Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

Hyperbolic equations - structure preserving methods & other topics

Mária Lukácová-Medvidová

Mainz University, Mainz, Germany

What is a limit of solutions computed by structure preserving schemes?

Abstract:

In this talk we discuss the question of convergence of structure preserving finite volume methods for multi-dimensional Euler equations of gas dynamics. We show that in general there is only *weak* ∗ convergence to a generalized, the so-called dissipative weak solution. In the case that the strong solution of the Euler equations exists, the dissipative weak solutions coincide with the strong solution on its life span.

Otherwise, we apply a newly developed concept of K-convergence and prove the strong convergence of the empirical means of finite volume solutions to a dissipative weak solution. The latter is the expected value of a dissipative measure-valued solution and satisfies a weak formulation of the Euler equations modulo the Reynolds defect measure. In the class of dissipative weak solutions there exists a solution that is obtained as a vanishing viscosity limit of the Navier-Stokes system. Theoretical results will be illustrated by a series of numerical simulations.

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

Friday, March 4 at 3 pm CET

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg