Sol – Cecatto
Período: 23 – 30 de Outubro 2023

Summary

10/23 – No M/X flare; No fast wind stream; 11 CME can have component toward the Earth *;
10/24 – No M/X flare; No fast wind stream; 5 CME can have component toward the Earth;
10/25 – No M/X flare; No fast wind stream; 1 CME can have component toward the Earth;
10/26 – Flare M1.4; ; Fast (=< 550 km/s) wind stream; 3 CME can have component toward the Earth *,*;
10/27 – No M/X flare; Fast (=< 500 km/s) wind stream; 3 CME can have component toward the Earth;
10/28 – No M/X flare; Fast (=< 550 km/s) wind stream; 2 CME can have component toward the Earth *;
10/29 – No M/X flare; Fast (=< 650 km/s) wind stream; 1 CME can have component toward the Earth;
10/30 – No M/X flare; Fast (=< 600 km/s) wind stream; 1 CME can have component toward the Earth;
Prev.: Fast wind stream for today and next 1-2 days; for while low (15% M, 01% X) probability of M / X flares next 2 days; also, occasionally some other CME can present a component toward the Earth.

Resumo

23/10 – Sem "flare" M/X; Sem corrente de vento rápido; 11 CME podem ter uma componente para a Terra *;
24/10 – Sem "flare" M/X; Sem corrente de vento rápido; 5 CME podem ter uma componente para a Terra;
25/10 – Sem "flare" M/X; Sem corrente de vento rápido); 1 CME podem ter uma componente para a Terra;
26/10 – "Flare" M1.4; Vento rápido (< 550 km/s); 3 CME podem ter uma componente para a Terra *,*;
27/10 – Sem "flare" M/X; Vento rápido (< 500 km/s); 3 CME podem ter uma componente para a Terra;
28/10 – Sem "flare" M/X; Vento rápido (< 550 km/s); 2 CME podem ter uma componente para a Terra *;
29/10 – Sem "flare" M/X; Vento rápido (< 650 km/s); 1 CME podem ter uma componente para a Terra;
30/10 – Sem "flare" M/X; Vento rápido (< 600 km/s); 1 CME podem ter uma componente para a Terra;
Prev.: Vento rápido para hoje e próximos 1-2 dias; baixa probabilidade de "flares" (15% M, 01% X) nos próximos 02 dias; eventualmente alguma outra CME pode apresentar componente dirigida para a Terra.

Geomagnetic Field / Campo Geomagnético

Summary

In the week of 24-30/10, the Embrace magnetometer network data recorded instabilities throughout the week, with emphasis on:

- 26, 28 and 29/10: The magnetometers of the Embrace network recorded a drop of H-component at VSS, of -80, -40 e -50 nT,
- AE index was active, above 1000 nT on the 26th. The minimum Dst index was -49 nT. The highest Kp of the week was 5o.

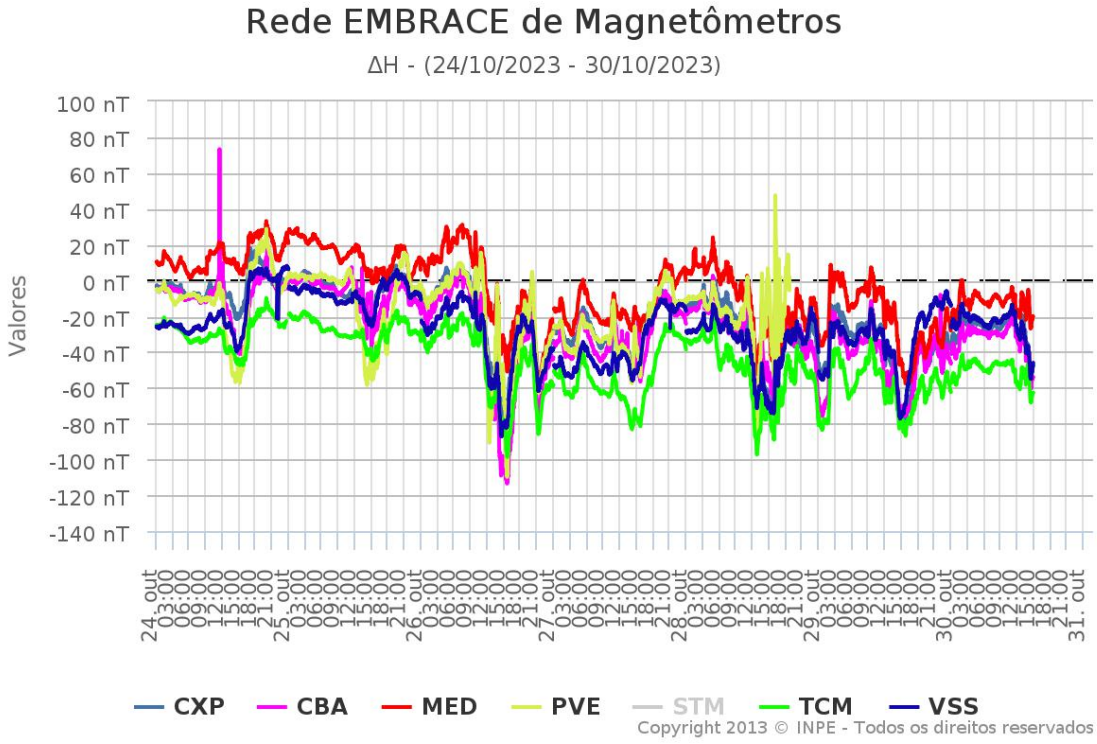


Figure 1.: Daily variation of the geomagnetic field from H (nT) measured at Embrace MagNet from 24 to 30 October 2023

