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：

Inverse Lax-Wendroff procedure for numerical boundary conditions of conservation laws

邀请人：　　刘伟博士

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下午 **16：00**

报告地点：　　科技综合楼三层 **311**

计算数学所报告厅

Abstract:

We develop a high order finite difference numerical boundary condition for solving hyperbolic conservation laws involving complex static or moving geometries on a Cartesian mesh. The challenge results from the wide stencil of the interior high order scheme and the fact that the boundary intersects the grids in an arbitrary fashion. Our method is based on an inverse Lax-Wendroff procedure for the inflow boundary conditions. We repeatedly use the partial differential equation to write the normal derivatives to the inflow boundary in terms of the tangential derivatives and the time derivatives. With these normal derivatives, we can then impose accurate values of ghost points near the boundary by a Taylor expansion. At the outflow boundaries, we use Lagrange extrapolation or least squares extrapolation if the solution is smooth, or a weighted essentially non-oscillatory (WENO) type extrapolation if a shock is close to the boundary. Extensive numerical examples are provided to illustrate that our method is high order accurate and has good performance when applied to one and two dimensional scalar or system cases with the physical boundary not aligned with the grids and with various boundary conditions including the solid wall boundary condition. This is a joint work with Prof. Chi-Wang Shu.

欢迎大家参加！