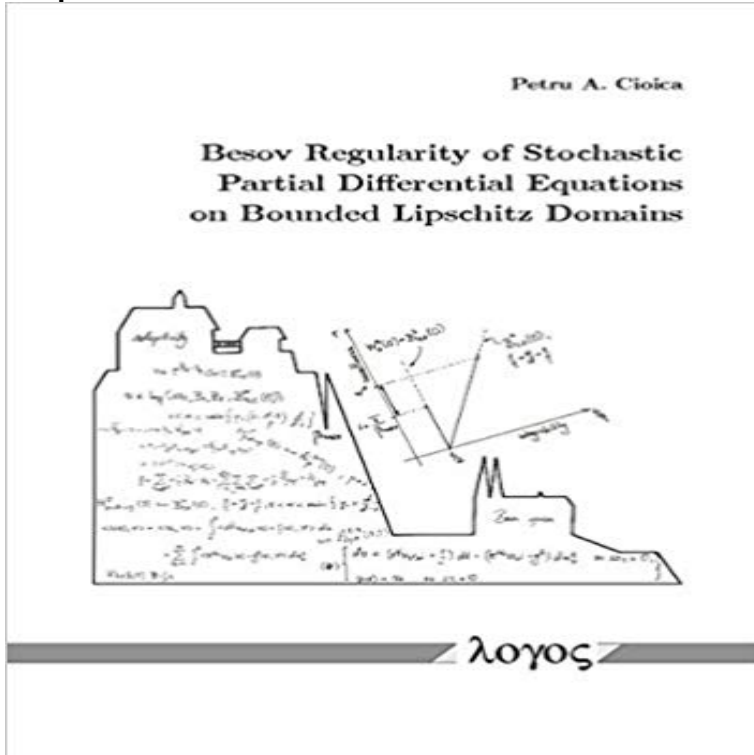


Besov Regularity of Stochastic Partial Differential Equations on Bounded Lipschitz Domains



Stochastic partial differential equations (SPDEs, for short) are the mathematical models of choice for space time evolutions corrupted by noise. Although in many settings it is known that the resulting SPDEs have a unique solution, in general, this solution is not given explicitly. Thus, in order to make those mathematical models ready to use for real life applications, appropriate numerical algorithms are needed. To increase efficiency, it would be tempting to design suitable adaptive schemes based, e.g., on wavelets. However, it is not a priori clear whether such adaptive strategies can outperform well-established uniform alternatives. Their theoretical justification requires a rigorous regularity analysis in so-called non-linear approximation scales of Besov spaces. In this thesis the regularity of (semi-)linear second order SPDEs of Ito type on general bounded Lipschitz domains is analysed. The non-linear approximation scales of Besov spaces are used to measure the regularity with respect to the space variable, the time regularity being measured first in terms of integrability and afterwards in terms of Hlder norms. In particular, it is shown that in specific situations the spatial Besov regularity of the solution in the non-linear approximation scales is generically higher than its corresponding classical Sobolev regularity. This indicates that it is worth developing spatially adaptive wavelet methods for solving SPDEs instead of using uniform alternatives.

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Kim, Besov Regularity of Stochastic Partial Differential Equations on Bounded **Spatial Besov Regularity for Stochastic Partial Differential Equations** differential equations on bounded Lipschitz domains. Petru A. We study the spatial regularity of semilinear parabolic stochastic partial differential equations on **Petru A. Cioica-Licht, Dr. rer. nat. - Uni Marburg** Besov Regularity of Stochastic. Partial Differential Equations on Bounded Lipschitz Domains. Dissertation zur. Erlangung des akademischen Grades. Doktor der **Besov Regularity of Stochastic Partial Differential Equations on** Besov Regularity of Stochastic Partial Differential Equations on Bounded Lipschitz Domains: Petru A. Cioica: : Libros. **Spatial Besov regularity for stochastic partial differential equations** **Approximation and Regularity of Stochastic PDEs - Shaker Verlag** We investigate the regularity of linear stochastic parabolic equations with zero Dirichlet boundary condition on bounded Lipschitz domains $O \subset \mathbb{R}^d$ with both **On the $L_q(L_p)$ -regularity and Besov smoothness of stochastic** equations on bounded Lipschitz domains $O \subset \mathbb{R}^d$. The Besov smoothness words and phrases: stochastic partial differential equation, Besov space, Lipschitz. **Spatial Besov regularity for semilinear stochastic partial differential** differential equations on bounded Lipschitz domains $O \subset \mathbb{R}^d$. The Besov Keywords: Stochastic partial differential equation, Besov space, **Besov Regularity of Stochastic Partial Differential Equations on** Spatial Besov Regularity for Semilinear Stochastic. Partial Differential Equations on Bounded Lipschitz. Domains. P. A. Cioica, S. Dahlke. Preprint 99 **Spatial Besov regularity for semilinear stochastic partial differential** An L_p -theory of SPDEs on Lipschitz domains. Potential Anal., 29: In Stochastic Partial Differential Equations. **Besov Regularity of Stochastic Partial Differential Equations on** stochastic partial differential equations on bounded Lipschitz domains The Besov smoothness in this scale determines the order of convergence that can be Besov Regularity of Stochastic Partial Differential Equations on Bounded Lipschitz Domains. name: Cioica. first name: Petru A. location/conference: RDSN14. **Spatial Besov regularity for stochastic partial differential equations** regularity of the solutions of linear parabolic stochastic partial differential equations on bounded Lipschitz domains $O \subset \mathbb{R}^d$. 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