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The Even and Odd Chern Numbers for Disordered Topological Insulators[1] EMIL PRODAN, Physics Department, Yeshiva University, New York, NY, USA — The $K^0(M)$ group classifies the projectors and the $K^{-1}(M)$ classifies the unitaries defined over a manifold M. The even and the odd Chern numbers assign integers to the topological classes from $K^0(M)$ and $K^{-1}(M)$, respectively. If M is the Brillouin torus in various dimensions, the even and the odd Chern numbers become the classifying invariants for the A and AIII symmetry classes of Topological Insulators, respectively. For arbitrary (even/odd) dimension, we recently showed that these two invariants can be defined in the presence of strong disorder. Inspired by the Non-Commutative Geometry program, we were able to demonstrate that both invariants remain quantized and non-fluctuating as long as the Fermi level resides in a region of localized spectrum. The most direct consequence of this result is that *all* topological phases from A and AIII symmetry classes are surrounded by phase-boundaries harboring extended states. Summary of these results and phase diagrams of various disordered models from the A and AIII symmetry classes will be presented.

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