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Quantum phase transition and anomalous Hall effect in a pyrochlore Kondo lattice SARAH GREFE, WENXIN DING, QIMIAO SI, Rice University — Motivated by recent experimental evidence for a possible chiral spin liquid phase in the metallic pyrochlore heavy fermion iridates ($Pr_2Ir_2O_7$) [Phys.Rev.Lett, **96**, 087204 (2006), Phys.Rev.Lett **98**, 057203 (2007), Nature **463**, 210 (2010)] as well as quantum critical behavior in this system [Nat. Mater. **13**, 356 (2014)], we study the effect of Kondo coupling on various spin liquid states of the Heisenberg model on pyrochlore lattices, including states exhibiting time-reversal-symmetry-breaking. Using a slave fermion representation for the f-moments which are coupled to conduction electrons, we study the large-N limit to determine the ground state energies of various feasible states and map out the zero-temperature phase diagram. We calculate the anomalous Hall response across the quantum phase transition from the Kondo destroyed phase to the Kondo screened phase. Finally we discuss the implications of our results for the properties of $Pr_2Ir_2O_7$.

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