

Učinci svemirskog vremena na Zemlju i tehnološke sustave

Solarne baklje

- Kratkotrajni, intenzivni događaji pojačane emisije elektromagnetskog zračenja iz Sunčeve atmosfere
- Frekvencije energije – preko cijelog spektra, od radio valova do gamma zračenja
- Ovo zračenje putuje brzinom svjetlosti i naglo ionizira Zemljinu gornju atmosferu

Solarne baklje i „radio blackout”

- Nagla ionizacija dovodi do nemogućnosti radio komunikacija na HF području, a ponekad ometa i GNSS signale i druge navigacijske radio sustave (posebno u zračnom prometu – goniometri itd.)
- Klasifikacija „radio blackouta”: R1 – R5
- R5 – gubitak HF komunikacije i do nekoliko sati

Solar flares

GOES X-ray satellite 1 minute solar X-rays average in the 1-8 Ångström passband

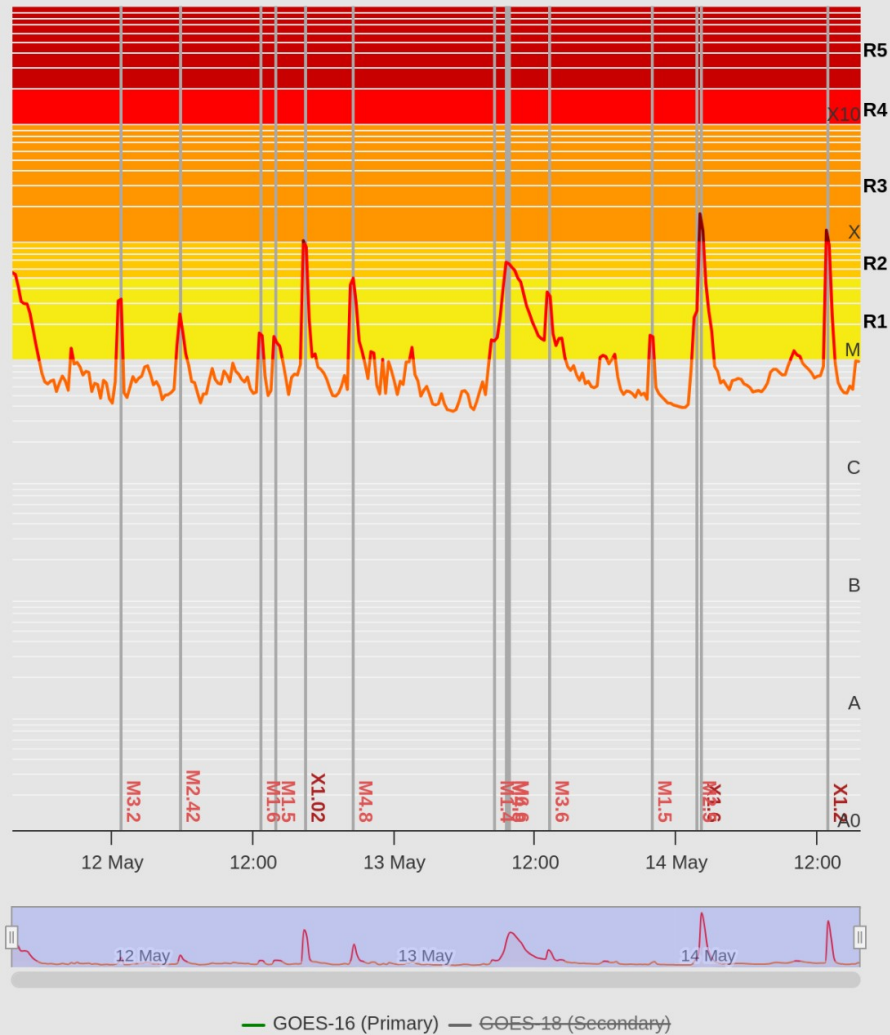
Zoom

2 hours

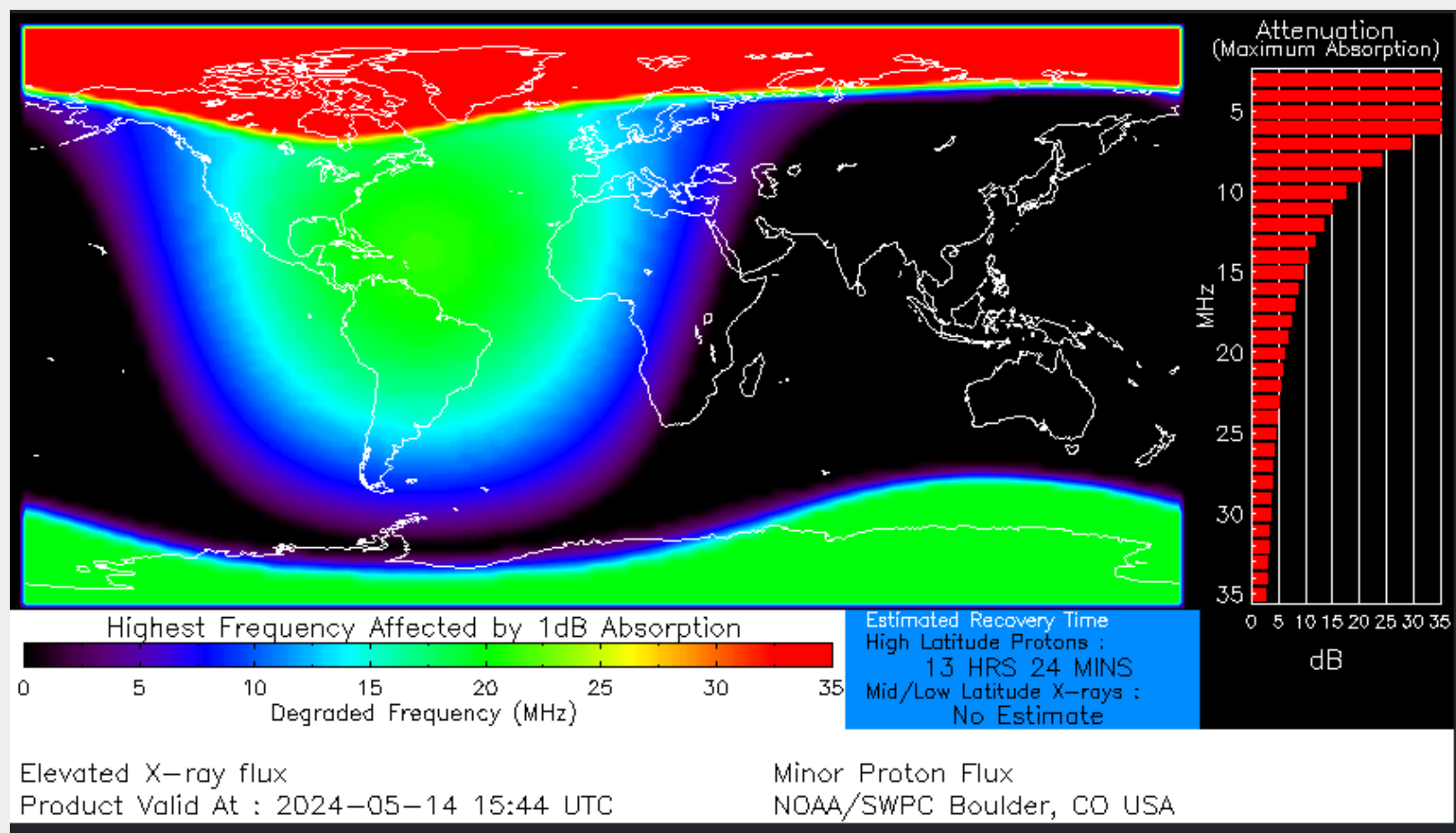
6 hours

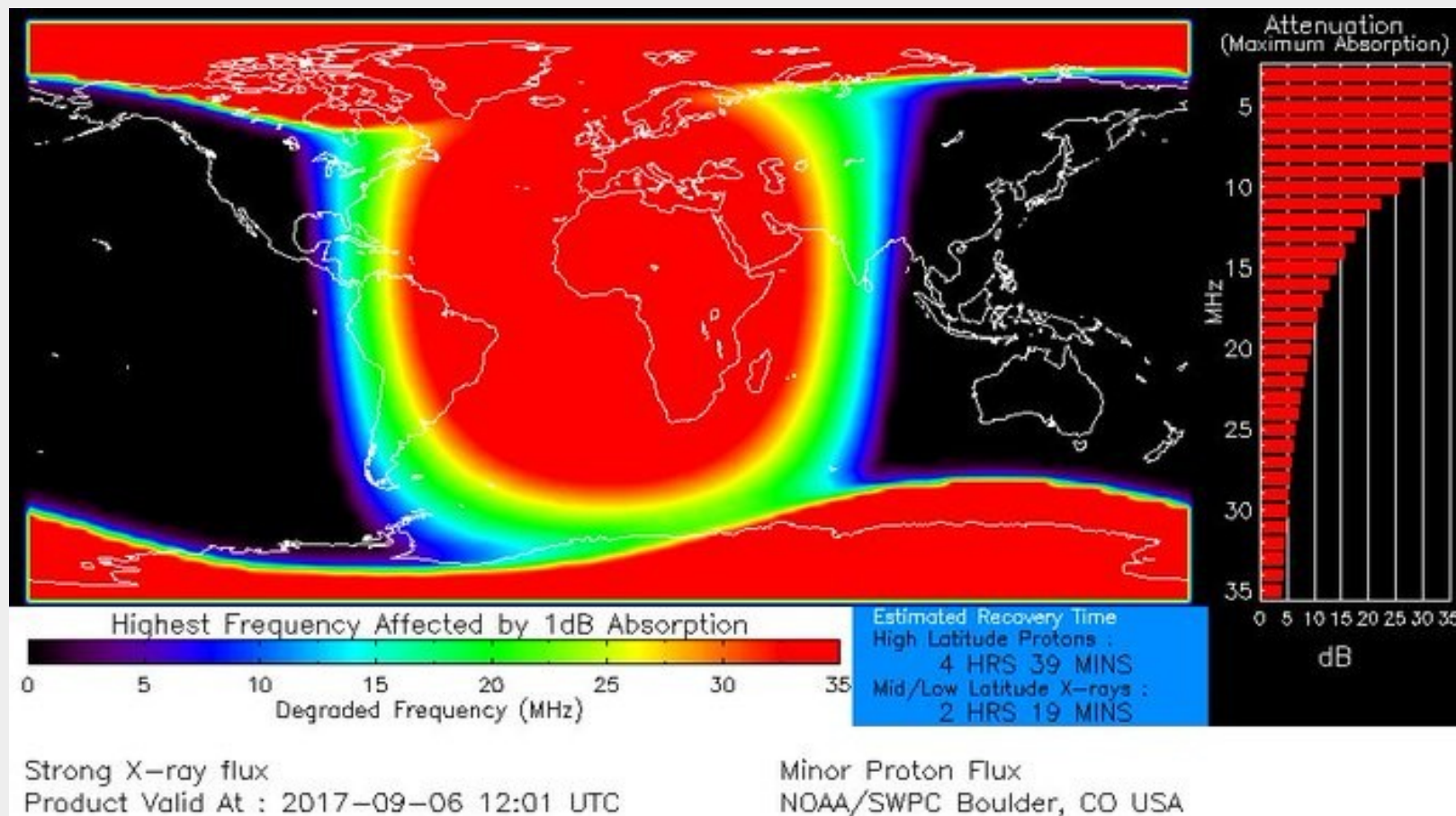
24 hours

3 days



<https://www.spaceweatherlive.com/en/solar-activity/solar-flares.html>





Sunčeve oluje

- Solar radiation storms
- Visokoenergetske čestice (protoni) koje imaju dovoljnu energiju da se probiju kroz Zemljino magnetsko polje
- Predstavljaju rizik za satelite, astronaute, pa čak i posadu i putnike u avionima na većim visinama
- Klasifikacija: S1 - S5

Radio emisije

- Zračenje solarnih baklji u najnižem dijelu frekvencijskog spektra (radio valovi) može interferirati s navigacijskom opremom poput radara, GNSS signala i komunikacijskih sustava

Koronarna izbacivanja mase

- Koronarna izbacivanja mase (CMEs), tj. izbačaji plazme i magnetskog polja u međuplanetarni prostor imaju ponajveći utjecaj na Zemlju i tehnologiju
- Učinci zavise o gustoći tvari (broj protona po cm^3 , brzini gibanja tvari te orijentaciji interplanetarnog magnetskog polja)

