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P.57

NASA Technical Memorandum

NASA TM - 103566

SPACE SCIENCE LABORATORY PUBLICATIONS AND PRESENTATIONS JANUARY 1-DECEMBER 31, 1991

Compiled by Tauna W. Moorehead

Space Science Laboratory
Science and Engineering Directorate

April 1992

National Aeronautics and Space Administration

George C. Marshall Space Flight Center

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 1992	Technical Memorandum

4. TITLE AND SUBTITLE

Space Science Laboratory Publications and Presentations
January 1–December 31, 1991

5. FUNDING NUMBERS

6. AUTHOR(S)

Compiled by Tauna W. Moorehead

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

National Aeronautics and Space Administration
Washington, D.C. 20546

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

NASA TM-103566

11. SUPPLEMENTARY NOTES

Prepared by Space Science Laboratory, Science & Engineering Directorate

12a. DISTRIBUTION / AVAILABILITY STATEMENT

Unclassified—Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This document lists the significant publications and presentations of the Space Science Laboratory during the period January 1–December 31, 1991. Entries in the main part of the document are categorized according to NASA Reports (arranged by report number), Open Literature, and Presentations (arranged alphabetically by title). Also included for completeness is an Appendix (arranged by report number) listing preprints issued by the Laboratory during this reporting period. Some of the preprints have not yet been published; those already published are so indicated. Most of the articles listed under Open Literature have appeared in refereed professional journals, books, or conference proceedings. Although many published abstracts are eventually expanded into full papers for publication in scientific and technical journals, they are often sufficiently comprehensive to include the significant results of the research reported. Therefore, published abstracts are listed separately in a subsection under Open Literature. Questions or requests for additional information about the entries in this report should be directed to Ms. T. Moorehead (ES01; 544-7581) or to one of the authors. The organizational code of the cognizant SSL branch or office is given at the end of each entry.

14. SUBJECT TERMS	15. NUMBER OF PAGES	16. PRICE CODE
	60	NTIS

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited

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NASA REPORTS

Reference Publication

1. Development of the Burst and Transient Source Experiment. NASA RP-1268, September 1991. John M. Horack. (ES62)

Conference Publication

1. NASA/MSFC FY91 Global Scale Atmospheric Processes Research Program Review. NASA CP-3126, July 1991. F. W. Leslie (editor) (ES42)

Technical Memorandum

1. The NASA/MSFC Global Reference Atmospheric Model-1990 Version (GRAM-90), Part I: Technical/Users Manual and Part II: Program/Data Listings. NASA TM-4268, April 1991. C. G. Justus, F. N. Alyea, D. M. Cunnold, W. R. Jeffries III, and D. L. Johnson. (ES44)

2. Atmospheric Turbulence Review of Space Shuttle Launches. NASA TM-4289, May 1991. Michael Susko. (ES44)

3. The QDP/PLT User's Guide. NASA TM-4301, June 1991. Allyn F. Tennant. (ES65)

4. GEOSIM-A Numerical Model for Geophysical Fluid Flow Simulation. NASA TM-103528, February 1991. Karen A. Butler, Timothy L. Miller, and Huei-Iin Lu. (ES42)

5. Atmospheric Environment for Space Shuttle (STS-38) Launch. NASA TM-103530, February 1991. G. L. Jasper and G. W. Batts. (ES44)

6. NASA Marshall Space Flight Center Solar Observatory Report, July-September 1990. NASA TM-103531, April 1991. James E. Smith. (ES52)

7. NASA Marshall Space Flight Center Solar Observatory Report, October-December 1990. NASA TM-103532, April 1991. James E. Smith. (ES52)

8. Atmospheric Environment for Space Shuttle (STS-35) Launch. NASA TM-103538, June 1991. G. L. Jasper and G. W. Batts. (ES44)

9. Analysis of Lightning Field Changes Produced by Florida Thunderstorms. NASA TM-103539, April 1991. William J. Koshak. (ES43)

10. BATSE-GRO Observations of Bremsstrahlung from Electron Precipitation Events. NASA TM-103546, July 1991. J. M. Horack and G. J. Fishman. (ES62)

11. Multiplexing Readout Channels in Proportional Counters. NASA TM-103552, August 1991. James Caristi. (ES65)

Technical Memorandum (Concluded)

12. NASA Marshall Space Flight Center Solar Observatory Report - January-June 1991. NASA TM-103555, October 1991. James E. Smith. (ES52)

13. Atmospheric Environment for Space Shuttle (STS-37) Launch. NASA TM-103556, November 1991. G. L. Jasper and G. W. Batts. (ES44)

14. BUGS System Clock Distributor. NASA TM-103569, November 1991. Thomas Dietrich. (ES62)

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1. Aerosol Backscatter Measurements at 10.6 Micrometers with Airborne and Ground-Based CO_2 Lidars Over the Colorado High Plains. 1. Lidar Intercomparison. J. Geophys. Res., 96(D4), 5327-5335 (1991). D. A. Bowdle, J. Rothermel, J. M. Vaughan, D. W. Brown, and M. J. Post. (ES43)

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4. Background in X-Ray Astronomy Proportional Counters. IEEE Trans. on Nucl. Sci., 38(2), 585-590 (1991). C. R. Bower, K. L. Dietz, B. D. Ramsey, and M. C. Weisskopf. (ES65)

5. A Bioassay for Monitoring Cadmium Based on Bioconvective Patterns. J. Envrion. Sci. Health, A26(2), 273-286 (1991). David A. Noever and Helen C. Matsos. (ES76)

