

Sun – Solar Activity (Jean C. Santos)

Summary

The Sun exhibited low activity with the presence of three active regions of high (beta-gamma) magnetic complexity in the solar disk during the week. No M- or X-class solar flares occurred during this period. The Cactus software identified 29 CMEs, two of which were halo-type (angular width greater than 180 degrees). Two coronal holes with significant area ($>2.0\%$ of the solar disk area) crossing the solar disk at low latitudes were identified during this interval.

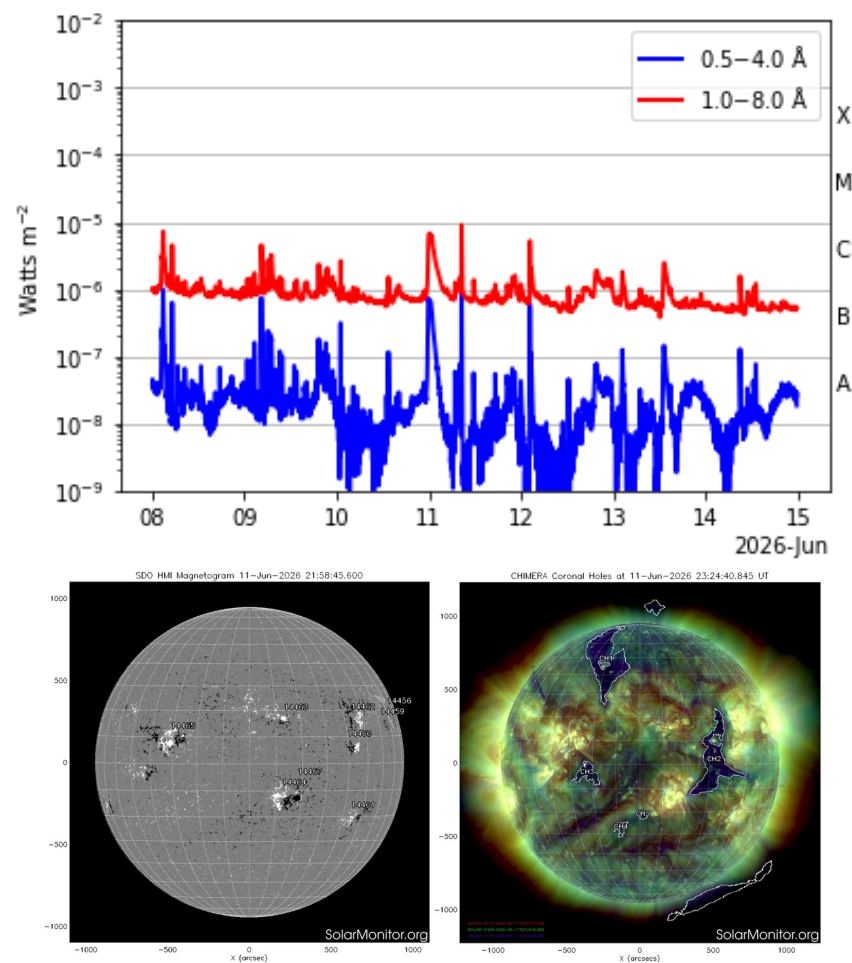


Figure 1 – X-ray flux measured by the GOES satellite (top panel) for the period of June 8-14, magnetic field in the line of sight (bottom left panel) and image at 193 angstroms (bottom right panel) measured on June 11, 2026.