Koronarna izbacivanja mase

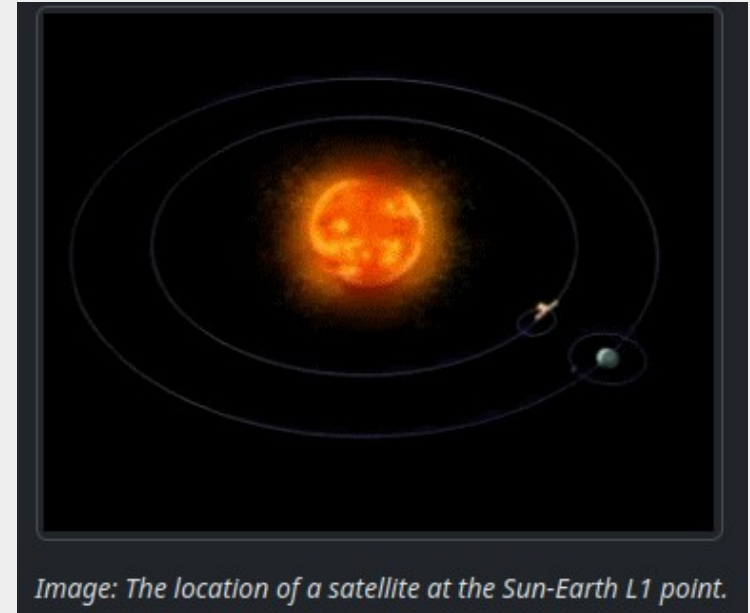
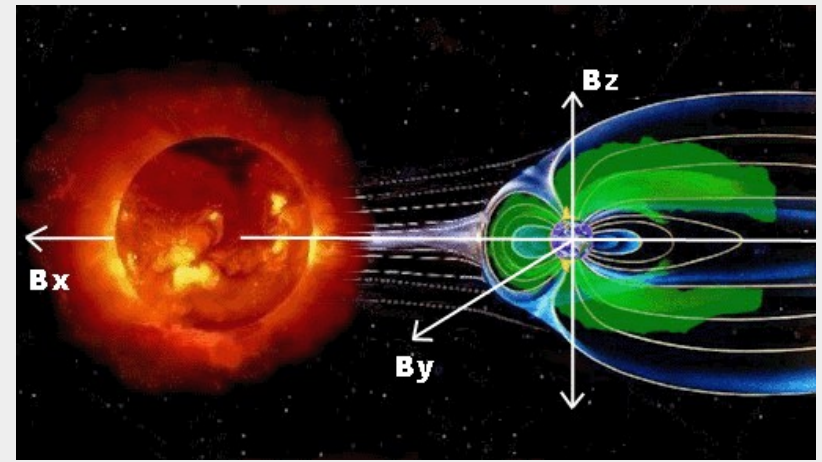
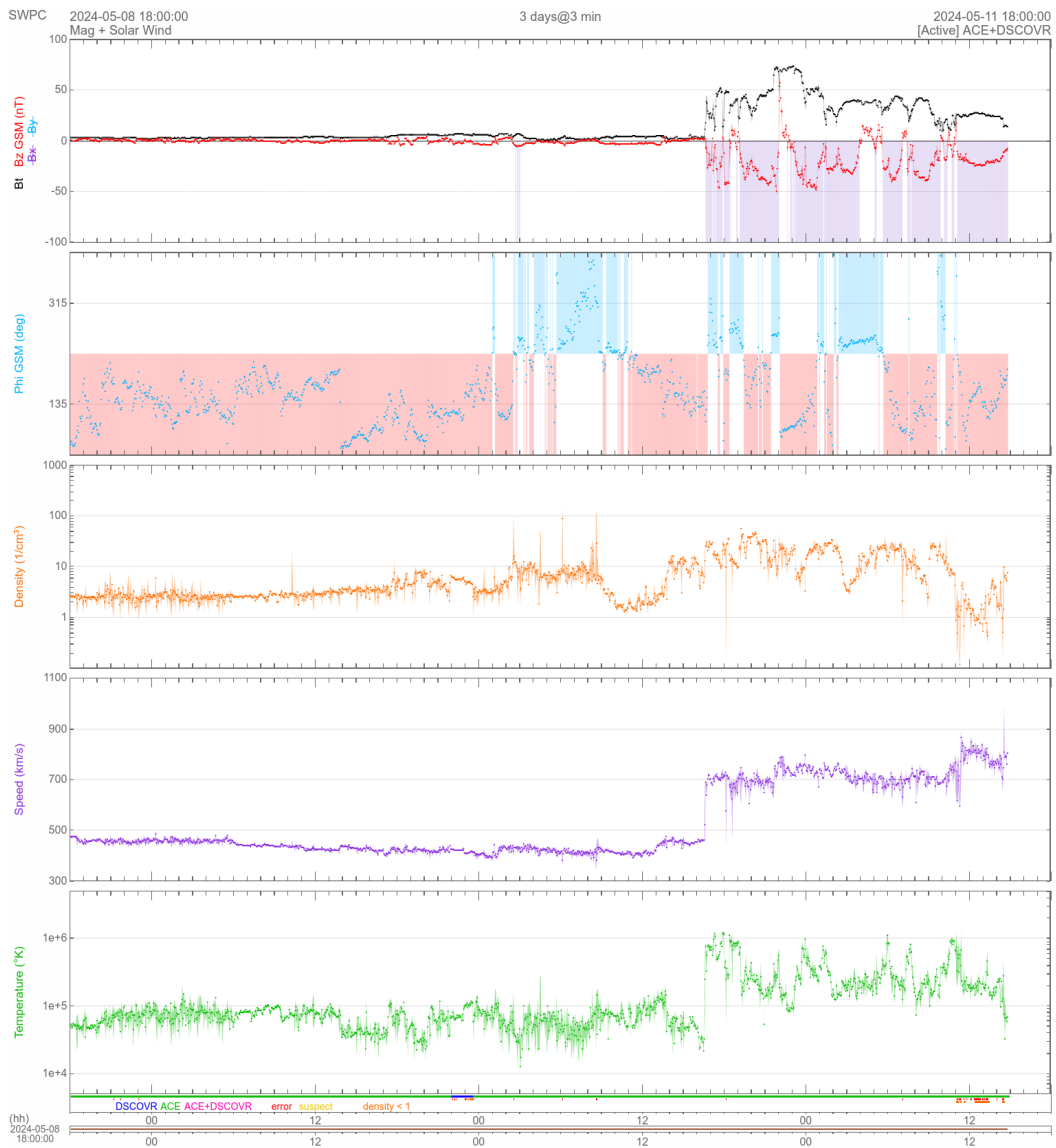
- Učinci se očituju u klasifikaciji po različitim indeksima i kategorijama, npr. Kp index (0-9), ili kategorija geomagnetske oluje (G1 – G5)
- Ovi događaji predstavljaju rizik za satelite, električnu mrežu (transformatore, dalekovode, itd) te komunikacijske sustave
- Učinci u atmosferi su vidljivi u obliku polarne svjetlosti

Koronarna izbacivanja mase

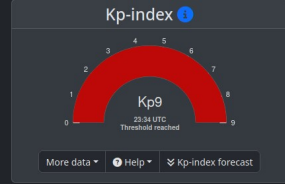
- Hemispheric Power Index (HPI) je mjera za snagu čestica koja ulazi u atmosferu i izražava se u gigavatima (GW) te se računa posebno za sjevernu i južnu hemisferu

10. svibnja 2024.

