

Chronological Index

A91-001 Martian Regolith as Space Radiation Shielding. L. C. Simonsen, J. E. Nealy, L. W. Townsend and J. W. Wilson, *NASA Langley Research Center* (28, 1, p. 7) Synoptic

A91-002 Supersonic Aerodynamic Characteristics of Monoplanar Missiles with Low-Profile Quadriform Tails. A. B. Blair Jr., *NASA Langley Research Center* (28, 1, p. 9) Article based on AIAA Paper 90-0620

A91-003 Flowfield and Vehicle Parameter Influence on Results of Engineering Aerothermal Methods. Kathryn E. Wurster, E. Vincent Zoby and Richard A. Thompson, *NASA Langley Research Center* (28, 1, p. 16) Article based on AIAA Paper 89-1769

A91-004 Computation of Flowfields for Projectiles in Hypersonic Chemically Reacting Flows. Klaus A. Hoffmann, *Wichita State University*; Ting-Lung Chiang, *University of Texas at Austin*; and Walter H. Rutledge, *Sandia National Laboratories* (28, 1, p. 23) Article

A91-005 Fully Coupled Implicit Method for Thermochemical Nonequilibrium Air at Suborbital Flight Speeds. Chul Park, *NASA Ames Research Center*; and Seokkwan Yoon, *MCAT Institute* (28, 1, p. 31) Article based on AIAA Paper 89-1974 CP895

A91-006 Stagnation-Point Radiative Heating Relations for Earth and Mars Entries. M. E. Tauber, *NASA Ames Research Center*; and K. Sutton, *NASA Langley Research Center* (28, 1, p. 40) Article

A91-007 Prediction of Slender Body Coning Characteristics. L. E. Ericsson, *Lockheed Missiles & Space Company, Inc.* (28, 1, p. 43) Article based on AIAA Paper 89-2223 CP896

A91-008 Tethered Aerothermodynamic Research Needs. F. C. Hurlbut, *University of California at Berkeley*; and J. L. Potter, *Vanderbilt University* (28, 1, p. 50) Article based on AIAA Paper 90-0533

A91-009 Simple, Inexpensive Optical Beacon for Use on Small Satellites. T. L. Hayhurst, M. N. Osibov, R. W. Russell and R. J. Maulfair, *The Aerospace Corporation*; and R. Fleeter, *Defense Systems Incorporated* (28, 1, p. 58) Article

A91-010 Evaluation of Damage Fields Near Crack Tips in a Composite Solid Propellant. C. T. Liu, *Astronautics Laboratory (AFSC), Edwards AFB* (28, 1, p. 64) Article based on AIAA Paper 88-2284 CP882

A91-011 Reorientation of Rotating Fluid in Microgravity Environment With and Without Gravity Jitters. R. J. Hung, C. C. Lee and K. L. Shyu, *University of Alabama in Huntsville* (28, 1, p. 71) Article

A91-012 Combustion Efficiencies of Aluminum and Boron in Solid Propellants. Tohru Mitani and Muneo Izumikawa, *National Aerospace Laboratory, Kakuda Research Center, Japan* (28, 1, p. 79) Article

A91-013 Propulsive Options for a Manned Mars Transportation System. Robert D. Braun, *NASA Langley Research Center*; and Donald J. Blersch, *Analytical Services, Inc.* (28, 1, p. 85) Article based on AIAA Paper 89-2950

A91-014 Magnetic Signatures for Satellite Anomalies. Hing-Lan Lam and Jaroslava Hruska, *Geological Survey of Canada* (28, 1, p. 93) Article

A91-015 Consort 3 Flight Experiments. Francis C. Wessling, *University of Alabama in Huntsville*; and George W. Maybee, *McDonnell Douglas Space Systems Company* (28, 1, p. 100) Article

A91-016 Spacecraft Protective Structures Design Optimization. Robert A. Mog, *Science Applications International Corporation* (28, 1, p. 109) Article based on AIAA Paper 90-0087

