

Abstract Submitted
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Small Angle Neutron Scattering Studies of the Vortex Lattice of UPt_3 ¹ W.J. GANNON, W.P. HALPERIN, Northwestern University, IL, USA, M.R. ESKILDSEN, University of Notre Dame, IN, USA, J. GAVILANO, Paul Scherrer Institute, Switzerland — Although a paradigm for unconventional superconductivity, the true nature of the superconducting order parameter in UPt_3 is still an open question. We present results from small angle neutron scattering (SANS) studies on the vortex lattice (VL) of UPt_3 , for fields both perpendicular and parallel to the crystal \mathbf{c} -axis, that have implications for the superconducting order parameter. For perpendicular fields, an unconventional temperature dependence of the VL form factor – and thus penetration depth – is seen, with different dependences in the A and B-phases. This bulk measurement of the penetration depth indicates the presence of nodes in the superconducting gap. For parallel fields, we report the first measurement of a rocking curve from the VL. This is an encouraging result for the viability of using SANS to detect signatures of time reversal symmetry breaking, as the \mathbf{c} -axis is taken as the chiral axis in these order parameter theories.

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