Briefing Space Weather

1 Sun (José Cecatto)

1.1 Summary

08/28 – No M/X flare; No fast wind stream; 3 CME can have component toward the Earth;
08/29 – No M/X flare; No fast wind stream; 2 CME can have component toward the Earth *;
08/30 – No M/X flare; No fast wind stream; 2 CME can have component toward the Earth;
08/31 – No M/X flare; Fast (< 450 km/s) wind stream; 2 CME can have component toward the Earth;
09/01 – M1.2 flare; Fast (< 550 km/s) wind stream; 6 CME can have component toward the Earth *,*;
09/02 – M3.3 flare; Fast (< 600 km/s) wind stream; 9 CME can have component toward the Earth *;
09/03 – M1.1, M6.0 flares; Fast (< 500 km/s) wind stream; 9 CME can have component toward the Earth *,*;
09/04 – No M/X flare; Fast (< 450 km/s) wind stream; 1 CME can have component toward the Earth;
Prev.: No fast wind stream for next 01-02 days; for while low (05% M, 01% X) probability of M / X flares next 2 days;
also, occasionally some other CME can present a component toward the Earth.

2 Sun (Douglas Silva)

2.1 Summary

Summary of Solar Events between August 28 and September 04, 2023

WSA-ENLIL (CME 2023-08-30T22:12:00 UT)
● The simulation results indicate that the CME will reach the DSCOVR mission between 2023-09-02T06:09:00 UT and 2023-09-02T20:09:00 UT.
WSA-ENLIL (CME 2023-09-01T03:24:00 UT)
● The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2023-09-03T08:00:00 UT and 2023-09-03T22:00:00 UT
WSA-ENLIL (CME 2023-09-01T23:12 UT)
● The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2023-09-05T05:30:00 UT and 2023-09-05T19:30:00 UT.

Coronal holes (SPOCA):

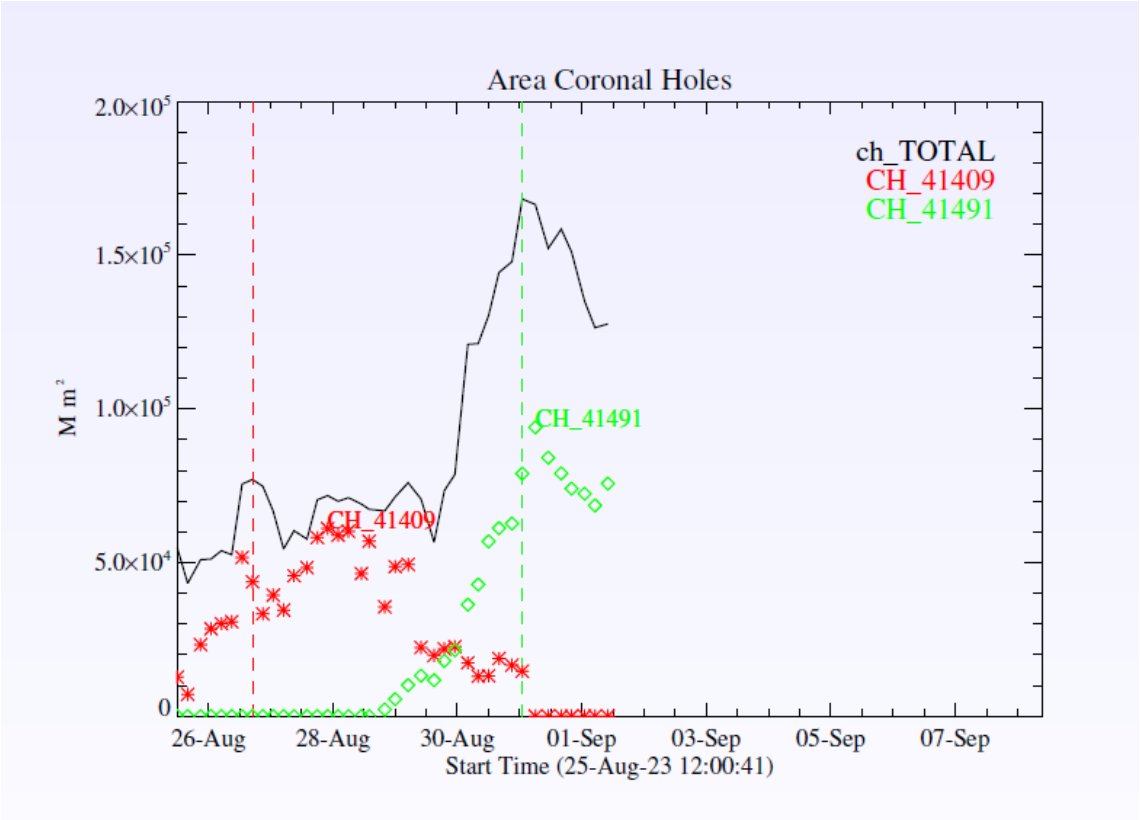


Figura: The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between August 25 and September 02, 2023.