A91-017 Response of Spacecraft Window Materials to Hypervelocity Projectile Impact. William P. Schonberg, *University of Alabama in Huntsville* (28, 1, p. 118) Article

A91-018 Missile Loads at High Angles of Attack. Richard M. Howard and Archibald S. Dunn, *Naval Postgraduate School* (28, 1, p. 124) Engineering Note

A91-019 Flight Stagnation-Point Heating Calculations on Aeroassist Flight Experiment Vehicle. H. H. Hamilton II, Roop N. Gupta and Jim J. Jones, *NASA Langley Research Center* (28, 1, p. 125) Engineering Note

A91-020 Thermal Redesign of the Galileo Spacecraft for a VEEGA Trajectory. Ronald T. Reeve, *Jet Propulsion Laboratory, California Institute of Technology* (28, 2, p. 130) Article based on AIAA Paper 89-1748

A91-021 Thermal Design of the Galileo Spun and Despun Science. James W. Stultz, *Jet Propulsion Laboratory, California Institute of Technology* (28, 2, p. 139) Article based on AIAA Paper 89-1750

A91-022 Thermal Design of the Galileo Bus and Retropropulsion Module. James W. Stultz, *Jet Propulsion Laboratory, California Institute of Technology* (28, 2, p. 146) Article based on AIAA Paper 89-1749

A91-023 Low Reynolds Number Navier-Stokes Simulation for Rotating Liquid-Filled Containers. Michael J. Nusca, *U. S. Army Ballistic Research Laboratory, Aberdeen Proving Ground* (28, 2, p. 152) Article

A91-024 Structured and Unstructured Remeshing Method for High-Speed Flows. Gururaja R. Vemaganti, *Lockheed Engineering and Sciences Company*; Earl A. Thornton, *University of Virginia*; and Allan R. Wieting, *NASA Langley Research Center* (28, 2, p. 158) Article based on AIAA Paper 90-0401

A91-025 Approximate Method for the Calculation of Nonequilibrium Radiative Heat Transfer. Robert B. Greendyke, *Analytical Services and Materials, Inc.*; and Lin C. Hartung, *NASA Langley Research Center* (28, 2, p. 165) Article based on AIAA Paper 90-0135

A91-026 Improved Airbreathing Launch Vehicle Performance with the Use of Rocket Propulsion. H. G. Kauffman, R. V. Grandhi, W. L. Hankey and P. J. Belcher, *Wright State University* (28, 2, p. 172) Article

A91-027 Ascent Performance Issues of a Vertical-Takeoff Rocket Launch Vehicle. Richard W. Powell, J. Christopher Naftel and Christopher I. Cruz, *NASA Langley Research Center* (28, 2, p. 179) Article

A91-028 Abort Capabilities of Rocket-Powered Single-Stage Launch Vehicles. Douglas O. Stanley and Richard W. Powell, *NASA Langley Research Center* (28, 2, p. 184) Article based on AIAA Paper 90-0296

A91-029 Shuttle Evolution: Improved Aft Propulsion System. Witalij Karakulko, *NASA Johnson Space Center*; and Scott R. Frazier, *McDonnell Douglas Space Systems Company* (28, 2, p. 192) Article based on AIAA Paper 89-2518

A91-030 Magnetic Sails and Interplanetary Travel. Robert M. Zubrin, *Martin Marietta Astronautics*; and Dana G. Andrews, *Boeing Aerospace* (28, 2, p. 197) Article based on AIAA Paper 89-2441

A91-031 Meteoroid and Orbital Debris Record of the Long Duration Exposure Facility's Frame. Michael Zolensky, *NASA Johnson Space Center*; Dale Atkinson, *POD Associates*; Thomas See, *Lockheed Engineering and Science Company*; Martha Allbrooks, *S-Cubed*; Charles Simon, *McDonnell Center for Space Sciences, Washington University*; Miria Finckenor, *NASA Marshall Space Flight Center*; and Jack Warren, *Lockheed Engineering and Science Company* (28, 2, p. 204) Article

