**Sun – Solar Activity (Jean C. Santos)**

Summary

The Sun showed little activity during the week, with the presence of active regions of low (alpha) and medium (beta) magnetic complexity on the solar surface. During this period, only one M-class solar flare occurred, and twenty-nine CMEs were observed, but none of the halo type (angular width greater than 180 degrees). During this period, the presence of a coronal hole with a significant area (>2.0% of the solar disk area) was identified at low latitudes.

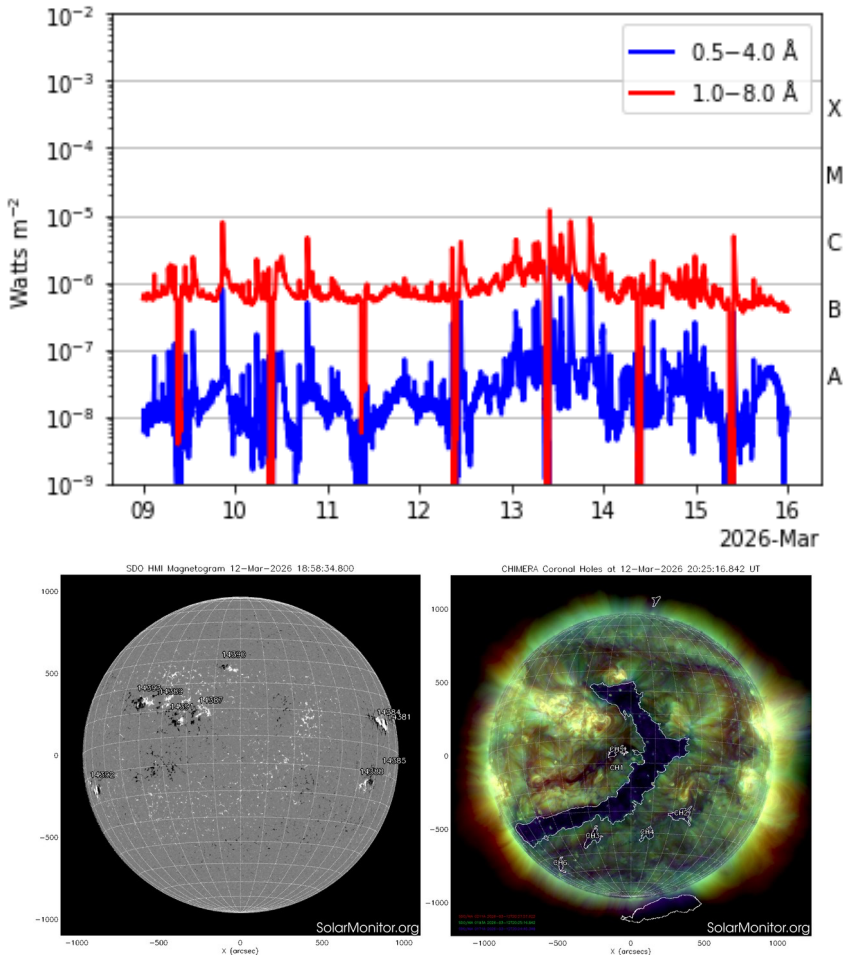


**Figure 1 –** X-ray flux measured by the GOES satellite (top panel) for the period of March 9-15, magnetic field in the line of sight (bottom left panel) and image at 193 angstroms (bottom right panel) measured on March 12, 2026.

**Interplanetary Medium – IM – Daniele da S. F. Medeiros and Paulo R. Jauer**
**Period: March 9th to 16th**

## Summary

Summary of IM conditions for the last week. The interplanetary medium region in the last week showed a moderate level of plasma disturbances due to the possible interaction with the solar wind and cross sector identified by the DSCOVR satellite in the interplanetary medium. The interplanetary Kp index obtained by NOAA/SWPC and the modeling.

- The magnitude of the interplanetary magnetic field component peaked on March 13th at 13:30 UT at +12.74 nT.

- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-9.22, +9.13] nT. Showing five rotations of the By component.

- The Bz component presents negative values for most of the week with a maximum negative -6.53 nT at 02:30 UT on March 14th. It presented positive value of +5.88 nT on March 13th at 12:30 UT.

- The solar wind density maximum peaked on March 13th at 08:30 UT, reaching 14.05 protons/cm^3.

- The solar wind speed fluctuated between 399 to 693 km/s, with an increase beginning at 08:30 UT on March 13th.

