

PRELIMINARY PROGRAM

MONDAY 18 JUNE

12.00 – 14.00 **Registration**

14.00 – 15.00 Opening address

On-orbit investigations (1)

15.00 – 15.25 *Initial results from the floating potential measurement unit aboard the International Space Station*

K. WRIGHT – University of Alabama, Huntsville, USA

C. SWENSON, D. THOMPSON, A. BARJATYA – Utah State University, Logan, USA

S.KOONTZ - NASA, Houston, USA

T. SCHNEIDER, J. VAUGHN, J. MINOW, P. CRAVEN, V. COFFEY – NASA, Huntsville, USA

L. PARKER, T. BUI – ESTS Group, Huntsville, USA

B. REDDELL - Boeing Company, Houston, USA

15.25 – 15.50 *HEO satellite surface charging*

J. FENNELL, J. ROEDER – The Aerospace Corporation, Los Angeles, USA

15.50 – 16.15 *Going beyond anomalies to engineering corrective action: new internal ESD guidelines derived from a root-cause investigation*

M. BODEAU – Boeing Satellite Design Center, Los Angeles, USA

16.15 – 17.00 **Coffee-break and poster session**

On-orbit investigations (2)

17.00 – 17.25 *Differential charging of satellite surface materials*

J. ROEDER, J. FENNELL – The Aerospace Corporation, Los Angeles, USA

17.25 – 17.50 *Review of flight failures in relation with arcing on the power lines*

J.-P. CATANI – CNES, Toulouse, France

17.50 – 18.15 *The search for possible root causes for on-orbit satellite anomalies*

R. BRIET, R. COHEN, R. KEYES, M. WERNER, B. REED – The Aerospace Corporation, Los Angeles, USA

18.30 – 19.30 **Welcome cocktail reception**

TUESDAY 19 JUNE

Models and computer simulation

- 08.30 – 08.55 *Review of an internal charging code, NUMIT*
I. JUN, H. GARRETT, A. WHITTLESEY, I. KATZ – Jet Propulsion
Laboratory, Pasadena, USA
J. MINOW – NASA, Huntsville, USA
- 08.55 – 09.20 *Final version of Multi-Utility Spacecraft Charging Analysis Tool
(MUSCAT)*
T. MURANAKA, S. HOSODA – JAXA, Kanagawa, Japan
S. HATTA, J. KIM – MUSCAT Space Engineering – Fukuoka, Japan
K. IKEDA, M. CHO – Kyushu Institute of Technology, Fukuoka, Japan
H. UEDA, K. KOGA, T. GOKA – JAXA, Ibaraki, Japan
- 09.20 – 09.45 *SPIS modelling capabilities, achievements and prospects*
J.-F. ROUSSEL, F. ROGIER, G. DUFOUR, J.-C. MATEO-VELEZ –
ONERA, Toulouse, France
A. HILGERS, D. RODGERS – ESA, Noordwijk, The Netherlands
L. GIRARD, D. PAYAN – CNES, Toulouse, France
J. FOREST – ARTENUM Company, Paris, France
- 09.45 – 10.25 Coffee-break and poster session**

Solar arrays and discharge phenomena

- 10.25 – 10.50 *Secondary arc issue triggered by an ESD - Investigation on unit
connector*
P. PELISSOU, M. SEVOZ – EADS Astrium, Toulouse, France
- 10.50 – 11.15 *Study of arc propagation in solar array drive mechanisms*
V. INGUIMBERT, L. LEVY, F. BOUAY, D. SARRAIL – ONERA,
Toulouse, France
G. MIGLIORERO – ESA / ESTEC, Noordwijk, The Netherlands
P. MAUSLI - RUAG Aerospace, Nyon, Switzerland
- 11.15 – 11.40 *Emission spectra of arc plasmas*
B. VAYNER – Ohio Aerospace Institute, Cleveland, USA
D. FERGUSON – NASA, Huntsville, USA
J. GALOFARO – NASA, Cleveland, USA
- 11.40 – 12.05 *Study on the electron beam irradiation effects on silica glass by
cathodoluminescence*
S. HIROKAWA, T. HARADA, H. NISHIKAWA – Shibaura Institute of
Technology, Tokyo, Japan

