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**Spin Waves and Quantum Criticality in the Frustrated XY Pyrochlore Antiferromagnet  $\text{Er}_2\text{Ti}_2\text{O}_7$**  JACOB RUFF, PATRICK CLANCY, BRUCE GAULIN, HANNA DABKOWSKA, MEHMET RAMAZANOGLU, McMaster University, JASON GARDNER, NCNR, ALEX BOURQUE, MARY ANNE WHITE, Dalhousie University, YIMING QIU, JOHN COPLEY, NCNR — We report recent single crystal neutron scattering measurements of the XY pyrochlore antiferromagnet  $\text{Er}_2\text{Ti}_2\text{O}_7$ , in zero and non-zero magnetic field applied along the (110) direction. Previous results show a magnetically-ordered ground state which is suggested to be stabilized by an unusual order-by-disorder mechanism driven by quantum fluctuations [1]. We present measurements of the low-lying spin excitations of this system, revealing Goldstone modes previously thought to be absent [1]. Also, we explore the response of the ground state to applied magnetic fields, which are shown to induce a quantum phase transition separating the low-field antiferromagnetically ordered phase from the high-field polarized phase.

[1] J.D.M. Champion et al. “ $\text{Er}_2\text{Ti}_2\text{O}_7$ : Evidence of quantum order by disorder in a frustrated antiferromagnet” PRB 68 (2003)

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