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The behavior of an equivalent ionospheric thickness in the cycle of solar activity according to the global TEC maps

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An equivalent thickness of the ionosphere connects its basic parameters: the total electron content TEC and the maximum electron concentration of plasma Nm (= TEC/Nm). The aim of the paper is to investigate whether it is possible to use the parameter in order to: 1) adapt the IRI model to the real conditions in a certain spatial region by means of the TEC values, 2) fill gaps in the data of the critical frequency foF2, 3) use an index of disturbance of the magnetosphere, based on variations of TEC (), for example, WT (Gulyaeva, 2009), to assess the ionospheric disturbance (foF2). It will focus on the transition from low to high solar activity. Global maps of TEC (JPL, CODE, UPC, ESA) for 1999-2009 and foF2 data from the database SPIDR are used. Some results on the example of the station Juliusruh for 3 mentioned directions are as follows. 1. Using the model values of (IRI) does not always lead to improved correspondence between the calculated and experimental values of foF2, the use of empirical values of (obs) and the coefficient K()=(obs)/ (IRI) helps to improve conformity. This improvement is significant for the conditions close to the median ones. In most cases the best fit is provided by a map of JPL. In conditions of low solar activity coefficients of K() are greater than 1, in conditions of high solar activity they are less than 1. 2. Filling gaps in foF2 data using the coefficient K() is possible with a relative deviation of $\sim$ 5-10% in quiet conditions, and $\sim$ 20-30% - during the disturbances. These figures are little dependent on the level of solar activity, but the absolute deviations are corresponding to 0.2-0.3 MHz at the minimum of activity and $\sim$ 0.5-0.6 MHz at the maximum. 3. To use needs to know the dependence (). To identify behaviors of () depending on the type of disturbances remains elusive yet. It is shown that in most cases the highest correlation between foF2 and corresponds to the JPL map.