- The magnetopause position remained relaxed almost throughout the analyzed period, reaching maximum compression (9.00 RE) at 08:30 UT on March 13th.

- During the early part of the week, the measured interplanetary Kp index remained below 4, indicating relatively quiet geomagnetic conditions. On March 13th, the index was around 5 (Kp = 5) minor geomagnetic storm (G1 level), rising to approximately 6 (Kp = 6) on March 14th which is classified as a moderate geomagnetic storm (G2 level). The modeled interplanetary Kp index reached values close to 4 (Kp = 4) at the start of the week. On March 13th and 14th, it reached values of approximately 5 (Kp = 5) minor geomagnetic storm (G1 level), ending the week with values fluctuated between 3 and 5.

Figure 1 ilustrates a set of parameters observed in the solar wind by the DSCVR 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. Column 2: Solar wind density, speed, temperature and the last graph represents the position of the subsolar magnetopause.

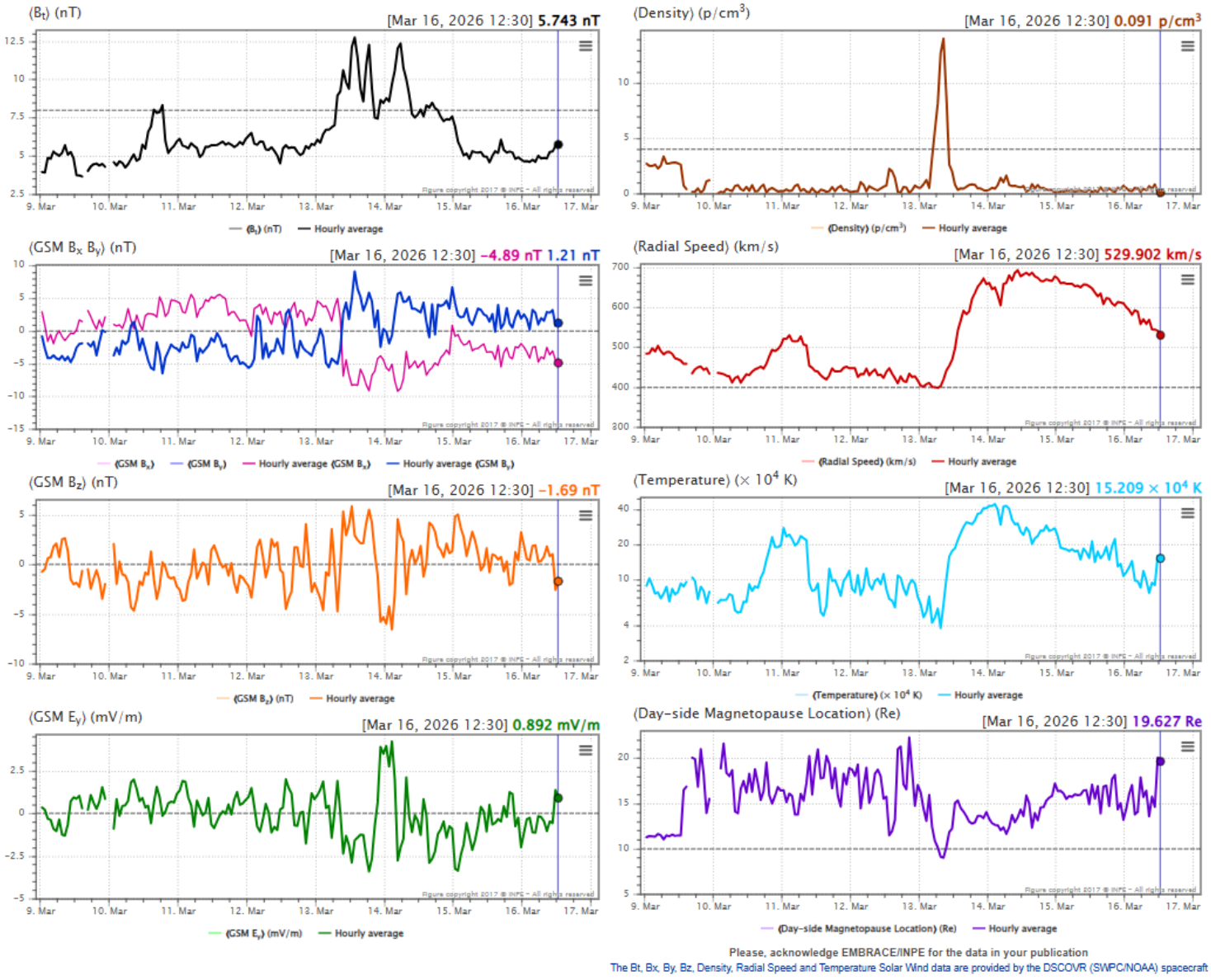


**Figure 1**: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

Figure 2 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 with the panels below: solar wind speed, Bz component of the interplanetary magnetic field (IMF), solar wind density, and the last graph represents the Kp index obtained by NOAA/SWPC and the modeling.

