

Thesis Topic

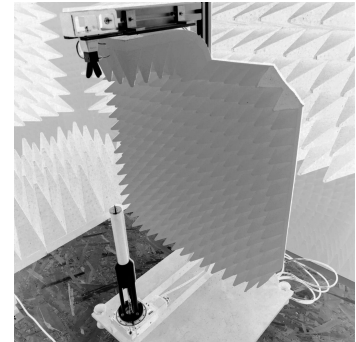
The CEM team offers the following topic

“Advancing Near-Field Measurement through Adaptive Quadrature”

to be chosen by a student and elaborated as the final thesis.

DESCRIPTION

Near-field measurement is a method for experimental verification of antenna radiation patterns. The key step is to measure the electric field around an antenna, project it onto spherical waves, and transform it into the far field. The used quadrature rule governs the accuracy of the procedure. Explore existing quadrature, select a suitable option, and implement it in MATLAB. Evaluate the performance of the implemented quadrature on a prototype developed in collaboration with the company.



CONTEXT

The topic will be solved within the collaboration with RFspin company. Collaboration with the members of the CEM group is expected.

PREREQUISITIES

Knowledge of programming, mathematical analysis, and basic knowledge of electromagnetism is expected.


REWARD

There is a monthly financial reward of ~8.000 CZK (before tax) associated with the topic elaboration.

LITERATURE

- [1] Behjoo, *et al.*: Optimal Sampling in Spherical Near-Field Antenna Measurements by Utilizing the Information Content of Spherical Wave Harmonics, *IEEE Trans. AP*, vol. 70, 3762–3771, 2022.
- [2] Hansen (Ed.): *Spherical Near-Field Antenna Measurements*, IET Series, Peter Peregrinus Ltd., 2008.

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Surface current density on two plates, $ka = 0.5$.
The 5th mode of $\mathbf{X}_0 \mathbf{I}_n = \lambda_n \mathbf{R}_0 \mathbf{I}_n$ decomposition is depicted.