

Abstract Submitted  
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**Nonequilibrium electron spectroscopy of Luttinger liquids** SO TAKEI, MIRCO MILLETARI, BERND ROSENOW, Max Planck Institute for Solid State Research — We theoretically study a Luttinger liquid (LL) driven out of equilibrium by injection of high-energy electrons. The electrons enter the LL locally, far away from any contacts, and at a fixed energy. Their spectral properties are detected at another spatial point some distance away by evaluating the average tunneling current from the LL into a resonant level with tunable energy. For energies slightly below the injection energy, the dependence of the detected current on the difference between injection and detection energies is described by a power law whose exponent depends continuously on the Luttinger parameter. In contrast, for tunneling into the chiral LL edge of a fractional quantum Hall state from the Laughlin sequence, we find that the detected current grows linearly with the energy difference, independent of the LL parameter determined by the inverse filling fraction. We develop a diagrammatic approach for the standard (non-chiral) LL which provides an intuitive physical picture for how the electrons can relax inside the wire.

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