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

Period: June 8th to 15th

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 CIR 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 11th at 22:30 UT at +13.94 nT.
- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [-9.30, +7.96] nT. Showing ten rotations of the By component.
- The Bz component presents negative values for most of the week with a maximum negative -8.08 nT at 20:30 UT on June 11th. It presented positive value of +11.73 nT on June 11th at 22:30 UT.
- The solar wind density maximum peaked on June 11th at 16:30 UT, reaching 24.66 protons/cm³.
- The solar wind speed fluctuated between 377 to 550 km/s, with an increase beginning at 11:30 UT on June 11th.
- The magnetopause position remained relaxed almost throughout the analyzed period, reaching maximum compression (7.70 RE) at 20:30 UT on June 11th.
- During the early part of the week, the measured and modeled interplanetary Kp index remained fluctuating between 1 and 3. On June 11th, the measured and modeled interplanetary Kp index increased, reached a value above 5 (Kp > 5), modeled Kp index, corresponding to a minor storm (G5 level) on June 12th. On June 12th, both the measured and modeled Kp values showed a decreasing trend, and the week concluded with values ranging between 0 and 4 (Kp < 4).



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.

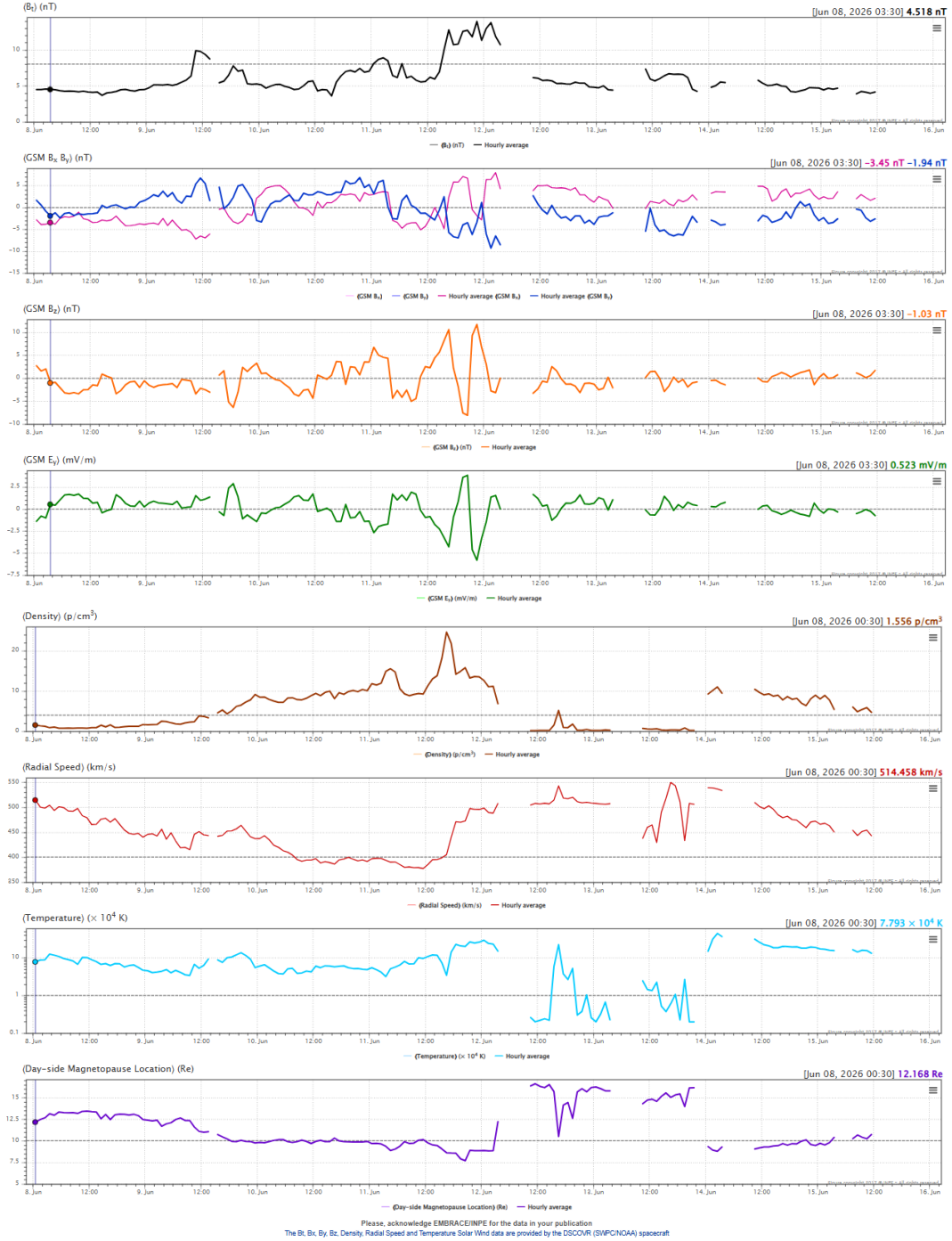


Figure 1: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite.

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.

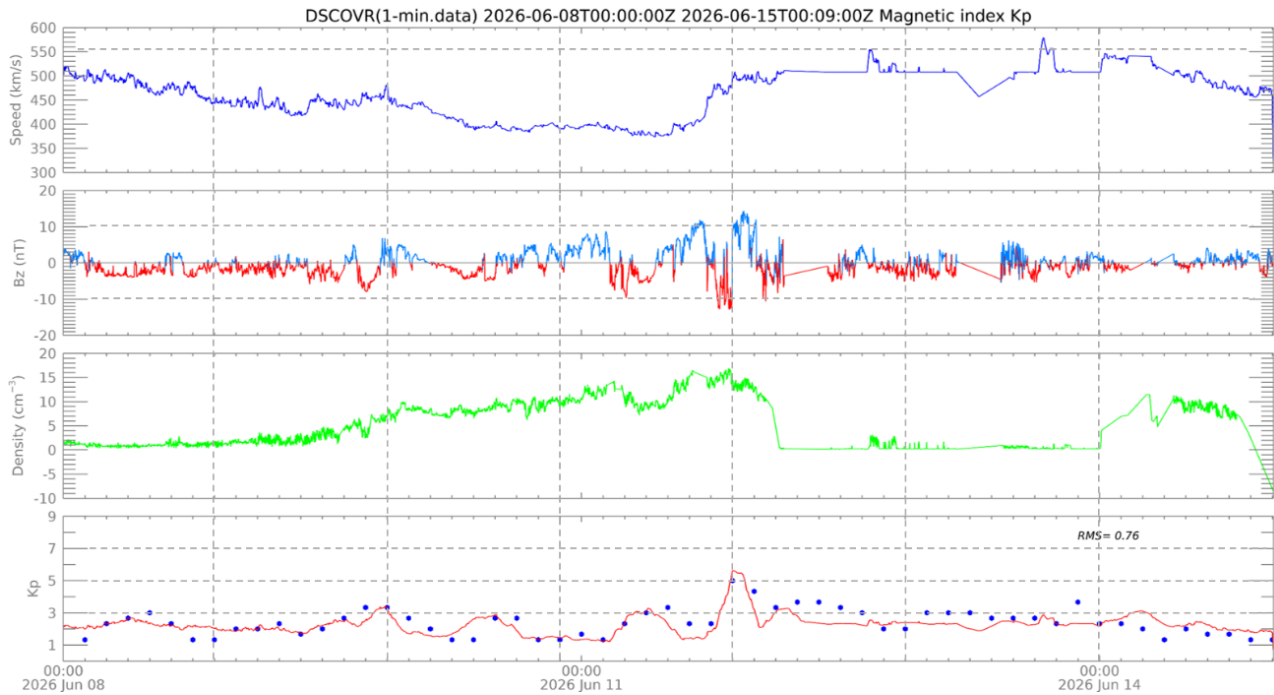


Figure 2: Illustrates a set of parameters observed in the solar wind by the DSCVR satellite and the Kp index by NOAA/SWPC, blue dot, and the modeling, red line.

