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Nota di contenuto	The approximation and the generation of stationary vector processes -- Numerical methods and mathematical aspects for simulation of homogeneous and non homogeneous gaussian vector fields -- Simulation of stochastic differential systems -- Lyapunov exponents indicate stability and detect stochastic bifurcations -- Pitchfork and Hopf bifurcations in stochastic systems — Effective methods to calculate Lyapunov exponents -- Stochastic center as a tool in a stochastic bifurcation theory -- Lyapunov exponents for a class of hyperbolic random equations -- Functional analysis in stochastic modelling -- Pullback of measures and singular conditioning -- Adaptive sub-optimal parametric control for non-linear stochastic systems. Application to semi-active isolators -- Optimal ergodic

control of nonlinear stochastic systems -- Stochastic dynamics of hysteretic media -- Exact steady-state solution of FKP equation in higher dimension for a class of non linear Hamiltonian dissipative dynamical systems excited by Gaussian white noise -- Power spectra of nonlinear dynamic systems — Analysis via generalized Hermite polynomials -- Some remarks concerning convergence of orthogonal polynomial expansions -- Un Solveur de Wiener Rapide: Résolution des Systèmes de Toeplitz par une Méthode de Gradient Conjugué Préconditionné.

Sommario/riassunto

This book is an outcome of a European collaboration on applications of stochastical methods to problems of science and engineering. The articles present methods allowing concrete calculations without neglecting the mathematical foundations. They address physicists and engineers interested in scientific computation and simulation techniques. In particular the volume covers: simulation, stability theory, Lyapounov exponents, stochastic modelling, statistics on trajectories, parametric stochastic control, Fokker Planck equations, and Wiener filtering.