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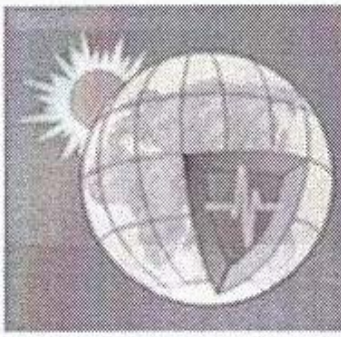

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The middle latitude D-region of the ionosphere response to the strongest Solar X-flares

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In [1] the reaction of the middle latitude D-region of the ionosphere to the small and middle intensity Solar X-flares (classes C and M) is considered. In this report the results of experimental investigations by the method of partial reflections (PR) of the influence of strongest Solar X-flares (of class X) on characteristics of radionoises, PR-signals (on frequencies of 2,3–2,4 MHz) and on the parameters of the middle latitude D-region are adduced .

The probing of the ionospheric D-region was performed with the Kharkiv V. Karazin National University MF radar located at the Kharkiv V. Karazin National University Radio-Physical observatory (geographic coordinates: latitude = 49° 38'N, longitude = 36° 20'E, , elevation –156 m, inclination – 66° 36.8', declination –6° 19.6', L ~2.0) in the period of 4 X-flares: 10.11.2004 (01.59–02.13(max)–02.20 UT, X2.5), 17.01.2005 (06.59–09.52(max)–10.07 UT, X3.8), 19.01.2005 (08.03–08.22 (max) – 08.40 UT, X1.8), 20.01.2005 (06.36–07.01 (max)–07.26 UT, X7.1).

The measurements of the amplitudes of signal plus noise and of noise amplitudes of the ordinary and extraordinary polarizations were made within an altitude range of 60 – 126 km. The duration of observations was ten of minutes–hours both before and after the flares. The $N(z)$ profiles were estimated over intervals of 5–10 min during the entire observation period with an error of not more than 30%.

The experimental data analysis showed that for the considered events take place characteristic features both in variations of the PR signals and radionoises and in height-temporal variations of the electron density. On the whole they, mainly, have the same type and character, as well as the features set in [1] for the flares of less intensity, but they more expressed. In the report the basic features of variations of characteristics of radionoises, PR-signals and electron density in periods of strong X-flares is discussed.

The calculations of changes of the ionization rate are made. The results of investigations are compared with data obtained in the undis-

turbed conditions and during the flares of less intensity (classes C and M). Basic differences and features are analysed.

Literature:

1. Gokov A.M., Tyrnov O.F., Chernogor L.F. Experimental investigations by the partial reflection method of response of the middle latitude D–region of the ionosphere on the X-ray and optical flares. Space science and technology. 2005. V. 11. No 3/4. P. 56 – 67.