

Briefing Space Weather - 2021/12/06

Sun

Responsible: José R. Cecatto

12/29 – No fast wind stream; 3 CME can have component toward the Earth; (26) SB Pred. Arrival - Nov/29, 06:14Z - 11:00Z;

11/30 – No fast wind stream; No CME toward the Earth; Arrival of a C.I.R. caused a geomagn storm;

12/01 – Fast (< 600 km/s) wind stream; 1 CME can have component toward the Earth;

12/02 – Fast (< 550 km/s) wind stream; No CME toward the Earth; (29) SB Pred. Arrival – Dec/02, 05:52Z – 20:00Z;

12/03 – Fast (< 500 km/s) wind stream; 2 CME can have component toward the Earth;

12/04 – Fast (< 550 km/s) wind stream; 6 CME can have component toward the Earth (1 partial halo);

12/05 – Fast (< 500 km/s) wind stream; 6 CME can have component toward the Earth (1 partial halo); Partial halo, SB

Pred. Arrival – Dec/09, 18:00Z – 23:00Z; at 07:19 UT a M1.4 flare generated a minor shortwave radio blackout;

12/06 – Fast (\leq 500 km/s) wind stream; 1 partial halo CME can have component toward the Earth; Partial halo, SB Pred.

Arrival – Dec/11, 15:00Z; Prev.: Fast wind expected on December 07; for while low (1% M, 1% X) probability of M / X flares next 2 days; also, occasionally some other CME can present a component toward the Earth.

