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： **LARGE AMPLITUDE PROBLEM OF BGK MODEL: RELAXATION TO QUADRATIC NONLINEARITY**

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摘　　要： Bhatnagar－Gross－Krook (BGK) equation is a relaxation model of the Boltzmann equation which is widely used in place of the Boltzmann equation for the simulation of various kinetic flow problems. In this work, we study the asymptotic stability of the BGK model when the initial data is not necessarily close to the global equilibrium pointwisely. Due to the highly nonlinear structure of the relaxation operator, the argument developed to derive the bootstrap estimate for the Boltzmann equation leads to a weaker estimate in the case of the BGK model, which does not exclude the possible blow-up of the perturbation. To overcome this issue, we carry out a refined analysis of the macroscopic fields to guarantee that the system transits from a highly nonlinear regime into a quadratic nonlinear regime after a long but finite time, in which the highly nonlinear perturbative term relaxes to essentially quadratic nonlinearity.