

Abstract Submitted
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Topological insulators in the presence of interactions STEPHAN RACHEL, KARYN LE HUR, Department of Physics, Yale University — We study the behavior of topological insulators in the presence of interactions. As a paradigm, we consider the Haldane model subject to a standard Hubbard onsite term. The Haldane model consists of a nearest neighbor tight binding model on a honeycomb lattice plus second neighbor hopping accounting for intrinsic spin-orbit interaction. For strong interactions, the system develops a Mott gap and we derive an effective spin model by including the intrinsic spin-orbit interaction. In the weak-coupling limit, we thoroughly investigate the competition between the Dirac liquid phase and the topological insulator phase which is favored by the Haldane term. The stability of the topological insulator phase in the presence of the Hubbard term is discussed.

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