

TABLE OF CONTENTS

	Pages
Preface and Acknowledgements	i
Previous Spacecraft Charging Conferences	ii
List of Attendees	iii-vi
Plasma Effects on Spacecraft Then and Now! A Welcome to Participants, <i>by Dale C. Ferguson</i>	1-6
The Impact of the Space Environment on Space Systems, <i>by H.C. Koons, J.E. Mazur, R.S. Selesnick, J.B. Blake, J.F. Fennell, J.L. Roeder, P.C. Anderson</i>	7-11
Ultraviolet-Visible Imagery and Spectra of the Fluxus-1 and -2 Artificial Plasma Jets, <i>by R. E. Erlandson, P. K. Swaminathan, C. I. Meng, B. J. Stoyanov, J. I. Zetzer, B. G. Gavrilov, Yu. N. Kiselev, Yu. A. Romanovsky</i>	13-16
The Fluxes-1 and -2 active experiments: Investigation of plasma jet dynamics and interactions with the ionosphere, <i>by J.I.Zetzer, B.G.Gavrilov, Yu.N.Kiselev, V.A.Rybakov, V.Gritskiv, Yu.A.Romanovsky, R.E.Erlandson, C.I.Meng, and B.J.Stoyanov</i>	17-20
In Flight Results of Spacecraft Charging Investigation for Russian High Altitude Satellites, <i>by V. I. Guselnikov, A. A. Kocheev, Yu. M. Prokopiev, O.S. Grafodatsky</i>	21-26
Spacecraft Potential Control Using Indium Ion Sources - Experience and Outlook Based on Six Years of Operation in Space, <i>by K.Torkar, M.Fehringner, H.Arends, R.Goldstein, R.J.L.Gard, B.T.Narheim, R.C.Olsen, A.Pedersen, W.Riedler, F.R. Denauer, R.Schmidt, K.Svenes, E.Whipple, R.Torbert, and Hua Zhao</i>	27-32
Simulation of an Auroral Charging Anomaly on the DMSP Satellite, <i>by David L. Cooke</i>	33-37
ESD Triggered Solar Array Failure Mechanism, <i>by Ira Katz, V.A. Davis, David B. Snyder, Ernest A. Robertson</i>	39-42
In-flight and Laboratory Evidences of ESD Triggered Anomalies and Secondary Arcs, <i>by L. Levy, R. Reulet, D. Sarrail, G. Migliorero</i>	43-48
A Critical Overview on Spacecraft Charging Control Methods, <i>by Shu T. Lai</i>	49-54
Surface Charging in the Auroral Zone on the DMSP Spacecraft in LEO, <i>by Phillip C. Anderson</i>	55-59
Ion sheath structure and Material Degradation due to Ion Bombardment around High Voltage Solar Arrays -Ground Simulation, <i>by Hirokazu Tahara and Takao Yoshikawa</i>	61-65
Evolution of Secondary Electron Emission Characteristics of Spacecraft Charging, <i>by R.E. Davies, and J.R. Dennison</i>	67-68
Meteosat Anomalies and Time Varying Plasma Conditions, <i>by A. Hilgers, D. Grystad, L. Andersson, J.G. Wu</i>	69-72
Utah State University Ground-based Test Facility for Study of Electronic Properties of Spacecraft Materials, <i>by W.Y.Chang, N. Nickles, R.E. Davies, and J.R. Dennison</i>	73-77

