



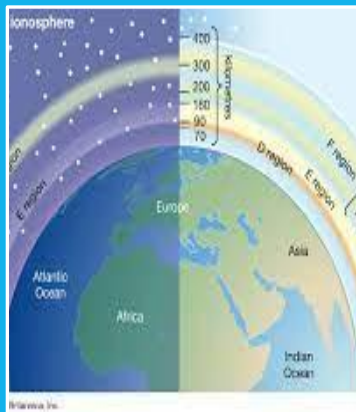
Examination of the ionospheric response to intense solar activity from September 6 to 10, 2017

Jelena Barović^{1,2}, Vladimir A. Srećković¹ and Aleksandra Kolarski¹

¹Institute of Physics, Pregrevnica 118, Belgrade, Serbia

²University of Montenegro, Podgorica, Montenegro

The ionosphere is a layer within the Earth's atmosphere that contains charged particles, whose characteristics are influenced by solar, external and other extraterrestrial ionizing factors.



Solar flares are strong explosions on the surface of the Sun, which are known to produce additional ionization of the Earth's atmosphere in the sunlit hemisphere. When the energy from the solar flare reaches the Earth, it performs additional ionization in the ionosphere, changing the density and location of its constituents



The International Reference Ionosphere (IRI) is a joint venture of the Committee of Space Research (COSPAR) and the International Union of Radio Science (URSI) to develop and improve an international standard for parameters in the Earth's ionosphere. IRI represents the average values of electron and ion densities for the altitude range of 50-2000 km (see Bilitza et al. 2017).

Reference Ionosphere - IRI (2016) with IGRF-15 is now available on the new CCMC Instant-IRI 12/31/2022. Please migrate and use the new IRI

plotting of IRI parameters: electron and ion (O^+ , H^+ , He^+ , O_2^+ , NO^+) densities, neutral (CIRA-86) temperatures, equatorial vertical ion drift and others.

14-2022 8 11) does STORM could not be named off.

Alt: 15

deg: 50 Longitude (0 - 360 deg): 40

Stop: 2000 Stepsize: 50

In this paper, we examined the response of the ionosphere to intense solar activity in the period September 6-10, 2017. The IRI model was used in this research with the goal to examine the behavior of the ionosphere under the influence of intense solar activity in this specified period. Calculations were performed for M and X-class flares and included three ionosonde stations: Juliusruh (54.6° N, 13.4° E), San Vito (40.6° N, 17.8° E) and Pruhonice (50° N, 14.6° E).



The initial modeling parameters used for given stations and periods before and after examined flare events were taken from site <https://giro.uml.edu/dibase/scaled.php>.

Plasma Drift Data TID Data GAMBIT Weather Maps Radio Link Evaluation

FastChar

Digital Ionogram Data Base (DIDBase)

Ionogram-Derived Characteristics

1. Time Interval:

Start: 2-07-02 21:00

End: 2-07-03 03:00

Hour: +1 Day

2. Select Data to Download:

foF2 -- F2 layer critical frequency

foF1 -- F1 layer critical frequency

foE -- E layer critical frequency

foEs -- Es layer critical frequency

fbEs -- Blanketing frequency of Es-layer

foEa -- Critical frequency of auroral E-layer

foFp -- Critical frequency of F region patch trace

fsl -- Maximum frequency of F trace

MUF3000 -- Maximum usable frequency, 3000 km

M3000 -- MUF(3000)foF2

h'F2 -- Minimum virtual height of F2 trace

h'F -- Minimum virtual height of F trace