Sun – Solar Activity (Jean C. Santos)

Summary

The Sun showed little activity during the week, with a reduced number of active regions of low (alpha) and medium (beta) magnetic complexity present on the solar surface. During this period, only one M-class solar flare occurred, and several CMEs also occurred, but none of the halo type (angular width greater than 180 degrees). Two coronal holes with significant area (>2.0% of the solar disk area) were identified, which may have given rise to fast beams in the solar wind.

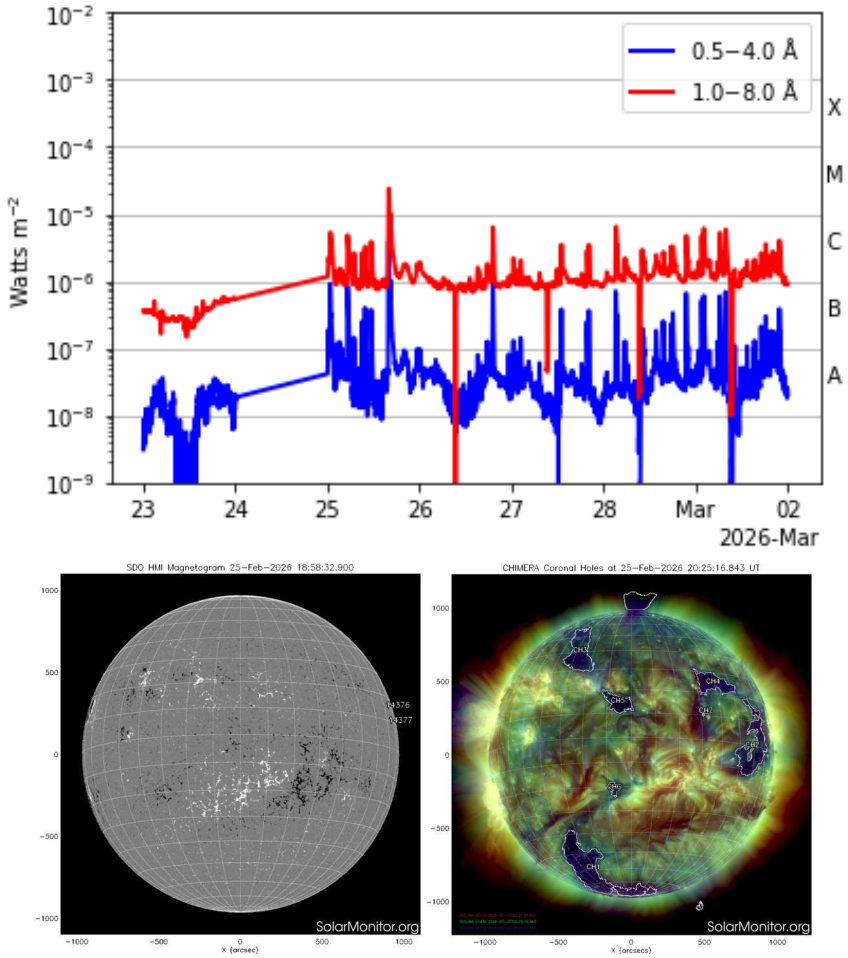

Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period from February 23 to March 1, magnetic field in the line of sight (bottom left panel) and image at 193 angstroms (bottom right panel) measured on March 25, 2026.

Interplanetary Medium – IM – Daniele da S. F. Medeiros and Paulo R. Jauer
Period: February 23rd to March 2nd.

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 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 February 23rd at 01:30 UT at +6.97 nT.

- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-5.72, +6.23] nT. Showing eleven rotations of the By component.

- The Bz component presents negative values for most of the week with a maximum negative -4.49 nT at 03:30 UT on February 23rd. It presented positive value of +3.78 nT on March 1st at 08:30 UT.

- The solar wind density maximum peaked on March 2nd at 00:30 UT, reaching 7.29 protons/cm^3.

- The solar wind speed fluctuated between 311 to 700 km/s, with a decrease beginning at 16:30 UT on February 23rd.

- The magnetopause position remained relaxed throughout the analyzed period.

