

The effect of the large-scale structure of the Es layer on limiting frequencies at oblique incidence

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Abstract

The results of experimental determinations of the correction coefficient K to the parameter M for converting the vertical-sounding frequency parameters of the Es layer into oblique-incidence limiting frequencies are reported. The measurements were made on the Moscow-Kazan path using a digital ionospheric sounder operating in the variable-frequency oblique-incidence sounding mode. Vertical-incidence sounding was performed on the path midpoint simultaneously with the oblique-incidence measurements. The coefficients K were determined by computing the ratios of the experimentally determined parameters M to the corresponding computed parameters M_0 for specular signals reflected from the Es layer at a height of 110 km. The resulting distribution of the coefficient K can be fully interpreted in terms of the cloud model of the Es layer with the parameters inferred from the temporal variations in the blanketing frequency $f_b E_s$. The signal-amplitude dependence of the coefficient K is found to differ during daytime and nighttime hours. The corresponding differences for signal levels below -30 dB can also be interpreted in terms of the gradient and scattering Es layer models. Copyright © 2001 by MAIK "Nauka/Interperiodica".
