

Free boundary problem for one-dimensional compressible Navier-Stokes equations with temperature dependent viscosity and heat conductivity

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Abstract

We prove the existence and uniqueness of global strong solution to the free boundary problem in one dimensional compressible Navier-Stokes system for the viscous and heat conducting ideal polytropic gas flow, when the viscosity and heat conductivity depend on temperature in power law of Chapman-Enskog and the data is in the neighborhood of some background solution at initial time. We also study the large time behavior of the solution and obtain its decay property.

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