

## SOL (Cecatto)

### Summary – Week March 18 – March 25

03/18 – M2.7, M1.0, M6.7 flares; No fast wind stream; No CME can have component toward the Earth;

03/19 – M1.4, M2.1 flares; No fast wind stream; 1 CME can have component toward the Earth \*;

03/20 – M7.4, M1.9 flares; No fast wind stream; 11 CME can have component toward the Earth \*;

03/21 – No M/X flare; No fast wind stream; 8 CME can have component toward the Earth;

03/22 – M4.2, M1.1 flares; ; No fast wind stream; 8 CME can have component toward the Earth;

03/23 – X1.1, M1.1, M2.4, M3.1, M1.0, M1.3, M1.1, M1.9, M5.3, M1.5, M3.8, M2.8, M2.4 flares; Fast ( $\leq 500$  km/s) wind stream; 7 CME can have component toward the Earth \*\*;

03/24 – M1.4, M2.1, M2.3, M2.7, M2.2, M1.3, M1.1, M1.0, M1.2 flares; Fast ( $\leq 900$  km/s) wind stream; 5 CME can have component toward the Earth. OBS: At 14:37 UT arrival of the halo CME associated to the X1.1 flare;

03/25 – M4.4 flare; Fast ( $\leq 800$  km/s) wind stream; No CME toward the Earth

Forecast: Fast wind stream for today and next 1-2 days; for while, (85% M, 25% X) probability of M / X flares next 2 days; also, occasionally some other CME can present a component toward the Earth.

### Resumo – Semana de 18 a 25 de Março

18/03 – "Flares" M2.7, M1.0, M6.7; Sem vento rápido; Sem CME podem ter uma componente para a Terra;

19/03 – "Flares" M1.4, M2.1; Sem vento rápido; 1 CME podem ter uma componente para a Terra \*;

20/03 – "Flares" M7.4, M1.9; Sem vento rápido; 11 CME podem ter uma componente para a Terra \*;

21/03 – Sem "flare" M/X; Sem vento rápido; 8 CME podem ter uma componente para a Terra;

22/03 – "Flares" M4.2, M1.1; Sem vento rápido; 8 CME podem ter uma componente para a Terra;

23/03 – "Flares" X1.1, M1.1, M2.4, M3.1, M1.0, M1.3, M1.1, M1.9, M5.3, M1.5, M3.8, M2.8, M2.4; Vento rápido ( $< 500$  km/s); 7 CME podem ter uma componente para a Terra \*\*;

24/03 – "Flares" M1.4, M2.1, M2.3, M2.7, M2.2, M1.3, M1.1, M1.0, M1.2; Vento rápido ( $< 900$  km/s); 5 CME podem ter uma componente para a Terra. OBS: Às 14:37 UT chegada da CME em halo associada ao "flare" X1.1;

25/03 – "Flare" M4.4; Vento rápido ( $< 800$  km/s); Sem CME dirigida para a Terra

Prev.: Vento rápido para hoje e próximo(s) 1-2 dia(s); probabilidade de “flares” M/X (85% M, 25% X) nos próximos 02 dias; eventualmente alguma(s) outra(s) CME pode(m) apresentar componente dirigida para a Terra.



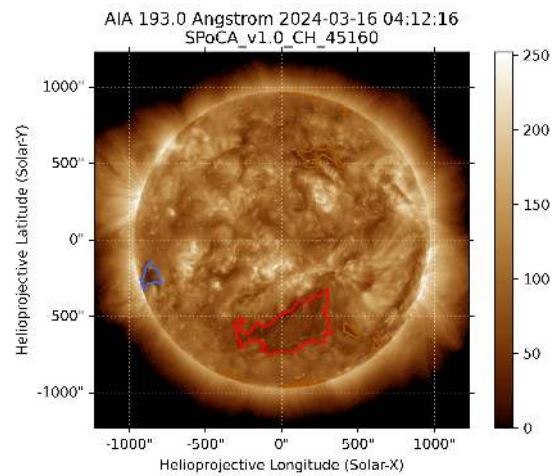
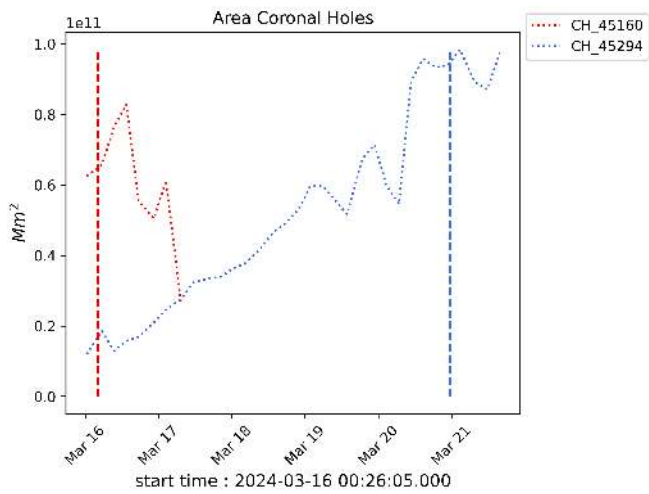
## Solar - WSA-ENLIL

