Novel local characteristic decomposition based path-conservative central-upwind schemes

Abstract: We introduce local characteristic decomposition based path-conservative centralupwind schemes for (nonconservative) hyperbolic systems of balance laws. The proposed schemes are made to be well-balanced via a flux globalization approach, in which source terms are incorporated into the fluxes: This helps to enforce the well-balanced property when the resulting quasi-conservative system is solved using the local characteristic decomposition based centralupwind scheme recently introduced in [A. CHERTOCK, S. CHU, M. HERTY, A. KURGANOV, AND M. LUKÁČOVÁ-MEDVIDOVÁ, J. Comput. Phys., 473 (2023), Paper No. 111718]. Nonconservative product terms are also incorporated into the global fluxes using a path-conservative technique. We illustrate the performance of the developed schemes by applying them to one- and two-dimensional compressible multifluid systems and thermal rotating shallow water equations.

This is a joint work with

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