



## SOL (Cecatto)

### Summary

04/15 – M1.7, M1.0, M2.3, M1.2, M1.1, M1.4, M2.2, M4.0 flares; No fast wind stream; 2 CME can have component toward the Earth;

04/16 – M1.1 flare; No fast wind stream; 7 CME can have component toward the Earth \*;

04/17 – M1.6 flare; Fast ( $\leq 500$  km/s) wind stream; 8 CME can have component toward the Earth \*;

04/18 – M2.2, M1.3, M1.6 flares; Fast ( $\leq 450$  km/s) wind stream; 5 CME can have component toward the Earth;

04/19 – M2.1, M1.0 flares; Fast ( $\leq 550$  km/s) wind stream; 8 CME can have component toward the Earth;

04/20 – No M/X flare; Fast ( $\leq 550$  km/s) wind stream; 5 CME can have component toward the Earth \*\*;

04/21 – M1.0, M2.2, M3.4 flares; Fast ( $\leq 500$  km/s) wind stream; 6 CME can have component toward the Earth;

04/22 – M1.0 flare; Fast ( $\leq 500$  km/s) wind stream; 1 CME can have component toward the Earth;

Forecast: Fast wind stream for today and next 1-2 days; for while (70% M, 20% X) probability of M / X flares next 2 days; also, occasionally some other CME can present a component toward the Earth.

### Resumo

15/04 – "Flares" M1.7, M1.0, M2.3, M1.2, M1.1, M1.4, M2.2, M4.0; Sem vento rápido; 2 CMEs podem ter uma componente para a Terra;

16/04 – "Flare" M1.1; Sem vento rápido; 7 CME podem ter uma componente para a Terra \*;

17/04 – "Flare" M1.6; Vento rápido ( $\leq 500$  km/s); 8 CME podem ter uma componente para a Terra \*;

18/04 – "Flares" M2.2, M1.3, M1.6; Vento rápido ( $\leq 450$  km/s); 5 CME podem ter uma componente para a Terra;

19/04 – "Flares" M2.1, M1.0; Vento rápido ( $\leq 550$  km/s); 8 CME podem ter uma componente para a Terra;

20/04 – Sem "flare" M/X; Vento rápido ( $\leq 550$  km/s); 5 CME podem ter uma componente para a Terra \*\*;

21/04 – "Flares" M1.0, M2.2, M3.4; Vento rápido ( $\leq 500$  km/s); 6 CME podem ter uma componente para a Terra;

22/04 – "Flare" M1.0; Vento rápido ( $\leq 500$  km/s); 1 CME podem ter uma componente para a Terra

Prev.: Vento rápido para hoje e próximo(s) 1-2 dia(s); probabilidade de "flares" M/X (70% M, 20% X) nos próximos 02 dias; eventualmente alguma(s) outra(s) CME pode(m) apresentar componente dirigida para a Terra.



## Solar - WSA-ENLIL

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

WSA-ENLIL(CME 2024-04-11 07:00:00 UT )

The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2024-04-14 05:00:00 UT and 2024-04-14 19:00:00 UT.

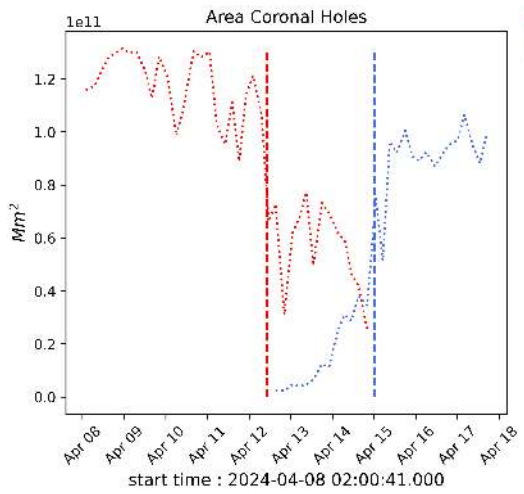
WSA-ENLIL(CMEs 2024-04-14 11:12:00 UT and 2024-04-15 06:48:00 UT )

The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2024-04-16 18:05:00 UT and 2024-04-17 08:05:00 UT.

