Briefing Space Weather

2023/07/05

1 Sun

1.1 Responsible: José Cecatto

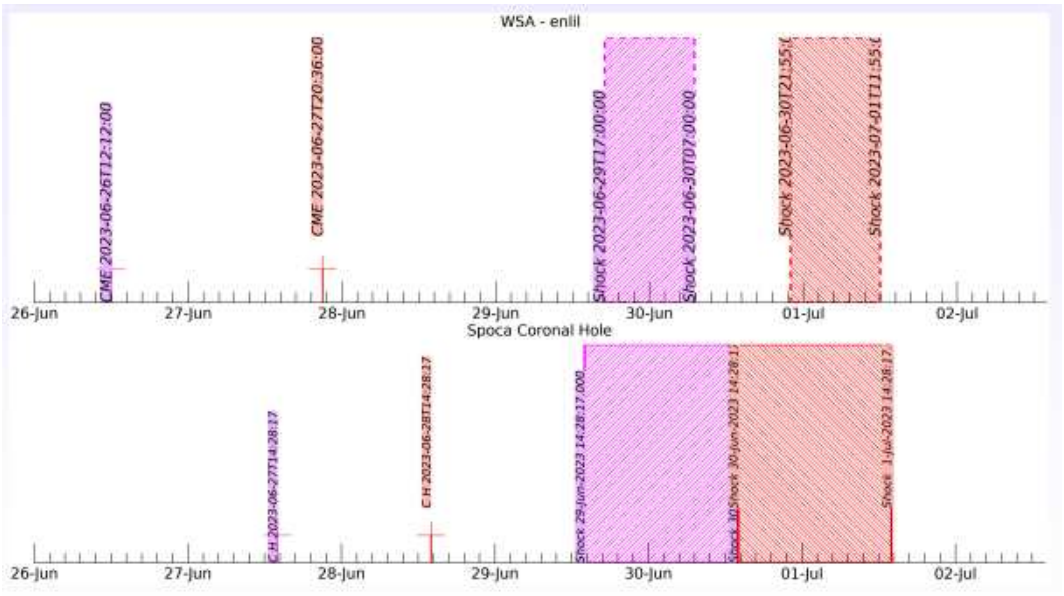
06/26 – M1.6 flare; Fast wind stream (=< 600 km/s); 5 CME c.h.c. toward the Earth;
06/27 – M1.2 flare; Fast wind stream (=< 500 km/s); 6 CME c.h.c. toward the Earth *;
06/28 – M1.9 flare; Fast wind stream (=< 500 km/s); 4 CME c.h.c. toward the Earth;
06/29 – M3.8 flare; Fast wind stream (=< 550 km/s); 2 CME c.h.c. toward the Earth;
06/30 – No (M/X) flare; Fast wind stream (=< 600 km/s); 3 CME c.h.c. toward the Earth;
07/01 – M1.1 flare; Fast wind stream (=< 500 km/s); 3 CME c.h.c. toward the Earth;
07/02 – M2.0, X1.0 flares; Fast wind stream (=< 500 km/s); 2 CME c.h.c. toward the Earth;
07/03 – M1.3 flare; No fast wind stream; 3 CME c.h.c. toward the Earth
Prev.: No fast wind stream for the next 01-02 days; for the next 2 days (55% M, 10% X) probability of M / X flares;
also, occasionally other CME can present component toward the Earth.
c.h.c. – can have a component; * partial halo; ** halo

2 Sun

2.1 Responsible: Douglas Silva

WSA-ENLIL (CME 023-06-26T12:12:00 UT)
The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2023-06-29T17:00:00 UT and 2023-06-30T07:00:00 UT.

WSA-ENLIL (CME 2023-06-27T20:36:00 UT)
The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2023-06-30T21:55:00 UT and 2023-07-01T11:55:00 UT



3 Interplanetary medium

3.1 Resposible: Paulo Jauer

- The modulus of the interplanetary magnetic field component on average fluctuated below 7 nT.
- The BxBy components presented variations in the analyzed period, keeping both oscillating within the interval [+5, -5] nT, with the presence of a sector change on June 30 at 01:30 UT.
- The bz field component showed variations in the analyzed period and oscillated negatively on average with more evident peaks on June 29 at 9:30 am at -5 nT.
- The solar wind density fluctuated on average below 13 p/cm^3 with a peak recorded on June 29 at 08:30 of 12.92 p/cm^3.
- The solar wind speed remained on average above 400 km/s with a peak on June 30th at 14:30 UT of 557 km/s.
- The magnetopause position was oscillating on average above the equilibrium position, with maximum compression on 29/June at 14:30 at 8.6 RE.

