Stochastic resonance in stochastic PDEs

Rita Nader*[1]

[1]Institut Denis Poisson – Université d'Orléans : UMR7013, CNRS : UMR7013 – France

Résumé

We consider stochastic partial differential equations (SPDEs) on the one-dimensional torus, driven by space-time white noise, and with a time-periodic drift term, which vanishes on two stable and one unstable equilibrium branches. Each of the stable branches approaches the unstable one once per period. We prove that there exists a critical noise intensity, depending on the forcing period and on the minimal distance between equilibrium branches, such that the probability that solutions of the SPDE make transitions between stable equilibria is exponentially small for subcritical noise intensity, while they happen with probability exponentially close to 1 for supercritical noise intensity. Concentration estimates of solutions are given in the $Hˆs$ Sobolev norm for any $s< 1 2$.$Theresultsgeneralisetoaninfinite−dimensionalsettingthoseobtainedfor1−dimensionalSDE

*Intervenant