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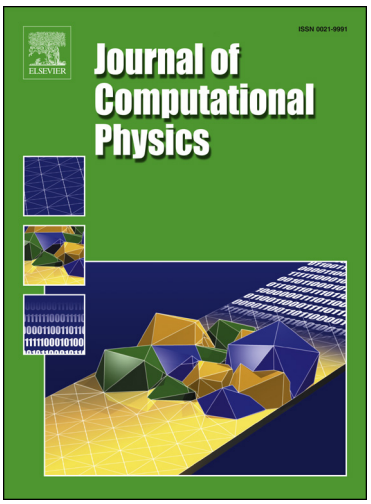

Interface-preserving level set method for simulating dam-break flows

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PII: S0021-9991(18)30520-5
DOI: https://doi.org/10.1016/j.jcp.2018.07.057
Reference: YJCPH 8183

To appear in: *Journal of Computational Physics*

Received date: 11 August 2017
Revised date: 8 February 2018
Accepted date: 31 July 2018

Please cite this article in press as: Z.H. Gu et al., Interface-preserving level set method for simulating dam-break flows, *J. Comput. Phys.* (2018), https://doi.org/10.1016/j.jcp.2018.07.057

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Highlights

- A three-dimensional interface-preserving level set method is developed in two steps to simulate dam break flow problems.
- A dispersion-relation-preserving compact reconstruction weighted essentially non-oscillatory (DRP-CRWENO4) which achieves high-order accuracy with low dispersion error at smooth regions and switches to compact candidate stencils to avoid oscillations near discontinuities is developed.
- Three benchmark cases including linear wave propagation, Zalesak's disk, and a vortex deforming problem are simulated to validate the proposed DPP-CRWENO4 scheme.
- Dam break flows with/without solid obstacle are successfully simulated through the comparison of the predicted results with their corresponding experimental or other numerical results.

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