

Prachakon Kaewkhiaw 2010: Simulation of Cavitation on Marine Propeller Using CFD. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering.

Thesis Advisor: Associate Professor Varangrat Juntasaro, Ph.D. 204 pages.

The realistic simulation of cavitation on a marine propeller is important for the efficient design of the propeller. However, the flow characteristic occurred on the marine propeller is complicated and difficult to predict due to the combined effects of turbulence, cavitation, complex geometry and multiphase phenomena. There is still currently no turbulence model that can predict these combined effects satisfactory. The nonlinear turbulence model is therefore modified and applied to predict the cavitation on a marine propeller for the first time in this work. It is found that both nonlinear and modified nonlinear turbulence models can predict the cavitation and hence the thrust and torque coefficients much more accurately than the existing Reynolds-averaged Navier-Stokes (RANS) turbulence models including Reynolds-stress model (RSM).

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Thesis Advisor's signature