

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Domain wall ordering and motion in Mn_3O_4 ¹ ALEXANDER THALER, Physics Illinois Oak Ridge National Lab, ALEXANDER ZAKJEVSKII, BRIAN NGUYEN, DALMAU REIG-I-PLESSIS, YEWON GIM, Physics Illinois, ADAM ACZEL, LISA DEBEER-SCHMITT, Oak Ridge National Lab, S. LANCE COOPER, GREGORY MACDOUGALL, Physics Illinois — Mn_3O_4 is an orbitally ordered, magnetically frustrated spinel with strong spin-lattice coupling, which exhibits a series of low temperature magnetic and structural transitions. Transverse field μSR has shown that ordered and disordered volumes coexist within this material, while MFM measurements have further shown that the magnetic domain walls themselves order in specific crystallographic directions, with a typical length scale of 100's of nm. In order to directly study these phenomena, we have performed small angle neutron scattering (SANS) and ultra-small angle neutron scattering (USANS) measurements at both zero and applied magnetic field. We will present the results of these measurements and discuss what they show as far as the formation of domains, as well as the motion of the domain walls. We will also discuss the effects of internal disorder on the behavior of the material.

¹This work was sponsored by the National Science Foundation, under grant number DMR-1455264.

Alexander Thaler
Oak Ridge National Lab

Date submitted: 11 Nov 2016

Electronic form version 1.4