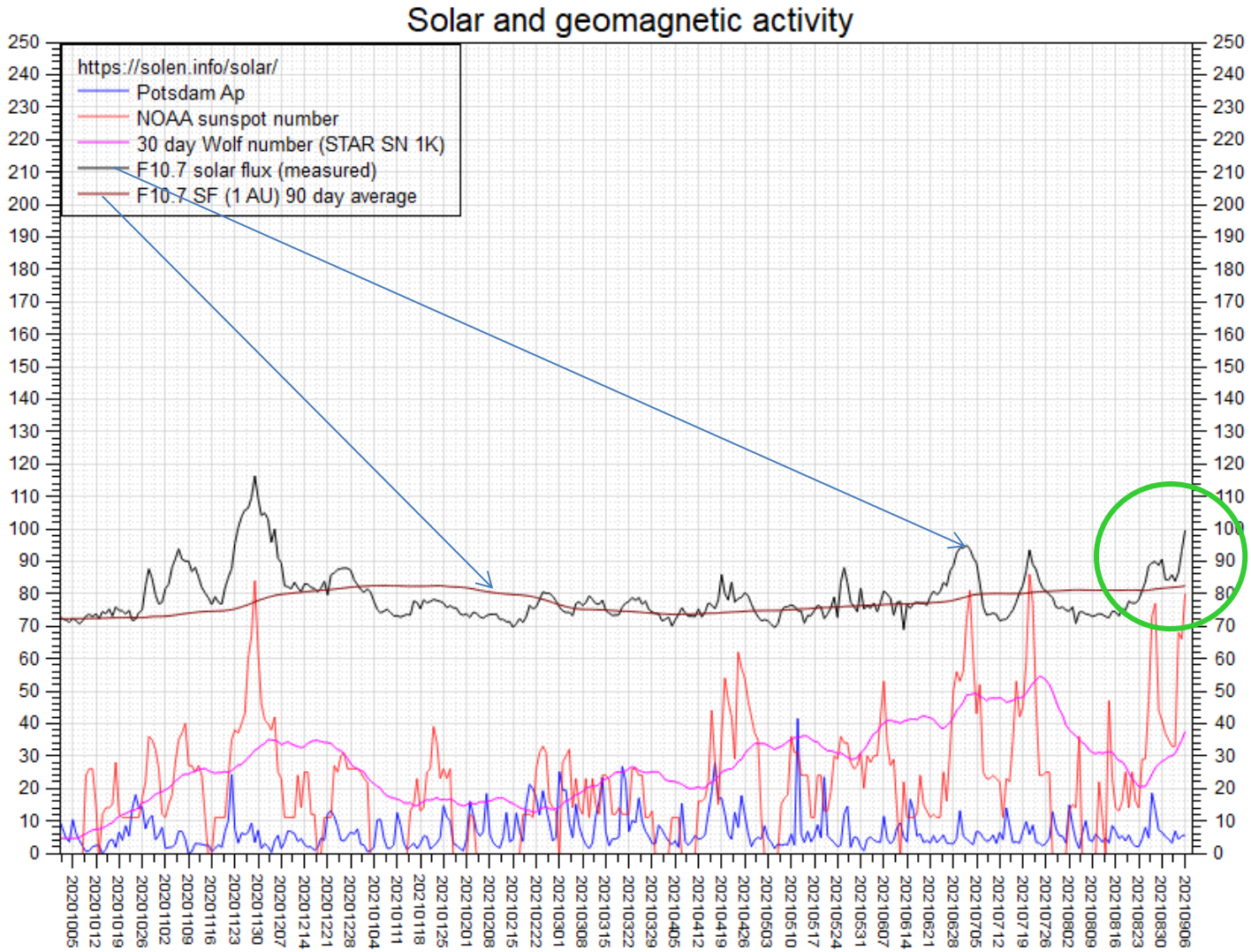
SOLAR WEATHER
7 SEP 2021

Lewis Thompson
W5IFQ

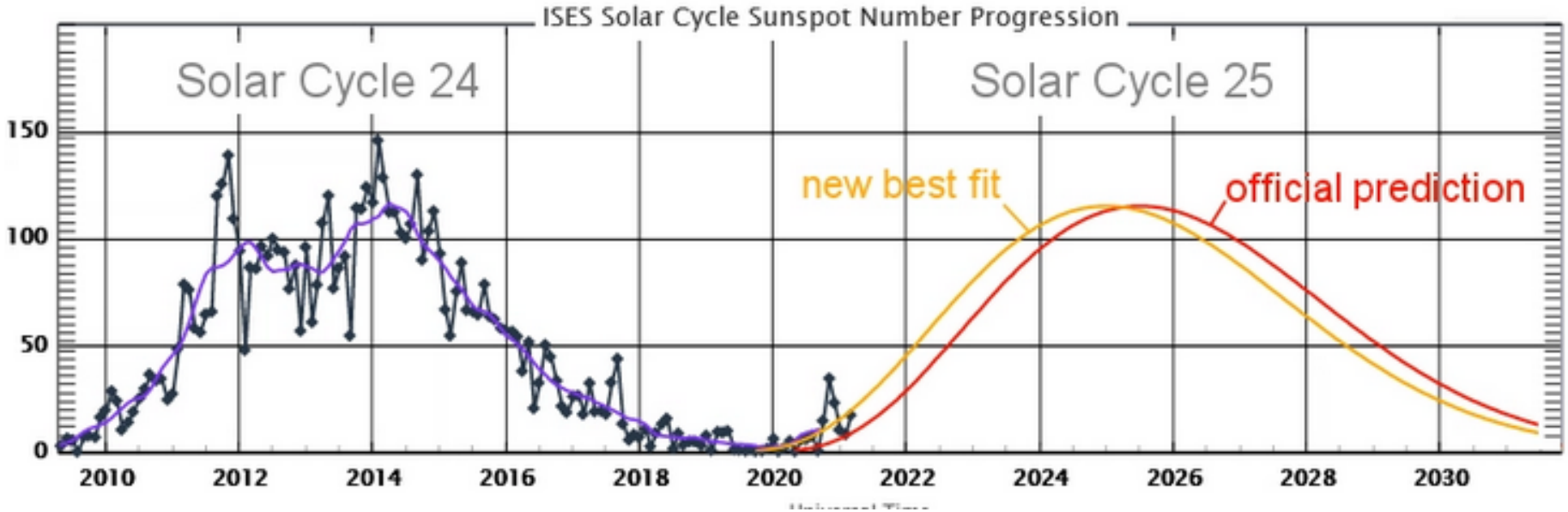
Thomas McCarty
Sep 3 11:39am
Fairbanks Alaska

