

Newsletter Shallow Water

Knowledge Centre Manoeuvring in
Shallow and Confined Water

Flanders
Hydraulics



Flanders
State of the Art



March 2025

This is the 60th newsletter of the Knowledge Centre Manoeuvring in Shallow and Confined Water, which is a collaboration between Flanders Hydraulics and the Ships and Marine Technology Division at Ghent University. In this newsletter, we have an item on the 7th MASHCON conference, on the PIANC WG186 publication and on the FOREMAST general assembly.

7th MASHCON - Clean power

The organization of the 7th MASHCON conference is now well underway. The 7th MASHCON conference will be held from 18 to 21 May 2025 in Bruges, Belgium. The MASHCON conferences offer researchers and experts the possibility to discuss the latest developments in research and practice related to ship manoeuvring in shallow and confined water. With keynote speakers from CLdN and Wärtislä and topics such as the green energy transition in shipping and near shore emissions and manoeuvring in shallow water using auxiliary propulsion, such as wind assistance the conference will pay special attention to clean power in shallow water from both an academic and an industry perspective. 35 papers will be presented in this three days conference.

To benefit from the reduced registration and accommodation fees you must register and complete your payment before the 31st of March.

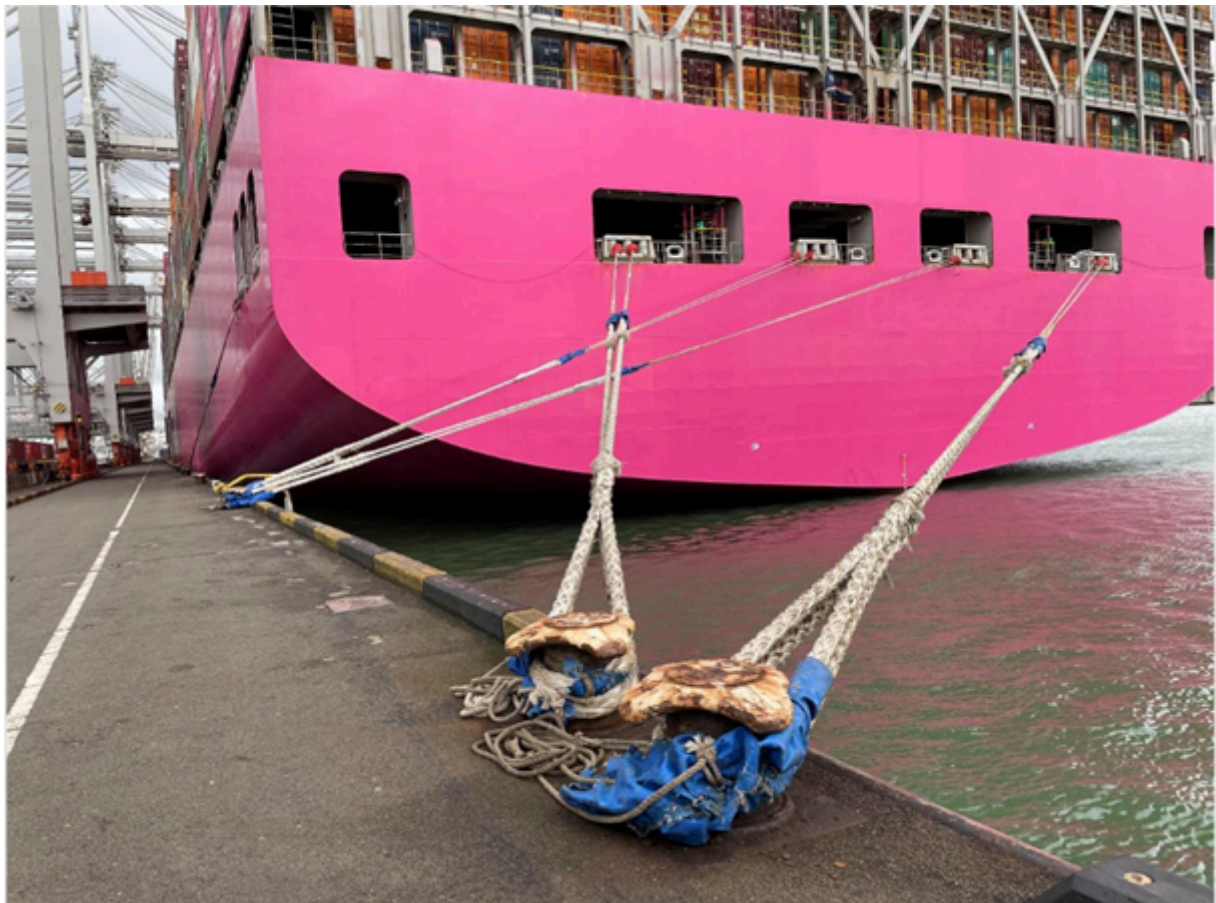
For any information please reach out to us on info@shallowwater.be. Do not hesitate to forward this invitation to your contacts!

