

Sun – Solar Activity (Jean C. Santos)

Summary

Solar activity was low, with four active regions of high magnetic complexity (beta-gamma and beta-gamma-delta) present on the solar disk during the week. No M- or X-class solar flares occurred during this period. The Cactus software identified 32 CMEs, none of which were of the halo type (angular width greater than 180 degrees). Three coronal holes with significant area ($>2.0\%$ of the solar disk area) were identified crossing the solar disk at low latitudes during this interval.

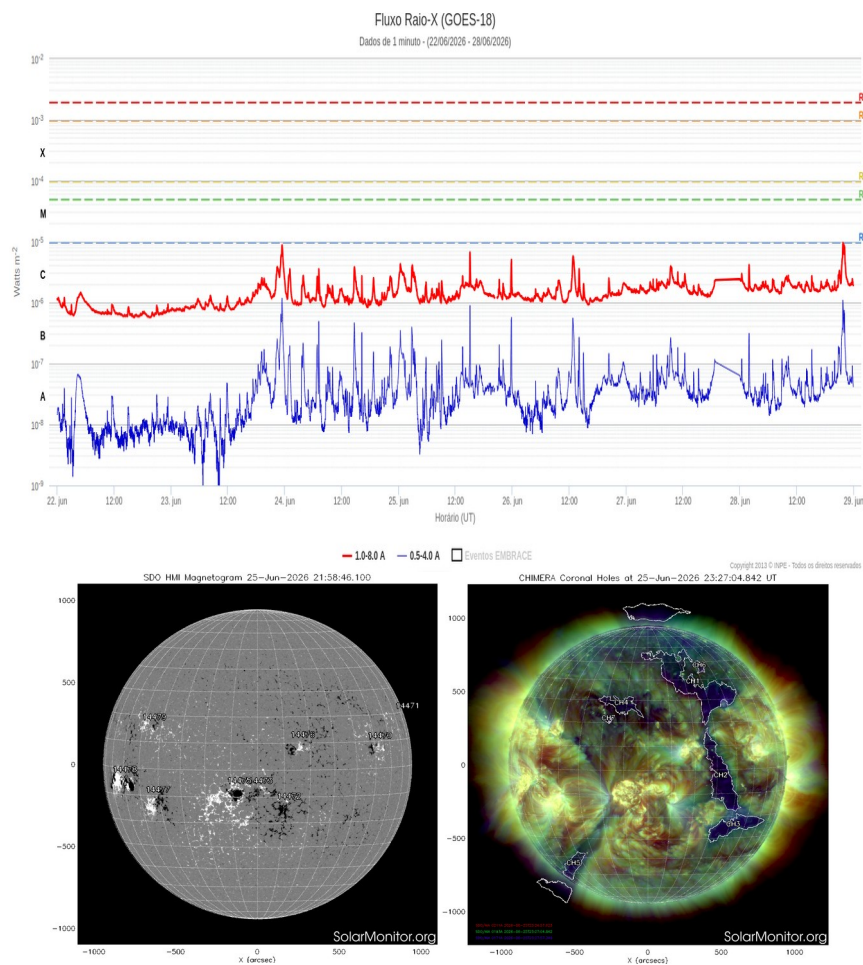


Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period of June 22–28, line-of-sight magnetic field (bottom left panel), and 193-angstrom image (bottom right panel) measured on June 25, 2026.



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

Period: June 22nd to 30th

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 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 June 24th at 15:30 UT at +14.82 nT.
- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-12.96, +11.35] nT. Showing seven rotations of the By component.
- The Bz component presents negative values for most of the week with a maximum negative -5.81 nT at 15:30 UT on June 23rd. It presented positive value of +5.15 nT on June 24th at 06:30 UT.
- The solar wind density maximum peaked on June 24th at 19:30 UT, reaching 19.38 protons/cm³.
- The solar wind speed fluctuated between 329 to 650 km/s, with an increase beginning at 16:30 UT on June 24th.
- The magnetopause position remained relaxed (> 10 RE) almost throughout the analyzed period, reaching maximum compression (7.49 RE) at 00:30 UT on June 25th.
- During the early part of the week, the measured and modeled interplanetary Kp index remained fluctuating between 1 and 3 ($K_p < 3$), characterized a calm period. The modeled Kp index reached values above 5 ($K_p > 5$) on June 23rd and 24th, indicating a minor storm (G1 level), while the measured Kp index ranged from 0 to 5 ($K_p < 5$). This situation persists as of the time of writing this briefing.



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.

