

Postdoctoral position

Design of plasma-based microwave power limiters

Laboratory:

DEOS - Département Electronique, Optronique et Signal
ISAE-SUPAERO - Institut Supérieur de l'Aéronautique et de l'Espace
10 avenue Edouard Belin
BP 54032
31055 Toulouse Cedex 4
FRANCE

Context:

This postdoctoral position is proposed in the frame of the research project DIOMEDE funded by the French Research Funding Agency (ANR). It involves two laboratories from the Université Fédérale Toulouse Midi Pyrénées (namely, the ISAE-DEOS and the LAPLACE) and the CEA Gramat.

This project concerns the protection of microwave receivers against high-power microwave (HPM) threats. Such receivers have an important role in telecommunication, navigation, or detection systems, but front-door coupling due to receiving antennas makes them highly vulnerable to HPM signals. Current protection of these sensitive components usually involves microwave power limiters based on semi-conductor diodes. However, the use of such a microwave power limiter generally leads to additional insertion loss in the receiver that increases its noise figure and reduces its dynamic range.

The main objective of the DIOMEDE project is to study the capabilities of plasma micro-discharges as power limiter elements in microwave planar devices [1,2].

[1] R. Pascaud, F. Pizarro, T. Callegari, L. Liard, O. Pigaglio, and O. Pascal, "Low insertion loss microplasma-based limiter integrated into a microstrip bandpass filter", *Electronics Letters*, vol. 51, no. 14, pp. 1090-1092, July 2015.

[2] R. Pascaud, F. Pizarro, T. Callegari, L. Liard, and O. Pascal, "Plasma Microdischarge as Power-Induced Limiter Element in Microstrip Devices", *European Conference on Antennas and Propagation EuCAP 2015*, Lisbon (Portugal), April 2015.

Position description:

First of all, the postdoctoral researcher will have to study the interaction between microwave signals and plasma micro-discharge in order to derive guidelines for the design of plasma-based microwave power limiters. This work will specifically focus on experimental studies (e.g., microwave power budget, hot S-parameters...) and numerical simulations.

Then, the postdoctoral researcher will have to design different prototypes in order to assess their capabilities as a function of several parameters, namely the geometry of the circuit, the type of gas, its pressure...

Qualifications:

The successful applicant is expected to hold or to be about to receive an internationally-recognized Ph.D.-equivalent degree in Electrical Engineering, Engineering Physics, or equivalent.

The expertise in microwave design, technology, and techniques are highly required. Besides, the successful applicant should have a proven experience in analysis, numerical simulations (Keysight ADS and Ansys HFSS), and measurements of microwave devices.

Application:

Full curriculum vitae including your relevant academic, professional, and other experience and knowledge as well as a publication list.

First day of employment:

Review of applications will start immediately and will continue until the position is filled.

Duration of the contract:

The employment is time limited to 1 year with possibility of extension with 1 more year.

Salary:

2223€ per month.

Contact:

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