Experimental testing and numerical modelling of WEC arrays

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This work refers to PhD research performed at Ghent University, Belgium, within the topic: "Experimental study and numerical modelling of combined near-field interactions and far-field effects of wave energy converter farms". Since the execution of the WECwakes experiments in 2013, which generated a large database to be used for numerical validation purposes, numerical models have progressively advanced [1] - [2]. As a result, a new experimental campaign within the WECfarm project has been initiated to obtain a database to validate these new advanced numerical models for WEC array modelling. The WECfarm experiments will be conducted at the Coastal and Ocean Basin (COB) [3] in Ostend in 2021, as part of the collaboration between Aalborg University, Denmark (Jens Peter Kofoed, Francesco Ferri), Queen's University Belfast, UK (Matt Folley) and The University of Edinburgh, UK (David Forehand). This part of the 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".

The SPH software DualSPHysics [4] is used for numerical modelling of the tested WEC arrays, in collaboration with the EPhysLab research group of The University of Vigo, Spain. Finally, a coupled DualSPHysics-OceanWave3D numerical wave basin will be established to model WEC arrays, where the wave propagation model Oceanwave3D will also be employed to model impact of WEC arrays on the surrounding wave field [5]. This part of the research is situated in the topics of "Working Group 1: Numerical hydrodynamic modelling for WECs, WEC arrays/farms and wave energy resources".

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