The measured interplanetary Kp index reached a peak value of approximately 5 (Kp = 5) on February 23rd, classified as a minor geomagnetic storm (G1 level). Similarly, the modeled interplanetary Kp index reached values close to 5 (Kp = 5), also characterized as a minor storm (G1 level). The week ended with values below 3 (Kp < 3).

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.

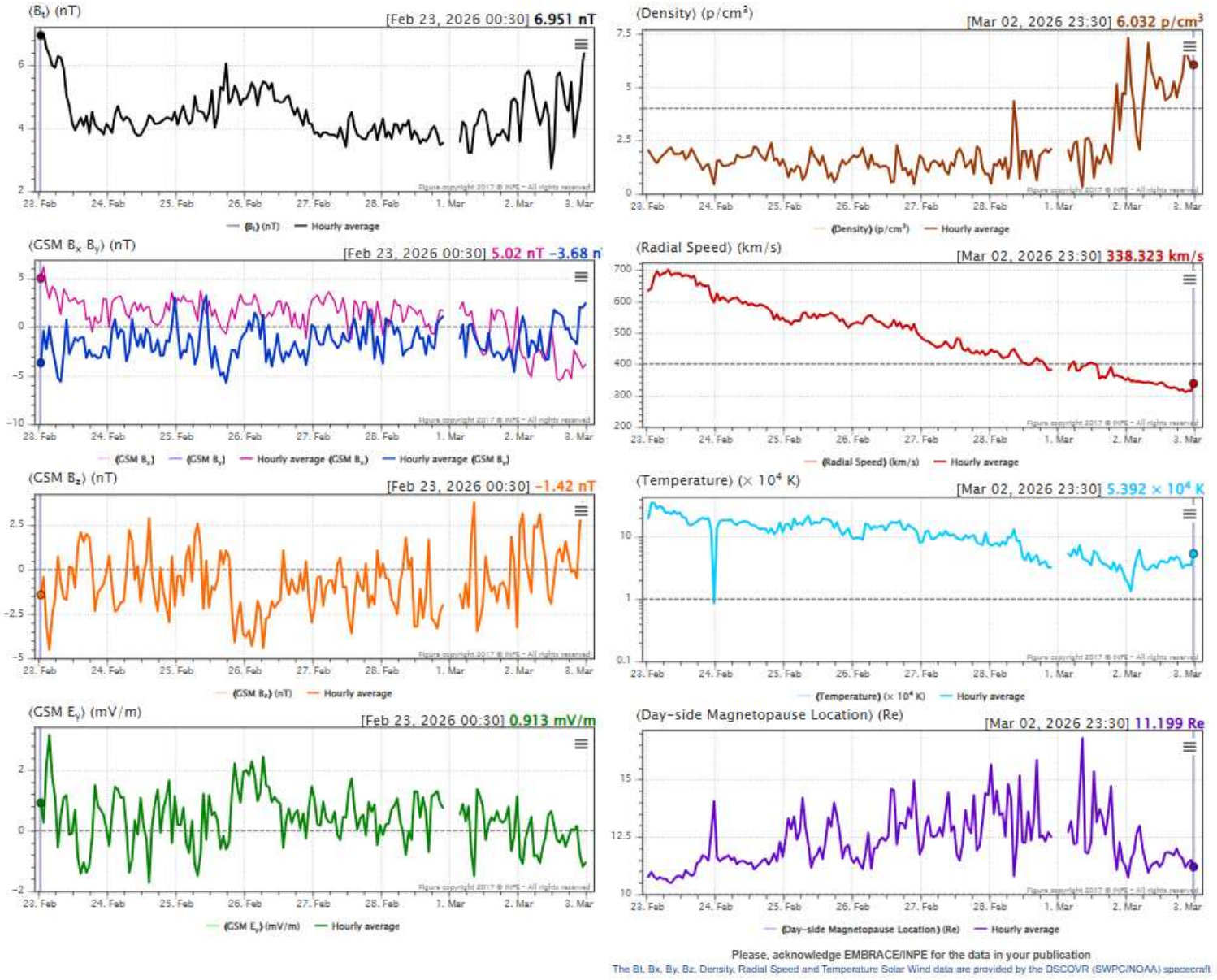

Figure 1: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

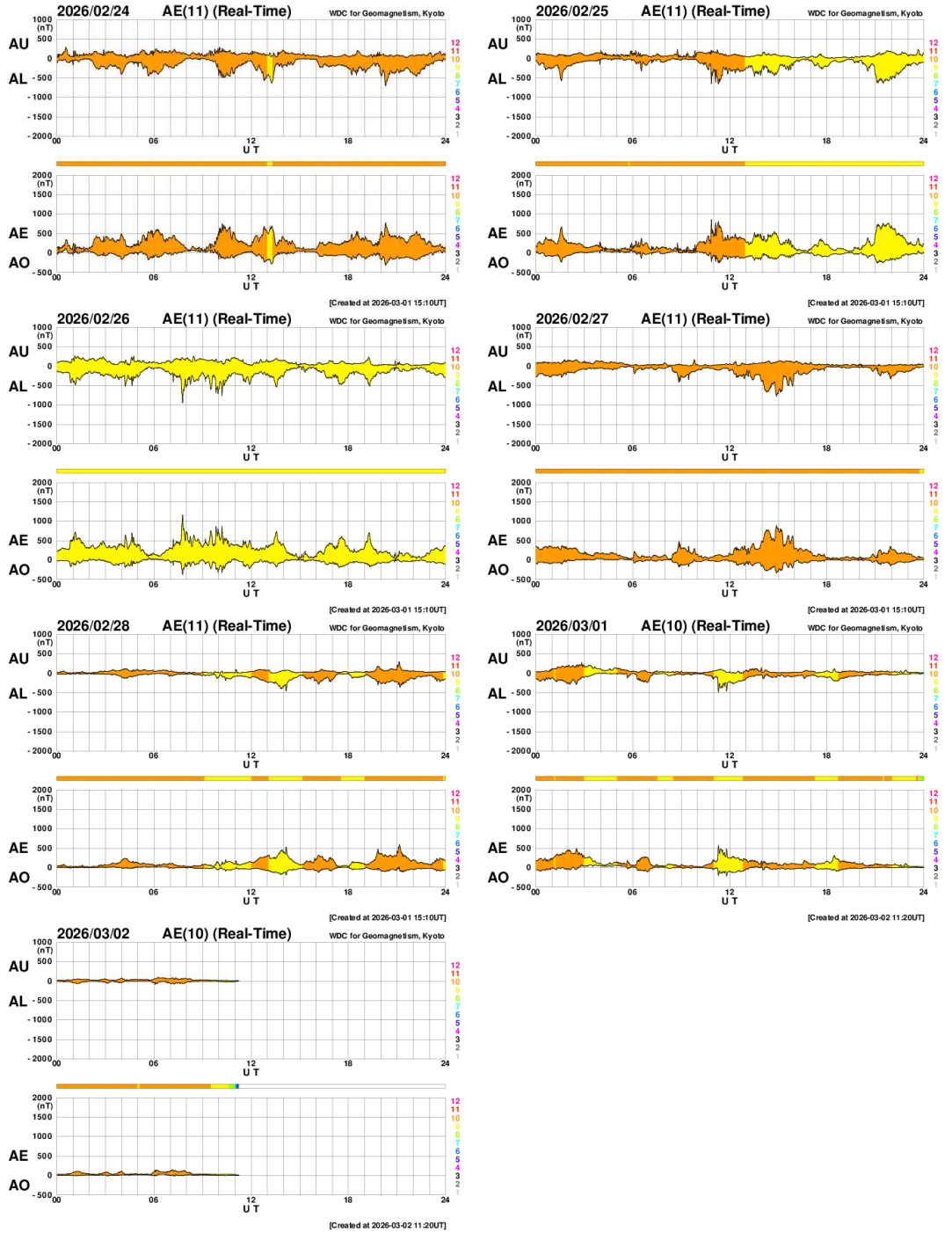

Figure 2 – AE index for the days of the week.

