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EEI KOLLOQUIUM

Energy Harvesting for Autonomous Wireless Sensors and RFIDs

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Cauerstraße 9, Tietze-Schenk-Saal (4. O.G.)
Diskussionsleitung: Prof. Dr.-Ing. R. Weigel

Energy harvesting technologies provide a foundation, an enabling technology towards the realization of 'zero-power' wireless sensors and implementing the Internet-of-Things (IoT) and machine-to-machine (M2M) communication. The state-of-the-art in energy harvesting technologies such as solar, piezoelectric, thermal and electromagnetic is presented. Figures of merit are provided and emphasis is placed on design challenges and novel technologies and materials, such as paper, textiles, nano-materials and large volume inkjet printing fabrication. Energy considerations and challenges for energy autonomous operation in emerging applications from health and biomedical systems, to smart homes and environmental monitoring are addressed.

Hybrid–multiple technology harvesters are discussed and the development of low profile and conformal solar antennas and solar–electromagnetic harvesters is presented. Interest in electromagnetic energy harvesting is further attributed to the capability for powering of wireless devices by intentional radiation known as wireless power transmission. The latter is addressed and novel system concepts such as transmission of chaotic signals for optimum performance are proposed. Circuit and system examples of autonomous system operation are demonstrated such as wirelessly powered sensors, beacon signal generators, and energy harvesting applied to RFID systems.