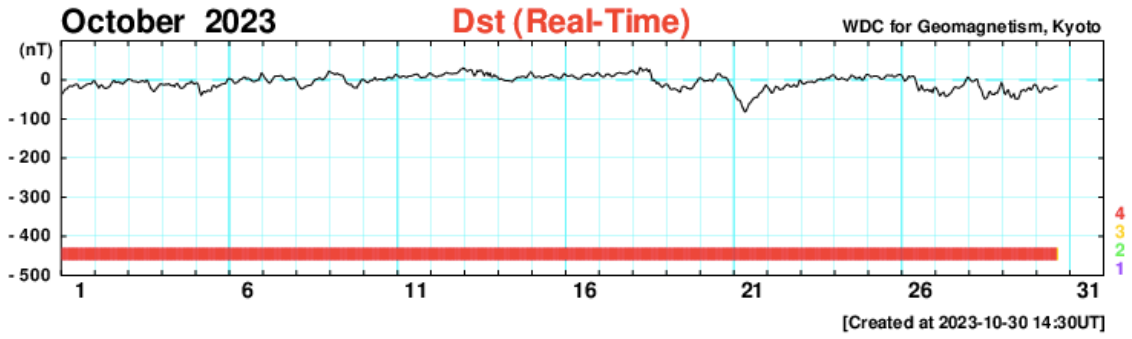
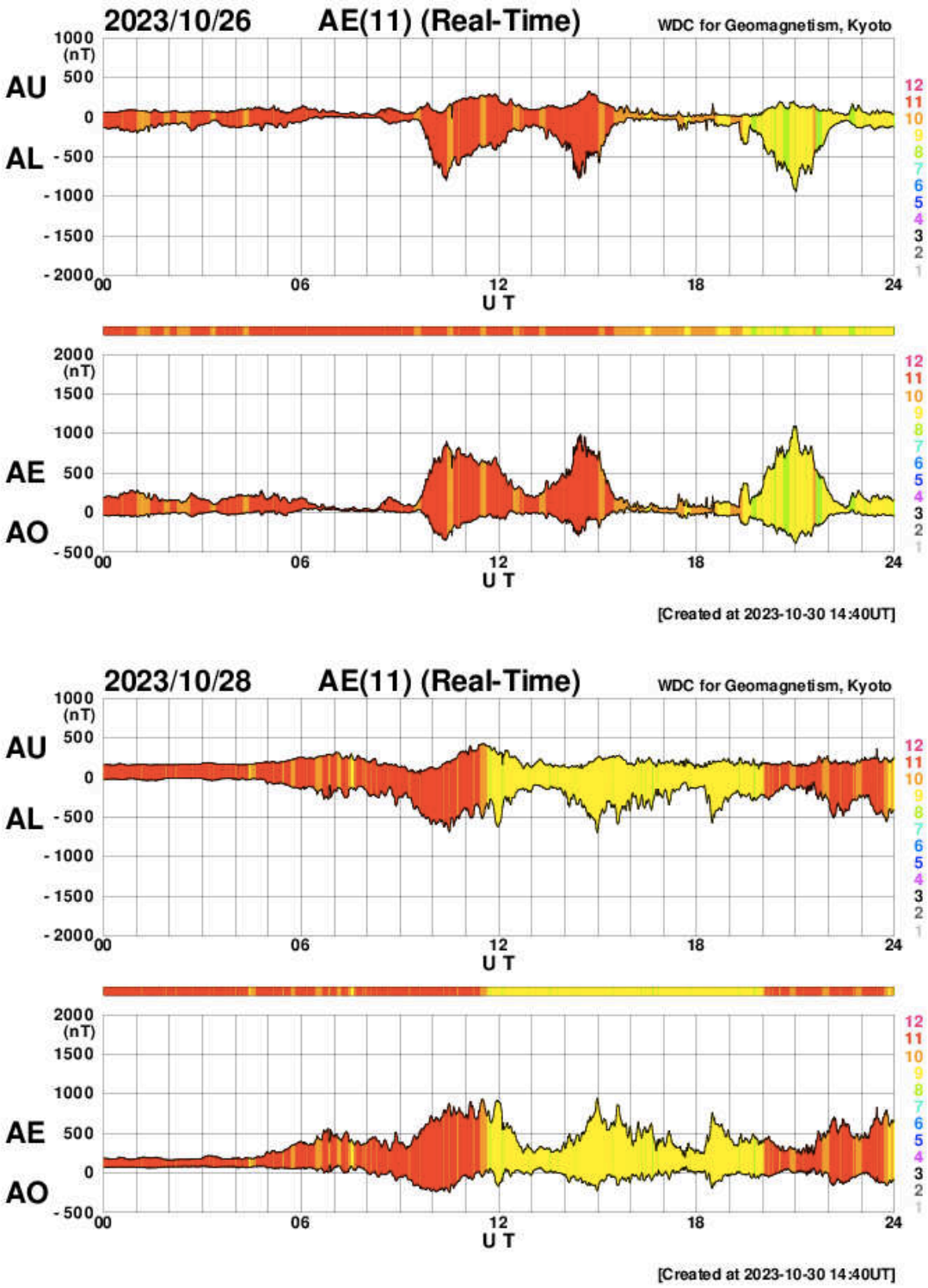


