

Stability Criteria and Choked Flow Condition for the One Dimensional Compressible Two-Fluid Model

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Abstract

Characteristic analyses are performed for the compressible one-dimensional two-fluid model to investigate the well-posedness of the governing differential equations and conditions for choked flow. The momentum flux parameters are introduced to consider the effect of void fraction profile and velocity profile across the flow area, which represent flow regime. It is shown that the compressible one-dimensional two-fluid model is well posed as an initial value problem with certain restrictions on the momentum flux parameters. The choked flow condition is also calculated for the one-dimensional two-fluid model with momentum flux parameters and is compared with that resulted from conventional model. It is suggested that the momentum flux parameters should be used for the one-dimensional two-fluid model.