عنوان مقاله:

(Numerical Hydrodynamic Performance of the Stepped Planing Craft and Its Step Height Effect (RESEARCH NOTE

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خلاصه مقاله:

One of the most efficient methods of reducing drag on planing craft is the use of transverse step on the bottom of a hull. Applying steps on the hull reduces the contact area with water and as a result, it reduces drag of the craft. Planing craft are able to have one or two transverse steps. In this paper, numerical hydrodynamic performance of the stepped planing craft and its step height effect is investigated by making use of finite volume method (FVM). The Reynolds-Averaged Navier-Stokes (RANS) equations are coupled with the standard k- ε turbulence model and volume of fluid equations are solved to simulate transient turbulent free surface flow surrounding the hull by ANSYS-CFX. In order to predict the motion of the craft, equations of two degrees of freedom for rigid body are coupled with governing equations of fluid flow. In order to validate the numerical model presented in this paper, the obtained numerical results are compared with the available experimental data. The numerical results obtained for drag, dynamic trim, rising of center of mass and the pressure distribution on the body at different speeds and different heights of the steps are presented and discussed.

کلمات کلیدی:
Stepped Planing Craft, Transverse Step Height, Pressure distribution, Lift and Drag

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