SOLAR FLUX INDEX – 2021

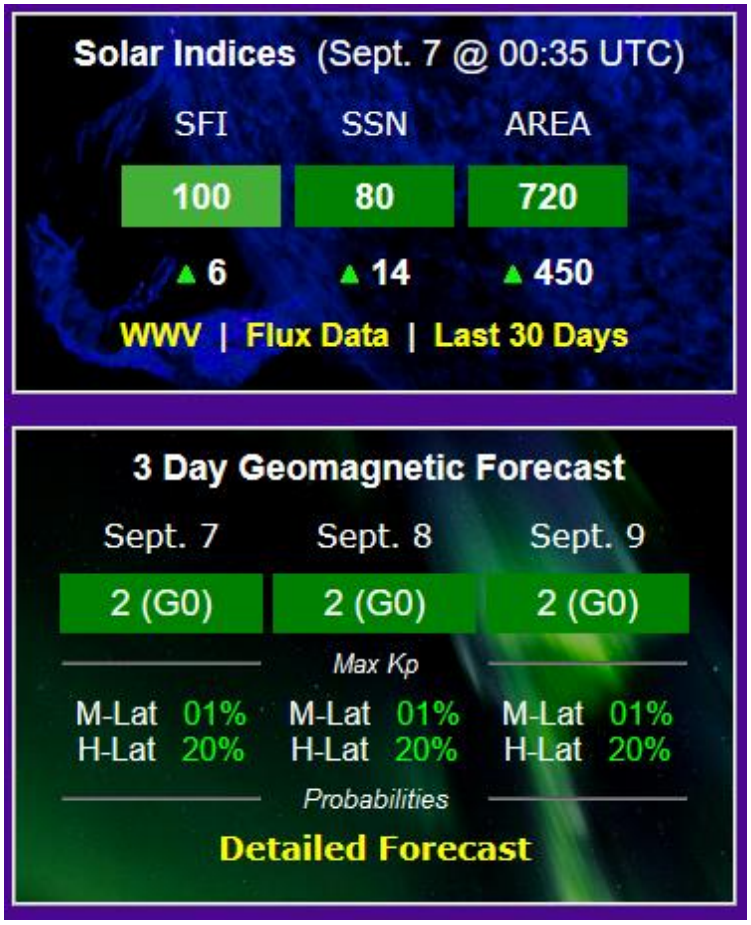


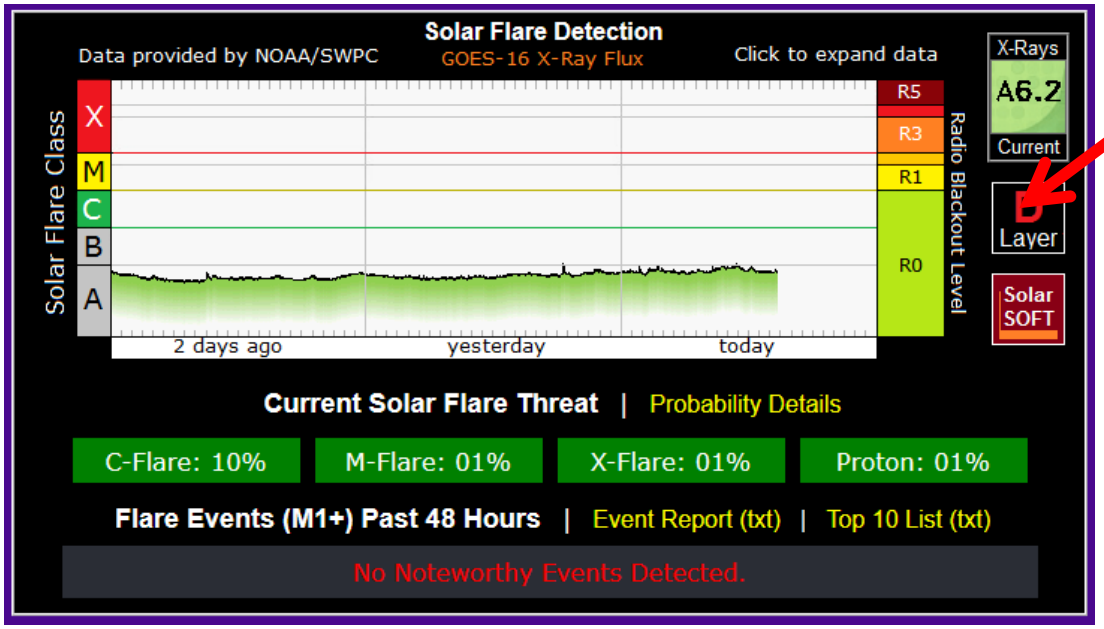
SF 99.5 (26.2 increase from one previous 27 day solar rotation)

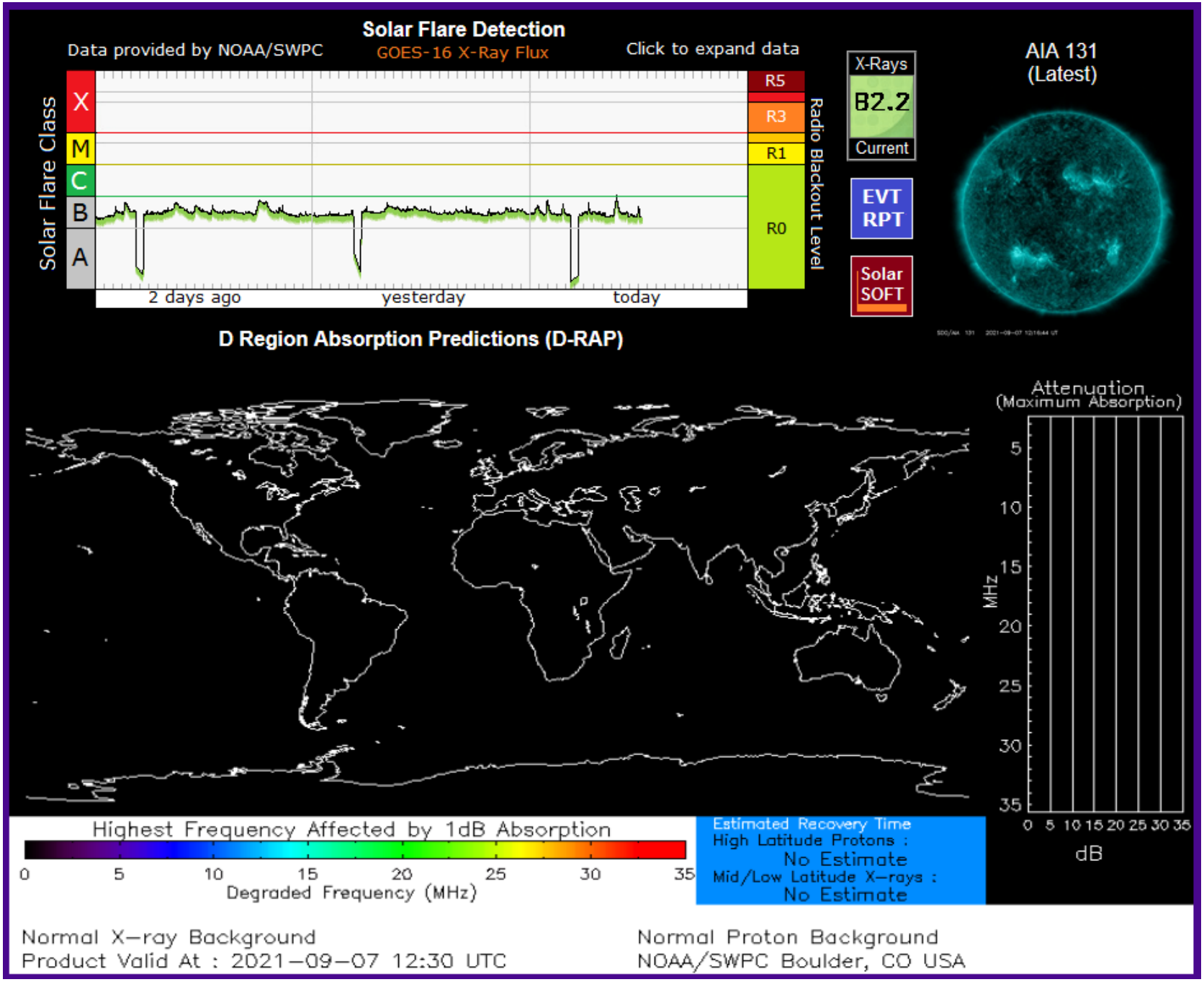
Solar Cycle 25 Prediction



SolarHam.org Forecast






Solar Flare Detection
Data provided by NOAA/SWPC
GOES-16 X-Ray Flux
Click to expand data
Solar Flare Class
X
M
C
B
A
R5
R3
R1
R0
Radio Blackout Level
2 days ago
yesterday
today
X-Rays
B2.2
Current
EVT RPT
Solar SOFT
AIA 131 (Latest)
D Region Absorption Predictions (D-RAP)
Attenuation (Maximum Absorption)
MHz
5
10
15
20
25
30
35
0 5 10 15 20 25 30 35
dB
Highest Frequency Affected by 1dB Absorption
0 5 10 15 20 25 30 35
Degraded Frequency (MHz)
Estimated Recovery Time
High Latitude Protons :
No Estimate
Mid/Low Latitude X-rays :
No Estimate
Normal X-ray Background
Product Valid At : 2021-09-07 12:30 UTC
Normal Proton Background
NOAA/SWPC Boulder, CO USA