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10. Comments on 'Convection in a Rotating, Laterally Heated Annulus: Transition to Lower Symmetry' by Lewis and Koschmieder. Geophys. Astrophys. Fluid Dynamics, 59, 83-90 (1991). Timothy L. Miller. (ES42)

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5. Atmospheric Effects of Chemical Rocket Propulsion (Report of an AIAA Workshop, held Sacramento, CA, June 28-29, 1991) (1991) (AIAA: Washington, D.C.), Steering Committee Member and Workshop Participant. G. H. Fichtl. (ES01)

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63. Spectral Characteristics of Single Spike GRBs from BATSE. 179th Meeting of the American Astronomical Society, Atlanta, Georgia, January 13-16, 1992; Bull. AAS, 23(4), 1323 (1991). R. D. Preece, C. Kouveliotou, G. J. Fishman, C. A. Meegan, R. B. Wilson, M. N. Brock, W. S. Paciesas, G. N. Pendleton, et al. (ES62)

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PRESENTATIONS

1. The Advanced X-Ray Astrophysics Facility. Colloquium on AXAF, Toledo, Ohio, June 5-7, 1991. Martin C. Weisskopf. (ES65)

2. Airborne Coherent Continuous Wave CO_2 Doppler Lidars for Aerosol Backscatter Measurement. Fourth Interagency Airborne Geoscience Workshop, La Jolla, California, January 29-February 1, 1991. J. Rothermel, W. D. Jones, D. Hampton, V. Srivastava, and M. Jarzembski. (ES43)

3. Alfven Wave Trapping and Heating in Coronal Holes: Theory and Observation. Solar Wind Seven, Goslar, Germany, September 16-21, 1991 (to appear in proceedings). S. T. Suess, R. L. Moore, Z. E. Musielak, and C.-H. An. (ES52)

4. Analysis of High Rapidity Density Interactions in JACEE. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. Asakimori, K., M. J. Christl, J. H. Derrickson, W. F. Fountain, J. C. Gregory, T. Hayashi, T. A. Parnell, F. E. Roberts, Y. Takahashi, J. W. Watts, et al. (ES62)

5. Applications of Containerless Processing in the Studies of Metals and Alloys. IKI/AIAA Microgravity Science Symposium, Moscow, Russia, May 13-17, 1991. R. J. Bayuzick, W. H. Hofmeister, and M. B. Robinson. (ES75)

6. The BATSE Experiment on the Compton Gamma Ray Observatory: Status and Some Early Results. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). G. J. Fishman, C. A. Meegan, R. B. Wilson, W. S. Paciesas, and G. N. Pendleton. (ES62)

7. BATSE Flare Observations in Solar Cycle 22. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). R. A. Schwartz, G. J. Fishman, C. A. Meegan, R. B. Wilson, W. S. Paciesas, et al. (ES62)

8. BATSE Spectroscopy Analysis System. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). B. E. Schaefer, G. J. Fishman, C. A. Meegan, R. B. Wilson, W. S. Paciesas, G. Pendleton, et al. (ES62)

9. Broadening of Low-Hybrid Waves for Non-Linear Landau Damping. 1991 Cambridge Workshop, Cambridge, Massachusetts, June 24-28, 1991. D. L. Gallagher and M. Ashour-Abdalla. (ES53)

10. Characteristic Refilling Rates in the Plasmatrough from Observations by DE 1/RIMS. 20th General Assembly of the International Union of Geodesy and Geophysics, Vienna, Austria, August 11-24, 1991. R. H. Comfort, J. L. Horwitz, P. D. Craven, and C. R. Chappell. (ES53)

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11. Characteristics of a High Pressure Gas Proportional Counter Filled with Xenon. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). H. Sakurai and B. D. Ramsey. (ES65)

12. Comparison of CO_2 Backscatter Using Mie Theory from Aerosol Measurements Over Pacific Basin with Lidar Data. Seventh AMS Symposium on Meteorological Observations and Instrumentation, New Orleans, Louisiana, January 14-18, 1991. V. Srivastava, A. Clarke, D. Bowdle, J. Porter, and M. Jarzembski. (ES43)

13. Comparisons of Reagents for Immunoaffinity Partition. Advances in Separations in Biochemistry, Cell Biology, and Biotechnology, New Orleans, Louisiana, June 2-7, 1991. L. J. Karr, D. L. Donnelly, A. Koslowsky, and J. M. Harris. (ES76)

14. A Composite Empirical Model of Magnetospheric Plasma. 20th General Assembly of the International Union of Geodesy and Geophysics, Vienna, Austria, August 11-24, 1991. D. L. Gallagher, P. D. Craven, and R. H. Comfort. (ES53)

15. Continuing Adventures with Lysozyme Crystal Growth. Fourth International Conference on Crystallization of Biological Macromolecules, Freiburg, Germany, August 18-24, 1991. Marc L. Pusey. (ES76)

16. Cosmic X-Ray Spectroscopy with Multilayer Optics. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). A.B.C. Walker, D. S. Martinez, and R. B. Hoover. (ES52)

17. Decisive Test of Gravity's Role in Bioconvection. Gordon Research Conference, Plymouth, New Hampshire, June 16, 1991. David A. Noever. (ES76)

18. Description of a Subset of Single Events from the BATSE Gamma Ray Burst Data. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). C. Kouveliotou, W. S. Paciesas, G. J. Fishman, C. A. Meegan, and R. B. Wilson. (ES52)