12.05 – 12.30 *Solar array arcing due to plasma created by space debris impact*
S. FUKUSHIGE, Y. AKAHOSHI, N. FURUSAWA, S. KUSUNOKI,
T. KOURA, S. HOSODA, M. CHO, S. HARADA – Kyushu Institute of
Technology, Kitakyushu, Japan
K. WATANABE – Ritsumeikan University, Ritsumeikan, Japan
T. FUJITA - JAXA, Japan

12.30 – 12.55 *Simulation of an electrostatic discharge initiation with software SPIS*
L. GIRARD, D. PAYAN - CNES, Toulouse, France
J.-F. ROUSSEL – ONERA, Toulouse, France
F. SEVERIN – CRIL TECHNOLOGY, Toulouse, France

13.00 – 14.30 Lunch

Solar array test (1)

14.30 – 14.55 *Alcatel Alenia Space plasma ESD test results synthesis of solar array designs and solarbus flight heritage on satellite fleet*
B. BOULANGER – ALCATEL ALENIA SPACE, Cannes La Bocca, France
L. LEVY, V. INGUIMBERT, D. SARRAIL – ONERA, Toulouse, France

14.55 – 15.20 *Solar cell degradation test due to ESD for international standardization of solar array ESD test*
T. OKUMURA, S. NINOMIYA, H. MASUI, K. TOYODA, M. CHO -
Kyushu Institute of Technology, Kitakyushu, Japan
M. IMAIZUMI – JAXA, Kanagawa, Japan

15.20 – 15.45 *Secondary arc tests on solar arrays for international standardization of ESD test and Japanese spacecraft charging guideline*
T. KITAMURA, H. MASUI, K. TOYODA, M. CHO – Kyushu Institute of Technology, Kitakyushu, Japan

15.45 – 16.10 *Degradation of solar cells by ESDs*
V. INGUIMBERT, D. SARRAIL, L. LEVY, F. BOULAY, J.-C. MATEO-VELEZ – ONERA, Toulouse, France

16.10 – 16.35 *Electrostatic discharge and secondary arcing on solar array. Flash-over measurement and consequences on arc occurrence. Dependence with the test set-up.*
D. PAYAN - CNES, Toulouse, France
D. SARRAIL, R. REULET, V. INGUIMBERT, L. LEVY – ONERA, Toulouse, France

16.35 – 17.15 Coffee-break and poster session

Solar array test (2)

- 17.15 – 17.40 *Detrimental effects of arcing on solar array surfaces*
B. VAYNER – Ohio Aerospace Institute, Cleveland, USA
D. FERGUSON – NASA, Huntsville, USA
J. GALOFARO – NASA, Cleveland, USA
- 17.40 – 18.05 *Title to be confirmed*
K. TOYODA - Kyushu Institute of Technology, Kitakyushu, Japan
T. MIURA – JAXA, Kanagawa, Japan
- 18.05 – 18.30 *Evaluation of damaged solar cells due to arcing by electroluminescence imaging technique*
H. TOYOTA, K. TANAKA, S. SASAKI, M. TAJIMA – JAXA, Kanagawa, Japan

WEDNESDAY 20 JUNE

Interactions with charging environment

- 08.30 – 08.55 *Spacecraft charging at geosynchronous altitudes during major CME, CIR, and solar x-ray events*
S. LAI – AFRL, Hanscom AFB, USA
M. TAUTZ – AER / Radex, Lexington, USA
- 08.55 – 09.20 *Modeling of the jovian auroral environment and its effects on spacecraft charging*
H. GARRETT, A. WHITTLESEY, I. KATZ – Jet Propulsion Laboratory, Pasadena, USA
- 09.20 – 09.45 *Laboratory experiments for code validation of Multi-Utility Spacecraft Charging Analysis Tool (MUSCAT)*
S. HOSODA, T. MURANAKA, H. UEDA, K. KOGA, T. GOKA, H. KUNINAKA – JAXA, Kanagawa, Japan
S. HATTA, J. KIM, N. KURAHARA, M. CHO – Kyushu Institute of Technology, Kitakyushu, Japan
- 09.45 – 10.10 *Full particle PIC simulations of solar sail charging and plasma interactions*
J. WANG, H. JEONG – Virginia Polytechnic Institute and State University, Blacksburg, USA
- 10.10 – 10.50 Coffee-break and poster session**

