

数学与系统科学研究院

计算数学所学术报告

报告人: Associate Prof. Xiaoliang Wan

(*Louisiana State University*)

报告题目:

Asymptotically efficient simulation of
elliptic problems with small random
forcing

邀请人: 于海军 副研究员

报告时间: 2017 年 7 月 14 日 (周五)

下午 15:00-16:00

报告地点: 数学院南楼九层

902 教室

Abstract:

Recent rare-event simulations show that the large deviation principle (LDP) for stochastic problems plays an important role in both theory and simulation, for studying rare events induced by small noise. Practical challenges of applying this useful technique include minimizing the rate function numerically and incorporating the minimizer into the importance sampling scheme for the construction of efficient probability estimators.

For a spatially extended system where the noise is modeled as a random field, even for simple steady state problems, many new issues are encountered in comparison to the finite dimensional models. We consider the Poisson's equation subject to a Gaussian random forcing with vanishing amplitude.

In contrast to the simplified rate functional given by space white noise, we consider the covariance operator of trace class such that the effects of small noise of moderate or large correlation length on rare events can be studied. We have constructed an LDP-based importance sampling estimator with a sufficient and necessary condition to guarantee the weak efficiency, where numerical approximation of the large deviation principle is also addressed. Numerical studies have been presented.

欢迎大家参加！