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：

Augmented Strategies and Applications

邀请人：　陈志明研究员

报告时间：**2011** 年 **5** 月 **23** 日（周一）

下午 **14:00～17:00**

报告地点：科技综合楼三层 **311**

计算数学所报告厅

Abstract:

In this talk, I will first show some examples using IIM to solve full Navier-Stokes equations with moving interfaces. Then I will introduce the augmented approach through simple examples. In the augmented approach, we introduce an augmented variable so that the original problem can be solved easily, or faster. Sometimes it is only way to get accurate discretization. Applications includes the pressure condition for Stokes equations with non-slip boundary conditions; fast IIM for elliptic interface problems with piecewise constant coefficient; problems defined on irregular domains, simulations and sensitivity analysis for flow past obstacles; and moving incompressible interfaces in incompressible flows.

Using the augmented IIM, we have a unified approach for solving Navier-Stokes equations in various setting. Often the GMRES method is used to solve the augmented variable. An open problem is how to develop preconditioning techniques for the Shur compliment for which we only know the matrix-vector multiplication. I show one example whose condition number is order one, but almost all the Matlab iterative solvers failed.

I will also explain how the IIM can be coupled with the level set function for free boundary and moving interface problems. Along this line, the basic idea of the level set algorithm will also be introduced with some applications.

欢迎大家参加！