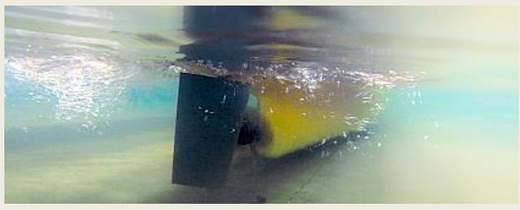
This is the 50th newsletter of the *Knowledge Centre Manoeuvring in Shallow and Confined Water*, which aims to consolidate, extend and disseminate knowledge on the behaviour of ships in shallow and confined water. In this newsletter, we give more details of the upcoming MASHCON conference and we present the state of the art free running system that was installed in the Towing Tank for Manoeuvres in Shallow Water at Flanders Maritime Laboratory.



About 30 peer-reviewed papers are expected to be presented at the 6th MASHCON conference, which will be held at the Technology & Innovation Centre, University of Strathclyde, Glasgow, UK, from 22 to 26 May 2022. The conference will have a non-exclusive focus on port manoeuvres, but a large number of papers dealing with other aspects related to manoeuvring in shallow and confined water, such as shallow water effects, are included in the conference program. Other papers will validate numerical results with experimental benchmark data, which are always available upon simple request for researchers wishing to validate numerical tools against experimental model test results.

The conference is intended as an in-person event, but in view of any remaining travel restrictions or difficulties, the conference will be organized as a hybrid event and online participation is possible.

If you are interested to participate, you are invited to register for the conference through our secure link. The 6th MASHCON conference is organized jointly by the University of Strathclyde, Ghent University and Flanders Hydraulics Research.

In the period of January – February 2022, a state of the art free running system, developed in cooperation with Kapernikov, was successfully tested at Flanders Maritime Laboratory. This system operates based on Robot Operating System software, which allows to connect several position measurements (e.g. by camera or lidar), as well as steering of rudders and propellers.

The KVLCC2 ship model performed several runs, where the ship was successfully controlled by an autopilot. The autopilots developed in the framework of the PhD research of Changyuan Chen were implemented. The system controlled the acceleration and deceleration phase based on a PID controller, performing a zigzag manoeuvre at regime speed.

Further developments include reaching sub-millimetre precision in the position measurements. As part of the PhD work of Hongwei He, the system will be used to model interactions between multiple autonomous sailing ships in the basin, as well as to further expand existing path planning and object avoiding control systems.

On 18 February 2022, Thibaut Van Zwijnsvoorde successfully defended his PhD thesis "Modelling the Behaviour of a Moored Ship in Sheltered Waters". The thesis discusses all parts of the mooring analysis, generating the input, performing time-domain calculations and the interpretation of the output. The mooring analysis was carried out with the software package Vlugmoor, specifically developed by the Maritime Technology Division at Ghent University for Dynamic Mooring Analysis. Furthermore, tensile

tests on mooring ropes performed at Bexco are presented. Passing ship interaction effects in shallow and confined areas have been studied in the model test program PESCA, executed in the Towing Tank for Manoeuvres in Confined Water. These tests are used to build an empirical model to predict passing ship effects in sections with high blockage, as well as to validate the potential, double body, software package Ropes.

Mr. Bagué, Prof. Degroote, Dr. Demeester and Prof. Lataire won the 2021 JST Best Paper Award for their paper "Dynamic Stability Analysis of a Hydrofoiling Sailing Boat Using CFD", published in the SNAME Journal of Sailing Technology in March 2021. This Award is for "The Most Outstanding Contribution to the Journal".

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