Figure 2: Dst index for October 2023



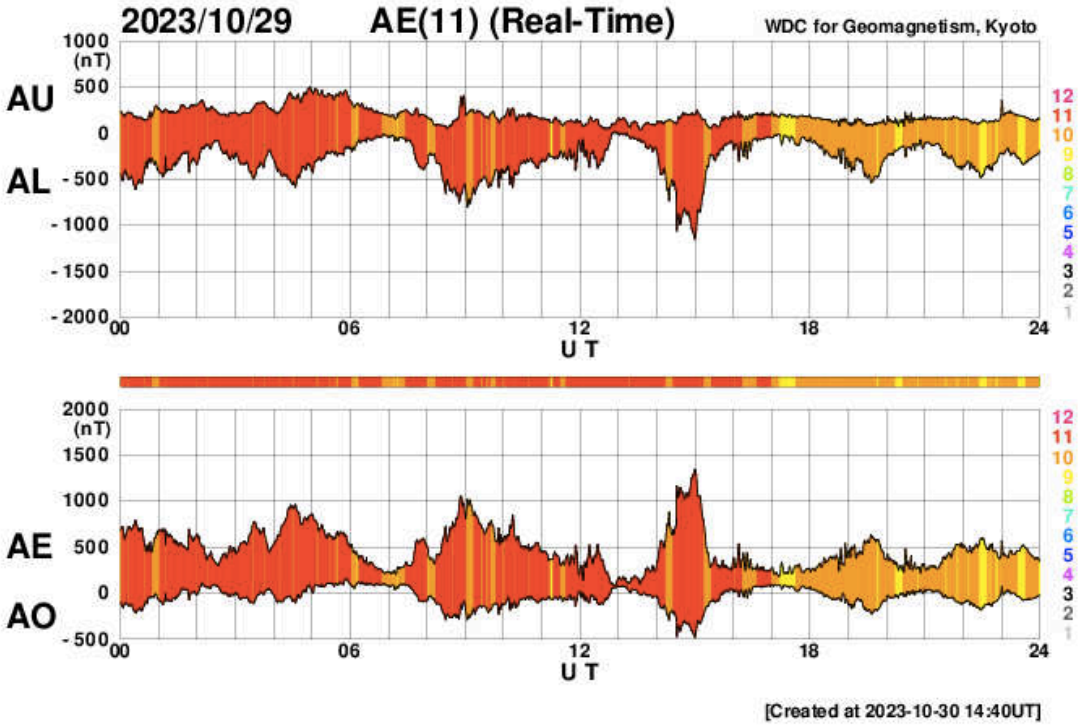


Figure 3.: AE index for the most disturbed days in the current week.

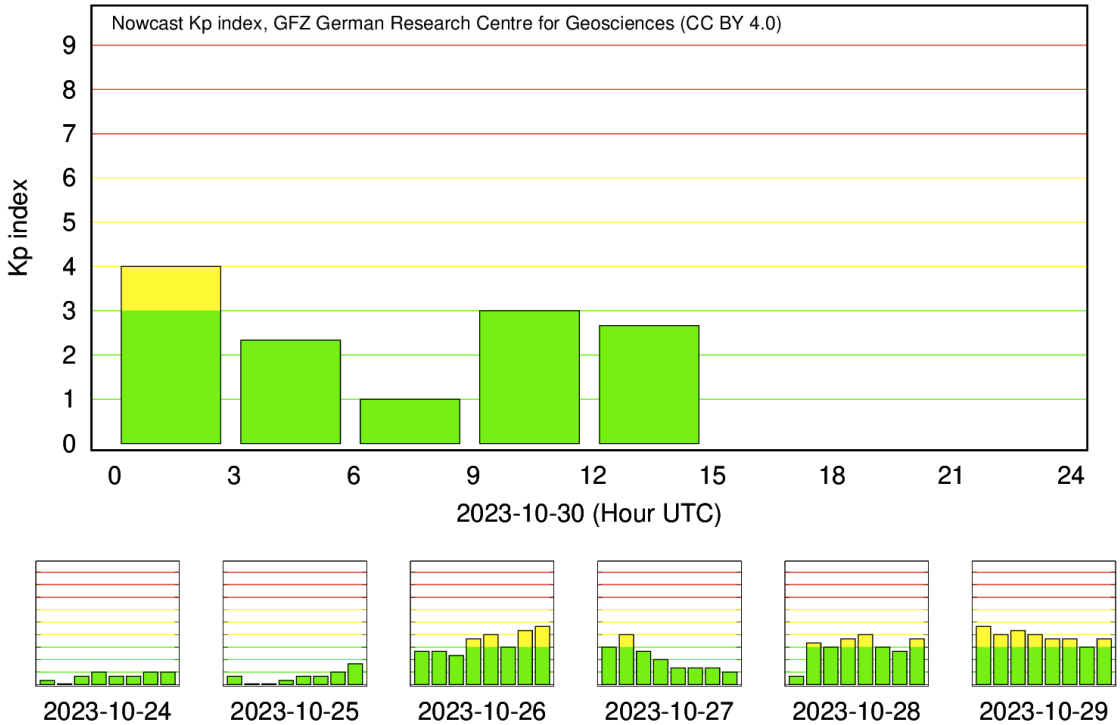


Figure 4: Kp index for the current week (24-30 October 2023)

