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Comparative study on catamaran and monohull for the hull form design of livestock carrier

[Zakki, Ahmad F.](#)^a ; [Windyandari, Aulia](#)^b; [Suharto](#)^b; [Ramadhan, Akbar](#)^a
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The process of transporting cattle (livestock transportation) between islands takes a long sailing time, therefore the vessel should be arranged to provide the reliable services for the animal welfare even under severe condition during sea transport. The aim of the research is to compare the performance of catamaran and monohull technology for the hull form design of the livestock carrier as a vessel that transport the commodities such as cows, goats, and sheep. The investigation of resistance, intact stability and seakeeping performance of the both hull forms type will be discussed. Based on this study, it might be concluded that the catamaran design has better resistance performance in the high service speed than the monohull. On stability review, the initial stability of catamaran has enabled the larger transversal weight shifts than the monohull, which means the Catamaran has better safety level for livestock carrier. On motion review, the catamaran has better performances notably at roll motion. However, it is indicated that the operability should be limited to the significant wave height below 3 meters to avoid deck-wetness. © School of Engineering, Taylor's University.

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COMPARATIVE STUDY ON CATAMARAN AND MONOHULL FOR THE HULL FORM DESIGN OF LIVESTOCK CARRIER

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Abstract

The process of transporting cattle (livestock transportation) between islands takes a long sailing time, therefore the vessel should be arranged to provide the reliable services for the animal welfare even under severe condition during sea transport. The aim of the research is to compare the performance of catamaran and monohull technology for the hull form design of the livestock carrier as a vessel that transport the commodities such as cows, goats, and sheep. The investigation of resistance, intact stability and seakeeping performance of the both hull forms type will be discussed. Based on this study, it might be concluded that the catamaran design has better resistance performance in the high service speed than the monohull. On stability review, the initial stability of catamaran has enabled the larger transversal weight shifts than the monohull, which means the Catamaran has better safety level for livestock carrier. On motion review, the catamaran has better performances notably at roll motion. However, it is indicated that the operability should be limited to the significant wave height below 3 meters to avoid deck-wetness.

Keywords: Catamaran, Livestock carrier, Monohull.

INTENSIFICATION OF SHALE OIL EXTRACTION FROM OIL SHALE – AN ALTERNATIVE SOLUTION FOR SUSTAINABLE ENERGY IN JORDAN

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Abstract

The present study proposes a prototype comprising a set of unit operations for the intensification of shale oil extraction from Jordanian oil shale. The extraction process involves the utilization of microwave irradiation, ultrasound irradiation and solvent extraction as tools for process intensification. Full factorial design methodology of type 2^4 was applied to study the main and interaction effects of process variables. The extent of extraction of shale oil was found to be strongly affected by the power of microwave and time of microwave irradiation with an appreciable interaction effect. At optimized conditions, the extent of extraction of shale oil was 38.8%. A first-degree polynomial model was employed to correlate the extent of extraction to the process input variables and their interactions.

Keywords: Factorial design, Microwave, Oil shale, Shale oil, Ultrasound.

HIGH-RESOLUTION TIME TO DIGITAL CONVERTER IN 0.13 μm CMOS PROCESS FOR RFID PHASE LOCKED LOOP

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Abstract

Time to Digital Converter (TDC) has become an attractive replacement of the traditional phase/frequency detector and charge pump with the appearance of digitally intensive All-Digital Phase-Locked-Loop (ADPLL) in deep submicron Complementary Metal-Oxide Semiconductor (CMOS). The performance of Radio Frequency Identification (RFID) ADPLL is limited by the TDC time resolution because it contributes to the in-band phase noise. The available TDC design consumes more power and also difficult to implement in ADPLL because of its complex circuitry. In this article, a simple TDC architecture, based on modified current starved delay element and D flip-flop, has been proposed for RFID ADPLL, which is implemented and tested in TSMC 0.13 μm CMOS process. The proposed TDC circuit achieves 1.31 ps resolution and consumes an average power of 0.061 μW only with 1.8 V power supply. The designed TDC will be suitable to be used in ADPLL frequency synthesizer for RFID applications, high-speed data transmission, automotive solutions etc.

Keywords: All-digital phase-locked loop (ADPLL), CMOS, Delay-line TDC (DL-TDC), TDC.