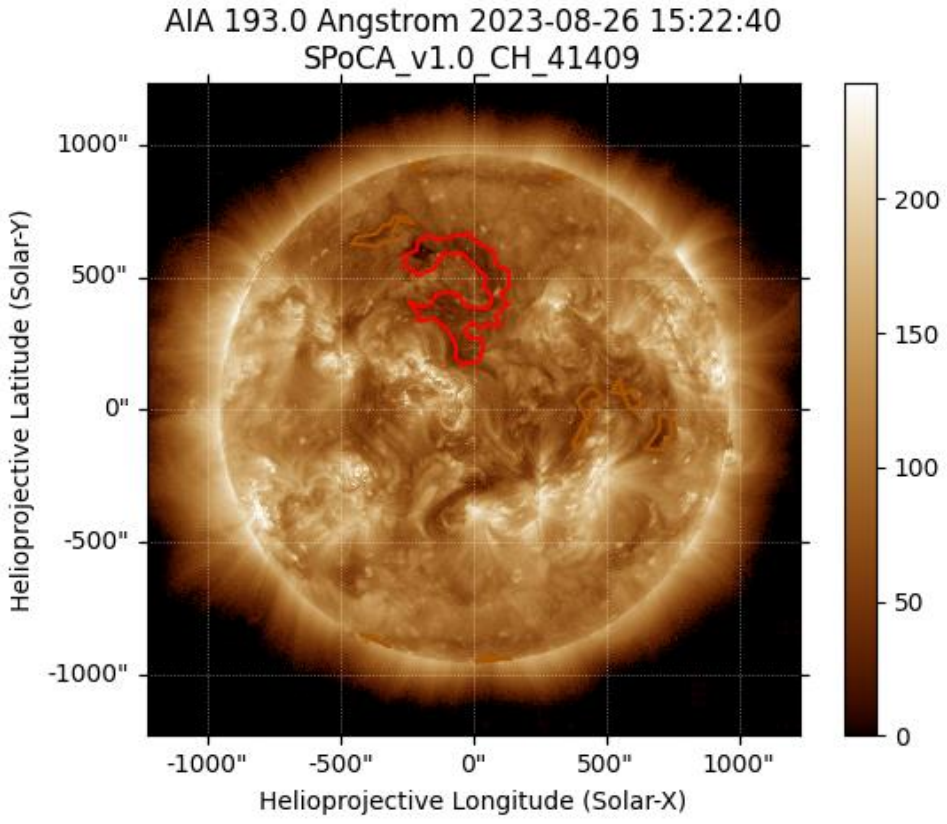


Figura: Above the 193 ˚A image of the Sun are highlighted coronal holes observed by SPOCA around 15:20 UT on August 26, 2023 (red dot line).

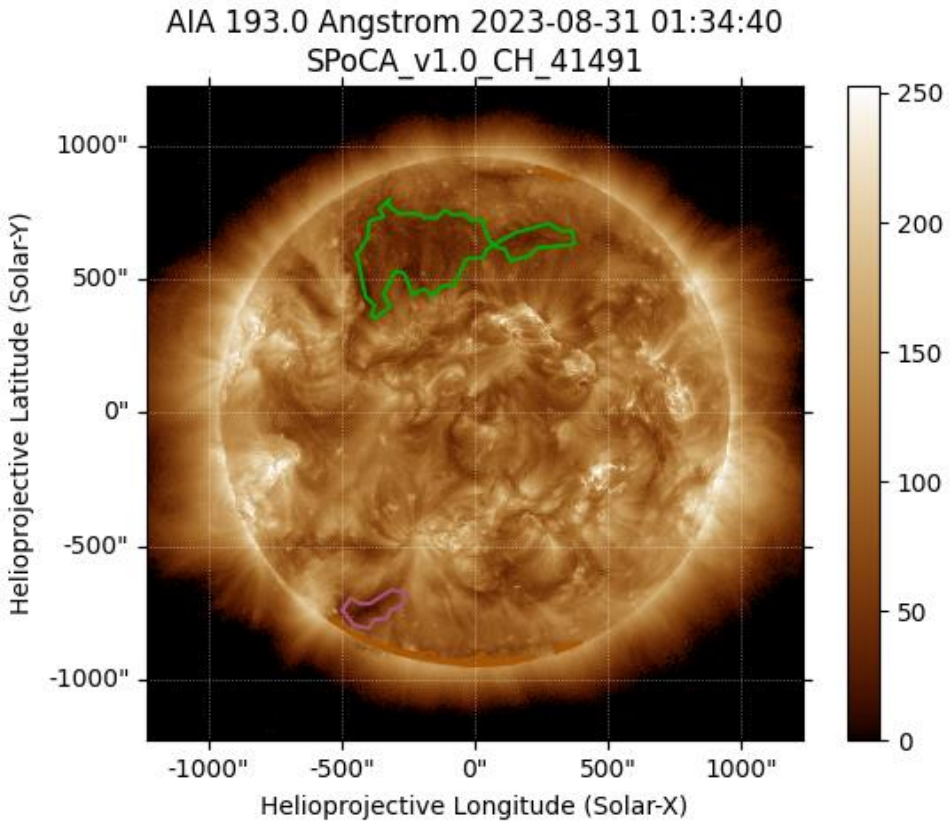
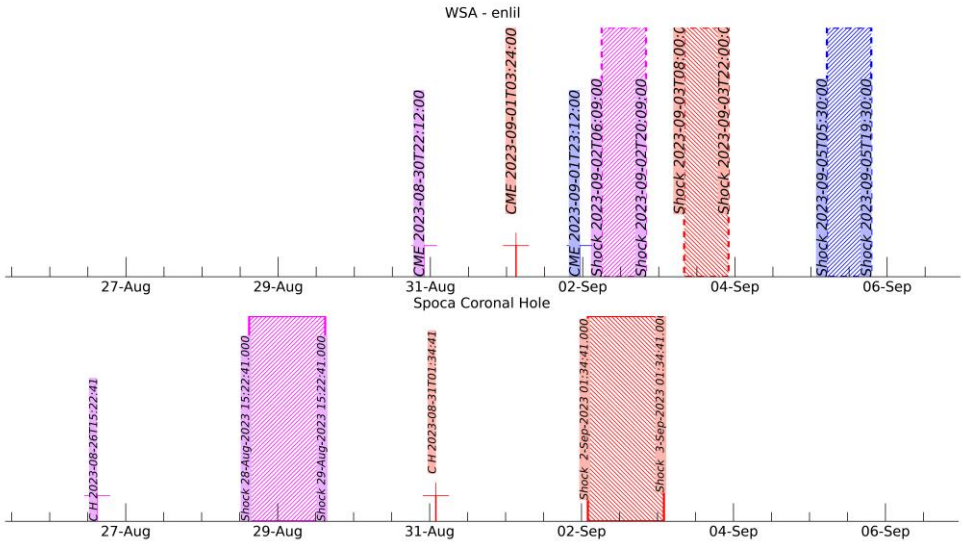