A91-032 New Method for Estimating Low-Earth-Orbit Collision Probabilities. John D. Vedder and Jill L. Tabor, *McDonnell Douglas Space Systems Company* (28, 2, p. 210) Article

A91-033 Mars Global Reference Atmospheric Model for Mission Planning and Analysis. C. G. Justus, *Georgia Institute of Technology* (28, 2, p. 216) Article based on AIAA Paper 90-0004

A91-034 Estimates of Photochemically Deposited Contamination on the GPS Satellites. Alan C. Tribble and James W. Haffner, *Rockwell International* (28, 2, p. 222) Article

A91-035 Limits on the Isolation of Stochastic Vibration for Microgravity Space Experiments. C. R. Knospe and P. E. Allaire, *University of Virginia* (28, 2, p. 229) Article

A91-036 Three-Dimensional Flow Transport Modes in Directional Solidification During Space Processing. W. A. Arnold, D. A. Jacqmin, R. L. Gaug and A. Chait, *NASA Lewis Research Center* (28, 2, p. 238) Article based on AIAA Paper 90-0409

A91-037 Development of Test-Analysis Models for Large Space Structures Using Substructure Representations. Daniel C. Kammer, *University of Wisconsin*; and Christopher C. Flanigan, *SDRC, Inc.* (28, 2, p. 244) Article

A91-038 Design and Fabrication of an Erectable Truss for Precision Segmented Reflector Application. Harold G. Bush, Catherine L. Herstrom, Walter L. Heard Jr., Timothy J. Collins and W. B. Fichter, *NASA Langley Research Center*; Richard E. Wallsom and James E. Phelps, *Lockheed Engineering and Sciences Company* (28, 2, p. 251) Article based on AIAA Paper 90-0999 CP902

A91-039 Navier-Stokes Computations of Vortex Asymmetries Controlled by Small Surface Imperfections. Peter M. Hartwich, *ViGYAN, Inc.*; Robert M. Hall, *NASA Langley Research Center*; and Michael J. Hemsch, *PRC Aerospace Technologies Division* (28, 2, p. 258) Article based on AIAA Paper 90-0385

A91-040 Atmospheres of Earth, Mars, and Venus, as Defined by Entry Probe Experiments. Alvin Seiff, *San Jose State University Foundation, NASA Ames Research Center* (28, 3, p. 265) Article based on AIAA Paper 90-0765

A91-041 Supersonic Submunition Aerodynamics During Dispense. S. C. Perkins Jr. and M. F. E. Dillenius, *Nielsen Engineering & Research, Inc.* (28, 3, p. 276) Article based on AIAA Paper 88-0335

A91-042 Stability of the Boundary Layer on a Spinning Semi-Infinite Circular Cylinder. Kai-Hsiung Kao and Chuen-Yen Chow, *University of Colorado* (28, 3, p. 284) Article based on AIAA Paper 90-0116

A91-043 Model of Electron Collecting Plasma Contactors. V. A. Davis, I. Katz, M. J. Mandell and D. E. Parks, *S-CUBED Division of Maxwell Laboratories, Inc.* (28, 3, p. 292) Article

A91-044 Stability of the Boundary Layer on a Spinning Blunt-Nosed Cylinder. Kai-Hsiung Kao and Chuen-Yen Chow, *University of Colorado* (28, 3, p. 299) Article based on AIAA Paper 90-0117

A91-045 External Tank Chill Effect on the Space Transportation System Launch Pad Environment. R. A. Ahmad and S. Boraas, *Thiokol Corporation* (28, 3, p. 306) Article