4 ULF waves

4.1 Responsible: Graziela B. D. Silva

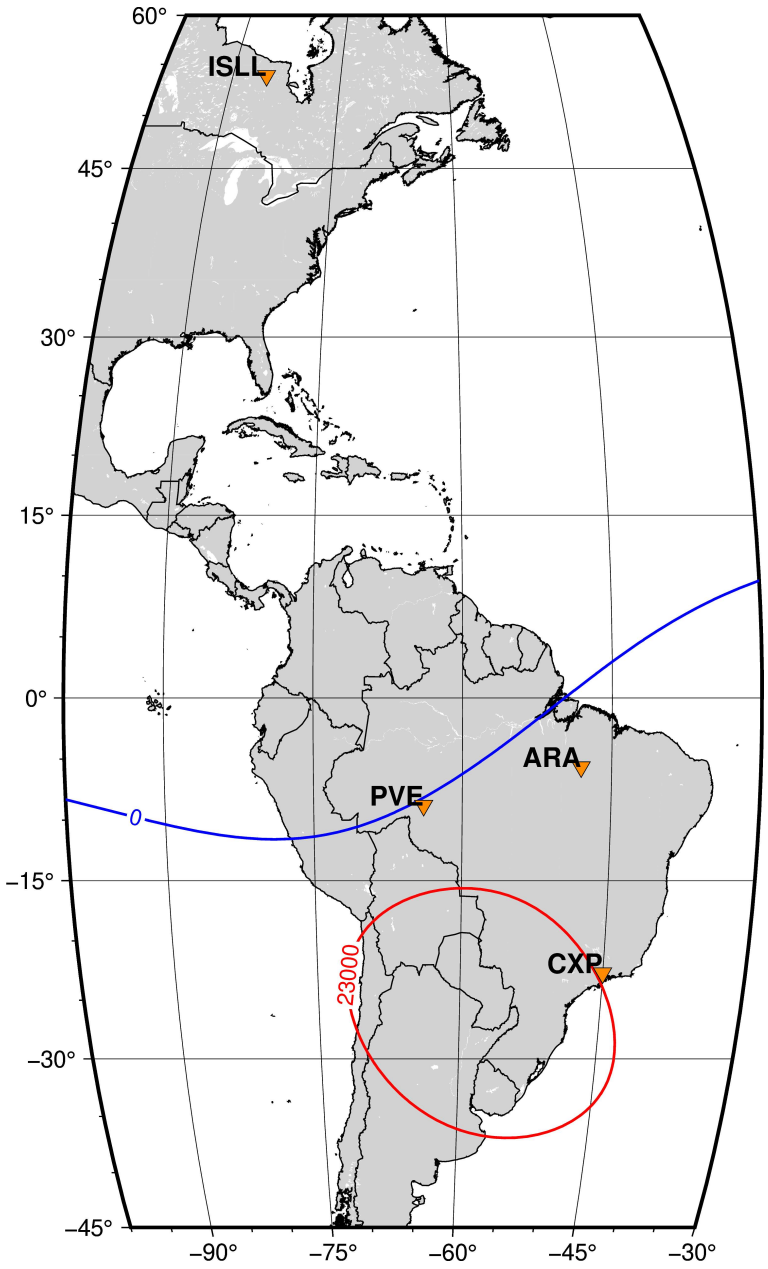


Figura 1: a) Map describing the geographic location of the stations together with the magnetic isolines to show that magnetic equator (blue) and the SAMA region (red). Cortesy: Karen Sarmiento.

