Well-posedness of a non-conservative compressible two-fluid model with far field vacuum in three dimensions

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报告时间： 2022 年 6 月 30 日下午 15:00-16:00

腾讯会议 ID: 806 550 722

链接： https://meeting.tencent.com/dm/rNd4GmiFuwMM

报告摘要： We study the wellposedness of the Cauchy problem for a non-conservative compressible two-fluid model with density-dependent viscosity coefficients vanishing at far field in three dimensions. The non-conservative pressure term (an implicit function) and the degenerate viscosity coefficients due to the vanishing of the volume fractions and the densities are the main issues. To overcome the difficulties, we construct iteration sequences in terms of the average densities and the velocities, and find some new connections between the pressure term (including its gradients) and some other terms of the average densities. Those estimates are uniform for the positive lower bound of the average densities, and they are not trivial in particular when the adiabatic indexes are close to 1. Moreover, to get the strong convergence for the full sequences, one can not use the mean value theorem in the pressure term to get the desired estimates of the difference between the average densities due to the possible vanishing of the densities. Instead, we introduce some equations in terms of some new quantities associated with the volume fractions, the densities, and the average densities.

报告人简介：

　　温焕尧，男，华南理工大学数学学院教授、博士生导师、副院长。目前担任广东省青年科学家协会副会长和华南理工大学党外知识分子联席会副会长。主要从事流体力学中的偏微分方程的数学理论研究。研究成果发表在 Adv. Math.、Arch. Rational Mech. Anal.、CVPDEs、J. Functional Analysis、J. Math. Pures Appl.、 Math. Models Meth. Appl. Sci.、SIAM J. Math. Anal.等杂志。先后主持国家自然科学基金青年项目、面上项目和优秀青年科学基金项目共 4 项。2016-2019 年获聘广东省青年珠江学者。

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西北大学数学学院

2022 年 6 月 28 日