Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Phase diagram of the Heisenberg model on the decorated honeycomb lattice. DMITRII KOCHKOV, University of Illinois at Urbana Champaing, REBECCA FLINT, Iowa State University, BRYAN CLARK, University of Illinois at Urbana Champaign — We numerically investigate the phase diagram of quantum Heisenberg model on lattices which interpolate between honeycomb and triangular lattice. We show how the known phase diagrams of the honeycomb and triangular lattices interpolate into each other and examine the robustness of the spin liquid phase on the triangular lattice. Using fidelity analysis we discover a host of new ordered phases in this diagram which do not appear in the triangular and honeycomb phase diagrams separately. For the topological phases, we discuss possible spin liquid classifications based on the analysis of modular matrices and the effects of additional chiral interactions.

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Date submitted: 11 Nov 2016 Electronic form version 1.4