19. Design and Analysis of Soft X-Ray Imaging Microscopes. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). D. L. Shealy, C. Wang, W. Jiang, and R. B. Hoover. (ES52)

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23. Directional Solidification and Casting of HgCdTe in a Transverse Magnetic Field. Third European Conference on Crystal Growth, Budapest, Hungary, May 5-11, 1991. Ching-Hua Su, S. L. Lehoczky, F. R. Szofran, D. C. Gillies, and G.L.E. Perry. (ES75)

24. Earth Science Data Processing, Archiving, and Access at NASA/MSFC in the EOS Era. Seventh International Conference on Interactive Information and Processing Systems (IIPS) for Meteorology, Hydrology, and Oceanography, New Orleans, Louisiana, January 14-18, 1991. H. Michael Goodman, Matthew Smith, Vada LaFontaine, and Don Moss. (ES44)

25. The Effect of a Transverse Magnetic Field on the Microstructure of Directionally Solidified CdTe. Gordon Research Conference, Plymouth, New Hampshire, July 15-19, 1991. M. W. Price, R. N. Andrews, C.-H. Su, S. L. Lehoczky, and F. R. Szofran. (ES75)

26. The Effects of Acid Treatment and Calcium Ions on the Solubility of Concanavalin A. Fourth International Conference on Crystallization of Biological Macromolecules, Freiburg, Germany, August 18-24, 1991. Marc L. Pusey and Elizabeth Cacioppo. (ES76)

27. Effects on LDEF Exposed Copper Film and Bulk. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991 (to appear in proceedings). Palmer N. Peters, John C. Gregory, Ligia C. Christl, and Ganesh N. Raikar. (ES63)

28. Electrophoresis Experiments in Microgravity. IKI/AIAA Microgravity Science Symposium, Moscow, Russia, May 13-17, 1991. Robert S. Snyder and Percy H. Rhodes. (ES71)

29. Energy Dependence for Direct Pair Production Using Relativistic Oxygen Ions. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). D. T. King, J. H. Derrickson, P. B. Eby, W. F. Fountain, J. C. Gregory, K. H. Moon, T. Ogata, T. A. Parnell, B. L. Dong, and Y. Takahashi. (ES62)

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31. Energy Spectra and Composition of Cosmic Rays Above 1 TeV per Nucleon. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. Asakimori, K., M. J. Christl, J. H. Derrickson, W. F. Fountain, J. C. Gregory, T. Hayashi, T. A. Parnell, F. E. Roberts, Y. Takahashi, J. W. Watts, et al. (ES62)

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32. Energy Spectra of Proton and Helium Nuclei Above 5 TeV/Nucleon. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. Asakimori, K., M. J. Christl, J. H. Derrickson, W. F. Fountain, J. C. Gregory, T. Hayashi, T. A. Parnell, F. E. Roberts, Y. Takahashi, J. W. Watts, et al. (ES62)

33. Fabrication and Testing of an Imaging Multilayer X-Ray Microscope. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991. R. B. Hoover, D. L. Shealy, A.B.C. Walker, Jr., T. W. Barbee, Jr., and P. C. Baker. (ES52)

34. Fluorescence Measurements of the Thermal Control Coatings on LDEF Experiments S0069 and A0114. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991. J. M. Zwiener, R. J. Mell, P. N. Peters, D. R. Wilkes, E. R. Miller, and J. C. Gregory. (ES63)

35. Gamma-Ray Burst Observations from the Gamma Ray Observatory: Capabilities and Early Results. University of Toronto Colloquium, Toronto Ontario, Canada, November 7-8, 1991. Gerald J. Fishman. (ES62)

36. Gamma-Ray Burst Source Locations with the New Interplanetary Network. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). T. L. Cline, G. Fishman, et al. (ES62)

37. Gamma-Ray Monitoring of A.G.N. and Galactic Black Hole Candidates by the Compton Gamma-Ray Observatory. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). R. T. Skelton, A. Harmon, G. J. Fishman, C. A. Meegan, W. S. Paciesas, B. Rubin, R. B. Wilson, et al. (ES62)

38. The GLObal Backscatter Experiment (GLOBE). Seventh Symposium on Meteorological Observations and Instrumentation, 71st AMS Annual Meeting, New Orleans, Louisiana, January 14-18, 1991. D. Bowdle, S. Williams, and J. Rothermel. (ES43)

39. Global Backscatter Experiment (GLOBE) Pacific Survey Mission. Fourth Interagency Airborne Geoscience Workshop, La Jolla, California, January 29-February 1, 1991. D. A. Bowdle, J. Rothermel, J. E. Arnold, and S. F. Williams. (ES43)

40. Global Nighttime Lightning Detection from DMSP Imagery. IUGG/IAMAP Symposium M1, Vienna, Austria, August 11-24, 1991. Greg R. Scharfen and Steven J. Goodman. (ES44)

41. On the Global Properties of Active Regions. Seventh Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, Tucson, Arizona, October 1991. Reiner Hammer. (ES52)

Presentations (Continued)

42. Gravity Coarsening of Bubble Lattices. Gordon Research Conference, Plymouth, New Hampshire, June 17-21, 1991. David A. Noever and Raymond J. Cronise, IV. (ES76)

43. Gravity Effects on Three-Dimensional Froths. Fifth Annual Alabama Materials Research Conference, Birmingham, Alabama, September 25-16, 1991. Raymond J. Cronise and David A. Noever. (ES76)

