Zegeling, P. A.; **de Boer, W. D.**; **Tang, H. Z.**

Robust and efficient adaptive moving mesh solution of the 2-D Euler equations. (English)

Zbl 1096.76035

Shi, Zhong-Ci (ed.) et al., Recent advances in adaptive computation. Proceedings of the international conference on recent advances in adaptive computation, May 24–28, 2004, Zhejiang University, Hangzhou, China. Providence, RI: American Mathematical Society (AMS) (ISBN 0-8218-3662-5/pbk). Contemporary Mathematics 383, 375-386 (2005).

Summary: We describe an adaptive moving mesh technique and its application to the 2D Euler equations. The adaptive mesh is derived from the minimization of a mesh-energy integral. A robust and efficient monitor function with a time-dependent, automatically chosen, adaptivity parameter is used to track individual features of the physical solutions, such as shocks and emerging instabilities. The results of numerical experiments are presented, including shock waves and a Rayleigh-Taylor instability.

For the entire collection see [Zbl 1084.65006].

MSC:

76M20	Finite difference methods applied to problems in fluid mechanics
76N15	Gas dynamics (general theory)
65M50	Mesh generation, refinement, and adaptive methods for the numerical solution of initial value and initial-boundary value problems involving PDEs
76L05	Shock waves and blast waves in fluid mechanics
76E17	Interfacial stability and instability in hydrodynamic stability

Keywords:

minimization; mesh-energy integral; Rayleigh-Taylor instability

Software:

Algorithm 731; CWRESX; CWRESU