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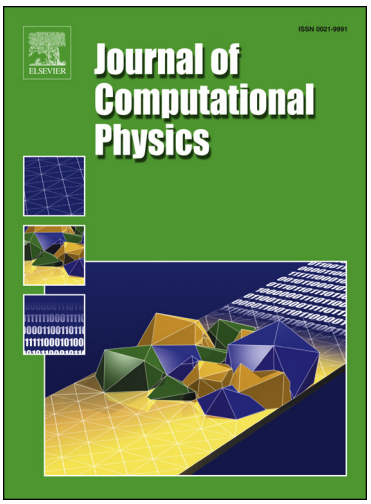

Weighted interior penalty discretization of fully nonlinear and weakly dispersive free surface shallow water flows

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Highlights

- New reformulations of recently introduced fully nonlinear and weakly dispersive free surface shallow water models are proposed.
- Decoupling strategies are investigated, in which we approximate the solutions of the classical shallow water equations supplemented with source terms globally accounting for the non-hydrostatic effects.
- SWIP-DG discrete formulations of arbitrary spatial order are carefully and systematically designed for these models, allowing to deal with the discontinuous nature of the elliptic problems coefficients in a stable and consistant way.
- Discrete gradient and discrete Laplace operators are introduced in order to account for the nonconformity of the discrete functions.

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