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**Robustness of topological invariants: Implications for localization**

EMIL PRODAN, Physics Department, Yeshiva University — A class of bulk and edge topological invariants that includes the spin-Chern number has been recently shown to be robust against smooth deformations of the models and disorder [Phys. Rev. B **80**, 125327 (2009), J. Math. Phys. **50**, 083517 (2009), Journal of Phys. A: Math. Theor. **42** 082001 (2009), Journal of Phys. A: Math. Theor. **42**, 065207 (2009)]. Such topological invariants are useful for classifying the topological phases, but in some instances their robustness have non-trivial consequences for the localization of the bulk and edge states. For Integer Quantum Hall Effect, for example, the robustness of the Chern number implies existence of bulk states that resist localization. In this talk, I will discuss what topological invariants can tell us about the localization of the bulk and edge states in Quantum spin-Hall Insulators.

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