

Sun – Solar Activity (Jean C. Santos)

Summary

The Sun exhibited low activity with the presence of two active regions of high (beta-gamma) magnetic complexity in the solar disk during the week. During this period, an M-class solar flare occurred. The Cactus software identified 30 CMEs, two of which was a halo (angular width greater than 180 degrees). The presence of four coronal holes with significant area ($>2.0\%$ of the solar disk area) crossing the solar disk was identified during this interval.

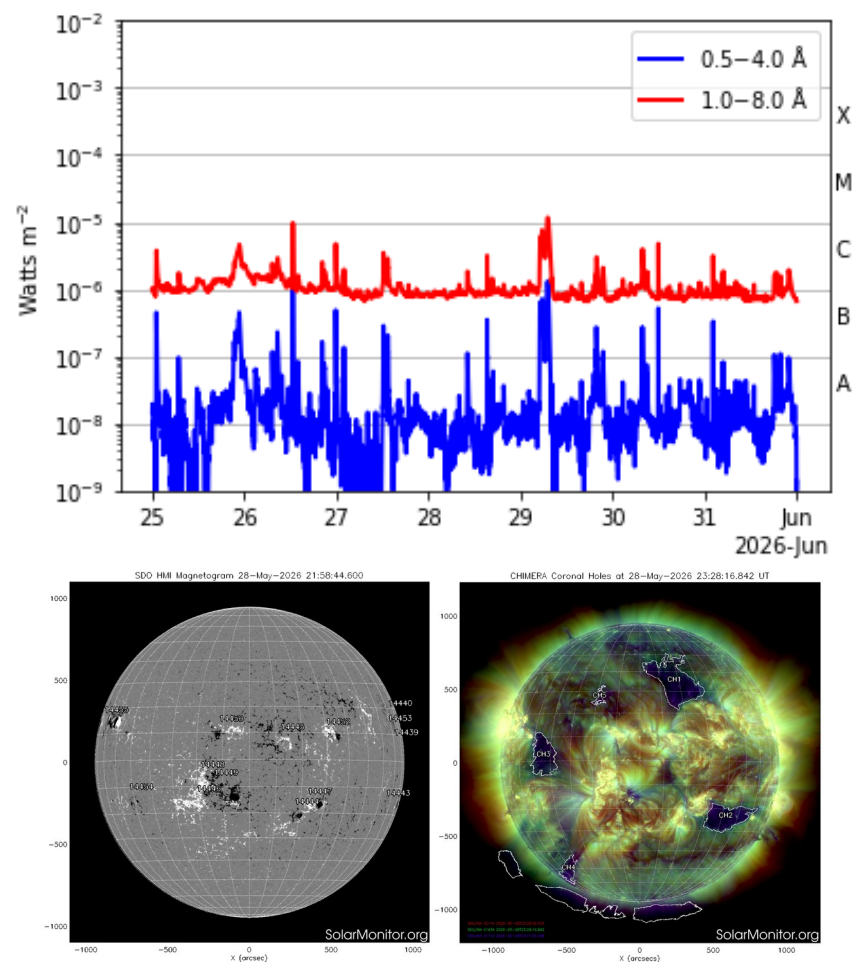


Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period of May 25-31, magnetic field in the line of sight (bottom left panel) and image at 193 angstroms (bottom right panel) measured on May 28, 2026.



Interplanetary Medium – IM – Daniele da S. F. Medeiros and Paulo R. Jauer

Period: May 25th to June 1st

Summary

Summary of interplanetary medium (IM) conditions for the last week. The IM region in the last week showed a moderate level of plasma disturbances due to the possible interaction with disturbance in the solar wind 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 May 30th at 13:30 UT at +11.07 nT.
- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-9.50, +6.55] nT. Showing three rotations of the By component.
- The Bz component presents negative values for most of the week with a maximum negative -7.07 nT at 18:30 UT on May 30th. It presented positive value of +6.66 nT on May 28th at 07:30 UT.
- The solar wind density maximum peaked on May 25th at 14:30 UT, reaching 10.38 protons/cm³.
- The solar wind speed fluctuated between 331 to 532 km/s, with an increase beginning at 16:30 UT on May 30th.
- The magnetopause position remained relaxed almost throughout the analyzed period, reaching maximum compression (9.80 RE) at 14:30 UT on May 29th.
- During the early part of the week, the measured and modeled interplanetary Kp index remained fluctuating between 1 and 3. Between May 27th and 29th, the measured and modeled interplanetary Kp index increased, fluctuating between 2 and 4; the measured Kp index, while the modeled Kp reached a value close to 5 (Kp = 5), corresponding to a minor storm (G1 level). On May 29th, the modeled Kp index exhibited an intensification, with values exceeding 5 (Kp > 5). On May 30th, the modeled Kp index reached value above 6 (Kp > 6), indicative of a moderate geomagnetic storm (G2 level), whereas the measured Kp index remained varying between 1 and 4. The week ending with values fluctuating between 1 and below 3 (Kp < 3) for both the measured and modeled Kp indices.



Figure 1 illustrates 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.

