

IAF SPACE POWER SYMPOSIUM (C3)
Solar Power Satellite (1)

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PROGRESS STATUS OF OHISAMA PROJECT

Abstract

We are developing and manufacturing mission instruments and bus systems for the experimental satellite in OHISAMA Project A. This project, commissioned by the Ministry of Economy, Trade and Industry (METI), aims to verify long-range microwave beam control technology from orbit for the future utilization of a lunar power generation system using a solar power satellite orbiting the Moon. Five experiments are planned in the OHISAM project. One is the evaluation of a modular structure of phased array antenna systems for space applications. The second is to confirm the beam control accuracy for long-range energy transmission using microwaves from orbit to ground. The third is the demonstration of power reception and its energy utilization by wireless power transmission from orbit. We plan to conduct an LED lighting experiment using only the energy transmitted from orbit, utilizing a large parabolic antenna as the receiver. Additionally, we plan to conduct experiments utilizing AM-modulated microwaves for power transmission, employing crystal radios on the ground to transmit energy through sound. The fourth is a technology demonstration of wireless power transmission between flying objects in orbit. The fifth is the evaluation of the effect on ionospheric plasma and atmospheric propagation when high power microwaves are emitted in orbit. We will observe variations in plasma parameters during high-power microwave radiation using Langmuir probes and impedance probes and monitor the excited waves using a wave receiver. The experiment consists of two segments. One is the space segment and the other is the ground segment. The space segment will use a 180 kg class small satellite equipped with a wireless power transmission system. A pilot signal uplink antenna and many receiving systems are used as the ground segment. The flight models (FM) for most components have been completed and are now in the assembly phase. We will present the status of the project, which focuses on the development of mission instruments.