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# Science and Technology Directorate Publications and Presentations, January 1–December 31, 2005

*Compiled by*
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***September 2006***

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1. Science and Technology Directorate Publications and Presentations, *NASA/TM–2005–214219,* December 2005. Compiled by F.G. Summers.

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13. Pre-Launch GOES-R Risk Reduction Activities for the Geostationary Lightning Mapper, *Proceedings of WWRP International Symposium on Now Casting and Very Short Range Forecasting*, Toulouse, France, September 5–9, 2005, Published abstracts p. 130, 2005. S.J. Goodman, R.J. Blakeslee, D.J. Boccippio, H.J. Christian, W.J. Koshak, and W.A. Peterson.

14. Ring Current Dynamic in the Presence of EMIC Waves, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), p. JA426, May 2005. G.V. Khazanov and K.V. Gamayunov.

15. Satellite-Derived High Resolution Land Use/Land Cover Data to Improve Urban Air Quality Model Forecasts and Decision Making, *Proceedings of U.S. Climate Change Science Program Workshop,* Climate Science in Support of Decision Making, *Abstract Book,* Arlington, VA, November 14–16, 2005, p. 92. D.L. Rickman, A.S. Niskar, J. Qualters, D.A. Quattrochi, M.G. Estes, A.S. Limaye, W.L. Crosson, and M. Al-Hamdan.

16. Scattering Efficiency of High-Voltage Tethers in Space, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), pp. JA426–JA427, May 2005. E.N. Krivorutsky, G.V. Khazanov, K.V. Gamayunov, and L.A. Avanov.

17. Scattering of Solar X-Rays by Jupiter and Saturn, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), p. JA369, May 2005. T.E. Cravens, J. Clark, A. Bhardwaj, R.F. Elsner, J.H. Waite, Jr., L.W. Acton, A.N. Maurellis, and G.R. Gladstone.

18. Shape and Reconnection of the Exploding Magnetic Field in the Onset of CMEs, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), pp. JA468–JA469, May 2005. R.L. Moore, A.C. Sterling, D.A. Falconer, and G.A. Gary.

19. Strong Pitch-Angle Diffusion of the Ring Current Ions Induced by Electromagnetic Ion Cyclotron Waves, 2005 American Geophysical Union Fall Meeting, San Francisco, CA, December 5–9, 2005; *Eos, 86*(52), p. F1626, December 2005. K.V. Gamayunov and G.V. Khazanov.

20. A Study of Characteristics and Behavior of the Low-Energy in the Magnetospheric Lobal Wind, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), p. JA431, May 2005. P.D. Craven, M.W. Liemohn, M.O. Chandler, and T.E. Moore.

**Published Abstracts (Continued)**

21. Unusual Density Structures in the Outer Plasmasphere Near the Magnetic Equator, 2005 American Geophysical Union Fall Meeting, San Francisco, CA, December 5–9, 2005; *Eos, 86*(52), p. F1619, December 2005. D.L. Gallagher, J.L. Green, and Z. Smith.

22. X-Ray Spectroscopy of Optically Bright Planets Using the Chandra Observatory, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), p. JA369, May 2005. P.G. Ford and R.F. Elsner.

23. X-Rays From Saturn and Its Rings, 2005 American Geophysical Union Joint Assembly, New Orleans, LA, May 23–27, 2005; *Eos, 86*(18), p. JA369, May 2005. A. Bhardwaj, R.F. Elsner, J.H. Waite, Jr., G.R. Gladstone, T.E. Cravens, and P.G. Ford.

## PRESENTATIONS

1. 3-D GRMHD Simulations of Disk-Jet Coupling and Associated Variabilities and Emission, International Workshop on Magnetohydrodynamic (MHD) Accretion Flows and Jets, Kyoto, Japan, January 25–27, 2005. K.-I. Nishikawa.

2. 3-D Structure of Sunspots Using Imaging Spectroscopy, Astronomical Society of the Pacific Workshop, at National Solar Observatory, Sunspot, NM, July 18–22, 2005. K.S. Balasubramaniam, G.A. Gary, and K. Reardon.

3. Acceleration Mechanics in Relativistic Shocks by the Weibel Instability, http://arxiv.org/archive/astro-ph, 2005. K.-I. Nishikawa, P.E. Hardee, C.B. Hededal, and G.J. Fishman.

4. Advanced Sensors for NASA's Exploration Missions, National Science Foundation (NSF) Workshop on Sensors at Alabama A&M University, Huntsville, AL, June 7, 2005. R.B. Lal, R.G. Clinton, Jr., D.O. Frazier.

5. Aircraft Based Remotely Sensed Albedo and Surface Temperatures for Three U.S. Cities, RCI Foundation Presents: Cool Roofing, Cutting Through the Glare, Atlanta, GA, May 11–13, 2005. J.C. Luvall, D.L. Rickman, D.A. Quattrochi, and M.G. Estes.

6. Amazing SGR 1806–20, Part II, 2005 SWIFT Team Meeting, State College, PA, March 1–2, 2005. C. Kouveliotou.

7. Analysis of Bare-Tether Systems as a Thruster for MXER Studies 9th Spacecraft Charging Technology Conference, Tsukuba, Japan, April 4–8, 2005. G.V. Khazanov, E.N. Krivorutsky, and K. Sorensen.

8. Analysis of Iron Meteorites Using Computed Tomography and Electron-Probe Microanalysis, 2005 Microscopy and Microanalysis Meeting, Honolulu, HI, July 31–August 4, 2005. P.K. Carpenter and D.C. Gillies.

9. Analysis of Upper Air, Ground and Remote Sensing Data for the ATLAS Field Campaign in San Juan, Puerto Rico, 85th American Meteorological Society Annual Meeting, January 9–13, 2005. J.E. Gonzalez, J.C. Luvall, D.L. Rickman, D.E. Comarazamy, and A.J. Picon.

10. Are We There Yet? Developing In Situ Fabrication and Repair (ISFR) Technologies to Explore and Live on the Moon and Mars, AIAA Conference, Orlando, FL, January 30–February 2, 2005. J.A. Bassler, M.P. Bodiford, M.R. Fiske, and J.D. Strong.