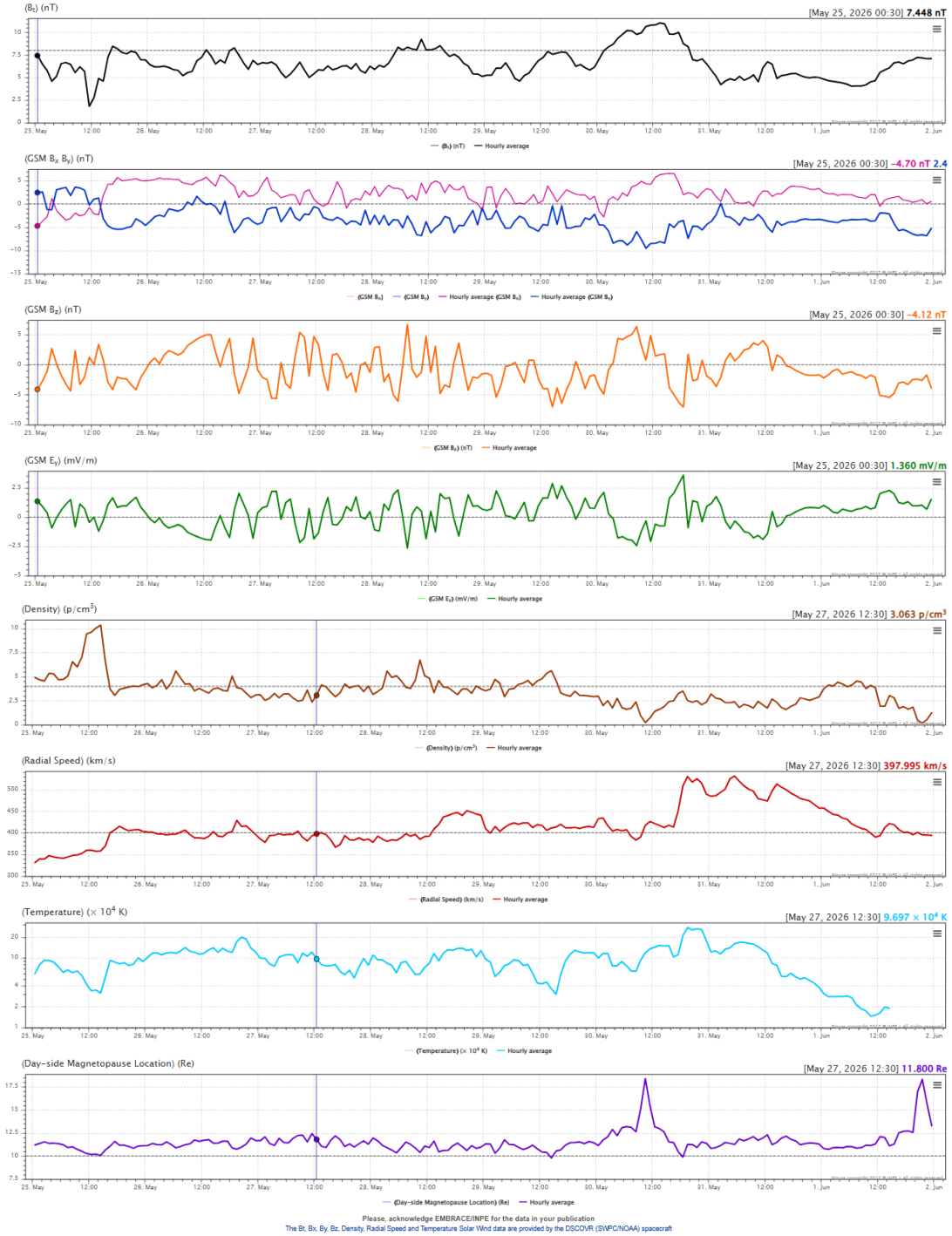


Figure 1: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

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.

