

# 数学与系统科学研究院

## 计算数学所学术报告

报告人: 陈艳萍 教授

( 华南师范大学 )

报告题目:

**A Legendre–Galerkin spectral method for optimal control problems governed by stokes equations**

邀请人: 袁亚湘 院士

报告时间: 2015 年 1 月 13 日 (周二)

下午 16:30-17:30

报告地点: 数学院南楼二层 210

会议室

## **Abstract:**

In this work, we study the Legendre–Galerkin spectral approximation of distributed optimal control problems governed by Stokes equations. We show that the discretized control problems satisfy the well-known Babuska–Brezzi conditions by choosing an appropriate pair of discretization spaces for the velocity and the pressure. Constructing suitable base functions of the discretization spaces leads to sparse coefficient matrices. We first derive a priori error estimates in both  $H^1$  and  $L^2$  norms for the Legendre–Galerkin approximation of the unconstrained control problems. Then both a priori and a posteriori error estimates are obtained for control problems with the constraints of an integral type, thanks to the higher regularity of the optimal control. Finally, some illustrative numerical examples are presented to demonstrate the error estimates.

**欢迎大家参加！**