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Nonequilibrium steady-states for some interacting particle systems.

In this talk I will present our recent results on non-equilibrium steady states (NESS) for a class of microscopic heat conduction models, in which energy exchange among particles is mediated by a lattice of “energy tanks”. Those heat conduction models are derived from billiards-like mechanical chain models (Eckmann & Young 2006) by randomizing certain chaotic quantities. We proved various rigorous results including the existence and uniqueness of NESS, the exponential convergence towards NESS, and the slow (polynomial) mixing phenomenon under some relaxed conditions. (Received January 19, 2015)