REAL TIME SOLAR WIND

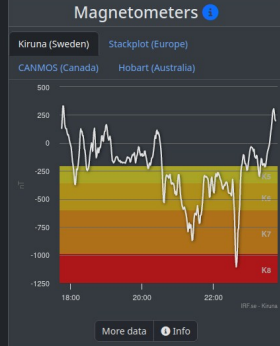
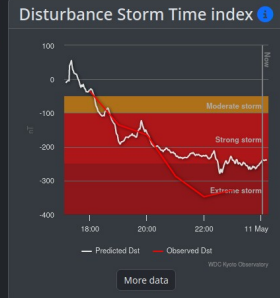
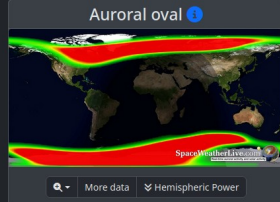
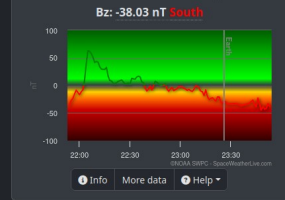
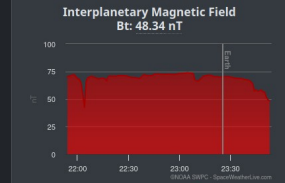
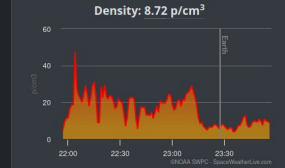
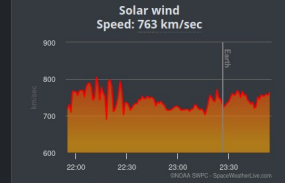


<https://www.swpc.noaa.gov/products/real-time-solar-wind>



Real Time Solar Wind

With the current speed, it will take the solar wind 33 minutes to propagate from DSCOVR to Earth.



G5 - Extreme geomagnetic storm

Observed Kp: 9
Threshold reached: 23:34 UTC

Current data suggests there is a slight possibility for aurora to appear at the following middle-latitude regions in the near future

Aalborg, Aarhus
Gothenburg
Belfast, Edinburgh

The solar wind speed is currently high (763 km/sec.)

The strength of the interplanetary magnetic field is very high (48.34nT), the direction is strong south (-38.03nT).

The Disturbance Storm Time index predicts extreme storm conditions right now (-255nT)

The maximum X-ray flux of the past two hours is:

M1.6

S1 - Minor solar radiation storm
Minor impacts on HF radio through polar regions



Latest forum messages

Geomagnetic storming, CMEs from AR 13664, 2024-05-09/10 [798](#)

Is there any truth to this "Internet/Electrical Grid Apocalypse"?

AR3664 [719](#)

Weakening of Earth's magnetic field due to geomagnetic excursion [21](#)

Is the DST index been updated?

More topics

Support SpaceWeatherLive.com!

