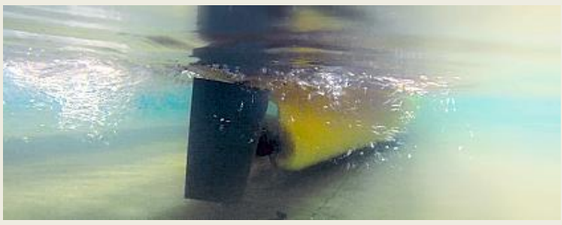
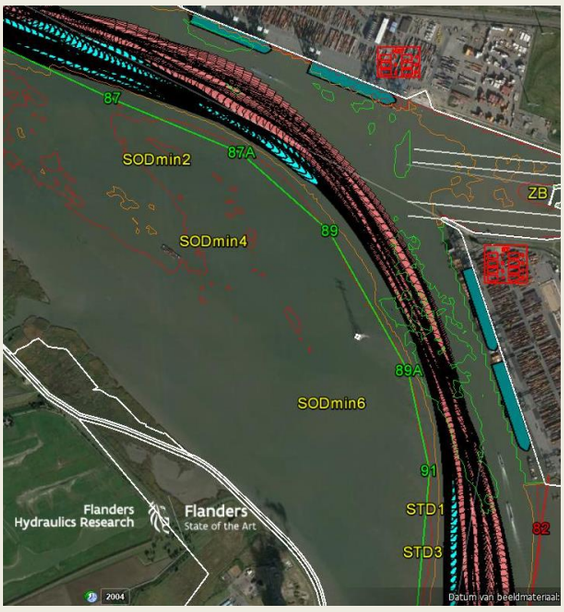
This is the 43rd newsletter of the *Knowledge Centre Manoeuvring in Shallow and Confined Water*, which aims to consolidate, extend and disseminate knowledge on the behaviour of ships in shallow and confined water. In this newsletter, it is our pleasure to announce that new open benchmark data have been released for the 6th MASHCON conference. In addition, two projects are discussed that were commissioned by the Port of Antwerp to study the accessibility of the Europe terminal.

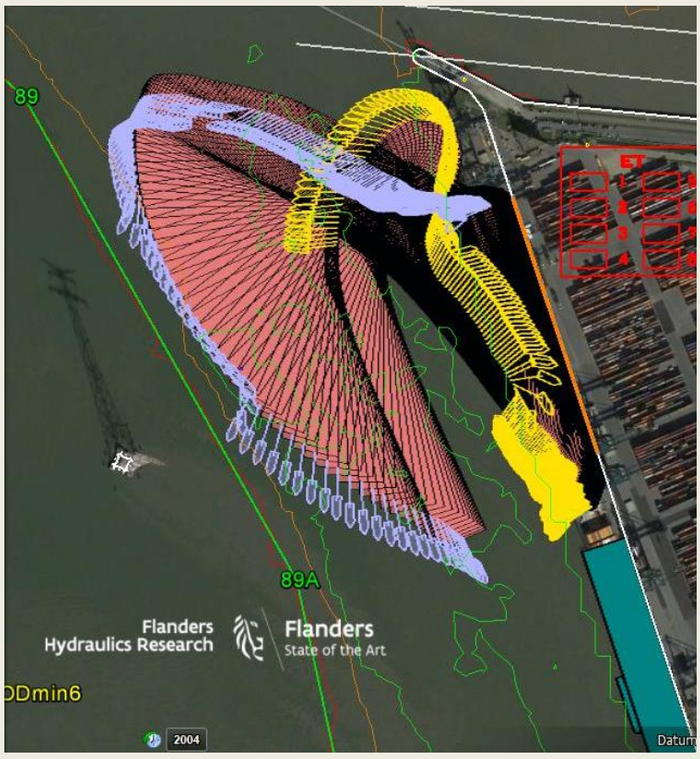


The 6th MASHCON conference will be held in Glasgow from 22 to 26 May 2022 and will have a non-exclusive focus on port manoeuvres, where several shallow and confined water challenges are present. A lot of these manoeuvres occur in the vicinity of moored ships, leading to passing ship effects on moored ships.
To open a joined research effort on the validation and verification of the different research methods, the Knowledge Centre Manoeuvring in Shallow and Confined Water has selected model test data which were obtained during the PESCA (Passing Effects in Shallow and Confined Areas) captive model test program, which was executed in the Towing Tank for Manoeuvres in Confined Water at Flanders Hydraulics Research. The captive model tests present results with the KCS as passing ship and a Neo-Panamax container carrier and an Aframax tanker as moored ships. The benchmark data and accompanying explanatory paper are available upon simple request for interested parties and in particular for researchers wishing to validate numerical tools.
The 6th MASHCON conference is organized jointly by the University of Strathclyde, Ghent University and Flanders Hydraulics Research.