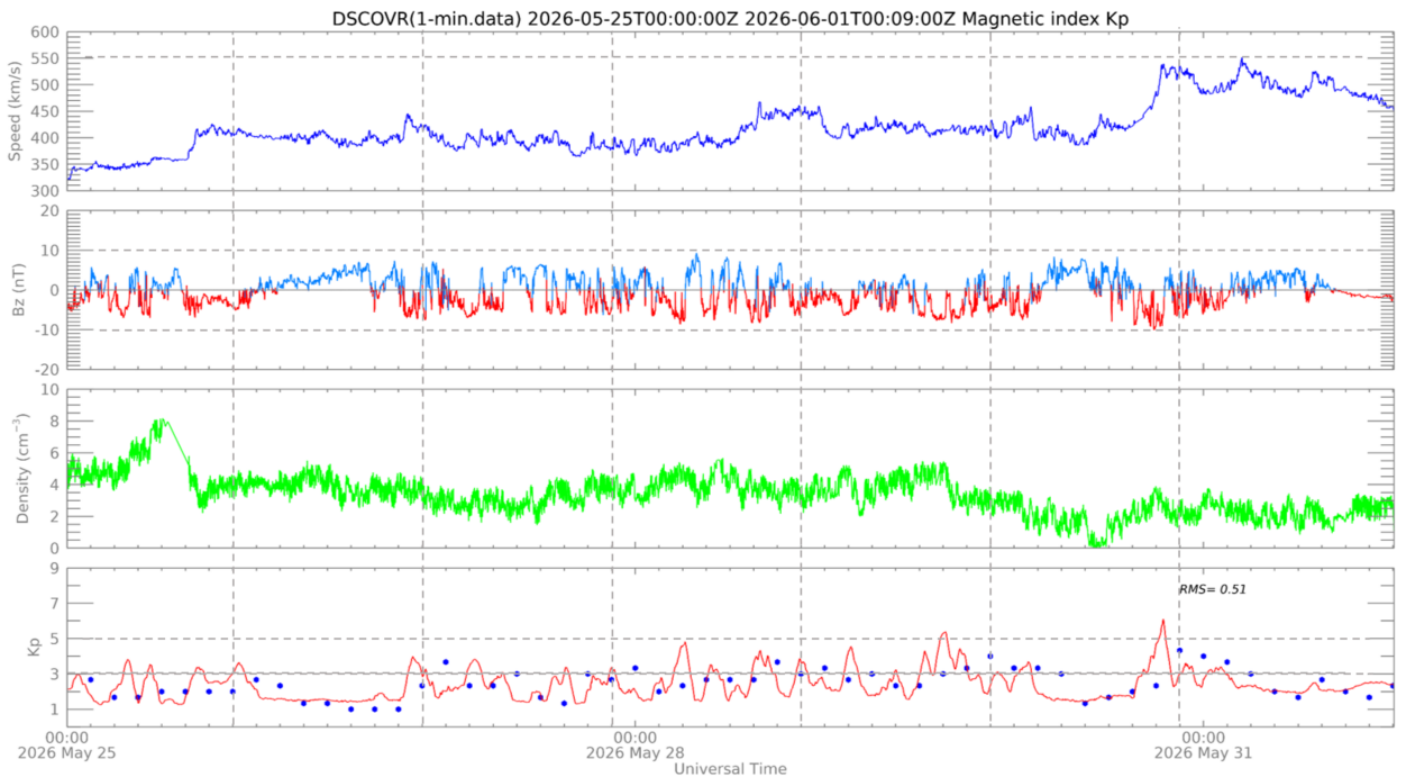


Figure 2: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

EARTH'S RADIATION BELT

Responsible: Ligia Da Silva

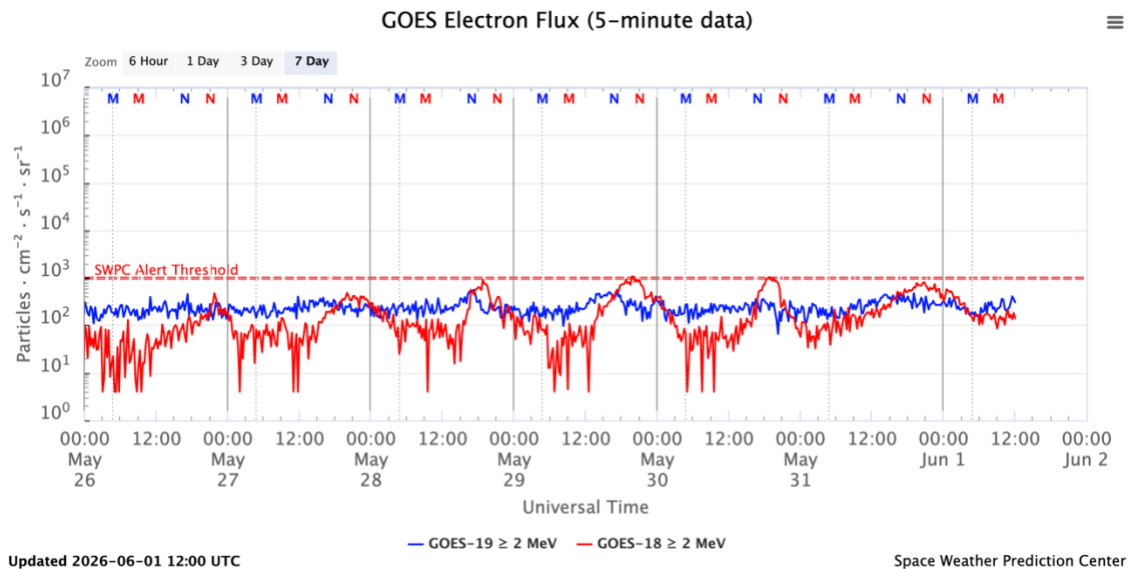


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-18 and GOES-19 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

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) is below the alert threshold (103 particles/(cm² s sr)) throughout the analyzed period. Three dropouts were observed, possibly associated with the arrival of solar wind structures. The first dropout started on May 28th, the second on May 29th, and the third on May 30th.

Geomagnetic field

Responsible: Karen Sarmiento /Lívia Alves/Sony Su Chen

Summary

The period from May 25 to June 1 was marked by episodes of instability in the Earth's magnetic field, including the issuance of a G1 (Minor) geomagnetic storm alert.

Throughout this interval, geomagnetic activity indices exhibited intermittent enhancements, reaching their peak intensity between 18h UT and 21h UT on May 30, when a G1-level geomagnetic storm alert ($K_{sa} = 5+$) was issued. Despite these increases, the K_p index remained below the corresponding threshold, reaching a maximum value of 4o during the analyzed period.

In the auroral region, the AE index also showed periods of enhancement, with intermittent values exceeding 500 nT. The most significant intervals occurred between 13h UT and 15h UT on May 29, and between 18h UT and 21h UT on May 30, when the index surpassed 1000 nT.

The Dst index reached a minimum value of -37 nT between 23h UT and 24h UT on May 30, while the dHsa index recorded a minimum of -80 nT around 20h UT on the same day.

During the last 24 hours of the period, geomagnetic activity remained predominantly quiet, with only isolated episodes of instability.

