Sun – Solar Activity (Jean C. Santos)

Summary

The Sun exhibited low activity throughout the week, with active regions of low (alpha) and medium (beta) magnetic complexity present on the solar disk. No M-class or X-class solar flares occurred during this period. The Cactus software identified 17 CMEs, none of which were of the "halo" type (having an angular width greater than 180 degrees). A coronal hole with a significant area (>2.0% of the solar disk's total area) was also observed crossing the solar disk during this interval.

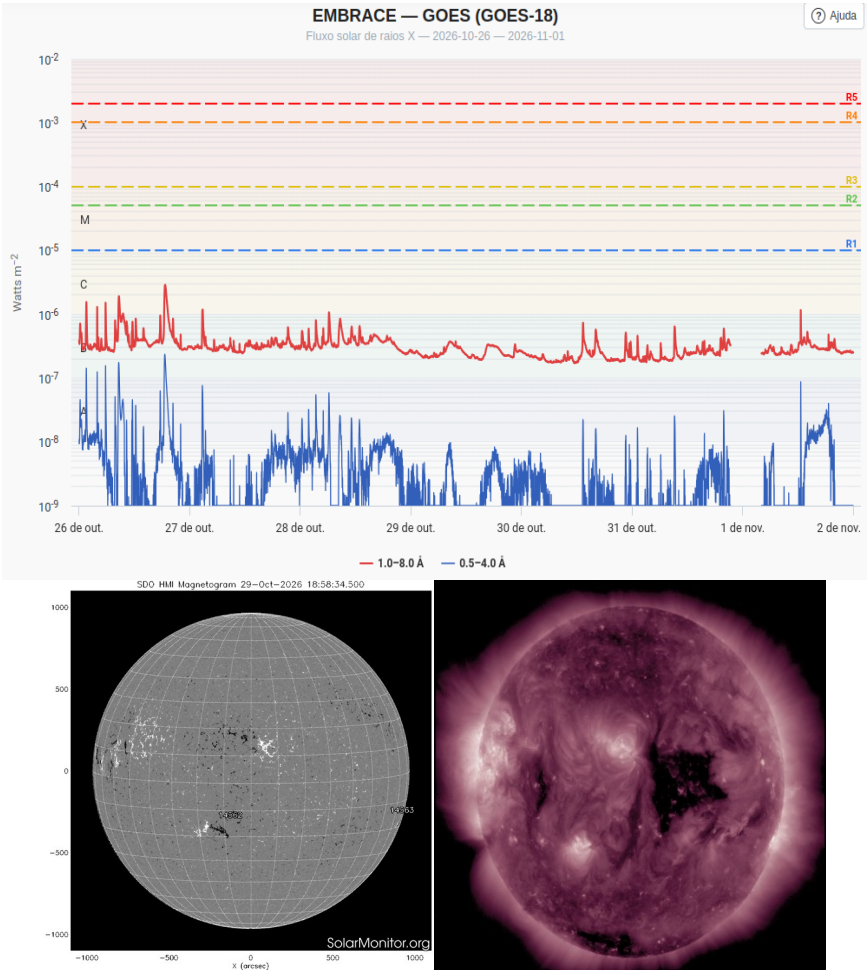


Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period from October 26 to November 1, line-of-sight magnetic field (bottom left panel), and an image at 211 angstroms (bottom right panel), as measured on October 29, 2026.

Interplanetary Medium – IM – Daniele da S. F. Medeiros and Paulo R. Jauer
Period: October 26th to November 3rt

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 HSS identified by the SOLAR-1 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 October 31st at 15:30 UT at +11.67 nT.

- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-8.32, +7.31] nT. Showing sixteen rotations of the By component.

- The Bz component presents negative values for most of the week with a maximum negative -7.08 nT at 17:30 UT on October 31st. It presented positive value of +4.85 nT on October 26th at 17:30 UT.

- The solar wind density maximum peaked on October 27th at 02:30 UT, reaching 8.51 protons/cm^3.

- The solar wind speed fluctuated between 309 to 552 km/s. An increase was observed beginning at 03:30 UT on October 31st.

