Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

μSR study of $LiHo_xY_{1-x}F$ J. RODRIGUEZ, S. DUNSIGER, G.J. MACDOUGALL, G.M. LUKE, McMaster University, Y.J. UEMURA, P. RUSSO, A. SAVICI, Columbia University, J. QUILLIAM, University of Waterloo — $LiHo_xY_{1-x}F$ is a dipolar ferromagnet with a complex phase diagram. The undiluted compound LiHoF is an Ising ferromagnet with a transition temperature of 1.53 K with a $\hat{c}$-easy axis. A very interesting feature of the phase diagram arises when $x \sim 0.045$. Magnetic ac-susceptibility measurements have shown a narrowing of χ'' in the low frequency side as the temperature is decreased. This narrowing is in contrast to the spin glass behavior that the material was expected to have at this doping and, due to this, this new phase is called the "anti-glass" phase. Even though there have been studies on this material (neutron scattering, magnetic susceptibility and specific heat) the phase diagram has not been fully mapped and some phases, like the antiglass phase, are not well understood. We have studied this system using μSR. This local magnetic probe allows to measure the microscopic distribution of magnetic fields as well as their dynamics. In this talk I will present our results on the $x = 1$ (Ising ferromagnet) and $x = 0.045$ (anti-glass) samples.

Jose Rodriguez
McMaster University

Date submitted: 06 Dec 2004 Electronic form version 1.4