

Sun – Solar Activity (Jean C. Santos)

Summary

The Sun exhibited moderate activity with the presence of two highly complex magnetic (beta-gamma-delta) active regions on the solar disk at the beginning of the week. During this period, four M-class solar flares occurred. The Cactus software identified 25 CMEs, none of which were halo-type (angular width greater than 180 degrees). During this period, the presence of some coronal holes with significant area (>2.0% of the solar disk area) was identified on the Sun's surface, which may have affected the characteristics of the solar wind.

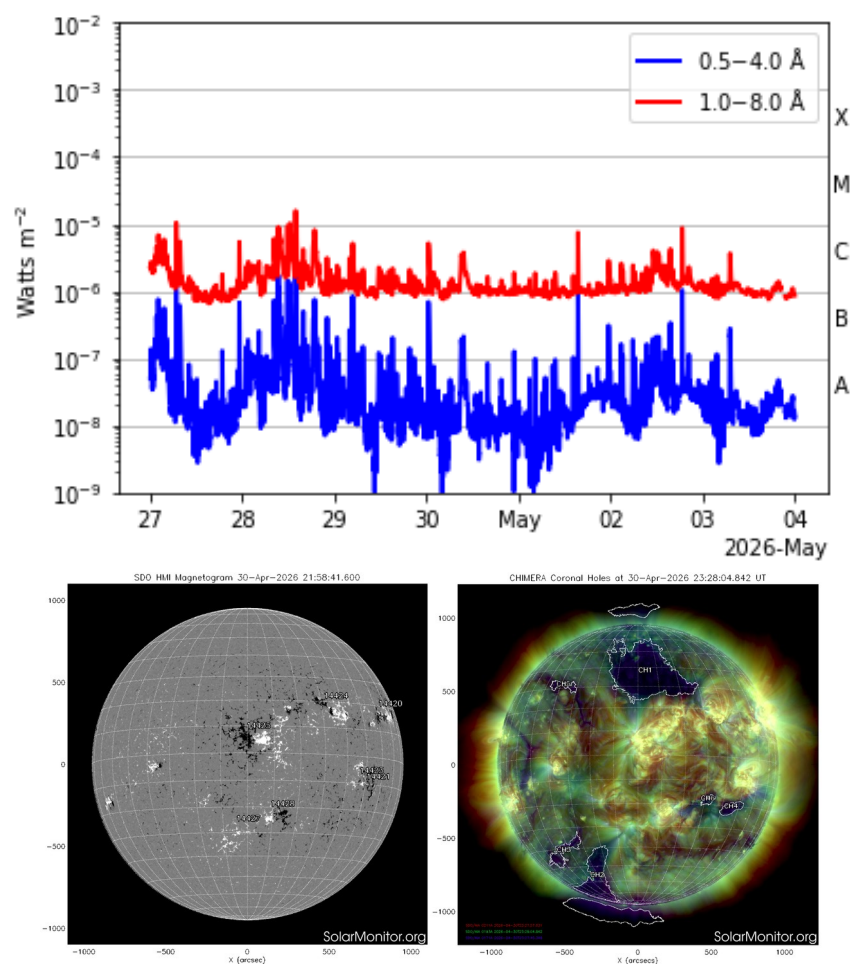


Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period from April 27 to May 3, magnetic field in the line of sight (bottom left panel) and image at 193 angstroms (bottom right panel) measured on April 30, 2026.



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

Period: April 27th to May 4th

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 CME 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 April 30th at 16:30 UT at +13.45 nT.
- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-10.75, +8.13] nT. Showing fifteen rotations of the By component.
- The Bz component presents negative values for most of the week with a maximum negative -9.65 nT at 15:30 UT on May 4th. It presented positive value of +6.61 nT on May 4th at 13:30 UT.
- The solar wind density maximum peaked on May 4th at 13:30 UT, reaching 8.46 protons/cm³.
- The solar wind speed fluctuated between 309 to 503 km/s, with a decrease beginning at 18:30 UT on April 27th.
- The magnetopause position remained relaxed almost throughout the analyzed period, reaching maximum compression (9.29 RE) at 17:30 UT on May 4th.
- During the early part of the week, the measured and modeled interplanetary Kp index fluctuated between 0 and 3, reaching values above 4 (Kp > 4) on May 1st, indicating active geomagnetic conditions. The week ending with values fluctuating between 1 (Kp = 1) and below 4 (Kp < 4) 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.

