Quantum diffusion and entropy production: An exactly solvable model WIM MAGNUS, IMEC / Universiteit Antwerpen, KWINTEN NELISSEN, Universiteit Antwerpen, UA, DEPT. PHYSICS, CONDENSED MATTER THEORY TEAM, IMEC MODELING, SIMULATION AND PHYSICS GROUP TEAM — An exact, analytical solution of a simple, quantum mechanical model describing diffusion currents flowing between two fermion reservoirs is presented. The quantum fluctuations characterizing the transient diffusion current and entropy production are explicitly shown, whereas the long-time behavior of the fermion densities is determined by a power law. The interaction Hamiltonian defining the coupling between the reservoirs is related to fermions hopping between real space sites.

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