Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Magnetic and chemical superstructures in Gd2PdSi3 studied using synchrotron radiation A. KREYSSIG, J.-W. KIM, L. TAN, D. WERMEILLE, A. I. GOLDMAN, Ames Laboratory USDOE and Department of Physics and Astronomy, Iowa State University, Ames IA 50011, M. FRONTZEK, M. LOEWENHAUPT, Institut fuer Festkoerperphysik, Technische Universitaet, Dresden, D-01062, Germany — R_2PdSi_3 compounds have stimulate a recent interest due to the coexistence of long-range antiferromagnetic order and spin-glass like behavior. We present xray resonant magnetic scattering studies on a Gd_2PdSi_3 single crystal at temperatures between 8 K and 30 K performed on the MUCAT beamline, APS, Argonne. Charge satellite reflections were observed with the propagation vectors (1/2 0 1/8) and (1/2 0 1/3). The corresponding chemical superstructure can be described by an ordered distribution of the Pd and Si ions on the B site in the hexagonal AlB_2 derived structure. Below $T_N = 23$ K antiferromagnetic satellite reflections appear. The propagation vector is incommensurate with temperature dependent values between (0.14 0 0) and (0.13 0 0). This emphasizes the dominance of the RKKY interaction in Gd_2PdSi_3 in comparison to the strong influence of crystal electric field effects in the other R_2PdSi_3 compounds.

Alan I. Goldman
Ames Laboratory USDOE

Date submitted: 30 Nov 2004 Electronic form version 1.4