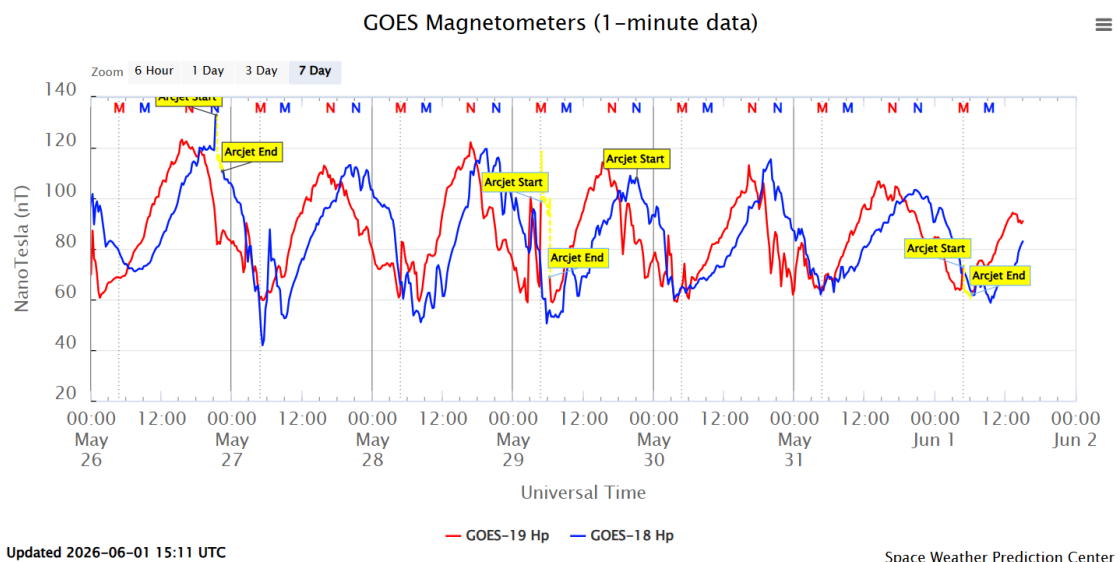


Figure 1 - Magnetic field measurement at the GOES satellite position.

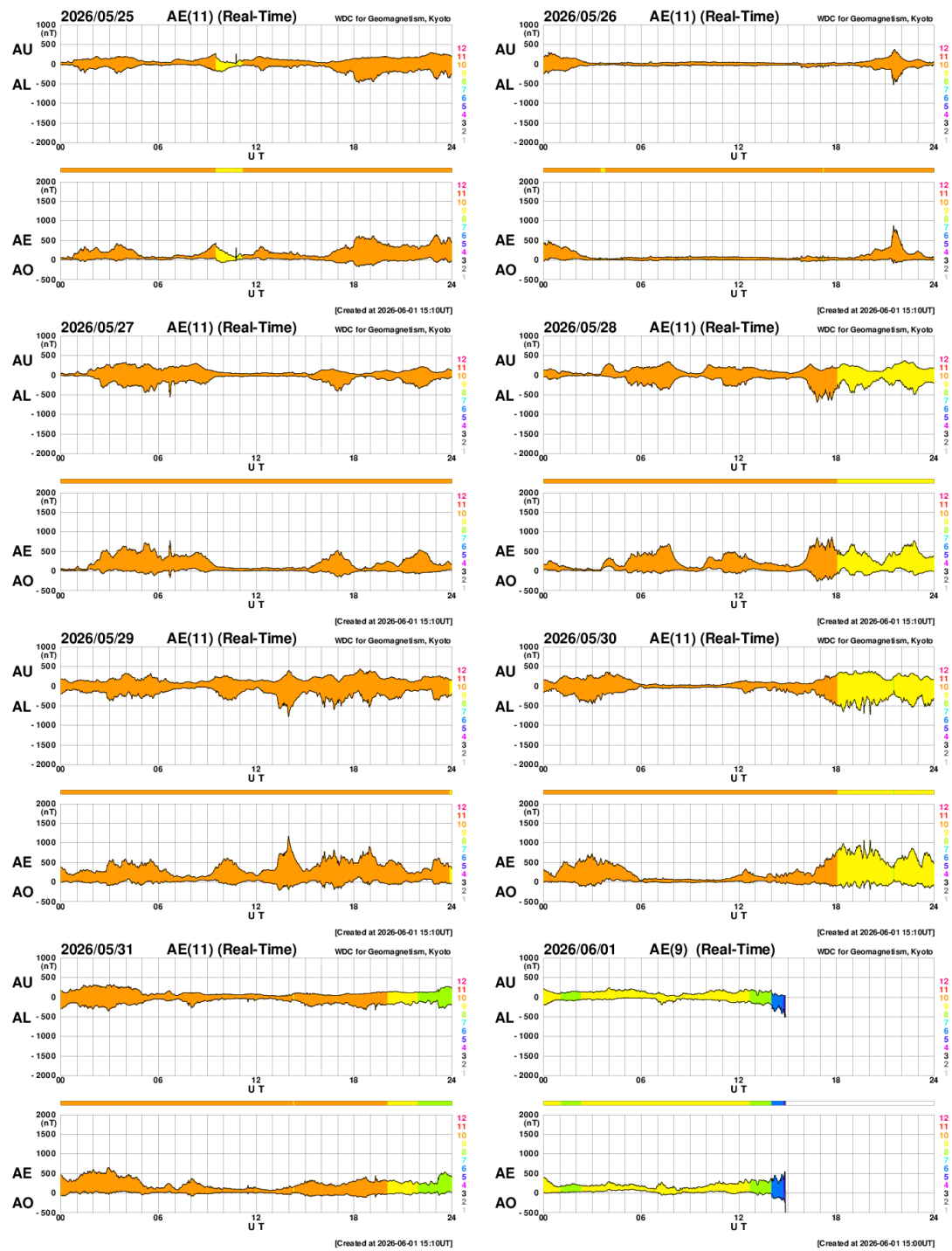


Figure 2 - AE index for the days of the week.

