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*Analysis of a fluid-kinetic system of equations*

We study a coupled system of kinetic and fluid equations modeling fluid-particles interactions arising in sprays, aerosols or sedimentation problems. More precisely, we consider a Vlasov–Fokker–Planck equation coupled to compressible Navier–Stokes equation via a drag force. We establish the existence of solutions and we rigorously derive the asymptotic regime corresponding to a strong drag force and a strong Brownian motion.