- The modeled and measured Kp index began the week with values below 4 (Kp < 4), indicating a quiet period. However, on October 30, both the measured and modeled Kp indices reached values above 4 (Kp > 4), and on October 31, the modeled Kp index reached values above 7 (Kp > 7), indicating a strong storm (G3 level). After this storm, the indices fluctuated and remained during the calm period below 4 (Kp < 4)

Figure 1 illustrates a set of parameters observed in the solar wind by the SOLAR-1 and ACE satellite. The measured solar wind parameters can be identified in the following order starting: Interplanetary magnetic field modulus (IMF), the Bx, By, Bz components, Ey component, Solar wind density, speed and temperature.

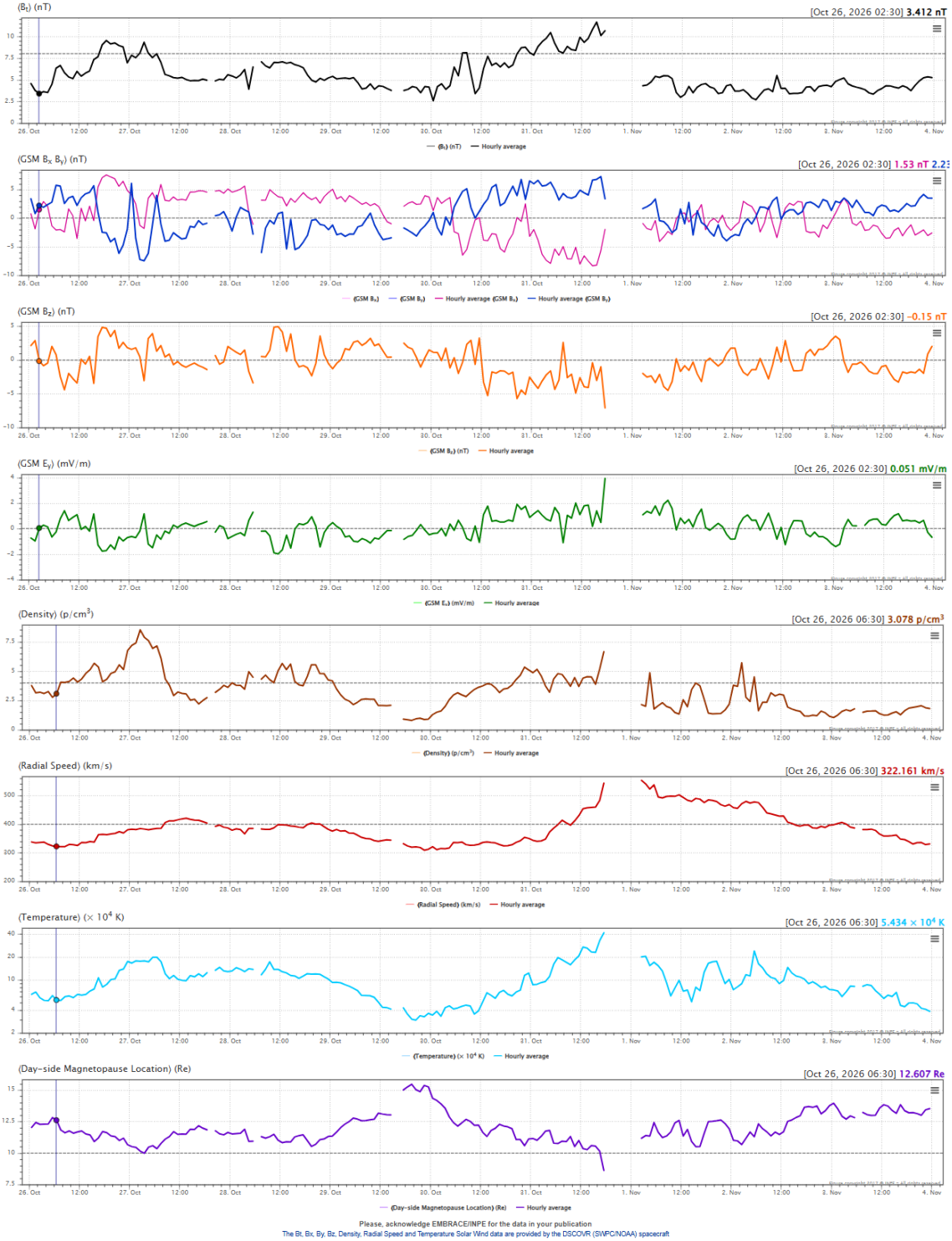


Figure 1: Illustrates a set of parameters observed in the solar wind by the SOLAR-1 and ACE satellite.

