

Abstract Submitted  
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**Low temperature freezing and dynamics in Tb<sub>2</sub>Sn<sub>2</sub>O<sub>7</sub>**<sup>1</sup> MARIA MATTHEWS, MARIA DAHLBERG, Pennsylvania State University, PAWINA JIRAMONGKOLCHAI, ROBERT CAVA, Princeton University, PETER SCHIFFER, Pennsylvania State University — We have probed the low temperature magnetic behavior of the ordered spin ice material Tb<sub>2</sub>Sn<sub>2</sub>O<sub>7</sub> through ac magnetic susceptibility measurements of both the pure material and samples with small percentages of Ti substituted on the Sn sublattice. Our aim is to qualitatively probe the nature low temperature spin state of the stanate by slowly adjusting the chemical composition towards a known spin liquid— terbium titanate. In pure Tb<sub>2</sub>Sn<sub>2</sub>O<sub>7</sub>, we observe a clear signature for the previously reported ordering transition at  $T_c = 850$  mK, and we also observe evidence for dynamic freezing at temperatures well below  $T_c$ , confirming the persistence of significant magnetic fluctuations deep in the spin-ordered regime. We found that the long range ordering transition was completely suppressed by substitution with as little as 5 percent Ti, whereas larger Ti substitution resulted in a spin-glass-like spin freezing transition near 250 mK. The suppression of ordering with minimal substitution demonstrates a remarkable fragility to the spin ordering in this system.

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