SC/Tetra

CRADLE
Software Cradle Co., Ltd.

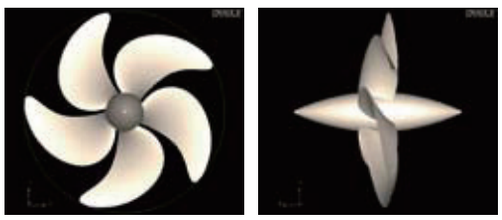
SC/Tetra Case Example

Performance evaluation of ship propeller by fluid analysis

Analyzing independent performance of propeller blade and estimating propeller thrust using SC/Tetra

Propeller shape

[HSP2]

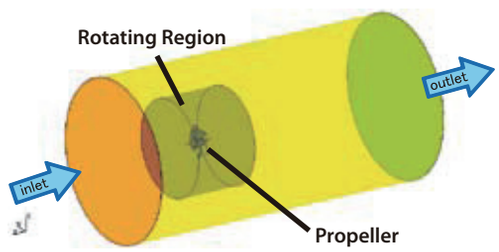


Left: Front view Right: Side view

Surface mesh
Show one blade only.

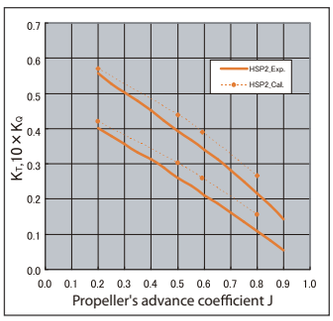
	HSP2
Diameter of Propeller [m]	3.6
Pitch Ratio (mean)	0.92
Expanded Area Ratio	0.70
Boss Ratio	0.1972
Number of Blades	5
Blade Thickness Ratio	0.0496
Mean Blade Width Ratio	0.2739
Skew Angle [deg.]	45.0
Rake Angle [deg.]	-3.03
Blade Section	Modified SRI-B

[Computational domain]

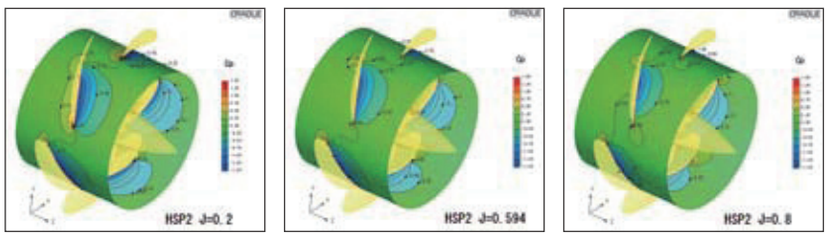


Evaluation of propeller performance

Comparison with experimental data.



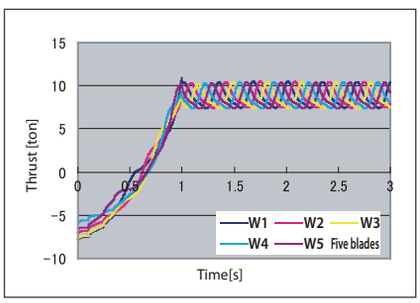
Pressure distribution near propeller - HSP2 (Cylindrical section displayed)



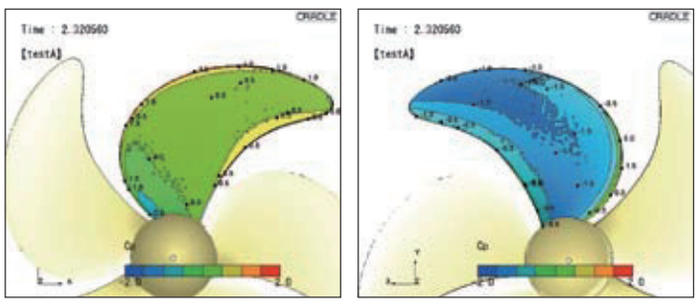
The smaller the propeller's advance coefficient J is, the larger the negative pressure region at the upstream side becomes. It shows the consistency with experimental data regarding thrust.

Estimation of thrust generated by each blade

Time variation of thrust generated by each blade



Surface pressure distribution at the maximum thrust



Left: Upstream surface Right: Downstream surface

Notes

To increase total performance of a ship, we have to not only improve the efficiency of a propeller but also capture their performance correctly. Utilization of CFD helps reduce the lead time and costs in design phase.