

Briefing Space Weather

2022/05/23

1 Sun

1.1 Responsible: José Cecatto

05/16 – M2 flare and radio blackout; Fast wind stream (≤ 550 km/s); 1 CME c.h.c. toward the Earth;

05/17 – M1 flare; Fast wind stream (≤ 600 km/s); 7 CME c.h.c. toward the Earth;

05/18 – M1 flare; Fast wind stream (≤ 550 km/s); 3 CME c.h.c. toward the Earth;

05/19 – 3 M-Flares (2M1, M6); Fast wind stream (≤ 550 km/s); 7 CME c.h.c. toward the Earth;

05/20 – M3 flare; M1 flare; Fast wind stream (≤ 600 km/s); 2 CME c.h.c. toward the Earth;

05/21 – No flare (M/X); Fast wind stream (≤ 550 km/s); 8 CME c.h.c. toward the Earth *;

05/22 – No flare (M/X); Fast wind stream (≤ 550 km/s); 9 CME c.h.c. toward the Earth;

05/23 – No flare (M/X); Fast wind stream (≤ 550 km/s); 3 CME c.h.c. toward the Earth;

Prev.: Fast wind stream up to May 24; for the next 2 days relatively low (40% M, 05% 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 2022-05-17T05:48Z, 2022-05-17T06:48Z)
 - The simulation results indicate that the flanks of combined Coronal Mass Ejections will reach the DSCOVR mission between 2022-05-19T22:30Z and 2022-05-20T12:30Z.
- WSA-ENLIL (CME 2022-05-17T09:23Z)
 - The simulation results indicate that the flank of CME will reach the DSCOVR mission between 2022-05-21T10:00Z e 2022-05-22T00:00Z.

Buracos coronais (SPoCA : Spatial Possibilistic Clustering Algorithm):

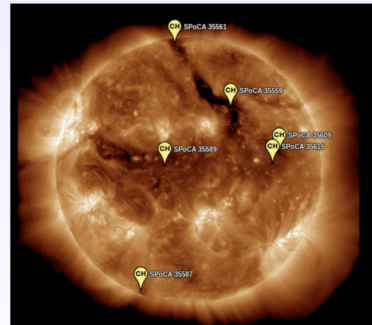
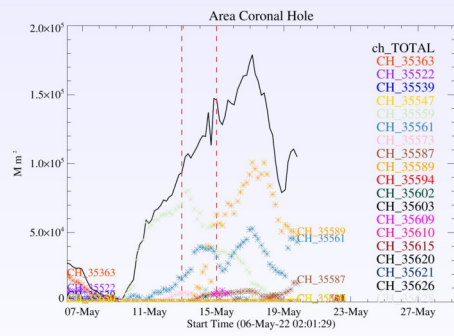
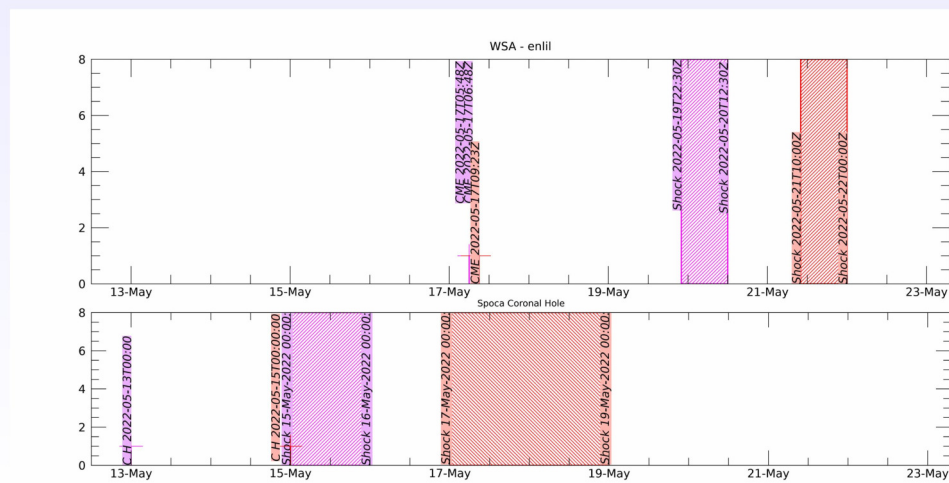


Figura: A linha em preto mostra o resultado da soma das áreas para cada intervalo da detecção realizado pelo SPOCA entre os dias 06 e 20 de maio de 2022

Sobre a imagem em 193 Å do Sol estão destacados os Buracos coronais observados pelo SPOCA por volta das 04:00 UT do dia 15 de maio de 2022.



WSA - ENLIL SPOCA



3 ULF Waves

3.1 Responsible: José Paulo Marchezi

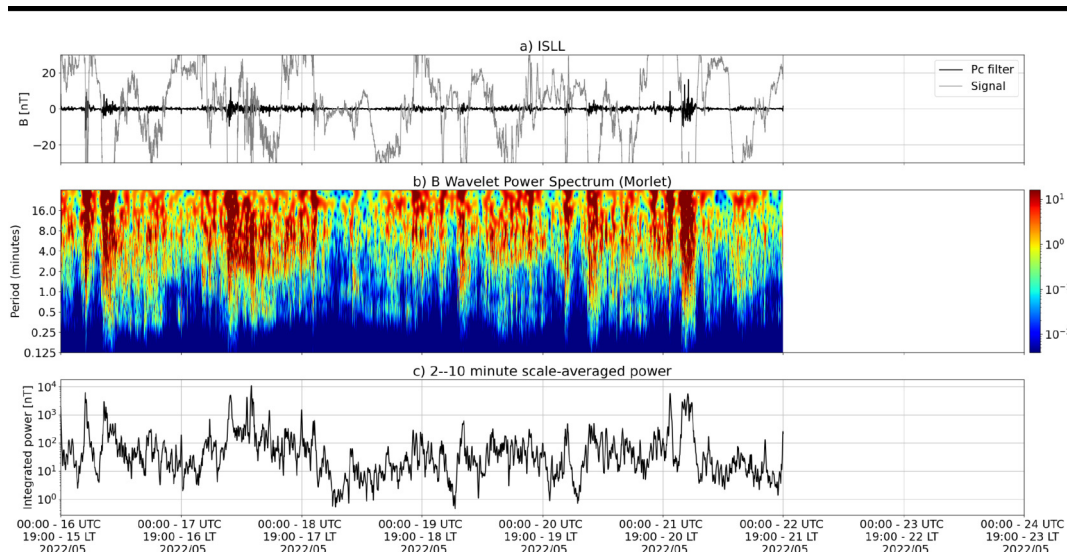


Figura 1: a) signal of the total magnetic field measured in the ISLL Station of the CARISMA network in gray, together with the fluctuation in the range of Pc5 in black. b) Wavelet power spectrum of the filtered signal. c) Average spectral power in the ranges from 2 to 10 minutes (ULF waves).

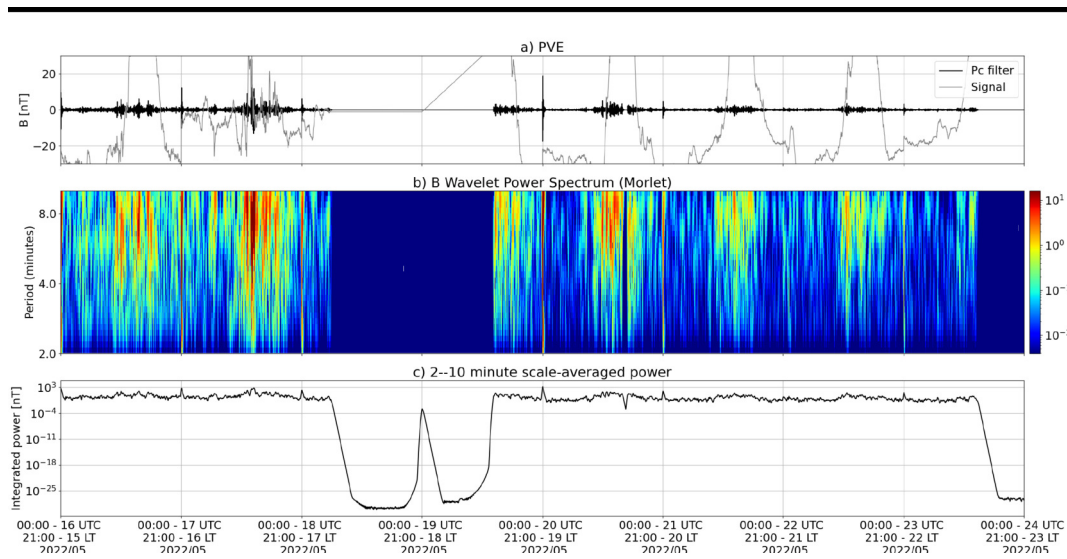


Figura 2: a) signal of the total magnetic field measured in the EMBRACE network in gray, together with the fluctuation in the range of Pc5 in black. b) Wavelet power spectrum of the filtered signal. c) Average spectral power in the ranges from 2 to 10 minutes (ULF waves).

