

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Experimental Study of the Phase Diagram of $\text{LiHo}_x\text{Y}_{1-x}\text{F}_4$ J. A. QUILLIAM, C.G.A. MUGFORD, L. LETTRESS, J.B. KYCIA, Department of Physics, University of Waterloo — The diluted dipolar-coupled Ising spin system $\text{LiHo}_x\text{Y}_{1-x}\text{F}_4$ has been found to have a very rich phase diagram and some unique magnetic properties. Most notably, as the concentration of magnetic Ho ions is reduced, the material appears to leave the spin glass phase and enter the so-called “anti-glass” phase where spins do not freeze down to very low temperatures (D. H. Reich *et al*). This doping regime has also shown some unusual features in the temperature dependence of the specific heat. We are performing measurements on a variety of stoichiometries to refine the phase diagram of $\text{LiHo}_x\text{Y}_{1-x}\text{F}_4$. More specifically we are attempting to better understand the nature of the “anti-glass” phase and the range of stoichiometries over which it exists. Recent results from heat capacity and SQUID-based AC magnetic susceptibility measurements at dilution refrigerator temperatures will be presented.

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Date submitted: 01 Dec 2004

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