

Sun – Solar Activity (Jean C. Santos)

Summary

The Sun exhibited low activity with only one active region 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 37 CMEs, one of which was a halo (angular width greater than 180 degrees). No coronal holes with a significant area ($>2.0\%$ of the solar disk area) crossing the solar disk were identified during this interval.

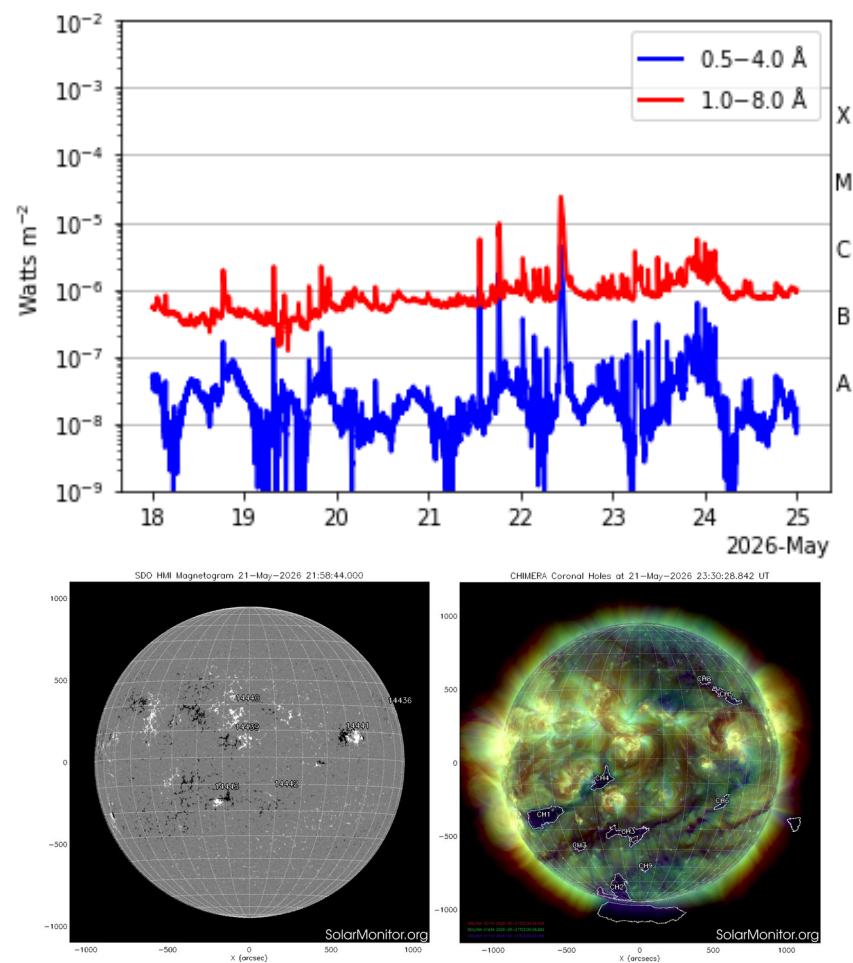


Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period of May 18-24, magnetic field in the line of sight (bottom left panel) and image at 193 angstroms (bottom right panel) measured on May 21, 2026.



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

Period: May 18th to 25th

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 a shock on May 19th at 05:30 UT and an HSS 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 19th at 10:30 UT at +7.48 nT.
- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-5.33, +5.28] nT. Showing six rotations of the By component.
- The Bz component presents negative values for most of the week with a maximum negative -5.16 nT at 10:30 UT on May 19th. It presented positive value of +3.93 nT on May 21st at 07:30 UT.
- The solar wind density maximum peaked on May 22nd at 02:30 UT, reaching 12.01 protons/cm³.
- The solar wind speed fluctuated between 281 to 606 km/s, with a decrease beginning at 09:30 UT on May 19th.
- The magnetopause position remained relaxed throughout the analyzed period.
- During the early part of the week, the measured and modeled interplanetary Kp index fluctuated between 1 and 3, reaching values close to 3 (Kp ~ 3), characterizing a calm period. On May 19th, the Kp measured reaching values above 3 (Kp > 3), while the modeled Kp index peaked above 5 (Kp > 5), corresponding to a minor storm (G1 level). 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.

