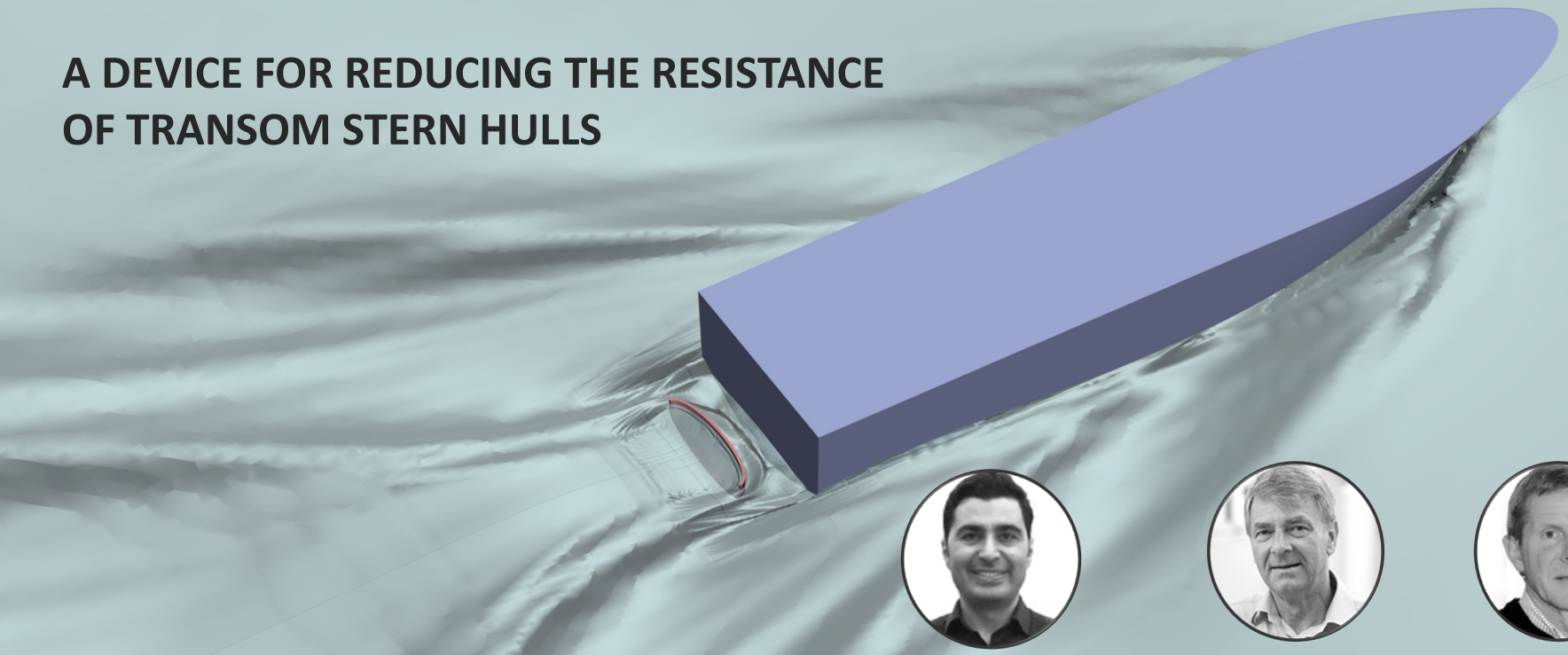
A DEVICE FOR REDUCING THE RESISTANCE OF TRANSOM STERN HULLS



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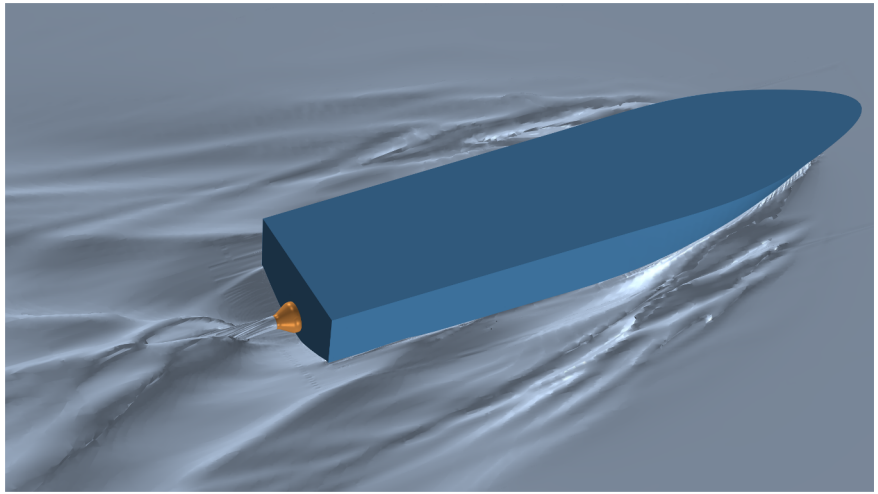
[1]Department of Mechanics and Maritime Sciences
Chalmers University of Technology