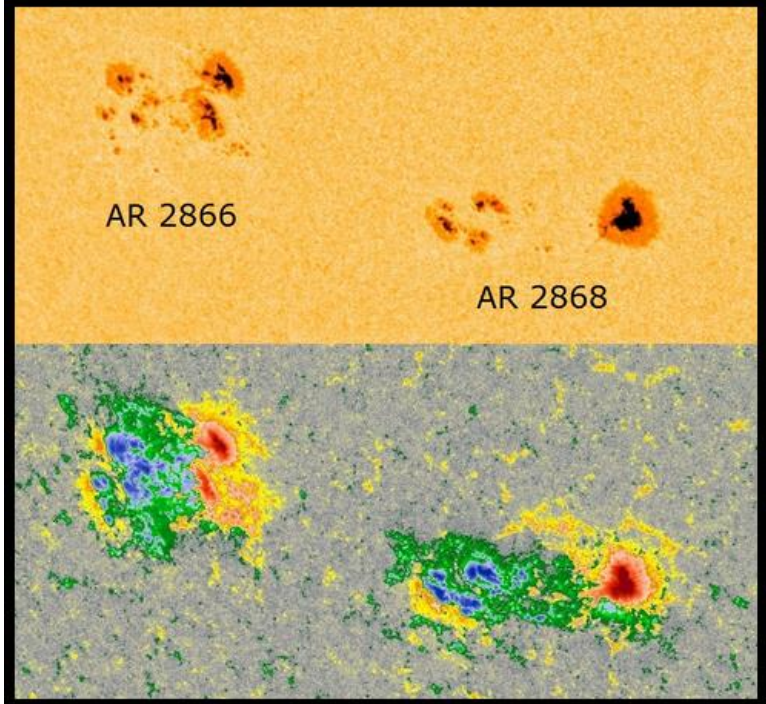
Visible Sunspot Regions | Sunspot Summary | SRS (txt)

2863 2864 2866 2868

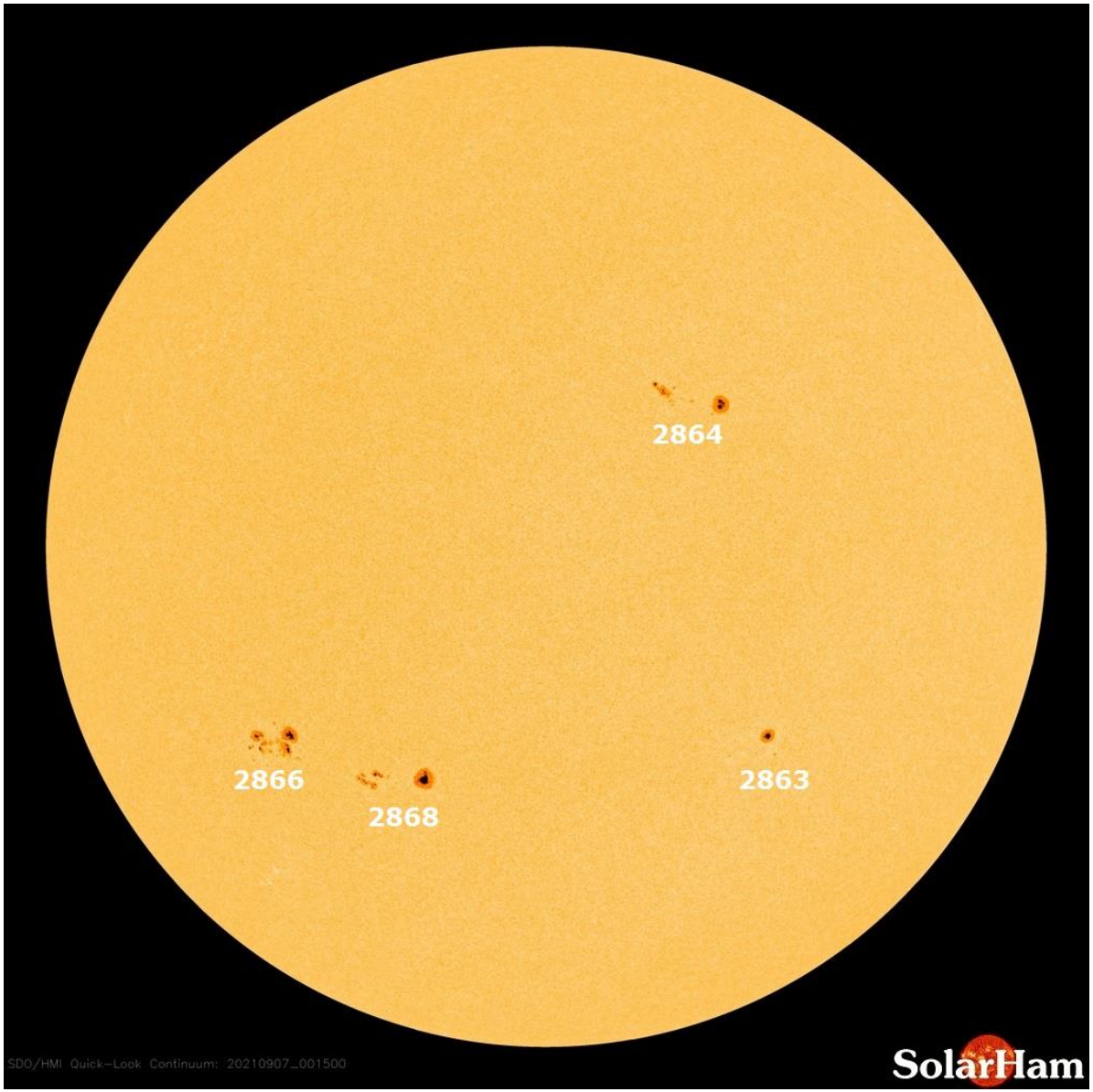
Big Sunspots

September 6, 2021 @ 19:05 UTC

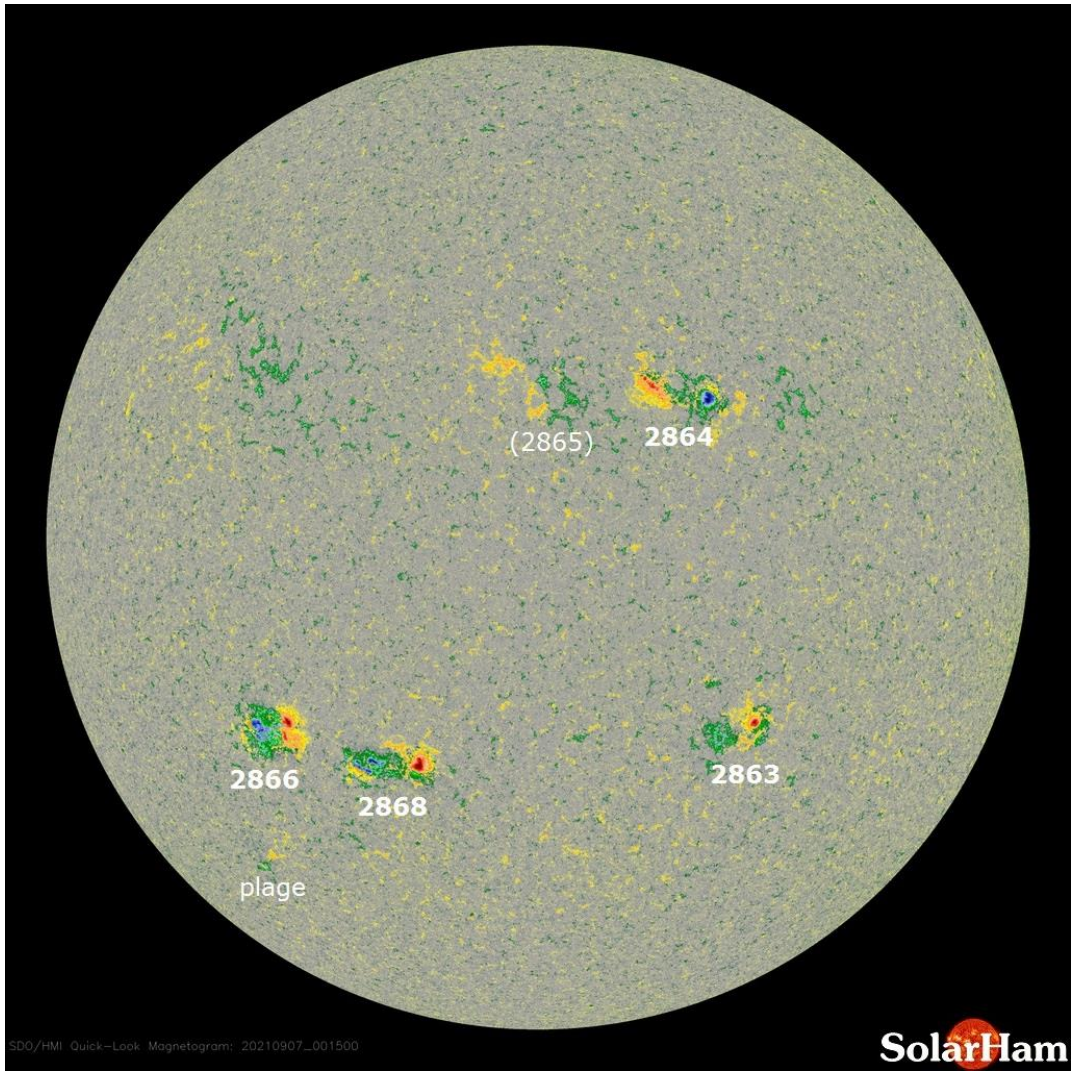
Both AR 2866 and 2868 located in the southeast quadrant are large sunspot groups, but so far have lacked the magnetic instability to generate noteworthy solar flares. Over the past 24 hours AR 2866 showed gradual spot growth, especially within the central portion of the group. This region should be monitored closely as it continues to evolve and turns into a better Earth facing position. AR 2868 also expanded in terms of area coverage, but separation between the leader spot and trailing spots was evident. An increased chance for at least minor C-Class solar flares is likely.