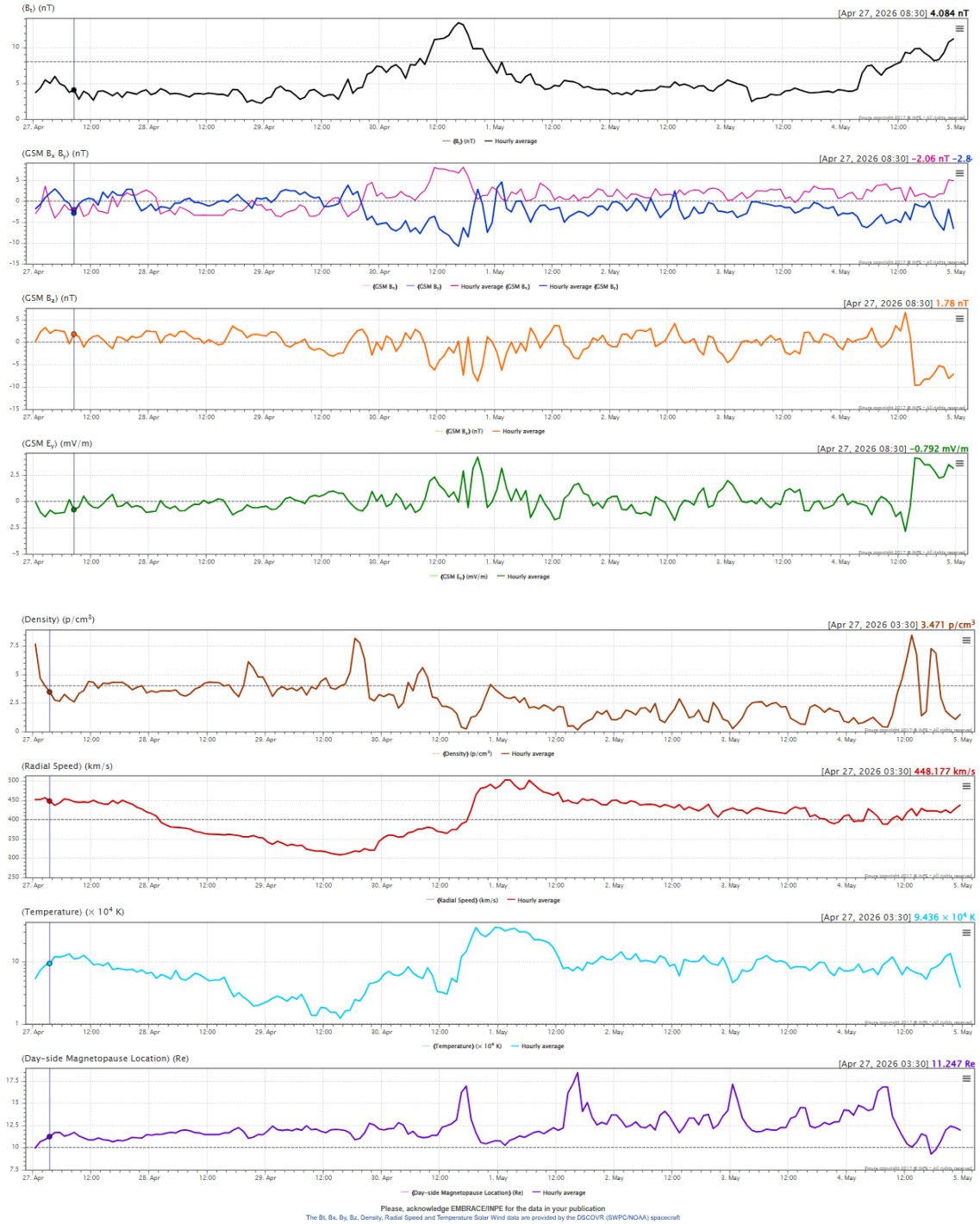


Figure 1: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

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.

