

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Neutron scattering investigation of magnetic phases in  $\text{Mn}_3\text{O}_4$  with field applied away from the easy axis**<sup>1</sup> ALEXANDER THALER, ALEXANDER ZAKJEVSKI, BRIAN NGUYEN, YEWON GIM, University of Illinois - Urbana, ANNE FARWICK, Xavier University, ADAM ACZEL, Oak Ridge National Laboratory, S. LANCE COOPER, GREGORY MACDOUGALL, University of Illinois - Urbana —  $\text{Mn}_3\text{O}_4$  is an orbitally ordered, magnetically frustrated spinel with strong spin-lattice coupling, which exhibits a series of low temperature magnetic and structural transitions. Recent data shows that the structural phases are radically different with  $\mathbf{H}$  applied perpendicular to the easy-axis. With the current understanding of the magneto-structural coupling in this material, this data suggests the possibility of a field-tuned quantum phase transition into a tetragonal spin-disordered phase with  $T=0$  spin frustration. In order to probe the field-direction dependence of the magnetic phase, we have performed elastic neutron scattering measurements of the magnetic properties of  $\text{Mn}_3\text{O}_4$  with applied field at several different angles to the easy axis. We will present data suggesting that the field-temperature phase diagram of this material is radically altered by varying the applied field direction.

<sup>1</sup>This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under award number DE-FG02-07ER46453.

Alexander Thaler  
University of Illinois - Urbana

Date submitted: 11 Nov 2014

Electronic form version 1.4