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DELOCALIZATION OF BOUNDARY STATES IN DISORDERED TOPOLOGICAL INSULATORS

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Abstract:

We develop a method to characterize edge states of topological insulators directly in terms of their topological invariants. The method is powerful and works regardless of the presence of disorder and interactions. We apply this method to reproduce some known results, such as the structure of the edge states in one, two and three dimensions and the way they respond to disorder. Finally, we show that the absence of localization of the boundary modes of any topological insulator in any number of dimensions has a simple interpretation as a necessary condition for the existence of the boundary topological invariants.