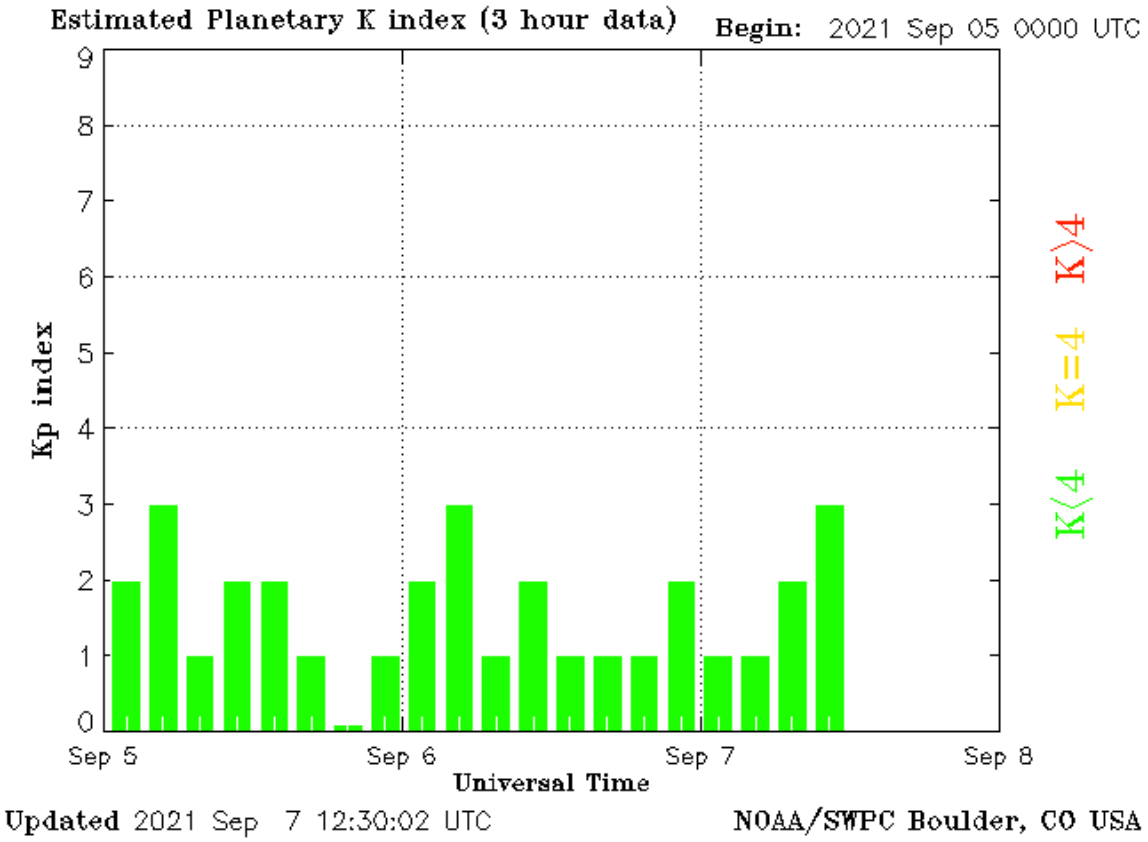
Visible Sun Spots – 7 SEP 2021



Sun Spots – 7 SEP 2021 (Magnetogram)



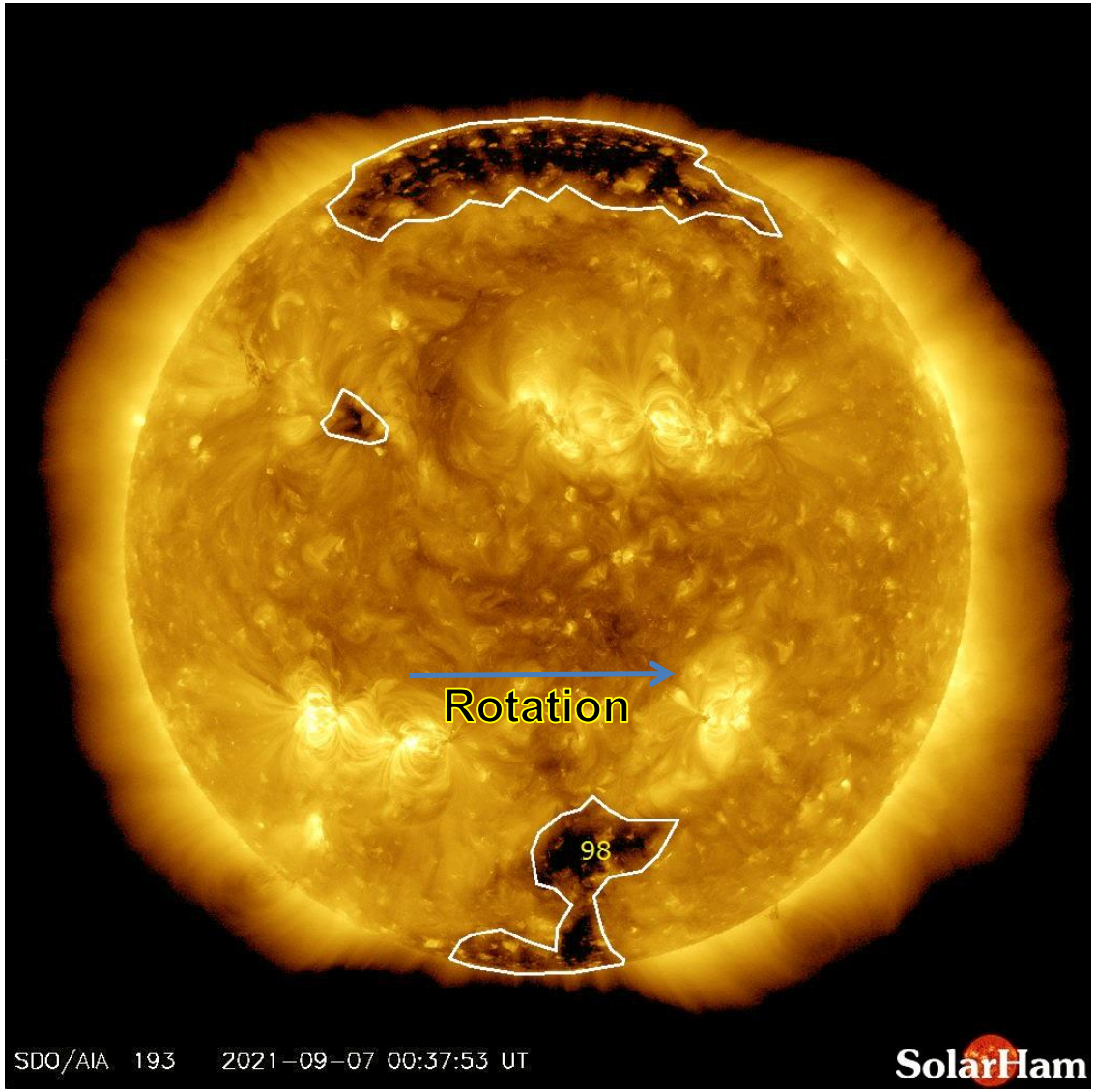
Planetary K index 5 – 7 SEP 2021



Generally, as planetary K-Index rises, critical frequency is suppressed.

