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CHARACTERISTIC'S RESEARCH OF "ROV – CABLE – VESSEL" TETHERED SYSTEM'S IN STEADY MOTION MODES

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The efficiency of using uninhabited underwater vehicles of the tethered type is associated with the need for its propulsion and steering complex (PSC) to compensate for the reaction of the communication cable of the device with the support vessel when maneuvering near the work site. The work examines the achievable boundaries of the maneuvering zone of a remotely controlled uninhabited underwater vehicle (ROV) for known values of the length of the communication cable, the submersion depth of the device, the current speed in the work area and the traction characteristics of the PSC. Algorithms for determining the boundaries of the working area and the achievable speed of the apparatus are presented, based on calculating the tension at the ends of the communication cable in a stationary flow, using the equations of a catenary line and the numerical integration of the equations of an inextensible flexible thread. In order to increase the operational reliability of underwater technical work, recommendations have been developed for choosing a cable length that prevents it from sagging below the submersion depth of the apparatus with possible snagging and damage by bottom objects. During the model experiment, the boundaries of the maneuvering zone were assessed relative to the coordinates of the carrier for a promising ROV with known hydrodynamic resistance and traction characteristics of the PSC, as well as the dependence of the achievable speeds of the vehicle within the maneuvering zone on the immersion depth and the speed of the oncoming current.

Keywords: remotely controlled uninhabited underwater vehicle, support vessel, underwater tethering system, communication cable, steady motion, maneuvering zone, catenary line, flexible inextensible thread equation.

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