Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

**Thermodynamic and magnetic studies of novel spin ice materials**[1]
M.L. DAHLBERG, X. KE, B.G. UELAND[2], P. SCHIFFER, Department of Physics and Materials Research Institute, Pennsylvania State University, D.V. WEST, R.J. CAVA, Department of Chemistry and Princeton Materials Institute, Princeton University — We report systematic low temperature measurements of the dc magnetization, ac susceptibility, and heat capacity of $Dy_2Sn_{2-x}Sb_xO_{7+x/2}$ (x=0, 0.25, and 0.5), and $Dy_2NbScO_7$. We find evidence for Ising-like single ion ground states in the $Dy_2Sn_{2-x}Sb_xO_{7+x/2}$ materials, and these materials possess nearly the same zero-point entropy as the canonical spin ices $Ho_2Ti_2O_7$ and $Dy_2Ti_2O_7$. These results strongly suggest that the $Dy_2Sn_{2-x}Sb_xO_{7+x/2}$ materials studied have spin-ice states at low temperatures despite the cation disorder on the B sites of the pyrochlore lattice We also observe a somewhat reduced zero-point entropy in $Dy_2NbScO_7$, which is possibly associated with a higher level of cation disorder

[1]NSF Grant No. DMR-0353610
[2]Now at NIST, Gaithersburg, MD

M.L. Dahlberg
Dept of Physics and Materials Research Institute, Pennsylvania State University

Date submitted: 19 Dec 2007 Electronic form version 1.4