[2] SSPA Sweden AB

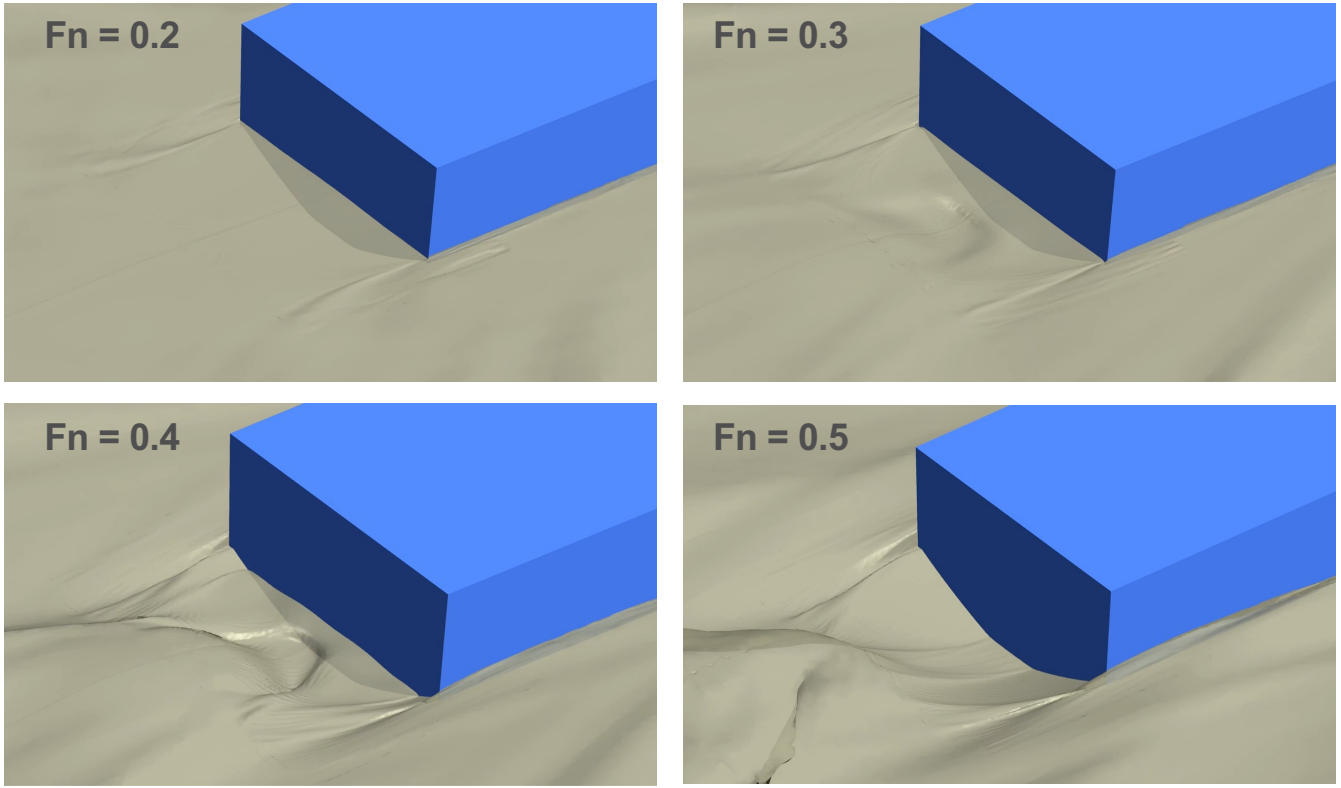
CHALMERS
UNIVERSITY OF TECHNOLOGY



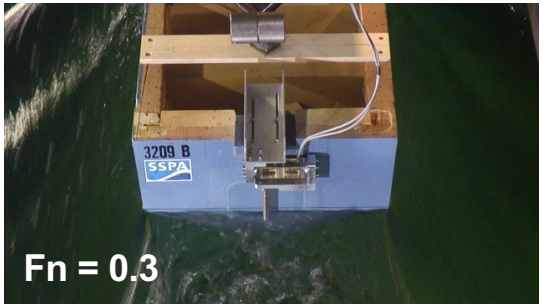

DETECTION OF A SUSPICIOUS BEHAVIOUR!

