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Angular Dependent Torque Measurements on $CeCoIn_5$ Single Crystals[1] H. XIAO, T. HU, C. C. ALMASAN, Kent State University, T. A. SAYLES, M. B. MAPLE, University of California, San Diego — Angular dependent torque measurements were performed on single crystals of $CeCoIn_5$ heavy fermion superconductor ($T_{c0} = 2.3$ K) in the temperature T range 1.9 K $\leq T \leq$ 20 K and magnetic fields H up to 14 T. Large paramagnetic effect is found in the normal state due to magnetic moment of the magnetic ion Ce^{3+}. Torque measurements in the mixed state were also performed. The torque curves show sharp hysteresis peaks at $\theta = 90^o$ (θ is the angle between H and the $c-$axis of the crystal), a result of intrinsic pinning of vortices. The anisotropy $\gamma \equiv \sqrt{m_c/m_a}$ in the mixed state was determined from the reversible part of the vortex contribution to the torque signal using Kogan's model [Phys. Rev. B **38**, 7049 (1988)]. The anisotropy γ decreases with increasing magnetic field and temperature. The fact that γ is not a constant points towards a multiband scenario in this heavy fermion material.

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