EARTH'S RADIATION BELT

Responsible: Ligia Da Silva

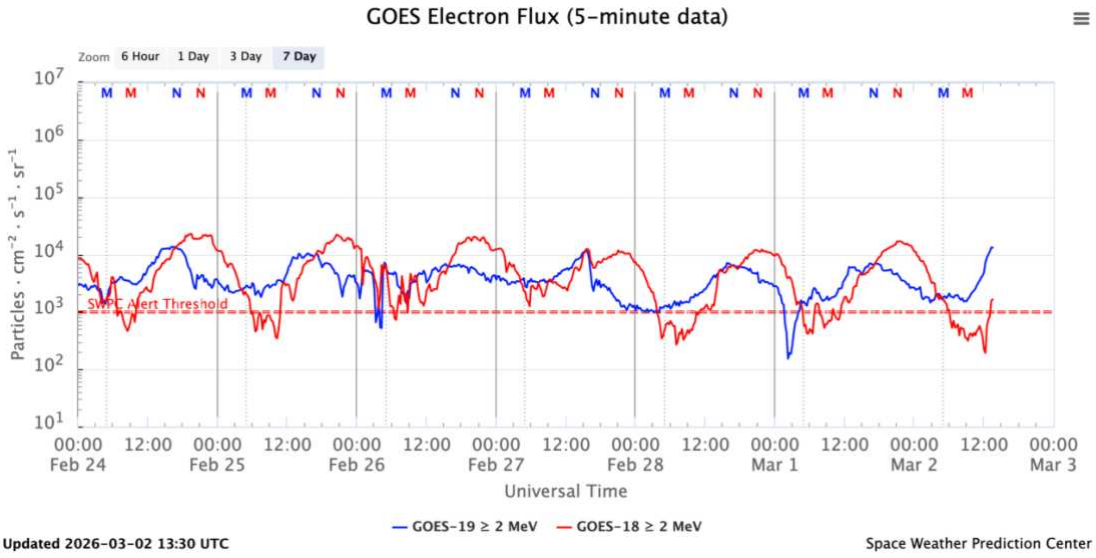

Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-18 and GOES-19 satellite. Source: https://www.swpc.noaa.gov/products/goes-electron-flux

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 significantly high. It oscillates between the alert threshold (10^3 particles/(cm2 s sr)) and 10^4 particles/(cm2 s sr) for almost the entire period analyzed, showing slight dropouts on four days, February 25 and 28, and March 1 and 2.

Geomagnetic field

Responsible: Karen Sarmiento /Lívia Alves/Sony Su Chen

Summary

Between February 24 and March 2, the geomagnetic field predominantly exhibited calm activity, except for the period from February 24 to 26, when the Kp index exceeded 3o, indicating instabilities in geomagnetic activity. The Dst index recorded its minimum value of -28 nT at 11 UT on February 26.

Between February 24 and 27, geomagnetic activity in the auroral region reached values above 500 nT, with a peak on February 26, when the index exceeded 1000 nT. On subsequent days, geomagnetic indices stabilized at typical levels for calm conditions. The Kp index reached its peak of 4o on February 26. On the other days, the Kp index ranged from 0+ to 3o, remaining below the G1 geomagnetic storm threshold. The Ksa index fluctuated between 1+ and 4o.

