

## **Master Thesis - Microwave Substrate Filter implementation for a 5G Advanced Antenna System.**

### **Background**

High integration level is required in new advanced antenna systems in 5G. Ericsson in Lund wants to explore some new methods with the help of new curious and enthusiastic future engineers.

### **Project Goal**

**Objective** : . Getting more knowledge about filter performance and de-embedding techniques when implementing the filter on a Printed Circuit Board (PCB) substrate. This will involve 3 phases:-

Phase 1: Pre-study, literature review of available research material.

Phase 2: EM (Electromagnetic) Simulation of possible band pass filter topologies or layouts for a 25 GHz 5G Advanced Antenna System.

Phase 3: Based on simulation results from Phase 2, design and evaluate a HW band pass filter. suitable for a 5G Advanced Antenna System for centre frequencies around 25 GHz. Finally analyse differences between simulation and measurement results.

### **Thesis work description**

Study research papers, your own and existing ideas to find out what type of band pass filters ~~that~~ can be integrated with an antenna element and implemented on a PCB. Compare with given filter requirements.

You will also Study de-embedding techniques to implement needed test structures and methods to evaluate the filter and its interfaces.

Design and simulate the filter by using state of the art Electro Magnetic 3D simulators.

Make a board - The filter design will be implemented on a PCB and sent for manufacturing.

Evaluate the filter performance with and without an antenna element.

### **Qualifications**

MSc Student in Electrical Engineering or Engineering Physics.

Interested in high frequency radio/antenna design.

Self- motivated and good time management skills.

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