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On the stability of surface states in topological insulators YOUNG HOON MOON, LEONID ISAEV, GERARDO ORTIZ, Indiana University Bloomington — The existence of robust surface/edge states is arguably a fingerprint of topological insulators. These states are protected against scattering by time-reversal invariant perturbations, and lead to dissipationless transport even at high temperatures. This characteristic behavior is believed to be quite insensitive to the properties of the surface of a particular sample. We investigate the above conjecture by considering the stability of edge states with respect to the *time-reversal invariant* surface perturbations in several models of topological insulators. We demonstrate that in certain regimes the surface spectrum is modified quite dramatically. In particular, the number of edge states, which cross the Fermi level inside the bulk band gap, is very sensitive to the properties of the surface. Our results can be of great importance for future transport measurements in topological insulators.

Leonid Isaev
Indiana University Bloomington

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