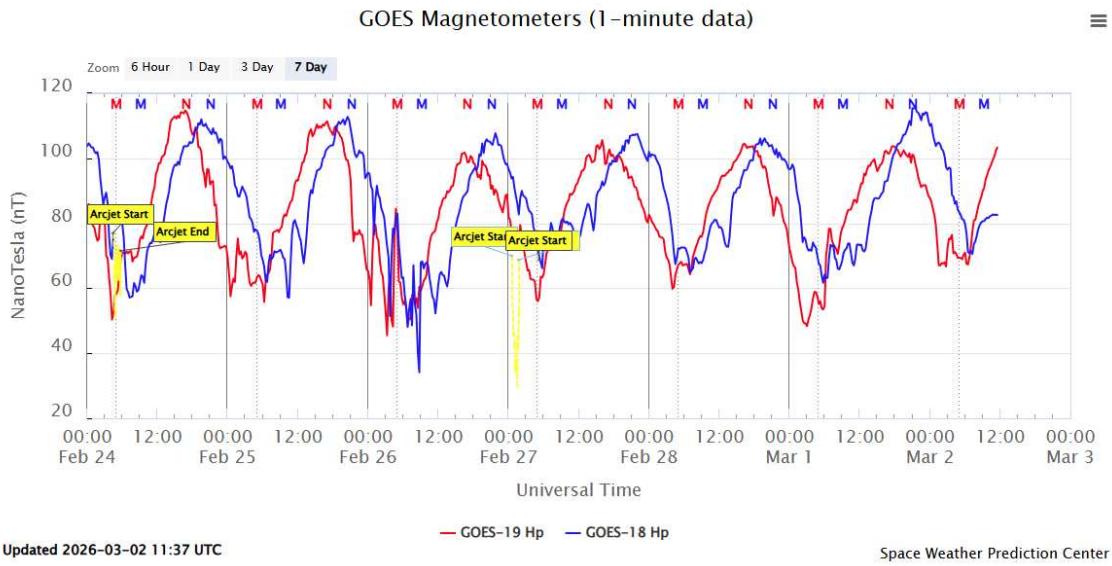

Figure 1 - Magnetic field measurement at the GOES satellite position.

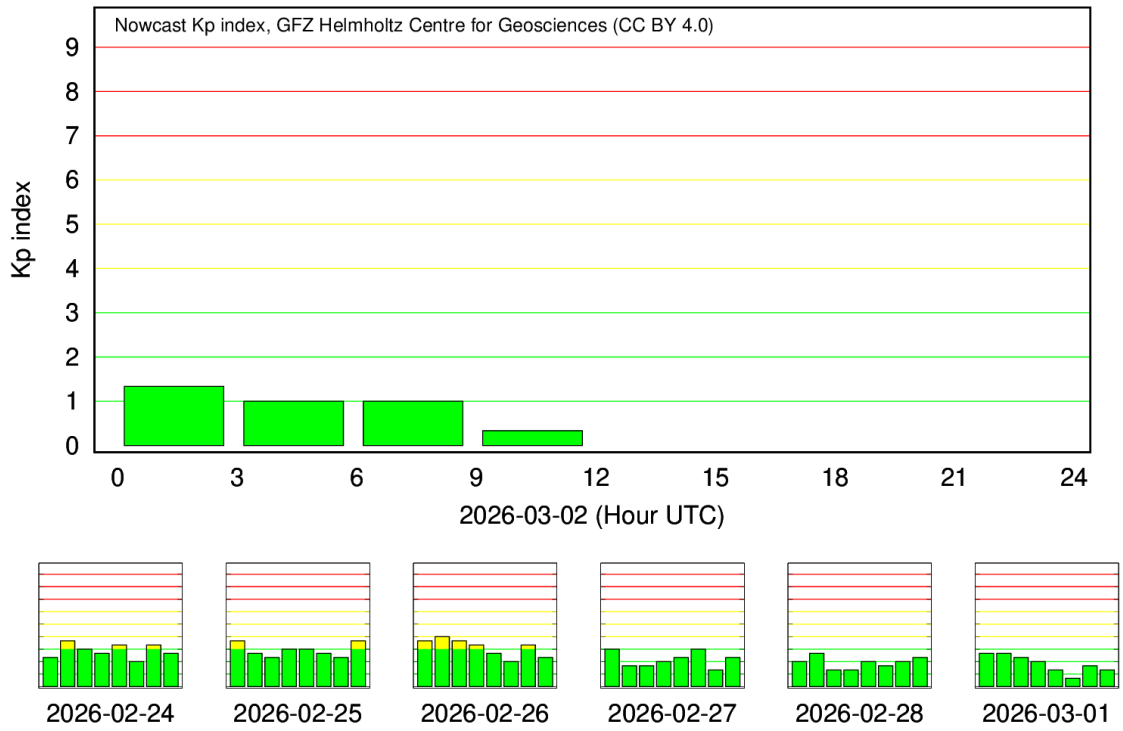

Figure 3 – Kp index on a logarithmic scale.

