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Positivity-preserving high order finite difference WENO schemes for compressible Euler equations. (English) [Zbl 1426.76493](#)

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Summary: In Zhang and Shu (2010) [20], Zhang and Shu (2011) [21] and Zhang et al. (in press) [23], we constructed uniformly high order accurate discontinuous Galerkin (DG) and finite volume schemes which preserve positivity of density and pressure for the Euler equations of compressible gas dynamics. In this paper, we present an extension of this framework to construct positivity-preserving high order essentially non-oscillatory (ENO) and weighted essentially non-oscillatory (WENO) finite difference schemes for compressible Euler equations. General equations of state and source terms are also discussed. Numerical tests of the fifth order finite difference WENO scheme are reported to demonstrate the good behavior of such schemes.

MSC:

76M20 Finite difference methods applied to problems in fluid mechanics

76N15 Gas dynamics (general theory)

Cited in **1** Review
Cited in **59** Documents

Keywords:

positivity preserving; high order accuracy; compressible Euler equations; gas dynamics; finite difference scheme; essentially non-oscillatory scheme; weighted essentially non-oscillatory scheme

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