



Research / Master
Thesis Topic
FA / MA

HF

Cross-polarization Effects in Broadband Wireless Communication Systems

Description & Motivation:

- Measurement, modeling and characterization of the atmospheric and weather effects on an E/W band communication link (71-76 GHz & 81-86 GHz) with different elevation angles;
- Demonstration of wireless radio broadband Internet in remote areas (>40 Gbps in frequency and polarization multiplex scenarios).

Goals:

- Measurement and quantification of the cross polarization effects introduced by the septum polarizer and the orthomode transducer (OMT).
- Analyze the cross-polarization effects on the received signal quality (signal power, error vector magnitude, bit-error rate).
- Analyze and implement methods for reduction of cross-polarization effects.
- Investigation of the atmospheric cross-polarization effects on a broadband millimeter-wave wireless communication system.
- Simulation, measurement and characterization of mutual coupling effects (if 2 antennas per site are used).
- Comparison between mutual coupling impairments and cross-polarization signal degradation.