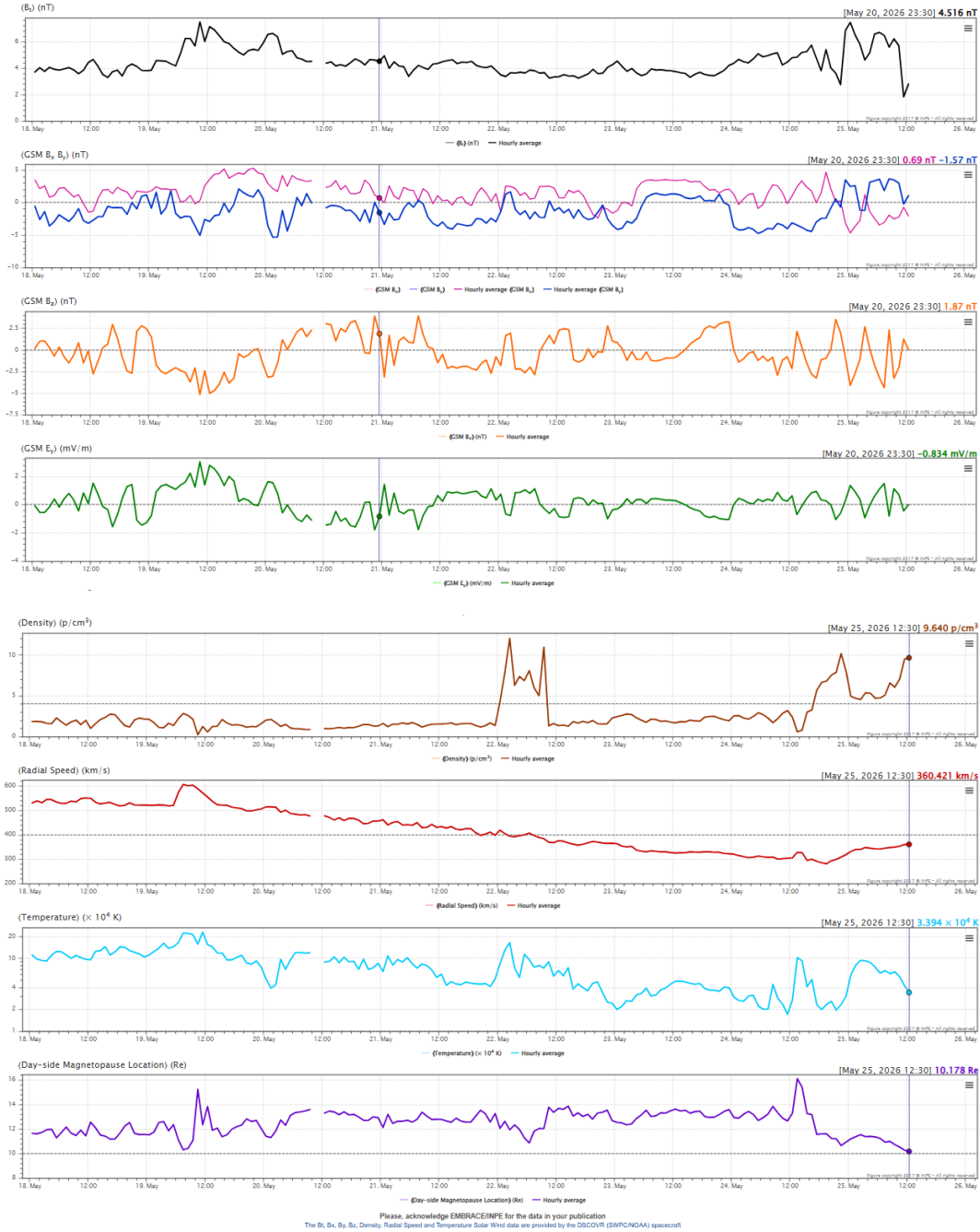


Figure 1: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

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.