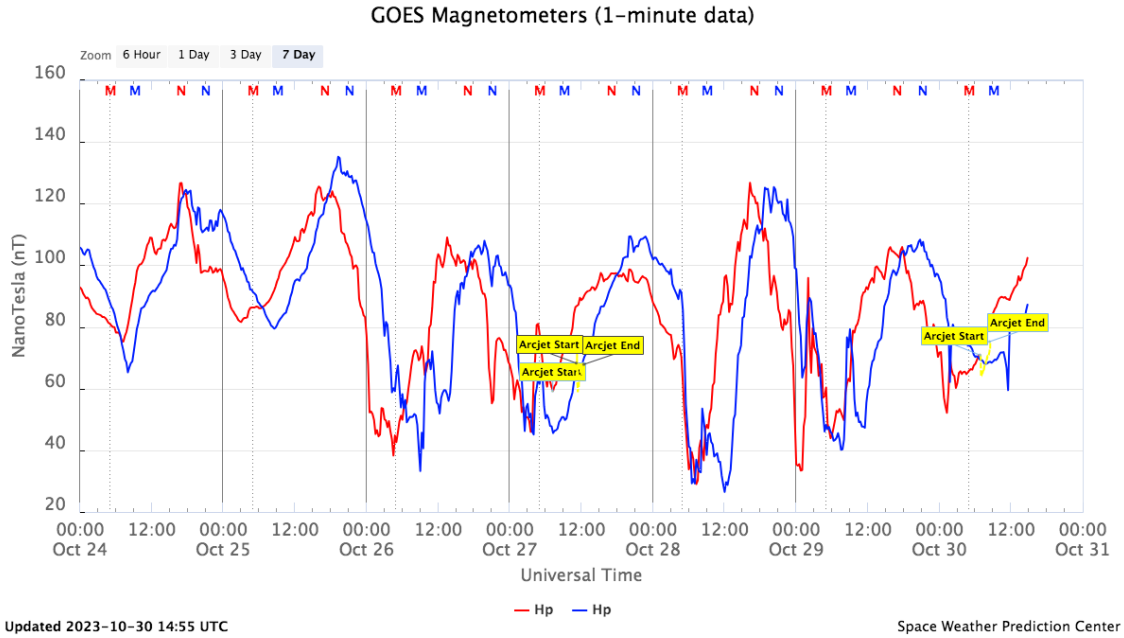


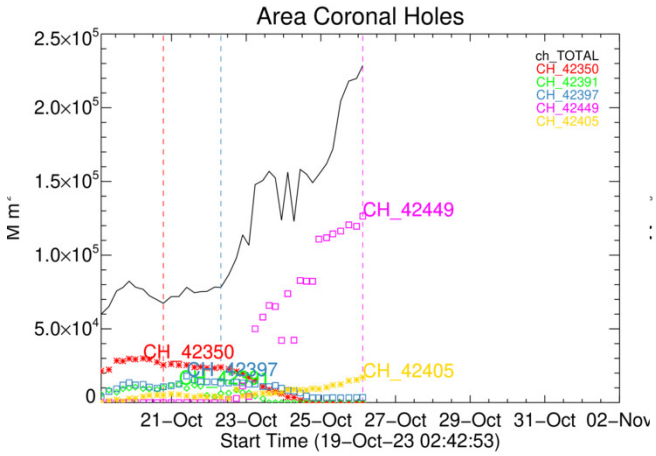
Figure 5.: Magnetic field horizontal component at the GOES satellite orbit through 24 to 30 October 2023

Solar - WSA-ENLIL

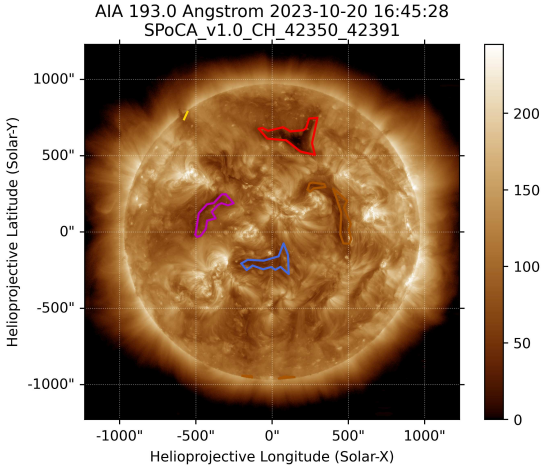
EMC (https://ccmc.gsfc.nasa.gov/donki/):

No Coronal Mass Ejection directed towards Earth.

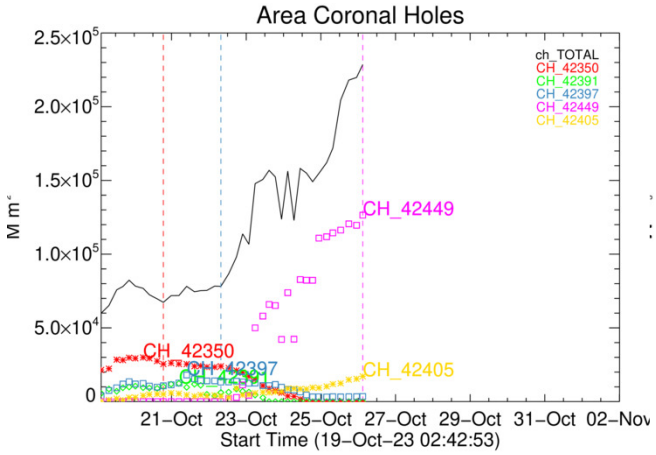
Solar - Coronal holes Spatial Possibilistic Clustering Algorithm (SPoCAS):



