Stochastic systems: uncertainty quantification and propagation

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Abstrak

The solution of stochastic equations poses notable technical difficulties that are frequently circumvented by heuristic assumptions at the expense of accuracy and rigor. The main objective of Stochastic Systems is to promoting the development of accurate and efficient methods for solving stochastic equations and to foster interactions between engineers, scientists, and mathematicians. To achieve these objectives Stochastic Systems presents, a clear and brief review of essential concepts on probability theory, random functions, stochastic calculus, Monte Carlo simulation, and functional analysis, probabilistic models for random variables and functions needed to formulate stochastic equations describing realistic problems in engineering and applied sciences, practical methods for quantifying the uncertain parameters in the definition of stochastic equations, solving approximately these equations, and assessing the accuracy of approximate solutions.