

Abstract Submitted
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Andreev Bound states in One Dimensional Topological Superconductor with Broken Spatial Inversion Symmetry¹ XIONG-JUN LIU, KAI SUN, SANKAR DAS SARMA², Joint Quantum Institute and Condensed Matter Theory Center, Department of Physics, University of Maryland, College Park, Maryland 20742 — We study the Andreev bound states (ABSs) at the Josephson junction of one dimensional topological superconductors (SC) when the spatial inversion symmetry (SIS) is broken. While in the absence of inversion symmetry, we show a hidden symmetry for the Bogoliubov de Gennes equations in the case of SC gap much smaller than Fermi energy in addition to the particle-hole symmetry, due to which the ABSs are predicted to carry irrational charge, with the charge value solely depending on the SIS breaking term, regardless of the details of the superconductor order parameter and whether the disorder scattering is present or not. We demonstrate that in the tunneling transport spectroscopy the irrationally charged ABSs are measured by the resonant differential tunneling conductance.

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