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Gapped symmetric boundaries of topological insulators DUNG-HAI LEE, YUAN-MING LU, University of California, Berkeley — Topological insulators (TIs) are gapped quantum phases which host symmetry-protected gapless boundary excitations. On the other hand, the boundary states can be gapped by spontaneously breaking symmetry. We show that topological defects on the symmetry-broken boundary cannot proliferate due to their fractional statistics. A gapped symmetric boundary, however, can be achieved between a TI phase and certain fractionalized phase by condensing the bound state of a topological defect and an anyon. Such a hybrid structure containing TI and fractionalized phase generally support ground state degeneracy on torus.

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