

Briefing Space Weather

2022/06/06

1 Sun

1.1 Responsible: José Cecatto

05/30 – No flare (M/X); Fast wind stream (≤ 600 km/s); 5 CME c.h.c. toward the Earth;
05/31 – No flare (M/X); Fast wind stream (≤ 550 km/s); 2 CME c.h.c. toward the Earth;
06/01 – No flare (M/X); Fast wind stream (≤ 500 km/s); 1 CME c.h.c. toward the Earth;
06/02 – No flare (M/X); No fast wind stream; 5 CME c.h.c. toward the Earth;
06/03 – No flare (M/X); No fast wind stream; 1 CME c.h.c. toward the Earth;
06/04 – No flare (M/X); No fast wind stream; 2 CME c.h.c. toward the Earth;
06/05 – No flare (M/X); No fast wind stream; 2 CME c.h.c. toward the Earth;
06/06 – No flare (M/X); No fast wind stream; 2 CME c.h.c. toward the Earth;
Prev.: No fast wind stream up to June 08; for the next 2 days quite low (05% M, 01% 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 2022-06-01T01:54Z)
 - The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2022-06-04T19:00Z and 2022-06-05T09:00Z.
- WSA-ENLIL (CME 2022-06-02T06:09Z)
 - The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2022-06-05T13:25Z and 2022-06-06T02:25Z.
- WSA-ENLIL (CME 2022-06-04T03:48Z)
 - The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2022-06-07T17:00Z and 2022-06-08T07:00Z.

Buracos coronais (SPoCA : Spatial Possibilistic Clustering Algorithm):

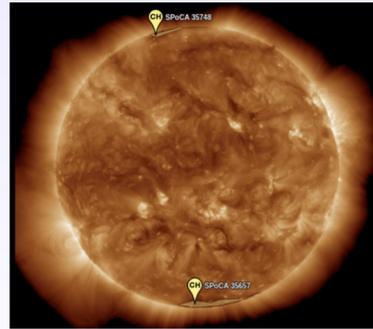
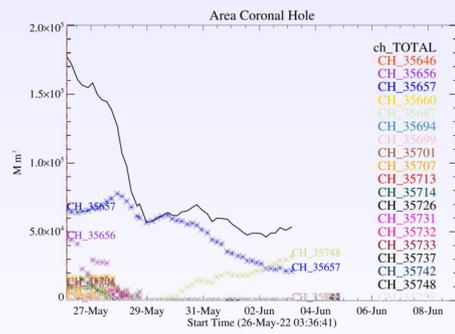
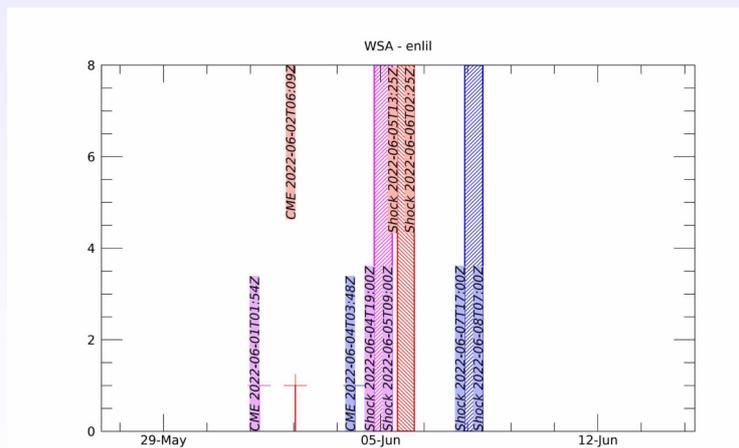


Figura: A linha em preto mostra o resultado da soma das áreas para cada intervalo da detecção realizado pelo SPOCA entre os dias 26 de maio e 04 de junho de 2022

Sobre a imagem em 193 Å do Sol estão destacados os Buracos coronais observados pelo SPOCA por volta das 00:00 UT do dia 31 de maio de 2022.



