Maritime DTU
Center for Maritime Activities

Numerical Wave Tanks and Comparison with Measurements

Type of project: MSc

Project description:

A two-hinged, flap-type wave maker is installed in the 220m long, 12m wide and 5.5m deep towing tank at FORCE Technology. The wave maker is used to make a large variety of different waves including regular waves, irregular waves and focused wave trains to produce a single breaking wave event. The goal of this project is to set up two numerical models of this wave flume and compare them to measurements. One model will be created using the commercial CFD code STAR CCM+, and the other model will use an existing DTU-developed potential flow solver. The numerical models will be driven by experimentally measured time-series of the upper and lower flap angles. First, 2D models will be validated by comparing wave elevations along the tank for a single breaking wave event and a nonlinear regular wave case. The feasibility of extending the CFD model to 3D will then be investigated. Finally, possibilities for using the numerical tank(s) to optimize the physical wave generation signal will be explored.

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