11. Axisymmetric Numerical Modeling of Pulse Detonation Rocket Engines, 41st AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Tucson, AZ, July 10–13, 2005. C.I. Morris.

**PRESENTATIONS (Continued)**

12. Back To the Future: A Historical Perspective of Lunar and Martian In Situ Fabrication and Repair, AIAA Conference, Orlando, FL, January 30–February 2, 2005. J.A. Bassler, R.N. Grugel, M.P. Bodiford, M.R. Fiske, S.D. Gilley, S.J. Epps, B.W. Evans, and D.D. Ezell.

13. Beamed Energy and Other Concepts for Aerospace Propulsion Applications, Advanced Power and Energy Conference, Quantico, VA, August 3–5, 2005. J.W. Cole.

14. Calculated X-Ray Intensities Using Monte Carlo Algorithms: A Comparison to Experimental EPMA Data, 2005 Microscopy and Microanalysis Meeting, Honolulu, HI, July 31–August 4, 2005. P.K. Carpenter.

15. The Chandra X-Ray Observatory: The Past, the Present, and the Future, 205th Meeting of the American Astronomical Society, San Diego, CA, January 9–13, 2005. M.C. Weisskopf and H. Tananbaum.

16. Characterization Strategies and Requirements for Lunar Regolith Simulant Materials, Lunar Regolith Materials Simulant Workshop, Marshall Institute, Madison, AL, January 24–26, 2005. P.K. Carpenter.

17. Characterization Strategies and Requirements for Lunar Regolith Simulant Materials, Workshop on Granular Materials for Exploration, Kennedy Space Center, Orlando, FL, February 1–3, 2005. P.K. Carpenter.

18. CIV Vacuum Ultraviolet Fabry-Perot Interferometer for Transition-Region Magnetography, Astronomical Society of the Pacific, Boulder, CO, September 19–23, 2005. G.A. Gary, E.A. West, D. Rees, M. Zukic, P. Herman, and J. Li.

19. Comparison of Two IRI Plasmasphere Extensions with GPS–TEC Observations, IRI 2005 Workshop, Roquetes, Spain, June 27–July 1, 2005. T. Gulyaeva and D.L. Gallagher.

20. Cosmological Constraints From Sunyaev-Zeldovich Effect and X-Ray Data for 37 Galaxy Clusters, The Future of Cosmology With Clusters of Galaxies, Kona, HI, February 26–March 2, 2005. M. Bonamente, M.K. Joy, S. LaRoque, J.E. Carlstrom, and E.D. Reese.

21. Cryogenic Performance of Trex SiC Mirror, Mirror Technology Days 2005, Huntsville, AL, August 16–18 August, 2005. R. Eng, D. Bray, J. Carpenter, C. Foss, H.J. Haight, W. Hogue, J. Kegley, T.J. Kester, H.P. Stahl, E.R. Wright, D. Kane, and J. Hadaway.

22. Current Collection by Grid-Sphere Electrode in Space, 53rd Propulsion Meeting, Monterey, CA, December 5–8, 2005. G.V. Khazanov, E.N. Krivorutsky, and K. Sorensen.

23. Determining Important Nuclear Fragmentation Processes for Human Space Explorations, Nuclear Equation of State for Nuclei, Neutron Stars, and Supernovae, Arkansas State University, Little Rock, AK, April 14–15, 2005. Z.-W. Lin.

**PRESENTATIONS (Continued)**

24. The Development of Focusing Telescopes for the Hard X-Ray Region, COSPAR, Spectra and Timing of Compact X-Ray Binaries, Mumbai, India, January 17–21, 2005. B.D. Ramsey.

25. Development of Ionic Liquid Monopropellants for In-Space Propulsion, 41st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Tucson, AZ, July 10–13, 2005. J.A. Blevins, G.W. Drake, and R. Osborne.

26. Development of Ionic Liquid Monopropellants for In-Space Propulsion, 53rd JPM/2nd LPS/SP Joint Meeting, Monterey, CA, December 5–8, 2005. J.A. Blevins, G.W. Drake, and R. Osborne.

27. Development of Standardized Lunar Regolith Simulant Materials, 2005 Lunar Exploration Analysis Group/Space Resources Roundtable Meeting, League City, TX, October 25–28, 2005. P.K. Carpenter, L. Sibille, and S. Wilson.

28. Diagnostics for In-Space Testing of Electric Thrusters in the International Space Station, 29th International Electric Propulsion Conference, Princeton, NJ, October 31–November 4, 2005. D.G. Chavers.

29. Distributed Sensing of Composite Over-Wrapped Pressure Vessel Using Fiber-Bragg Gratings. National Space and Missile Materials Symposium: "Betting on Materials: A Sure Win," Summerlin, NV, June 25–July 1, 2005. J. Grant.

30. Don Clayton and Nuclear Gamma-Ray Astronomy, Astronomy With Radioactivites V, Clemson University, Clemson, SC, September 5–9, 2005. G.J. Fishman.

31. Effects of Nuclear Interactions in Space Radiation Transport. 1st Space Exploration Conference, Continuing the Voyage of Discover, Orlando, FL, January 30–February 1, 2005. Z.-W. Lin and A.F. Barghouty.

32. Effects of Nuclear Interactions on Accuracy of Space Radiation Transport, Space Nuclear Conference 2005, San Diego, CA, June 5–9, 2005. Z.-W. Lin and A.F. Barghouty.

33. Electrodynamic Tether as a Thruster for MXER Studies, AIAA Propulsion Conference, Tucson, AZ, July 11–13, 2005. G.V. Khazanov, E.N. Krivorutsky, and K. Sorensen.

34. Electromagnetic Pumps for Conductive-Propellant Feed Systems, Joint Propulsion Conference, Tucson, AZ, July 11–13, 2005. T.E. Markusic and K.A. Polzin.

35. Electromagnetic Pumps for Conductive-Propellant Feed Systems. 29th International Electric Propulstion Conference (IEPC), Princeton University, Newark, NJ, October 31–November 4, 2005. T.E. Markusic, K.A. Polzin, and A. Dehoyos.

