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**Single field-induced phase in  $U(\text{Ru}_{1-x}\text{Rh}_x)_2\text{Si}_2$  at a Quantum Critical Point** ALEJANDRO SILHANEK, MST-NHMFL, Los Alamos National Laboratory, Los Alamos, NM 87544, USA, VICTOR FANELLI, Dep. of Phys. and Astron., University of California, Irvine, CA 92697-4575, MARCELO JAIME, NEIL HARRISON, MST-NHMFL, Los Alamos National Laboratory, Los Alamos, NM 87544, USA, H. AMITSUKA, Hokkaido Univ., N10W8 Sapporo 060-0810, Japan, JOHN MYDOSH, Max-Planck Inst. Chem. Phys. of Sol., Dresden, Germany — A detailed analysis of the specific heat and magneto-caloric effect is carried out in the heavy fermion system  $U(\text{Ru}_{1-x}\text{Rh}_x)_2\text{Si}_2$  with  $x=4\%$ . This compound exhibits a much simpler  $H - T$  phase diagram than the stoichiometric parent  $\text{URu}_2\text{Si}_2$ , with a single field-induced magnetic phase, known as phase II, surrounding a quantum critical point. We show that the boundary of this phase II corresponds to a first order transition as revealed by a large specific heat anomaly and an asymmetric magnetocaloric effect between entering and exiting the phase. An anomalous history and time dependent specific heat support this interpretation. We argue that the observed irreversibilities might be associated with a structural transformation in the crystal lattice.

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