# M.I. Freidlin
# A.D. Wentzell

# Random Perturbations of Dynamical Systems

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**Mark I. Frejdlin,Matthias Weber**

**Random Perturbations Of Dynamical Systems:**

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distribution for a given initial point and a time scale is identical to the idea of metastability that the stochastic resonance is a manifestation of metastability and that the theory of this effect is a part of the large deviation theory The reader will also find new comments on the notion of quasi potential that the authors introduced more than forty years ago and new references to recent papers in which the proofs of some conjectures included in previous editions have been obtained Apart from the above mentioned changes the main innovations in the 3rd edition concern the averaging principle A new Section on deterministic perturbations of one degree of freedom systems was added in Chapter 8 It is shown there that pure deterministic perturbations of an oscillator may lead to a stochastic in a certain sense long time behavior of the system if the corresponding Hamiltonian has saddle points The usefulness of a joint consideration of classical theory of deterministic perturbations together with stochastic perturbations is illustrated in this section Also a new Chapter 9 has been inserted in which deterministic and stochastic perturbations of systems with many degrees of freedom are considered Because of the resonances stochastic regularization in this case is even more important **Random Perturbations of Dynamical Systems** Yuri Kifer,1988-05-01 Random Perturbations of Dynamical Systems M. I. Freidlin,A. D. Wentzell,2012-03-18 Asymptotical problems have always played an important role in probability theory In classical probability theory dealing mainly with sequences of independent variables theorems of the type of laws of large numbers theorems of the type of the central limit theorem and theorems on large deviations constitute a major part of all investigations In recent years when random processes have become the main subject of study asymptotic investigations have continued to playa major role We can say that in the theory of random processes such investigations play an even greater role than in classical probability theory because it is apparently impossible to obtain simple exact formulas in problems connected with large classes of random processes Asymptotical investigations in the theory of random processes include results of the types of both the laws of large numbers and the central limit theorem and in the past decade theorems on large deviations Of course all these problems have acquired new aspects and new interpretations in the theory of random processes Fluktuatsii V Dinamicheskikh Sistemakh Pod Deistviem Malykh Sluchainykh Vozmushchenii Mark Iosifovich Freĭdlin,Alexander D. Wentzell,Joseph Szücs,1984 *Random Perturbations of Dynamical Systems* M. I. Freidlin,A. D. Wentzell,1983-10-24 Asymptotical problems have always played an important role in probability theory In classical probability theory dealing mainly with sequences of independent variables theorems of the type of laws of large numbers theorems of the type of the central limit theorem and theorems on large deviations constitute a major part of all investigations In recent years when random processes have become the main subject of study asymptotic investigations have continued to playa major role We can say that in the theory of random processes such investigations play an even greater role than in classical probability theory because it is apparently impossible to obtain simple exact formulas in problems connected with large classes of random processes Asymptotical investigations in the theory of random processes include results of the types of both the laws

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