

Mathematics Modeling and Motion Simulation of Submarine at Periscope Depth

ZHONG Kai, JIANG Yu-ming

Journal of System Simulation, 2005, (9)4, 2096-2110

Abstract: Submarine motion at the periscope depth, will suffer the interference that comes from waves. A model of vertical plane submarine dynamics was presented with the first and the second order wave force disturbances. The first and the second order wave force, as interference factors, were added into the equations of a deeply submerged submarine at moderate speeds. The wave force was calculated by the sea wave spectra. The submarine at the periscope depth motion was simulated. Moreover, The regulation of operating submarine at the periscope depth was discussed. The results of the computer simulation are presented.

Keywords: Submarine, periscope depth control, mathematical model, motion simulation, wave spectrum

Bibliography:

- [1] Simulation of submarine near-surface motion under disturbance effect. Journal of System Simulation, 2003,15 (1): 84-87. (in Chinese with English abstract)
- [2] YAO Ji-huan, FANG Yi-dong, Fractal Simulation of Dynamic Sea Surface and Its Electromagnetic Scattering. Journal of Xidian University, 1999,26 (6): 763-766.
- [3] Mandzuka, S., Mathematical Model of a Submarine Dynamics at the Periscope Depth, Brodogradnja 36 (1998), 5-6.
- [4] Musteric, I., Velebit - The first Croatian Navy Submarine, Brodogradnja, 1996, 44.