PENGARUH INTERCEPTOR TERHADAP OLAH GERAK KAPAL PADA MONOHULL DAN MULTIHULL

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ABSTRAK

Penelitian ini menganalisis pengaruh interceptor terhadap olah gerak kapal pada konfigurasi mono hull dan multi hull menggunakan simulasi Ansys AQWA 2024 R2. Model kapal dirancang dengan dimensi LOA 2,5 m, lebar 0,25 m, draft 0,04 m, dengan tiga variasi posisi interceptor (Full Interceptor, Near Keel, Near Side) pada sudut 0° dan tinggi 3,73 mm. Analisis dilakukan pada empat arah gelombang (0°, 45°, 90°, 180°) dengan kecepatan 4,8 m/s. Hasil menunjukkan gerakan Heave mencapai puncak resonansi 1,1335 pada sudut 0° dan stabil di 0,6305 pada sudut 90°. Gerakan Pitch menunjukkan lonjakan ekstrem mencapai 2621,6545 pada sudut 90° frekuensi tinggi, sementara sudut 0° dan 180° tetap stabil di bawah 1,0. Gerakan Roll mencapai puncak tertinggi 124,1355 pada sudut 45°. Interceptor terbukti efektif meredam resonansi Heave, mencegah lonjakan Pitch di kondisi beam sea, dan memotong puncak Roll pada gelombang diagonal. Konfigurasi Full Interceptor menunjukkan efektivitas tertinggi dalam menstabilkan ketiga gerakan kapal pada frekuensi menengah dan kondisi ekstrem.

Kata Kunci: Interceptor, motion, mono hull, multi hull, Heave, Pitch, Roll, Ansys AQWA

THE EFFECT OF INTERCEPTORS ON SHIP MOTION IN MONOHULLS AND MULTIHULLS

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ABSTRACT

This research analyzes the effect of interceptors on ship motion performance in mono hull and multi hull configurations using Ansys AQWA 2024 R2 simulation. Ship models were designed with dimensions LOA 2.5 m, breadth 0,25 m, draft 0.04 m, with three interceptor position variations (Full Interceptor, Near Keel, Near Side) at 0° angle and 3,73 mm height. Analysis was conducted at four wave headings (0°, 45°, 90°, 180°) at 4.8 m/s speed. Results show Heave motion reached resonance peak of 1.1335 at 0° heading and remained stable at 0.6305 at 90° heading. Pitch motion exhibited extreme spike reaching 2621.6545 at 90° heading at high frequency, while 0° and 180° headings remained stable below 1.0. Roll motion reached highest peak of 124.1355 at 45° heading. Interceptors proved effective in dampening Heave resonance, preventing Pitch spikes in beam sea conditions, and cutting Roll peaks in diagonal waves. Full Interceptor configuration demonstrated highest effectiveness in stabilizing all three ship motions at medium frequencies and extreme conditions.

Keywords: *Interceptor, motion, mono hull*, multi hull, Heave, Pitch, Roll, Ansys AQWA