α-Navier-Stokes-Vlasov model for spray flows

Gabriela Del Valle Planas [*]

We investigate the interaction of a spray of particles with a Newtonian, viscous, and incompressible fluid. We consider the α-Navier-Stokes equations coupled with a Vlasov type equation to model the flow of the incompressible fluid containing small particles. We prove the global existence of weak solutions to the coupled system subject to periodic boundary conditions. The convergence of its solutions to that of the Navier-Stokes-Vlasov equations when α tends to zero is also established.

[*]IMECC-UNICAMP email: gplanas@ime.unicamp.br