1145-35-184 **Joshua Ballew*** (joshua.ballew@sru.edu), Slippery Rock University, 106 Central Loop, Suite 200 VSC, Slippery Rock, PA 16057. *Asymptotic Analysis for a Homogeneous Bubbling Regime Vlasov-Fokker-Planck/Navier-Stokes System.* Preliminary report.

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)