

HF propagation model reflected by frontal Es

Ichiro Tomizawa^{1*}, Kotaro Fujii¹

¹SSRE, Univ. of Electro-Comm.

We have developed the method to derive precisely both direction and speed of the frontal Es by using the HF Doppler observation network with multi-reflection points. Based on the analysis of this method we have shown that the HF Doppler variation due to the frontal Es can be described by the mirror reflection model instead of the scattering model. It is therefore concluded that the frontal structure of Es should have both the thin cross-section less than the diameter of the first Fresnel zone and the horizontal straight-line shape much more than the same diameter.

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