



PhD THESIS

Fast and Accurate Iterative Physical Optics Approach for the Modeling of Electrically Huge Platforms

- **Laboratory**

- Institut d'Électronique et de Télécommunications de Rennes (IETR), UMR CNRS 6164. Rennes, France. www.ietr.fr
- Applied Electromagnetic Laboratory (LEA), University of Siena, Siena, Italy. <http://www.dii.unisi.it/~lea/>

- **Keywords**

Iterative physical optics, High frequency techniques, numerical methods.

- **PhD description**

The Iterative Physical Optics (IPO) is a High Frequency method for the electromagnetic analysis, which is inherently parallelizable, thus providing an unrivaled fast tool for the description of large platforms, prediction of RCS, antenna siting, etc. Since based on Physical Optics approximation, though augmented by its iterative scheme, IPO is an approximate method that is not capable to accurately describe effects like edge/vertex diffraction or creeping waves (Fock's currents). To enhance IPO accuracy, this PhD program aims to combine it with an exact method, i.e., the Electric Field Integral Equation (EFIE), which is cast in a similar iterative algorithm through a Calderon preconditioning.

- **Location and supervision**

The candidate will be equally hosted by IETR (France) and LEA (Italy), during the timeframe of the PhD program. The main supervisors of the candidate will be Dr. Mauro Ettore, CRN CNRS (IETR) and Prof. Matteo Albani (LEA).

- **Candidate profile**

The PhD candidate should hold a master degree in electrical engineering, physics or an equivalent title recognized by the doctoral schools in France and Italy. In particular, he should master electromagnetic theory, physics, mathematics, and circuit analysis. A good level of spoken and written English is required.

- **How to apply?**

Interested candidate should send a detailed CV, motivation letter and the name and contact details of 3 references by email to Mauro Ettore (mauro.ettore@univ-rennes1.fr) and Matteo Albani (matteo.albani@dii.unisi.it)