

SOUND SCATTERING AND VARIABILITY OF THE UPPER LAYER STRUCTURE IN THE SEA OF JAPAN AND THE SEA OF OKHOTSK

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The results of sound scattering studies in the Sea of Japan and the Sea of Okhotsk in various years are presented. The relevance of the research is related to the need to create operational methods to assess the variability of the structure of the marine environment during the continuous movement of the vessel. This circumstance is especially important near the frontal zones and flow boundaries, when the characteristics of the medium change over a short distance and therefore no contact methods allow for a detailed spatial survey of the structure of the medium near such boundaries. An effective acoustic method based on sound scattering has been developed, which allows studying the structure of sound-scattering layers, including bubbles, plankton, underwater gas flares, at various frequencies. Sound scattering coefficients were measured during the course of the vessel and at individual stations at frequencies from 12 to 100 kHz. Estimates of plankton biomass along traces based on sound scattering have been carried out. Studies of sound scattering in underwater gas flares found at the shelf boundary in the Sea of Japan are presented. The presented theoretical models made it possible to estimate the concentration of gas in the bubbles forming gas flares, as well as to estimate the total amount of gas escaping from the discovered gas flares on the shelf of the Sea of Japan.

Keywords: sound scattering, seawater, bubbles, plankton, acoustic spectroscopy, underwater gas torch

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