K-Index	Effect
0-2	Inactive/Quiet, no impact on HF
3-4	Unsettled/Active, minor HF fade in higher latitudes
5-6	HF fade at higher latitudes
7-8	HF sporadic
9	HF impossible above 40M

Coronal Holes – 7 SEP 2021



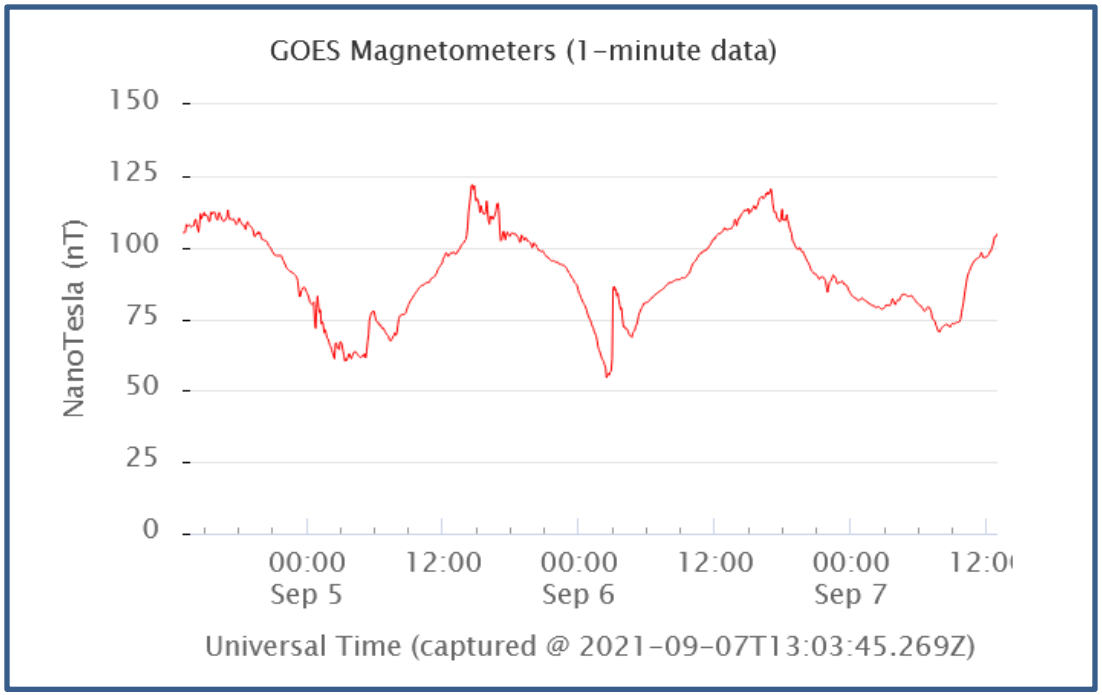
Analysis

There are currently no large coronal holes facing Earth.

Geomagnetic Conditions: 7 SEP 2021

Solar wind:
Bz = -1 nT South
speed = 317 km/sec
density = 7.25 protons/cm^3

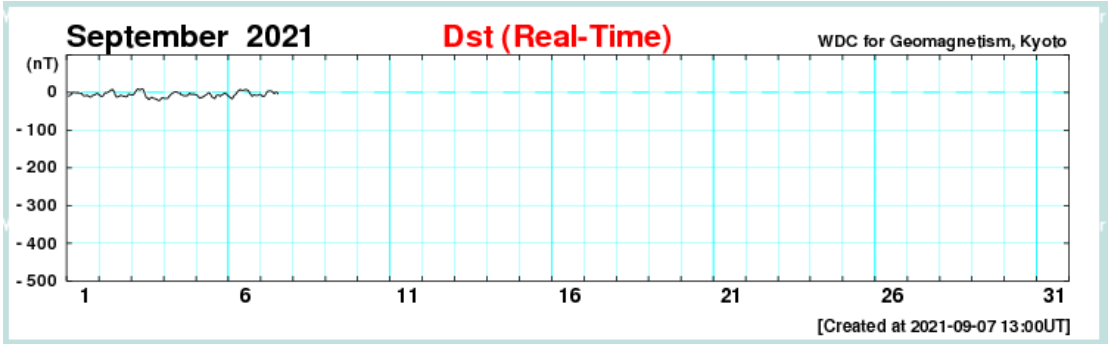
(From – NOAA DSCOVR
In L1, Lagrange Point)



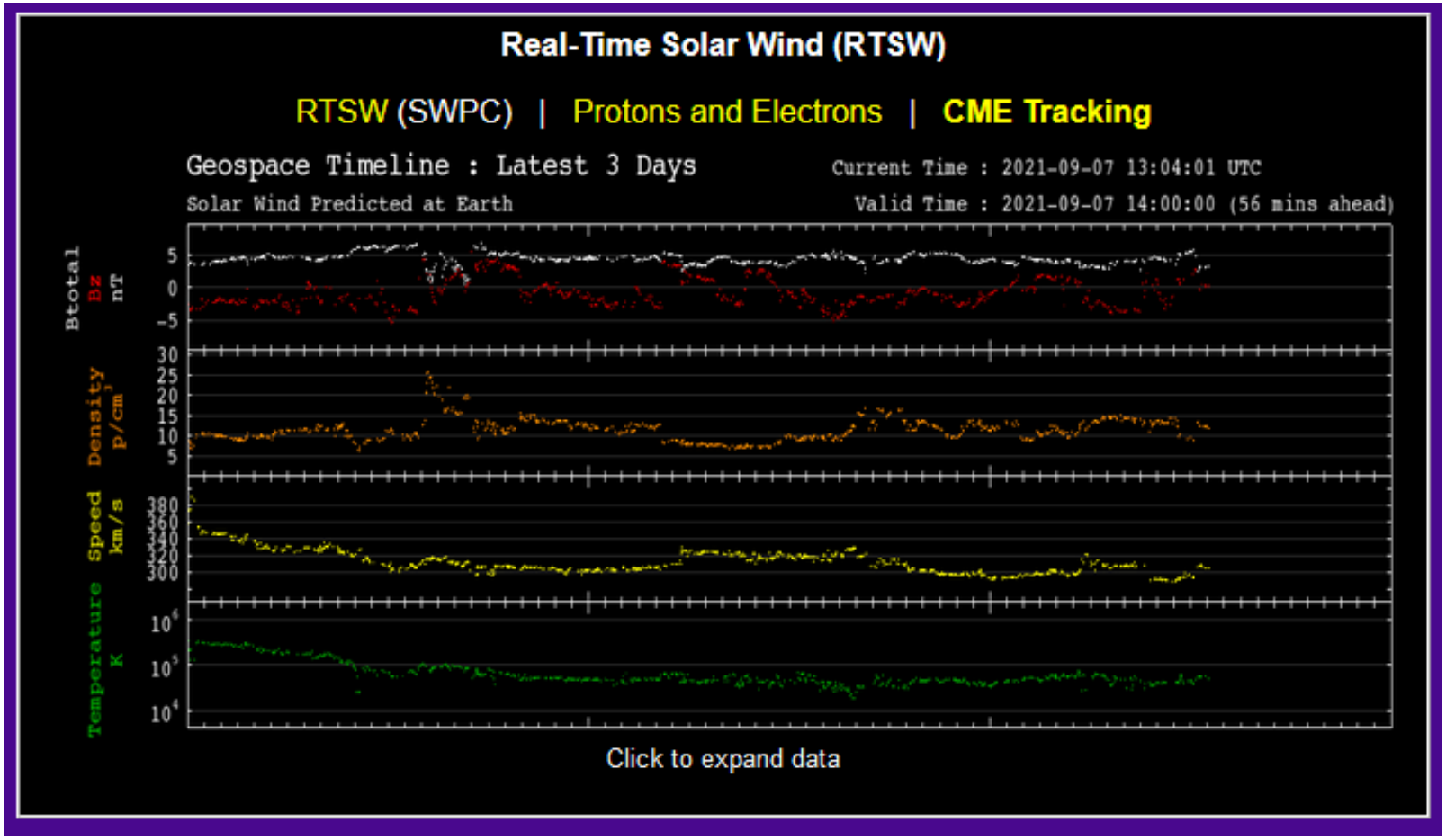
Dst = -4 nT (Ring Field)