Responsible: Ligia Da Silva

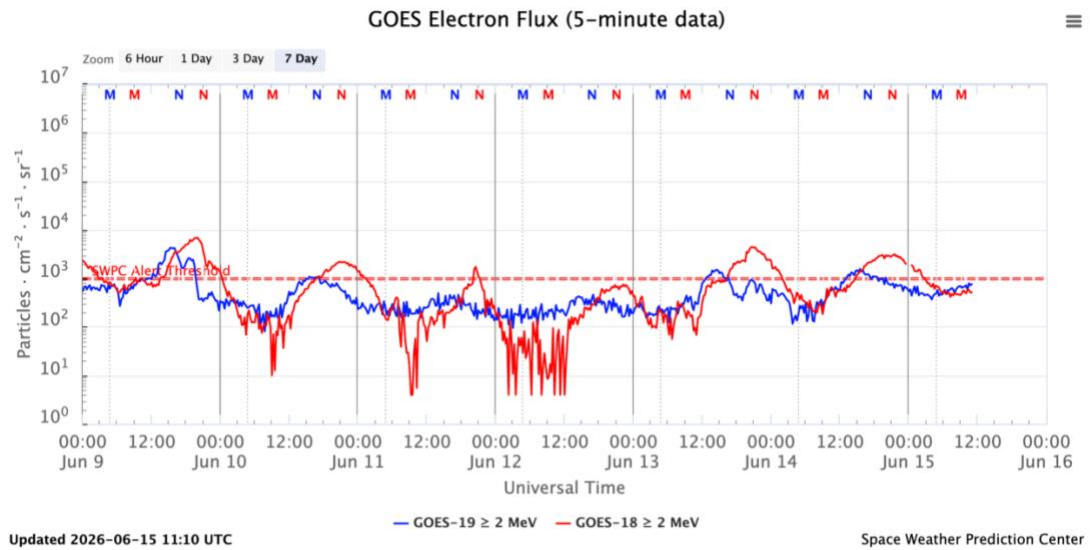


Figure 1: High-energy electron flux ($> 2\text{MeV}$) obtained from GOES-18 and GOES-19 satellite. Source: <https://www.swpc.noaa.gov/products/goes-electron-flux>

Summary

The high-energy electron flux ($>2\text{ MeV}$) in the outer boundary of the outer radiation belt obtained from the GOES-18 and GOES-19 geostationary satellites (Figure 1) presents three dropouts on June 10, 11 and 12, respectively. The electron flux enhancement is observed from June 13.

wind structures.

Geomagnetic Field / Campo Geomagnético

Summary

During the period from 02 to 15 June, the geomagnetic indices and data from the Embrace MagNet magnetometer network recorded several disturbances, with the following events standing out:

- **03 June:** The magnetometers recorded an enhancement of the H component consistent with the passage of a CIR, followed by a decrease to values around zero near 21 UT. The Dst index ranged from -51 to -7 nT, while the AE index fluctuated between 500 and 1000 nT for more than 15 hours. The maximum Kp index reached 5o.
- **05 June:** The Embrace MagNet network detected a sudden impulse (SI) at approximately 05:53 UT, consistent with the arrival of an ICME, followed by a main phase that reached a minimum H-component value of -81 nT at CAR at 22:23 UT. During the main phase, several disturbances were observed, possibly associated with wave activity in the Pc5 pulsation frequency range. The Dst index reached -60 nT, while auroral activity, as measured by the AE index, varied between 500 and 1500 nT. The maximum Kp index was 5-.
- **11 June:** The Embrace magnetometers recorded an increase in the H component of up to +44 nT, followed by a rapid decrease around 18 UT. After this event, the H component remained at negative values for the remainder of the period.

