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Non-equilibrium relaxation between two quasi-stationary states in a stochastic lattice Lotka-Volterra model[1] SHENG CHEN, UWE C. TÄUBER, Department of Physics, Virginia Tech — Spatially extended stochastic models for predator-prey competition and coexistence display complex, correlated spatio-temporal structures and are governed by remarkably large fluctuations. Both populations are characterized by damped erratic oscillations whose properties are governed by the reaction rates. Here, we specifically study a stochastic lattice Lotka-Volterra model by means of Monte Carlo simulations that impose spatial restrictions on the number of occupants per site. The system tends to relax into a quasi-stationary state, independent of the imposed initial conditions. We investigate the non-equilibrium relaxation between two such quasi-stationary states, following an instantaneous change of the predation rate. The ensuing relaxation times are measured via the peak width of the population density Fourier transforms. As expected, we find that the initial state only influences the oscillations for the duration of this relaxation time, implying that the system quickly loses any memory of the initial configuration.

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