

HIGH-FIDELITY MODELLING OF RENEWABLE ENERGY SYSTEMS

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ABSTRACT

Offshore Ocean platforms, Offshore Wind Turbines (fixed or floating), Current/Tidal turbines and Wave Energy converters (WEC) are often designed and even analyzed via potential-flow or empirical-based tools. This due to the past experience and trust on this type of tools, to the generally lower influence of viscosity in wave-related phenomena and their low computational cost. Nowadays, with the democratization of viscous-flow tools (CFD, or Computational Fluid Dynamic), and HPC (High-Performance Computing) hardware, almost all fields of Maritime problems are seeing an increased use of these higher-fidelity tools, and the Renewable Energy World is not an exception [1,4]. Due to the increase interest on these technologies by the Industry, Governments and Public opinion in general, due to the European and World targets to reach on the lowering of gas emissions, and inevitable decarbonization of shipping, a considerable amount of research is being done on high-fidelity modelling and Renewables. The objectives are mainly to increase the understanding of the complex physical phenomena behind, to augment the numerical and modelling accuracy of the simulations, permit coupled multi-physics simulations, to consequently decrease the risks on these technologies, decrease design safety margins and finally lower their LCOE costs.

In this session we intend to have publications and presentations on all sorts of Renewable Energy topics *with emphasis* on viscous-flow CFD. Both standard high-fidelity unsteady RANS and more leading-edge turbulence solving approaches (Scale-Resolving Simulations such as DES/SAS, PANS, LES) are welcome. Multi-physics approaches such as FSI, aero+hydro+soil dynamics, and tool advanced coupling are also foreseen. The extended network of contacts of the organizers will be used to attract speakers, being 6 presentations a manageable target.

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