ON THE CAUCHY PROBLEM FOR THE PRESSURELESS EULER–NAVIER–STOKES SYSTEM IN THE WHOLE SPACE

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ABSTRACT

In this talk, we study the global Cauchy problem for a two-phase fluid model consisting of the pressureless Euler equations and the incompressible Navier–Stokes equations where the coupling of two equations is through the drag force. We establish the global-in-time existence and uniqueness of classical solutions for that system when the initial data are sufficiently small and regular. Main difficulties arise in the absence of pressure in the Euler equations. In order to resolve it, we properly combine the large-time behavior of classical solutions and the bootstrapping argument to construct the global-in-time unique classical solutions.