

KARAKTERISTIK HIDRODINAMIKA PENGGUNAAN DUAL FOIL NACA 0012 PADA *MONOHULL* DAN PENTAMARAN DENGAN MENGGUNAKAN SIMULASI CFD

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ABSTRAK

Analisis dan inovasi terus berkembang mengenai sistem *dual foil*. Penelitian ini bertujuan untuk membandingkan kelebihan penggunaan *dual foil* NACA 0012 model *case 3* pada lambung *monohull* dan pentamaran dengan mempertahankan *Displacement* kapal. Untuk investigasi hidrodinamik dan perhitungan model menggunakan *Computational Fluid Dynamic* (CFD) dengan *software ansys*. Analisis hidrodinamik pada kedua lambung dilakukan terhadap komponen hambatan total, hambatan *friction*, hambatan gesek, hambatan gelombang dan gaya angkat kapal dengan variasi studi parametrik untuk foil ($L_{x2} = 2c, L_y = 0.5c$); ($L_{x2} = 2c, L_y = 0.7c$); ($L_{x2} = 2c, L_y = 1c$). Rata-rata hasil analisis perbandingan variasi *dual foil* antara keenam model *monohull* dan pentamaran menunjukkan, bahwa pentamaran memiliki rata-rata hasil analisis komponen hambatan lebih kecil sekitar 33% dan gaya angkat yang lebih besar sekitar 42%.

Kata kunci: CFD, Pentamaran, *Dual foil*

HYDRODYNAMIC CHARACTERISTICS OF USING DUAL FOIL NACA 0012 ON MONOHULL AND PENTAMARAN USING CFD SIMULATION

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ABSTRACT

Analysis and continuous innovation regarding dual foil systems are constantly evolving. This study aims to compare the advantages of using the NACA 0012 dual foil model (case 3) on both monohull and pentamaran hulls while maintaining the ship's displacement. Computational Fluid Dynamics (CFD) simulation with ANSYS software is employed for hydrodynamic investigation and model calculations. Hydrodynamic analysis is conducted on both hull types, considering total resistance, frictional resistance, wave resistance, viscous resistance, and lift force of the ship. Parametric study variations for the foils include ($Lx2 = 2c$, $Ly = 0.5c$); ($Lx2 = 2c$, $Ly = 0.7c$); ($Lx2 = 2c$, $Ly = 1c$). The average analysis results comparing the variations of the dual foil between the six monohull and pentamaran models indicate that the pentamaran shows a smaller average analysis result for resistance components, approximately 33% lower, and a larger lift force, approximately 42% greater.

Keywords : CFD, Pentamaran, Dual foil