**PRESENTATIONS (Continued)**

36. An Energy-Rich Environment for the Moon by Solar Cell Fabrication on the Moon, Space for Inspiration of Humankind, 56th International Astronautical Congress, Fukuoka, Japan, October 17–21, 2005. P.A. Curreri, L. Sibille, A. Ignatiev, A. Freundlich, and A. Alemu.

37. Environmental Public Health Tracking: Health and Environment Linked for Information Exchange—Atlanta (HELIX-Atlanta): A Cooperative Program Between CDC and NASA for Development of an Environmental Public Health Tracking Network in the Atlanta Metropolitan Area, NASA Ecological Modeling Workshop, Monterey, CA, March 29–April 1, 2005. D.A. Quattrochi and A.S. Niskar.

38. Exploring the Relationship Between Lightning, Liquid and Frozen Water Phases Using TRMM Precipitation Radar and Lightning Imaging Sensor Data, 32nd Radar Meteorology Conference, American Meteorological Society, Albuquerque, NM, October 23–29, 2005. W.A. Petersen, H.J. Christian, and S.A. Rutledge.

39. The First Chandra Field: The Discovery and Identification of Leon X-1, Six Years of Science With Chandra Symposium, November 2–4, 2005. M.C. Weisskopf.

40. First Terrestrial Soft X-Ray Auroral Observation by the Chandra X-Ray Observatory, 2004 Workshop, Challenges to Modeling the Sun-Earth System, Huntsville, AL, October 18–22, 2004. A. Bhardwaj, G.R. Gladstone, R.F. Elsner, N. Ostgaard, J.H. Waite, Jr., T.E. Cravens, S.-W. Chang, T. Majeed, and A.E. Metzger.

41. Fluorescent Approaches to High Throughput Crystallography, American Crystallographic Association (ACA) Conference, Orlando, FL, May 27–June 2, 2005. M.L. Pusey, E.L. Forsythe, and A. Achari.

42. Fluorescent Approaches to High Throughput Crystallography, American Institute of Chemical Engineers (AIChE), Cincinnati, OH, October 30–November 4, 2005. M.L. Pusey, E.L. Forsythe, and A. Achari.

43. Fluorescent Approaches to High Throughput Crystallography, Protein Production and Crystallization Workshop, Bethesda, MD, February 2–3, 2005. M.L. Pusey and E.L. Forsythe.

44. Fusion Ignition Rocket Engine With Ballistic Ablative Lithium, NASA/JPL/MSFC 16th Annual Event Propulsion Workshop at University of Alabama in Huntsville, Huntsville, AL, April 7–8, 2005. A. Martin, R. Eskridge, and P.J. Fimognari III.

45. Galium Electromagnetic (GEM) Thruster Concept and Design, 53rd JPM/2nd LPS/SP Joint Meeting, Monterey, CA, December 5–8, 2005. K.A. Polzin and T.E. Markusic.

46. Galium Electromagnetic (GEM) Thruster Concept and Design, Joint Propulsion Conference, Tucson, AZ, July 11–13, 2005. J.P. Foote and R.J. Litchford.

**PRESENTATIONS (Continued)**

47. General Relativistic Magnetohydrodynamic Simulations of Collapsars, Ultra-Relativistic Jets in Astrophysics Observations, Theory, and Simulations, Banff, Alberta, Canada, July 11–15, 2005. Y. Mizuno, S. Yamada, S. Koide, and K. Shibata.

48. General Relativistic MHD Simulation of Relativistic Jets From a Rotating Black Hole Magnetosphere, Relativistic Astrophysics and Cosmology—Einstein's Legacy, Munich, Germany, November 7–11, 2005. Y. Mizuno, K. Shibata, S. Koide, and K.-I. Nishikawa.

49. General Relativistic MHD Simulations of Jet Formation, Gamma Ray Burst in the Swift Era, Washington, DC, November 29–December 2, 2005. Y. Mizuno, K.-I. Nishikawa, P.E. Hardee, S. Koise, and G.J. Fishman.

50. General Relativistic MHD Simulations of Jet Production, Relativistic Jets: The Common Physics of AGN, Microquasars and Gamma-Ray Bursts, University of Michigan, Ann Arbor, MI, December 14–17, 2005. Y. Mizuno, K.-I. Nishikawa, P.E. Hardee, S. Koise, K.K. Ghosh, and G.J. Fishman.

51. Glass and Glass-Ceramic Materials from Simulated Composition of Lunar and Martian Soils: Selected Properties and Potential Applications, 1st Space Exploration Conference Continuing the Voyage of Discovery, Orlando, FL, January 30–February 1, 2005. C.S. Ray, S. Sen, S.T. Reis, and C.W. Kim.

52. Global Lightning Activity, Cosmosphere and Space Center, Wichita, KA, April 14–15, 2005. H.J. Christian, Jr.

53. Global Lightning Activity, The Mexican Meteorological Conference, Cancun, Mexico, February 28–March 4, 2005. H.J. Christian, Jr.

54. Global Lightning Observations, 7th Plinius Conference on Mediterranean Storms, Rithymnon, Crete, October 1–9, 2005. H.J. Christian.

55. GRBs—The Prompt Emission, 3rd American Association of Variable Star Observers (AAVSO) High Energy Astrophysics Workshop, Las Cruces, NM, March 21, 2005. G.J. Fishman.

56. Growth From Solutions: Kink Dynamics, Stoichiometry, Face Kinetics and Stability in Turbulent Flow, American Conference on Crystal Growth and Epitaxy-16, Big Sky, MT, July 10–15, 2005. A.A. Chernov, J.J. De Yoreo, L.N. Rashkovich, and P.G. Vekilov.

57. Growth of Periodic Nano-Layers of Nano-Crystals of Au, Ag, Cu By Ion Beam, International Conference on Surface Modification of Materials by Ion Beams, Kusadasi, Turkey, September 4–9, 2005. C.C. Smith, Z. Zheng, C.I. Muntele, I.C. Muntele, and D. Ila.