Resumo

No período de 02 a 15 de Junho, os índices geomagnéticos e os dados provenientes da rede de magnetômetros Embrace Mag-Net registraram várias instabilidades, com destaque para:

- **03- Junho:** Os magnetômetros registraram aumento da componente H compatível com a passagem de uma CIR, seguido de queda para valores em torno de zero, por volta das 21 UT. O índice Dst variou de -51 a -7 nT e o índice AE oscilou de 500 a 1000 nT por várias horas. O índice Kp máximo desse dia foi de 5o
- **05- Junho:** Os magnetômetros da rede Embrace MagNet registraram um SI no por volta das 05:53 UT, compatível com a chegada de uma ICME, seguido de fase principal que atingiu o nível mínimo da componente H de -81 nT (CAR) às 22:23 UT. Ao longo da fase principal pode-se observar várias instabilidades possivelmente relacionada à ocorrência de ondas na faixa de frequência das pulsações Pc5. O índice Dst atígiu -60 nT, com atividade auroral variando de 500 nT a 1500 nT. O índice Kp foi 5-
- **11 - Junho:** Os magnetômetros da rede Embrace registraram aumento da componente H de até + 44 nT seguida de uma rápida queda por volta das 18 UT.

Após esse evento, a componente H manteve-se em valores negativos o restante do período.

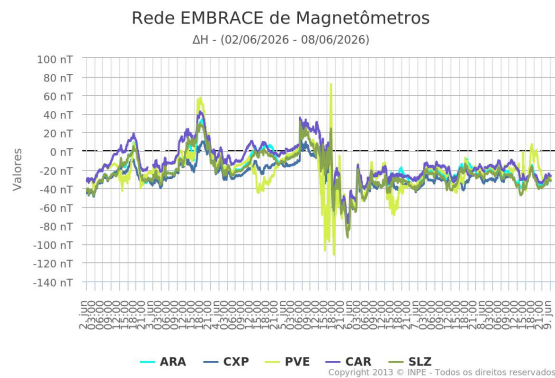


Figura 1.: Variação diurna da componente geomagnética H (nT) das estações da rede Embrace

Figure 1.: Daily variation of the geomagnetic field from H (nT) measured at Embrace MagNet

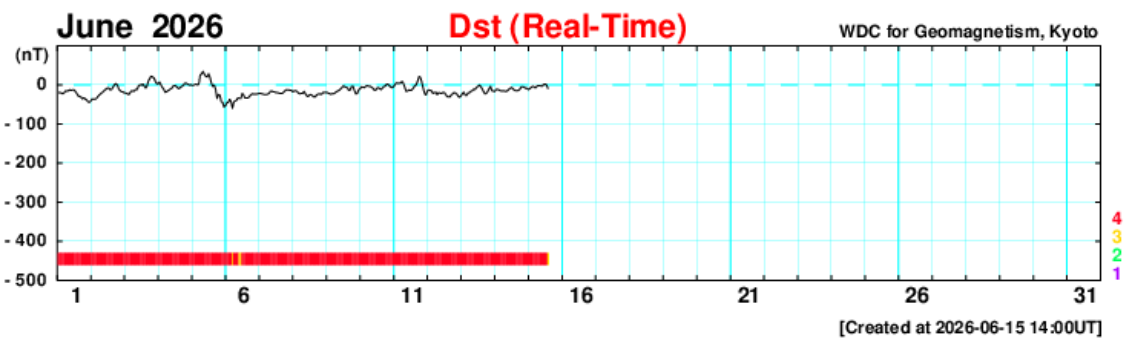
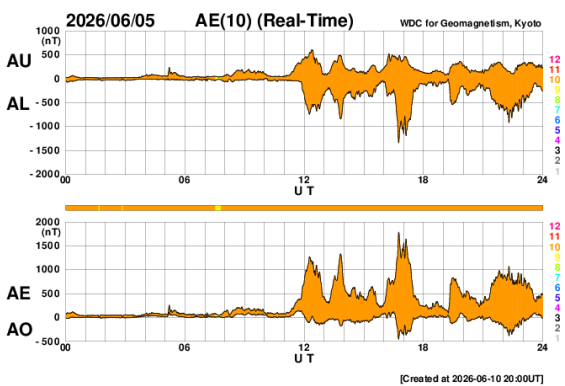


Figura 2.: Índice Dst.

