数学与系统科学研究院

计算数学所学术报告

报告人： **Prof. Jie Shen**

（ Purdue University and Xiamen University ）

报告题目：

Efficient numerical methods for solving fractional Laplacian equations

邀请人： 于海军 副研究员

报告时间：2017 年 9 月 26 日（周二）
下午 15:30-16:30

报告地点： 科技综合楼三层
301 报告厅

Abstract：

We consider spectral approximations of fractional Laplacian equations in bounded and unbounded domains.

For fractional Laplacian problem in bounded domains, we adopt the Caffarelli-Silvestre extension which transforms the fractional Laplacian equation in d-dimension into an equivalent system with local derivatives in (d+1)-dimension. We develop an efficient numerical method based on the generalized Laguerre approximation in the extended direction and usual (FEM or spectral) approximation in the original domain. Moreover, we enrich the spectral approximation space by using leading singular functions associted with the extended y-direction so that high-accuracy can be achieved despite the singularity of extended problem at $y=0$.

For fractional PDEs based on fractional Laplacians in unbounded domains, no transparent boundary condition is available for domain truncation, we develop efficient spectral-collocation and spectral-Galerkin methods using Hermite functions to solve this problems in unbounded domains directly.

欢迎大家参加！