Figure 2 presents the temporal evolution of the Kp index. The measured Kp data were obtained from NOAA/SWPC and are compared with the 1-minute Kp values estimated by the proposed model.

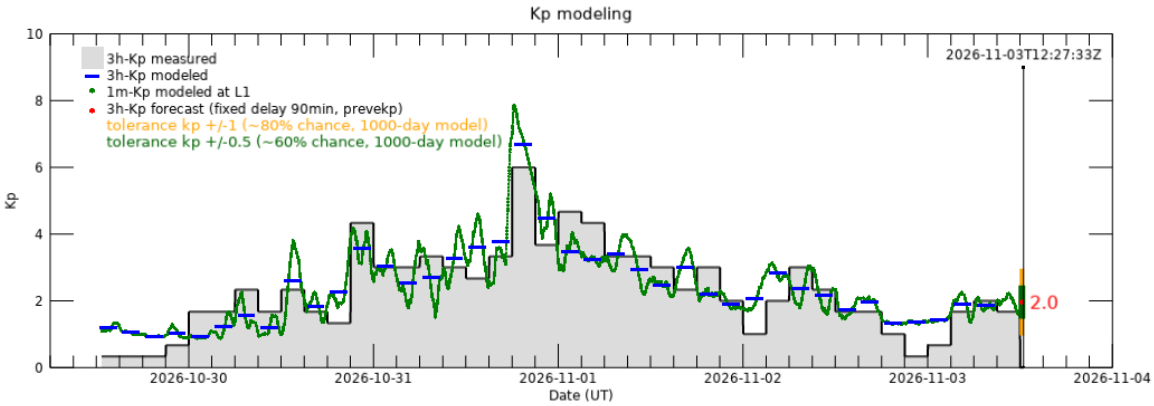


Figure 2: Observed and modeled Kp. Gray bars represent the measured Kp at 3-hour intervals, the green line shows the modeled Kp at 1-minute resolution, and the dashed blue line indicates the 3-hour forecast. The dashed red line marks forecasts above the active level (Kp > 4), while the vertical line indicates the time of the most recent forecast.

Geomagnetic field

Responsible: Karen Sarmiento /Lívia Alves/Sony Su Chen

Summary

The period from October 26 to November 3 was marked by initially quiet conditions, followed by a G1-level (minor) geomagnetic storm. The disturbances were primarily associated with the passage of an interplanetary magnetic structure beginning on October 30.

Geomagnetically quiet conditions prevailed from October 26 to 29. Beginning on October 30, disturbances in the geomagnetic field were observed, including a geomagnetic storm, primarily associated with the passage of an interplanetary magnetic structure.

The periods of greatest geomagnetic activity occurred on October 31 and November 1, when the AE index recorded average values above 500 nT. The storm reached its peak intensity on October 31, when the Dst index reached -56 nT at around 21 UT. The Ksa index reached the G1 level (6-) only during the interval from 18 to 21 UT that day, while the dHsa index recorded -119 nT during the main phase of the storm. A gradual recovery of geomagnetic conditions was subsequently observed.

Over the last 24 hours, geomagnetic activity remained predominantly quiet, although some brief intensifications were recorded. The AE index generally remained below 500 nT, exceeding this threshold between 07 and 11 UT on November 2. The Ksa index fluctuated between 2- and 4o, indicating periods of quiet to unsettled geomagnetic activity. Meanwhile, the Dst and dHsa indices continued to show a recovery trend, with values ranging from -27 to 0 nT and from -50 to 5 nT, respectively.

