

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:

**An modied WENO schemes for  
hyperbolic conservation laws**

邀请人: 明平兵 研究员

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上午 10:00-11:00

报告地点: 数学院南楼九层

902 教室

## **Abstract:**

In this presentation, a class of modified weighted essentially non-oscillatory (MWENO) schemes is presented in the finite difference framework for solving the hyperbolic conservation laws. These schemes adapt between the linear upwind scheme and the WENO scheme automatically by the usage of a new simple switching principle. The methodology to reconstruct numerical fluxes for the MWENO schemes is split into two parts: if all extreme points of the reconstruction polynomial for numerical flux in the big spatial stencil are located outside of the stencil, then the numerical flux is approximated directly by the reconstruction polynomial, and the approximation is a linear and high order accuracy; otherwise the WENO procedure in [G.-S. Jiang and C.-W. Shu, J. Comput. Phys., 126 (1996), 202-228] is applied to reconstruct the numerical flux. The main advantage of these new MWENO schemes is their robustness and efficiency comparing with the classical WENO schemes specified in [G.-S. Jiang and C.-W. Shu, J. Comput. Phys., 126 (1996), 202-228]. The MWENO schemes can be applied to compute some extreme test cases such as the Sedov blast wave, the Leblanc and the high Mach number astrophysical jet problems et al. by using a normal CFL number without any further positivity preserving procedure for the purpose of controlling the concurrence of the negative density and pressure. Extensive numerical results are provided to illustrate the good performance of the MWENO schemes.

**欢迎大家参加！**