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：

High Order Extended Finite Element Methods for Solving Interface Problem

邀请人：　毛士鹏 副研究员

报告时间：**2016 年 7 月 23 日（周六）**

下午 15:00-16:00

报告地点：　科技综合楼三层

311 报告厅

Abstract：

Many problems in physics, engineering, and other fields involve a certain level of coupling between different physical systems. For many multi-physics problems, the most difficult part is how to deal with the interface, which separates two phases of matter, each may be solid, liquid, or gaseous. The extended finite element method (XFEM), which extends the classical FEM by enriching the numerical solution space locally around the interface with discontinuous functions, has shown its potential in a variety of applications that involve non-smooth solutions near interface. In this talk, we will discuss high order XFEM with DG schemes to solve an elliptic interface problem. It is hard to analyze the stability of high order XFEM, because generally, trace and inverse inequalities do not hold true on the shape irregular curved sub-elements divided by interface. Therefore, the standard analysis for finite element methods can not be applied to the high order XFEM. Under a reasonable assumption for the interface and mesh, we proved a special trace inequality for every possible cases in a unified argument. Then, we can obtain the stability of DG-XFE schemes. Finally we show the optimal convergence rate for any order XFE space if the solution satisfies　curtain regularity in each subdomain.

欢迎大家参加！