Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Effects of interaction strength on the ground states of magnetically frustrated pyrochlores ALANNAH HALLAS, McMaster University, ANGEL AREVALO LOPEZ, The University of Edinburgh, HAIDONG ZHOU, University of Tennessee, GRAEME LUKE, McMaster University, CHRISTOPHER WIEBE, The University of Winnipeg — The pyrochlore oxides are ubiquitous in frustrated magnetism because of their diverse array of novel magnetic ground states. The magnetism in these materials can be probed by the application of chemical pressure, that is, by varying the size of the non-magnetic ion. Germanium and lead are, respectively, the smallest and largest possible B-site cations for the pyrochlore lattice. We present thermodynamic and magnetization measurements on five new materials $A_2Ge_2O_7$ (A = Yb, Er, Tb) and $A_2Pb_2O_7$ (A = Pr, Nd). The strength of the magnetic interactions in these materials is strongly enhanced for the germanium pyrochlores and significantly reduced in the case of the lead pyrochlores. Comparison to the well-studied titanium and tin pyrochlores (B = Ti, Sn) provide context for our results. Our measurements reveal that, in some cases, the magnetic ground state for a given magnetic ion is stable against changes in chemical pressure. In other cases, varying the chemical pressure for a given magnetic ion gives rise to a distinctly different magnetic ground state.

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Date submitted: 15 Nov 2013 Electronic form version 1.4