

Structured Session: Shallow Water Acoustics

Analysis of Temporal Fluctuations of Acoustic Energy Caused by Shallow Water Internal Waves

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A shallow water internal-wave and acoustic-field fluctuation experiment was carried out in the Yellow Sea in summer. By using the experimental data, a joint model of underwater acoustic environment and acoustic field is constructed, and the relationship between the characteristics of internal waves and the temporal fluctuations of acoustic-energy is analyzed. Analysis of experimental data and simulation results indicates that the fluctuation characteristics of acoustic-energy are related to the characteristics of internal waves. When the propagation velocity of internal-wave increases, the period of acoustic energy fluctuation decreases. By analyzing the relationship between the power spectral density of the acoustic energy fluctuations, and the propagation velocity of the internal-wave, an inversion method of internal-wave propagation velocity is proposed, and the internal-wave propagation velocity obtained by the method is similar to the result of experimental measurement analysis.

Keywords: internal waves, acoustic energy fluctuation, inversion method.

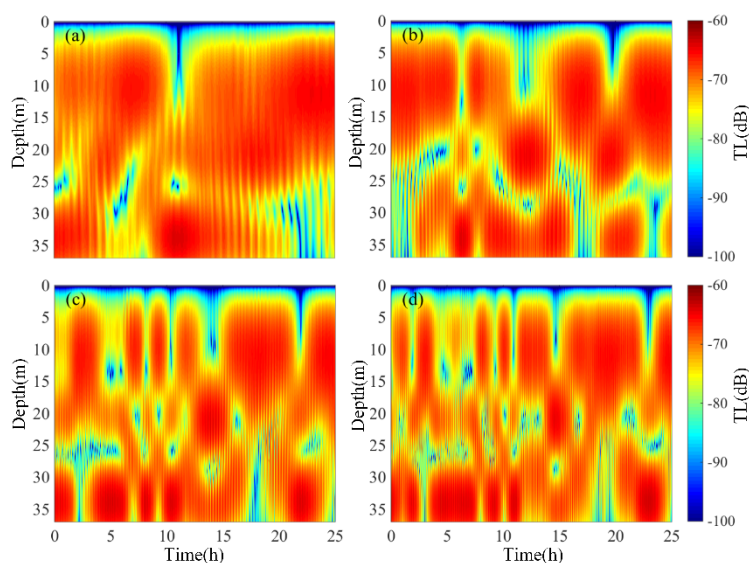


Figure 1: Comparison of acoustic energy fluctuations when the propagation velocities of internal waves are (a) 0.17m/s, (b) 0.33 m/s, (c) 0.50 m/s and (d) 0.67 m/s.

References

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