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AC susceptibility studies of the cooperative paramagnet $Tb_2Ti_2O_7$ B.G. UELAND, P. SCHIFFER, Department of Physics, The Pennsylvania State University, G.C. LAU, R.J. CAVA, Department of Chemistry, Princeton University — The cooperative paramagnet $Tb_2Ti_2O_7$ has generated much interest in the frustrated magnetism community due to the lack of ordering down to temperatures well below its Curie-Weiss temperature which is $\sim$10 K. Its pyrochlore magnetic lattice and highly anisotropic g-factor suggest a similarity to spin ice (i.e. $Dy_2Ti_2O_7$ and $Ho_2Ti_2O_7$), however, the first excited crystal field level is of the same order as the exchange interaction. This presents a novel system where crystal field degeneracy should have an effect as a magnetic field is applied. We present ac susceptibility studies on single and polycrystalline samples over broad ranges of temperature, static magnetic field, and frequency. We find two peaks emerge in the complex susceptibility as a function of temperature in the presence of a static magnetic field, and we discuss the data in terms of the effects of single ion and cooperative behavior. This research is supported by the National Science Foundation.

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