Post-doc position: Modelling of RF circuits and antenna arrays for system simulation

Applications are invited for a post-doctoral in the “RF Systems Axis" of XLIM Laboratory-France, for a period of **18 months**, **beginning in January 2018**.

XLIM (http://www.xlim.fr) has an expertise in the domain of electronics and microwaves, optics and photonics, CAD, mathematics, computer sciences and image processing for the application in telecommunications, secured environments, biotechnology and health, energy control and saving. It is a multidisciplinary research institute with more than 440 people among professors, CNRS researchers, engineers, technicians, post-doctoral researchers, PhD students and administrative staff.

XLIM is structured around 3 scientific poles and has two important platforms. One is dedicated to measurement and instrumentation (PLATINOM) and another one for advanced CAD and modelling of complex multiphysical systems (PREMISS). The laboratory also belongs to the Labex Sigma-Lim, which is a joint academic research laboratory with a label of "Laboratory of Excellence" since 2011. It emerges from collaboration between XLIM Institute (Electronics, Microwave, Photonics, Mathematics, Informatics and Cryptography) and SPCTS Laboratory (Science of Ceramic Processes and Surface Treatments).

XLIM laboratory is involved in 6 joints laboratories with industrial companies and has contributed to the creation of 14 start-ups since 2004.

Context of the post-doc position:

The Post-doc work will be directly involved in the ANR ASTRID project funded by the French national research Agency (ANR) and DGA (French defense procurement agency). The purpose of this project is to study an hybrid antenna system featuring a reduced beam forming network operating in Ku band (12-18 GHz) both in emission and in reception (Tx/Rx). In this project the novelty is that only a few elements are supplied with RF signals, the other ones being self-supplied by electromagnetic couplings. The whole system must be simulated in order to optimize the efficiency and to catch the interaction between the RF front-end and the complex radiating panel.

In this aim, a tool developed by XLIM’s PREMISS platform (http://xlim.fr/en/plateforms/premiss) and named SCERNE will be used. SCERNE is a system level simulator, which allows the performance evaluation of large scale systems with a high precision thanks to a seamless hierarchical modelling approach combining physics, RF circuit simulation, EM, thermal and mechanical simulation, and measurement-acquired data mining. It allows an early evaluation of complex architectures and/or

innovative concepts. It is interfaced with Simulink/Matlab and it is composed of block-schemes, which can be used to graphically wire circuits or systems.

Mission:

The candidate will participate in the modelling and simulation work in the project and will use the system simulator SCERNE to design models, perform simulations and compare results to experimental data. In order to design the system, the candidate will have to perform a rigorous modelling of all the elements, especially the radiating elements (radiation diagram and S-parameter matrix). The complex loads used to optimize the reflection coefficients will also be modelled in order to accurately simulate the beam produced by the entire radiating panel. Once the nominal simulation is performed, a final step will be to optimize the system with the optimization tool offered by SCERNE, including the amplifiers.

Profile:

The candidate must have a PhD in high frequency electronics. In addition, the following skills are required:

- Experience in modelling and simulation in the following domains : RF circuits, electromagnetics ;
- A good knowledge of Matlab/Simulink programming ;
- Experience with the main high frequency electronics CAD softwares (Cadence, CST, HFSS, Momentum, ADS, …) ;
- Good English level (spoken, read and written)

This work will be done in collaboration with several research teams in XLIM laboratory. The successful candidate will interface with multiple people in the system integration chain: modelling platform developers, circuit and antenna designers. Therefore the applicant must have excellent interpersonal skills and integration capabilities, and show a strong motivation to participate in a multidisciplinary project.

Candidate and restrictions:

European citizens are invited to submit a full CV, a cover letter and a list of references or recommendation letters to:

cyrille.menudier@xlim.fr

sebastien.mons@xlim.fr

arnaud.beaumont@xlim.fr

Location: Limoges, France.