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Limit Cycles with Random Perturbations Involving Fast Switching and Small Diffusion.

This talk focuses on multi-scale stochastic systems. The motivation is to treat limit cycles under random perturbations involving fast random switching and small diffusion, which are represented by the use of two small parameters. Associated with the underlying systems, there are averaged or limit systems. Suppose that for each pair of the parameters, the solution of the corresponding equation has an invariant measure $\mu^{\varepsilon,\delta}$, and that the averaged equation has a limit cycle in which there is an averaged occupation measure μ^0 for the averaged equation. We prove that $\mu^{\varepsilon,\delta}$ converges to μ^0 as $\varepsilon \rightarrow 0$ and $\delta \rightarrow 0$ under suitable conditions. We also examine application to a stochastic predator-prey model. In addition, some numerical examples will also be reported. (Received January 22, 2015)