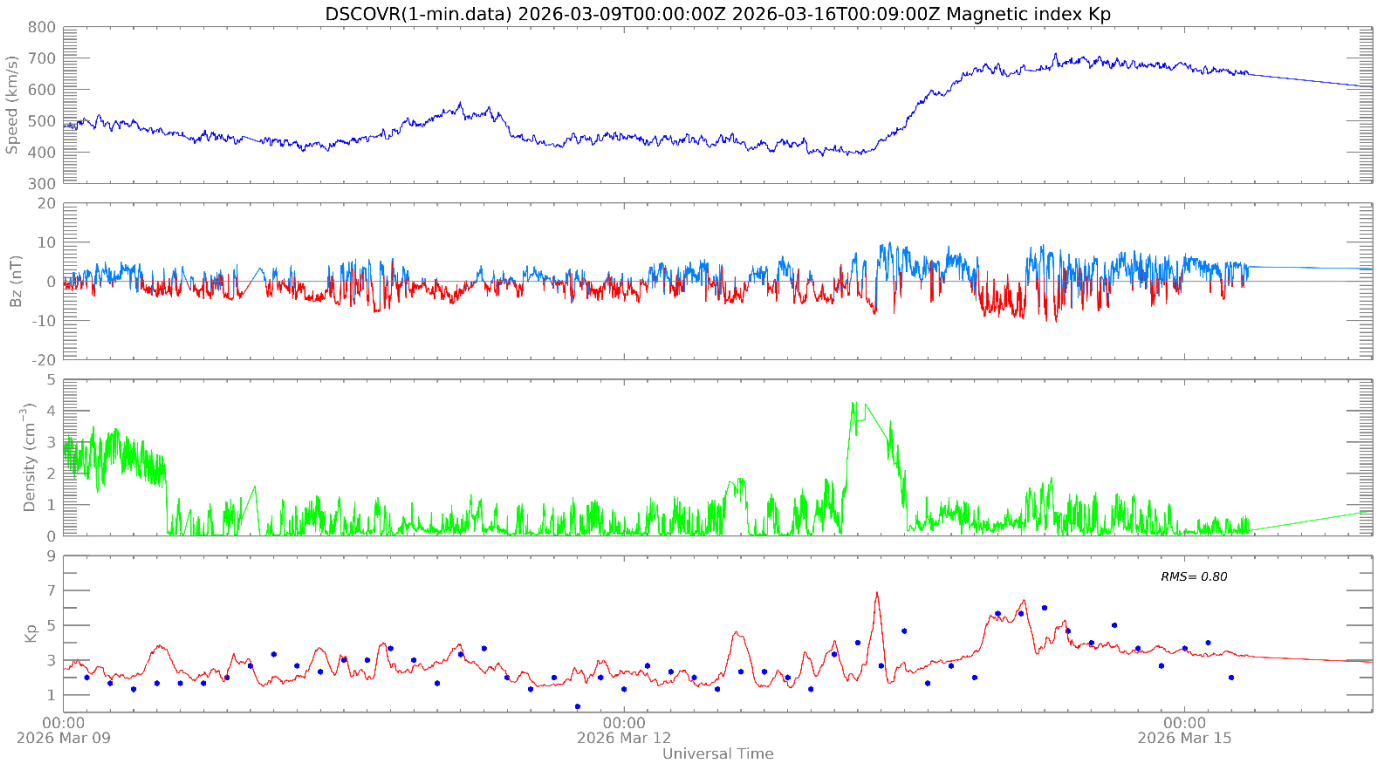


**Figure 2:** Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

## EARTH'S RADIATION BELT

**Responsible: Ligia Da Silva**

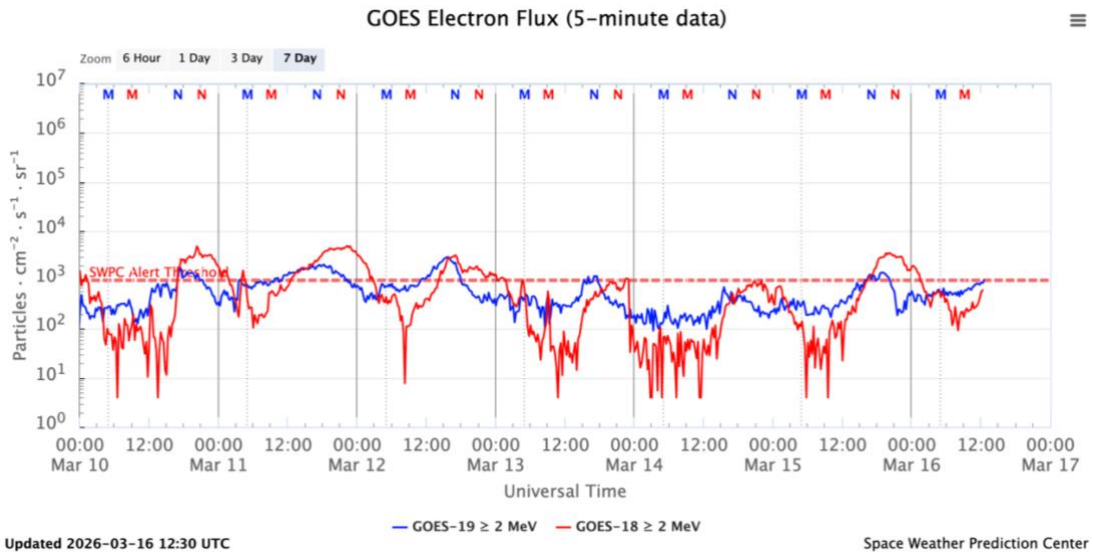


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-18 and GOES-19 satellite. Source: https://www.swpc.noaa.gov/products/goes-electron-flux

**Summary**

The high-energy electron flux (>2 MeV) in the outer boundary of the outer radiation belt obtained from the GOES-18 and GOES-19 geostationary satellites (Figure 1) exhibits dropout behavior on March 10, 13, 14, and the beginning of March 15, concentrating below the alert threshold ($10^3$ particles/($cm^2$ s sr)). Periods of flux increase are observed at the end of March 10 and on March 11, 12, and the end of March 15.

# Geomagnetic field

**Responsible: Karen Sarmiento /Lívia Alves/Sony Su Chen**

## Summary

*The period between 10 and 16 March was characterized by a transition from a predominantly quiet geomagnetic field regime to a moderate geomagnetic storm event (G2), accompanied by instabilities.*

*Between 10 and 12 March, geomagnetic activity remained at low levels, with only occasional instabilities. In the auroral region, intermittent variations were observed, with the AE index oscillating around 500 nT. During this interval, the Kp and Ksa magnetic indices recorded isolated peaks of 4- and 4+, respectively, both remaining below the G1 geomagnetic storm threshold. The Dst index remained relatively stable, reaching a minimum value of -29 nT.*

*Between 13 and 14 March, a geomagnetic storm occurred, with the issuance of G1 and G2 geomagnetic storm alerts. The event began around 18UT on 13 March, while the main phase started at approximately 20UT on the same day. The storm minimum was recorded around 05UT on 14 March, when the Dst index reached -72 nT. The dHsa index reached a minimum value of -87 nT at 01UT on the same day.*

*Following these minima in the Dst and dHsa indices, the geomagnetic field entered the recovery phase. On 15 and 16 March, instabilities associated with the recovery of the storm that occurred on the previous days were still observed.*

*During the main phase, the Kp index varied between G1 and G2 storm levels. The G1 level (Kp=5+) was reached between 21-24UT on 13 March. Subsequently, the activity intensified to G2 (Kp=6o) between 00-03UT on 14 March. Later, the index returned to the G1 level (Kp=5+) between 03-06UT and again between 12-15UT on 14 March. During the remaining intervals, geomagnetic activity remained below the G1 storm threshold.*

*The Ksa index also reached the G1 storm level between 21-24UT on 13 March, and during the 00-03UT and 03-06UT intervals on 14 March, recording a maximum value of 5+ between 00-03UT on 14 March. After this period, geomagnetic activity returned to levels below the storm threshold.*

