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Instabilities of quadratic band crossing points STEFAN UEBELACKER, CARSTEN HONERKAMP, RWTH Aachen University — The variation of the orbital composition of bands around band crossing points near the Fermi level can generate interesting effects. In particular, rather simple interactions can give rise to the spontaneous formation of topological insulating phases (S. Raghu et al., Phys. Rev. Lett. 100, 156401 (2008)). In contrast with Dirac points, quadratic band crossing points offer the advantage of a nonzero density of states at the crossing point, and instabilities occur already at small interaction strengths. Here, we present results of functional renormalization group calculations for models with a quadratic band crossing point and discuss the possibilities for nontrivial insulating phases induced by local interactions.

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