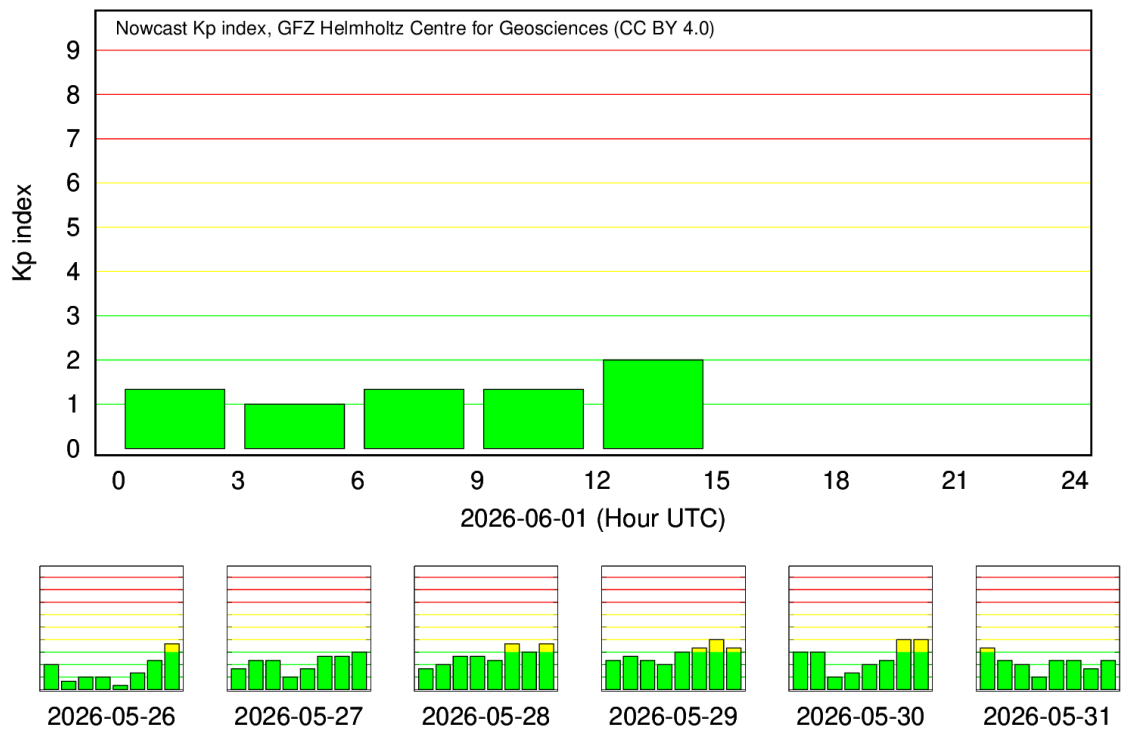


Figure 3 - Kp index on a logarithmic scale.

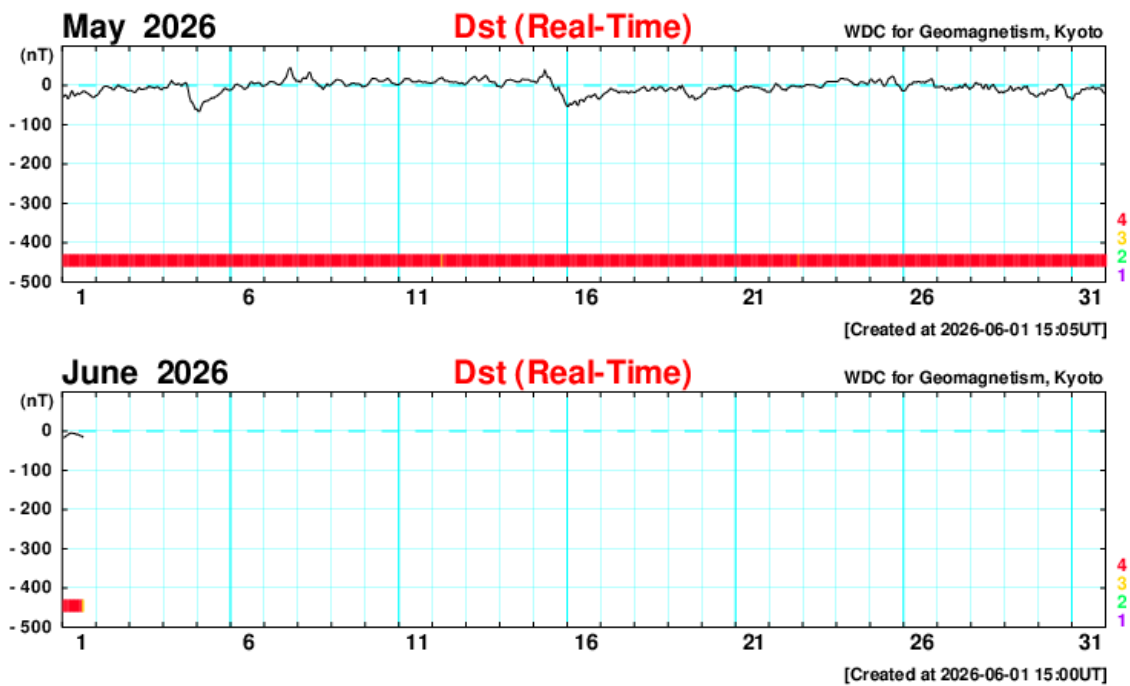


Figure 4 - Dst index.

