Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Transverse Magnetic Susceptibility in an Ising Spin Liquid D. M. SILEVITCH, C. ANCONA-TORRES, T. F. ROSENBAUM, James Franck Institute/University of Chicago, G. AEPPLI, University College, London — We study the AC vector magnetic susceptibility of the dilute Ising magnet $LiHo_{0.045}Y_{0.955}F_4$. Driving the system into the nonlinear regime excites coherent oscillations of hundreds of spins. We find that these clusters can be projected from the Ising axis into the transverse plane by applying a DC transverse field. The lineshape of the oscillations changes as a function of this transverse field, indicating the presence of additional excitation modes. We study as well the time dependence of the excitation spectra and find a pronounced asymmetry along and transverse to the Ising axis. The spin liquid not only permits the encoding of information labeled by frequency, but is amenable to manipulation of quantum superposed states.

Daniel Silevitch
James Franck Institute/University of Chicago

Date submitted: 30 Nov 2004 Electronic form version 1.4