Abstract Submitted
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correlation effects in topological phase transitions[1] HSIANG-HSUAN HUNG, VICTOR CHUA, Department of Physics, The University of Texas at Austin, LEI WANG, Theoretische Physik, ETH Zurich, GREGORY FIETE, Department of Physics, The University of Texas at Austin — We study topological insulators/trivial insulators topological phase transitions in the Kane-Mele-Hubbard model using the projective quantum Monte Carlo method. We numerically compute the topological invariants and study topological phase transitions under correlation. We find that quantum fluctuation effects from interactions can act both to stabilize and destabilize topological phases, depending on the details of the model. When the one-body terms break the lattice symmetry, e.g. bond dimerization breaks the rotational symmetry in the Kane-Mele model, the Hubbard interaction destabilizes the topological insulator phase. On the other hand, when the one-body terms (e.g. the third-nearest neighbor hopping) preserves the lattice symmetry, the interaction stabilizes the topological phase.

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