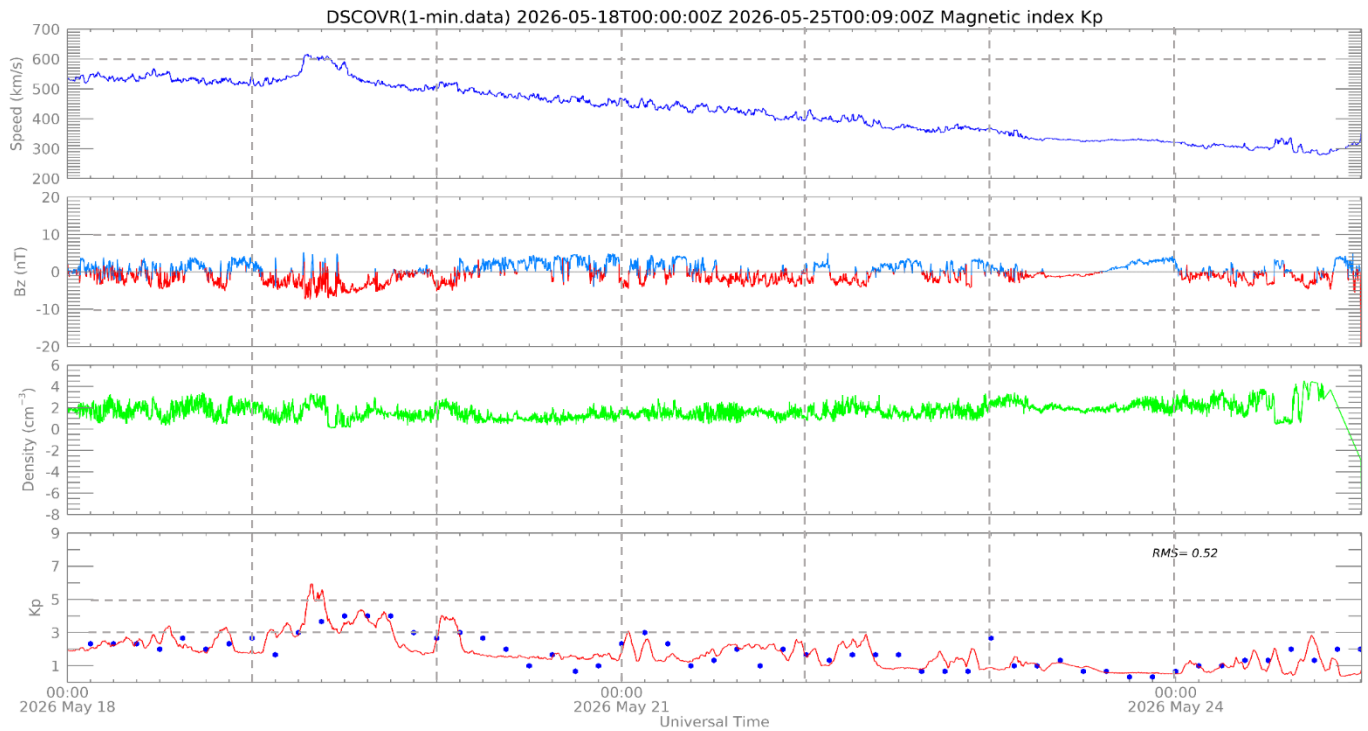


Figure 2: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

Responsible: José Paulo Marchezi

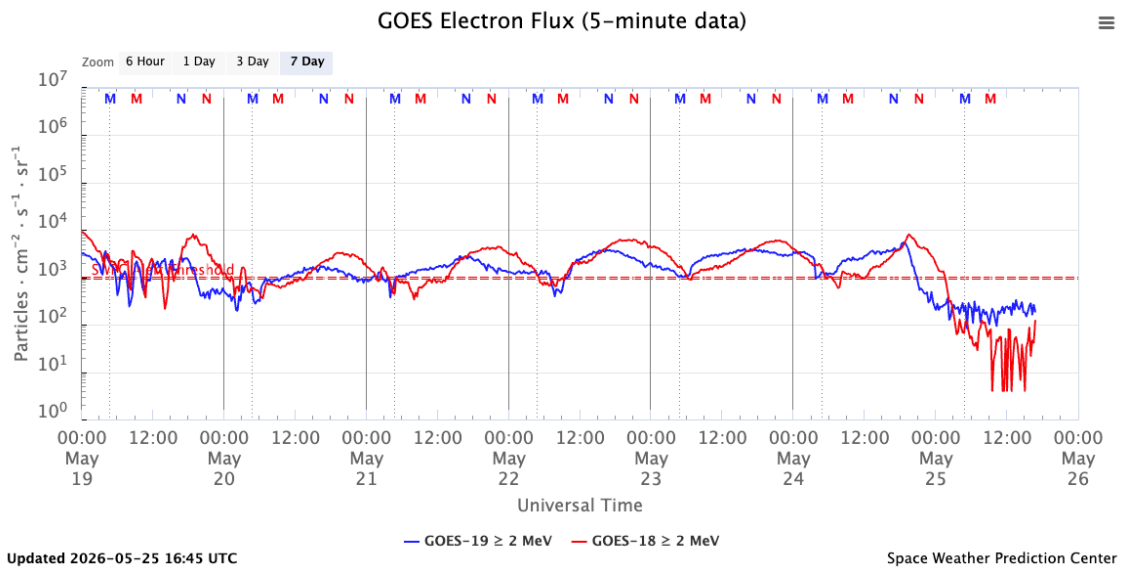


Figure 1: High-energy electron flux ($> 2\text{MeV}$) obtained from GOES-18 and GOES-19 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

