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Wireless Power Transmission Technologies and Application (2)

Author: Mr. Rick Hodgson
Emrod, United Kingdom

A WIRELESS POWER BEAMING DEMONSTRATOR SYSTEM WITH OPTIMISED BEAM
COLLECTION EFFICIENCY.

Abstract

This paper describes Emrod's proof-of-concept wireless power beaming system. This was used to successfully deliver 550W of rectified DC power to a load over a distance of 36m at a frequency of 5.8GHz. This demonstration took place in Munich on 27th September 2022 in association with the European Space Agency and Airbus in support of Europe's future space-based solar power endeavours. The system operates in the radiating near-field region using identical 1.92m x 1.92m phased array antennas as transmitter and rectenna. The antennas were specifically designed to produce a microwave beam profile with optimised beam collection efficiency for the given antenna size, wavelength and range. Excellent agreement was obtained between computed and measured beam profiles with a beam collection efficiency of 95