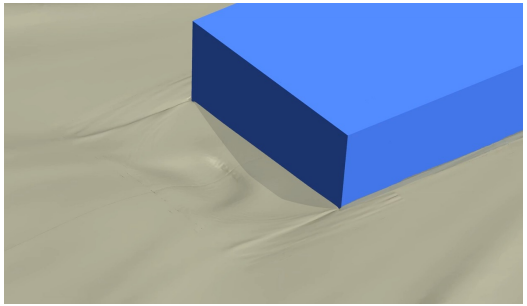

ÄLV-SNABBEN 3
GÖTEBORG

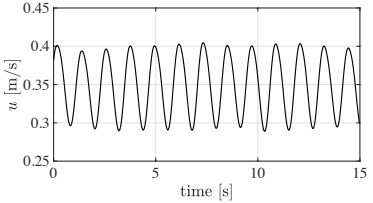
TRANSOM FLOW

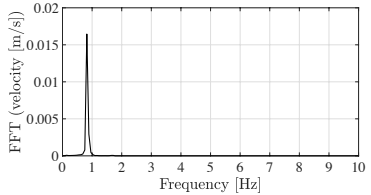


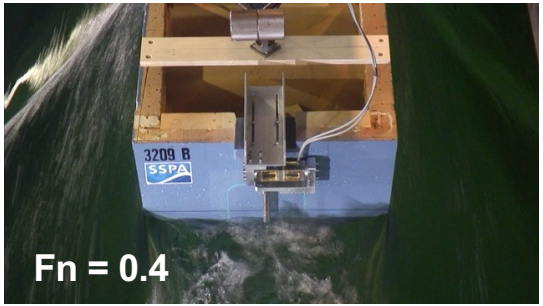
TRANSOM FLOW

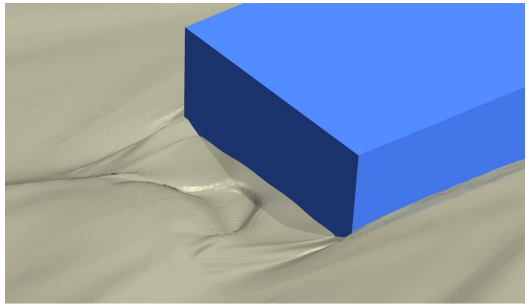


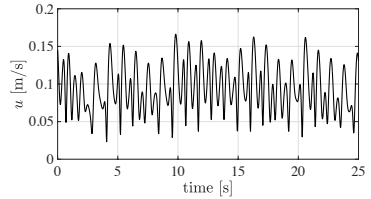


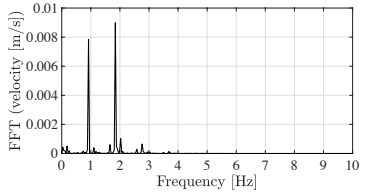




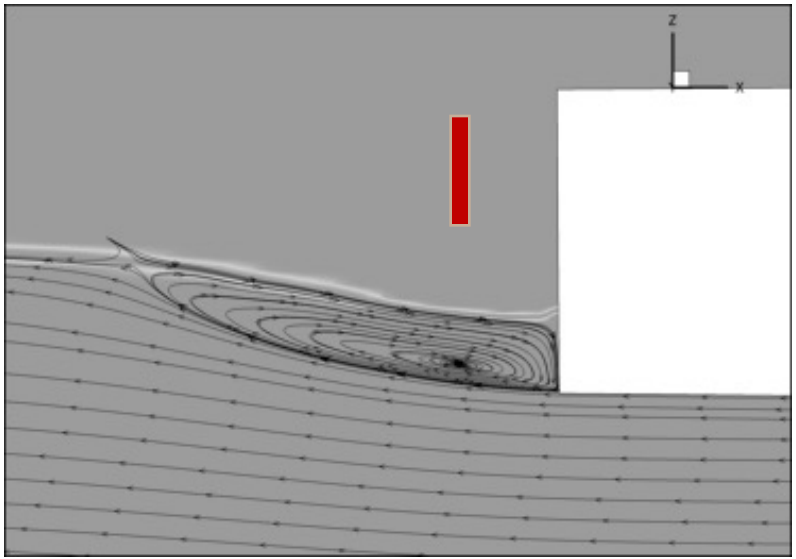






