

THE OBSERVATION OF IONOSPHERE RESPONSE AT PARTIAL SOLAR ECLIPSES

CHERNIAK I.U., Lysenko V.N.

Institute of ionosphere NAS and MES of Ukraine, Kharkiv, Ukraine

The solar eclipses give us the unique opportunity to study the features of interactions of upper Earth atmosphere with solar radiation. The incoherent scatter radars provide the potentiality to realize the most complete diagnostics of this phenomenon. The ionospheric effects of solar eclipse of 29 March 2006 and 1 August 2008 at the Kharkiv radar were measured from the height of 100 km. For solving the problem of simultaneous electron density (N_e) determinations in E and F regions of the ionosphere it was used the dual-frequency measuring channel.

The comparisons with ionosphere response this solar eclipses it is carried out. It is the important feature of both this experiments that it was carried out in a postmeridian period in quiet geophysical conditions i.e. in the conditions of the formed stationary daytime F2 layer of the ionosphere.

Partial Sun eclipse take place 29.03.2006, disk shadow factor $\sim 73\%$. The whole duration of this eclipse was 2 h 18 min. The solar eclipse of 1 August 2008 over the point of observation was partial, the maximal percent of covering of visible solar disk was about 33%. The eclipse was observed from 9.12 till 11.21 UT. The maximal phase of eclipse was registered at 10.15. The variations of N_e was found out in the form of decrease as the phase of Solar disk covering was increased up to the maximum phase of eclipse; after that with small temporal delay the concentration was practically restored. The maximal decreasing of N_e was registered at the maximum of layer and at the heights of 250 km and 300 km, it can be explained by predominance of the loss processes near the maximum of F2 layer after the eclipse start. The electron density higher 400 km did not varied noticeably. At the height of the F2-layer maximum the electron temperature is decreased, significant changes of the ion temperature behavior was not observed. On the whole the ionosphere response is characterized by short-term change to the evening conditions.

The altitude dependences of electron density and plasma temperatures are presented.

Solar eclipse, ionosphere, incoherent scatter radar

Iurii Cherniak, Kharkiv, Ukraine, e-mail: tcherniak@ukr.net