ABSTRACT OF THE TALK

This talk is about the three-dimensional Ginzburg-Landau model of superconductivity for strong applied magnetic fields varying between the second and third critical fields. In this regime, it is known from physics that superconductivity should be essentially restricted to a thin layer along the boundary of the sample. This leads to the introduction of a Ginzburg-Landau model on a half-space. We will see that the non-linear Ginzburg Landau energy on the half-space with constant magnetic field is a decreasing function of the angle \( \nu \) that the magnetic field makes with the boundary. In the case when the magnetic field is tangent to the boundary (\( \nu = 0 \)), we show that the energy is determined to leading order by the minimization of a simplified 1D functional in the direction perpendicular to the boundary. We will also study the geometric behavior of the order parameter near the surface of the sample by constructing formal solutions with lattice properties. This is a joint work with S. Fournais and X. Pan.

BIOGRAPHY

Dr. Jean-Philippe Miqueu is a Post-doc at the Institute of Mathematics of Aarhus University (Denmark), since November 2016. He obtained his Ph.D. in Mathematics in September 2016, from the University of Rennes (France). His research concerns the spectral analysis of the magnetic Laplacian, the Ginzburg-Landau functional, and numerical simulations based on the eXtended Library of Finite Element in C++ (XLiFE++).