

STUDI WATER BUS QUADRIMARAN PADA PERAIRAN DANGKAL

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ABSTRAK

Perubahan jumlah lambung cukup banyak diteliti dengan cara memvariasikan jumlah lambung untuk memperoleh sebuah lambung kapal yang optimal. Salah satu caranya adalah dengan menambah jumlah lambung menjadi lebih banyak. Pada penelitian ini, dilakukan perbandingan antara lambung katamaran dan lambung quadrimaran terhadap variasi rasio perairan dangkal. Permodelan lambung menggunakan maxsurf, dan analisis terhadap pengaruh squat, sinkage trim by stern didapatkan menggunakan software ANSYS AQWA Hydrodynamic Diffraction. Menurut hasil simulasi terhadap efek squat, lambung quadrimaran memiliki efek squat paling signifikan pada rata-rata 14% lebih rendah dibandingkan lambung katamaran. Sedangkan dari segi efek sinkage, lambung quadrimaran memiliki efek sinkage paling besar dengan rata-rata 49% saat trim by stern lebih kecil dibandingkan lambung katamaran. Dan pada efek trim, pada perubahan LCG -10 % ketika trim by stern, pada lambung katamaran dan quadrimaran menghasilkan efek sinkage paling kecil. Pengaruh dari squat, sinkage, dan trim, sangat berdampak pada kondisi kedalaman terendah yaitu pada rasio $H/T = 1,2$. Dapat disimpulkan bahwa model quadrimara lebih aman untuk berlayar di wilayah perairan dangkal dibandingkan model katamaran.

Kata kunci: *Lambung Quadrimaran, Lambung Katamaran, Squat, Sinkage Trim By Stern, Faktor perairan dangkal, Rasio perairan dangkal*

STUDY OF QUADRIMARAN BUS WATER IN SHALLOW WATER

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ABSTRACT

Modifying the number of hulls has been widely studied by varying the number of hulls to obtain an optimal hull. One way is to increase the number of hulls to be multihull. In this study, a comparison was made between the catamaran hull and the quadrimaran hull for variations in the ratio of shallow water. Hull modeling using maxsurf, and analysis of the effect of squat, sinkage trim by stern obtained using ANSYS AQWA Hydrodynamic Diffraction software. According to the simulation results on the effect of the squat, the quadrimaran hull has the most significant squat effect at an average of 14% lower than that of the catamaran hull. Meanwhile, in terms of the sinkage effect, the quadrimaran hull has the greatest sinkage effect with an average of 49% when trim by stern is smaller than the catamaran hull. And on the effect of trim, the LCG changes of -10% when trim by stern, on the catamaran and quadrimaran hulls produce the smallest sinkage effect. The effect of squat, sinkage, and trim, is very significant at the lowest depth condition, which is the H/T ratio = 1.2. It can be concluded that the quadrimara model is safer for sailing in shallow water areas than the catamaran model.

Keywords: *Quadrimaran Hull, Katamaran Hull, Squat, Sinkage, Trim, Shallow water factor, Shallow water ratio*