

THE CONSTRUCTION OF NEW QUASIMONOTONE SCHEMES FOR THE NUMERICAL SOLUTION OF ADVECTION EQUATION

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There are presented the results of new nonlinear schemes development for the numerical solution of a Cauchy problem for the advection equation with finite initial data. The schemes are constructed by monotonization of K.I. Babenko finite - difference scheme [1]-[2] and scheme on the base of finite element method by introduction of artificial viscosity with “limiters”. The used way of monotonization allows to ensure the monotonicity at the conservation of increased approximation order on linear and close to them profiles. The suggested schemes have shown the best results in contrast with well - known schemes when solution the advection equation. The numerical solution, obtained with use of monotonized schemes, “spreads” on the small number of mesh points, the amplitude reduction of the profiles is small in contrast with other considered schemes. For instance, in the case of the two - dimensional linear equation the monotonized K.I. Babenko scheme saves a form of the initial profile in the manner of letter “M” by the best way. Databases of mistakes are formed as a results of numerical studies. The offered system of presentation of numerical solution results in the manner of databases of mistakes on the standard test system allows to compare any new scheme with already known ones.

REFERENCES

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