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Effect of surface curvature on conductivity in 3D topological insulator CHANG-YU HOU, JAN DAHLHAUS, ANTON AKHMEROV, CARLO BEENAKKER, Institute-Lorentz, Leiden University — The surface spectrum of a three-dimensional (3D) topological insulator consists of massless Dirac fermions. Hence, an electron moving on a curved surface in a 3D topological insulator follows a geodesic trajectory, akin to a photon in curved space. In this work, we study electron scattering due to the surface roughness (defects) modeled as a curved surface. The resulting effect on conductivity is estimated using the Boltzmann Equation. This scattering mechanism leads to a distinguishable signature of the conductivity on the electron density.

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