44. Gravity Probe-B Spacecraft Attitude Control Based on the Dynamics of Slosh Wave-Induced Fluid Stress Distribution on Rotating Dewar Container of Cryogenic Propellant. 42nd Congress of the International Astronautical Federation, Montreal, Canada, October 5-11, 1991. R. J. Hung, C. C. Lee, and F. W. Leslie. (ES42)

45. The GRO/BATSE Data Analysis System. Astronomical Data Analysis Software and System Annual Conference, Tucson, Arizona, November 6-8, 1991 (to appear in proceedings). Sethanne Howard. (ES62)

46. Ground-Based Studies of Directionally Solidified Mercury Zinc Telluride in Preparation for a United States Microgravity Laboratory Mission. Third European Conference on Crystal Growth, Budapest, Hungary, May 5-11, 1991. S. L. Lehoczky, Ching-Hua Su (USRA), F. R. Szofran, D. C. Gillies, and G.L.E. Perry. (ES75)

47. Growth of Thin Films of Organic Nonlinear Optical Materials by Vapor Growth Processes: An Overview and Examination of Shortfalls. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). D. O. Frazier, B. Penn, W. K. Witherow, and M. S. Paley. (ES74)

48. Heating of Solar Coronal Holes by Reflected Alfven Waves. IAU Joint Commission Meeting on Solar and Stellar Coronae, Buenos Aires, Argentina, July 31, 1991 (to appear in proceedings). R. L. Moore, Z. E. Musielak, S. T. Suess, and C.-H. An. (ES52)

49. The High Resolution Telescope Cluster. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). A.B.C. Walker, Jr., R. Moore, W. Roberts, R. B. Hoover, S. T. Wu, and W. Bailey. (ES52)

50. Hydrogen Lyman Alpha Coronagraph/Polarimeter. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). S. Fineschi, R. B. Hoover, and A.B.C. Walker, Jr. (ES52)

51. Imaging the Sun in Hard X-Rays: Spatial and Rotating Modulation Collimators. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). J. W. Campbell, J. M. Davis, and A. G. Emslie. (ES52)

Presentations (Continued)

52. Improving the Velocity Estimates from the NASA 50 MHz Wind Profiler. Second Symposium on Tropospheric Profiling, Boulder, Colorado, September 9-13, 1991. T. L. Wilfong and S. A. Smith. (ES44)

53. Induced Radioactivity in LDEF Components. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991 (to appear in proceedings). B. A. Harmon, G. J. Fishman, T. A. Parnell, and C. E. Laird. (ES62)

54. Influence of Interactive Surface Hydrology on Atmospheric Response to SST Anomalies. Fifth Conference on Climate Variations, Denver, Colorado, October 14-18, 1991. D. Fitzjarrald, F. Robertson, J. Christy, and L. White. (ES42)

55. Infrared Observations of Extragalatic Star Formation. 21st General Assembly of the International Astronomical Union, Buenos Aires, Argentina, July 22-August 1, 1991. C. M. Telesco. (ES63)

56. In Situ Backscatter Measurements over Pacific Ocean Using Two Focused CO_2 Lidars. Seventh Symposium on Meteorological Observations and Instrumentation, 71st AMS Annual Meeting, New Orleans, Louisiana, January 14-18, 1991. J. Rothermel, W. D. Jones, V. Srivastava, M. Jarzembski, and D. Hampton. (ES43)

57. An Instrument to Measure the Energy Spectra of Cosmic Rays from 20 to 1000 GeV per Nucleon. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). P. H. Fowler, J. C. Gregory, T. A. Parnell, R. W. Austin, J. H. Derrickson, J. W. Watts, et al. (ES62)

58. Interannual Variability in a 3-D Baroclinic Flow Model with Periodic Changes of Thermal Forcing. Eighth Conference on Atmospheric & Oceanic Waves and Stability, Denver, Colorado, October 14-18, 1991. Huei-Iin Lu, Timothy L. Miller, and Daniel Fitzjarrald. (ES42)

59. Intercomparison of HUMICAP and VIZ Humidity Sensors. Seventh Symposium on Meteorological Observations and Instrumentation, New Orleans, Louisiana, January 14-18, 1991. G. J. Jedlovec and S. T. Williams. (ES43)

60. Interface Demarcation in Bridgman-Stockbarger Crystal Growth of II-VI Compounds. SPIE's Symposium on Growth and Characterization of Materials for Infrared Detectors and Nonlinear Optical Switches, Orlando, Florida, April 1-5, 1991 (to appear in proceedings). D. C. Gillies, S. L. Lehoczky, F. R. Szofran, G.L.E. Perry, and Ching-Hua Su. (ES75)

61. Investigation into the Early Stages of Lysozyme Nucleation. Fourth International Conference on Crystallization of Biological Macromolecules, Freiburg, Germany, August 18-24, 1991. Laurent Sibille and M. L. Pusey. (ES76)

62. The Ionizing Radiation Environment of LDEF Prerecovery Predictions. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991 (to appear in proceedings). J. W. Watts, Jr., J. H. Derrickson, T. A. Parnell, G. J. Fishman, A. Harmon, E. V. Benton, L. A. Frank, and W. Heinrich. (ES62)

Presentations (Continued)

63. LDEF Radiation Environment. NATO Advanced Study Institute Meeting on Biological Effects and Physics of Solar and Galactic Cosmic Radiation, Algarve, Portugal, October 12-23, 1991. John W. Watts. (ES62)

