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Scientific and Technical Information
Output of the Langley Research Center for Calendar Year 1982

JUNE 1983
NASA Technical Memorandum 84615

Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1982

Compiled by
Research Information and Applications Division
Langley Research Center
Hampton, Virginia

National Aeronautics
and Space Administration
Scientific and Technical
Information Branch
1983
FOREWORD

This report contains a listing of Langley Research Center's scientific and technical research output for calendar year 1982.

The intent of this report is to provide a greater awareness of the broad scope of results and the importance of the research and development work conducted by scientists and engineers at Langley. This current awareness is mandated by the National Aeronautics and Space Act of 1958, which provides for the widest practical dissemination of NASA research.


Comments or suggestions concerning this publication should be addressed to the Research Information and Applications Division, Mail Stop 180A, NASA Langley Research Center, Hampton, Virginia 23665.

Jess G. Ross
Chief, Research Information and Applications Division
INTRODUCTION

The NASA Langley Research Center is one of the Nation's leading laboratories for research and development in the sciences of aeronautics and space technology. Langley conducts basic and applied research in fluid and flight mechanics, structures and materials, acoustics and noise reduction, measurement and instrumentation systems, numerical methods and techniques, data systems, electronics, physics, chemistry, and Earth and space sciences.

This publication is a compilation of Langley's scientific and technical research output for 1982 which is processed through the Center's Research Information and Applications Division, an integral part of NASA's Agency-wide Scientific and Technical Information (STI) system. This document is intended as a reference summary for researchers and as a current awareness publication for the scientific, research, and academic community.

The results of Langley's research are disseminated in a variety of NASA and non-NASA scientific and technical media and information systems. Details of the availability of the research references in this document are found in the section, "Availability," on page vii.

The citations are grouped first by Langley Directorates, then by the Langley Office or Division to which the senior author or innovator belongs. Citations are listed alphabetically by author or innovator under the following headings: Formal Reports (Technical Papers, Technical Memorandums, Conference Publications, Reference Publications, and Special Publications), Quick-Release Technical Memorandums, Contractor Reports, Journal Articles and Periodical Literature, Technical Talks and Meeting Presentations, Computer Programs, Tech Briefs, and Patents. There is a separate section listing NASA Contractor Reports funded by the Army Structures Laboratory, USARTL (AVRADCOM). If a citation has more than one author, it is listed only once under the first author's name. The subject category number used to index the citation and the Research Technology Objectives and Plans (RTOP) number are noted below citations when appropriate.

Computer Programs listed are those which were submitted by Langley to COSMIC in 1982. Those programs listed with an M accession number are available from COSMIC.

The NASA Tech Briefs cited have been released in 1982 for publication in "NASA Tech Briefs," a quarterly journal for United States industry and technology transfer agents. Subscriptions to this journal are available through the NASA Technology Utilization Program by writing to the Director, Technology Transfer Division, NASA Scientific and Technical Information, P. O. Box 8757, Baltimore/Washington International Airport, Maryland 21240.

Patents listed, which are owned in whole or in part by Langley Research Center personnel, have been published in issues of "Scientific and Technical Aerospace Reports" (STAR), a NASA announcement journal for report literature. A subscription to STAR is available from the U.S. Government Printing Office (GPO) or to qualified recipients from the NASA Scientific and Technical Information Facility (STIF).

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Technical Talks and Meeting Presentations

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Computer Programs

No computer programs.

Tech Briefs

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Patents

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PUBLICATIONS FOR OFFICE OF DIRECTOR FOR PROJECTS

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Quick-Release Technical Memorandums

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Contractor Reports


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Technical Talks and Meeting Presentations

No technical talks and meeting presentations.

Computer Programs

No computer programs.

Tech Briefs


Journal Articles and Periodical Literature


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Computer Programs


Tech Briefs

No tech briefs.

Patents

No patents.
Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles and Periodical Literature

No journal articles and periodical literature.

Technical Talks and Meeting Presentations

No technical talks and meeting presentations.

Computer Programs


Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR LONG DURATION EXPOSURE FACILITY PROJECT OFFICE

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles and Periodical Literature

No journal articles and periodical literature.

