DEVELOPMENT OF NEW TECHNIQUES TO DESIGN ANTENNAS AND FILTERS FOR MULTI-FREQUENCY AND UWB COMMUNICATION SYSTEMS

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GreenIT — AtlantTIC

Thesis Motivation:

Increasing interest in investigating antennas, filters and Antennas-Filters for UWB systems

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Performance Improvement challenges in design of Antennas-Filters for UWB systems: indeed/Notched

Thesis Motivation

Design and manufacture low cost Antennas-Filters with simple structures, using the planar technology.

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UWB Systems requirement: High gain antennas, good selectivity, sharp rejection, integrity, notch function…

Thesis Objectives:

Implementation of design techniques available to build practical prototypes of UWB Antennas-filters.

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Development of specific measurement techniques for analysis of implemented prototypes.

Thesis Objectives

Analysis of experimental results, according to the simulation and theory approximations.

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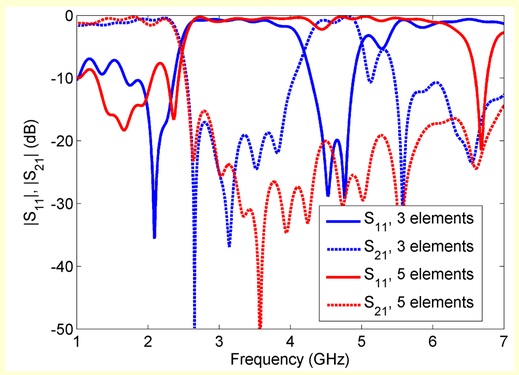
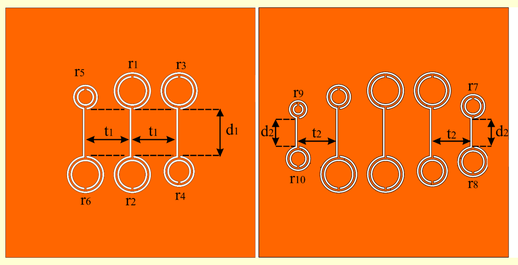
Publication of scientific and academics papers in international journals and conferences

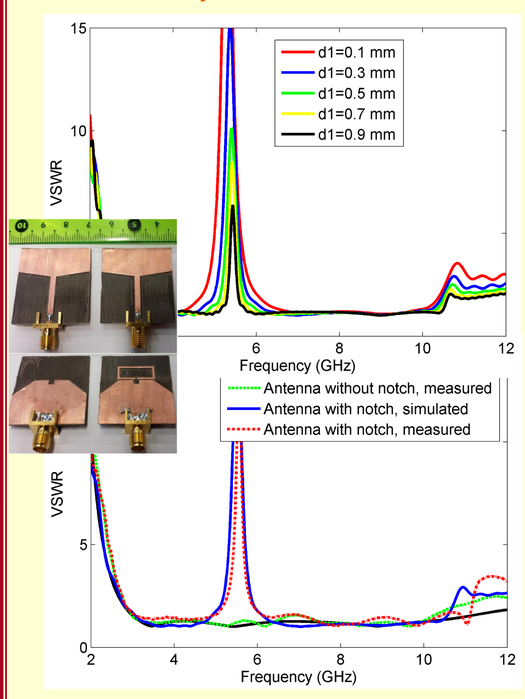
Elaboration of new collaborations with famous universities to learn about new technology and have research stages

Results & Discussions:

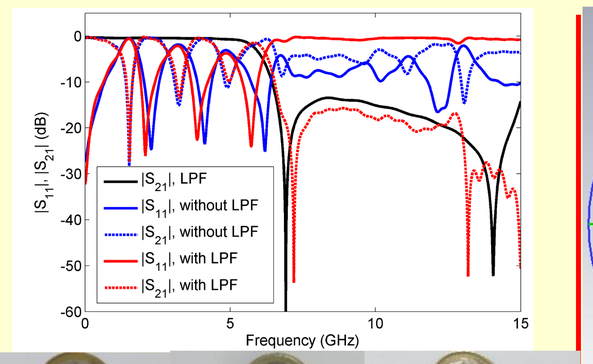


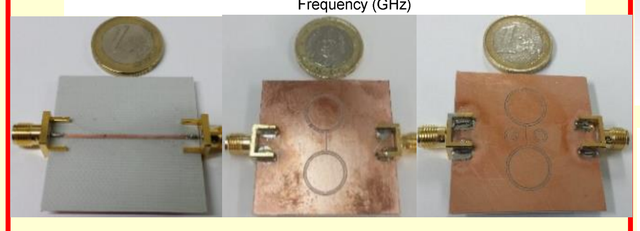


- Low Pass Filter Design with Wide Rejection Based on Array of Modified CSRRs,

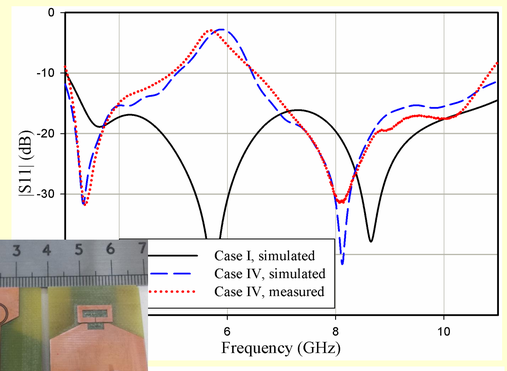


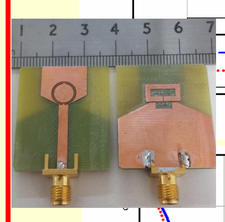
- UWB Tapered Microstrip Antenna With Wideband Notch Using single Split Ring Resonators Shaped Parasitic Conductor SSRR

