



Workshop on Stochastic Analysis

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Pathwise quantitative particle approximation of nonlinear stochastic Fokker-Planck equations via relative entropy

Abstract

We derive the nonlinear stochastic Fokker-Planck equation from stochastic systems particles with individual and environmental noises via relative entropy method, with pathwise quantitative bounds. Moreover, we prove the existence of a unique strong solution to the associated Fokker-Planck equation. Our proof is based on tools from PDE analysis, stochastic analysis, functional inequalities, such as the log-Sobolev inequality, and also we use the dissipation of entropy which provides some bound on the Fisher information of the particle system. The approach applies to repulsive and attractive kernels.