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Featureless Quantum Insulator on the Honeycomb Lattice[1]
SHENGHAN JIANG, Boston College, HYUNYONG LEE, PANJIN KIM, JUNG HOON HAN, Sungkyunkwan University, YING RAN, Boston College — We construct fully symmetric, gapped states without topological order on a spin-1/2's honeycomb lattice at half-filling in terms of projected entangled pair states (PEPS) Four distinct classes differing by lattice quantum numbers are found by applying the systematic classification scheme introduced by two of the authors [S. Jiang and Y. Ran, arXiv:1505.03171 (2015)]. Lack of topological degeneracy or other conventional form of symmetry breaking, and the existence of the energy gap in both wave functions are checked by numerical calculation of the entanglement entropy and various correlation functions.

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