



Workshop on Stochastic Analysis

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Quantitative uniform-in-time propagation of chaos for stochastic particle systems interacting through L^p kernels

Abstract

Deriving macroscopic evolution equations from interacting particle systems is a classical problem in mathematical physics. In the mean-field regime, such systems are expected to converge, as the number of particles tends to infinity, to solutions of nonlinear Fokker-Planck equations. One particular challenge is to establish whether this convergence holds uniformly in time, especially for systems with singular interaction kernels.

In this talk, we first briefly review recent results establishing uniform-in-time propagation of chaos. We then introduce the framework of mollified interacting particle systems. Finally, we discuss recent work establishing quantitative uniform-in-time propagation of chaos for interaction kernels in L^p ($p > d$). The approach is based on a mild formulation of the limiting equation together with semigroup estimates.