Post-doc in applied mathematics

Modeling superconducting magnets

Location : INSA de Rouen
Key words : superconductivity, electromagnetism, modeling and optimization
Salary : about 2000 Euros per month
Duration : 9 months starting in December 2022

Context

The post-doc will take place at the Laboratoire de Mathématiques de l'INSA de Rouen (LMI – EA3226 FR CNRS 3335) within the SUPRAMAG project financed by the Région Normandie and the European Union. SUPRAMAG gathers mathematicians interested in models of superconductivity and experimentalists in Caen making and characterizing the devices.
Superconductors expell magnetic field (Meissner effect); when cooled in the presence of a magnetic field they become magnets. Therefore, they can screen a magnetic field or be used as magnets for levitation (Maglev) and motors with a large power/weight ratio. The research will consist in modeling the properties of these magnets and ,if possible, relating their screening properties to the experiments.

Profile of the candidate :

We expect a doctorate in applied mathematics, electrical engineering or physics with good modeling and computing abilities (Comsol or Freefem).

Application:

Send your application with a vitae to Jean-Guy Caputo : caputo@insa-rouen.fr
and Ionut Danaila : ionut.danaila@univ-rouen.fr

References :

J.-G. Caputo, L. Gozzelino, F.Laviano, G.Ghigo, R.Gerbaldo, J.Noudem, Y.Thimont, P.Bernstein , Screening magnetic fields by a superconducting disk: a simple model, J. Appl. Phys. 114, 233913 (2013) http://arxiv.org/abs/1308.2204

J.-G.Caputo, I. Danaila and C. Tain, An Abelian Higgs model of pulsed field magnetisation in superconductors, J. Physics : Conference Series, 2043, 012006, (2021). http://arxiv.org/abs/2109.12898