Abstract Submitted
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Investigating the nature of magnetic correlations in the anti-ferromagnetic hyper-kagome material, $Yb_3Ga_5O_{12}$ KATE ROSS, KATHARINA FRITSCH, McMaster University, ROBERT BEWLEY, TATIANA GUIDI, ISIS, Rutherford Appleton Laboratory, YIMING QIU, NCNR, NIST, CHRIS WIEBE, University of Winnipeg, HAIDONG ZHOU, Florida State University, HANNA DABKOWSKA, BRUCE GAULIN, McMaster University — The magnetic Yb^{3+} ions in $Yb_3Ga_5O_{12}$ (YbGG) reside on a hyper-kagome lattice, which has the same connectivity as the planar kagome lattice but in higher dimensions. For anti-ferromagnetically (AFM) coupled spins the hyper-kagome lattice provides a highly-frustrated geometry in three-dimensions. YbGG is isostructural with the well-studied $Gd_3Ga_5O_{12}$ (GGG), which enjoys an exotic magnetic phase diagram. In GGG, the effects of geometric frustration manifest as a disordered, partial spin-glass ground state down to 25mK in zero-field. The application of an external magnetic field first induces an intermediate spin liquid state, then a long range AFM ordered phase. Much less is known about YbGG, though all experimental evidence indicates a lack of LRO in zero-field down to 30mK. We have recently produced single crystals of YbGG and have performed neutron scattering experiments over a range of temperatures (80mK - 10K) and magnetic field strengths (0T - 8T). The results indicate low-energy, fluctuating spin correlations at 80mK, 0T, as well as a dramatic response to an applied magnetic field. At zero-field, we also observe a low-energy dispersionless spin excitation that softens as the temperature is increased above the Schottky anomaly in the specific heat.

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