio to detect this volatile phosphorus containing compound, using a gas chromatograph (GC) with a flame photometric detector (FPD) specific for phosphorus and sulfur, two sulfur compounds, in addition to H2S, were detected and identified. These compounds, methylmercaptan, and dimethyldisulfide, were found to be relatively non-corrosive to iron under anaerobic conditions. No volatile phosphorus compounds were detected. (U)
DESCRIPTORS: *Corrosion, *Anaerobic bacteria, *Anaerobic processes, Iron compounds, Reduction(Chemistry), Hydrogen sulfide, Phosphine, Phosphorus, Metabolites, Microbiology (U)
IDENTIFIERS: Microbial corrison, Desulfovibio, WUNR205046, PE61102F, WUAFOSR2303A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 221 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

Stable Equilibria in a Scalar Parabolic Equation with Variable Diffusion, (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 29P Fusco,G. ;Hale,Jack K. ;
REPT. NO. LCDS-83-10
CONTRACT: DAAG29-79-C-0161, AFOSR-81-0198
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0673

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grant NSF-MCS82-05355.
ABSTRACT: A scalar parabolic equation with nonconstant diffusion and nonlinear source term is considered and some aspects of the influence of changing the diffusion on existence, stability and bifurcation properties of the equilibria are discussed. (Author) (U)
DESCRIPTORS: *Differential equations, *Diffusion, *Equilibrium(General), Scalar functions, Nonlinear systems, Parabolas, Stability, Bifurcation(Mathematics), Theorems (U)
IDENTIFIERS: Parabolic equations, PE61102F, WUAFOSR2304A4 (U)

AD-A131 209 12/1 9/4

CONNECTICUT UNIV STORRS DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Robust Linear Filtering for Multivariable Stationary Time Series. (U)

DESCRIPTIVE NOTE: Technical rept., APR 83 69P Tsaknakis,Haralampos ; Papantoni-Kazakos,P. ;
REPT. NO. TR-83-6
CONTRACT: AFOSR-78-3695
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0684

UNCLASSIFIED REPORT

ABSTRACT: The problem of asymptotic, non-causal linear filtering for statistically contaminated multivariable stationary time series is considered. The spectra of both the signal and the noise components of the observation process are assumed to belong to certain convex and compact classes. The minimax criterion of optimality is adopted, and for some specific spectral classes the corresponding solutions are found. The performance of those solutions is studied, where the performance criteria used are efficiency, error variation within the classes and breakdown curves or points. Some examples are studied quantitatively. Author) (U)
DESCRIPTORS: *Mathematical filters, *Time series analysis, *Information theory, Stationary, Multivariate analysis, Eigenvectors, Optimization, Theorems, Computations, Tables(Data), Matrices(Mathematics), Asymptotic series, Contamination, Signal to noise ratio, Minimax technique (U)
IDENTIFIERS: Robust procedures, *Linear filters, WUAFOSR2304A5, PE61102F (U)

AD-A131 208 12/1 20/14

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

Analysis of a Delayed Delta Modulator. (U)

DESCRIPTIVE NOTE: Technical rept., MAY 83 49P Gerr,Neil L. ;Cambanis, Stamatis ;
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0683

UNCLASSIFIED REPORT

ABSTRACT: Delayed Delta Modulation (DDM) uses a second feedback loop in addition to the standard DM loop. While the standard loop compares the current predictive estimate of the input to the current sample, the new loop compares it to the upcoming sample so as to detect and anticipate slope overloading. Since this future sample must be available before the present output is determined and the estimate updated, delay is introduced at the encoding. The performance of DDM with perfect integration and step-function reconstruction is analyzed for each of three inputs. In every case, the stochastic stability of the system is established. For a discrete time i.i.d input, the (limiting) joint distribution of input and output is derived, and the (asymptotic) mean square sample point error MSE(SP) is computed when the input is Gaussian. For a Wiener input, the joint distribution of the sample point and predictive errors is derived, and MSE(SP) and the time-averaged MSE (MSE(TA)) are computed. For a stationary, first-order Gauss-Markov input, the joint distribution of input and output is derived, and MSE(SP) and MSE(TA) computed. Graphs of the MSE's illustrate the improvement attainable by using DDM instead of DM. With optimal setting of parameters, MSE(SP) (MSE(TA) is reduced about 15% (35%). (Author) (U)
DESCRIPTORS: *Mathematical prediction, *Delta modulation, *Stochastic processes, Delay, Loops, Feedback, Input, Output, Parameters, Optimization, Stability, Integration, Distribution functions, Linear systems, Stationary, Convergence, Computations, Slope, (U)
IDENTIFIERS: WUAFOSR2304A5, PE61102F (U)

AD-A131 206 8/11

S-CUBED LA JOLLA CA

Simulation of Ground Motions from the 1971 San Fernando Earthquake and an Aftershock of the 1975 Oroville Earthquake. (U)

DESCRIPTIVE NOTE: Technical rept., APR 83 22P Barker,T. G. ;
REPT. NO. SSS-R-83-6079
CONTRACT: F49620-81-C-0093, ARPA Order-4332
MONITOR: AFOSR TR-83-0668

UNCLASSIFIED REPORT

ABSTRACT: In this report, we describe a model for earthquakes which can be used to calculate ground motions at the earth's surface cheaply and accurately. The method was developed to be used as input to computer programs which can predict atmospheric pressure waves due to earthquakes. The method was used in a previous report to model the 1971 San Fernando earthquake. Approximations used in that work are checked in this report using more exact methods. The model is then modified to fit observations of an aftershock of the 1975 Oroville earthquake. (Author) (U)
DESCRIPTORS: *Earthquakes, *Ground motion, *Computerized simulation, Ground shock, Approximation(Mathematics), Mathematical prediction, Seismic waves, Velocity, Atmospheric motion, Pressure, Models (U)
IDENTIFIERS: Aftershock (U)

AD-A131 081 6/19 12/1

CONCORDIA UNIV MONTREAL (QUEBEC) DEPT OF ELECTRICAL ENGINEERING

Cervical Spline Analysis for Ejection Injury Prediction. (U)

DESCRIPTIVE NOTE: Final research rept. Oct 80-Sep 82, NOV 82 99P Gracovetsky,S. ;Farfan,H. F. ;Helleur,Christopher D. ;
CONTRACT: AFOSR-81-0012
PROJ: 2312
TASK: A2
MONITOR: AFOSR TR-83-0590

UNCLASSIFIED REPORT

ABSTRACT: We have developed a sagittal plane mathematical model for the cervical spine (including T6-T1, C7-C1 and skull). In our model the moments due to the weight of the head and neck and the effect of external forces are balanced by forces generated internally by muscle, ligament, and intervertebral joint. With this formulation, the problem is to find a method for distributing the moment between muscle and ligament. Our calculations show that the mathematical representation of physiological behavior demands that stress be minimized at the intervertebral joint. It is interesting to note that Wolff has observed that bone architecture at the microscopic level responds to stress. Our findings suggest the system as a whole is controlled by stress. This model was then subjected to simulation in order to determine the maximum acceleration that the cervical spine would take for different postures. We found that the maximum supportable acceleration (i.e. acceleration that would result in any cervical component reaching 2/3 of its limit) depends upon the neck posture and orientation vis-a-vis the acceleration vector. (U)
DESCRIPTORS: *Spinal column, *Head(Anatomy), *Neck(Anatomy), *Ejection, *Wounds and injuries, *Mathematical models, Central nervous system, Muscles, Ligaments, Stress(Physiology), Acceleration tolerance, Electromyography, Anatomical models, Optimization, Joints(Anatomy), Simulation, Predictions, Biodynamics (U)
IDENTIFIERS: WUAFOSR2312A2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 018 11/6 13/9 20/3 20/13

RICE UNIV HOUSTON TX DEPT OF MECHANICAL ENGINEERING

Metallurgical Characterization of Niobium/Tin Superconducting Multifilamentary Wires. (U)

DESCRIPTIVE NOTE: Final rept. 1 Apr-31 Dec 82,
MAR 83 39P Roberts,John Melville ;
CONTRACT: AFOSR-82-0150
PROJ: 2306
TASK: D9
MONITOR: AFOSR TR-83-0596

UNCLASSIFIED REPORT

ABSTRACT: The origin of a high incidence of discontinuous Nb filaments in Niobium/bronze multifilamentary drawn wires is discussed. It is suggested their occurrence is most likely an intrinsic part of the manufacturing process. Studies on the application of the limiting grain size concept in the bronze by the Nb filaments, suggests this effect only sets an upper bound on the attainable grain size and in reality, the actually observed grain size and sub-grain size is lower than this upper bound. This leads to extensive hardening of the bronze phase as the Nb/bronze multifilamentary wires are progressively reduced to ultra-fine dimensions. Preliminary ageing studies of a 13 wt % Sn bronze alloy, suggest the alpha bronze may exhibit some age hardening decomposition phenomena in the 300 to 400 degree C temperature range for unprestrained solution heat treated and quenched material. An even stronger hardening phenomena in this temperature range occurs if the material is prestrained 65% in compression after solution heat treatment but prior to ageing. Contemplated further studies in the area are presented. (Author) (U)
DESCRIPTORS: *Metallurgy, *Superconductors, *Wire, *Thermal conductivity, *Electrical conductivity, Niobium, Tin, Bronze, Filament wound construction, Grain size, Tensile strength, Hardening, Decomposition, Heat treatment, Thermal expansion, Coefficients, Annealing, Yield strength (U)
IDENTIFIERS: WUAFOSR2306D9, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A131 016 12/1 9/4

ALPHATECH INC BURLINGTON MA

Distributed Detection of Signal Waveforms in Additive Gaussian Observation Noise. (U)

DESCRIPTIVE NOTE: Technical paper,
83 61P Lauer,G. S. ;Sandell,N. R. , Jr;
REPT. NO. TP-160
CONTRACT: F49620-81-C-0015
PROJ: 2304
TASK: A6
MONITOR: AFOSR TR-83-0588

UNCLASSIFIED REPORT

ABSTRACT: This paper is concerned with the detection of signal waveforms by a distributed surveillance network comprised of: a collection of spatially separated sensors, and local signal processors collocated with the sensors. The local signal processors are assumed to implement likelihood ratio tests to detect the presence or absence of the signals. Signal detections may be used for local decisionmaking or passed upward to a fusion center for further processing. In either case, the local detection thresholds cannot be determined independently, but must be determined jointly to optimize overall surveillance system performance. Results are presented concerning the nature of this threshold computation for a number of interesting cases. (Author) (U)
DESCRIPTORS: *Numerical methods and procedures, *Signal processing, *Waveforms, *Signal to noise ratio, Stochastic processes, Surveillance, Probability density functions, Decision making, Global, Gaussian noise, Threshold effects, White noise, Correlation (U)
IDENTIFIERS: WUAFOSR2304A6, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 973 12/1

CONNECTICUT UNIV STORRS DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Robust Prediction and Interpolation for Vector Stationary Processes. (U)

DESCRIPTIVE NOTE: Technical rept., NOV 82 39P Tsaknakis,Haralampos ;Kazakos, Dimitri ;Papantoni Kazakos,P. ;
REPT NO. EECS-TR-82-7
CONTRACT: AFOSR-82-0030
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0448

UNCLASSIFIED REPORT

ABSTRACT: Asymptotic linear prediction and interpolation, for statistically contaminated vector stationary processes is considered. Both prediction and interpolation are then formalized as stochastic games with saddle point solutions. The existence of unique solutions on convex and closed classes of vector stationary processes is shown. Then, those solutions are found and analyzed, for two specific classes of vector stationary processes. (Author) (U)
DESCRIPTORS: *Statistical processes, *Game theory, Mathematical prediction, Interpolation, Stochastic processes, Vector analysis, Stationary, Asymptotic normality, Contamination, Solutions(General), Linearity (U)
IDENTIFIERS: Robust procedures, PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 949 8/13 20/11

NORTHWESTERN UNIV EVANSTON IL DEPT OF CIVIL ENGINEERING

Influence of Fabric on Liquefaction and Densification Potential of Cohesionless Sand, (U)

82 22P Nemat-Nasser,S. ;Tobita,Y. ;
CONTRACT: AFOSR-80-0017
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0608

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Mechanics of Materials, v1 p43-62 1982.
Reprint: Influence of Fabric on Liquefaction and Densification Potential of Cohesionless Sand.

DESCRIPTORS: *Sand, *Fabrication, *Liquid phases, *Cohesion, Granules, Density, Shear stresses, Soil mechanics, Reprints (U)
IDENTIFIERS: Liquefaction, WUAFOSR2307C1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 882 21/2 20/4 2 /5

CALIFORNIA INST OF TECH PASADENA DEPT OF ENGINEERING AND APPLIED SCIENCE

Linear Theory of Pressure Oscillations in Liquid Fueled Ramjet Engines. (U)

DESCRIPTIVE NOTE: Interim rept.,
83 9P Culick,F. E. C. ;Yang,V.
;
CONTRACT: AFOSR-80-0265
PROJ: 2308
TASK: A2
MONITOR: AFOSR TR-83-0600

UNCLASSIFIED REPORT

ABSTRACT: Low frequency pressure oscillations in ramjet engines are treated within the one-dimensional approximation. The engine is treated in two parts: the inlet section, containing relatively high speed flow, and the combustion chamber. A linearized analysis of a normal shock exposed to acoustic waves provides the upstream boundary condition. Most of the work reported was concerned with the combustion chamber. A simple model of the steady flow in a dump combustor has been worked out, comprising three regions: the flow of unburnt reactions; the region containing products of combustion; and the recirculation zone. Combustion is assumed to occur in an infinitesimally thin sheet; an infinitesimally thin shear layer separates the recirculation zone from the remainder of the flow field. Acoustic fields in the inlet and the combustion chamber are formed separately and joined at the dump plane to provide a transcendental equation for the computer wave number. Results for the frequencies of oscillations and the pressure distributions compare well with experimental data taken at the Naval Weapons Center, China Lake. Some preliminary results are given for the unsteady behavior of a normal shock wave in a diffuser, calculated with a modified form of a computer program obtained from AFRPL. (U)
DESCRIPTORS: *Combustion, *Ramjet engines, Pressure distribution, Oscillation, Low frequency, Combustion stability, Combustion chambers, Pressure, Steady flow, Ramjet inlets, High velocity, Diffusers, Shock waves, Acoustic wave (U)
IDENTIFIERS: Recirculating flow, Combustion (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 857 20/12 7/4

DELAWARE UNIV NEWARK

Superconductivity and Phonon Specific Heat of the Alkali Metal Mercurographitides (Rb,K) HgC4 and (Rb,K) HgC8. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 81 3P Alexander,M. Grayson ; Guerard,D. ;Lagrange,P. ;Makrini,M. El ; Onn,David G. ;
CONTRACT: AFOSR-77-3393
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0589

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Biennial Conference on Carbon (15th), pi4-15, 22-23 Jun 81. Reprint: Superconductivity and Phonon Specific Heat of the Alkali Metal Mercurographitides (Rb, K) HgC3 and (Rb,K) HgC8.

DESCRIPTORS: *Graphite, *Superconductivity, *Specific heat, Alkali metals, Temperature, Phonons, Spectrum analysis, Mercury compounds, Reprints (U)
IDENTIFIERS: *Metal mercurographitides, WUAFOSR2306C3, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 806 12/1 9/2

STATE UNIV OF NEW YORK AT BUFFALO AMHERST DEPT OF COMPUTER SCIENCE

Approaches to Automatic Strategy Analysis and Synthesis. (U)

DESCRIPTIVE NOTE: Final rept. on Phase 1, 1 Jul 81-31 Aug 82,
SEP 82 8P Findler,Nicholas V. ;
CONTRACT: AFOSR-81-0220
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0592

UNCLASSIFIED REPORT

ABSTRACT: The efforts of the research group for Computer Studies of Strategies centered on three long-term projects: (1) The Generalized Production Rules System (GPRS) is a program which can support decision-making for a variety of expert systems in need of estimates of hidden variables. Hidden variables are such that their values can be identified only at certain times, either intermittently or periodically. In contrast, open variables are readily measurable at any time. The estimation is vased on stochastic, causal relations between hidden and open variables. (2) The Quasi-Optimizer System (QO) is a program which observes and measures adversaries' behavior in confrontations, infers their strategies, and constructs a descriptive theory, i.e., a model of each. It then identifies the components of the strategies, evaluates their effectiveness and combincs the most satisfactory ones into a normative theory which is an optimum strategy in the statistical sense. (3) The Advice Taker/ Inquirer System (AT/I) is a program which can be taught strategies by a human advisor. The advisor provides principles and high-level examples of actions in different situations. The system applies the strategy to test, verify and optimize the strategy. (Author) (U)
DESCRIPTORS: *Statistical analysis, *Decision making, *Computer applications, *Automatic, *Strategy, Variables, Optimization, Observation, Test and evaluation, Theory, Parts, Normality, Measurement, Fault tree analysis, Estimates, (U)
IDENTIFIERS: Normative theory, Decision trees, (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 791 5/1 5/2 9/3

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES ELECTRONIC SCIENCES LAB

Research in Electronics: Joint Services Electronics Program. (U)

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 82-31 Mar 83,
APR 83 140P Steier,William H. ;
CONTRACT: F49620-81-C-0070
PROJ: 2305
TASK: A9
MONITOR: AFOSR TR-83-0617

UNCLASSIFIED REPORT

ABSTRACT: This annual technical report summarizes accomplishments and progress of fifteen (15) projects (work units) which were active during all or part of the reporting period of 1 April 1982 to 31 March 1983 under contract F49620-81-C-0070 at the Electronic Sciences Laboratory of the University of Southern California under the Joint Services Electronics Program. (U)
DESCRIPTORS: *Research management, *Electronics, *Reports, Quantum electronics, Solid state electronics, Lasers, Semiconductors, Signal processing, Computers, Optics, Data bases (U)
IDENTIFIERS: PE61102F, WUAFOSR2305A9 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 782 12/1 11/4 20/11

DREXEL UNIV PHILADELPHIA PA DEPT OF MECHANICAL ENGINEERING AND MECHANICS

Fracture Mechanics of Sub-Laminate Cracks. (U)

DESCRIPTIVE NOTE: Interim rept. 1 Sep 79-30 Sep 82, OCT 82 220P Wang,A. S. D. ;Crossman, F. W. ;
CONTRACT: F49620-79-C-0206
PROJ: 2307
TASK: B2
MONITOR: AFOSR TR-83-0594

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Lockheed Missiles and Space Co., Inc., Palo Alto, CA. Research Lab.
ABSTRACT: A monograph is presented which details the analysis and experiment on the mechanics of sub-laminate crack propagation in polymer-based composite laminates. The analytical approach is based on the energy release rate concept of the classical fracture mechanics, in conjunction with a numerical crack propagation simulation technique using finite elements. Main emphasis is placed on statically induced cracks, although fatigue induced cracks are also discussed. (Author) (U)
DESCRIPTORS: *Finite element analysis, *Composite materials, *Epoxy laminates, *Polymers, *Fracture(Mechanics), Crack propagation, Fatigue(Mechanics), Energy transfer, Bases(Chemistry), Structural properties (U)
IDENTIFIERS: PE61102F, WUAFOSR2307B2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 776 20/12 20/2

FLORIDA UNIV GAINESVILLE DEPT OF ELECTRICAL ENGINEERING

Study of Deep-Level Defects and Transport Properties vs Growth Parameters and Annealing Conditions in III-V Compound Semiconductors. (U)

DESCRIPTIVE NOTE: Annual technical rept. 11 Jun 82-10 Jun 83, JUN 83 111P Li,Sheng S. ;
CONTRACT: AFOSR-81-0187
PROJ: 2306
TASK: B1
MONITOR: AFOSR TR-83-0630

UNCLASSIFIED REPORT

ABSTRACT: The objectives of this research program are: (1) To investigate the grown-in defects and the effects of thermal and laser annealing on the grown-in defects in LEC grown Zn-doped InP, (2) to study the transport properties in n-type InP, (3) to characterize the grown-in defects vs annealing temperature in the LEC grown GaAs, and compare the deep-level defects in the MOCVD grown GaAs on semi-insulating GaAs- and Ge- substrates, (4) to study the one-MeV electron radiation induced deep level defects in LPE grown GaAs and the effects of thermal annealing on these defects. Deep-level Transient Spectroscopy (DLTS) Capacitance-Voltage (C-V), Current-Voltage (I-V), Resistivity, and Hall effect measurements were employed to study the deep-level defects and transport properties vs growth parameters and annealing conditions in GaAs and InP specimens. (Author) (U)
DESCRIPTORS: *Semiconductors, *Group III compounds, *Group V compounds, *Annealing, Electron mobility, *Crystal growth, Transport properties, Defects(Materials), Depth, Gallium arsenides, Indium phosphides, Epitaxial growth, Electron density, Trapping(Charged Particles) (U)
IDENTIFIERS: PE61102F, WUAFOSR2306B1 (U)

AD-A130 770 5/1 9/3

SOUTHEASTERN CENTER FOR ELECTRICAL ENGINEERING EDUCATION INC ST CLOUD FL

USAF/SCEEE Summer Faculty Research Program (1982). Research Reports. Volume 2. (U)

DESCRIPTIVE NOTE: Final rept., OCT 82 780P Peele,Warren D. ;Steele, Earl L. ;
CONTRACT: F49620-82-C-0035
PROJ: 2301
TASK: D5
MONITOR: AFOSR TR-83-0614

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A130 769.
ABSTRACT: For abstract see AD-A130 769. (U)
DESCRIPTORS: *Research management, Electrical engineering, Air Force research, Scientists, Instructions, Air Force facilities, Laboratories, Instructors, Universities, Recruiting, Selection, Reports, Abstracts (U)
IDENTIFIERS: PE61102F, WUAFOSR2301D5 (U)

AD-A130 769 5/1 9/3

SOUTHEASTERN CENTER FOR ELECTRICAL ENGINEERING EDUCATION INC ST CLOUD FL

USAF/SCEEE Summer Faculty Research Program. Research Reports. Volume 1. (U)

DESCRIPTIVE NOTE: Final rept., OCT 82 933P Peele,Warren D. ;Steele, Earl L. ;
CONTRACT: F49620-82-C-0035
PROJ: 2301
TASK: D5
MONITOR: AFOSR TR-83-0613

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A130 770.
ABSTRACT: The United States Air Force Summer Faculty Research Program (USAF-SFRP) is a program designed to introduce university, college, and technical institute faculty members to Air Force research. This is accomplished by faculty competition on a nationally advertised competitive basis for a ten-week assignment during the summer intersession to perform research at Air Force laboratories/centers. Each assignment is in a subject area and at an Air Force facility mutually agreed upon by the faculty member and the Air Force. In addition to compensation and travel expenses, a cost of living allowance is also paid. The USAF-SFRP is sponsored by the Air Force Office of Scientific Research/Air Force Systems Command, United States Air Force, and is conducted by the Southeastern Center for Electrical Engineering Education(SCEEE). (Author) (U)
DESCRIPTORS: *Research management, *Electrical engineering, Air Force research, Scientists, Instructions, Air Force facilities, laboratories, Instructions, Universities, Recruiting, Selection, Reports, Abstracts (U)
IDENTIFIERS: PE61102F, WUAFOSR2301D5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 768 5/9

SOUTHEASTERN CENTER FOR ELECTRICAL ENGINEERING EDUCATION INC ST CLOUD FL

USAF/SCEEE Summer Faculty Research Program (1982). Management Report. (U)

DESCRIPTIVE NOTE: Final rept., OCT 82 165P Peele,Warren D. ;Steele, Earl L. ;
CONTRACT: F49620-82-C-0035
PROJ: 2301
TASK: D5
MONITOR: AFOSR TR-83-0612

UNCLASSIFIED REPORT

ABSTRACT: The program provides opportunities for research in the physical sciences, engineering, life sciences, business, and administrative sciences. The program has been effective in providing basic research opportunities to the faculty of universities, colleges, and technical institutions throughout the United States. (Author) (U)
DESCRIPTORS: *Students, Air Force Training, Education, Research management, Human resources, Physical sciences, Engineering, Life sciences, Public administration, Air Force facilities, Air Force planning (U)
IDENTIFIERS: Pilot programs, PE61102F, WUAFOSR2301D5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 767 5/9

SOUTHEASTERN CENTER FOR ELECTRICAL ENGINEERING EDUCATION INC ST CLOUD FL

USAF/SCEEE Graduate Student Summer Support Program (1982). Management and Technical Report. (U)

DESCRIPTIVE NOTE: Final rept., OCT 82 383P Peele,Warren D. ;Steele, Earl L. ;
CONTRACT: F49620-82-C-0035
PROJ: 2301
TASK: D5
MONITOR: AFOSR TR-83-0611

UNCLASSIFIED REPORT

ABSTRACT: A pilot program for graduate Student Summer Support via the AFOSR Summer Faculty Research Program (SFRP) was initiated by contract modification on 26 March 1982. The program was developed as an adjunct effort to the SFRP. Its purpose is to provide funds for selected graduate students to work at an appropriate Air Force Laboratory or Center with a supervising professor who holds a concurrent SFRP appointment. Although only 16 positions were budgeted, SCEEE appointed 17 graduate students who represented fifteen schools and ten disciplines in science and engineering. (Author) (U)
DESCRIPTORS: *Students, *Air Force training, Education, Research management, Human resources, Physical sciences, Engineering, Life sciences, Public administration, Air Force facilities, Air Force planning (U)
IDENTIFIERS: Pilot programs, PE61102F, WUAFOSR2301D5 (U)

AD-A130 758 8/7 17/9 8/11 14/5

PENNSYLVANIA STATE UNIV UNIVERSITY PARK

Lateral Variations in Geologic Structure and Tectonic Setting from Remote Sensing Data. (U)

DESCRIPTIVE NOTE: Final rept. 16 Mar 80-30 Sep 82,
MAY 83 231P Alexander,Shelton S. ;
CONTRACT: AFOSR-77-3340
PROJ: A032
TASK: 91
MONITOR: AFOSR TR-83-0610

UNCLASSIFIED REPORT

ABSTRACT: The principal objective of this study was: (1) to assess the usefulness of remote sensing digital imagery, principally LANDSAT multispectral scanning (MSS) data, for inferring lateral variations in geologic structure and tectonic setting; and (2) to determine the extent to which these inferred variations correlate with observed variations in seismic excitation from underground nuclear explosion test sites in the Soviet Union. Soviet, French and U.S. test sites have been investigated to compare their geologic and tectonic responses as seen by LANDSAT. The characteristics of 'granite' intrusive bodies exposed at Semipalatinsk (Degelen), North Africa (Hoggar), NTS (Climax stock), and an analog site in Maine (Mt. Katahdin), have been studied in detail. The tectonic stress field inferred from the tectonic release portion of seismic signatures of explosions in these three areas is compared with local and regional fracture patterns discernable from imagery. The usefulness of satellite synthetic aperture radar (SAR) to determine geologic conditions and delineate fault (fracture) patterns is demonstrated by the analysis of SEASAT data for an area in the eastern United States. Algorithms to enhance structural boundaries and to use textures to identify rock types were developed and applied to several test sites. (Author) (U)
DESCRIPTORS: *Structural geology, *Image processing, *Tectonics, *Pattern recognition, Remote detectors, Spaceborne, Seismic signatures, Granite, Faults(Geology), Scanning, Multiband spectral reconnaissance, Radar images, Synthetic (U)
IDENTIFIERS: LANDSAT, Multispectral scanning, (U)
AD-A130 758

AD-A130 755 17/7 18/4

STANFORD UNIV CA

Background Information on the He(3) Nuclear Gyroscope. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Jun 78-30 Apr 82,
FEB 83 72P Fairbank,William M. ;
CONTRACT: F49620-78-C-0088
PROJ: 2305
TASK: B2
MONITOR: AFOSR TR-83-0597

UNCLASSIFIED REPORT

ABSTRACT: During the contract period the background necessary to proceed with the assembly and testing of the precision He(3) nuclear gyroscope was completed. This background work included experiments on He(3)-He(4) liquid and gas mixtures in a prototype apparatus which was modified to provide additional information useful to the He(3) gyroscope research program. The precision quartz He(3) gyroscope was designed, constructed and delivered during the period as were the components of the airlock and cryostat probe assembly. A new ultra-low magnetic field shield was made which achieved 2 x 10 to the 8th power/G over the volume necessary for the He(3)gyroscope. This not only exceeds the nominal requirements of the He(3) gyroscope, but is the lowest magnetic field region ever made. An engineering Ph.D thesis was completed by Captain Gerald Shaw, working with professor Daniel DeBra, on a theoretical analysis of the cross-axis response of a three-axis He(3) gyroscope and on kinematic rectification in a nuclear gyro. (Author) (U)
DESCRIPTORS: *Gyroscopes, Nuclear instrumentation, Nuclear magnetic resonance, Cryogenics, Optical pumping, Helium, Gases (U)
IDENTIFIERS: Nuclear gyroscopes, PE61102F, WUAFOSR2305B2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 749 12/1

ARIZONA STATE UNIV TEMPE GROUP FOR COMPUTER STUDIES OF STRATEGIES

A Note on the Functional Estimation of Values of Hidden Variables --- An Extended Module for Expert Systems. (U)

DESCRIPTIVE NOTE: Technical rept., 82 46P Findler,Nicholas V. ;Lo, Ron ;
CONTRACT: AFOSR-82-0340
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0593

UNCLASSIFIED REPORT

ABSTRACT: The paper describes an extension of the author's work on the Generalized Production Rules System. In its original form, it could estimate at a given point of time or space the value of hidden variables -- variables that can be measured only intermittently or periodically. In contrast, open variables are readily measurable any time. The system establishes stochastic, causal relations, generalized production rules, between known values of hidden variables and certain mathematical properties of the open variables' behavior. These rules are then used to make the point estimates. The authors have now provided the system with the additional ability to estimate the functional behavior of the hidden variables. The system can serve as a domain-independent module to a knowledge-based expert system in need of such numerical estimates. (U)
DESCRIPTORS: *Variables, *Estimates, Value, Numerical analysis, Strategy, Decision making, Distribution functions, Computer files, Instructions (U)
IDENTIFIERS: *Expert systems, *Hidden variables, GPRS(Generalized Production Rules System), WUAFOSR2304A2, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 748 20/8

OREGON UNIV EUGENE

Atomic Inner-Shell Transitions---Theory and the Need for Experiments, (U)

APR 83 5P Crasemann,Bernd ;
CONTRACT: F49620-83-K-0020, AFOSR-79-0026
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0621

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Nuclear Science, vNS-30 n2 p887-890 Apr 83. Reprint: Atomic Inner-Shell Transitions---Theory and the Need for Experiments.

DESCRIPTORS: *Atomic energy levels, *Translations, *Theory, Atomic orbitals, Physics, X rays, Reprints (U)
IDENTIFIERS: Atomic inner levels, Atomic physics, WUAFOSR2301A4, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 747 20/11

NORTHWESTERN UNIV EVANSTON IL

A Plasticity Model for Flow of Granular Materials under Triaxial Stress States, (U)

82 36P Dorris,J. F. ;Nemat-Nasser,S. ;

CONTRACT: AFOSR-80-0017
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0606

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Solids and Structures, v18 n6 p497-531 1982.
Reprint: A Plasticity Model for Flow of Granular Materials under Triaxial Stress States.

DESCRIPTORS: *Plastic properties, Triaxial stresses, Theory, Models, Stresses, Pressure, Sensitivity, Mathematical models, Reprints (U)
IDENTIFIERS: WUAFOSR2307C1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 742 12/1

NORTHWESTERN UNIV EVANSTON IL DEPT OF CIVIL ENGINEERING

A Statistical Study of Fabric in a Random Assembly of Spherical Granules, (U)

82 20P Oda,M. ;Nemat-Nasser,S. ; Mehrabadi,M. M. ;

CONTRACT: AFOSR-80-0017
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0607

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in International Jnl. for Numerical and Analytical Methods in Geomechanics, v6 p77-94 1982.
Reprint: A Statistical Study of Fabric in a Random Assembly of Spherical Granules.

DESCRIPTORS: *Statistical analysis, *Fabrics, *Spheres, *Granules, Random variables, Reprints (U)
IDENTIFIERS: Random assembly, PE61102F, WUAFOSR2307C1 (U)

AD-A130 729 20/14 20/6

NORTH TEXAS STATE UNIV DENTON DEPT OF PHYSICS

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

DESCRIPTIVE NOTE: Final rept. 1 Nov 81-31 Oct 82,
OCT 82 15P Diels,Jean-Claude ;
CONTRACT: AFOSR-82-0044
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0595

UNCLASSIFIED REPORT

ABSTRACT: An experimental and theoretical study of resonant coherent four wave mixing has been initiated. Prior theoretical investigation by the author has demonstrated that coherent propagation effects can be used to keep all the energy in the radiation field, even in the presence of resonant absorption. An energy conversion efficiency of 6% was predicted for third harmonic conversion in lithium to 190 nm. In the period covered, (1) Constructed a dye laser amplifier, and achieved an output of 1 mJ for wavelengths covering the most important resonances of lithium (571 nm, 672 nm, 639 nm); (2) Purchased and assembled the hardware of a data acquisition system to accurately characterize each pulse (amplitude, duration, phase modulation) and perform the measurement of two photon absorption and third harmonic as a function of the relative phase and delay in the pulse sequence; (3) Investigated the feasibility of increasing the conversion efficiency through the use of natural or induced autoionizing resonances; and (4) Made a theoretical study of the influence of coherence on three photon ionization in lithium. (U)
DESCRIPTORS: *Coherent electromagnetic radiation, *Wave propagation, *Vacuum ultraviolet radiation, Metal vapors, Photons, Harmonic generators (U)
IDENTIFIERS: Photon absorption, PE61102F, WUAFOSR2301A1 (U)

AD-A130 727 20/3 20/14 18/4 20/6

CALIFORNIA UNIV IRVINE DEPT OF PHYSICS

The Interaction of Electromagnetic Radiation with Solid Materials. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jan 78-31 Dec 82,
JUN 83 10P Maradudin,Alexei A. ;Mills, D. L. ;
CONTRACT: F49620-78-C-0019
PROJ: 2306
TASK: C2
MONITOR: AFOSR TR-83-0618

UNCLASSIFIED REPORT

ABSTRACT: Results are reported which were obtained during a theoretical program on the interaction of electromagnetic waves with solids. The report places special emphasis on the 1982 calendar year, which is the final year of the program. We have explored, during the tenure of the program a variety of interactions which influence the (linear) response of solids to external electromagnetic radiation, with emphasis on the frequency regime which extends from the visible, through the infrared and down to the microwave. Examples are the study of intrinsic free carrier scattering mechanisms in doped, polar materials, where our theory provides an excellent account of data with no adjustable parameters. Also, the scattering of electrons from phonons and other electrons in the near proximity of the surface, and their influence on the microwave response of metals has been explored. The last few years of the program saw increasing emphasis on the propagation of waves along interfaces with nonplanar profile (rough surfaces, periodic grating structures), and on the nonlinear interaction between waves in the near vicinity of planar, and nonplanar interfaces. In this body of work, perturbation theoretic methods were developed, which treat the deviations from a perfectly flat profile as small, and also we had considerable success with nonperturbative methods applied to periodic structures possibly of large amplitude. (U)
DESCRIPTORS: *Electromagnetic radiation, *Surface roughness, *Optical properties, *Solids, Diffraction analysis, Polaritrons, Surface waves, Theory Microwaves, Frequency response, (U)
IDENTIFIERS: Surface responses, Surface (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 715 7/4 20/8

HULL UNIV (ENGLAND)

Surface Termination in Chain Reaction and the Interaction with Homogeneous Termination, (U)

81 16P Baldwin,Ray R.;Howarth, John A. ;

CONTRACT: AFOSR-77-3215
PROJ: 2308
TASK: B2
MONITOR: AFOSR TR-83-0604

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Society Faraday Trans I, v78 p451-464 1982.
Reprint: Surface Termination in Chain Reactions and the Interaction with Homogeneous Termination.

DESCRIPTORS: *Surface chemistry, *Reaction kinetics, *Chain reactions, Experimental data, Constants, Rates, Reprints (U)
IDENTIFIERS: Surface termination, Spherical vessels, Chain termination, PE61102F, WUAFOSR2308B2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 714 20/4

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF AEROSPACE AND OCEAN ENGINEERING

Atomization of Impinging Liquid Jets in a Supersonic Crossflow, (U)

DESCRIPTIVE NOTE: Rept. for 1 Dec 81-30 Nov 82,
FEB 83 5P Hewitt,P. W. ;Schetz,J. A. ;

CONTRACT: AFOSR-82-0159
PROJ: 2308
TASK: A2
MONITOR: AFOSR TR-83-0599

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in AIAA Jnl., v21 n2 p178-179 Feb 83.
Reprint: Atomization of Impinging Liquid Jets in a Supersonic Crossflow.

