

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

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HIGH FREQUENCY RECTIFICATION: A DISRUPTIVE SCENARIO FOR WIRELESS POWER
TRANSMISSION

Abstract

High-frequency operations play a crucial role in data transmission, as the rate of information transfer is directly proportional to the signal frequency. Despite its well-established significance in data transmission, the broad application of this paradigm faces challenges in other domains, notably in electronics and the unconventional field of wireless power transfer. Particularly, the latter has found diverse applications in low-frequency (kHz-GHz range) power wireless transfer, such as door locks, highway tolls, and packaging reading. However, the scenario changes significantly when high-frequency (PHz) wireless power transfer is considered. Currently, there are no developed applications in this domain due to limited scientific understanding and technological constraints. Here, we shall introduce the current state-of-the-art in high-frequency wireless power transfer, highlighting its achievements and limitations. Additionally, we will explore how utilizing wireless power solutions operating at high frequency could significantly broaden the range of applications by incorporating data transfer alongside power transmission. This innovation could be applied in various contexts, including communication between satellites, satellite-to-surface stations, and, adopting a mirrored approach, communication between rovers and planetary stations.