

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

High Field (H, T) Phase Diagram and Anisotropy of CeRhIn_5 single crystals YOSHIMITSU KOHAMA, MPA-CMMS, Los Alamos National Laboratory, Los Alamos, NM 87545, USA, HUIQIU YUAN, LIN JIAO, Department of Physics, Zhejiang University, Hangzhou 310027, China, MARCELO JAIME, FEDOR BALAKIREV, ERIC BAUER, MPA-CMMS, Los Alamos National Laboratory, Los Alamos, NM 87545, USA — The specific heat (C_p) of a single crystal sample of composition CeRhIn_5 was measured as a function of temperature and magnetic field applied perpendicular and parallel to the crystallographic c -axis. Our experiments, carried out at temperatures below the AFM ordering temperature $T_N = 3.7$ K, show a clear anomaly in $C_p(H)$ when the applied field is strong enough to suppress the magnetic order. This anomaly, which reduces the magnitude as the temperature is lowered, was used to map the (H, T) phase diagram for the first time to a magnetic field of 55 T and temperatures as low as 700mK.¹ Extrapolation of the low temperature phase boundary indicates the presence of a magnetic field-induced quantum critical point at $H_c \approx 50$ T that is weakly dependent of the sample orientation, although intermediate magnetic fields reveal clear anisotropy. Our results will be discussed in the context of field-induced quantum phase transitions in strongly anisotropic correlated matter.

¹Y. Kohama, C. Marcenat, T. Klein, and M. Jaime, *Rev. Sci. Instrum.*, **81**, 104902 (2010).

Yoshimitsu Kohama
MPA-CMMS, Los Alamos National Laboratory,
Los Alamos, NM 87545, USA

Date submitted: 30 Dec 2010

Electronic form version 1.4