

The WECANet-RORO testing program

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The interactions between Wave Energy Converters (WECs) and wave motion lead to complex fluid dynamics, mechanical and electrical phenomena. The experimental modelling seems to be the most powerful scientific approach to explore such dynamics up to their full extends. Laboratory effects may alter some physical processes under study and controlling such effects is fundamental to produce good-quality data. Advanced numerical modelling techniques, able to simulate very complex physical systems where fluid-dynamics and mechanical components interact, are emerging and in support of their further development there is an acute need of good-quality experimental data. The execution of an experimental test program in different laboratories, where the same WEC model is tested, seems to be the most viable methodological approach to: i) assess the reproducibility of experiments with WECs, and ii) develop a reliable database for validating advanced numerical models. Under WECANet, an experimental and numerical ROUNd-ROBin testing program (WECANet-RORO) was proposed (Cappietti, 2019) and a first group of WECANet partners joined this initiative. A managing committee was formed, aiming at: i) setting up starting activities and coordination; ii) promoting the formation of a group of experimental and numerical infrastructures participating in WECANet-RORO. The Oscillating Water Column Wave Energy Converter (WEC) has been selected as the reference model. Studying such kind of WEC permits to explore



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the inherent difficulties of numerical modelling in simulating a two-phases physical system, namely, water and air. Moreover, in order to acquire laboratory measurements of those physical phenomena that are still very challenging in term of numerical modelling (e.g. mooring dynamics, moving rigid boundaries) one floating and one fixed laboratory-scale models will be tested (Fig. 1).

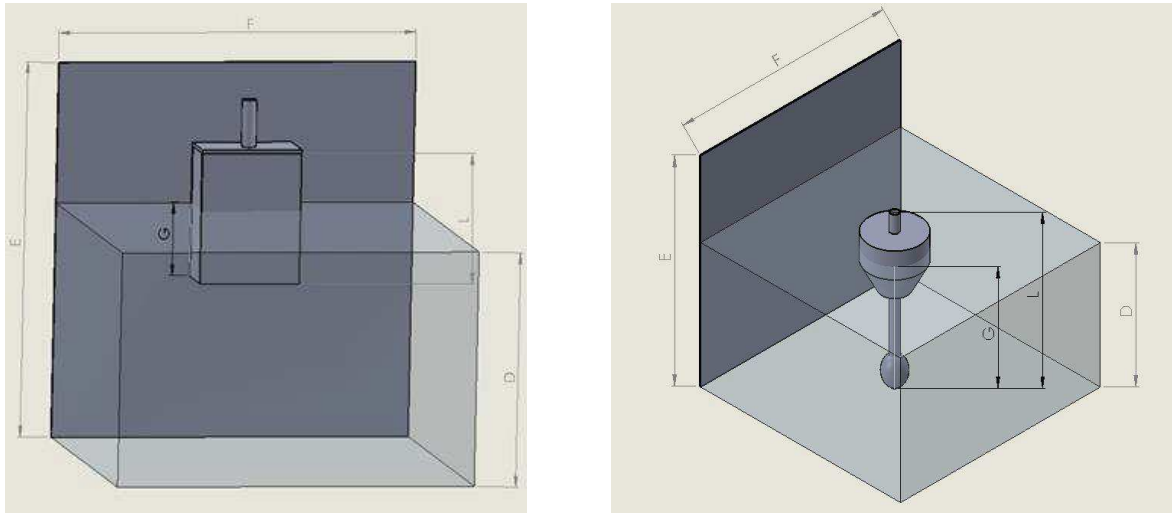


Figure 1 – schematic layout of the WECANet-RORO OWC models, fixed (left) and floating (right).

Belgium (www.ugent.be), Denmark (www.build.aau.dk), Greece (www.auth.gr), Italy (www.unifi.it), Portugal (paginas.fe.up.pt/~nemarwebsite/), Spain (www.uvigo.gal, lim.upc.edu), Turkey (<http://imst.deu.edu.tr>), and United Kingdom (www.qub.ac.uk) countries are presently participating in the WECANet-RORO. Advancements in the organization is going to be presented in the 2020 General Assembly aiming at attracting the interest of more WECANet members and increase the number of the WECANet-RORO experimental and numerical participating infrastructures, but also the number of the WECANet-RORO data users for numerical validation purposes.

References

Cappiotti, L. (2019). The LABIMA’s proposal for a “Round-Robin” testing program under the WECANet Network. WECANet COST Action CA17105 General Assembly 2019, Porto, Portugal, November 28-29, 2019, p.50, COST - European Cooperation in Science and Technology, ISBN: 9789464000160

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