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Majorana bound state signatures in current through quantum dots in the presence of electron-phonon coupling

In the present work, we study the Majorana bound states-induced transport properties of a quantum dot coupled to Majorana bound states located at the ends of a topological superconductor nanowire, where the localized electrons in the dot also interact with a single long-wave optical phonon mode. We used the canonical transformation combined with the nonequilibrium Green's function formalism in order to treat the electron-phonon interaction. The retarded Green's functions are calculated by employing the equation of motion method. The effect of electron-phonon interaction on transport properties of the system is analyzed in two cases, strong and weak electron-phonon interaction. In the case of strong electron-phonon interaction, the spectral function and differential conductance present well observable phonon-assisted satellite peaks.

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Biography

Levente Máthé has completed his BSc and MSc at Babeş-Bolyai University from Cluj-Napoca, Romania and is currently PhD student at the same university. He is working as Scientific Researcher at National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca. His research area is focused on quantum transport in mesoscopic systems, based on quantum dots, graphene and Majorana bound states.

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