Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Longitudinal Field μSR Study of Spin Dynamics and Onset of Magnetic Correlations in $LiY_{1-x}Ho_xF_4$ with $0.002 \leq x \leq 0.10$[1] R.C. JOHNSON, K. CHEN, M.J. GRAF, Department of Physics, Boston College, Chestnut Hill, MA 02467 USA — The Ho^{3+} ions in $LiY_{1-x}Ho_xF_4$ exhibit a crossover from single ion to spin glass behavior with increasing x. We have studied the longitudinal field depolarization rate for samples with $0.002 \leq x \leq 0.10$ over the temperature range 50 mK $\leq x \leq$ 50 K and for magnetic fields up to 0.1 T. For low concentrations, we find a peak in the temperature-dependent depolarization, as often observed in $1/T_1$ NMR measurements on single molecule magnets (SMM); at high concentrations the depolarization rate increases monotonically with decreasing temperature. These results suggest that the difference in behavior of SMMs systems as seen in NMR and μSR measurements may be due to differences in the strength of the interactions between the magnetic clusters.

[1]Supported by National Science Foundation grant DMR-0710525.

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Date submitted: 29 Nov 2008 Electronic form version 1.4