RANDOM PERIODIC SOLUTIONS

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Abstract: In this talk, I will talk about the random periodic solution of stochastic dynamical systems, generated by stochastic differential equations or random mappings. We study the existence of random periodic solutions for semilinear stochastic differential equations. We identify them as the solutions of coupled forward-backward infinite horizon stochastic integral equations in general cases. We then use the argument of the relative compactness of Wiener-Sobolev spaces in $C^0([0,T], L^2(\Omega))$ and generalized Schauder's fixed point theorem to prove the existence of a solution of the coupled stochastic forward-backward infinite horizon integral equations. The results are also valid for stationary solutions as a special case when the period τ can take an arbitrary number. For random logistic mapping, we obtain the existence and stability of stationary solution and random periodic solution of periodic 2. This is talk is based recent works with Feng, Lian, Zheng and Zhou.