Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Conductance spectroscopy of nontopological-topological superconductor junctions[1] F. SETIAWAN, WILLIAM COLE, Condensed Matter Theory Center, Station Q Maryland, and Joint Quantum Institute, Department of Physics, University of Maryland, College Park — We calculate the zero-temperature differential conductance dI/dV of a voltage-biased one-dimensional junction between a nontopological and a topological superconductor for arbitrary junction transparency using the scattering matrix formalism. We consider two models for the topological superconductors: (i) spinful p-wave and (ii) s-wave with spin-orbit coupling and spin splitting. In the tunneling limit (small junction transparencies) where only single Andreev reflections contribute to the current, the conductance for voltages below the nontopological superconductor gap Δ_s is zero and there are two conductance peaks at $eV = \pm\Delta_s$ with the quantized value $(4-\pi)2e^2/h$ due to resonant Andreev reflection from the Majorana zero mode. However, when the junction transparency is not small, there is a finite conductance for $e|V| < \Delta_s$ arising from multiple Andreev reflections. The conductance at $eV = \pm\Delta_s$ in this case is no longer quantized. In general, the conductance is particle-hole asymmetric except for sufficiently small transparencies. We further show that, for certain values of parameters, the tunneling conductance of a zero-energy conventional Andreev bound state can resemble that of Majorana. Ref: Setiawan et. al. arXiv:1609.09086

[1]This work is in collaboration with Jay D. Sau and Sankar Das Sarma. This work is supported by Microsoft Station Q, LPS-MPO-CMTC, and JQI-NSF-PFC.

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Date submitted: 10 Nov 2016 Electronic form version 1.4