

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Model reduction via a data-driven  
stochastic multiscale method**

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报告地点: **科技综合楼三层 311**

**计算数学所报告厅**

**Abstract:** We introduce a data-driven stochastic multiscale method. This method consists of two steps: Offline and Online. In the Offline step, we construct a multiscale stochastic basis by approximating the covariance of the solution of the SPDE by Monte Carlo methods. In the Online step, we represent the stochastic solution as a truncated expansion using the multiscale stochastic basis. By solving a set of coupled PDEs of deterministic coefficients, we obtain the numerical solutions to SPDEs. One important property of this method is that the stochastic basis obtained in the offline computation can be used repeatedly in online computation for a large class of stochastic problems with different deterministic forcing coefficients or boundary conditions. This method effectively reduces the dimension of the stochastic PDEs. As a consequence, much smaller number of basis is required in the online computation to achieve the same level of error tolerance compared to the (generalized) polynomial chaos method or Wiener-Chaos Expansion method. Some numerical results will be presented to demonstrate the effectiveness of the method.

欢迎大家参加!