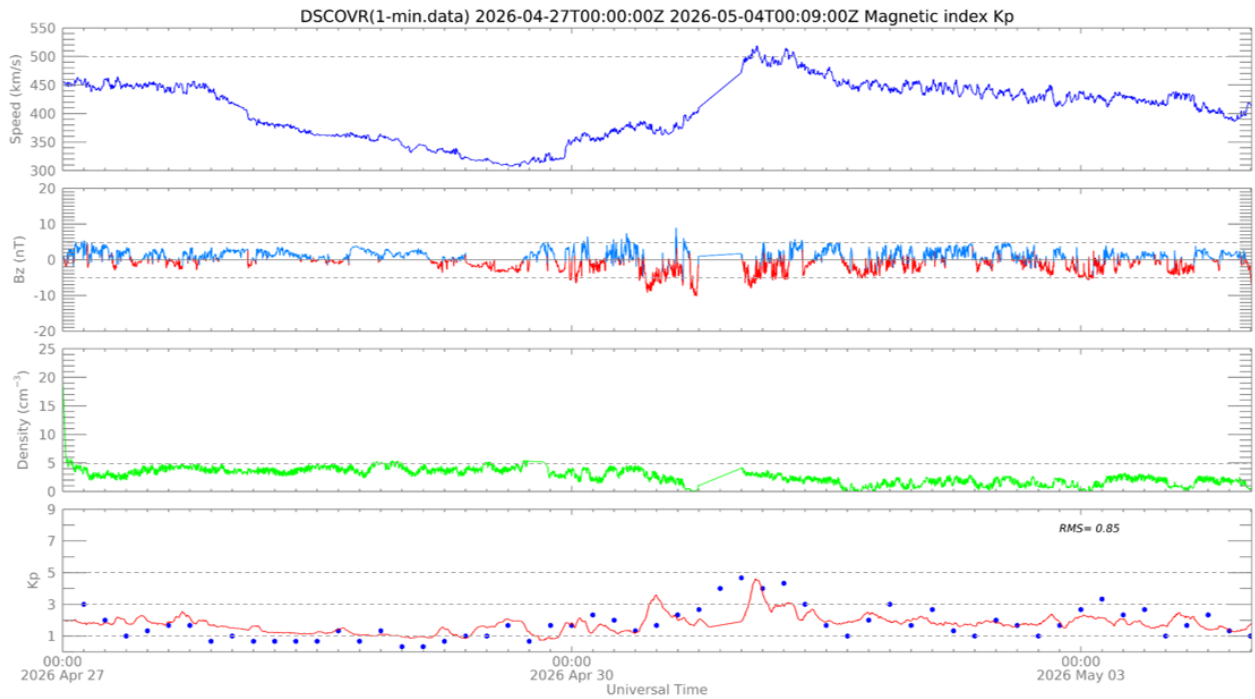


Figure 2: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

EARTH'S RADIATION BELT

Responsible: Ligia Da Silva

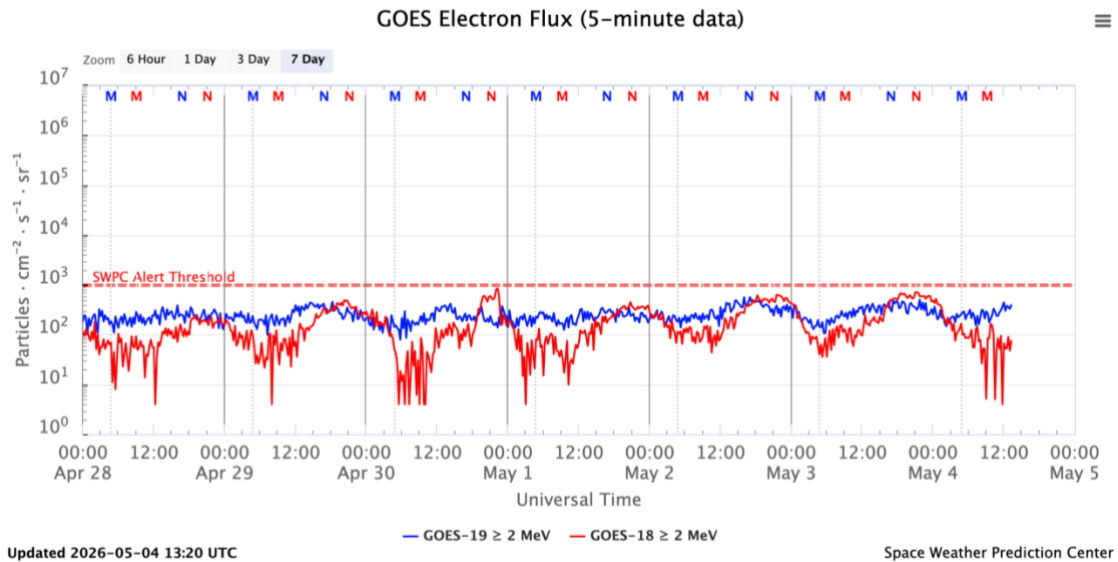


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-18 and GOES-19 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