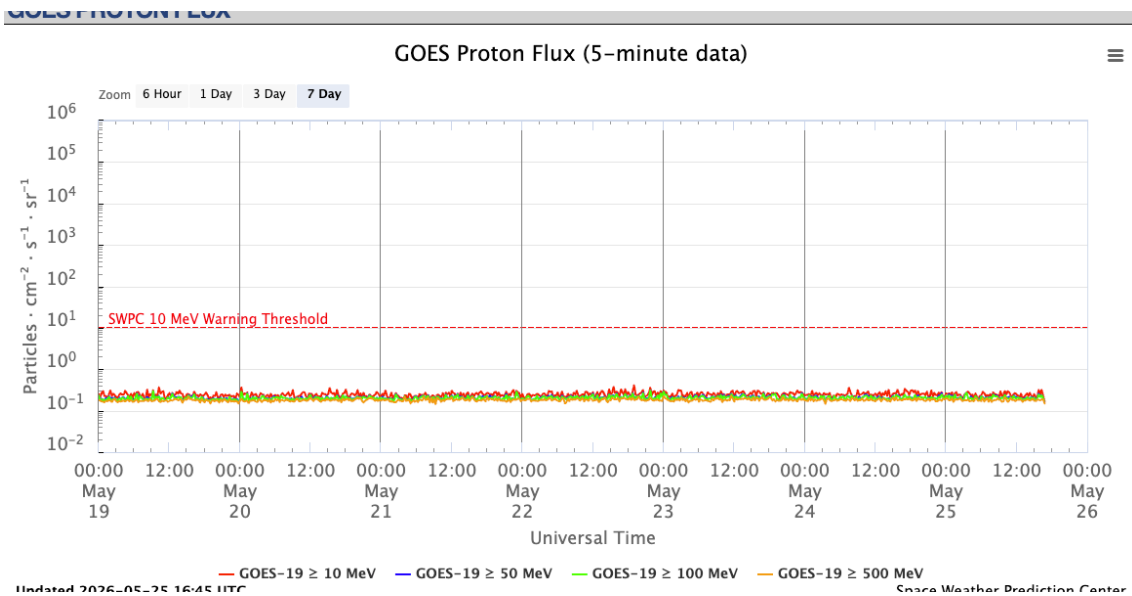


Figure 2: Proton flux ($\geq 10\text{ MeV}$, $\geq 50\text{ MeV}$, $\geq 100\text{ MeV}$, $\geq 500\text{ MeV}$) obtained from GOES-18 satellite. Source: <https://www.swpc.noaa.gov/products/goes-proton-flux>



Summary

The high-energy electron flux (≥ 2 MeV) at the outer edge of the radiation belt, obtained from the geostationary satellites GOES-18 and GOES-19 (Figure 1), remained above the alert threshold from May 19 to 24, 2026. Beginning on May 25, an abrupt decrease in the flux was observed, reaching approximately $\sim 10^2$ particles/(cm² s sr), characterizing a dropout of one order of magnitude.

The proton fluxes ≥ 10 MeV and ≥ 50 MeV at the outer edge of the radiation belt, obtained from the geostationary satellite GOES-18 (Figure 2), remained at background levels, below the alert threshold [10^1 particles/(cm² s sr)], with no significant changes.

Geomagnetic field

Responsible: Karen Sarmiento /Lívia Alves/Sony Su Chen

Summary

The period from May 18 to 25 was initially marked by the occurrence of a G1 (minor) geomagnetic storm, followed by a gradual return to predominantly quiet geomagnetic conditions.

Between May 18 and 20, instabilities in geomagnetic activity were observed, evolving into a G1 geomagnetic storm on May 19. During this interval, the Kp index reached a maximum value of 4o between 09:00 UT and 12:00 UT on May 19. The Ksa index, in turn, reached the G1 level between 15:00 UT and 18:00 UT on the same day, registering a maximum value of 6-.

In the auroral region, the AE index remained above 500 nT during several intervals, with the most significant intensification occurring between 06:00 UT and 19:00 UT on May 19. The Dst index reached a minimum value of -36 nT between 19:00 UT and 20:00 UT, while the dHsa index registered a minimum of -98 nT around 15:00 UT on the same day.

From May 21 onward, geomagnetic activity returned to predominantly quiet levels, although isolated instabilities were still observed. Despite these variations, the indices remained below the threshold characteristic of a G1 geomagnetic storm.

Over the last 24 hours, geomagnetic activity remained predominantly quiet, with only isolated instabilities observed.

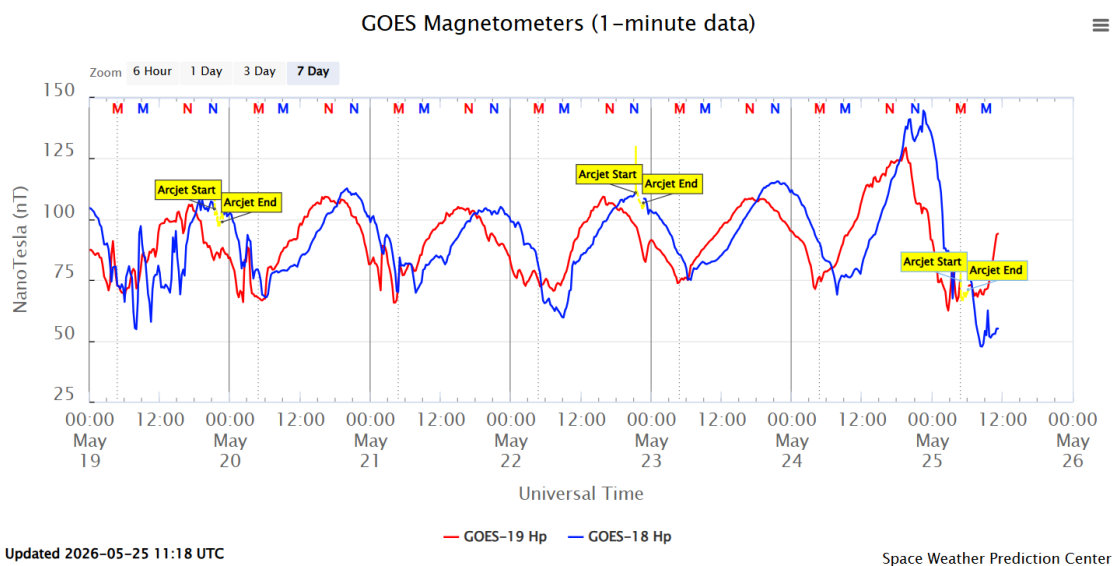


Figure 1 - Magnetic field measurement at the GOES satellite position.

