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## Topological Edge States and Nonequilibrium Quantum Transport in One-Dimensional Topological Models: A Green's Function Approach

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This work presents an analytical Green's function study of one-dimensional topological models aimed at connecting their equilibrium spectral properties to nonequilibrium quantum transport. Working in the continuum limit, we derive exact expressions for the retarded Green's function of the bulk, the semi-infinite chain, and the finite chain, computing the Local Density of States (LDOS) in each geometry and tracing the progressive emergence of topologically protected boundary states, which are absent in the bulk spectrum. By this framework, we model a two-terminal junction consisting of a finite topological chain contacted by two normal metallic leads and using the Keldysh Non-Equilibrium Green Function formalism, we compute the transmission function and analyze the nonequilibrium transport properties of the junction. This work provides a fully analytical and unified framework connecting bulk topology, boundary spectral properties, and out-of-equilibrium current statistics in topological junctions.

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