WSA - ENLIL SPOCA

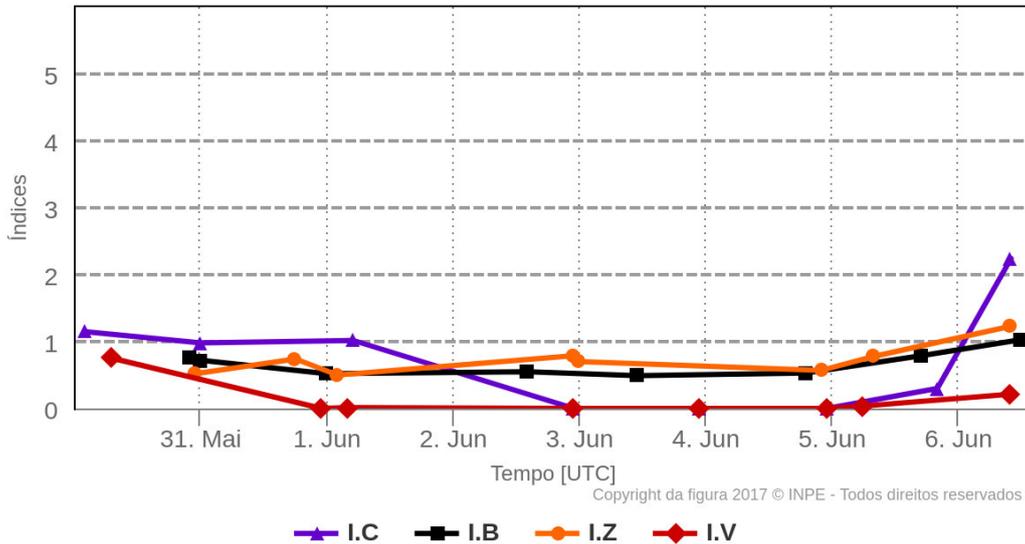


3 Interplanetary Medium

3.1 Responsible: Paulo Jauer

Resumo dos índices do meio interplanetário

Máximos diários - mais recentes entre 30 Mai, 2022 e 6 Jun, 2022



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- The interplanetary medium region in the last week showed a low/moderate level of plasma perturbations due to the possible interaction of CME and HSS-like structures identified by the DISCOVERY satellite in the interplanetary medium.
- The modulus of the interplanetary magnetic field component showed 1 maximum peak on 06/June at 09:50 of ~ 11.4 nT.
- The BxBy components showed variations in the analyzed period, both remaining oscillating within the $[+10, -10]$ nT interval, without the presence of sector switching.
- The component of the bz field showed fluctuations oscillating mostly around negative values. The bz component showed an abrupt variation of -10.58 nT on 06/June at 09:50 due to the interaction of an ICME.
- The solar wind density peaked on June 6th at 10:30 am at $42.6 p/m^3$. The solar wind speed had fluctuated decreasing throughout the week, with a minimum value on June 6 at 8:30 am of 263 km/s and a maximum value at 1:30 pm on May 30 of 572.6 km/s.
- The magnetopause position was oscillating on average below the equilibrium position until 01/June at 05:30. After, it remained oscillating above the equilibrium position until June 6th at 10:30 am, whose compression was 8,014 Re.

