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Classical Chiral Antiferromagnet on a Kagome Lattice[1] JACKSON PITTS, KIRILL SHTENGEL, Department of Physics and Astronomy, University of California at Riverside, Riverside CA 92511, USA — Extensive ground-state degeneracy in classical spin systems has motivated the study of these systems' quantum counterparts in search of topological phases of matter. But the possibility of entropic ground-state selection—order-by-disorder—has also motivated the study of these systems in their own right. Among these is the kagome Heisenberg antiferromagnet (KHAFM) whose low-T classical phase exhibits coplanar order. Like the KHAFM, the so-called "kagome chiral model" whose interactions are defined by the scalar triple product of neighboring spins has a large classical ground-state degeneracy. Furthermore, the two ground-state manifolds exhibit remarkable similarity, but linear spin-wave analysis reveals crucially differing dynamics. All coplanar KHAFM ground-states are equivalent at harmonic order and have flat bands, but the kagome chiral model admits flat bands only for certain states among its analogous "triaxial" ground-states: The only zero modes of the kagome chiral model are zero to all orders. Although this undoes the standard argument for order-by-disorder, the set of ground-states having the greatest number of zero modes forms a Z_2 spin liquid which may be stabilized by other means.

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