DESCRIPTORS: *Liquid jets, *Atomization, Supersonic flow, Sprays, Gas flow, High velocity, Injection, Cross flow, Transverse, Injectors, Drops, Plumes, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2308A2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 707 20/13

PURDUE UNIV LAFAYETTE IN THERMOPHYSICAL PROPERTIES RESEARCH LAB

Thermophysical Property Determinations Using Transient Techniques. (U)

DESCRIPTIVE NOTE: Annual rept. 15 Feb 82-15 Feb 83, APR 83 10P Taylor,R. E. ;Shoemaker,R. L. ;Koshigoe,L. G. ;
REPT. NO. TPRL-317
CONTRACT: F49620-81-K-0011
PROJ: 2308
TASK: A1
MONITOR: AFOSR TR-83-0605

UNCLASSIFIED REPORT

ABSTRACT: In this program, determinations of the thermophysical properties of HMX, RDX and AP are being made. Two thermal properties are being measured: (1) specific heat and (2) thermal diffusivity. The product of these results and the densities of the propellants, yields the thermal conductivity of the material. Specific heat as a function of temperature for single crystals of HMX in both their beta and delta phases have been completed. Delta phase results were obtained using two techniques: (1) short range results from 477-486 degrees K just after the phase transition (beta to delta), and (2) extended range results from 415-485 degrees K. The second technique was possible due to hysteresis in the conversion of delta-HMX back to beta-hmx following cooling from above the phase transition temperature. The delta phase results for a powdered blend of HMX were obtained and yielded good agreement of the single crystals. Also, the specific heat of HMX inter-mixed with decomposition products was found to be slightly larger than for pure HMX. (U)
DESCRIPTORS: *Thermophysical properties, *Transients, *Methodology, Single crystals, Specific heat, RDX, HMX, Ammonium perchlorate, Thermal conductivity, Thermal diffusion, Solid propellants (U)
IDENTIFIERS: PE61102F, WUAFOSR2308A1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 706 20/4 14/2 21/5 21/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF AEROSPACE AND OCEAN ENGINEERING

Transverse Jet Break-up and Atomization with Rapid Vaporization along the Trajectory. (U)

DESCRIPTIVE NOTE: Interim rept. 1 Dec 81-30 Nov 82, JAN 83 13P Hewitt,P. W. ;Schetz,J. A. ;
CONTRACT: AFOSR-82-0159
PROJ: 2308
TASK: A2
MONITOR: AFOSR TR-83-0602

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Proceedings of the AIAA Aerospace Sciences Meeting (21st), Reno, Nevada, 10-13 Jan 83, Paper AIAA-83-0419.
ABSTRACT: A simulation approach to studying hot flow subsonic cross-stream fuel injection problems in a less complex and costly cold flow facility was developed and implemented. A typical ramjet combustion chamber fuel injection problem was posed where ambient temperature fuel (Kerosene) is injected into a hot airstream. This case was transformed through two new similarity parameters involving injection and freestream properties to a simulated case where a chilled injectant is injected into an ambient temperature airstream. Experiments for the simulated case using chilled Freon-12 injected into the Virginia Tech 23 x 23 cm. blow-down wind tunnel at a freestream Mach number of 0.44 were run. The freestream stagnation pressure and temperature were held at 2.5 atm. and 300 K respectively. The resulting spray plume was carefully examined and documented with photographs and droplet measurements. The results showed a clear picture of the mechanisms of jet decomposition in the presence of rapid vaporization. Immediately after injection a vapor cloud was formed in the jet plume, which dissipated downstream leaving droplets on the order of 8 to 10 microns in diameter for the conditions examined. This represents a substantial reduction compared to baseline tests run at the same conditions with water which had little vaporization. (U)
DESCRIPTORS: *Fuel injection, *Atomization, *Jet mixing flow, Transverse, Cross flow, Sprays, (U)
IDENTIFIERS: Transverse injection, Freon-12, Je (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 705 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PRECESSES

Weak and Strong Law Results for a Function of the Spacings. (U)

DESCRIPTIVE NOTE: Technical rept., MAY 83 16P McCormick,William P. ;
REPT. NO. TR-30
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0627

UNCLASSIFIED REPORT

DESCRIPTORS: *Order statistics, *Distribution functions, Permutations, Random variables, Statistical samples, Numbers, Asymptotic series, Theorems, Stationary, Limitations (U)
IDENTIFIERS: *Spacings, PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 699 21/9.1 21/4 22/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF AEROSPACE AND OCEAN ENGINEERING

Breakup and Droplet Formation of Slurry Jets. (U)

DESCRIPTIVE NOTE: Rept. for 1 Dec 81-30 Nov 82, JAN 83 16P Ogg,John C. ;Schetz,Joseph A. ;
CONTRACT: AFOSR-82-0159
PROJ: 2308
TASK: A2
MONITOR: AFOSR TR-83-0601

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of AIAA Aerospace Sciences Meeting (21st), p1-13, 10-13 Jan 83.
Reprint: Breakup and Droplet Formation of Slurry Jets.

DESCRIPTORS: *Slurry fuels, *Aerospace systems, *Atomization, Boron, Petroleum products, Reprints (U)
IDENTIFIERS: Slurry jets, Petroleum slurry fuels, PE61102F, WUAFOSR2303A2 (U)

AD-A130 691 20/6 20/2 20/10

MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY

Coherent Scattering of Light into High Frequency Radiowaves. (U)

DESCRIPTIVE NOTE: Annual rept. 1 Feb 82-31 Jan 83, MAR 83 39P Weber,J. ;
CONTRACT: AFOSR-82-0164
PROJ: 2301
TASK: A8
MONITOR: AFOSR TR-83-0615

UNCLASSIFIED REPORT

ABSTRACT: The coherent radiation interaction, and scattering, by nuclei of a crystal for which each volume element has the same sign of the interaction with an incident beam, and for which the coupling of scatters with each other is important, is computed. Experiments are described which appear to verify the theory. (Author) (U)

DESCRIPTORS: *Electromagnetic scattering, *Frequency dividers, *Coherent scattering, *Single crystals, *Nuclear scattering, Laser beams, Helium neon lasers, Operators(Mathematics), Photons, Phase shift, Nuclear magnetic moments, Magnetic fields, Scattering cross sections, Cryogenics, Photometers, Volume, Interactions, Nuclei, Momentum, Infrared radiation, Silicon, Light, Nuclear moments, Energy, Quantum theory, Sapphire, Radio waves (U)

IDENTIFIERS: Lithium fluorides, Recoil energy, Physical optics, Scarlet lasers, Coherent scattering, Compton wavelength, Cration operators, Liquid helium, Annihilation operators, Weber scattering, PE61102F, WUAFOSR2301A8 (U)

AD-A130 688 12/1

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

Rejection of Multivariate Outliers. (U)

DESCRIPTIVE NOTE: Technical rept., MAY 83 31P Sinha,Bimal Kumar ;
REPT. NO. TR-83-08
CONTRACT: F49620-82-K-0001
MONITOR: AFOSR TR-83-0628

UNCLASSIFIED REPORT

ABSTRACT: An extension of Ferguson's univariate normal results for rejection of outliers is made to the multivariate case with mean slippage. The formulation is more general than that in Schwager and Margolin and the approach is also different. The main result can be viewed as a robustness property of Mardia's locally optimum multivariate normal kurtosis test to detect outliers against nonnormal multivariate distributions. (U)

DESCRIPTORS: *Multivariate analysis, Normal distribution, Invariance, Transformations(Mathematics), Matrices(Mathematics), Probability distribution functions, Statistical analysis, Modification, Statistical inference, Computations, Rejection, Mathematical models (U)

IDENTIFIERS: *Outliers, Kurtosis, Robust procedures, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO EVN35A

AD-A130 683 7/3 11/3

HULL UNIV (ENGLAND) DEPT OF CHEMISTRY

The Decomposition of 2,2,3,3-Tetramethylbutane in KCl- and B2O3 Coated Vessels in the Presence of Oxygen. (U)

82 14P Baldwin,Roy R. ;Hisham, Mohamed W. M. ;Keen,Alan ;Walker,Raymond W. ;

CONTRACT: AFOSR-77 3215
PROJ: 2308
TASK: B2
MONITOR: AFOSR TR 83-0603

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society Faraday Trans 1 v78 p1165-1176 1982. Reprint: The Decomposition of 2,2,3,3-Tetramethylbutane in KCl- and B2O3-Coated Vessels in the Presence of Oxygen.

DESCRIPTORS: Decomposition, *Butanes, *Methyl radicals, *Coatings, Test and evaluation, Entropy, Enthalpy, Reprints (U)
IDENTIFIERS: TMB(Tetramethylbutane), Arrhenius parameters, Rate constants, PE61102F, WUAFOSR2308B2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 682 12/1 14/4 13/9

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

Reliability Analysis of a Parallel System with Exponential Life Times and Phase Type Repairs. (U)

DESCRIPTIVE NOTE: Technical rept.,
83 10P Chakravarthy,S. ;
CONTRACT: AFOSR-77-3236, NSF-ENG79-08351
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0625

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in OR Spektrum v5 p25-32 1983. Reprint: Reliability Analysis of a Parallel System with Exponential Life Times and Phase Type Repairs.

DESCRIPTORS: *Mathematical models, *Reliability, *Mechanical components, Repair, Failure(Mechanics), Probability distribution functions, Algorithms, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 678 12/1 20/4

TENNESSEE UNIV KNOXVILLE DEPT OF MATHEMATICS

Mixed Finite Element Methods with Applications to Flow and Other Problems. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jan 80-31 Mar 83,
MAY 83 17P Gunzburger,Max D. ;
CONTRACT: AFOSR-80-0083
PROJ: 2304
TASK: A3
MONITOR: AFOSR TR-83-0624

UNCLASSIFIED REPORT

ABSTRACT: The thrust of this work was the development of efficient and accurate finite element methods for flow problems. Specific applications include periodic acoustic problems, potential flow problems and incompressible viscous flows. However, the theoretical analyses carried out also have a direct bearing on the approximation of problems in other areas, e.g., electromagnetics and elasticity. For the particular fluids applications mentioned above, computer codes implementing the algorithms have also been developed. (U)
DESCRIPTORS: *Flow, *Finite element analysis, Eigenvalues, Navier stokes equations, Least squares method, Acoustics, Potential flow, Viscous flow, Incompressible flow, Fluid mechanics, Computations, Problem solving, Algorithms (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A3 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 665 12/1 20/1

LA JOLLA INST CA CENTER FOR THE STUDY OF NONLINEAR DYNAMICS

Scattering of Waves by Irregularities in Periodic Discrete Lattice Spaces. 2. Calculations. (U)

DESCRIPTIVE NOTE: Interim rept.,
83 40P Pomphrey,Neil ;Montroll, Elliott W. ;West,Bruce J. ;
REPT. NO. LJI-R-83-229
CONTRACT: F49620-81-K-0017
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0633

UNCLASSIFIED REPORT

ABSTRACT: The general formalism for the exact scattering of a scalar wave from N scatterers on a discrete lattice is reviewed. The interpretation of the exact solution in terms of approximation techniques is given and the expression for the scattering cross sections is derived. The expressions necessary for the calculation of the lattice Greens function are discussed and a number of asymmetric scattering configurations are considered. (Author) (U)
DESCRIPTORS: *Computations, *Greens function, *Scalar functions, *Acoustic scattering, *Acoustic waves, Nondestructive testing, Cross sections, Finite element analysis, Discrete distribution, Models, Defects(Materials), Transverse waves, Elastic properties (U)
IDENTIFIERS: Scalar waves, Lattice structure, PE61102F, WUAFOSR2306A2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 664 12/1 20/8

OREGON UNIV EUGENE

Relativistic Calculation of Atomic M-Shell Ionization by Protons. (U)

MAY 83 8P Chen,Mau Hsiung ;Crasemann, Bernd ;Mark,Hans ;
CONTRACT: F49620 83 K 0020, AFOSR 79-0026
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR 83-0620

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v27 n5 p2358-2364 May 83.
Reprint: Relativistic Calculation of Atomic M-Shell Ionization by Protons.

DESCRIPTORS: *Computations, *Atomic energy levels, Ionization, Protons, X rays, Plane waves, Uranium, Gold, Holmium, Reprints (U)
IDENTIFIERS: Relativistic calculations, Atomic shells, PE61102F, WUAFOSR2301A4 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 656 20/6

HUGHES RESEARCH LABS MALIBU CA

Investigation of Optical Fibers for Nonlinear Optics. (U)

DESCRIPTIVE NOTE: Annual rept. no. 1, 1 Jan-31 Dec 82,
FEB 83 46P DeShazer,Larry G. ;
Harrington,James A. ;Pastor,Antonio C. ;
Pastor,Ricardo C. ;Rand,Stephen C. ;
CONTRACT: F49620-82-C-0030
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0598

UNCLASSIFIED REPORT

ABSTRACT: The principal objective of this research program is to develop single crystal (SC) fibers for use in nonlinear optical devices. This encompasses measurement of physical and chemical properties of several candidate materials, fabrication of SC fibers, and demonstration of nonlinear optical applications. (Author) (U)
DESCRIPTORS: *Fiber optics, *Optical materials, *Nonlinear systems, Single crystals, Hybrid systems, Research management, Measurement, Physical properties, Chemical properties (U)
IDENTIFIERS: Optical fibers, Nonlinear optics, Candidate materials, PE61102F, WUAFSOR2301A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 228 3/2 20/6

LOUISIANA STATE UNIV BATON ROUGE OBSERVATORY

UBVRI Photometric Standard Stars around the Celestial Equator. (U)

NOV 82 22P Landolt,Arlo U. ;
REPT. NO. CONTRIB-174
CONTRACT: AFOSR-82-0192
PROJ: 2301
TASK: A2
MONITOR: AFOSR TR-83-0567

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Astronomical Jnl., v88 n3 p439-460 Mar 83.
Reprint: UBVRI Photometric Standard Stars around the Celestial Equator.

DESCRIPTORS: *Stars, Photometry, Intensity, Color temperature, Night sky, Reprints (U)
IDENTIFIERS: Celestial equator, UBVRI photometric standard, PE61102F, WUAFOSR2301A2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 224 20/13 11/6 7/4

MARQUETTE UNIV MILWAUKEE WI DEPT OF MECHANICAL ENGINEERING

Properties of Mercury-Cadmium-Telluride Solid Solutions. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jul 78-30 Jun 83,
JUN 83 11P Brebrick,Robert F. ;
CONTRACT: AFOSR-78-3611
PROJ: 2306
TASK: C2
MONITOR: AFOSR TR-83-0585

UNCLASSIFIED REPORT

ABSTRACT: Measurements of the partial pressures in the mercury-cadmium-tellurium system are indicated. The thermodynamic analysis of this system is briefly sketched. References to detailed accounts of these results are cited. There now exist sufficient data that this system is to a large extent thermodynamically characterized. Moreover, a thermodynamic model has been established that allows a quantitative reproduction of essentially all of what appears to be the reliable phase diagram, partial pressure, and general thermodynamic data. (Author) (U)
DESCRIPTORS: *Thermodynamic properties, *Solid solutions, *Cadmium, *Mercury, *Tellurides, Quantitative analysis, Reliability, Partial pressure, Phase diagrams, Chemical composition, Metals, Equations, Test methods (U)
IDENTIFIERS: PE61102F, WUAFOSR2306C2 (U)

AD A130 218 9/1 12/1 5/1

YALE UNIV NEW HAVEN CT CENTER FOR SYSTEMS SCIENCE

Analysis of the Howells-Applebaum Algorithm in the Presence of Moving Interference. The Use of Lattice Filters in Adaptive Array Processors. Stability Analysis of LMS Adaptive Filters. Adaptive Array Processors with Moving Interference. (U)

DESCRIPTIVE NOTE: Final rept.,
OCT 82 15P Tuteur,Franz B. ;
REPT. NO. 8213
CONTRACT: AFOSR-80-0077
PROJ: 2304
TASK: AC
MONITOR: AFOSR TR-83-0561

UNCLASSIFIED REPORT

ABSTRACT: Four ongoing projects are briefly described. These are: 1. Analysis of the Howells-Applebaum algorithm in the presence of moving interference; 2. The use of lattice filters in adaptive array processors; 3. Stability analysis of LMS adaptive filters; and 4. Adaptive array processors with moving interference treated from the frequency-domain point of view. Conclusions are: the Howells-Applebaum algorithm is so insensitive to interference motion that it is unnecessary to consider such motion in the design; and adaptive array processors based on the frequency-domain approach have a worst performance than those based on time-domain approaches mainly because of the time lag required in the operation of the Fourier transform operation. (Author) (U)

DESCRIPTORS: *Signal processing, *Adaptive filters, *Mathematics, *Research management, Arrays, Interference, Fourier transformation, White noise, Noise reduction, Hydrophones, Stability (U)
IDENTIFIERS: Howells applebaum algorithm, Transversal filters, PE61102F, WUAFOSR2304AC (U)

AD-A130 217 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

Maximum Likelihood Estimation of Unimodal and Decreasing Densities Based on Arbitrarily Right-Censored Data. (U)

DESCRIPTIVE NOTE: Technical rept.,
82 14P McNichols,D. T. ;Padgett, W. J. ;
CONTRACT: F49620-79-C-0140, AFOSR-81-0166
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0546

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Communications in Statistics: Theory and Methods: Simulation and Computation, v11 n20 p2259-2270 1982.
Reprint: Maximum Likelihood Estimation of Unimodal and Decreasing Densities Based on Arbitrarily Right-Censored Data.

DESCRIPTORS: *Maximum likelihood estimation, *Probability density functions, Nonparametric statistics, Optimization, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 192 7/3

DUKE UNIV DURHAM NC PAUL M GROSS CHEMICAL LAB

An Approach to Molecular Composites. (U)

DESCRIPTIVE NOTE: Final rept. 1 Apr 79-31 Dec 82,
DEC 82 9P Ulrich,Donald ;
CONTRACT: AFOSR-79-0080
PROJ: 2303
TASK: A3
MONITOR: AFOSR TR-83-0578

UNCLASSIFIED REPORT

ABSTRACT: One objective was to demonstrate that a nematogen can be made to exhibit a cholesteric phase by the incorporation of chiral centers into the polymer chain. The Yamazaki reaction was used to introduce 3 mole percent of chiral L-valine into poly(p-benzamide). This was shown to form a lyotropic cholesteric phase by circular dichroism and the induced circular dichroism of an achiral dye. A disadvantage of the use of lyotropic mesomorphism was that few solvents were available and the production costs were high. The early lattice model treatment of Flory indicated that a highly extended molecular conformation was essential to the formation of this type of mesophase. It has been demonstrated that the melting point depression of a crystalline polymer by this type of mesophase will be quite small unless the polymer-solvent interaction is very favorable. This implies that the polymer solubility will only be sufficient for the formation of a lyotropic mesaphase for those few polymer-solvent systems in which the interactions were very favorable. It was found that the Yamazaki phosphorylation reaction could be made to yield aromatic polyamides of higher inherent viscosity by using a monomer having pre-formed amide linkages. It is believed that this occurs due to reduction in the byproducts of the polymerization. (U)
DESCRIPTORS: *Polymers, *Amides, Polyamide plastics, Films, Dichroism, Circular, Phosphorylation, Solubility, Copolymers, Copolymerization, High strength (U)
IDENTIFIERS: Nematogens, Valine, Poly(P-benzamide), PE61102F, WUAFOSR2303A3 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 168 8/14

MCDONNELL DOUGLAS ASTRONAUTICS CO-HB HUNTINGTON BEACH CA

Sources of Surface Magnetic Field Variability. (U)

DESCRIPTIVE NOTE: Final rept.,
APR 83 44P Olson,W. P. ;
CONTRACT: F49620-81-C-0001
PROJ: 2311
TASK: A1
MONITOR: AFOSR TR-83-0577

UNCLASSIFIED REPORT

ABSTRACT: The contribution of non-ionospheric currents to the quiet daily variation in the earth's surface magnetic field (the sub Sq variation) is being reexamined. It has been found that the direct use of magnetospheric magnetic field models to represent the contribution of these currents to the surface field produces large errors. Thus direct integration over the currents was used. The induction problem was addressed and the contribution to sub Sq from currents induced in the earth's crust was determined. The total day to night contribution to sub Sq was found to be a minimum of 12 nanotesla. This contrasts with a measured variation of from 20 to 45 nanotesla. Thus the magnetospheric currents produce from about 1/4 to over 1/2 of the observed pattern. The Birkeland currents also contribute to sub Sq at sub-auroral latitudes. A study was initiated to examine the day to day variability in sub Sq using ground based magnetometer data and direct (satellite observations) of the solar wind. A means for experimentally determining the baseline for sub Sq (and the main field) was developed. (Author) (U)
DESCRIPTORS: *Geomagnetism, *Magnetic fields, Surface waves, Diurnal variations, Graphs, Earth crust, Magnetosphere, Models, Solar wind (U)
IDENTIFIERS: Surface field, PE61102F, WUAFOSR2311A1 (U)

AD-A130 163 12/1

DELAWARE UNIV NEWARK APPLIED MATHEMATICS INST

Asymptotic Methods in Reliability Theory: A Review. (U)

DESCRIPTIVE NOTE: Technical rept.,
SEP 82 57P Gertsbakh,Ilya B. ;
REPT. NO. 80B
CONTRACT: AFOSR-77-3236
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0548

UNCLASSIFIED REPORT

ABSTRACT: Section 1 of this paper reviews some works related to reliability evaluation of nonrenewable systems. The assumption that element failure rates are low allows to obtain an expression for the main term in the asymptotic representation of system reliability function. Section 2 is devoted to renewable systems. The main index of interest in reliability is the time to the first system failure. A typical situation in reliability is that the repair time is much smaller than the element lifetime. This fast repair property leads to an interesting phenomenon that for many renewable systems the time to system failure converges in probability, under appropriate norming, to exponential distribution. Some basic theorems explaining this fact are presented and a series of typical examples is considered. Special attention is paid to reviewing the works describing the exponentiality phenomenon in the birth-and-death processes. Some important aspects of computing the normalizing constants are considered, among them, the role played by so-called main event. Section 2 contains also a review on various bounds on the deviation from exponentiality. Sections 3 , 4 describe some additional aspects of asymptotics in reliability. It is typical for the probabilistic models considered in these sections, that a small parameter is introduced in an explicit form into the characteristic of the random processes. A considerable part of this review is based on the sources which were originally published in Russian and are available in the English translation. (Author) (U)
DESCRIPTORS: *Mathematical models, *Numerical (U)
AD-A130 163

AD-A130 160 20/10 20/5

CALIFORNIA INST OF TECH PASADENA DIV OF CHEMISTRY AND CHEMICAL ENGINEERING

The Quantum Dynamics of Chemical Reactions. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Jul 81-30 Jun 82,
MAR 83 489P Kuppermann,Aron ;
CONTRACT: AFOSR-81-0235
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0565

UNCLASSIFIED REPORT

ABSTRACT: In this project, we developed accurate and approximate methods for calculating cross sections of elementary reactions. These methods were applied to systems of importance for the fundamental aspects of chemical dynamics and for advanced technologies of interest to the United States Air Force. The application included calculations of three-atom exchange reactions, break-up and three-body recombination collisions and vibrational quenching by reaction. These calculations improved our understanding of such processes and permitted an assessment of some approximate methods. (Author) (U)
DESCRIPTORS: *Quantum theory, *Dynamics, *Recombination reactions, *Cross sections, Computations, Ion exchange, Collisions, Quenching, Molecular vibration, Approximation(Mathematics), Chemical lasers, High energy, Molecular rotation (U)
IDENTIFIERS: Quantum dynamics, Chemical dynamics, Vibrational quenching, Three body recombination reactions, WUAFOSR2303B1, PE61102F (U)

AD-A130 160

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 157 7/3 7/4

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

Micellar Systems as 'Supercages' for Reactions of Geminate Radical Pairs. Magnetic Effects, (U)

83 10P Turro,Nicholas J. ;Weed, Gregory C. ;

CONTRACT: AFOSR-81-0013
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0582

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v105 n7 p1861-1868 1983. Reprint: Micellar Systems as 'Supercages' for Reactions of Geminate Radical Pairs. Magnetic Effects.

DESCRIPTORS: *Benzyl radicals, *Photochemical reactions, *Magnetic forces, Ketones, Photolysis, Substitution reactions, Magnetic fields, Isotopes, Quantum chemistry, Reprints (U)
IDENTIFIERS: DBK(Dibenzyl Ketones), Cage effect, Micellan systems, WUAFOSR2303B2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 138 20/5 7/4 20/6

COLORADO UNIV AT BOULDER DEPT OF CHEMISTRY

Infrared Chemiluminescence Studies of Ion-Molecule Reactions in a Flowing Afterglow. (U)

DESCRIPTIVE NOTE: Final rept.,
82 56P Bierbaum,Veronica M. ;Leone, Stephen R. ;Ellison,G. Barney ;

CONTRACT: AFOSR-78-3565
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0558

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Mar 79, AD-A070 068.
ABSTRACT: A powerful new method has been developed for studying the dynamics of thermal energy ion-molecule reactions. Ion reactions are carried out in a well-characterized, state-of-the-art flowing afterglow apparatus and the excited products are monitored optically. Two complementary techniques are used: direct observation of wavelength dispersed infrared chemiluminescence and laser-induced fluorescence detection, i.e. laser excitation of the product molecules to bound electronic states and detection of the resulting visible fluorescence. The initial vibrational distributions have been determined for products formed in a wide variety of ion-molecule processes, including proton transfer, charge transfer, heavy atom transfer and associative detachment reactions. information on nascent rotational populations and on vibrational deactivation of ions has also been obtained recently. (Author) (U)
DESCRIPTORS: *Laser induced fluorescence, *Infrared spectroscopy, *Chemiluminescence, *Afterglows, Ion ion interactions, Dynamics, Molecule molecule interactions, Flow, State of the Art, Excitation, Frequency, Visible spectra, Detection, Observation (U)
IDENTIFIERS: Infrared chemiluminescence, Ion molecule dynamics, Ion molecule reactions, PE61102F, WUAFOSR2303B1 (U)

AD-A130 135 4/1 8/14

TRW DEFENSE AND SPACE SYSTEMS GROUP REDONDO BEACH CA SPACE SCIENCES DEPT

A Project to Develop an Index of PC 3,4,5 Geomagnetic Pulsations and to Study Their control by Solar Wind Parameters. (U)

DESCRIPTIVE NOTE: Final rept.,
APR 83 83P Greenstadt,Eugene W. ;
REPT. NO. TRW-36116-6006-UT-00
CONTRACT: F49620-81-C-0003
PROJ: 2311
TASK: A1
MONITOR: AFOSR TR-83-0575

UNCLASSIFIED REPORT

Availability: Document partially illegible.
ABSTRACT: This report summarizes the recent activities and results of a study seeking to discover and quantify the relationship between solar wind parameters, magnetosheath turbulence, and daytime geomagnetic pulsations. The most significant achievement has been a major advance in data processing and computational analysis leading to the first observations and measurements of magnetospheric resonance thickness, wave transfer across the magnetopause, and wave structure in the outer magnetosheath. (Author) (U)
DESCRIPTORS: *Geomagnetism, Solar wind, Magnetosphere, Variations, MIcropulsations, Turbulence, Power spectra, Statistical analysis, Indexes(Ratios) (U)
IDENTIFIERS: Magnetopause, PE61102F, WUAFOSR2311A1 (U)

AD-A130 111 9/1 20/6 14/2 20/10

WISCONSIN UNIV-MADISON DEPT OF PHYSICS

Experimental and Theoretical Investigation of Optogalvanic Effects. (U)

DESCRIPTIVE NOTE: Annual technical rept. 30 Jun 81-29 Sep 82,
NOV 82 39P Lawler,James E. ;
CONTRACT: AFOSR-81-0208
PROJ: 2301
TASK: A7
MONITOR: AFOSR TR-83-0552

UNCLASSIFIED REPORT

ABSTRACT: Research on the 594.5 nm optogalvanic effect in the Neon positive column discharge was performed. Absolute measurements of the effect per unit of absorbed laser power were performed for discharge radius-pressure products of 9.1 cm-Torr to 1.0 cm-Torr and for substaining direct currents of 1 to 16 mA. The effect was modeled in this regime by applying perturbation theory to key rate equations. The model predictions are in agreement with the experimental measurements. Associated measurements of absolute metastable densities indicate that the studied regime covers the transition from a discharge sustained primarily by single-step electron impact ionization to a discharge sustained primarily by two-step ionizatrion via the 2p53s metastable levels. (Author) (U)
DESCRIPTORS: *Cathodes, *Optics, *Glow discharges, *Measurement, Photons, Electron density, Absorption, Models, Predictions, Theory, Experimental data, Capillary tubes, Helium, Neon, Transitions, mercury (U)
IDENTIFIERS: Optogalvanic effect, PE61102F, WUAFOSR2301A7 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 102 17/7 7/4

HUGHES RESEARCH LABS MALIBU CA

Nuclear Magnetic Resonance Gyroscope. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Sep 82-28 Feb 83,
APR 83 64P Pepper,David M. ;Wang, Harry T. M. ;
CONTRACT: F49620-82-C-0095, F49620-80-C-0046
PROJ: 2305
TASK: B2
MONITOR: AFOSR TR-83-0574

UNCLASSIFIED REPCRT

SUPPLEMENTARY NOTE: See also report dated Dec 82, AD-A124 925.
ABSTRACT: A study of physics of a nuclear magnetic resnance gyroscope is described. Experimental results in nuclear polarization and relaxation in 3He are obtained using an optical pumping apparatus and a high resolution rf spectroscopic technique. Signigicant polarization in excited state neon was observed via collisional transfer from optically pumped helium in a cell filled with a mixture of helium and neon isotopes. The measured polarization was essentially independent of the isotopic composition. Moverover, the polarization fo helium in the (He - Ne) binary system was not materially perturbed by the addition of the Ne (for our operating fill pressure). A sensitive rf NMR detection apparatus was fabricated and characterized. The required NMR linewidths of a dual-isotope NMRG sensor necessary to meet the required angular rate sensitivities were estimated. Although we were unable to detect the NMR ground state resonances directly, it is shown theoretically that the required rate sensitivities can be satisfied, given the anticipated output power and observed ground state polarization of helium. (U)
DESCRIPTORS: *Gyroscopes, *Nuclear magnetic resonance, *Atomic structure, *Rare gases, Polarization, Isotopes, Energy transfer, Collisions, Helium, Experimental data, Optical pumping, Neon, Excitation (U)
IDENTIFIERS: Noble gases, Excited state, Collisional transfer, Neon isotopes, Helium isotopes, PE61102F, WUAFOSR230582 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 101 12/1 7/1

BOSTON UNIV MA CENTER FOR POLYMER STUDIES

Final Report on AFOSR-81-0042. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 82,
SEP 82 64P Stanley,H. Eugene ;
CONTRACT: AFOSR-81-0042
PROJ: 2301
TASK: A5
MONITOR: AFOSR TR-83-0570

UNCLASSIFIED REPORT

ABSTRACT: A statistical-mechanical model for reversible gelation is developed. This model takes into account solvent effects, which usually are neglected in the calssical theory of gelation. The exact solution of this model is given for the limiting case in which 'loops' or intermolecular interactions may be neglected (Cayley tree). The general phase diagram is obtained and it is shown that, with a particular choice of a solvent, one can realize the interesting situation in which gelation point and consolute point coincide. This point has peculiar properties associated with the simultaneous divergence of 'connectivity' and thermal fluctutation. The recent experimental data of Tanka and collaborators are in good qualitative agreement with the predictions of the model. (U)
DESCRIPTORS: *Statistical analysis, *Models, *Gelation, *Phase diagrams, *Theory, Gels, Mechanical properties, Molecule molecule interactions, Loops, Solvents, Thermal properties, Variations (U)
IDENTIFIERS: Gayley tree, Statistical mechanical models, Connectivity, Intermolecular interactions, Gelation point, Thermal fluctuations, PE61102, WUAFOSR2301A5 (U)

AD-A130 100 20/7 20/3 20/5

WASHINGTON UNIV SEATTLE

Aerodynamics of E-Beam Sustained Discharges in Flow. (U)

DESCRIPTIVE NOTE: Final scientific rept. 15 Jul 82-14 Feb 83,
APR 83 4P Christiansen,Walter H. ;
CONTRACT: AFOSR-82-0289
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0572

UNCLASSIFIED REPORT

ABSTRACT: The fundamental mechanism of the interaction of electric discharge of the glow type and the fluid mechanics normally found in electric discharge lasers has been studied. (Author) (U)
DESCRIPTORS: *Electron beams, *Interactions, *Electric discharges, *Lasers, Glow discharges, Fluid mechanics, High pressure, High power, Arc lamps, Pulses, Performance(Engineering) (U)
IDENTIFIERS: Experimental studies, Electric lasers, Electric discharge lasers, PE61102F, WUAFOSR2301A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 099 7/4 11/3

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

Fundamental Studies of Underpotential Metal Deposition and Trace Analysis Using Solid Electrodes. (U)

DESCRIPTIVE NOTE: Final rept. 15 May 78-30 Sep 82,
82 11P Bruckenstein,Stanley ;
CONTRACT: AFOSR-78-3621
PROJ: 2303
TASK: A1
MONITOR: AFOSR TR-83-0557

UNCLASSIFIED REPORT

ABSTRACT: One of the objectives of this research was to study and to interpret the be havior of films at solid electrodes. With a sound understanding of the characteristics of submonolayer, monolayer and thicker films and their effect on electrochemical processes, it should be possible to apply this knowledge to understanding important solution heterogeneous processes, such as corrosion and electrocatalyis (by underpotential metal deposition). A second objective was to develop new approaches to studying electrochemical reactions at solid electrodes, particularly the use of controlled hydrodynamics, in order to provide new diagnostic criteria for elucidating complex electrode processes. Another goal was to apply solid electrode structures to analytically important problems. A study of the electrocatalysis of the oxidation of formic acid by the UPD of lead, bismuth of thallium on polycrystalline platinum has shown that the third body hypothesis is a satisfactory explanation. It is necessary, however, to take into account the selective UPD of these metals and the uncatalyzed oxidation process on the various cystal planes of platinum. The lack of catalysis of the formic acid oxidation process by UPD silver and copper has been shown to caused by the selective UPD of these metals on the platinum plane which contributes least to the uncatalyzed oxidation process. (U)
DESCRIPTORS: *Electrochemistry, *Electrodeposition, *Metal films, Tracer studies, Solid electrolytes, Electrodes, Electrocatalysts, Sorption, Hydrodynamics, Modulation, Platinum, Gold (U)
IDENTIFIERS: Electronalytical chemistry, Trace ANALYSIS, Electrosorption, Platinum electrodes, (U)

AD-A130 097 17/7 17/8 20/6

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF ELECTRICAL ENGINEERING

Optical Pattern Recognition for Missile Guidance. (U)

DESCRIPTIVE NOTE: Interim rept. Sep 81-Oct 82,
NOV 82 108P Casasent,David ;
CONTRACT: AFOSR-79-0091
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0556

UNCLASSIFIED REPORT

ABSTRACT: Progress on real-time spatial light modulators, image pattern recognition and optical signal processing for missile guidance is documented. A full description of our test and evaluation of the Soviet PRIZ spatial light modulator is included. In image pattern recognition, a unified formulation of four different and new types of synthetic discriminant functions is advanced. These include synthetic discriminant functions for intra and inter-class pattern recognition and multi-class pattern recognition. In the area of image pattern recognition, we also advance new statistical synthetic discriminant function filter concepts and a new principal component synthetic discriminant function. These analyses utilize new performance measures and new image models. Conventional holographic pattern recognition research conducted under AFOSR support is also reviewed. Our new AFOSR optical signal processing research concerns optical matrix-vector processors. Initial research in this area includes fabrication of a fiber-optic microprocessor-based iterative optical processor and its use in adaptive phased array radar processing and for the calculation of eigenvalues and eigenvectors of a matrix. (Author) (U)

DESCRIPTORS: *Light homing, *Pattern recognition, *Light modulators, *Optical target designators, *Optical correlators, Optical processing, Hybrid systems, Infrared images, Optical analysis, Kerr cells, Spatial distribution, Performance(Engineering), Guided missiles, Two dimensional, Statistical analysis, Data processing, Models, Signal processing, Images, Optics, (U)
IDENTIFIERS: BSO(Bismuth Silicon Oxide), (U)

AD-A130 096 20/6 12/1 14/5 20/5
9/2 9/4

TEXAS TECH UNIV LUBBOCK OPTICAL SYSTEMS LAB

Space-Variant Optical Systems. (U)

DESCRIPTIVE NOTE: Annual technical rept. 30 Sep 81-30 Sep 82,
NOV 82 14P Walkup,John F. ;Krile, Thomas F. ;
CONTRACT: AFOSR-79-0076
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0553

UNCLASSIFIED REPORT

ABSTRACT: Analytical and experimental investigations of 2-D space-variant optical processing techniques have been conducted. Coherent processing investigations have included (1) a continuing experimental study of the characteristics of UV-exposed photoresist phase masks for multiplex holography, and (2) both analytical and experimental studies of a technique for using wavelength-encoded tandem 1-D processors for performing 2-D processing. In the area of incoherent processing, we have completed an investigation of a tristimulus-based technique for performing complex operations using hue, saturation, and intensity parameters to represent complex numbers. (Author) (U)

DESCRIPTORS: *Optical processing, *Holography, *Complex numbers, *Multiplexing, Intensity, Incoherence, Computer applications, Two dimensional, Pseudo random systems, Photolithography, Argon lasers, Masking, Plotters, Power spectra, Correlation techniques, Color television, Fourier transformation, Processing, One dimensional (U)
IDENTIFIERS: Hue, SVOP(Space Variant Optical Processing), Saturation, Coherent processing, Representation(Complex), Multiplex holography, White light, Complex products, Incoherent processing, Tristumulus processors, Multiplication, Subtraction, PE61102F, WUAFOSR2305B1 (U)

IAC NO.: NT-027790
IAC DOCUMENT TYPE: NTIAC -MICROFICHE--

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 095 20/7 20/5 20/8

TEL-AVIV UNIV (ISRAEL) SCHOOL OF ENGINEERING

A Study of the Angular Radiation Pattern of Smith-Purcell Radiation. (U)

DESCRIPTIVE NOTE: Final scientific rept. Nov 80-Oct 81.
MAY 83 26P Gover,A. ;Dvorkis,P. ; Elisha,U. ;
CONTRACT: AFOSR-81-0060
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0566

UNCLASSIFIED REPORT

DESCRIPTORS: *Electron beams, *Free electrons, *Lasers, *Radiation, Measurement, Radiation patterns, Test and evaluation, Optical properties, Gratings(Spectra), Models, Focal planes, Frequency, Emission spectra (U)
IDENTIFIERS: Free electron lasers, Smith Purcell radiation, Smith Purcell effect, Optical gratings, PE61102f, WUAFOSR2301A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 094 7/4

OREGON UNIV EUGENE DEPT OF PHYSICS

Relativistic Calculations and Measurements of Energies, Auger Rates, and Lifetimes. (U)

DESCRIPTIVE NOTE: Annual scientific rept. 1 Dec 81-30 Nov 82,
DEC 82 18P Crasemann,B. ;Chen,M. H. ;
CONTRACT: AFOSR-79-0026
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0550

UNCLASSIFIED REPORT

ABSTRACT: Substantial progress has been made with ab initio relativistic computations of atomic inner-shell energy levels and properties of few-electron ions. A relativistic calculation fo inner-shell ionization by slow protons has been very successful. Threshold-excitation experiments with hard synchrotron radiation have been extended to explore post-collision interaction and the resonant Auger Raman effect which link the atomic excitation and deexcitation processes. (U)
DESCRIPTORS: *Atomic energy levels, *Quantum chemistry, *Electronic states, Measurement, Computations, X ray spectra, Auger electrons, Transitions, Excitation, Ionization, Synchrotrons, Spectroscopy (U)
IDENTIFIERS: Dirac-Hartree-Slater computations, PE61102F, WUAFOSR2301A4 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 093 20/8 7/4

CALIFORNIA UNIV SANTA BARBARA QUANTUM INST

Radiation and Laser Potential of Homo and Heteronuclear Rare-Gas Diatomic Molecules. (U)

DESCRIPTIVE NOTE: Final rept.,
DEC 82 45P Walker,William ;Tanaka, Yoshio ;
CONTRACT: F49620-77-C-0010, AFOSR-77-3137
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0559

UNCLASSIFIED REPORT

ABSTRACT: High resolution emission spectra of the rare-gas dimers Ne2, Ar2, and Kr2 were studied in the vacuum ultraviolet region 500 - 1500 Angstroms. Four band systems previously observed in all three dimers were studied in detail and classified in terms of the transition involved. Molecular constants and details of the dimer potential curves were determined. (U)
DESCRIPTORS: *Diatomic molecules, *Rare gases, *Emission spectra, Laser materials, Vacuum ultraviolet radiation, Visible spectra, Nuclear properties, Energy bands, Electronic states Molecular states, Excitation, Oxides, Sulfides, Continuum mechanics (U)
IDENTIFIERS: PE61102F, WUAFOSR2303B1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 081 14/4 12/2 14/1

FLORIDA STATE UNIV TALLAHASSEE

Periodic Replacement with Increasing Minimal Repair Costs at Failure, (U)

JUN 81 9P Proschan,Frank ;Boland, Philip J. ;
CONTRACT: AFOSR-78-3678
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0580

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Operations Research, v30 n6 p1183-1189 Nov-Dec 82.
Reprint: Periodic Replacement with Increasing Minimal Repair Costs at Failure.