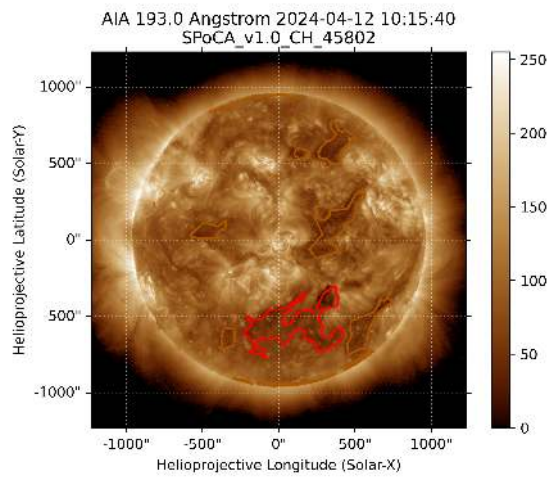
WSA-ENLIL(CMEs: 2024-04-17 21:12:00 UT, 2024-04-18 02:48:00 UT and 2024-04-18 06:48:00 UT )

The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2024-04-21 07:00:00 UT and 2024-04-21 21:00:00 UT.

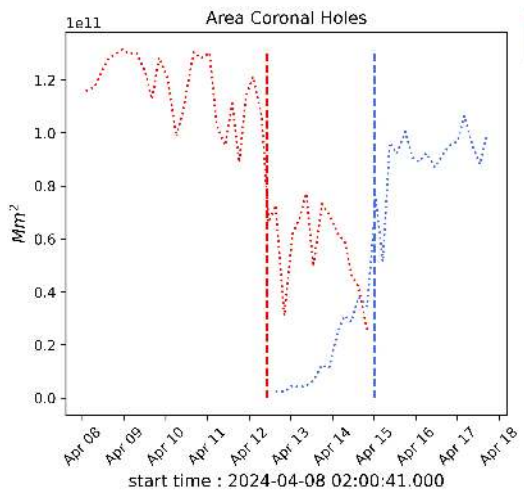
## Solar - Coronal holes Spatial Possibilistic Clustering Algorithm (SPoCAS):



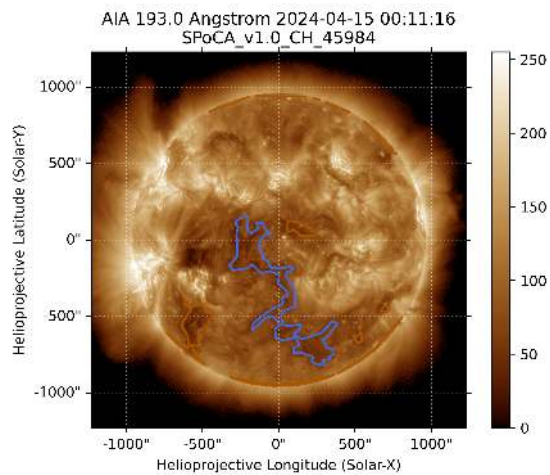
(a) The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between April 08 and 17, 2024.



(b) Above the 193 Å image of the Sun are highlighted coronal holes observed by SPOCA around 10:15 UT on April 12, 2024 (red dot line).