(From – Data Analysis Center
For Geomagnetics and Space
Magnetism – Kyoto University)

From – GOES 16
In geostationary orbit



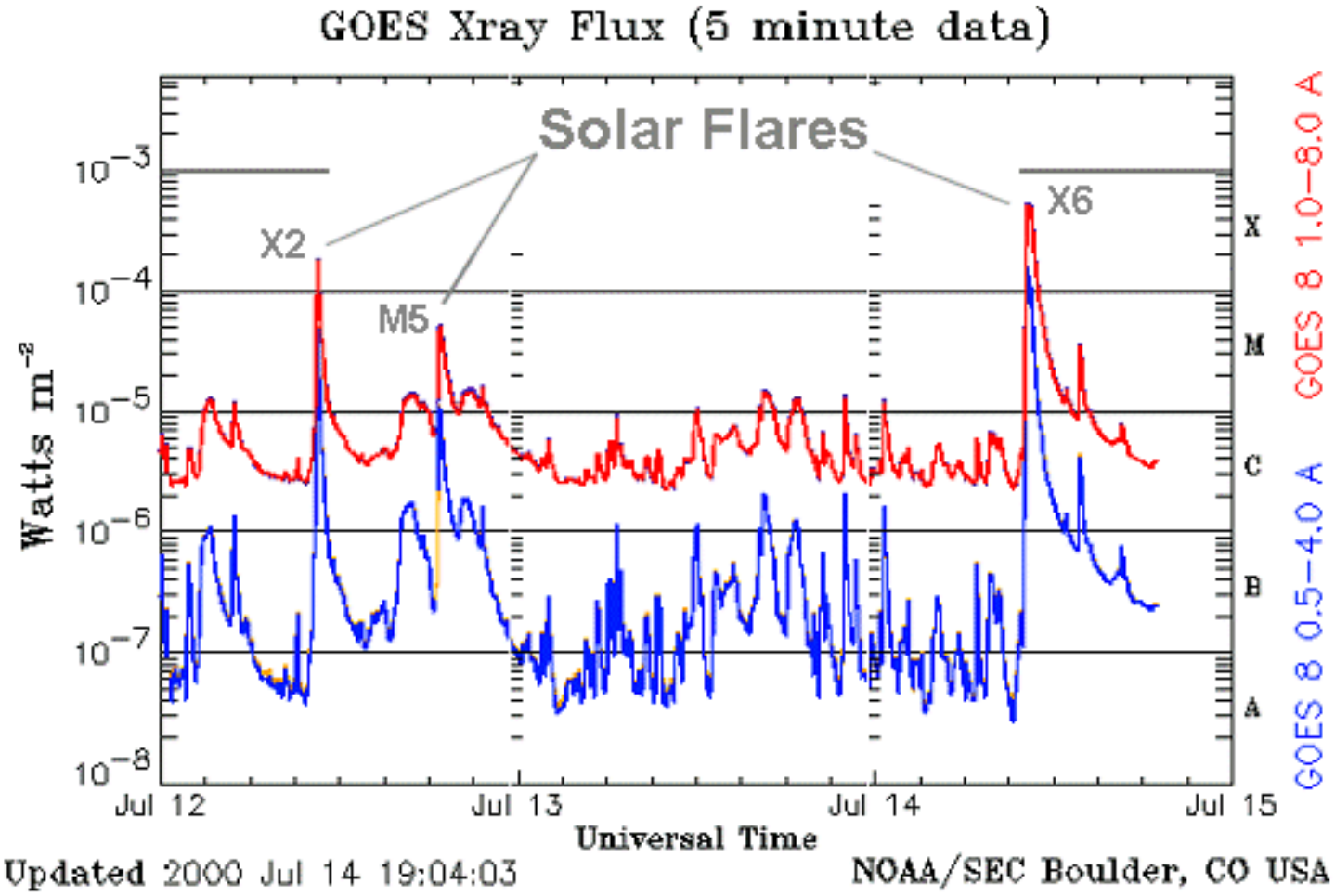
Real Time Solar Wind



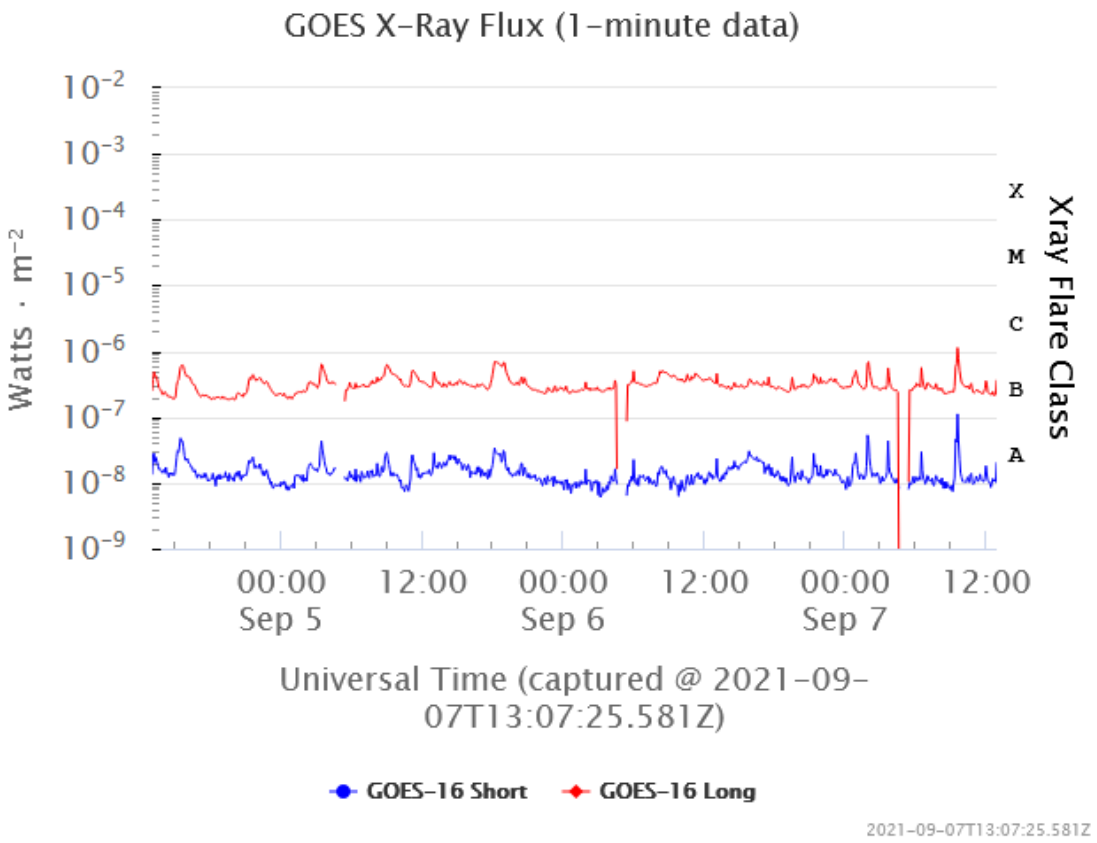
SolarHam

Solar Flare Classification – Intensity

(Why is This Important?)



