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Wireless Power Transmission Technologies and Application (2)

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SYSTEM DESIGN OF WIRELESS POWER TRANSMISSION FOR ELECTRIC POWERED UAV

Abstract

We studied the concept of a wireless power transmission system for electric powered unmanned aerial vehicles such as multicopter using microwave. Recently, various types of multicopters for monitoring, surveying, observation, sports racing, hobby and transportation are being developed. However, operating time of multicopter is limited by battery. It is expected that the operation time of multicopter can be extended and the payload can be increased by wireless power transmission. We developed wireless power transmission system with around 130W output adopting a phased array antenna with a frequency of 5.8 GHz. The phased array antenna with the size of around 50 cm squares consists of 64 sub array antenna elements. Phase of each subarray can be controlled digitally with 6 bits. Microwave beam focusing characteristics by two methods were compared by experiments in the near field conditions. The performance of lightweight rectenna was evaluated. In our system, RTK-GNSS is adopted for monitoring of the position of the multicopter. In this paper, system design of the wireless power transmission system for multicopter using microwave based on the experiments will be described.