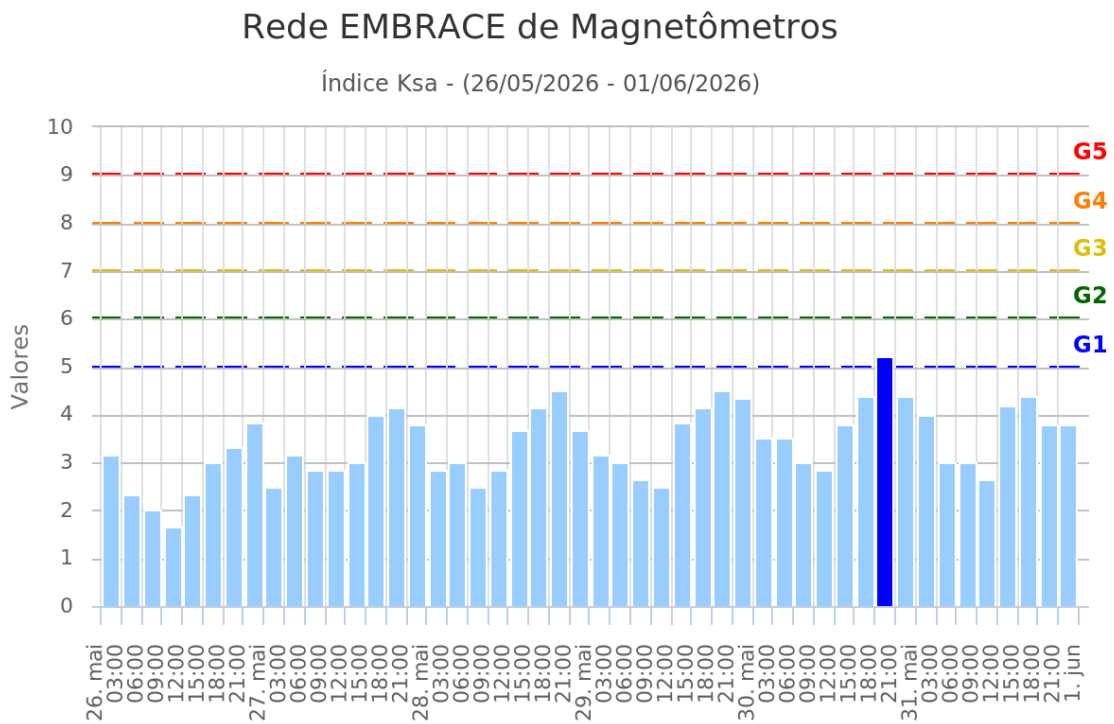
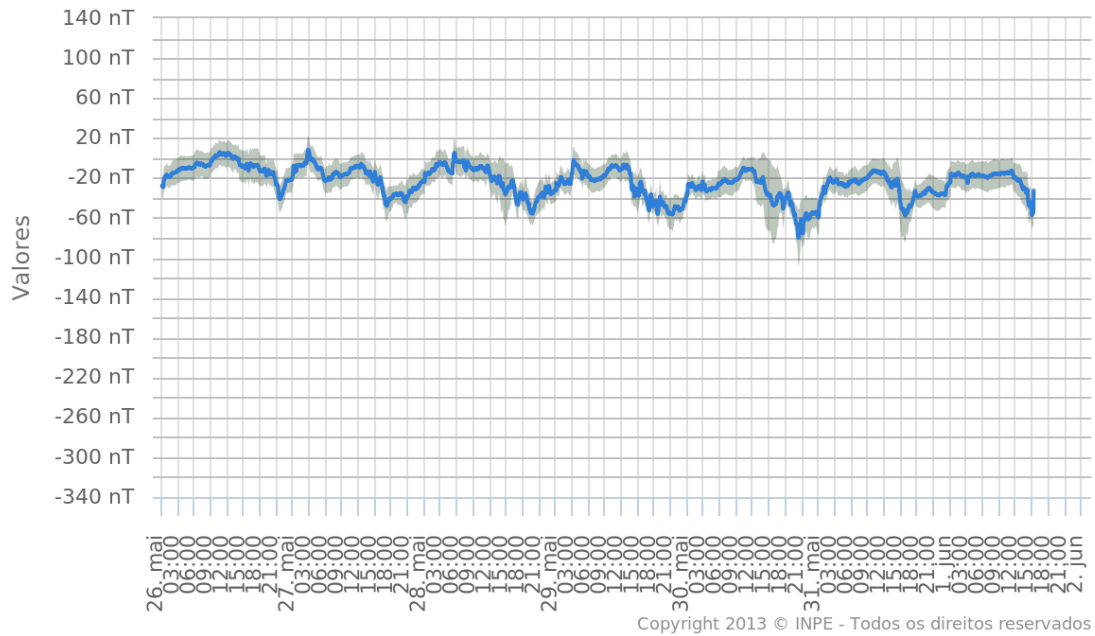


Figure 5 - Geomagnetic index in South America - Ksa Index.

Rede EMBRACE de Magnetômetros

ΔH_{sa} - (26/05/2026 - 01/06/2026)



Rede EMBRACE de Magnetômetros

ΔH - (26/05/2026 - 01/06/2026)

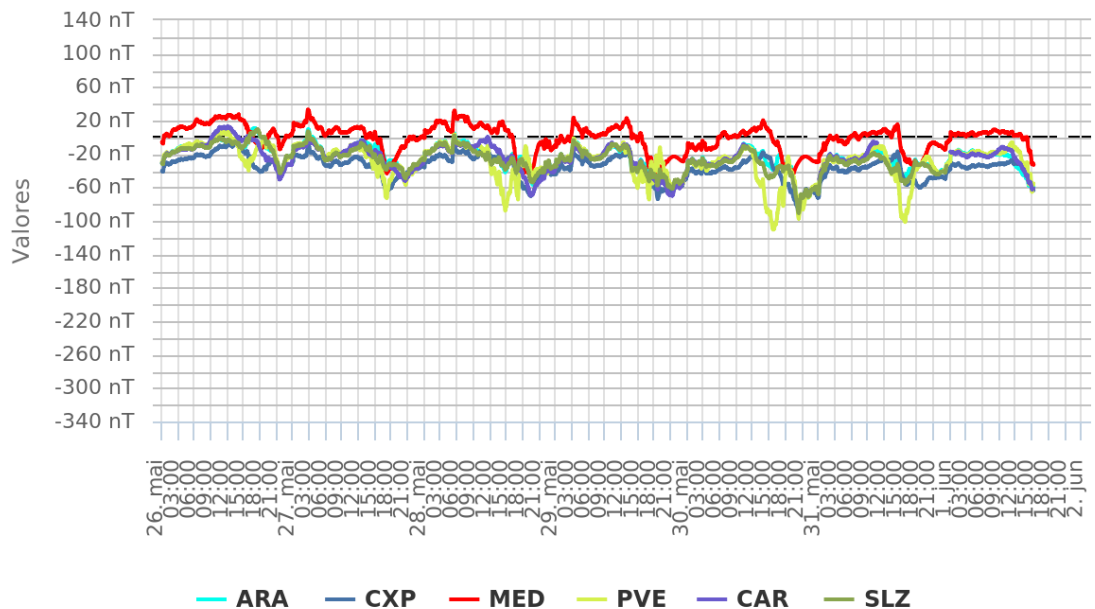


Figure 6 - Geomagnetic index in South America - ΔH index and at magnetic stations of the EMBRACE Program.

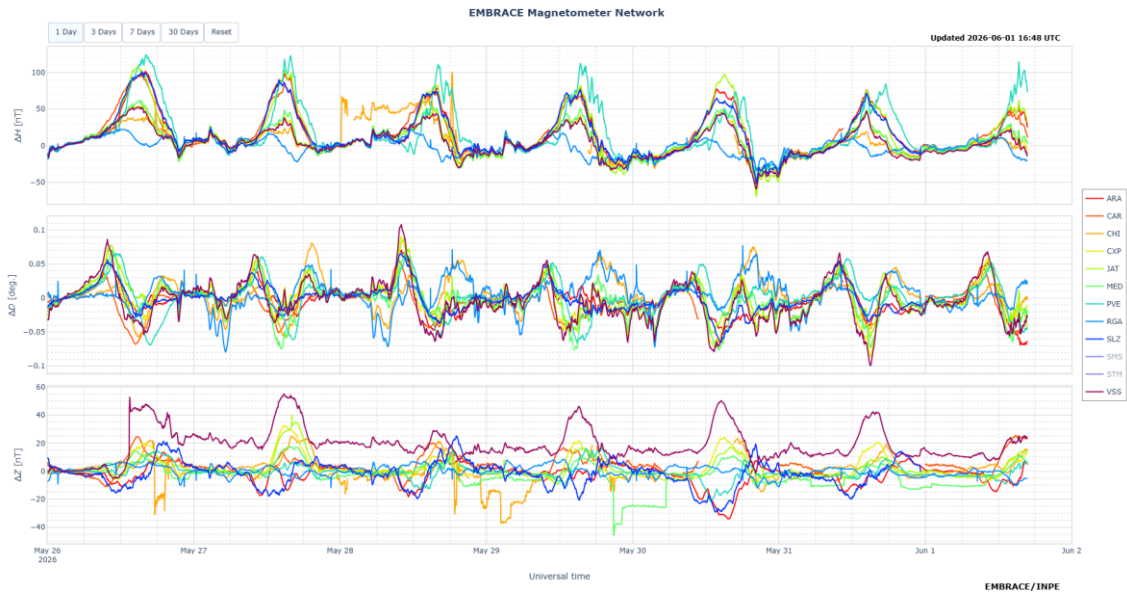


Figura 7 – Variation of the geomagnetic field at the magnetic stations of the EMBRACE Program.

Ionosfera – Digisonde (**Laysa Resende**)

Summary

During this week, spread F was observed over Boa Vista, whereas spread F signatures were detected over Cachoeira Paulista only on May 31. Strong sporadic E (Es) layers were also recorded, reaching the maximum intensity level, index 5, over Boa Vista (Figure 1). Variations in the Maximum Usable Frequency (MUF) remained below the threshold required to classify the ionospheric conditions as moderate.

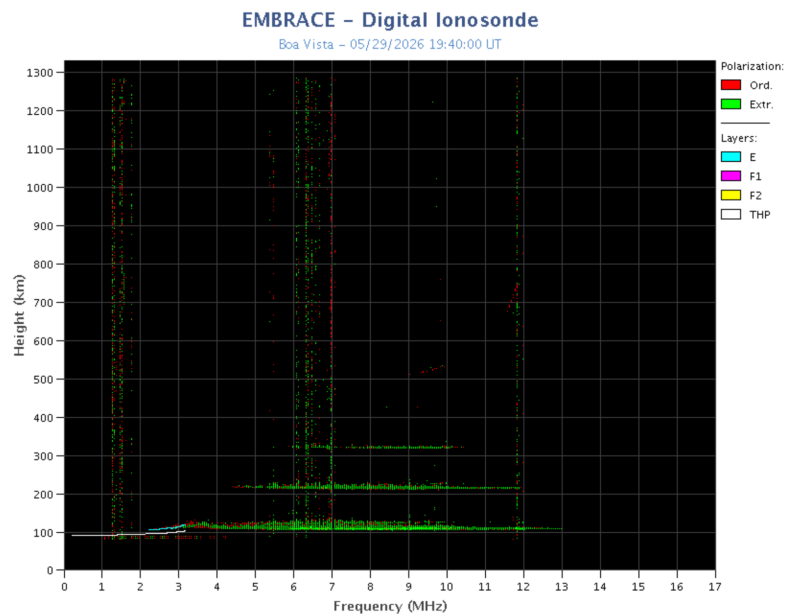


Figure 1 – Ionograms over Boa Vista, showing the strong Es layer.

