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Nontrivial topological effects on the surface of strong and weak topological insulators and superconductors CHING-KAI CHIU, MICHAEL STONE, University of Illinois at Urbana-Champaign — We investigate states on the surface of strong or weak topological insulators and superconductors that have been gapped by a magnetic material or by a charge density wave. The surface of a strong 3D topological insulator gapped by a magnetic material is well known to possess a half quantum Hall effect. Furthermore, a recent paper (arXiv:1110.3420) showed that the surface of a weak 3D topological insulator gapped by charge density wave has a half quantum spin Hall effect. We generalize these results to all classes of topological insulator and superconductors. We find that if, in d-1 dimension and that symmetry class, there is a Z or Z_2 topological invariant, then the resulting surface state may have a nontrivial topological phase.

Ching-Kai Chiu
University of Illinois at Urbana-Champaign

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