Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Partially disordered state and spin-lattice coupling in an S=3/2 triangular lattice antiferromagnet Ag_2CrO_2 M. MATSUDA, Quantum Condensed Matter Division, Oak Ridge National Laboratory, H. YOSHIDA, M. ISOBE, National Institute for Materials Science (NIMS), Tsukuba, Japan, C. DE LA CRUZ, Quantum Condensed Matter Division, Oak Ridge National Laboratory, R.S. FISHMAN, Materials Science and Technology Division, Oak Ridge National Laboratory — Ag_2CrO_2 consists of triangular lattice planes of CrO_2, which are well separated by the metallic Ag_2 layers. [1] This compound is an S=3/2 frustrated triangular lattice antiferromagnet without orbital degree of freedom. We performed neutron diffraction experiments on a powder sample of Ag_2CrO_2 on a neutron powder diffractometer HB-2A and a triple-axis neutron spectrometer HB-1, installed at HFIR in Oak Ridge National Laboratory. With decreasing temperature, a short-range 4-sublatice spin state develops. However, a long-range partially disordered state with 5 sublattices abruptly appears at T_N=24 K, accompanied by a structural distortion, and persists at least down to 2 K. The spin-lattice coupling stabilizes the anomalous state, which is expected to appear only in limited ranges of further-neighbor interactions and temperature. It was found that the spin-lattice coupling is a common feature in triangular lattice antiferromagnets with multiple-sublattice spin states, since the triangular lattice is elastic.

[1] H. Yoshida *et al.*, to appear in J. Phys. Soc. Jpn.

M. Matsuda
Quantum Condensed Matter Division, Oak Ridge National Laboratory

Date submitted: 02 Nov 2011 Electronic form version 1.4