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Spiral spin liquid correlations in diamond antiferromagnets DORON BERGMAN, JASON ALICEA, Phys Dept., U of California Santa Barbara, EMANUEL GULL, SIMON TREBST, Station Q, U of California Santa Barbara, LEON BALENTS, Phys Dept., U of California Santa Barbara — We have introduced a simple model for frustrated magnetism on a diamond lattice, appropriate for a number of recently studied normal spinel materials. The model possesses a massive degeneracy of coplanar spin spiral states, characterized by propagation wavevectors that reside on a two-dimensional surface in momentum space. The degeneracy of low energy states significantly suppresses the ordering temperature relative to the Curie-Weiss temperature Θ_{CW}. In the intermediate temperature regime $T_c < T < \Theta_{CW}$, the system fluctuates primarily amongst the low energy configurations, resulting in a "spiral spin liquid" state. We discuss the correlations in this regime, and their precise observation in extensive Monte Carlo simulation. Finally, we connect our specific model with a number of possible experimental realizations, and provide a recipe for identifying the spiral spin liquid correlations in experiment.

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