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Linear bicharacteristic schemes without dissipation. (English) Zbl 0915.65106

SIAM J. Sci. Comput. 19, No. 5, 1405-1427 (1998).

The paper deals with non-dissipative numerical methods designed to compute the propagation of linear waves. They are inspired from the leapfrog methods developed in 1-D by *A. Iserles* [IMA J. Numer. Anal. 6, 381-392 (1986; [Zbl 0637.65089](#))]. These methods are reviewed in the first part of the present paper. Their generalization to multidimensional problems requires some new ideas, based on the bicharacteristic equations and a staggered storage. The equations of acoustics, elastodynamics, and electromagnetics are treated this way, in two dimensions, and computational results are presented.

Reviewer: S.Benzoni (Lyon)

MSC:

- [65M25](#) Numerical aspects of the method of characteristics for initial value and initial-boundary value problems involving PDEs
- [74H45](#) Vibrations in dynamical problems in solid mechanics
- [76Q05](#) Hydro- and aero-acoustics
- [78A25](#) Electromagnetic theory (general)
- [35L15](#) Initial value problems for second-order hyperbolic equations
- [65M06](#) Finite difference methods for initial value and initial-boundary value problems involving PDEs

Cited in 11 Documents

Keywords:

[wave propagation](#); [linear bicharacteristic schemes](#); [leapfrog methods](#)

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