

NUMERICAL WAVE TANKS APPLIED TO COASTAL AND OFFSHORE ENGINEERING IN OPENFOAM

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ABSTRACT

Physical scale model testing applied to coastal and offshore engineering, despite offering valuable insights into real fluid-structure interactions, presents significant limitations. Performing experiments in wave tank facilities is not only expensive but also limited in its ability to rapidly refine and optimize prototype geometries.

Numerical wave tanks (NWT) have become very popular in industry and academia to accurately simulate multiple extreme events at the same time, as a complement to laboratory tests. The aim of this Invited Session (IS) is to prove the ability of the numerical model OpenFOAM, an open-source C++ toolbox, to replicate and complement experiments related to coastal and offshore engineering.

Numerical Wave Tanks (NWTs) developed under the OpenFOAM framework provide an excellent numerical tool for the research, development and innovation, offering a cost-effective platform for their experimentation, analysis, and optimisation, such as numerical modelling of wave generation, transformation and interaction with structures [1], numerical modelling of tsunamis generated by granular landslides [2] or hydrodynamic analysis and optimization of wave energy converters [3].

REFERENCES

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