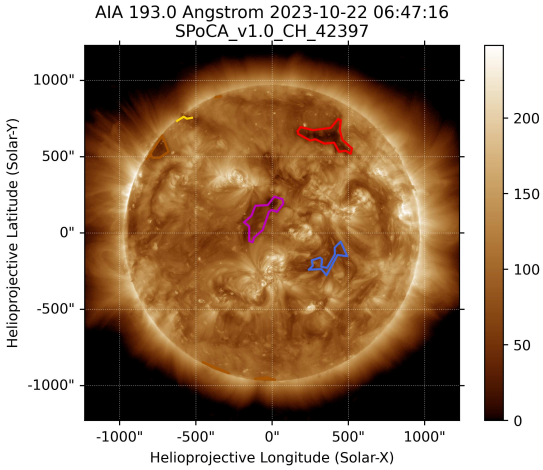
(a) The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between October 19 and 26, 2023.



(b) Above the 193 Å image of the Sun are highlighted coronal holes observed by SPOCA around 16:45 UT on October 20, 2023 (red dot line).

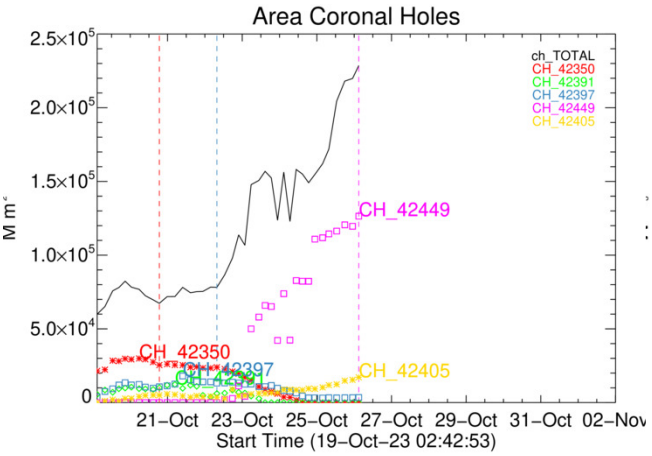


(a) The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between October 19 and 26, 2023.

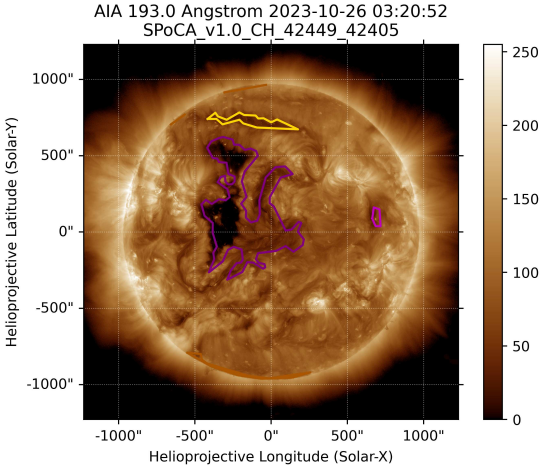


(b) Above the 193 Å image of the Sun are highlighted coronal holes observed by SPOCA around 06:47 UT on October 22, 2023 (blue dot line).

Solar - Coronal holes Spatial Possibilistic Clustering Algorithm (SPoCAS):



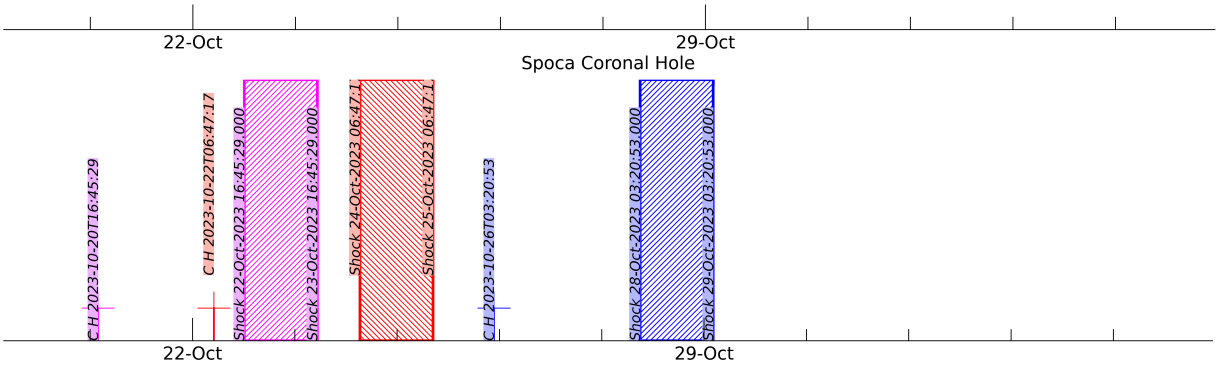
(a) The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between October 19 and 26, 2023.



(b) Above the 193 Å image of the Sun are highlighted coronal holes observed by SPOCA around 03:20 UT on October 26, 2023 (magenta dot line).

Solar - WSA - ENLIL and SPoCA

WSA - enlil



Meio interplanetário – IM – Paulo Ricardo Jauer 23/10 to 30/10 2023

Summary

Summary of IM conditions for the last week. The interplanetary medium region in the last week showed a moderate to high level of plasma disturbances due to the possible interaction of complex HSS-CME-like structures identified by the DSCOVR satellite in the interplanetary medium.

