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Low temperature metamagnetic transitions in single crystal $ErNi_2B_2C$: torque magnetometry study[1] DONALD NAUGLE, K.D.D. RATHNAYAKA, Texas A&M University, BORIS BELEVTSEV, B. Verkin Institute for Low Temperature Physics and Engineering, SUNG-IK LEE, Pohang University of Science and Technology — The phase diagram of metamagnetic transitions in single-crystal rare-earth nickel borocarbide $ErNi_2B_2C$ has been determined at 1.9 K with a Quantum Design torque magnetometer. The critical fields of the transitions depend crucially on the angle between applied field and the easy axis [100] in the *ab*-plane. Torque measurements have been made while sweeping the magnitude of the magnetic field at a constant angular direction (parallel to basal tetragonal *ab*-planes) over an angular range greater than two quadrants. Sequences of metamagnetic transitions with increasing field differ for the fields along (or close enough to) the easy [100] axis from those near the hard [110] axis. These torque measurements reveal new metamagnetic states in $ErNi_2B_2C$ which were not apparent in previous longitudinal-magnetization and neutron studies. Their nature is considered and clarified. In the low-field range influences of superconductivity are observed and interpreted.

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