Electric propulsion

- 10.50 – 11.15 *The structure of plasma beams and the beam-induced disturbances in the ionospheric plasma*
Y. RUZHIN, V. DOKUKIN - Russian Academy of Sciences, Moscow, Russia
A. MOROZOV – Russian Research Centre, Moscow, Russia
- 11.15 – 11.40 *The SMART-1 spacecraft potential investigations*
D. ESTUBLIER – ESA / ESTEC, Noordwijk, The Netherlands
- 11.40 – 12.05 *Modeling the NEXT Multi-Thruster Array Test with Nascap-2k*
M. MANDELL, V. DAVIS – SAIC, San Diego, USA
- 12.05 – 12.30 *Modelling of FEEP electric propulsion plume effects on Microscope spacecraft*
J.-F. ROUSSEL, T. TONDU, J.-C. MATEO-VELEZ – ONERA, Toulouse, France
E. CHESTA, S. D'ESCRIVAN – CNES, Toulouse, France
- 12.30 – 14.00 Lunch**

Interactions with plasma

- 14.00 – 14.25 *Electrodynamic tether at Jupiter. 2. Tour missions after capture*
J. SANMARTIN, M. CHARRO – Polytechnic University, Madrid, Spain
E. LORENZINI - Padova University, Padova, Italy
H. GARRETT – JPL / NASA, Huntsville, USA
C. BRAMANTI, C. BOMBARDELLI – ESA / ESTEC, Noordwijk, The Netherlands
- 14.25 – 14.50 *Making use of spacecraft-plasma interactions: Determining tenuous plasma winds from wake observations and numerical simulations*
A. ERIKSSON, E. ENGWALL, R. PRAKASH – Swedish Institute of Space Physics, Uppsala, Sweden
- 14.50 – 15.15 *Long-term study of active spacecraft potential control*
K. TORKAR - Australian Academy of Sciences, Graz, Austria
M. ANDRE – Swedish Institute of Space Physics, Uppsala, Sweden
A. FAZAKERLEY - MSSL, UCL, Dorking, UK
W. STEIGER – ARC Seibersdorf Research GmbH, Seibersdorf, Austria
- 15.15 – 15.40 *Preliminary spacecraft charging calculations for a spacecraft with large solar arrays in the Jovian aurora*
I. Katz, I. JUN, H. GARRETT, A. WHITTLESEY - Jet Propulsion Laboratory, Pasadena, USA
M. MANDELL – SAIC, San Diego, USA
- 15.40 – 16.20 Coffee-break and poster session**

- 16.20 – 16.45 *Modeling spacecraft charging and charged dust particle interactions with spacecraft on lunar surface*
J. WANG – Virginia Polytechnic Institute and State University, Blacksburg, USA
D. BRINZA – Jet Propulsion Laboratory, Pasadena, USA
- 16.45 – 17.10 *DEMETER potential measurements: observations from the ion analyzer, model calculation using SPIS and implications for plasma and field measurements*
J.-J. BERTHELIER – CETP / IPSL, Saint-Maur, France
J. YANG – IECAS, Beijing, China
J. FOREST – Artenum - Science & Groupware, Paris, France
M. QUASSIM – National Research Institute of Astronomy and Geophysics, Cairo, Egypt
- 17.10 – 17.35 *Russian segment of the ISS: study of near-surface environment*
S. KLIMOV – Russian Academy of sciences, Moscow, Russia
- 19.30 Conference dinner**