DESCRIPTORS: *Maintenance, *Replacement, *Reliability, *Operations research, *Cost effectiveness, Systems analysis, Failure, Repair, Time intervals, Policies, Mathematical models, Poisson density functions, Costs, Preventive maintenance, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2303A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 063 12/1 5/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

Estimation under Reliability Growth Assuming Gamma Failure Models. (U)

DESCRIPTIVE NOTE: Technical rept., FEB 81 6P Padgett,W. J. ,McNichols, D. T. ;
CONTRACT: F49620-79-C-0140, AFOSR-81-0166
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83 0545

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Reliability, vR-31 n2 p155-158 Jun 82. Reprint: Estimation under Reliability Growth Assuming Gamma Failure Models.

DESCRIPTORS: *Iterations, *Mathematical models, *Maximum likelihood estimation, *Systems engineering, Reliability, Failure, Parametric analysis, Optimization, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 062 14/2 20/1 17/1

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

Quantitative Evaluation of Real-Time Synthetic Aperture Acoustic Images. (U)

DESCRIPTIVE NOTE: Interim technical rept., 82 12P Peterson,D. K. ;Baer,R. ; Liang,K. ;Bennett,S. D. ,Khuri-Yakub,B. T. ;
REPT. NO. GL-3361
CONTRACT: F49620-79-C-0217, W-7405-eng-82
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0554

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Review of Progress in Quantitative Nondestructive Evaluation, v1 p767-776 1982.
ABSTRACT: Recent developments of two synthetic aperture acoustic imaging systems are described. The first, operating at 3.3 MHz in real time, was used to obtain images of cracks which can be interpreted to give quantitative estimates of crack dimension. A thorough understanding of the performance of this imaging system was developed which makes accurate predictions of such parameters as sidelobe levels. The second imaging systems (unlike the first) operates with a single scanned transducer rather than an array. Realtime imaging is not then possible, but operation at very high frequencies (50 MHz) has been demonstrated with the associated improvement in resolution. An analysis of the reconstruction process is given with examples of images obtained from experimental data. (Author-PL). (U)
DESCRIPTORS: *Nondestructive testing, *Ultrasonics, *Acoustic detection, *Synthetic aperture sonar, Images, High frequency, Transducers, Very high frequency, Real time, Reprints (U)
IDENTIFIERS: Acoustic images, Ultrasonic images, Sonar images, Slot defects, Rayleigh waves, PE61102F, WUAFOSR2306A2 (U)

IAC NO.: PL-044911
IAC DOCUMENT TYPE: PLASTC -MICROFICHE--

IAC SUBJECT TERMS: P--(U)Composites, NDE, NDT,

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 057 4/1

CALIFORNIA UNIV LOS ANGELES

An Experimental Study of Atmosphere-Ionosphere Coupling Using Magnetometers. (U)

DESCRIPTIVE NOTE: Final technical rept. 15 Feb-15 Nov 82.
NOV 82 13P Luhmann,Janet G. ;Coleman, Paul J. , Jr;
CONTRACT: AFOSR-82-0193, ARPA Order-4513
PROJ: 2309
TASK: A1
MONITOR: AFOSR TR-83-0571

UNCLASSIFIED REPORT

ABSTRACT: On three occasions, portable magnetometer experiments with automated data systems designed especially for unsupervised operation were sited within a 50 km radius of underground nuclear tests at the Nevada Test Site. The purpose of these experiments was to determine whether the disturbance of the atmosphere by the ground movement related to the test created a measurable perturbation current in the ionosphere. Preliminary analyses of the results suggest that the natural ULF magnetic background is too noisy to allow the certain identification of a test related signal by visual inspection of chart records. However, more sophisticated computerized methods can be applied to identify small differences in magnetic fields measured at several sites. The negative result reported here is thus qualified to the extent that we have not made use of these more sensitive data analysis tools. (U)

DESCRIPTORS: *Ground motion, *Ionosphere, Troposphere, Explosions, Microbarometric waves, Coupling(Interaction), Ionosphere, Perturbations, Electric current, Magnetic fields, Detection, Geomagnetism, Background (U)
IDENTIFIERS: PE61102F, WUAFOSR2309A1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 055 11/6 7/4

DELAWARE UNIV NEWARK DEPT OF PHYSICS

Resistivity Anomalies and Phase Transitions in Alkali Metal Graphite Intercalation Compounds, (U)

77 7P Onn,David G. ;Foley,G. M. T. ;Fischer,J. E. ;
CONTRACT: AFOSR-77-3393, NSF-DMR76-00678
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0586

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Materials Science and Engineering, v31 p271-275 1977. Reprint: Resistivity Anomalies and Phase Transitions in Alkali Metal Graphite Intercalation Compounds.

DESCRIPTORS: *Pyrolytic graphite, *Alkali metals, *Resistance, *Anomalies, Temperature, Transitions, Potassium, Rubidium, Cesium, Reprints (U)
IDENTIFIERS: *Graphite intercalation compounds, PE61102F, WUAFOSR2306C3 (U)

AD-A130 054 20/8 20/10

ROCHESTER UNIV NY DEPT OF CHEMISTRY

Semiclassical Theory of Collisional Ionization. (U)

MAY 82 9P Lam,Kai-Shue ;George, Thomas F. ;Bhattacharyya,Dilip K. ;

CONTRACT: AFOSR-82-0046, NSF-CHE80-22874
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0581

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v27 n3 p1353-1359 Mar 83.
Reprint: Semiclassical Theory of Collisional Ionization.

DESCRIPTORS: *Ionization, *Particle collisions, *Quantum theory, Dynamics, Nuclear reactions, Adiabatic conditions, Energy levels, Electron energy, Equations of motion, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2303A2 (U)

AD-A130 053 7/4 20/10

OREGON UNIV EUGENE DEPT OF PHYSICS

K-MM Auger-Intensity Peaks from Double-Hole Energy-Level Crossings, (U)

NOV 82 5P Chen,Mau Hsiung ;Crasemann, Bernd ;Mark,Hans ;

CONTRACT: F49620-83-K-0020
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0579

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v27 n2 p1213-1216 Feb 83.
Reprint: K-MM Auger-Intensity Peaks from Double-Hole Energy-Level Crossings.

DESCRIPTORS: *Auger electron spectroscopy, *Energy levels, *Quantum theory, Auger electrons, Holes(Electron Deficiencies), Atoms, Coupling(Interaction), Peak values, Intensity, Reprints (U)
IDENTIFIERS: Divac-Hartree-Slater calculations, Auger processes, Atomic inner shell transitions, PE61102F, WUAFOSR2301A4 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A130 048 9/2

KESTREL INST PALO ALTO CA

Research on Synthesis of Concurrent Computing Systems. (U)

DESCRIPTIVE NOTE: Final technical rept. 2 Oct 81-30 Sep 82,
SEP 82 45P King,Richard M. ;Brown, Thomas C. ;Green,Cordell ;
CONTRACT: F49620-82 C-0007
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83 0562

UNCLASSIFIED REPORT

ABSTRACT: The object of our research is the codification of programming knowledge for the synthesis of concurrent programs. This final report presents the derivation of two concurrent algorithms: dynamic programming (for the class of problems that run in polynomial time on sequential machines) and [illegible] multiplication. Both derived concurrent programs run in linear time. The concurrent programs are significant and complex algorithms, though they are not new and already have been reported in the literature. The synthesis knowledge for the derivations is embodied in seven synthesis rules; preliminary versions of which are presented in this report. The rules will probably generalize to other classes of algorithms but we have not explored that issue yet. We have also discovered a pair of techniques called virtualization and aggregation. This pair of techniques (plus the other seven rules) is shown to be powerful enough to synthesize Kung's systolic array architecture (Kung 76) from a specification of matrix multiplication. (U)

DESCRIPTORS: *Computer programming, *Computer programs, Coding, Algorithms, Dynamic programming, Multiplication, Matrices(Mathematics), Parallel processing, Linearity, Time, Architecture, Synthesis, Transformations, Polynomials, Computer communications, Input output processing, Arrays, Optimization, Connectors, Reduction, Computers (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 044 20/6 20/5

HUGHES RESEARCH LABS MALIBU CA

Phase Conjugate Optical Resonator. (U)

DESCRIPTIVE NOTE: Interim technical rept. 15 Jul 81-14 Mar 82,
APR 82 26P Jain,R. K. ;
CONTRACT: F49620-80-C-0041
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0543

UNCLASSIFIED REPORT

ABSTRACT: During this reporting period, a paper on the study of longitudinal modes and the aberration correction potential of a PCR based on a continuous wave dye laser with a sodium phase conjugate mirror was published in Optics Letters as well as a paper on multiresonant behavior in nearly degenerate four-wave mixing in sodium. In addition, we report the measurement of spatial and temporal properties of a PCR based on the photorefractive crystal BaTiO3, and pumped with mW power levels from a He Ne or a Kr(+) ion laser. In the absence of an intracavity aperture, the output beam is observed to be elongated in the plane of the crystal axis, via preferential self-defocussing of the beam due to the large anisotropy of the photorefractive effect in BaTiO3. The resonator buildup time constants are found to be significantly larger than the time constants of the photorefractive response, particularly when the coherence length of the pump lasers are much smaller than the roundtrip distance in the phase conjugate resonator. (Author) (U)

DESCRIPTORS: *Resonators, *Mirrors, *Corrections, *Optical properties, Reflectivity, Distortion, Continuous wave lasers, Krypton, Dye lasers, Laser pumping, Helium neon lasers, Coherence, Constants, Sodium, Power levels, Gain, metal vapors, Pressure, Crystals, Length, Barium titanates, Axes, Output, Time, Stark effect, Anisotropy, Dyes (U)
IDENTIFIERS: Optical resonators, PCR(Phase Conjugate Resonators), Phase conjugation, Photorefractive crystals, Four wave mixing, Time reserved wavefronts, Longitudinal modes, (U)

AD-A130 043 22/2 4/1 20/3

YORK UNIV DOWNSVIEW (ONTARIO) CENTRE FOR RESEARCH IN EXPERIMENTAL SPACE SCIENCE

Numerical Simulation of Spacecraft Charging Phenomena at High Altitude. (U)

DESCRIPTIVE NOTE: Final rept. 1 Mar 76-31 Aug 81, AUG 82 57P Laframboise,J. G. ; Kamitsuma,M. ;Prokopenko,S. M. L. ;Chang, Jen-Shih ;Godard,R. ;
CONTRACT: AFOSR-76-2962
PROJ: 2311
TASK: A1
MONITOR: AFOSR TR-83-0549

UNCLASSIFIED REPORT

ABSTRACT: This report describes work done under grant AFOSR-76-2962. This work has included the development of computer programs for simulating spacecraft charging at three levels of complexity: LOCHG, a relatively simple local-charging calculation; CYLVIA, a two-dimensional simulation program for treating cylindrical spacecraft cross-sections, and XYCIC, a simulation program for the treatment of a larger variety of two-dimensional geometries. This work has also included studies of two physical phenomena which are fundamental to an improved understanding of spacecraft charging: the threshold temperature effect and the barrier effect. Also included is a derivation of two results which appear likely to be of use in future simulation studies: an analytic expression for photoelectron currents on surfaces with variable illumination in electric fields, and a perturbation technique for calculating space-charge density and flux along particle orbits. (Author) (U)
DESCRIPTORS: *Space charge, *Spacecraft components, Space systems, High altitude, Ion density, Computerized simulation, Numerical analysis, Photoelectric emission (U)
IDENTIFIERS: *Spacecraft charging, PE61102F, WUAFOSR2311A1 (U)

AD-A130 041 11/6 20/11

LEHIGH UNIV BETHLEHEM PA INST OF FRACTURE AND SOLID MECHANICS

Mechanisms of Corrosion Fatigue in High Strength I/M (Ingot Metallurgy) and P/M (Powder Metallurgy) Aluminum Alloys. (U)

DESCRIPTIVE NOTE: Technical rept., FEB 83 70P Wei,R. P. ;Pao,P. S. ;
REPT. NO. IFSM-83-114, TR-2
CONTRACT: F49620-81-K-0004
PROJ: 2306
TASK: A1
MONITOR: AFOSR TR-83-0560

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with McDonnell Douglas Research Labs.
ABSTRACT: High strength aluminum alloys are employed extensively in the primary structure of current and projected Air Force and civilian aircraft. The service lives and reliability of these aircrafts depend to a great extent on the corrosion fatigue resistance of the structure alloys. Significant efforts are underway to develop powder metallurgy (P/M) alloys that would provide improved corrosion fatigue resistance along with improvements in other mechanical properties. The objective of this study is to understand the chemical and metallurgical aspects of environmental assisted fatigue crack growth (or corrosion fatigue) that can serve (1) as a basis for guiding the development of new and improved alloys, and (2) as a basis for developing rational design procedures for service life predictions. A coordinated fracture mechanics, surface chemistry and materials science approach is used. The research is being performed by Lehigh University with technical support by McDonnell Douglas Research Laboratories. (Author) (U)
DESCRIPTORS: *Aluminum alloys, *Corrosion, *Fatigue(Mechanics), High strength alloys, Fracture(Mechanics), Cracking(Fracturing), Strength(Mechanics), Powder metallurgy, Chemical attack(Degradation), Microstructure, Resistance, Structural analysis (U)
IDENTIFIERS: PE61102F, WUAFOSR2306A1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 040 20/5 20/10 20/8

FLORIDA UNIV GAINESVILLE QUANTUM THEORY PROJECT

Molecular Interactions with Many-Body Methods. (U)

DESCRIPTIVE NOTE: Annual technical rept., DEC 82 46P Bartlett,Rodney J. ;
CONTRACT: AFOSR-82-0026
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0551

UNCLASSIFIED REPORT

ABSTRACT: Modern military technology has become highly dependent on a detailed knowledge of atom-molecule and molecule-molecule interactions. This type of information is required in diverse defense applications including chemical laser development, in the detection and modeling of plumes, and in the decomposition of energetic materials. The description of forces governing molecular reactions is provided by potential energy surfaces. These surfaces are the crucial first step in dynamics calculations that provide required information about state-to state cross-sections and rate constants. Since potential energy surfaces are not generally available from experiment, the most reliable approach to their determination lies in the development and application of predictive ab initio quantum mechanical methods. The following annual report describes our research on the development of many-body perturbation theory (MBPT) and related infinite-order coupled-cluster (CC) methods for potential energy surfaces. (U)
DESCRIPTORS: *Chemical lasers, *Quantum theory, *N body problem, *Molecule molecule interactions, Reaction kinetics, Detection, Plumes, Perturbation theory, Clustering, Coupling(Interaction), Atomic structure, Decomposition, Models, Defense systems, Military applications, Molecular energy levels, Mechanics, Rates, Constants, Energetic properties (U)
IDENTIFIERS: Quantum mechanics, Quantum mechanic methods, Molecular reactions, Molecular chemistry, Rate constants, PE61102F, WUAFOSR2301A4 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 037 14/4 15/5 5/1

CITY COLL NEW YORK DEPT OF MATHEMATICS

On the Reliability of Repairable Systems. (U)

DESCRIPTIVE NOTE: Technical rept., OCT 82 19P Brown,Mark ;
REPT. NO. CUNY-MB1, TR-82-01-AFOSR
CONTRACT: AFOSR-82-0024
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0547

UNCLASSIFIED REPORT

ABSTRACT: The problem of time to first failure for repairable coherent systems of independent exponential components is discussed. Several inequalities are derived and related to previous work of the author and of Keilson to obtain approximations with error bounds for the distribution of the time to first failure. (Author) (U)
DESCRIPTORS: *Reliability, Failure, Repair, Errors, Mathematical models, Systems approach, Inequalities, Stochastic control (U)
IDENTIFIERS: Fault free analysis, Time to first failure, PE61102F, WUAFOSR2304A5 (U)

AD-A130 036 20/5 20/2 20/12 12/1

CORNELL UNIV ITHACA NY

Exciton-Laser Amplifier. (U)

DESCRIPTIVE NOTE: Interim technical rept., DEC 82 9P Liboff,Richard L. ;Liu,K. C. ;
REPT. NO. R4-82
CONTRACT: AFOSR-78-3574
PROJ: 2301
TASK: A3
MONITOR: AFOSR TR-83-0544

UNCLASSIFIED REPORT

ABSTRACT: A laser-amplifying device is described which is based on the stimulated decay of excitons in a pure crystal. An estimate is made of the gain of the device. At a typical frequency the gain is found to be appreciably large thus suggesting practical application of the laser amplifier. (Author) (U)

DESCRIPTORS: *Excitons, *Laser amplifiers, *Ultraviolet lasers, *Single crystals, *Statistics, *Semiconductors, Zinc sulfides, Optical pumping, Infrared lasers, Flash lamps, Zinc oxides, Stimulation(General), Zinc selenides, Purity, Gain, Gallium arsenides, Cadmium sulfides, Indium antimonides, Amplifiers, Photons, Crystals, Silicon, Decay, Germaniu (U)
IDENTIFIERS: Bose commutation relation, Cyan Hued lasers, Wannier state functions, Energy gaps, Lorentzian lineshape factor, Binding energy, Exciton laser amplifiers, Nonbose excitons, PE61102F, WUAFOSR2301A3 (U)

AD-A130 035 20/10

CORNELL UNIV ITHACA NY

Induced Decay of Positronium and Grasers. (U)

DESCRIPTIVE NOTE: Technical rept., APR 83 16P Heffernan,Daniel M. ;Liboff, Richard L. ;
REPT. NO. IJTP-1-83
CONTRACT: AFOSR-78-3574
PROJ: 2301
TASK: A3
MONITOR: AFOSR TR-83-0573

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in International Jnl. of Theoretical Physics, v22 n2 p193-206 1983. Reprint: Induced Decay of Positronium and Grasers.

DESCRIPTORS: *Photons, *Decay, *Positronium, Blackbody radiation, Cross sections, Reprints (U)
IDENTIFIERS: Graser, Induced decay, PE61102F, WUAFOSR2301A3 (U)

AD-A130 034 20/6 9/2 17/8 12/1

LOUISIANA STATE UNIV BATON ROUGE DEPT OF ELECTRICAL ENGINEERING

A Study of Texture Analysis Algorithms. (U)

DESCRIPTIVE NOTE: Final rept. 1 Mar 79-28 Feb 81, APR 81 79P Harlow,Charles A. ;Conners, Richard W. ;
CONTRACT: F49620-79-C-0042
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0563

UNCLASSIFIED REPORT

ABSTRACT: This research has focused upon developing improved texture analysis algorithms. Work performed during the second year of the grant has shown that the Spatial Gray Level Dependence (SGLDM) texture analysis algorithm is a superior algorithm under fairly weak assumptions. For this reason our subsequent work has continued the development of the SGLDM method. Tiling theory has been combined with the SGLDM analysis procedure to create a structural (SSA) analyzer for texture patterns. Recent work has focused upon determining measures derived from the SGLDM [illegible] matrices that characterize texture patterns. It has been shown that the commonly used measures are inadequate. A texture generation procedure has been developed and this has been used to generate new measures based upon the perceptual concepts of uniformity and proximity. These measures offer promise of developing measures related to perceptual features. Experiments were also conducted which shows that the SGLDM algorithm can discriminate known counterexamples to the Julesz conjecture. Thus the robustness of the SGLDM has been further established over this theoretically troublesome class of textures. (Author) (U)

DESCRIPTORS: *Image processing, *Computer graphics, *Optical images, *Texture, *Algorithms, Visual perception, Spatial distribution, Gray scale, Pattern recognition, Target detection, Rank order statistics (U)

IDENTIFIERS: SGLD(Spatial Gray Level Dependence), Scene analysis, Texture analysis, PE61102F, WUAFOSR2304A2 (U)

AD-A130 033 17/1 14/2

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

Focused Acoustic Beams for Accurate Phase Measurements, (U)

82 15P Bennett,S. D. ;Husson,D. ; Kino,G. S. ;
REPT. NO. GL-3275
CONTRACT: F49620-79-C-0217
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0555

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acoustical Imaging, v11 p583-595 1982.

ABSTRACT: Nondestructive evaluation tasks which the ability to determine the state of stress in a component would be invaluable are described. The use of ultrasonic probes offers a real possibility of measuring stress below the immediate surface region. Acoustic measurements based on the acousto-elastic effect successfully determined the cross sectional variation of stress for specimens in plane strain. Until now there has been little success in measuring stress distribution through the thickness of a specimen. A theory is outlined and an initial experiment was conducted with a new technique which is capable of determining the distribution of stress in a solid body in three dimensions. (Author, modified PL). (U)

DESCRIPTORS: *Acoustic beams, *Nondestructive testing, *Beams(Radiation), *Measurement, Plane waves, Probes, Stresses, Surfaces, Distribution, Thickness, Electron scattering, Reprints (U)

IDENTIFIERS: Ultrasonic waves, Ultrasonic probes, Phase measurements, State of stress, Test specimens, PE61102F, WUAFOSR2306A2 (U)

IAC NO.: NT-027791 PL-044912
IAC DOCUMENT TYPE: NTIAC -MICROFICHE-- PLASTC - MICROFICHE--

IAC SUBJECT TERMS: N--(U)ACOUSTIC WAVES, ULTRASONICS, PROBES, PHASE, MEASUREMENT, FOCUSING, STRESSES, THREE DIMENSIONAL, THEORY, REFERENCE BEAMS, PHASE SHIFT, FOCUSED TRANSDUCERS, ACOUSTOELASTICITY; P--(U)NDE, NDT, Acoustic emission, Ultrasonics, Phase velocity,

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A130 018 20/12 20/6 12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

Third-Order Optical Nonlinearity Induced by Effective Mass Gradient in Heterostructures. (U)

SEP 82 4P Yuen,S. Y. ;
CONTRACT: F49620-80-C-0008
PROJ: 2306
TASK: C2
MONITOR: AFOSR TR-83-0583

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Physics Letters, v42 n4 p331-333, 15 Feb 83. Reprint: Third-Order Optical Nonlinearity Induced by Effective Mass Gradient in Heterostructures.

DESCRIPTORS: *Semiconductors, *Nonlinear systems, *Refractive index, Electrons, Heterogeneity, Aluminum gallium arsenide, Mercury compounds, Cadmium compounds, Tellurides, Mass, Reprints (U)
IDENTIFIERS: Nonlinear optics, Effective mass, Refractive indices(Nonlinear), Gallium indium arsenide phosphide, Third order nonlinearities, Heterostructures(Semiconductor), Relaxation time, Optical fields, PE61102F, WUAFOSR2306C2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 995 20/12 20/5

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

Non-Linear Optical Interactions in Semiconductors. (U)

DESCRIPTIVE NOTE: Final rept. 1 Apr 79-31 Mar 83,
APR 83 15P Salour,M. M. ;
CONTRACT: F49620-79-C-0071
MONITOR: AFOSR TR-83-0584

UNCLASSIFIED REPORT

ABSTRACT: The first tunable CW laser action in both mode-locked and unmode-locked (in both straight and ring cavity) configurations has been demonstrated. The gain media were plate ets of CdS, CdSe, InGaAsP, and HgCdTe. Pulse as short as 2.8 Psec and continous tunability between .5 micrometers and 2.5 micrometers has been achieved. Picosecond spectroscopy of bound excitons, using a synchronously operating streak camera; and picosecond photoelectric emission from a Zirconium metal surface have been studied. The first experimental technique for compensating the pulse broading in single-mode optical fibers using the slow anomalous pulse propagation in the exciton-polariton resonance in a Direct-gap semiconductor has been demonstrated. (Author) (U)
DESCRIPTORS: *Semiconductors, *Continuous wave lasers, *Tunable lasers, *Spectroscopy, Gallium arsenides, Pulses, Photoelectric emission, Nonlinear systems, Optical properties, Fiber optics, Gain, Zirconium, Surfaces, Excitons, Cadmium tellurides, Cavities (U)
IDENTIFIERS: Piscosecond spectroscopy, Exciton, Polariton, Continous tunability lasers, PE61102F, WUAFOSR2306C2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 994 12/1

ENVIRONMENTAL RESEARCH INST OF MICHIGAN ANN ARBOR

Uniqueness of Phase Retrieval for Functions with Sufficiently Disconnected Support, (U)

AUG 82 5P Crimmins,T. R. ;Fienup,J. R. ;

REPT. NO. 161900-2-J
CONTRACT: F49620-82-K-0018
MONITOR: AFOSR TR-83-0568

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America, v73 n2 p218-221 Feb 83. Reprint: Uniqueness of Phase Retrieval for Functions with Sufficiently Disconnected Support.

DESCRIPTORS: *Functions(Mathematics), *Fourier transformation, Autocorrelation, Integrals, One dimensional, Complex numbers, Value, Theorems, Laplace transformation, Cross correlation, Reprints (U)
IDENTIFIERS: Phase retrieval, Image reconstruction, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 993 20/6 20/12 20/9 20/5

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF ELECTRONICS

Infrared Nonlinear Optics, (U)

81 3P Wolff,Peter A. ;Aggarwal, Roshan L. ;Brown,F. ;Jagannath,Chiravurri ; Ram-Mohan,L. R. ;

CONTRACT: F49620-80-C-0008
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0587

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in RLE Progress Report Number 124, Research Lab. of Electronics, M.I.T., Cambridge, MA. Section 9 p45-46 Jan 82. Reprint: Infrared Nonlinear optics.

DESCRIPTORS: *Optics, *Semiconductors, *Infrared radiation, Plasma generators, Carbon dioxide lasers, Gallium arsenides, Indium antimonides, Mercury, Cadmium tellurides, Infrared lasers, Reprints (U)
IDENTIFIERS: Nonlinear optics, Gallium antimonides, Four wave mixing, PE61102F, WUAFOSR2306C3 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 832 20/9 7/4

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

Theoretical Studies of Kinetic Mechanisms of Negative Ion Formation in Plasmas. (U)

DESCRIPTIVE NOTE: Final technical rept. 15 Jan 81-15 Jan 83,
MAR 83 30P Michels,H. Harvey ;Hobbs, Robert H. ;
REPT. NO. UTRC/R83-925499
CONTRACT: F49620-81-C-0022
PROJ: 2301
TASK: A7
MONITOR: AFOSR TR-83-0576

UNCLASSIFIED REPORT

ABSTRACT: This technical program constitutes a theortical research investigation of the kinetic mechanisms of negative ion formation in plasmas. This study was directed toward elucidating the mechanisms of the most important volume-dependent reactions that occur in hydrogen-ion, H-(D-), source devices, primarily of the Belchenko-Dimov-Dudnikov (BDD) type. The primary goal of this research program was to identify the most important reactions leading to H-(D-) production or destruction and to estimate these reaction rates as function of system parameters such as density, composition and temperature. A further goal was to explore new chemical sources for the production of light mass negative atomic ions. The results of this program furnish data and provide direction for more detailed investigations into the kinetics of both gas phase and gas-surface reaction rates of importance in ion source devices and provide input for reliable modeling of such systems. This investigation was carried out using quantum mechanical mehtods. both ab initio and density functional approaches were employed in these studies(U)
DESCRIPTORS: *Plasmas(Physics), *Anions, *Kinetics, Potential energy, Configurations, Interactions, Gases, Quantum theory, Computations, Experimental data (U)
IDENTIFIERS: Negative ions, PE61102F, WUAFOSR2301A7 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 761 12/1 9/3 17/2

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA DEPT OF SYSTEMS ENGINEERING

Robust Signal Processing for Communication Systems, (U)

82 10P Kassam,Saleem A. ;Poor,H. Vincent ;
CONTRACT: AFOSR-82-0022, DAAG29-81-K-0062
PROJ: 2304
TASK: A5
MONITOR: AFOSR,ARO TR-83-0508,17761.9-EL

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Communications Magazine, v21 n1 p20-28 Jan 83. Sponsored in part by N00014-80-K-0945 and N00014-81-K-0014.
Reprint: Robust Signal Processing for Communication Systems.

DESCRIPTORS: *Mathematical models, *Signal processing, *Communication and radio systems, Game theory, Matched filters, Estimates, Equalization, Reprints (U)
IDENTIFIERS: Robust procedures, Wiener filters, PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 759 7/3 7/4

DELAWARE UNIV NEWARK DEPT OF PHYSICS

Superconductivity of the Graphite Intercalation Compounds KHgC8 and RbHgC8: Evidence from Specific Heat, (U)

NOV 80 7P Alexander,M. Grayson ; Goshorn,David P. ;Guerard,Daniel ;Lagrange, Philipe ;Makrini,Mohamed El ;

CONTRACT: AFOSR-77-3393
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0525

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Solid State Communications, v38 p103-107 1981. Reprint: Superconductivity of the Graphite Intercalation Compounds KHgC8 and RbHgC8: Evidence from Specific Heat.

DESCRIPTORS: *Graphite, *Mercury compounds, *Superconductivity, Specific heat, Temperature, Measurement, Electron density, Phonons, Coupling(Interaction), Reprints (U)
IDENTIFIERS: GIC(Graphite Intercalation Compounds), Mercurographitides, PE61102F, WUAFOSR2306C3 (U)

AD-A129 759 UNCLASSIFIED

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 746 20/6 12/1 9/1 20/1

BATTELLE COLUMBUS LABS OH

Optical Waveguide Spatial Filters. (U)

DESCRIPTIVE NOTE: Annual technical rept., MAY 83 38P Kenan,R. F. ;Verber,C. M. ;
CONTRACT: F49620-79-C-0044
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0530

UNCLASSIFIED REPORT

ABSTRACT: Progress in the development of an Integrated Optical Circuit (IOC) to perform (analog) matrix-vector multiplication (16 squared x 16) is presented. The IOC utilizes the engagement architecture. (Author) (U)
DESCRIPTORS: *Spatial filtering, *Optical waveguides, *Surface acoustic wave devices, *Light modulators, *Optical correlators, Parallel processing, Signal processing, Optical circuits, Fourier transformation, Programmed instruction, Integrated circuits, Electrooptics (U)
IDENTIFIERS: Numerical optical computing, Analog multiplication, Matrix multiplication, IOC(Integrated Optical Circuits), Vector multiplication, Grating arrays, Integrated optics, PE61102F, WUAFOSR2305B1 (U)

AD-A129 746 UNCLASSIFIED

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 703 6/1

CALIFORNIA UNIV SAN FRANCISCO

ADP-ribosylation of Nonhistone Chromatin Proteins in Vivo and of Actin in Vitro and Effects of Normal and Abnormal Growth Conditions and Organ-Specific Hormonal Influences. (U)

DESCRIPTIVE NOTE: Technical rept.,
81 17P Kun,E. ;Romaschin,A. D. ;
Blaisdell,R. J. ;Jackowski,G. ;
CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0534

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Metabolic Interconversion of Enzymes 1980, p280-293.
Reprint: ADP-ribosylation of Nonhistone Chromatin Proteins in Vivo and of Actin in Vitro and Effects of Normal and Abnormal Growth Conditions and Organ-Specific Hormonal Influences.

DESCRIPTORS: *Chromatin, *Proteins, *Adenosine, Polymers, In vivo analysis, In vitro analysis, Hormones, Deoxyribonucleic acids, Ribose, Nuclei, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2312A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 686 6/1

CALIFORNIA UNIV SAN FRANCISCO

Age Dependent Selective Effects of Hydrocortisone and Aldosterone on the Polyadenosine Diphosphoribose Metabolism of Isolated Cardiocyte Nuclei, (U)

NOV 81 10P Jackowski,George ;Romaschin, Alexander D. ;Kun,Ernest ;
CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0539

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Biochemistry International, v4 n1 p17-24 Jan 82.
Reprint: Age Dependent Selective Effects of Hydrocortisone and Aldosterone on the Polyadenosine Diphosphoribose Metabolism of Isolated Cardiocyte Nuclei.

DESCRIPTORS: *Aldosterone, *Adenosine, *Ribose, Polymers, Organic phosphorus compounds, Metabolism, Cells(Biology), Synthesis, Rats, Nuclei, Reprints (U)
IDENTIFIERS: Polyadenosine-diphosphoribose, *Hydrocortisone, PE61102F, WUAFOSR2312A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A129 685 6/19 6/16

WISCONSIN UNIV-MADISON

Neuroendocrine and Metabolic Factors in Pulmonary Circulatory Control, (U)

82 10P Will,James A. ;
CONTRACT: AFOSR-78-3497
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0518

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Advances in Shock Research, v8 p13-20 1982.
Reprint: Neuroendocrine and Metabolic Factors in Pulmonary Circulatory Control.

