

PhD Thesis Proposal

3D/Conformal Antennas for radar applications

Deadline for submission : **April 20th 2013**



Aims

Current RF-Seekers use mechanical steerable antennas. In order to reduce the cost of the mechanical system and to enhance the steering sensibility of the radar, we propose to replace any mechanical antenna components with an electrically controlled 3D antenna array. 3D antenna arrays can be easily produced with existing manufacturing technologies and offer significant advantages in terms of miniaturisation, integration and performances. The main objectives of this project are:

- 1) to design a novel 3-dimensionnal shape antenna by combing 3D SIW excitation structures with a conformal metalized area which supports the radiating slots,
- 2) to design novel 3D power divider structures by combining spatially distributed SIW excitation waveguides and a set of single input multiple output switches,
- 3) to design holographic arrays of meta-material elements combined with a MEMs switched feed network to effect beam scanning. These scattering elements are small with respect to the wavelength and are printed on a microstrip which lends itself to a planar or conformal geometry. A gradual variation of element geometry (local periodicity) is used to continuously adjust the surface impedance supporting the guiding or radiating of surface or leaky waves respectively.



Pr C. Person
PhD Advisor



Dr I. Morrow
PhD co-Advisor



Pr E. Rius
Supervisor

Tasks

The successful candidate will be expected to analyse, design, manufacture and characterize new antenna solutions for the radar.



Dr A. Balleri
Supervisor

The Team

This project will be carried out under the supervision of a team of the Lab-STICC laboratory at the University of Brest (Université de Bretagne Occidentale and Telecom Bretagne) and a team of Cranfield University consisting of five persons. It will rely on a highly specialized network of service providers in different key areas addressed by this project (Antennas, SIW structures, Radar, Meta-materials, Injection Molding, Stereolithography, Metallo-dielectric printing, Antenna measurements).

(<http://www.lab-sticc.fr/>, <http://www.cranfield.ac.uk/>)



Dr Y. Quéré
Supervisor

Context

This UK/France PhD application will be funded by the DGA. This project will be carried out in France for 18 months and in the UK for 18 months

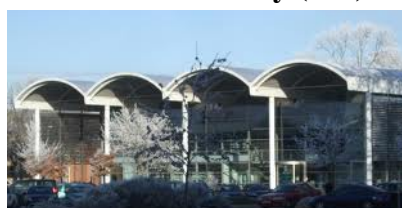


Candidate profile

Eligibility : maximum age of 27 years on 1st October 2013 and a Union European Student.

Scientific profile : Microwave active and passive devices, filter and antenna designs, Electromagnetic simulation (HFSS, ADS, Momentum...). Experience on radar is desirable.

Cranfield University (UK)



Brest, FRANCE

Monthly salary : 1550€

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