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Kinetic Seminar

Mixture estimate in fractional sense and its application to the well-posedness of the Boltzmann Equation with very soft potential

by

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Abstract :

In this paper, we consider the Boltzmann equation with angular-cutoff for very soft potential case $-3 < \gamma \leq -2$. We prove a regularization mechanism that transfers the microscopic velocity regularity to macroscopic space regularity in the fractional sense. The result extends the smoothing effect results of Liu-Yu (see "mixture lemma" in Comm. Pure Appl. Math. 57:1543-1608, 2004), and of Gualdani-Mischler-Mouhot (see "iterated averaging lemma" in M´em. Soc. Math. Fr. 153, 2017), both established for the hard sphere case. A precise pointwise estimate of the fractional derivative of collision kernel, and a connection between velocity derivative and space derivative in the fractional sense are exploited to overcome the high singularity for very soft potential case. As an application of fractional regularization estimates, we prove the global well posedness and large time behavior of the solution for nonsmooth initial perturbation.

Date :	August 25, 2022 (Thursday)
Time :	4:00pm – 5:00pm (Hong Kong SAR)
ZOOM Meeting Link:	
https://cuhk.zoom.us/j/98784724393?pwd=NVB5NmN0OHUweFVl bTFKamFldFpmZz09	
Meeting ID :	987 8472 4393
Passcode :	20220825

All are Welcome