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Accessing topological order in fractionalized liquids with gapped edges THOMAS IADECOLA, Boston University, TITUS NEUPERT, Princeton University, CLAUDIO CHAMON, Boston University, CHRISTOPHER MUDRY, Paul Scherrer Institute — We consider manifestations of topological order in time-reversal-symmetric fractional topological liquids (TRS-FTLs), defined on planar surfaces with holes. We derive a formula for the topological ground state degeneracy of such a TRS-FTL, which applies to cases where the edge modes on each boundary are fully gapped by appropriate backscattering terms. The degeneracy is exact in the limit of infinite system size, and is given by q^{N_h}, where N_h is the number of holes and q is an integer that is determined by the topological field theory. When the degeneracy is lifted by finite-size effects, the holes realize a system of N_h coupled spin-like q-state degrees of freedom. In particular, we provide examples where Z_q quantum clock models are realized on the low-energy manifold of states. We also investigate the possibility of measuring the topological ground state degeneracy with calorimetry.

Thomas Iadecola
Boston University

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