

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Domain wall order and motion in Mn_3O_4 ALEXANDER THALER, Oak Ridge National Lab, Oak Ridge, TN, ALEXANDER ZAKJEVSKII, BRIAN NGUYEN, YEWON GIM, Physics Illinois & Seitz MRL, University of Illinois, Urbana, IL, ADAM ACZEL, LISA DEBEER-SCHMITT, Oak Ridge National Lab, Oak Ridge, TN, S. LANCE COOPER, GREGORY MACDOUGALL, Physics Illinois & Seitz MRL, University of Illinois, Urbana, IL — 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) 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. This work was sponsored by the National Science Foundation, under grant number DMR-1455264.

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Date submitted: 05 Nov 2015

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