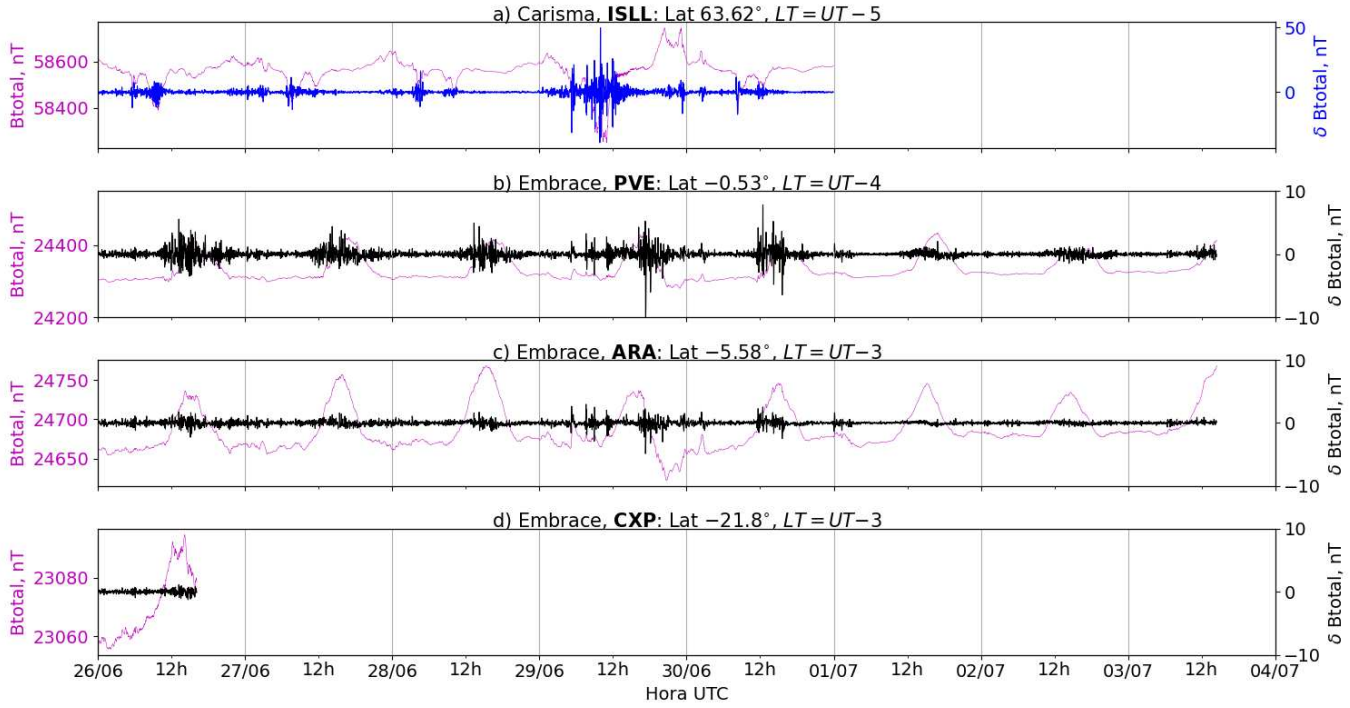


Figura 2: a) Timeseries of the geomagnetic field total component measured at ISLL station (Island Lake) of the CARISMA magnetometer network in magenta, along with the associated perturbation in the Pc5 band shown in blue. b-d) timeseries of the geomagnetic field total component measured at stations PVE (Porto Velho), ARA (Araguatins), and CXP (Cachoeira Paulista) of the EMBRACE network in magenta, along with the Pc5 perturbation in blue.

