

Abstract Submitted
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In-plane torque measurements on CeCoIn₅ single crystals¹ H. XIAO, T. HU, C.C. ALMASAN, Kent State University, Kent, Ohio, 44240, USA, T.A. SAYLES, M.B. MAPLE, University of California at San Diego, La Jolla, California, 92903, USA — In-plane torque measurements were performed on single crystals of CeCoIn₅ in the mixed state in order to determine the symmetry of the superconducting gap. The reversible part of the mixed state torque shows a four fold symmetry. The sign of the four fold symmetry is positive. The amplitude of the in-plane torque first increases with increasing magnetic field H , and then decreases with further increasing field until it vanishes towards H_{c2} . Sharp irreversible peaks are present in the irreversible torque at 45, 135, 225, and 315⁰. These experimental results imply d_{xy} symmetry of the superconducting order parameter. We also performed in-plane torque measurements in the normal state. Another four fold symmetry is found which has a different origin than the one in the mixed state. The amplitude of the normal state torque has an H^4 dependence and it shows no saturation up to 14 T. This later four fold symmetry could be related with the symmetry of the Fermi surface.

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