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Field and Temperature dependence of the Vortex Lattice Rotation in the Chiral phase of UPt_3 with $\mathbf{H} \parallel \mathbf{c}$ ¹ KEENAN AVERS, Northwestern Univ, MORTEN ESKILDSEN, Univ. of Norte Dame, WILLIAM HALPERIN, Northwestern Univ, WILLIAM GANNON, Texas A and M, JORGE GAVILANO, GERGELY NAGY, URS GASSER, Paul Scherrer Institute, CHARLES DEWHURST, Institut Laue Langevin — The unconventional, multi-phase, superconductor UPt_3 is suspected to have one chiral superconducting phase. We have performed small angle neutron scattering (SANS) from the vortex lattice (VL) in UPt_3 at the Paul Scherrer Institute, ILL, and Oak Ridge National Lab with the magnetic field parallel to the hexagonal c -axis. At low temperatures the diffraction pattern of the VL rotates away from a high symmetry direction producing two domains of different orientation. This rotation can be reduced or eliminated by increasing the temperature at constant field within the chiral state. We have found that there are two different rotated vortex states, one that is stable and one metastable, the former being realized by entering the chiral state by decreasing the magnitude of the applied field, and the latter generated starting from zero field. This rotation may be evidence of a non-singular, field history dependent, vortex core structure in UPt_3 .

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Keenan Avers
Northwestern Univ

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