

SEMINAR

CAPDE

EXPOSITOR

Carlos Román

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TITLE

On the 3D Ginzburg-Landau model of superconductivity.

Abstract: The Ginzburg-Landau model is a phenomenological description of superconductivity. A crucial feature is the occurrence of vortices (similar to those in fluid mechanics, but quantized), which appear above a certain value of the applied magnetic field called the first critical field. We are interested in the regime of small ε , where $\varepsilon > 0$ is the inverse of the Ginzburg-Landau parameter. In this regime, the vortices are at main order codimension 2 topological singularities. In this talk I will present a quantitative 3D vortex approximation construction for the Ginzburg-Landau functional, which provides an approximation of vortex lines coupled to a lower bound for the energy, optimal to leading order, analogous to the 2D ones, and valid for the first time at the ε -level. I will then apply these results to describe the behavior of global minimizers for the 3D Ginzburg-Landau functional below and near the first critical field. I will also provide a quantitative product-type estimate for the study of Ginzburg-Landau dynamics.

April 2, 2018, 5.00. pm

Sala de Seminarios Felipe Álvarez Daziano 5to piso del DIM