

INFLUENCE OF SOLAR X-RAY FLARES ON RADIO SIGNAL PROPAGATION IN THE LOW IONOSPHERE

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In addition to pure scientific significance, and possible applications in prediction of elementary disasters, ionospheric investigation can be of practical use in the field of radio communications. Namely, radio wave propagation over long distances is enabled by multiple reflections of electromagnetic (EM) waves inside the Earth - ionosphere waveguide and is dependent of ionospheric properties which can be changed by X-flares, Lyman- α radiation, lightning, geomagnetic storms and many other effects. Also, ionospheric plasma changes characteristics of satellite signals.

In this paper, we study general characteristics of a solar X-ray flare (the most important sudden perturber of the low ionosphere) influence on telecommunication radio signals. We based our analysis on the low ionospheric monitoring using VLF signal while the D-region plasma parameters and signal propagation characteristics are calculated using procedures explained in Grubor et al. (2008), Nina and Čadež (2014) and Bajčetić et al. in press.

References

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