
Spray Water- Spray jets from wave run-up against ship bows and steep walls

A Data Management Plan created using DMPonline

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Project abstract:

In Arctic and sub-Arctic open waters with harsh conditions, ship operations are intensifying due to the reduction of sea ice coverage: transits for transport, tourist and yacht cruises, and crew change transits to offshore operation sites. Their safety is affected by icing, i.e. sea spray that freezes upon contact with the ship. As climate change induces more and more intense storms, the damage and hindrance of spray jets on ships will aggravate. Similar observations hold for spray jets overtopping coastal structures such as levees, flood gates, breakwaters and quay walls, that impact their functionality and safety level of the hinterland. In order to enable better control of overtopping and icing, the formation of spray-jets from wave run-up needs to be investigated. The fundamental research questions in this context are: how much spray is formed and how does it break up in drops under various representative storm conditions. Understanding of the physical processes, and from there, computational modelling, will be based on an indispensable and so far non-existing data sets generated in an experimental research program. As proper scaling of the processes is of key importance, two different experiments are proposed aiming at representing the important physics at different scales. The results will be used in the development of winterisation guidelines as related to IMO Polar Code operational guidelines. Fundamental knowledge on spray formation will also be used in the design of coastal defence structures.

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General information

Prof. dr. ir. W.S.J. Uijtewaal, TUD

- Yes

Description of the data

There will be three experimental campaigns.

1. Large-scale jet model
2. Full-scale model tests (field experiments)
3. Small-scale wave run-up experiments in TU Delft WaterLab. The data that will be collected are:
 - surface elevation (ASCII files)
 - high-speed images of the run-up process of a wave against a wall with different inclinations
 - velocities at the run-up of wall (TIFF and txt files with positions and velocity components)

The raw data will be mainly .txt files and .tif images. The nomenclature of the files will gather the key information of each of the files, namely the test campaign, the measurement technique and the conditions of each test.

The processed data is subjected to the characteristics of the analyses.

Data storage during the project

The volume of data will be approximately of 2TB per experimental campaign.

It will be stored in an 4TB external hard-drive and in the TU Delft webdrive.

- Yes
- Yes

The PhD, Irene Rivera-Arreba is responsible for this back-up

The costs of storage devices should not go over 700euros (5 times 4TB external hard drive).

Archiving of data after the project

Question not answered.

- Yes

Question not answered.

Question not answered.

Standards and Metadata

The documentation (or explanation) of the data will go together with the storage drivers. A report after every experimental campaign clarifying the collected data and where is what will follow.

Making data available

- Yes

Question not answered.

- No