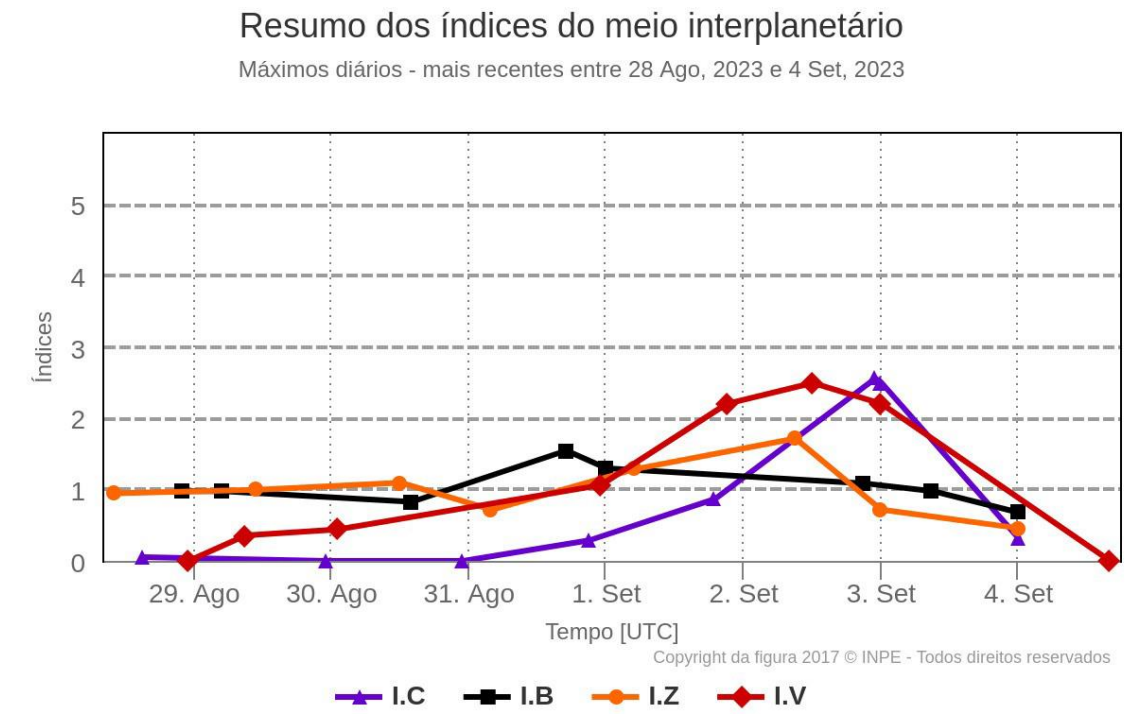
Figura: Above the 193˚A image of the Sun are highlighted coronal holes observed by SPOCA around 01:30 UT on August 31, 2023 (green dot line).

