Abstract Submitted
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Magnetic Order in the Mixed-Spin Triangular Lattice Antiferromagnet Na_xMnO_2 ROBIN CHISNELL, DAN PARSHALL, NIST Center for Neutron Research, XIN LI, Harvard, AMBER LARSON, University of Maryland, TAKEHITO SUZUKI, JOSEPH CHECKELSKY, MIT, EFRAIN RODRIGUEZ, University of Maryland, JEFFREY LYNN, NIST Center for Neutron Research — Na_xTMO_2 (TM = transition metal) materials consist of alternating layers of Na and TM ions with the TM ions arranged on a geometrically frustrated triangular lattice. Na can be easily and reversibly removed from these materials, making them of interest for application in rechargeable batteries and allowing for exploration of their rich phase diagrams as a function of Na concentration. Na ordering is an important factor in ground state selection, and is driven by electrostatic interactions in many Na_xTMO_2 systems. The TM = Mn series differs in that Na ordering is driven by a cooperative Jahn-Teller effect, due to the coexistence of Jahn-Teller active Mn^{3+} and inactive Mn^{4+} ions. This effect also results in an ordered arrangement of the Mn^{3+} and Mn^{4+} ions, and thus of spin-2 and spin-3/2 moments. For x = 5/8, we have recently shown the coexistence of charge and magnetic stripe orderings [1]. Here, we present the results of neutron diffraction measurements performed on single crystal samples of Na_xMnO_2 and discuss the details of the magnetic structure in the magnetically ordered phase.

[1] X. Li *et al.* Nature Mater. **13**, 586 (2014).

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