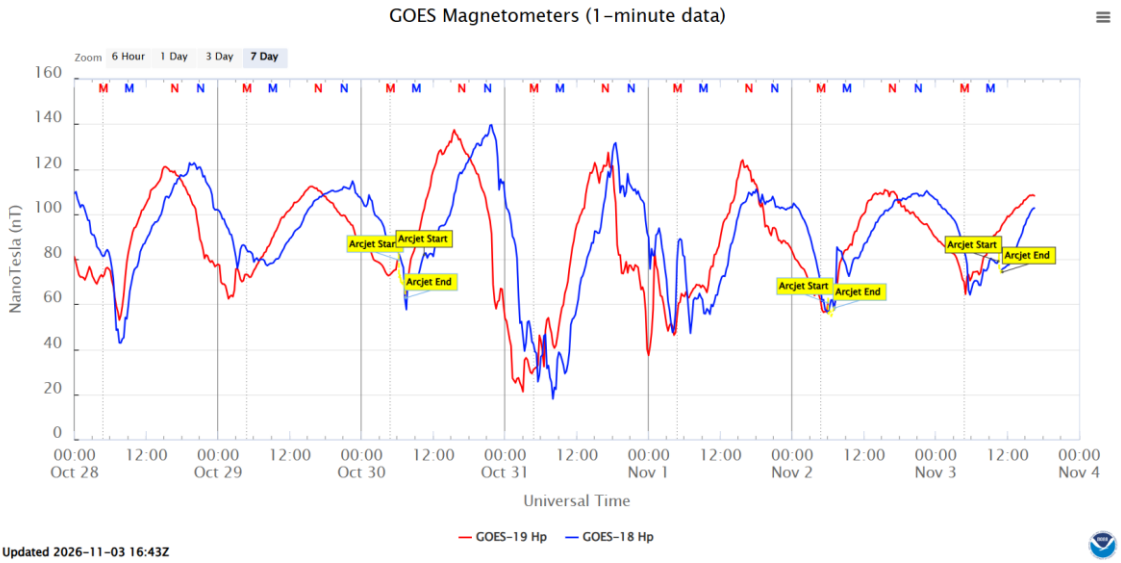


Figure 1 - Magnetic field measurement at the GOES satellite position.