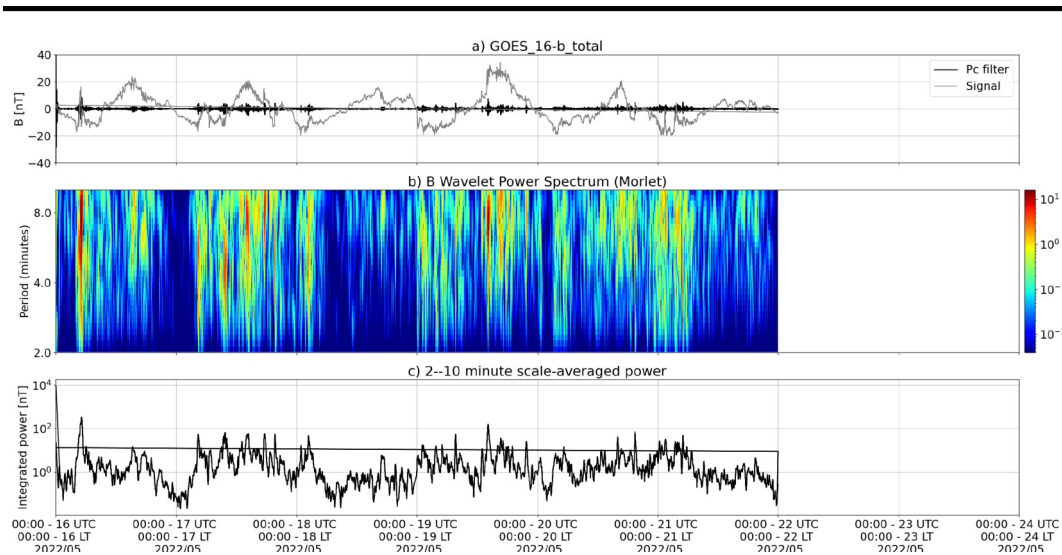
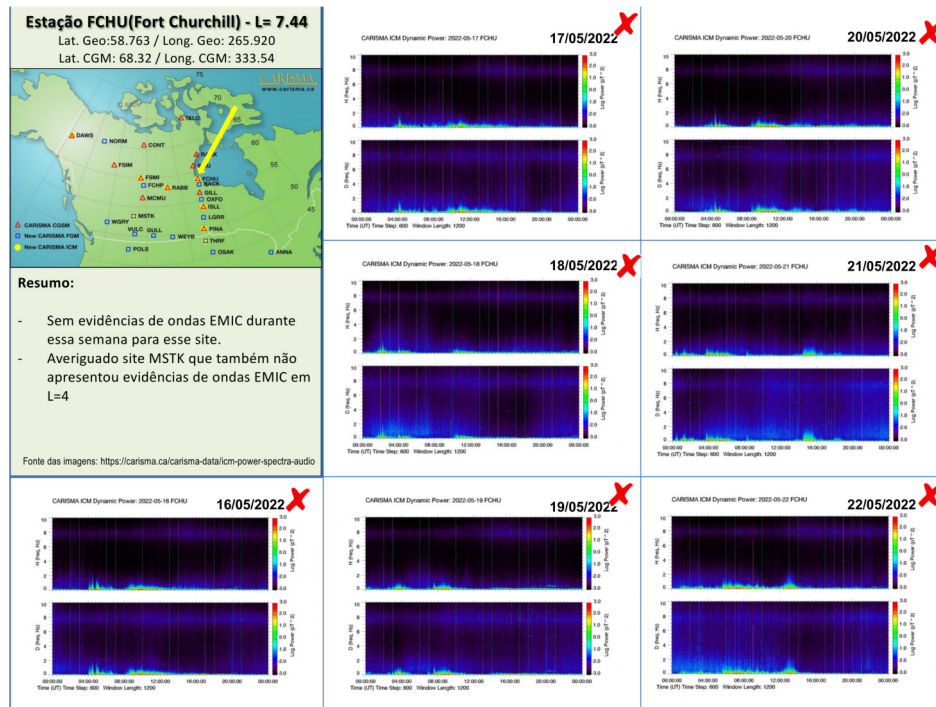


Figura 3: a) signal of the total magnetic field measured by the GOES 16 satellite, together with the fluctuation in the range of Pc5 in black. b) Wavelet power spectrum of the filtered signal. c) Average spectral power in the ranges from 2 to 10 minutes (ULF waves).

The ULF wave activity starts on May 16, presents two short peaks before 12:00 UT and after noon it remains at the lowest power with characteristics of continuous geomagnetic pulsations. On the 17th, around 11:00 UT there is a new signal increase, with continuous characteristics, possibly related to an increase in the solar wind speed. Between the 18th and 19th, activity remains reduced, with some peaks, mainly at high latitudes, also recorded by the GOES satellite. The disturbances increase on May 20, also recorded at low latitude, by EMBRACE magnetometers. Summary 10/10 The ULF wave activity starts on May 16, presents two short peaks before 12:00 UT and after noon it remains at the lowest power with characteristics of continuous geomagnetic pulsations. On the 17th, around 11:00 UT there is a new signal increase, with continuous characteristics, possibly related to an increase in the solar wind speed. Between the 18th and 19th, activity remains reduced, with some peaks, mainly at high latitudes, also recorded by the GOES satellite. The disturbances increase on May 20, also recorded at low latitude, by EMBRACE magnetometers.