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58. Impurity Studies of $Cd_{0.8}Zn_{0.2}Te$ Crystals Using Photoluminescence and Glow Discharge Mass Spectroscopy, 16th American Conference on Crystal Growth and Epitaxy (ACCGE), Big Sky Resort, MT, July 10–15, 2005. C. Li, C.-H. Su, S.L. Lehoczky, and R.N. Scripa.

59. In Situ Resource Utilization Technology Research and Facilities Supporting the NASA's Human Systems Research and Technology Life Support Program, Northern Centre for Advanced Technology, Inc., Planetary and Terrestrial Mining Sciences Symposium, Sudbury, Canada, June 5–8, 2005. R.A. Schlagheck, L. Sibille, K. Sacksteder, and C. Owens.

60. Initiation of Coronal Mass Ejections: Implications for Forecasting Solar Energetic Particle Storms, Solar and Space Physics and the Vision for Space Exploration, Charlottesville, VA, October 15–20, 2005. R.L. Moore, A.C. Sterling, D.A. Falconer, and J.M. Davis.

61. Inorganic and Protein Crystal Assembly in Solutions, Invited talk at Lawrence Livermore National Laboratory, Livermore, CA, March 9–10, 2005. A.A. Chernov.

62. In Situ Resource-Based Lunar and Martian Habitat Structures Development at NASA/MSFC, AIAA Conference, Orlando, FL, January 30–February 2, 2005. M.P. Bodiford, K.H. Burks, M.R. Fiske, J.D. Strong, and W. McGregor.

63. In Situ Resources in Space, National Space & Missile Materials Symposium, Summerlin, NV, June 27–July 1, 2005. P.A. Curreri.

64. Interannual Variability in Surface LW Fluxes Over the Tropical Oceans as Seen in ISCCP–FD and GEWEX SRB Data Sheets, 5th International Scientific Conference on the Global Energy and Water Cycle, Costa Mesa, CA, June 18–24, 2005. F.R. Robertson and H.-I. Lu.

65. Interannual Variability of Tropical Rainfall as Seen From TRMM, 5th International Scientific Conference on the Global Energy and Water Cycle, Costa Mesa, CA, June 18–24, 2005. F.R. Robertson.

66. Introduction to the Sub-Pixel Spatial Resolution Interferometry Process, Opti Fab Conference, Rochester, NY, May 2–5, 2005. J.T. Mooney and H.P. Stahl.

67. James Webb Space Telescope—The "First Light Machine," Beijing Institute of Technology, Beijing, China, August 29, 2005. H.P. Stahl.

68. James Webb Space Telescope—The "First Light Machine," William Jewell College, Liberty, MO, December 5, 2005. H.P. Stahl.

69. Jupiter's Galilean Satellites, Asia Oceania Geosciences Society's 2nd Meeting, Singapore, Singapore, June 20–24, 2005. M.A. McGrath.

**PRESENTATIONS (Continued)**

70. Laboratory Investigation of Space and Planetary Dust Grains, Institute of Planetary Science at the University of Muenster, Muenster, Germany, June 6–June 12, 2005. J.F. Spann, Jr.

71. Laboratory Investigations of the Physical and Optical Properties of the Analogs of Individual Cosmic Dust Grains, The Gordon Research Conference on Origins of Solar Systems, New London, CT, June 26–July 1, 2005. M.M. Abbas, D. Tankosic, P.D. Craven, J.F. Spann, Jr., A. LeClair, and E.A. West.

72. Large Field of View KD*P Modulator for Solar Polarization Measurements, 4th SOLAR POLARIZATION WORKSHOP (SPW 4), Boulder, CO, September 19–23, 2005. E.A. West.

73. Lightning Mapping and the Nowcasting of Severe Storms, 2005 European Geophysical Union Meeting, Vienna, Austria, April 24–29, 2005. S.J. Goodman, C. Darden, and J. Burks.

74. Liquid Between Macromolecules in Protein Crystals—Static vs. Dynamics, 5th International Surface Science Workshop, Sofia, Bulgaria, February 19–17, 2005. A.A. Chernov.

75. Liquid Metal Flow Sensors for Electric Propulsion, 53rd JANNAF Propulsion Meeting/2nd Liquid Propulsion Subcommittee/1st Spacecraft Propulsion Meeting, Monterey, CA, December 5–8, 2005. T.E. Markusic, K.A. Polzin, B.J. Stanojev, C. Dodson, and A. Dehoyos.

76. Lunar and Martian Sub-Surface Habitat Structure Technology Development and Application, AIAA Conference, Orlando, FL, January 30–February 2, 2005. P.J. Boston and J.D. Strong.

77. Magnetars, 3rd American Association of Variable Star Observers (AAVSO) High Energy Astrophysics Workshop, Las Cruces, NM, March 21, 2005. C. Kouveliotou.

78. Magnetars, A Life With Stars Conference, Amsterdam, The Netherlands, August 21–26, 2005. C. Kouveliotou.

79. Materials Requirements for Advanced Propulsion Systems, 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 10–13, 2005. A.F. Whitaker, M.B. Cook, and R.G. Clinton, Jr.

80. Maunder's Butterfly Diagram in the 21st Century, 2nd Asia Oceania Geosciences Society Annual Meeting 2005, Singapore, Singapore, June 20–24, 2005. D.H. Hathaway.

81. Measurements of Photoelectric Yield and Physical Properties of Individual Lunar Dust Grains, Dust in Planetary Systems, Kauai, HI, September 26–30, 2005. M.M. Abbas, D. Tankosic, P.D. Craven, J.F. Spann, Jr., A. LeClair, E.A. West, L. Taylor, and R.B. Hoover.

82. Microinstabilities in the Gasdynamic Mirror Propulsion System, 41st AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Tucson, AZ, July 10–13, 2005. W. Emrich.

**PRESENTATIONS (Continued)**

83. Mission Analysis for LEO Microwave Power-Beaming Station in Orbital Launch of Microwave Lightcraft, 4th International Symposium on Beamed Energy Propulsion (ISBEP4), Nara, Japan, November 15–18, 2005. T. Dickerson and L.N. Myrabo.

