THE ESTIMATION OF THE SPATIAL FREQUENCY STRUCTURE OF THE SOUND FIELD IN THE SHALLOW SEA IN THE INFRASONIC FREQUENCY RANGE

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The paper analyzes experimental research results of the sound field registered by the combined vertically oriented two-element receiver. The sound field was created by discrete components of the shaft and blade sound noise sequence emitted by the research vessel "Yuri Molokov" in the infrasonic frequency band of 2-20 Hz, and low-frequency towed emitter of polyharmonic signal in the frequency band of 30-60 Hz. Sea depth and the operating band of 2-20 Hz together eliminate the possibility of discrete spectrum normal waves excitation in the Pekeris waveguide in this frequency band. Based on the spectral analysis of noise signal, potential noise sustainability was estimated when using the full set of informative parameters describing the sound field's energetic structure. The sound field vertical structure analysis results conclude that the sound field of an extremely low-frequencies of the infrasonic band is formed by Railegh-Scholte regular wave localized on the seawater-bottom interface. With frequency increasing, the role of the first inhomogeneous (slow) wave excited by a complex angular spectrum of the emitter becomes higher. In the near-field zone, the role of generalized Scholte wave localized on the source horizon increases, and a couple of Scholte waves, the first inhomogeneous wave and both regular and generalized, create the sound field.

Key words combined receiver, noise field, noise immunity, generalized non-uniform waves, hybrid waves.

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