DOI: 10.37102/1992-4429_2022_42_04_07

RESONANT PHENOMENA IN A WEDGE-SHAPED WAVEGUIDE AND THEIR VERIFICATION IN A SHALLOW SEA IN THE INFRASONIC FREQUENCY RANGE

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In the forming of sound fields in irregular waveguides of the coastal wedge type, the process of excitation of normal waves captured by the waveguide plays an important role. The capture process itself has a different description in different model statements, which can serve as an additional sign of verification of the model solutions themselves. The best conditions for experimental observation of the process of capturing normal waves by a waveguide are realized in conditions of a shallow sea of variable depth in the infrasonic frequency range. In this frequency range, the most suitable source is the discrete components of the shaft-blade scale (VLZR) of a moving vessel, which was used by RV "Yuri MOLOKOV". A vertical antenna equipped with combined receivers is used as a receiving system. In the frequency range greater than the first critical frequency of the model waveguide, a spectral analysis of power flows in the channels of the combined receiver was performed. Based on the results of spectral analysis, a set of resonant frequencies of a waveguide of variable depth excited by discrete components of a roller-blade scale of a noise source is determined. Most of the detected resonances correspond well to the model description, and the experimental data together unequivocally confirm the preference of the generalized solution.

Keywords: non-self-adjoint model formulation, generalized solution, acoustic vector sensor, informative parameters, infrasound, shallow sea, longitudinal resonances.

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Recommended citation:

Kasatkin B.A., Zlobina N.V., Kasatkin S.B. Resonant phenomena in a wedge-shaped waveguide and their verification in a shallow sea in the infrasonic frequency range. Underwater investigations and robotics. 2022. No. 4 (42). P. 71–83. DOI: 10.37102/1992-4429_2022_42_04_07. EDN: NVTDQT.