

Study of mesoscale irregularities of the refraction coefficient of radiowaves in the troposphere by the methods of numerical simulation

Teptin G., Khutorova O., Zinin D., Khutorov V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We propose a model of the mesoscale irregular structure of the refraction coefficient of radiowaves and its dynamics in the real atmosphere at altitudes of up to 20 km. This model was verified according to multiyear continuous measurements. The obtained dynamics of the refraction coefficient shows considerable horizontal, vertical, and temporal variability of the mesoscale irregular structure as well as anisotropy of the horizontal spatial structure of the refraction coefficient, which is determined by the fields of wind speed and the synoptic gradient of atmospheric pressure. Dependences of the disturbance of the optical length of the radio paths on the path length, zenith angle, time of the day, and meteorological conditions are found. © 2010 Springer Science+Business Media, Inc.

<http://dx.doi.org/10.1007/s11141-010-9199-7>