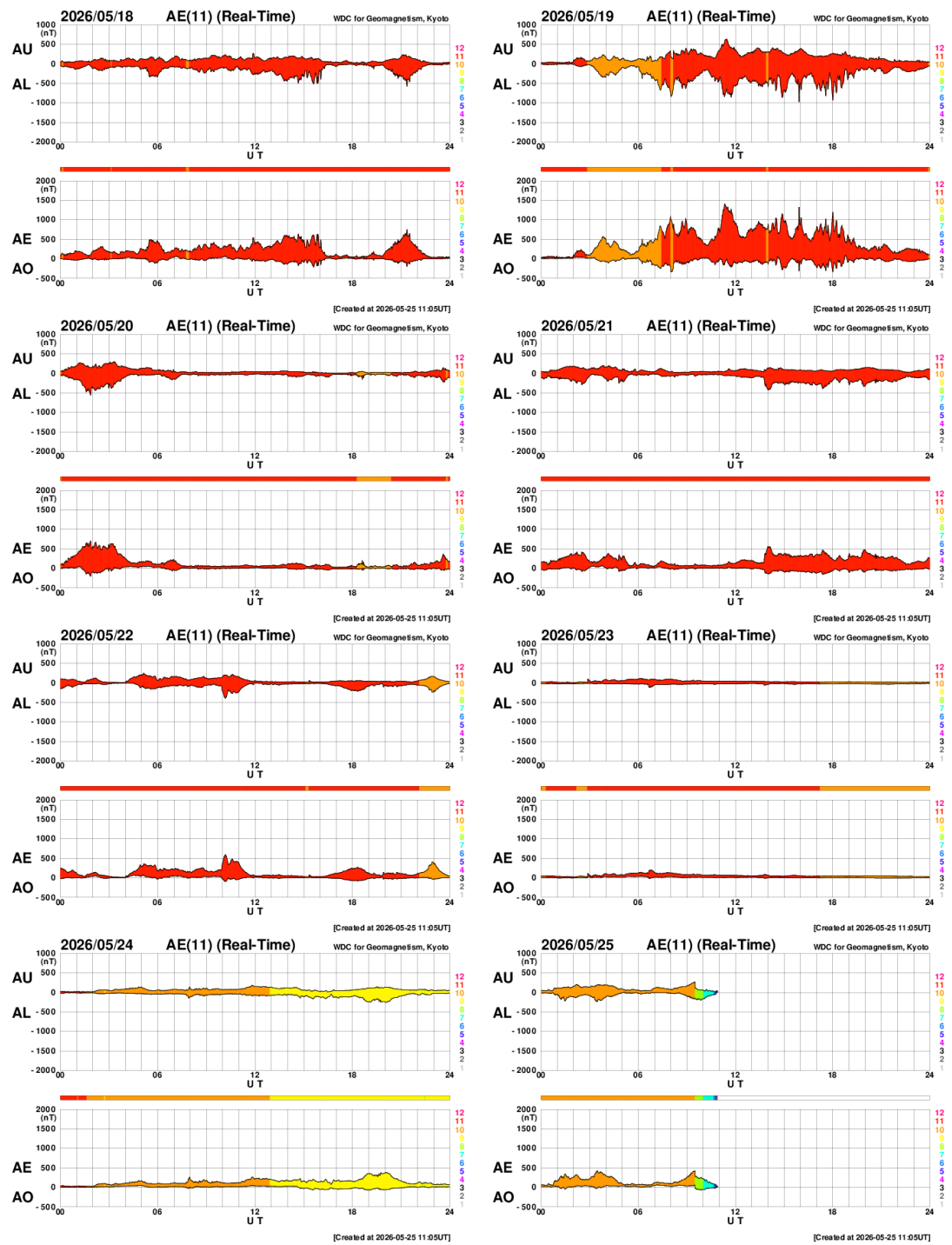


Figure 2 - AE index for the days of the week.

