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FINITE DIFFERENCE METHODS FOR NONLINEAR HYPERBOLIC SYSTEMS

Mathematics of Computation (U.S.A.), No. 101, vol. 22, 1968

This paper deals with a method for solving systems of equations with non-linear partial derivatives of the hyperbolic type.

The following system of the first order is considered

$$\frac{\partial f}{\partial t} + \frac{\partial f}{\partial x} = 0 \qquad u(x, 0) = u_0(x), \quad t \geqslant 0$$

where f is a vector of composition u, and u is an unknown vector of x and of t.

If $A(u)$ is the Jacobian, the following equation is obtained:

$$\frac{\partial u}{\partial t} + A(u)\frac{\partial u}{\partial x} = 0.$$

The author suggests a new scheme for the method of finite differences.

He concludes that this method requires less iterations than the schemes suggested by P. Lax and Wendroff.

The same problem is solved by the author in the second part of the paper where he also deals with the bidimensional case. Illustrative ples are given for both cases.

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