Technical Talks and Meeting Presentations


Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


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Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR OFFICE OF DIRECTOR FOR ELECTRONICS

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No formal reports.

Quick-Release Technical Memorandums
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No contractor reports.

Journal Articles and Periodical Literature
No journal articles and periodical literature.

Technical Talks and Meeting Presentations
No technical talks and meeting presentations.

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
PUBLICATIONS FOR ANALYSIS AND COMPUTATION DIVISION

Formal Reports


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Journal Articles and Periodical Literature


100. Lambiotte, J. J.; and Bokhari, S.; Hussaini, M. Y.; and Orszag, S. A.: Navier-Stokes Solution on the CYBER-203 by a Pseudospectral Technique. Presented at the 10th IMACS World Congress on Systems Simulation and Scientific Computation, August 8-13, 1982, Montreal, Canada. (Subject Category 59 RTOP 505-31-83)


Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
Formal Reports


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140. Cantrell, John H., Jr.: Characterization of Crystalline Binding From Solid Nonlinearity Parameters. Presented at the 1982 March General Meeting of the American Physical Society, March 8-12, 1982, Dallas, Texas. (Subject Category 71 RTOP 505-33-23)


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155. Hendricks, Herbert D.: An Overview of NASA's Fiber Optic Programs. Presented at the Naval Research Laboratory Tri-Service Workshop on Fiber Optics Sensor and Guided Wave Technology, October 5-8, 1982, Fort Eustis, Virginia. (Subject Category 34 RTOP 506-54-63)


165. Heyman, Joseph S.; and Issler, Wolfgang: Ultrasonic Mapping of Internal Stresses. Presented at the IEEE 1982 Ultrasonic Symposium, October 27-29, 1982, San Diego, California. (Subject Category 71 RTOP 505-33-23)


170. Kern, Frederick A.: NASA's Metrology Program. Presented at the National Conference of Standards Laboratory Region III Meeting, January 28, 1982, Clarksburg, Maryland. (Subject Category 38 RTOP 992-19-00)

171. Kern, Frederick A.: General Metrology and Challenges Related to NDE at NASA. Presented at the NCSSL and PMA Symposium on Validity of NDE Measurements, February 1-3, 1982, Butler, Pennsylvania. (Subject Category 38 RTOP 992-19-00)


175. Mitchell, Michael: Electronically Scanned Pressure Measurement Application at the Langley Research Center. Presented at the 58th Meeting of Supersonic Tunnel Association, October 4-5, 1982, Ottawa, Canada. (Subject Category 72 RTOP 505-31-53)


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191. Winfree, William P.; and Cantrell, John H., Jr.: Sign Reversal of Ultrasonically Induced Static Displacement. Presented at the 1982 March General Meeting of the American Physical Society, March 8-12, 1982, Dallas, Texas. (Subject Category 71 RTOP 505-33-23)


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237. Taylor, Lawrence W., Jr.: Applications of Parameter Estimation in the Study of Spinning Airplanes. Presented at the AIAA Guidance and Control Conference, August 9-11, 1982, San Diego, California. (Subject Category 08 RTOP 505-34-13)


239. Williams, Jeffrey P.; and Montgomery, Raymond C.: Simulation and Testing of Digital Control on a Flexible Beam. Presented at the AIAA Guidance and Control Conference, August 9-11, 1982, San Diego, California. (Subject Category 18 RTOP 506-54-73)
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Tech Briefs

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**Technical Talks and Meeting Presentations**


291. Delnore, V. E.; Jones, W. L.; Grantham, W. L.; Businger, J. A.; and Oncley, S.: Aircraft Measurements of Sea Surface Radar Cross-Section and In-Situ Wind and Stress. Presented at the Fall Meeting of the American Geophysical Union, December 7-15, 1982, San Francisco, California. (Subject Category 48 RTOP 146-40-05)

292. Dvorak, G. J.; and Johnson, W. S.: Fatigue of B-Al Laminated Plates. Presented at the 111th AIME Annual Meeting, Symposium on Failure Modes in Metal Matrix Composites, February 9-11, 1982, Dallas, Texas. (Subject Category 39 RTOP 505-33-33)


