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PeWEC: preliminary design of full-scale plant for the for the Mediterranean Sea

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Nowadays, atmospheric pollution and climate changing have encouraged Governments to invest in renewable technologies for clean energy production.

Wave Power constitutes an interesting option in the panorama of renewables and starting from the first results achieved in the '70s, in the last and present decade the major efforts have been concentrated to make Wave Energy Converters (WECs) more protable and predictable.

The research activities described in the present work are concerned with the development of a pendulum converter (PeWEC: Pendulum Wave Energy Converter), specifically designed for the Mediterranean Sea scenario. In the first part of the paper, the mathematical model of the system is presented and benchmarked against the experimental campaign results carried out at the INSEAN wave basin (Rome), in 2015.

Numerical models proved to be in good agreement with experimental data and thus suitable for the implementation of a model based design and optimization methodology. The latter is constituted by three different tools, with increasing degree of fidelity, that combined together allows to optimize the device performances on the installation site chosen.

Lastly, the optimizations tools previously described are used to evaluate a preliminary full-scale PeWEC layout, suitable for the Pantelleria Island (Italy) installation site.

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