84. A Molten Salt Am242M Production Reactor for Space Applications, 2005 ANS Annual Meeting, San Diego, CA, June 5–9, 2005. W. Emrich.

85. Mossbauer and EPR Spectra for Glasses and Glass Ceramics Prepared from Simulated Compositions of Lunar and Martian Soils, 3rd International Symposium on Non-Crystalline Solids and the 7th Brazilian Symposium on Glass and Related Materials, Sao Paulo, Brazil, November 13–16, 2005. C.S. Ray, S.T. Reis, F.F. Sene, J.B. Yang, W.M. Pontuschka, J.M. Giehl, C.W. Kim, and S. Sen.

86. NASA Celebrates The World Year of Physics, American Association of Physics Teachers, Albuquerque, NM, January 8–12, 2005. F.R. Szofran and T.A. Schneider.

87. NASA Celebrates the World Year of Physics. American Association of Physics Teachers, Albuquerque, NM, January 8–12, 2005. M.L. Adams.

88. The NASA Short-Term Prediction and Research Transition (SPoRT) Center—A Research to Operations Test Bed, Second NPOESS Training Workshop, Boulder, CO, May 23–25, 2005. G.J. Jedlovec.

89. NASA's Challenges in Optics for Future Space-Based Science Missions, SPIE 20th Congress of the International Commission for Optics, Challenging Optics in Science and Technology, Changchun, China, August 21–26, 2005. H.P. Stahl.

90. A Neutral Network "Virtual Radar" From Passive Microwave and Lightning Observations, Precipitation Measurements Mission Science Team Meeting, Monterey, CA, December 12–15, 2005. D.J. Boccippio, W.A. Petersen, and D.J. Cecil.

91. New Alternative Fuels for Bipropellant Applications, 53rd JPM/2nd LPS/SP Joint Meeting, Monterey, CA, December 5–8, 2005. G.W. Drake, J.A. Sheehy, and T. Hawkins.

92. New Energetic Materials for Chemical Propulsion, 53rd JPM/2nd LPS/SP Joint Meeting, Monterey, CA, December 5–8, 2005. G.W. Drake and J.B. Neidert.

93. New Evidence for Equatorially Trapped Thermal Plasma During Early Post-Storm Recovery, Geospace Environment Modeling (GEM) Workshop, Santa Fe, NM, June 27–29, 2005. D.L. Gallagher, and J.L. Green.

94. New Fiber Reinforced Waterless Concrete for Extraterrestrial Structural Applications, 12th International Conference on Composites/Nano Engineering (ICCE–12), Tenerife, Canary Islands, Spain, August 1–6, 2005. H. Toutanji, D.S. Tucker, and E.C. Ethridge.

**PRESENTATIONS (Continued)**

95. A New Variety of CMEs: Streamer Puffs from Compact Ejective Flares, SHINE 2005 Workshop, Kailua-Kona, HI, July 10–15, 2005. A.C. Sterling, A. Bemporad, R.L. Moore, and G. Poletto.

96. Non-Contact Creep Resistance Measurement for Ultra-High Temperature Materials, 2005 National Space and Missile Materials Symposium, Summerlin, NV, June 27–July 1, 2005. R.W. Hyers, J. Lee, R.C. Bradshaw, J.R. Rogers, T.J. Rathz, J.J. Wall, H. Choo, and P.K. Liaw.

97. Non-Contact Creep Resistance Measurement for Ultra-High Temperature Materials, Materials Science and Technology 2005, Pittsburgh, PA, September 25–28, 2005. J. Lee, C. Bradshaw, J.R. Rogers, T.J. Rathz, J.J. Wall, H. Choo, P.K. Liaw, and R.W. Hyers.

98. Nondestructive Evaluation of Advanced Materials With X-Ray Phase Mapping, 2005 National Space and Missile Materials Symposium (NSMMS), Las Vegas, NV, June 27–July 1, 2005. Z. Hu.

99. Novel Applications of Magnetic Fields for Fluid Flow Control and for Simulating Variable Gravity Conditions, Mechanical Engineering Department, University of Illinois, Chicago, IL, March 9, 2005. N. Ramachandran.

100. A Novel Material For Future Spacecrafts, BAE System's Chairman Award Committee Panel, Rockville, MD, September 8, 2005. S. Sen and E. Cothran.

101. Observations of Compact X-Ray Binaries With Chandra, COSPAR Colloquium "Spectra and Timing of Compact X-Ray Binaries," Mumbai, India, January 17–21, 2005. M.C. Weisskopf.

102. Observations of Soft Gamma Repeaters, Triggering Relativistic Jets Meeting, Cozumel, Mexico, March 28–April 1, 2005. C. Kouveliotou.

103. Observing Filament Eruptions With Solar-B, 6th Solar-B Science Meeting, Kyoto, Japan, November 8–11, 2005. A.C. Sterling and R.L. Moore.

104. Observing Solar Eruptions With Solar-B and STEREO, STEREO/Solar-B Science Planning Workshop, Oahu, HI, November 15–18, 2005. A.C. Sterling.

105. Origin of the Sheared Magnetic Fields That Erupt in Flares and Coronal Mass Ejections, 6th Solar-B Science Meeting, Kyoto, Japan, November 8–11, 2005. R.L. Moore and A.C. Sterling.

106. Particle Acceleration in Jets, 2006th Meeting of the American Astronomical Society, Minneapolis, MN, May 29–June 2, 2005. K.-I. Nishikawa.

107. Particle Acceleration, Magnetic Field Generation in Relativistic Shocks, International Workshop on Particles and Radiation from Cosmic Accelerators, Chiba, Japan, March 2–4, 2005.

**PRESENTATIONS (Continued)**

K.-I. Nishikawa, P.E. Hardee, C.B. Hededal, G.A. Richardson, H. Sol, R.D. Preece, and G.J. Fishman.

108. Particle Acceleration, Magnetic Field Generation, and Emission in Relativistic Jets, Max-Planck-Institut fur Astronomie, Munich, Germany, November 6, 2005. K.-I. Nishikawa.