4 ULF Waves

4.1 Responsible: Graziela B. D. Silva

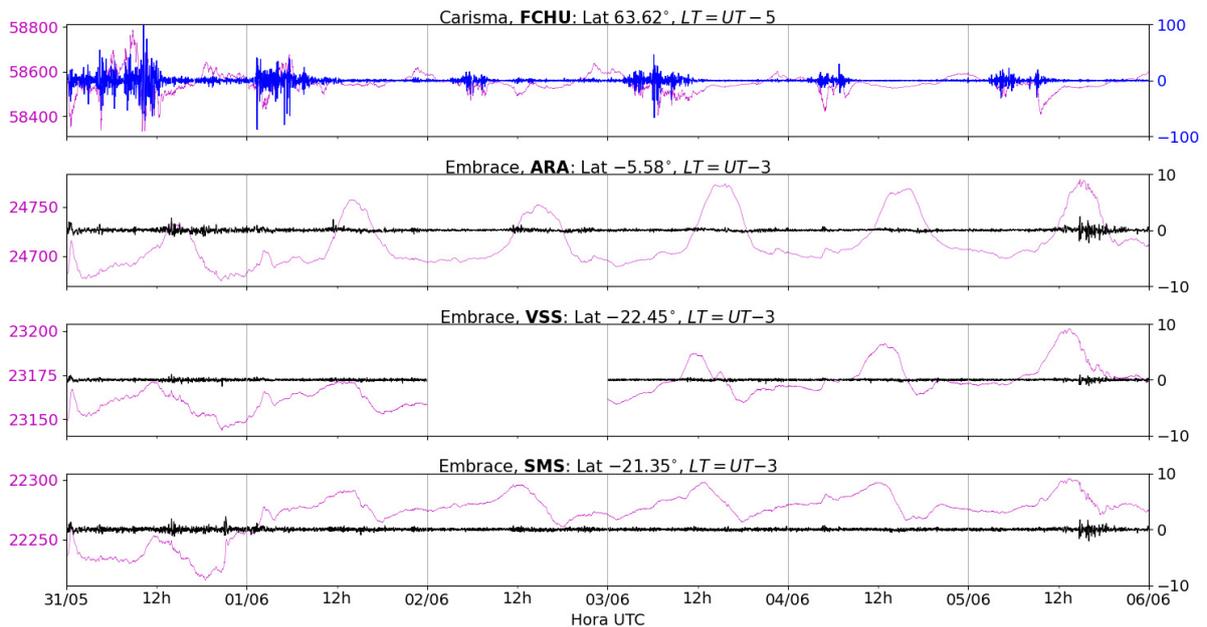


Figura 1: a) Timeseries of the geomagnetic field total component measured at FCHU station (Fort Churchill) of the CARISMA magnetometer network in magenta, along with the associated perturbation in the Pc5 band shown in blue. b-d) timeseries of the geomagnetic field total component measured at stations ARA (Araguatins), VSS (Vassouras) and SMS (São Martinho da Serra) of the EMBRACE network in magenta, along with the Pc5 perturbation in blue. The data in these plots are in units of nanotesla (nT).

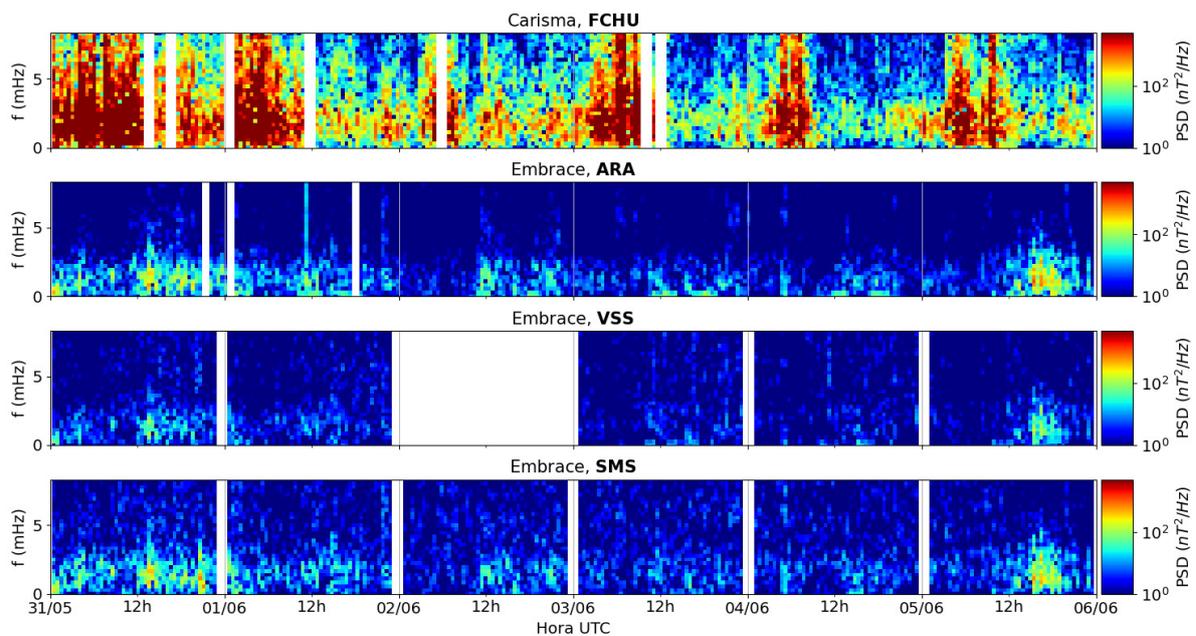


Figura 2: a-d) Time evolution of the power spectral density obtained from the filtered timeseries of the geomagnetic field total component (δB_{total}) for a) the high latitude station (FCHU-CARISMA), and b-d) for the low latitude stations of EMBRACE (ARA, VSS, SMS).

