

Abstract Submitted
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Magneto-Structural coupling in compressed Manganese Oxide¹

ANTONIO M. DOS SANTOS, CHRIS A. TULK, JAMIE J. MOLAISSON, NEELAM PRADHAN, Neutron Sciences Directorate, ORNL Oak Ridge TN 37831-6475 — Transition metal oxides are relevant systems for the earth sciences as these are ideal model systems for Earth's interior. In these systems, pressure increases the magnetic transition temperature, up to a point, where magnetic quenching is predicted. MnO orders magnetically at 118 K in a type II antiferromagnetic structure. This magnetic transition is accompanied by a first order structural transition, from the high temperature cubic paramagnetic phase to a low temperature rhombohedral structure [1], and is well correlated with the magnetic ordering [2]. Interestingly, although magnetic ordering at room temperature is expected only at 60 GPa, a sharp anomaly in the resistivity data has been detected below 10 GPa [3]. Here we present recent results at SNAP at the SNS where high-pressure low-temperature neutron powder diffraction data were collected up to 10 GPa. These data allow determination of the increase of T_c with pressure and characterize the strength of the magneto-structural coupling in MnO when magnetic ordering is induced by pressure.

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[2] Kantor AP, et.al, J. Alloys and Comp. : 402(1-2): 42-45 (2005)

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