# Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

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# An entropy stable space-time Discontinuous Galerkin scheme for the compressible Euler equations

*Abstract:*

Consider a high-order scheme for solving hyperbolic conservation laws in semi-discret form. For the time integration the method of lines with a Runge-Kutta method is used. This results in rather restrictive time step. One way to overcome this problem is the use of a fully-discret *space-time* Discontinuous Galerkin method, where the discretisation of the temporal derivative is done in a similar way as the discretisation of the spatial derivative of the flux. In order to ensure entropy stability of such a scheme, the discretisation of the volume integral is changed by a flux derivative projection approach. Additionally entropy conserving and entropy stable temporal states and spatial fluxes are introduced. Numerical tests show that the derived entropy stable space-time DG method maintains the high order of a semi-discret method, it satisfies entropy stability and therefore it is stable for a wider range of problems.

This is joint work among others with Gregor Gassner and Gero Schnücke.

Raum 40.03.003 (Mathematikgebäude Ost)          Donnerstag, der 27. Juni 2019 um 13 Uhr

Zu diesem Vortrag sind Sie herzlich eingeladen.

*gez. Christian Klingenberg*