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Correlated effects in topological phase transitions HSIANG-HSUAN HUNG, Department of Physics, The University of Texas at Austin, Austin, TX, 78712, USA, LEI WANG, Theoretische Physik, ETH Zurich, 8093 Zurich, Switzerland, ZHENG-CHENG GU, Institute for Quantum Information, California Institute of Technology, Pasadena, California 91125, USA, GREGORY A. FIETE, Department of Physics, The University of Texas at Austin, Austin, TX, 78712, USA — Correlation effects in topological phases have been a central topic of interest, yet elusive in experiment. In this talk, we present the results of a numerical study beyond mean-field theory of a phase transition between a two-dimensional Z2 topological insulator phase and a trivial insulator that is driven by correlation effects. In addition to the Z2 invariant, we find that certain features of the single-particle Green's functions (simpler to compute than the full Z2 invariant) carry important information that are strongly indicative of a non-trivial Z2 topological character. We observe that the fluctuations originating from correlations tend to move the topological phase transition boundary to larger values of interactions.

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