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ACCURACY EVALUATION OF THE CORRELATION-EXTREME NAVIGATION SYSTEM ACCORDING TO A LOCAL GRAVITY MAP BASED ON TRAJECTORY MEASUREMENTS MADE BY AN AUTONOMOUS UNDERWATER VEHICLE

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**ABSTRACT**

The accuracy assessment of underwater navigation based on gravimetric measurements, acquired from the autonomous underwater vehicle, is directly related to issues of mapping the local gravitational field (LGF) using high-precision small-sized gravimeters. The paper presents research aimed to improve the accuracy of navigation using the map of LGF, which is suitable for the implementation of algorithms of real-time navigation correction. Addressed to this problem, the new method based on the analysis of the sidelobe level of the matching function was studied for estimating the error of correlation-extreme navigation. The feature of the proposed method, in contrast with the well-known Bayesian approach, lies in the opportunity of its implementation in onboard algorithms and utilization for the preliminary assessment of informational content of the field map for route planning. The results of computational experiments show that under certain conditions, the studied estimates are near the calculated Bayesian estimate.

**Key words:** autonomous underwater robot (autonomous unmanned underwater vehicle), trajectory measurements, map-aided method of navigation, gravimetric, informativeness.

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