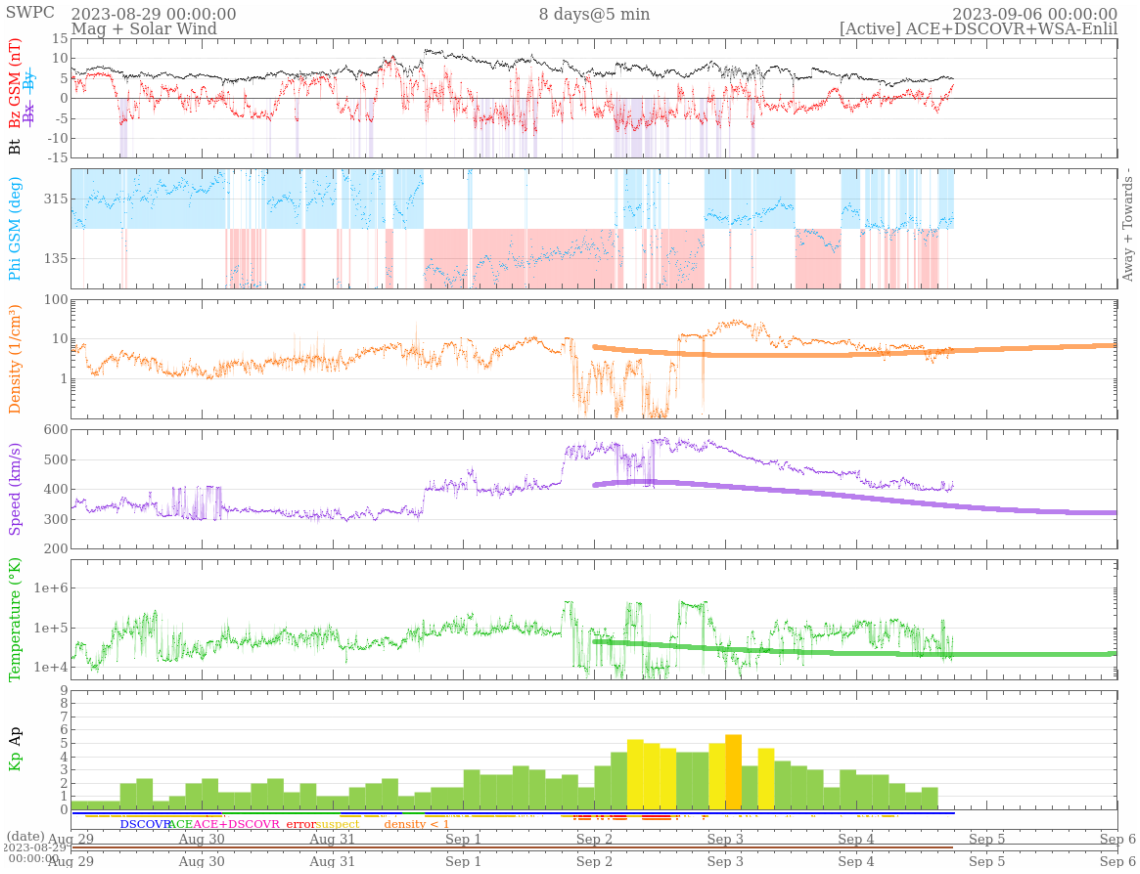
WSA - ENLIL and SPOCA

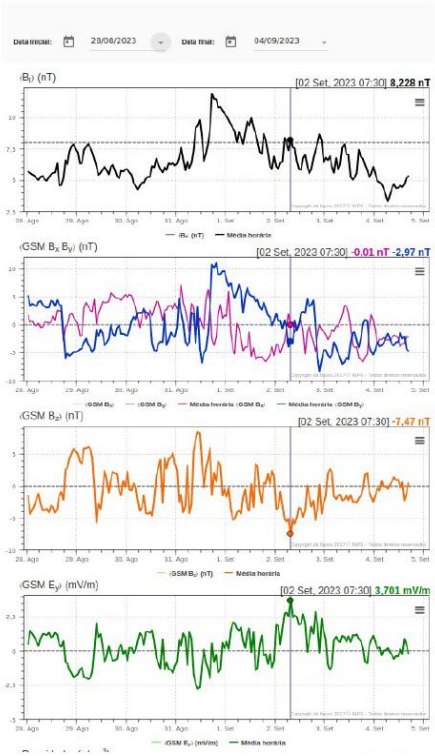


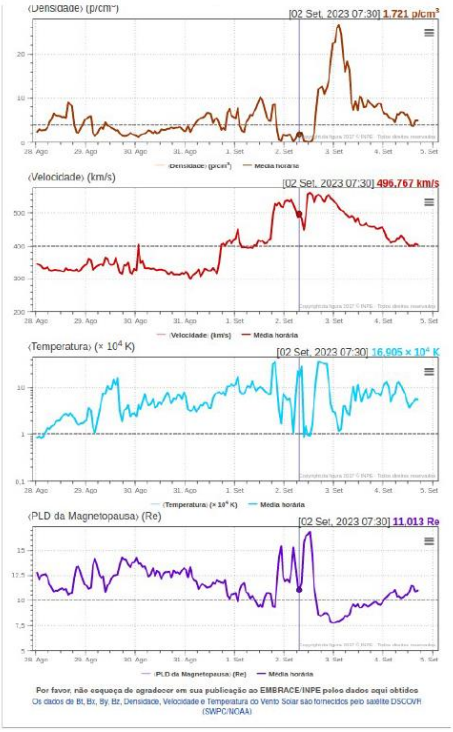
3 Interplanetary Medium (Paulo Jauer)