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 was observed on April 30th, the second on May 1st, and the third on May 4th.

Geomagnetic field

Responsible: Karen Sarmiento /Livia Alves/Sony Su Chen

Summary

The period from April 27 to May 4 was marked by a transition from predominantly quiet geomagnetic conditions to a G1 (minor) geomagnetic storm scenario.

Between April 27 and 29, geomagnetic activity remained generally quiet, with indices fluctuating near their baseline values. During this interval, the Kp index ranged from 0o to 3o, while the Ksa index varied between 1- and 4o. In the auroral region, the AE index remained below 500 nT for most of the time, and the Dst index ranged between -8 and 20 nT.

Starting on April 30, instabilities began to be observed in the geomagnetic activity indices, culminating in the onset of a geomagnetic storm during the second half of the day. The Kp index reached 4- between 21 and 24 UT, while the Ksa index registered 5o over the same interval, characterizing a minor (G1) geomagnetic storm. In the auroral region, the AE index exceeded 500 nT around 12 UT and remained elevated for several hours. Meanwhile, the Dst index reached its minimum value of -42 nT at approximately 23 UT on April 30. Subsequently, the geomagnetic field entered the recovery phase, showing only isolated instabilities.

Over the past 24 hours, however, geomagnetic activity has intensified again, with new instabilities associated with the onset of another geomagnetic storm.

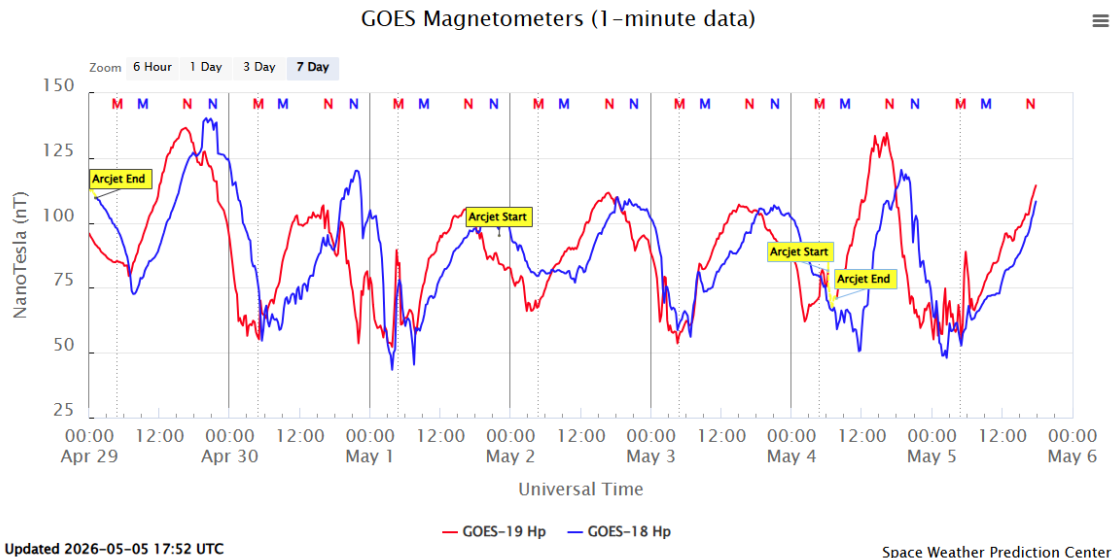


Figure 1 - Magnetic field measurement at the GOES satellite position.

