

M A T H E M A T I C A L P H Y S I C S S E M I N A R

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Transitions in mean field active rotator systems

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Abstract

The large scale behavior of a system of many interacting finite dimensional stochastic dynamical systems may be very difficult to predict by looking at the dynamics of the isolated systems and part of this difficulty comes from the fact that these systems are typically non reversible. We attack this issue by considering active rotators with mean field interactions. By 'active rotators' we mean that the dynamics of the isolated rotator is non-trivial. Our approach is based on the precise control we have on the inactive case, which is reversible, and on the fact that for this reference case we can identify a normally hyperbolic invariant manifold: the robustness of such a structure under a large class of perturbations allows a detailed analysis of the active case, at least for weak activity.