For Favour of Posting

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Kinetic Seminar

Faster decay of the microscopic part of a solution to the Boltzmann equation

by

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Abstract :
We show that the microscopic part of a solution to the Boltzmann equation without angular cutoff enjoys $t^{-1/2}$-faster decay than the solution itself in $(L^1\cap L^p)_k (\mathbb{R}^3)$. In the previous work, the speaker and his collaborators showed that we have a global-in-time solution in this space, and it decays in time with the rate $(1+t)^{-3(1-1/p)/2 + \varepsilon}$, where $\varepsilon>0$ is arbitrary small. Considering the estimate of higher derivatives, we can generalize this result as follows: if the L^1_k norm of the αth-derivative of the solution is also small, then the decay rate is $(1+t)^{-3(1-1/p)/2 -\alpha/2+ \varepsilon}$, and the microscopic part decays with the rate $(1+t)^{-3(1-1/p)/2 -\alpha/2-1/2+ \varepsilon}$ for any $\alpha \ge 0$. This is an adaptation of the result of [Strain, KRM, 2013], where the solution space is the usual Sobolev space, to the $(L^1\cap L^p)_k$ setting.

Date :	September 27, 2023 (Wednesday)
Time :	4:00pm – 5:00pm (Hong Kong SAR)
Venue:	Room 204, 2/F, Lee Shau Kee Building, The Chinese University of Hong Kong, Shatin

All are Welcome