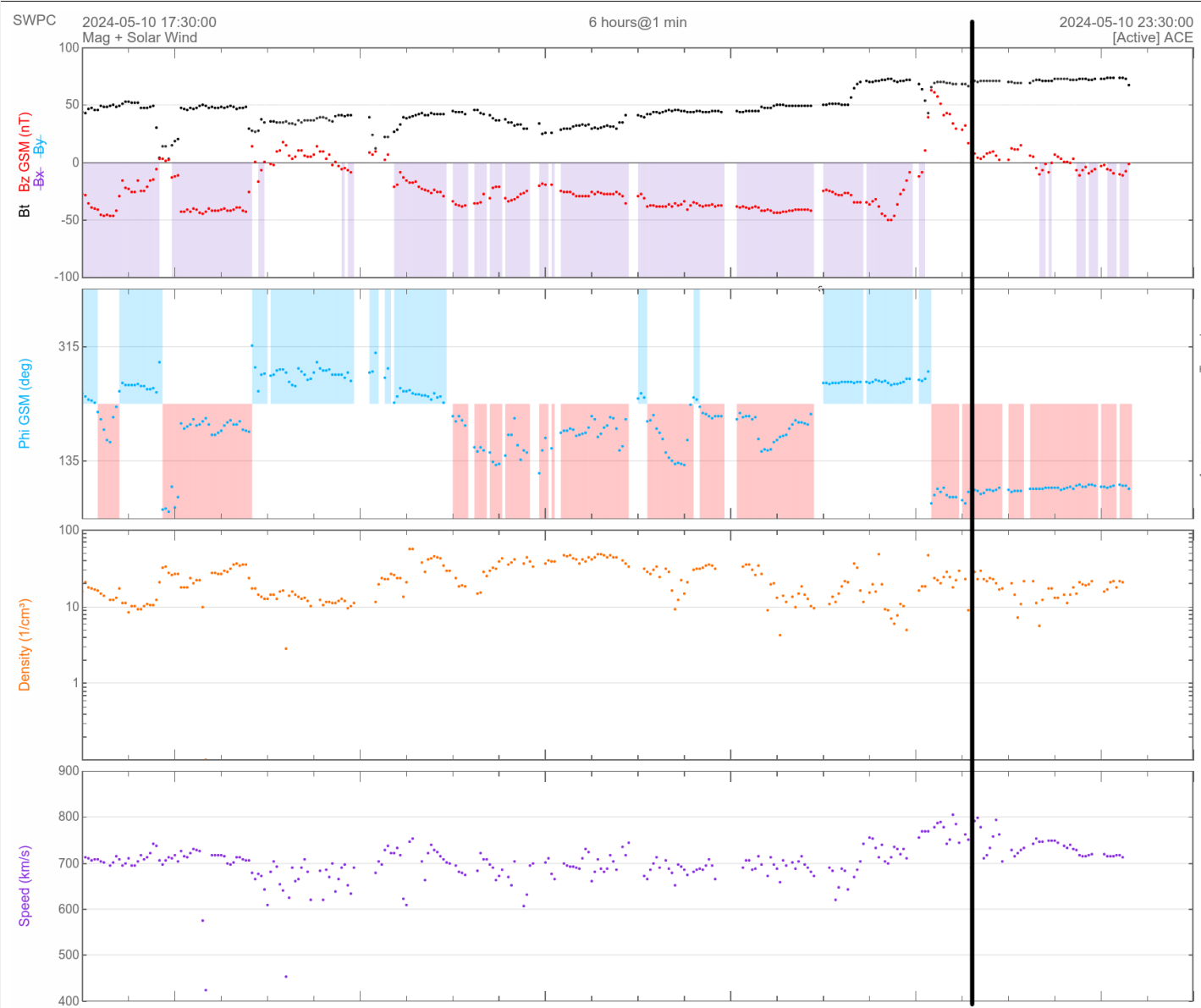
A lot of people come to SpaceWeatherLive to follow the Sun's activity or if there is aurora to be seen, but with more traffic comes higher server costs. Consider a donation if you enjoy SpaceWeatherLive so we can keep the website online!

55%

Donate

22:17 UTC





<https://www.meteoadriatic.net/polarna-svjetlost-u-hrvatskoj-10-11-svibnja-2024/>

