

Tank Test Simulation of Blunt Ship (Self-Propulsion Condition)

Using SC/Tetra to simulate self-propulsion test and verify analysis results with experiment

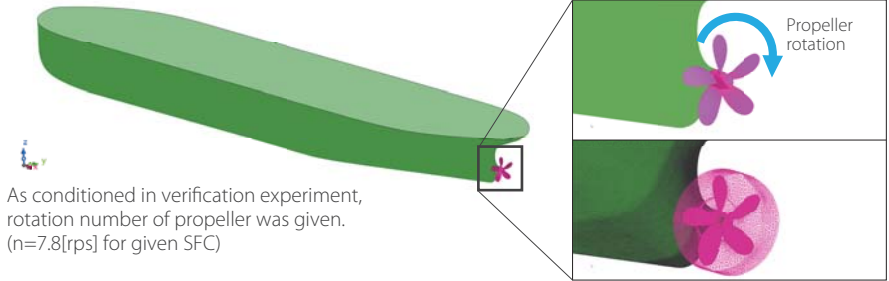
Analysis Purpose

Self-propulsion test that accounts for propeller operation is very important for the propulsive performance of ships.

SC/Tetra was used to simulate self-propulsion test and compare analysis and experiment results. Propeller influence was considered by an actual propeller rotation.

Analysis target was a blunt ship, which was same in towing condition. In this section, free surface was ignored (double model was employed).

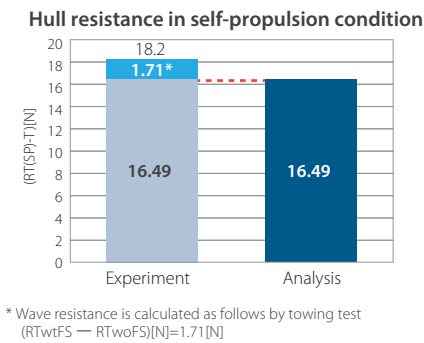
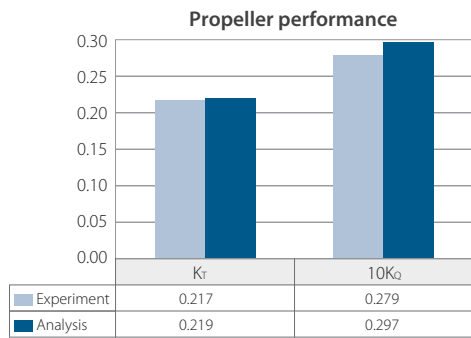
Analysis details and meshing around propeller



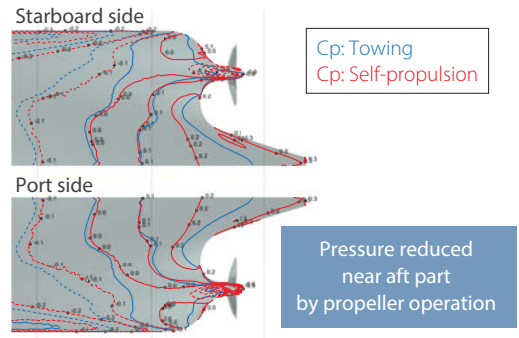
As conditioned in verification experiment, rotation number of propeller was given. (n=7.8[rps] for given SFC)

Reference: Tokyo 2015 A Workshop on CFD in Ship Hydrodynamics
http://www.nmri.go.jp/institutes/fluid_performance_evaluation/cfd_rd/cfdws15/index.html

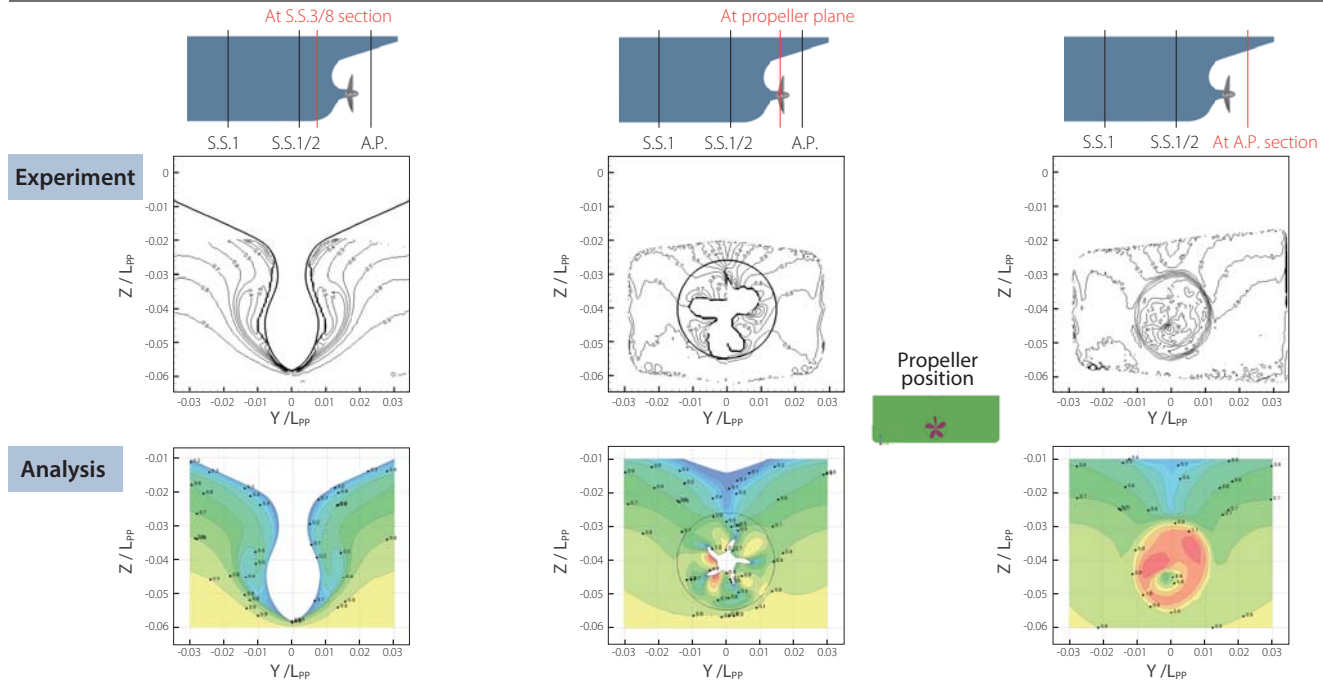
Analysis results (self-propulsion parameter)



Analysis results (pressure distribution)



Analysis results (wake distribution)



Notes

- SC/Tetra was used to simulate self-propulsion test. Propeller influence was considered by actual shape rotation.
- Estimated propeller performance parameters and hull resistance in self-propulsion condition showed good agreement with results of model tests.
- Simplified propeller model based on infinitely bladed propeller theory that requires small calculation load can be applied to simulate self-propulsion condition, and either approach is applicable.