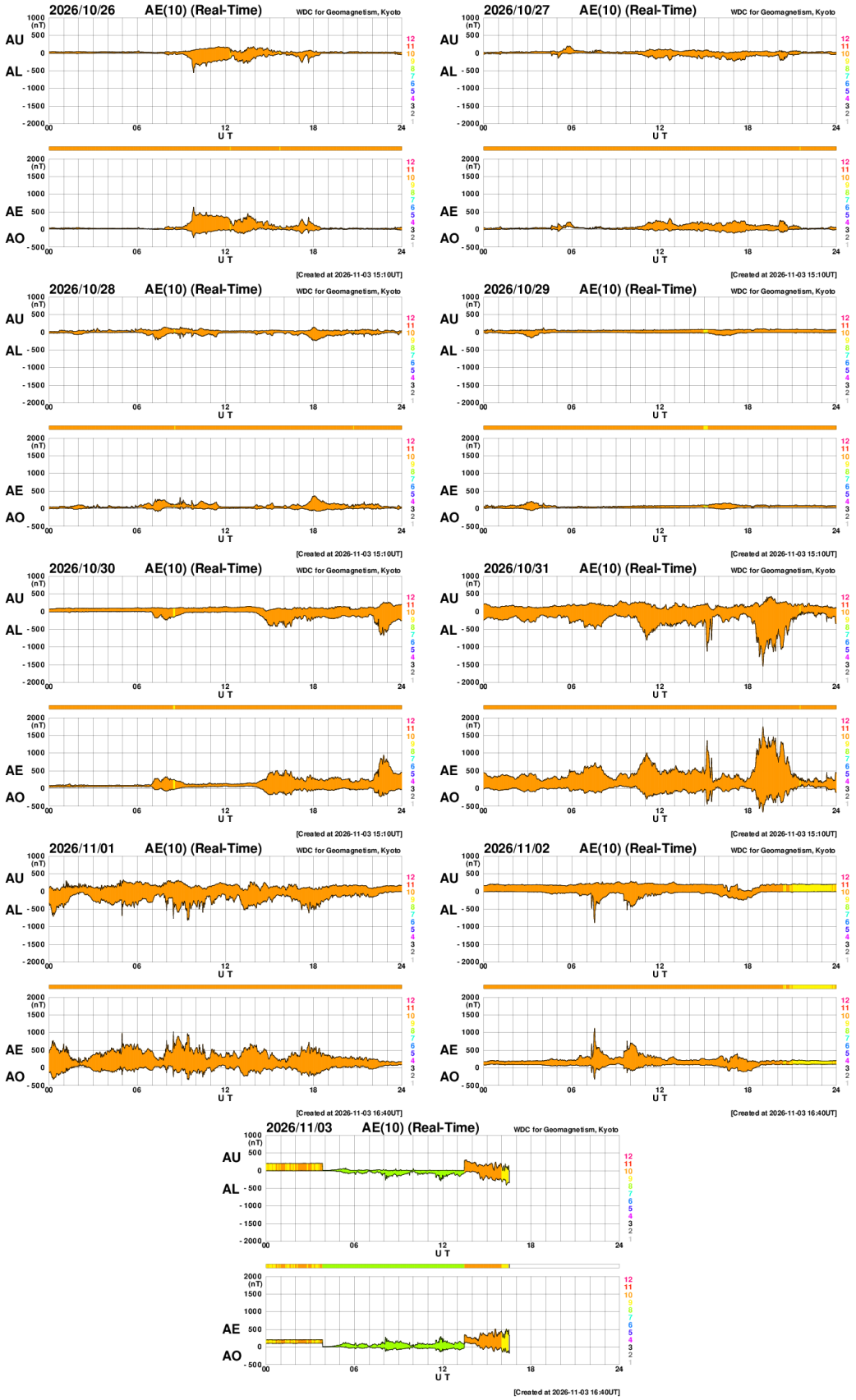


Figure 2 - AE index for the days of the week.



Figure 3 - Kp index on a logarithmic scale.

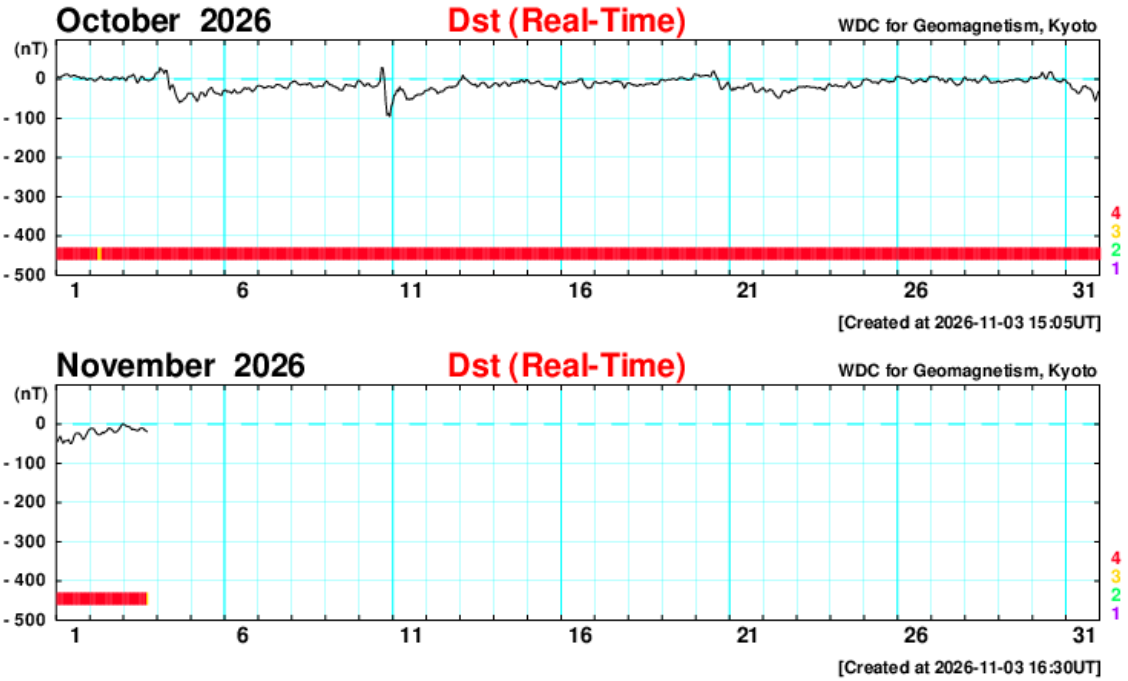


Figure 4 - Dst index.

