

Abstract Submitted
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Indications of a Field Dependent Vortex Core Size in CeCoIn₅

L. DEBEER-SCHMITT, M. R. ESKILDSEN, Department of Physics, University of Notre Dame, Notre Dame, IN 46556 USA, C. D. DEWHURST, Institut Laue-Langevin, 6 Rue Jules Horowitz, F-38042 Grenoble, France, B. W. HOOGENBOOM, University of Basel, Klingelbergstasse 70, CH-4056 Basel, Switzerland, C. PETROVIC, Department of Physics, Brookhaven National Laboratory, Upton, NY 11973 USA — Using Small-Angle Neutron Scattering, we have imaged the flux-line lattice (FLL) in the *d*-wave, heavy fermion superconductor CeCoIn₅. At low fields, a hexagonal FLL is observed which undergoes a first order transition to a rhombic (distorted square) symmetry as the field is increased above 0.55 T. As the field is increased further, the FLL approaches a square symmetry. Measurements of the FLL reflectivity yields a constant form factor independent of the applied magnetic field, in stark contrast to the exponential decrease usually observed. The field-independent form factor may indicate a field dependent vortex core size, $\xi \propto H^{-1/2}$, in qualitative agreement with recent theoretical predictions for ultra-clean, high- κ superconductors [V.G. Kogan and N.V. Zhelezina, PRB **71**, 134505 (2005)].

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