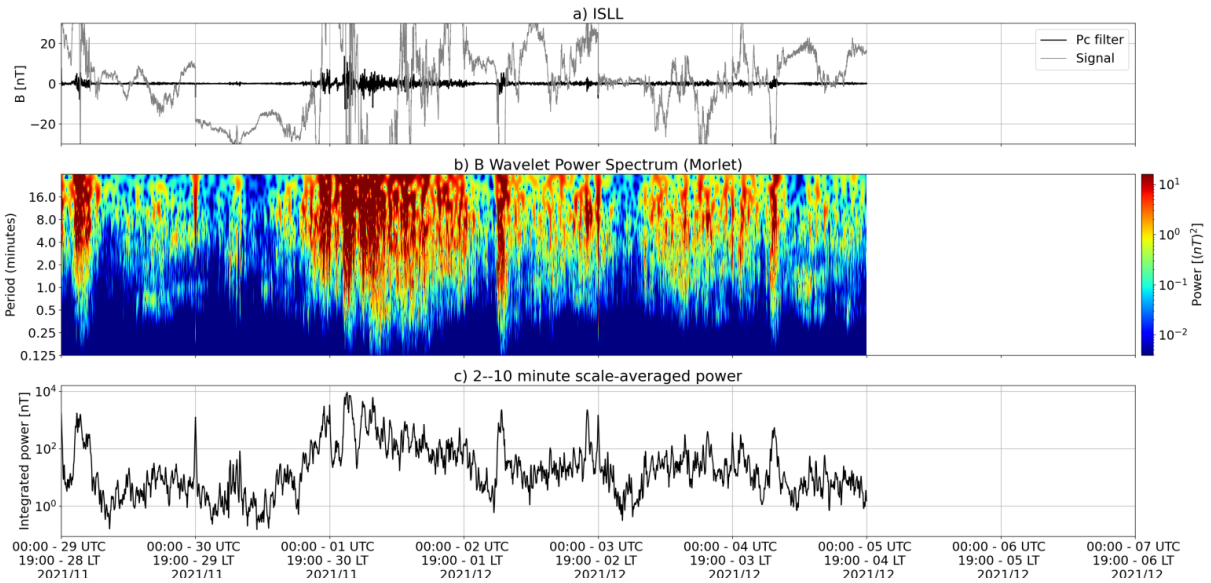
Interplanetary Medium

Responsible: Paulo Jauer

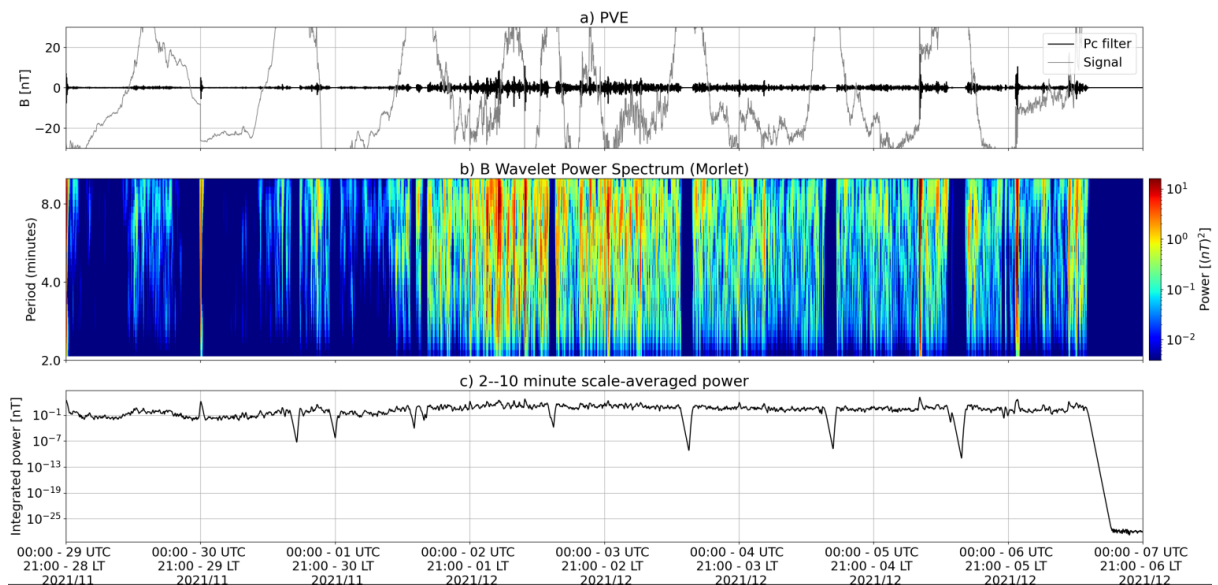
- The interplanetary region in the last week showed a moderate/low level of plasma perturbations due to the passage of the CME and HSS structures identified by the DISCOVERY satellite in the interplanetary region along with sector boundary crossing.
- The total Bt magnetic field oscillated, remaining below 8 nT for most of the period, peaking on Nov 30 at 21:30 at 13.68 nT.
- The component of the IMF Bz oscillated with peaks on the 30/Nov at 21:30 from -9.74 nT.
- There was a clear occurrence of the change of sector in the BxBy components, on the 30th/Nov at 19:30. In the rest of the period, the bxy components oscillated in the interval [-8,+8] nT.
- The density of Vsw, presented oscillations presenting a significant peak on the 30/Nov at 18:30 of 31.2 p/cm³.
- The solar wind speed Vsw increased above 400km/s on 30/Nov. There were 2 peaks in speed. On December 1st at 6:30 am 533 km/s and on December 4 at 4:30 am 512km/s.
- The subsolar Mp showed maximum compression on Nov 30 at 7:30 pm from 7.89 Re and maximum expansion on Nov 30 at 7:30 am at 11.2 Re.