Figure 2: Dst index



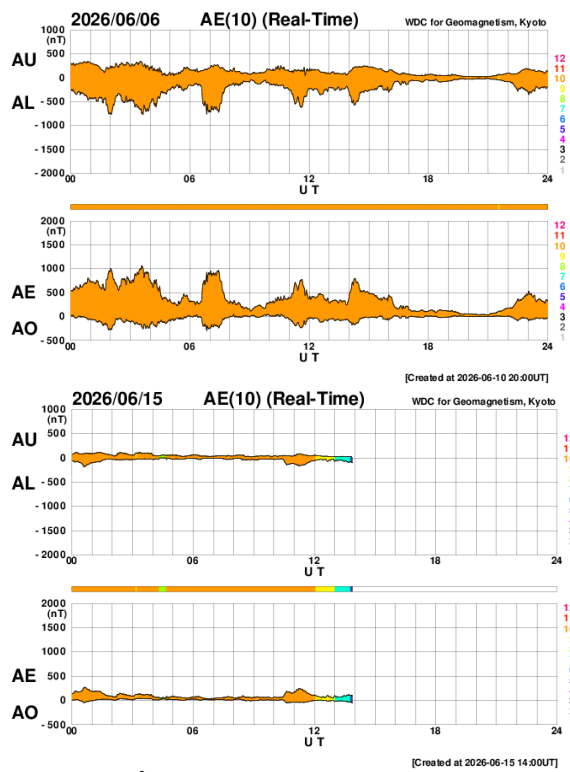


Figura 3.: Índice AE para os dias mais perturbados da semana.
 Figure 3.: AE index for the most disturbed days in the current week.

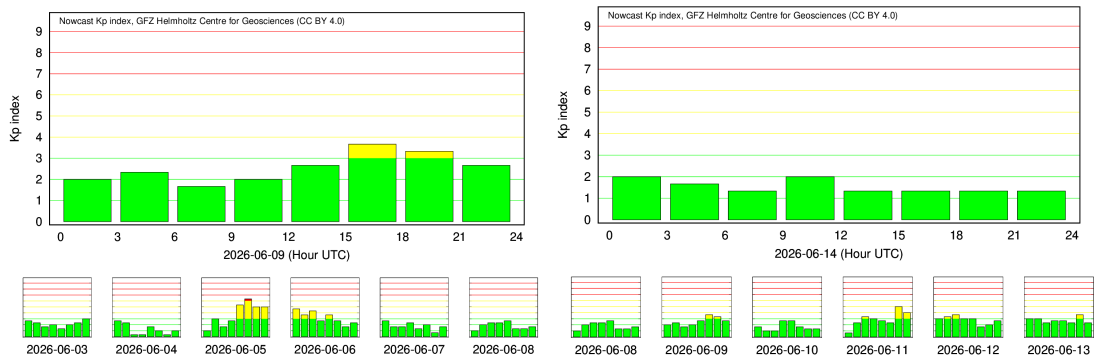


Figura 4.: Índice Kp.
 Figure 4: Kp index for the current week

Ionospheric F2-Layer Irregularities

Summary

During the period from June 7 to June 13, 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 444 to 498 km, while the vertical drift velocity varied between 16 and 25 m/s (Figure 1).