DESCRIPTORS: *Endocrine glands, Neurophysiology, Lung, Blood circulation, Control, Oxygen, Hypoxia, Hyperoxia, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2312A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 682 20/6 14/5 5/2

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF ELECTRICAL ENGINEERING

White-Light Optical Information Processing and Holography. (U)

DESCRIPTIVE NOTE: Annual rept. 15 Feb 82-14 Feb 83,
MAY 83 53P Yu,Francis T. S. ;
CONTRACT: AFOSR-81-0148
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0502

UNCLASSIFIED REPORT

ABSTRACT: During the second year (FY'82) a great deal of progress has been made on the white-light optical information processing and holography research program. In this period, we have evaluated the coherence requirement, source encoding, and signal sampling concept for the proposed white-light optical signal processor. We have shown that the spatial coherence requirement is governed by source distributions while the temporal coherence requirement is controlled by spatial frequency bandwidth of the input signal and the grating sampling frequency. In order to alleviate the basic constraints of a white-light source, we have developed a source encoding and signal sampling concept, so that the information can be processed in complex amplitude for the entire spectral band of the white-light source. We have also evaluated an apparent transfer function for the proposed white-light signal processor. We have shown that the MTF is dependent upon the degree of spatial and temporal coherence. The derived apparent transfer function is very general, which can be applied to any partially coherent optical processor. Since the proposed white-light signal processor is very suitable for color image processing, we have, in this period, also demonstrated several color image processing capabilities. Among those are broadband color image deblurring and color image subtraction. From those results, we have seen high quality deblurred color images and subtracted color images can be performed by the proposed white-light optical processor. We have also in this period evaluated the primary aberrations and the bandwidth (U)
DESCRIPTORS: *Optical processing, *Image processi (U)

AD-A129 677 7/3 7/4

DELAWARE UNIV NEWARK DEPT OF PHYSICS

Thermal and Physical Properties of Graphite Intercalation Compounds. (U)

DESCRIPTIVE NOTE: Final rept. 15 Jul 77-30 Jun 82,
82 12P Onn,David G. ;
CONTRACT: AFOSR-77-3393
PROJ: 2306
TASK: C3
MONITOR: AFOSR TR-83-0529

UNCLASSIFIED REPORT

ABSTRACT: Five major contributions to research in graphite intercalation compounds (GIC's) have been made. They are (1) the discovery of superconductivity in the mercurographitides (KHgC8 and RbHgC8) which was first seen in low temperature specific heat (Cp) studies, (2) that low-energy phonon states appear to play a role in suppressing Tc for superconducting GIC's and may suppress superconductivity altogether, (3) the re-awakening of interest in magnetic graphite intercalation compounds arising in part from our specific heat studies which suggest the possibility of a magnetic spin-glass state in FeCl3 and NiCl2 compounds, and (4) the confirmation that a low density of electronic states is common to a wide class of acceptor intercalation compounds. In addition, (5) it permitted completion of research that showed for the first time the university of 'twin' phase transitions in donor alkali metal GIC's below stage 1. Of the above, (1), (3) and (5) have led to a wealth of further research by other groups in recent years and have had lasting influence in this research area. Research performed under this grant was devoted primarily to the determination of the low temperature physical properties of a wide range of graphite intercalation compounds (GIC's) and the interpretation of these properties. In addition some new GIC's were synthesized and transport studies initiated elsewhere were completed. (U)

DESCRIPTORS: *Graphite, *Mercury compounds, *Physical properties, *Thermal properties, Superconductivity, Specific heat, Magnetoresistance, Electrical resistance, Low (U)
IDENTIFIERS: GIC(Graphite Intercalation (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 675 6/1

CALIFORNIA UNIV SAN FRANCISCO

Regulation of Chromatin Function by Polyadenosine Diphosphoribosylation, (U)

JUN 82 15P Kun,Ernest ;Minaga,Takeyoshi ;Kirsten,Eva ;Jackowski,George ;Peller,Leonard ;
CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0537

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Steembock-Lizzy Symposium (12th), 7-11 Jun 82, Madison, WI. Prepared in cooperation with Ohio State Univ., Columbus. Comprehensive Cancer Center.

ABSTRACT: The biological function of poly (ADP-R) based on its macromolecular properties is envisaged as a nucleic acid component of a cross linking system capable of promoting or inhibiting the regulatory effect of chromatin proteins on transcription. Two examples, the action of triiodothyronine and of chemical carcinogens illustrate this complex action of the homopolymer functioning as a protein modifier. Although DNA and RNA can be profitably studied in isolated systems without paying attention to poly (ADP R), integration with cellular physiology makes it mandatory to include poly (ADP-R) as a nucleic acid that possesses exclusively regulatory function. (U)

DESCRIPTORS: *Chromatin, *Adenosine, Polymers, Proteins, Crosslinking(Chemistry), Carcinogens, Nuclei, Macromolecules (U)
IDENTIFIERS: WUAFOSR2312A5, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 670 6/5 6/16 5/10

CALIFORNIA UNIV SANTA BARBARA INST OF ENVIRONMENTAL STRESS

Effects of Exhaustive Exercise on the Sleep of Men and Women. (U)

APR 82 12P Bunnell,David E. ;Bevier, Wendy ;Horvath,Steven M. ;
CONTRACT: AFOSR-78-3534
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0522

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Psychophysiology, v20 n1 p50-58 Jan 83.
Effects of Exhaustive Exercise on the Sleep of Men and Women.

DESCRIPTORS: *Clinical medicine, *Sleep, *Exercise(Physiology), *Exhaustion(Psychological), *Women, *Males, Females, Stress(Physiology), Heart rate, Eye movements, Cardiovascular system, Cortisol, Psychophysiology, Research management, Reprints (U)
IDENTIFIERS: Slow-wave sleep, WUAFOSR2312A1, [illegible]2F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 661 6/19 6/16 6/1

WISCONSIN UNIV-MADISON DEPT OF VETERINARY SCIENCE

Lung Metabolism, Function, and Morphology during Hyperoxic and Hyperbaric Exposure. (U)

DESCRIPTIVE NOTE: Final rept. 1 [illegible]n-31 Dec 78,
JAN 83 13P Will,James A. ;
CONTRACT: AFOSR-78-3497
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0515

UNCLASSIFIED REPORT

ABSTRACT: Indolamine 2,3 dioxygenase has been found in human lung; this enzyme has potential as an important oxygen radical scavenger, MK421, is a non-sulfhydryl group angiotensin-converting-enzyme inhibitor which was found not to alter adrenergic responsiveness, Neuron-specific-enolase and 5-HT immunoreactive lung neuroendocrine cell populations are not the same in the fetal monkey lung implying that either development rates are not the same or more than one population is present, a possible genetic relationship between cytochrome P-450 enzyme induction and oxidative stress has been established implying that the susceptibility to oxygen toxicity may be inherited as well as environmental, Selenium and vitamin E deficiency may cause a decrease of the medial thickness in small pulmonary arteries implying that regulation of smooth muscle reactivity may be related to levels of organic hydroperoxides, lipid peroxidation, lipoxygenase or cyclooxygenase products, or a change in platelet activation status, The smallest subunit of Lipid A,Lipid X (mol.wgt. 711) has been characterized and causes all of the physiological effects on the pulmonary circulation seen with complete endotoxin, and finally Venous dispersion of lung 5-HT uptake kinetics using the bolus injection technique were different when trace doses were superimposed on constant background concentrations. (U)
DESCRIPTORS: *Oxygen, *Toxicity, *Serotonin, *Tryptophan, Enzymes, Selenium, Vitamin E, Deficiencies, Hyperoxia, Hyperbaric conditions, Endotoxins, Peptides, Lung, Biological absorption, Kinetics, Peroxides (U)
IDENTIFIERS: Indolamine-2,3-Dioxygenase, Enolase, Phentolamine, WUAFOSR2312A1, (U)

AD-A129 660 6/18

JOHN B PIERCE FOUNDATION LAB NEW HAVEN CONN

Microwaves and Thermoregulation: A Symposium. (U)

DESCRIPTIVE NOTE: Final rept. 30 Jun 81-31 Dec 82,
FEB 83 [illegible] Adair,Eleanor R. ;
CONTRACT: AFOSR-81-0211
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0514

UNCLASSIFIED REPORT

ABSTRACT: The primary goal of the Symposium was to discuss how nonionizing radiation deposits thermalizing energy in biological tissues and the means by which this energy may be detected and effectively dealt with by the conscious organism. Much is known of the mechanisms by which endotherms achieve and maintain a characteristic stable internal body temperature in the face of environmental and internal thermal stresses. Nonionizing radio-frequency radiation provides a unique thermal challenge to deep as well as peripheral tissues that must be dealt with by these same mechanisms. Over the past several years, research into the biological effects of microwave exposure has advanced considerably; research emphasis has shifted from high intensity to low intensity exposure as scientists probe more and more subtle biological effects. With this shift in emphasis has come the realization that a body temperature increase in an experimental animal exposed to microwaves implies a breakdown of thermoregulatory mechanisms. On the other hand, low intensity exposures (previously dubbed non-thermal) usually initiate immediate and efficient thermoregulatory processes that ensure the constancy of the internal body temperature. (U)
DESCRIPTORS: *Microwaves, *Temperature control, *Symposia, *Radiation effects, *Infrared radiation, Tissues(Biology), Body temperature, Response(Biology), Humans, Behavior, Rhesus monkeys, Rats, Squirrel monkeys, Stability (U)
IDENTIFIERS: WUAFOSR2312A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 651 12/1 9/1 6/16

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

Signal Processing in Evoked Potential Research: Applications of Filtering and Pattern Recognition, (U)

81 43P McGillem,Clare D. ;Aunon, Jorge I. ;Childers,Donald G. ;
CONTRACT: AFOSR-80-0152, PHS-NS-1534F
PROJ: 2313
TASK: A4
MONITOR: AFOSR TR-83-0524

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in CRC Critical Reviews in Bioengineering, v7 p225-265 Oct 81.
Reprint: Signal Processing in Evoked Potential Research: Applications of Filtering and Pattern Recognition.

DESCRIPTORS: *Mathematical filters, *Signal processing, *Brain, Pattern recognition, Waveforms, Signal to noise ratio, Reprints (U)
IDENTIFIERS: WUAFOSR2313A4, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 648 12/1 9/4

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA DEPT OF SYSTEMS ENGINEERING

Robust Wiener Filtering for Multiple Inputs with Channel Distortion. (U)

DESCRIPTIVE NOTE: Interim rept.,
83 13P Chen,Cheng-Tie ;Kassam, Saleem A. ;
CONTRACT: AFOSR-82-0022
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0507

UNCLASSIFIED REPORT

ABSTRACT: Robust Wiener filtering has previously been considered for the single-input (scalar) case where there is no channel distortion and where the signal to be estimated is the source signal itself. In this correspondence, the authors extend these results to the multiple-input (vector) case where linear channel distortion is allowed and the signal to be estimated is a linear-filtered version of the source signal. The results ae obtained from those for the single-input case by modifying appropriately the constraints on signal and noise characteristics. Such a modification is motivated by an examination of the expression of the mean-square error for the optimum filter. (U)

DESCRIPTORS: *Mathematical filters, *Signal processing, *Linear filtering, Channels, Distortion, Estimates, Input, Multiple operation, Signal to noise ratio, Minimax technique, Modification, Matrices(Mathematics), Optimization, Spectra, Density (U)
IDENTIFIERS: Robust procedures, Wiener filters, WUAFOSR2304A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 647 6/1

CALIFORNIA UNIV SAN FRANCISCO

Age-Dependent Variation of Rates of Polyadenosine-Diphosphoribose Synthesis by Cardiocyte Nuclei and the Lack of Correlation of Enzymatic Activity with Macromolecular Size Distribution of DNA, (U)

DEC 80 6P Jackowski,George ;Kun,Ernest ;
CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0536

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Biological Chemistry, v256 n8 p3667-3670, 25 Apr 81. Reprint: Age-Dependent Variation of Rates of Polyadenosine-Diphosphoribose Synthesis by Cardiocyte Nuclei and the Lack of Correlation of Enzymatic Activity with Macromolecular Size Distribution of DNA.

DESCRIPTORS: *Adenosine, *Ribose, *Deoxyribonucleic acids, Polymers, Synthases, Biosynthesis, Organic phosphorus compounds, Nuclei, Rates, Reprints (U)
IDENTIFIERS: Polyadenosine-diphosphoribose (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 645 6/16 14/2

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

Preprocessing for Improved Classification of Evoked Potentials, (U)

82 4P McGillem,Clare D. ;
Pomalaza,Carlos A. ;Aunon,Jorge I. ;
CONTRACT: AFOSR-80-0152
PROJ: 2313
TASK: A4
MONITOR: AFOSR TR-83-0520

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the IEEE Conference on Engineering in Medicine and Biology, p212-214 Sep 82.
Reprint: Preprocessing for Improved Classification of Evoked Potentials.

DESCRIPTORS: *Signals, *Classification, *Electroencephalography, *Voltage, *Potentiometric analysis, *Symbols, Electrodes, Superlow frequency, Signal to noise ratio, Extremely low frequency, Focusing, Real time, Site selection, Images, Voltmeters, Reprints (U)
IDENTIFIERS: *Evoked potentials, Letters, Preprocessing, Defocused letters, ERP(Event Related Potentials), Potentials(Evoked), Scalp, Electrode positions, Events, PE61102F, WUAFOSR2313A4 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 617 8/11

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

Localized Velocity Anomalies in the Lower Mantle, (U)

AUG 82 36P Lay,Thorne ;
REPT. NO. CONTRIB-3761
CONTRACT: F49620-81-C-0008, NSF-EAR81-08616
MONITOR: AFOSR TR-83-0526

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v72 p483-516 1983.
Reprint: Localized Velocity Anomalies in the Lower Mantle.

DESCRIPTORS: *Seismic waves, Velocity, Anomalies, Earth mantle, Heterogeneity, Delay, Amplitude, Reprints (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 612 7/4 11/9

CALIFORNIA UNIV SAN FRANCISCO

Spectral Analysis of the Conformation of Polyadenosine Diphosphoribose: Evidence Indicating Secondary Structure, (U)

AUG 82 8P Minaga,Takeyoshi ;Kun,Ernest ;

CONTRACT: F49620 81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0516

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Biological Chemistry, v258 n2 p725-730, 25 Jan 83. Reprint: Spectral Analysis of the Conformation of Polyadenosine Diphosphoribose: Evidence Indicating Secondary Structure.

DESCRIPTORS: *Chromatographic analysis, *Spectra, *Polymers, *Adenosine, Phosphorus compounds, Ribose, Reprints (U)
IDENTIFIERS: Spectral analysis, Polyadenosine diphosphoribose, Secondary structure, PE61102F, WUAFOSR2312A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 610 6/1

CALIFORNIA UNIV SAN FRANCISCO

Decrease of Hepatic Mono and Oligo Adenosine Dipohsphoribose Content and Augmentation of (14C) Ribose Incorporation during Induction of Growth by Bovine Growth Hormone in Hypophysectomized Rats, (U)

SEP 81 8P Romaschin,Alexander D. ;Kun, Ernest ;

CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0535

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Biochemical and Biophysical Research Communications, v102 n3 p952-957, 15 Oct 81. Reprint: Decrease of Hepatic Mono and Oligo Adenosine Dipohsphoribose Content and Augmentation of (14C) Ribose Incorporation during Induction of Growth by Bovine Growth Hormone in Hypophysectomized Rats.

DESCRIPTORS: *Adenosine, *Ribose, Organic phosphorus compounds, Polymers, Hormones, Rats, Reprints (U)
IDENTIFIERS: Polyadenosine-diphosphoribose, PE61102F, WUAFOSR2312A5 (U)

AD-A129 604 8/11 8/5 8/7

INSTITUTE FOR THE STUDY OF EARTH AND MAN DALLAS TX GEOPHYSICAL LAB

Development of Automated Detection and Discrimination Techniques for Use at Regional to Teleseismic Distances. (U)

DESCRIPTIVE NOTE: Final rept. 15 Oct 80-14 Oct 82, OCT 82 178P Herrin,Eugene ;Goforth,Tom ;
CONTRACT: F49620-81-C-0010
PROJ: 2309
TASK: A1
MONITOR: AFOSR TR-83-0528

UNCLASSIFIED REPORT

ABSTRACT: The resolution of the seismic sensors discussed in this report is limited either by the self-noise of the system or the ambient ground noise at the observing site. The resolution limits of a particular system are frequency-dependent. A major objective of the designer is to insure that seismic sensors are available which will be limited in resolution only by the ambient background noise at the quietest sites over the frequency band of interest in treaty verification research. This report presents a review of the data currently available on the limiting resolution of the most advanced instruments used in this research program. (Author) (U)

DESCRIPTORS: *Seismic waves, *Seismic detection, Nevada, Land areas, Nuclear explosions, Underground explosions, Gravity, Mathematical models, Gravity anomalies, Structural geology, Texas, Seismological stations, Seismometers, Resolution, Noise (U)
IDENTIFIERS: Body waves, Yucca Flat, Seismic noise, PE61102F, WUAFOSR2309A1 (U)

AD-A129 600 20/13 11/3 9/2

SAGINAW VALLEY STATE COLL UNIVERSITY CENTER MI DEPT OF PHYSICS

Transient Heat Transfer in Coated Superconductors. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Jun 81-1 Sep 82, OCT 82 54P Menard,Albert R. ;
REPT. NO. SP-80-10-112
CONTRACT: AFOSR-81-0184
PROJ: 2301
TASK: D9
MONITOR: AFOSR TR-83-0504

UNCLASSIFIED REPORT

ABSTRACT: Computer simulation of transient heat transfer from coated superconductors to liquid helium have revealed that coating a superconductor with certain new materials, called Laketites, instead of traditional insulation, such as GE7031, substantially improves the ability of the superconductor to withstand transient heat pulses without making the transition to the normal i.e. non-superconducting state. In the best cases, the length of time that constant heating can be withstood is improved twenty fold. This report shows that the most important property of these new materials is their increased thermal conductivity relative to current materials. The highest thermal conductivity materials designed SC-2, SC-3 are the most desirable for further research and development. The increased specific heat of the Laketites is desirable, but not crucial. Furthermore, the thickness of the coating has little effect on the improved ability of the superconductor to withstand heat pulses. This report recommends a vigorous program of further development of the Laketites. A complete theoretical background of the computer simulation and examples of the programs used are also included in this report. (Author) (U)

DESCRIPTORS: *Heat transfer, *Transients, *Coatings, *Superconductors, *Computerized simulation, Test and evaluation, Liquid helium, Constants, Thermal conductivity, High rate, Thickness, Pulses, Theory, Boundary layer, Differential thermal analysis, Circuits, Copper (U)
IDENTIFIERS: Coated superconductors, Laketites, (U)

AD-A129 599 12/1 9/5

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA DEPT OF SYSTEMS ENGINEERING

Optimum Quantization of Fir Wiener and Matched Filters. (U)

DESCRIPTIVE NOTE: Technical rept., 83 5P Chen,Cheng-Tie ;Kassam, Saleem A. ;
CONTRACT: AFOSR-82-0022
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0506

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings IEEE International Conference on Communications, p1-4 Jun 83.
Reprint: Optimum Quantization of Fir Wiener and Matched Filters.

DESCRIPTORS: *Algorithms, *Recursive filters, *Matched filters, *Quantization, Optimization, Signal processing, Coefficients, Numerical methods and procedures, Reprints (U)
IDENTIFIERS: *Wiener filters, Finite impulse response filters, WUAFOSR2304A5, PE61102F (U)

AD-A129 582 9/1 17/2

CALIFORNIA UNIV IRVINE DEPT OF ELECTRICAL ENGINEERING

Thin-Film Guided-Wave Devices for Integrated/Fiber Optic Signal Processing and Communications. (U)

DESCRIPTIVE NOTE: Annual scientific rept. 1 Oct 81-30 Nov 82, APR 83 25P Tsai,Chen S. ;
CONTRACT: AFOSR-80-0288
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0501

UNCLASSIFIED REPORT

ABSTRACT: Integrated or Guided-Wave Optics is an emerging technology that has the ultimate potential of integrating miniature optical components such as laser light sources, modulators, switches, deflectors, lenses, prisms, and detectors in a common substrate. The resultant integrated optic circuits and subsystems are expected to have a number of advantages over the conventional bulk optical systems in certain areas of applications. Some of the advantages include smaller size and lighter weight, wider bandwidth, lesser electrical drive power requirement, greater signal accessibility, and integratability. The integrated optic circuits are also expected to possess advantages in stability, reliability, ruggedness, and ultimate cost. It has been recognized for some time that the most immediate applications of integrated optics lie in the areas of wideband multichannel communications and signal processing (for both civilian applications such as fiber optic systems and military hardwares such as sensors and radars). The general objectives of this research program are to study the basic physical mechanisms/phenomenon of new and novel guided-wave devices with application to wideband multichannel optical information processing. (U)
DESCRIPTORS: *Waveguides, *Thin films, *Fiber optics, *Integrated systems, *Multichannel communications, *Signal processing, Deflectors, Modulators, Broadband, Detectors, Substrates, Physical properties, Research management, Sizes(Dimensions), Optical equipment, Laser beams, Reliability, Access, Lightweight, (U)
IDENTIFIERS: Magnetostatic surface waves, (U)

AD-A129 579 7/4 11/7

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF METALLURGY AND MATERIALS SCIENCE

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

DESCRIPTIVE NOTE: Final rept. 1 Mar 78-28 Feb 83, APR 83 185P Chung,Deborah D. L. ;
CONTRACT: AFOSR-78-3536
PROJ: 2306
TASK: D2
MONITOR: AFOSR TR-83-0532

UNCLASSIFIED REPORT

ABSTRACT: An extensive investigation was undertaken on the mechanism, kinetics and thermodynamics of intercalation of graphite. It was found that bromine intercalate transport in graphite at room temperature occurred by solid-state intercalate displacement. Upon exposure by stage-2 graphite-bromine to IC1, bromine was expelled by the incoming IC1, which dissolved the remaining bromine to form a solid solution with the IC1 in-plane superlattice. During bromine intercalation, an intercalate front moved toward the center of the graphite. The first time-temperature-transformation (TTT) diagram describing the stage evolution during intercalation was obtained. The TTT-curves for bromine intercalation were C-shaped for the growth of each stage, suggesting diffusion-controlled kinetics at low temperatures and interface-controlled kinetics at high temperatures. The pressure-temperature equilibrium diagram for stages 2-4 of graphite-bromine was determined. Based on the change in free energy from stage of stage and the intercalate diffusion rate, the kinetics of bromine intercalation of graphite was modeled. (U)

DESCRIPTORS: *Graphite, *Layers, *Structural properties, *Reaction kinetics, Bromine, Interactions, Crystal lattices, Symmetry(Crystallography), Chemical compounds, Phase transformations, Temperature, Desorption, Exfoliation, Expansion, Pyrolytic graphite, X ray diffraction, Microscopy, Thermogravimetric analysis, Dilatometers, Acoustic measurement (U)
IDENTIFIERS: Intercalation compounds, WUAFOSR2306D2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 575 6/1

CALIFORNIA UNIV SAN FRANCISCO CARDIOVASCULAR RESEARCH INST

Cell Specific Response of Cardiac Poly ADP-R and DNA Synthesis to Circulatory Stress, (U)

DEC 81 3P Jackowski,G. ;Heymann,M. A. ;Rudolph,A. M. ;Kun,E. ;
CONTRACT: F49620-81-C-0007, PHS-HL-24056
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0540

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Experientia, v38 p1068-1069 1982.
Reprint: Cell Specific Response of Cardiac Poly ADP-R and DNA Synthesis to Circulatory Stress.

DESCRIPTORS: *Synthesis, *Deoxyribonucleic acids, Polymers, Cells(Biology), Nuclei, Inhibition, Metabolism, Response(Biology), Biosynthesis, Stress(Physiology), Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2312A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 571 20/6 20/8

CORNELL UNIV ITHACA NY

Study of a Nuclear Gamma-Ray Laser. (U)

DESCRIPTIVE NOTE: Interim technical rept.,
JUN 83 16P Liboff,Richard L. ;
Heffernan,Daniel M. ;Yaakobi,Barukh ;
REPT. NO. R-3-83
CONTRACT: AFOSR-78-3574
PROJ: 2301
TASK: A3
MONITOR: AFOSR TR-83-0527

UNCLASSIFIED REPORT

ABSTRACT: In this analysis we describe briefly a possible approach to the realization of a gamma-ray laser ('graser') 1,2. The proposed scheme has its basis in certain long-lived excited states among the heavier nuclei. Decay of such states, for the most part, gives rise to high-order multipole radiation. These excited states are populated through either beta decay or electron capture. The device presumes that a collection of such long-lived excited states is amenable to induced resonant emission. Decay of parent nuclei serve as the pumping mechanism in the proposed lasing scheme. (Author) (U)
DESCRIPTORS: *Lasers, *Gamma rays, *Nuclear properties, Nuclear pumping, Decay, Nuclear radiation, Multipolarity, Electron capture, Emission, Resonance, Nuclei (U)
IDENTIFIERS: Nuclear gamma ray lasers, PE61102/F, WUAFOSR2301A3 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 570 11/2 13/8 20/11

ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER

Strengthening and Strength Uniformity of Structural Ceramics. (U)

DESCRIPTIVE NOTE: Annual rept. no 2. 1 Feb 82-31 Jan 83,
MAY 83 85P Lange,F. F. ;
REPT. NO. SC5295.2AR
CONTRACT: F49620-81-C-0036
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0531

UNCLASSIFIED REPORT

ABSTRACT: Stresses created by differential sintering, due to differences in initial bulk density, were determined experimentally. The experiments entailed determining the shrinkage rates of a powder isostatically pressed to two different bulk densities. Using this information, stresses were determined by forcing the slower densifying compact to shrink at the same rate as the faster densifying compact and measuring the resulting forces with a load cell. Maximum stresses (between 200 and 400 psi) were observed to occur in the intermediate stage of densification. Despite larger differential strains at higher temperatures, stresses decreased to zero at the latter stage of densification. Viscoelastic experiments, of the stress relaxation type were performed. Results showed that the sintering specimen was more rigid at lower temperatures and more fluid-like at higher temperatures, to explain the development of maximum stresses at intermediate temperatures. (U)
DESCRIPTORS: *Ceramic materials, *Sintering, *Strength(Mechanics), Agglomerates, Mathematical models, Differentials(Mechanical), Phase transformations, Toughness, Stress relaxation, Viscoelasticity, Reaction kinetics, Rigidity, Shrinkage, Isostatic pressing, Density, Bulk materials, Aluminum, Oxides, Zirconium, Structural analysis, Microstructure (U)
IDENTIFIERS: PE61102F, WUAFOSR2306A2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 559 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

An Iterated Logarithm Law Result for Extreme Values form Gaussian Sequences. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 19P McCormick,William P. ;
REPT. NO. TR-29
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0510

UNCLASSIFIED REPORT

DESCRIPTORS: *Stochastic processes, *Statistical processes, *Logarithm functions, *Iterations, Sequences(Mathematics), Gaussian quadrature, Value, Vector analysis, Stationary, Points(Mathematics), Convergence, Random variables (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 554 20/3 20/5 9/3 14/2

TEXAS TECH UNIV LUBBOCK DEPT OF ELECTRICAL ENGINEERING

Coordinated Research Program in Pulsed Power Physics. (U)

DESCRIPTIVE NOTE: Annual rept. no. 3, 1 Oct 81-30 Sep 82,
DEC 82 283P Kristiansen,M. ;Hagler,M. ; Craig,J. ;Hatfield,L. ;Schaefer,G. ;
CONTRACT: F49620-79-C-0191
PROJ: 2301
TASK: A7
MONITOR: AFOSR TR-83-0503

UNCLASSIFIED REPORT

ABSTRACT: Eight program elements related to pulsed power research are described. These program elements form a multi-disciplinary, coordinated program whose main emphasis is to gain improved understanding of high power, repetitive closing and opening switches. The main emphasis is concerned with triggering of discharges in gas filled spark gaps and the associated electrode erosion and insulator damage. Considerable efforts are also being made to understand the limitations and fundamental discharge phenomena in fast opening switches for inductive energy storage. A novel electromechanical pulse generator which promises to deliver fast, repetitive pulses to a load is also being investigated. (Author) (U)

DESCRIPTORS: *Pulse generators, *Switching circuits, *Electromechanical converters, *Spark gaps, *Laser beams, Electromechanical devices, Gas discharges, Breakdown(Electronic Threshold), Energy storage, High power, Electron beams, Electric arcs, Opening(Process), Transients, Pulses, Spectroscopy, Excitation, Research management, Gases, Physics, Power, Erosion, Filling, Surfaces, Switches (U)
IDENTIFIERS: Laser triggers, Electromechanical pulsers, Surface physics, EPA(Electromechanical Pulse Amplifiers), Opening switches, Time varying inductors, Inductive storage, Insulator damage, PE61102F, WUAFOSR2301A7 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 553 12/1

CITY COLL NEW YORK DEPT OF MATHEMATICS

IFR (Increasing Failure Rate) for Repairable Systems. (U)

DESCRIPTIVE NOTE: Technical rept.,
APR 83 10P Chaganty,N. R. ;
REPT. NO. CUNY-MB4, TR-82-04-AFOSR
CONTRACT: AFOSR-82-0024
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0511

UNCLASSIFIED REPORT

ABSTRACT: Document considers k-out-of-n system with independent repairable components. It assumes that the repair and failure distributions are exponential with parameters micron (sub 1, ..., micron sub n) and (lambda sub 1,..., lambda sub n) respectively. In this paper the author shows that if lambda sub i-micron sub i = delta for all i then the life distribution of the system is Increasing Failure Rate. (U)
DESCRIPTORS: *Life tests, *Distribution functions, *Failure, *Repair, Exponential functions, Parameters, Markov processes (U)
IDENTIFIERS: IFT(Increasing Failure Rate), Increasing Failure Rate, *Life distribution, Markov chains, PE61102F, WUAFOSR2304A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 544 12/1

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA DEPT OF SYSTEMS ENGINEERING

Robust Hypothesis Testing and Robust Time Series Interpolation and Regression, (U)

82 12P Kassam,Saleem A. ;
CONTRACT: AFOSR-82-0022
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0509

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Time Series Analysis, v3 n3 p185-194 1982.
Reprint: Robust Hypothesis Testing and Robust Time Series Interpolation and Regression.

DESCRIPTORS: *Time series analysis, *Minimax technique, *Test methods, Interpolation, Regression analysis, Hypotheses, Reprints (U)
IDENTIFIERS: *Robust procedures, WUAFOSR2304A5, PE61102F (U)

AD-A129 540 6/1

CALIFORNIA UNIV SAN FRANCISCO

Quantitative Isolation of Oligo- and Polyadenosine-Diphosphoribosylated Proteins by Affinity Chromatography from Livers of Normal and Dimethylnitrosamine-Treated Syrian Hamsters. (U)

JAN 81 8P Romaschin,Alexander D. ; Kirsten,Eva ;Jackowski,George ;Kun,Ernest ;

CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0533

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Biological Chemistry, v256 n15 p7800-7805, 10 Aug 81. Reprint: Quantitative Isolation of Oligo- and Polyadenosine-Diphosphoribosylated Proteins by Affinity Chromatography from Livers of Normal and Dimethylnitrosamine-Treated Syrian Hamsters.

DESCRIPTORS: *Adenosine, *Proteins, *Nitrosamines, Liver, Hamsters, Methyl radicals, Nuclei, Synthases, Reprints (U)
IDENTIFIERS: Dimethylnitrosamine, Diphosphoribose, WUAFOS2312A5, PE61102F (U)

AD-A129 537 6/19

KENTUCKY UNIV LEXINGTON WENNER-GREN RESEARCH LAB

Cardiovascular Regulation in Canines during Low-Frequency Acceleration, (U)

AUG 81 14P Knapp,C. F. ;Evans,J. M. ;Randall,D. C. ;Marquis,J. A. ;

CONTRACT: F49620-83-K-0002, F49620-79-C-0014
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0523

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in American Jnl. of Physiological (Heart Circ. Physiol.), v243 n12 pH998-H1009 1982. Reprint: Cardiovascular Regulation in Canines during Low-Frequency Acceleration.

DESCRIPTORS: *Acceleration, *Stress(Physiology), *Cardiovascular system, Control, Blood pressure, Heart rate, Dogs, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2312A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 534 5/9

DALHOUSIE UNIV HALIFAX (NOVA SCOTIA) CENTRE FOR RESEARCH IN SENSORY PSYCHOLOGY AND MEDICAL PHYSICS

Assessment and Development of Oculomotor Flying Skills by the Application of the Channel Theory of Vision. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 82,
DEC 82 74P Regan,D. ;
CONTRACT: AFOSR-78-3711
PROJ: 2313
TASK: A5
MONITOR: AFOSR TR-83-0541

UNCLASSIFIED REPORT

ABSTRACT: Pilot's landing and formation flight performance on the ASPT simulator correlated with visual sensitivity to an expanding flow pattern and with depth tracking test errors. Aircraft flying grades correlated with flow pattern test results. As stimuli for motion in depth, either texture changes alone or changes in object size alone are effective, but the presence of static texture dramatically reduces the effectiveness of changes in object size. In contrast, to the traditional emphasis on static picture quality in visual simulation, this finding emphasizes the importance of dynamic parameters in simulation fidelity. In terms of monocular two-dimension simulation of motion in depth, our findings suggest that in many conditions the presence of texture reduces stimulus effectiveness, and at best the presence of texture adds little to the effectiveness of an untectured stimulus. Subjects cannot accurately locate the center of expansion of an expanding flow pattern in the presence of translational motion of the retinal image when there is no accompanying geometrical distortion. However, subjects are very sensitive to geometrical distortions of the retinal image, and can accurately judge the location of teh maximum rate of object magnification even in the presence of translational motion. (U)
DESCRIPTORS: *Pilots, *Flight simulators, *Skills, *Vision, Tracking, Errors, Patterns, Motion, Images, Retina (U)
IDENTIFIERS: WUAFOSR2313A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 529 5/2 9/2

CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

Concurrent Updates and Retrieval in Distributed Database Systems. (U)

DESCRIPTIVE NOTE: Final rep:. 1 Jul 81-31 Dec 82,
JAN 83 13P Stonebraker,M. R. ;Wong,E.
;.
CONTRACT: AFOSR-78-3596
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0512

UNCLASSIFIED REPORT

ABSTRACT: At its inception, this project was designed to represent a comprehensive program of research in the field of distributed database management. The problems to be dealt with were to include the three major topics in distributed database: query processing, concurrency control and crash recovery. In addition, the problem of interconnecting heterogeneous databases was also proposed. To a substantial extent, major progress has been achieved in all these areas. In this report a summary of the principal findings is presented. (U)
DESCRIPTORS: *Data bases, Algorithms, Distributed data processing, Integration, Control, Interrogation, Heterogeneity (U)
IDENTIFIERS: *Distributed data bases, Data base management systems, Query processing, Crash recovery, WUAFOSR2304A2, PE61102F (U)

AD-A129 526 21/4 6/3

NORTH DAKO A STATE UNIV FARGO DEPT OF ZOJLOGY

Identification and Quantification of the Water Soluble Components of JP-4 and a Determination of Their Biological Effects upon Selected Freshwater Organisms. (U)

DESCRIPTIVE NOTE: Annual technical rept. 30 Sep 81-29 Sep 82,
DEC 82 161P Brammer,J. D. ;Puyear,R. L. ;
CONTRACT: AFOSR-78-3709
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0513

UNCLASSIFIED REPORT

ABSTRACT: This phase of the research entailed: I. Repeating and completing work on water solubilities of major JP-4 jet fuel alkylbenzenes at five different temperatures and four different salinities. Work is nearly complete for determining the maximal water solubilities of JP-4 derived alkylbenzenes. II. LC50 and MATC for toluence in fathead minnow embryos, 1-day posthatch protolarvae and 30-day old fish has been published. III. Metabolism of benzene and toluene, aminopyrine demethylase and aniline hydroxylase activities by liver subcellular fractions from control and induced rats activities. IV. Toluene metabolism and activities of aminopyrine demethylase and aniline hydroxylase in the lier of Bluegill sunfish Lepomis ssp. V. Bioaccumulation and tissue distribution of 14C benzene and 14C toluene by fathead minnows in a closed static bioassay system. VI. The prehatching development of the fathead minnow. VII. Effects of toluene on the prehatching development of the fathead minnow. (U)
DESCRIPTORS: Jet engine fuels, *Water soluble materials, *Fresh water, *Minnows, *Metabolism, Environmental tests, Liver, Benzene, Alkyl radicals, Toluenes, Contamination, Anilines, Hydrolases, Toxicity, Fishes, Embryos, Aquatic animals, Bioassay, Salinity, Rats (U)
IDENTIFIERS: JP-4 fuel, Biological effects, White rats, Fathead minnows, Bioaccumulation, Aminopyrine demethylase, Bluegill sunfish, (U)

AD-A129 522 5/10

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

Comparison of Linear and Quadratic Classification of Event-Related Potentials on the Basis of Their Exogenous or Endogenous Components, (U)

JUL 81 9P Aunon,Jorge I. ;McGillem, Clare D. ;O'Donnell,Robert D. ;
CONTRACT: AFOSR-80-0152
PROJ: 2313
TASK: A4
MONITOR: AFOSR TR-83-0521

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Psychophysiology, v19 n5 p531-537 1982.
Reprint: Comparison of Linear and Quadratic Classification of Event-Related Potentials on the Basis of Their Exogenous or Endogenous Components.

DESCRIPTORS: *Psychophysiology, Bioelectricity, Patterns, Classification, Waveforms, Electrodes, Reprints (U)
IDENTIFIERS: WUAFOSR2313A4, PE61102F (U)

AD-A129 520 12/1 6/5

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

Effects of Ongoing EEG on Latency Measurements of Evoked Potentials. (U)

82 6P McGillem, Clare D. ;Yu, Kai Bor ;Aunon, Jorge I. ;

CONTRACT: AFOSR-80-0152
PROJ: 2313
TASK: A4
MONITOR: AFOSR TR-83-0519

UNCLASSIFIED REPORT

SUPPLEMENTARY [illegible] in Proceedings of the Annual [illegible] in Medicine Biology [illegible] Effects of Ongoing EEG on Latency Measurements [illegible] Potentials.