64. Lightning-Rainfall Relationships. Third Conference on Modeling of Rainfall Fields: Hydrologic and Meteorological Aspects, College Station, Texas, February 27-March 1, 1991. Steven J. Goodman, D. E. Buechler, and P. D. Wright. (ES44)

65. A Limit-Cycle Behavior of Pair Density in Accretion-Disk Coronae. 28th Yamada Conference on Frontiers of X-Ray Astronomy, Nagoya, Japan, April 8-12, 1991. Masaaki Kusunose and Shin Mineshige. (ES65)

66. Long-Term Source Monitoring Capabilities of BATSE. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). R. B. Wilson, B. A. Harmon, M. H. Finger, G. J. Fishman, C. A. Meegan and W. S. Paciesas. (ES62)

67. Longitudinal and Transverse Modes of Slosh Wave Excitation in Rotating Dewar Associated with Gravity Jitters. 42nd Congress of the International Astronautical Federation, Montreal, Canada, October 5-11, 1991. R. J. Hung, C. C. Lee, and F. W. Leslie. (ES42)

68. Low Frequency Variability in SSM/I Moisture Retrievals. Ninth Conference on Numerical Weather Prediction, Denver, Colorado, October 14-18, 1991. Franklin R. Robertson. (ES42)

69. Magnetic Field Configuration Associated with Gamma-Ray Flares in June 1991. Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). M. J. Hagyard, E. A. West, J. E. Smith, F.-M. Trussart, and E. G. Kenny. (ES52)

70. The Magnetic Field in the Heliosheath. Solar Wind Seven, Goslar, Germany, September 16-21, 1991 (to appear in proceedings). S. T. Suess and S. Nerney. (ES52)

71. The MAMS Quick View System 2 (QVS2): A Workstation for NASA Aircraft Scanner Data Evaluation. Seventh International Conference on Interactive Information and Processing Systems (IIPS) for Meteorology, Hydrology, and Oceanography, New Orleans, Louisiana, January 14-18, 1991. G. J. Jedlovec, M. W. James, M. R. Smith, and R. J. Atkinson. (ES43)

72. Mapping Crystal Defects with a Digital Scanning Ultramicroscope. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991. J. Springer, E. Silberman, R. Kroes, and D. Reiss. (ES74)

73. Marshall Engineering Thermosphere Model Statistical Analysis Mode. 29th Aerospace Sciences Meeting, Reno, Nevada, January 7-10, 1991. Robert E. Smith, B. Jeffrey Anderson, and Karen Catlett. (ES44)

Presentations (Continued)

74. Measurements of Direct Electron Pairs Along Oxygen and Sulfur Ion Tracks at 200 GeV/n. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. H. Moon, J. H. Derrickson, P. B. Eby, W. F. Fountain, J. C. Gregory, T. A. Parnell, Y. Takahashi, et al. (ES62)

75. Measurements of Erosion Characteristics for Metal and Polymer Surfaces Using Profilametry. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991 (to appear in proceedings). Ligia C. Christl, John C. Gregory, and Palmer N. Peters. (ES63)

76. Measuring Residual Accelerations in the Spacelab Environment. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991. William K. Witherow. (ES74)

77. Metrology of X-Ray Optics Utilizing Shearing Interferometric Techniques. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). P. C. Baker and R. B. Hoover. (ES52)

78. Mission to Planet Earth (MTPE). 42nd International Astronautical Congress, Montreal, Canada, October 6-11, 1991. Gregory S. Wilson and Wesley T. Huntress. (ES41)

79. Monitoring Cen X-3 with BATSE. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). M. H. Finger, R. B. Wilson, C. A. Meegan, W. S. Paciesas, and G. J. Fishman. (ES62)

80. MSFC Shuttle Lightning Research. 1991 International Conference on Lightning and Static Electricity, Orlando, Florida, April 16-19, 1991. Otha H. Vaughan, Jr. (ES43)

81. The MSFC Vector Magnetograph, Eruptive Flares, and the Solar-A X-Ray Images. 21st IAU General Assembly, Buenos Aires, Argentina, July 23-August 1, 1991. R. L. Moore, M. J. Hagyard, J. M. Davis, and J. G. Porter. (ES52)

83. A Multiparameter Radar Examination of a Mesoscale Convective System. 25th International Conference on Radar Meteorology, Paris, France, June 24-28, 1991. Patrick D. Wright and Steven J. Goodman. (ES44)

83. Multispectral Solar Telescope Array II. Soft X-Ray EUV Reflectivity of the Multilayer Mirrors. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). T. W. Barbee, Jr., R. B. Hoover, et al. (ES52)

Presentations (Continued)

84. Narrow Band Solar Images in the Soft X-Ray (∿5-50 Å) Regime with Multilayer Optics. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). A.B.C. Walker, Jr., R. B. Hoover, et al. (ES52)

85. NASA's Geostationary Earth Observatory (GEO). SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). Ronald J. Koczor. (ES41)

86. The Objective Double Crystal Spectrometer. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). A.B.C. Walker, Jr., T. D. Willis, and R. B. Hoover. (ES52)

87. Occultation Analysis of BATSE Data - Operational Aspects. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991. B. A. Harmon, M. H. Finger, B. Rubin, R. Mallozzi, W. S. Paciesas, R. B. Wilson, G. J. Fishman, and C. A. Meegan. (ES62)

88. Off-Axis Effects in Focal Plane Stellar X-Ray Polarimeters. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991. M. C. Weisskopf and R. F. Elsner. (ES65)

