

Internship proposal 2009-2010

Laboratory : Applied Electromagnetics	
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Electromagnetic Band- Gap Metamaterials (EBG): microwave applications

Scientific project :

Electromagnetic bandgap (EBG) materials are a novel class of artificially fabricated structures which have the ability to control and manipulate the propagation of electromagnetic (EM) waves. Properly designed EBGs can prohibit the propagation or allow it along only certain directions.

Description (max 10 lines)

In recent years, these structures have found a wide variety of applications in the microwave field, i.e., in the design of resonators, waveguides, and antennas. In particular, EBGs can be employed to realize directive and high-efficiency radiators, by accomplishing surface-wave suppression, when used as substrates of patch antennas, and by acting as spatial filters, when employed as superstrates.

How the best performances could be obtained? Which kind of structure is better to choose? Are two-dimensional structures better of three-dimensional one? It is better to use EBGs as superstrates or as a host material for antennas? These and other exciting question have to be solved in the following future.

The application for such structures are interesting in every field where an high-directive compact antenna could be used. For instance the concept is well-known in space telecommunication systems.

Techniques in use :

Fourier Modal Method and Finite Element CAD

Applicant skills :

She/He must have a good preparation in Electromagnetics, and good abilities in working on numerical methods.

Granted internship : yes

C'nano IdF laboratory (France only) : yes / no

Possibility for a thesis : yes , financial support possible after selection according to national rules.

Amount of the grant: approximately 13640 €/year (previdential contribution shall be deducted).