> The magnitude of the interplanetary magnetic field component showed a significant peak on October 26th at 09:30 UT and at 09:30 UT of 12.3 nT during the analyzed period.

> The BxBy components showed variations in the analyzed period, keeping both oscillating within the range BxBy[(Min,Max); (Min,Max)] [(-86 ; 5.66);(-4.10; 9.59)] nT, with the presence of a Sector Boundary Crossing on 25/Oct at 15:30 UT.

> The bz field component presented a maximum negative peak on October 26th at 09:30 UT of – 10.16 nT. The bz component on average remained with negative values during the analyzed period.

> The density of the solar wind showed fluctuations with a maximum peak recorded on 26/Oct at 5:30 am of 17.4 p/cm³. During the remainder of the period, the density fluctuated on average below 10 p/cm³.

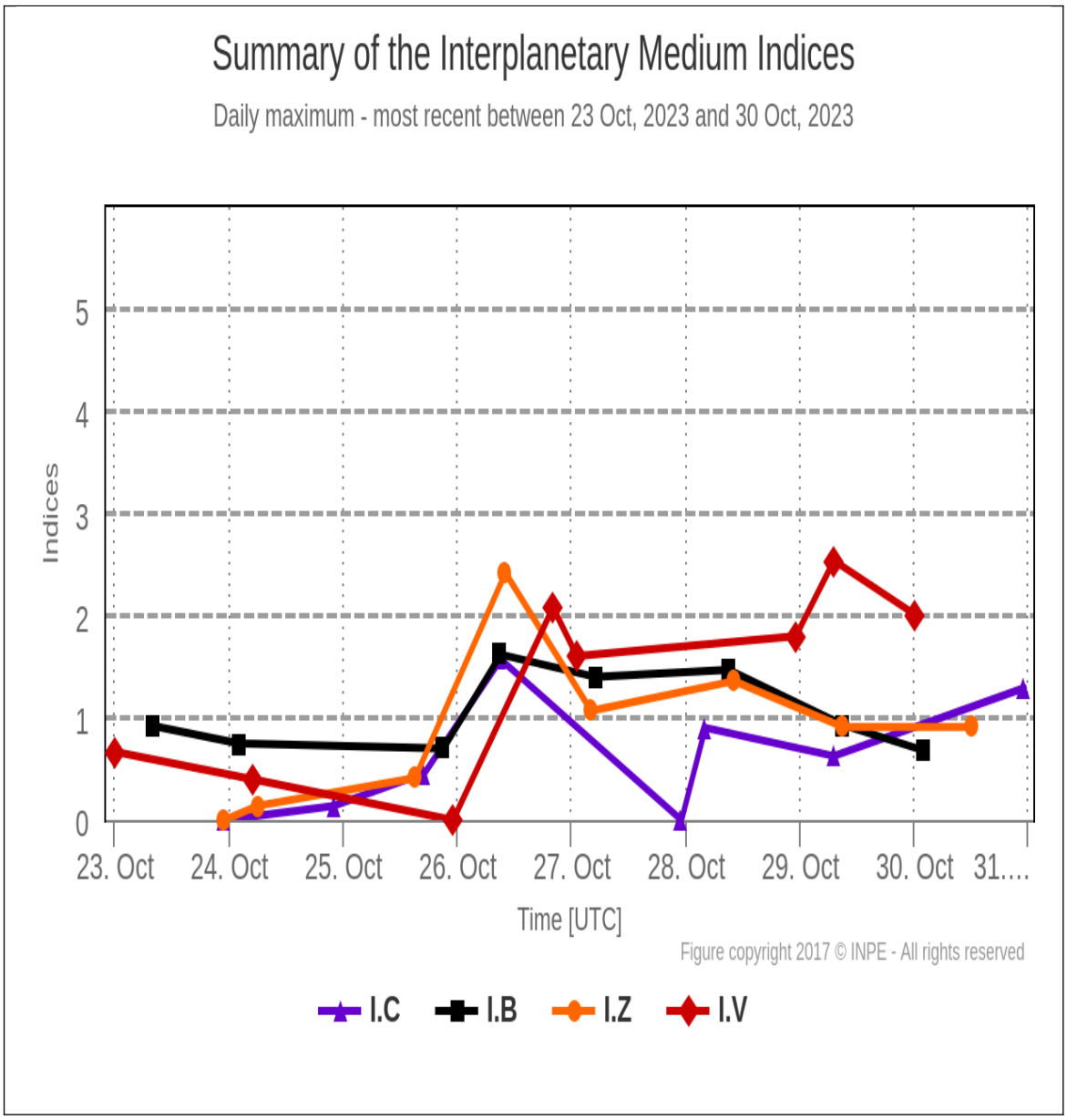
> The average speed of the solar wind remained on average below 400 km/s. The speed had a maximum value on 29/Oct at 07:30 UT of 630 km/s and a minimum value on 25/Oct at 11:30 UT of 305 km/s. Discontinuities in the velocity component were found due to interactions of interplanetary structures.

> The position of the magnetopause fluctuated on average above the equilibrium positions. He presented compressions whose minimum value recorded was on October 26th at 9:30 am of 8.5 Re.

Figure 1 - illustrates a set of parameters observed in the solar wind by the DSCOVR satellite. The measured solar wind parameters can be identified in the following order starting in column 1: Interplanetary magnetic field modulus (IMF), the Bx and By components, Bz component, convection electric field Ey, solar wind density, speed, temperature and the last graph represents the position of the subsolar magnetopause. Note that some profile are repeated in column 2.