Ionospheric F2-Layer Irregularities

Summary

During the period from May 24 to May 30, 2026, the parameters of F2-layer height (derived from the mean ionosonde fixed frequencies in the 3–10 MHz range), vertical drift velocity, total electron content (TEC), and ionospheric scintillation index (S4) were analyzed in order to monitor F2-layer ionospheric irregularities over South America.

The maximum F2-layer height associated with the pre-reversal enhancement ranged from 416 to 526 km, while the vertical drift velocity varied between 13 and 33 m/s (Figure 1).

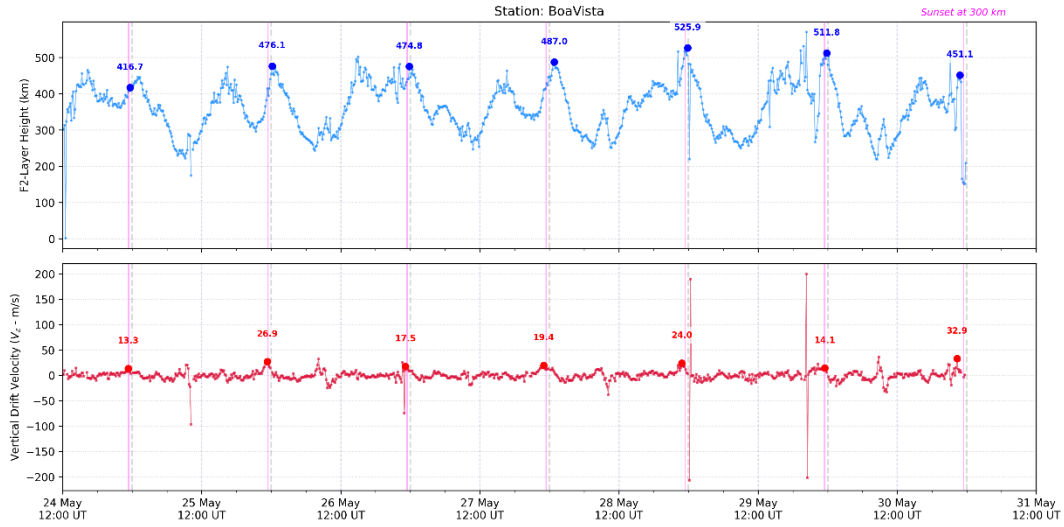


Figure 1 – F2-layer height (upper panel) and vertical drift velocity (lower panel).

The equatorial ionization anomaly (EIA) was observed on all days except May 25 and 27. TEC reached maximum values of approximately 80 TECU at the southern crest of the EIA. Regarding scintillation, S4 values remained low ($S4 < 0.5$), indicating quiet conditions. No events associated with equatorial plasma bubbles were observed (Figure 2).

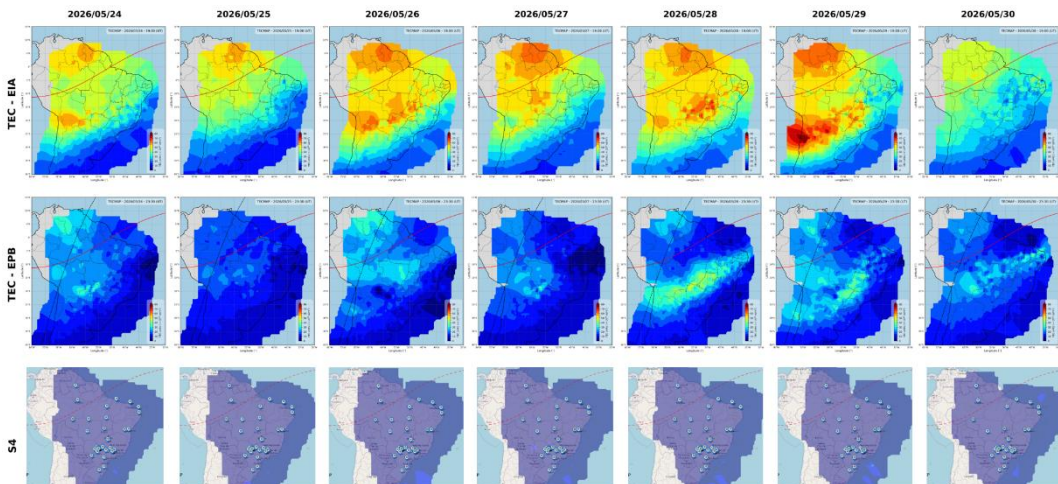


Figure 2 – Total electron content (TEC) maps (upper and middle panels) and S4 index (lower panel).

1. All data presented are under the domain and responsibility of the Embrace Program. *Todos os dados apresentados são de domínio e responsabilidade do Programa Embrace.*
2. The figures presented were selected to represent ionospheric dynamics and may correspond to different times. *As figuras apresentadas foram selecionadas para representar a dinâmica ionosférica e podem corresponder a horários distintos entre si.*
3. For additional information and access to the complete dataset, please visit: <https://www2.inpe.br/climaespacial/portal/en/home/>. Para informações adicionais e acesso aos dados completos, consulte: <https://www2.inpe.br/climaespacial/portal/>.