



Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

Hyperbolic equations - structure preserving methods & other topics

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High order numerical methods for the Boltzmann equation and related problems

Abstract:

We discuss Implicit-Explicit (IMEX) Runge Kutta and Linear multistep methods which are particularly adapted to stiff kinetic equations of Boltzmann type. We consider both the case of easy invertible collision operators and the challenging case of Boltzmann collision operators. We give sufficient conditions in order that such methods are asymptotic preserving and asymptotically accurate with respect to the compressible Euler equations. Their monotonicity properties are also studied. For the sole case of linear multistep methods, the consistency with the compressible Navier-Stokes equations is analysed as well. In the second part, we discuss the extension of such schemes to the multidimensional case using high order Finite Volume and Discontinuous Galerkin methods over arbitrarily shaped cells to show the capability of the presented approach to deal with prototype engineering problems.

via Zoom video conference (request the Zoom link from klingen@mathematik.uni-wuerzburg.de)

Friday, April 8 at 3 pm CET

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg