

Large time asymptotics for evolution equations with mean field couplings

Jean DOLBEAULT, Ceremade - Paris

This lecture is devoted to the convergence rates towards an equilibrium solution of the solutions of some simple evolution equations with mean field nonlinear couplings, like the Keller-Segel and Nernst-Planck systems, Cucker-Smale type models, and the Vlasov-Poisson-Fokker-Planck equation. The key point is the use of Lyapunov functionals adapted to the nonlinear version of the model to produce a functional framework adapted to the asymptotic regime and study the spectral properties of the linearized evolution equation.

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