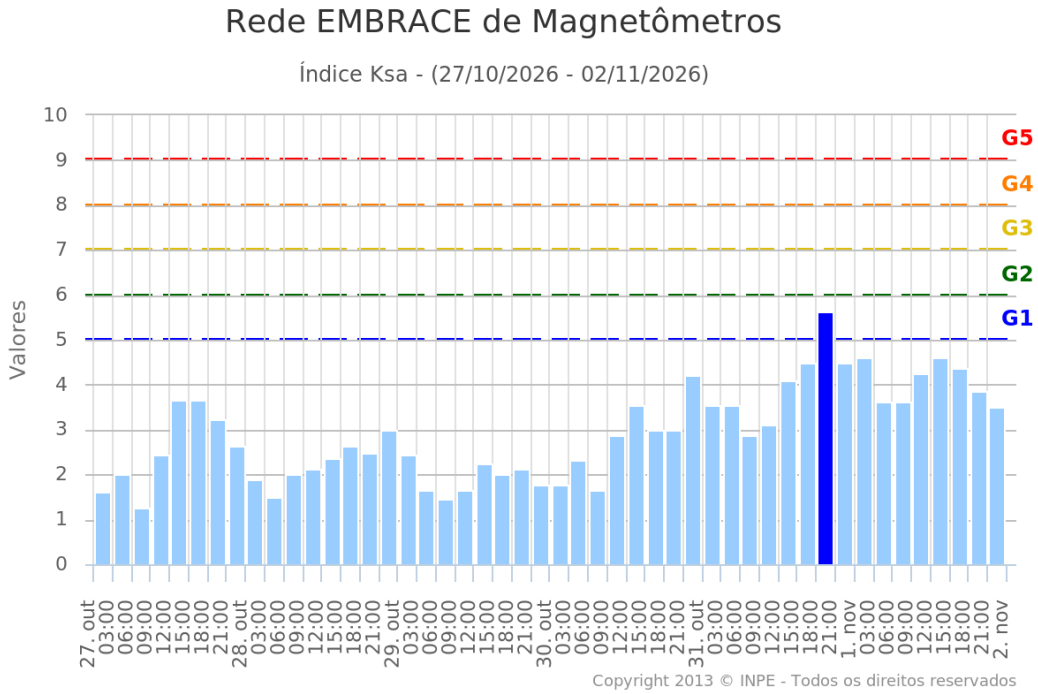


Figure 5 - Geomagnetic index in South America - Ksa Index.

