

Student Project Proposal

Project title: Open stop band suppression technique benchmarking

Project type: **Master Thesis Project (30 credits)**

Faculty and Laboratory: STI, Microwaves and Antennas Group

(MAG) Contact: amir.ahmadi@epfl.ch anja.skrivervik@epfl.ch

Project Description

One-dimensional (1-D) leaky-wave antennas are attractive because of their simple construction, high gain, and beam-steering characteristics. A multitude of leaky-wave antenna topologies has been proposed, employing diverse technological frameworks, including waveguides, dielectric image lines, microstrip lines, substrate-integrated waveguides (SIW), and groundless spoof plasmon structures. A periodic leaky-wave antenna can steer the beam either backward or forward; nevertheless, it typically experiences an open stopband when the main beam is scanned across broadside.

Project Goal

The goal of this project is to benchmark and categorize the available open stop band mitigation strategies and investigate the drawbacks and advantages of each of these solutions.

Student Task

- Study of leaky wave antenna.
- Study of open stop band mitigation solution
- Comparison of the solution
- Design and simulate and analytical modelling of the promising solutions.
- Fabrication and measurement (if time permits).

Outcomes

- Students will learn leaky wave antenna and their beam steering capabilities.
- Open stop band mitigation techniques will be investigated.
- Periodic structure design will be studied.
- EM Simulation and measurement techniques will be learned.

Type of Work

- Theory 35%
- Simulation 40%
- Measurement 5%
- Documentation & Reporting 20%