THURSDAY 21 JUNE

Internal charging

- 09.00 – 09.25 *Evaluation of bulk charging in geostationary transfer orbit and Earth escape trajectories using the NUMIT 1-D charging model*
J. MINOW, V. COFFEY – NASA, Huntsville, USA
L. PARKER, W. BLACKWELL – ESTS Group, Huntsville, USA
I. JUN, H. GARRETT – Jet Propulsion Laboratory, Pasadena, USA
- 09.25 – 09.50 *Observations of internal charging currents in medium Earth orbit*
K. RYDEN, P. MORRIS, C. DYER – QinetiQ, Farnborough, UK
B. TAYLOR, C. UNDERWOOD, S. JASON – University of Surrey, Guildford, UK
D. RODGERS, G. MANDORLO, G. GATTI, H. EVANS, E. DALY – ESA / ESTEC, Noordwijk, The Netherlands
- 09.50 – 10.15 *A new surface and international charging design guideline for the 21st Century*
A. WHITTLESEY, H. GARRETT, I. JUN – Jet Propulsion Laboratory, Pasadena, USA
- 10.15 – 10.55 Coffee-break and poster session**

Material characterizations (1)

- 10.55 – 11.20 *Open PEA measurements on irradiated polymers and space charge distribution modelisation*
C. PERRIN, D. PAYAN – CNES, Toulouse, France
V. GRISERI, C. LAURENT – Université Paul Sabatier, Toulouse, France
K. FUKUNAGA, T. MAENO – National Institute of Information and Communications Technology, Tokyo, Japan
C. INGUIMBERT, B. DIRASSEN, L. LEVY – ONERA, Toulouse, France
- 11.20 – 11.45 *Charge implantation and diffusion modelling in dielectrics*
J.-P. DUDON, S. CLERC – ALCATEL ALENIA SPACE, Cannes, France
L. PHU – ASTEK, Cannes, France
C. PERRIN - CNES-ONERA-LAPLACE, Toulouse, France
- 11.45 – 12.10 *Effect of a realistic charging environment on electrostatic qualification methods for space dielectrics*
D. PAYAN – CNES, Toulouse, France
R. REULET, B. DIRASSEN, L. LEVY – ONERA, Toulouse, France
- 12.10 – 12.35 *Aging and prompt effects on space material properties*
L. LEVY, B. DIRASSEN – ONERA, Toulouse, France
M. VAN EESBEEK – ESTEC/ESA, Noordwijk, The Netherland
- 12.35 – 14.00 Lunch**

Material characterizations (2)

- 14.00 – 14.25 *Mitigation of the internal charging threat posed by energetic electrons using an electrically leaky coating*
P. LEUNG, E. MIKKELSON – Boeing Satellite Development Center, El Segundo, USA
- 14.25 – 14.50 *Dependence of resistivity in low-density polyethylene on space environment parameters*
J. BRUNSON, J. DENNISON – Utah State University, Logan, USA
- 14.50 – 15.15 *Electron-induced electron yields of uncharged insulating materials*
R. HOFFMANN, JR. DENNISON - Utah State University, Logan, USA
- 15.15 – 15.40 *Evaluation of thin film charge dissipative materials with negligible RF losses*
N. NOUSHKAM, S. DAVIS, J. RODAS, J. VALLES – Northrop Grumman Space Technology, Redondo Beach, USA
- 15.40 – 16.20 Coffee-break and poster session**
- 16.20 – 16.35 *Status of ISO standardization efforts of solar panel ESD test methods*
M. CHO – Kyushu Institute of Technology, Kitakyushu, Japan

POSTER SESSION

Models and computer simulation

Nascap-2k self-consistent simulations of a VLF plasma antenna

M. MANDELL, V. DAVIS – SAIC, San Diego, USA

D. COOKE, A. WHEELLOCK – AFRL, USA

C. ROTH – Atmospheric and Environmental Research – Lexington, USA

MUSCAT validation tests with full PIC simulations

H. USUI, K. IMASATO – Kyoto University, Japan

An educational multimedia presentation on the introduction to spacecraft charging, version 2

E. LIN, M. DE PAYREBRUNE – DPL Science Inc, Québec, Canada

The SCOS project: inter-operability between scientific software and perspectives in space environment applications

S. JOURDAIN, S. BAGNIER, J. FOREST – Artemum Company, Paris, France

A. SCHMUTZ – Oxalya Company, Paris

B. NOUIALLAS, C. MOUTON – EDF Company, R&D Center, Clamart, France

C. GOMEZ – INRIA, Rocquencourt, France

J-F. ROUSSEL – ONERA, Toulouse, France

A. HILGERS – ESA, ESTEC, Noordwijk, The Netherlands

On-orbit investigations

Measurements of magnetosphere plasma and spacecraft charging parameters in GEO and LEO

