

# Atmospheric boundary layer as a laboratory for modeling infrasound propagation and scattering in the atmosphere

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The experimental results of studying the effect of a fine-scale layered structure of a stably stratified atmospheric boundary layer (ABL) on fluctuations of the parameters of acoustic pulses generated with a certain period (1 min) by an artificial detonation source are presented. The vertical profiles of wind velocity fluctuations in the thin layers of the ABL have been retrieved using the wave forms and travel times of the recorded arrivals of pulses from the source. It is shown that the mechanism of scattering of pulse signals in a stably stratified ABL is similar to the mechanism of scattering of signals from ground surface explosions by layered nonhomogeneities of wind velocity and temperature in the stratosphere and lower thermosphere. The role of similarity parameter here place the dimensionless thickness of the reflecting nonhomogeneous layers, which is the vertical scale of the layer multiplied by the relative difference in effective sound velocity and normalized by the vertical wavelength. The effect of such inhomogeneities on the temporal fluctuations of the azimuth and arrival times of the signals is studied. The estimation of the error in localization of pulsed sources is given.

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