

Abstract Submitted
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Neutron Scattering Study of Magnetic and Orbital Order in MnV_2O_4 STEPHEN NAGLER, OVIDIU GARLEA, Oak Ridge National Laboratory, RONYING JIN, DAVID MANDRUS, DOUG ABERNATHY, Oak Ridge National Laboratory, BERTRAND ROESSLI, Paul Scherrer Institute, MARTHA MILLER, ARTHUR SCHULTZ, Argonne National Laboratory, QINGZHEN HUANG, NIST Center for Neutron Research, CHRIS FROST, Rutherford-Appleton Laboratories — Neutron diffraction and inelastic scattering has been used to study the spinel system MnV_2O_4 . The results confirm the existence of two phase transitions. The first, near 56 K, is from a paramagnetic state to a collinear ferrimagnetic phase. There is a second simultaneous structural and magnetic transition at 53 K to a tetragonal structure with a non-collinear ferrimagnetic state. The low T magnetic structure has been definitively resolved, and is seen to be associated with a gap in the magnetic excitation spectrum. The magnetic structure is compatible with a staggered orbital ordering. Inelastic scattering has been carried out using both triple axis and time of flight techniques, and several branches of magnetic excitations are visible. These observations put tight constraints on theoretical models for MnV_2O_4 . An initial account of some of the results of this work appears in arXiv:0711.1844v1.

Stephen Nagler
Oak Ridge National Laboratory

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