

Speculations on the Propagation of Chaos in Kinetic Theory

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Abstract

This talk concerns the propagation of chaos in kinetic theory. This concept is fundamental in order to justify, under suitable scaling limits, the use of effective equations (like Vlasov, Boltzmann, Landau), replacing the more complicated particle systems by a nonlinear PDE.

In particular I plan to focus on the size of chaos, roughly speaking, the maximum number of particles which can be considered as independent, and the correlation error which is a useful tool in investigating these problems.

Finally I will focus on a recent result in collaboration with S. Simonella and T. Paul, presenting a quantitative evaluation of the propagation of chaos for a class of models including the Kac's model and large Quantum particle system in the mean-field regime.