The Onset Problem for a thin Superconducting Loop in a Large Magnetic Field

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Abstract

We present a rigorous analysis of the eigenvalue problem associated with the onset of superconductivity for a thin domain in the presence of a large applied magnetic field. We prove the validity of the formal result of Richardson and Rubinsteins paper revealing that in this double limit of thin domain and large field, the appropriate Rayleigh quotient differs from the standard one for order 1 applied fields through the addition of a potential depending on the field.