DESCRIPTORS: *Mathematical models, *Polynomials, [illegible], Latency, [illegible], [illegible] Reprints (U)
IDENTIFIERS: [illegible] Evoked Potentials), [illegible]2313A4, PE61102F (U)

AD-A129 519 6/1

CALIFORNIA UNIV SAN FRANCISCO

The Influence of Triiodothyronine on Polyadenosine Diphosphoribose Polymerase and RNA Synthesis in Cardiocyte Nuclei, (U)

MAR 81 8P Jackowski, George ;Kun, Ernest ;

CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0538

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Molecular and Cellular Cardiology, v14 suppl 3 p65-70 1982. Reprint: The Influence of Triiodothyronine on Polyadenosine Diphosphoribose Polymerase and RNA Synthesis in Cardiocyte Nuclei.

DESCRIPTORS: *Enzymes, *Ribonucleic acids, *Adenosine, Polymers, Nuclei, Reprints (U)
IDENTIFIERS: *Triiodothyronine, Polymerases, WUAFOSR2312A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A129 518 6 5

WISCONSIN UNIV MADISON

A Modification for Preparing the Chronic Lung Lymph Fistula in Sheep. (U)

OCT 81 5P Brown,Marilyn J. ;Fredheim, Deborah F. ;Helgerson,Richard ;Will,James A. ;

CONTRACT: AFOSR 78 3497
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0517

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physiology: Respirat. Environ. Exercise Physiol., 52 (6 p1554-1556 1982.
Abstract: A Modification for Preparing the Chronic Lung Lymph Fistula in Sheep.

DESCRIPTORS: *Fistulas, Anatomical models, Lung, Models, Sheep, Surgical instruments (U)
IDENTIFIERS: WUAFOSR2312A1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 480 6/16

SALK INST SAN DIEGO CALIF

Reciprocal Neural Pathways and Associative Networks. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Nov 81-31 Oct 82,
DEC 82 31P Crick Francis H. C. ;Mitchison,Graeme J. ;
CONTRACT: AFOSR-82-0042
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0542

UNCLASSIFIED REPORT

ABSTRACT: This report of covers four separate but related topics. The first concerns the suggestion that dendritic spines may twitch -- that is, change shape rapidly. This has already been published and appears as Appendix A. The second concerns the patterns of long-range connections in the visual cortex. This also has been published and is reproduced as Appendix B. The third topic concerns the problem of memory storage at higher levels in the cortex. This is in an preliminary stage and only a very broad account is given here. The fourth topic is the most speculative and concerns the function of Rapid Eye Movement Sleep and the nature of dreams. A draft paper on this is reproduced as Appendix C. The body of the report gives brief accounts of all these topics and shows how they are linked together. (U)

DESCRIPTORS: *Visual cortex, *Cerebral cortex, Patterns, Networks, Memory(Psychology), Sleep, Dendritic structure, Rapid eye movement in sleep (U)
IDENTIFIERS: WUAFOSR2312A1, PE61102F (U)

AD-A129 441 8/11

NATO ADVANCED STUDY INST OSLO (NORWAY)

Identification of Seismic Sources - Earthquake or Underground Explosion. Proceedings of the NATO Advanced Study Institute Held at Voksenasen, Oslo, Norway, September 8-18, 1980. (U)

81 667P Husebye,Eystein S. ; Mykkeltveit,Svein ;
CONTRACT: AFOSR-80-0199
PROJ: 2309
TASK: A1
MONITOR: AFOSR TR-83-0497

UNCLASSIFIED REPORT

Availability: Kluwer Boston, Inc., 190 Old Derby St., Hingham, MA 02043 HC $98.00 (No copies furnished by DTIC/NTIS).

ABSTRACT: Contents: Earthquake Source Modelling; Explosion Source Modelling; Seismic Source Parameter Estimation; Seismic Wavefield Synthesis; Seismic Wave Analysis; Scattering and Earth Heterogeneities; Signal Analysis, Seismic Source Discrimination; Developments in Seismic Instrumentation; Seismic Data Centers. (U)

DESCRIPTORS: *Seismic waves, Earthquakes, Nuclear explosions, Seismic detection, Sources, Mathematical models, Waveforms, Signal processing, Scattering, Earth crust, Heterogeneity, Discrimination, Data processing, Symposia, Bo (U)
IDENTIFIERS: Synthetic seismograms, *Seismic sources, PE61102F, WUAFOSR2309A1 (U)

AD-A129 437 20/11 20/5

CORNELL UNIV ITHACA NY

Kinetic Theory. (U)

DESCRIPTIVE NOTE: Annual technical rept. Mar 82-Feb 83,
APR 83 9P Liboff,Richard L. ;
REPT. NO. R-2-83
CONTRACT: AFOSR-78-3574
PROJ: 2301
TASK: A3
MONITOR: AFOSR TR-83-0497

UNCLASSIFIED REPORT

ABSTRACT: A review of work performed under contract AFOSR 78-3574 during the '82- '83 support interval is presented. A list of titles and abstracts of technical reports issued during this period is included. A brief summary is presented of lectures delivered at the University of California on contractual research. The report concludes with a description of ongoing research. (Author) (U)

DESCRIPTORS: *Kinetic theory, Abstracts, Laser beams, Laser target interactions, Recombination reactions (U)
IDENTIFIERS: PE61102F, WUAFOSR2301A3 (U)

AD-A129 406 20/4 21/1

MCDONNELL DOUGLAS RESEARCH LABS ST LOUIS MO

Unsteady Transonic Flow in a Two-Dimensional Diffuser: Interpretation of Experimental Results. (U)

DESCRIPTIVE NOTE: Scientific rept. 1 Apr 81-31 Mar 82, MAR 82 76P Sajben,Miklos ;Bogar,Thomas J. ;
REPT. NO. MDC-Q0779
CONTRACT: F49620-77-C-0082
PROJ: 2307
TASK: A4
MONITOR: AFOSR TR-83-0453

UNCLASSIFIED REPORT

ABSTRACT: Experimental data obtained over a four-year period on transonic, oscillatory diffuser flows were examined and compared with the predictions of simple, one-dimensional theories. Acoustic theory, accounting for upstream- and downstream-propagating acoustic waves, correctly describes pressure perturbations in attached flows, provided the wave reflection process at the shock is properly modeled. Unsteady boundary layers strongly influence pressure perturbations in separated flows and velocity perturbations in both attached and separated flows, with the result that acoustic theory fails in these cases. The boundary layers display slow, transverse, downstream-moving waves (termed interface waves) that strongly influence the core flow velocity and pressure perturbations through displacement effects. The Eulerian velocity perturbations associated with this wave motion are large within the boundary layer. A one-dimensional model was constructed, incorporating both acoustic waves and the interface waves: their effect is most evident in the phase-angle distributions and in the predicted natural frequencies. (U)

DESCRIPTORS: *Transonic flow, *Two dimensional flow, *Flow fields, *Diffusers, Oscillation, Air breathing engines, Internal, Acoustic waves, Wave propagation, Pressure, Perturbations, Reflection, Shock, Boundary layer, Unsteady flow, supersonic diffusers, Velocity, Euler angles, Interfaces, Mathematical models, One dimensional, Resonance, Mathematical prediction, Amplitude (U)
IDENTIFIERS: PE61102F, WUAFOSR2307A4 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 396 9/2 12/1

ARIZONA STATE UNIV TEMPE GROUP FOR COMPUTER STUDIES OF STRATEGIES

On Automatic Generation of Descriptive and Normative Theories. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 83 5P Findler,Nicholas V. ;
CONTRACT: AFOSR-82-0340
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0486

UNCLASSIFIED REPORT

ABSTRACT: This paper discusses a large-scale programming system, the Quasi-Optimizer (QO), that has four major objectives: (1) to observe and measure adversaries' behavior in a competitive environment, to infer their strategies and to construct a computer model, a descriptive theory, of each; (2) to identify strategy components, evaluate their effectiveness and to select the most satisfactory ones from a set of computed descriptive theories; (3) to combine these components in a quasi-optimum strategy that represents a normative theory in the statistical sense; and (4) to provide information as to in which regions a given strategy is most proficient, to a meta-strategy. It will then shift the domain of confrontations between the strategy and its adversaries to the regions specified and, thereby, increase the effective quality of the strategy. (Author) (U)

DESCRIPTORS: *Computer programs, *Computerized simulation, *Models, *Comparison, *Normalizing(Statistics), Identification, Theory, Environments, Observation, Optimization, Measurement, Strategy (U)
IDENTIFIERS: Normative theories, Descriptive theories, Computerized descriptive theory, Quasi optimizer, Competitive environment, WUAFOSR2304A2, PE61102F (U)

AD A129 359 12/1

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

Prediction of Future Observations in Polynomial Growth Curve Models, Part 1. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 17P Rao,C. Radhakrishna ;
REPT. NO. 83-05 PT-1
CONTRACT: F49620-82 K 0001
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR 83-0491-PT-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Indian Statistical Inst., Calcutta, Dec 81, during the Golden Jubilee Celebrations.

ABSTRACT: The problem considered is that of simultaneous prediction of future measurements on a given number of individuals using their past measurements. Assuming a polynomial growth curve model, a number of methods are proposed and their relative efficiencies in terms of the compound mean square prediction error (CMSPE) are compared. There is a similarity between the problem of simultaneous estimation of parameters as considered by Stein and that of simultaneous prediction of future observations. It is found that the empirical Bayes predictor (EBP) based on the empirical Bayes estimator (EBE) of the unknown vector parameters in several linear models proposed by the author (Rao, 1975) has the best possible efficiency when applied to the others studied. The problem of determining the appropriate degree of the polynomial growth curve is also studied from the point of view of minimising the CMSPE. (Author) (U)

DESCRIPTORS: *Polynomials, *Curves(Geometry), *Mathematical models, *Bayes theorem, Growth(General), Predictions, Estimates, Decision theory, Measurement, Mean, Errors, Graphs, Vector analysis (U)

IDENTIFIERS: Growth curves, Growth curve models, CMSPE(Compound Mean Square Error), James Stein estimators, EBP(Empircle Bayes Prediction), PE61102F, WUAFOSR2304A5 (U)

AD-A129 344 12/1

BOEING COMPUTER SERVICES CO SEATTLE WA MATHEMATICS AND MODELING UNIT

A Structurally Stable Modification of Hellerman-Rarick's P4 Algorithm for Reordering Unsymmetric Sparse Matrices. (U)

DESCRIPTIVE NOTE: Technical rept.,
APR 83 50P Erisman,A. M. ;Grimes,R. G. ;Lewis,J. G. ;Poole,W. G. , Jr;
REPT. NO. MM-3
CONTRACT: F49620-81-C-0072
PROJ: 2304
TASK: A3
MONITOR: AFOSR TR-83-0479

UNCLASSIFIED REPORT

ABSTRACT: The Partitioned Preassigned Pivot Procedure of Hellerman and Rarick reorders unsymmetric sparse matrices in order to decrease computation and storage requirements when solving sparse systems of linear equations. It is known that the algorithm, when applied to matrices which are not structurally singular, can generate intermediate matrices which are structurally singular, causing a breakdown in the elimination process. In this paper its authors present the algorithm in a structured, top-down, form and explain several of the problems which may occur. We then define a modification of the algorithm to treat the difficulties. This revised version of the algorithm will never produce structurally singular intermediate matrices if the original matrix is not structurally singular. Test results with this modified algorithm show that it is as effective as the Markowitz algorithm as a preordering when the block structure of the new algorithm is recognized and used. (Author) (U)

DESCRIPTORS: *Algorithms, *Sparse matrix, Stability, Modification, Linear programming, Heuristic methods (U)

IDENTIFIERS: Hellerman rarick algorithm, WUAFOSR2304A3, PE61102F (U)

AD-A129 343 4/2

CENTRAL CONNECTICUT STATE COLL NEW BRITAIN

An Investigation Into the Nature of Snowflake Aggregation in the Vicinity of the Melting Layer in Stratiform Clouds. (U)

DESCRIPTIVE NOTE: Final rept.,
MAR 83 31P Newman,Steven B. ;
CONTRACT: AFOSR 82 0173
PROJ: 2310
TASK: D9
MONITOR: AFOSR TR-83-0438

UNCLASSIFIED REPORT

ABSTRACT: Data from AFGL research flights were analyzed to determine the size spectra of snowflakes vs. temperature at levels just above the melting layer in stratiform clouds. Percentages of particles in various size ranges reveal a pattern of apparent snowflake aggregation and breakup which compare well with the mechanism proposed by Lo and Passarelli (1982). In addition, a model of snowflake aggregation and breakup has been developed and run for various cloud parameters such as collection efficiency and cloud ice contents. The results of this analysis predict snowflake breakup temperatures quite close to those observed from the AFGL data. (Author) (U)
DESCRIPTORS: *Snow, Stratus clouds, Ice, Crystals, Particles, Accumulation, Particle size, Concentration(Composition), Atmospheric temperature, Statistical analysis, Fragmentation (U)
IDENTIFIERS: *Snowflakes, Aggregation, WUAFOSR2310D9, PE61102F (U)

AD-A129 338 7/4 20/10

PRINCETON UNIV NJ DEPT OF CHEMISTRY

Studies in Non Equilibrium Statistical Mechanics. (U)

DESCRIPTIVE NOTE: Final technical rept. 30 Sep 78-29 Sep 82,
SEP 82 19P Rabitz,Herschel ;
CONTRACT: AFOSR-78-3724
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0467

UNCLASSIFIED REPORT

ABSTRACT: The research accomplished under the stated contract is summarized with work performed in the following primary areas: Stochastic dynamics; Sensitivity analysis; Collisional scaling theories; and Quantum collision dynamics. (Author) (U)
DESCRIPTORS: *Gas dynamics, *Particle collisions, *Statistical mechanics, Stochastic processes, Theory, Molecular energy levels, Energy transfer, Kinetics, Sensitivity, Molecular vibration, Relaxation, Greens function, Mathematical models, Scaling factors (U)
IDENTIFIERS: PE61102F, WUAFOSR2303B1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 323 20/6 14/2

HONEYWELL ELECTRO OPTICS DIV LEXINGTON MA

Use of Holographic Linear Fringe Linearization Interferometry (FLI) for Detection of Defects. (U)

DESCRIPTIVE NOTE: Annual rept. 15 Jan 82-15 Jan 83, APR 83 73P Reynolds,George O. ;Servaes, Donald A. ;DeVelis,John G. ,Mayville,Ronald A. ;
REPT. NO. 8303-22
CONTRACT: F49620-82-C-0001
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0464

UNCLASSIFIED REPORT

ABSTRACT: This report describes the progress during Phase I on the two step Holographic Fringe Linearization Interferometry (FLI) Study. The FLI process consists of deflecting the object beam between holographic exposures to create linear fringes and spatially filtering of the fringe reconstructed from the hologram to discriminate between subsurface defects and random fringe noise. The fringe localization procedures utilized to put the linear fringes on the surface of interest are described. The design of the repeatable thermal deformation procedures used in the preliminary experiments are discussed. The design of both the holographic recordirg, reconstruction and spatial filtering systems are given. Preliminary experimental results show the separation of linear fringe information and random noise in the Fourier plane of the spatial filtering system. Various filter designs which enhance the images are also discussed. System feasibility is demonstrated for a triple exposure experiment in which controlled noise was added with a third exposure. Controlled loading experiments are shown to agree with the results predicted analytically with a simple bending finite element model. Plans for the work in Phase II are presented. (Author) (U)
DESCRIPTORS: *Holography, *Linear systems, *Interferometers, *Detection, Defects(Materials), Deformation, Thermal analysis, Holograms, Spatial filtering, Recordi (U)
IDENTIFIERS: Linearization interferometry, (U)
AD-A129 323

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 322 12/1

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS

A Collection of A-Optimal Designs for Control-Test Treatment Comparisons. I. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 83 36P Hedayat,A. S. ;Majumdar,D. ;
CONTRACT: AFOSR-80-0170
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0462

UNCLASSIFIED REPORT

ABSTRACT: A-optimal designs for comparing v test treatments with a control in b blocks of size k each are considered. 111 such designs are given when the parameters are in the range: 2 < or = k < or = 8, k < or = v < or = 30, v < or = b < or = 50. (Author) (U)
DESCRIPTORS: *Control theory, Optimization, Computer aided design, Computer applications, Comparison, Mathematical models, Collection (U)
IDENTIFIERS: Block design, WUAFOSR2304A5, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 320 20/9 20/14 4/1

COLORADO UNIV AT BOULDER DEPT OF ASTRO-GEOPHYSICS

Plasma Wave Turbulence and Particle Heating Caused by Electron Beams, Radiation, and Pinches. (U)

DESCRIPTIVE NOTE: Annual interim rept. 1 Oct 81-30 Sep 82,
JAN 83 276P Goldman,Martin V. ;
REPT. NO. CU-1533201
CONTRACT: AFOSR-80-0022
PROJ: 2301
TASK: A8
MONITOR: AFOSR TR-83-0498

UNCLASSIFIED REPORT

ABSTRACT: This report covers research performed from 1 Oct 81 through 30 Sep 82 on electron beam excited plasma turbulence and electromagnetic emission, on propagation of intense electromagnetic radiation in the earth's ionosphere, and on laboratory experiments on particle beams and plasma waves. (Author) (U)
DESCRIPTORS: *Plasmas(Physics), *Plasma waves, *Ionospheric disturbances, Air Force research, Particle beams, Electron beams, Electromagnetic radiation, Electromagnetic wave propagation, Pinch effect, Excitation, Turbulence, Ion exchange, Cyclotron waves, Ionospheric modification, Backscattering, Steady state (U)
IDENTIFIERS: Plasma wave turbulence, PE61101F, WUAFOSR2301A8 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 313 11/4 20/11 12/1

DREXEL UNIV PHILADELPHIA PA DEPT OF MECHANICAL ENGINEERING AND MECHANICS

Fracture Mechanics of Transverse Cracks and Edge Delamination in Graphite-Epoxy Composite Laminates. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Sep 79-30 Sep 81,
MAR 82 167P Wang,A. S. D. ;Crossman, Frank W. ;
CONTRACT: F49620-79-C-0206
PROJ: 2307
TASK: B2
MONITOR: AFOSR TR-83-0452

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Lockheed Missiles and Space Co., Inc., Palo Alto, CA. Palo Alto Research Lab.
ABSTRACT: The fracture mechanics of matrix-dominated cracks--multiple transverse cracks and edge delamination--has been presented in this report. Analytical models are developed which describe the initiation, growth and the growth stability of these two types of cracking mechanisms. A finite element crack-closure method is used to simulate the crack growth numerically; and an extensive experimental case study is conducted to correlate with the analytical models. (Author) (U)
DESCRIPTORS: *Composite materials, *Epoxy laminates, *Graphited materials, *Cracks, *Crack propagation, *Finite element analysis, Mathematical models, Cracking(Fracturing), Fracture(Mechanics), Stability, Transverse, Numerical analysis, Mathematical prediction, Thickness, Failure(Mechanics), Matrix materials, Fibers, Microstructure, Defects(Materials), Unidirectional, Edges, Mechanical properties, Stress strain relations (U)
IDENTIFIERS: PE61102F, WUAFOSR2307B2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A129 307 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

Sequential Excitation Preparation of Molecular Energy Levels with Special Structural and Chemical Properties. (U)

DESCRIPTIVE NOTE: Final rept. 1 Sep 81-30 Sep 82,
SEP 82 8P Field, Robert W. ,Kinsey, James L. ;
CONTRACT: AFOSR-80-0254
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR 83-0451

UNCLASSIFIED REPORT

ABSTRACT: Three types of experiments are discussed. Stimulated Emission Pumping (SEP) [illegible] H2CO, Modulated Gain Spectroscopy (MGS) on Na2, and sub Doppler spectroscopy of the Ca+O3 flame. The SEP experiments have reached the intensive data generation stage. [illegible] of vibrational excitation, H2CO is shown [illegible] oscillator in low vibrational levels. [illegible] exhibits extensive Coriolis [illegible] mixing [illegible] J approx. greater than 10, Ka [illegible] vibrational levels. A laser [illegible] scheme has improved the sensitivity of MGS [illegible] factor of 1000. A new but puzzling assignment [illegible] been made of the Ca + 1000 flame orange band [illegible]. (U)

DESCRIPTORS: [illegible] Emission spectroscopy, *Molecular energy levels, *Excitation, Formaldehyde, Pulsed lasers, Laser pumping, Molecular vibration, Coriolis effect, Vibrational spectra, Sodium, [illegible], Calcium, Oxidation, Fluorescence (U)

IDENTIFIERS: SEP(Stimulated Emission Pumping), MGS(Modulated Gain Spectroscopy), PE61102F, WUAFOSR2303B1 (U)

DTIC REPORT BIBLIOGPAPHY SEARCH CONTROL NO. EVN35A

AD-A129 296 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

Optimal Control of Markov Processes. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 27P Fleming, Wendell H. ;
REPT. NO. LCDS-83-4
CONTRACT: AFOSR-81-0116
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0492

UNCLASSIFIED REPORT

ABSTRACT: The purpose of this article is to give an overview of some recent developments in optimal stochastic control theory. Broadly speaking, stochastic control theory deals with models of systems whose evolution is affected both by certain random influences and also by certain inputs chosen by a controller. The authors are concerned here only with state-space formulations of control problems in continuous time. Moreover, the authors consider only markovian control problems in which the state x sub t of the process being controlled is Markov provided the controller follows a Markov control policy. They mainly discuss the case of continuously acting control, in which at each time t a control u sub t is applied to the system. (U)

DESCRIPTORS: *Stochastic control, *Control theory, *Markov processes, Optimization, Diffusion theory, Partial differential equations, Solutions(General), Dynamic programming, Transformations(Mathematics), Operators(Mathematics), Adaptive control system (U)

IDENTIFIERS: WUAFOSR2304A4, PE61102F (U)

AD-A129 293 12/1 14/2 17/7 9/2
8/6

TEXAS A AND M UNIV COLLEGE STATION DEPT OF ELECTRICAL ENGINEERING

Efficient Computation for Large Scale Optimization. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jun-31 Aug 82, NOV 82 67P Fleming,John A. ;
CONTRACT: AFOSR-82-0212
PROJ: 2304
TASK: D9
MONITOR: AFOSR TR-83-0445

UNCLASSIFIED REPORT

ABSTRACT: Several classes of algorithms for solution of the general nonlinear programming (constrained optimization) problem, and four specific implementations of these were chosen and evaluated with respect to expected speed of computation. A test problem based on the path generation problem of terrain following/terrain aviodance flight was developed, and the performance of the chosen optimization procedures was compared. It was found that the generalized reduced gradient method was faster and moe reliable that either of two augmented Lagrangian methods and a quadratic approximation method. However, the solution time for the TF/TA type problems was found to be far in excess of what would be required. Several simplifications of the problem statement were attempted in order to decrease computation time without compromising the integrity of the solution. (U)
DESCRIPTORS: *Algorithms, *Nonlinear programming, *Problem solving, *Flight simulation, *Terrain models, *Terrain following, *Terrain avoidance, Computations, Efficiency, Optimization, Lagrangian functions, Interpolation, Computer programs, Paths, Gradients, Approximation(Mathematics) (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 292 11/6 11/3

SRI INTERNATIONAL MENLO PARK CA

Dip Process Thermal-Barrier Coatings for Superalloys. (U)

DESCRIPTIVE NOTE: Final technical rept. 15 Dec 80-14 Jan 83,
MAR 83 36P Allam,Ibrahim M. ;Rowcliffe, David J. ;
REPT. NO. SRI-2509
CONTRACT: F49620-81-K-0009
PROJ: 2306
TASK: A2
MONITOR: AFOSR TR-83-0441

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Jun 80, AD-A088 064.
ABSTRACT: A new concept of growing a ceramic-based thermal barrier coating on gas turbine alloys was investigated. This process involves hot dipping alloy substrates in low-melting cerium-nickel or zirconium-nickel eutectics. Cerium oxide (CeO2) or zirconium oxide (ZrO2) were then grown by selective oxidation to form an external thermal barrier layer above an inner composite (CeO2 or ZrO2/substrate alloy) layer. The microstructure and chemical composition of the thermal barriers were studied as a function of composition of melts and substrates, dipping temperature and oxidation conditions. This evaluation has led to a good understanding of the factors that control the formation of desirable coatings and to the specification of the conditions to produce them. An important advantage of ZrO2-baed coatings over CeO2-based coatings produced by this technique is that ZrO2 grows totally as an overlay layer with little or no influence of elements from the substrate. In contrast, CeO2-based coatings grow completely within the surface zone of the coated substrate, and thus their properties can be affected by substrate constituents. The results of this progam suggest that the dip process could be an important alternative approach to plasma spraying for producing thermal barrier coatings on superalloys. (U)
DESCRIPTORS: *Superalloys, *Barrier coatings, *Processing, *Dip coating, *Thermal insulation, (U)
IDENTIFIERS: Thermal barriers, Molten bath, (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A129 291 20/6 14/5 9/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES IMAGE PROCESSING INST

Nonlinear Real Time Optical Signal Processing. (U)

DESCRIPTIVE NOTE: Annual technical rept. 15 Apr 81-14 Apr 82.
JUN 82 70P Sawchuk,A. A. ;Strand,T. C. ;Tanguay,A. R. , Jr.
REPT. NO. USCIPI-1080
CONTRACT: AFOSR-81-0082
PROJ: 2301
TASK: D9
MONITOR: AFOSR TR-83-0500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Rept. no. USCIPI-1020, AD A105 186.
ABSTRACT: The results of a one year research program in nonlinear real-time optical signal processing are described. The goal of the program is to develop fast parallel nonlinear operations to optical processing systems with large time-bandwidth and space bandwidth products. The research has concentrated on optical mode (vgm) liquid crystal real time spatial light modulators. Parallel and twisted nemtic liquid crystal light value (lclv) devices have been used as a nonlinear element in a feedback arrangement in the sequential logic systems. A computer genreated hologram fabricated on an e-beam system serves as a beam steering interconnection element. A completely optical oscillator and frequency divider have been exprimentally demonstrated. Research has continued on variable-grating mode (VGM) liquid crystal devices that perform local spatial frequency modulation as a function of the incident intensity. these devices can be used for nonlinear processing by selection and recombination of these spatial frequency components. These devices have many interesting physical effects with useful applications in both analog and numerical optical signal processing. Preliminary theoretical modeling work to expalin these effects is given, and an improved implementation of the intensity level slice function with VGM devices has been demonstrated. (U)
DESCRIPTORS: *Optical processing, *Signal (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 290 11 19/3

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

Evidence of Tectonic Release from Underground Nuclear Explosions in Long Period P Waves. (U)

DESCRIPTIVE NOTE: Technical rept.,
AUG 82 23P Wallace,Terry C. ;
Helmberger,Donald V. ;Engen,Gladys R. ;
CONTRACT: F49620-81-C-0008
MONITOR: AFOSR TR-83-0495

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Bull. of the Seismological Society of America, v73 n2 p593-613 Apr 83. Reprint: Evidence of Tectonic Release from Underground Nuclear Explosions in Long Period P Waves.

DESCRIPTORS: Tectonics, *Underground explosions, *Primary waves(Seismic waves), Nuclear explosion testing, Waveforms, Comparison, Seismic data, Earthquakes, Earth mantle, Reprints (U)
IDENTIFIERS: PE61102F (U)

AD A129 289 14/2 20/1 20/12

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF ELECTRICAL COMPUTER AND SYSTEMS ENGINEERING

Profiling the Implanted Region in Si Using Nondestructive Transverse Acoustoelectric Voltage versus Voltage Technique. (U)

DESCRIPTIVE NOTE: Technical rept., 82 8P Davari,B. ;Das,P. ;
CONTRACT: AFOSR-82-0281
PROJ: 2306
TASK: B2
MONITOR: AFOSR TR-83-0472

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Ultrasonics Symposium, p379-384 1982.
Reprint: Profiling the Implanted Region in Si Using Nondestructive Transverse Acoustoelectric Voltage versus Voltage Technique.

DESCRIPTORS: *Nondestructive testing, *Ultrasonic tests, *Silicon, *Semiconductors, *Ion implantation, Chemicals, Vapor deposition, *Acoustooptics, Measurement, Voltage, Electrical conductivity, Transverse, Symposia, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2306B2 (U)

IAC NO.: NT-027668
IAC DOCUMENT TYPE: NTIAC -MICROFICHE--

IAC SUBJECT TERMS: N--(U)SEMICONDUCTORS, ACOUSTOELECTRIC VOLTAGE, DELAY LINES, MONITORING, CONDUCTIVITY, ANALYSIS, PROFILES, SURFACE WAVES, ACOUSTIC WAVES, ION IMPLANTATION, IN SITU, FORMULAS(MATHEMATICS);

AD-A129 288 12/1 14/2 1/3

KENTUCKY UNIV LEXINGTON DEPT OF ELECTRICAL ENGINEERING

Synthesis of Optimal Digital Controller for Continuous-Data Model-Following. (U)

DESCRIPTIVE NOTE: Final rept. 1 May-31 Aug 82, JAN 83 88P Yeh,Hsi-Han ;
CONTRACT: AFOSR-82-0207
PROJ: 2304
TASK: D9
MONITOR: AFOSR TR-83-0461

UNCLASSIFIED REPORT

ABSTRACT: The digitalization of flight control systems has been of increasing interest to the Air Force. One of the problems confronting the designer is the real-time implementation of advanced control algorithms within the computational capability of the on-board computer. In converting a continuous-data (analog) controller into a digital controller, ad hoc approaches such as bilinear transform and prewarped Tustin transform techniques have typically been used. These methods have the advantage of being straightforward and easy to use, and they are intuitively appealing. But the performance of a system digitalized by these approaches resembles the performance of the baseline (continuous) system only when the sampling frequency is relatively high, because the dynamics of the plant and the feedback structure of the system are not taken into consideration. (U)

DESCRIPTORS: *Algorithms, *Mathematical models, *Control systems, *Digital systems, Analog to digital converters, Flight control systems, Computations, Air Force planning, Optimization, Onboard, Transformations(Mathematics), Transfer functions, Equations (U)
IDENTIFIERS: PE61102F, WUAFOSR2304D9 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 264 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

Stability in Linear Delay Equations. (U)

DESCRIPTIVE NOTE: Technical rept., AUG 82 36P Hale,Jack K. ;Infante, Ettore F. ;Tsen,Fu-Shiang Peter ;
REPT. NO. LCDS-82-23
CONTRACT: AFOSR-81-0198
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0482

UNCLASSIFIED REPORT

ABSTRACT: For linear autonomous differential difference equations of retarded or neutral type, necessary and sufficient conditions are given for the zero solution to stable (hyperbolic) for all values of the delays. (Author) (U)
DESCRIPTORS: *Linear differential equations, *Difference equations, *Stability, Solutions(General), Value, Delay, Coefficients, Asymptotic normality, Hyperbolas (U)
IDENTIFIERS: Retarded equations, Neutral equations, WUAFOSR2304A4, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 263 12/1 20/1

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

The Unique Solvability of the Null Field Equations of Acoustics. (U)

DESCRIPTIVE NOTE: Technical rept., OCT 81 10P Colton,David ;Kress,Rainer ;
CONTRACT: AFOSR-81-0103
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0476

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Quarterly Jnl. of Mechanics and Applied Mathematics, v36 pt1 p87-95 1983.
Reprint: The Unique Solvability of the Null Field Equations of Acoustics.

DESCRIPTORS: *Boundary value problems, *Integral equations, *Acoustic waves, Problem solving, Acoustic scattering, Reprints (U)
IDENTIFIERS: Null field equations, WUAFOSR2304A4, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A129 262 12/1 14/2

WRIGHT STATE UNIV DAYTON OH DEPT OF MATHEMATICS AND STATISTICS

Multivariable Linear Digital Control via State Space Output Matching. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 83 30P Miller,David F. ;
CONTRACT: AFOSR-82-0208
PROJ: 2304
TASK: A6
MONITOR: AFOSR TR-83-0487

UNCLASSIFIED REPORT

ABSTRACT: A direct state space approach to the digital control of multivariable linear systems is presented. Control is provided by minimizing the mean square error between controlled plant outputs and specified desired output trajectories at sampling instants. Linear equations for digital control inputs are solved in constant forward and feedback gain form. Numerical applications to problems in simple model following, digital redesign, and direct digital design are given. (Author) (U)

DESCRIPTORS: Numerical methods and procedures, *Control systems, *Digital systems, Multivariate analysis, Linear systems, Difference equations, Feedback, Mathematical models, Input output processing, Optimization, Trajectories, Flight control systems (U)

IDENTIFIERS: WUAFOSR2304A6, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 261 17/2 20/6

TEXAS A AND M UNIV COLLEGE STATION DEPT OF ELECTRICAL ENGINEERING

Interim Report for CY 1982. (U)

DESCRIPTIVE NOTE: Rept. for 1 Jan-31 Dec 82,
FEB 83 12P Halverson,Don R. ;
CONTRACT: AFOSR-82-0033
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0480

UNCLASSIFIED REPORT

ABSTRACT: A number of results were obtained pertaining to signal detection and block truncation coding for image compression. These results led to improved performance over previous approaches, with special attention given to methods which required less statistical knowledge and which were easier to implement. In particular, use of robustness techniques was employed to allow the exploitation of whatever knowledge was available, while retaining insensitivity to the remaining inexactness in knowledge. (Author) (U)

DESCRIPTORS: *Algorithms, *Signal processing, *Image processing, Time signals, Coding, Statistical processes, Signal to noise ratio, Methodology, Matched filters (U)

IDENTIFIERS: Robust procedures, Image compression, Block truncation coding, PE61102F, WUAFOSR2304A5 (U)

AD-A129 251 17/2 12/1

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF ELECTRICAL ENGINEERING

Limited Sensing Random Multiple Access Using Binary Feedback. (U)

DESCRIPTIVE NOTE: Technical rept., JAN 83 47P Merakos,Lazaros ;Kazakos, Dimitrios ;
REPT. NO. UVA/525634/EE83/109
CONTRACT: AFOSR-82-0030
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0493

UNCLASSIFIED REPORT

ABSTRACT: The authors consider the random-accessing problem of a single, collision-type, slotted, packet-switched communication channel by a large number of independent, data transmitting bursty users. They propose and analyze an easy-to-implement algorithm under the realistic assumption that each user inspects the channel outcome feedback only whenever he is blocked. Assumed is binary feedback which informs the users only about whether or not there was a collision in the previous slot. It is shown that the algorithm results in finite average delays for transmission at rates less than 0.36 packets per channel slot, and an exact upper bound for the average delay is given. (Author) (U)
DESCRIPTORS: *Communications centrals, *Algorithms, *Multiple access, *Data transmission systems, Delay, User needs, Sharing, Channels, Feedback, Slots, Collisions, Monitoring (U)
IDENTIFIERS: Packet communications, Packet switching, Limited sensing random access algorithm, Recursive equations, WUAFOSR2304A5, PE61102F (U)

AD-A129 248 20/9 7/5

PRINCETON UNIV NJ

Spatial Dependence of the Strong Optogalvanic Effects Due to Metastable Quenching in a DC Helium Discharge, (U)

MAR 82 7P Tam,Andrew C. ;
CONTRACT: AFOSR-81-0104
PROJ: 2301
TASK: A4
MONITOR: AFOSR TR-83-0496

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Plasma Science, vPS-10 n4 p252-256 Dec 82. Prepared in cooperation with Columbia Radiation Lab., New York.
Reprint: Spatial Dependence of the Strong Optogalvanic Effects Due to Metastable Quenching in a DC Helium Discharge.

