Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Fragile antiferromagnetic order in the heavy-fermion YbBiPt B.G. UELAND, A. KREYSSIG, Ames Laboratory, Dept. of Physics and Astronomy, Iowa State University, K. PROKEŠ, Helmholtz-Zentrum Berlin für Materialien und Energie, J.W. LYNN, L.W. HARRIGER, D.K. PRATT, D.K. SINGH, NIST Center for Neutron Research, National Institute of Standards and Technology, T.W. HEITMANN, The Missouri Research Reactor, University of Missouri, S. SAUERBREI, S.M. SAUNDERS, E.D. MUN, S.L. BUD'KO, R.J. MCQUEENEY, P.C. CANFIELD, A.I. GOLDMAN, Ames Laboratory, Dept. of Physics and Astronomy, Iowa State University — YbBiPt is a heavy-fermion compound ($\gamma \approx 8$ J/molK^2) possessing antiferromagnetic order below a Néel temperature of $T_{\rm N}$= 0.4 K, and a proposed quantum critical point at a magnetic field of $H_{\rm c} \approx 0.4$ T. We report results from neutron scattering experiments on single crystals which characterize the antiferromagnetic order. The magnetic scattering is described in terms of two components: a narrow component that appears below $T_{\rm N}$ which corresponds to the onset of antiferromagnetic order observed in bulk thermodynamic and transport measurements, and a broad component corresponding to antiferromagnetic correlations extending over ≈ 20 Å that persists up to $T^* \approx 0.7$ K. These results illustrate the unconventional nature of the magnetism in YbBiPt and may be a consequence of its competing low-energy magnetic interactions and proximity to a quantum critical point.

Work at the Ames Laboratory was supported by the Department of Energy, Basic Energy Sciences under Contract No. DE-AC02-07CH11358.

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Date submitted: 15 Nov 2013 Electronic form version 1.4