109. Particle Acceleration, Magnetic Field Generation, and Emission in Relativistic Pair Jets, Ultra-Relativistic Jets in Astrophysics Observations, Theory, and Simulations, Banff, Alberta, Canada, July 11–15, 2005. K.-I. Nishikawa, E. Ramirez-Ruiz, P.E. Hardee, C.B. Hededal, C. Kouveliotou, G.J. Fishman, and Y. Mizuno.

110. Particle Acceleration, Magnetic Field Generation, and Emission in Relativistic Pair Jets, Relativistic Astrophysics and Cosmology: Einstein's Legacy, Munich, Germany, November 7–11, 2005. K.-I. Nishikawa, E. Ramirez-Ruiz, P.E. Hardee, C.B. Hededal, C. Kouveliotou, G.J. Fishman, and Y. Mizuno.

111. Particle Acceleration, Magnetic Field Generation, and Emission in Relativistic Pair Jets, Research Training Network School: GRBs: The First Three Hours, Santorini, Greece, August 29–September 2, 2005. K.-I. Nishikawa, E. Ramirez-Ruiz, P.E. Hardee, C.B Hededal, C. Kouveliotou, G.J. Fishman, and Y. Mizuno.

112. Performance of a Low-Power Cylindrical Hall Thruster, 29th International Electric Propulsion Conference (IEPC), Princeton, NJ, October 31–November 4, 2005. K.A. Polzin, T.E. Markusic, B.J. Stanojev, A. Dehoyos, Y. Raitses, A. Smirnov, and N.J. Fisch.

113. Performance Optimization Criteria for Pulsed Inductive Plasma Acceleration, 41st AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Tucson, AZ, July 10–13, 2005. K.A. Polzin and E.Y. Choueiri.

114. Phase Contrast X-Ray Imaging of Shuttle Insulating Foam, User Science Seminar, Advanced Photon Source, Argonne National Laboratory, Chicago, IL, August 12–16, 2005. Z. Hu.

115. Poco Graphite Mirror Metrology Report, Mirror Technology Days 2005, Huntsville, AL, August 16–18, 2005. T.J. Kester.

116. Polarization Measurements in the Vacuum Ultraviolet Using SUMI, 4th Solar Polarization Workshop (SPW 4), Boulder, CO, September 19–23, 2005. E.A. West.

117. Powdered Magnesium-Carbon Dioxide Combustion for Mars Propulsion, 41st AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Tucson, AZ, July 10–13, 2005. J.P. Foote and R.J. Litchford.

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118. Present Status of Lunar Regolith Simulants, Workshop Overview and Objectives. Lunar Regolith Materials Simulant Workshop, Marshall Institute, Madison, AL, January 24–26, 2005. L. Sibille.

119. Processing of Lunar Soil Simulant for Space Exploration Applications, International Conference on Advances in Solidification Science, Stockholm, Sweden, June 7–10, 2005. S. Sen, C.S. Ray, and N. Ramachandran.

120. Progress on the Plasmoid Thruster Experiment (PTX), Joint Propulsion Conference, Tucson, AZ, July 11–13, 2005. A. Martin, R. Eskridge, M. Lee, P. Fimognari, and S. Koelfgen.

121. Prospective Individual Risk Assessment Using Repetitive Large Datasets, Photonic Nanosystems 2005 and Micro-Electro-Mechanical and Biological Systems (MEMS and BioMEMS) Conference, San Francisco, CA, November 7–9, 2005. S. Rao, H. Malak, A. Bishop, E. Ciszak, and R.C. Richmond.

122. Protein Crystallization, Invited Seminar—Rennselaer Polytechnic Institute, Troy, NY, June 20–22, 2005. A.A. Chernov.

123. Quantitative Electron Probe Microanalysis: State of the Art, Goldschmidt Conference, Moscow, ID, May 20–25, 2005. P.K. Carpenter.

124. Reduction, Analysis, and Properties of Electric Current Systems, Ambiguity Workshop, Boulder, CO, September 26–29, 2005. G.A. Gary and P. Demoulin.

125. Relativistic MHD Simulations of Jets, Max-Planck-Institut fur Astronomie, Munich, Germany, November 7, 2005. Y. Mizuno.

126. Replicated Nickel Optics for the Hard-X-Ray Region, Focusing Telescopes in Nuclear Astrophysics, Corsica, France, September 12–15, 2005. B.D. Ramsey.

127. Reproducible Crystal Growth Experiments in MSG at the ISS (SUBSA) Investigation, 43rd American Institute of Aeronautics and Astronautics (AIAA) Aerospace Sciences Meeting and Exhibit, Reno, NV, January 10–13, 2005. A.G. Ostrogorsky, C. Marin, M.P. Volz, and W.A. Bonner.

128. Resolving Risks in Individual Astronauts: A New Paradigm for Critical Path Exposures, Environmental Sentinels (ES) 2005, Houston, TX, June 1–2, 2005. R.C. Richmond.

129. Results From the NASA Capability Roadmap Team for In Situ Resource Utilization (ISRU), International Lunar Conference 2005, Toronto, Canada, September 18–23, 2005. G.B. Sanders, K. Romig, W. Larson, D. Rapp, K. Sacksteder, D. Linne, P.A. Curreri, M. Duke, B. Blair, L. Gertsch, E. Rice, D.L. Clark, E. McCullough, and R. Zubrin.

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130. RF Stabilization for Storage of Antiprotons, Space Technology and Applications International Forum (STAIF–2005), Albuquerque, NM, February 13–17, 2005. J.B. Pearson and R.A. Lewis.

131. Ring Current-Electromagnetic Ion Cyclotron Waves Coupling, CEDAR/GEM Workshop, Santa Fe, NM, June 27–July 1, 2005. G.V. Khazanov.

132. ROBOSIM Modeling of NASA and DoD Robotic Concepts, IEEE Southeastern Software Engineering Conference, Huntsville, AL, March 28–31, 2005. K.R. Fernandez.

133. The Role of the Heavy Ions in the Generation of EMIC Waves, European Geophysical Union General Assembly 2005, Vienna, Austria, April 24–29, 2005. G.V. Khazanov, D.L. Gallagher, and K.V. Gamayunov.