294. Hearn, Chase P.: An Experimental System to Verify the Presence of a Water-Film on Aircraft Radomes Under Heavy Rain Conditions. Presented at the 1982 Virginia IEEE Conference and Exhibit, October 28-29, 1982, Hampton, Virginia. (Subject Category 33 RTOP 506-54-23)


297. Kendall, Bruce M.: Radiometer Synoptic Survey of a Warm Core Ring. Presented at the AGU/ASLO Joint Meeting on Ocean Sciences, February 16-19, 1982, San Antonio, Texas. (Subject Category 48 RTOP 146-40-13)


301. Staton, W. J.; Klich, P. J.; and Cockrell, C. E.: Mechanical Properties of Adhesive Systems at Cryogenic and Other Temperatures. Presented at the 54th Annual Convention of the National Technical Association, August 2-7, 1982, Baltimore, Maryland. (Subject Category 27 RTOP 505-31-63)


Computer Programs

No computer programs.
Tech Briefs


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358. Kelly, James R.; and Williams, David H.: Factors Affecting In-Trail Following Using CDTI. Presented at the AFWAL 18th Annual Conference on Manual Control, June 8-10, 1982, Dayton, Ohio. (Subject Category 04 RTOP 505-35-23)


365. Spencer, J. Larry: Fiber Optics for the Future - Wavelength Division Multiplexing. Presented at the 2nd AFSC Standardization Conference, November 30 - December 2, 1982, Dayton, Ohio. (Subject Category 33 RTOP 505-34-43)


Computer Programs

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*Army Structures Laboratory, USARTL (AVRADCOM)


Contractor Reports


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Technical Talks and Meeting Presentations


444. Baucom, Robert M.: Composite Material Applications to the Biomedical Field. Presented at the VA/RESNA Wheelchair III Workshop, March 25-27, 1982, La Jolla, California. (Subject Category 24 RTOP 141-20-20)


446. Blankenship, C. P.: Advanced Composites. Presented at the Third Conference on Rapid Solidification Technology Panel Discussion Entitled "Alternatives to RSP," December 7, 1982, Gaithersburg, Maryland. (Subject Category 24 RTOP 505-33-33)


*Army Structures Laboratory, USARTL (AVRADCOM)


456. Dvorak, G. J.; and Johnson, W. S.: Fatigue of Boron/Aluminum Laminated Plates. Presented at the 111th AIME Annual Meeting, Symposium on Failure Modes in Metal Matrix Composites, February 14-18, 1982, Dallas, TX. (Subject Category 39 RTOP 505-33-33)


460. Hergenrother, Paul M.: High Temperature Adhesives. Presented at the Plastics Institute of America (PIA) Course on Advances in Adhesion Science and Adhesives, September 29 - October 1, 1982, Boston, Massachusetts. (Subject Category 27 RTOP N/A)

*Army Structures Laboratory, USARTL (AVRADCOM)
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(Subject Category 24 RTOP 505-33-33)

*Army Structures Laboratory, USARL (AVRADCOM)


473. Johnston, N. J.: Evaluation of Toughness in Graphite Resin Composites. Presented at the American Chemical Society Symposium on "Advanced Composites--Toward the Next Generation, April 21, 1982, Newark, Delaware. (Subject Category 24 RTOP 505-33-33)


477. Lisagor, W. B.: Metallurgical Analysis of Failed Mine MK-60 Captor Straps. Presented at the Naval Mine Engineering Facility, Naval Weapons Station, July 22, 1982, Yorktown, VA. (Subject Category 26 RTOP 505-33-13)

478. Lisagor, W. B.: Metallurgical Analysis of Failed Mine MK-60 Captor Straps. Presented at the Naval Surface Weapons Center, October 5, 1982, White Oak, MD. (Subject Category 26 RTOP 505-33-13)


492. *O'Brien, T. Kevin; Johnston, Norman J.; Morris, Donald H.; and Simmonds, Robert A.: A Simple Test for the Interlaminar Fracture Toughness of Composites. Presented at the 27th National SAMPE Symposium and Exhibition, May 4-6, 1982, San Diego, California. (Subject Category 24 RTOP 506-53-23)


