



Prediction of HF Channel Characteristics on The Basis of The IRI Model for Disturbed Conditions

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Prediction quality of HF channel characteristics is determined by the ionospheric model and possibility of its adaptation to real, especially, disturbed conditions. In this paper the evaluation of quality of the storm-factor SF model (Araujo -Pradere E.A. et al. Radio Sci., 2002, v.37, N 5) is given and possibilities of the IRI2001 correction by data of vertical sounding (VS) are investigated for negative and positive disturbances. The evaluation is fulfilled by means of VS data and data of oblique sounding (OS) on European paths (1217 and 1850km). For VS data diurnal observational dependences of foF2 are compared with IRI model values calculated with and without SF. For OS data diurnal observational dependences of MOF are compared with calculated MUF. These calculations are fulfilled by two ways using: 1) values foF2 corrected by SF, 2) the spatial distribution of foF2 which is built by the kriging method for VS stations remote on 90-500km from OS paths. It is shown that the storm -factor allows to decrease a prediction error of foF2 and MUF for midlatitudinal paths by ~40% for day hours and ~25% for night hours for negative disturbances. Meanwhile the use of SF leads to an additional prediction error for positive disturbances. Hence, it is necessary to control the character of ionospheric disturbances for the successful use of SF. Construction of the spatial distribution of foF2 by means of real VS data and subsequent correction of the IRI model allows to increase the MUF prediction precision over long term one by 1.5-2 times for quiet and disturbed conditions.