3.1 Summary


Resumo dos índices do meio interplanetário
Máximos diários - mais recentes entre 28 Ago, 2023 e 4 Set, 2023
Índices
0
1
2
3
4
5
29. Ago
30. Ago
31. Ago
1. Set
2. Set
3. Set
4. Set
Tempo [UTC]
Copyright da figura 2017 © INPE - Todos direitos reservados
I.C
I.B
I.Z
I.V


SWPC
2023-08-29 00:00:00
Mag + Solar Wind
8 days@5 min
2023-09-06 00:00:00
[Active] ACE+DSCOVR+WSA-Enlil
Bt
Bz GSM (nT)
Bx
By
Phi GSM (deg)
Away + Towards -
Density (1/cm³)
Speed (km/s)
Temperature (°K)
Kp Ap
DSCOVR
ACE
ACE+DSCOVR
error
suspect
density < 1
(date) Aug 29
2023-08-29 00:00:00
Aug 29
Aug 30
Aug 31
Sep 1
Sep 2
Sep 3
Sep 4
Sep 5
Sep 6





The interplanetary medium region in the last week showed a moderate to high level of plasma disturbances due to the possible interaction of CME-like structures identified by the DSCOVR satellite in the interplanetary medium.
The magnitude of the interplanetary magnetic field component remained below 12 nT during the analyzed period.
The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [+12,-12] nT, with the presence of sector boundary crossing on 31/Aug at 16:30 UT.
The component of the bz field showed oscillations remaining on average oscillating around negative values. The lowest recorded value was on 02/Sep at 07:30 UT of ~ -7.47 nT.
The solar wind density showed oscillations with a maximum peak recorded on 03/Aug at 02:30 UT of 26 p/cm³.
The solar wind speed remained on average below 400 km/s until 31/Aug at 15:30 UT. Afterwards, there was an increase due to the interaction of interplanetary structures, whose maximum value recorded was 561 km/s on 02/Aug at 12:30 UT.
The position of the magnetopause was oscillating on average above the equilibrium position. Minimum registered value occurred on 02/Sep at 23:30 UT of 7.7 Re.

4 Radiation Belts (Ligia Da Silva)

4.1 Summary

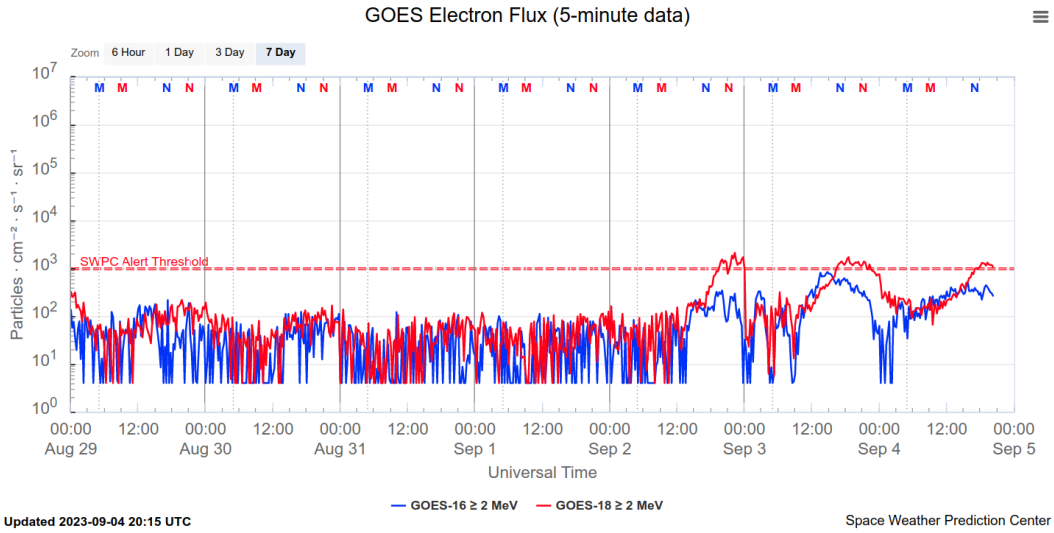
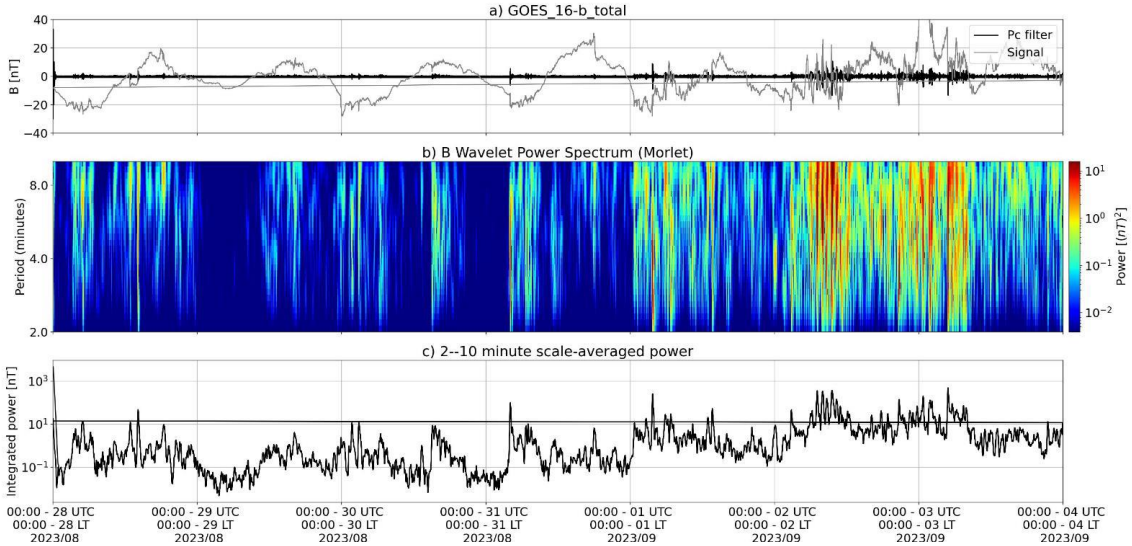