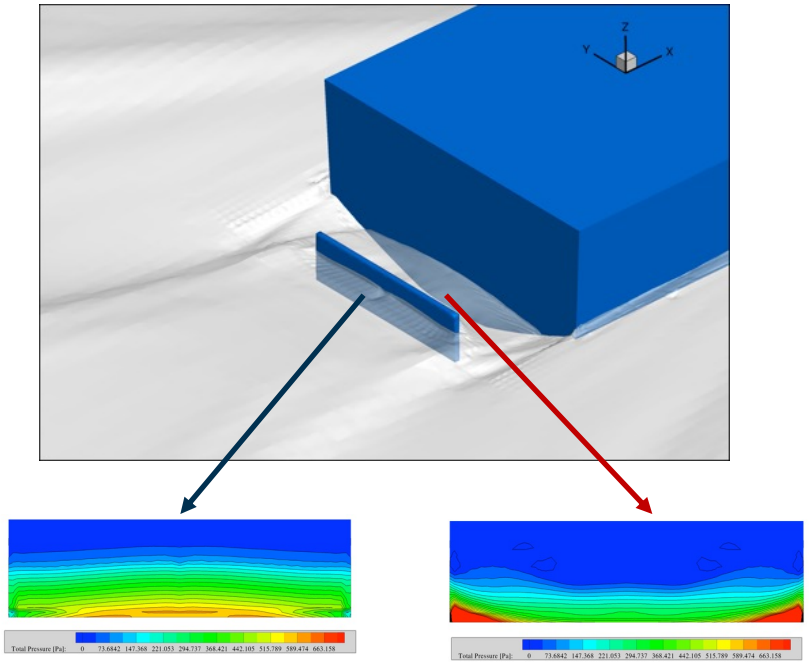


RECIRCULATING WATER BEHIND TRANSOM

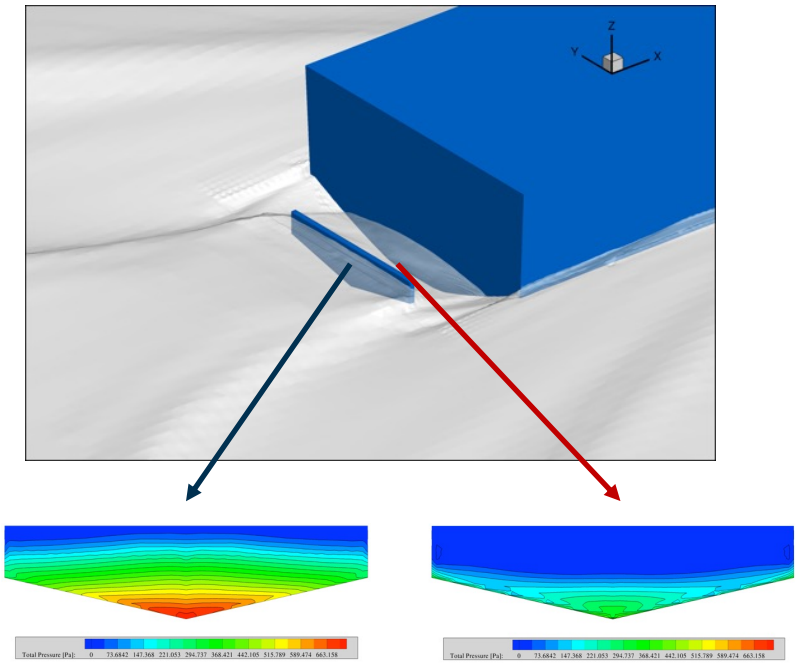


IDEA EVALUATION

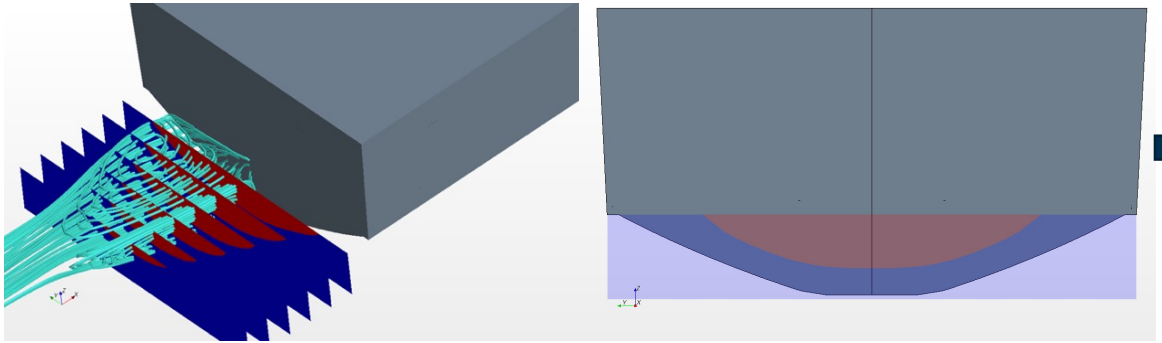
2.8% resistance reduction



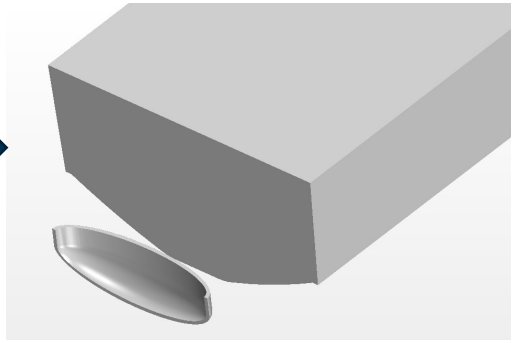
4.6% resistance reduction



DESIGN OF TRANSOM PUSHING DEVICE (TPD)

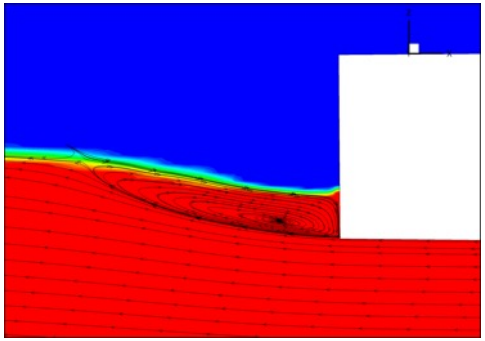


