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# Influence of the canal width and depth on the resistance of 750 DWT Perintis ship using CFD simulation

[Hadi, Eko Sasmito<sup>a</sup>](#); [Tuswan, Tuswan<sup>a</sup>](#) ; [Azizah, Ghina<sup>a</sup>](#); [Ali, Baharuddin<sup>b</sup>](#); [Samuel, Samuel<sup>a</sup>](#); [Hakim, Muhammad Luqman<sup>a</sup>](#); [Hadi, Muhammad Raafie Caesar Putra<sup>a</sup>](#); [Iqbal, Muhammad<sup>c</sup>](#); [Sari, Dian Purnama<sup>b</sup>](#); [Satrio, Dendy<sup>d</sup>](#)

[Save all to author list](#)<sup>a</sup> Department of Naval Architecture, Universitas Diponegoro, Semarang, 50275, Indonesia<sup>b</sup> Research Center for Hydrodynamics Technology, National Research and Innovation Agency (BRIN), Surabaya, 60117, Indonesia<sup>c</sup> Department of Naval Architecture, Ocean, and Marine Engineering, University of Strathclyde, Glasgow, United Kingdom<sup>d</sup> Department of Ocean Engineering, Institut Teknologi Sepuluh Nopember, Surabaya, 60111, Indonesia2 85th percentile  
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FWCI [View all metrics](#) [Full text options](#) [Export](#) **Abstract**[Author keywords](#)[SciVal Topics](#)[Metrics](#)[Funding details](#)**Abstract**

Investigation of hydrodynamic interaction between the vessel and the seabed when entering shallow water is considered one of the most critical considerations of inland waterway transport. There are many investigations into the behavior of ships in restricted waters, such as ships traveling in different forms of canal cross-sections. The present study aims to evaluate the hydrodynamic interaction of the 750 DWT Perintis Ship moving through the different canal types to determine the relative effects of

**Cited by 2 documents**

The Influence of Deflector on the Performance of Cross-Flow Savonius Turbine

Satrio, D. , Adityaputra, K.A. , Suntoyo  
(2023) *International Review on Modelling and Simulations*

The Benefit Using a Circular Flow Disturbance on the Darrieus Turbine Performance

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(2023) *International Journal on Engineering Applications*

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Terziev, M. , Elsherbiny, K. , Tezdogan, T.  
(2020) *Proceedings of the International Conference on Offshore Mechanics and Arctic Engineering - OMAE*

Computational fluid dynamics predictions of draught and trim variations on ship resistance in confined waters

Campbell, R. , Terziev, M. , Tezdogan, T.  
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Experimental and numerical investigation of shallow water effects on resistance and propulsion of coupled pusher-barge convoys

Zentari, L. , el Moctar, O. , Lassen, J.  
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limiting the width and depth cross section on the ship's resistance. Two different canals with different cross sections, including canal bank and rectangular canal, were evaluated to investigate the influence of canal width ( $W_b$ ), depth ratio ( $h_w/T$ ), and blockage ratio function ( $A_s/A_c$ ). The Computational Fluid Dynamic (CFD) method with Reynolds-averaged Navier–Stokes (RANS) solver and turbulent model  $k-\epsilon$  were used to predict the total resistance of the ship. The proposed numerical simulation was initially validated with an experimental towing tank test in the error range of 0.11–7.74%. The results indicated similar phenomena were found both in rectangular and canal banks. The case with a shallower (lower  $h_w/T$ ) and a narrower (lower  $B_c/B_s$ ) canal dimension has a higher resistance value. Backflow and subsidence of free surface became significant around the ship's hull in more restricted water, changing the ship's hydrodynamic characteristics and increasing resistance. It can be found that the higher the blockage ratio ( $mb$ ), the higher the total resistance value in both canal types, which proved that ships with higher speeds were more sensitive to changes in waterway restrictions. © 2023, University of Zagreb Faculty of Mechanical Engineering and Naval Architecture. All rights reserved.

#### Author keywords

750 DWT Perintis; Canal; Restricted Waters; Ship Resistance

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✉ Tuswan, T.; Department of Naval Architecture, Universitas Diponegoro, Semarang, Indonesia; email:tuswan@lecturer.undip.ac.id

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