4 Ondas EMIC

4.1 Responsável: Claudia Medeiros

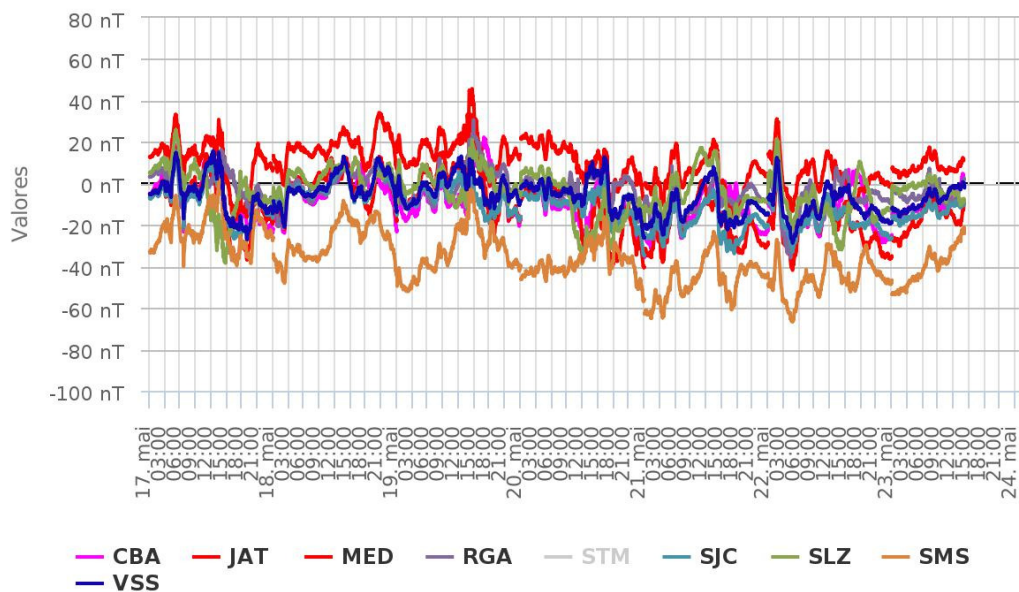


5 Geomagnetism

5.1 Responsible: Livia Riveiro Alves

Rede EMBRACE de Magnetômetros

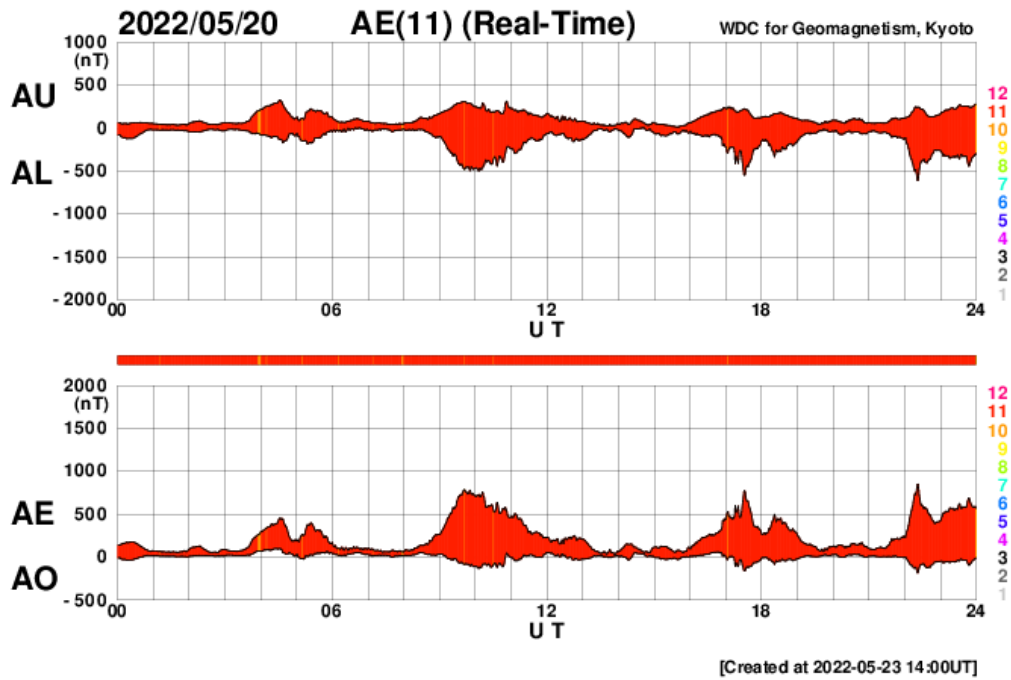
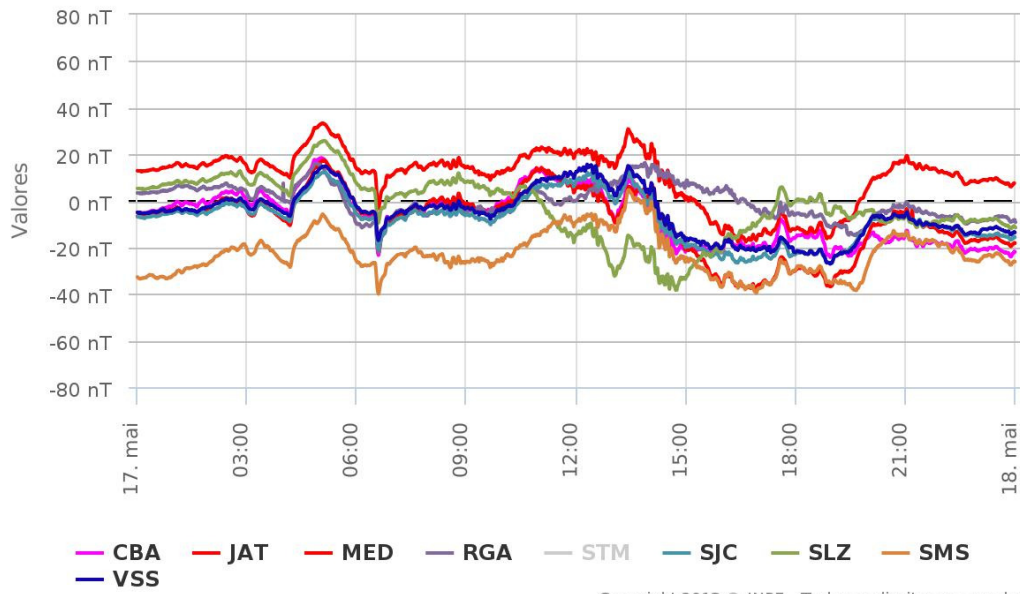
ΔH - (17/05/2022 - 23/05/2022)