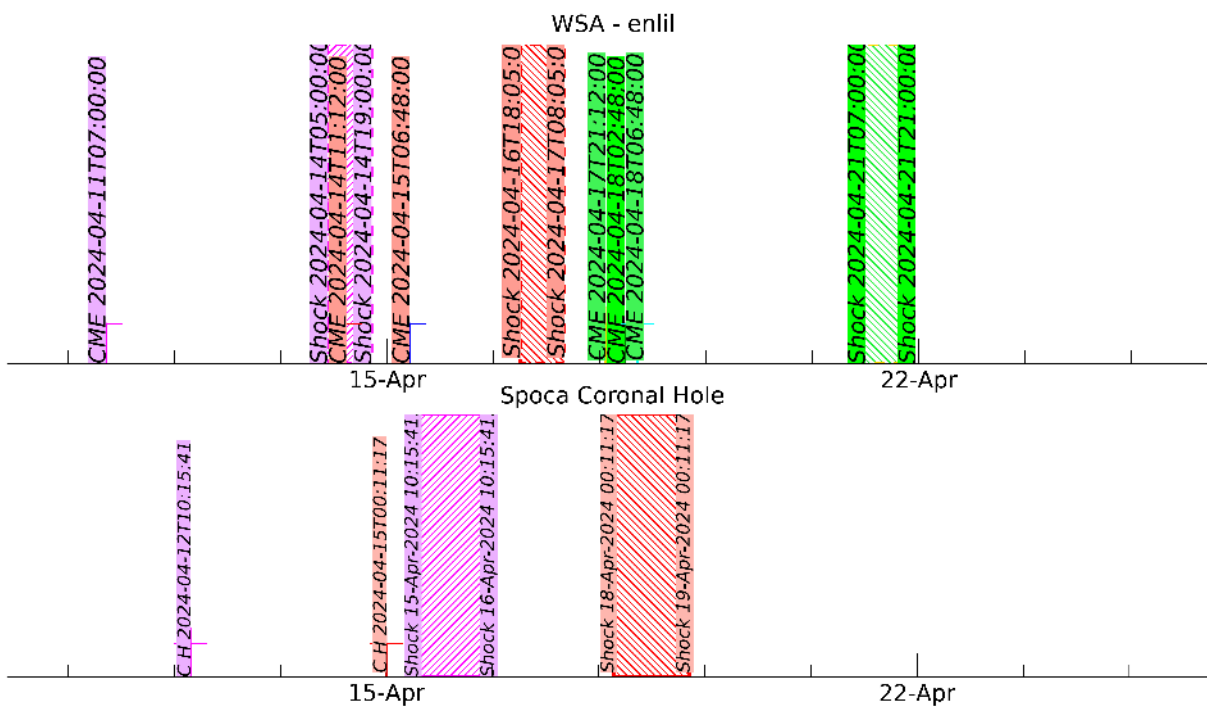


(a) The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between April 08 and 17, 2024.



(b) Above the 193 Å image of the Sun are highlighted coronal holes observed by SPOCA around 00:11 UT on April 15, 2024 (blue dot line).

# Solar - WSA - ENLIL and SPoCA



## EARTH'S RADIATION BELT

Responsible: Ligia Da Silva

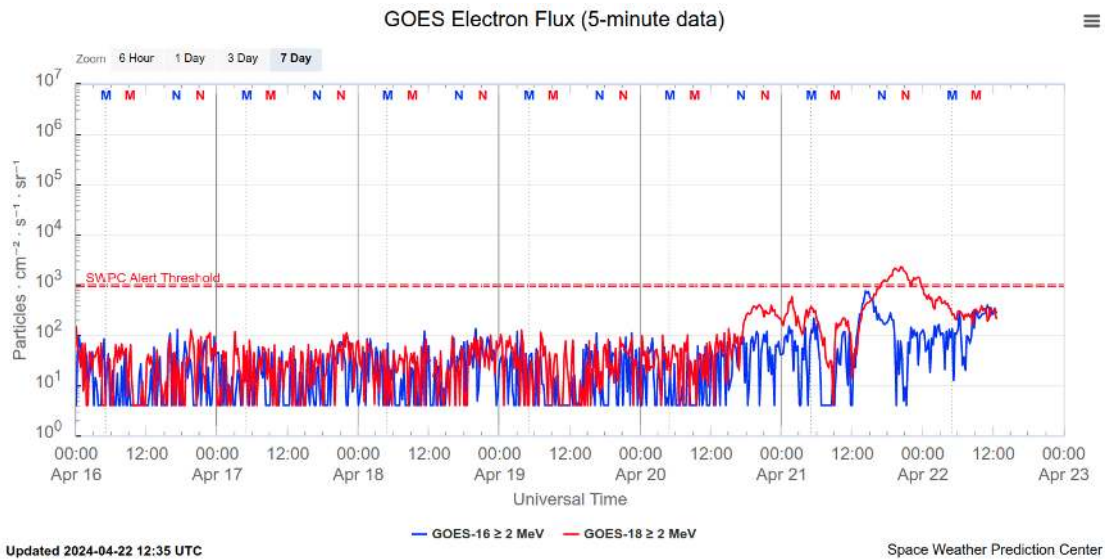


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-16 and GOES-18 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