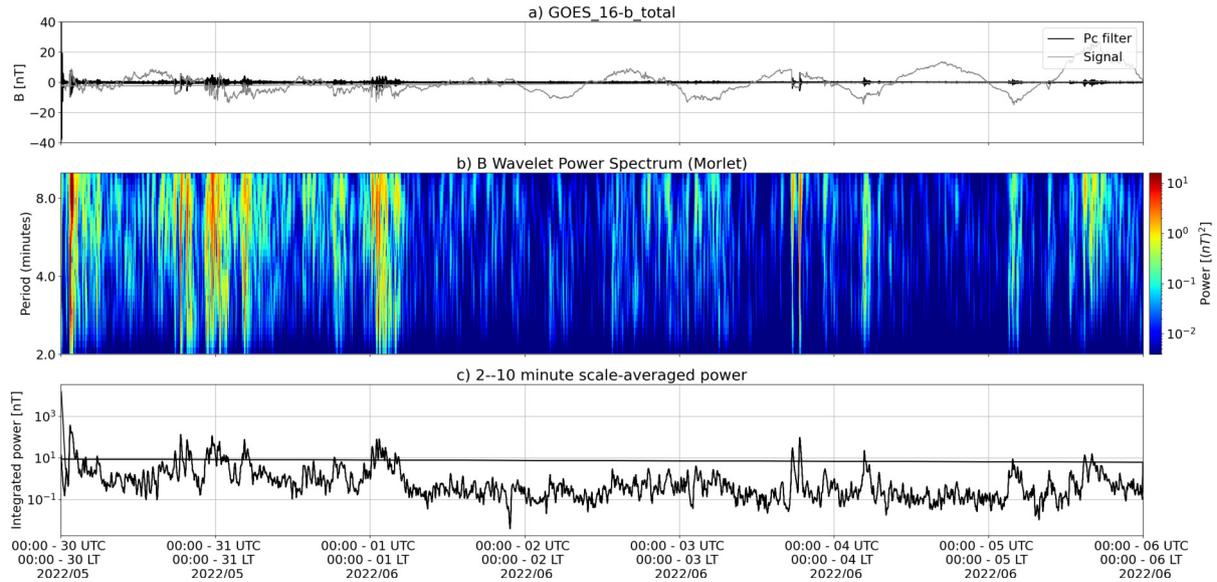


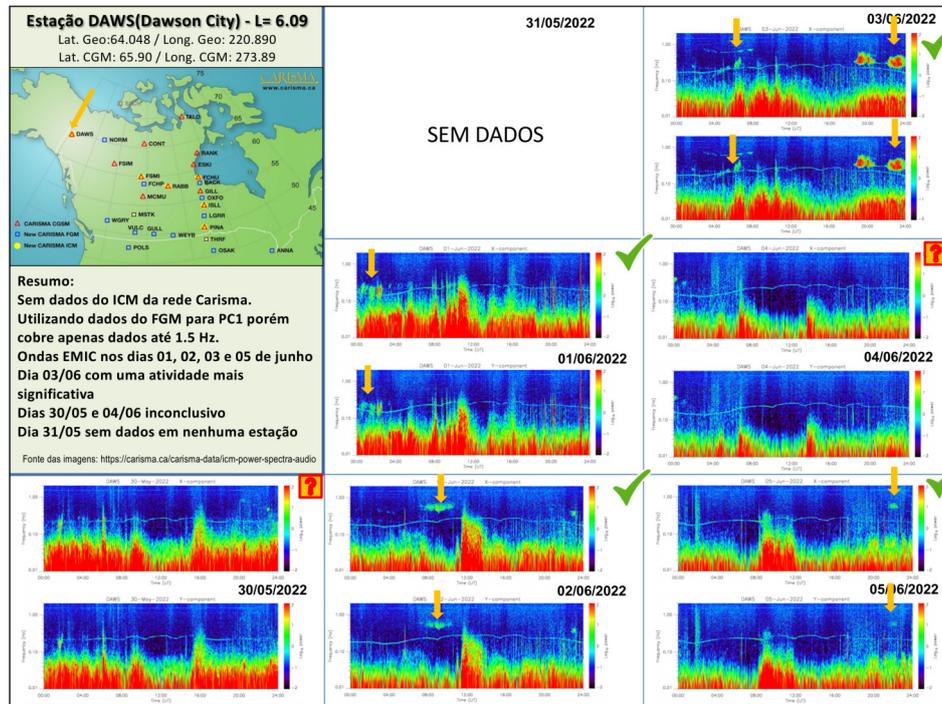
Figura 3: a) Timeseries of the geomagnetic field total component measured by GOES 16, together with the Pc5 fluctuation in black. b) Wavelet power spectrum of the filtered timeseries. c) Average ULF power in the period range from 2 to 10 minutes.

