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高速高频船舶舵机系统动态特性分析与研究

Characteristics Analysis of High Speed andHigh Frequency Steering Gear of Ship

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中文关键词： 高速高频舵机 泵控液压系统 动态特性

英文关键词: high-speed high-frequency steering gear pump controlled hydraulic system dynamic characteristics

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中文摘要:

为船舶高速高频舵机的设计提供理论依据和技术支撑,提出了基于ADAMS、SIMULINK和AMESim的联合仿真分析的新方法,分析了船舶舵机分系统单元、非线性因素与整机系统动态特性的关系。基于ADAMS、SIMULINK和AMESim建立了船舶舵机系统联合仿真模型,从时频角度研究了变量泵、控制系统、反馈机构及传感器的特性,以及间隙、死区、泄露、灵敏度等非线性因素对舵机系统频响特性的影响关系和规律,得出了高速高频舵机设计的一般准则。

英文摘要:

In order to provide theoretical basis and technical support for high-speed high-frequency ship steering gear design, a new method based on ADAMS, SIMULINK and AMESim co-simulation analysis is put forward, the relationship between the dynamic characteristics of system and subsystem unit, nonlinear factors is analyzed in the article. Co-simulation model of ship steering gear based on ADAMS, SIMULINK and AMESim is built. From the perspective of time-frequency to research the effect of the subsystem characteristics including variable pumps, control systems, feedback mechanism sensor, and the nonlinear factors including space, the dead zone, disclosure sensitivity, on system frequency response characteristic of steering gear, as well as the relationship and rules. Then acquired the general guidelines for high-speed high-frequency steering gear design.

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