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-16 and GOES-18 satellite. Source: https://www.swpc.noaa.gov/products/goes-electron-flux

The high-energy electron flux (>2 MeV) in the outer boundary of the outer radiation belt obtained from geostationary satellite data GOES-16 and GOES-18 (Figure 1) shows below 103 particles/(cm2 sr) during almost the entire analyzed time. An electron flux increase was observed at the beginning of September 2nd, reaching values just above 103 particles/(cm2 sr) on the analysis's last days.

5 ULF waves (Graziela B. D. Silva)

5.1 Summary



a) Timeseries of the geomagnetic field total component measured by GOES 16, together with the Pc5 fluctuation in black. b) Wavelet power spectrum of the filtered timeseries. c) Average ULF power in the period range from 2 to 10 minutes.

Observations:

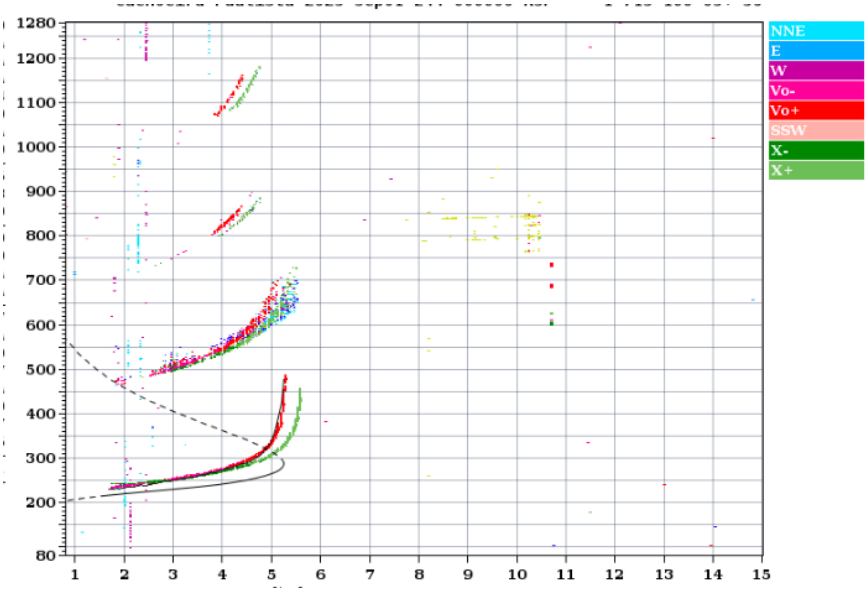
- The GOES 16 satellite in geosynchronous orbit (L~6.6) registered significant activity of Pc5 ULF waves over the week, especially from Sep. 2.