134. Satellite Basics, U.N. World Meteorological Organization Nowcasting Training Working Shop for Africa/South African Weather Service, Pretoria, South Africa, November 28–December 9, 2005. S.J. Goodman.

135. Satellite-Derived High-Resolution Land Use/Land Cover Data to Improve Urban Air Quality Model Forecasts and Decision-Making, Climate Change Science Program Workshop, Arlington, VA, November 14–16, 2005. D.A. Quattrochi, W.L. Crosson, M.G. Estes, M. Al-Hamdan, and M. Khan.

136. Self-Consistent Ionosphere-Magnetosphere Electrodynamic Coupling. Workshop on Penetration Electric Fields and Their Effects on the Inner Magnetosphere and Ionosphere, Westford, MA, November 7–9, 2005. G.V. Khazanov and D.L. Gallagher.

137. SIAM-SERVIR: An Environmental Monitoring and Decision Support System for Mesoamerica, Lecture for the City of Knowledge, City of Knowledge Foundation, Panama City, Panama, August 18, 2005. D.E. Irwin, T.L. Sever, S. Graves, and D. Hardin.

138. Simulant Materials of Lunar Dust: Requirements and Feasibility, Biological Effects of Lunar Dust Workshop, Ames, CA, March 28–April 1, 2005. L. Sibille.

139. Simulation of the ATIC–2 Silicon Matrix for Protons and Helium GCR Primaries at 0.3, 10, and 25 TeV/Nucleon, 29th International Cosmic Ray Conference, Pune, India, August 3–10, 2005. J.W. Watts, J.H. Adams, Jr., G.L. Bashindzhagyan, K.E. Batkov, J. Chang, M.J. Christl, A.R. Fazely, O. Ganel, R.M. Gunasingha, T.G. Guzik, J. Isbert, K.C. Kim, E. Kouznetsov, M. Panasyuk, A.D. Panov, W.K.H. Schmidt, E.S. Seo, R. Sina, N.V. Sokolskaya, J.Z. Wang, J.P. Wefel, J. Wu, and V.I. Zatsepin.

140. Simulation Studies of Early Afterglows Observed With SWIFT, Gamma Ray Bursts in the Swift Era, Washington, DC, November 29–December 2, 2005. K.-I. Nishikawa, E. Ramirez-Ruiz, P.E. Hardee, C.B. Hededal, C. Kouveliotou, G.J. Fishman, and Y. Mizuno.

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141. Six Years of Chandra Observations of Supernova Remnants, *Astrophysics Update 2,* Praxis Publishing Ltd., The White House, 2005. M.C. Weisskopf and J.P. Hughes.

142. Six Years of Science With the Chandra X-Ray Observatory, Purdue University, West Lafayette, LA, September 22, 2005. M.C. Weisskopf.

143. Solar Physics, UV Interferometers, and Eximer Lasers, University of Toronto, Toronto, Canada, September 18, 2005. G.A. Gary.

144. Space Laboratory on a Table Top—A Next Generation ECLSS Design and Diagnostic Tool, 35th International Conference on Environmental Systems (ICES), Rome, Italy, July 11–14, 2005. N. Ramachandran.

145. Space Resource Utilization and Extending Human Presence Across the Solar System, 1st Space Exploration Conference, Continuing the Voyage of Discover, Orlando, FL, January 30–February 1, 2005. P.A. Curreri.

146. Space Science at Marshall Space Flight Center, Gymnasium Wolbeck, Muenster, Germany, June 10, 2005. J.F. Spann, Jr.

147. Space-Borne Observations of Intense Gamma-Ray Flashes Above Thunderstorms, Union Radio-Scientifique Internationale (USRI) National Meeting, Boulder, CO, January 5–8, 2005. G.J. Fishman.

148. The Status of Lunar Simulants: Conclusions and Recommendations from the 2005 Lunar Regolith Simulant Materials Workshop, Workshop on Granular Materials for Exploration, Kennedy Space Center, Orlando, FL, February 1–3, 2005. L. Sibille and R.A. Schlagheck.

149. Status of Magnetic Nozzle and Plasma Detachment Experiment, 53rd JPM/2nd LPS/SP Joint Meeting (JANNAF), Monterey, CA, December 5–8, 2005. D.G. Chavers, R. Bengston, B. Breizman, F. Chang-Diaz, J.E. Jones, and C.C. Dobson.

150. The Status of Simulant Materials of Lunar Regolith: Requirements, Feasibility, and Recommendations, Planetary and Terrestrial Mining Sciences Symposium (PTMSS), Northern Centre for Advanced Technology, Inc. (NORCAT), Sudbury, Ontario, Canada, June 5–8, 2005. L. Sibille, P.K. Carpenter, and R.A. Schlagheck.

151. Strained Hydrocarbons as Potential Hypergolic Fuels, American Chemical Society Spring 2005 National Meeting, San Diego, CA, March 13–17, 2005. W. Eccles, P. Kaszynski, B. Stulgies, R. Gostowski, and J.A. Blevins.

152. Structural Assessment of the 20m Microwave Lightcraft Conceptual Design, 4th International Symposium on Beamed Energy Propulsion (ISBEP4), Nara, Japan, November 15–18, 2005. E. Poole and L.N. Myrabo.

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153. Sub-Pixel Phase-Measuring Interferometry With Interlace Stitching, Mirror Technology Days 2005, Huntsville, AL, August 16–18, 2005. J.T. Mooney.

154. Sub-Pixel Spatial Resolution Micro-Roughness Measurements With Interlaced Stitching, SPIE Conference, Optics and Photonics, San Diego, CA, July 31–August 2, 2005. J.T. Mooney and H.P. Stahl.

155. Synlam™ Composite Mirror for Cryogenic Applications, Mirror Technology Days 2005, Huntsville, AL, August 16–18, 2005. J. Hermiller and H.P. Stahl.

156. Temperature, Velocity, and Magnetic Field Mapping Within an Electron Cyclotron Resonance Driven Magnetic Mirror, Joint Army-Navy-NASA-Air Force (JANNAF) Conference, Monterey, CA, December 5–9, 2005. J.E. Jones, C.C. Dobson, D.G. Chavers, J.A. Vaughn, and T.A. Schneider.

