

Underlying deterministic dynamics in noisy systems

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Abstract

The main emphasis of this paper is on interactions of low-dimensional deterministic structures with stochastic perturbations. Low-dimensional stochastic models are utilized to study the influence of noise on heteroclinic cycles in the underlying deterministic dynamics. As the magnitude of the noise is increased, the system undergoes a series of “stochastic” bifurcations described by changes in various stochastic quantities of the dynamic variables. The role of underlying deterministic structures for large perturbations will receive particular attention.