IAF SPACE POWER SYMPOSIUM (C3)
Wireless Power Transmission Technologies and Application (2)

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CURRENT STATUS OF THE SSPS DEVELOPMENT AND THE RESULT OF GROUND TO AIR MICROWAVE POWER TRANSMISSION EXPERIMENT.

Abstract

Japan Space Systems (J-spacesystems) has been studying wireless power transmission (WPT) for Space Solar Power System (SSPS) from the beginning of 2000. In this study, we have focused on the microwave power transmission as a key technology for the realization of future SSPS. J-spacesystems group have been kept on developing high efficient microwave transmission and receive system. The result of the first stage development was demonstrated as a ground wireless transmission experiment to the horizontal direction in March 2015. The development was completed under the contract of Ministry of Economy, Trade and Industry (METI) from FY2009 to FY2014. In this stage, we have developed thin phased array antenna with high power amplifiers by high efficient GaN HEMT and class-F amplifier circuits. Japan Aerospace Exploration Agency (JAXA) was responsible for the development of this precise beam direction control in this program. As a second stage development, we have been working for the development of higher efficient microwave WPT since FY 2014. Results of the development were applied to the experiment of Ground to Air microwave WPT experiment. Improved performance of microwave transmission section and improved receiving part were applied to this experiment. Rectenna was installed under Drone, and microwave power transmitter was tilted to send microwave to upward direction. The experiment was

completed in the first quarter of 2019, which is the last quarter of FY 2018. The general development road map, the result of the second stage development and vertical microwave WPT experiment will be explain in this paper.