Abstract Submitted
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Spin-orbital fluctuations in the paramagnetic Mott insulator $(V_{1-x}Cr_x)_2O_3$[1] JONATHAN LEINER, MATTHEW STONE, MARK LUMSDEN, Oak Ridge National Lab, WEI BAO, Renmin University of China, COLLIN BROHOLM, Johns Hopkins University — The phase diagram of rhombohedral V_2O_3 features several distinct strongly correlated phases as a function of doping, pressure and temperature. When doped with chromium for 180 K<T<450 K the material undergoes a Mott metal to insulator transition. Using the modern time-of-flight neutron scattering spectrometer SEQUOIA at the SNS, we have probed the excitation spectrum of $(V_{0.96}Cr_{0.04})_2O_3$ in the PI phase and in the monoclinic commensurate anti-ferromagnet for T<180 K. An effective exchange Hamiltonian that accounts for the low T spin waves indicates alternating FM and AFM interactions for nearest neighbor spin pairs that are equivalent in the PI. We argue that the corresponding spin-orbital fluctuations are responsible for the extremely short-range dynamic spin correlations that we document in the PI phase.

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