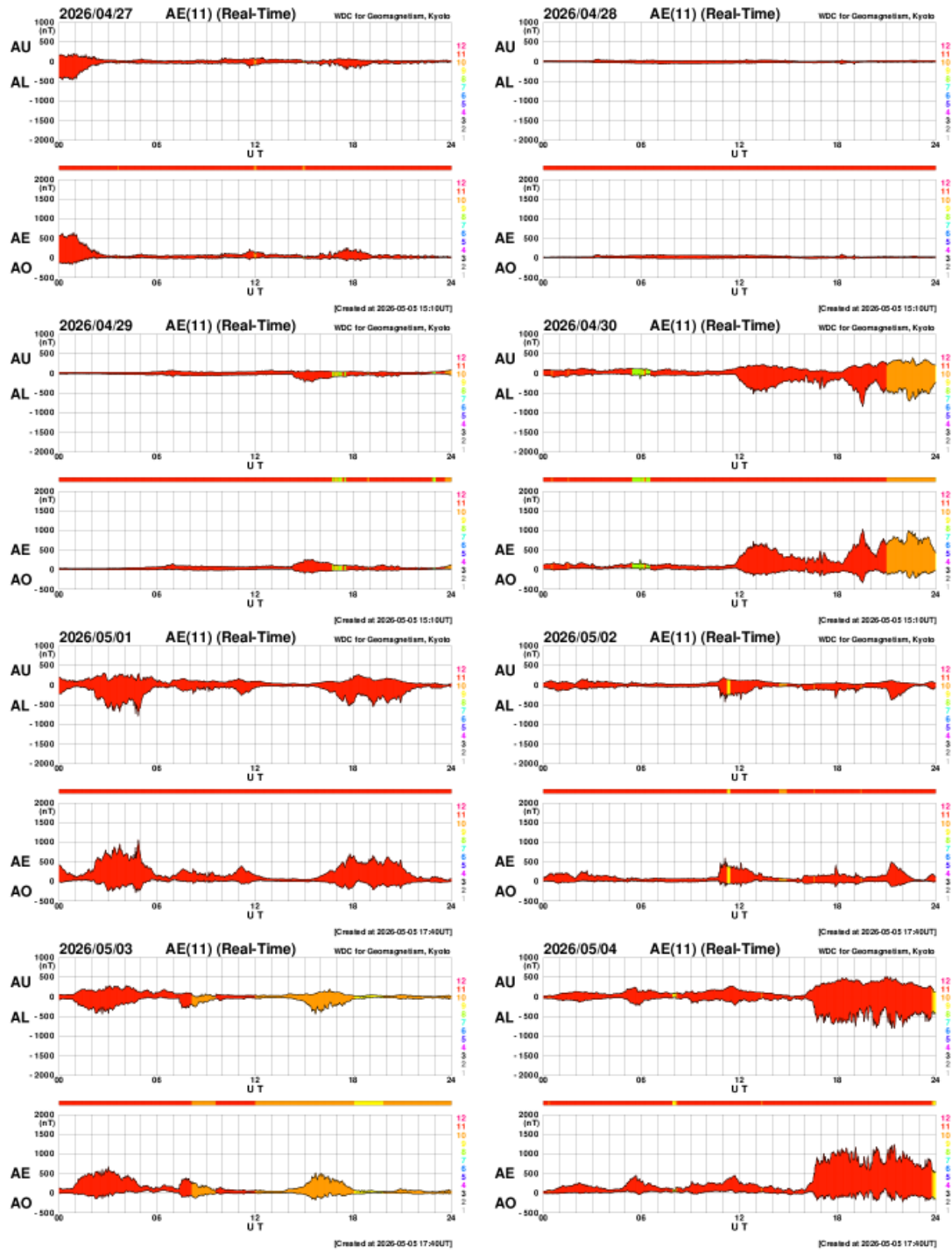


Figure 2 - AE index for the days of the week.

