

# ***Study of TEC variations by means of two dimensional maps constructed for HF-disturbed ionosphere around the SURA heating facility***

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The first results of measurements of TEC variations in a wide region of space around the SURA heating facility are considered in the report. The measurements have been performed employing ~ 150 two-frequency GPS/GLONASS receivers located in Tatarstan and Mari-El. Data obtained allow constructing two-dimensional maps of TEC variations HF-induced in the ionospheric  $F_2$  region [1]. Generation of AGVs (TIDs) in ionosphere heating experiments performed at the SURA facility must be taken as proved [2-4].

Results presented in the report make it clear that HF-induced TEC variations are observed in a wide region of space; they are registered, at least, up to 50°N that is of about 800 km to the south from the SURA facility. It is significant that the TEC variations begin to register there within ~ 5 min after the pump wave switch-on. This result allows to estimate the velocity of an agent inducing ionospheric TEC perturbations as  $V \approx 3 \cdot 10^3$  m/s (souther), which is one order higher than AGV velocity at ionospheric altitudes. It can also be said with assurance that existence of TIDs of natural origins with wave lengths of 150 – 200 km stimulates the occurrence of artificial TEC perturbations.

The magnitude of TEC perturbations, HF-induced in the ionospheric  $F_2$  region, may be as much as 0.3 – 0.5 TECU. Assuming that there size in the line from satellite to receiver is of about 200 – 400 km, the value of plasma density variations has to be  $\Delta N \approx (1 - 2) \cdot 10^{10}$  el/m<sup>3</sup>. On the assumption of the main part of  $\Delta N$  account for the  $F_2$  region, it gives estimation of  $\Delta N / N$  as (3 – 6)%, which is in a good agreement with data obtained in [2].

First measurements of TEC variations performed in a wide region of space around the SURA heating facility have shown large informativeness of such investigations.

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