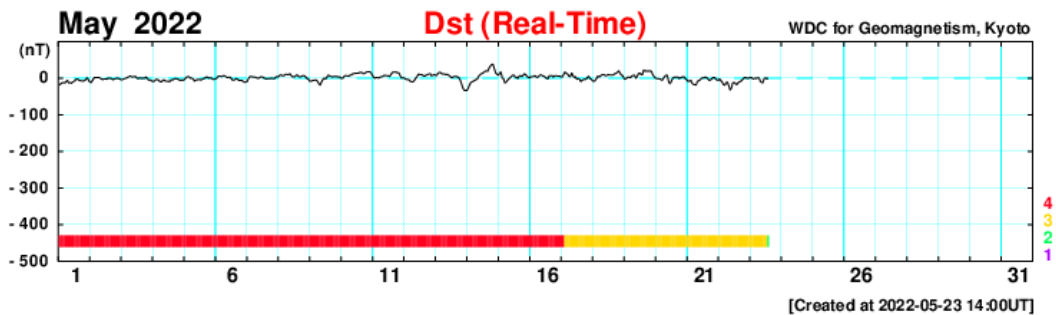
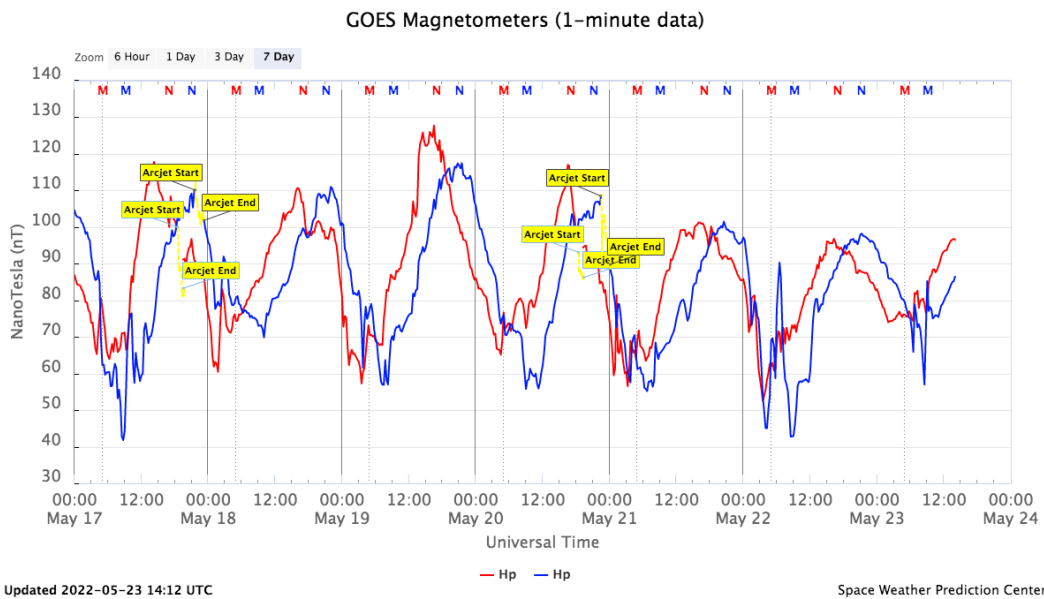
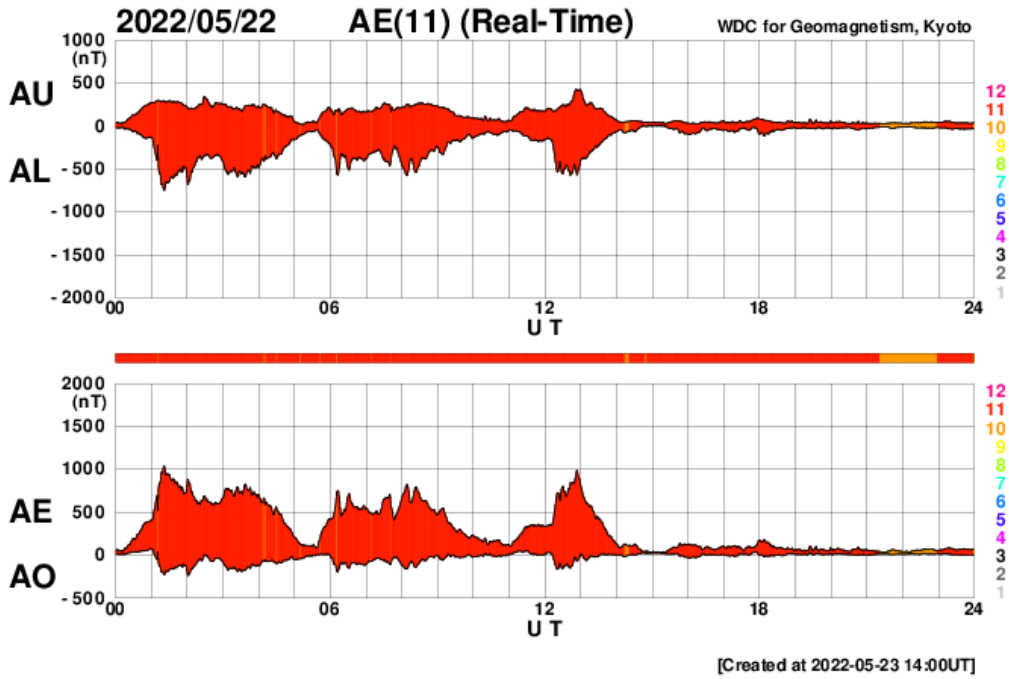