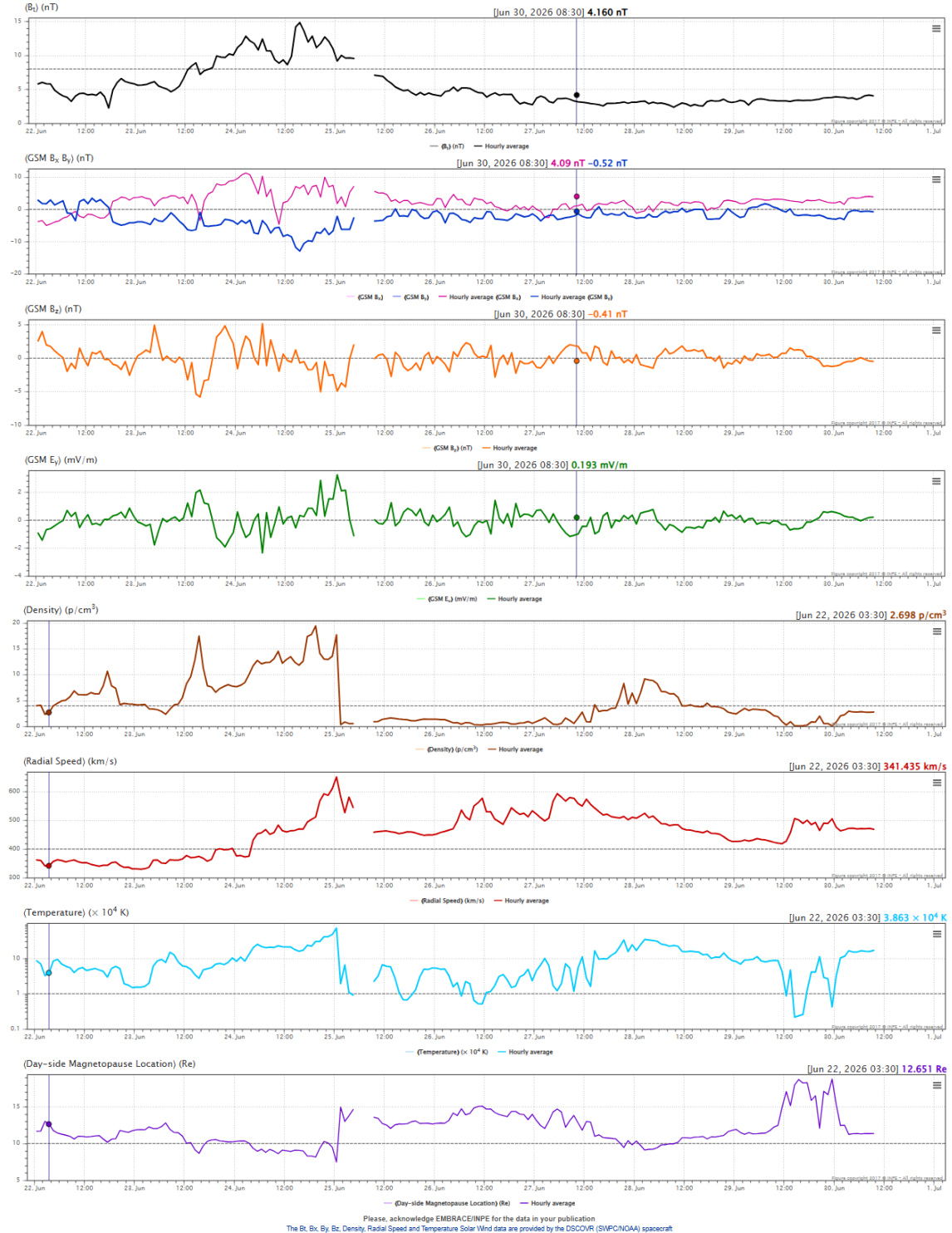


Figure 1: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

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.