21:15 UTC



Učinci svemirskog vremena na točnost GNSS sustava

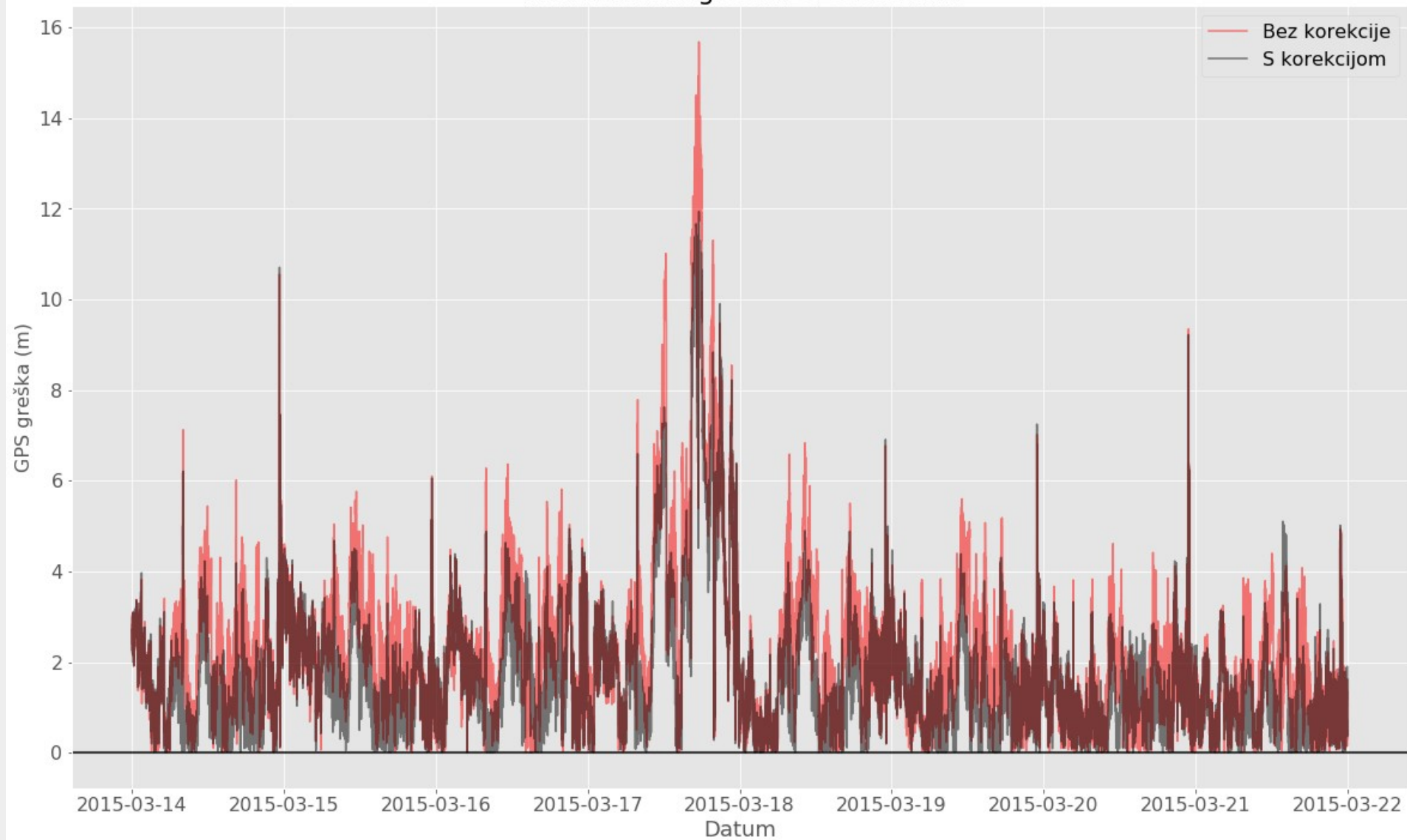


<https://igs.org/>

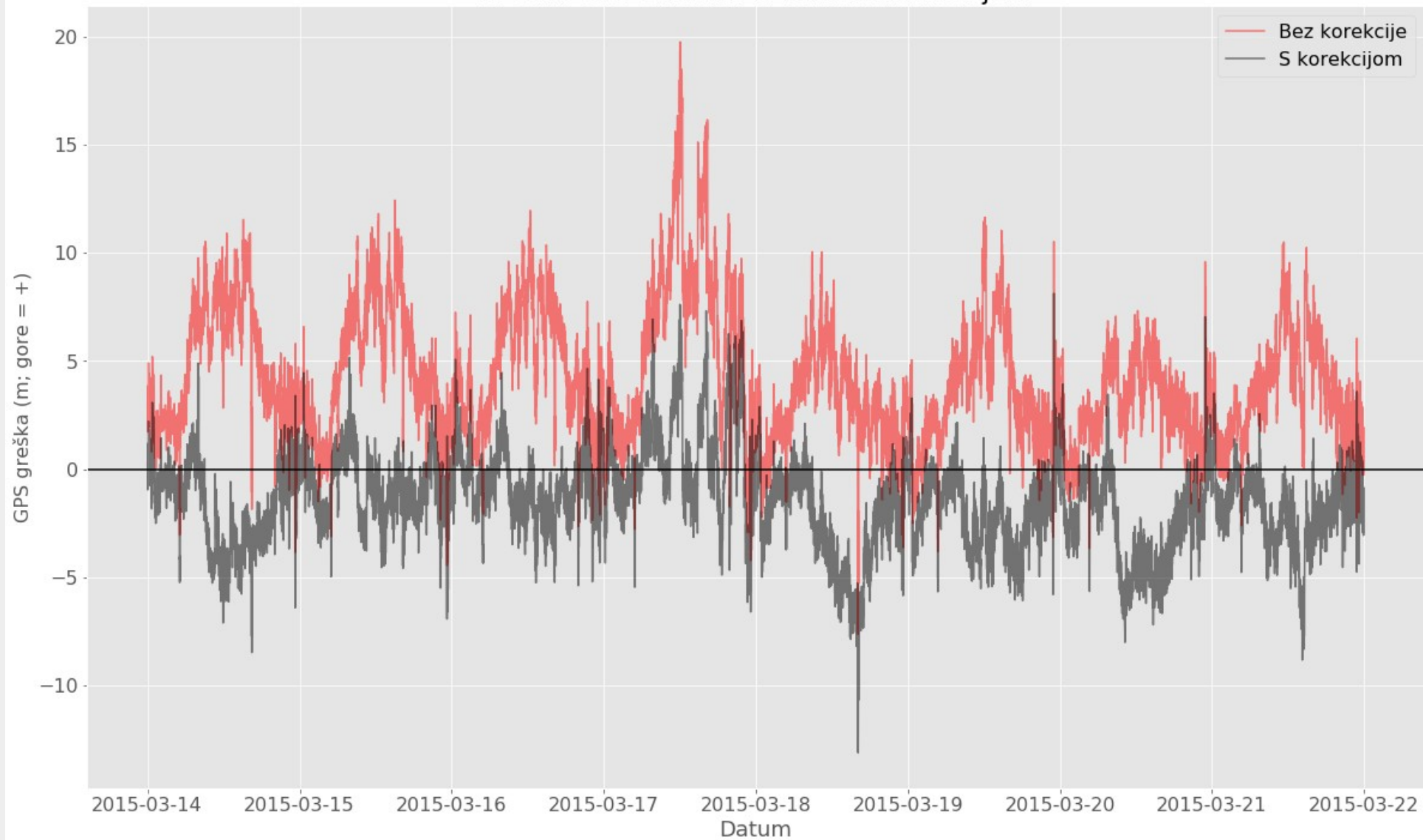
IGS Frankfurt

- Period: 14. - 21. ožujka 2015.
- RINEX format datoteke
- Data serveri, npr.
 - <https://gssc.esa.int/activities/ftp-and-web-access-to-gnss-repository/>