L. NOVIKOV, V. MILEEV, K. KRUPNIKOV, A. MAKLETSOV, B. MARJIN, M.

RJAZANTSEVA, V. SINOLITS, N. VLASOVA – Moscow State University, Moscow, Russia

Material characterizations

Measurements of charge accumulation in electron beam irradiated dielectric materials for spacecraft

M. HONJOH, S. MARUTA, Y. TAKANA, R. WATANABE – Musashi Institute of Technology, Tokyo, Japan

New approach to derivation of resistivity: experimental and theoretical considerations

M. PETKOV – Jet propulsion laboratory, Pasadena, USA

Radiation induced conductivity of highly-insulating spacecraft materials

J. DENNISON, J. GILLESPIE, J. HODGES, RC HOFFMANN, J. ABBOTT – Utah State University, Logan, USA

A. HUNT – Idaho State University, Pocatello, USA

Development of measurement system for temperature distribution in electron beam irradiated polymeric insulating materials using thermo-chromic liquid crystal

H. SHINOHARA, K. MITSUHASHI, Y. TANAKA, T. TAKADA - Musashi Institute of Technology, Tokyo, Japan

Y. SUZUKI – Tokyo Metropolitan University, Tokyo, Japan

K. FUKUNAGA – National Institute of Communications Technology, Tokyo, Japan

Internal charge accumulation and no accumulation in external material for spacecraft under Proton beam irradiation

H. MIYAKE, H. MATSUMOTO, T. GOKA – JAXA, Kanagawa, Japan

Y. TANAKA, T. TAKADA - Musashi Institute of Technology, Tokyo, Japan

Secondary electron emission measurement of insulating materials for spacecraft

H. MIYAKE, K. NITTA - JAXA, Kanagawa, Japan

S. MICHIZONO, Y. SAITO – High-Energy Accelerator Research Organization, Japan

Interactions with plasma

Plasma diagnostics for laboratory experiment simulating wake charging of a polar orbiting satellite

N. KURAHARA, S. HOSODA, S. HATTA, T. MURANAKA, J. KIM, M. CHO – Kyushu Institute of Technology, Fukuoka, Japan

H. KUNINAKA – JAXA, Kanagawa, Japan

Ground experiment and simulation of bare tether current collection in plasma environment

K. KASHIHARA, M. CHO – Kyushu Institute of Technology, Fukuoka, Japan

S. KAWAMOTO – JAXA, Kitakyushu, Japan

James Webb Space Telescope NASCAP-2K surface charging analysis

A. SUN - Northrop Grumman Space Technology, Redondo Beach, USA

Spacecraft wakes in the solar wind

A. ERIKSSON, Y. KHOTYAINTEV - Swedish Institute of Space Physics, Uppsala, Sweden

P. LINDQVIST – Royal Institute of Technology, Stockholm, Sweden

Electron collection by a long cylinder parallel to the magnetic field

E. AHEDO – Madrid Polytechnic University, Madrid, Spain

A theory of electron collection by a grid sphere

J. SANMARTIN, O. LOPEZ-REBOLLAL - Madrid Polytechnic University, Madrid, Spain

Correlation analysis of energetic electrons and low temperature ions in polar orbit using the satellite observation data

T. HAMANAGA, M. CHO - Kyushu Institute of Technology, Kitakyusu, Japan

Comparison of plasma parameters reduced from floating potential measurement unit aboard the International Space Station with IRI and USU-GAIM model

A. BARJATYA, C. SWENSON, D. THOMPSON, L. SCHERLIESS, R. SCHUNK - Utah State University, Logan, USA

K. WRIGHT – University of Alabama, Huntsville, USA

S. KOONTZ – NASA, Houston, USA

On the charged particle drag acting on LAGEOS

J. ANDRES, R. NOOMEN – Delft University of Technology, Delft, The Netherlands

J. SANMARTIN – Madrid Polytechnic University, Madrid, Spain

Initial plasma tests of the IProSEC cathode device

A. WHEELLOCK, D. COOKE – AFRL, Hanscom AFB, USA

M. GEIS – Massachusetts Institute of Technology, Lexington, USA

Electrostatic full-particle simulations modeling of REIMEI satellite in polar orbit

