

Final Thesis Within the Topic Area Antenna Measurements

Bachelor / Master Thesis

Motivation:

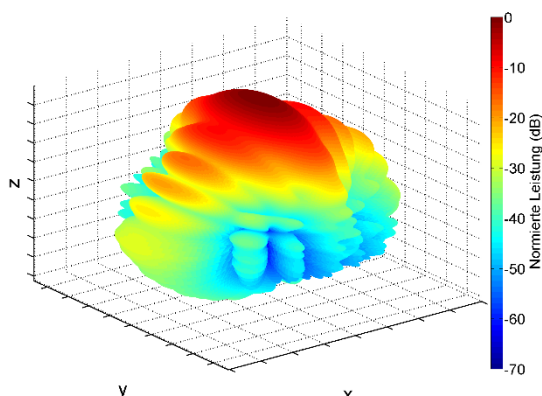
Antennas are an essential part of every high-frequency wireless system, be it satellite and mobile communications, radar sensors or nuclear magnetic resonance imaging. Exact knowledge about the antenna far-field radiation characteristic (3D/2D), radiated power in each direction, is essential for the functionality and development of any of these systems.

There are basically two methods generally used for antenna measurements: the first one is to place the antennas in the far-field of each other which is not perfectly possible in practice. At IHF, we therefore use a Compact Antenna Test Range (CATR). Here, a reflector is used to transform the spherical wave from the test antenna into a plane wave in a compact way. The second method is to measure the antenna in the near field and transform the measurement results to the far field mathematically. The main measurement geometries that are used for this method are planar, cylindrical, and spherical. At IHF, we mostly work with the spherical geometry. Both measurement methods have different advantages and limitations, and both are not perfect.

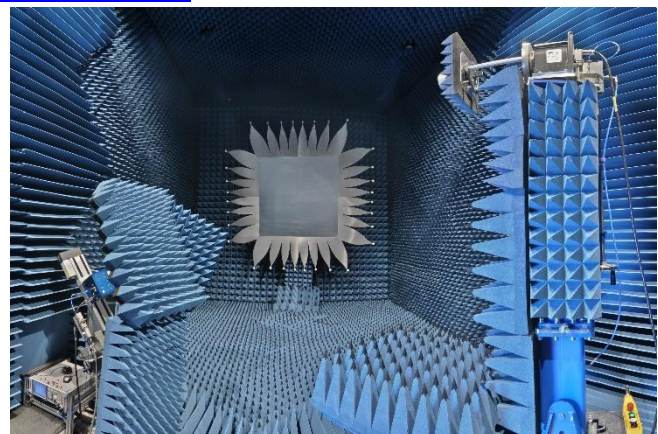
Therefore, further research and development is required to meet the challenges of future antenna applications and our measurement team is always working on challenging tasks to enhance our measurement capabilities. Currently, we are building up a robotic measurement facility to measure with further degrees of freedom and unconventional measurement geometries.

Tasks:

We regularly have interesting tasks for Bachelor and Master Theses within our measurement team. Typical problems are, for example, the testing of new measurement methods and theoretical evaluation and analysis of measurement data. Please have a look at some past topics on the next page! Interested? - please contact measurements@ihf.rwth-aachen.de for further information.



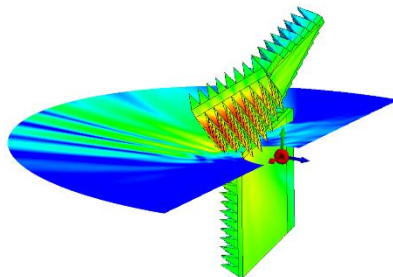
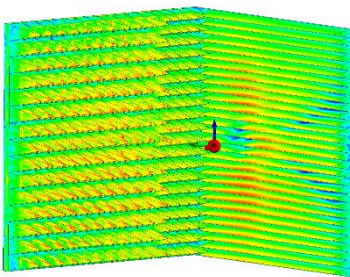
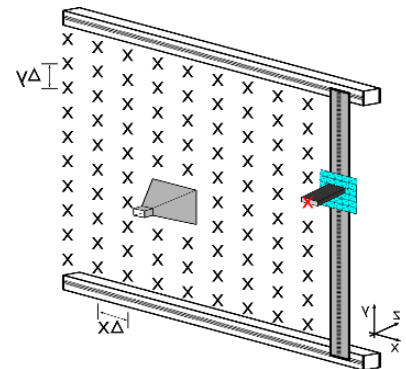
3D Plot of an antenna radiation characteristic.



Compact Antenna Test Range (CATR) at IHF.

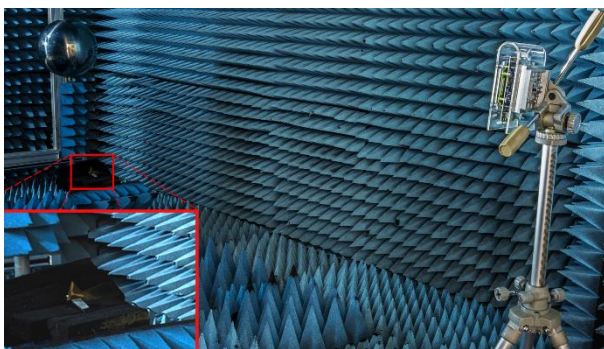
Past Theses:

1. "Extension of an antenna measurement chamber for the implementation of cylindrical near-field measurements" (MA).



2. "Modeling and Full-Wave Analysis of the Baffle in the Compact Antenna Test Range" (BA).

3. "Polarimetric Evaluation of Scattering Mechanisms of Automotive Landmarks" (MA).



4. "Analysis of Correlated Signals onto the Source Separation Performance of Estimation Techniques" (MA).