

LeFloch, Philippe G.; Mai Duc Thanh

The Riemann problem for fluid flows in a nozzle with discontinuous cross-section. (English)

Zbl 1091.35044

Commun. Math. Sci. 1, No. 4, 763-797 (2003).

The paper studies the Riemann problem for fluid flow in a nozzle. The system prescribing the motion is a nonstrictly hyperbolic system of partial differential equations. The cross-section of the nozzle is variable. Particularly, the section of the nozzle can be assumed to have discontinuity. In this case the right-hand side of an equation of the system contains a Dirac function. In the paper the authors study the existence of solutions in different cases, and show that for different initial data the system may have three, one or zero solutions. Some numerical plot of these solutions is also included in the paper.

Reviewer: [Chen Shuxing \(Shanghai\)](#)

MSC:

[35L80](#) Degenerate hyperbolic equations

[35L65](#) Hyperbolic conservation laws

[76N10](#) Existence, uniqueness, and regularity theory for compressible fluids and gas dynamics

[76L05](#) Shock waves and blast waves in fluid mechanics

[35L67](#) Shocks and singularities for hyperbolic equations

Cited in **51** Documents

Keywords:

[non-strictly hyperbolic system](#)

Full Text: [DOI](#)