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Global regular solutions for 1-D degenerate compressible Navier-Stokes equations with large data and far field vacuum

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链接: <https://meeting.tencent.com/dm/d0IydDP8eN7L>

报告摘要: We talk about the Cauchy problem for the 1-D isentropic compressible Navier-Stokes equations. When the viscosity depends on the density in a sublinear power law, based on an elaborate analysis of the intrinsic singular structure of this degenerate system, we prove the global-in-time well-posedness of regular solutions with conserved total mass, momentum, and finite total energy in some inhomogeneous Sobolev spaces. Moreover, the solutions we obtained satisfy that the density keeps positive for all point but decays to zero in the far field, which is consistent with the facts that the total mass of the whole space is conserved, and CNS is a model of non-dilute fluids where the density is bounded below away from zero. The key to the proof is the introduction of a well-designed reformulated structure by introducing some new variables and initial compatibility conditions, which, actually, can transfer the degeneracies of the time evolution and the viscosity to the possible singularity of some special source terms. Then, combined with the BD entropy estimates and transport properties of the so-called effective velocity, one can obtain the required uniform a priori estimates of corresponding solutions.

报告人简介:

朱圣国, 上海交通大学数学科学学院副教授, 博士生导师。2015 年 6 月于上海交通大学获理学博士学位。毕业之后, 先后在香港中文大学、莫纳什大学、牛津大学做博士后。曾于 2017 年入选英国皇家学会牛顿学者; 2019 年入选中组部国家海外高层次人才引进计划 (青年项目); 2020 年入选上海市海外高层次人才引进计划。主要研究领域为可压缩流体力学方程组, 已在 *Adv. Math.*、*Arch. Ration. Mech. Anal.*、*Trans. Amer. Math. Soc.*、*J. Math. Pures Appl.* 等学术期刊上发表/接收论文 20 余篇。

欢迎各位老师和同学参加!

西北大学数学学院、非线性科学研究中心
2022 年 5 月 31 日