ULF waves in the Magnetosphere

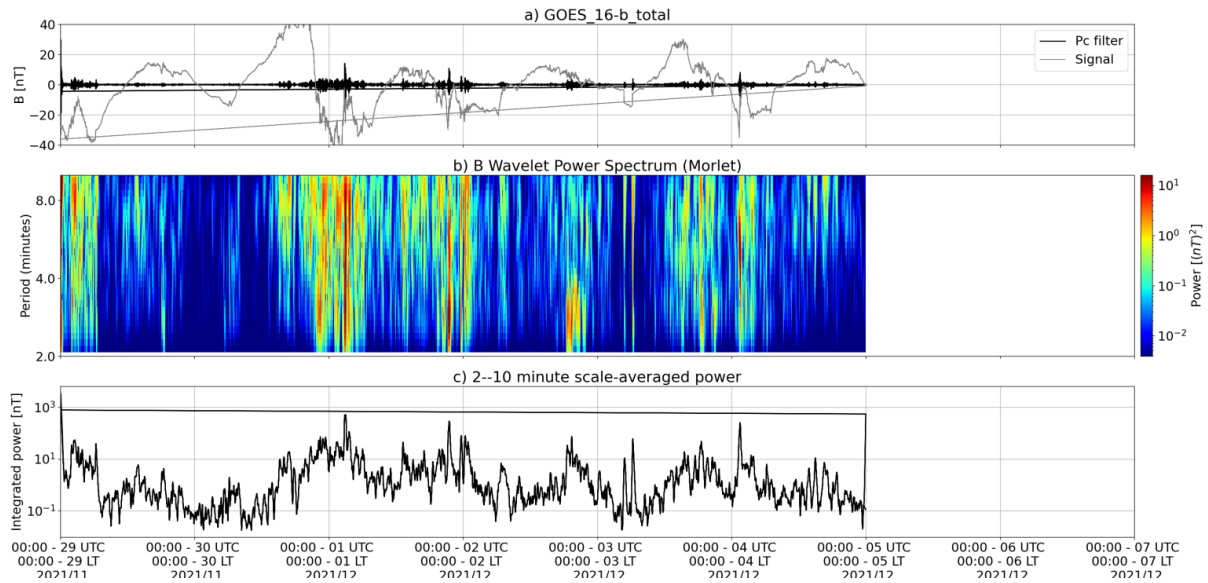
Responsible: José Paulo Marchezi



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).



a) signal of the total magnetic field measured in the PVE Station of 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).



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).

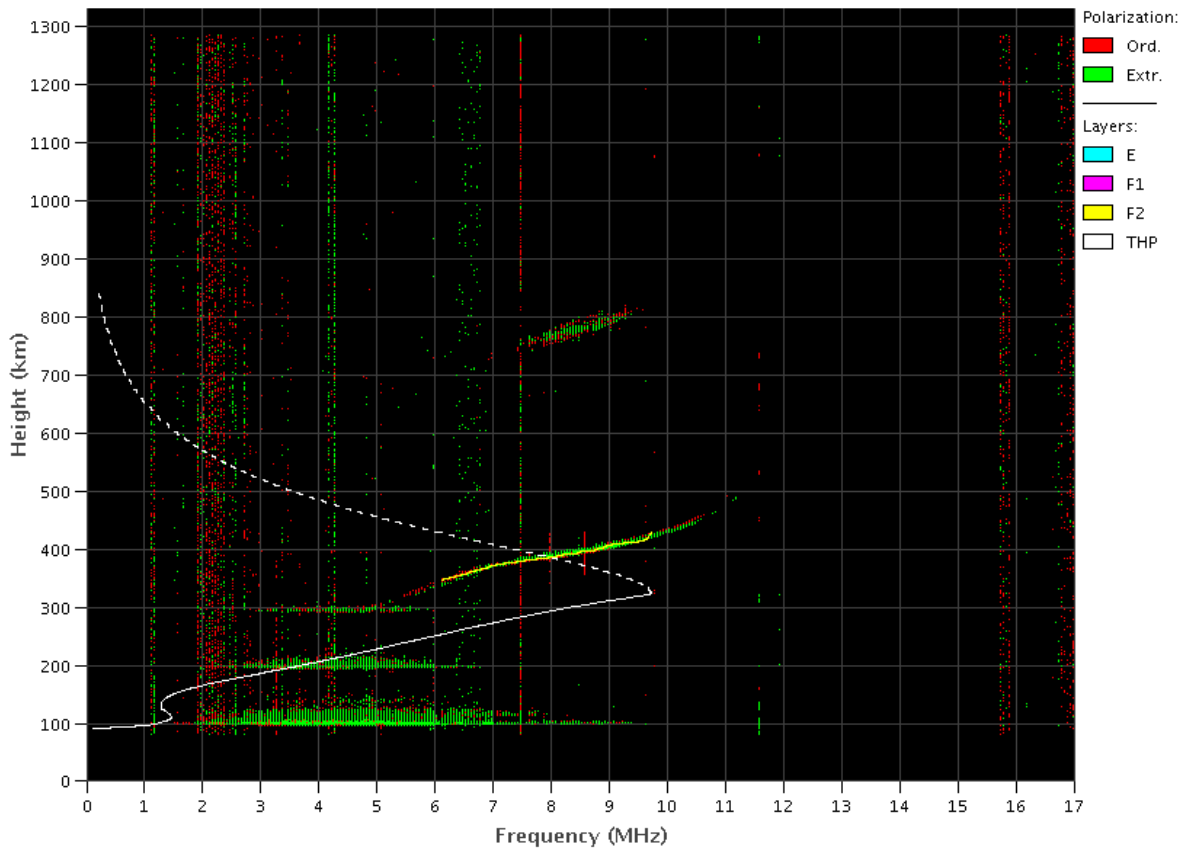
The week starts with continuous high ULF wave activity from November 30th to December 2nd at high latitudes (ISLL Station) possibly caused by the interaction of a light CME and a subsequent HSS. This activity may be related to the increase in the flux of relativistic electrons in the outer belt. There is a signal with higher intensity between December 2nd and 4th at the Porto Velho station (PVE) which differs from the other stations and the satellite goes, possibly associated with variations in the equatorial electrojet.

