



Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

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Stationary flows of the ES-BGK Model with the correct Prandtl number

Abstract:

Abstract. Ellipsoidal BGK model (ES-BGK) is a general version of the BGK model where the local Maxwellian is generalized to an ellipsoidal Gaussian with a Prandtl parameter so that the model can produce the correct transport coefficient in the Navier-Stokes limit. In this work, we consider the existence and uniqueness of stationary solutions for the ES-BGK model in a slab imposed with the mixed boundary conditions. One of the key difficulties arise in the uniform control of the temperature tensor from below. In the non-critical case (Prandtl parameter lies between $-1/2$ and 1), we utilize the property that the temperature tensor is equivalent to the temperature in this range. In the critical case, (Prandtl parameter is $-1/2$), where such equivalence relation breaks down, we observe that the size of bulk velocity in the slab direction can be controlled by the discrepancy of boundary flux, which enables one to bound the temperature tensor from below. This is a joint work with Stephane Brull (IMB).

Raum 40.03.003 (Mathematikgebäude Ost)

Dienstag, der 25. Feb. 2020 um 13 Uhr

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg