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Publication date:
2023

Document Version
Peer reviewed version

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ABSTRACT

Ocean wave energy has the potential of contributing significantly to the industrial energy production and export, both as a standalone solution by using wave energy converters (WECs) in wave energy parks, and in combination with offshore wind energy. For comparison the power intensity of wind is 0.4 - 0.6 kW/m^2, solar is 0.1 - 0.2 kW/m^2 and wave power intensity is about 2 - 3 kW/m^2 [1, 2].
The wave energy converter Crestwing is an attenuator type of WEC with proven technology and simple feasibility originated from the shipbuilding industry [3]. Although it seems to be a feasible technology it still has many avenues for optimizing efficiency and minimizing costs to drive down levelized cost of electricity. Effective energy harvesting is only conceivable by interpretation of underlying physics and optimization of key parameters of a WEC such as hull shape. For these goals we use state-of-the-art CFD simulation tools based on fifth-order Stokes wave theory, overset mesh technique and dynamic fluid body interaction. At the symposium we will present verification and validation of the CFD model relying on existing model tests and use the CFD results to highlight the key components of the Crestwing WEC [4, 5].

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