

# Comparison of LS TIDs' relative amplitudes according GPS and ionosondes data

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Correspondence of ionospheric disturbance parameters obtained from total electron content (TEC) data to characteristics of local electron density irregularities is one of the key problems of ionosphere research using transionospheric signals. We estimated ratio  $R = \text{DTEC}/\text{DN}$  between disturbance relative amplitudes according TEC data ( $\text{DTEC} = d\text{TEC}/\text{TEC}$ ) and local electron density data ( $\text{DN} = dN/N$ ) for large-scale traveling ionospheric disturbances (LS TIDs) registered during the strong magnetic storms 29-31 October 2003 and 7-11 November 2004. We used TEC data obtained on ground-based GPS receivers located close to ionospheric stations and corresponding values of  $f_0F_2$ . It was found that TEC and  $f_0F_2$  variations were almost similar for all considered disturbances.

Calculated ratio  $R = \text{DTEC}/\text{DN}$  was in the order of 1/3-1/4 for the electron density disturbance  $dN/N$  in F2-layer maximum of about 50-60%. Such a ratio was in agreement with the supposition that during TIDs propagation the main contribution to TEC modulation  $d\text{TEC}/\text{TEC}$  occurred near ionospheric F2-layer maximum  $h_{max}$  in the altitude range of  $h_{max} \pm 100$  km. However, when the electron density disturbance  $dN/N$  in F2-layer was about 80%, the ratio  $R$  increased up to 2/3. Apparently, corresponding altitude range of LS TIDs' propagation became wider.

We have simulated LS TIDs propagating in different altitude ranges. Results of the simulation confirmed our conclusions on TID localization in F2-layer.