Wave energy research in the new Coastal and Ocean Basin in Ostend, Belgium

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The new Coastal and Ocean Basin (COB) [1] is located at the Greenbridge Science Park in Ostend in Belgium (http://COB.ugent.be). The laboratory will provide a versatile facility that will make a wide range of physical modelling studies possible, including the ability to generate waves in combination with currents and wind at a wide range of model scales.

The facility is designed to serve research and industry needs in the fields of mainly offshore renewable energy and coastal engineering. The wave basin will have state-of-the-art generating and absorbing wave generators, a current generation system and a wind generator. The aim is to generate waves and currents in the same, opposite and oblique directions. The wave basin will be fully operational in 2020.

In the field of renewable energies we aim at a detailed understanding of the optimal geometrical lay-outs of wave energy converter (WEC) arrays and farms under realistic 3D wave-current conditions, as well as of the interactions between the WECs of the farms. This comprises the establishment of a generic dataset to validate the recently developed high precision numerical models ([2] - [4]) used to simulate WEC farm effects. This new dataset will be realised at the COB within the upcoming 'WECfarm' research project, designed to follow-up the completed 'WECwakes' project [5] - [6]. Furthermore, experimental research aiming at numerical model validation of wave slamming on complex floating objects such as (but not limited to) WECs, as well as on WEC mooring effects, is planned.

This research is situated in the topics of "Working Group 2: Experimental hydrodynamic modelling and testing of WECs, WEC arrays/farms, PTO systems, and field data" and "Working Group 1: Numerical hydrodynamic modelling for WECs, WEC arrays/farms and wave energy resources".

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