Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Quantum critical scaling near the antiferromagnetic quantum critical point in CeCu6-xPdx[1] LIUSUO WU, QCMD, ORNL, TN, L. POUDEL, QCMD, ORNL, TN - UTK, TN, A. F. MAY, MSTD, ORNL, TN, W. L. NELSON, A. GALLAGHER, Y. LAI, NHMFL-FSU, D. E. GRAF, T. BESARA, T. M. SIEGRIST, R. BAUMBACH, NHMFL, G. EHLERS, A. A. PODLESNYAK, M. D. LUMSDEN, QCMD, ORNL, TN, D. MANDRUS, MSTD, ORNL, TN - UTK, TN, A. D. CHRISTIANSON, QCMD, ORNL, TN — A remarkable behavior of many quantum critical systems is the scaling of physical properties such as the dynamic susceptibility near a quantum critical point (QCP), where Fermi liquid physics usually break down. The quantum critical behavior in the vicinity of a QCP in metallic systems remains an important open question. In particular, a self-consistent universal scaling of both magnetic susceptibility and the specific heat remains missing for most cases. Recently, we have studied $CeCu_{6-x}T_x$ (T=Au, Ag, Pd), which is a prototypical heavy fermion material that hosts an antiferromagnetic (AF) QCP. We have investigated the low temperature thermal properties including the specific heat and magnetic susceptibility. We also investigated the spin fluctuation spectrum at both critical doping and within the magnetically ordered phase. A key finding is the spin excitations exhibit a strong Ising character, resulting in the strong suppression of transverse fluctuations. A detailed scaling analysis of the quantum critical behaviors relating the thermodynamic properties to the dynamic susceptibility will be presented.

[1]DOE, ORNL LDRD

Liusuo Wu
QCMD, ORNL, TN

Date submitted: 10 Nov 2016 Electronic form version 1.4