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Polynomial convergence rate to nonequilibrium steady state

In this talk I will present my recent result about the ergodic properties of nonequilibrium steady-state (NESS) for a stochastic energy exchange model. The energy exchange model is numerically reduced from a billiards-like deterministic particle system that models the microscopic heat conduction in a 1D chain. By using some new techniques, we proved the existence, uniqueness, polynomial speed of convergence to the NESS, and polynomial speed of mixing for the stochastic energy exchange model. All of these are consistent with the numerical simulation results of the original deterministic billiards-like system.