

Nonequilibrium Transitions Driven by External Dichotomous Noise

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The stationary probability density P_s for a class of nonlinear one-dimensional models driven by a dichotomous Markovian process (DMP) I_t can be calculated explicitly. For the specific case of the Stratonovich model, $\dot{x} = ax - x^3 + I_t x$, the qualitative shape of P_s and its support is discussed in the whole parameter region. The location of the maxima of P_s shows a behavior similar to order parameters in continuous phase transitions. The possibility of a noise-induced change from continuous to a discontinuous transition in an extended model, in which the DMP couples also to the cubic term, is discussed. The time-dependent moments $\langle x_t^n \rangle$ can be represented as an infinite series of terms, which are determined by a recursion formula. For negative even moments the series terminates and the long-time behavior can be obtained analytically. As a function of the physical parameters, qualitative changes of this behavior may occur which can be partially related to the behavior of P_s . All results reproduce those for Gaussian white noise in the corresponding limit. The influence of the finite correlation time and the discreteness of the space of states of the DMP are discussed. An extensive list of references is contained in U. Behn, K. Schiele, and A. Teubel, *Wiss. Z. Karl-Marx-Univ. Leipzig, Mathem.-Naturwiss. R.* **34**:602 (1985).

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