

## PREFACE

The 31st annual ISAS Space Energy Symposium was held at ISAS Sagamihara on February 24, 2012. The symposium this year had 3 sessions; Spacecraft Power System, Wireless Power Transmission/High Voltage Technologies, and Large Structure/Transportation/Environmental Effects/Economics related to the space energy system. Totally 22 papers were presented this time.

The serious accident in the nuclear plants following the Great East Japan Earthquake has been a big blow to our society. Our government has not been able to establish the energy policy yet. Solar Power Satellite (SPS), a major subject of this symposium, can be one of the potential candidates for the clean and safe energy system in the future.

In the session of Spacecraft Power System, 8 papers regarding innovative technologies were presented; a next-generation satellite power system, a power system using heat of chemical decomposition, a regenerative fuel cell system, crystal growth of In-Se thermophotovoltaic generator, a spacecraft power system using lithium-ion capacitor, secondary lithium ion batteries for HAYABUSA-2 mission, a power system for Mars airplane, and an electric power system for planetary rover. 7 papers were presented in the session of Wireless Power Transmission/High Voltage Technologies. Among them, 4 papers were related to the microwave power transmission; energy/information transmission for Micro Aerial Vehicle, prospects of phased array microwave power transmission system for SPS, high power amplifiers for wireless power transmission in space, and experimental results of microwave beam forming. 3 papers were dedicated to the discharge phenomena in space; discharges under electron irradiation environment, high voltage cables in space environment, and discharges on high power microwave antenna. In the session of Large Structure/Transportation/Environmental Effects/Economics, 7 papers were presented in various fields; a structural analysis for a large reflecting SPS mirror, flatness control for large SPS antenna panels, a feasibility demonstration experiment for microwave rocket, physiological effects of ELF irradiation in mice, physiological effects of microwave irradiation in mice, and an economic analysis on SPS. In this session, a paper concerning extraterrestrial resources was presented but is not included in this open document file by author's request.

Approximately 45 researchers and students attended the symposium from universities, research institutes, space agencies, and private organizations. Foreign researchers from Taiwan, Republic of China, attended this symposium and presented a paper. In order to save publishing cost, the proceedings of this symposium are not published in printed matter, but the symposium papers are open on the ISAS web site. The coordinators of this symposium will appreciate any comment and advice on the topics for the next Space Energy Symposium in 2013.

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