Longitudinal Field $\mu$SR Study of Spin Dynamics and Onset of Magnetic Correlations in $\text{LiY}_{1-x}\text{Ho}_x\text{F}_4$ with $0.002 \leq x \leq 0.10$. R.C. JOHNSON, K. CHEN, M.J. GRAF, Department of Physics, Boston College, Chestnut Hill, MA 02467 USA — The $\text{Ho}^{3+}$ ions in $\text{LiY}_{1-x}\text{Ho}_x\text{F}_4$ 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 $0.05 \text{ mK} \leq T \leq 50 \text{ K}$ 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 SMM systems as seen in NMR and $\mu$SR measurements may be due to differences in the strength of the interactions between the magnetic clusters.

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