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Scaling of electrical and thermal conductivities in an almost integrable chain JOEL MOORE, CHRISTOPH KARRASCH, UC Berkeley and Lawrence Berkeley National Laboratory, RONI ILAN, UC Berkeley — Many low-dimensional materials are well described by integrable one-dimensional models such as the Hubbard model of electrons or the Heisenberg model of spins. However, the small perturbations to these models required to describe real materials are expected to have singular effects on transport quantities: integrable models often support dissipationless transport, while weak non-integrable terms lead to finite conductivities. We use translation-invariant matrix-product-state methods to obtain quantitative values of electrical and thermal conductivities in an almost integrable chain (an XXZ spin chain with staggered fields, or equivalently a spinless fermion chain with staggered on-site potentials).

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