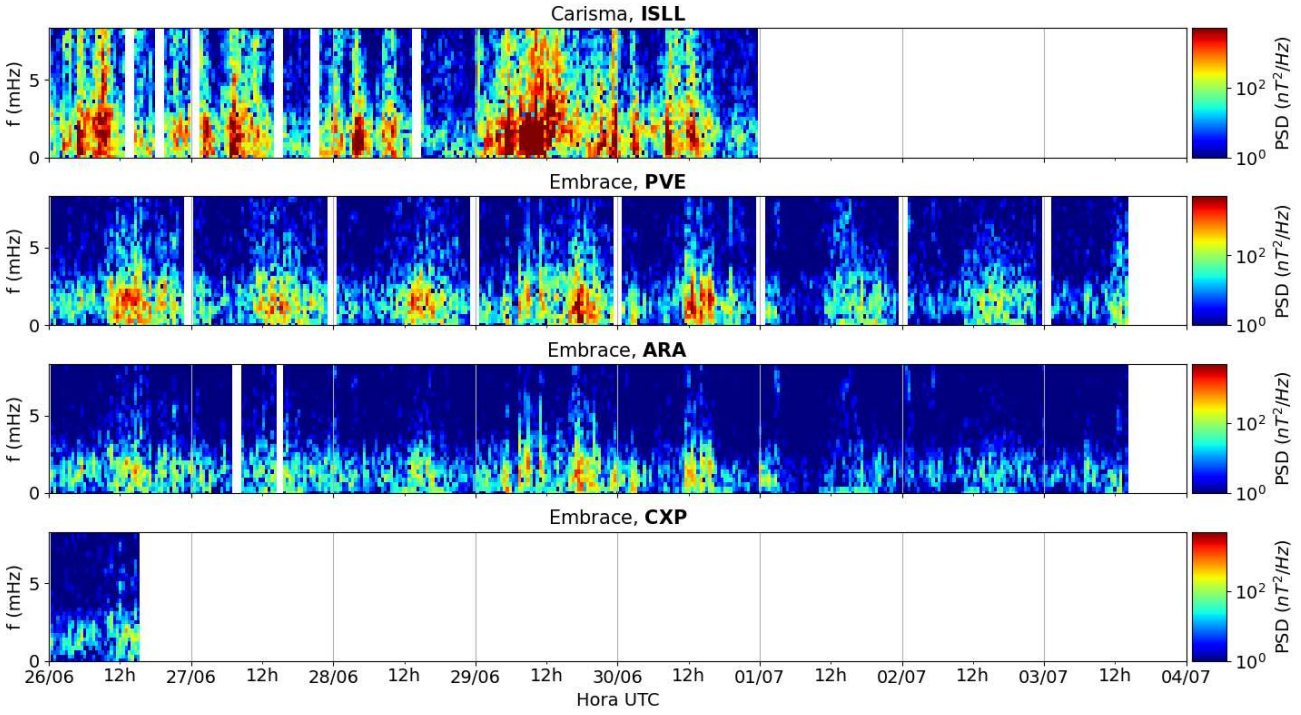


Figura 3: a-d) Time evolution of the power spectral density obtained from the filtered timeseries of the geomagnetic field total component (δ Btotal) for a) the high latitude station (ISLL-CARISMA), and b-d) for the low latitude stations of EMBRACE (PVE, ARA, CXP).

