

Abstract Submitted
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Zero modes in the bulk of the Topological Insulators induced by disorder or dislocations DAVID SCHMELTZER, City College of New York — The enigma of the finite conductivity which comes from the bulk of the Topological Insulators (T.I.) is solved by showing that domain walls in the T.I. bind protected zero modes. We consider two scenarios: a)-Dislocations: -We solve the massive Dirac equation (which corresponds to the T.I. in four and two dimensions) in a curved space generated by the coordinates transformation induced by a single dislocation or a single disclination. We examine the condition for the protected zero modes caused by Torsion and Curvature. b) Disorder:-We use the Keldish formalism to study the effect of disorder and interaction of the T.I. We identify an effective Non-Linear Sigma model with a Maxwell and Chern-Simon term which correspond to the different phases: regular metal, regular insulator, topological insulator and protected metals.

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