



Emission of acoustic waves in the atmosphere of concentrated sources and evolution of spatially modulated waves and bounded beams in a stratified atmosphere

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Very often, the radiators of acoustic signals in the atmosphere can be considered as concentrated and even point radiators compared to the other scales of the problem, so for a more reliable description of the evolution of nonlinear profiles it is necessary to solve the three-dimensional problem, taking into account the initial curvature of the wavefront, diffraction and spherical divergence.

In this paper analytical solution for intense diffracted beams in the paraxial approximation was obtained. Methods of nonlinear geometrical acoustics applied to spatially modulated waves in a stratified atmosphere were developed. It is shown that for the vertical propagation of acoustic waves in a stratified atmosphere, the role of diffraction effects diminished compared to non-linear effects. The peculiarities of the nonlinear transformation of the spatial structure of profiles and beams in a stratified atmosphere were calculated, taking into account the spherical divergence.