89. Optical Configurations of H I Lyman Alpha Coronagraph/Polarimeters. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). R. B. Hoover, S. Fineschi, A.B.C. Walker, Jr., R. B. Johnson, and M. Zukic. (ES52)

90. Optimized Radiative Cooling of Infrared Space Telescopes. The Next Generation Infrared Telescope Meeting, Edinburgh, United Kingdom, May 22-24, 1991 (to appear in proceedings). T. G. Hawarden, R. O. Cummings, and C. M. Telesco. (ES63)

91. Overview of the X-30 Natural Environment. 10th NASP Technology Symposium, Monterey, California, April 23-26, 1991. Dale L. Johnson. (ES44)

92. A PC-Based Multispectral Scanner Data Evaluation Workstation: Application to Daedalus Scanners. Fourth Airborne Geoscience Workshop, LaJolla, California, January 29-February 1, 1991. Gary J. Jedlovec, Mark W. James, Matthew R. Smith, and Robert J. Atkinson. (ES43)

93. Photographic Films for the Multispectral Solar Telescope Array. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). R. B. Hoover, et al. (ES52)

Presentations (Continued)

94. A Physical Interpretation of Brightness Temperatures Observed by the Microwave Sounding Units Based on Raobs. Fifth Conference on Climate Variations, Denver, Colorado, October 14-18, 1991. Roy W. Spencer and John Christy. (ES42)

95. A Physical Split Window Technique for Deriving Precipitable Water Utilizing VAS Data. Fifth Topical Meeting on Optical Remote Sensing, Williamsburg, Virginia, November 18-21, 1991. Anthony R. Guillory, Henry E. Fuelberg, and Gary J. Jedlovec. (ES43)

96. Pinhole Cameras: Multi-Purpose Sensors for Atomic Oxygen in Orbit; Application to Attitude Determination of the LDEF. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991 (to appear in proceedings). Palmer N. Peters and John C. Gregory. (ES63)

97. Plasma Contactor for the ISTP/POLAR Spacecraft. 22nd International Electric Propulsion Conference, Viareggio, Italy, October 14-17, 1991. R. R. Robson, W. S. Williamson, R. C. Olsen, and T. E. Moore. (ES53)

98. Preliminary Calibration Results for the BATSE Instrument on CGRO. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). G. N. Pendleton, W. S. Paciesas, G. J. Fishman, R. B. Wilson, C. A. Meegan, F. E. Roberts, J. P. Lestrade, J. M. Horack, M. N. Brock, and M. D. Flickinger. (ES62)

99. Processing of Bulk HTS Materials at NASA/Marshall Space Flight Center. DARPA Workshop on NTS Bulk Technology Development, Santa Fe, New Mexico, January 31, 1991. M. Vlasse. (ES74)

100. Production of Continuous Glass Fiber Using Lunar Simulant. 23rd International SAMPE Technical Conference, Kiamesha Lake, New York, October 22-24, 1991 (to appear in proceedings). Dennis S. Tucker, Edwin C. Ethridge, and Peter A. Curreri. (ES75)

101. Protein Crystal Growth in Microgravity. IKI/AIAA Microgravity Science Symposium, Moscow, Russia, May 13-17, 1991. R. S. Snyder, M. Pusey, D. C. Carter, L. J. Delucas, and C. E. Bugg. (ES71)

102. The Quiet Solar Network at 10^6 K. Gordon Research Conference, Plymouth, New Hampshire, August 5-9, 1991. J. G. Porter, R. B. Hoover, R. L. Moore, and A.B.C. Walker, Jr. (ES52)

103. Radar Characteristics of Cloud-to-Ground Lightning Producing Storms in Florida. 25th International Conference on Radar Meteorology, Paris, France, June 24-28, 1991. D. E. Buechler and S. J. Goodman. (ES43)

Presentations (Continued)

104. Rapidity and Transverse Momentum Distributions in 6.4 TeV S + Pb Interactions from CERN EMU05 Experiments. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). A. Iyono, Y. Takahashi, J. C. Gregory, T. Hayashi, T. Shiina, M. J. Christl, J. H. Derrickson, W. F. Fountain, T. A. Parnell, B. Rubin, J. W. Watts, et al. (ES62)

105. Recent Improvements in Atmospheric Environment Models for Space Station Applications. 29th Aerospace Sciences Meeting, Reno, Nevada, January 7-10, 1991. B. Jeffrey Anderson, Robert E. Smith, Ronald J. Suggs, Karen Catlett, and Michael Hickey. (ES44)

106. Refractive Properties of TGS Aqueous Solution for Two-Color Interferometry. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991. Chandra S. Vikram, William K. Witherow, and James D. Trolinger. (ES74)

107. A Regularization Method for the Extrapolation of Solar Magnetic Fields. Department of Mathematical Sciences, University of Alabama in Huntsville, Huntsville, Alabama, May 10, 1991. G. A. Gary. (ES52)

108. Reluctant Glass Formers and Their Applications in Lens Design. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991. R. B. Johnson, C. Feng, and E. C. Ethridge. (ES75)

109. Remote Sensing Density Perturbations Induced by Subtropical Rainfalls for Spacecraft Environment Study. Seventh Annual TABES 91, Huntsville, Alabama, May 14-15, 1991. R. J. Hung, C. C. Lee, D. L. Johnson, and A. J. Chen. (ES44)

110. Remote Sensing of Ozone Variability Using an Airborne Scanning Infrared Spectrometer. Fifth Topical Meeting on Optical Remote Sensing, Williamsburg, Virginia, November 18-21, 1991. G. S. Carlson, G. J. Jedlovec, and R. Suggs. (ES43)

