

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Low temperature metamagnetic transitions in single crystal  $\text{ErNi}_2\text{B}_2\text{C}$ : torque magnetometry study**<sup>1</sup> DONALD NAUGLE, K.D.D. RATHNAYAKA, Texas A&M University, BORIS BELEVTSSEV, 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  $\text{ErNi}_2\text{B}_2\text{C}$  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  $\text{ErNi}_2\text{B}_2\text{C}$  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.

<sup>1</sup>Work supported by the Robert A Welch Foundation (A-0514) and the National Science Foundation (DMR-0315476).

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Date submitted: 28 Nov 2007

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