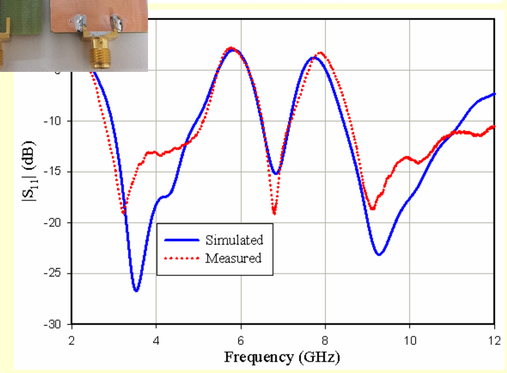




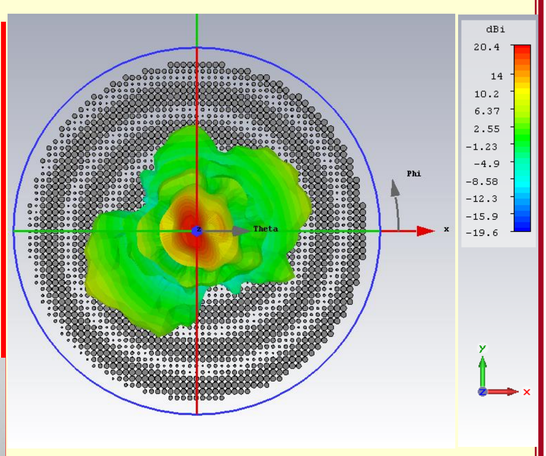
- Tri-band Bandpass Filter Design with High Selectivity and Wide Rejection Based on Modified CSRRs

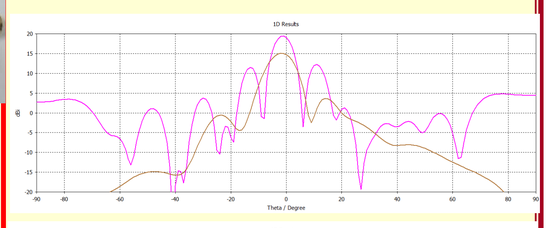


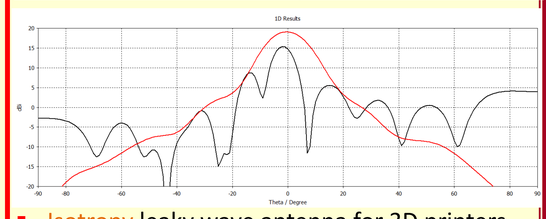




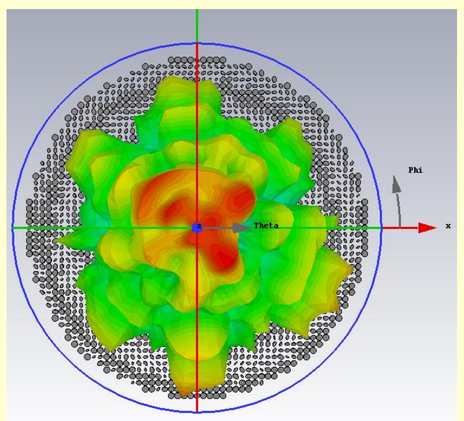
- UWB Antenna With dual Notched-Wideband Characteristics using SSRR/CSRR







- Isotropy leaky wave antenna for 3D printers



- Anisotropy leaky wave antenna for 3D printers; with control of polarization

References:

- International Reviewed Journal Papers, Published

5 PAPERS

- International Reviewed Journal Papers, Accepted

1 PAPERS

- International Reviewed Journal Papers, Submitted

4 PAPERS

- International Reviewed Journal Papers, Accepted

12 PAPERS

- International Reviewed Conference Papers, Published

2 PAPERS

- National Reviewed Conference Papers, Published

2 PAPERS

- National Reviewed Conference Papers, Published

1 PAPERS

Research Plan

- Literature review of background theory of Ultra-Wideband Antennas-filters.
- Mastering in CAD program for design of Ultra Wideband Antennas-filters.
- Development of an ad-hoc simulation tool to design bandpass filters
- Mastering in implementation techniques to build prototypes of Ultra-Wideband Antennas-filters
- Publication of achieved results for specific applications as Articles and Internationl Conference presentations

Next Year Planning

- Publications of pending research Works
- Thesis Presentation

Conclusions

- The presented thesis adds knowledge in the field of antenna and filter designs by developing new techniques and ideas which are proved by successful fabrication, experiments and evaluation. These designs are dotted for multi-frequency and ultra-wideband features.
- From a scientific perspective, finally, the value of this thesis in terms of novelty and relevance of the field is attested by the acceptance of the appended international papers and the referred international conference proceedings though an established scientific reviewing process.