数学与系统科学研究院

计算数学所学术报告

报告人：　　**Prof. Raul Tempone**

（Director, KAUST Strategic Research Initiative, Uncertainty Quantification Center）

报告题目：

ANALYSIS AND COMPUTATIONS FOR LINEAR HYPERBOLIC PDES WITH STOCHASTIC COEFFICIENTS

邀请人：　　周涛 博士

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上午 10：00～11：00

报告地点：　　科技综合楼 311

计算数学所报告厅

Abstract:

Partial Differential Equations with stochastic coefficients are a suitable tool to describe systems whose parameters are not completely determined, either because of measurement errors or intrinsic lack of knowledge on the system.

In the case of linear elliptic PDEs with random inputs, an effective strategy to approximate the state variables and their statistical moments is to use polynomial based approximations like Stochastic Galerkin or Stochastic Collocation method. These approximations exploit the high regularity of the state variables with respect to the input random parameters and for a moderate number of input parameters, are remarkably more effective than classical sampling methods.

In this talk we analyze a Stochastic Collocation method for solving the second order wave equation with a random wave speed. The speed is piecewise smooth in the physical space and depends on a finite number of random variables. We consider both full and sparse tensor product spaces of orthogonal polynomials, providing a convergence analysis. In particular, we show that, unlike the solutions of elliptic and parabolic problems, the wave solution to hyperbolic problems is not in general analytic with respect to the input random variables. Therefore, the rate of convergence may only be algebraic. Faster convergence rates are still possible for some quantities of interest and for the wave solution with particular types of data.

This is a joint work with F. Nobile and M. Motamed.

欢迎大家参加！