Summary of the week from 31/05 to 05/06

- There were intense and continuous activity of Pc5 ULF waves between 30/05-00:00 UT and 01/06-12:00 UT, as measured by GOES 16 at geosynchronous orbit ($L \sim 6.6$). From 01/06-12:00 UT until 04/06 the ULF wave activity was weak. The presence of these waves in the magnetosphere can be related to the arrival of the solar wind transients aforementioned.
- On the ground, a significant Pc5 ULF wave activity was registered at high latitude in Fort Churchill on 31/05 and 01/06. Later on days 02, 04 and 05/06, the wave activity became mostly weak, except on 03/06 when such activity enhanced to moderate levels as compared to prior days.
- At low latitudes over Brazil, the Pc5 ULF wave activity was mostly weak throughout the week until 04/06. On 05/06, there was an increase in the wave activity after 12 UT, although not concomitant with the enhanced activity observed at Fort Churchill. This may indicate a distinct source and propagation mode for these ULF waves localized over the equatorial ionosphere.
- It can be noted that the signals registered at ARA and SMS are more amplified than those of VSS, possibly due to secondary effects induced by the Equatorial Electrojet and the South America Magnetic Anomaly respectively at these stations.

5 Ondas EMIC

5.1 Responsável: Claudia Medeiros



6 Geomagnetic activity

6.1 Responsible: Lívia Alves

In the week of 05/31 to 06/06, the following events related to geomagnetic activity stand out:

- The data from the Embrace magnetometer network showed instabilities throughout the period, with emphasis on Jun 06 - The magnetometers of the Embrace network recorded a drop followed by an enhancement in the H component.
- The geomagnetic activity was unstable throughout the period, the AE index was unsettled in the period. The Dst index ranged from +22 nT to -15 nT. The highest Kp of the week was 3+