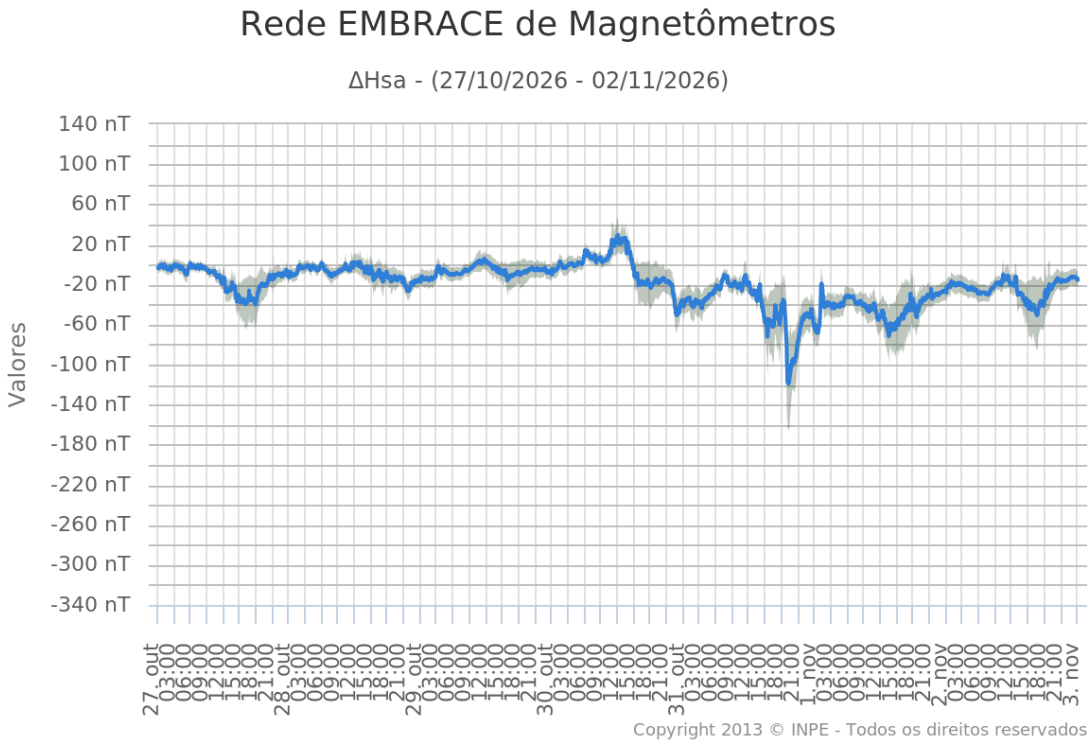


Figure 6 - Geomagnetic index in South America - ΔHsa index of the EMBRACE Program.

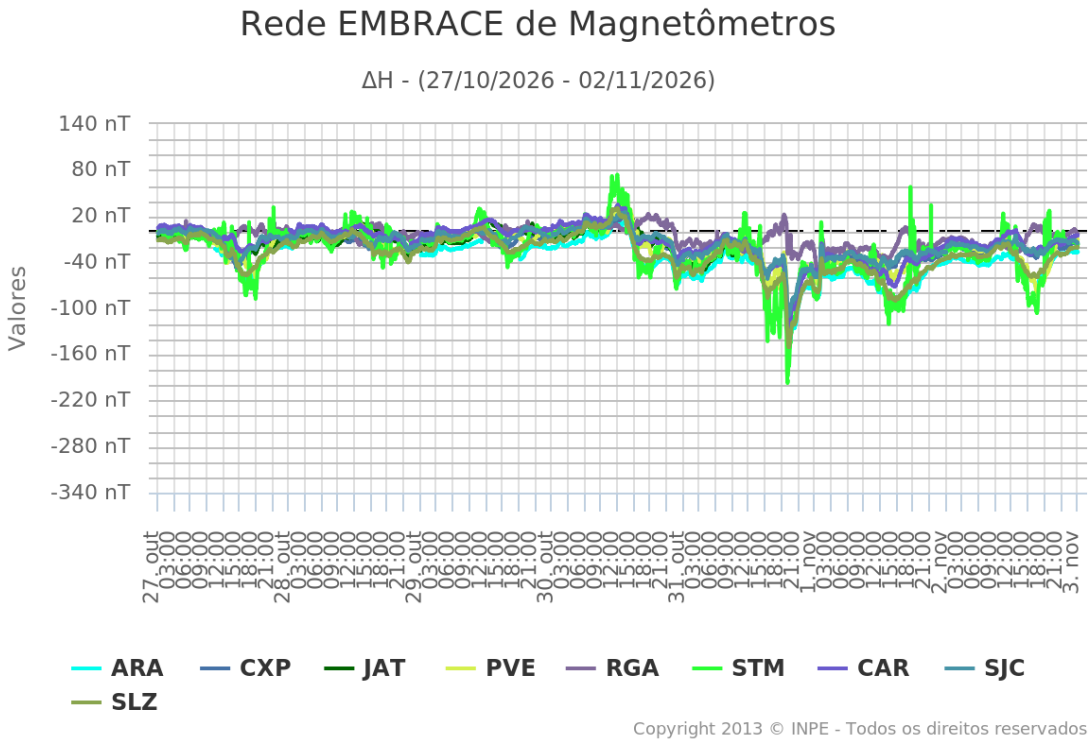


Figure 7 - Geomagnetic index in South America - ΔH index at magnetic stations of the EMBRACE Program.

