

## Nonlinear Response of SemiSWATH Ship, Bow-diving, and Fin Stabilizer Effect in Following Seas

### Abstract

In this research, the response of a Semi-SWATH (Small Waterplane Area) ship in following sea condition with fins stabilizer was investigated. In the waves, a ship move with periodic dynamic surge motion caused by the external sea wave force and moment. In addition, in following seas with high steep waves, the ship can surf, high pitch, bow-dive, and lead the ship in the non-linear response. A numerical simulation program in 3DOF (surge, heave and pitch) with time varying model equation was developed to study the ship responses. This study focuses on the effect of variation of wave parameter to the ship response and the effects of fins stabilizer; fixed and active. The numerical simulations were validated with model tests in towing tank. Simulations results showed that the dynamic ship response was stabilized effectively and reduced pitch angle by active fins stabilizer action.