

VANISHING DIFFUSION LIMIT FOR AGGREGATION EQUATIONS

Sébastien TRAN TIEN

Institut Camille Jordan

trantien@math.univ-lyon1.fr

Aggregation-diffusion equations arise in biology to model collective motion of individuals in interaction. I will present some recent results obtained with Frédéric Lagoutière and Filippo Santambrogio on the zero diffusion limit for such equations. In the absence of diffusion, when the interaction potential is singular, L^p norms of weak solutions blow up in finite time and the continuation of these solutions - potentially singular measures - requires a careful definition of the velocity field. We will see that, in the asymptotics of vanishing diffusion, we recover the correct velocity field for weak solutions. I will focus in particular on estimating the Wasserstein distance between the diffusive solutions and inviscid limit. In addition, I will give some sharp convergence rates of the steady states towards the Dirac mass, under some uniform attractiveness assumption and I will conclude with a word on AP schemes.