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Software

- Review
- Repository
- Archive

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Summary

Numerical simulations of shallow flows are required in numerous applications and are typically performed by solving shallow-water equations. FullSWOF solves these equations by using up-to-date finite volume methods and well-balanced schemes. Several features make FullSWOF particularly suitable for surface water hydrologists: small water depths and wet-dry transitions are robustly addressed, rainfall and infiltration are incorporated, and grid-based digital topographies can be used directly. The modular structure of FullSWOF is also useful to numerical modelers willing to test new schemes or boundary conditions.

A detailed mathematical description is given (Delestre et al. 2014) and the capabilities of FullSWOF are tested against analytic solutions (Delestre et al. 2013). Depending on the scenario to be simulated, both a 1D version (FullSWOF_1D) and 2D version (FullSWOF_2D) are available.

FullSWOF is mainly developed in C++. It is freely available, easy to use, and open for further development. Manuals, as well as variable names and comments, are written in English. Reproducibility of the computation is ensured by benchmarking scripts.

The codes and manuals are hosted on a web-based forge, making convenient to share code and to interact with users and developers (https://sourcesup.renater.fr/projects/fullswof-1d/ for FullSWOF_1D; https://sourcesup.renater.fr/projects/fullswof-2d/ for FullSWOF_2D). A basic graphic user interface (FullSWOF_UI), written in Java, is also available (https://sourcesup.renater.fr/projects/fullswof-ui/). A generic webpage (http://www.univ-orleans.fr/mapmo/soft/FullSWOF/) summarizes the recent developments, case studies and citations.

References

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