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Experimental Evidence for field induced emergent clock anisotropies in the XY pyrochlore $Er_2Ti_2O_7$ JONATHAN GAUDET, ALANNAH M. HALLAS, JACQUES THIBAULT, McMaster University, NICHOLAS P. BUTCH, Neutron center for Neutron research (NIST), HANNA DABKOWSKA, Brockhouse Institute for materials research, BRUCE GAULIN, McMaster University — The XY pyrochlore $Er_2Ti_2O_7$, with its ψ_2 magnetic ground state, has garnered much attention due to the possibility that its ground state selection could originate from an order-by-disorder mechanism[1,2]. However, recently, theoretical work has exploited the fact that the symmetry breaking in this system is a rare case of high discrete symmetry (Z_6) [3]. This work studied the effect of a magnetic field on the Z_6 symmetry breaking and predicted rich and controllable magnetothermodynamic properties. Indeed, the authors predict numerous domains transitions in the low field regime that strongly depends on the field direction. In this talk, I will present neutron scattering data on $Er_2Ti_2O_7$ with a magnetic field applied along different high symmetry direction. Our experimental study has provided the first experimental evidence for this rich Z_6 domain phase behaviour. Lastly, I will address how our results could shed light on the putative ground state selection mechanism in $Er_2Ti_2O_7$. [1]L. Savary et al., Phys. Rev. Lett.,109,167201 (2012) [2]M. E. Zhitomirsky et al., Phys. Rev. Lett.,109,077204 (2012) [3]V. S. Maryasin et al., Phys. Rev. B., 93,100406(R) (2016)

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