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Edge state transport in 2D topological insulators without inversion symmetry[1] YANG-ZHI CHOU, MATTHEW FOSTER, Department of Physics and Astronomy, Rice University, Houston, Texas 77005, USA — We investigate finite temperature transport within one and between two edges of a 2D Z_2 topological insulator. For experimentally relevant systems (e.g., HgTe and GaSb/InAs quantum wells), inelastic spin flip backscattering can occur in the absence of inversion symmetry. We use bosonization and the effective action formalism to compute the dc conductivity of helical Luttinger liquid edge states in the absence of inversion symmetry, due to interactions and disorder. These perturbations manifest as irrelevant operators that control the temperature dependence of the conductivity in a single edge. With respect to two edges, the importance of the inelastic mechanism and applications to Coulomb drag will be discussed.

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