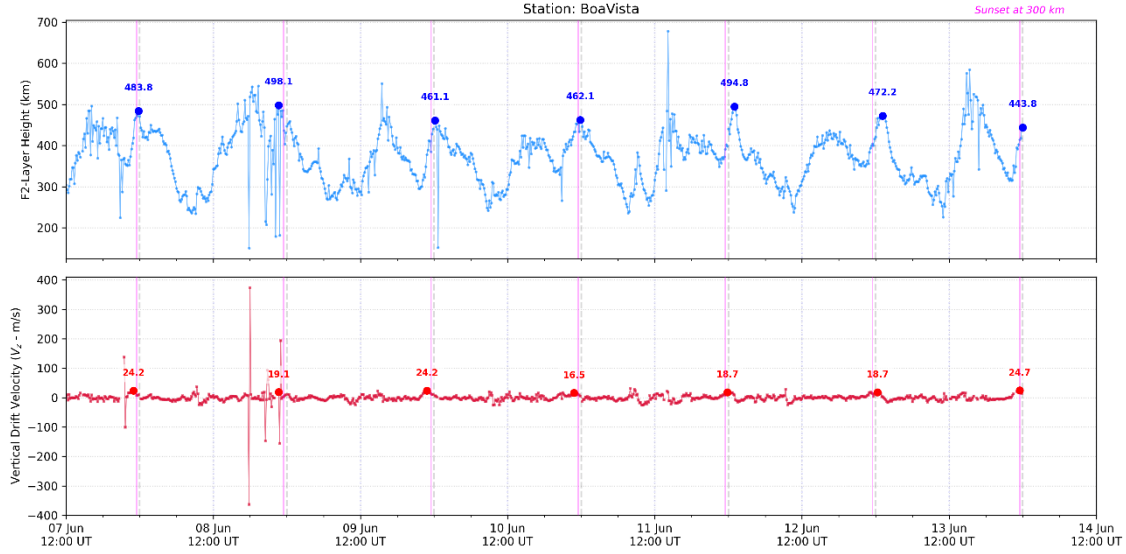


Figure 1 – F2-layer height (upper panel) and vertical drift velocity (lower panel).

The equatorial ionization anomaly (EIA) was observed on all days except June 12 and 13. TEC reached maximum values of approximately 70 TECU at the southern crest of the anomaly. Scintillation levels remained low ($S4 < 0.5$) throughout the week, indicating quiet ionospheric conditions. No events associated with equatorial plasma bubbles were observed (Figure 2).

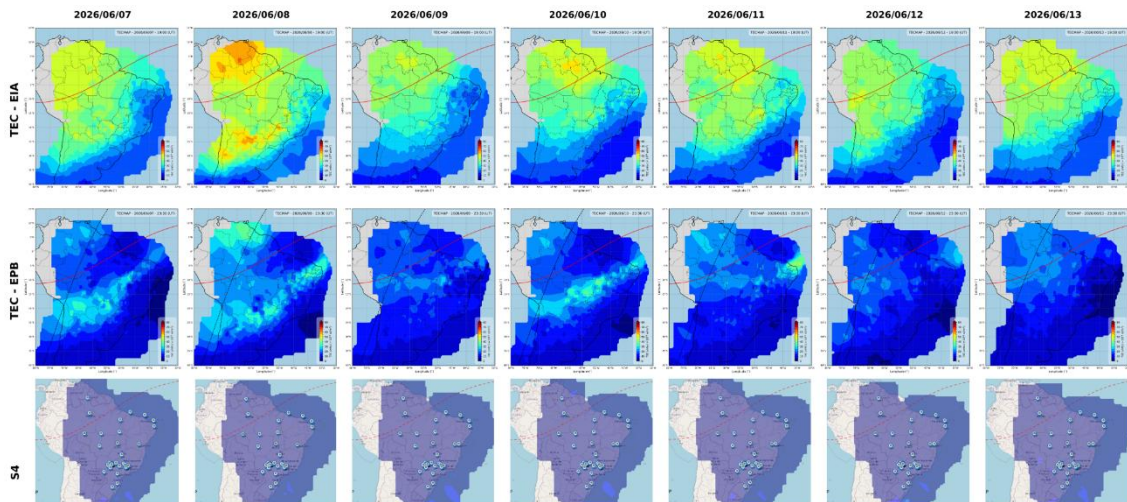


Figure 2 – Total electron content (TEC) maps (upper and middle panels) and S4 index (lower panel).

1. All data presented are under the domain and responsibility of the Embrace Program. *Todos os dados apresentados são de domínio e responsabilidade do Programa Embrace.*
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/>.