ON VORTEX SHEDDING FROM TRAILING EDGE OF A FULL-SCALE MARINE PROPELLER BLADE

Saeed Javdani*, Nicholas Mitroglou, John S. Carlton
City University London, School of Engineering and Mathematical Sciences, UK

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ABSTRACT –
This paper discusses influential aspects of modelling vortex shedding from trailing edge of a full scale propeller. A cyclic pure hexa mesh was generated on flow passage around a single blade of the propeller in this study, using ANSA meshing package, to assure a node to node connection of periodic boundaries. A suitable Reynolds-Averaged Navier-Stokes (RANS) unsteady method was employed in CFX Solver package to resolve the turbulent flow, boundary layer on surface of blades and trailing edge flow separation. Vortex shedding was observed at trailing edge of blades from 0.7 R to 0.9 radial lengths. To support the 3D simulation of the propeller, a comparison was made of the results with those obtained from 2D simulations of blades' hydrofoil sections and a good agreement was seen. In this study, steady simulations are also performed for DTNSRDC propeller 4382 (36° skew) under ahead condition and the open water characteristics compared with available experimental data to prove the accuracy of the employed methodology.