数学与系统科学研究院

计算数学所学术报告

(定期学术报告)

报告人：　　刘铁钢教授

　　　　　(北京航天航空大学数学系)

报告题目：　多介质 Riemann 问题与修正的虚拟介质方法及其应用

邀请人:　　Prof. Yu–hong Dai

报告时间：　2007 年 11 月 8 日(周四)

　　　　　下午 16:00—17:00

报告地点：　科技综合楼三层 311

　　　　　计算数学所报告厅

Abstract：

It is still very challenging in modeling and simulating compressible multi-phase flows due to the poor

mathematical understanding to them, the lack of effective numerical methods and physical models. In this talk, I shall present my recent research work in simulating and modeling compressible multi-phase flow and cavitating flow. To understand and model cavitating flow, I have introduced the conception of a Riemann problem with cavitation, derived the jump conditions through a cavitation front and developed a one-fluid cavitation model called isentropic one-fluid cavitation model [1]. To prevent numerical instability, recently I have successfully developed a robust numerical method called the modified ghost fluid method (MGFM) [3] to treat moving material interfaces. The MGFM has shown its robustness, high accuracy and flexibility in contrast to the original ghost fluid method (GFM) [4], which has been shown by me that its performance is problem-related and that it has actually no accuracy when applied to strong shock wave/jet impacting on a material interface [5]. With the help of MGFM and isentropic one-fluid cavitation model, it is first time that we can capture the cavitation evolution and cavitation reloading in underwater explosions.

欢迎大家参加！