Simplex SU(3) quantum antiferromagnets on the kagome and hyperkagome lattices[1] YURY YU. KISELEV, University of California San Diego, SIDDHARTH A. PARAMESWARAN, University of California Berkeley, DANIEL P. AROVAS, University of California San Diego — We investigate SU(3) "simplex solid" antiferromagnets on the kagome and hyperkagome lattices. The ground states of these systems are annihilated by certain local projectors acting on triples of sites, and are analogous to the valence bond solid wavefunctions constructed by Affleck, Kennedy, Lieb, and Tasaki. Using a coherent state representation, we map to a classical model of CP^2 spins with 3-spin interactions, which we analyze via single-spin Monte Carlo simulations and a cluster algorithm for the three-body interactions. We compute the static structure factor and short-range correlations encoded by the simplex solid wavefunction and rationalize the results in terms of the "order by disorder" mechanism.

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