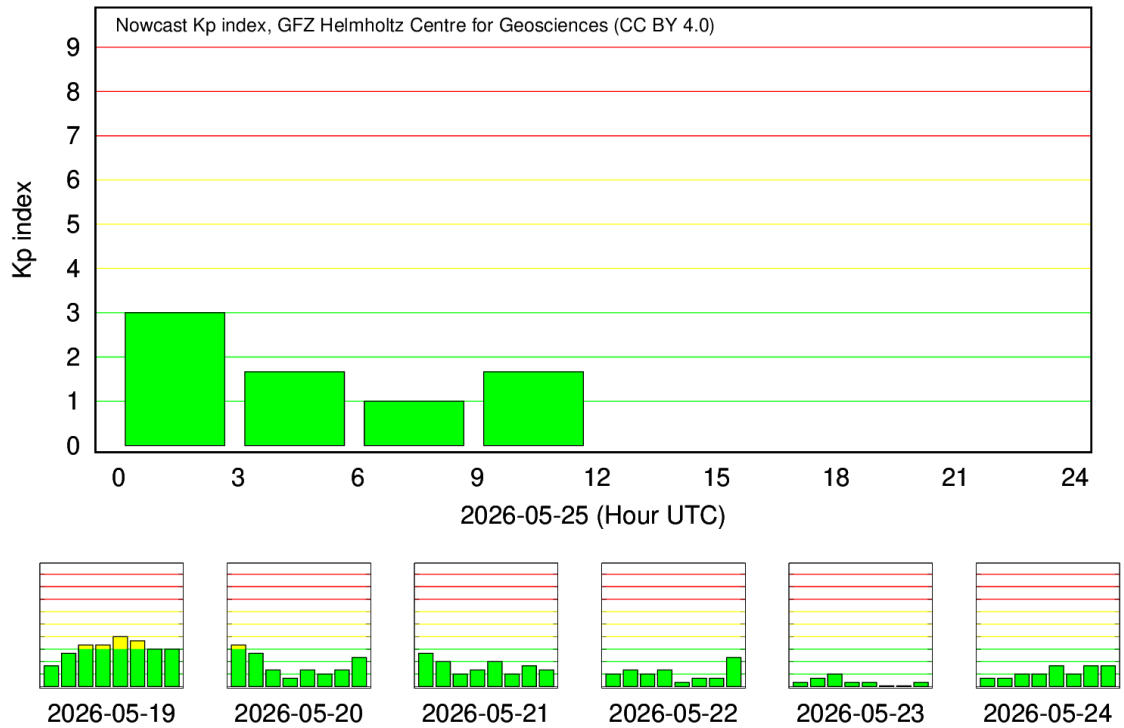


Figure 3 - Kp index on a logarithmic scale.

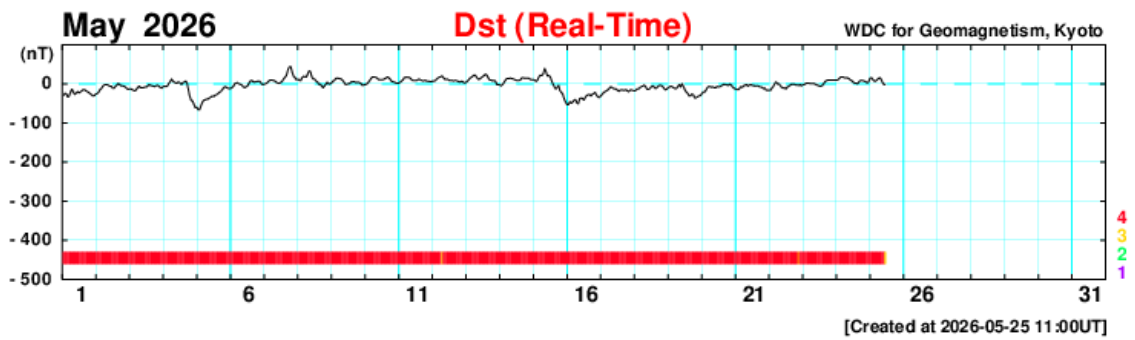


Figure 4 - Dst index.