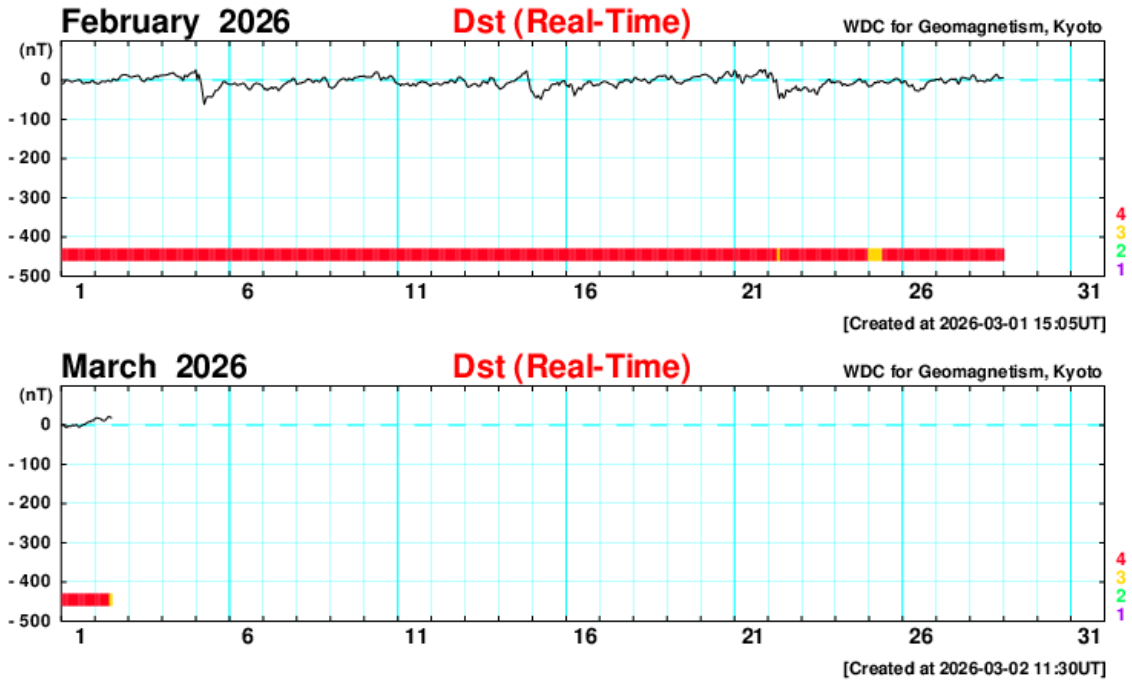

Figure 4 – Dst index.

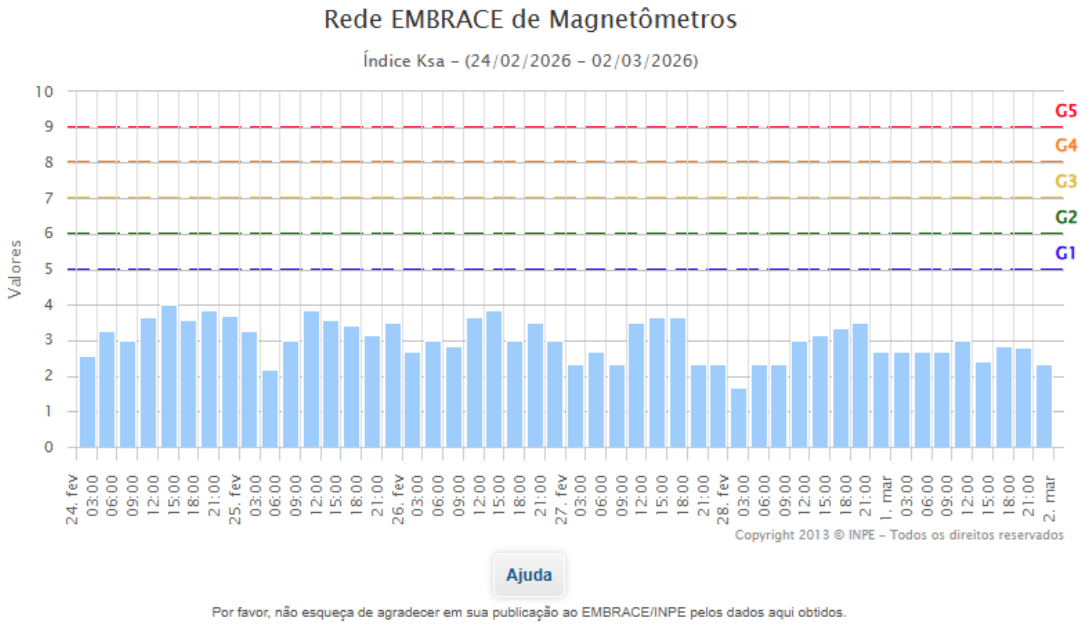

Figure 5 – Geomagnetic index in South America – Ksa Index.