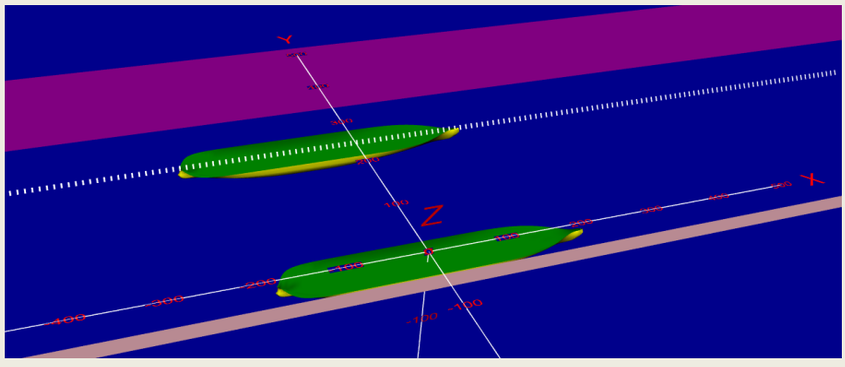
The Port of Antwerp is preparing to upgrade the Europe terminal on the right bank of the river Scheldt in order to accommodate Ultra Large Container Carriers (ULCC). Researchers associated with the Knowledge Centre were involved in two projects that were commissioned by the Port of Antwerp to study the accessibility of the Europe terminal, directly south of the Berendrecht/Zandvliet lock complex. The objective of the studies was to allow the Europe terminal to accept 24.000 TEU vessels while minimising the impact on the passage of other ULCC's entering and leaving the Deurganck dock.

In the first study, Flanders Hydraulics Research executed a real time simulation study on coupled full-mission ship manoeuvring simulators (sim360+ and sim225) for the evaluation of an optimised Europe terminal layout. In this optimized orientation, ULCC encounters and swinging manoeuvres were studied. The pilots passing by moored MM24 ships at the optimised Europe terminal adapted the speed through water and passing distances in order to guarantee a safe passage. The simulations were executed in strong wind conditions of 5 and 6 Bft and with maximum current during flood or ebb tide.

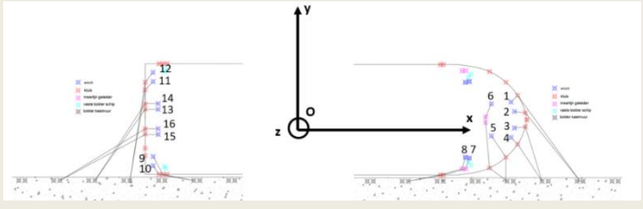


For the swinging manoeuvres in the vicinity of the Europe terminal, ULCCs of up to 430 m were handled by pilots of both the Flemish and the Dutch Pilotage and by tug captains of Antwerp Towage and Boluda during the simulations at Flanders Hydraulics Research.

Although the access to the Berendrecht/Zandvliet lock complex is the preferred swinging area for MM24 ships, it was found that in milder wind and current conditions MM24 ships can be swung directly at the northern berth thanks to the widening of the waterway by turning the Europe terminal inland at this location.



In the second study, the Division of Maritime Technology at Ghent University conducted a Dynamic Mooring Analysis to investigate the safety of the moored MM24 ships under the influence of passing ships and wind. The potential code ROPES was first used to calculate the passing ship forces, which were then put in the software Vlugmoor, which has been developed specifically by the Division of Maritime Technology for Dynamic Mooring Analysis. Not only mooring line forces, but also motions of moored ships need to be limited, as large motions can cause delays and potential safety risks.



It was found that the passing trajectory and speed of the passing ship influence the forces on the moored ship to a large extent. A lower passing speed and larger distance is favourable for the moored ship, but impedes the freedom of the passing traffic, resulting in conflicting needs. Ghent University and Flanders Hydraulics Research worked in close coordination to make sure that the modelled conditions were compatible. This method of close cooperation between manoeuvring simulations and mooring studies proves to be successful and will be further refined in future projects.

The Dynamic Mooring Analysis reveals that the mooring lines as such can withstand large passing ship forces in moderate to high wind conditions. However, significant surge motions on the moored ship may occur because of the limited capacity of the mooring arrangement to deal with large surge forces. Stiffer mooring lines would greatly reduce this effect, yet there is a lack of international regulations on used line types on board. In a next step, the impact of using ShoreTension units was modelled to lower the motions of the moored ships. The results show a significant reduction of the motions of the moored ship under the given passages, showing that ShoreTension could be used at this terminal to increase the safety of the moored MM24.

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