

Abstract Submitted
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Boundary degeneracy of topological order states JUVEN WANG, XIAO-GANG WEN, MIT/Perimeter Institute — It is known that topological ordered states have degenerate ground states on compact space manifold. Its ground state degeneracy on higher genus Riemann surface is encoded by the fusion rules of the fractionalized quasiparticles and the genus number. Here we study topologically ordered states on space manifold with boundary. We find that Bulk-Edge correspondence is not a complete story - edge theory information may not be fully-determined by the bulk theory. Ground state degeneracy of boundary states depends on boundary gapping conditions. Take Abelian topological order as an example, K matrix Chern-Simons theory, the boundary ground state degeneracy counts the number of group elements in a discrete finite quotient group from anyon transport and fusion algebra. We compare this result to Toric code model, Levin-Wen string-net model and flux insertion argument. By glueing the edges of a non-compact manifold to make it compact, we go back to demonstrate bulk ground state degeneracy from edge theory viewpoint, in terms of the Betti number and homology group, such as 2+1 D Chern-Simons or higher dimensional B-F theory.

Juven Wang
MIT

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