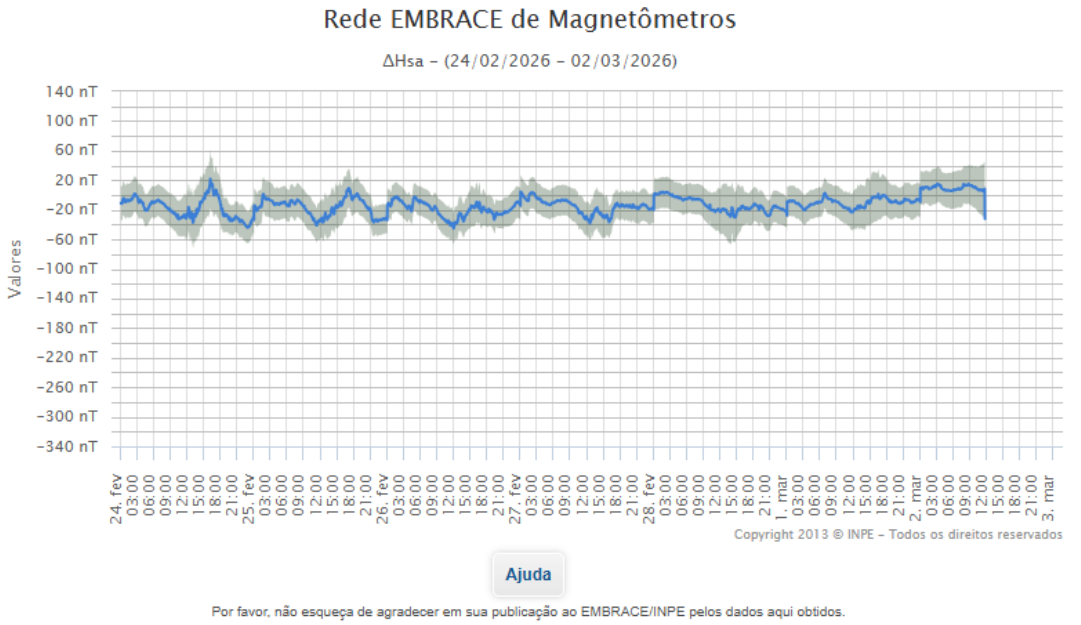

Figure 6 – Geomagnetic index in South America – ΔH index at magnetic stations of the EMBRACE Program.

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.