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

WSA-ENLIL(CME 2024-03-17 03:12:00 UT and 2024-03-17 03:36:00 UT)

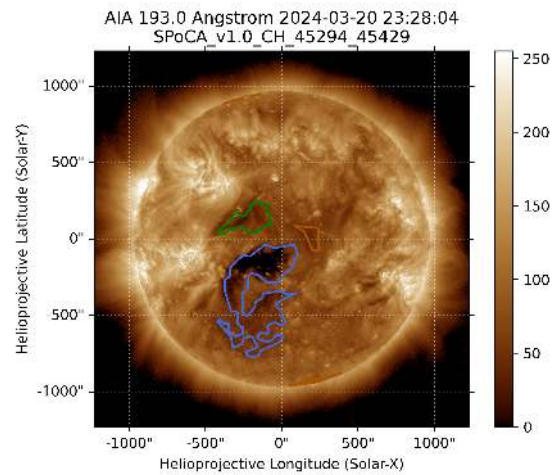
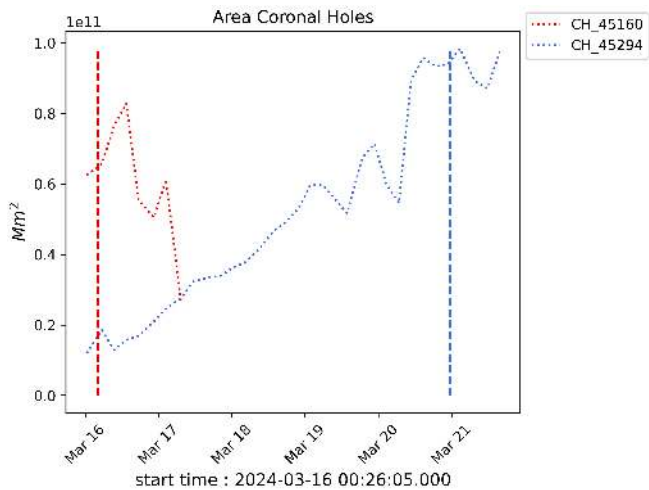
The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2024-03-20 21:00:00 UT and 2024-03-21 11:00:00 UT.

## 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 March 16 and 21, 2024.

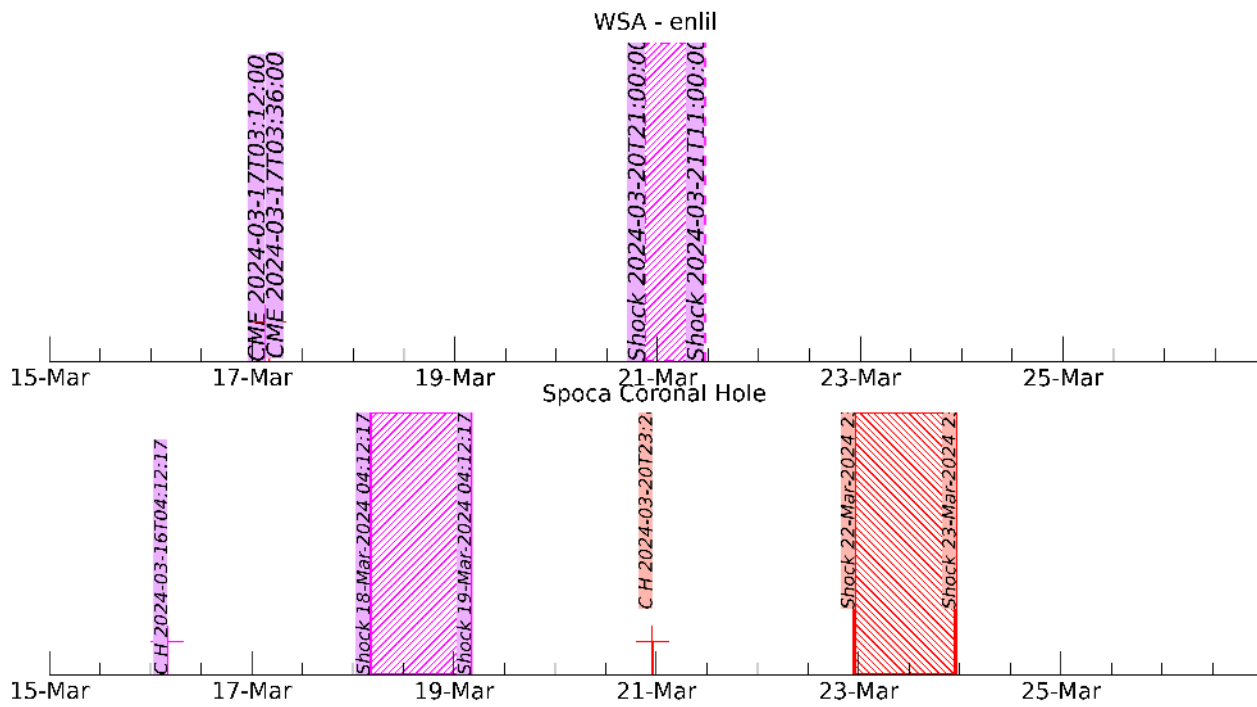
(b) Above the 193 rÅ image of the Sun are highlighted coronal holes observed by SPOCA around 04:12 UT on March 16, 2024 (red dot line).