6 Ionosphere - (Laysa resende.)

6.1 Summary

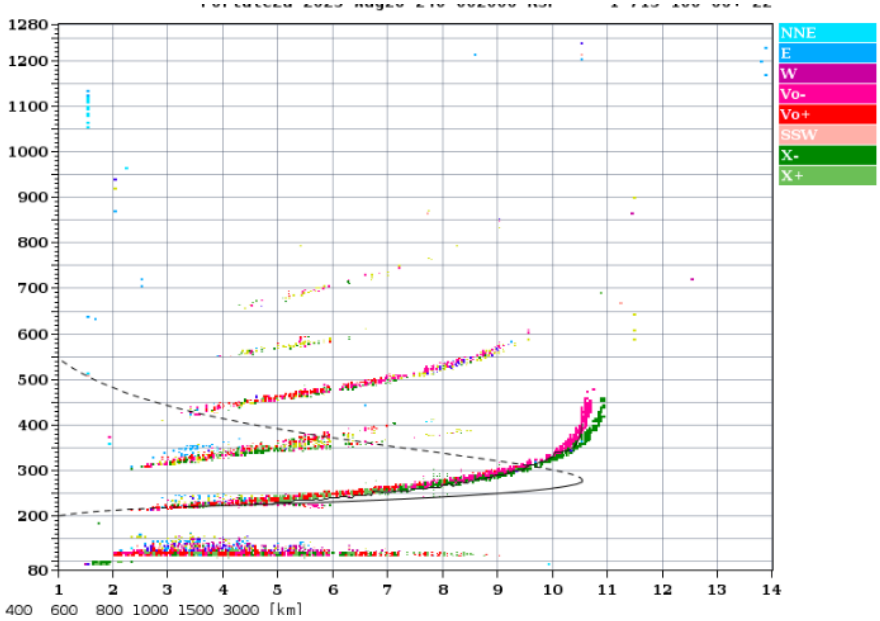
Cachoeira Paulista:

- There were not spread F during this week.
- The Es layers reached scale 2 during this week.



Fortaleza

- There were spread F during this week.
- The Es layers reached scale 4during this week.



7 Ionosphere - Scintillation (Siomel Savio Odriozola.)

7.1 Summary

In this report on the S4 scintillation index, data from SLMA in São Luiz/MA, STNT in Natal/RN, STCB in Cuiabá/MT and SJCE in São José dos Campos/SP are presented. The S4 index tracks the presence of irregularities in the ionosphere having a spatial scale ~ 400 m.
The SJCE station was the only one that did not show scintillation events during the entire week analyzed in this report. The rest of the stations report at least one day with the presence of moderate scintillation, with emphasis on SLMA (with moderate to strong scintillation for most of the week) and STNT with a severe scintillation event between September 3rd and 4th (Figure 1). The regularity of scintillations in SLMA indicate the possible start of the 2023-2024 bubble season.

