

Local theory for thick spray equations

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We consider a coupled system between kinetic and fluid equations, describing a cloud of particles immersed within a gas. We are interested in the so-called "thick spray" case, where the volume fraction for the particles is not negligible compared to that of the fluid.

Because of the coupling between both phases, several losses of derivatives are at stake in the system. In particular, and contrary to some other fluid-kinetic models, its rigorous study is almost completely absent.

Based on ideas used for singular Vlasov equations, I will show how to build a local Sobolev theory for this system and its variants (in the compressible Navier-Stokes case), when the initial data satisfies a Penrose type stability condition.

This is a joint work with D. Han-Kwan (CNRS and Université de Nantes).