Research project and supervisor team

Supervisory Team	Prof. Giampaolo Buticchi Prof. He Zhang Dr. Liang Huang
Short introduction & description of research project	Wireless Power Transfer (WPT) is an innovative technology that delivers power to load without direct electrical connection. By elimination of cables and connectors, it can increase the reliability and safety of system operations. Various techniques are used to implement WPT, among which inductive coupling is dominant. WPT has found various applications in consumer electronics, biomedical devices, aerospace, and electrical vehicles. To promote its wide adoption, much work has been done to increase the efficiency and power transfer capability. Compensation circuits play a key role in improving power transfer capability and tolerance to variations. Commonly used compensation circuits include series LC, parallel LC, series-parallel resonant networks. They can be deployed at the primary side, secondary sides, or both sides, depending on applications. Different compensation circuits are suited to different scenarios. If the load or mutual coupling changes, the original compensation circuit may not be suitable. This research is to develop a flexible compensation topology for inductive WPT systems (IWPT). The topology of the compensation circuit can be adjusted according to the requirements of the secondary side load. Methods of implementing active switching of compensation circuits will be investigated. Transient behaviors of the dynamic switching between different topologies will be studied. This research will further enhance the robustness and universal adaptability of WPT systems.
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