495. Ransone, Philip O.; and Rumlmer, Donald R.: Edge Softening of the Shuttle TPS Strain-Isolation Pad. Presented at the 14th National SAMPE Technical Conference, October 12-14, 1982, Atlanta, Georgia. (Subject Category 27 RTOP 506-33-23)


*Army Structures Laboratory, USARLT (AVRADCOM)
497. Royster, Dick M.; Bales, Thomas T.; and Wiant, H. Ross: Superplastic Forming/Weld-brazing of Titanium Skin-Stiffened Compression Panels. Presented at the 27th National SAMPE Symposium and Exhibition, May 4-6, 1982, San Diego, California. (Subject Category 26 RTOP 505-33-13)


509. Stein, Bland A.: NASA Program on Research and Development of Metal Matrix Composite Materials. Presented at the DOD Metal Matrix Composites Coordination Meeting, December 14-16, 1982, West Palm Beach, FL. (Subject Category 27 RTOP 505-33-33)

510. Stoakley, Diane M.; and St. Clair, Anne K.: Metal Ion-Containing Epoxies. Presented at the 34th Southeastern Regional Meeting of the American Chemical Society, November 3-5, 1982, Birmingham, Alabama. (Subject Category 27 RTOP 505-33-33)


Computer Programs

No computer programs.

Tech Briefs


Patents

520. Elber, Wolf: Means for Controlling Aerodynamically Induced Twist. U.S. Patent 4,330,100. Issued May 18, 1982. (Subject Category 05)

PUBLICATIONS FOR ACOUSTICS AND NOISE REDUCTION DIVISION

Formal Reports

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Contractor Reports


554. Shepherd, Kevin P.; and Hubbard, Harvey H.: Sound Measurements and Observations of the MOD-OAA Wind Turbine Generator. (NAS1-14970 The Bionetics Corporation and NAG1-166 The College of William and Mary.) NASA CR-165856, February 1982, 19 p. (Avail: NTIS Subject Category 71 RTOP 776-31-41)


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589. Seiner, John M.: Developments in Hot-Film Anemometry for Measurements in Supersonic Turbulent Shear Layers. Presented at the IUTAM Symposium on Structure of Complex Turbulent Shear Flow, August 31 – September 3, 1982, Marseille, France. (Subject Category 71 RTOP 505-32-03)


Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.
Formal Reports

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Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
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(Subject Category 46 RTOP 146-20-10)

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1182. Lawrence, James D.: NASA Research in the Atmospheric Sciences. Presented at the Annual Meeting of the Technical Advisory Committee of the Air Pollution Control Board, October 5, 1982, Virginia Beach, Virginia. (Subject Category 45 RTOP 176-20-10)


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1191. Reichle, Henry G., Jr.: Initial Results From the OSTA-1 MAPS Experiment. Presented at the 1982 American Congress on Surveying and Mapping/American Society of Photogrammetry (ACSM/ASP) Annual Convention, March 14-20, 1982, Denver, Colorado. (Subject Category 47 RTOP 618-22-31)

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Computer Programs

No computer programs.

Tech Briefs

No tech briefs.
PUBLICATIONS FOR SPACE SYSTEMS DIVISION

Formal Reports

(Avail: NTIS Subject Category 35 RTOP 506-62-43)

(Avail: NTIS Subject Category 02 RTOP 506-51-23)

(Avail: NTIS Subject Category 31 RTOP 506-55-43)

(Avail: NTIS Subject Category 23 RTOP 506-51-23)

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(Avail: NTIS Subject Category 36 RTOP 506-55-13)

(Avail: NTIS Subject Category 34 RTOP 506-51-23)
(Avail: NTIS Subject Category 34 RTOP 506-51-13)

(Avail: NTIS Subject Category 43 RTOP 506-62-43)

(Avail: NTIS Subject Category 48 RTOP 691-09-02)

(Avail: NTIS Subject Category 34 RTOP 506-51-33)

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(Avail: NTIS Subject Category 73 RTOP 199-20-76)

(Avail: NTIS Subject Category 39 RTOP 506-55-43)

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(Avail: NTIS Subject Category 35 RTOP 506-62-43)


