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**Acoustic tomography of the internal wave-associated fluctuations in  
the lower atmosphere**

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The two different schemes of acoustic tomography of the atmospheric boundary layer (ABL) were used in the field experiments conducted near Melpitz (Germany) and Zvenigorod (Russia). The mesoscale effective sound speed fluctuations (periods 1min-1h) averaged over different acoustic ray paths were retrieved from the fluctuations of sound travel time between sources and receivers. It was found that a major contribution to the retrieved fluctuations comes from the wind speed fluctuations. By using a coherence analysis of the retrieved and measured wind speed fluctuations in the spatially distanced points the wave like fluctuations with periods of 16-20min, 8-10min, 4-5min, 1-2min have been filtered, and their horizontal translation velocities and scales have been estimated. Similar periods were also found in the variations of the vertical turbulent fluxes of momentum and heat near ground. The mechanism of origination of these periods in the observed fluctuations is proposed. The effect of the wind shear variations induced by internal waves on the turbulence intensity was observed. This effect showed a substantial role played by internal waves in the origin of an intermittency of turbulence in the stably stratified ABL. This work was supported by RFBR, grants 06-05-64229, 05-05-64973, 07-05-91555.