(a) The solid black line depicts the products of the sum of areas for each detection interval performed by SPOCA between March 16 and 21, 2024.

(b) Above the 193 rÅ image of the Sun are highlighted coronal holes observed by SPOCA around 23:28 UT on March 20, 2024 (blue dot line).

# Solar - WSA - ENLIL and SPoCA



## EARTH'S OUTER RADIATION BELT

**Responsible: Ligia Da Silva**

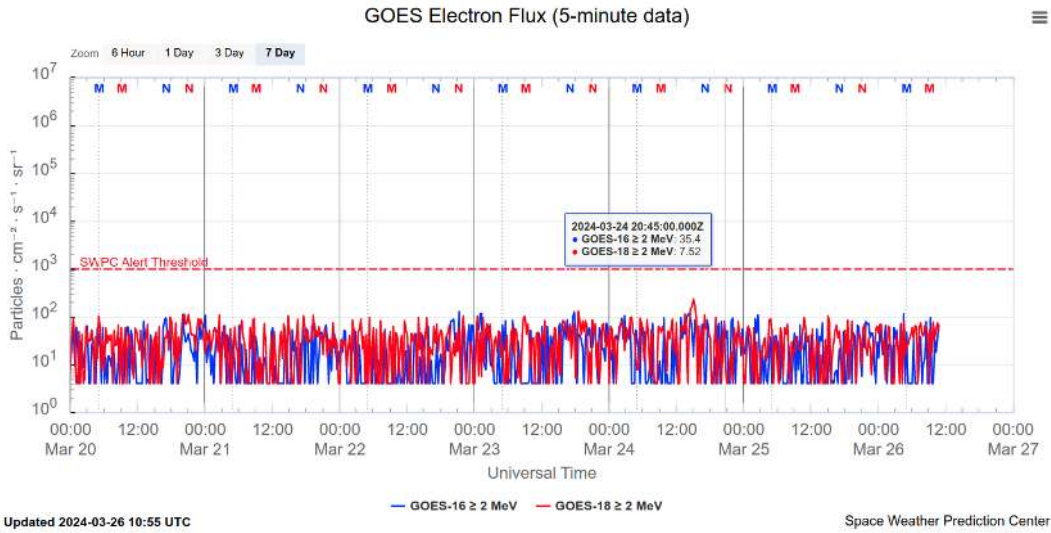


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-16 and GOES-18 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