H. UEDA – JAXA, Ibaraki, Japan

M. OKADA – National Institute of Polar Research, Japan

H. USUI, K. IMASATO – Kyoto University, Kyoto, Japan

Spherical EUV and Plasma Spectrometer (SEPS)

R. BRUNNER, W. KONZ, G. SCHMIDTKE – Fraunhofer-Institut, Freiburg, Germany

Validation of ISS floating potential measurement unit electron densities and temperatures
J. MINOW, V. COFFEY, T. SCHNEIDER, J. VAUGHN, P. CRAVEN – NASA, Huntsville, USA

L. PARKER, T. BUI – ESTS Group, Huntsville, USA

K. WRIGHT – University of Alabama, Huntsville, USA

S. KOONTZ – NASA, Houston, USA

Analysis of lunar surface charging for a candidate spacecraft using Nascap-2k

L. PARKER – ESTS Group, Huntsville, USA

J. MINOW – NASA, Huntsville, USA

Surface charging effects on the DEMETER langmuir probe and e-field sensors: observations and implications for ionospheric plasma parameters determination

J.P. LEBRETON – ESA/ESTEC, Noordwijk, The Netherlands

J.J. BERTHELIER – CETP/IPSL, Saint-Maur, France

Spacecraft surface charging in near-Earth-orbit plasma environments

R. BRIET, K. SIRI, R. COHEN, J. POLLARD, B. REED – The Aerospace Corporation, Los Angeles, USA

Interactions with charging environment

Electrostatic modelling of ARIANE 5 launcher during stages' separation

V. SRITHAMMAVANH, I. REVEL, G. AKOUN – EADS CCR, Suresnes, France

S. DESHAYES, A. SCHAFFAR – EADS AST, Les Mureaux, France

An extreme case of sunlight and shadow triggered surface discharging in GEO

M. BODEAU – Boeing Satellite Design Center, Los Angeles, USA

Surface charging application for geosynchronous spacecraft

R. HILMER, D. COOKE – AFR/VSBR, Hanscom AFB, USA

M. TAUTZ – AER Inc, Bedford, USA

V. DAVIS, M. MANDELL, R. KUHARSKI – SAIC, San Diego, USA

Preliminary surface and internal charging analysis of the radiation belt storm probe spacecraft

V. DAVIS, M. MANDELL – SAIC, San Diego, USA

R. MAURER – Johns Hopkins University, Laurel, USA

Mitigation of surface charging on solar array in geostationary Earth orbit

M. IWATA, H. IGAWA, T. OSE, Y. HARAGUCHI, Y. SANMARU, H. MASUI, K. TOYODA,

M. CHO – Kyushu Institute of Technology, Fukuoka, Japan

S. HOSODA – JAXA, Kanagawa, Japan

T. FUJITA – JAXA, Ibaraki, Japan

The impact of low energy ambient electrons on GEO satellite charging

L. KRAUSE, R. BALTHAZOR, G. FONT – USAF Academy, USA

Photoemission current and solar EUV radiation: Cluster observations

A. ERIKSSON, E. WINKLER – Swedish Institute of Space Physics, Uppsala, Sweden

Electric propulsion

Effects of plasma injection and beam - Plasma interaction

Y. SHPAKOVSKY, Y. RUZHIN – Russian Academy of Sciences, Moscow, Russia

Instability-driven fluctuations as mixing agent in ion beam neutralization for electric propulsion

A. WHEELOCK, D. COOKE – AFRL, Hanscom AFB, USA

N. GATSONIS – Worcester Polytechnic Institute, Worcester, USA

Solar arrays

Plasma interaction tests on Cu(In, Ga)Se₂ thin-film solar cell

T. OKUMURA, K. TOYODA, M. CHO – Kyushu Institute of Technology, Kitakyushu, Japan

S. KAWAKITA, M. IMAIZUMI – JAXA, Japan

Electrostatic discharges on triple junction solar cells in simulated LEO environment

