



Universidad
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Higher-order averaging of linear Fokker-Planck equations

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Abstract

Energy dynamics of stochastic Hamiltonian systems can be investigated by the method of stochastic averaging. If the mechanical system is under additional periodic forcing, say friction, the energy dynamics and equilibria will change. These small deviations in energy cannot be captured by classical stochastic averaging. We present a method of higher-order averaging based on an asymptotic expansion of equilibria, which is able to (numerically) generate averages in the subtle limit of small noise and small friction. The influence of periodic forcing will become visible only to second order. We present our method and its results for standard oscillators as well as an application to fiber dynamics.

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