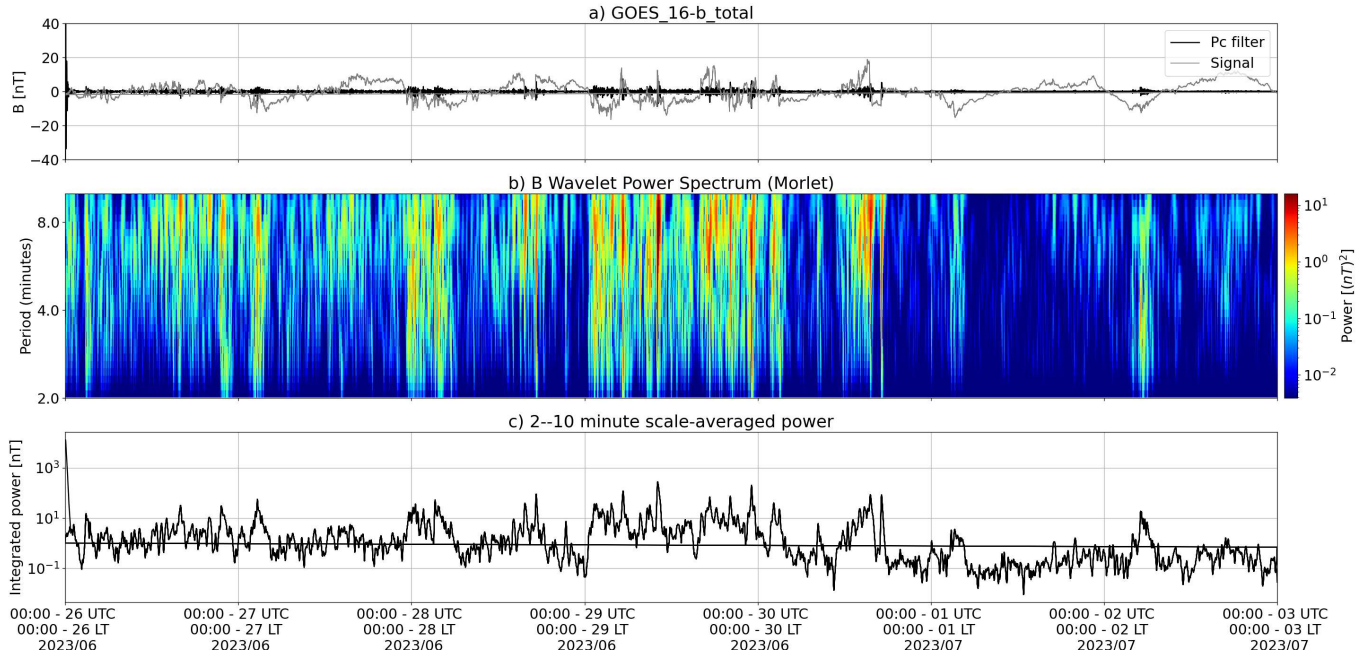


Figura 4: a) Timeseries of the geomagnetic field total component measured by GOES 16, together with the Pc5 fluctuation in black. b) Wavelet power spectrum of the filtered timeseries. c) Average ULF power in the period range from 2 to 10 minutes.

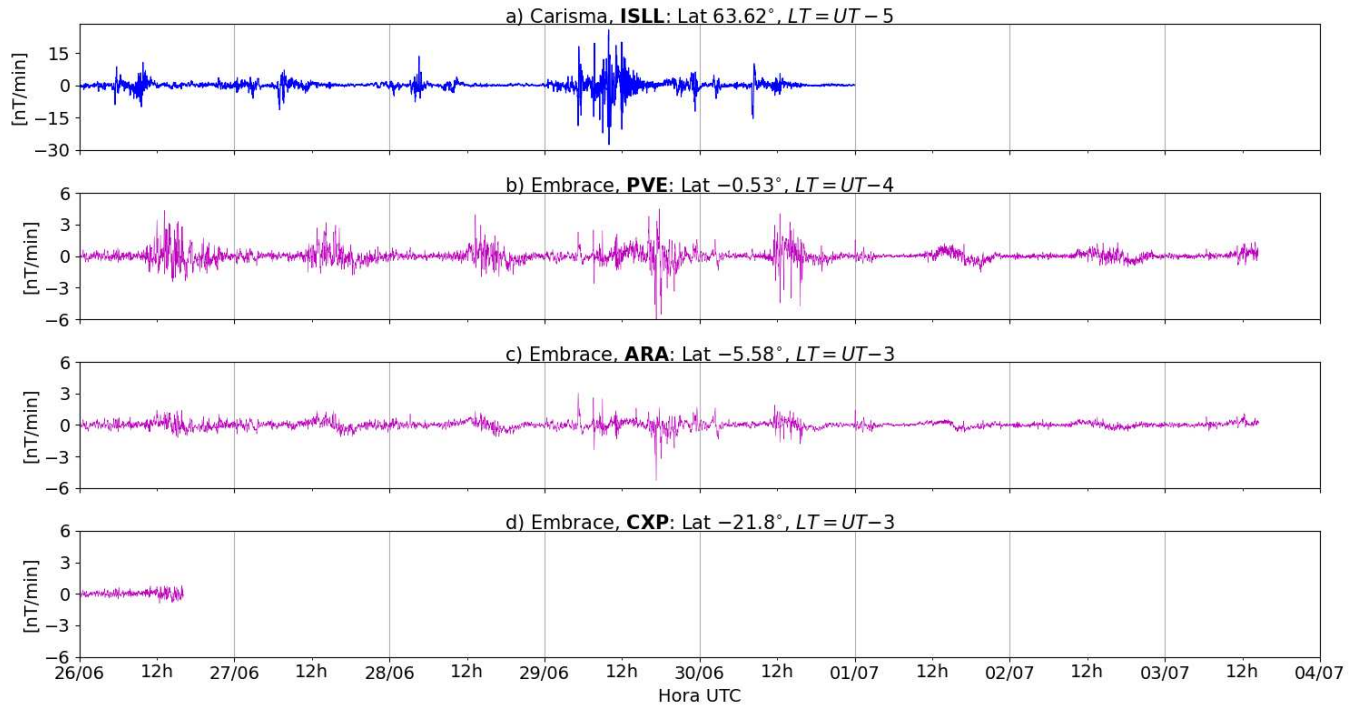


Figura 5: a-d) The rate of change of the geomagnetic field total component (dB/dt) obtained for a) the high latitude station (ISLL-CARISMA), and b-d) for the low latitude stations of EMBRACE (PVE, ARA, CXP).