DESCRIPTORS: *Gas discharges, *Illumination, *Metastable state, Helium, Electric current, Electron density, Irradiation, Resonance absorption, Quenching, Reprints (U)
IDENTIFIERS: Optogalvanics, PE61102F, WUAFOSR2301A4 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 247 4/2

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF METEOROLOGY

Analysis and Prediction of Severe Storm Environment. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 83 17P Carlson,Toby N. ;Warner, Thomas T. ;Fritsch,J.M.Michael J. ;
CONTRACT: AFOSR-79-0125
PROJ: 2310
TASK: A1
MONITOR: AFOSR TR-83-0440

UNCLASSIFIED REPORT

ABSTRACT: The most significant aspect of this research regards the role of differential surface heating and topography in the development of mesoscale weather. Research has progressed in four areas: conceptual development, model development, model sensitivity tests, and prediction. The effect of surface heating and topography on precipitation and lid generation are forming the basis of current and on going numerical and conceptual research. The effect of variations in soil moisture on the mesoscale environment has been identified as a most significant factor. The strength of the capping lid has been related to the likelihood and intensity of convective precipitation, especially involving the dynamics of lid edge zone. A great deal of effort was devoted to parameterization of surface heating, cloudiness, and convective precipitation. During this research effort great strides were made in the conceptual awareness of the complexity of the relationships between synoptic forcing and mesoscale development. Enormous improvements were made in parameterizing the surface boundary layer. What began as an examination of the lid mechanism with regard to severe convection broadened to explain the complex interaction of a variety of differing influences on the severe storm environment and on precipitation. (Author) (U)
DESCRIPTORS: *Thunderstorms, Stratification, Temperature inversion, Atmospheric motion, Jet streams, Low altitude, Friction, Atmospheric precipitation (U)
IDENTIFIERS: *Severe storms, Lid effect, (U)
PE61102F, WUAFOSR2310A1
AD A129 247

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 233 6/19

FLORIDA UNIV GAINESVILLE DEPT OF PHYSIOLOGICAL SCIENCES

Analysis of Long Bone and Vertebral Failure Patterns. (U)

DESCRIPTIVE NOTE: Annual technical rept. 20 Feb 82-19 Feb 83,
MAR 83 27P Currell,Jo Ann C. ;
CONTRACT: AFOSR-80-0130
PROJ: 2312
TASK: A2
MONITOR: AFOSR TR-83-0459

UNCLASSIFIED REPORT

ABSTRACT: Baboons were dropped vertically from four feet above the ground. The vertebral columns were examined with light microscopy and scanning electron microscopy. Six months post-impaction, there was damage to the vertebral end plates and beginning osteoarthrosis of the facet joints. Six years post-impaction, the lesions had progressed to anterior osteophyte formation and severe osteoarthrosis of the facet joints. The lesions observed in this study are thought to be related to the impaction sequence. Normal anatomy of the rhesus monkey spine was also investigated. (U)
DESCRIPTORS: *Bones, *Spinal column, *Biomechanics, Light, Patterns, Microscopy, Electron microscopy, Baboons, Lesions, Rhesus monkeys, Anatomy, Radiography, Cartilage, Joints(Anatomy), Impact tests, Disks (U)
IDENTIFIERS: End plates, WUAFOSR2312A2, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 232 6/

CALIFORNIA UNIV SANTA BARBARA INST OF ENVIRONMENTAL STRESS

Automated Limb Blood Flow Plethysmograph. (U)

JAN 82 6P Marcus,Richard R. ;Horvath, Steven M. ;

CONTRACT: AFOSR-78-3534
PROJ: 2312
TASK: A1
MONITOR: AFOSR TR-83-0455

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in American Physiological Society, pH413-H416 1983. Reprint: Automated Limb Blood Flow Plethysmograph

DESCRIPTORS: *Blood circulation, Plethysmography, Automation, Measurement, Computer applications, Digital computers, Real time, Data displays, Strain gages, Reprints (U)
IDENTIFIERS: AUAFOSR2312A1, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 227 20/4 1/3

STANFORD UNIV CA JOINT INST OF AERONAUTICS AND ACOUSTICS

On the Structure of an Underexpanded Rectangular Jet. (U)

DESCRIPTIVE NOTE: Interim rept.,
JUL 82 56P Krothapalli,A. ;Hsia,Y. ; Baganoff,D. ;Karamcheti,K. ;
REPT. NO. JIAA-TR-47
CONTRACT: F49620-79-C-0180
PROJ: 2307
TASK: A1
MONITOR: AFOSR TR-83-0454

UNCLASSIFIED REPORT

ABSTRACT: An experimental investigation was carried out on an underexpanded jet of air issuing from a converging rectangular nozzle of moderate aspect ratio. Schlieren pictures of the flow field along with hot-wire measurements in the jet were obtained at different pressure ratios. At the pressure ratio corresponding to the maximum screeching sound, Schlieren photographs show a very strong organized cylindrical wave pattern on either side of the jet, with their respective sources being located at the end of the third shock cell. Associated with this wave pattern is a large increase in the angle of spread of the jet. It is shown that the self excitation helps to induce large-scale vortical motions in the jet both in the plane containing the small dimension of the nozzle and in the plane containing the long dimension of the nozzle. However, the locations of these structures are different in the two planes. Nevertheless, the characteristic Strouhal number corresponding to these large-scale structures in both planes is the same and equal to 0.12. The influence of the self excitation on the mean velocities and rms intensities was investigated. For the full range of pressure ratios studied, similarity was found both in the mean velocity and rms intensity profiles in the two central planes beyond 80 widths downstream of the nozzle exit. However, the shapes of the similarity profiles are different in the two planes. For the downstream distances studied, complete axisymmetry (identical mean velocity profiles in both planes) wa (U)
DESCRIPTORS: *Nozzles, *Flow fields, *Air flow, (U)

AD-A129 225 5/10

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

Eye Movements and Visual Information Processing. (U)

DESCRIPTIVE NOTE: Interim rept. 1 Jan-31 Dec 82, APR 83 11P Kowler,Eileen ;
CONTRACT: AFOSR-82-0085
PROJ: 2313
TASK: A5
MONITOR: AFOSR TR-83-0458

UNCLASSIFIED REPORT

ABSTRACT: Eye movements determine the location and velocity of the retinal image. The eye moves smoothly in the direction of expected future target motion. Experiments will determine: (1) how expectations and guesses about the direction of future motion are formulated and (2) the relative contributions of expectations and retinal image motion to smooth eye movements. Saccades continually displace the retinal image, yet we see the world as a single coherent picture. Experiments will find out whether the visual system selectively tolerates rapid lateral displacements, or whether the decision to move the eye is required. Experiments will show whether sequences of saccades can be pre-programmed, and whether use of such sequences improves performance of visual tasks. (U)
DESCRIPTORS: *Eye movements, *Information processing, *Vision, Retina, Images, Motion, Visual signals, Moving targets, Visual perception (U)
IDENTIFIERS: WUAFOSR2313A5, PE61102F (U)

AD-A129 224 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

A Finitely Additive White Noise Approach to Nonlinear Filtering. (U)

DESCRIPTIVE NOTE: Technical rept., OCT 82 37P Kallianpur,G. ;Karandikar,R. L. ;
REPT. NO. TR-21
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0447

UNCLASSIFIED REPORT

ABSTRACT: A finitely additive white noise approach to nonlinear filtering is developed. It is shown that a pathwise solution of the problem is possible where the observed paths belong to the reproducing kernel Hilbert space of the Wiener process. Connections with robust filtering and recent developments are explored. (Author) (U)
DESCRIPTORS: *Mathematical filters, *Nonlinear systems, *White noise, Mathematical models, Problem solving, Bayes theorem, Stochastic processes, Paths, Hilbert space, Signal processing, Partial differential equations (U)
IDENTIFIERS: Wiener process, Nonlinear filtering, Zakai equations, WUAFOSR2304A5, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A129 221 12/1 20/6

ARKANSAS UNIV FAYETTEVILLE DEPT OF ELECTRICAL ENGINEERING

Adaptive Hybrid Picture Coding. (U)

DESCRIPTIVE NOTE: Final rept. 30 Sep 77-1 Oct 82, FEB 83 122P Jones,Richard A. ;Bowling, Carl D. ;Tejwani,Yogendra ;
CONTRACT: AFOSR-77-3156
PROJ: 2305
TASK: B3
MONITOR: AFOSR TR-83-0499

UNCLASSIFIED REPORT

ABSTRACT: This report consist of two parts. In part one, a time modified autoregressive model for interframe image coding is presented. This method is compared with previous work in the field of interframe image coding and it is shown that substantial simplifications occur when the nearest integer displacement is taken into account. It is demonstrated that when the between frame noise is minimal and the motion is pure translation or can be modelled by translation, enough information can be extracted from the predictor coefficients to determine the non-integer displacement with small error. In part two, a new concept for examining shapes as vectors in a shape space is described. The shape space is defined in terms of its properties and the importance of the independence of the size variable to the shape vectors, defined on this shape space, is stressed. Also, two theorems helpful in the process of comparing partial shapes to the complete shape are stated and proved. A new method for detecting the points on a shape which appear to dominate visual perception is described. This method, called the Adaptive Line of Sight method detects the dominant points on a shape even though they do not always occur on points of high curvature. With this method, the critical points, or dominant points, of the shape that are determined are based on a set of coordinate axes that are dependent on the shape itself. Therefore, the points determined are independent of size, rotation, or relative displacement. (U)
DESCRIPTORS: *Mathematical models, *Image processing, *Coding, *Shape, Vector spaces, (U)
IDENTIFIERS: Autoregressive processes, Image (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 220 20/10 20/7 7/2

ROCHESTER UNIV NY DEPT OF CHEMISTRY

Zeeman Transitions in Collisions of Na with Xe, (U)

SEP 82 5P George,Thomas F. ;DeVries, Paul L. ;
CONTRACT: AFOSR-82-0046
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0469

UNCLASSIFIED REPORT

Reprint: Zeeman Transitions in Collisions of Na with Xe.

DESCRIPTORS: *Quantum statistics, *Computations, *Collisions, *Sodium, *Xenon, Zeeman effect, Atomic beams, Reprints (U)
IDENTIFIERS: Zeeman transitions, Quantum mechanics, Centrifical barrier resonances, Fine structure transitions, WUAFOSR2303A2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 219 12/1

WISCONSIN UNIV-MILWAUKEE

The Occupational Statistics for Indistinguishable Trimers on a 3XN Lattice Space. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 82 6P Hock,J. L. ;Licato,P. E. ;McQuistan,R. B. ;
CONTRACT: AFOSR-81-0192
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0449

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Mathematical Physics, v23 n11 p2185-2189 Nov 82. Reprint: The Occupational Statistics for Indistinguishable Trimers on a 3XN Lattice Space.

DESCRIPTORS: *Distribution functions, *Statistics, Polynomials, Recursive functions, Computations, Value, Normalizing(Statistics), Reprints (U)
IDENTIFIERS: *Occupational statistics (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 218 12/1 14/2

PURDUE UNIV LAFAYETTE IN SCHOOL OF ELECTRICAL ENGINEERING

Spectral Analysis: Prediction and Extrapolation, (U)

81 44P Childers,Donald G. ;Aunon, Jorge I. ;McGillem,Clare D. ;
CONTRACT: AFOSR-80-0152
PROJ: 2313
TASK: A4
MONITOR: AFOSR TR-83-0456

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in CRC Critical Reviews in Bioengineering, v6 p133-175 Sep 81. Reprint: Spectral Analysis: Prediction and Extrapolation.

DESCRIPTORS: *Mathematical models, *Spectrum analysis, Mathematical prediction, Extrapolation, Estimates, Potential theory, Signal processing, Reprints (U)
IDENTIFIERS: Autoregressive processes, WUAFOSR2313A4, .PE61102F (U)

AD-A129 217 12/1

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS

The Family of t Designs. Part II. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 78 33P Kageyama,S. ;Hedayat,A. S.
;
CONTRACT: AFOSR-80-0170, AFOSR-76-3050
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0463

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Statistical Planning and Inference, v7 p257-287 1983. See also Part 1, AD-A095 946.
Reprint: The Family of t-Designs. Part II.

DESCRIPTORS: *Factorial design, *Statistical inference, Set theory, Combinatorial analysis, Reprints (U)
IDENTIFIERS: *T design, WUAFOSR2304A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 215 5/9 9/2

MCDONNELL DOUGLAS ELECTRONICS CO ST CHARLES MO

Advanced Training Techniques Using Computer Generated Imagery. (U)

DESCRIPTIVE NOTE: Final technical rept. Apr 79-Feb 83,
FEB 83 161P Coblitz,D. ;Verstegen,M. ;
Hauck,D. ;
REPT. NO. MDC-M3027
CONTRACT: F49620-79-C-0067
PROJ: 2313
TASK: A2
MONITOR: AFOSR TR-83-0460

UNCLASSIFIED REPORT

ABSTRACT: The objectives of this study were to generate new concepts in aircrew training methods that take advantage of the flexibility of computer generated imagery, to demonstrate examples, and to perform exploratory testing of these examples. The purposes of the testing were to determine pilot acceptance of the use of a simulator as a training device as opposed to just an aircraft replicator, and to provide a baseline of information from which detailed training experiments could be designed for future testing by others. These goals were met. In general, both student and instructor pilot reactions were quite favorable. Experiments on ability to judge depression angles (e.g., for glideslope or dive angles) showed that this ability is quite poor among novice and experienced pilots alike. Methods of successfully improving these capabilities were demonstrated, but, found to be much more effective with limited experience pilot than with experienced pilots. A new form of energy/maneuverability diagram was designed and implemented on a simulator visual system. A sample syllabus for use of this diagram in aircombat training is presented. Studies of the minimal cues necessary for low level flight showed that, while the number of cues required by most pilots is quite large, the number required after appropriate training in visual cue understanding is suprisingly small. (U)
DESCRIPTORS: *Computer aided instruction, *Flight training, *Image processing, *Flight simulation, Computerized simulation, Visual aids, Flight simulators, Pilots, Learning, Skills, Combat (U)
IDENTIFIERS: PE61102F, WUAFOSR2313A2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 214 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

Weak Convergence and Asymptotic Properties of Adaptive Filters with Constant Gains. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 83 27P Kushner,Harold J. ;Shwartz, Adam ;
REPT. NO. LCDS-83-7
CONTRACT: N00014-76-C-0279, AFOSR-81-0116
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-33-0478

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grant NSF-ECS82-11476.
ABSTRACT: This paper illustrates th. power of weak convergence methods through the analysis of the basic algorithm of adaptive filtering. Except for the simplest cases (e.g., when (y sub n, psi sub n) are mutually independent), the analysis of the algorithm for fixed epsilon is difficult. However, asymptotic analysis (epsilon approaches limit of 0) via weak convergence methods provides much information, relatively painlessly. (U)
DESCRIPTORS: *Algorithms, *Adaptive filters, *Weak convergence, Asymptotic normality, Gain, Interpolation, Sequences(Mathematics), Iterations, Errors, Truncation (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A4 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 211 20/4

RENSSELAER POLYTECHNIC INST TROY NY

Note on the Axisymmetric Sonic Jet. (U)

DESCRIPTIVE NOTE: Technical rept., 82 9P Cole,Julian D. ;
CONTRACT: AFOSR-82-0155
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0450

UNCLASSIFIED REPORT

ABSTRACT: The axisymmetric jet exhausting to sonic pressure is considered, for simplicity, under the assumptions of transonic small disturbance theory. It is shown that the jet reaches its final state at a finite distance from the orifice. This result for the axisymmetric jet is thus the same as that for a jet. Part of the argument used to show that the jet reaches its asymptotic state is local in the hodograph. The result should also apply to a gas dynamic flow without the restriction of small disturbance theory. In the neighborhood of its final state disturbances from parallel sonic flow are in fact small. (U)
DESCRIPTORS: *Sonic boom, *Transonic flow, Jet flow, Axisymmetric, Hodographs, Gas flow (U)
IDENTIFIERS: Axisymmetric jet, Sonic pressure, PE61102F, WUAFOSR2304A4 (U)

AD A129 209 12/1

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

Asymptotic Behavior of Stochastic Approximation and Large Deviations. (U)

DESCRIPTIVE NOTE: Technical rept., JAN 83 35P Kushner,Harold J. ;
REPT. NO. LCDS 83-1
CONTRACT: N00014-76-C-0279, AFOSR-81-0116
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0483

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Grant NSF-ENG77-22946.
ABSTRACT: The theory of large deviations is applied to the study of the asymptotic properties of the stochastic approximation algorithms. The method provides a useful alternative to the currently used technique of obtaining rate of convergence results. (U)
DESCRIPTORS: *Algorithms, *Asymptotic normality, Stochastic processes, *Approximation(Mathematics), Interpolation, Intervals, Convergence, Estimates (U)
IDENTIFIERS: Stochastic approximation algorithm Large deviations theory, PE61102F, WUAFOSR2304A4 (U)

AD-A129 207 7/2 12/1 18/8

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

Phase-Plane and Guggenheim Methods for Treatment of Kinetic Data, (U)

AUG 82 6P Bacon,J. Roger ;Demas,J. N. ;
CONTRACT: AFOSR-78-3590, NSF-CHE82-06279
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0466

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Analytical Chemistry, v55 n4 p653-656 Apr 83.
Reprint: Phase-Plane and Guggenheim Methods for Treatment of Kinetic Data.

DESCRIPTORS: *Reaction kinetics, *Exponential functions, *Rates, *Decay, Constants, Test and evaluation, Corrections, Base lines, Reprints (U)
IDENTIFIERS: Kinetic data, Reaction rates, Guggenheim method, Phase plane, Rate parameters, PE61102F, WUAFOSR230382 (U)

AD-A129 205 7/4

MONTANA STATE UNIV BOZEMAN DEPT OF PHYSICS

Angular-Resolved Electron Emission Studies of Microwave Materials. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Jul 77-30 Apr 82,
APR 82 22P Lapeyre,Gerald J. ;
CONTRACT: F49620-77-C-0125
PROJ: 2306
TASK: B2
MONITOR: AFOSR TR-83-0474

UNCLASSIFIED REPORT

ABSTRACT: Experiments were performed to determine the electronic structure of III-V compound semiconductors and transition metals, for example, the cleavage surface of gallium arsenide and tungsten. The results, in addition to contributing to an understanding of these materials, formed the necessary background information for interpreting the fundamental physical and chemical properties of adatoms on the surface. Several overlayer systems were studied with emphasis being placed on Ge and GaAs (110) and oxygen on W an hydrogen on W. Theoretical modeling indicates that Ge monolayers essentially exhibit the interface states expected for the Ge/GaAs(110) heterojunction. Ultraviolet photoemission (UPS) was the method used to measure the electronic structure which included the new techniques of angular resolution and polarization dependence. Synchrotron radiation was used as the radiation source so advantages of the polarizer, continuum extending into the far ultraviolet could be employed. Several of these experimental methods used to measure and interpret UPS data were developed in the program, for example, polarization-symmetry analysis and photon energy scanning of core threshold behavior. Core threshold studies yield information on the conduction band density of states (bulk and surface) and decay processes of the core hole. Studies were performed for the shallow levels of GaAs(110), GaSe, and Pt. (Author) (U)
DESCRIPTORS: *Photoelectric emission, *Surface chemistry, *Transition metals, *Semiconductors, Gallium arsenides, Tungsten, Chemisorption, Adatoms, Cleavage, Surfaces, Electronic state (U)
IDENTIFIERS: PE61102F, WUAFOSR2306B2 (U)
AD-A129 205

AD-A129 204 7/2 7/4

TEXAS UNIV AT AUSTIN DEPT OF PHYSICS

High Resolution Electron Energy Loss Studies of Chemisorbed Species on Aluminum and Titanium. (U)

DESCRIPTIVE NOTE: Final rept. 1 Apr 80-31 Mar 83,
83 8P Erskine,J. L. ;
CONTRACT: AFOSR-80-0154
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0471

UNCLASSIFIED REPORT

ABSTRACT: This report summarizes significant accomplishments and research progress achieved during the last three years under grant AFOSR-80-0154. The overall project objective was to apply high-resolution electron-loss-spectroscopy to the study of chemisorbed species on aluminum and titanium surfaces. Pursuant to this objective, a suitable spectrometer was constructed which incorporates the necessary sample preparation and characterization capabilities including low energy electron diffraction and Auger electron spectroscopy in addition to a state-of-the-art electron energy loss spectrometer. This instrument has been used to study several chemisorbed systems including oxygen on aluminum, oxygen on nickel and hydrogen on tungsten. The primary scientific results of this program to date have been published and have been described in the four interim reports to AFOSR. Significant results include: electron energy loss studies of oxygen on aluminum which establish the simultaneous formation of overlayer and underlayer oxygen during initial oxidation, demonstration of the applicability of lattice-dynamical modeling to interpretation of energy loss data in order to test structural models, and observation of the first azimuthal pattern for impact scattering in electron energy loss studies of hydrogen on tungsten. (U)
DESCRIPTORS: *Aluminum, *Titanium, *Chemisorption, *Electron spectroscopy, Surface chemistry, Surface analysis, Oxidation, Electron scattering, High resolution, Auger electron spectroscopy, Vibrational spectra, Energy levels, Electron diffraction (U)
IDENTIFIERS: EELS(Electron Energy Loss Spectroscopy), PE61102F, WUAFOSR2303 (U)
AD-A129 204

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 203 4/2 17/9

ALASKA UNIV FAIRBANKS GEOPHYSICAL INST

Investigation of Shear Induced Turbulence by MST (Mesosphere Stratosphere Troposphere Radar). (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 80-30 Sep 82,
SEP 82 32P Romick,Gerald J. ;Jayaweera, Kolf ;Smith,Steven A. ;
CONTRACT: AFOSR-80-0286
PROJ: 2310
TASK: A1
MONITOR: AFOSR TR-83-0437

UNCLASSIFIED REPORT

ABSTRACT: Wind speed and C sub N squared measurements made with the Poker Flat, Alaska MST radar are used to study the development of clear air turbulence (CAT) near the tropopause. Arguments and observations that indicate C sub N squared is proportional to the intensity of turbulence are presented. The relationship between wind shear and turbulence is examined using time-lagged cross correlations of measured shears and C sub N squared time series. From analysis of data taken with spatial resolutions of 2200 m and 750 m, it is found that the correlation improves as the time and spatial resolutions of the measurements improve. The implications for forecasting CAT are discussed, based on the correlation results and a comparison of radar data with National Weather Service CAT forecasts. (Author) (U)

DESCRIPTORS: *Meteorological radar, *Clear air turbulence, Troposphere, Stratosphere, Weather forecasting, Wind velocity, Cross correlation (U)
IDENTIFIERS: MST(Mesosphere Stratosphere Troposphere), Wind sheer, PE61102F, WUAFOSR2310A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 202 12/1

MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA DEPT OF SYSTEMS ENGINEERING

Some Generalizations of Median Filters. (U)

DESCRIPTIVE NOTE: Technical rept.,
82 5P Lee,Yong Hoon ;Kassam, Saleem A. ;
CONTRACT: AFOSR-82-0022
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0481

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE International Conference on Acoustics, Speech and Signal Processing, April 14-16 1983, Boston, MA, Proceedings p1-4.
Reprint: Some Generalizations of Median Filters.

DESCRIPTORS: *Mathematical filters, *Algorithms, Signal processing, Simulation, Reprints (U)
IDENTIFIERS: Median filters, Smoothing(Mathematics), Noisy data, PE61102F, WUAFOSR2304A5 (U)

AD-A129 192 7/3

HULL UNIV (ENGLAND) DEPT OF CHEMISTRY

Arrhenius Parameters of Elementary Reactions Involved in the Oxidation of Neopentane. (U)

JUL 81 15P Baldwin,Robert R. ;Hisham, Mohamed W. M. ;Walker,Raymond W. ;

CONTRACT: AFOSR-77-3215
PROJ: 2308
TASK: B2
MONITOR: AFOSR TR 83-0439

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society, Faraday Transactions 1, v78 p1615-1627 1982
Reprint: Arrhenius Parameters of Elementary Reactions Involved in the Oxidation of Neopentane.

DESCRIPTORS: *Pentanes, *Oxidation, *Reaction kinetics, High temperature, Butanes, Acetones, Ketones, Pyrolysis, Formaldehyde, Constants, Rates, Reprints (U)
IDENTIFIERS: Neopentane, Arrhenius parameters, Neopentylhydroperoxide, Rate constants, Neopentyl radicals, PE61102F, WUAFOSR2308B2 (U)

AD-A129 166 20/6 9/2

STANFORD UNIV CA STANFORD ELECTRONICS LABS

Optical Computing Research. (U)

DESCRIPTIVE NOTE: Annual rept. 1 Jan 82-31 Jan 83,
MAR 83 57P Goodman,Joseph ;Messelink, Lambertus ;Cao,Qizhi ;Kostuk,Raymond ;Ochoa, Ellen ;

CONTRACT: AFOSR-82-0089
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0494

UNCLASSIFIED REPORT

ABSTRACT: The work covers several different areas of optical computing, as well as some work on digital processing of optically obtained images. The primary emphasis of the work is on the possible applications of optics to interconnections in integrated circuit technology. Other areas of effort include the diagonalization and inversion of circulant matrices using coherent optics, the division of complex wavefronts using four-wave mixing, and the suppression of speckle in coherently formed images. Publications during the last year arising out of work supported by the grant are also detailed. (U)

DESCRIPTORS: *Optical analysis, *Data processing, *Optical processing, *Optical data, *Computations, Signal processing, Iterations, Image processing, Linear algebraic equations, Digital systems, Simultaneous equations, Matrices(Mathematics), Processing, Incoherence, Integrated circuits, Coherence, Work, Suppression, Fiber optics, Specular reflection, Optical properties, Eigenvalues, Optics, Limitations (U)
IDENTIFIERS: Speckle suppression, Circulant matrices, Optical computing, Inversions(Matrix), Four wave mixing, Diagonalization, Matrices(Optics), PE61102F, WUAFOSR2305B1 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 163 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

Prediction and Power Transformations When the Choice of Power is Restricted to a Finite Set. (U)

DESCRIPTIVE NOTE: Technical rept.,
82 9P Carroll,Raymond J. ;
CONTRACT: AFOSR-80-0080
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0473

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Statistical Association, v77 n380 p908-915 Dec 82.
Reprint: Prediction and Power Transformations When the Choice of Power is Restricted to a Finite Set.

DESCRIPTORS: *Transformations(Mathematics), *Mathematical prediction, Finite element analysis, *Maximum likelihood estimation, Set theory, Linear regression analysis, Parameters, Asymptotic series, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 162 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

A Comparison between Maximum Likelihood and Generalized Least Squares in a Heteroscedastic Linear Model. (U)

DESCRIPTIVE NOTE: Technical rept.,
82 7P Carroll,R. J. ;Ruppert, David ;
CONTRACT: AFOSR-80-0080
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0475

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Statistical Association, v77 n380 p878-882 Dec 82.
Reprint: A Comparison between Maximum Likelihood and Generalized Least Squares in a Heteroscedastic Linear Model.

DESCRIPTORS: *Mathematical models, *Maximum likelihood estimation, *Least squares method, Comparison, Linearity, Linear regression analysis, Parameters, Reprints (U)
IDENTIFIERS: Heteroscedasticity, Linear models, PE61102F, WUAFOSR2304A5 (U)

AD-A129 157 12/1 9/4

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF ELECTRICAL ENGINEERING

Optimal Constrained Representation and Filtering of Signals. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 83 [illegible] Kazakos,Dimitri ;
REPT. NO. [illegible]
CONTRACT: AFOSR-82-0030
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0[illegible]5

UNCLASSIFIED REPORT

ABSTRACT: A random signal is observed in [illegible] noise. [illegible] the problem of finding [illegible] signal estimate [illegible] in a given linear [illegible]. The [illegible] is defined in the sense of weighted mean square error. In the second step, the [illegible] ability [illegible] the linear [illegible] the signal and noise covariance, that [illegible] the largest [illegible] continuous time. For large observation time and stationary signals, it is shown that the constrained optimal estimate is determined by the two spectral [illegible] and a weighted Fourier Transform of the noise observations. The [illegible] result applies to both discrete time and continuous time signals. The Wiener filter [illegible] a special case of the constrained filtering estimate, when the linear subspace is enlarged to coincide with the total measurement space. (Author) (U)

DESCRIPTORS: *Signal processing, *Noise, *Filters, Signals, Stationary, Estimates, Covariance, Fourier transformation, Spectral energy distribution, Eigenvalues, Observation, Time signals, Weighting functions, Errors, [illegible]ization, Eigenvectors, Time (U)

IDENTIFIERS: Manifolds(Linear), Discrete time signals, Wiener filters, Periodic sampling, PE61102F, WUAFOSR2304A5 (U)

AD-A129 153 9/2 5/8

ADVANCED INFORMATION AND DECISION SYSTEMS MOUNTAIN VIEW CA

The Intelligent Program Editor: A Knowledge Based System for Supporting Program and Documentation Maintenance. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 9P Shapiro,Daniel G. ;McCune, Brian P. ;
CONTRACT: F49620-81-C-0067
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0488

UNCLASSIFIED REPORT

ABSTRACT: This paper presents work in progress towards a program development and maintenance aid called the Intelligent Program Editor (IPE), which applies artificial intelligence techniques to the task of manipulating and analyzing programs. The IPE [illegible] its power by explicitly representing textual, syntactic, and many of the semantic (coding related) and pragmatic (application oriented) structures in programs. To demonstrate this approach, the authors implemented [illegible] this knowledge base, and a search mechanism called the Program Reference Language (PRL), which is able to locate portions of programs based on a description provided by a user. This work is an applied research effort. It was motivated by issues discovered during a study of software maintenance problems in the Air Force, and is intended to be moved into application within seven years. (U)

DESCRIPTORS: *Computer programs, *Computer programming, *Editing, *Artificial intelligence, Data bases, Systems analysis, Text processing, Syntax, Semantics, Subroutines, Programming languages, Computer program documentation, Data management, Computer program verification, Models, Computer program reliability, Programmers, Man computer interface, User needs, Maintenance (U)

IDENTIFIERS: PE61102F, WUAFOSR2304A2 (U)

DTIC REPORT BIBLIOGRAPHY ACCESSION CONTROL NO. EVN35A

AD-A129 147 7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

Electric Dipole Moments of Excited Vibrational Levels in the X1A1 State of Formaldehyde by Stimulated Emission Spectroscopy, (U)

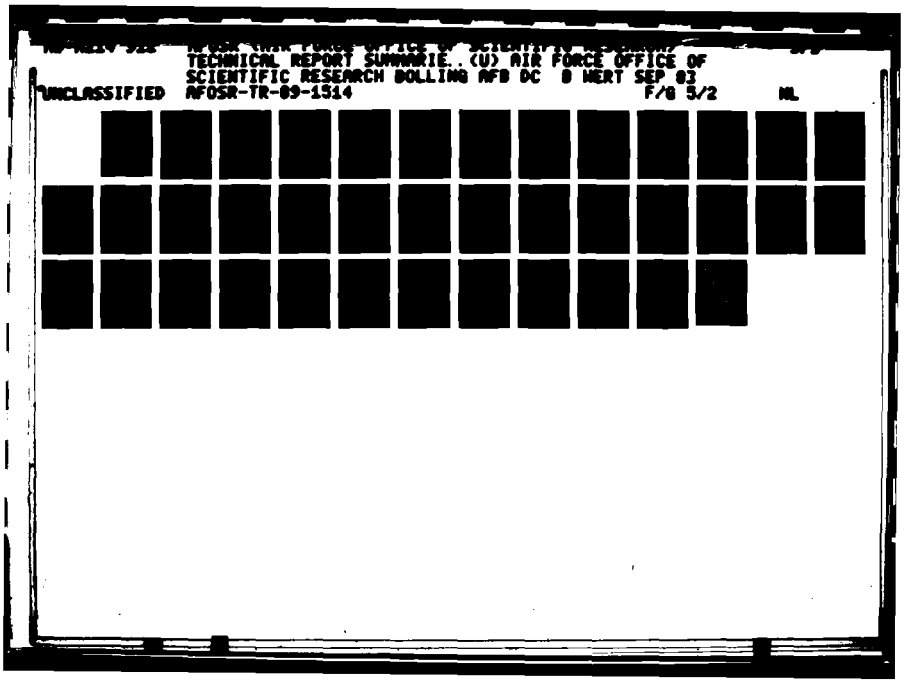
SEP 82 7P Moccaro,Patrick M. ;Kinsey, James L. ;Field,Robert W. ;Dai,Hai-Lung ;

CONTRACT: AFOSR 80-0254
PROJ: 2303
TASK: 81
MONITOR: AFOSR TR 83 0470

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v78 part 2 n6 p3659-3664, 15 Mar 83. Reprint: Electric Dipole Moments of Excited Vibrational Levels in the X1A1 State of Formaldehyde by Stimulated Emission Spectroscopy.

DESCRIPTORS: *Dipole moments, *Formaldehyde, *Vibrational spectra, *Emission spectroscopy, Measurement, Carbon, Oxygen, Chemical bonds, Excitation, Energy levels, Electric fields, Reprints (U)
IDENTIFIERS: SEP(Stimulated Emission Pumping), PE61102F, WUAFOSR2303B1 (U)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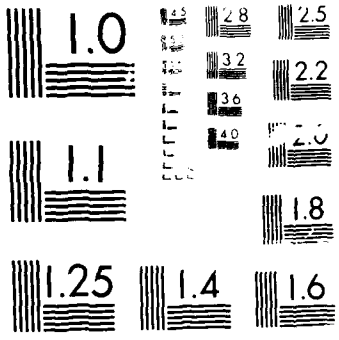
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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 144 12/1 20/4

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

An Example of Boundary Layer in Delay Equations (U)

DESCRIPTIVE NOTE: Technical rept.,
83 8P Hannsgen,Kenneth B. ;
Herdman,Terry L. ;Stech,Harlan W. ;Wheeler,
Robert L. ;
CONTRACT: AFOSR-76-3092
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0490

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Volterra and Functional Differential, p45-49 1982.
Reprint: An Example of Boundary Layer in Delay Equations.

DESCRIPTORS: *Boundary layer, *Perturbations, *Differential equations, Convergence, Reprints (U)
IDENTIFIERS: *Delay equations, PE61102F, WUAFOSR2304A4 (U)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 137 5/1 14/5 20/6

RHODE ISLAND UNIV KINGSTON

1982 Gordon Research Conference on Holography and Optical Information Processing. (U)

DESCRIPTIVE NOTE: Final rept.,
JUL 82 22P Cruickshank,Alexander M. ;
CONTRACT: AFOSR-82-0257
PROJ: 2305
TASK: B1
MONITOR: AFOSR TR-83-0223

UNCLASSIFIED REPORT

ABSTRACT: Document includes a schedule of session and a list of attendees. (U)
DESCRIPTORS: *Symposia, *Holography, *Optical processing, *Data processing, Synthetic aperture radar, Image processing, Pattern recognition, Acoustooptics (U)
IDENTIFIERS: WUAFOSR2305B1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 132 12/1 9/2

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

Prime Program Decomposition, (U)

83 6P Gannon,J. D. ;Hecht,M. S. ;Herbold,R. J. ;

CONTRACT: F49620-80-C-0001
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0489

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the Annual Hawaii International Conference on System Sciences (16th) p25-29 1983.
Reprint: Prime Program Decomposition.

DESCRIPTORS: *Algorithms, *Computer programs, *Subroutines, Metric system, Graphs, Flow charting, Nodes, Fortran, Functions, (U)
Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A2

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A129 131 7/4

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

Ground States of Molecules. 56. MNDO Calculations for Molecules Containing Sulfur, (U)

SEP 81 23P Dewar,Michael J. S. ; McKee,Michael L. ;

CONTRACT: AFOSR-79-0008
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0468

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Computational Chemistry, v4 n1 p84-103 1983.
Reprint: Ground States of Molecules. 56. MNDO Calculations for Molecules Containing Sulfur.

DESCRIPTORS: *Ground state, *Sulfur compounds, *Molecular orbitals, Heat of formation, Dipole moments Energy levels, Bonding, Ionization potentials, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2303B2 (U)

AD-A129 060 5/2 20/13 20/11

THERMOPHYSICAL AND ELECTRONIC PROPERTIES INFORMATION ANALYSIS CENTER LAFAYETTE IN

Transport Properties of Selected Elements and Compounds in the Gaseous State. Part 2. (U)

DESCRIPTIVE NOTE: State-of-the-art rept., DEC 73 82P Liley,P. E. ;
REPT. NO. CINDAS-TPRC-22
CONTRACT: AFOSR-72-2396
PROJ: 9750
TASK: 01
MONITOR: AFOSR TR-74-1165

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-A008 471.
ABSTRACT: Tables of viscosity, thermal conductivity, and diffusion coefficient have been prepared for sixty-nine binary mixtures. The temperature range was from 100 to 3000 K. For the substances comprising the binary mixtures recent recommendations were used, some of these being taken from our earlier report (Part 1). For the mixtures the Lennard-Jones 6-12 potential was used for viscosity and diffusion, and a linear mixing rule was employed for thermal conductivity. The precision of the tabulated values is reviewed. It is concluded that significant discreparcies can still exist between theoretical and experimental quantities. (Author) (U)
DESCRIPTORS: *Tables(Data), *Thermophysical properties, *Thermal properties, *Physical properties, Viscosity, Diffusion coefficient, Gases, Thermal conductivity, Value, Tabulation processes, Liquids (U)
IDENTIFIERS: Binary mixtures, WUAFOSR975001 (U)

AD-A129 013 9/2

STATE UNIV OF NEW YORK AT STONY BROOK DEPT OF COMPUTER SCIENCE

Proving Real-Time Properties of Programs with Temporal Logic. (U)

DESCRIPTIVE NOTE: Technical rept., 81 13P Bernstein,Arthur ;Harter, Paul K. , Jr;
CONTRACT: AFOSR-81-0197
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0284

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of the Symposium on Operating Systems Principles (8th), p1-11 Dec 81.
Reprint: Proving Real-Time Properties of Programs with Temporal Logic.

DESCRIPTORS: *Computer programming, Programmers, Real time, Computer logic, Reprints (U)
IDENTIFIERS: WUAFOSR2304A2, PE61102F (U)

AD-A128 818 12/1

MARYLAND UNIV COLLEGE PARK DEPT OF MATHEMATICS

Multivariate Dependent Renewal Processes. (U)

DESCRIPTIVE NOTE: Technical rept., JAN 83 28P Slud,Eric ;
REPT. NO. MD83-1-ES, TR-83-1
CONTRACT: AFOSR-82-0187
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0293

UNCLASSIFIED REPORT

ABSTRACT: A new class of reliability point-process models for dependent components is introduced. The dependence is expressed through a regression, following a form suggested for survival data analysis involving the current life-length of the components. After formulating the current-life process as a Markov process with stationary transitions and stating some general results on asymptotic behavior, the authors describe the stationary distributions in some bivariate examples. Finally, they discuss statistical inference for the new models, exhibiting and justifying full- and partial-likelihood methods for their analysis. (U)
DESCRIPTORS: *Mathematical models, *Reliability, *Replacement theory, Life tests, Markov processes, Multivariate analysis, Bivariate analysis, Regression analysis, Statistical inference (U)
IDENTIFIERS: WUAFOSR2304A5, PE61102F (U)

AD-A128 671 11/9 7/5 20/3

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

Magnetic Field and Magnetic Isotope Effects on Photoinduced Emulsion Polymerization. (U)

DESCRIPTIVE NOTE: Technical rept., FEB 82 8P Turro,Nicholas J. ;Chow, Ming-Fea ;Chung,Chao-Jen ;Tung,Chem-Ho ;
CONTRACT: AFOSR-81-0013
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0404

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v105 n6 p1572-1577 1983. Reprint: Magnetic Field and Magnetic Isotope Effects on Photoinduced Emulsion Polymerization.

