

Quotient Symmetry Protected Topological Phenomena and Quantum Criticality

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Topological phenomena are commonly studied in phases of matter which are separated from a trivial phase by an unavoidable quantum phase transition. This can be overly restrictive, leaving out scenarios of practical relevance—similar to the distinction between liquid water and vapor. We show that topological phenomena can be stable over a large part of parameter space even when the bulk is strictly speaking in a trivial phase of matter. In particular, we focus on symmetry-protected topological phases, which can be trivialized by extending the symmetry group. We demonstrate a direct continuous quantum phase transition can be stabilized by a quotient group that emerges as low-energy symmetry.