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ON UNDERWATER GLIDER'S STABILITY IN BALANCING MODE OF MOTION

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This study defines hydrodynamic characteristics of underwater gliders based upon numeric solution of Reynolds-averaged Navier-Stokes equation. Methodological aspects of determination of coefficients of rotary derivatives of hydrodynamic forces and moments of underwater objects based on mechanism of "sliding computation meshes" implemented in many computing software packages of mechanics of fluids are examined. The paper identifies the main stages of development of the calculation model for solving similar tasks. The non-stationary calculation of the flow of viscous fluid past the underwater object resulted in determination of velocity and pressure fields in the stream. Ratios have been obtained which allow to determine coefficients of rotary derivatives of hydrodynamic forces and moments based on the preset values of hydrodynamic impacts.

Mathematical model of glider's motion was designed. Glider's motion parameters dependences on effect of alternating excessive buoyancy are presented. Based on analysis of rootes of linearized system 's characteristic equation the glider's stability zones in balancing mode of motion are determined under varying values of excessive buoyancy, metacentric height and excessive buoyancy arm.

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