Cockburn, Bernardo

Quasimonotone schemes for scalar conservation laws. (English) Zbl 0693.65057

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Quasimonotone schemes for scalar conservation laws are introduced. These new schemes share with monotone schemes both maximum principles and convergence to the entropy solution. However, they are not necessarily first order accurate. They include both finite-difference schemes that are total variation diminishing and finite element ones that are not total variation diminishing, they can be either explicit or implicit; and they can be used with time dependent grids. Error estimates are provided. Quasimonotone finite difference schemes in one dimension, quasimonotone finite element schemes in one dimension and the general case are considered.

Reviewer: W.Ames

MSC:

65M06 Finite difference methods for initial value and initial-boundary value problems involving PDEs
65M12 Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs
65M60 Finite element, Rayleigh-Ritz and Galerkin methods for initial value and initial-boundary value problems involving PDEs
35J65 Nonlinear boundary value problems for linear elliptic equations

Keywords:

Quasimonotone schemes; conservation laws; maximum principles; convergence; entropy solution; finite-difference schemes; total variation diminishing; finite element; Error estimates

Full Text: DOI