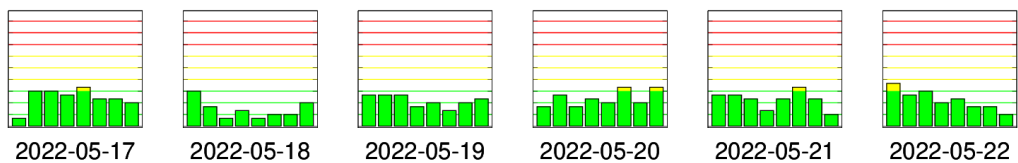
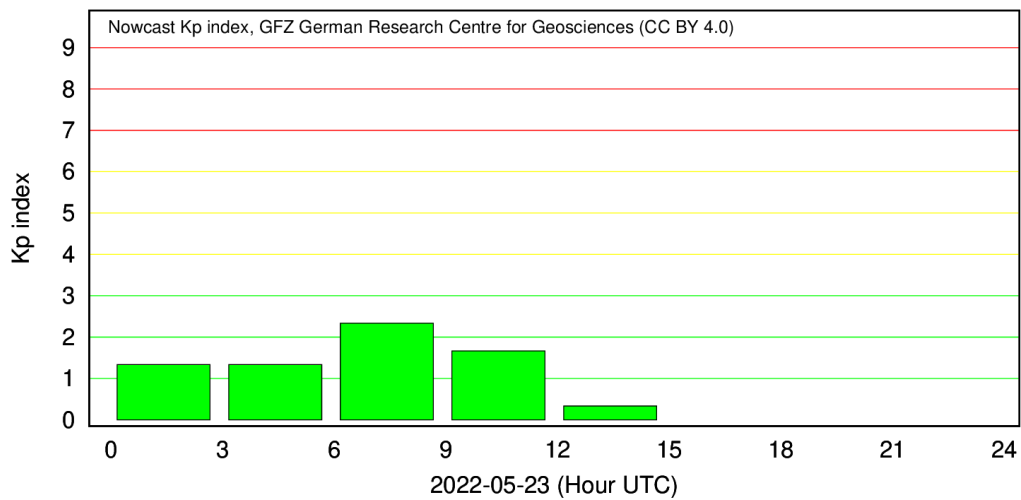
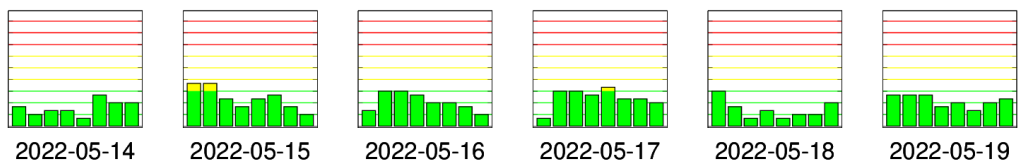
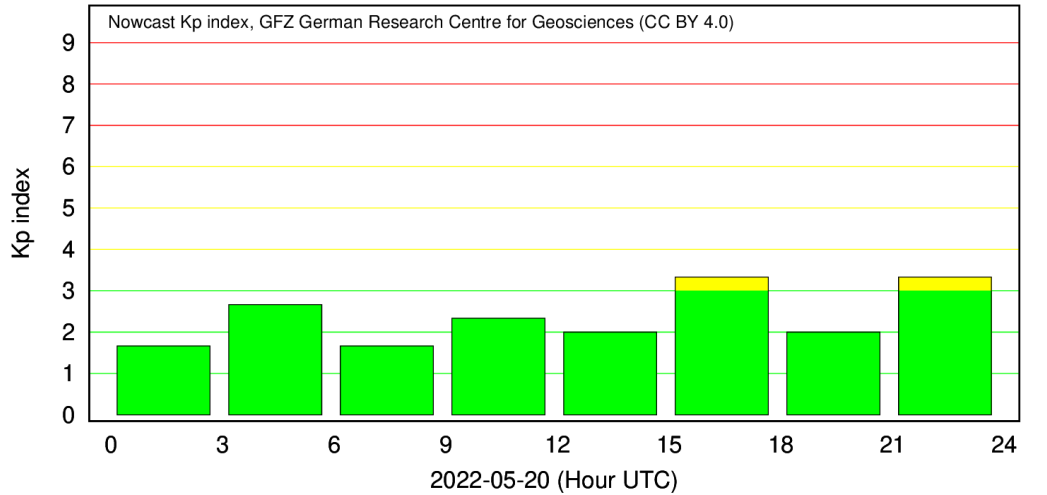
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Rede EMBRACE de Magnetômetros

ΔH - (17/05/2022 - 17/05/2022)







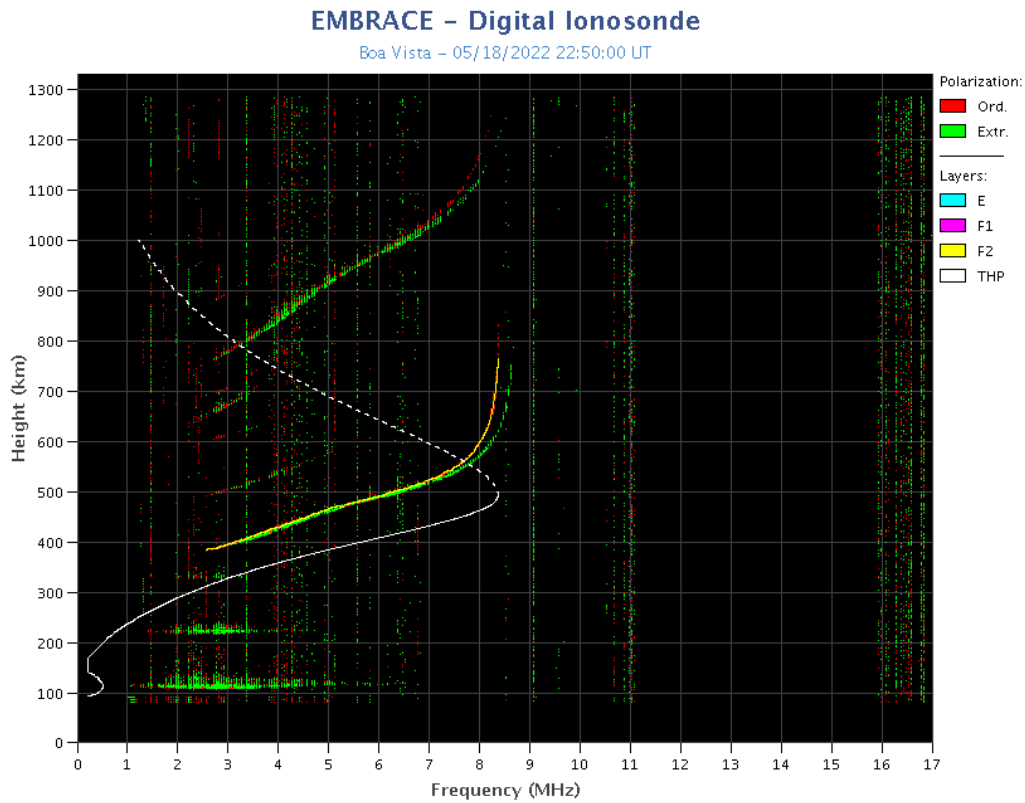
- In the week of 05/17 to 05/23, the following events related to geomagnetic activity stand out:
- Data from the Embrace magnetometer network showed instabilities throughout the period, no significant events in the last period
- Geomagnetic activity was unstable throughout the AE index, with the Dst index oscillating around zero. Highest Kp of the week was 3+
- The auroral activity was slightly intensified on the 20th and 22th of May.

