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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	General Introduction -- Stochastic Invariant Manifolds: Background and Main Contributions -- Preliminaries -- Stochastic Evolution Equations -- Random Dynamical Systems -- Cohomologous Cocycles and Random Evolution Equations -- Linearized Stochastic Flow and Related Estimates -- Existence and Attraction Properties of Global Stochastic Invariant Manifolds -- Existence and Smoothness of Global Stochastic Invariant Manifolds -- Asymptotic Completeness of Stochastic Invariant Manifolds -- Local Stochastic Invariant Manifolds: Preparation to Critical Manifolds -- Local Stochastic Critical Manifolds: Existence and

Approximation Formulas -- Standing Hypotheses -- Existence of Local Stochastic Critical Manifolds -- Approximation of Local Stochastic Critical Manifolds -- Proofs of Theorem 6.1 and Corollary 6.1 -- Approximation of Stochastic Hyperbolic Invariant Manifolds -- A Classical and Mild Solutions of the Transformed RPDE -- B Proof of Theorem 4.1 -- References.

Sommario/riassunto

This first volume is concerned with the analytic derivation of explicit formulas for the leading-order Taylor approximations of (local) stochastic invariant manifolds associated with a broad class of nonlinear stochastic partial differential equations. These approximations take the form of Lyapunov-Perron integrals, which are further characterized in Volume II as pullback limits associated with some partially coupled backward-forward systems. This pullback characterization provides a useful interpretation of the corresponding approximating manifolds and leads to a simple framework that unifies some other approximation approaches in the literature. A self-contained survey is also included on the existence and attraction of one-parameter families of stochastic invariant manifolds, from the point of view of the theory of random dynamical systems.