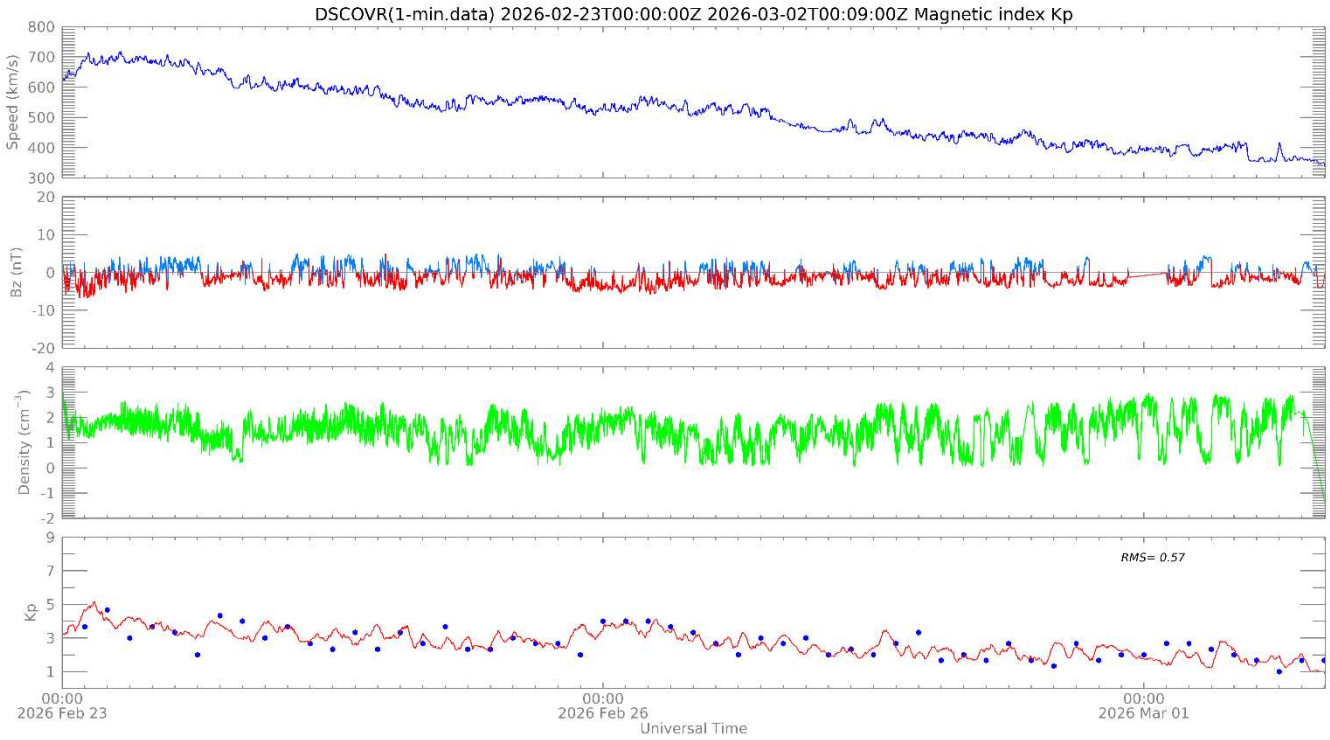

Figure 2: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

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 not detected at Cachoeira Paulista. Strong sporadic E (Es) layers persisted over Boa Vista 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.

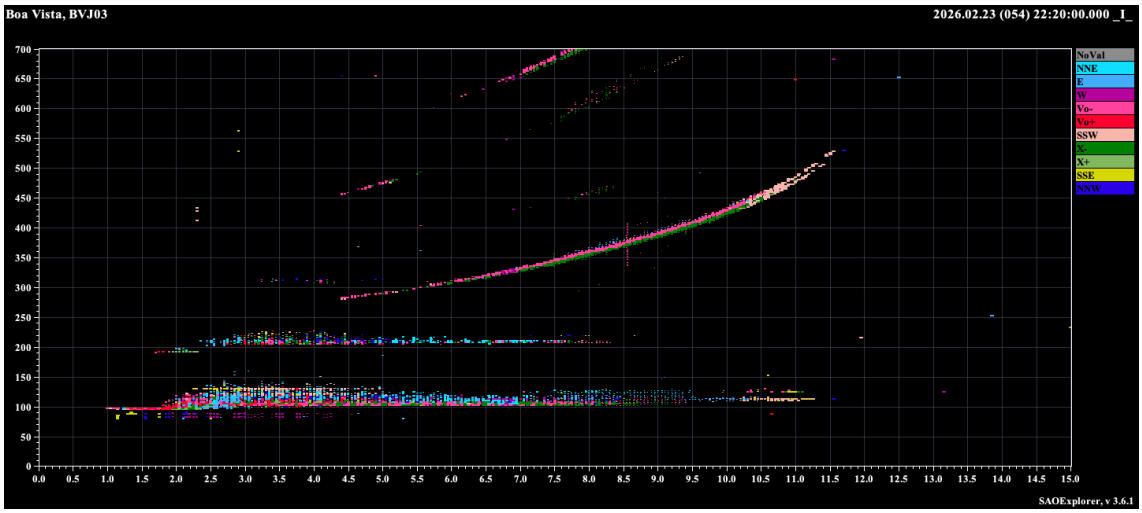

Figure 1 – Sequence of ionograms over Boa Vista, showing the strong Es layer (scale 5).