Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Neutron scattering in $Er_{2-x}Y_xTi_2O_7$ JONATHAN GAUDET, ALANNAH HALLAS, DALINI MAHARAJ, EDWIN KERMARREC, McMaster Univ, NICHOLAS P. BUTCH, NIST Center for Neutron Research, HANNA DABOWSKA, BRUCE GAULIN, McMaster Univ — $Er_2Ti_2O_7$(ETO) is a strong candidate for ground state selection via the order by disorder mechanism. A ψ_2 magnetic ground state appears below T_N=1.2 K, where ψ_2 and ψ_3 are the two basis states of the irreducible representation Γ_5. No sample dependance has been observed in the thermodynamics properties of ETO at low temperature, and in particular on its phase transition to long range magnetic order. ETO's ordered Neel state has been shown to be robust even to a relatively high level of magnetic dilution, as occurs with non-magnetic Y^{3+} substitution of Er^{3+}.However, recently two theoretical studies have predicted that ETO's ψ_2 ground state should be unstable to formation of the ψ_3 state, in the presence of such disorder. To explore this possibility,we grew single crystals of $Er_{2-x}Y_xTi_2O_7$(EYTO) with x = 0,0.2 and 0.4 and performed a systematic inelastic neutron scattering studies using the Disk Chopper time-of-flight spectrometer (DCS) at the National Institute of Standards and Technology (NIST). We will show elastic and inelastic neutron scattering at low temperatures and as a a function of applied magnetic field for all three samples and discuss the role of such quenched disorder on the spin dynamics of EYTO.

Jonathan Gaudet
McMaster Univ

Date submitted: 06 Nov 2015 Electronic form version 1.4