Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

**Low-Temperature Low-Field Phases of the Pyrochlore Quantum Magnet $Tb_2Ti_2O_7$** LIANG YIN, JIAN SHENG XIA, YASU TAKANO, NEIL SULLIVAN, University of Florida, QIU JU LI, XUE FENG SUN, University of Science and Technology of China — By means of ac magnetic-susceptibility measurements, we have found evidence for a new magnetic phase of $Tb_2Ti_2O_7$ below about 140 mK in zero magnetic field. In magnetic fields parallel to [111], this phase—exhibiting frequency- and amplitude-dependent susceptibility and an extremely slow spin dynamics—extends to about 70 mT, at which it gives way to another phase. The field dependence of the susceptibility of this second phase, which extends to about 0.6 T, indicates the presence of a weak magnetization plateau below 50 mK, as has been predicted by a single-tetrahedron four-spin model, giving support to the underlying proposal that the disordered low-field ground state of $Tb_2Ti_2O_7$ is a quantum spin ice.

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Date submitted: 02 Nov 2012 Electronic form version 1.4