Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Absence of Magnetic Order and Persistent Spin Dynamics in $Tb_2Ge_2O_7$ ALANNAH HALLAS, McMaster University, ANGEL AREVALO-LOPEZ, University of Edinburgh, MURRAY WILSON, McMaster University, LIAN LIU, Columbia University, J. PAUL ATTFIELD, University of Edinburgh, YASUTOMO UEMURA, Columbia University, CHRIS WIEBE, University of Winnipeg, GRAEME LUKE, McMaster University — The terbium pyrochlores exhibit many unique magnetic properties, which has generated significant interest in this family of frustrated materials. A candidate spin liquid, $Tb_2Ti_2O_7$ fails to magnetically order, despite strong antiferromagnetic correlations. The application of external pressure has been found to produce partial antiferromagnetic order in $Tb_2Ti_2O_7$. Recently, we synthesized a new member of this family, $Tb_2Ge_2O_7$. Due to the large ionic radii decrease from titanium to germanium, $Tb_2Ge_2O_7$ can be considered a chemical pressure analog of $Tb_2Ti_2O_7$. However, neutron scattering measurements revealed an absence of magnetic order in $Tb_2Ge_2O_7$ down to 20 mK and dominant ferromagnetic correlations. Now, we have investigated the low temperature magnetism of $Tb_2Ge_2O_7$ with muon spin rotation. Our zero field μSR measurements confirm an absence of static order in $Tb_2Ge_2O_7$. We find a sharp increase in magnetic correlations below 10 K and persistent spin dynamics down to 25 mK. Our longitudinal field μSR measurements on $Tb_2Ge_2O_7$ at 25 mK are consistent with a system of fluctuating moments, with a fluctuation rate of 11 MHz. This fluctuation rate is nearly temperature independent below 2.5 K.

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Date submitted: 14 Nov 2014 Electronic form version 1.4