Solar X-Ray Flux: 5 – 7 SEP 2021

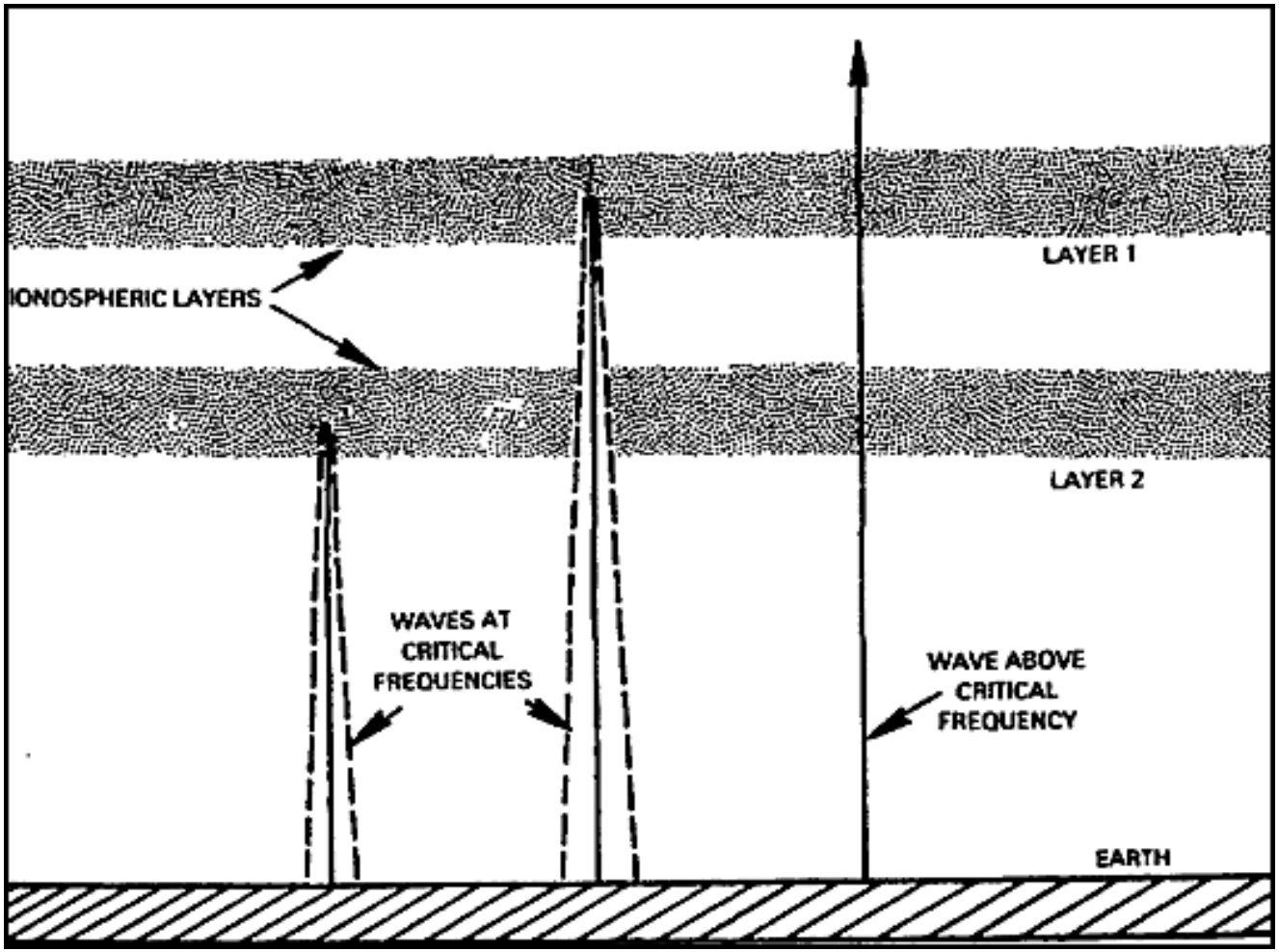


The X-ray radiation that ionizes the D-layer is the 1.0 - 8.0 A (red) plot. These measurements currently taken from the GOES 16 satelite.

Flare Category	Effect
A1-B9	No or minor impact on HF
C1	Low absorption of HF signals
M1	Occaisional loss of radio contact on sun-lit side
M5	Limited HF blackout for several minutes
X1	Wide area HF blackout for approx. 1 hr
X10	HF blackout over most of sun-lit side for 1-2 hrs
X20	Complete HF blackout of all sun-lit areas lasting hours

Critical or foF2 Frequency Definition
(Why is This Important?)

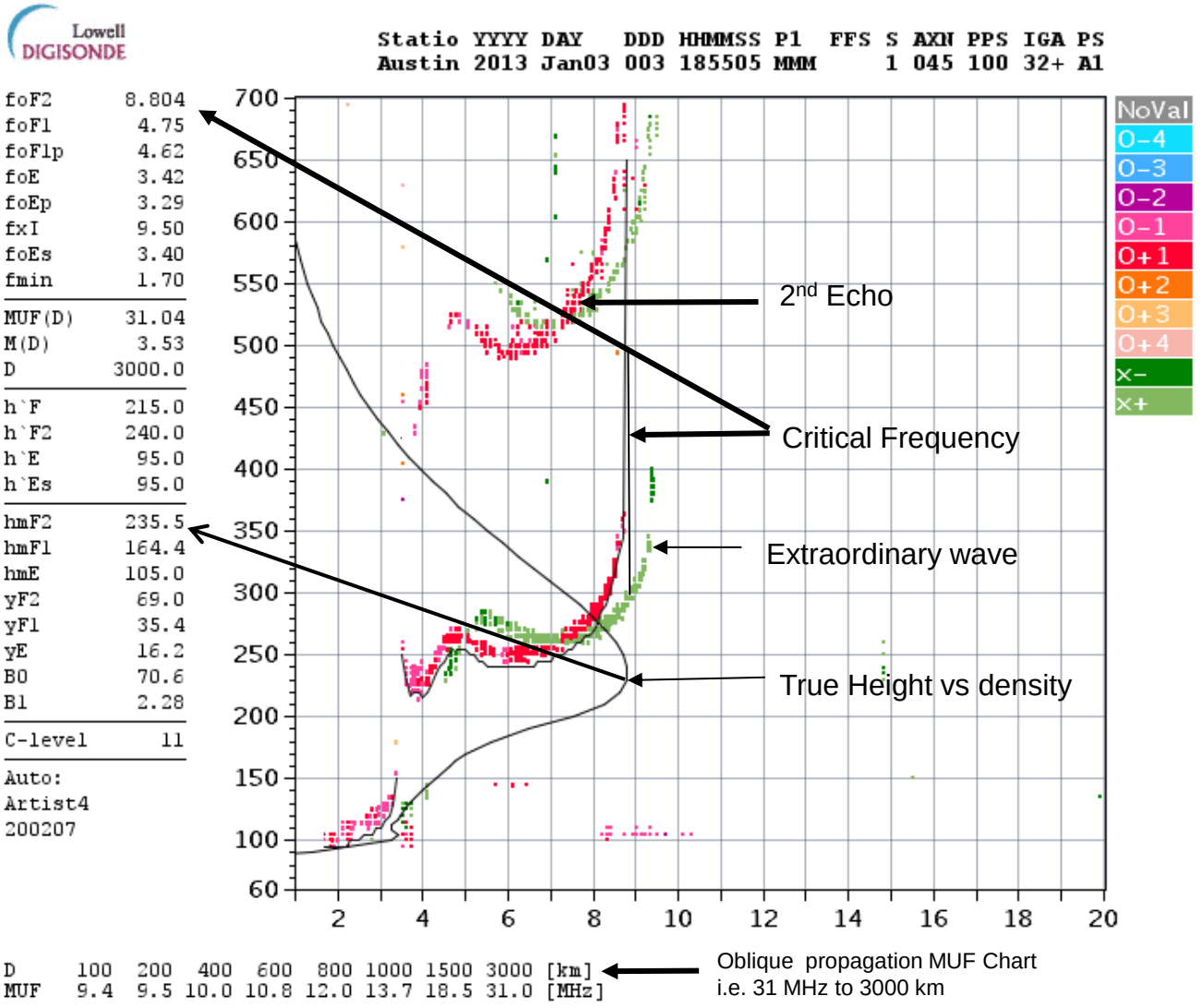
- For State-Wide HF communications (NVIS), must operate at or below CF