Figure 1 – illustrates a set of parameters observed in the solar wind by the DSCOVR satellite.

Figure 3- illustrates a set of parameters/indices that represents the response to the interplanetary medium conditions and the global magnetosphere. The parameters are the compression of the magnetopause (I.C), the modulus of the interplanetary magnetic field (I.B), the Variation of the Bz component of the IMF (I.Z) and finally an index that responds to variations in the speed of the Solar wind (I.V).



EARTH'S RADIATION BELT

Responsible: Ligia Da Silva

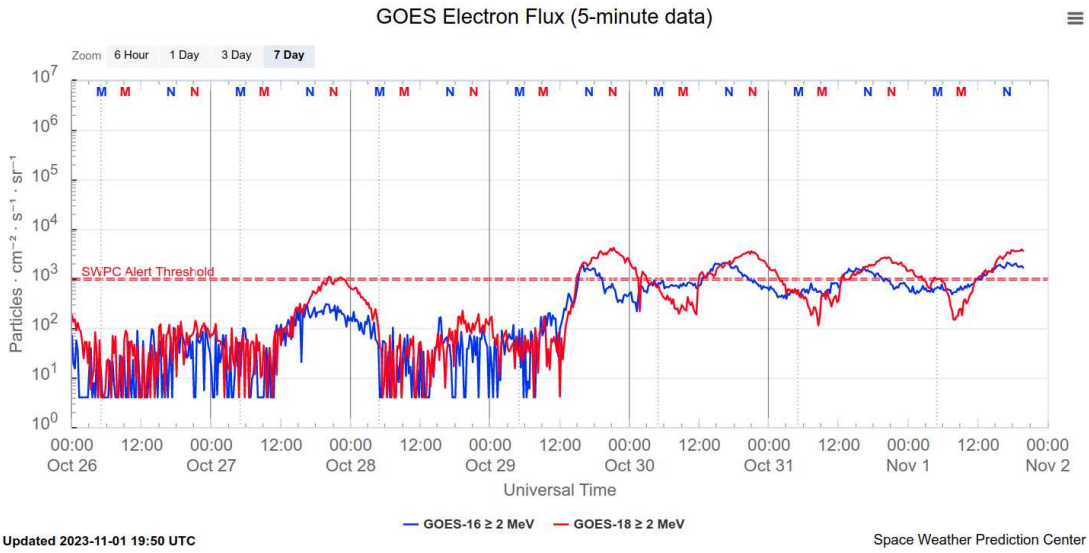


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-16 and GOES-18 satellite. Source: https://www.swpc.noaa.gov/products/goes-electron-flux

Summary

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) is below 10^3 particles/(cm^2 s sr) until mid- October 29th. The electron flux increases by more than an order of magnitude from 15:00 UT on October 29th, persisting at around 10^3 particles/(cm^2 s sr) until November 1st. The variabilities in electron flow occurred during influences of solar wind structures.

Ionosfera – Digissonda (Laysa Resende)

Summary

We observed the F spread-F in Fortaleza and Cachoeira Paulista every day during this week (Figures 1 and 2). The Es layers reached a maximum of scale 2 in Cachoeira Paulista and a maximum of scale 4 in Fortaleza.

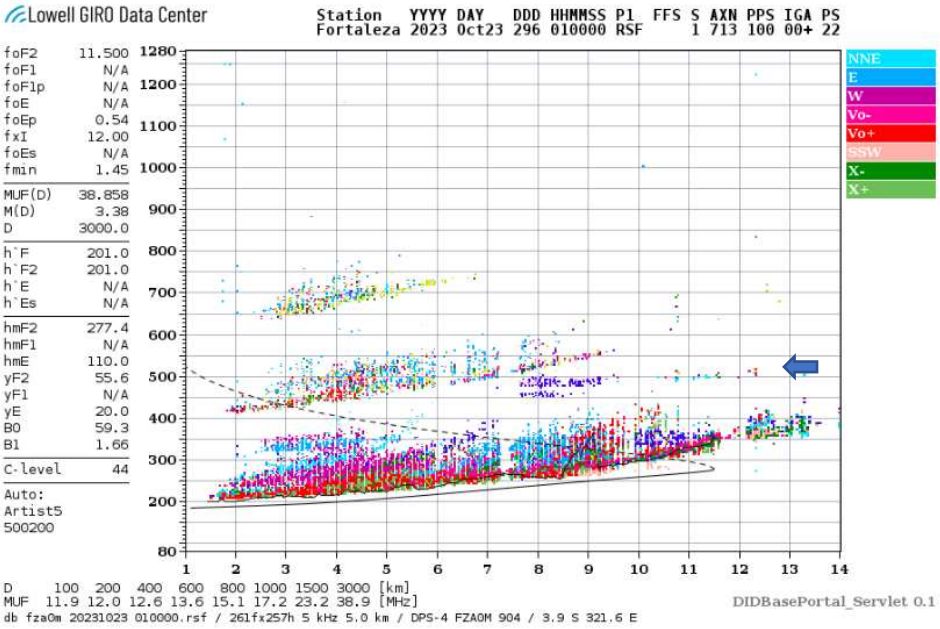


Figure 1 – Ionogram over Fortaleza, showing the spread F occurrence on October 17, 2023.

