

## Non-Stationary Stochastic Optimization of an Oscillating Water Column

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**Abstract :** A non-stationary stochastic optimization methodology is applied to an OWC (oscillating water column) to find the design that maximizes the wave energy extraction. Different temporal cycles are considered to represent the long-term variability of the wave climate at the site in the optimization problem. The results of the non-stationary stochastic optimization problem are compared against those obtained by a stationary stochastic optimization problem. The comparative analysis reveals that the proposed non-stationary optimization provides designs with a better fit to reality. However, the stationarity assumption can be adequate when looking at averaged system response.

**Keywords :** non-stationary stochastic optimization, oscillating water, temporal variability, wave energy

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