*In the auroral region, activity remained elevated during part of the event, with the AE index oscillating above 500 nT between 22UT on 13 March and 01UT on 15 March. Notable peaks occurred at 01UT and 14UT on 14 March, when the AE index reached values close to 1500 nT.*

*For the next few hours, geomagnetic activity is expected to remain at slightly unstable levels.*

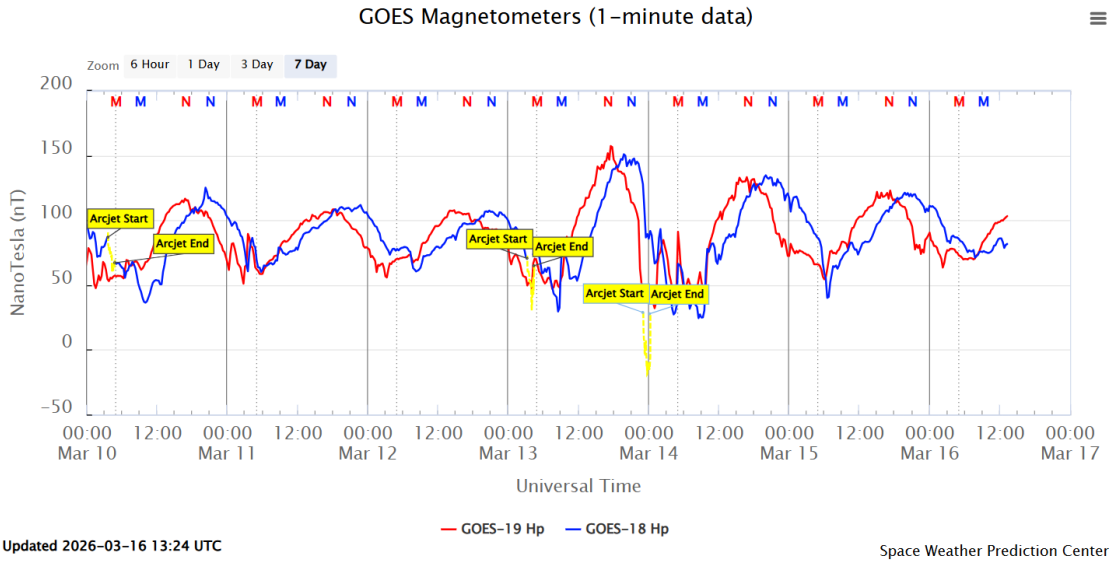


