中国科学院数学与系统科学研究院

偏微分方程及其应用中心

学术报告

报告题目： Asymptotic Analysis of Steady Viscous Shocks in a 1-D Finite Nozzle in the Small Viscosity Limit

报 告 人： 方北香教授，上海交通大学

时 间： 2024.10.26(周六)，上午 11:00--12:00

地 点： 思源楼 813

摘 要： In this talk, I will report our recent results on uniqueness of steady 1-D shock solutions in a finite nozzle via vanishing viscosity arguments. It is well-known from the viewpoint of inviscid flows that for a given supersonic state at the entrance of the nozzle, there exist infinite transonic shock solutions with the same state behind the shock front, while the position of the shock front could be arbitrary in the nozzle. In this talk, we are going to investigate the uniqueness of the inviscid shock solution by regarding it as a vanishing viscosity limit of smooth viscous shock solutions for the steady 1-D Navier-Stokes system. It will be shown that the viscous shock solutions converge under the L^1 norm as the viscosity coefficient goes to zero, which implies the uniqueness of the steady 1-D shock solution for the inviscid flow. Moreover, the position of the shock front for the limit shock solution can also be obtained. This talk is based on joint works with Qin Zhao, with Su Jiang and Piye Sun, as well as with Ya-Guang Wang.