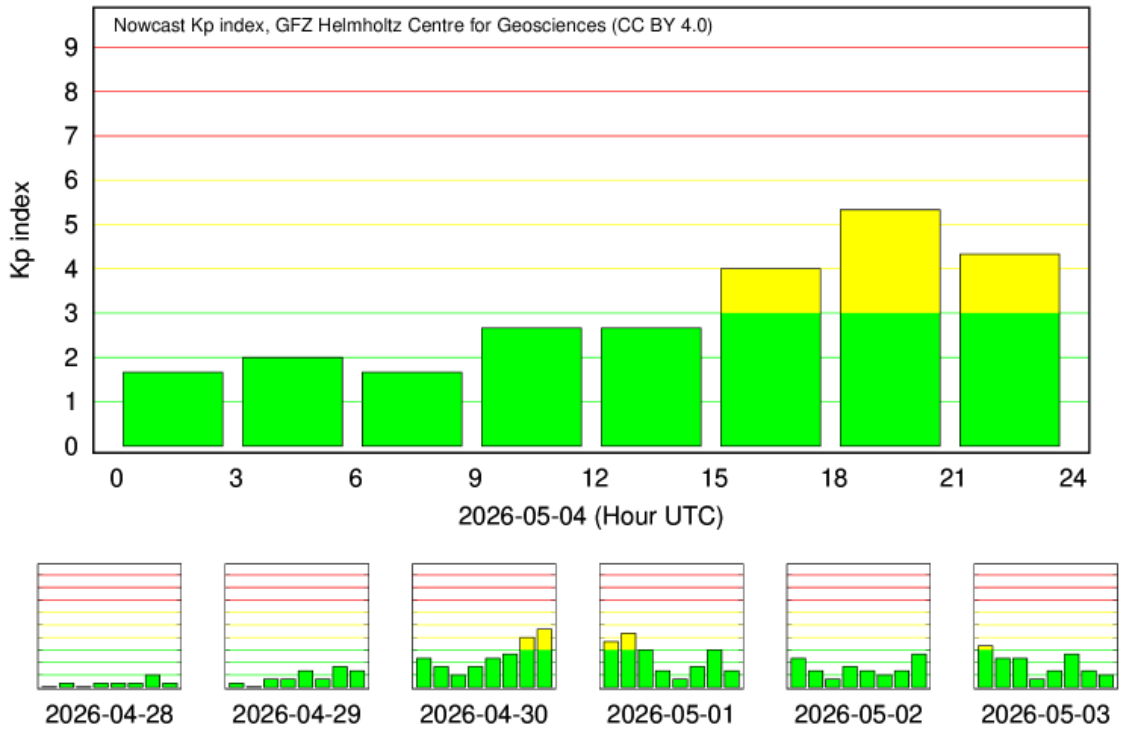


Figure 3 - Kp index on a logarithmic scale.

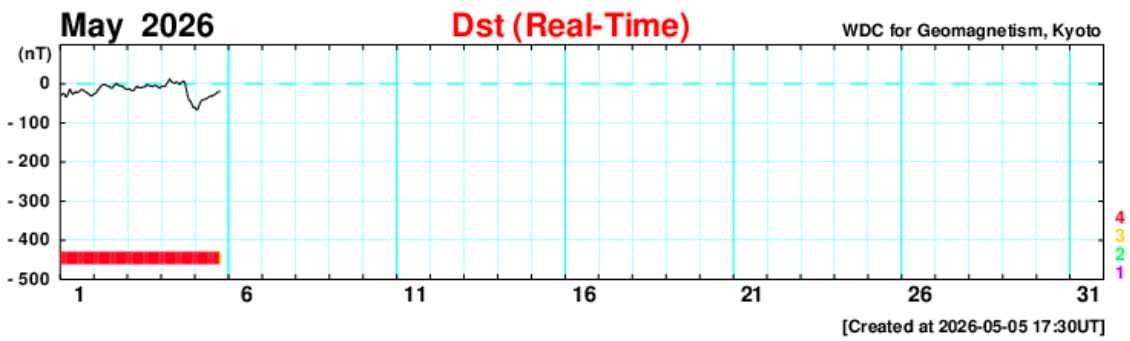
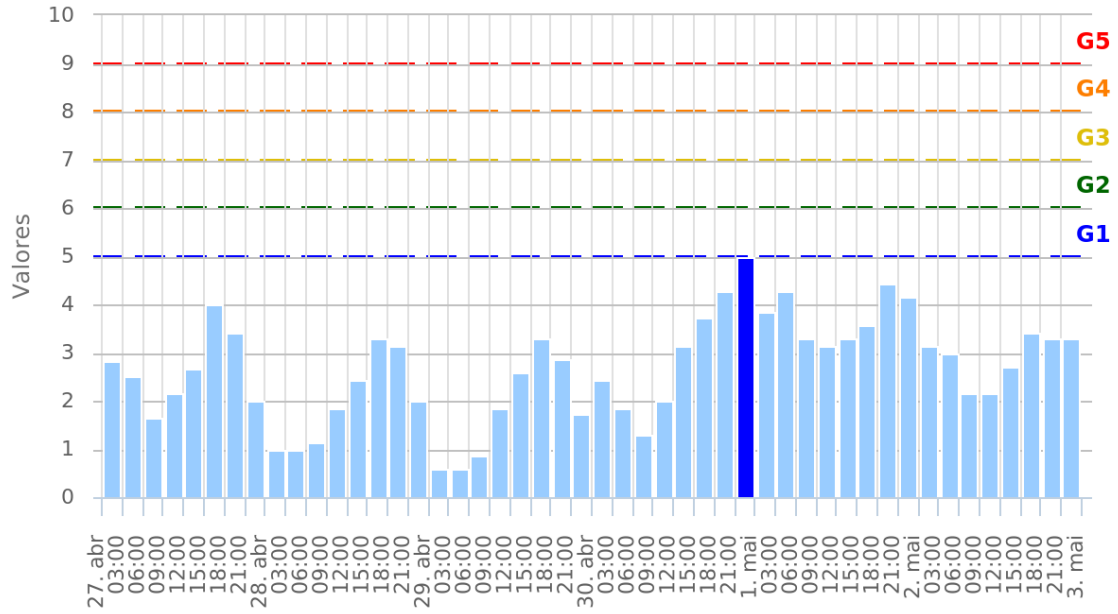


