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The noise thermal impedance of a diffusive wire BERTRAND REULET, DANIEL PROBER, Yale University — The current noise density S_2 of a conductor at equilibrium is determined by its temperature T: $S_2 = 4k_BTG$ with G the conductance (Johnson noise). The noise temperature $T_N = S_2/(4k_BG)$ generalizes T for a system even out of equilibrium. We introduce the noise thermal impedance of a sample as the amplitude of the oscillation of T_N when heated by an ac power. It is the usual thermal impedance for a macroscopic sample. We show for a diffusive wire, how this (complex) frequency-dependent quantity gives access to the electron-phonon interaction time in a long wire and to the diffusion time in a shorter one, and how its real part may also give access to the electron-electron interaction time. We will also present experimental results in various limits.

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