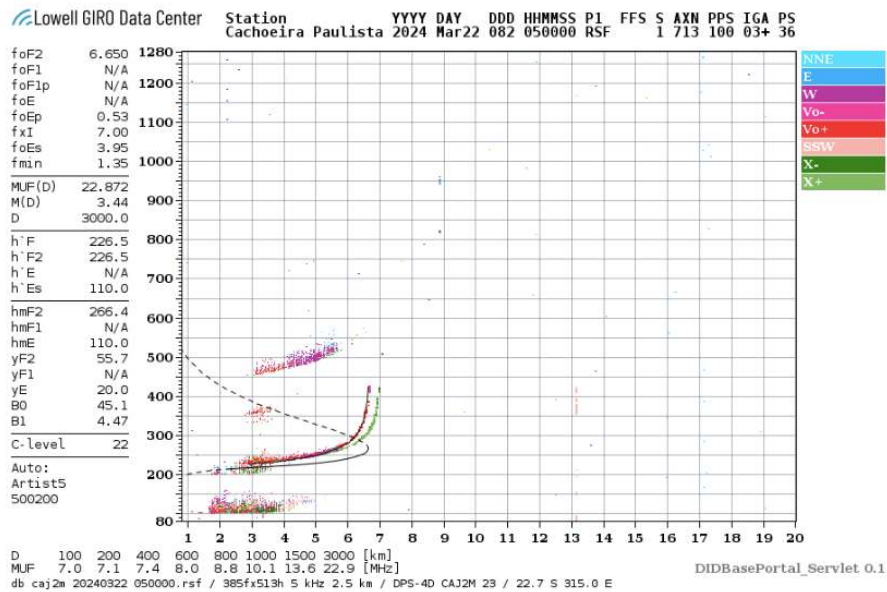
### Summary

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 confined below  $10^2$  particles/( $\text{cm}^2 \text{ s sr}$ ) for the entire analyzed period.

## Ionosfera – Digissonda (Laysa Resende)

### Summary

We observed the spread F in Fortaleza during this week. In Cachoeira Paulista, the spread F was very weak during the days in this week and between the 19<sup>th</sup> and 22<sup>nd</sup> it was not observed. The Es layers reached a maximum of scale 3 in Cachoeira Paulista and 4 in Fortaleza. The auroral trace of the Es layer was observed on March 22<sup>nd</sup>, referring to particle precipitation due to the SAMA presence (Figure 1).

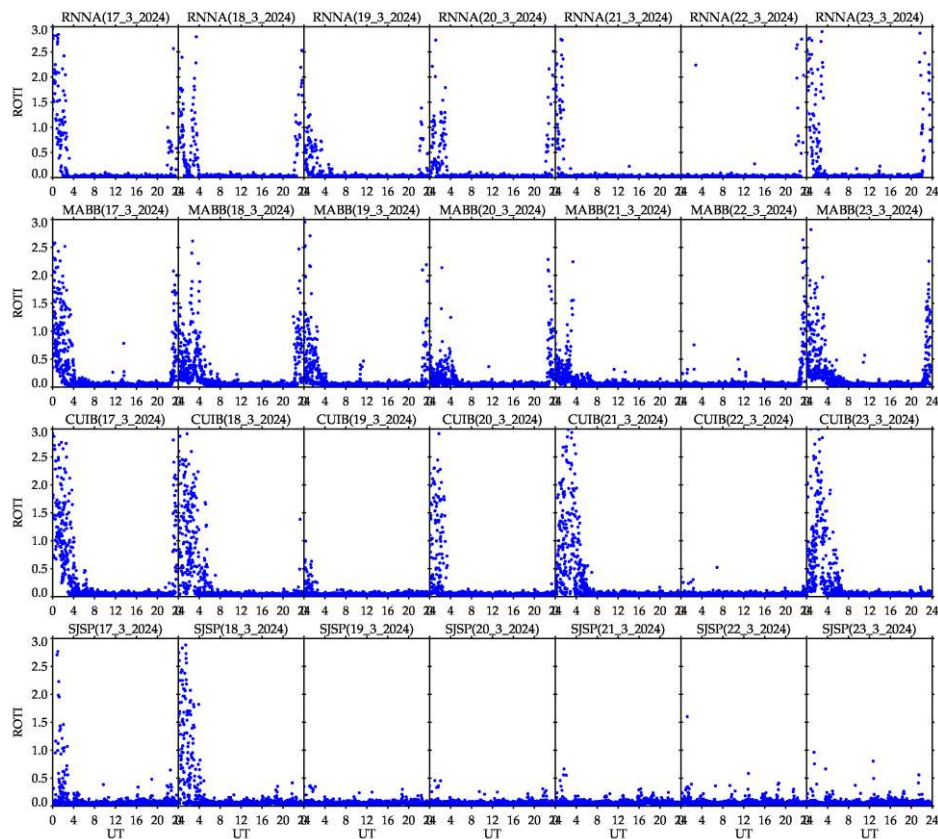


**Figure 1** – Ionogram over Cachoeira Paulista, showing the auroral trace of the Es layer occurred on March 22, 2024.

## Ionosphere - ROTI Summary for Week 2306 (March 17 to 23, 2024)

Carolina de Sousa do Carmo

In the week 2306 (March 17 to 23, 2024), ionospheric irregularities (plasma bubbles) were observed on all analyzed nights except for March 21<sup>st</sup>, when bubble suppression occurred. 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 March 17 to 23, 2024.