ID: Type: **Poster**

Infrasound Monitoring of the Wind Velocity Fine-Scale Structure in the Middle and Upper Atmosphere

The scattering of infrasound from anisotropic wind velocity and temperature fluctuations in the middle and upper atmosphere leads to the penetration of the infrasound field into acoustic shadow zones. Based on this effect a method of acoustic sounding of an atmospheric fine-scale wind velocity vertical structure is developed to retrieve vertical profiles and vertical wavenumber spectra of the wind velocity fluctuations in the middle and upper atmosphere (up to a height of 130 km above ground). Some recently obtained results of the reconstruction of these fluctuations from the wave forms and travel times of the stratospheric and thermospheric arrivals detected in the shadow zones near surface explosions and volcano eruptions are presented. The temporal variability of the retrieved wind vertical profiles over the time scales of 10-30 min is analyzed.

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Track Classification: Theme 1: The Earth as a Complex System