

Abstract Submitted
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Topological Insulators on the Decorated Honeycomb Lattice¹ ANDREAS RUEGG, JUN WEN, GREGORY A. FIETE, University of Texas at Austin — We show that the decorated honeycomb lattice supports a number of topological insulating phases with a non-trivial Z_2 invariant and time-reversal symmetry protected gapless edge modes. We investigate the stability of these phases with respect to various symmetry breaking perturbations and demonstrate the connection to the recent discovery of an exactly solvable $S = 1/2$ chiral spin liquid model [Phys. Rev. Lett. **99**, 247203 (2007)] with non-Abelian and Abelian excitations on the same lattice. Our work highlights the relationship between topological band insulators and topologically ordered spin systems, and points to promising avenues for enlarging the number of known examples of both.

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