Abstract Submitted
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Detecting Majorana bound states coupling with an Aharonov-Bohm interferometer[1] PEDRO ORELLANA, JUAN PABLO RAMOS ANDRADE, Universidad Técnica Federico Santa María, Valparaíso, Chile, SERGIO ULLOA, Ohio University, Athens, OH, USA — In this work we consider a quantum dot (QD) connected to current leads arranged to mediate the interaction between two topological nanowires, both hosting Majorana bound states (MBS) at their ends. In an interesting system geometry, one nanowire has both ends coupled with the QD, forming an Aharonov-Bohm (AB) interferometer, while the other is placed nearby such that two MBS belonging to different nanowires can interact. We model the system using an effective low energy Hamiltonian, considering that the QD is embedded between metallic leads. Using a Greens function formalism via the equation of motion procedure, we find that the conductance across the leads can show MBS signatures, i.e. half-maximum conductance at zero-energy, when both topological nanowires are connected, independent of the AB flux phase. This system may be used as a detector of the effective connections between independent MBS by monitoring the conductance while tuning the AB phase.

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