Figure 4 - Dst index.

Rede EMBRACE de Magnetômetros

Índice Ksa - (27/04/2026 - 03/05/2026)

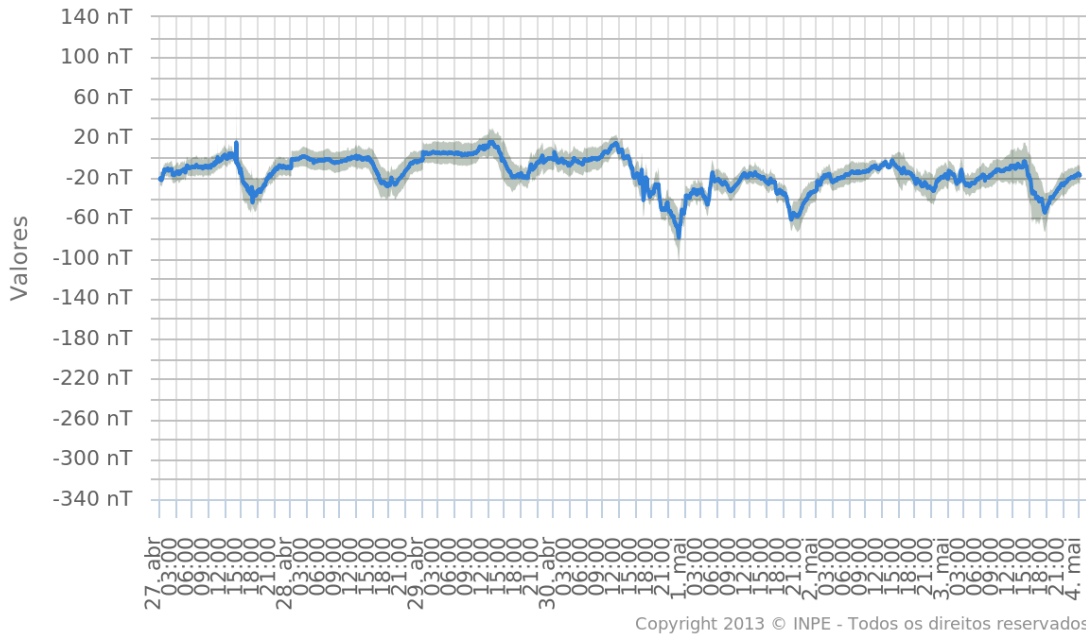


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Figure 5 - Geomagnetic index in South America - Ksa Index.

Rede EMBRACE de Magnetômetros

ΔH_{sa} - (27/04/2026 - 03/05/2026)



Rede EMBRACE de Magnetômetros

ΔH - (27/04/2026 - 03/05/2026)

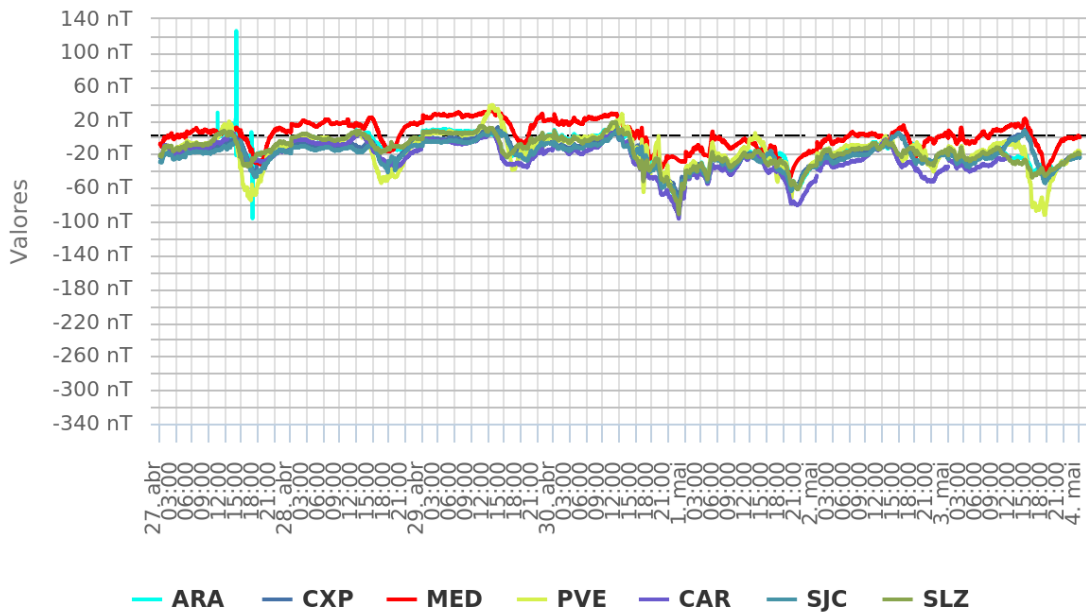


Figure 6 - Geomagnetic index in South America - ΔH index and at magnetic stations of the EMBRACE Program.

Ionosfera – Digisonde (Laysa Resende)

Summary

This week, spread F was observed over Boa Vista (Figure 1), whereas no spread F was detected over Cachoeira Paulista, a low-latitude station. Sporadic E (Es) layers were weak throughout the week over both Boa Vista and Cachoeira Paulista.

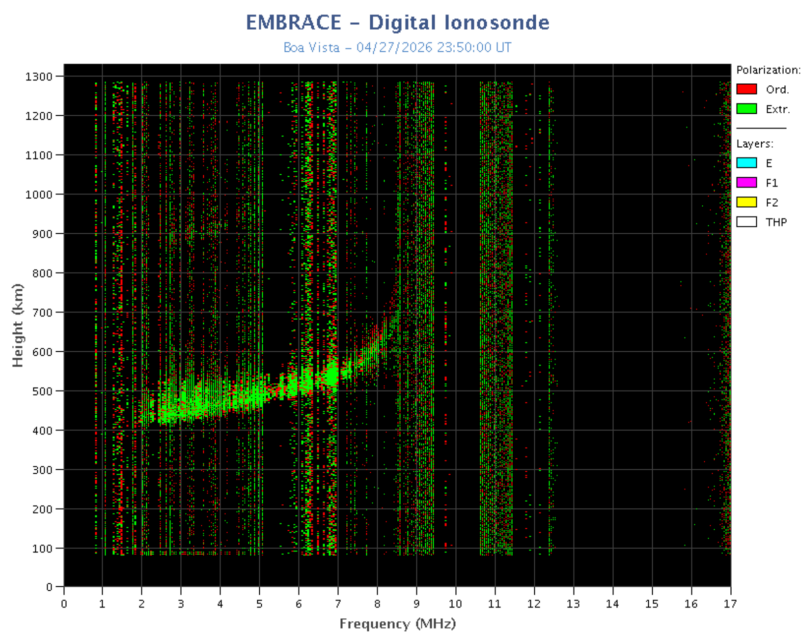


Figure 1 –Ionogram over Cachoeira Paulista, showing the spread F.