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Field-induced magnetic phase transition in antiferromagnetic YbPtSi[1] YURI JANSSEN, Brookhaven National Laboratory, YUEN YIU, Stony Brook University, PETER KHALIFAH, MEIGAN ARONSON, Brookhaven National Laboratory, Stony Brook University — We have studied single crystals of the orthorhombic intermetallic compound YbPtSi. Here we present results of anisotropic field-and-temperature dependent magnetization and specific heat. Magnetization isotherms measured between 1.8 K and the ordering temperature of 4.65 K show a sudden anomalous increase in magnetization. This phase transition becomes sharper and takes place at progressively higher fields as temperature decreases. Measurements of field-and-temperature dependent specific heat above 0.4 K confirm this magnetic phase transition above 1.8 K, and allow us to draw anisotropic magnetic phase diagrams down to 0.4 K. These phase diagrams indicate that the magnetic phase transition in YbPtSi can be brought close to zero temperature in relatively modest applied fields, $\sim$ 3.5 T for the hard magnetization direction. The critical line is well described by $T_N(H)/T_N(0) = (1 - (H_C(T)/H_C(0))^2)^{0.3}$, very different from quasi-one-dimensional or two-dimensional quantum critical antiferromagnets.

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