Ionosphere

Responsible: Laysa Resende

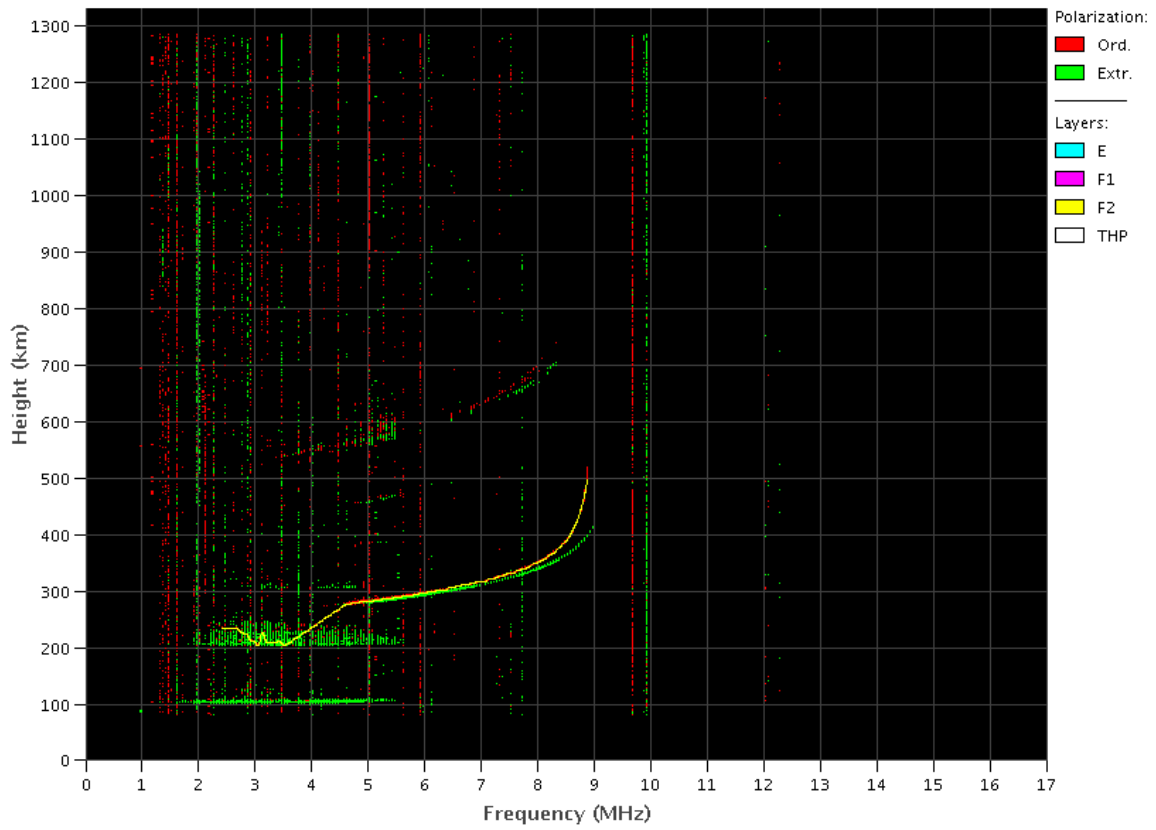
Boa Vista:

- There were spread F during all days in this week.
- The Es layers reached scale 4 on days 30, 02, and 03.



