

AUV PROPULSION SYSTEM CONTROL INVARIANT TO TRAVEL SPEED

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The aim of the study is to improve the accuracy of the trajectory movement of autonomous underwater vehicles (AUVs) through the use of control algorithms that take into account the influence of travel speed on the static characteristics of march thrusters (MT). A formal statement of the problem of determining the thrust of an MT with a torque-controlled electric drive for a known value of the steady-state travel speed is given. A technique has been developed for assessing the effect of the steady travel speed of the AUV on the thrust of the MT, based on the results of hydrodynamic calculation of the propeller and load tests of the drive motor, which made it possible to determine the analytical representation of the static characteristic of the MT with a torque-controlled electric drive. The results obtained make it possible to further solve the actual problem of adaptive redistribution of the main propulsion stops between the vehicle motion controllers by varying the portion restrictions in accordance with the assigned rating and the target value of the control actions. Thus, the maximum efficiency of using the capabilities of the propulsion and steering complex can be ensured, as well as the accuracy of the AUV trajectory movement can be increased.

Keywords: Autonomous underwater vehicles, march thrusters, travel speed, static characteristic, torque control, electric drive load tests, pool propulsion tests.

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