 - <https://intermagnet.org/>
- Softver:
 - RTKLIB <https://www.rtklib.com/>
 - GPS-TEC analysis <https://seemala.blogspot.com/>

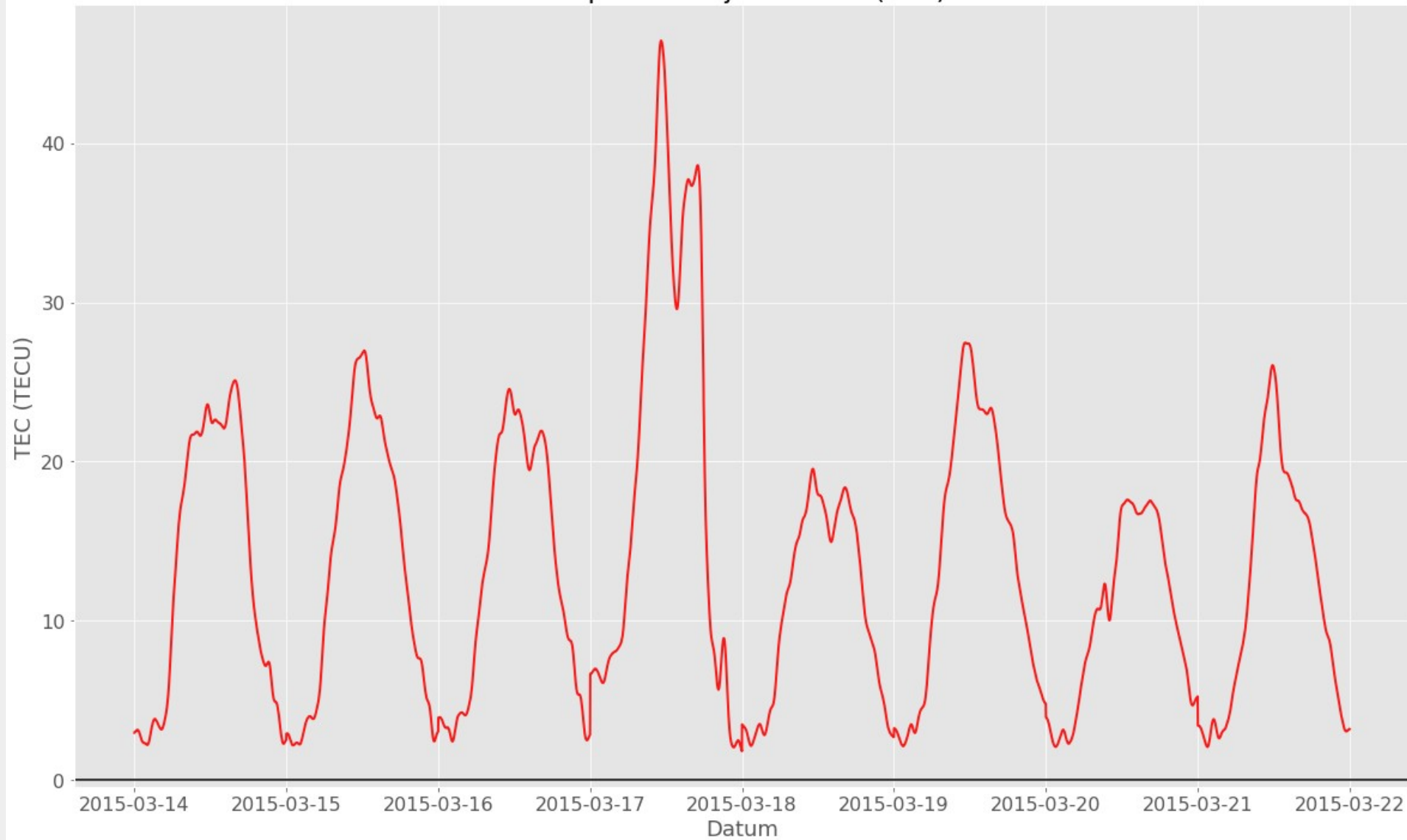
Horizontalna greška GPS sustava



Greška GPS sustava u vertikalnom smjeru



Ukupni sadržaj elektrona (TEC)



Komponente geomagnetskog polja

