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Effects of a magnetic field on the fragile antiferromagnetism of the heavy-fermion YbBiPt B. G. UELAND, A. KREYSSIG, Ames Laboratory, Iowa State University, J. W. LYNN, L. W. HARRIGER, NIST Center for Neutron Research, K. PROKEŠ, Helmholtz-Zentrum Berlin für Materialien und Energie, E. D. MUN, Ames Laboratory, Iowa State University, Simon Fraser University, S. SAUERBREI, S. M. SAUNDERS , S. L. BUD'KO, R. J. MCQUEENEY, P. C. CANFIELD, A. I. GOLDMAN, Ames Laboratory, Iowa State University — YbBiPt is a cubic super-heavy-fermion compound possessing antiferromagnetic (AFM) order below $T_N = 0.4$ K, and a quantum critical point at a magnetic field of $H_c \approx 0.4$ T. The order is characterized by a propagation vector of $\tau_m = (\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$, with the ordered moment aligned along τ_m. Here, we present results from neutron scattering experiments performed while applying a magnetic field along various crystal directions. We find that the intensity of the magnetic scattering at $(\frac{1}{2}, \frac{1}{2}, \frac{3}{2})$ increases when a field is applied along the $(1, -1, 0)$ direction, and reaches a maximum at ≈ 0.6 T. With the field along $(0, 0, 1)$, the scattering intensity smoothly decreases with increasing field. For the field along $(1, 1, 0)$, the intensity is constant up to ≈ 0.6 T and then decreases. We explain our results by considering the orientations of the magnetic domains with respect to the applied field. Work at the Ames Laboratory was supported by the Department of Energy, Basic Energy Sciences under Contract No. DE-AC02-07CH11358. This research is funded in part by the Gordon and Betty Moore Foundations EPiQS Initiative through Grant GBMF4411.

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