

## WECANet-LABIMA Open Access Data Base for Numerical Models Benchmarking

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Due to wave-energy dissipation while propagating towards the shore, fixed Oscillating Water Column (OWC) Wave Energy Converters (WECs) mounted on coastal structures exploit a wave-energy resource that can be substantially lower than the offshore counterpart. Indeed, focusing mechanisms triggered by the wave bottom interaction may lead to the formation of coastal hotspots but it is a rare case thus most of the time the offshore resource is greater. In order to exploit the offshore wave-energy resource the Floating OWC devices might represent a feasible alternative and the best cost-benefit compromise.

The performance of floating OWC WECs has been widely studied using both numerical and experimental methods. However, due to the complexity of fluid-structure interaction of floating OWC WECs, most of the available studies focus on 2D problems with WEC models of limited Degrees-Of-Freedom (DOF) of motion, while 3D mooring effects and multiple-DOF OWC WECs have not been extensively investigated yet. Therefore, in order to gain a deeper insight into these problems, the present study focuses on wave flume experiments to investigate the wave-OWC interaction and mooring performance of a laboratory-scale floating OWC-WEC model. A series of flume experiments were already done in the MaRINET2 EsfLOWC project completed at the end of 2017 and a new laboratory-scale experimental campaign is under conduction under the LABIMA-UNIFI and STMS-WECanet support. The data already obtained and new data comprises multiple-DOF OWC WEC motions, mooring line tensions, change in the air pressure inside the OWC WEC chamber and free surface elevations throughout: wave flume, close to and inside the OWC-WEC. The tested wave conditions include regular and irregular waves. The obtained data will provide a database for numerical validation of research on floating OWC-WECs and, on floating OWC-WEC farms or arrays used by researchers worldwide.

These measurements will be: i) deeply described in a detailed report in order to be used by third parties, ii) organized in an online open-access database for easy downloading and use. The developed database, comprising OWC, will constitute the reference database for benchmarking numerical models. Worth to mention that the new experimental campaign comprises also laboratory-scale tests on a model of Overtopping-Devices, but the presentation of these tests is planned for a subsequent WECnet meeting.



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