Design of novel breakwaters

Background and motivation
A breakwater is a permanent structure constructed at a coastal area to protect against tides, currents, waves, and storm surges. It can also be a permanent structure that shields a smaller harbour. There are different types of breakwater structures ranging from permanent structures made of concrete and stones to floating structures made of pontoons. These are often very costly and take time to build. New innovative concepts or solutions are therefore asked for.

Objectives and goals of the project
Corrugated panel structures can effectively reduce the motions of liquids and wave sloshing loads inside larger tanks in, e.g., ships. This project will explore the possibility of using large, corrugated panel structures as efficient shields for ocean waves acting as breakwaters. Emphasis is on simulation and analysis of ocean wave-breakwater structure interaction for different corrugation profiles. The purpose is to propose what is the most suitable corrugation profile for different seastate conditions or waves encountering a breakwater.

Methods and tools
The thesis candidates should explore which numerical method that is the most suitable for the analysis of the problem. It can be, e.g., Matlab, the DNV-GL software SESAM, or any CFD software. The thesis report should be written in Word using a template provided by the department.

Number of students: 1 or 2 students.

Prerequisites: CFD.

Tasks
- Literature study on the topic.
- Modelling and simulation of breakwaters with corrugated profiles subjected to different seastate conditions and wave directions: systematic numerical case studies.
- Analyze and identify which corrugation profiles that minimize the loads acting on the breakwater.
- Write a thesis report and present it at a public seminar.

Contacts
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