111. Review of Space Shuttle Externally-Induced Environment Compared with Skylab's Natural Environment. AIAA 29th Aerospace Sciences Meeting, Reno, Nevada, January 7-10, 1991. Michael Susko. (ES44)

112. The Role of Sea-Surface Temperature Distribution on Numerically Simulated Cyclogenesis During ERICA. Ninth Conference on Numerical Weather Prediction, Denver, Colorado, October 14-18, 1991. William M. Lapenta, Donald J. Perkey, C. Kreitzberg, and Franklin R. Robertson. (ES42)

113. Spectra, Composition, and Interactions of Nuclei with a Balloon-Borne Superconducting Magnetic. 22nd International CRC, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. Asakimori, M. J. Christl, J. H. Derrickson, W. F. Fountain, J. C. Gregory, T. Hayashi, T. A. Parnell, F. E. Roberts, Y. Takahashi, J. W. Watts, et al. (ES62)

Presentations (Continued)

114. Self-Collapse of Protein Crystals: Scaling Relations for Structural Fragility. Fourth International Conference on Crystallization of Biological Macromolecules, Freiburg, Germany, August 18-24, 1991. David A. Noever. (ES76)

115. Sensor Fusion Techniques for Predicting Thunderstorm Evolution Using Lightning and Radar Networks. 25th Conference on Radar Meteorology, Paris, France, June 24-28, 1991. Steven J. Goodman. (ES44)

116. Size Effects and a Failure Model for Mechanically-Stressed Protein Crystals and Aggregates. Fourth International Conference on Crystallization of Biological Macromolecules, Freiburg, Germany, August 18-24, 1991. David A. Noever. (ES76)

117. Solar Observations with the Multispectral Solar Telescope Array. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). R. B. Hoover, A.B.C. Walker, Jr., J. Lindblom, M. Allen, R. O'Neal, C. DeForest, and T. W. Barbee, Jr. (ES52)

118. Solar/Stellar Coronal Explorer and the Solar/Stellar Coronal Observatory. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, July 21-26, 1991 (to appear in proceedings). A.B.C. Walker, Jr., R. B. Hoover, E. Tandberg-Hanssen, et al. (ES52)

119. Space Station Freedom Capabilities for Users. 42nd Congress of the International Astronautical Federation, Montreal, Canada, October 5-11, 1991. W.W.L. Taylor, R. S. Snyder, and H. J. Willenberg. (ES71)

120. A Strong-Field Synchrotron Self-Compton Gamma Ray Burst Emission Model. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). Robert D. Preece and Alice K. Harding. (ES62)

121. A Study of Isospin Clustering and Intermittency Fluctuations in 6.4 TeV S + Pb Interactions from CERN EMU05. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). Y. Takahashi, J. C. Gregory, T. Hayashi, T. Shiina, M. J. Christl, J. H. Derrickson, T. A. Parnell, B. Rubin, J. W. Watts, et al. (ES62)

122. Summary of Ionizing Radiation Analysis on the Long Duration Exposure Facility. First LDEF Post-Retrieval Symposium, Orlando, Florida, June 2-8, 1991 (to appear in proceedings). T. A. Parnell. (ES62)

123. A Sunward Taillike Extension of the Duskside Plasmasphere, Scanned by Whistler Ground Stations. 20th General Assembly of International Union of Geodesy & Geophysics, Vienna, Austria, August 11-24, 1991. D. L. Carpenter, A. J. Smith, B. L. Giles, C. R. Chappell, P.M.E. Decreau. (ES53)

Presentations (Continued)

124. Survey of Thermal O^+ Temperatures Observed in and Near the Plasmasphere by DE-1/RIMS. 20th General Assembly of the International Union of Geodesy and Geophysics, Vienna, Austria, August 11-24, 1991. R. H. Comfort, P. D. Craven, D. L. Gallagher, C. R. Chappell, and R. L. West. (ES53)

125. Symmetric Instability in a Growing Baroclinic Wave. Eighth Conference on Atmospheric and Oceanic Waves and Stability, Denver, Colorado, October 14-18, 1991. Shih-Hung Chou and Timothy L. Miller. (ES42)

126. Test of an Orbiting Hydrogen Maser Clock System Using Laser Time Transfer. 23rd Annual Precise Time & Time Interval (PTTI) Applications and Planning Meeting, Pasadena, California, December 3-5, 1991 (to appear in proceedings). R.F.C. Vessot, E. M. Mattison, G. U. Nystrom, and R. Decher. (ES61)

127. Thermal Buoyancy and Solutal Convection Due to G-Jitter. AIAA 29th Aerospace Sciences Meeting, Reno, Nevada, January 7-10, 1991. N. Ramachandran. (ES42)

128. Three-Dimensional Numerical Investigation of Gravitational and Solutal Effects in a Cylindrical Cell. AIAA 26th Thermophysics Conference, Honolulu, Hawaii, June 24-26, 1991. N. Ramachandran and James Patton Downey. (ES42)

129. Three-Dimensional Simulations of Colarimeter X-Ray Film Spots for Determining P_T . 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. Asakimori, M. J. Christl, J. H. Derrickson, W. F. Fountain, J. C. Gregory, T. Hayashi, T. A. Parnell, F. E. Roberts, Y. Takahashi, J. W. Watts, et al. (ES62)