7 Ionosphere

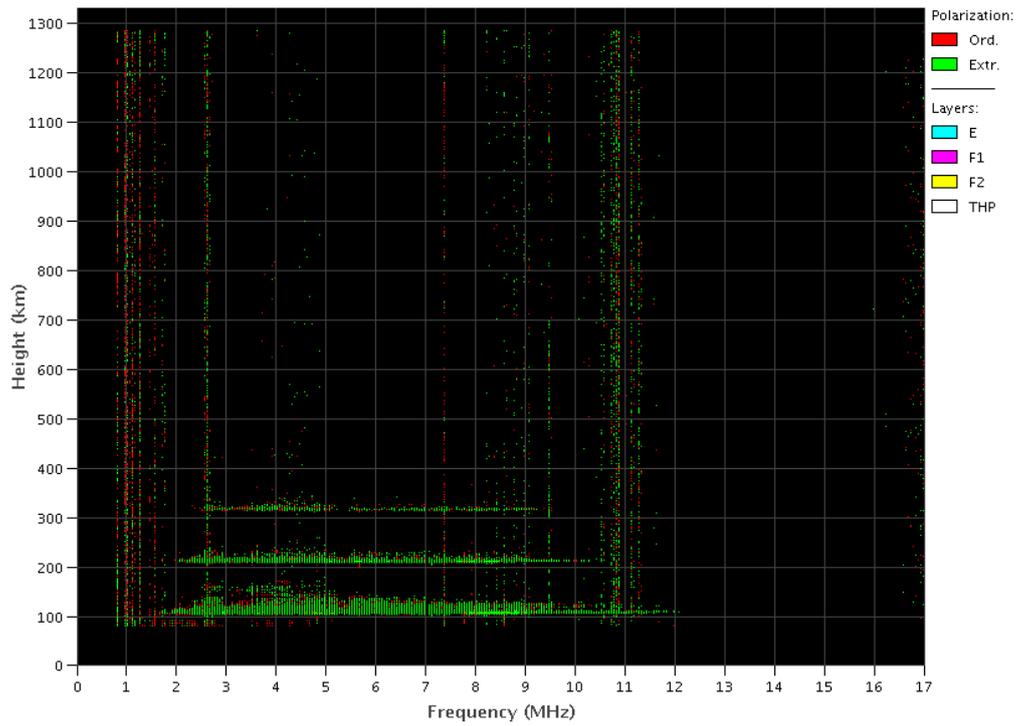
7.1 Responsible: Laysa Resende

Boa Vista:

- There were not occurred spread F on day 01.
- The Es layers reached scale 5 on day 01.

EMBRACE – Digital Ionosonde

Boa Vista – 06/01/2022 00:40:00 UT

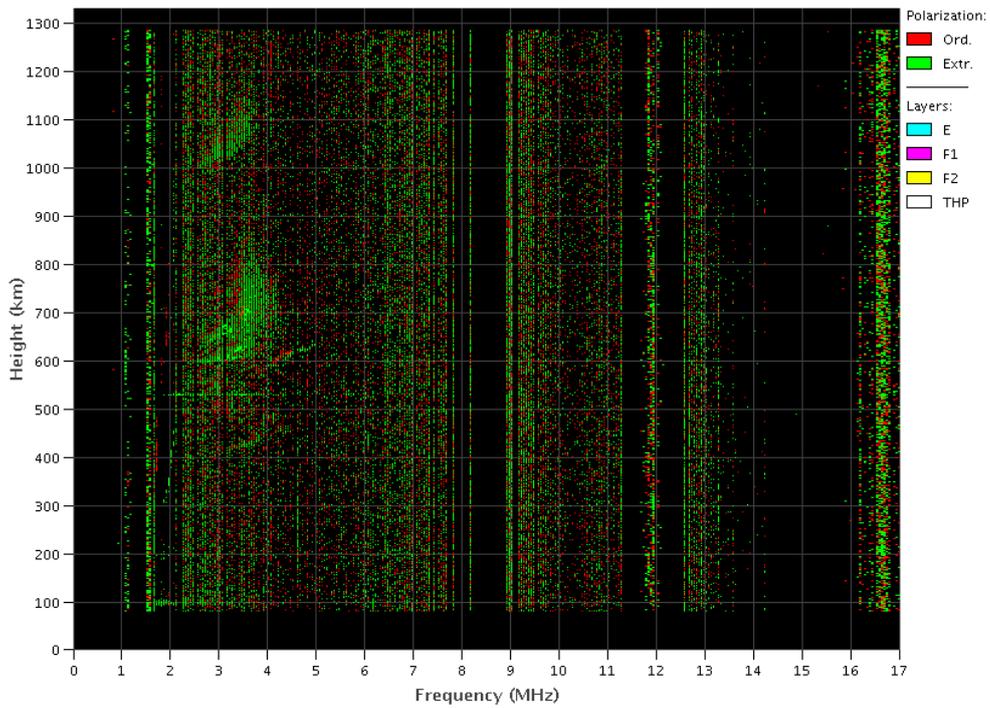


Cachoeira Paulista:

- There were a weak spread F on days 03 and 05.
- The Es layers reached scale 2 and 3 during this week.

