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TECHNOLOGY FOR MEASURING THE MOTION PARAMETERS OF THE TETHERED SYSTEM OF AN AUTONOMOUS UNDERWATER ROBOT WITH A SURFACE RADIO COMMUNICATION MODULE

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The work considers the technology for measuring the navigational, control, and dynamic parameters of the specialized tethered system of an autonomous underwater robot (AUR). Its main idea is to use a towed surface retranslation buoy equipped with means of satellite positioning and radiocommunication with the vessel control station. The questions at issue are measuring the vector of communication cable tension in points of its attachment to AUR and retranslation buoy, synthesis of an integrated information-measuring system capable of efficient real-time operation. Decisions made in work provide measuring and registration of key parameters of AUR motion concerning communication cable influence. Hardware-software means of measurement complex allow merging in one file the data of movement speed and geographical coordinates of retranslation buoy with AUR movement parameters. At the same time, the AUR location is determined by an underwater acoustic positioning system. The element base of the complex provides the stated measurement accuracy of parameters in their variation range. The developed algorithm determines the projections of cable tension vector on the axes of a vehicle-buoy fixed coordinate system according to measured angles deviation from vertical position of corresponding measuring modules. The AUR onboard computer's storage records the measured parameters as a time-synchronized file with a possibility of further graphic-analytical processing and parametric identification of the communication cable dynamic model.

Key words: autonomous underwater robot, tethered retranslation buoy, radiocommunication module, satellite positioning system, ultrashort baseline underwater acoustic positioning system, information and measuring module, motion dynamic model.

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