Material-Characterization using Waveguide Probes
Project work (Master thesis with further objectives)

EPS_r?
tan_d?
µ_r?

Motivation

- Material characterization is a complex topic
- Characterization tools can be expensive
- At ENAS, there are measurement receiver, positioning tools, probes (near-field scanner, NFS)
- These should be used to characterize material properties
- So, a new method to characterize materials using the NFS should be evaluated

Tasks

- Literature review on waveguides, material properties and wave propagation
- Modeling of open ended waveguide probes for given frequency range (e.g. 50 GHz)
- Simulation of characterization method (e.g. two probes with material inbetween)
- Evaluation of results (e.g. S-parameters) to calculate material properties
- Assessment of possibilities to enhance accuracy (e.g. diff. positions, diff. probes, …)
- Report and presentation of the results

Requirements

- Passed courses in theoretical electrical engineering and CST course (if offered)
- Python/MATLAB

Contact

Dominik Schröder, mail: dominik.schroeder@enas-pb.fraunhofer.de

TET
Theoretische Elektrotechnik
Prof. Dr. Jens Förstner

UNIVERSITÄT PADERBORN

Fraunhofer
ENAS