A91-046 Atomic Oxygen Testing with Thermal Atom Systems: A Critical Evaluation. Steven L. Koontz, Keith Albyn and Lubert J. Leger, *NASA Johnson Space Center* (28, 3, p. 315) Article

A91-047 Environment-Induced Anomalies on the TDRS and the Role of Spacecraft Charging. S. Daughtridge, *Contel Federal Systems*; H. B. Garrett and A. Whittlesey, *Jet Propulsion Laboratory, California Institute of Technology* (28, 3, p. 324) Article based on AIAA Paper 90-0178

A91-048 New Deployable Truss Concepts for Large Antenna Structures or Solar Concentrators. K. A. Takamatsu, *Fuji Heavy Industries, Ltd., Japan*; and J. Onoda, *Institute of Space and Astronautical Science, Japan* (28, 3, p. 330) Article based on AIAA Paper 89-1346 CP891

A91-049 Application of Material Nonlinearity to a Composite Pressure Vessel Design. David Cohen, *Hercules Aerospace Company* (28, 3, p. 339) Article based on AIAA Paper 90-1002 CP902

A91-050 Orbital Debris Environment for Spacecraft in Low Earth Orbit. Donald J. Kessler, *NASA Johnson Space Center* (28, 3, p. 347) Article based on AIAA Paper 90-1353

A91-051 Prototype Expert System Workstation for Satellite Anomaly Resolution. S. R. Turner, P. K. Mangan, M. D. Meloan and C. B. Simmons, *The Aerospace Corporation* (28, 3, p. 352) Engineering Note based on AIAA Paper 90-0323

A91-052 Rapid Prediction of Static Stability Characteristics of Slender-Wing Aerospace Vehicles. L. E. Ericsson and H. H. C. King, *Lockheed Missiles & Space Company, Inc.* (28, 3, p. 354) Engineering Note based on AIAA Paper 90-0301

A91-053 Titan Improvement Study: Hydrogen Core Stages. James A. Martin, *NASA Langley Research Center* (28, 3, p. 356) Engineering Note

A91-054 Hypersonic Nonequilibrium Viscous Solutions over Slender Bodies. E. V. Zoby, *NASA Langley Research Center*; K. P. Lee, *Vigyan Research Associates, Inc.*; and R. N. Gupta, *NASA Langley Research Center* (28, 3, p. 358) Engineering Note

- A91-055 Aerodynamic Requirements of a Manned Mars Aerobraking Transfer Vehicle.** Robert D. Braun and Richard W. Powell, *NASA Langley Research Center* (28, 4, p. 361) Article based on AIAA Paper 90-2817 CP906
- A91-056 Rarefied-Flow Aerodynamics Measurement Experiment on the Aeroassist Flight Experiment Vehicle.** Robert C. Blanchard, *NASA Langley Research Center* (28, 4, p. 368) Article based on AIAA Paper 89-0636
- A91-057 Comparison of Hypersonic Experiments and PNS Predictions Part I: Aerothermodynamics.** Bilal A. Bhutta and Clark H. Lewis, *VRA, Inc.* (28, 4, p. 376) Article based on AIAA Paper 90-3068 CP908
- A91-058 Comparison of Hypersonic Experiments and PNS Predictions Part II: Aerodynamics.** Bilal A. Bhutta and Clark H. Lewis, *VRA, Inc.* (28, 4, p. 387) Article based on AIAA Paper 90-3068 CP908
- A91-059 Aerobrake Plasmadynamics: Macroscopic Effects.** John V. Shebalin, *NASA Langley Research Center* (28, 4, p. 394) Article based on AIAA Paper 90-1559
- A91-060 Hypersonic Waveriders for Planetary Atmospheres.** John D. Anderson Jr., Mark J. Lewis and Ajay P. Kothari, *University of Maryland*; and Stephen Corda, *Johns Hopkins Applied Physics Laboratory* (28, 4, p. 401) Article based on AIAA Paper 90-0538
- A91-061 Effect of Forebody Strakes on Missile Asymmetric Vortices.** Chih-Chung Yuan and Richard M. Howard, *Naval Postgraduate School* (28, 4, p. 411) Article based on AIAA Paper 91-286 CP916
- A91-062 Spike-Nosed Projectiles: Computations and Dual Flow Modes in Supersonic Flight.** Ameer G. Mikhail, *U.S. Army Ballistic Research Laboratory, Aberdeen Proving Ground* (28, 4, p. 418) Article based on AIAA Paper 89-1820
- A91-063 Liquid Motions in Nonaxisymmetric, Partially Filled Containers Rotating at Zero Gravity.** D. Weihs and F. T. Dodge, *Southwest Research Institute* (28, 4, p. 425) Article
- A91-064 Performance and Flow Calculations for a Gaseous H_2/O_2 Thruster.** S. C. Kim, *Sverdrup Technology, Inc.*; and T. J. VanOverbeke, *NASA Lewis Research Center* (28, 4, p. 433) Article based on AIAA Paper 90-2490
- A91-065 Preliminary Design Considerations for 10-40 Meter-Diameter Precision Truss Reflectors.** Martin M. Mikulas Jr. and Timothy J. Collins, *NASA Langley Research Center*; and John M. Hedgepeth, *Astro Aerospace Corporation* (28, 4, p. 439) Article based on AIAA Paper 90-1000 CP902
- A91-066 Optimal Temperature Estimation for Modeling the Thermal Elastic Shock Disturbance Torque.** Darrell F. Zimelman and Raymond V. Welch, *Fairchild Space & Defense Corporation*; and George H. Born, *University of Colorado* (28, 4, p. 448) Article
- A91-067 Thermoelastic Analysis of Space Structures in Periodic Motion.** Dan Givoli and Omri Rand, *Technion-Israel Institute of Technology* (28, 4, p. 457) Article
- A91-068 Orbital Debris Detection: Techniques and Issues.** Nicholas L. Johnson and David J. Nauer, *Teledyne Brown Engineering* (28, 4, p. 465) Article based on AIAA Paper 90-1330
- A91-069 Determination of Breakup Initial Conditions.** Darren S. McKnight, *Kaman Sciences Corporation* (28, 4, p. 470) Article based on AIAA Paper 91-0299
- A91-070 Approach and Landing Simulator for Space Shuttle Orbiter Touchdown Conditions.** Keith D. Walyus, *NASA Johnson Space Center*; and Charles Dalton, *University of Houston* (28, 4, p. 478) Article
- A91-071 Low Energy Trajectories to Mars via Gravity Assist from Venus to Earth.** S. N. Williams and J. M. Longuski, *Purdue University* (28, 4, p. 486) Engineering Note
- A91-072 Mars Observer Project: An Introduction.** E. L. McKinley, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 489) Article
- A91-073 Mars Observer Mission and Systems Overview.** Suzanne Palocz, *General Electric Company* (28, 5, p. 491) Article
- A91-074 Mars Observer: The Next Mars Mission.** Arden L. Albee, *California Institute of Technology*; and Frank D. Palluconi, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 498) Article
- A91-075 Mars Observer Instrument Complement.** Fred G. Komro and Frank N. Hujber, *General Electric Company* (28, 5, p. 501) Article
- A91-076 Mars Observer Spacecraft Description.** Dennis L. Potts, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 507) Article
- A91-077 Mars Observer Trajectory and Orbit Design.** Joseph G. Beerer and Ralph B. Roncoli, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 515) Article
- A91-078 Mars Observer Mission Plan.** William H. Blume, Suzanne R. Dodd and Charles W. Whetsel, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 522) Article
- A91-079 Mars Observer Orbit Determination Analysis.** Pasquale Esposito and Duane Roth, *Jet Propulsion Laboratory, California Institute of Technology*; and Stuart Demcak, *OAO Corporation* (28, 5, p. 530) Article
- A91-080 Mars Observer Trajectory and Orbit Control.** C. A. Halsell and W. E. Bollman, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 536) Article
- A91-081 Mars Observer Mission Operations.** Kerry D. Erickson and Edward L. McKinley, *Jet Propulsion Laboratory, California Institute of Technology* (28, 5, p. 542) Article
- A91-082 Thermochemical Nonequilibrium Issues for Earth Re-Entry of Mars Mission Vehicles.** R. A. Mitcheltree and P. A. Gnoffo, *NASA Langley Research Center* (28, 5, p. 552) Article based on AIAA Paper 90-1698
- A91-083 Utilizing Air-Turborocket and Rocket Propulsion for a Single-Stage-to-Orbit Vehicle.** Roger A. Lepsch Jr., Douglas O. Stanley, Christopher I. Cruz and Shelby J. Morris Jr., *NASA Langley Research Center* (28, 5, p. 560) Article based on AIAA Paper 90-0295
- A91-084 Guidance Scheme for a Mach 3 Staged Gliding Booster.** J. Christopher Naftel and Richard W. Powell, *NASA Langley Research Center* (28, 5, p. 567) Article based on AIAA Paper 90-0223