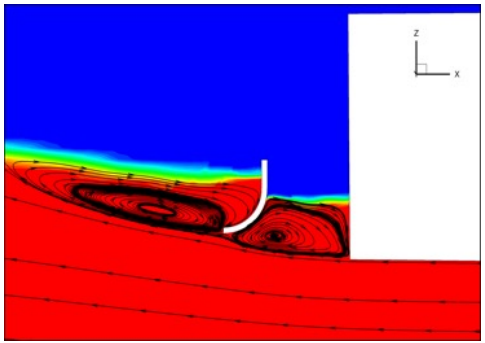
Streamlines in the recirculating water region as well as split of the flow based on its direction. The flow moving in the opposite direction relative to the hull motion is shown in dark blue and the flow mowing towards transom is shown in red.



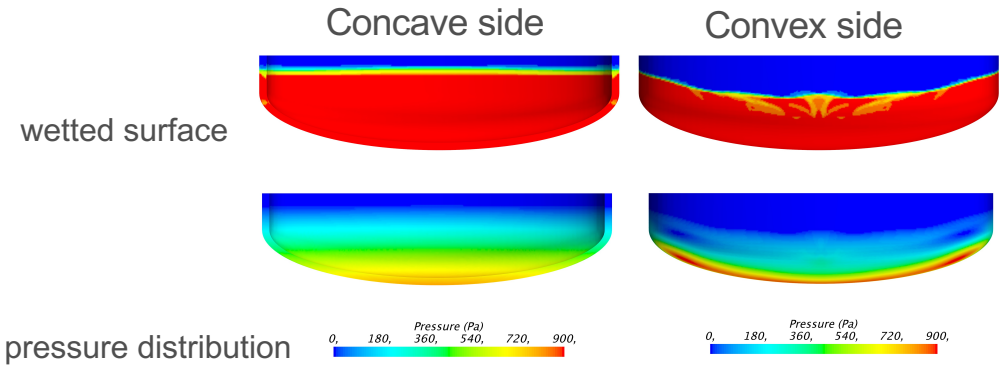
Wake adapted design for the TPD.

TRANSOM FLOW WITH TPD (FN=0.4)