Looking forward to seeing you in Bruges!



PIANC WG186 report

Januari 2025 the PIANC WG186 report 'Mooring large ships at quay walls' was published. Thibaut Van Zwijnsvoorde was a member of this group and contributed based on his expertise in mooring studies done at Flanders Hydraulics and Ghent University. The report highlights the importance of assessing passing ship effects in confined conditions. As with many shallow and confined effects, the passing ship effect is highly non-linear, meaning that the choice of tool (numerical, physical) depends on the situation; an expert in the matter should always assist in this decision process. In most cases, the combination of ship size, environmental effects and the evolution on mooring equipment on board creates the necessity for a detailed assessment of the situation in order to minimize impact on operational efficiency and to manage the risks appropriately.



FOREMAST GENERAL ASSEMBLY



Funded by the Horizon Europe programme, the 3-year long FOREMAST project addresses the urgent need for sustainable transport solutions in urban and coastal areas, with the aim to create a paradigm shift towards cleaner and more efficient logistics. Small, Flexible Automated, Zero-emission (SFAZ) vessels are being developed within the project. The Ships and Marine Technology Division at Ghent University is one of the 16 partners within the project. Their main task is to develop manoeuvring models of the different SFAZ vessels, so that controllers – partially or fully automated - can steer the vessels accurately, ultimately allowing automated berthing or platooning.

The FOREMAST project held its first General Assembly on January 29–30, 2025, in Ghent, Belgium, bringing together key partners and experts to discuss the latest advancements in Small Flexible Automated Zero-emissions (SFAZ) vessels and their role in modern logistics. The first day was hosted by Ghent University and featured updates and workshops on the project's major work packages, covering research and innovation in SFAZ solution components, automated logistics chains, vessel design, and project coordination.



On the second day, participants witnessed a live test of the AVATAR vessel, SFAZ prototype of the Living Lab in Ghent (LL1), while the vessel was remotely controlled by Seafar Remote Control Center. The partners were able to sail on one of the two vessels and experience several practical and operational tests in LL1 including remote control sailing and collision avoidance tests. This demonstration showcased the potential of automated vessels in inland waterways. Additionally, experts discussed a digital twinning prototype, highlighting how virtual simulations can enhance vessel design and operation.

Stay connected for more updates as the FOREMAST project moves forward!

Researchers associated with the Knowledge centre recently published:

He, H., Van Zwijsvoorde, T., Villagomez, J., Lataire, E., Delefortrie, G. (2025) Comprehensive experimental testing of parameter sensitivity on a model predictive controller for path following in shallow water. *Ocean Engineering*, Vol. 326, 120882, <https://doi.org/10.1016/j.oceaneng.2025.120882>

He, H., Villagomez, J., Van Zwijsvoorde, T., Lataire, E., Delefortrie, G. (2025) Experimental assessment of speed adaptive track control of rudder-propeller-actuated ships based on model predictive control. *Ocean Engineering*, Vol. 326, 120824, <https://doi.org/10.1016/j.oceaneng.2025.120824>

Activities

Meanwhile the first meeting of the ITTC Manoeuvring Committee was held in Genoa, Italy where José Villagómez Rosales attended. It was decided that the Wigley ship-ship interaction tests performed in Flanders Hydraulics will be included in the list of benchmark data of the next ITTC report coming in 2027. The second meeting of the MC will be hosted by Flanders Hydraulics the 20th and 21st of November 2025 in Antwerp, Belgium.

Steve Claes attended the 14th MARLOG Conference in Alexandria, Egypt. The conference was organised by the Arab Academy for Science, Technology and Maritime Transport, it focussed on "Artificial Intelligence Implementations - Towards Shaping the Future of the Digital World".

Congratulations



Hongwei He defended his PhD thesis at Ghent University on January 20, 2025. His thesis presents the development and validation of an autonomous navigation system for surface vessels, focusing on path planning, path following, trajectory tracking and collision avoidance, mainly by means of Model Predictive Control (MPC). The navigation system is designed to be COLREGS compliant, enabling safe and compliant manoeuvres in various maritime scenarios, such as overtaking, head-on collisions and crossing situations. The system has been extensively tested and validated by means of experiments in the towing tanks of Flanders Hydraulics and simulations, demonstrating robust performance under various operating conditions and environmental disturbances. The proposed autonomous system is promising for practical real-world applications and contributes to the advancement of autonomous shipping and maritime manoeuvring research.

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