Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Responses of many-species predator-prey systems to perturbations[1] SHADI ESMAILY, MICHEL PLEIMLING, Virginia Tech — We study the responses of many-species predator-prey systems, both in the well-mixed case as well as on a two-dimensional lattice, to permanent and transient perturbations. In the case of a weak transient perturbation the system returns to the original steady state, whereas a permanent perturbation pushes the system into a new steady state. Using Monte Carlo simulations, we monitor the approach to stationarity after a perturbation through a variety of quantities, as for example time-dependent particle densities and correlation functions. Different types of perturbations are studied, ranging from a change in reaction rates to the injection of additional individuals into the system, the latter perturbation mimicking immigration.

[1]This work is supported by the US National Science Foundation through grant DMR-1205309.

Michel Pleimling
Virginia Tech

Date submitted: 10 Nov 2014 Electronic form version 1.4