数学与系统科学研究院

计算数学所学术报告

报告人： Prof. Yau Shu Wong

(Department of Mathematical & Statistical Sciences University of Alberta Edmonton, Alberta, Canada)

报告题目：

Computational Solutions of Helmholtz Equation

邀请人： 张文生副研究员

报告时间： 2009 年 6 月 23 日(周二)

上午 10:00—11:00

报告地点： 科技综合楼三层 311

计算数学所报告厅

Abstract: The study of wave phenomena is important in all areas of science and engineering. Helmholtz equation arises from time-harmonic wave propagation, and the solutions are frequently required in many physical applications such as aero-acoustic, underwater acoustics, electromagnetic wave scattering, and geophysics. Computational methods have been developed successfully to solve many elliptic type boundary value problems. However, it has been accepted that it is extremely difficult to solve the Helmholtz equation numerically and in particularly, for the high-frequency cases.

In this talk, we discuss the difficulties associated with numerical solutions of the Helmholtz equation at large wave numbers. The effects on discretization schemes, treatment of boundary conditions and numerical methods for solving the resulting large system of indefinite and complex linear equations are investigated. We show that exact solutions for one-dimensional

Helmholtz equation can be computed numerically if the rounding error is not considered. However, more works are needed to develop efficient and accurate computational techniques for two– and three–dimensional Helmholtz equations.

欢迎大家参加！