DESCRIPTORS: *Polymerization, *Photochemical reactions, *Emulsions, Magnetic fields, Isotope effect, Reprints (U)
IDENTIFIERS: Photoinduced emulsion polymerization, Magnetic isotope effects, PE61102F, WUAFOSR2308Z (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 669 6/5 6/1

CALIFORNIA UNIV SAN FRANCISCO

Mitochondrial ADP-Ribosyltransferase System. (U)

DESCRIPTIVE NOTE: Technical rept., 82 15P Kun,Ernest ;Kirsten,Eva ;
CONTRACT: F49620-81-C-0007
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0144

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in ADP-Ribosylation Reactions, p193-205 1982. Reprint: Mitochondrial ADP-Ribosyltransferase System.

DESCRIPTORS: *Mitochondria, *Transferases, *Hydrolases, *Ribose, *Adenosine phosphates, Liver, Preparation, Bioassay, Extraction, Reprints (U)
IDENTIFIERS: *Glycohydrolases, PE61102F, WUAFOSR2312A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 662 14/2

WRIGHT STATE UNIV DAYTON OH DEPT OF MATHEMATICS AND STATISTICS

An Output Matching Approach to Multivariable Linear Digital Control. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Jun-31 Aug 82, NOV 82 9P Miller,David F. ;
REPT. NO. 0001
CONTRACT: AFOSR-82-0208
PROJ: 2304
TASK: D9
MONITOR: AFOSR TR-83-0400

UNCLASSIFIED REPORT

ABSTRACT: A simple and direct state space approach to the digital control of multivariable linear system is discussed. Control is provided by minimizing the mean square error between controlled plant outputs and specified desired output trajectories at sampling instants. Systems of linear equations for digital control inputs result with solutions assuming a natural constant forward and feedback gain form. Optimal gains are determined using elementary results form linear systems theory and standard techniques from linear algebra. Numerical applications to examples in simple model following, digital redesign, and direct digital design are described. Partial state observability and the effects of sampling rate upon system performance are considered. Control smoothing through matching at multiple sampling instants is discussed. This strategy provides improved performance without additional computational expense or increased sampling rate. (Author) (U)

DESCRIPTORS: *Control systems, *Linear systems, Multivariate analysis, Output, Matching, Linear algebraic equations, Errors, Numerical methods and procedures (U)
IDENTIFIERS: Digital control, PE61102F, WUAFOSR2304D9 (U)

AD-A128 637 22/2 7/4 20/6

SRI INTERNATIONAL MENLO PARK CA MOLECULAR PHYSICS LAB

Conjectures on the Origin of the Surface Glow of Space Vehicles. (U)

OCT 82 5P Slanger,Tom G. ;
CONTRACT: F49620-82-K-0025
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0409

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Geophysical Research Letters, v10 n2 p130-132 Feb 83.
Reprint: Conjectures on the Origin of the Surface Glow of Space Vehicles.

DESCRIPTORS: *Spacecraft, *Surface properties, *Fluorescence, *Glow discharges, Space shuttles, Oxygen, Hydroxides, Vibrational spectra, Reprints (U)
IDENTIFIERS: Surface glow, Space vehicles, WUAFOSR2303A2, PE61102F (U)

AD-A128 629 9/2

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

Event-Based Specification and Verification of Distributed Systems. (U)

DESCRIPTIVE NOTE: Doctoral thesis,
82 188P Chen,Bo-Shoe ;
CONTRACT: F49620-80-C-0001
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0388

UNCLASSIFIED REPORT

ABSTRACT: Computations of distributed systems are extremely difficult to specify and verify using traditional techniques because the systems are inherently concurrent, asynchronous and nondeterministic. Furthermore, computing nodes in a distributed system may be highly independent, and the entire system may lack an accurate global clock. In this thesis, the author develops an event-based model to specify formally the behavior (the external view) and the structure (the internal view) of distributed systems. The specification technique has a rather wide range of applications. Examples from different classes of distributed systems, including communication systems, transaction-based systems and process control systems are demonstrated. Both control-related and data-related properties of distributed systems are specified using two fundamental relationships among events: the precedes relation, representing time order; and the enables relation, representing causality. No assumption about the existence of a global clock is made in the specifications. The correctness of a design can be proved before implementation by checking the consistency between the behavior specification and structure specification of a system. Moreover, since the specification technique defines the orthogonal properties of a system separately, each of them can then be verified independently. Thus, the proof technique avoids the exponential state-explosion problem found in state-machine specification techniques. (U)
DESCRIPTORS: *Distributed data processing, *Computer program verification, *Specifications, Computer architecture, Nodes, Communications networks, (U)
IDENTIFIERS: Computer models, EVent based (U)

AD-A128 618 6/20 6/6

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG CENTER FOR ENVIRONMENTAL STUDIES

Sublethal Effects of JP-4 on Lepomis macrochirus. (U)

DESCRIPTIVE NOTE: Annual rept. no. 1, 1 Nov 81-31 Oct 82,
JAN 83 11P Cairns,John , Jr.;Buikema, Arthur L. , Jr.;Doane,Thomas R. ;
CONTRACT: AFOSR-82-0059
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0443

UNCLASSIFIED REPORT

ABSTRACT: During the research project to investigate the sublethal effects of the water soluble fraction (WSF) of JP-4, a constant flow water soluble fractionator for the JP-4 was constructed. Procedures for chemical analyses to determine the percent of the WSF were developed and used. Static and dynamic bioassays were performed using the bluegill, Lepomis macrochirus. Blood chemistry tests were performed on control and exposed fish, Electron micrographs were taken of gill and liver tissue from control and exposed fish. Equipment and protocols were developed for measurement of respiration rates and preference/ avoidance behavior of fish exposed to sublethal concentrations of the WSF of JP-4. (U)
DESCRIPTORS: *Jet engine fuels, *Toxicity, *Aquatic organisms, Water, Solubility, Water soluble materials, Electron microscopy, Bioassay, Fishes, Chemical analysis, Tissues(Biology), Blood chemistry, Blood analysis, Test methods, Behavior, Respiration, Rates (U)
IDENTIFIERS: PE61102F, WUAFOSR2312A5 (U)

AD-A128 612 4/1 20/9 5/2

SRI INTERNATIONAL MENLO PARK CA

Latitudinal Variations of Auroral-Zone Ionization Distribution. (U)

DESCRIPTIVE NOTE: Final scientific rept. 1 Dec 79-30 Nov 82,
FEB 83 212P Vickrey,James F. ;Robinson, Robert M. ;Tsunoda,Roland T. ;
CONTRACT: F49620-80-C-0014
PROJ: 2310
TASK: A2
MONITOR: AFOSR TR-83-0389

UNCLASSIFIED REPORT

ABSTRACT: This study on ionization in the aurcral zone involved data reduction and analysis to determine (1) the electrodynamics of the auroral E layer and (2) the origin and evolution of high-latitude F-region plasma-density structure. Data obtained by the Chatanika incoherent-scatter radar as well as by rockets and satellites were used in the study. The results are especially useful in characterizing the morphology of E-region conductivity enhancements, and the production, transport, and decay of F-region plasma throughout the auroral zone. The relationship between currents (both perpendicular and field-aligned) and electric fields has also been studied. In addition to these experimental investigations, SRI has contributed new theoretical concepts in the areas of cross-field plasma diffusion and global plasma-density irregularity morphology. (U)
DESCRIPTORS: *Aurorae, *Ionization, *Plasmas(Physics), *Literature surveys, Variations, Convection(Atmospheric), Diffusion, Electrodynamics, High latitudes, F region, Data reduction, Density, Currents, Electric fields, Ionosphere, Decay, Transport, Morphology (U)
IDENTIFIERS: E layer, PE61102F, WUAFOSR2310A2, SRI-1181 (U)

AD-A128 538 7/4

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

Versatile, High Resolution Continuum Source Atomic Absorption Flame Spectrometer with Resonance Flame Detector, (U)

APR 82 7P Blackburn,M. B. ; Winefordner,J. D. ;
CONTRACT: F49620-80-C-0005
PROJ: 2303
TASK: A1
MONITOR: AFOSR TR-83-0396

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Canadian Jnl. of Spectroscopy, v27 n5 p137-140 1982. Reprint: Versatile, High Resolution Continuum Source Atomic Absorption Flame Spectrometer with Resonance Flame Detector.

DESCRIPTORS: *Spectrometers, *High resolution, *Spectral emittance, *Bandwidth, Detection, Sensitivity, Monochromators, Spectral lines, Resonance, Fluorescence, Canada, Reprints (U)
IDENTIFIERS: *Atomic absorption flame spectrometers, AACS(Atomic Absorption Continuum Source Spectrometry), Resonance flame detector, Continuum source, PE61102F, WUAFOSR2303A1 (U)

AD-A128 536 12/1 5/2

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

Report on Sponsored Research on Algorithmic Methods In Probability. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jun 81-31 May 82,
APR 83 10P Neuts,Marcel F. ;
CONTRACT: AFOSR-77-3236
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0417

UNCLASSIFIED REPORT

ABSTRACT: This report covers the development of algorithmic procedures for the study of stochastic processes and queues. The report submitted for the preceding year listed a large number of papers, which were at that time submitted or accepted for publication. Most of these papers have now appeared and seem to have a seminal influence on the research on the algorithmic approach to probability and its applications, which is being initiated at more and more centers in Europe and Asia. The research program sponsored by the Air Force of Scientific Research since 1977 has, we believe, contributed significantly to the much needed task of bringing the findings and methodology of the theory of stochastic models closer to its genuine applications in technology. It has done so by the elaboration of mathematical methods that lead to implementable algorithms and to detailed numerical results, whose interpretation yields insight into the stochastic behavior of queues and related stochastic models. (U)
DESCRIPTORS: *Algorithms, *Probability, *Bibliographies, Air Force research, Stochastic processes, Queueing theory, Mathematical models, Reports, Grants (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 534 20/5

ILLINOIS UNIV AT URBANA DEPT OF ELECTRICAL ENGINEERING

Alkali-Rare Gas and Metal-Halide Molecules as Potential Tunable and Efficient Lasers in the Visible. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 82, NOV 82 25P Eden,J. G. ;
REPT. NO. UILU-ENG-82-2554
CONTRACT: AFOSR-79-0138
PROJ: 2301
TASK: A3
MONITOR: AFOSR TR-83-0429

UNCLASSIFIED REPORT

ABSTRACT: Experiments involving metal-halide dissociation lasers are described. A UV-preionized, discharge-pumped CdI (cadmium iodide) laser has been demonstrated at 657 nanometers. In addition, iron (Fe) and lithium (Li) photodissociation lasers have been demonstrated. (Author) (U)
DESCRIPTORS: *Halides, *Photodissociation, *Tunable lasers, Cadmium, Iodides, Visible spectra, Laser pumping, Zinc, Mercury, Iron, Dissociation, Dye lasers, Laser materials, Spectrum analysis, Rare gases, Salts (U)
IDENTIFIERS: Metal halides, Cadmium iodide laser, PE61102F, WUAFOSR2301A3 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 533 5/1 20/5 20/8

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

Research Studies on Radiative Collisional Processes. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 79-30 Sep 82, NOV 82 47P Harris,S. E. ;Young,J. F. ;
REPT. NO. GL-3520
CONTRACT: F49620-80-C-0023
PROJ: 2301
TASK: A1
MONITOR: AFOSR TR-83-0428

UNCLASSIFIED REPORT

ABSTRACT: This program has supported theoretical and experimental studies in several areas of device physics: the physics and applications of radiative collisional lasers, pair absorption pumped lasers, the use of microwave pumping for the excitation of excimer and other high pressure lasers, and the development of anti-Stokes spectroscopy for the study of core-excited atomic levels. (Author) (U)
DESCRIPTORS: *Research management, *Laser induced fluorescence, *Particle collisions, Excimers, Radiative transfer, Laser pumping, Microwave optics, Stokes radiation, Ultraviolet spectroscopy, Excitation, Emission spectra, Atomic energy levels, Theory, Experimental data (U)
IDENTIFIERS: Excimer lasers, Alkali atoms, PE61102F, WUAFOSR2301A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 520 7/3 7/4 20/2

BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

A Synthetic Route to Heteronuclear Clusters Containing Iridium and Rhodium: X Ray Crystal Structures of (IrOs3(u-H)2(u-Cl)(CO)12) and (Ir2Rh2(u-CO)(u3-CO)2(CO)4(h-C5Me5)2). (U)

JUN 82 4P Farrugia,Louis J. ;Orpen, A Guy ;Stone,F. Gordon A. ;

CONTRACT: AFOSR 82-0070
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0418

UNCLASSIFIED REPORT

DESCRIPTORS: (Synthesis(Chemistry), *Metal complexes, *Clustering, *Crystal structure, *X ray diffraction, Iridium, Rhodium, Heterocyclic compounds, Crystallography, Nuclear reactions, Reprints (U)
IDENTIFIERS: Heteronuclear clusters, W1AFOSR2303B2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 509 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

On a Problem Concerning Spacings. (U)

DESCRIPTIVE NOTE: Technical rept.,
FEB 83 14P Cheng,Shihong ;
REPT. NO. TR 27
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0420

UNCLASSIFIED REPORT

DESCRIPTORS: Distribution functions, Random [illegible] (U)
IDENTIFIERS: W1AFOSR2304A5, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 501 17/2 20/14 12/1

CONNECTICUT UNIV STORRS DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

A Collision Resolution Protocol with Limited Channel Sensing - Finitely Many Users. (U)

DESCRIPTIVE NOTE: Technical rept.,
FEB 83 46P Papantoni-Kazakos,P. ;
Marcus,Glenn D. ;Georgiopoulos,Michael ;
REPT. NO. EECS-TR-83-2
CONTRACT: AFOSR-78-3695
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0419

UNCLASSIFIED REPORT

ABSTRACT: In this paper, the authors consider the random accessing of a single slotted channel by a finite number of independent, data transmitting bursty users. They adopt the assumption that each user monitors the channel only while he is blocked. They also assume that the channel outcomes (visible to each user) are ternary. That is, each channel slot is perceived as either empty or successfully busy, or as a collision slot. Propagation delays are disregarded. For the above model, the authors propose and analyze a collision resolution protocol (CRLS) with tree search characteristics. For identical users with binomial transmission processes, they find lower bounds on the CRLS throughput, and compute upper bounds on the induced delays in transmission. Their results are compared with those induced by the dynamic tree protocol of Capetanakis; where the feedback sensing is continuous in the latter. The CRLS performs surprisingly well. For asymptotically many users, its throughput is higher than the throughput of the nondynamic tree protocol of Capetanakis, and less than 7 percent lower than the throughput of the dynamic form of the latter. The CRLS also compares well in terms of delays, and it is robust in the presence of channel errors. (U)

DESCRIPTORS: *Data transmission systems, *Burst transmission, *Multiple access, *Computations, Delay, User needs, Slots, Monitoring, Blocking, Collisions, Numerical methods and procedures, Throughput, Feedback, Channels (U)

IDENTIFIERS: Protocols, Collision resolution (U)
AD-A128 501

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A128 493 8/11 18/3

CALIFORNIA UNIV BERKELEY SEISMOGRAPHIC STATION

Regional Discrimination with Broadband Data. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 81-30 Sep 82,
FEB 83 140P McEvilly,T. V. ;Johnson, Lane R. ;
CONTRACT: F49620-79-C-0028, ARPA Order-3291
PROJ: 1A10
MONITOR: AFOSR TR-83-0380

UNCLASSIFIED REPORT

ABSTRACT: The research supported by this grant is directed toward the general problems of detection and identification of underground explosions through the study of radiated seismic waves. Particular emphasis is on the collection and analysis of broadband seismic data at near and regional distances. Specific elements of the research program are: (1) recording of broadband data from events at the Nevada Test Site; (2) analysis of the coherence of ground motion near explosions and earthquakes; (3) study of the relative isotropic and non isotropic components of explosive sources through the application of moment tensor inversion techniques; (4) analysis of regional surface wave data in order to obtain models for the velocity and attenuation in the crust; (5) archival of near and regional data sets which are of value to the general discrimination problem. Section II describes the analysis of array data recorded 1.9 km from the explosion Liptauer in Yucca Valley to the Nevada Test Site. Section III presents a new way of looking at frequency-wavenumber spectral estimation with array data. Section IV examines the problem that exists when the velocity structure is complicated to the extent that it can be considered to have a random component. Section V treats the problem of scattering of elastic waves by small inhomogeneities. The solution is expressed in terms of a moment tensor expansion of the properties of the scatterer. (U)

DESCRIPTORS: *Seismic waves, *Underground explosions, *Nuclear explosion detection, Discrimination, Seismic signatures, Broadband, Seismic arrays, Spatial filtering, Ground motio (U)

IDENTIFIERS: PE62714E (U)
AD-A128 493

AD A128 492   20/14   20/8   4/1

BEERS ASSOCIATES INC RESTON VA

Effects of Atmospheric Inhomogeneity on Long Range Ion Beam Propagation. (U)

DESCRIPTIVE NOTE: Final rept. May-Oct 82,
JAN 83   43P   Bloomberg,Howard W. ;
RLPT. NO. BEERS-1-83-55-09
CONTRACT: F49620-82-C-0089
PROJ: 2301
TASK: A7
MONITOR: AFOSR TR-83-0423

UNCLASSIFIED REPORT

ABSTRACT: A procedure has been developed to determine the particle energy and current for long range, high [illegible] flux ion beams. The smallest [illegible] for a proton beam was found to be [illegible] between the position of [illegible] high altitude [illegible] and 100 km. This beam required a current of about 500 A to suppress [illegible] expansion. A theory of radial beam [illegible] of inhomogeneity is proposed [illegible] W in the high [illegible] of the beam trajectory. W is related to the relative amount of radial spread due to [illegible] betatron wavelength. The properties of the charge neutralization channel required for effective [illegible] propagation are considered. It is shown that neutralizing electrons may respond to the bare ion beam charge differently at different locations on the trajectory. This has important implications in the creation of such channels. The effects of an imperfect neutralization channel on beam aiming is discussed. (U)

DESCRIPTORS: *Ion beams, Wave propagation, Particle beams, Atmospheric density, Charged particles, High altitude, Electrons (U)

IDENTIFIERS: PE61102F, WUAFOSR2301A7 (U)

AD-A128 486   20/12   7/4   14/2

ILLINOIS UNIV AT URBANA DEPT OF PHYSICS

Measurement of High Mobilities and Strain Confinement of Long-Lived Free Excitons in CU2O. (U)

DESCRIPTIVE NOTE: Interim scientific rept.,
JAN 83   14P   Wolfe,James P. ;
CONTRACT: AFOSR-79-0124
PROJ: 2301
TASK: A8
MONITOR: AFOSR TR-83-0381

UNCLASSIFIED REPORT

ABSTRACT: One of the long range goals of this project has been to produce a photoexcited exciton system which displays quantum statistics. A method is made to produce excitons in a superconducting or superfluid state. One of the prime difficulties in achieving this goal is that excitons in direct gap semiconductors generally have very short lifetimes, [illegible], which is not long enough to permit their kinetic energies to come into equilibrium with the lattice temperature. On the other hand, the direct gap semiconductor exhibits excitons with very small Bohr radii advantageous to [illegible] quantum statistics. To circumvent the lifetime problem stated above, high purity crystals of Cu2O, which recently were shown to display excitonic lifetimes in the microsecond range have been studied. (U)

DESCRIPTORS: *Semiconductors, *Excitons, *Photoluminescence, *Measurement, Copper compounds, Crystal structure, Excitation, Life expectancy(Service life), Mobility, Holes(Electron Deficiencies), Quantum statistics, Energy levels, Superconductivity, Superfluidity, Photoelectron spectra (U)

IDENTIFIERS: Paraexciton, Energy shifts, Direct gap semiconductor, Copper oxides, Strain confinement, PE61102F, WUAFOSR2301A8 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 485 20/4 12/1

NIELSEN ENGINEERING AND RESEARCH INC MOUNTAIN VIEW CA

Research on Topics in Transonic Flow Theory and Adaptive Grid Generation. (U)

DESCRIPTIVE NOTE: Annual technical rept. 1 Feb 82-31 Jan 83,
FEB 83 12P Nixon,D. ;Klopfer,G. H. ;
CONTRACT: F49620-79-C-0054
PROJ: 2307
TASK: A1
MONITOR: AFOSR TR-83-0424

UNCLASSIFIED REPORT

ABSTRACT: This report summarizes work concerned with some topics connected with a transonic flow theory and also some problems in adaptive mesh procedures. The work on adaptive mesh procedures is concerned with the development of adaptive mesh strategies and solution procedures for highly clustered adaptive meshes. It has been found that the strong conservation law form of the governing equations in computational variables cannot capture the shock waves correctly for arbitrary clustering. Methods for correcting this problem have been investigated. The work on transonic flow theory is concerned with the existence of multiple solutions in full potential calculations. Since the full potential equation is difficult to analyze compared with small disturbance equation, multiple solutions have been found using transonic small disturbance theory. These results have been analyzed using the transonic integral equation theory and indicate that the transonic potential theory is not formulated uniquely. (U)

DESCRIPTORS: *Transonic flow, *Grids, *Numerical analysis, Partial differential equations, Adaptive systems, Mesh, Clustering, Strategy, Computations, Shock waves, Variables, Corrections, Integral equations, Finite difference theory, Transformations(Mathematics), Truncation, Errors (U)
IDENTIFIERS: PE61102F, WUAFOSR2307A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 484 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

On Limiting Distributions of Order Statistics with Variable Ranks from Stationary Sequences. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 83 31P Cheng,Shihong ;
REPT. NO. TR-25
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0414

UNCLASSIFIED REPORT

DESCRIPTORS: *Order statistics, *Sequences(Mathematics), *Distribution functions, Normal distribution, Random variables, Limitations, Stationary, Theorems, Covariance, Convergence (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 482 12/1

UNIVERSITY OF CENTRAL FLORIDA ORLANDO DEPT OF MATHEMATICS AND STATISTICS

Characterizing Dominates on a Family of Triangular Norms. (U)

DESCRIPTIVE NOTE: Technical rept., OCT 82 28P Sherwood,Howard ;
REPT. NO. 20-1160 001
CONTRACT: AFOSR 81-0124
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0386

UNCLASSIFIED REPORT

ABSTRACT: In this paper the dominates relation is characterized on a family of subgroups on the unit interval. The dominates relation was shown to be [illegible] on the family. A t-norm is a function defined from I x I (I = [0, 1]) which is commutative, associative, nondecreasing in each [illegible], and 1 is a unit element and one as an identity. (U)
DESCRIPTORS: (Mathematical applications), Triangulation, Functions(Mathematics), Real numbers, Inequalities, Theorems, Transitions, Points(Mathematics), Boundaries (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A4 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 481 7/3 20/1

NORTH DAKOTA STATE UNIV FARGO DEPT OF CHEMISTRY

Organic Sonochemistry. Sonic Acceleration of the Reformatsky Reaction, (U)

APR 82 4P Han,Byung-Hee ;Boudjouk, Philip ;
CONTRACT: AFOSR-80-0239
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0377

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry, v47 p5030-5032 1982. Reprint: Organic Sonochemistry. Sonic Acceleration of the Reformatsky Reaction.

DESCRIPTORS: (Organic chemistry, Sound waves, Metals, Reaction kinetics, Activation energy, Acoustic waves, Ultrasonics, Reprints (U)
IDENTIFIERS: Sonochemistry, Reformatsky reactions, Sonocatalysis, Acoustichemistry, Sonically activated metals, Sonication, Active metals, WUAFOSR2303B2, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 477 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

On Bayes Estimation of Reliability for the Birnbaum-Saunders Fatigue Life Model, (U)

DEC 81 5P Padgett,W. J. ;
CONTRACT: F49620-79-C-0140, AFOSR-81-0166
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0384

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Reliability, vr-31 n5 p436-438 Dec 82.

DESCRIPTORS: *Mathematical models, *Fatigue life, *Reliability, Maximum likelihood estimation, Bayes theorem, Monte Carlo method, Reprints (U)
IDENTIFIERS: Method of moments, Birnbaum Saunders fatigue life model, PE61102F, WUAFOSR2304A5 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 476 7/4

TEXAS UNIV AT AUSTIN DEPT OF PHYSICS

Azimuthal Dependence of Impact Scattering in Electron Energy Loss Spectroscopy, (U)

83 8P Davies,B. M. ;Erskine,J. L. ;
CONTRACT: AFOSR-80-0154
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0394

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electron Spectroscopy and Related Phenomena, v29 p323-328 1983.
Reprint: Azimuthal Dependence of Impact Scattering in Electron Energy Loss Spectroscopy.

DESCRIPTORS: *Azimuth, *Electron impact spectra, *Surface chemistry, *Electron spectroscopy, Electron energy, Losses, Tungsten, Hydrogen, Angles, Electron scattering, Vibrational spectra, Chemisorption, Measurement, Reprints (U)
IDENTIFIERS: *EELS(Electron Energy Loss Spectroscopy), Impact scattering, PE61102F, WUAFOSR2303A2 (U)

AD-A128 475 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

Nonparametric Empirical Bayes Estimation of Reliability. (U)

81 12P Liang,K. Y. ;Padgett,W. J. ;

CONTRACT: F49620 79-C 0140
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83 0382

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Metron, Istituto Di Statistica E Ricerca Sociale 'Corrado Gini' v39 n1-2 p143-152, 30 Jun 81.
Reprint: Nonparametric Empirical Bayes Estimation of Reliability

DESCRIPTORS: (U) Probability distribution functions, Reliability, Estimates, Bayes theorem, Optimization, Asymptotic normality, Monte Carlo method, Simulation, Reprints, Italy (U)
IDENTIFIERS: (U) PE61102F, WUAFOSR2303A5 (U)

AD-A128 474 7/2 12/1 20/10

CALIFORNIA INST OF TECH PASADENA ARTHUR AMOS NOYES LAB OF CHEMICAL PHYSICS

Collinear Quantum Mechanical Probabilities and Rate Constants for the Br + HCl(v=2,3,4) Reaction Using Hyperspherical Coordinates. (U)

AUG 82 8P Kaye,Jack A. ;Kupperman, Aron ;

CONTRACT: F49620-79-C-0187
PROJ: 23-3
TASK: B1
MONITOR: AFOSR TR-83-0391

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v92 n6 p574-579, 12 Nov 82. Presented at the National Meeting of the American Chemical Society (184th) New York, NY Aug 81.
Reprint: Collinear Quantum Mechanical Probabilities and Rate Constants for the Br HCl(v=2,3,4) Reaction Using Hyperspherical Coordinates.

DESCRIPTORS: (U) Reaction kinetics, Bromine, Hydrogen chloride, Rates, Probability, Constants, Quantum statistics, Vibrational spectra, Deexcitation, Dynamics, Reprints (U)
IDENTIFIERS: Hyperspherical coordinates, Quantum mechanics, Vibrational state, Deexcitation, Rate constants, PE61102F, WUAFOSR2303B1 (U)

AD-A128 467 4/2 4/1

CORNELL UNIV ITHACA NY SCHOOL OF ELECTRICAL ENGINEERING

Comparison of Tropopause Height and Frontal Boundary Locations Based on Radar and Radiosonde Data. (U)

DESCRIPTIVE NOTE: Technical rept., DEC 82 6P Larsen,M. F. ;Roettger,J. ;
CONTRACT: AFOSR-83-0100
PROJ: 2314
TASK: A1
MONITOR: AFOSR TR-83-0392

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Geophysical Research Letters, v10 n4 p325-328 Apr 83.
Reprint: Comparison of Tropopause Height and Frontal Boundary Locations Based on Radar and Radiosonde Data.

DESCRIPTORS: *Tropopause, *Altitude, Fronts(Meteorology), Atmospheric temperature, Temperature gradients, Boundary layer, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2310A1 (U)

AD-A128 466 7/3

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

Organosilicon Rotanes. Synthesis and an Unexpected Rearrangement. (U)

DESCRIPTIVE NOTE: Technical rept., OCT 82 3P Carlson,Corey W. ;Zhang, Xing-Hua ;West,Robert ;
CONTRACT: AFOSR-82-0067
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0399

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v2 p453-454 1983.
Reprint: Organosilicon Rotanes: Synthesis and an Unexpected Rearrangement.

DESCRIPTORS: *Organic compounds, *Silanes, *Synthesis(Chemistry), *Cyclic compounds, Methylenes, Alkyl radicals, Alkali metals, Condensation reactions, Resonance, Formulations(Chemistry), Reprints (U)
IDENTIFIERS: Organosilicon rotanes, Polyspirocyclopolysilanes, PE61102F, WUAFOSR2303B2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 465 7/3 11/9 7/4 20/8

BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

Synthesis and Characterization of Tungsten-Cobalt, -Rhodium and -Platinum Compounds and the X-Ray Crystal Structures of RhW(mu-CCGH4Me-4)(CO)2(PMe3)(eta5-C5H5)(eta5-C9H7) and PtW mu-C(C6H4Me-4)C(O)(CO)(PMe3)(eta4-C8H12)(eta5-C5H5). (U)

DESCRIPTIVE NOTE: Technical rept.,
JUL 82 9P Jeffery,John C. ;Sambale, Clemens ;Schmidt,Manfred F. ;Stone,F. Gordon A. ;
CONTRACT: AFOSR-82-0070
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0407

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v1 n12 p1507-1604 1982.
Reprint: Synthesis and Characterization of Tungsten-Cobalt, -Rhodium, and -Platinum Compounds and the X-Ray Crystal Structures of RhW(mu-CCGH4Me-4)(CO)2(PMe3)(eta5-C5H5)(eta5-C9H7) and PtW mu-C(C6H4Me-4)C(O)(CO)(PMe3)(eta4-C8H12)(eta5-C5H5).

DESCRIPTORS: *Synthesis(Chemistry), *Classification, *Metal complexes, *Organometallic compounds, *X ray spectroscopy, Molecular structure, X ray diffraction, Crystal structure, Rhodium, Platinum, Cobalt, Tungsten, Metal metal bonds, Phosphine, Ketenes, Cyclic compounds, Reprints (U)
IDENTIFIERS: Ketenyl radicals, X ray crystallography, PE61102F, WUAFOSR2303B2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 464 7/4

TEXAS UNIV AT AUSTIN DEPT OF PHYSICS

Adsorbate Structure Modeling Based on Electron Energy Loss Spectroscopy and Lattice Dynamical Calculations. Application to O/Al(111). (U)

DESCRIPTIVE NOTE: Technical rept.,
83 8P Strong,R. L. ;Firey,B. ; deWette,F. W. ;Erskine,J. L. ;
CONTRACT: AFOSR-80-0154, NSF-DMR81-21916
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0402

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electron Spectroscopy and Related Phenomena, v29 p187-190 1983.
Reprint: Adsorbate Structure Modeling Based on Electron Energy Loss Spectroscopy and Lattice Dynamical Calculations. Application to O/Al(111).

DESCRIPTORS: *Electron spectroscopy, *Lattice dynamics, *Chemisorption, *Oxygen, *Aluminum, Vibrational spectra, Chemical bonds, Models, Reprints (U)
IDENTIFIERS: *EELS(Electron Energy Loss Spectroscopy), Calculations, PE61102F, WUAFOSR2303A2 (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 463 12/1

UNIVERSITY OF CENTRAL FLORIDA ORLANDO DEPT OF MATHEMATICS AND STATISTICS

Dominates on Equivalence Classes of Semigroup Operations (U)

DESCRIPTIVE NOTE: Final rept. May 81-Aug 82,
OCT 82 22P Sherwood,Howard ;
CONTRACT: AFOSR-81-0124
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0385

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the International Symposium on Functional Equations (19th), Brittany, France, May 81 and at the International Symposium on Functional Equations (20th), Oberwolfach, Germany, F.R. Aug 82.

ABSTRACT: Initially the problem was to study the dominates relation on a collection of semigroup operations called triangular norms. This led to an equivalent problem -- studying subadditivity of certain semigroup operations defined on the non-negative reals. The setting was later generalized to include both problems and to bring essentials of the problem into sharper focus. In the generalization, a partially ordered set S was endowed with the collection, Op(s), of all semigroup operations which had the same identity, e, and were non-decreasing in place. The dominates relation was defined on Op(S). The collection, Map(S), of order-preserving bijections from S to S map e to itself was used to partition Op(S) into equivalence classes -- two objects being placed in the same class if they were isomorphic via some member of Map(S). Dominates restricted to any equivalence class in via some member of Map(S). Dominates restricted to any equivalence class in Op(S) was shown to to exhibit a certain homogeniety relative to composition of elements in Map(S). Transitivity of dominates on an equivalence class was shown to be equivalent to an appropriate subset of Map(S) being alegbraically closed under composition. The equivalence classes determined by continuous triangular norms were characterized in terms of (U)

DESCRIPTORS: *Groups(Mathematics), (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 462 8/5 20/14

PHYSICAL DYNAMICS INC BELLEVUE WA

The Transient Critical-Level Interaction in a Boussinesq Fluid, (U)

OCT 81 22P Fritts,David C. ;
CONTRACT: F49620-81-C-0009
PROJ: 2310
TASK: A1
MONITOR: AFOSR TR-83-0374

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Geophysical Research, v87 nC10 p7997-8016, 20 Sep 82. Reprint: The Transient Critical-Level Interaction in a Boussinesq Fluid.

DESCRIPTORS: *Internal waves, *Gravity waves, Wave packets, Wave propagation, Interactions, Reprints (U)
IDENTIFIERS: Boussinesq fluid, Shear flow, PE61102F, WUAFOSR2310A1 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 461 7/4

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

Spatial and Temporal Studies of a Glow Discharge, (U)

NOV 81 12P VAN Dijk,C. ;Smith,B. W. ; Winefordner,J. D. ;
CONTRACT: F49620-80-C-0005
PROJ: 2303
TASK: A1
MONITOR: AFOSR TR-83-0401

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Spectrochimica Acta, v37B n3 p759-768 1982.
Reprint: Spatial and Temporal Studies of a Glow Discharge.

DESCRIPTORS: *Glow discharges, *Spatial distribution, *Reaction time, *Chemical analysis, Lasers, Excitation, Argon, Neon, Sodium, Diffusivity, Sputtering, Reprints (U)
IDENTIFIERS: Analytes, Diffusion coefficient, PE61102F, WUAFOSR2303A1 (U)

AD-A128 461 UNCLASSIFIED

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 457 7/3

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

Chemical Reactions of Tetramesityldisilene, (U)

OCT 83 3P Fink,Mark J. ;De Young, Douglas J. ;West,Robert ;Michl,Josef ;
CONTRACT: AFOSR-82-0067, NSF-CHE81-21122
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0398

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of American Chemistry Society, v105 n4 p1070-1071 1983.
Reprint: Chemical Reactions of Tetramesityldisilene.

DESCRIPTORS: *Organic compounds, *Chemical reactions, Silicon, Bonding, Methyl radicals, Phenyl radicals, Thermal properties, Photochemical reactions, Addition reactions, Reprints (U)
IDENTIFIERS: *Tetramesityldisilene, Thermolysis, Disilenes (U)

AD-A128 457 UNCLASSIFIED

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 454 20/8 12/1

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

Tritium Migration in Tritiated Anisole, (U)

SEP 81 4P Dewar,Michael J. S. ; Reynolds,Charles H. ;
CONTRACT: AFOSR-79-0008, NSF-CHE78-03213
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0376

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of American Chemical Society, v104 n11 p3244-3246 1982. Reprint: Tritium Migration in Tritiated Anisole.

DESCRIPTORS: *Molecular orbitals, *Migration, *Computations, *Tritium, Chemical shifts, Ethylenes, Alkyl radicals, Computers, Stability, Hydrogen, Reprints (U)
IDENTIFIERS: Experimental studies, MINDO-3, MEP(Minimum Energy Reaction Paths), Tritiated anisole, MINDO calculations, PE61102F, WUAFOSR2303B2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 453 20/8 11/9

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

Isomeric Sigma and Pi Radicals from Carboxylic Acids and Amides, (U)

AUG 81 4P Dewar,Michael J. S. ; Pakiari,Ali H. ;Pierini,Adriana B. ;
CONTRACT: AFOSR-79-0008
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0375

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of American Chemical Society, v104 n11 p3242-3244 1982. Reprint: Isomeric Sigma and Pi Radicals from Carboxylic Acids and Amides.

DESCRIPTORS: *Isomerization, *Carboxylic acids, *Carbenes, Molecular structure, Isomeric transitions, Cyclic compounds, Electron transfer, Computations, Molecular orbitals, Reprints (U)
IDENTIFIERS: Cyclic carbenes, Orbital isomerisms, Singlet forms, Biradicals, MNDO(Modified Neglect Diatomic Overlap), PE61102F, WUAFOSR2303B2 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 452 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

Convergence of Weighted Sums of Arrays of Random Elements in Type p Spaces with Application to Density Estimation, (U)

SEP 81 13P Taylor,Robert Lee ;
CONTRACT: F49620-79-C-0140
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0383

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Sankhya: The Indian Jnl. of Statistics, v44 Series A Pt 3 p341-351 1982.
Reprint: Convergence of Weighted Sums of Arrays of Random Elements in Type p Spaces with Application to Density Estimation.

