

Abstract Submitted
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Topological Response Theory of Abelian Symmetry-Protected Topological Phases in Two Dimensions MENG CHENG, Station Q, Microsoft Research, Santa Barbara, CA 93106, USA, ZHENG-CHENG GU, Perimeter Institute for Theoretical Physics, Waterloo, Ontario, N2L 2Y5 Canada — Symmetry-protected topological (SPT) phases in two-dimensions can be largely described by Chern-Simons topological field theories. We propose a topological response theory to uniquely identify the SPT orders, which allows us to obtain a systematic scheme to classify bosonic SPT phases with any finite Abelian symmetry group. We also apply the theory to fermionic SPT phases with Z_m symmetry and find the classification of SPT phases depends on the parity of m : for even m there are $2m$ classes, m out of which is intrinsically fermionic SPT phases and can not be realized in any bosonic system. We outline the general classification scheme for fermionic SPT phases in two dimensions.

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