

# On a monotone local fifth order accurate reconstruction for the approximation of hyperbolic conservation laws

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We construct a local fifth-order accurate shock capturing method for hyperbolic scalar conservation laws, based on numerical fluxes with a total variation diminishing (TVD) Runge-Kutta evolution in time. The method constructed is an upwind conservative scheme that is local in the sense that numerical fluxes are reconstructed without using extrapolation from the data of the smoothest neighboring cell. To design the method, local smoothing is introduced to prevent the increasing of total variation of the solution near discontinuities and to achieve fifth-order accuracy in smooth regions. The reconstruction is monotone, preserving the sign of the numerical derivatives at the interfaces. This property is verified by the third-order methods PPHM [?] and PHM [3], but not by fifth-order WENO methods [2, 4].

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