*Figure 1 - Magnetic field measurement at the GOES satellite position.*

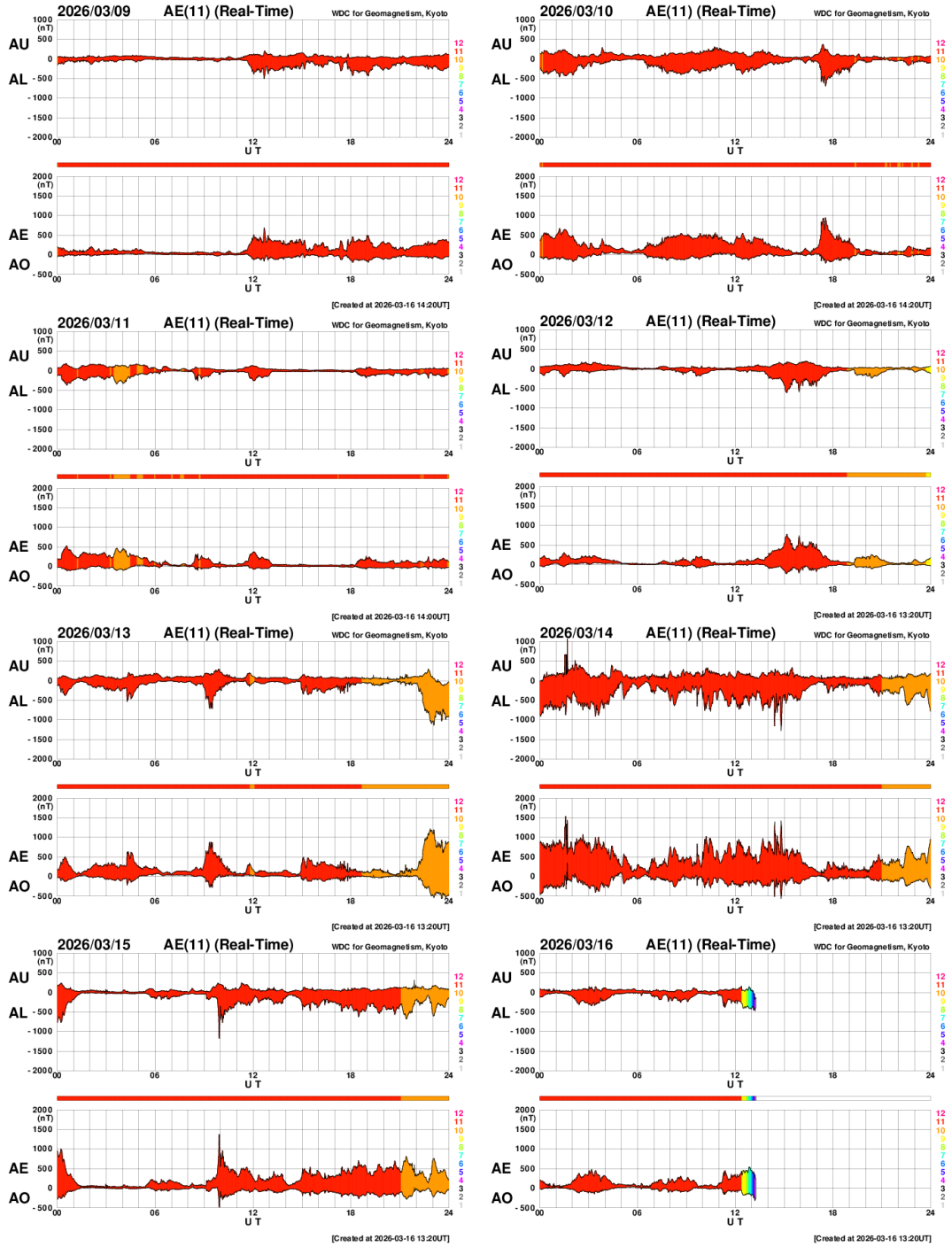


*Figure 2 - AE index for the days of the week.*

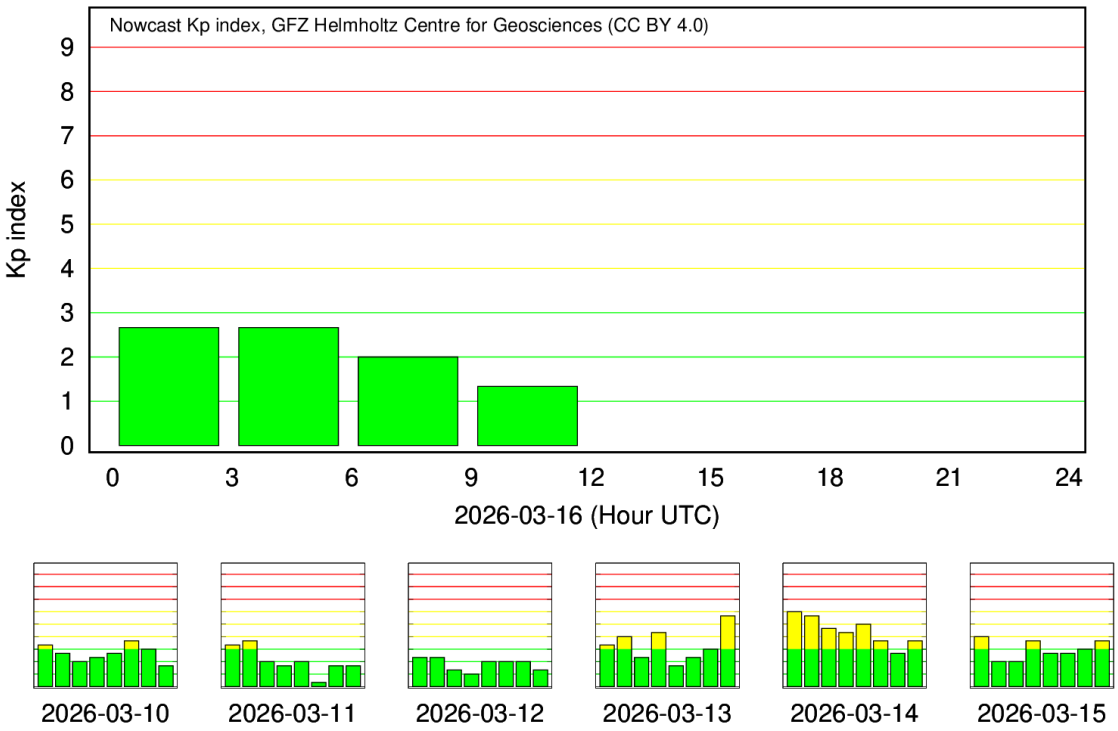


*Figure 3 - Kp index on a logarithmic scale.*

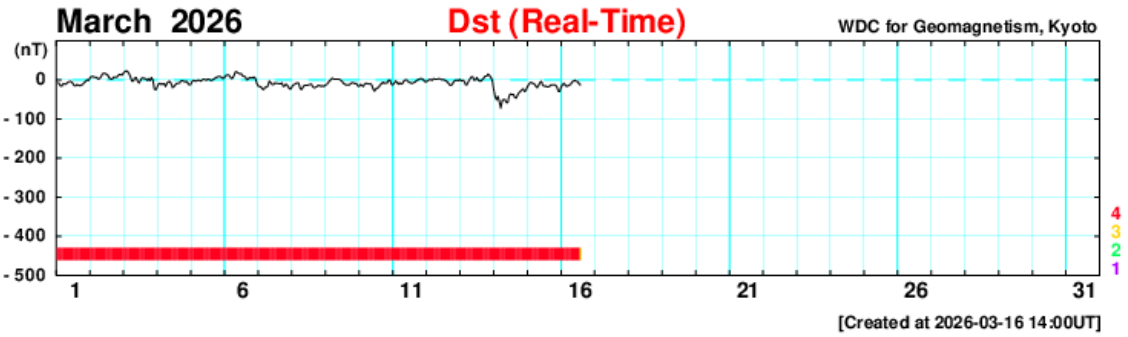


*Figure 4 - Dst index.*

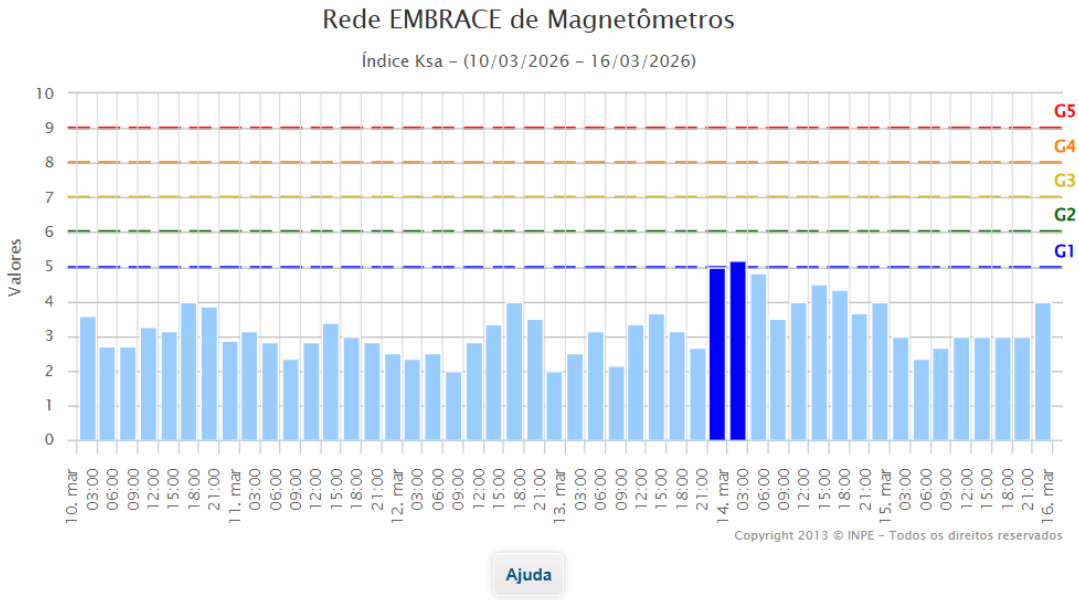


*Figure 5 - Geomagnetic index in South America - Ksa Index.*

