

Internship proposal 2009-2010

Laboratory : Applied Electromagnetics	
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Electromagnetic Scattering by buried objects

Scientific project :

The electromagnetic scattering by buried objects is a subject of great interest due to its application to remote sensing of the earth's subsurface, to the detection of landmines, pipes, conduits, or to communication through the earth.

In this thesis, the student will work on the development of a new spectral-domain rigorous approach for the solution of the plane-wave electromagnetic scattering problem by a generic configuration of three-dimensional dielectric and metallic objects, above and below a plane interface. In this method, the field diffracted by the obstacles is expanded in terms of spherical functions, and the presence of the plane surface is taken into account by means of its plane-wave transmission and reflection coefficients, exploiting the angular-spectrum representation of spherical waves.

The student will also apply the method to the characterization of composite scenarios, of interest for the detection of landmines.

Techniques in use :

Cylindrical and Spherical Wave Approach; Finite Difference Time Domain

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).