6 Ionosphere

6.1 Responsible: Laysa Resende

Boa Vista:

- There were not occurred spread F on day 16.
- The Es layers reached scale 4 on days 18 and 21.

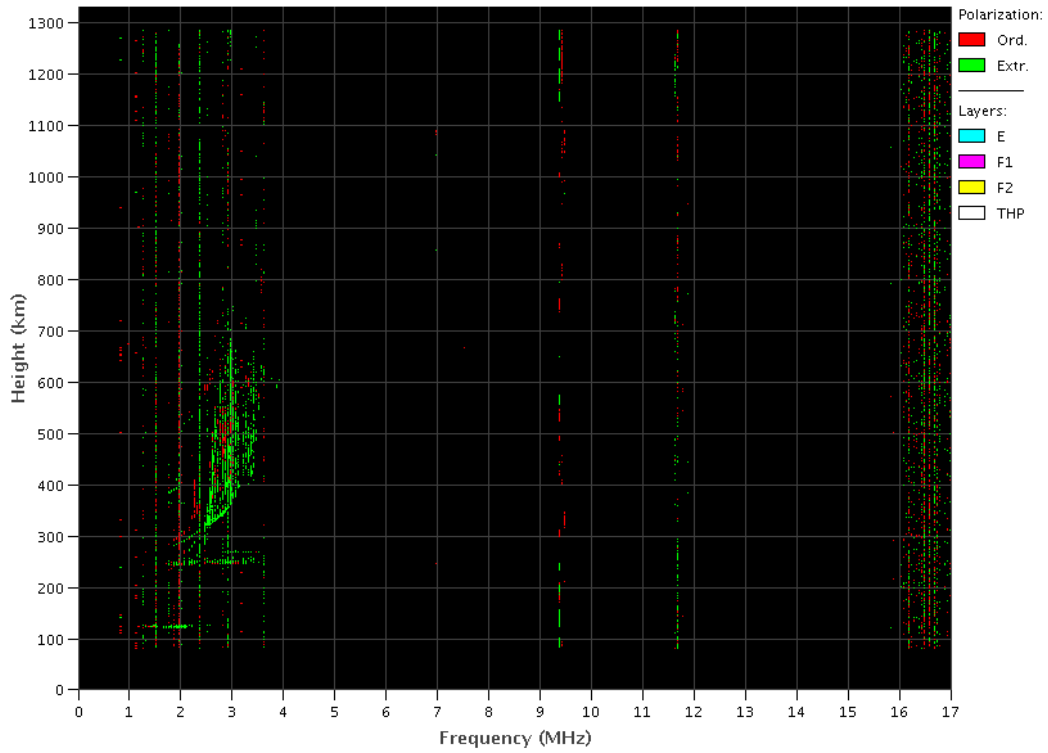


Cachoeira Paulista:

- There were spread F on day 18.
- The Es layers reached scale 3 on day 19.

EMBRACE - Digital Ionosonde

Cachoeira Paulista - 05/18/2022 02:10:00 UT



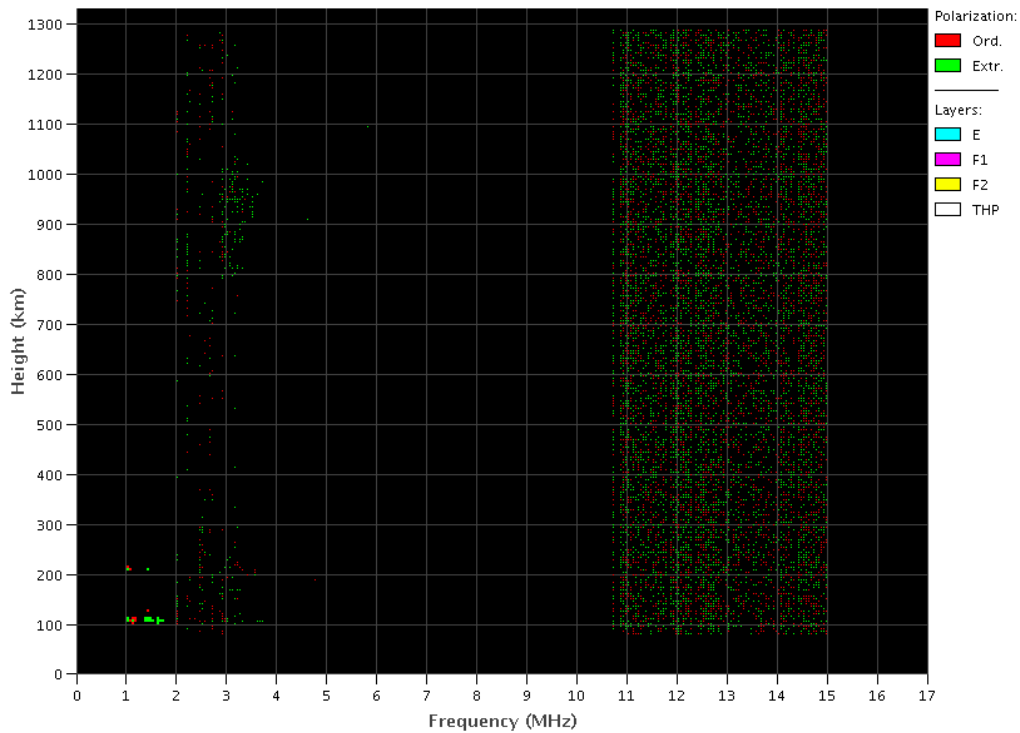
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São Luís:

