

T1.1-P18. Study of the atmospheric structure and dynamics by infrasound probing method.

The results of study of the wind field structure in the upper stratosphere, mesosphere and lower thermosphere obtained by a recently developed infrasound probing method are presented. The method is based on the effect of infrasound scattering from highly anisotropic wind velocity and temperature nonhomogeneities in the atmosphere. The spectral characteristics of the wind velocity vertical variations in the middle atmosphere such as vertical wavenumber spectra and coherences are obtained from the vertical profiles of wind velocity retrieved from the infrasound signals detected in the shadow zones. The infrasound propagation from volcanoes and surface explosions through the atmosphere with the retrieved profiles of the effective sound speed is modeled by using parabolic equation method. The obtained consistency between modeled and recorded infrasound signals at different ranges from the infrasound source shows that real-time retrieval of the fine-scale wind velocity structure allows us to better predict infrasound field and localize its source as compared to the case when such structure is not taken into account in the existing atmospheric models. The possibility of using retrieved wind velocity structure for improving the models of pollution transport and long-range infrasound propagation in the atmosphere is discussed.

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