**Magnetization of a New Kagome Antiferromagnet**

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**Introduction**

 Frustration happens when competing interactions cannot be simultaneously satisfied [1-4]. Strong

frustration produces exotic ground states, such as valence bond crystals, quantum spin liquids, etc. In these states, the spins are entangled without freezing or ordering down to *T* = 0. Experimental realization of such states have been challenging since static local moments are almost always stabilized as *T* 🡪 0 due to disorder, symmetry breaking interactions, etc.

 Lattices involving kagome motifs have been an active playground. Recently, barlowite has emerged as a new mother compound of spin liquids [5]. Thermodynamic studies often provide crucial hints for precise theoretical modeling [6]. We would like to understand the magnetization of single crystalline barlowite at varies temperatures.

**Experimental**

 The field dependence of magnetization, with H applied normal to the kagome lattices, has been measured using a pulsed magnet with a Helium-3 cryostat at NHMFL LANL. Below 5 K, the temperature dependence becomes very weak. In Fig.1, M vs H has been measured using an extraction magnetometer up to 60 T at several temperatures above and below the spin ordering temperature of 15 K [5].

**Result and Discussion**

 The magnetization shows a kink around 30 T at 5 K. This anomaly gradually phases out as temperature approaches 15 K.

**Conclusion**

 The 30 T features is likely related to the long-range spin order.

**Fig.1** Magnetization of barlowite as a function of field applied normal to the kagome lattice. Long-range spin ordering occurs below 15 K [5].

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