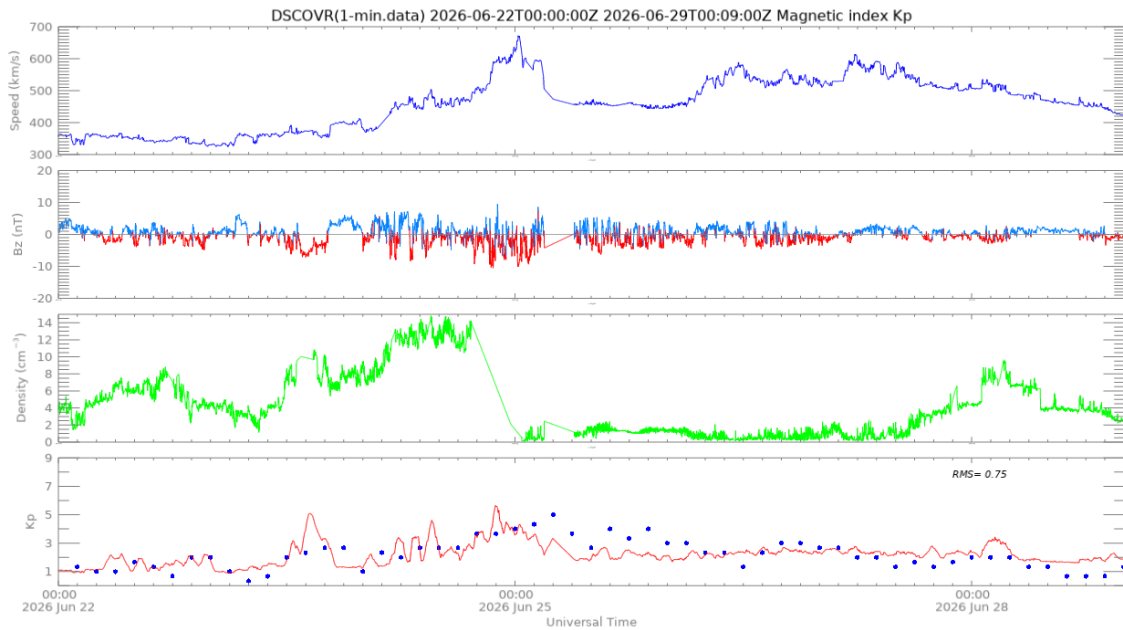


Figure 2: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

EARTH'S RADIATION BELT

Responsible: Ligia Da Silva

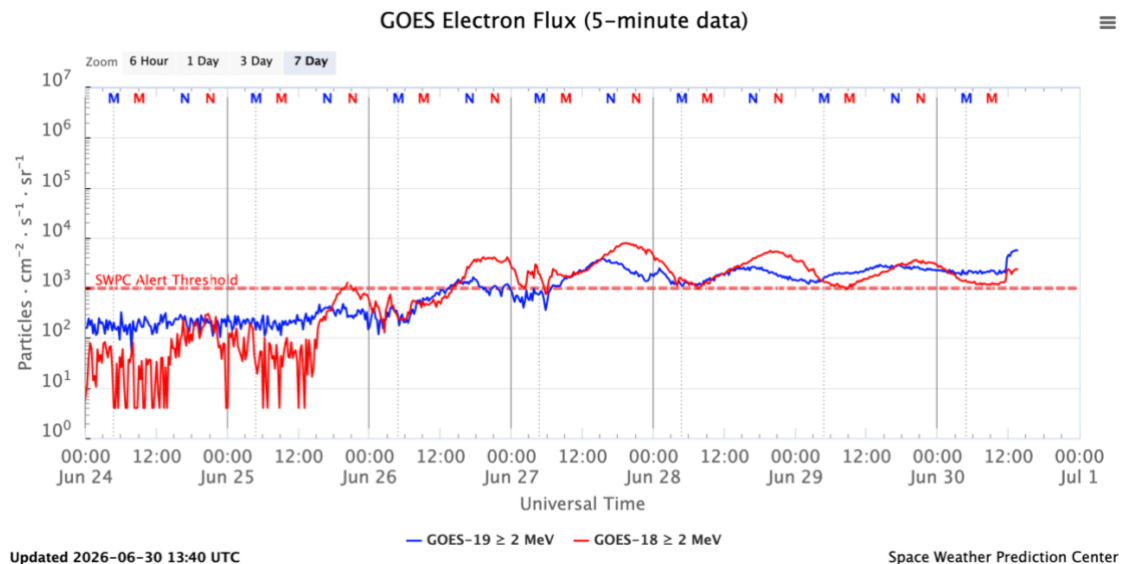


Figure 1: High-energy electron flux (> 2MeV) obtained from GOES-18 and GOES-19 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

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) was below the minimum alert threshold [10^3 particles/(cm² s sr)] on June 24 and 25. At the end of June 25, a significant electron flux increase was observed, exceeding the alert threshold on June 26 and remaining stable until today, June 30.

Ionospheric F2-Layer Irregularities

Summary

During the period from June 21 to June 27, 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 422 to 540 km, while the vertical drift velocity varied between 14 and 27 m/s (Figure 1).

