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Macroturbulence fluctuations of air impurities concentration and refractive index in the bottom layer

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Abstract

Spatial variability of impurity concentration and refraction index in the bottom layer for the turbulence scales interval 16 km is investigated in the work. This work based on the data of continues monitoring of urban air parameters. Structural functions of impurity concentrations and that of calculated refraction index were plotted to measuring. Approximation of the obtained structural functions by power-behaved dependence showed that in the researched range the exponent has the value (0,4-0,6) and decreases with increasing of the distance. Experimentally obtained results correspond well with theory of large-scale turbulence. The separate research has shown, that in scales range 1-3.5 kms exponent located in the range [0.6-1], and in the range 3,5-6 kms - [0.01-0.22]. Thus the impurities with the horizontal scales of 1-6 km in the bottom layer are located in the boundary of buoyancy range and of the large-scale turbulence range.

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Keywords

Large-scale inhomogenities, Pollution impurities, Turbulence