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

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WIRELESS POWER TRANSMISSION SYSTEM BASED ON SPACE TECHNOLOGIES

Abstract

A wireless power transmission system (WPT) is defined, as one which efficiently transmits electric power from one point to another through the vacuum of space without the use of wires or any other substance. WPT is distinguished from other types of power transmission systems by its high efficiency, by the comparatively high levels of power being handled, and by its technology and physical components that are distinctly different from those used in communication systems. These technologies have the potential to simplify spacecraft design by eliminating the need for physical connections between components, which can be challenging to implement in the harsh environment of space. Our main goal in researching wireless power transmission technologies is to simplify power transmission between equipment and other systems used in the energy supply system, taken into consideration mass, which is an important factor in space, to minimize energy losses and to provide power transmission to systems where power transmission is not available without using any components. In this study, it is aimed to minimize the losses due to resistance, the weight of the antenna and other internal components, the total cost and other problems during the energy exchange stage between the satellites as well as the components inside the spacecraft. In terms of effectiveness, health and safety, the most unique types of energy transmission over long and short distances have been taken into consideration. There are several types of WPT technology in use today: Capacitive power transmission (CPT), Microwave power transmission (MPT), Laser power transmission (LPT), Inductive power transmission (IPT) and Ultrasound power transmission (UPT). The benefits and advantages of using that energy supply in satellites or spacecraft are mentioned in this article based on research and results. Overall, this article aims to explore wireless power transmission technologies and their use in the space industry, compare all available information on this technology, and bring together industrial and academic engineers and researchers around the most appropriate choice for today's technology requirements.