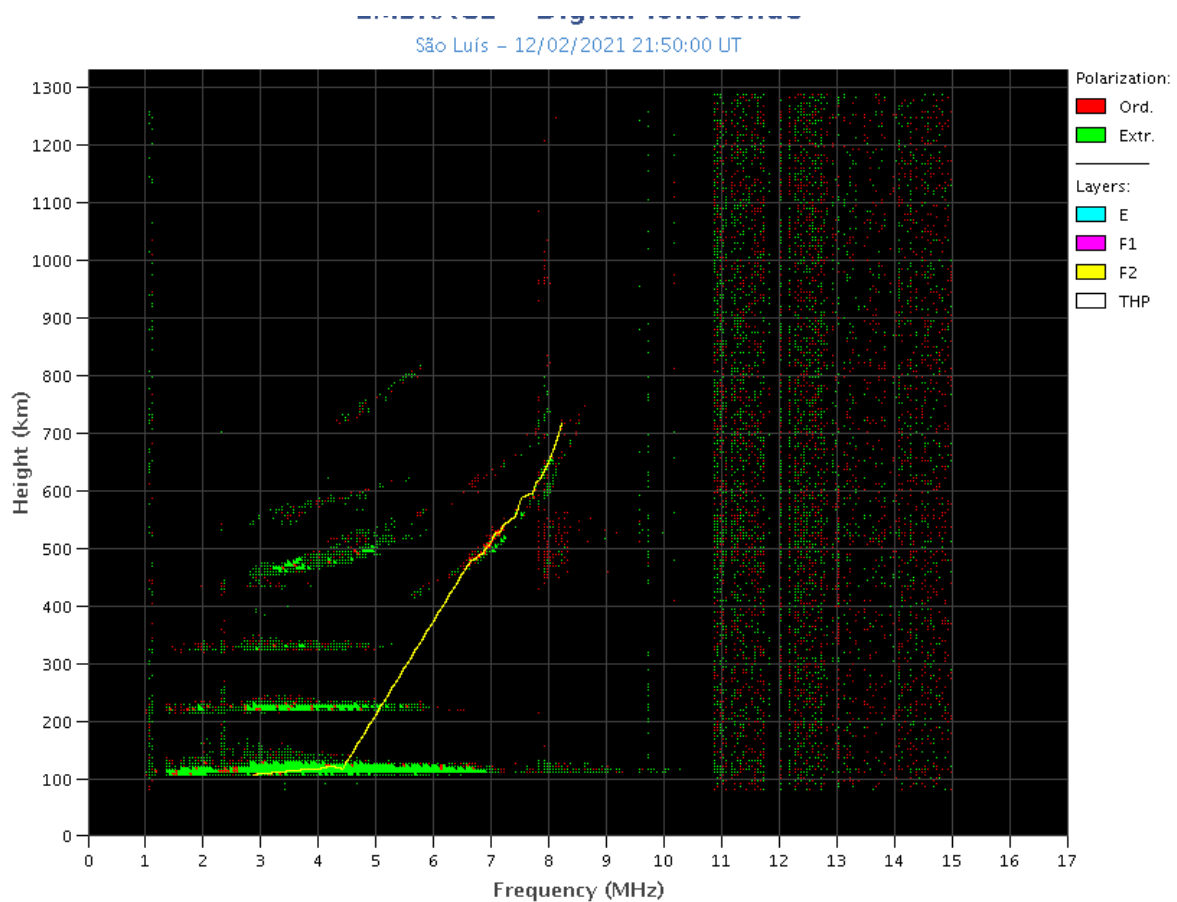
Cachoeira Paulista:

- There were not spread F on days 02, 04, and 05.
- The Es layers reached scale 3 on days 30.



São Luís:

- There were spread F during all days in this week.
- The Es layers reached scale 4 on days 22, 26, 27, and 28.



Scintillation S4

Responsible: Siomel Savio Odriozola

In this report on the S4 scintillation index, data from the SLMA stations in São Luís / MA, STSN in Sinop /MT, UFBA, in Bahia / BA and SJCE in São José dos Campos / SP were presented. The S4 index tracks the presence of irregularities in the ionosphere having a spatial scale ~ 360 m.

