

Strong solutions to the kinetic equations  
coupled with compressible viscous fluid equations.

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**Abstract**

In this talk, we discuss the existence and uniqueness of strong solutions to the kinetic equations coupled with compressible Navier-Stokes equations. Here the coupling of two equations is through a friction (or drag) force which depends on the density of the compressible fluid and the relative velocity between particles and fluid. Presenting two examples, i.e. Vlasov-Navier-Stokes model and BGK-Navier-Stokes model, we stress that for the existence in  $L^2$ -Sobolev spaces, exponential weight on the kinetic density in the velocity variable is crucial due to the fluid density in the coupling term. Then we show that when the exponential weight is imposed on the kinetic density, we can find a unique strong solution at least locally in time. This talk is based on the joint work with Y.-P. Choi (Yonsei University).