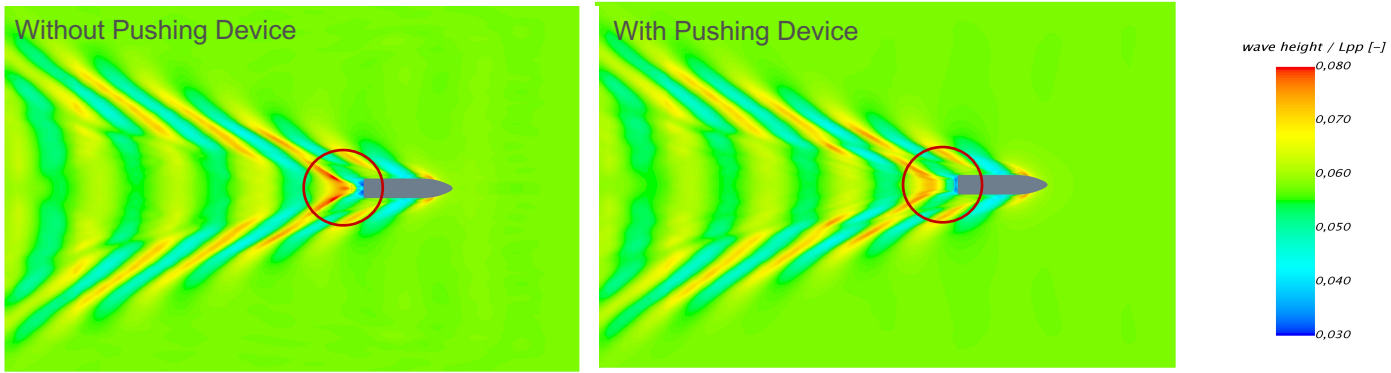




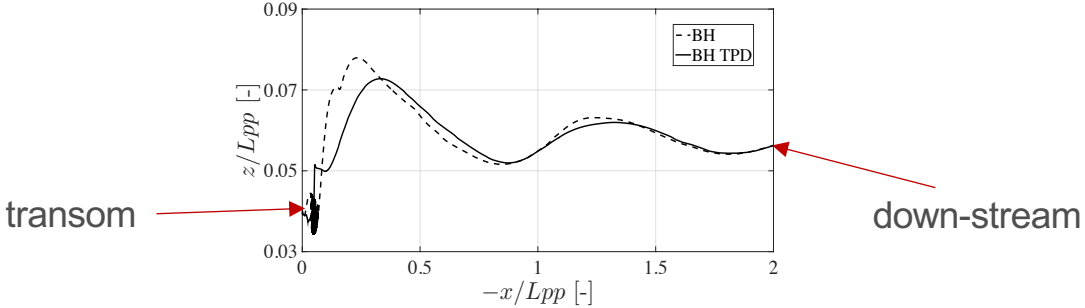
Recirculating water region on the symmetry plane behind the bare hull transom (top) and with the TPD (bottom).



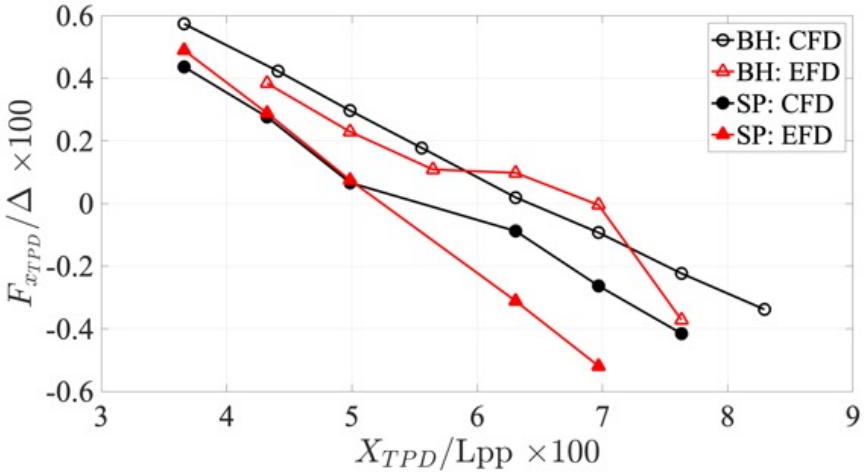
EFFECT OF TPD ON WAVE HEIGHT (FN=0.4)



Wave-cut on the symmetry plane behind the hull



VALIDATION: THE PUSHING FORCE

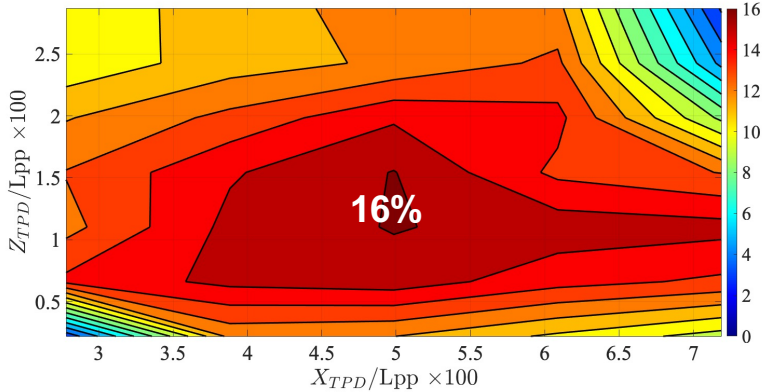


Measured (EFD) and computed (CFD) horizontal force acting on the TPD on the bare hull (BH) and the self-propelled hull (SP) at Froude number 0.4 ($Z_{TPD}/Lpp \times 100 = 0.84$).

