Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Quantum critical scaling in the disordered itinerant ferromagnet $UCo_{1-x}Fe_xGe$[1] MARC JANOSCHEK, Los Alamos National Laboratory, KEVIN HUANG, University of California, San Diego, SERENA ELEY, PRISCILLA F. S. ROSA, LEONARDO CIVALE, ERIC D. BAUER, Los Alamos National Laboratory, RYAN E. BAUMBACH, National High Magnetic Field Laboratory, Florida State University, M. BRIAN MAPLE, University of California, San Diego — Belitz-Kirkpatrick-Vojta (BKV) theory shows in excellent agreement with experiment that ferromagnetic quantum phase transitions (QPTs) in clean metals are generally first-order due to the coupling of the magnetization to electronic soft modes, in contrast to the classical analogue that is an archetypical second-order phase transition. For disordered metals BKV theory predicts that the second order nature of the QPT is restored because the electronic soft modes change their nature from ballistic to diffusive. Our low-temperature magnetization study identifies the ferromagnetic QPT in the disordered metal $UCo_{1-x}Fe_xGe$ as the first clear example that exhibits the associated critical exponents predicted by BKV theory.

[1]Work at LANL was done under the auspices of the U.S. DOE, OBES, Division of Materials Sciences and Engineering. Research at UCSD was supported by the U.S. DOE, BES under Grant No. DE-FG02-04ER46105. K. H. acknowledges support via a Seaborg Fellowship.

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Date submitted: 02 Nov 2016 Electronic form version 1.4