Student Project Proposal

Project title: A dual polarized MIMO antenna for 5G applications

Project type: Master Thesis Project

Faculty and Laboratory: STI, Microwaves and Antennas Group (MAG)

Contact: Danelys Rodriguez Avila – danelys.rodriguezavila@epfl.ch  
Anja Skrivervik – anja.skrivervik@epfl.ch

Project description

With the advent of 5G and Internet of Things (IoT), the design of mm-Waves antenna arrays has gained increasing interest. Considering the high absorption due to environment conditions and high path loss characteristic to mm-Waves, high gain and wide-band antennas with a relatively low profile and low transmission losses are preferred. A stacked patch antenna fed by a suspended stripline (SSL) is a good solution to meet such requirements. This type of antennas has been investigated within our group for applications requiring linear and circular polarization. This project aims at extending this basis to develop a dual polarized prototype for and increased network capacity in 5G applications.

The novelty of this project is the investigation of a dual polarized antenna when fed by a SSL.

Type of work: Theory 30%, Simulation 40%, Documentation & Reporting 30%

Student tasks

1. Investigate the different techniques used for obtaining dual polarization in printed antennas. They should be compared regarding,
   - Integration with the feeding line technique (SSL)
   - Polarization purity
   - Cost and complexity
   - Scalability for an array design

2. Design a dual polarized stacked patch antenna fed by a SSL. This antenna should be compared to a linear polarized prototype to examine the antenna performance (gain, bandwidth, antenna efficiency).