Seminar of Probability and Stochastic Process

Tuesday, 28th June, from 14h15
[MA A3 31](), EPFL, Ecublens

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Mean Field Hamiltonian particles and the Vlasov-Fokker-Planck equation.

Abstract:

Consider N Hamiltonian particles in an external potential
with a mean field interaction (i.e. each particle is equally influenced by all the others
at once). As N go to infinity, two given particles are less and less correlated (this is
the propagation of chaos phenomenon), and the density probability of a given particle
converges to the solution of a non-linear PDE, the Vlasov-Fokker-Planck (VFP) equation.
When the external potential is convex, we prove the rate of convergence to equilibrium in
large time for the whole cloud of particles does not, in fact, depend on N,
which yields: first, a rate of convergence for the VFP equation, and second,
uniform in time propagation of chaos estimates.

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