

## SPACE POWER SYMPOSIUM (C3)

## Wireless Power Transmission Technologies, Experiments and Demonstrations (2)

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PRELIMINARY EXPERIMENTAL RESULTS OF BEAM STEERING CONTROL SUBSYSTEM FOR  
SOLAR POWER SATELLITE**Abstract**

Solar Power Satellite (SPS) converts the space solar energy into microwave or laser, and transmits it to the earth. The SPS in the geostationary orbit can collect the power at any time of the day and night, and transmit gigawatts of power to a power receiving subsystem on the earth. To achieve 1GW-class SPS, a power transmitting subsystem on the scale of square kilometers is required for microwave power transmission (MPT). Consequently, it is crucial to construct a number of transmitting modules in the power transmitting subsystem, and transmit microwave beams pointing accurately to power receiving subsystem. To achieve MPT technology, the Japan Aerospace Exploration Agency and the Institute for Unmanned Space Experiment Free Flyer are planning to conduct a MPT ground experiment in fiscal year 2014. In this joint effort, we are in charge of a beam steering control (BSC) subsystem, which is important among MPT technologies. We have defined the functions and specifications of the BSC Breadboard Models (BBMs). Using the BBMs of the BSC subsystem, we conduct the functional verification of a REV method and a monopulse method. We have two test items. First, we check the detection of the arrival angle of the pilot signal. At a tracking receiver, we receive the “sum” and “difference” signals derived from the pilot signal, and pass an angle error signal to a CPU card. Then, we confirm that phase control signal which comes from the CPU card is correct. Second, we confirm that phase differences which are set initially are corrected for three transmitting modules using the REV method. This paper describes the functions and specification of the BSC BBMs, the results of system tests for BSC BBMs.