数学与系统科学研究院

计算数学所学术报告

报告人： Professor Rolf Jeltsch

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报告题目：

Stablized Explicit Runge–Kutta Methods for Solving Hyperbolic–Parabolic Equations

邀请人： 陈志明研究员

报告时间： 2007 年 4 月 23 日(周一)

上午 11:00—12:00

报告地点： 科技综合楼三层311

计算数学所报告厅

Abstract：

Essentially optimal explicit Runge-Kutta methods

consider more stages in order to include a particular spectrum in their stability domain and thus reduce step restrictions. This idea, so far used mostly for real line spectra, is generalized to more general spectra in form of a thin region. In this regions the eigenvalues may extend away from the real axis into the imaginary plane. We give a direct characterization of essentially optimal stability polynomials containing a maximal thin region and calculate these polynomials for various cases. Semi-discretizations of hyperbolic-parabolic equations are a relevant application which exhibit a thin region spectrum. As a model, linear scalar advection-diffusion is inverstigated. The second order stabilized Runge-Kutta methods derived from the stability polynomials are applied to advection-diffusion and compressible, viscous fluid dynamics in numerical experiments. Due to the stabilization the time step can be controlled solely from the hyperbolic CFL condition even in the presence of viscous fluxes. This is a joint work with M. Torrilhon

欢迎大家参加！