

Numerical study of dissipative terms in the Lagrangian CSTS (Conservative Space- and Time-Staggered) hydrodynamic scheme

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ABSTRACT

In the context of Lagrangian computation of compressible fluid dynamics, we proposed in [1, 2] a modification, in the spirit of [3], of the basic STS scheme [4], denoted by CSTS scheme, which is conservative, entropic, compatible, positive definite in kinetic energy, explicit in momentum equation and second order accurate (even for variable time steps). Corrections have thus been brought to the simplest STS scheme in order to recover energy conservation.

In this work, we propose a numerical study on the dissipative terms of such CSTS scheme. In particular, we will focus on artificial viscosity and hourglassing. The connection between these two processes will be highlighted and higher order formulation will be considered. Several relevant numerical tests will be shown.

References

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