

Effects of nonlocal superconductivity in $\text{YNi}_2\text{B}_2\text{C}$

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Abstract

Previous neutron scattering studies of the flux line lattice in borocarbide compounds have revealed quite complex behavior, which has been attributed to the effects of non-local superconductivity. Complementing this work, we have studied the (surprisingly reversible) magnetization of a single crystal of $\text{YNi}_2\text{B}_2\text{C}$. Unlike many HTSC's, this material is not dominated by a uniaxial anisotropy. The experiments with $H \parallel c$ -axis are described well by non-local London theory [Kogan *et al.*, Phys. Rev. B **54**, 12386 (1996)], and the resulting material parameters (London penetration depth $\lambda_{ab}(T)$, nonlocal field scale $H_0(T)$) are well behaved. This reinforces the idea that nonlocality plays an important role in "clean" borocarbides. The present results will be compared both with similar investigations in Bi-2212 crystals and Tl-2212 materials, and with determinations of $\lambda_{ab}(T)$ from a neutron scattering study.