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TO THE ISSUE OF THEORETICAL AND EXPERIMENTAL ESTIMATES OF THE GROUP VELOCITY OF THE ACOUSTIC SIGNAL MODAL COMPONENTS ON LONG TRACKS USING OCEAN CIRCULATION MODELS

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The paper focuses on the theoretical analysis of propagation velocities of modal components of broadband phase manipulated pulse acoustic signal along the 500 km length tracks. Calculation of averaged along the track group velocities are performed with the results of ocean circulation modeling, which are used for the three-dimension sound speed field mapping in the considered water area. Results of theoretical analysis are compared with experimental data. Also, the role of horizontal refraction of acoustic waves on the bottom relief inhomogeneities and sound speed field in the increasing of the general propagation time from the emission point to the reception point is analyzed. It's shown, that the influence of this phenomenon for the studied tracks could be neglected. The results of a comparison of the waveguide impulse response function and theoretical estimates prove the possibilities of using ocean circulation models in predicting the arrival times and propagation velocities of the modal components of broadband signals.

Keywords: pulse signals, group velocities, horizontal refraction, normal waves theory, acoustic ranging.

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