

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Neutron Scattering Studies of a Flat Mode in an $S=\frac{1}{2}$ Kagome Ferromagnet¹ ROBIN CHISNELL, DANNA FREEDMAN, MIT, JOEL HELTON, DEEPAK SINGH, NIST Center for Neutron Research, CHRIS STOCK, FRANZ DEMMEL, ROBERT BEWLEY, ISIS Facility - Rutherford Appleton Laboratory, DANIEL NOCERA, YOUNG LEE, MIT — Systems with flat bands provide macroscopic degeneracy that allows for the emergence of interesting strongly correlated phenomena such as the fractional quantum Hall effect. Hopping models on geometrically frustrated lattices with spin-orbit interactions predict the existence of flat, topologically nontrivial bands. Experimental realizations of these systems have proved challenging, as the flat band is often distorted by additional interactions. Cu(1,3-bdc) is a hybrid organometallic compound featuring $S=\frac{1}{2}$ Cu^{2+} ions on a kagome lattice. The magnetic moments order ferromagnetically below $T=1.8\text{K}$. We present neutron scattering measurements of Cu(1,3-bdc) and note the emergence of a flat magnon band in the ordered phase. The presence of a small Dzaloshinsky-Moriya interaction along with an applied magnetic field perpendicular to the kagome plane creates a gap between the flat band and lower energy dispersive band.

¹This work was supported by the US Department of Energy under Grant No. DE-FG02-07ER46134

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Date submitted: 09 Nov 2012

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