



Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

Gudrun Grünwald

Ruhr Universität Bochum

A split-step Active Flux method for the Vlasov-Poisson system

Abstract:

Active Flux is a finite volume method that besides cell averages has additional degrees of freedom for each cell. These are point values located on the cell interface. The point values are updated by a high order non-conservative method. These are used to compute the numerical fluxes through the cell interface which allow to evolve the cell-average in a conservative way.

In this talk, we apply the method to the Vlasov-Poisson system describing the time evolution of the time-dependent distribution function of a collisionless plasma. In particular, we consider the evaluation of the flux integrals in higher dimensions. We propose a dimensional splitting and three types of formulations of the flux integral: a one-dimensional reconstruction of second order, a third-order reconstruction based on information along each dimension, and a third-order reconstruction based on a discrepancy formulation of the Active Flux method. Numerical results in 1 dim. - 1 velocity phase-space compare the properties of the various methods.

This is joint work with R. Grauer, L. Hensel and K. Kormann.

room 40.03.003 (Emil Fischer Str. 40)

Donnerstag, Feb. 27, 2025 at 12:30 pm

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg