



IMT Atlantique
Bretagne-Pays de la Loire
École Mines-Télécom

IMT Atlantique

Description de poste pour
appel à candidatures

Date de mise à jour :	15/01/2024
Intitulé du poste :	Post-doctoral in design of RF passive coaxial components for 5G applications
Nom du projet :	YACARI coax
Contrat (+ durée si CDD) :	CDD 18 month
Date prévisible d'embauche :	01/02/2024
Localisation :	Département d'Electronique – UBO Lab-STICC 6, avenue le Gorgeu - CS 93837 29238 Brest Cedex 3 France
Direction/Service/UO :	Microwave Department
Poste du supérieur hiérarchique :	Head of the Microwave departement
Catégorie et métier du poste dans le cadre de gestion de l'IMT – Code emploi :	II P – E00070
Catégorie dans la fonction publique :	A
Pour tout renseignement :	
Contact poste :	Christian PERSON – Director of the Labsticc christian.person@imt-atlantique.fr
Contact administratif/RH :	Mélessandre MORVAN – Recruitment assistant melissandre.morvan@imt-atlantique.fr
Pour candidater CV et lettre de motivation A l'adresse :	
<i>lien Recrutee à ajouter par la DRH</i>	
Date limite de candidature :	01/03/2024

1- ENVIRONNEMENT DU POSTE

As a leading general engineering school of the IMT-Institut Mines-Télécom, France's leading engineering school group, IMT Atlantique's ambition is to accompany transitions, train responsible engineers and place scientific and technical excellence at the service of teaching, research and innovation.

The Microwave department, located at the Brest site, carries out research into the modeling, design, realization and characterization of high-frequency signal processing devices, antennas and associated devices, and original propagation media for their applications in various communications systems (HF, IoT, Wi-Fi, 3G, 4G, 5G, Radar, etc.). The candidate will join the DH (Microwave Components) research team at Lab-STICC (UMR CNRS 6285).

Among other things, the DH team at Lab-STICC conducts research into impedance-skipping coaxial topologies for microwave filter design. These topologies are mainly used on the TX channels of telecommunication systems, as they are capable of handling RF power. They have many degrees of

freedom, allowing the dimensions of the structures to be freely modulated, along XY and Z axes, to meet requirements as closely as possible. Based on these coaxial topologies, the team has developed a wide range of resonators differing in the number of sections, the number of stages, short-circuit or open-circuit terminations... These developments cover: geometric definition of the topology, frequency synthesis and quality factor, including degrees of freedom. Work has also been carried out on the coupling and interconnection of these resonators. To this end, iris or direct connection solutions have been studied or are currently being validated. All this work has resulted in RF filters with different compromises in terms of size, electrical performance and power handling in vacuum (multipactor). This work on filters has given rise to 4 very recent publications in **IEEE**

[1] "Analytical Modelling of Three-Section Coaxial Stepped Impedance Resonators for the Design of Compact Tx Bandpass Filters ". J. Benedicto, H. Aouidad, E. Rius, J. F. Favennec, A. Martin-Guennou, A. Manchec. **IEEE Transactions on Microwave Theory and Technique**, September **2022**, Volume: 70, Issue: 9, Digital Object Identifier 10.1109/TMTT.2022.3194095

[2] "Modelization Methodology for the Quality Factor of Quarter-Wavelength n-Section Coaxial Stepped Impedance Resonators ". J. Benedicto, J. F. Favennec, A. Buitrago Bernal, E. Rius. **IEEE Journal of Microwaves**, October **2022**, Volume: 2, Issue: 4, Digital Object Identifier 10.1109/JMW.2022.3204801

[3] "Quarter-Wavelength Two-Section Coaxial Stepped Impedance Resonators with Parallel Central Sections for Constraint Reduction in Compact Tx Bandpass Filters", A. Buitrago Bernal, J. Benedicto, J. F. Favennec, E. Rius. **IEEE Transactions on Components, Packaging and Manufacturing Technology**, April **2023**, Volume: 13, Issue: 4, On pages(s) 537-544, Digital Object Identifier: 10.1109/TCPMT.2023.3274368

[4] "Quarter-Wavelength and Open-End Half-Wavelength Four-Section Coaxial Stepped Impedance Resonators for High-Power Space Bandpass Filters ". J. Benedicto,, E. Rius, A. Bonizec, J. F. Favennec, A. Buitrago Bernal, A. Martin-Guennou. **IEEE Transactions on Microwave Theory and Technique**, **2023**, Digital Object Identifier: 10.1109/TMTT.2023.3338531

Within the framework of PEPR5G, the aim is to study the integration of these topologies into different systems, such as antenna feed networks. Once the interface between the guide and the radiating element has been resolved, what added value can be derived in terms of functionality and performance, whether in terms of dimensions, power handling or electrical characteristics? This is a highly prospective subject, which can be applied in a terrestrial or space context.

2- MISSIONS

Under the responsibility of Mr Christian PERSON, Director of the Lab-STICC, and in collaboration with Mr Eric Rius, Professor in the Department of Electronics at UBO :

1. Contribute to the design of resonators and eventually associated filters, feeding networks, antenna arrays on the base of coaxial topologies
2. Contribute to the manufacture of demonstrators
3. Contribute to the experimental characterization of demonstrators

3- ACTIVITÉS :

1.
 - Contributes to demonstrator design
2.
 - Writes progress reports
 - Participates in project follow-up meetings
3.
 - Participates in demonstrator manufacturing
 - Monitor manufacturing (in-house and/or subcontracted)

4- FORMATION ET COMPÉTENCES :

Niveau de formation et/ou expérience minimums requis :

- Doctorate obtained less than 3 years before date of hire. Domain : Physics

Compétences, connaissances et expériences indispensables :

- Mastery of filter and antenna design
- Mastery of 3D EM simulation tools (Ansys HFSS), circuit simulation tools (ADS Keysight), multiphysic simulation tools (Spark-3D, PIC)
- Microwave measurement methods (calibration, S-parameter)

Capacités et aptitudes :

- Ability to work as part of a research team
- Ability to interact with people from different backgrounds (industrial partners, subcontractors, suppliers)

5- INFORMATIONS COMPLÉMENTAIRES (*Facultatif*)

DOCUMENT POUR CANDIDATER

- Resume
- Letter of motivation