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Wireless Power Transfer Systems for Biomedical Devices: Modeling, Simulation, Application

Dear Colleagues,

The application of wireless power transfer (WPT) technology in biomedical devices is not a new challenge. Since the early developments of WPT technology, implanted biomedical devices have been carefully considered. One of the biggest problems with active implantable medical devices (AIMDs) is the power supply to the device itself. A WPT system can transfer electrical energy via inductive, capacitive, or electromagnetic coupling from an external source to a biomedical device without using wires. For AIMDs, applying WPT technology is very beneficial as the device battery can be recharged remotely without having to surgically replace the device itself when the battery is low. WPT technology can be applied to low and very low power devices, such as pacemakers, neurostimulators, endoscopic capsules, etc., but also to high-power devices, such as artificial organs or heart pumps. The application of the WPT system on biomedical devices requires great attention because there are many electrical and clinical requirements such as system size, power level, electric and electromagnetic safety, temperature rise limits, etc.

The Special Issue focuses on the modelling, simulation, and optimization of wireless power and/or charging systems for biomedical devices that can be implantable but also wearable. Potential topics also include, but are not limited to, system design and optimization, advanced compensation, electromagnetic field safety, and dosimetric analysis.

Special Issue Website

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Special Issue