

عنوان مقاله:

Plume outflow intrusion impact on acoustical signal fluctuations in a pre-stratified environment

محل انتشار:

دوفصلنامه مبانی نظری و کاربردی علم آکوستیک و ارتعاشات, دوره 1, شماره 2 (سال: 1394)

تعداد صفحات اصل مقاله: 15

نویسنده:

Mohammad Akbarinasab - Assistant Professor, Faculty of Marine & Oceanic Science, University of Mazandaran, Babolsar, Iran

خلاصه مقاله:

Existence of outflow intrusion introduces small-scale turbulence that perturbs the vertically stratified character of the sound velocity and causes spatial and temporal fluctuations of the sound propagation. In this experimental study, we have investigated acoustic wave propagation with frequency of 50 kHz in a pre-stratified environment with intrusion of a turbulent plume while the signals received in different locations and times are recorded. At first, a fourth-order Butterworth band-pass filter was applied to the received voltage time series. Then the signals received at different times when entering the outflow intrusion at similar depths are compared to the ones without plume intrusion. In order to investigate the shapes of the signals received at different moments of the experiment they are analyzed in the time domain using trace envelope techniques. The results show that if the transmitter is positioned in the outflow intrusion location, the received signals in the upper and lower part of the outflow intrusion show a signal amplitude increase but the received signals in the dyed outflow show a signal amplitude decrease. Thereby, results indicate that the outflow intrusion could be important in shapes of the received signals. Also we have observed the occurrence of major signals fluctuations over time is accordance with the sound speed vertical structure changes due to the intrusion development.

کلمات کلیدی:

Pre-Stratified Environment, Outflow intrusions Sound propagation Trace envelope, Signal fluctuations

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