
Stationary harmonic functions whose Laplacian is a Radon measure

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Abstract

In this talk I will study regularity properties of limiting vorticity measures associated to the Ginzburg-Landau equations without magnetic field. E.Sandier and S.Serfaty proved that, in some cases, such a limiting vorticity measure can be written as the Laplacian of a stationary harmonic function h in H^1 . Assuming that h is a H^1 stationary harmonic function such that Δh is a measure, we can prove that, locally, near almost every point of the domain, h can be written as $h = |H|$ for some smooth harmonic function H . In particular we deduce that the measure Δh is concentrated on lines, which are sets of zeros of harmonic functions. This problem is also related to vorticity measure of the time independent Euler system in fluid mechanics and to limiting vorticity measures of system of point vortices.

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