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MATHEMATIKKOLLOQUIUM

Das Institut für Mathematik lädt zu folgendem Vortrag ein:

Total-Variation Diminishing Runge-Kutta Methods for Advection-Diffusion Equations in Astrophysics

Univ.-Doz. Dr. Othmar Koch

Technische Universität Wien

We investigate the properties of dissipative full discretizations for the equations of motion associated with models of flow and radiative transport inside stars. We derive dissipative space discretizations and demonstrate that together with specially adapted total-variation-diminishing (TVD) Runge-Kutta time discretizations with adaptive step-size control this yields reliable and efficient integrators for the underlying high-dimensional nonlinear evolution equations. In particular, TVD SDIRK methods in conjunction with fixed point iteration are demonstrated to yield improved accuracy at a performance comparable to explicit Runge-Kutta schemes. In some physical situations it is more advantageous to use partitioned IMEX Runge-Kutta schemes, where the solution of the nonlinear implicit part can be realized by the solution of a Poisson problem.

This is joint work with N. Happenhofer, F. Kupka, A. Mayrhofer, and F. Zaussinger.

Zeit: Donnerstag, den 24. März 2011 um 17⁰⁰ Uhr

Ort: Technikerstr. 13, Hörsaaltrakt Bau fakultät, HSB 9

Mechthild Thalhammer

Gäste sind herzlich willkommen!