A91-085 Analytical Modeling of No-Vent Fill Process. David A. Vaughan, *Martin Marietta Manned Space Systems*; and George R. Schmidt, *NASA Marshall Space Flight Center* (28, 5, p. 574) Article based on AIAA Paper 90-2377

A91-086 Multicarrier Demodulator Architecture for Onboard Processing Satellites. L. P. Eugene, P. J. Fernandes, M. M. Jamali and S. C. Kwatra, *University of Toledo*; and J. Budinger, *NASA Lewis Research Center* (28, 5, p. 580) Article based on AIAA Paper 90-0812 CP901

A91-087 Orbital Elements Determination for Breakup and Debris. Stephen H. Knowles, *Naval Space Surveillance Center* (28, 5, p. 587) Article based on AIAA Paper 90-1348

A91-088 Current Collection by a Long Conducting Cylinder in a Flowing Magnetized Plasma. Bharat I. Vashi and Nagendra Singh, *University of Alabama in Huntsville* (28, 5, p. 592) Article based on AIAA Paper 90-0724

A91-089 Slag and Thermal Environment of a Spinning Rocket Motor. I-Shih Chang, *The Aerospace Corporation* (28, 5, p. 599) Article based on AIAA Paper 90-2205

A91-090 Statite: A Spacecraft That Does Not Orbit. Robert L. Forward, *Forward Unlimited* (28, 5, p. 606) Article based on AIAA Paper 89-2546

A91-091 Optimization of Payload Placement on Arbitrary Spacecraft. Melvin J. Ferebee Jr. and Cheryl L. Allen, *NASA Langley Research Center* (28, 5, p. 612) Engineering Note

A91-092 Large Solar Proton Events and Geosynchronous Communication Spacecraft Solar Arrays. L. J. Lanzerotti and D. W. Maurer, *AT&T Bell Laboratories*; H. H. Sauer and R. D. Zwickl, *NOAA Space Environmental Laboratory* (28, 5, p. 614) Engineering Note

A91-093 Structural Dynamic Performance of a Geostationary Microwave Radiometer. Deborah M. Wahls and Jeffery T. Farmer, *NASA Langley Research Center*; and David W. Sleight, *University of Illinois* (28, 6, p. 617) Synoptic based on AIAA Paper 91-0428

A91-094 Parametric Study of Dissociation and Ionization Models at 12 Kilometers/Second. R. A. Mitcheltree, *NASA Langley Research Center* (28, 6, p. 619) Article based on AIAA Paper 91-1368

