
Total variation diminishing scheme for space-time least squares formulation of transport equation with finite element method.

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We develop a Total Variation Diminishing (TVD) scheme for approximating the transport equation within the finite element framework. Unlike the method proposed in [1], our approach is based on spatial total variation. The functional we consider is the Lagrangian associated with the optimization problem in the space-time integrated least squares (STILS) method [2], subject to constraints of positivity and the TVD property. This method provides accurate long-time behavior.

References

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- [2] O. Besson, J. Pousin. Solutions for Linear Conservation Laws with Velocity Fields in L^+ , Archive for Rational Mechanics and Analysis, 2, 2007, 159-175