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Induced Magnetic Order in $Yb_2Ti_2O_7$[1] CARL ADAMS, St. Francis Xavier University, K.A. ROSS, J.P. RUFF, B.D. GAULIN, H. DABKOWSKA, McMaster University, Y. QIU, UMD/NIST Center for Neutron Research, J.R.D. COPLEY, J.S. GARDNER, NIST Center for Neutron Research — $Yb_2Ti_2O_7$ is part of family of pyrochlore materials with a magnetic rare-earth and a non-magnetic transition metal. In similar compounds containing holmium, erbium, or terbium the geometric frustration results in several exotic ground states including spin-ice, spin-liquid, field-induced ordering, and low-dimensional behavior. The ytterbium-based compound has a strong anomaly in the specific heat at 240 mK [Hodges *et al.*, J Phys Cond Mat **13**, 9301 (2001)] but without accompanying long range order. We have made measurements of the elastic and inelastic neutron scattering on a large single crystal of $Yb_2Ti_2O_7$ over a broad range of the (hhl) scattering plane using the DCS spectrometer at the NIST Center for Neutron Research. Our studies have confirmed the presence of diffuse "rods" of scattering along the (111) directions that persist below 100 mK. However, when the sample is field-cooled in fields as low as 0.5 T the rods of scattering are replaced by well-defined magnetic excitations. We will present the results of our studies at a variety of temperatures and fields.

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