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# Reliability of Wave Energy Converters

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## Description:

This PhD thesis focuses on probabilistic structural reliability assessments of wave energy converters, considering uncertainties related to physical properties, limited data sets, considered simplified models and measurement errors. The resulting structural probability of failure can be used to calibrate safety factors used in structural standards as well as for reliability-based structural optimizations including operation and maintenance considerations.

The main objectives of this PhD thesis are as follows

- to determine wave energy converter specific uncertainties in connection with estimating structural loads onto wave energy converter structures,
- to perform probabilistic reliability assessments of wave energy converter details,
- to find appropriate structural reliability levels for wave energy converter structural details as well as
- to calibrate partial safety factors for design of wave energy converter structures,
- to introduce a method to extrapolate extreme loads of wave energy converters as well as
- to present different maintenance and operation strategies including different transportation strategies.

Furthermore, the thesis will use a reliability-based optimization method with focus on minimizing the resulting cost of energy.

**Keywords:** Structural reliability, Wave energy converter, Structural optimization