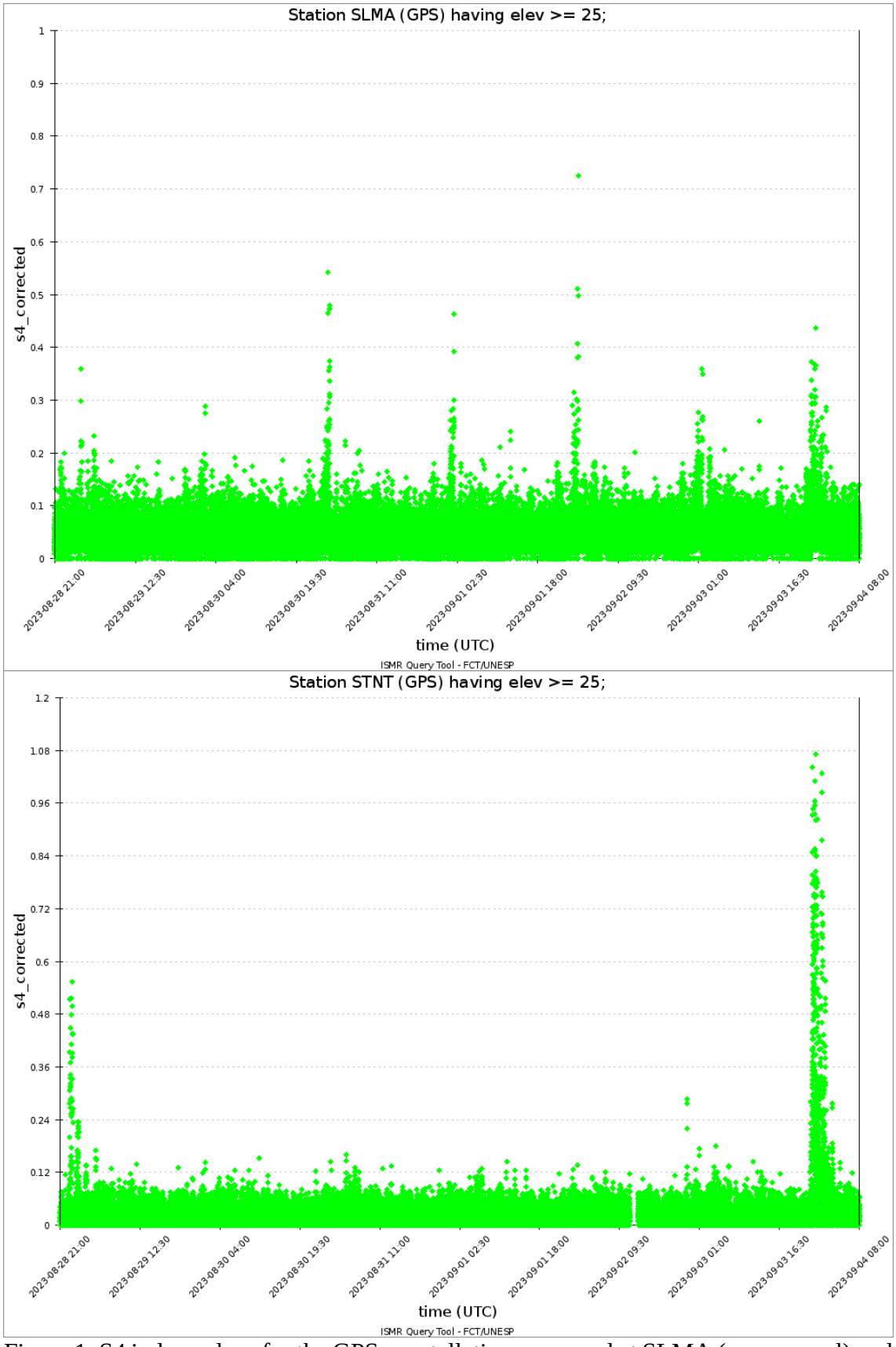


Figure 1: S4 index values for the GPS constellation measured at SLMA (upper panel) and STNT (lower panel), during the week 09/24—08.

8 Ionosphere - ROTI (Carolina de Sousa do Carmo)

8.1 Summary

In the week 2277 (August 27 to September 02, 2023) there were no ionospheric irregularities (plasma bubble), with the exception of the August 30 CUIB. Figure 1 shows the ROTI time series for four stations in the Brazilian sector (Natal (RNNA), Bacabal (MABB), Cuiabá (CUIB) and São José dos Campos (SJSP)).

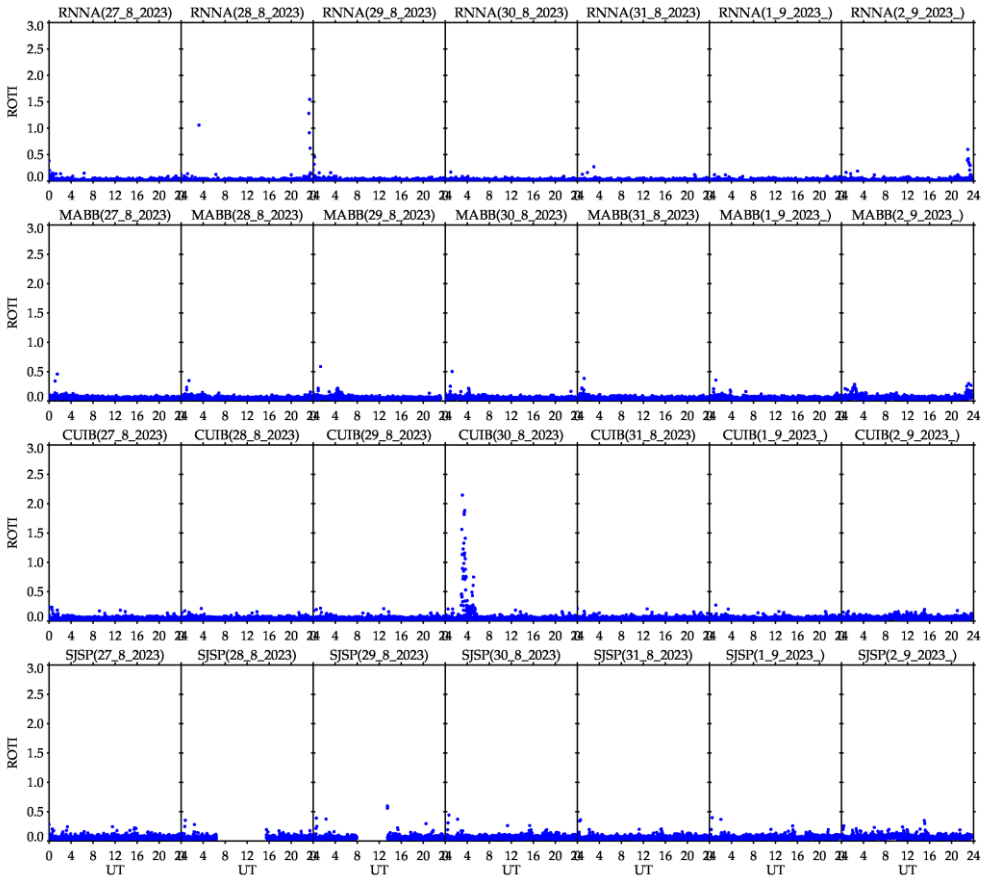


Figure 1 – ROTI time series for four stations in the Brazilian sector (Natal (RNNA), Bacabal (MABB), Cuiabá (CUIB) and São José dos Campos (SJSP)), from August 27 to September 02, 2023.