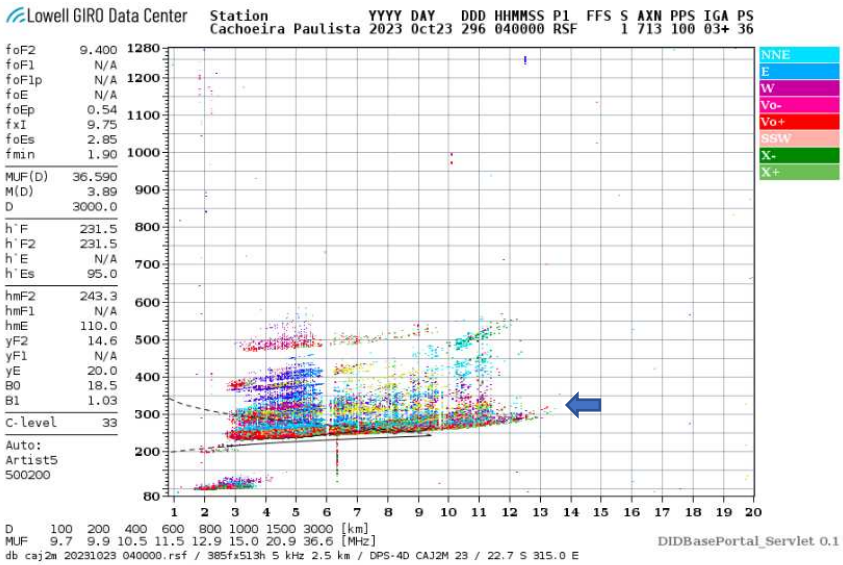


Figure 2 – Ionogram over Cachoeira Paulista, showing the spread F occurrence on October 23, 2023.

Ionosphere - ROTI
Summary for Week 2285 (October 22 to 28, 2023)

Carolina de Sousa do Carmo

In the week 2285 (October 22 to 28, 2023) there were ionospheric irregularities (plasma bubbles) on all nights analyzed. The Figure below shows the ROTI time series for four stations in the Brazilian sector (Natal (RNNA), Bacabal (MABB), Cuiabá (CUIB) and São José dos Campos (SJSP)).

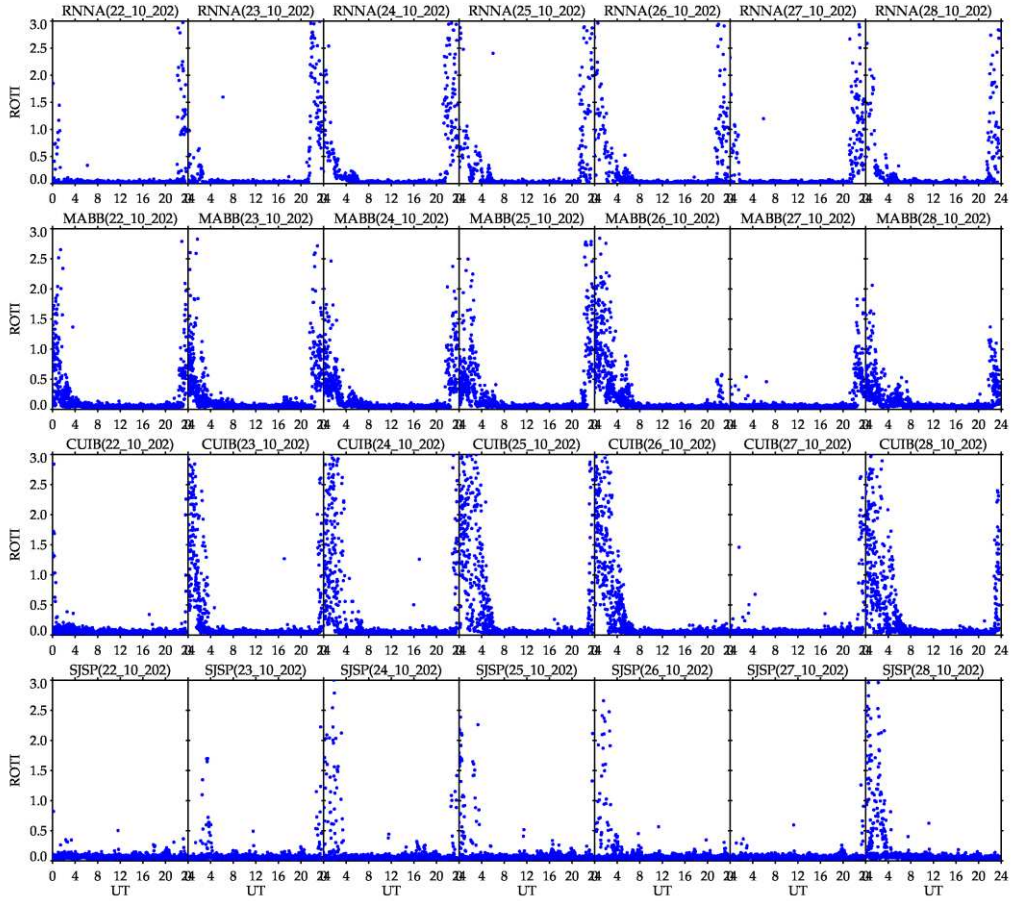


Figure – ROTI time series for four stations in the Brazilian sector (Natal (RNNA), Bacabal (MABB), Cuiabá (CUIB) and São José dos Campos (SJSP)), from October 22 to 28, 2023.