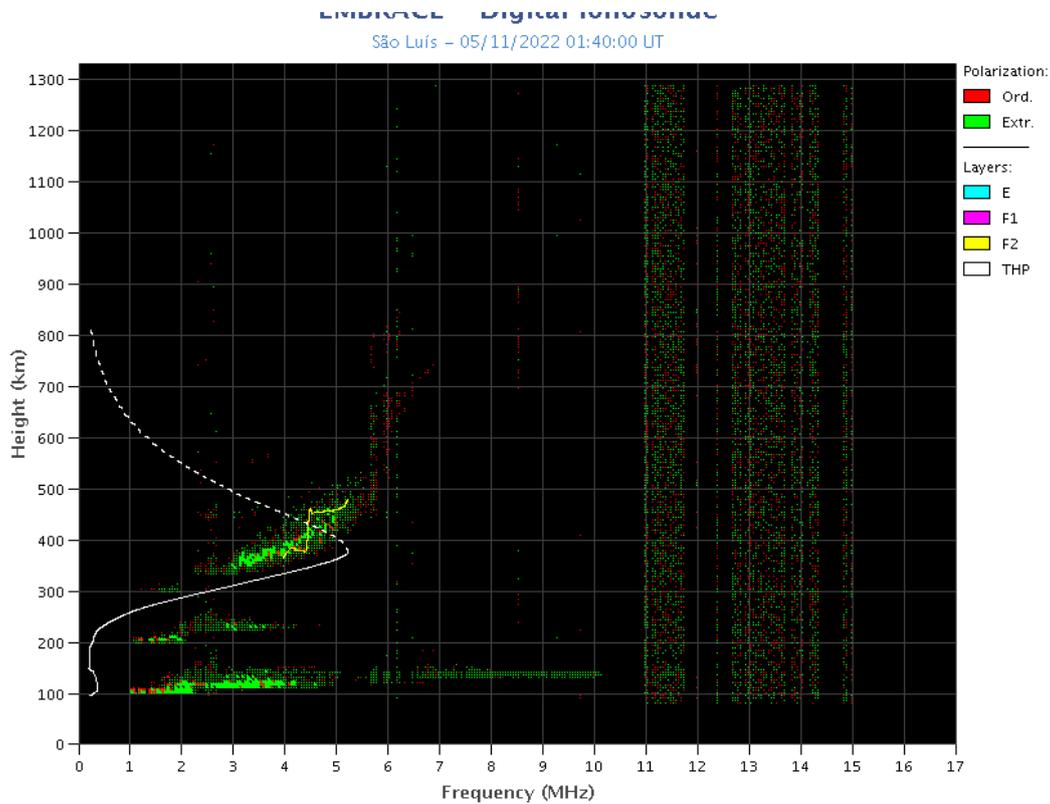
EMBRACE – Digital Ionosonde

Cachoeira Paulista – 06/03/2022 03:50:00 UT



São Luís:

- There were not spread F on days 03 and 04.
- The Es layers reached scale 4 on day 03.



8 Scintillation

8.1 Responsible: Siomel Savio Odriozola

In this report on the S4 scintillation index, data from SLMA in São Luiz/MA, STSN in Sinop/MT, UFBA in Bahia/BA and SJCE in São José dos Campos/SP are presented. The S4 index tracks the presence of irregularities in the ionosphere having a spatial scale ~ 360 m. The SLMA and SJCE stations showed S4 values below 0.2 throughout the week. The STSN station showed weak scintillation values on 05/31 and 06/5 as shown in Figure 1 in the upper panel. Moderate f scintillation was recorded at UFBA during the early hours of 03/06 (Figure 1 lower panel).

