

Electromagnetic measurements inside a reverberation chamber

Master internship project



About Thales:

With 80.000 talents working in 68 countries, we are one of the biggest high-tech employers in the field of safety and security. In the Netherlands, where 2800 employees are based, we are located in seven cities: Huizen, Amersfoort, Rotterdam, Delft, Breda, Eindhoven and Hengelo (HQ). Together with an extensive ecosystem of knowledge partners, customers and suppliers, we work on radars for naval vessels, cyber security solutions, transportation systems, communication equipment for land forces, cryogenic cooling solutions, research & development for radar tech (in collaboration with TU Delft).

Problem definition:

Unwanted electromagnetic fields can be measured in free space, but the ambient noise, due to legal transmitters (like mobile phone base stations) or other unwanted emission from generic electronics, is causing interference. Therefore EM experiments are often performed in shielded enclosures (Faraday cage). To prevent reflections, and to simulate free space environment, the walls and ceiling are covered by absorbers. Another approach is to make use of the reflections. This is done in a reverberation chamber. A reverberation chamber is simply a shielded room (Faraday cage). As the fields are very localized and frequency dependent, the fields are "mixed" by using a mode stirrer. Electromagnetic field measurements are then performed by averaging the field strength over the rotation of a stirrer. The major advantage of this approach is that the field strength is much higher than in an anechoic chamber, and the reverberation chamber is being used more and more. The automotive industry introduced a standard in 2023 to allow the use of this technique. But the focus is on generating a high field strength. Emission measurements, so measuring the unwanted emission from an object, is not used a lot. Experiments have to be performed in classic and in reverberation chambers. Typical objects like dipoles have to be evaluated, as well as more complex devices (like a cabinet). The experiments have to be combined with the most modern time-domain EMI receivers, evaluating trade-off between sampling time, sample size, and detectors.

Courses and supervision:

Labview programming and MatLab skills would be nice.

University of Twente.

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What's in it for you!

- An interesting internship or graduation assignment within our high-tech, innovative work environment;
- A comfortable, flexible work space in a modern environment;
- An excellent internship allowance;
- Its own student association where you can participate in educational and fun activities.

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