Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Inelastic neutron scattering studies of magnetism in A-site spinels[1] S.E. NAGLER, G.J. MACDOUGALL, Oak Ridge National Laboratory, D. GOUT, Oak Ridge National Laboratory; Julich Centre for Neutron Science, G. EHLERS, M.E. HAGEN, J. NIEDZIELA, T. HONG, D. MANDRUS, Oak Ridge National Laboratory — The A-site spinels, $CoAl_2O_4$ and $FeAl_2O_4$, have magnetic cations residing solely on the diamond sublattice. There is strong interest in these materials due to a the central role of frustration in determining physical properties. Despite large negative Curie-Weiss constants of $|\Theta|$ >100K, in neither of these systems has long range order been reported. Instead, anomalous glass transitions are seen with T^*=6K and 12K, respectively. In $CoAl_2O_4$, the emergence of short-range spin-spin correlations has led to speculations of novel 'spiral spin liquid' behaviour and perhaps an order-by-disorder transition. In $FeAl_2O_4$, alternate theories involving strongly entangled spin and orbital degrees of freedom may be more appropriate. In order to explore the nature of the magnetism in these systems, we have studied their excitation spectra with inelastic neutron using the HB-1 and CNCS instruments at the HFIR and SNS facilities, respectively. We will present the results of these studies, and discuss implications for the magnetic ground state.

[1]Research sponsored by the US DOE, Basic Energy Sciences: (A) Division of Materials Science and Engineering and (B) Division of Scientific User Facilities.

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Date submitted: 20 Nov 2009 Electronic form version 1.4