

Magnetic Transport on Topological Insulator Surface

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Abstract

In this paper, we have investigated the transport properties of the Dirac fermions on a topological insulator surface in the presence of external electric and magnetic fields. For this reason, firstly, we obtain the eigen energies (or eigenvalues) by using the Dirac Hamiltonian of the system for transmitted electrons via the surface and the Lorentz transformations. The conductance of the system is calculated by Landauer equation. Also, the effects of electric and magnetic fields are investigated on the electric conductance and Fano factor properties. The application of the numerical results may be useful in the design of nanodevices based on molecular electronics

Keywords: Magnetic transport, Topologic insulator, Conductance, Electric Tunneling