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Transport properties of interacting fermions in one-dimensional topological superconductors

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Abstract:

We study the transport properties of topological superconducting wires with an effective time reversal symmetry. In the presence of interactions, these fall into 8 distinct topological classes. As pointed out in a previous publication, all but the $n=4$ phase are topologically equivalent to non-interacting phases, and their transport properties readily follows from their non interacting analogs. Conversely, the $n=4$ was shown to be a true many body topological phase characterized by the formation of a topological Kondo resonance at its end. We calculate the conductance of the $n=4$ state in the low and high temperature limit. We show that the shot noise constitutes a clear experimental signature of the emergent topological Kondo resonance.