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Why is the bulk resistivity of topological insulators so small? TIANRAN CHEN, BRIAN SKINNER, BORIS SHKLOVSKII, Fine Theoretical Physics Institute, University of Minnesota — As-grown topological insulators (TIs) are typically heavily-doped n-type crystals. Compensation by acceptors is used to move the Fermi level to the middle of the band gap, but even then TIs have a frustratingly small bulk resistivity. We show that this small resistivity is the result of band bending by poorly screened fluctuations in the random Coulomb potential. Using numerical simulations of a completely compensated TI, we find that the bulk resistivity has an activation energy of just 0.15 times the band gap, in good agreement with experimental data. At lower temperatures activated transport crosses over to variable range hopping with a relatively large localization length. **Reference:** B. Skinner, T. Chen, B. I. Shklovskii, *Phys. Rev. Lett.* **109**, 176801 (2012).

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