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## BS/MS Thesis

# Harmonic Back-scatter Measurement

### Motivation

In existing mobile devices, the extensive use of metal contacts will be a potential source of nonlinearities due to the complexity and high integration of the system. If the phone is transmitting at 800 MHz and, at the same time tries to receive at Bluetooth or WIFI around 2400 MHz, then any, even very weak harmonics of the 800 MHz signal will disturb the 2400 MHz receiver. For such a good suppression one needs to consider even very weak harmonic sources: Metal-to-metal contacts are one of them.

### Research Topic

To analyze the effect of different metal contacts on harmonic generation, we propose a non-contact based harmonic test method. After excitation of the device to be tested with a high-power RF signal, the harmonic signals radiated are tested. Afterwards, the magnitude of the harmonics in the system is estimated by simulation modeling and inference of the harmonic generation. In this method, the source of nonlinear contact will be replaced by reference harmonic source which could provide a consistent harmonic level.

### You will learn

- Basic RF measurement technique.
- Full-wave and numerical combined simulation.
- PCB and antenna design.



### Contact

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