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Short-range correlations in single-crystalline $CoAl_2O_4$[1] G.J. MACDOUGALL, Oak Ridge National Laboratory, D. GOUT, Oak Ridge National Laboratory; Julich Centre for Neutron Science, J.L. ZARESTKY, Ames Laboratory and Iowa State University, D. MANDRUS, S.E. NAGLER, Oak Ridge National Laboratory — The A-site spinels, where magnetic cations reside on a diamond sublattice, have been receiving much attention in recent years. Order can be frustrated in these systems due to competing nearest and further neighbor exchange, and theoretical studies suggest a number of interesting ground states and a central role for fluctuations. One such spinel, $CoAl_2O_4$, has been held up as a material of particular interest. Despite a large Curie-Weiss constant of Θ $\sim$104K, only a glassy transition is reported at T^* $\sim$4-10K. Preliminary results on powders has been associated with novel spin liquid behavior, but careful studies of single crystals are needed. To this end, we have grown several large single crystals of $CoAl_2O_4$ at ORNL via the floating zone method, and studied them with neutron scattering using the HB-1a beamline at the High Flux Isotope Reactor. We will present the results of these neutron scattering experiments, and discuss both the evolution of magnetic properties in this system and implications for existing theories.

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