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USING A VECTOR–SCALAR SENSOR TO STUDY THE CHARACTERISTICS OF UNDERWATER NOISE OF A SCUBA DIVER

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The results of an experimental study in the frequency band 10-4000 Hz of spectral densities, coherence functions, and one-dimensional probability distribution densities of instantaneous sound pressure values and the horizontal component of the sound pressure gradient of underwater noise from a scuba diver equipped with Aeris scuba gear (USA) motionless at the bottom are presented. The noises were recorded in the coastal water area at a distance of 2 m from the source. During the experiment, man-made interference caused by the movement of ships, as well as pulse interference caused by marine crustaceans, was observed. It is shown that the main part of the noise energy generated by the breathing of a scuba diver is concentrated in the range of 15-1000 Hz. The highest values of the coherence function of the signals perceived by the sound pressure receiver and the sound pressure gradient receiver during exhalation were observed in the regions of 25-100 Hz and 350-600 Hz, during inspiration – in the regions of 80-250 Hz and 350-800 Hz. It is proposed to use the sums of Gaussian distributions as models of the distribution densities of the instantaneous values of the recorded noises. Recommendations on possible practical applications of the research results are given.

Keywords: hydroacoustic noise of shallow sea, vector–scalar sensor, underwater noise from a scuba diver.

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