



Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

Hyperbolic equations - structure preserving methods & other topics

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Two cases of schemes that use a non-conservative version of a conservative system: the Euler equations

Abstract:

In this talks, I will consider two cases of schemes that use a non-conservative version of a conservative system, namely the Euler equations for compressible fluid dynamics. The first one uses a staggered representation with a formulation in primitive variable (variables are density, velocity and internal energy, the thermodynamical variables are stored in elements, and the kinetic variables are at the vertices, so that the thermodynamics is locally discontinuous while the kinematics are globally continuous), and I will show a systematic way to recover local conservation, with some numerical examples to show that it works.

The second example is inspired by the Active Flux formulation by Roe and co-authors, but with some important changes. In one dimension, the average values of the conservative variables are updated in the cells, but on the boundary of the cells, we update directly a non conservative system, for example in the primitive variables, or in the variables entropy, velocity, pressure. We also show on numerical examples that it works well

In addition, in both case, we show, under standard assumptions, a Lax-Wendroff like theorem, though the formulation is a bit non standard.

This is a joint work with K. Ivanona, and I have benefited of discussions with W. Barsukow.

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

Friday, Sept. 24 at 3 pm CET

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg