

Numerical Study of Flow Past a Wall-Mounted Dolphin Dorsal Fin at Low Reynolds Number

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Hydrodynamics of dolphin swimming has long been an attractive topic, yet few studies have focused on the function of its iconic dorsal fin. Here, we present high fidelity numerical simulations for flow around a 3-D wall-mounted dolphin dorsal fin based on a scanning from a real dolphin. The spectral element method is applied through NEK5000 to ensure high accuracy and efficiency of the simulations, as well as the application of the unstructured hex mesh. Six cases are studied at attack angle $AoA = 0, 60^\circ$ and Reynolds number $Re = 691, 1000, 2000$ with the analysis of the force coefficient and the 3-D flow characteristics.

Relevance for Nek [100 words max]

This work is simulated by NEK5000.

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