The evolution of a cloud of particles in a compressible fluid can be modeled with a Vlasov-Fokker-Planck equation for the
distribution function of the particles coupled with Navier-Stokes or Euler equations for the density and velocity of the fluid.
Formal calculations have established the convergence of solution to the mesoscopic model to solutions to the macroscopic
Navier-Stokes or Euler model coupled with a Smoluchowski equation as the ratio of the settling time for the microscopic
velocity fluctuation of the particles to the characteristic macroscopic time scale goes to zero. This talk discusses a
rigorous asymptotic analysis for a homogeneous mesoscopic fluid-particle interaction model for particles dispersed in a
compressible fluid is provided for the bubbling regime. A relative entropy inequality for a mixed hyperbolic/parabolic
system of equations is employed. (Received August 16, 2018)