

A Family of Godunov-type Solvers for the Pressureless Gas Dynamics and Related Models

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Abstract

Abstract. In this study, a class of Godunov-type solvers are formulated for a weakly hyperbolic pressureless gas dynamics system and later extended to augmented Burgers systems. An Engquist-Osher type solver is constructed utilizing the homogeneity property. Whereas, the convexity of a second flux component of the one-dimensional pressureless flux function is used to construct a conservative Godunov-type solver. Since considered systems satisfy the generalized Rankine-Hugoniot conditions, a non-conservative version is also developed and tested on various numerical examples. In particular, non-conservative Godunov-Type solver developed here outclass other well-known solvers in capturing stationary δ and δ' waves. This is a joint work with Naveen Garg.