A91-095 Engineering Calculations of Three-Dimensional Inviscid Hypersonic Flowfields. Christopher J. Riley, *NASA Langley Research Center*; and Fred J. DeJarnette, *North Carolina State University* (28, 6, p. 628) Article based on AIAA Paper 91-0701

A91-096 Wedge-Induced Turbulent Boundary-Layer Separation on a Roughened Surface at Mach 6.0. P. J. Disimile, *University of Cincinnati*; and N. E. Scaggs, *Air Force Wright Research and Development Center, Wright-Patterson AFB* (28, 6, p. 636) Article based on AIAA Paper 89-2163 CP896

A91-097 Advanced Technologies for Rocket Single-Stage-to-Orbit Vehicles. Alan W. Wilhite, Lance B. Bush, Christopher I. Cruz, Roger A. Lepsch, W. Douglas Morris, Douglas O. Stanley and K. E. Wurster, *NASA Langley Research Center* (28, 6, p. 646) Article based on AIAA Paper 91-0540

A91-098 Plasma-Deposited Protective Coatings for Spacecraft Applications. D. G. Zimcik, *Canadian Space Agency*; M. R. Wertheimer, *Ecole Polytechnique, Canada*; K. B. Balmain and R. C. Tennyson, *University of Toronto* (28, 6, p. 652) Article

A91-099 Dynamic Finite Element Analysis of Solid Propellant Impact Test. W. So and E. C. Francis, *United Technologies* (28, 6, p. 658) Article based on AIAA Paper 90-2459

A91-100 Using Adaptive Structures to Enable Future Missions by Relaxing Ground Test Requirements. Ben K. Wada, James L. Fanson and G.-S. Chen, *Jet Propulsion Laboratory, California Institute of Technology* (28, 6, p. 663) Article

A91-101 Debris Evolution and Lifetime Following an Orbital Breakup. V. A. Chobotov and D. B. Spencer, *The Aerospace Corporation* (28, 6, p. 670) Article based on AIAA Paper 90-0085

A91-102 MU Radar Measurements of Orbital Debris. Toru Sato, Hidetoshi Kayama, Akira Furusawa and Iwane Kimura, *Kyoto University, Japan* (28, 6, p. 677) Article based on AIAA Paper 90-1343

A91-103 Relationship Between Electrostatic Discharges on Spacecraft P78-2 and the Electron Environment. Harry C. Koons and David J. Gorney, *The Aerospace Corporation* (28, 6, p. 683) Article

A91-104 Gaseous Oxygen Cooling of the Space Transportation System Launch Pad Environment. R. A. Ahmad, E. C. Mathias and S. Boraas, *Thiokol Corporation* (28, 6, p. 689) Article

A91-105 Dielectric Charging Processes and Arcing Rates of High Voltage Solar Arrays. Mengu Cho and Daniel E. Hastings, *Massachusetts Institute of Technology* (28, 6, p. 698) Article

A91-106 Analysis of Spacelab 3 Residual Acceleration Data. Melissa J. B. Rogers and J. Iwan D. Alexander, *University of Alabama in Huntsville* (28, 6, p. 707) Article

A91-107 Solar Proton Events of 1989: Effects on Spacecraft Solar Arrays. D. C. Marvin and D. J. Gorney, *The Aerospace Corporation* (28, 6, p. 713) Article

A91-108 Positioning Satellite System Using Intersatellite Communication. Kenichi Inamiya, *Mitsubishi Electric Corporation* (28, 6, p. 720) Article

A91-109 Acceleration and Pulse Control in Simulated Spacecraft Docking Manuevers. Adam R. Brody, *Sterling Software*; and Stephen R. Ellis, *NASA Ames Research Center* (28, 6, p. 728) Engineering Note based on AIAA Paper 91-0787

A91-110 Atomic Oxygen Protection of Carbon and Polycarbonate Using Boron Carbide Coating. Bruce M. Swinyard, *Rutherford Appleton Laboratory, Chilton, UK* (28, 6, p. 730) Engineering Note