157. Terrestrial Microgravity Model and Threshold Gravity Simulation Using Magnetic Levitation, 35th International Conference on Environmental Systems (ICES), Rome, Italy, July 11–14, 2005. N. Ramachandran.

158. Thermal Conductivity Based on Modified Laser Flash Measurement, 28th International Thermal Conductivity Conference, New Brunswick, Canada, June 26–29, 2005. B. Lin, H. Ban, C. Li, R.N. Scripa, C.-H. Su, and S.L. Lehoczky.

159. Thermodynamic Modeling and Experimental Studies on Planetary Materials. Continuing the Voyage of Discovery: 1st Space Exploration Conference, Orlando, FL, January 30–February 1, 2005. R.G. Reddy, L. Tong, and S. Sen.

160. Thermophysical and Optical Properties of Semiconducting $Ga_2Te_3$ Melt, 16th American Conference on Crystal Growth and Epitaxy (ACCGE), Big Sky Resort, MT, July 10–15, 2005. C. Li, C.-H. Su, S.L. Lehoczky, R.N. Scripa, and H. Ban.

161. Thin Films and Inflatable Applications in Exploration Habitat Structures, AIAA Conference, Orlando, FL, January 30–February 2, 2005. D.O. Frazier, M.S. Paley, and J.D. Strong.

162. Threshold Gravity Determination and Artificial Gravity Studies Using Magnetic Levitation, Interdisciplinary Transport Phenomena in Microgravity and Space Sciences IV, Tomar, Portugal, August 7–12, 2005. N. Ramachandran and F.W. Leslie.

163. Toward a Suite of Standard Lunar Regolith Simulants for NASA's Lunar Missions: Recommendations of the 2005 Workshop of Lunar Regolith Simulant Materials, 2005 Lunar Exploration Analysis Group/Space Resources Roundtable Meeting, League City, TX, October 25–28, 2005. L. Sibille, P.K. Carpenter, and R.A. Schlagheck.

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164. The UAH-NSSTC/WHNT ARMOR C-Band Dual-Polarimetric Radar: A Unique Collaboration in Research, Education, and Technology Transfer, 32nd Radar Meteorology Conference, American Meteorological Society, Albuquerque, NM, October 23–29, 2005. W.A. Petersen, K. Knupp, J. Walters, W. Deierling, M. Gauthier, B. Dolan, J.P. Dice, D. Satterfield, C. Davis, R.J. Blakeslee, S.J. Goodman, S. Podgorny, J. Hall, M. Budge, and A. Wooten.

165. Ulysses' Orbit in 2007–2008, STEREO/Solar-B Science Planning Workshop, Oahu, HI, November 15–18, 2005. S.T. Suess, G. Poletto, A. Bemporad, D. Biesecker, H. Elliott, R. Esser, G. Gloecker, B. Goldstein, Y.-K. Ko, J. Kohl, J. Lin, D.J. McComas, M. Neugebauer, S. Parenti, J. Raymond, P. Riley, M. Romoli, N. Schwadron, G. Simnett, and T. Zurbuchen.

166. Unveiling the High Energy Obscured Universe: Hunting Collapsed Objects Physics, Trends in Space Science and Cosmic Vision 2020, Noordwijk, The Netherlands, April 19–21, 2005. P. Ubertini, A. Bazzano, M. Cocchi, L. Natalucci, L. Bassani, E. Caroli, J.B. Stephen, P. Caraveo, S. Mereghetti, G. Villa, F. Frontera, G. Palumbo, A. Santangelo, R. Diehl, J. Greiner, G. Kanbach, V. Schnfelder, R. Staubert, J. Wilms, X. Barcons, J.M. Mas Hesse, V. Reglero, A.J. Bird, A.J. Dean, D. Barret, J. Kndlseder, T. Courvoisier, R. Walter, N. Lund, C. Winkler, A. Zdziarski, C. Kouveliotou, M.C. Weisskopf, N. Gerbels, and B. Teegarden.

167. Use of DTA/DSC for Measuring Fundamental Parameters for Nucleation and Crystallization in Glasses, North American Thermal Analysis Society Conference, Universal City, CA, September 18–21, 2005. C.S. Ray.

168. Using the EXIST Active Shields for Earth Occultation Observations of X-Ray Sources, 205th Meeting of the American Astronomical Society, San Diego, CA, January 9–13, 2005. C.A. Wilson, G.J. Fishman, J. Hong, and J. Grindlay.

169. A Viable Scheme for Elemental Extraction and Purification Using In-Situ Planetary Resources, 1st Space Exploration Conference: Continuing the Voyage of Discovery, Orlando, FL, January 30–February 1, 2005. S. Sen, E. Schofield, S.L. O'Dell, and C.S. Ray.

170. What Has Been Learned From Ulysses-SOHO Quadrature Observations. STEREO/Solar-B Science Planning Workshop, Oahu, HI, November 15–18, 2005. S.T. Suess and G. Poletto.

171. X-Ray Characterization of Detached-Grown Germanium Crystals, American Conference on Crystal Growth and Epitaxy-16, Big Sky, MT, July 10–15, 2005. M.P. Volz, M. Schweizer, B. Raghothamachar, M. Dudley, J. Szoke, S.D. Cobb, and F.R. Szofran.

172. X-Ray Emission for the Saturnian System, The Asia Oceania Geosciences Society's 2nd Annual Meeting, Singapore, Singapore, June 20–24, 2005. A. Bhardwaj, R.F. Elsner, J.H. Waite, Jr., G.R. Gladstone, G. Branduardi-Raymond, and P.G. Ford.

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**PRESENTATIONS**

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This Technical Memorandum (TM) lists the significant publications and presentations of the Science and Technology Directorate during the period January 1–December 31, 2005. 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). Most of the articles listed under Open Literature have appeared in refereed professional journals, books, monographs, 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 Dr. J.F. Spann, Jr. (VP60; 961-7512) or to one of the authors.

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