1. Record Nr. UNISA996418186803316

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Titolo	Asymptotic Analysis of Unstable Solutions of Stochastic Differential Equations [[electronic resource] /] / by Grigorij Kulinich, Svitlana Kushnirenko, Yuliya Mishura
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2020
ISBN	3-030-41291-1
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (XV, 240 p. 4 illus., 2 illus. in color.)
Collana	Bocconi & Springer Series, Mathematics, Statistics, Finance and Economics, , 2039-1471 ; ; 9
Disciplina	519.2
Soggetti	Probabilities Dynamics Ergodic theory Differential equations Functional analysis Partial differential equations Probability Theory and Stochastic Processes Dynamical Systems and Ergodic Theory Ordinary Differential Equations Functional Analysis Partial Differential Equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction to Unstable Processes and Their Asymptotic Behavior -- Convergence of Unstable Solutions of SDEs to Homogeneous Markov Processes with Discontinuous Transition Density -- Asymptotic Analysis of Equations with Ergodic and Stochastically Unstable Solutions -- Asymptotic Behavior of Integral Functionals of Stochastically Unstable Solutions -- Asymptotic Behavior of Homogeneous Additive Functionals Defined on the Solutions of Itô SDEs with Non-regular Dependence on a Parameter -- Asymptotic Behavior of Homogeneous Additive Functionals of the Solutions to Inhomogeneous Itô SDEs with Non-regular Dependence on a Parameter -- A Selected Facts and

Auxiliary Results -- References.

Sommario/riassunto

This book is devoted to unstable solutions of stochastic differential equations (SDEs). Despite the huge interest in the theory of SDEs, this book is the first to present a systematic study of the instability and asymptotic behavior of the corresponding unstable stochastic systems. The limit theorems contained in the book are not merely of purely mathematical value; rather, they also have practical value. Instability or violations of stability are noted in many phenomena, and the authors attempt to apply mathematical and stochastic methods to deal with them. The main goals include exploration of Brownian motion in environments with anomalies and study of the motion of the Brownian particle in layered media. A fairly wide class of continuous Markov processes is obtained in the limit. It includes Markov processes with discontinuous transition densities, processes that are not solutions of any Itô's SDEs, and the Bessel diffusion process. The book is self-contained, with presentation of definitions and auxiliary results in an Appendix. It will be of value for specialists in stochastic analysis and SDEs, as well as for researchers in other fields who deal with unstable systems and practitioners who apply stochastic models to describe phenomena of instability. .