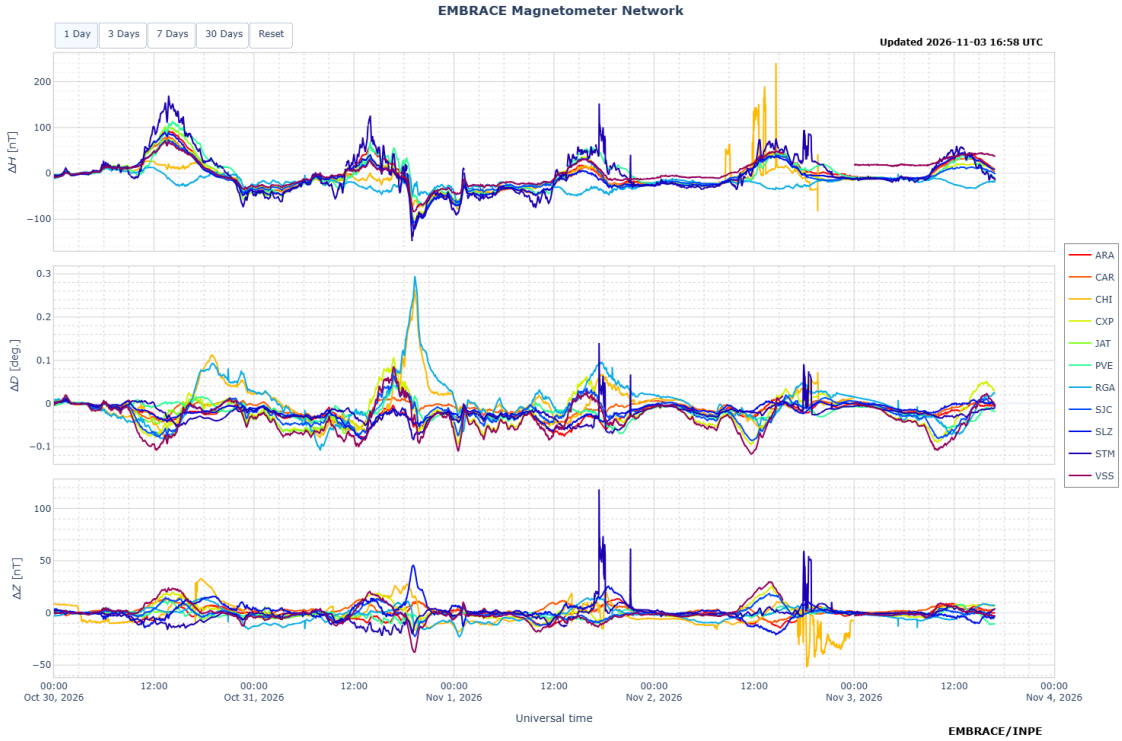


Figure 8 – Variation of the geomagnetic field at the magnetic stations of the EMBRACE Program.

Ionosfera – Digisonde (Laysa Resende)

Summary

During the reporting week, spread-F signatures were observed over Boa Vista and São Luís, whereas their occurrence over Cachoeira Paulista was detected only after October 29. Sporadic E (Es) layer activity remained weak across all three stations, with a maximum intensity level of 3 recorded over Boa Vista on October 31. Variations in the Maximum Usable Frequency (MUF) remained below the threshold for moderate ionospheric disturbance conditions throughout the analyzed period.

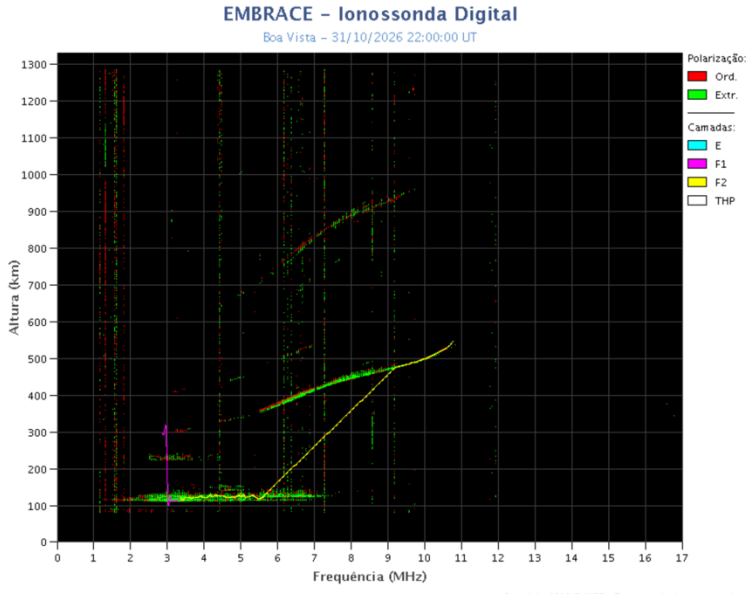


Figure 1 – Ionograms over Boa Vista, showing the Es layer.