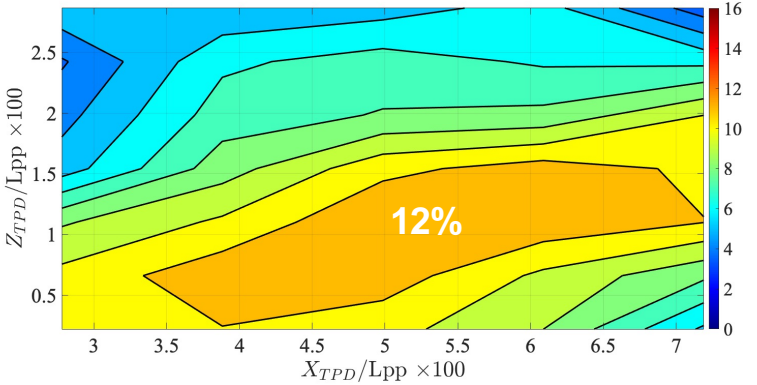
SYSTEMATIC VARIATION OF THE TPD POSITION (F_N=0.4)

RESISTANCE REDUCTION

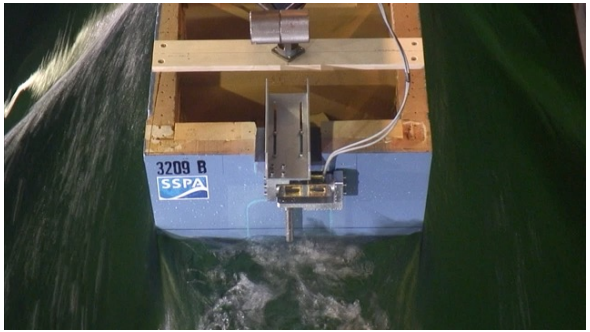
TOWED HULL

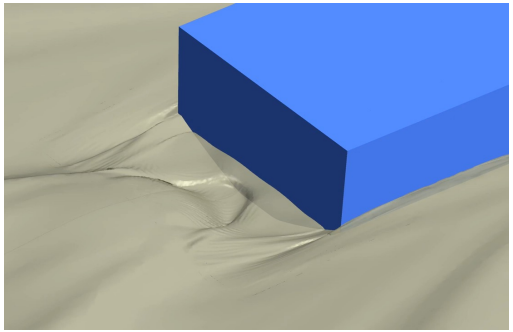


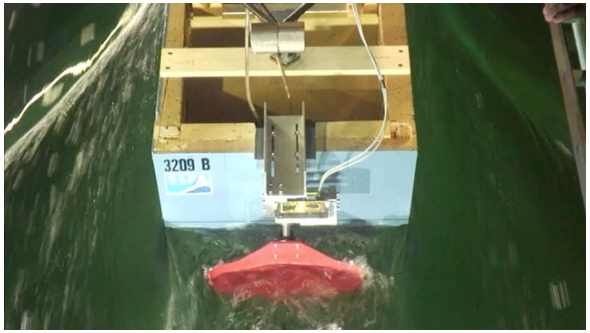
SELF-PROPELLED HULL

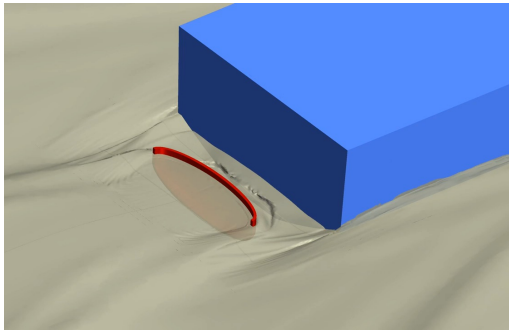


TRANSOM FLOW WITH AND WITHOUT THE TPD (FN=0.4)

