Topological protection of bound states against the hybridization

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Localization of electronic wave functions is governed by their Topological nature as well as the symmetry and dimensionality of the system. An example is the surface states of three dimensional topological insulators, which are extended as long as the gap in the bulk remains. In this talk, I will discuss the opposite case; i.e. the topology protects the “localized states”. More explicitly, when the two-dimensional quantum Hall system is put on the three dimensional trivial insulator, the two dimensional states remain localized along the normal direction to the surface in spite of the hybridization with the continuum of extended states. The behavior of the edge channels is also discussed.

This work has been done in collaboration with B.J. Yang and M. S. Bahramy.