

# Advanced Spherical Near-Field Antenna Measurement Techniques

June 17 – June 21, 2019  
DTU-ESA Spherical Near-Field Antenna Test Facility  
Technical University of Denmark  
Kgs. Lyngby, Denmark

The course is aimed at giving the participants an understanding of the theory as well as the practice of spherical near-field measurement techniques for high-accuracy antenna testing. The course is based on the development of the spherical near-field measurement technique at DTU, the experience of operating the DTU-ESA Facility as an ESA external reference laboratory, and DTU's research in antenna diagnostics, probe technology, phaseless measurements, validation standards antennas, and special measurement techniques.

In 2019, the course will contain the following theoretical elements:

- Spherical vector wave functions and spherical wave expansion
- Antenna scattering matrix
- Spherical transmission formula
- Probe characterization and correction
- Solution of transmission formula
- Uncertainty sources and uncertainty estimation
- Gain calibration and near-field gain technique
- Spherical-to-plane-wave antenna diagnostics



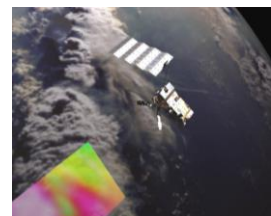
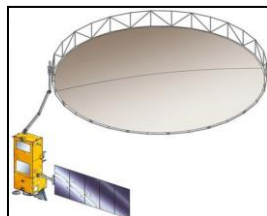
The course will also contain the following practical elements:

- Mechanical alignment using theodolite and optical tools
- Data acquisition set-up
- Probe calibration measurements
- Full-sphere near-field measurements
- Point measurements for gain determination
- Practical work in anechoic chamber of DTU-ESA Facility
- Data processing



Case studies and examples will be based on a number of measurement projects at the DTU-ESA Facility:

- Facility validation with DTU-ESA VAST12 and mm-VAST antennas
- ESA missions SMOS, BIOMASS, JUICE, SENTINEL, MetOP SG, ...



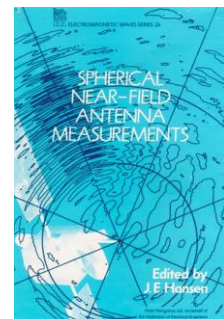
The course will take place at the DTU-ESA Spherical Near-Field Antenna Test Facility located at the Technical University of Denmark (Akustikvej, building 353, DK-2800 Kgs. Lyngby, Denmark). The DTU-ESA Facility is operated by the Electromagnetic Systems Group at DTU's Department of Electrical Engineering.

Due to the practical work inside the 17m x 14m x 12m anechoic chamber of the DTU-ESA Facility, the number of course participants is limited, and the participants will work in small groups of 3 - 4 persons.



In 2019, the course teachers from DTU will be:

- Professor Olav Breinbjerg
- Research Assistant Jeppe Majlund Børstorp
- Research Assistant Javier Fernández Álvarez
- Research Assistant Kyriakos Kaslis



For questions about the course, please contact

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