### Summary

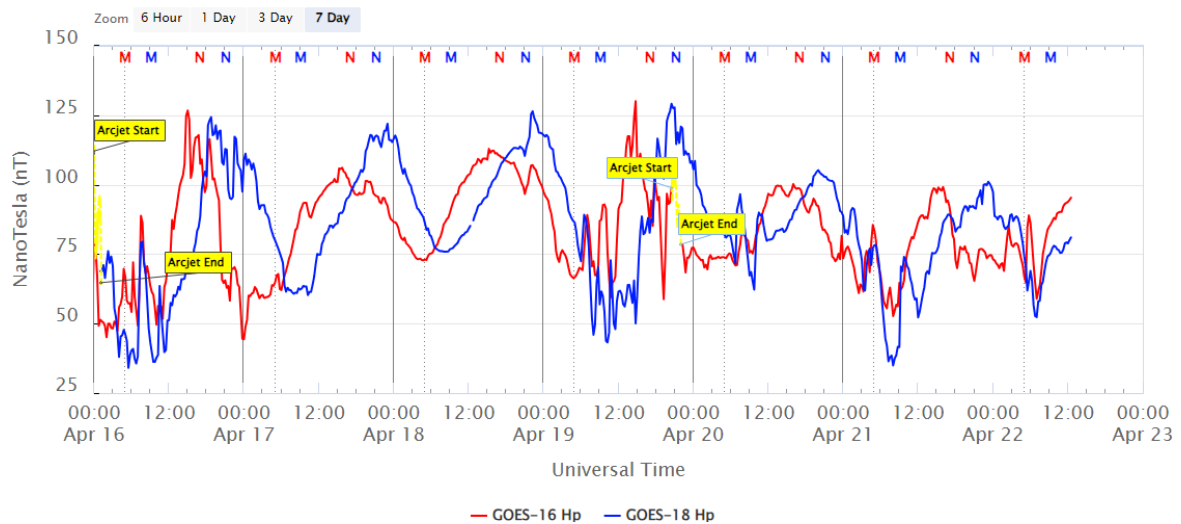
The high-energy electron flux (>2 MeV) in the outer boundary of the outer radiation belt obtained from geostationary satellite data GOES-16 and GOES-18 (Figure 1) is below  $10^2$  particles/(cm<sup>2</sup> s sr) until 17:30 UT on April 20<sup>th</sup>. After that, an electron flux increase was observed, which overtook  $10^3$  particles/(cm<sup>2</sup> s sr) from 17:15 UT on April 21<sup>st</sup>.

## Geomagnetic Field

**Responsible: Karen Sarmiento/ Lívia Alves**

### Summary

During the week of 16/04 to 22/04, prevailing conditions were of active magnetic field, reaching the strong G3 storm level. The GOES magnetometers recorded rapid fluctuations in the amplitude of the north component of the magnetic field on the days 16, 19, and 21/04, with a minimum value reaching about 34 nT on 21/04 on the nighttime side. Aurora activity in both hemispheres reflected an intensification of the Auroral Electrojet currents, with the AE index surpassing 1500 nT on 19/04 (~16-17 UT) and oscillating between 500 nT and 1500 nT for several hours on 16, 19, and 21/04. The Kp index reached conditions of weak magnetic storm (G1) on 16/04 (15-24 UT) and strong magnetic storm (G3) on 19/04 (6-9 UT). The Dst index remained predominantly negative, reaching a minimum value of -122nT on 19/04 (24 UT), indicating an intensification of the ring current coinciding with the negative Bz component of the interplanetary magnetic field, which reached values close to -16nT at 14 UT on 19/04. The Embrace Magnet network magnetometers detected rapid variations in the magnetic field at the end of the day on 16/04 and between 9-21 UT on 19/04, due to the passage of ICMEs that did not have a significant initial impact on the magnetosphere but caused a decrease in the H component of up to -180 nT on 19/04 at the Porto Velho-PVE station during the main phase of the storm.



