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Partially ordered state in stoichiometric Yb2Ti2O7[1] KATE ROSS, Colorado State University, EDWIN KERMARREC, JONATHAN GAUDET, BRUCE GAULIN, McMaster University — The nature of the magnetic state below a first order transition at T_c = 265 mK in the Quantum Spin Ice $Yb_2Ti_2O_7$ is hotly debated. It has been proposed as a Quantum Spin Liquid (QSL) ground state, but some studies find evidence for long range ferromagnetic order; results seemingly vary from sample to sample. We will present low temperature neutron measurements on a polycrystalline sample of $Yb_2Ti_2O_7$ that is known to be stoichiometric. Our measurements reveal 1) there is a change of intensity at nuclear Bragg positions upon warming which does not occur sharply at T_c, and which involves an ordered moment size of ∼1.1muB (58% of the saturation moment) and 2) the inelastic excitations below T_c suggest the presence of dispersive modes coexisting with incoherent low energy fluctuations. The data will be compared to $Yb_2Sn_2O_7$, which shows nearly identical behavior via inelastic neutron scattering. Our results suggest that the ground state in nominally pure $Yb_2Ti_2O_7$ and $Yb_2Sn_2O_7$ is not a conventionally ordered ferromagnet, but instead involves only partial polarization of the magnetic moments coexisting with a disordered component, a situation reminiscent of the partially polarized QSL called the Coulomb Ferromagnetic phase.

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