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Nodal Behavior of the Superconducting State in Sr_2RuO_4[1] S.J. KUHN, M.R. ESKILDSEN, C. RASTOVSKI, University of Notre Dame, C.D. DEWHURST, Institut Laue-Langevin, J. GAVILANO, Paul Scherrer Institute, Y. MAENO, Kyoto University — Multiple experimental and theoretical studies provide compelling support for triplet pairing of electrons and an odd, p-wave order parameter symmetry in superconducting Sr_2RuO_4. However, seemingly contradictory experimental results have left important questions concerning the detailed structure and coupling of the orbital and spin parts of the order parameter in this compound unresolved. The nodal behavior constrains the possibilities for the order parameter. We have used small-angle neutron scattering (SANS) to study the scattering intensity of the vortex lattice (VL) in Sr_2RuO_4, with H along the [110] crystalline direction. Because the VL anisotropy in Sr_2RuO_4 is large [C. Rastovski *et al.*, Phys. Rev. Lett. **111**, 087003 (2013)], this measurement effectively determines the current along the field direction, and hence the penetration depth along $[1\bar{1}0]$. The intensity vs. temperature curve is linear for T/T_c of 0.25-0.75, but flattens out as T approaches 0. This is consistent with a gap mode in the [110] direction, coupled with non-local effects.

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Stephen Kuhn
University of Notre Dame

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