*Figure 1- Magnetic field horizontal component at the GOES satellite orbit through.*



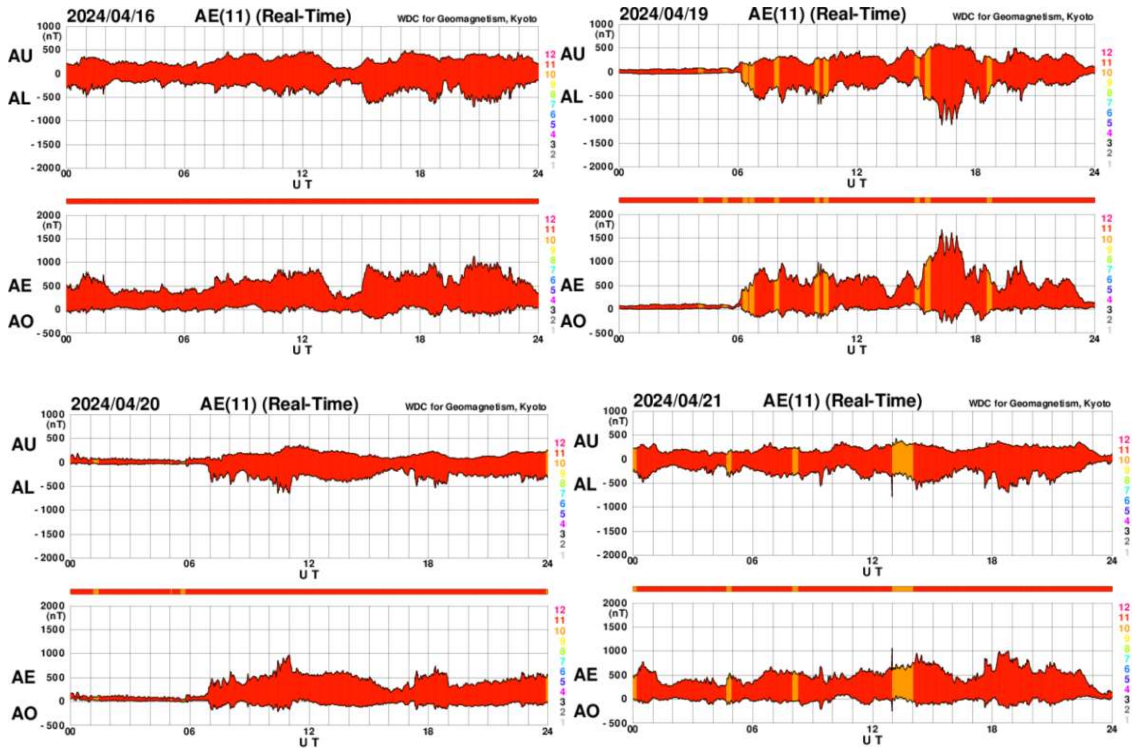


Figura 2- Índice AE para os dias da semana com maior atividade auroral.



Figure 3- Dst Index.