- There were spread F during all days in this week.
- The Es layers reached scale 4 on day 21.
- There was blackout on day 19.

EMBRACE – Digital Ionosonde

São Luís – 05/19/2022 03:40:00 UT



7 Scintillation

7.1 Responsible: Siomel Savio Odriozola

In this report on the S4 scintillation index, data from SLMA in São Luiz/MA, STSN in Sinop/MG, STNT in Natal/RN 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, STSN and SJCE stations did not show relevant values of the S4 index throughout the week. The STSN station in Sinop, presented, at the same time on the 18th and 19th of May, S4 values close to 0.7. Figure 1 shows the map with satellites recorded by STSN in the time interval between 1200(UT) to 1500(UT) on 05/19 (top panel) and between 1130(UT) to 1500(UT) 05/20 (bottom panel) and with S4 values ≥ 0.2 . The same satellite (G9) appears to be solely responsible for the high values recorded in this time interval, which indicates an extra geophysical cause in the high values of S4 in Sinop.

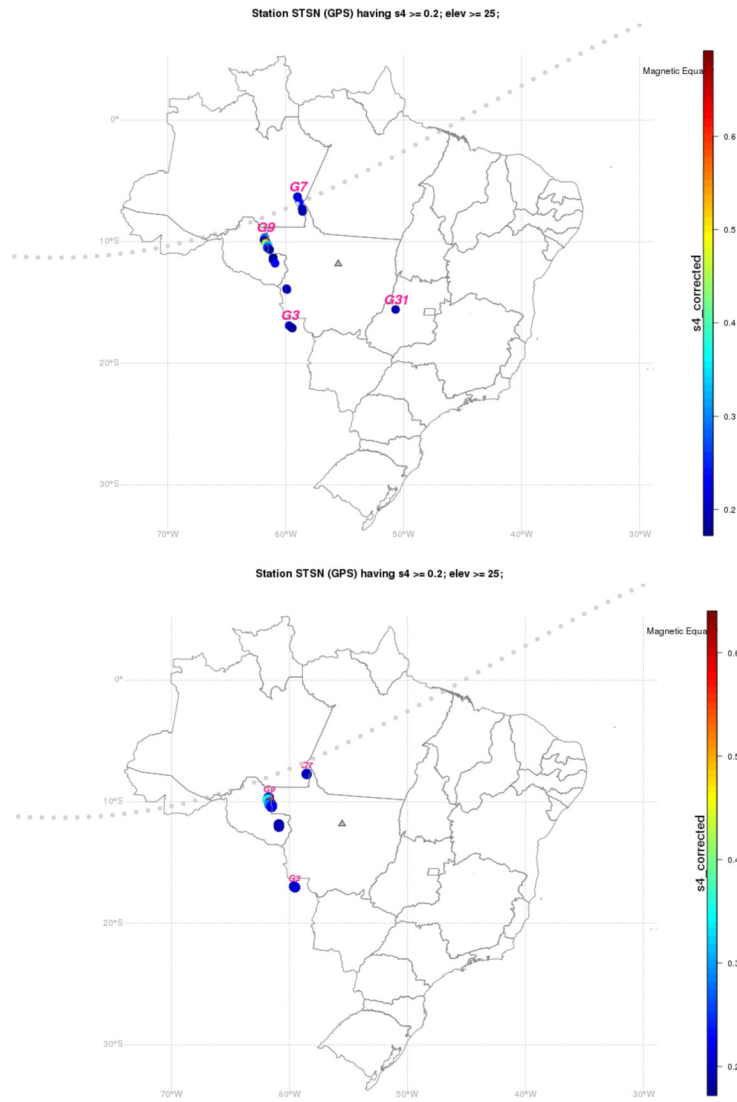


Figura 1: Mapa dos valores do S4 > 0.2 para os satélites GPS com elevação > 25° no campo de visada do receptor em STSN entre as 1200-1500 do dia 18/05 (painel superior) e as 1130-1500 do dia 19/05 (painel inferior)

8 All-Sky Imager

8.1 Responsible: LUME

All-Sky Imager EPBs Observation
Observações das EPBs por meio do imageador All-Sky
May 15- 21, 2022 || 15 - 21 de maio, 2022

Observatory Observatório	May 15 maio 15	May 16 maio 16	May 17 maio 17	May 18 maio 18	May 19 maio 19	May 20 maio 20	May 21 maio 21
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						
☁	Cloudy - Nublado						
☁	Cloudy with Rain - Nublado com Chuva						

- 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, no geophysical phenomena such as plasma bubbles and traveling ionospheric disturbances were observed during the period. 2

TEC

- No plasma bubbles were observed during the entire period. As bubble sea- sonality is at the end, thus bubbles have small spatial dimensions and they are difficult to observe on TEC maps. Besides, the equatorial anomaly was observed every day. 3