Journal Articles and Periodical Literature


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1306. Smith, Barry T.; Reichman, Benjamin; and Byvik, Charles E.: Layered Transition Metal Thiophosphates (MPX₃) as Photoelectrodes in Photoelectrochemical Cells. Presented at the 162nd Meeting of the Electrochemical Society, October 17-22, 1982, Detroit, Michigan. (Subject Category 44 RTOP 506-55-13)


1308. Throckmorton, David A.: Space Shuttle Heat Transfer Predictions and Results. Presented at the University of Kansas Aerospace Colloquium, April 2, 1982, Lawrence, Kansas. (Subject Category 34 RTOP 505-51-33)


1319. Zapata, L. E.; and DeYoung, R. J.: Efficient Iodine Bromide Direct Solar-Pumped Laser Candidate Characteristics. Presented at the Society for Optical and Quantum Electronics Fifth International Conference on Lasers and Applications (Lasers '82), December 13-17, 1982, New Orleans, Louisiana. (Subject Category 36 RTOP 506-55-13)


Computer Programs

No computer programs.

Tech Briefs

1323. Hohl, Frank (LaRC); and Lee, Ja H. (Vanderbilt Univ.): Solar-Driven Liquid-Metal MHD Generator. NASA Tech Brief LAR-12495. Released 1982. (Category: Physical Sciences)


Patents

No patents.
PUBLICATIONS FOR OFFICE OF DIRECTOR FOR SYSTEMS ENGINEERING AND OPERATIONS

Formal Reports
No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
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No journal articles and periodical literature.

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Contractor Reports


Journal Articles and Periodical Literature

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Technical Talks and Meeting Presentations


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Tech Briefs

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PUBLICATIONS FOR SYSTEMS ENGINEERING DIVISION

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

1332. Gifford, Robert V.; and Van Dam, Cornelis P.: The Design Integration of Wingtip Devices for Light General Aviation Aircraft. NASA TM-83252, August 1982, 7 p. (Avail: NTIS Subject Category 05 RTOP 505-41-83)

Contractor Reports


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PUBLICATIONS FOR FACILITIES ENGINEERING DIVISION

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No formal reports.

Quick-Release Technical Memorandums


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   (Subject Category 26 RTOP 992-24-01)

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   (Subject Category 35 RTOP 141-20-10)

Computer Programs

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Journal Articles and Periodical Literature

No journal articles and periodical literature.

Technical Talks and Meeting Presentations

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Computer Programs

No computer programs.

Tech Briefs


Patents

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Formal Reports

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Quick-Release Technical Memorandums

(Avail: NTIS Subject Category 82)

(Avail: NTIS Subject Category 82)

(Avail: NTIS Subject Category 82)

(Avail: NTIS Subject Category 81)

Contractor Reports

(Avail: IAC Subject Category 51 RTOP 141-20-21)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Technical Talks and Meeting Presentations

(Subject Category 82)
Computer Programs


Tech Briefs

No tech briefs.

Patents

No patents.


APPENDIX

INDUSTRIAL APPLICATIONS CENTERS

Aerospace Research Applications Center
Indianapolis Center for Advanced Research
1201 East 38th Street
P. O. Box 647
Indianapolis, IN 46223
(317) 264-4544

Kerr Industrial Applications Center
Southeastern Oklahoma State University
Station A, Box 2534
Durant, OK 74701
(405) 924-6822

NASA Industrial Applications Center
710 LIS Building
University of Pittsburgh
Pittsburgh, PA 15260
(412) 624-5211

NASA Industrial Applications Center
University of Southern California
Research Annex, Room 200
3716 South Hope Street
Los Angeles, CA 90007
(213) 743-6132

New England Research Applications Center
Mansfield Professional Park
Storrs, CT 06268
(203) 486-4533

North Carolina Science and Technology Research Center
Post Office Box 12235
Research Triangle Park, NC 27709
(919) 549-0671

Technology Applications Center
University of New Mexico
2500 Central Avenue, SE
Albuquerque, NM 87131
(505) 277-3622

NASA/Florida State Technology Applications Center
State University System of Florida
500 Weil Hall
Gainesville, FL 32611
(904) 392-6626
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