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Hybridization of surface states in thin films of topological insulators ROGER MONG, POUYAN GHAEMI, JOEL E. MOORE, U.C. Berkeley
— Recent theory and experiments have shown that 3D topological insulators have an odd number of Dirac fermions on their surfaces. The single Dirac cone in the simplest case is topologically protected and robust to impurities for a single surface. Here we consider the hybridization of surface states in a thin film due to their proximity, which opens a gap in the surface modes. We construct a low energy effective Hamiltonian in various cases to compute the surface structure. These thin films have recently been synthesized using molecular-beam epitaxy, and we use the effective Hamiltonian to discuss their possible applications.

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