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Dipolar Hyperkagome Spin Ice[1] TRAVIS E. REDPATH, University of Manitoba, JOHN M. HOPKINSON, Brandon University, University of Manitoba, MATTHEW ENJALRAN, PATRICK CARTER, Southern Connecticut State University — Non-magnetic doping of the Pyrochlore spin ices $Dy_2Ti_2O_7$ and $Ho_2Ti_2O_7$ has been shown[2] to exhibit a nonmonotonic residual entropy per spin as a function of doping, with an increase near one quarter doping. Hyperkagome corresponds to a disorder-free one quarter doping of the Pyrochlore lattice with a large residual Pauling entropy $S/N = 1/3\ln(9/2)$. In this talk we discuss the physics of local Ising spins coupled through antiferromagnetic nearest neighbour exchange and a long range dipolar interaction. We generalize the phase diagram[3] of dipolar Pyrochlore spin ice to the Hyperkagome case, finding a crossover to a spin ice state followed by a transition to a charge ordered state and finally a transition to an ordered ground state, as first seen on the Kagome lattice[4]. We show that our hybrid single spin flip/loop algorithm Monte Carlo simulations agree with analytical results for small sizes, and present results for systems as large as $12 * L^3$ spins with $L = 4$.

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