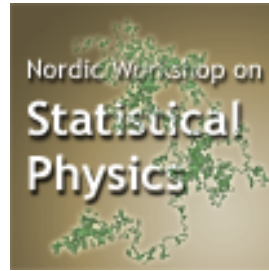


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Aging dynamics in ant societies

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In recent experiments (Richardson et al. (2010), PLoS ONE 5(3): e9621. doi:10.1371/journal.pone.0009621) ant motion out of the nest is shown to be a non-stationary process intriguingly similar to the so called *aging* dynamics, of physical glassy systems. Under different conditions, (Nouvellet et al.(2010), Journal of Theoretical Biology 266, 573) the same exit process is well described by a Poisson process. To investigate possible mechanisms producing both types of behavior, a model is introduced where interacting agents, e.g. ants, move from one site to a neighbor site on a finite 2D lattice. The probability of each move is determined by the ensuing changes of a utility function conventionally dubbed 'energy'. The latter is a sum of pairwise interactions between agents, weighted by distance. Depending on how the interactions are defined and on a control parameter dubbed 'temperature', the dynamics either quickly converges to a stationary state, where movements are a standard Poisson process, or may enter a non-stationary aging regime, where exits can be described in the way suggested by Richardson et al., i.e. as a Poisson process in logarithmic time, for short a log-Poisson process.

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