Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

The response of a triangular antiferromagnet to anisotropic lattice distortion DAN SUN, PALLAVI KUSHWAHA, JHUMA SANNIGRAHI, JACK BARTLETT, ANDREW MACKENZIE, CLIFFORD HICKS, Max-Planck Institute for Chemical Physics of Solids — The ground state of Heisenberg spins interacting antiferromagnetically on a triangular lattice is 120° antiferromagnetic order. We probe the effects of anisotropic lattice distortion on this phase using the material $PdCrO_2$, which has highly-conducting Pd sheets that alternate with Mott-insulating CrO_2 layers. The Cr spins order into a 120° phase at $T_N = 39$ K. The conductivity of the Pd sheets can be measured to probe magnetic scattering across the transition. In the unstrained lattice, the resistivity has a sharp first-order-like step at T_N. This step persists up to uniaxial compression by $\sim 0.3\%$, then splits into two much broader transitions. This feature suggests a rigidity of the 120° phase at $T \sim T_N$ against small perturbations, which we discuss in terms of magnetoelastic coupling and fluctuation effects.

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Date submitted: 11 Nov 2016 Electronic form version 1.4