- The GOES 16 satellite in geosynchronous orbit (L $\sim$ 6.6) registered significant activity of Pc5 ULF waves over the week, that is, until June 30.
- As observed on the ground, the ISLL station at high latitude registered intense ULF wave activity

over the week.

- The PVE station from Embrace MagNet, located under the dip equator, registered significant activity of the waves during the week, especially until June 30.
- The ARA stations at low latitude of Brazil registered low to moderate activity of the waves (mostly June 29-30) over the week.
- The dB/dt rates were below 30 nT/min in magnitude at ISLL (high latitude) and below 6 nT/min at the Embrace stations in lower latitudes.

5 Geomagnetic activity

5.1 Responsible: Lívia Alves

From June 27 to July 03, the geomagnetic field was unsettled, the following occurences are highlighted: jun/29: Embrace MagNet registered instabilities and a drop of -60 nT; AE index reached 1000 nT and Kp was 4o.

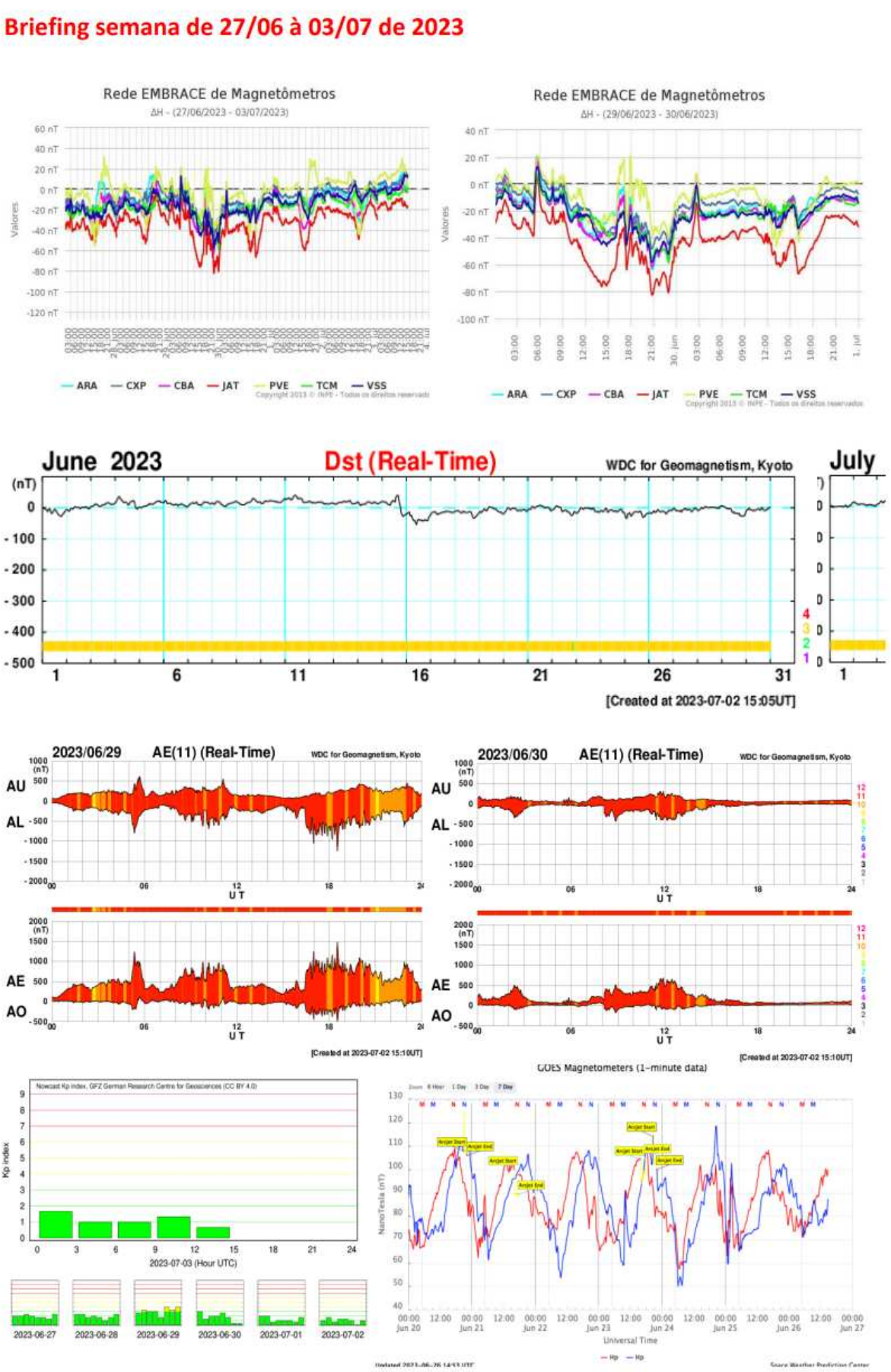


Figura 6: Time evolution of the geomagnetic field data and indices during the reported week.

