Post-doctoral fellow or research engineer in electromagnetic design (M/F)

Application Deadline : 30 October 2024 23:59:00 Paris time

General information

Offer title : Post-doctoral fellow or research engineer in electromagnetic design (M/F) (H/F)
Reference : UMR7252-AURCRU-002
Number of position : 1
Workplace : LIMOGES, France
Date of publication : 19 August 2024
Type of Contract : FTC Scientist
Contract Period : 12 months, possible extension up to 22 month
Expected date of employment : December - January 2024
Proportion of work : Full time
Remuneration : 2991.58- 4166.7€ gross monthly salary
Desired level of education : Niveau 8 - (Doctorat)
Experience required : Indifferent
Section(s) CN : Micro and nanotechnologies, micro and nanosystems, photonics, electronics, electromagnetism, electrical energy

Missions

As part of the OPALE collaborative project "Reconfigurable shutters and radiating panels" between CNRS (Centre National de la Recherche Scientifique) and AID (Agence Française d'Innovation et de Défense), French academic research laboratories (CEA LETI, ICMCB, IETR, Telecom Paris and XLIM) are joining forces to propose innovative architectures for reconfigurable devices (attenuators/shutters, low-profile and highly directive antennas) to go beyond the current state of the art.

Activities

As part of the OPALE project, we are offering a 12 -month position (10-month extension possible) for a post-doctoral researcher to tackle the specific challenges of RF shutter design and evaluation, in a unique collaborative environment.
The topology of the RF shutter, which resembles a large-area periodic surface based on elementary or unitary cells integrating active materials (electrically or optically), will require the development of a technology capable of replacing semiconductor components localized over a very large area, and therefore of using a technology capable of covering large surfaces, such as sputtering, inkjet or screen-printing technology. The overall aim of the project is to define the parameters of this technology (integration of high-performance electroactive, transition or phase-change materials (PTM/PCM)) and implement it to produce a large-scale circuit.

Skills

The main objective is to design and simulate the elementary cell of an RF shutter device based on the above-mentioned technology, bearing in mind the environmental constraints to which the final prototype will be subjected. It must also offer electromagnetic performance as close as possible to the specifications set within the framework of the project.
The research work will cover the following stages:
- Research into the state of the art and critical analysis of the use of active materials for microwave reconfiguration devices, comparing them with "conventional" solutions employing commercial solutions;
- Pre-design of an RF shutter using electromagnetic simulations, study of the integration of electrical/optical control schemes into the overall device;
- Design and simulation of the elementary cell of the RF shutter integrating electro-active materials.
- Manufacture of the device and measurements to assess the performance of the elementary cells, and evaluation by simulation of the overall characteristics of the device.
- Identification of scientific/ technological obstacles, integration feasibility prospects for planned applications and different frequency ranges.

Work Context

The post-doctoral researcher/engineer recruited should preferably hold a valid PhD with a specialization in electromagnetics, antennas, microwaves, high-frequency electronics. Solid knowledge of device design, electromagnetism, circuit theory, and the use of commercial electromagnetic software (Ansys-HFSS, CST Microwave Studio) will be required. Knowledge of functional materials integration and RF characterization of their dielectric properties, as well as of micro fabrication technologies, are appreciated assets. A good level of written and spoken English is required.

The research work will take place at the Institut de Recherche XLIM (UMR 7252 CNRS/ Université de Limoges), 123 Av. Albert Thomas, 87060, Limoges, France.
Candidates should send a full CV and university accreditation by November 1, 2024 to :

Dr. Aurelian Crunteanu, DR-CNRS

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The position is located in a sector under the protection of scientific and technical potential (PPST), and therefore requires, in accordance with the regulations, that your arrival is authorized by the competent authority of the MESR.