Post-doc proposal

Title	Array **Ge**ometry and mutual **C**ouplings study for See**k**ers antenna **O**ptimization: "Gecko"
Keywords	2D AESA, Sparse array antennas, ESPAR, Antenna design, Optimization algorithm
Subject	This post-doctoral proposal concerns the MCM-ITP project called "Gekco". Using 2D AESA technologies for various applications (such as radars, 5G antennas…), presents many advantages such as robustness or multiple beamforming. However, it also presents the challenge of integrating dense RF. To meet this challenge, one of the approaches is to decrease the number of channels to feed, decreasing automatically the number of components to integrate. This solution presents the advantage to address the integration as well as to decrease the cost and weight. The aim of "Gecko" project is to develop, design and compare two array architectures which maximize or minimize intentionally mutual couplings. **ESPAR** concepts exploit mutual couplings to feed "parasitic elements" and to optimize the number of array elements supplied. **Sparse arrays** have shown to enable wide-angle scanning performance and low side-lobe levels while maintaining low array element density. These architectures will be evaluated considering the sidelobe level, Direction Of Arrival (DOA) estimation as well as the reduction of powering complexity. Furthermore, the impact of the mesh geometry and size, of the substrate material and of the array element type on the nature of the coupling will be estimated. All results will be exploited to choose the right array element type and/or substrate material for each proposed concept.
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Laboratory	Lab-STICC (http://www.lab-sticc.fr)
Candidate Profile	PhD holder (experience in electromagnetic simulators (as CST or HFSS), in antenna arrays design and a good knowledge in optimization process, appreciated).
Work contract	Employer: Université de Bretagne Occidentale. (http://www.univ-brest.fr)
Situation	Université de Bretagne Occidentale, in Brest (France).
Duration	1 year
Starting date	January 2020

Monthly salary 2546€ (gross)