Title On ergodic properties of a diffusion with switching

Abstract

A multidimensional diffusion is considered with coefficients modulated by a Markov chain. There are two regimes for the diffusion component conditioned on the state of this Markov chain, one ergodic and one transient. A positive recurrence of the diffusion is established under appropriate assumptions. As a corollary, convergence in total variation towards the unique invariant measure is derived for the whole system of an SDE combined with a Markov chain. If time allows, some further features of this system may be discussed.