Abstract Submitted
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AC Susceptibility and Heat Capacity Studies of Geometrically Frustrated Pyrochlores[1] DANIEL ANTONIO, ANDREW CORNELIUS, UNLV, JASON GARDNER, Brookhaven National Lab, NIST — Materials with a geometrically frustrated magnetic pyrochlore lattice have been of interest due to their unusual ground states. $Tb_2Ti_2O_7$ is known for going to a spin liquid ground state and does not transition to a long-range ordered state down to at least 50 mK [1]. $Ho_2Ti_2O_7$ has a macroscopically degenerate spin ice ground state which resembles that of the proton ordering in water ice [2]. Heat Capacity measurements of $Tb_2Ti_{2-x}Sn_xO_7$ were done from 300 K to 0.36 K and AC magnetic susceptibility measurements of $Ho_{2-x}Y_xTi_2O_7$ and $_{2-x}La_xTi_2O_7$were done for frequencies from 10 Hz to 10 kHz down to 1.8 K, both in magnetic fields up to 9 T. These experiments were performed to further understand the factors leading to their unusual behavior and the effects of introducing disorder through doping with nonmagnetic elements. Determination of the effect of an external field on the hyperfine crystal field at the Tb sites was done. In addition, unusual behavior in the ac susceptibility of the Ho samples at lower temperatures was observed. [1] J.S. Gardner *et al.*, Phys. Rev. Lett. **82**, 1012 (1999) [2] S.T. Bramwell and M.J.P. Gingras, Science **294**, 1495 (2001)

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