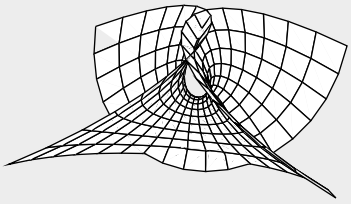

Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

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On multidimensional approximate Riemann-Solvers based on the relaxation technique with applications to fluid flows with elliptic constraints

Abstract:

Multidimensional approximate Riemann solvers (MDRS) are of growing interest in the field of computational flud dynamics. May it be for moving grid methods combined with finite volume or discontinuous Galerkin methods where a velocity at the vertices needs to be found or in constraint transport schemes, where the constrained variables are stored in a staggerd grid type approach on the faces of the cells and the update depends on the solution of a multi-dimensional Riemann problem. While other MDRS have been developed we search for a framework that gives on the one hand simple approximations to the multidimensional Riemann problem and on the other hand comes with consistency, robustness and stability properties.

Given these, we show possible extensions to the succesfull Jin-Xing and Suliciu relaxation. We concentrate on the 2D case where we first investiagte with the Jin-Xing relaxation the flexibility of the proposed approach to different geometries and then show how elliptic constraints may be realized. Further we investiagte the more accurate Suliciu relaxation and its extension to 2D flow problems in the case of the compressible Euler equations and the MHD system.

Raum 40.03.003 (Mathematikgebäude Ost) Dienstag, der 28. Mai 2019 um 13 Uhr

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg