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Transport in partially equilibrated inhomogeneous quantum wires¹ ALEX LEVCHENKO, Argonne National Laboratory, TOBIAS MICKLITZ, Freie Universitat Berlin, JEROME RECH, Centre de Physique Theorique Marseille, KONSTANTIN MATVEEV, Argonne National Laboratory — We study transport properties of weakly interacting one-dimensional electron systems including on an equal footing thermal equilibration due to three-particle collisions and the effects of large-scale inhomogeneities. We show that equilibration in an inhomogeneous quantum wire is characterized by the competition of interaction processes which reduce the electrons total momentum and such which change the number of right- and left-moving electrons. We find that the combined effect of interactions and inhomogeneities can dramatically increase the resistance of the wire. In addition, we find that the interactions strongly affect the thermoelectric properties of inhomogeneous wires and calculate their thermal conductance, thermopower, and Peltier coefficient.

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