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INTRODUCTION TO THE BROWN UNIVERSITY WORKSHOP PAPERS

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On October 20–22, 2006, a workshop on Advances and Challenges in the Solution of Stochastic Partial Differential Equations was hosted by the Division of Applied Mathematics at Brown University. Owing to applications in very diverse areas, stochastic partial differential equations now attract the interest of many researchers from mathematics, engineering and other sciences. Problems of approximation and numerical analysis for these processes are very difficult, but also very important. The goal of the conference was to bring together researchers well versed in the theoretical aspects and researchers whose principal interests are in algorithmic and modeling issues.

The next five papers represent some of the topics that were presented at the conference.

The paper by Lototsky and Stemmann considers the difficult problem of constructing solutions when a partial differential equation is driven by noise that is not white but rather correlated in the time variable. It also develops approximations to the solution that are based on a chaos expansion.

The short survey paper of Øksendal likewise considers equations driven by a nonstandard process, but in this case the process is multiparameter Lévy white noise.

The papers of Kotelenez and Birnir are concerned with issues related to modeling, with the former author considering limit theorems for large systems of particles in the many particle limit, and the latter focusing on formulation and qualitative properties of a one-dimensional model for turbulent flow in a river.

The final contribution by Ewald and Temam considers numerical approximation of the paths of solutions to stochastic (ordinary) differential equations, and in particular discusses the performance of an Adams-Bashforth type scheme for these problems.

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