
Zbl 1198.60005**Holden, Helge; Øksendal, Bernt; Ubøe, Jan; Zhang, Tusheng****Stochastic partial differential equations. A modeling, white noise functional approach. 2nd ed.**

Universitext. New York, NY: Springer (ISBN 978-0-387-89487-4/pbk; 978-0-387-89488-1/ebook). xv, 305 p. EUR 59.95; SFR 93.50 (2010).

This book is the second edition of [*H. Holden, B. Øksendal, J. Ubøe, T. Zhang*, Stochastic partial differential equations. A modeling, white noise functional approach. Probability and Its Applications. Basel: Birkhäuser. (1996; Zbl 0860.60045)] that presents an approach to solve Stochastic Partial Differential Equations (SPDEs) via white noise. In this framework it is possible to derive explicit solutions and regularity results for a large class of Stochastic Differential Equations (SDEs) and SPDEs.

The first four chapters (except one section in chapter three) are the same as in the first edition. An introduction to the white noise theory is followed by applications of this theory to SDEs and SPDEs with Gaussian noise. There is an additional section in chapter three that presents a result of *A. Lanconelli* and *F. Proske* [*Infin. Dimens. Anal. Quantum Probab. Relat. Top.* 7, No. 3, 437–447 (2004; Zbl 1050.60065)] for general (nonlinear) SDEs including explicit solution formulas using the white noise framework.

Also new is chapter five with a generalization of this solution concept to square integrable Lévy processes. In a first step white noise theory is developed along the lines of the Gaussian case. In the same way as in chapter four this is then used to get existence, uniqueness and regularity results for the Stochastic Poisson equation with Lévy noise as well as an explicit solution formula. Similar results are obtained for the stochastic wave equation and the stochastic heat equation.

*Claudia Hein (Berlin)**Classification:* 60-02 60H15 60H40*Keywords:* Stochastic Partial Differential Equations; SPDEs; White noise; Wiener-Itô chaos expansion; Hermite Polynomials; Stochastic Poisson Equation; Stochastic Wave Equation; Stochastic Heat Equation; Lévy Processes

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