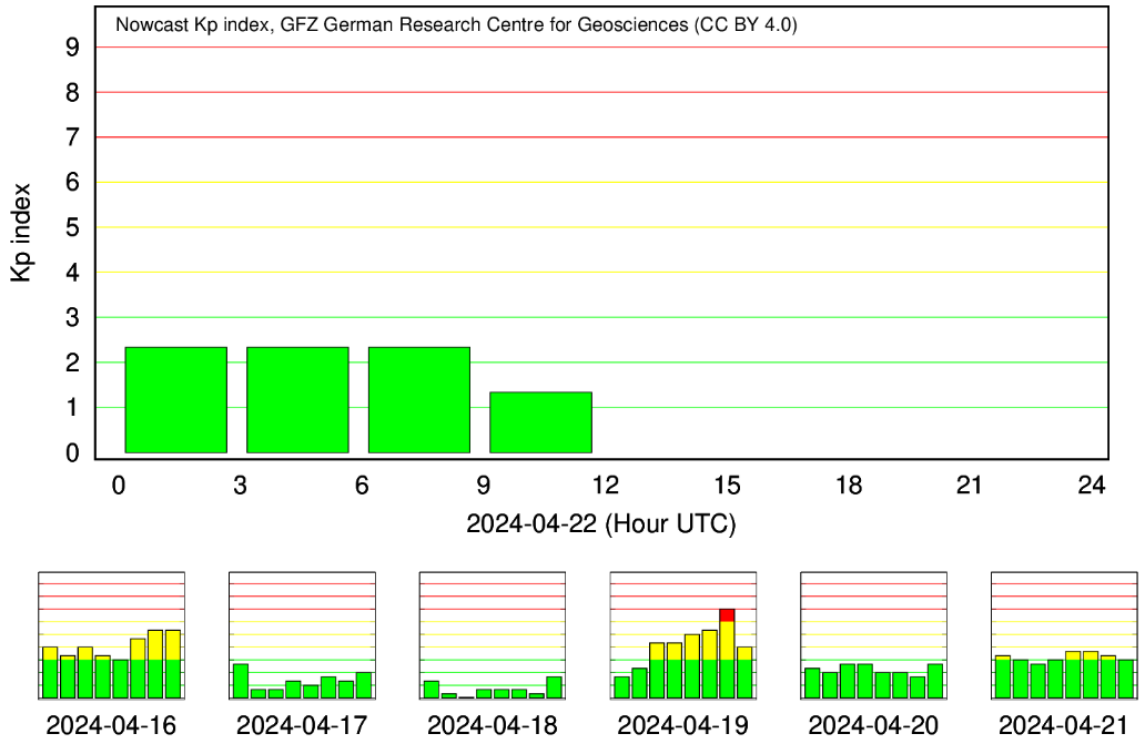


Figure 4- Kp index for the current week in logarithmic scale.

