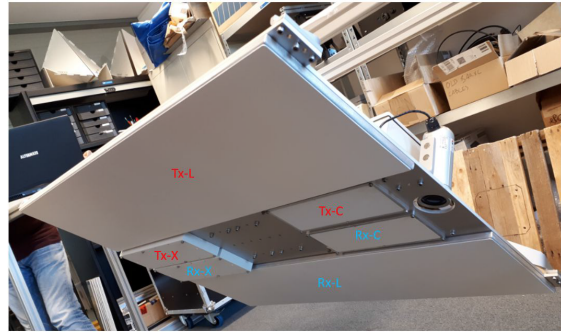


Internship: Characterization, Modeling and Calibration of MetaScatter

Background:

MetaScatter is a tower-mounted, stepped frequency, L-, C-, and X-band polarimetric radar system designed for near-range field-scale measurements of vegetated surfaces. It is used to collect experimental data to support the development of radar as a tool for vegetation monitoring.



Generally speaking, implementing radars to work in near range is a challenging task. There are two main reasons for this:

- 1) Limited isolation between the transmit and receive chain, including coupling effects at the antennas and scattering from nearby objects or support structures result in very strong signals in the first range gates.
- 2) A huge relative variation of the range, and in this case also the incident angle, result in the need to accommodate a very large dynamic range.

In the case of MetaScatter, while the system fundamentally works, it's sensitivity appears to be limited by these effects, rather than by the thermal noise-floor. There are also some indications that small non-linearities in the system may be introducing inter-modulation products.

Internship:

During this internship, you will contribute to the end-to-end characterization, modeling and calibration of the system. Having achieved a better understanding of the system, a second step will be the study and implementation of algorithms to suppress the aforementioned disturbing signals..

Desired skills:

- In MSc. programme of Electrical Engineering
- Background in radar systems or, at least, a good understanding of microwave front-ends.
- Good background in signal processing.
- Excellent python programming skills

Starting Date: ASAP

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