

Abstract Submitted
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Non-equilibrium relaxation in a two-dimensional stochastic lattice¹ SHENG CHEN, UWE C. TUBER, Department of Physics, Virginia Tech — We study a stochastic Lotka- Volterra model on a two-dimensional square lattice with periodic boundary conditions. This spatially extended stochastic model for predator-prey competition and coexistence displays complex, correlated spatio-temporal structures and is governed by large fluctuations. The system tends to quickly relax into a quasi-stationary state. If the local prey carrying capacity is finite, there emerges an extinction threshold for the predator population at a critical value of the predation rate. We investigate the non-equilibrium relaxation in the vicinity of this critical point. We obtain a power law dependence between the relaxation time and predation rate (critical slowing down), and numerically determine the associated critical exponents. Following a sudden predation rate change to its critical value, one observes critical aging with a universal scaling exponent.

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