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Conductance of Tomonaga-Luttinger liquid wires and junctions with resistances DIPTIMAN SEN, ABHIRAM SOORI, Indian Institute of Science, Bangalore — We study the effect that resistive regions have on the conductance of a quantum wire with interacting electrons which is connected to Fermi liquid leads. Using the bosonization formalism and a Rayleigh dissipation function to model the power dissipation, we use Green's function techniques to derive the DC conductance. The resistive regions are generally found to lead to incoherent transport. For a single wire, we find that the resistance adds in series to the contact resistance of e^2/h for spinless electrons, and the total resistance is independent of the Luttinger parameter K_W of the wire. We numerically solve the bosonic equations to illustrate what happens when a charge density pulse is incident on the wire; the results depend on the parameters of the resistive and interaction regions in interesting ways. For a junction of Tomonaga-Luttinger liquid wires, we use a dissipationless current splitting matrix to model the junction. For a three-wire junction, there are two families of such matrices; we find that the conductance matrix depends on K_W for one family but is independent of K_W for the other family.

Diptiman Sen
Indian Institute of Science, Bangalore

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