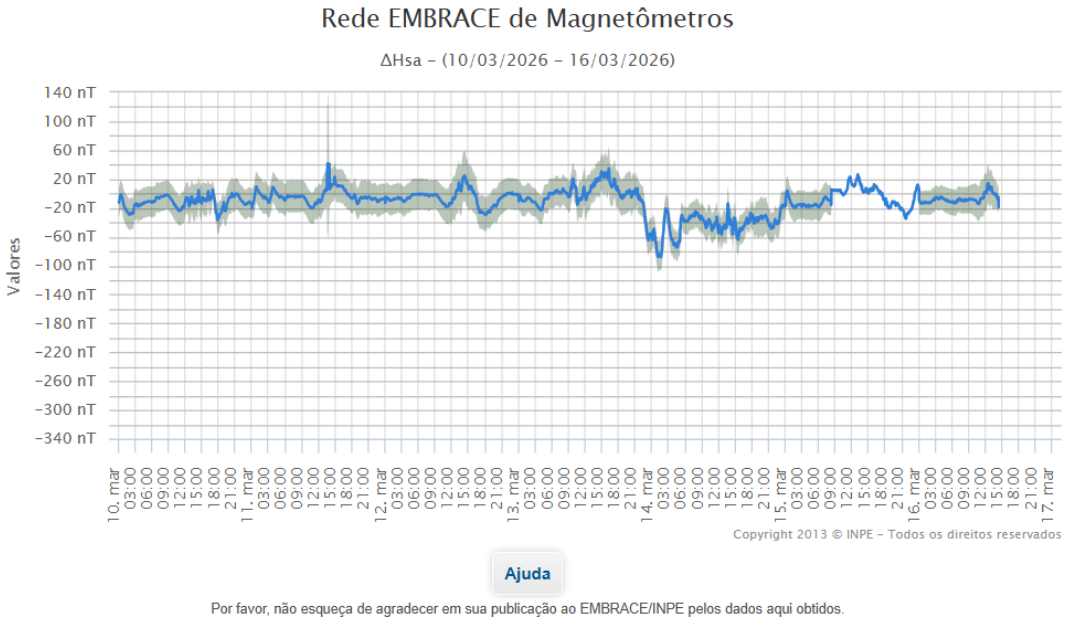


*Figure 6 - Geomagnetic index in South America - ΔH index at magnetic stations of the EMBRACE Program.*

## Ionosfera – Digisonde (Laysa Resende)

### Summary

During this week, spread F was observed at several Brazilian stations located near the magnetic equator and equatorial region, including Boa Vista and São Luís. In contrast, spread F was detected at Cachoeira Paulista only from March 12. Strong