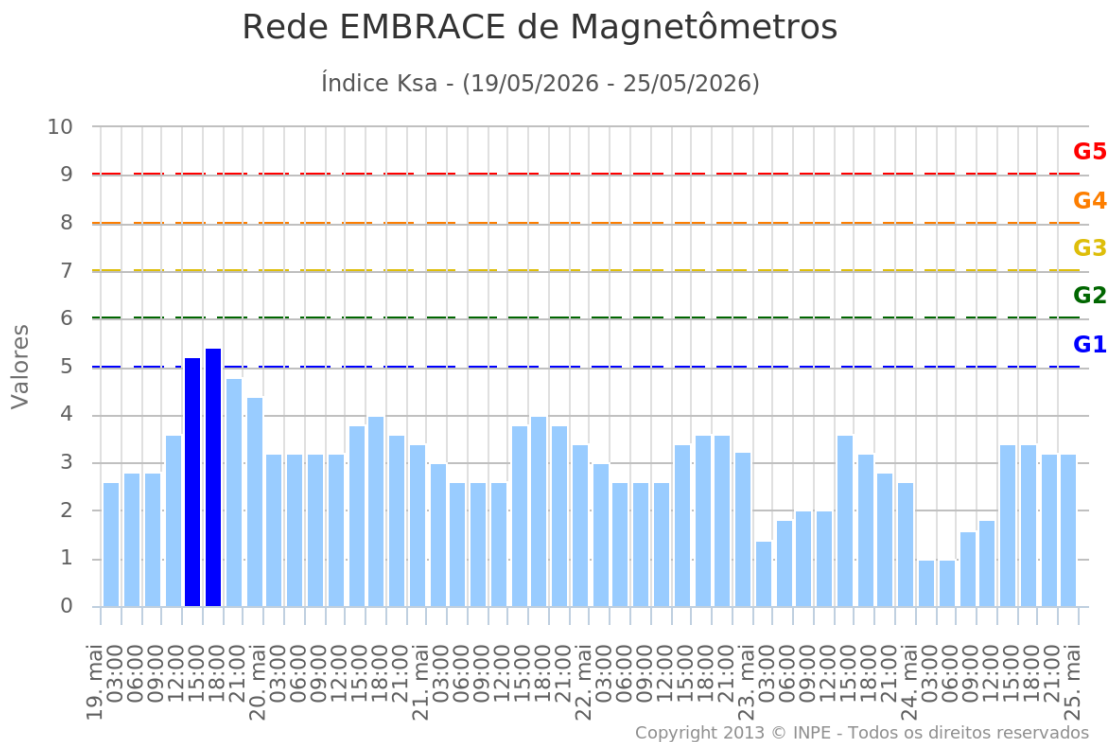
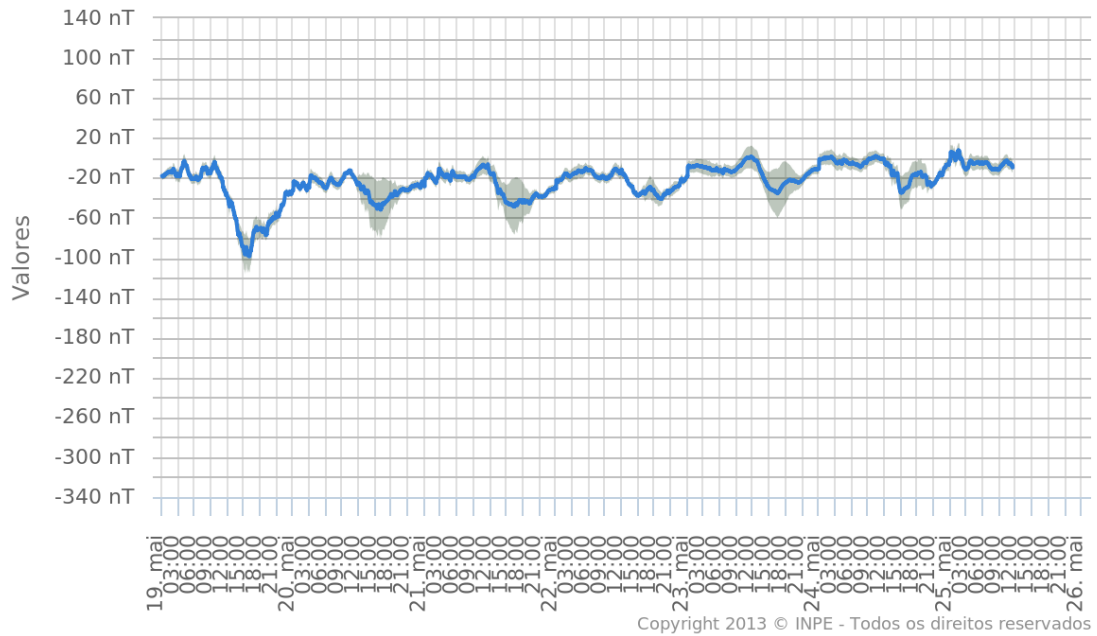


Figure 5 - Geomagnetic index in South America - Ksa Index.

Rede EMBRACE de Magnetômetros

ΔH_{sa} - (19/05/2026 - 25/05/2026)



Rede EMBRACE de Magnetômetros

ΔH - (19/05/2026 - 25/05/2026)

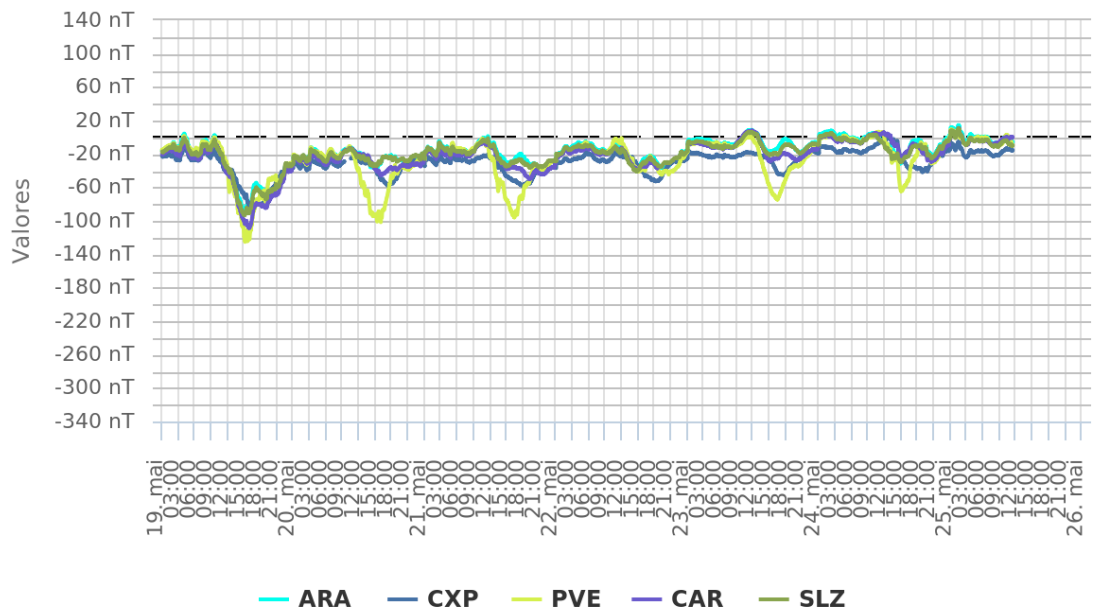


Figure 6 - Geomagnetic index in South America - ΔH index and at magnetic stations of the EMBRACE Program.

