

Abstract Submitted
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Tunneling spectroscopy of a spiral Luttinger liquid in contact with superconductors¹ DONG E. LIU, ALEX LEVCHENKO, Department of Physics and Astronomy, Michigan State University — One-dimensional wires with Rashba spin-orbit coupling, magnetic field, and strong electron-electron interactions are described by a spiral Luttinger liquid model. We develop a theory to investigate the tunneling density of states into a spiral Luttinger liquid in contact with superconductors at its two ends. This approach provides a way to disentangle the delicate interplay between superconducting correlations and strong electron interactions. If the wire-superconductor boundary is dominated by Andreev reflection, we find that in the vicinity of the interface the zero-bias tunneling anomaly reveals a power law enhancement with the unusual exponent. This zero-bias due to Andreev reflections may coexist and thus mask possible peak due to Majorana bound states. Far away from the interface strong correlations inherent to the Luttinger liquid prevail and restore conventional suppression of the tunneling density of states at the Fermi level, which acquires a Friedel-like oscillatory envelope with the period renormalized by the strength of the interaction.

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Dong E. Liu
Department of Physics and Astronomy, Michigan State University

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