130. Tornadogenesis via Squall Line and Supercell Interaction Revisited: The 15 November 1989 Huntsville Tornado. Tornado Symposium III, Norman, Oklahoma, April 2-5, 1991 (to appear in proceedings). Steven J. Goodman and Kevin R. Knupp. (ES44)

131. Triggering of Eruptive Flares: Distabilization of the Preflare Magnetic Field. IAU Colloquium No. 133 on Eruptive Solar Flares, Iguazu, Argentina, August 2-6, 1991 (to appear in proceedings). Ronald L. Moore. (ES52)

132. A Two-Dimensional MHD Coronal Model: Steady-State Streams. Solar Wind Seven, Goslar, Germany, September 16-21, 1991 (to appear in proceedings). A.-H. Wang, S. T. Wu, S. T. Suess, and G. Poletto. (ES52)

133. The Ultra High Resolution XUV Spectroheliograph. 21st SPD Meeting of the American Astronomical Society and Max '91 Meeting, Huntsville, Alabama, April 9-12, 1991. A.B.C. Walker, Jr., J. F. Lindblom, J. G. Timothy, R. B. Hoover, E. Tandberg-Hanssen, and T. W. Barbee, Jr. (ES52)

Presentations (Concluded)

134. The Ultra High Resolution XUV Telescope III. A Modified Configuration for a Free-Flying Platform. SPIE 36th Annual International Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California July 21-26, 1991 (to appear in proceedings). A.B.C. Walker, Jr., R. B. Hoover, E. Tandberg-Hanssen, et al. (ES52)

135. Ultra-Relativistic Heavy Nucleus Interactions in the Energy Range Above 500 GeV/Nucleon. 22nd International Cosmic Ray Conference, Dublin, Ireland, August 11-23, 1991 (to appear in proceedings). K. Asakimori, K., M. J. Christl, J. H. Derrickson, W. F. Fountain, J. C. Gregory, T. Hayashi, T. A. Parnell, F. E. Roberts, Y. Takahashi, J. W. Watts, et al. (ES62)

136. Ulysses/BATSE Observations of Cosmic Gamma-Ray Bursts. Second Gamma Ray Observatory Science Workshop, Annapolis, Maryland, September 23-25, 1991 (to appear in proceedings). K. Hurley, G. Fishman, C. Meegan, W. Paciesas, R. Wilson, C. Kouveliotou, et al. (ES62)

137. The Use of an Aircraft Based Thermal Infrared Multispectral Scanner (TIMS) Data to Measure Surface Energy Budgets on a Landscape Scale. Fourth Airborne Geoscience Workshop, LaJolla, California, January 29-February 1, 1991. Jeffrey C. Luvall. (ES43)

138. Vertical Bridgman Growth of Cd-Zn-Te (Modelling). SPIE's 36th Annual International Symposium on Optical and Optoelectronic Applied Science & Engineering, San Diego, California, July 21-26, 1991. D. T. Larson, A. Levy, D. C. Gillies, J.I.D. Alexander, and F. M. Carlson. (ES75)

139. Wave-Mean Flow Interactions During an Amplitude Vacillation. Eighth Conference on Atmospheric & Oceanic Waves and Stability, Denver, Colorado, October 14-18, 1991. Huei-Iin Lu and Timothy L. Miller. (ES42)

140. Why the Winds from Late-Type Giants and Supergiants are Cool. Seventh Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, Tucson, Arizona, October 1991 (to appear in proceedings). R. L. Moore, Z. E. Musielak, C.-H. An, R. Rosner, and S. T. Suess. (ES52)

141. X. Prominences. 21st IAU General Assembly, Buenos Aires, Argentina, July 23-August 1, 1991. E. Tandberg-Hanssen and J. M. Fontenla. (ES01)

APPENDIX

SSL PREPRINTS

1. Flow Downstream of the Heliospheric Terminal Shock: Magnetic Field Kinematics. No. 91-101, January 1991. (PUBLISHED; see section on OPEN LITERATURE.) Steven Nerney, Steven T. Suess, and E. J. Schmahl. (ES52)

2. The MSFC Vector Magnetograph, Eruptive Flares, and the Solar-A X-Ray Images. No. 91-102, January 1991, to appear in proceedings of the Solar-A Science Meeting (held Tokyo, Japan, October 23-26, 1990). R. L. Moore, M. J. Hagyard, J. M. Davis, and J. G. Porter. (ES52)

3. A Microflare-Related Activation of a Filament Observed in H-Alpha and C IV Lines. No. 91-103, January 1991. (PUBLISHED; see section on OPEN LITERATURE.) B. Schmieder, J. Fontenla, and E. Tandberg-Hanssen. (ES52)

4. Magnetic Energy Storage and Conversion in Transient Solar Activity - Observations. No. 91-104, January 1991, to appear in Proceedings of SCOSTEP International Solar-Terrestrial Physics Symposium (held The Hague, The Netherlands, June 1990). Marcos E. Machado and Ronald L. Moore. (ES52)

5. NASA/SPAN and DOE/ESnet-DECnet Transition Strategy for DECnet OSI/Phase V. No. 91-105, January 1991, to appear in Proceedings of the Digital Equipment Computer Users Society Fall 1990 Symposium (held Las Vegas, Nevada, December 10-14, 1990). Linda Porter and Phil DeMar. (ES01)

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APPROVAL

SPACE SCIENCE LABORATORY, PUBLICATIONS AND PRESENTATIONS JANUARY 1-DECEMBER 31, 1991

Compiled by Tauna W. Moorehead

The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

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☆ U. S. GOVERNMENT PRINTING OFFICE 1992 – 631–060/60111