## Quantitative particle approximation of nonlinear Fokker-Planck equations with singular kernel.

**Christian Olivera** [1]

[1] UNICAMP

We propose a new approach to obtain quantitative convergence of interacting particle systems to solutions of nonlinear Fokker-Planck equations with singular kernels. Our result only requires very weak regularity on the interaction kernel, including the Biot-Savart kernel(2D-Navier-Stoke equation), the family of Keller-Segel kernels in arbitrary dimension, and more generally singular Riesz kernels. This seems to be the first time that such quantitative convergence results are obtained in Lebesgue and Sobolev norms for the aforementioned kernels. In particular, this convergence holds locally in time for PDEs exhibiting a blow-up in finite time. The proof is based on a semigroup approach combined with stochastic calculus techniques, and we also exploit the regularity of the solutions of the limiting equation.

This work is in collaboration with A. Richard (Centrale-Supélec, France) M. Tomasevic(Ecole Polytechnique, France) .