DESCRIPTORS: *Banach space, Probability density functions, Random variables, Convergence, Estimates, Arrays, Weighting functions, Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

AD-A128 450 20/1 12/1

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

The Three Dimensional Inverse Scattering Problem for Acoustic Waves. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 81 14P Angell,T. S. ;Colton,David ;Kirsch,Andreas ;
CONTRACT: AFOSR-81-0103, AFOSR-79-0085
PROJ: 2304
TASK: A4
MONITOR: AFOSR TR-83-0408

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Differential Equations, v46 n1 p46-58 Oct 82.
Reprint: The Three Dimensional Inverse Scattering Problem for Acoustic Waves.

DESCRIPTORS: *Acoustic scattering, *Inverse scattering, *Acoustic waves, *Differential equations, Three dimensional, Far field, Problem solving, Optimization, Approximation(Mathematics), Reprints (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A4 (U)

AD-A128 448 7/4

STANFORD UNIV CA DEPT OF CHEMISTRY

Multiphoton Ionization Photoelectron Spectroscopy: A New Method for Determining Vibrational Structure of Molecular Ions, (U)

SEP 82 7P Anderson,S. L. ;Rider,D. M. ;Zare,R. N. ;

CONTRACT: AFOSR-81 0053
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0378

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v93 n1 p11-15, 19 Nov 82. Reprint: Multiphoton Ionization Photoelectron Spectroscopy: A New Method for Determining Vibrational Structure of Molecular Ions.

DESCRIPTORS: *Electron spectroscopy, *Molecular vibration, *Molecular ions, *Molecular structure, Photoelectron spectra, Vibrational spectra, Polyatomic molecules, Two photon absorption, Chlorobenzene, Excitation, Atomic energy levels, Measurement, Methodology, Reprints (U)
IDENTIFIERS: *MPI(Multiphoton Ionization), PES(Photoelectron Spectroscopy), WUAFOSR2303A1, PE61102F (U)

AD-A128 446 20/5 7/4

ROCHESTER UNIV NY DEPT OF CHEMISTRY

Model for the Propagation of Pulsed Surface Polaritons with Quasi-Self-Induced Transparency, (U)

NOV 82 8P Huang,Xi-Yi ;Lin,Jui-teng ;George,Thomas F. ;

CONTRACT: AFOSR-82-0046
PROJ: 2303
TASK: A2
MONITOR: AFOSR TR-83-0406

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Zeitschrift fuer Physik B - Condensed Matter, v50 n2 p181-186 1983. Reprint: Model for the Propagation of Pulsed Surface Polaritons with Quasi-Self-Induced Transparency.

DESCRIPTORS: *Pulsed lasers, *Surface chemistry, *Gas dynamics, *Reaction kinetics, Propagation, Interfaces, Maxwells equations, Reprints (U)
IDENTIFIERS: Polaritons, Quasi self induced transparency, Pulsed surface polaritons, WUAFOSR2303A2, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 445 4/2

COLORADO STATE UNIV FORT COLLINS DEPT OF ATMOSPHERIC SCIENCE

A Relationship between Planetary Waves and Persistent Rain- and Thunderstorms in China (Zusammenhaenge Zwischen Planetaren Wellen und Anhaltenden Regen- und Gewitterstuermen in China). (U)

MAY 82 34P Ding,Yi-hui ;Reiter,E. R. ;

CONTRACT: AFOSR 82-0162
PROJ: 2310
TASK: A1
MONITOR: AFOSR TR-83-0390

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Archives for Meteorology, Geophysics, and Bioclimatology, Ser. B, v31 p221-262 1982. Summary in German
Reprint. A Relationship between Planetary Waves and Persistent Rain- and Thunderstorms in China.

DESCRIPTORS: Rainfall, China, Thunderstorms, Rainfall intensity, Troposphere, Waves, Barometric pressure, Typhoons, German language, Reprints (U)
IDENTIFIERS: Planetary waves, WUAFOSR2310A1, PE61102F (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 444 7/3 21/9

PRINCETON UNIV NJ DEPT OF CHEMICAL ENGINEERING

A Mechanistic Study of Nitromethane Decomposition on Ni Catalysts. (U)

DESCRIPTIVE NOTE: Final rept., OCT 82 20P Benziger,Jay ;
CONTRACT: AFOSR-82-0099
PROJ: 2303
TASK: D9
MONITOR: AFOSR TR-83-0405

UNCLASSIFIED REPORT

ABSTRACT: Nitromethane is one of several compounds which decomposes exothermically and may be used as a monopropellant in small rocket thrusters and demand gas generators. The use of nitromethane for such uses has not received much attention due to the absence of an appropriate catalyst to facilitate its decomposition. Recently, the decomposition of nitromethane over NiO and Cr2O3 catalysts has been developed to examine the feasibility of a nitromethane based monopropellant system. These studies indicated that a NiO/alumina catalyst was effective in causing nitromethane decomposition. However, relative to existing hydrazine based monopropellant systems the nitromethane NiO/alumina system suffered two severe drawbacks; first, it required much higher light-off temperatures than hydrazine based systems, and second, the decomposition reaction poisoned the catalyst with carbon degrading performance with continued use. (U)
DESCRIPTORS: *Nitromethane, *Decomposition, *Catalysts, *Reaction kinetics, Monopropellants, Mixtures, Catalysis, Oxidation, Nickel compounds, Aluminum, Reaction time, Chemical bonds, Deposition, Carbon, Hydrogen cyanide (U)
IDENTIFIERS: Nickel oxide catalysts (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A128 443 12/1

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

Testing Whether New is Better than Used of a Specified Age. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 83 18P Hollander,Myles ;Park,Dong Ho ;Proschan,Frank ;
REPT. NO. FSU STATISTICS M646, TR 82-153 AFOSR
CONTRACT: F49620 82 K 0007
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR 83-0416

UNCLASSIFIED REPORT

ABSTRACT: The authors introduce a new better than used at t sub o class of life distributions, where the survival probability at age 0 is greater than or equal to the conditional survival probability at specified age t sub o greater than 0. The dual class of new worse than used at t sub o life distributions is defined by reversing the direction of inequality. The authors preservation and preservation properties of the two classes under series reliability operations. They then develop a test of the null hypothesis that a new item has stochastically the same residual lifelength as does a used item of age t sub o versus the alternative hypothesis that a new item has stochastically greater residual lifelength than does a used item of age t sub o. (U)

DESCRIPTORS: *Stochastic processes, *Probability distribution functions, Survivability, Probability, Failure, Preservation, Inequalities, Reliability, Statistical tests, Hypotheses (U)

IDENTIFIERS: Life distributions, WUAFOSR2304A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 442 19/1 20/2 20/13 14/2

PURDUE UNIV LAFAYETTE IN THERMOPHYSICAL PROPERTIES RESEARCH LAB

Specific Heat of Octahydro - 1,3,5,7 - Tetranitro - 1,3,5,7 - Tetrazocine (HMX). (U)

DESCRIPTIVE NOTE: Interim scientific rept.,
JAN 83 26P Koshigoe,L. G. ;Shoemaker, R. L. ;Taylor,R. E. ;
REPT. NO. TPRL-314
CONTRACT: F49620-81-K-0011
PROJ: 2308
TASK: A1
MONITOR: AFOSR TR-83-0373

UNCLASSIFIED REPORT

ABSTRACT: The specific heat of octahydro-1,3,5,7-tetranitro 1,3,5,7-tetrazocine (HMX) has been studied with a Differential Scanning Calorimeter from 315-486 degrees K. Measurements were made on both small pieces of single crystals of HMX and on a powdered blend. In both cases, the specific heats of the beta and alpha phases, and also of partially decomposed HMX were determined. The results show that the specific heat values for the two phases are nearly the same. Differences in the specific heat values for the single crystals, powdered and partially decomposed samples are small, and all lie within a bond of 6%. The value for the single crystals are the lowest; for the powdered blend, intermediate and for the partially decomposed; highest. In the case of the single crystals versus the powder, the values are within the combined experimental error of 3%. (Author) (U)

DESCRIPTORS: *HMX, *Specific heat, *Scanning, *Calorimeters, *Single crystals, Nitro radicals, Differential analyzers, Decomposition, Decay, Chemical bonds, Crystal structure (U)

IDENTIFIERS: Differential scanning calorimeters, Delta HMX, Beta HMX (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 441 12/1

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

Applications of a Unified Theory of Monotonicity in Selection Problems. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 83 17P Berger,Roger L. ;Proschan, Frank ,
REPT. NO. FSU STATISTICS M652, TR D 58 ARO
CONTRACT: F49620 82 K 0007, DAAG29 82-K-0168
PROJ: 2304
TASK: A5
MONITOR: AFOSR,ARO TR 83-0422,19367.3-MA

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Also available as Rept. no. TR 83-156 AFOSR
ABSTRACT: In this paper, the general monotonicity results concerning selection problems derived by Berger and Proschan are reviewed. They are then applied to several different formulations of the [illegible] problem. These include comparison with a control and restricted subset selection problems. Several classes of selection rules previously proposed in the literature are shown to possess the monotonicity properties. In addition, a new class of rules for the restricted subset selection formulation is proposed and shown to possess the monotonicity properties. (U)
DESCRIPTORS: *Population(Mathematics), *Selection, Ranking, Parametric analysis, Value, Coordinates, Inequalities, Permutations, Mathematical models (U)
IDENTIFIERS: *Monotonicity, WUAFOSR2304A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD A128 139 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

Central Limit Theory for Martingales via Random Change of Time. (U)

DESCRIPTIVE NOTE: Technical rept.,
FEB 83 39P Rootzen,Holger ;
REPT. NO. TR 28
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0421

UNCLASSIFIED REPORT

ABSTRACT: This paper contains an exposition of the by now rather complete central limit theory for discrete parameter martingales providing new and efficient proofs. The basic idea is to start by proving a central limit theorem under quite restrictive conditions (that the summands tend uniformly to zero and that the sums of squares converge uniformly) and then to obtain the most general results by random change of time and [illegible]. The emphasis is on the sums of squares (or squared variation process), and Burkholder's square function inequality plays a crucial role in the development. In particular, this approach leads to a very short and direct proof of tightness. In the proofs we make much use of a result which is believed to be new and which binds together convergence to zero of sums and of sums of conditional expectations. In the final section, the results are extended to several dimensions, to mixing convergence, and to convergence to mixtures of normal distributions. (Author) (U)
DESCRIPTORS: *Stochastic processes, Theorems, Normal distribution, Time, Parameters, Truncation, Random variables, Convergence, Inequalities (U)
IDENTIFIERS: Martingales, Central limit theory, WUAFOSR2304A5, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 434 6/15

CONNECTICUT UNIV STORRS DEPT OF BIOBEHAVIORAL SCIENCES

Acute Effects of Anticholinesterase Agents on Pupillary Function. (U)

DESCRIPTIVE NOTE: Final rept. 6 Jun 81-31 Dec 82,
MAR 83 16P Giacobini,Ezio ;
CONTRACT: AFOSR 81-0229
PROJ: 2312
TASK: K1
MONITOR: AFOSR TR-83-0435

UNCLASSIFIED REPORT

ABSTRACT: The strategy of this investigation was to correlate closely any impairment of pupillary function to parameters of cholinergic function in vitro and in vivo, following topical or systemic administration of anti-ChEs. The study focused upon three aspects of cholinergic function: the synthesis and turnover of ACh, the cholinergic receptor and the release of ACh. A schematic diagram of the various steps involved in the analysis of multiple parameters of acetylcholine metabolism in a single isolated iris is reported. The characteristics of the high and low affinity Ch uptake system which have been previously described for the developing and aging avian iris (Marchi et al., Dev. Neurosci. 3, 185, 1980 and Brain Res. 195, 423, 1980) have now been determined for the adult rat iris. (U)
DESCRIPTORS: *Cholinesterase inhibitors, *Acetylcholine, *Cholines, Pharmacokinetics, In vitro analysis, In vivo analysis, Chemoreceptors, Physiological effects, Iris, Rats, Biological absorption, Scopolamine, Metabolism (U)
IDENTIFIERS: WUAFOSR2312K1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 432 20/9 20/3 12/1

NORTHEASTERN UNIV BOSTON MA

Effects of Nonconvective Electric Fields on Magnetospheric Plasma Dynamics. (U)

DESCRIPTIVE NOTE: Final rept. 1 Dec 81-31 Jan 83,
JAN 83 99P Silevitch,M. B. ;
CONTRACT: AFOSR-78-3731
PROJ: 2311
TASK: A1
MONITOR: AFOSR TR-83-0379

UNCLASSIFIED REPORT

ABSTRACT: A study of a mechanism which can cause the disruption of a stationary electric potential structure was completed. Results were applied to the parallel electric fields which are associated with auroral arcs. A program of research directed towards analyzing the structure of small scale auroral vortices observed by an Air Force satellite was completed. Two intense auroral events marked by large deflections in the east-west magnetic field component were studied. The events are associated with electric fields whose magnitude can exceed 200 mV/m. Electric field variations give rise to plasma vortex flow patterns similar to these observed in auroral folds and curls. Observed values were consistent with collisionless, single-particle theories. (Author) (U)
DESCRIPTORS: *Plasmas(Physics), *Magnetosphere, *Electrodynamics, *Electric fields, Vortices, Magnetic fields, Deflection, Charts, Stationary, Electric arcs, Aurorae, Vortices (U)
IDENTIFIERS: WUAFOSR2311A1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 429 12/1 20/8

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

Spherical-Harmonic Expansion Techniques for Multicenter Integrals over STO's (Slater-Type Orbitals). A Re-Examination for Vector Processing Computers, (U)

82 21P Michels,H. Harvey ;
CONTRACT: F49620-81-C-0097
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0395

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in ETO Multicenter Molecular Integrals, p103-121 1982.
Reprint: Spherical Harmonic Expansion Techniques for Multicenter Integrals over STO's (Slater-Type Orbitals). A Re-Examination for Vector Processing Computers.

DESCRIPTORS: *Integrals, *Vector analysis, *Computers, *Atomic orbitals, Processing equipment, Reprints (U)
IDENTIFIERS: Spherical harmonic expansion, Vector processing computers, Multicenter integrals, WUAFOSR2303B1, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 428 11/9 7/4

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

Isomers of (PhMeSi)6 and (PhMeSi)5, (U)

SEP 82 7P Chen,San-Mei ;David, Lawrence D. ;Haller,Kenneth J. ;Wadsworth, Cynthia L. ;West,Robert ;
CONTRACT: AFOSR-82-0067, AFOSR-78-3570
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0397

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v2 p409-414 1983.
Reprint: Isomers of (PhMeSi)6 and (PhMeSi)5.

DESCRIPTORS: *Isomers, *Polysilanes, *Cyclic compounds, *Electron spectroscopy, Electron spin resonance, Organometallic compounds, Reprints (U)
IDENTIFIERS: Cyclosilanes, Electron spin resonance spectroscopy, WUAFOSR2303B2, PE61102F (U)

AD-A128 427 7/3

ROCKWELL INTERNATIONAL CANOGA PARK CA ROCKETDYNE DIV

New Syntheses of Pentafluorotellurium Hypochlorite, (U)

APR 82 5P Schack,Carl J. ;Christe, Karl O. ;

CONTRACT: F49620-81-C-0020
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0411

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluorine Chemistry, v21 p393-396 1982. Reprint: New Syntheses of Pentafluorotellurium Hypochlorite.

DESCRIPTORS: *Synthesis(Chemistry), *Fluorine, *Tellurium compounds, *Hypochlorites, Sulfates, Fluorides, Reprints (U)
IDENTIFIERS: Pentafluorotellurium hypochlorite, Fluorosulfate, Monofluoride, WUAFOSR2303B2, PE61102F (U)

AD-A128 424 6/16 6/15

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

The Electrophysiologic Mechanisms of Halogenated Alkane Arrhythmogenesis. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jul 79-31 Aug 82,
MAR 83 135P Strauch,S. Mark ;
CONTRACT: F49620-79-C-0185
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0436

UNCLASSIFIED REPORT

ABSTRACT: Bromochlorodifluoromethane (1211) has been shown to sensitize the myocardium to the arrhythmogenic effects of adrenergic amines. Various physiologic and pharmacologic interventions were shown to modify both FC 1211 membrane effects as well as the FC 1211 sensitization process. These interventions included alternations in potassium concentration, applying stretch to Purkinje fibers, production of hypoxic conditions, alpha adrenergic effects and beta blockage of calcium mediated slow channel effects. In studies combining cyclic nucleotide measurements with electrophysiologic parameters, it was shown that isoproterenol and FC 1211 act in an additive way to increase cyclic adenosine monophosphate levels in Purkinje fibers. Effects of FC 1211 in conscious dogs indicated that the arrhythmogenic action is due to cardiac sensitization and mediated through beta receptors. (Author) (U)

DESCRIPTORS: *Halogenated hydrocarbons, *Methanes, Electrophysiology, Arrhythmia, Physiological effects, Myocardium, Amines, Adenosine phosphates, Chlorine compounds, Bromine compounds, Fluorine compounds, Bioassay, Dogs, Dosage (U)
IDENTIFIERS: *Bromochlorodifluoromethane, Adrenergic amines, WUAFOSR2312A5, PE61102F, LPN-OSURF-761648/712005 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 421 11/9 20/8

CINCINNATI UNIV OH DEPT OF CHEMISTRY

Theoretical Studies of Relatively Rigid Polymer Chains. (U)

DESCRIPTIVE NOTE: Final rept. 1 Aug 78-31 Oct 82,
DEC 82 89P Welsh,W. J. ;Bhaumik,D. ;
Nayak,K. ;Mark,J. E. ;
CONTRACT: AFOSR 78 3683
PROJ: 2303
TASK: A3
MONITOR: AFOSR TR-83-0431

UNCLASSIFIED REPORT

ABSTRACT: Various theoretical approaches were applied to elucidate the structure and properties of rigid rodlike polymer chains which are of interest as high performance polymeric materials. First, semi-empirical molecular mechanics methods were used to calculate the intramolecular and intermolecular energies pertinent to conformational flexibility and chain packing effects, and to characterize the conformational flexibility of various molecular swivels which could be incorporated into these rodlike chains to facilitate their processing. Second, geometry optimized CNDO/2 molecular orbital calculations were carried out to investigate the structure and conformational characteristics of the rodlike polymers and of wholly aromatic swivels, in both the unprotonated and protonated states. Third, several theoretical approaches were used to calculate the molecular polarizabilities of the; rodlike chains and of several analogous aliphatic and aromatic hydrocarbons. Fourth, electronic band gap calculations within the extended Huckel approximation were carried out in both the axial and perpendicular directions to elucidate the packing and electronic properties of these chains in the crystalline state. Some of these same methods were also used to investigate a variety of molecular species possessing structural features similar to those of the rodlike polymers. (Author) (U)
DESCRIPTORS: *Polymers, *Molecular structure, *Chains, *Molecular weight, *Azoles, Rigidity, Feasibility studies, Stacking, Polarization, Electrical conductivity, Rods, Molecular energy levels, Heterocyclic compounds, Molecule molecule (U)
IDENTIFIERS: Experimental studies, Molecular (U)
AD-A128 421

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 418 12/1

MARYLAND UNIV COLLEGE PARK COMPUTER VISION LAB

Error-Free Parallel High-Order Convergent Iterative Matrix Inversion Based on p-ADIC Approximation. (U)

DESCRIPTIVE NOTE: Technical rept.,
NOV 82 22P Krishnamurthy,E. V. ;
REPT. NO. TR-1229
CONTRACT: AFOSR-77-3271
PROJ: 2304
TASK: A2
MONITOR: AFOSR TR-83-0387

UNCLASSIFIED REPORT

ABSTRACT: The Newton-Schultz iterative scheme is reformulated in an algebraic setting to compute the exact inverse of a matrix (or the solution of a linear system of equations) over the ring of integers, with a high order or convergence, by using a finite segment p-adic representation of a rational. This method is divergence-free; it starts with the inverse of a given matrix over a finite field (called the priming step) and then iterates successively to construct, in parallel, the p-adic approximants (Hensel Codes) of the rational elements of the inverse matrix. The p-adic approximant is then converted back to the equivalent rational using the extended Euclidean algorithm. The method involves only parallel matrix multiplications and complementations and has a quadratic convergence rate. Extension to achieve higher order convergence is straightforward if parallel matrix arithmetic facilities for higher precision operands (in a prime base system) are available. (Author) (U)
DESCRIPTORS: *Iterations, *Matrices(Mathematics), *Inversion, Algorithms, Computations, Approximation(Mathematics), Convergence, Linear algebraic equations, Numerical methods and procedures, Numbers (U)
IDENTIFIERS: Newton schultz iterative scheme, PE61102F, WUAFOSR2304AE (U)

AD-A128 416 7/3

ROCKWELL INTERNATIONAL CANOGA PARK CA ROCKETDYNE DIV

Reactions of Azidotrifluoromethane with Halogen-Containing Oxidizers, (U)

APR 82 5P Schack,Carl J. ;Christe, Karl O. ;

CONTRACT: F49620-81-C-0020
PROJ: 2303
TASK: B2
MONITOR: AFOSR TR-83-0413

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v22 n1 p22-25 1983.
Reprint: Reactions of Azidotrifluoromethane with Halogen-Containing Oxidizers.

DESCRIPTORS: *Methanes, *Chemical reactions, *Halogen compounds, *Oxidizers, Fluorine compounds, Sulfates, Synthesis(Chemistry), Chemical compounds, Chemical properties, Reprints (U)
IDENTIFIERS: *Azido trifluoromethane, Fluorosulfates, Peroxydisulfuryl difluoride, Caesium fluoride, PE61102F, WUAFOSR2303B2 (U)

AD-A128 414 20/4 12/1

RHODE ISLAND UNIV KINGSTON DEPT OF MATHEMATICS

Stability of Compressible Wake and Jet Flows. (U)

DESCRIPTIVE NOTE: Final rept. 15 Feb 82-14 Feb 83,
FEB 83 83P Verma,G. R. ;Scherr,S. J. ;Hankey,W. L. ;
CONTRACT: AFOSR-82-0130
PROJ: 2307
TASK: A1, N4
MONITOR: AFOSR TR-83-0425

UNCLASSIFIED REPORT

ABSTRACT: In this report the stability of compressible inviscid jets and wakes has been investigated for various wave numbers and Mach numbers for different velocity profiles. (Author) (U)
DESCRIPTORS: *Compressible flow, *Jet flow, *Wake, *Equations, Stability, Inviscid flow, Eigenvalues, Frequency, Mach number, Two dimensional flow, Velocity, Profiles, Perturbations, Computations, Tables(Data), Asymmetry, Symmetry (U)
IDENTIFIERS: PE61102F, WUAFOSR2307A1, WUAFOSR2307N4B6 (U)

AD-A128 396 8/11 18/3

SAINT LOUIS UNIV MO DEPT OF EARTH AND ATMOSPHERIC SCIENCES

Attenuation of Seismic Waves at Regional Distances. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 78-30 Sep 82,
FEB 83 78P Mitchell,Brian J. ;Nuttli, Otto W. ;
CONTRACT: F49620-79-C-0025, ARPA Order-3291
PROJ: 2309
TASK: A1
MONITOR: AFOSR TR-83-0427

UNCLASSIFIED REPORT

ABSTRACT: This final report deals in part with the use of regional seismic crustal phases, particularly Lg, to discriminate between explosions and earthquakes, to determine mb values of explosions and earthquakes, and to estimate yields at regional distances. An mb-log yield calibration relation is developed for NTS events, and then used to estimate the yields of selected explosions at the Eat Kazakh test sites in the USSR. The report is further concerned with the attenuation of seismic surface waves at intermediate periods and how the attenuation of those waves is related to that of higher frequency crustal phases. Significant regional variations of upper crustal Q values are found and higher frequency wave propagate more efficiently than expected on the basis of intermediate period waves. (U)
DESCRIPTORS: *Seismic waves, Periodic variations, Attenuation, Nuclear explosion detection, Rock, Earth crust, USSR, Primary waves(Seismic waves), Waveforms (U)
IDENTIFIERS: PE62714E, NUAFOSR2309A1 (U)

AD-A128 386 21/5 20/ 20/4

TENNESSEE UNIV SPACE INST TULLAHOMA DEPT OF AEROSPACE AND MECHANICAL ENGINEERING

Unsteady Swirling Flows in Gas Turbines. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Apr 78-31 Dec 82,
MAR 83 16P Kurosaka,M. ;
CONTRACT: F49620-78-C-0045
PROJ: 2307
TASK: A4
MONITOR: AFOSR TR-83-0426

UNCLASSIFIED REPORT

ABSTRACT: The overall objective was to acquire fundamental understanding of pheromena characterized by violent fluctuation induced by swirling flow - the 'vortex whistle', often found to occur in various aircraft engine components. By conducting a comprehensive and systematic investigation into the 'vortex whistle', it was in order to achieve the following specific goals: ( ) by performing analysis to predict the frequency of the vortex whistle and verifying it against the experimental results, one can detune the natural frequencies of engine components away from it in order to ensure their structural integrity, and (2) by appealing to the mechanism of acoustic streaming induced by the vortex whistle, we explained, through both analysis and experiment, the transformation of steady radial profile - in particular the total temperature separation or the Ranque-Hilsch tube effect; the implications of this are that the radial distortion of the flow field may have strong bearing on the 'steady' aero data obtained in the swirling flow environment of gas turbines. (Author) (U)
DESCRIPTORS: *Gas turbines, *Aircraft engines, *Unsteady flow, *Aerodynamic noise, Acoustics, Suppressors, Vortices, Gas flow, Flow rate, Oscillation, Fatigue(Mechanics), Failure(Mechanics), Turbomachinery, Aerodynamic stability, Variations, Flow fields, Nonlinear analysis, Flow noise (U)
IDENTIFIERS: Vortex whistle, Aeroacoustics, Swirling flow, Ranque-Hilsch effect, Flow induced oscillation, Fluctuations, (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 384 20/8 20/5

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

Rotational Relaxation Studies of Hydrogen Fluoride. (U)

DESCRIPTIVE NOTE: Final rept.,
NOV 82 33P Hinchen,J. J. ;Hobbs,R. H. ;
REPT. NO. UTRC/R82-955423
CONTRACT: F49620-81-C-0011
PROJ: 2303
TASK: B1
MONITOR: AFOSR TR-83-0432

UNCLASSIFIED REPORT

ABSTRACT: Laser double resonance experiments in HF were extended to probing levels as high as J= 13 to define the processes of population transfer between rotational levels and transfer from vibration to rotation. In the first part of this report rotational transfer experiments are described and the results are compared with three different kinetic models. Using the criteria of transfer rates and signal shapes for evaluation, the Polyani-Woodall model was found to best describe the data. The second part of the report describes observations of direct transfer of vibrational (V=1) transfer to rotational levels J=10-13 of V=0. Very fast transfer by this route was measured but only a small fraction of the V=1 population was involved. Dilution of the HF sample by rare gases was found to enhance V-R transfer in accord with observations reported for rotational HF lasers. (U)

DESCRIPTORS: *Molecular rotation, *Chemical lasers, *Relaxation, *Hydrogen fluoride lasers, Spin resonance, Molecular vibration, Energy transfer, Molecular energy levels, Kinetic theory, Models, Standards (U)

IDENTIFIERS: Rotational transfer experiments, Rotational population transfer, Polani woodall model, Rotational levels, WUAFOSR230381, PE61102F (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 378 6/13

OHIO STATE UNIV COLUMBUS DEPT OF MICROBIOLOGY

Development and Use of Anucleate Bacterial Cells to Assay the In vitro Activity of Pollutants. (U)

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 81-31 Jul 82,
DEC 82 25P Reeve,John N. ;
CONTRACT: AFOSR-81-0087
PROJ: 2312
TASK: A5
MONITOR: AFOSR TR-83-0442

UNCLASSIFIED REPORT

ABSTRACT: The T7 0.3 gene product (0.3 protein) was purified by a modification of the published procedure (2), and used to raise antibody to this protein. A radioimmune precipitation (RIP) assay was developed which could be used to estimate the increased misincorporation of cysteine into 0.3 protein. Parameters of the RIP assay were varied to make the RIP-polyacrylamide gel electrophoresis (RIP-PAGE) assay specific for the 0.3 protein. A single protein band was, however, never achieved although increased misincorporation of cysteine into the 0.3 protein can now be estimated by RIP-PAGE combined with scanning densitometry. (U)

DESCRIPTORS: *Bacteria, *Bioassay, *Radioimmunoassay, *Pollutants, In vitro analysis, Proteins, Cysteine (U)

IDENTIFIERS: PE61102F, WUAFOSR2312A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 376 8/11 9/2

RONDOUT ASSOCIATES INC STONE RIDGE NY

The Use of Regional Seismic Waves for Discrimination and Yield Determination. Volume II. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 79-31 Dec 82, JAN 83 124P Pomeroy,Paul W. ;Sutton, George H. ;Carter,Jerry A. ;
REPT. NO. RAI-FTR-04-83-01-VOL-2
CONTRACT: F49620-80-C-0021, ARPA Order-3291
MONITOR: AFOSR TR-83-0434

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A128 375.
ABSTRACT: This report, which is presented in two volumes as follows: Volume II entitled 'The Use of Regional Seismic Waves for Discrimination and Yield Determination' deals with the following topics: (a) Discrimination Techniques at Regional Distances, (b) Yield Determination Using Regional Seismic Waves, (c) The Cataskill Seismic Array (CSA), (d) The Nevada Test Site explosion HARZER Recorded at CSA, (e) Explosion P Waves Recorded at CSA and the Wake Island Hydrophone Array (WHA), (f) Q of the Northwest Pacific Lithosphere, and (g) The Instrumental Upgrade of WHA to Digital Recording. (U)
DESCRIPTORS: *Seismic data, *Seismological stations, Remote terminals, Seismic waves, Discrimination, Earthquake warning systems, Microcomputers, Yield, Lithosphere, Primary waves(Seismic waves), User needs, Seismic arrays (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 375 8/11 9/2

RONDOUT ASSOCIATES INC STONE RIDGE NY

Enhance and Test the Remote Seismic Terminal. Volume I. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 79-31 Dec 82, JAN 83 92P Pomeroy,Paul W. ;Sutton, George H. ;Carter,Jerry A. ;
REPT. NO. RAI-FTR-04-83-01-VOL-1
CONTRACT: F49620-80-C-0021, ARPA Order-3291
MONITOR: AFOSR TR-83-0433

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A128 376.
ABSTRACT: This report, which is presented in two volumes as follows: Volume I entitled Enhance and Test the Remote Seismic Terminal describes the terminal system and, in greater detail, the Seismic Recording System add-on to the terminal. (U)
DESCRIPTORS: *Seismic data, *Seismological stations, Remote terminals, Seismic waves, Discrimination, Microcomputers, Primary waves(Seismic waves), Earthquake warning systems, User needs, Computer program documentation, Seismic arrays (U)
IDENTIFIERS: PE61101E (U)

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 372 7/2 20/5

CLARKSON COLL OF TECHNOLOGY POTSDAM NY

Study of the Chlorine-Basic Hydrogen Peroxide Reaction. (U)

DESCRIPTIVE NOTE: Final rept.,
82 30P McCluskey,Richard J. ;
CONTRACT: AFOSR-81-0155
PROJ: 2303
TASK: D9
MONITOR: AFOSR TR-83-0430

UNCLASSIFIED REPORT

ABSTRACT: The reaction of chlorine with alkaline hydrogen peroxide solutions, approximately 2.5M in O2H-, has been examined in an unagitated batch reactor at 10 degrees C. Initial chlorine partial pressures of up to 450 torr and reaction times of one, three and six minutes were investigated. The results are in qualitative agreement with the theory for absorption with an instantaneous reaction, in which the rate of reaction becomes controlled by liquid phase mass transfer after an initial, rapid reaction depletes the interfacial region of O2H- reactant. The effective anion diffusivity was on the order of 7 times 10(-4) sq. cm per sec, a value much larger than typical liquid diffusivities. The rate of reaction declined faster than the time (-1/2) dependence predicted by the theory for absorption with an instantaneous reaction. In one minute's time, complete conversion of all added chlorine to chloride ion was achieved until 4.7 time 10(--4) moles of chlorine per sq. cm of interfacial area have reacted. Subsequent reaction was almost independent of initial chlorine partial pressure. The amount of chlorine reaction was not sensitive to the rate of oxygen produced by hydrogen peroxide disproportionation. The rate of disproportionation was seen to depend in a complicated manner on the composition of the alkaline solutions. (U)

DESCRIPTORS: *Chlorine, *Hydrogen peroxide, *Chemical reactions, *Chemical lasers, Alkalinity, Reaction time, Partial pressure, Liquid phases, Mass transfer, Anions, Diffusivity, Conversion, *Ionization, Chlorides, Rates* (U)
IDENTIFIERS: PE61102F, WUAFOSR2303D9 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 359 12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PRECESSES

Limit Laws for the Maximum of Weighted and Shifted I.I.D. Random Variables. (U)

DESCRIPTIVE NOTE: Technical rept.
FEB 83 34P Daley,D. J. ;Hall,Peter ;
REPT. NO. TR-26
CONTRACT: F49620-82-C-0009
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0415

UNCLASSIFIED REPORT

DESCRIPTORS: *Random variables, *Sequences(Mathematics), *Distribution functions, *Weighting functions, Stochastic processes, Limitations, Theorems (U)
IDENTIFIERS: PE61102F, WUAFOSR2304A5 (U)

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 160 11/9 20/3

CINCINNATI UNIV OH

Configurational Characteristics of the Polysulfides. 2. Dipole Moments and Gauche Effects in Poly (1,3-dithiocane). (U)

AUG 81 10P Welsh,W. J. ;Mark,J. E. ;Guzman,J. ;Riande,E. ;

CONTRACT: AFOSR-78-3683
PROJ: 2303
TASK: A3
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DESCRIPTORS: *Polysulfides, *Dipole moments, Thiols, Sulfur, Alkyl radicals, Oxides, Molecular structure, Configurations, Reprints (U)
IDENTIFIERS: Gauche effects, Polydithiocane, Polyalkylene oxides, WUAFOSR2303A3, PE61102F (U)

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AD-A128 159 11/9 20/3

CINCINNATI UNIV OH

Configurational Characteristics of the Polysulfides. 3. Dipole Moments of Poly(trimethylene sulfide) and Comparisons between some Polysulfides and the Corresponding Polyoxides, (U)

AUG 81 11P Buzman,J. ,Riande,E. ; Welsh,W. J. ;Mark,J. E. ;

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PROJ: 2303
TASK: A3
MONITOR: AFOSR TR-83-0356

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DESCRIPTORS: *Polysulfides, *Dipole moments, Thiols, Methyl radicals, Comparison, Alkyl radicals, Oxides, Molecular structure, Configurations, Reprints (U)
IDENTIFIERS: Polyoxides, Polytrimethylene sulfide, WUAFOSR2303A3, PE61102F (U)

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AD-A128 156 12/1

NORTHWESTERN UNIV EVANSTON IL DEPT OF CIVIL ENGINEERING

Instability of a Half-Space with Frictional Materials. (U)

JUL 81 18P Horii,H. ;Nemat-Nasser,S. ;

CONTRACT: AFOSR-80-0017
PROJ: 2307
TASK: C1
MONITOR: AFOSR TR-83-0348

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Mathematics and Physics (ZAMP), v33 p1-16 Jan 82.
Reprint: Instability of a Half-Space with Frictional Materials.

DESCRIPTORS: *Plastic deformation, *Equations, Parameters, Stability, Computations, Friction, Materials, Reprints (U)
IDENTIFIERS: Frictional materials, WUAFOSR2307C1, PE61102F (U)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVN35A

AD-A128 099 12/1

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS

Pairwise Orthogonal F-Rectangle Designs. (U)

DESCRIPTIVE NOTE: Technical rept., DEC 82 16P Federer,W. T. ;Hedayat,A. S. ;Mendell,J. P. ;
CONTRACT: AFOSR-80-0170
PROJ: 2304
TASK: A5
MONITOR: AFOSR TR-83-0332

UNCLASSIFIED REPORT

ABSTRACT: The concept of pairwise orthogonal Latin square designs is applied to r row by c column experiment designs which are called pairwise orthogonal F-rectangle designs. These designs are useful in designing successive and/or simultaneous experiments on the same set of rc experimental units, in constructing codes, and in constructing orthogonal arrays. A pair of orthogonal F-rectangle designs exists for any set of v treatments (symbols), whereas no pair of orthogonal Latin square designs of orders two and six exists, and one of the two construction methods presented does not rely on any previous knowledge about the existence of a pair of orthogonal Latin square designs, whereas the second one does. It is shown how to extend the methods to r = pv row by c = qv column designs and how to obtain t pairwise orthogonal F-rectangle designs. When the maximum possible number of pairwise orthogonal F-rectangle designs is attained the set is said to be complete. Complete sets are obtained for all v for which v is a prime power. The construction method makes use of the existence of a complete set of pairwise orthogonal Latin square designs and of an orthogonal array with v sub n columns, (v sub n - 1)/(v - 1) rows, v symbols, and of strength two. (Author) (U)

DESCRIPTORS: *Experimental design, *Set theory, *Orthogonality, Arrays, Coding, Construction, Methodology, Theorems (U)
IDENTIFIERS: F rectangle designs, PE61102F, WUAFOSR2304A5 (U)

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