

عنوان مقاله:

A Computational Fluid Dynamics Investigation on the Drag Coefficient Measurement of an AUV in a Towing Tank

محل انتشار:

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خلاصه مقاله:

The accuracy of experimental procedure used to calculate the drag coefficient of an Autonomous underwater vehicle (AUV) in a towing tank is investigated using computational fluid dynamics. Effects of struts, used to connect the AUV model to towing carriage, on the hydrodynamics coefficient of the AUV at various relative submergence depths, at AUV speeds of ۱.۵ and ۲.۵ m/s are numerically simulated. Various numerical modeling are performed to investigate the effects of free surface with and without presence of struts on the drag coefficient of the AUV. Volume of fluid (VOF) model is used to solve the two phase flow RANS equations. The drag coefficients obtained from two phase flow simulations are compared with those obtained from single phase flow at corresponding velocities. The results obtained from experiments conducted in the towing tank of the Subsea Science and Technology centre, on a full-scale model of the AUV developed in this Centre, agreed well with those obtained by numerical simulations.

کلمات کلیدی:

Free surface, AUV, Towing tank, Computational fluid dynamics, Strut, VOF

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