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Centered unsplit finite volume schemes for multi-dimensional hyperbolic conservation laws.
(English) [Zbl 0990.65095](#)

Toro, E. F. (ed.), Godunov methods. Theory and applications. International conference, Oxford, GB, October 1999. New York, NY: Kluwer Academic/ Plenum Publishers. 899-906 (2001).

Summary: New unsplit finite volume centered schemes are presented. The construction of the schemes relies on the finite-volume framework suggested by *S. J. Billett* and *E. F. Toro* [*J. Comput. Phys.* 130, No. 1, 1-24 (1997; [Zbl 0873.65088](#))], and on two existent one-dimensional centred schemes, namely the FORCE and the SLIC schemes. First and second order accurate schemes are constructed. These are found to possess improved stability properties as compared to existent finite volume methods. An application to the two-dimensional shallow water equations shows that the proposed schemes are accurate, robust and efficient.

For the entire collection see [[Zbl 0978.00036](#)].

MSC:

- [65M06](#) Finite difference methods for initial value and initial-boundary value problems involving PDEs Cited in 1 Document
- [65M12](#) Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs
- [35L65](#) Hyperbolic conservation laws
- [76B15](#) Water waves, gravity waves; dispersion and scattering, nonlinear interaction

Keywords:

[hyperbolic conservation laws](#); [FORCE](#); [SLIC](#); [stability](#); [finite volume methods](#); [shallow water equations](#)