sporadic E (Es) layers persisted over Cachoeira Paulista and São Luís throughout the week, with the Es layer index reaching level 5 (Figure 1). Meanwhile, variations in the Maximum Usable Frequency (MUF) remained below the threshold required to classify ionospheric conditions as moderate.

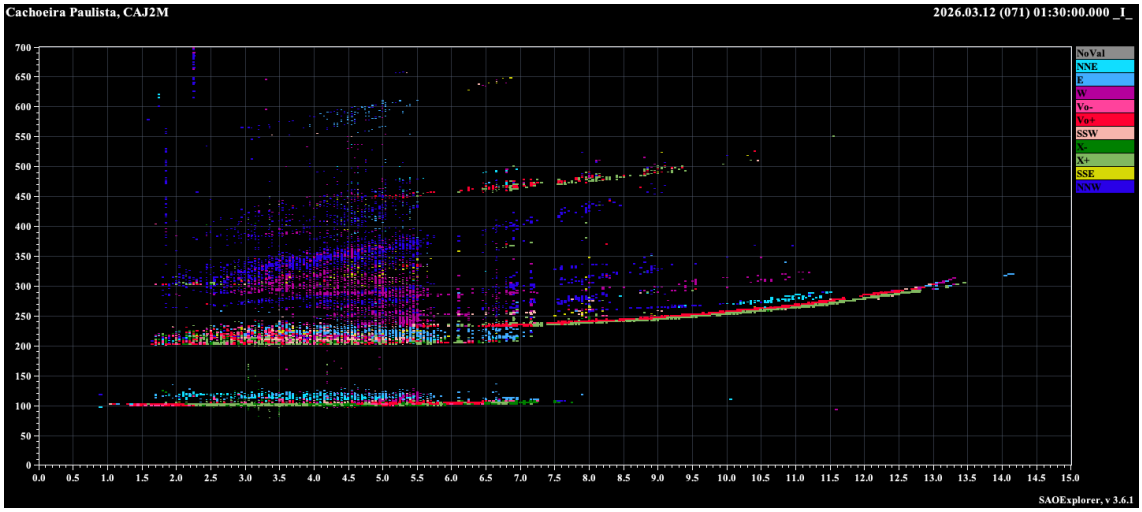


**Figure 1** – Sequence of ionograms over Cachoeira Paulista, showing the strong Es layer (scale 5).