6 Ionosphere

6.1 Responsible: Laysa Resende

Cachoeira Paulista:

- There was spread F on July 02.
- The Es layers reached scale 2 and 3 during this week.
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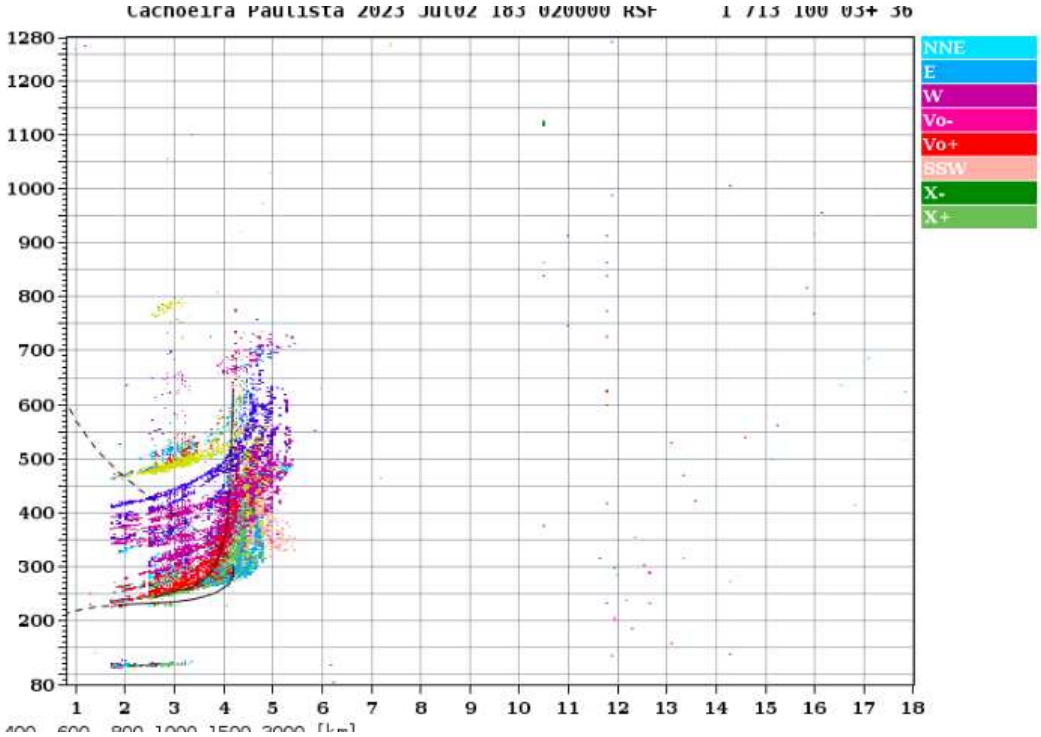
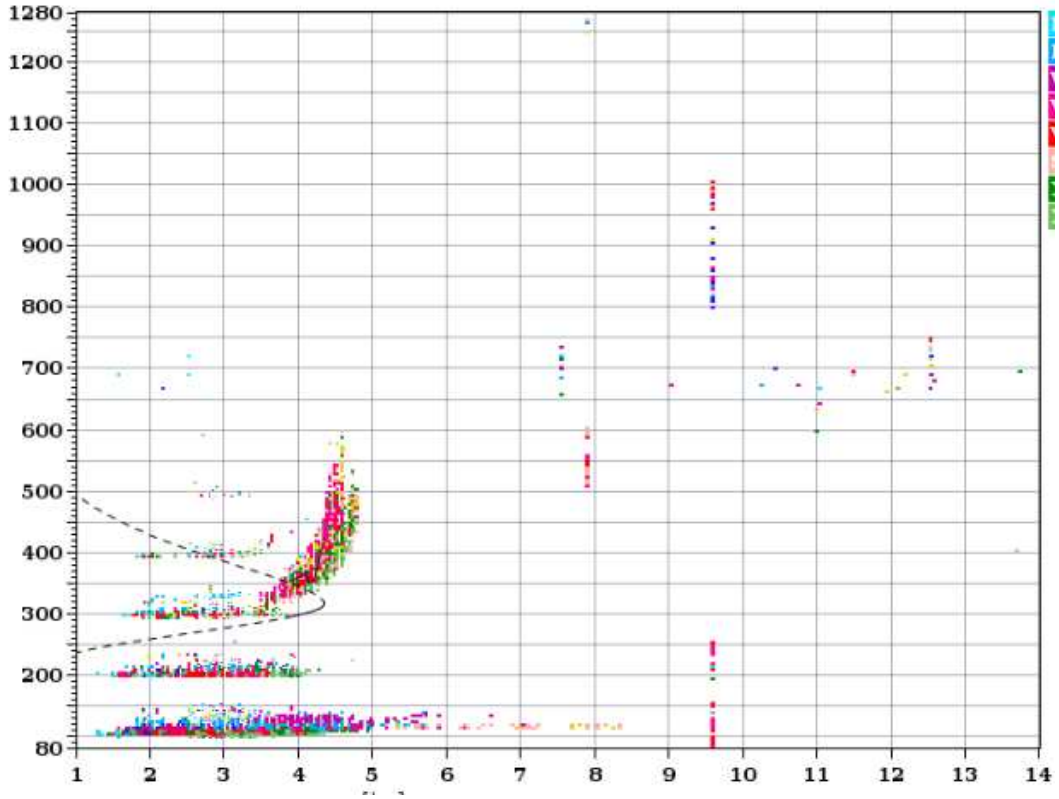