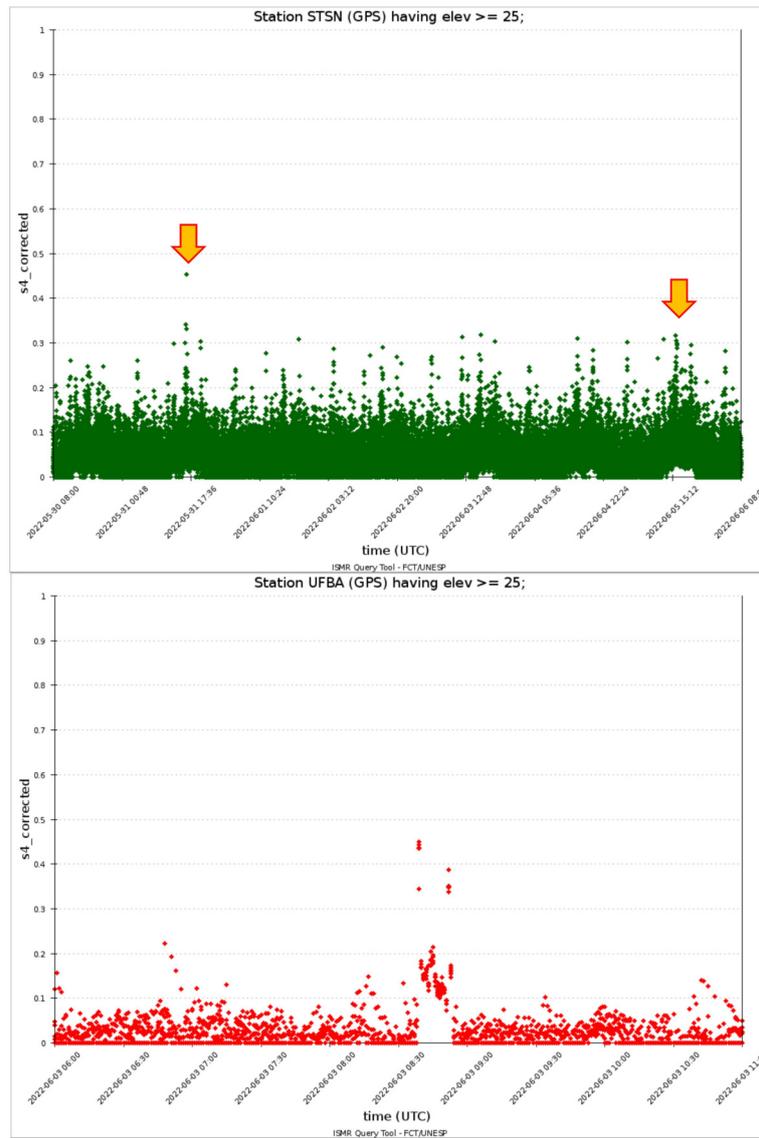


Figura 1: Valores do índice S4 para a constelação GPS medidos na estação STSN durante os dias 30/05 até 06/06 0800UT (painel superior). O painel inferior mostra os valores do S4 medidos em UFBA entre as 0600-1100 UT no dia 03/6.

9 All-Sky Imager

9.1 Responsible: LUME

All-Sky Imager EPBs Observation
Observações das EPBs por meio do imageador All-Sky
May 29 - June 04, 2022 || 29 de maio - 04 de junho, 2022

Observatory Observatório	May 29 maio 29	May 30 maio 30	May 31 maio 31	June 01 junho 01	June 02 junho 02	June 03 junho 03	June 04 junho 04
CA	✓☁☀☾	✓☁☀☾	✓☁☀☾	✓☁☀☾	✓☁☀☾	✓☁☀☾	✓☁☀☾
BJL	✗	✗	✗	✗	✗	✗	✗
CP	✓☁☾	✓☁☾	✓☁☾	✓☁☾	✓☁☾	✓☁☾	✓☁☾
SMS	✓☁☾	✓☁☾	✓☁☾	✓☁☾	✓☁☾	✓☁☾	✓☁☾
Definition of Symbols							
CA	São João do Cariri						
BJL	Bom Jesus da Lapa						
CP	Cachoeira Paulista						
SMS	São Martinho da Serra						
✓	Observation - Observação						
✗	No Observation - Sem Observação						
☁	Clear sky - Céu limpo						
☁	Partly Cloudy - Parcialmente Nublado						

- At the Sao Joao do Cariri observatory no geophysical phenomena such as plasma bubbles and traveling ionospheric disturbances were observed during the period.
- At the Bom de Jesus da Lapa observatory there was no observation due to technical problems.
- At the Cachoeira Paulista observatory no geophysical phenomena such as plasma bubbles and traveling ionospheric disturbances were observed during the period.
- Finally, at the observatory of Sao Martinho da Serra observatory, it was observed a traveling ionospheric disturbances on June 3rd.

TEC

- No plasma bubbles were observed during the entire period. Besides, the equatorial anomaly was observed every day.