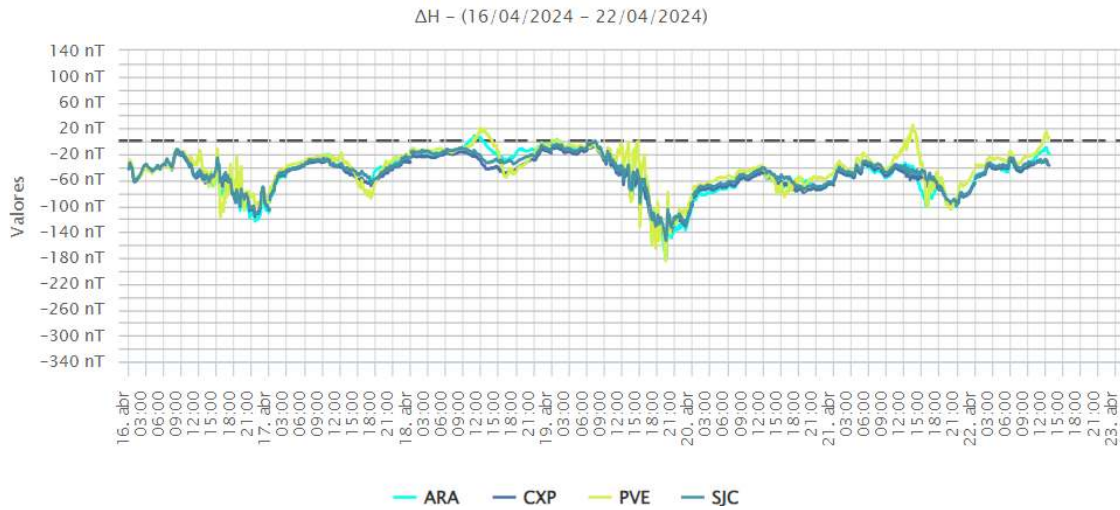


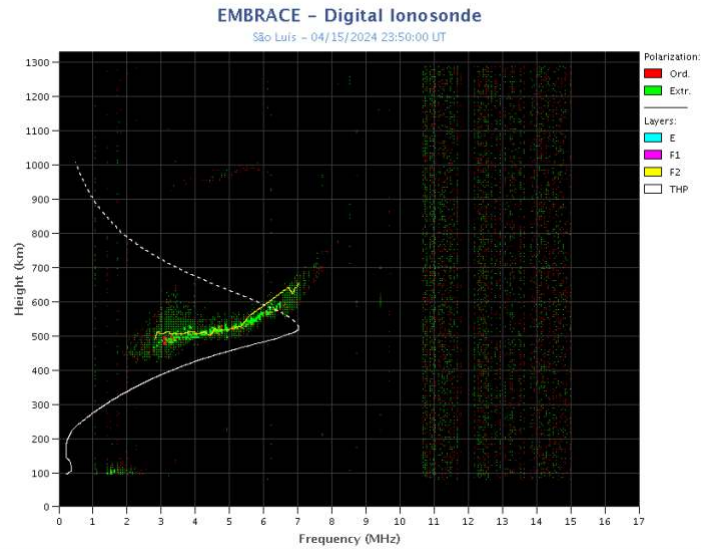
Figure 5- Daily variation of the geomagnetic field from H(nT) measured at Embrace MagNet.



## Ionosfera – Digisonda (Laysa Resende)

### Summary

Spread F was observed in the region closest to the magnetic equator only (São Luís) (Figure 1). In Cachoeira Paulista, it was not observed spread F. The Es layer reached values of scale 3 in São Luís and in Cachoeira Paulista.

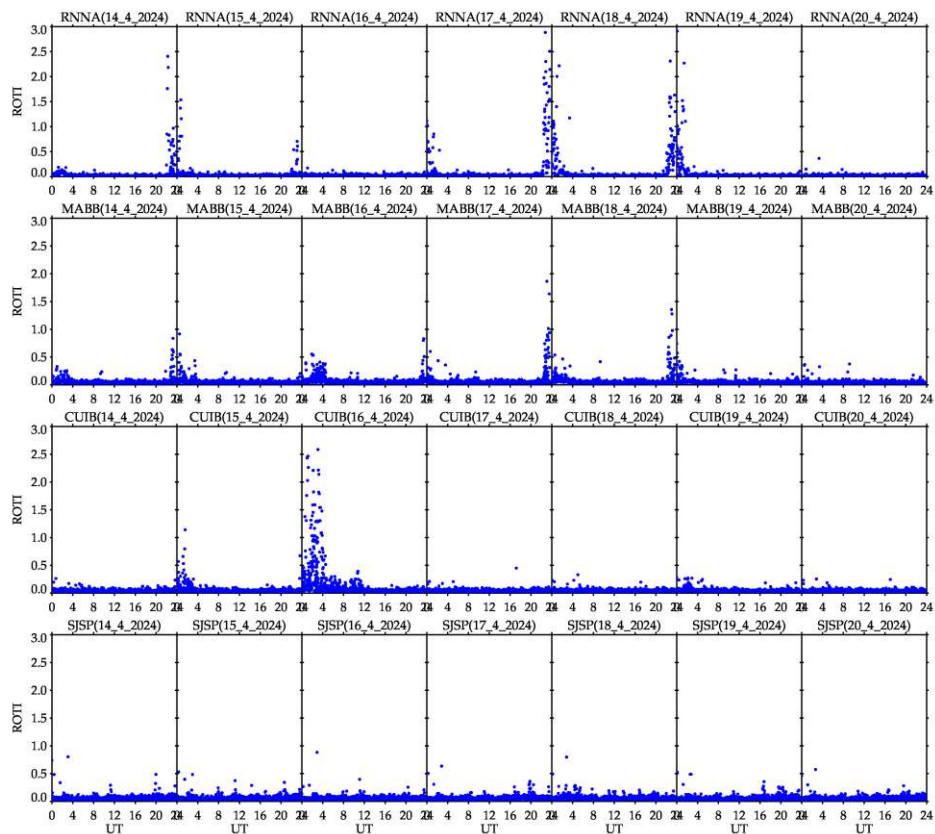


**Figure 1** – Ionogram over São Luís, showing the spread F.

## Ionosphere - ROTI Summary for Week 2310 (April 14 to 20, 2024)

Carolina de Sousa do Carmo

In the week 2310 (April 14 to 20, 2024), ionospheric irregularities (plasma bubbles) were observed on all analyzed nights at RNNA, except for April 19. The irregularities did not reach the other stations on most days. 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 April 14 to 20, 2024.