

## Colloquium

### Mixture estimate in fractional sense

主講人：吳恭儉 教授

國立成功大學數學系

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地 點：應用數學系多媒體教室(理 408 室)

#### 摘 要：

In this talk, 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.

