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： **Global stability and scattering theory for non-cutoff Boltzmann equation with soft potentials in the whole space: weak collision regime**

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时　　间： 2023.10.10(周二)，下午 15:00--16:00

地　　点： 思源楼 425

摘　　要：

A Traveling Maxwellian $\mathcal{M} = \mathcal{M}(t, x, v)$ represents a traveling wave solution to the Boltzmann equation in the whole space $\R^3$(for the spatial variable x). The primary objective of this talk is to investigate the global-in-time stability of $\mathcal{M}$ and its associated scattering theory in $L^1_{x,v}$ space for the non-cutoff Boltzmann equation with soft potentials when the dissipative effects induced by collisions are weak. We demonstrate the following results: (i) $\mathcal{M}$ exhibits Lyapunov stability; (ii) The perturbed solution, which is assumed to satisfy the same conservation law as $\mathcal{M}$, scatters in the $L^1_{x,v}$ space towards a particular traveling wave (with an explicit convergence rate), which may not necessarily be $\mathcal{M}$. The key elements in the proofs involve the formulation of the {\it Strichartz-Scaled Boltzmann equation}(achieved through the Strichartz scaling applied to the original equation) and the propagation of analytic smoothness.