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Systematic investigation of structural, transport, magnetic and thermodynamic properties of new hexagonal compound GdPtPb SOHAM MANNI, S. L. BUD'KO, P. C. CANFIELD, Ames Laboratory/ Iowa State University, Ames, IA 50011, USA — We have synthesized in single crystalline form a new hexagonal local moment magnet GdPtPb, in the spirit of searching for geometrically frustrated rare earth magnets. Analysis of high temperature magnetic susceptibility data reveals that the system is far from frustrated with a frustration parameter of (Θ/ T_N) 0.2-0.3, much less than one which can be explained from mean field theory (MFT) using a two sub-lattice model. Gd S=7/2 local moments order antiferomagnetically below 16 K, possibly having a very unusual magnetic structure for a hexagonal system. This magnetic ordering can be tuned by magnetic field along the plane of the spins including a metamagnetic transition around 20 kOe. We have studied the phase diagram under magnetic field. Basically GdPtPb can serve a good example of "anti-frustration" for MFT as a planar non collinear magnet with hexagonal crystal structure.

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Soham Manni
Iowa State Univ

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