Abstract Submitted
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Study of SU(N) magnets on the cubic lattice[1] HAO SONG, MICHAEL HERMELE, Department of Physics, University of Colorado at Boulder — We consider a class of $SU(N)$ magnets that have the same spin on every lattice site, which is obtained as the completely antisymmetric tensor product of $m < N$ fundamental representations. These models, which can be realized in ultracold gases of alkaline earth atoms in optical lattice potentials, have the remarkable property that more than two spins must be combined to form a singlet. A recent study of this model on the square lattice in the large-N limit found a chiral spin liquid ground state with topological order. Inspired by this result, we have studied the three-dimensional version of this model, solving it on the cubic lattice in the large-N limit, which addresses the competition among a variety of non-magnetic states, including some with exotic order. We present results on the phase diagram as the fraction m/N is varied.

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