Energy Partitioning of Tunneling Currents into Luttinger Liquids
TORSTEN KARZIG, GIL REFAEL, California Institute of Technology, LEONID I. GLAZMAN, Yale University, FELIX VON OPPEN, Freie Universität Berlin, Dahlem Center for Complex Quantum Systems — Tunneling of electrons of definite chirality into a quantum wire creates counterpropagating excitations, carrying both charge and energy. We find that the partitioning of energy is qualitatively different from that of charge. The partition ratio of energy depends on the excess energy of the tunneling electrons (controlled by the applied bias) and on the interaction strength within the wire (characterized by the Luttinger-liquid parameter $K$), while the partitioning of charge is fully determined by $K$. Moreover, unlike for charge currents, the partitioning of energy current should manifest itself in dc experiments on wires contacted by conventional (Fermi-liquid) leads.

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