B. VAYNER – Ohio Aerospace Institute, Cleveland, USA

L. VAYNER – DBSI, Mentor, USA

GEO surface charging/discharging qualification test facility and method for whole solar array

W. FENG, D. YANG, Y. LIU, Y. XU, D. LI – Beijing Institute of Spacecraft Environment Engineering, Beijing, China

Is there a largest ESD event? Power law scaling and self organized critically in ESD amplitudes

M. BODEAU – Boeing Satellite Design Center, Los Angeles, USA

Stretched Lens Array (SLA): a proven and affordable solution to spacecraft charging in GEO

H. BRANDHORST, J. RODIEK – Auburn University, Auburn, USA
D. FERGUSON – NASA, Huntsville, USA
M. O'NEILL – ENTECH, Keller, USA

Study of arcing events on Si solar cells in LEO like conditions

S. MUKHERJEE, M. RANJAN, N. VAGHELA, R. RANE, R. BANDYOPADHYAY, B. MEHTA, S. DESHPANDE – Institute for Plasma Research, Gandhinagar, India
E. SURESH, M. SANKARAN, M. SUDHAKAR – ISRO Satellite Center, Bangalore, India

Surface flashover on printed circuit boards under electron irradiation

H. FUJII – Nara National College of Technology, Nara, Japan
T. HASEGAWA, H. OSUGA – Mitsubishi Electric Corporation, Japan
K. MATSUI – USEF, Japan

ESD-Triggered arc discharge characteristics between wires in vacuum

H. FUJII, S. SUGIMORI – Nara National College of Technology, Nara, Japan

Experimental investigation of secondary arc plasma on solar array on GEO environment by emission spectroscopy

T. OSE, K. TOYODA, M. CHO – Kyushu Institute of Technology, Kitakyushu, Japan

Solar panel ESD ground tests under low temperature

K. NITTA, M. MIYAMOTO, H. MASHIDORI, S. KAWAKITA, M. TAKAHASHI – JAXA, Ibaraki, Japan
J. HARADA, Y. MIKI – Advanced Engineering Services Co, Ibaraki, Japan

Simulation experiment on high voltage solar array in the LEO plasma environment

K. TANAKA, H. TOYOTA, M. TAJIMA, S. SASAKI – JAXA, Kanagawa, Japan

Development of flashover current simulation circuit for ESD ground test of solar array paddle

M. NOMURA, H. MASUI, K. TOYODA, M. CHO – Kyushu Institute of Technology, Kitakyushu, Japan

Preliminary ESD ground tests using a large-scale solar array

H. MASHIDORI, K. NITTA, S. KAWAKITA, S. SHINOHARA – JAXA, Ibaraki, Japan
J. HARADA, Y. MIKI – Advanced Engineering Services Co, Ibaraki, Japan
K. TOYODA – Kyushu Institute of Technology, Kitakyushu, Japan

Laboratory tests at The Aerospace Corporation to simulate ESD-Induced solar power degradation

J. POLLARD, T. GRAVES, R. BRIET, R. FRANCIS, B. REED, J. WYRWITZKE, J. NOCERINO, B. SMITH – The Aerospace Corporation, Los Angeles, USA

Internal charging

Calculation of internal charging for spacecraft

Y. ZHONG, M. LIFEI, T. XIAOJIN, Y. XIAOXUE, M. HUIYUAN, Z. CHAO - China Academy of Space Technology, Beijing, China

Deep dielectric charging of spacecraft polymers by energetic protons

N. GREEN – Jet Propulsion laboratory, Pasadena, USA

J. DENNISON – Utah State University, Logan, USA

A satellite deep charge monitor for spacecraft operators

M. DE PAYREBRUNE, E. LIN – DPL Science Inc, Québec, Canada

Energetic electron results from the ESA SREM monitors and comparison with existing radiation belt internal charging models

H. EVANS, E. DALY, P. NIEMINEN, A. MOHAMMADZADEH – ESA/ESTEC, Noordwijk, The Netherlands

P. BUEHLER – Vienna, Austria

W. HAJDAS – Paul Scherrer Institute, Lilligen PSI, CH

FPP results, final report

D. FERGUSON – NASA MSFC, Huntsville, USA