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In-plane Torque Measurement on CeCoIn₅ Single Crystals¹ T. HU, H. XIAO, C. C. ALMASAN, Kent State University, T. A. SAYLES, M. B. MAPLE, University of California, San Diego — We report in-plane torque measurements on single crystals of the heavy fermion superconductor CeCoIn₅ performed in the normal state at 1.9, 3, 6, and 10 K, as a function of angle and applied magnetic field. The measurements at constant angle were done in sweeping the magnetic field up to 14 T. The measured torque has a reversible and an irreversible component, with the former larger than the latter. The reversible component can be expressed as $\tau_{rev}(\theta) = \tau_2 \sin 2\theta + \tau_4 \sin 4\theta$ (θ is the angle between the applied field and the a-axis of the crystal), which is typical of systems with long range magnetic order. However, it has been reported that the heavy fermion superconductor CeCoIn₅ has no long range magnetic order, but only short range antiferromagnetic fluctuations. The temperature and magnetic field dependence of the coefficients τ_2 and τ_4 will be discussed. The torque vs field curves at fixed angles show De-Hass Van-Alphen effect at temperatures as high as 10 K. The possible reasons behind this will also be discussed.

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T. Hu

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