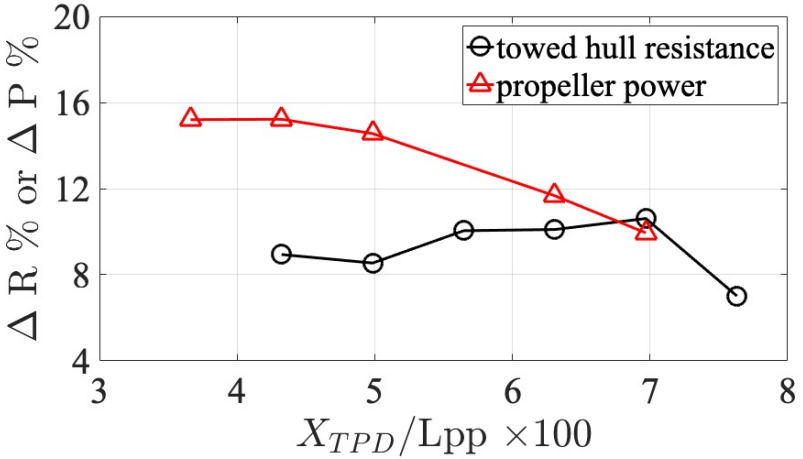






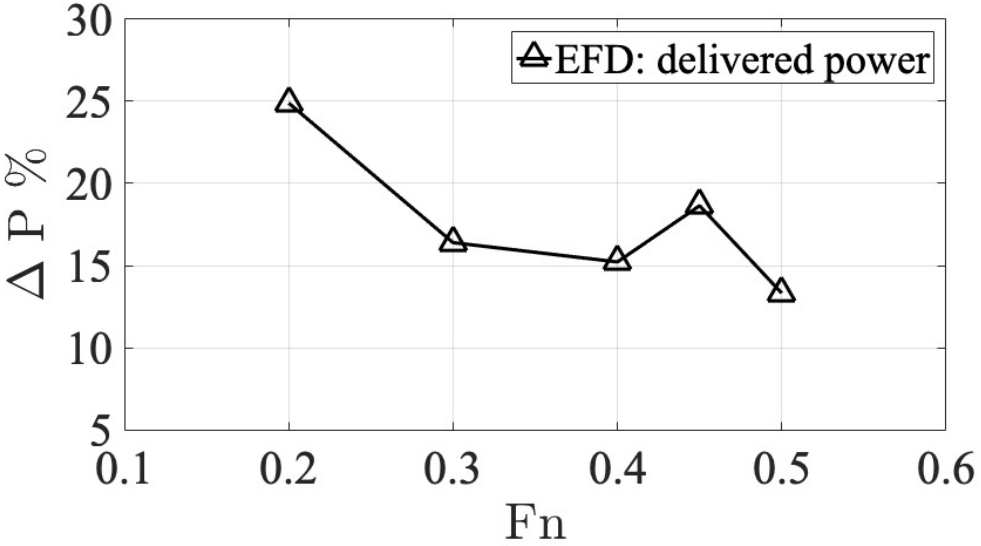


REDUCTION IN MEASURED RESISTANCE AND POWER (FN=0.4)



The reduction in the hull resistance with the TPD, results in a more favorable operating condition for the propeller and thus larger total power reduction.

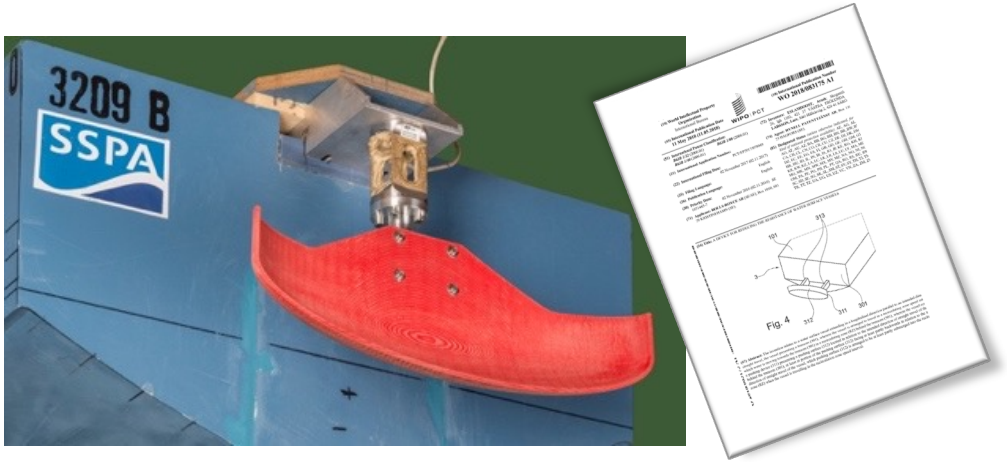
THE MEASURED POWER REDUCTION AT AT OTHER SPEEDS



Although the TPD shape and its position were optimized for Froude number 0.4, a significant reduction in propeller power is obtained at other speeds as well.

PATENT FILED:

A DEVICE FOR REDUCING THE RESISTANCE OF WATER SURFACE VESSELS



A Swedish as well as an international patent have been filed.
Inventors: Arash Eslamdoost[1], Lars Larsson[1] , Matz Brown[2] (1 Chalmers, 2 SSPA)
Owner: Kongsberg Maritime Sweden AB

Acknowledgements

KONGSBERG

TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

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SSPA

The experimental tests were carried out at SSPA Sweden AB.

C³SE NSC

Chalmers center for Computational Science and Engineering (C3SE) and National Supercomputer Center at Linköping University (NSC) provided the computational resources.

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