Combined Numerical Schemes

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A survey of works concerning high-order accurate numerical methods designed for shock-capturing computations of discontinuous solutions to hyperbolic systems of conservation laws is presented. The basic problems arising in the theory of such methods are formulated, and approaches to their solution are proposed. Primary attention is given to fundamentally new shock-capturing methods (known as combined schemes) that monotonically localize shock fronts, while preserving high accuracy in shock influence areas. Test computations are presented that demonstrate the significant advantages of combined schemes over standard NFC (Nonlinear Flux Correction) ones when applied to computing discontinuous solutions with shock waves.

Acknowledgements

The research was supported by the Russian Science Foundation, project no. 22-11-00060.

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