A De Giorgi Argument for L^∞ Solution to the Boltzmann Equation without Angular Cutoff

Tong YANG
Department of Mathematics, City University of Hong Kong
matyang@cityu.edu.hk

Abstract : In this talk, after reviewing the work on global well-posedness of the Boltzmann equation without angular cutoff with algebraic decay tails, we will present a recent work on the global weighted L^∞-solutions to the Boltzmann equation without angular cutoff in the regime close to equilibrium. A De Giorgi type argument, well developed for diffusion equations, is crafted in this kinetic context with the help of the averaging lemma. More specifically, we use a strong averaging lemma to obtain suitable L^p estimates for level-set functions. These estimates are crucial for constructing an appropriate energy functional to carry out the De Giorgi argument. Then we extend local solutions to global by using the spectral gap of the linearized Boltzmann operator with the convergence to the equilibrium state obtained as a byproduct. This result fill in the gap of well-posedness theory for the Boltzmann equation without angular cutoff in the L^∞ framework. The talk is based on the joint works with Ricardo Alonso, Yoshinori Morimoto and Weiran Sun.