

Research on the Vibration and Noise of Surface Ships Based on Time Domain Method

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Abstract

Vibration and noise prediction of surface ships mostly applies Frequency Domain Methods (FDM) at present, which might have the weakness of low calculating accuracy, inferior solve efficiency and peak data omissions. While this research, based on the wave theory, introduced Time Domain Analysis Method (TDAM) to serve for the ship vibration and noise prediction, where the steady response time and solve efficiency have been improved, and a new prediction method has been developed. In the discussion, a real surface ship is given as an example for the analysis of vibration and noise characteristics, in which the structure parameters such as bulkhead, hull, and deck et al. are investigated as influence factors of acoustic radiation. The result shows that, the TDAM has the advantage of higher solve efficiency and better calculating accuracy, and the vibration feature of surface ships can be optimized by increasing the thickness of deck, bulkhead and hull plates.

Keywords: Surface ships; Wave theory; Acoustic radiation; Time Domain Method; Structure parameters