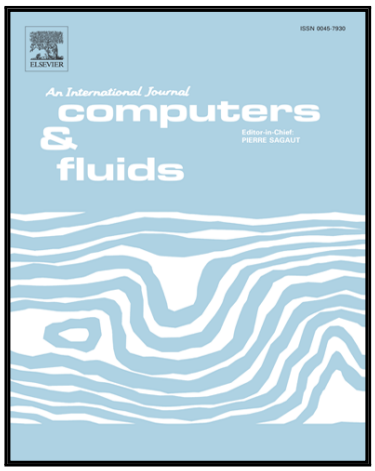

A perturbational weighted essentially non-oscillatory scheme

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Highlights

- A corollary about the accuracy of a kind of conservative schemes is generalized.
- A new WENO scheme is constructed by using the perturbed candidate fluxes.
- The new scheme relaxes the necessary and sufficient conditions for the fifth-order convergence.
- The new scheme is fifth-order accurate at critical points.
- The new scheme provides a novel method to decrease the numerical dissipation of traditional WENO schemes.