

SPACE POWER SYMPOSIUM (C3)
Space Power Technologies and Techniques (2)

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STUDY ON HIGH ACCURACY PHASE CONTROL METHOD
FOR SPACE SOLAR POWER SYSTEM

Abstract

Space Solar Power System generates the electrical power (Giga-watt level) using solar battery on Geostationary-Orbit, exchanges the electrical power into the Microwave/Laser power, transmits the Microwave/Laser power from the space to the Earth, and exchanges the Microwave/Laser power into the electrical power again by the ground system. Because this system does not use the fossil fuel to generate the electrical power, Space Solar Power System is expected to be one of the solutions for Global warming and Energy depletion. In Japan, research agencies (ex. Japan Aerospace Exploration Agency, Unmanned Space Experiment Facility), universities (ex. Kyoto University), and enterprises research and develop this system. Mitsubishi Heavy Industries also researches and develops this system earnestly.

This paper explains a summary of the study on high accuracy phase control method for Space Solar Power System. The phase control method means to align the phase of Microwave among solar battery panels for efficient beam forming (Giga-watt level Space Solar Power System consists of more than millions of solar battery panels). In this study, MHI have developed two kinds of phase control methods. The first is "PAC (Position and Angle correction) method" which is the MHI's original method by using a pilot signal. The second is "IQ method". IQ method has been jointly developed by MHI and Kyoto University by using a phase modulation signal. Mitsubishi Heavy Industries contributes to realize "Space Solar Power System" through these researches and developments.