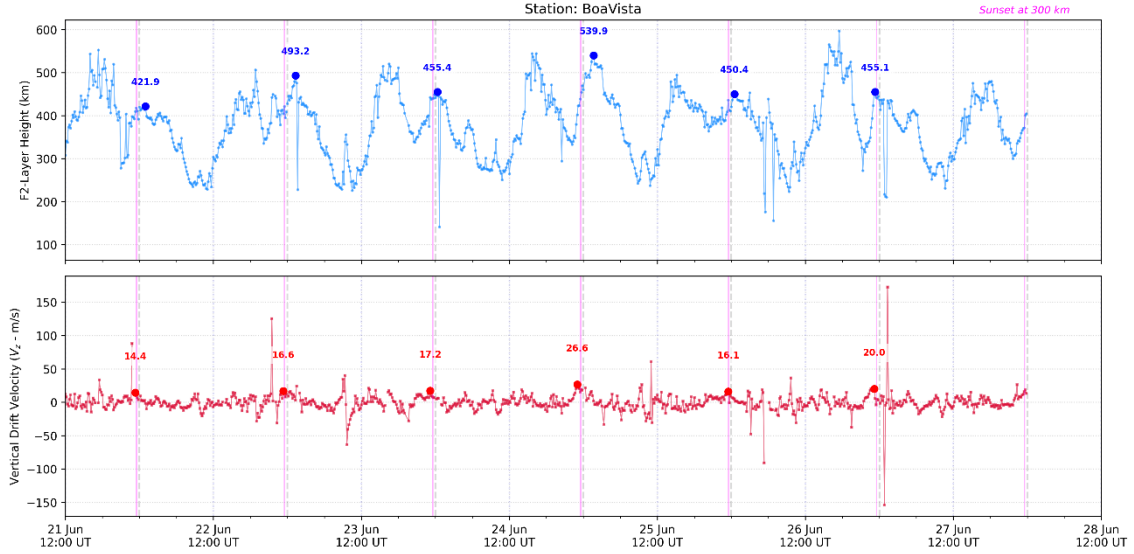


Figure 1 – F2-layer height (upper panel) and vertical drift velocity (lower panel).

The Equatorial Ionization Anomaly (EIA) was present on all days of the analyzed period. TEC values reached maxima of approximately 60 TECU. Scintillation levels remained low throughout the week ($S4 < 0.5$), indicating a relatively stable ionospheric environment. In addition, no events associated with equatorial plasma bubbles were detected in the observations (Figure 2).

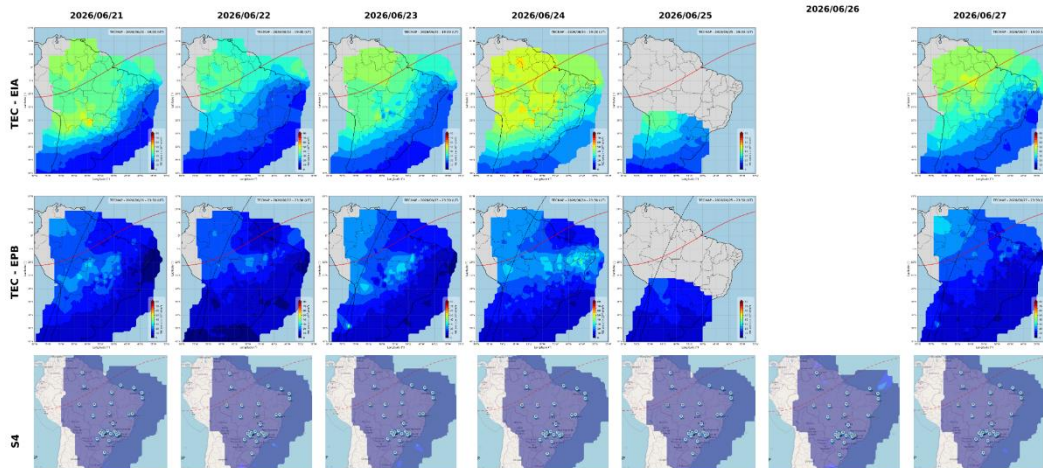


Figure 2 – Total electron content (TEC) maps (upper and middle panels) and S4 index (lower panel).

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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/>.

Although no signatures of equatorial plasma bubbles were identified in the previously analyzed parameters, images of the atomic oxygen red-line emission (OI 630 nm) recorded at Bom Jesus da Lapa revealed the presence of these ionospheric irregularities on the nights of June 24-25.

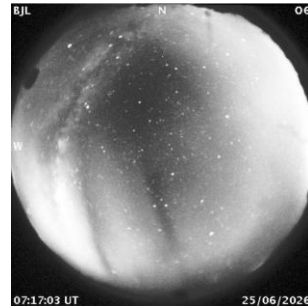


Figure 3 – Atomic oxygen red-line emission (OI 630 nm) images acquired by the Bom Jesus da Lapa all-sky imager on the nights of 24-25 June 2026.

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