Fortaleza

- There were spread F all days during this week.
- The Es layers reached scale 4 during this week.



7 ROTI

7.1 Responsible: Carolina de Sousa

In the week 2268 (June 25-July 01, 2023) there were no ionospheric irregularities (plasma bubble), except on June 29th. Figure below shows the ROTI time series for four stations in the Brazilian sector (Natal (RNNA), Bacabal (MABB), Cuiabá (CUIB) and São José dos Campos (SJSP)).

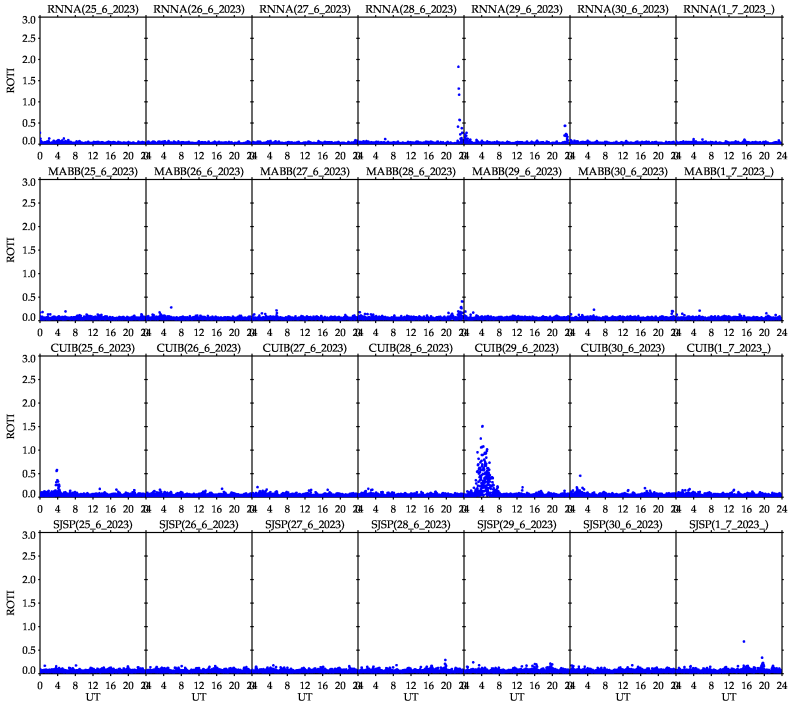


Figura 7: ROTI time series for four stations in the Brazilian sector (Natal (RNNA), Bacabal (MABB), Cuiabá (CUIB) and São José dos Campos (SJSP)), from June 25 - July 1, 2023.