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Study of correlated electron phase behavior in α-$Na_{0.90}MnO_2$ single crystals REBECCA DALLY, Boston College, University of California Santa Barbara, ROBIN CHISNELL, NIST Center for Neutron Research, YAOHUA LIU, Oak Ridge National Laboratory, JEFFREY LYNN, NIST Center for Neutron Research, STEPHEN WILSON, University of California Santa Barbara — The layered oxide system, α-Na_xMnO_2, has been studied extensively as a potential battery cathode material, and its structure is not only an attractive one for the battery community, but for the condensed matter physics community as well. It belongs to the class of AMO_2 (A = alkali metal, M = transition metal) materials, which have alternating MO_2 sheets and alkali ion sheets. The MO_2 sheets consist of MO_6 edge-sharing octahedra and the alkali ions can generally be intercalated or deintercalated without disrupting the M-O bonds, keeping the layered structure intact. A large Jahn-Teller distortion stabilizes ferro-orbital ordering, locking moments canted out of the *ab*-plane. When $x = 1$, $S = 2$ Mn^{3+} moments form chains along the crystallographic *b*-axis where antiferromagnetic intrachain coupling (J_1) is strong, and interchain coupling (J_2) remains weak. Here we present our recent work exploring single crystals of the sodium deficient $x = 0.90$ system. Discussion of α-$Na_{0.90}MnO_2$ will cover the quasi-1D static and dynamic magnetic behavior observed via bulk probes and neutron scattering experiments.

Rebecca Dally
Boston College, University of California Santa Barbara

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