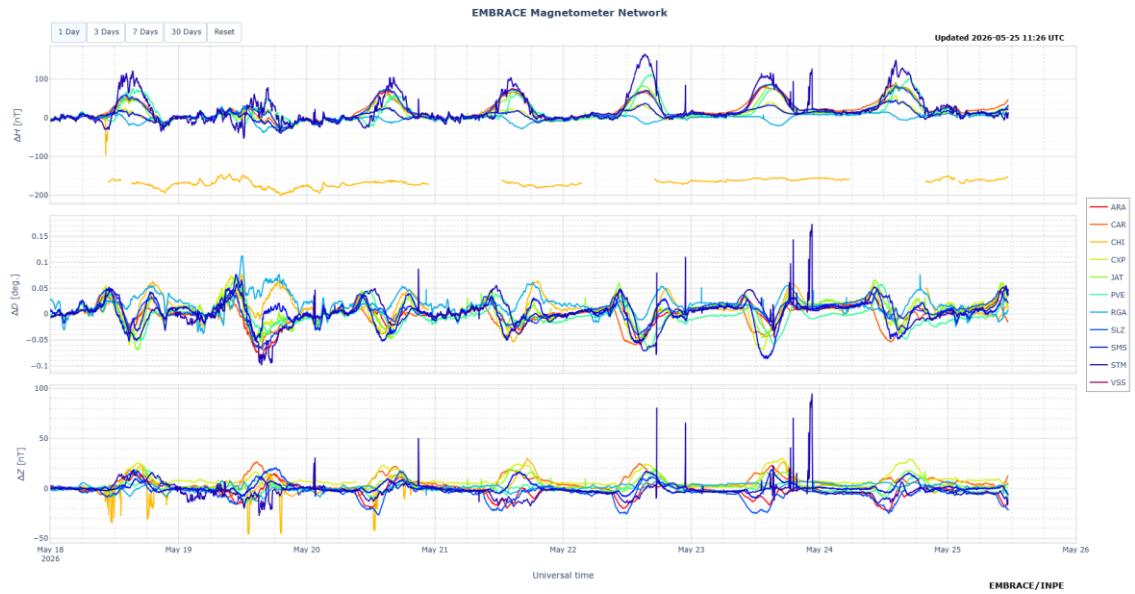


Figura 7 – Variation of the geomagnetic field at the magnetic stations of the EMBRACE Program.

Ionosfera – Digisonde (Laysa Resende)

Summary

During this week, spread F was observed over Boa Vista, whereas no spread F signatures were detected over Cachoeira Paulista. 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.

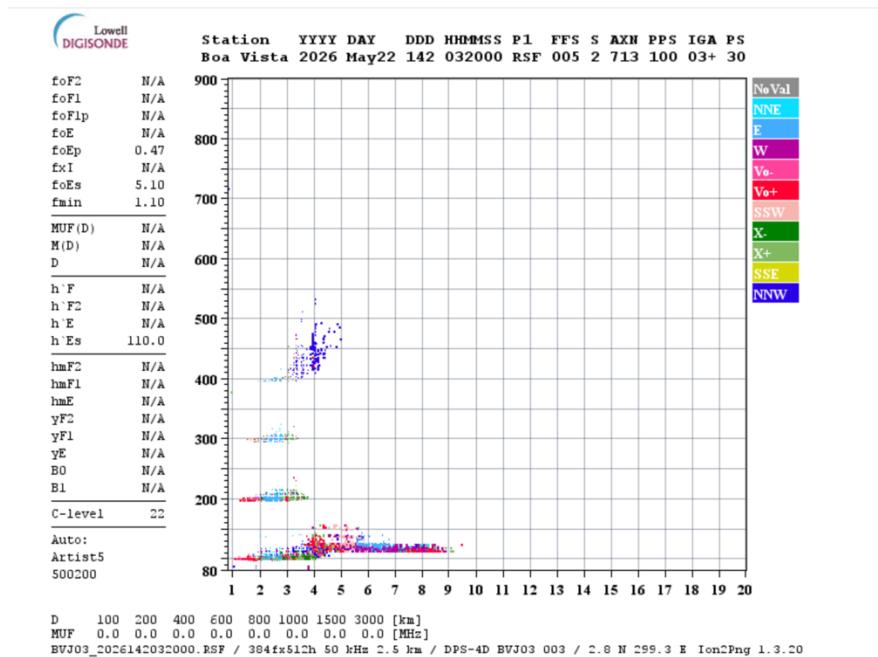


Figure 1 – Ionograms over Boa Vista, showing the strong Es layer.