Secondary and Backscatter Electron Emission Measurement, <i>by W.G. Wilson</i>	79-83
Vehicle Charging Results from the EXCEDE III Experiment, <i>by Duane E. Paulsen, Don Rieder, Ralph L. McNutt</i>	85-88
A Correction to Whipple's Law for Ion-Trap Current, <i>by J.R. Sanmartin, O. Lopez-Rebollal</i>	89-93
Opportunities for Joint Investigations of the Spacecraft Static Electricity Charging, <i>by A. Sokolov, E. Nikolski</i>	95-98
TDRS MA Antenna ESD Qualification Program, <i>by E. Mikkelson, S. Malek, P. Leung, S. Seki, E. Lee, J. Baldauf</i>	99-102
Research of Electrostatic Discharge (ESD) Pulse Injection System, <i>by Wang Li, Qing XiaoGang, Liu Yang, and Li Kai</i>	103-106
Computer experiments on Radio Blackout of a Reentry Vehicle, <i>by H.Usui, H.Matsumoto, F.Yamashita, M.Yamane, and S.Takenaka</i>	107-110
Anodized Aluminum as Used for Exterior Spacecraft Dielectrics, <i>by G.B. Hillard, S.G. Bailey, D.C. Ferguson</i>	111-113
Forty Years of Deep Dielectric Charging: A Random Walk Through the Physics of Space Charge, <i>by A. Robb Frederickson</i>	115-117
Scattering of Electrons in Grazing Incidence Mirror Telescopes, <i>by A. Hilgers, and P. Gondoin</i>	119-124
An Engineering Tool for the Prediction of Internal Dielectric Charging, <i>by D.J. Rodgers, K.A. Ryden, G.L. Wrenn, P.M. Latham, J. Sorensen, L. Levy</i>	125-130
NASA's Technical Handbook for Avoiding On-Orbit ESD Anomalies Due to Internal Charging Effects, <i>by Albert Whittlesey and Dr. Henry B. Garrett</i>	131-134
Analysis of Conduction Current in E-beam Irradiated PMMA Based on Simultaneous Measurement of TSC and Space Charge Distribution, <i>by Yasuhiro Tanaka, Hironori Kitajima, Masatsugu Kodaka and Tatsuo Takada</i>	135-138
Analysis of Active Space Experiments Using Artificial Relativistic Electron Beams, <i>by L.Habash Krause, B.E.Gilchrist, and T.Neubert</i>	139-142
Research of a Large Dielectric Plate Antenna Charging in Low-Altitude Polar Orbit Environment, <i>by Wang Li, Liu Yang, Lu Yusun, Li Kai, and Guo Shenhou</i>	143-146
Electrodynamic Tethers as Propulsion Systems: System Considerations and Future Plans, <i>by Brian E. Gilchrist, Les Johnson, Enrico Lorenzini</i>	147-151
Current Collection by Rapidly Moving Charged Bodies in the Ionosphere: TSS-1R Results, <i>by G. Vannaroni, M. Dobrowolny, F. De Venuto, L. Iess</i>	153-156
New Results on Bare-Tether Current, <i>by Robert D. Estes, Juan R. SanMartin</i>	157-160
Probe Current in a Magnetized, Collisional Plasma Revisited, <i>by M. Charro and J. R. Sanmartin</i>	161-164

High-Voltage Satellite Tethers For Active Experiments In Space, <i>by V.V.Danilov, B.A.Elgin, O.S.Grafodatsky, V.V.Mirnov</i>	165-168
Effect of the Magnetic Field on Current Balance Between Two Conductors in Space, <i>by J. O. Forest, A. Hilgers</i>	169-172
Electromagnetic Wave Scattering Experiments in Hall Thruster Plasma Plumes, <i>by Brian E. Gilchrist, Christopher N. Davis, Douglas O. Carlson, Shawn G. Ohler, and Alec D. Gallimore</i>	173-178
RF Charging of Topside Sounder Spacecraft, <i>by H.G. James</i>	179-180
Pulse Propagation Along Electrodynamic Tethers in the Ionosphere, <i>by Sven G. Bilén, Brian E. Gilchrist</i>	181-186
Charge Production due to Leonid Meteor Shower Impact on Spacecraft Surfaces, <i>by William J. McNeil, Shu T. Lai, Edmond Murad</i>	187-191
Computation of Current to a Moving Bare Tether, <i>by Tatsuo Onishi, Manuel Martinez-Sanchez, David Cooke</i>	193-198
Theoretical Studying and Numerical Simulation of an Electrical Discharge in Vacuum, <i>by Francois Severin, Armel De la Bourdonnaye, Jean-Pierre Marque</i>	199-203
Materials of Low Secondary Electron Emission to Prevent the Multipactor Effect in High-Power RF Devices in Space <i>by N.Diaz, S.Casraneda, J.M.Ripalda, I.Montero, L.Galan, S.Feltham, D.Rabosa, and F.Rueda</i>	205-209
Spacecraft Charging Interactive Handbook, <i>by V. A. Davis, I. Katz, M. J. Mandell, B. M. Gardner</i>	211-215
3D Computer Simulation of Spacecraft Charging Effects, <i>by K.K. Krupnikov, A.A. Makletsov, V.N. Mileev, L.S. Novikov, V.V. Sinolits</i>	217-220
Comparison of Spacecraft Charging Environments at the Earth, Jupiter, and Saturn, <i>by H. B. Garrett, A. Hoffman</i>	221-226
Environmental On-Orbit Anomaly Correlation Efforts at Hughes, <i>by P. T. Balcewicz, J. M. Bodeau, M. A. Frey, P. L. Leung, E. J. Mikkelsen</i>	227-230
The Use of Environmental Data to Predict and Analyse Spacecraft Anomalies, <i>by Laila Andersson, Olle Norberg, Lars Eliasson, Peter Wintoft</i>	231-235
SCATHA Restrospective: Satellite Frame Charging and Discharging in the Near-Geosynchronous Environment, <i>by M.S. Gussenhoven, E.G. Mullen</i>	237-242
A Summary of the Engineering Results from the Aerospace Corp. Experiments on the SCATHA Spacecraft, <i>by H.C. Koons, J.F. Fennell, and D.F. Hall</i>	243-249
Towards a More Robust Spacecraft Charging Algorithm, <i>by Myron J. Mandell, Ira Katz, David Cooke</i>	251-255