The SLMA and STSN stations showed scintillation values above 0.3 at some point in the week 29/11--05/12. The UFBA and SJCE stations, further away from the geomagnetic equator, had scintillation events between moderate and strong during the first day of the week (29/11--3/12), not showing S4 values above 0.3 on the rest of the days. After the evening of 11/30 and until the early hours of 12/1, the biggest scintillation event of this week was detected in all analyzed stations. Two stations very close (around 10 km away) presented data gaps possibly due to the "loss of lock" effect as a consequence of extreme scintillation events (Figure 1)

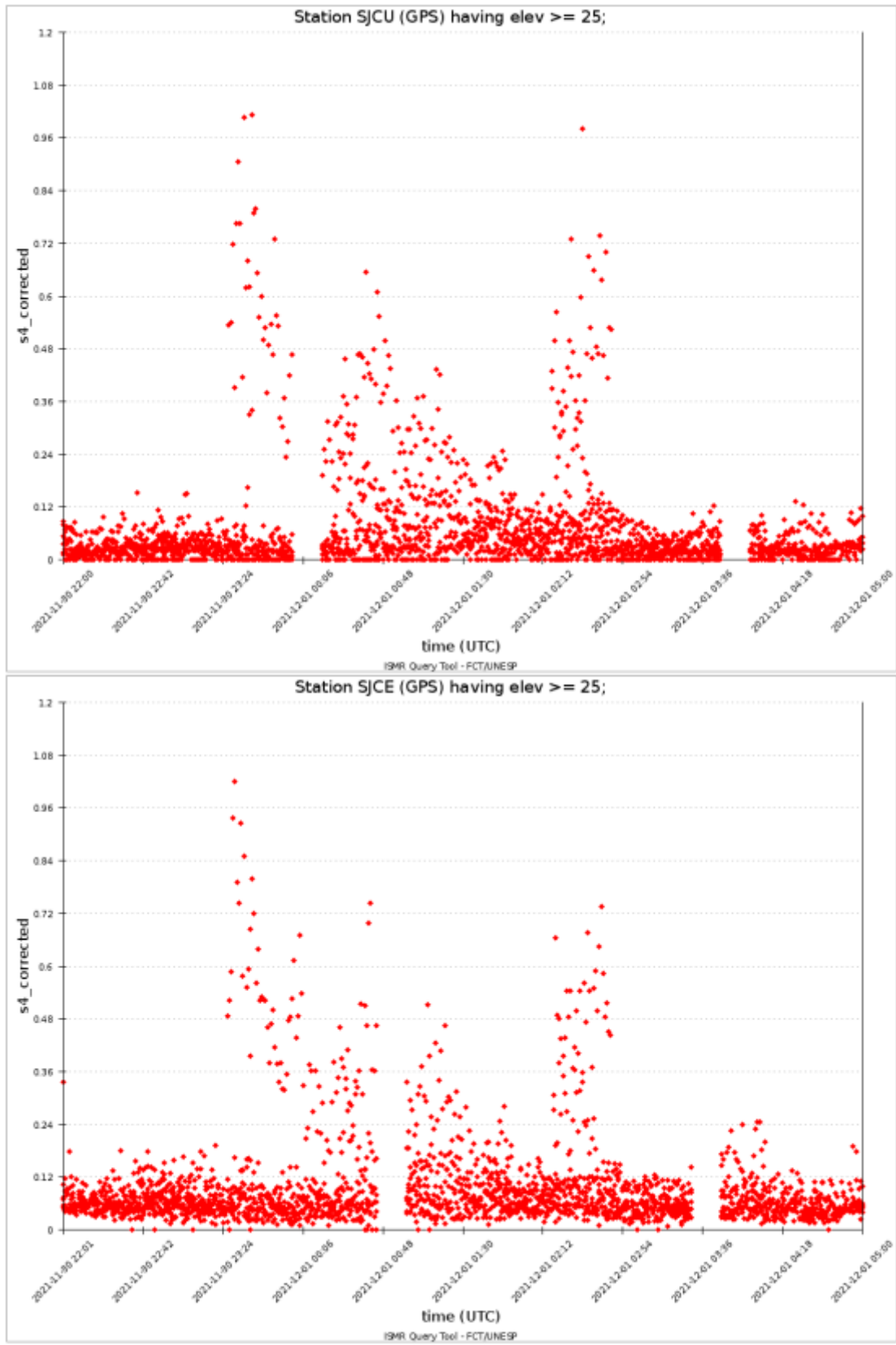


Figure 1: Values of the S4 index for the GPS constellation for SJCU station (upper panel) and SJCE (lower panel) between 2200 and 0500 UT on 12/1.