

Abstract Submitted
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Specific Heat of the Dilute Ising Magnet $\text{LiHo}_x\text{Y}_{1-x}\text{F}_4$ ¹ JEFFREY QUILLIAM, CHAS MUGFORD, LAUREN LETTRESS, JAN KYCIA, University of Waterloo — We will present specific heat results on the dilute dipolar-coupled Ising magnet $\text{LiHo}_x\text{Y}_{1-x}\text{F}_4$. This material was previously observed to change from a spin glass to an unusual “anti-glass” state at a Ho concentration of $x \simeq 0.045$. This state showed dynamics that are very different from those of a spin glass² and also exhibited sharp features in its specific heat at around 100 and 300 mK³. In contrast, our measurements of the heat capacity do not reproduce these sharp features and instead find broad curves for three concentrations (1.8%, 4.5% and 8.0%). Integrating C/T reveals a residual entropy S_0 which is 0 for 8.0% Ho but increases with lower concentration (to $0.31R$ at 1.8% Ho). This provides some evidence for a change to a different magnetic ground state below 8.0% Ho and is qualitatively consistent with Monte Carlo simulations⁴. AC susceptibility measurements probing the dynamics of this system are currently being performed and results will be presented.

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²S. Ghosh *et al.*, *Science* **296**, 2195 (2002)

³S. Ghosh *et al.*, *Nature* **425**, 48 (2003).

⁴J. Snider and C. C. Yu, *Phys. Rev. B* **72**, 214203 (2005).

Jeffrey Quilliam
University of Waterloo

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