Numerical Simulation of High-Voltage Spacecraft Charging at High Altitudes: Comparison of NASCAP and ECO-M, <i>by V.V. Danilov, V.M. Dvoryashin, B.A. Elgin, and G. Drolshagen</i>	257-267
Debye Shielding in a Spatially non-uniform Plasma: Application to Plasma Wake Current Collection, <i>by C. L. Enloe, D. L. Cooke, W. A. Pakula, V. A. Davis, M. J. Mandell</i>	269-273
Applications of Secondary Electron Energy-and-Angular-Distributions to Spacecraft Charging, <i>by Neal Nickles, R.E. Davies, J.R. Dennison</i>	275-280
The Effects of Spacecraft-Plasma Interaction on Plasma and Electrostatic Probe Measurements, <i>by J. J. Berthelier</i>	281-286
Measuring Spacecraft Potential with an Electron Spectrometer, <i>by Luke Goembel</i>	287-290
Monitoring of the Spacecraft Potential in the Magnetosphere With a Double Probe Instrument, <i>by H. Laakso</i>	291-296
New Spacecraft-Charging Solar Array Failure Mechanism, <i>by David B. Snyder, Dale C. Ferguson, Boris V. Vayner, and Joel T. Galofaro</i>	297-301
Spacecraft of Charging Analysis of the Hughes 702 Satellite, <i>by V. A. Davis, Ira Katz, P. Leung, C. Gelderloos</i>	303-306
A Test Program to Evaluate the Immunity of HS702 Solar Array to Sustained Discharges, <i>by P. Leung, C. Gelderloos, J.M. Bodeau, L. Goldhammer, S. Seki, A. Mason</i>	307-313
Charging Mitigation Experiments on Sounding Rockets, <i>by W.J. Raitt</i>	315-321
Effect of Conductive Surface Coatings on GEO Spacecraft Charging, <i>by N. John Stevens</i>	323-328
High Voltage Frame and Differential Charging Observed on a Geosynchronous Spacecraft, <i>by B.K. Dichter, K.P. Ray, M.S.Gussenhoven, E.G. Holeman, D.E. Delorey, and E.G. Mullen</i>	329-333
Computation of an ESD-induced E-field Environment and Definition of a Current Injector Test set-up at Equipment Level, <i>by J.P. Marque, F. Issac, J.P. Parmantier, S. Bertuol</i>	335-339
The Effects of Neutral Gas Release on Vehicle Charging: Experiment and Theory, <i>by D.N.Walker, W.E.Amatucci, J.H.Bowles, R.F.Fernsler, C.L.Siefring, J.A.Antoniades, and M.J.Keskinen</i>	341-346
Space Applications of Spindt Cathode Field Emission Arrays, <i>by V. M. Anguero, R. C. Adamo</i>	347-352