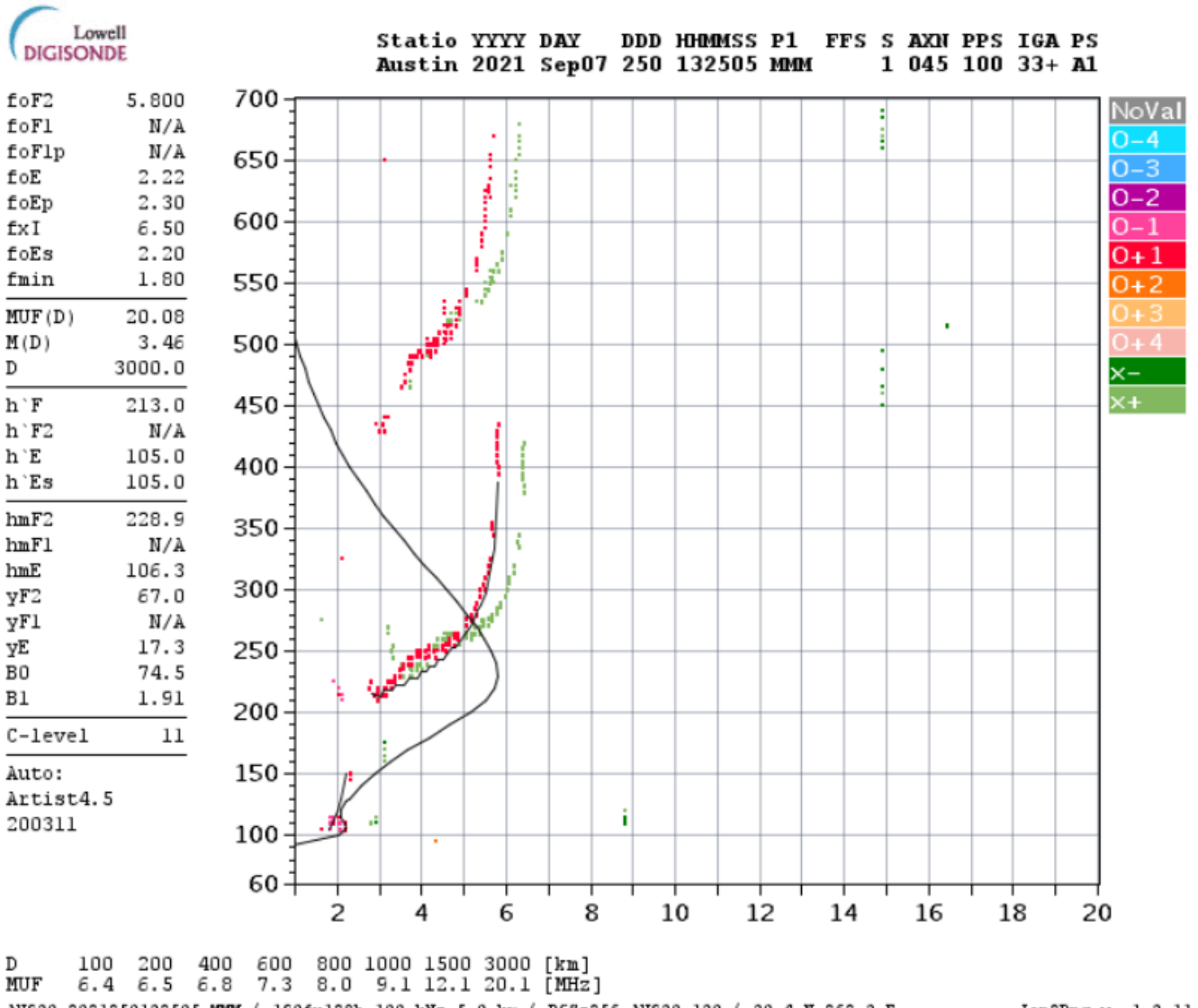
F2 layer

E layer

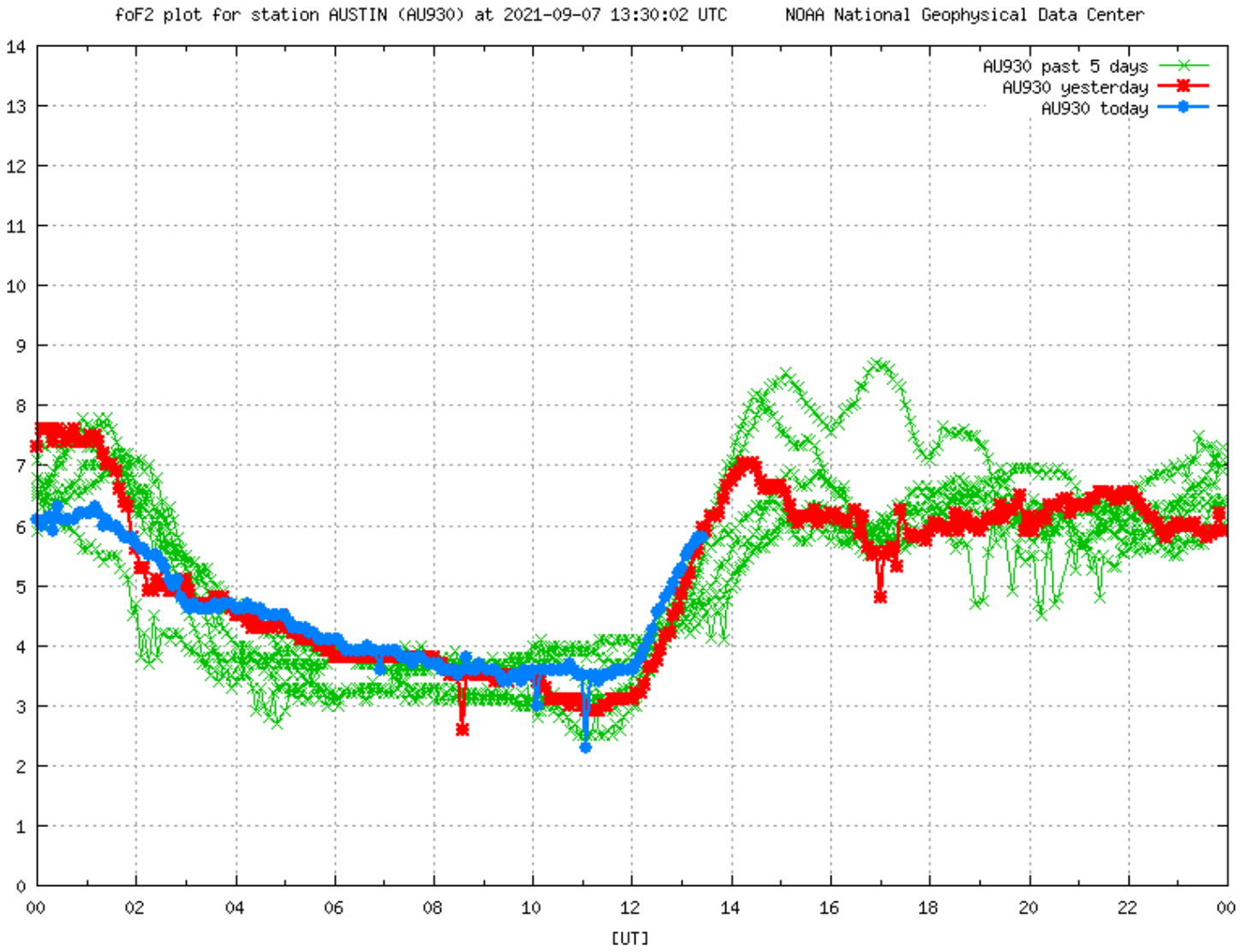
Ionogram Interpretation



Austin Ionogram – 7 SEP 1325Z



foF2 Trend – Austin Ionosonde

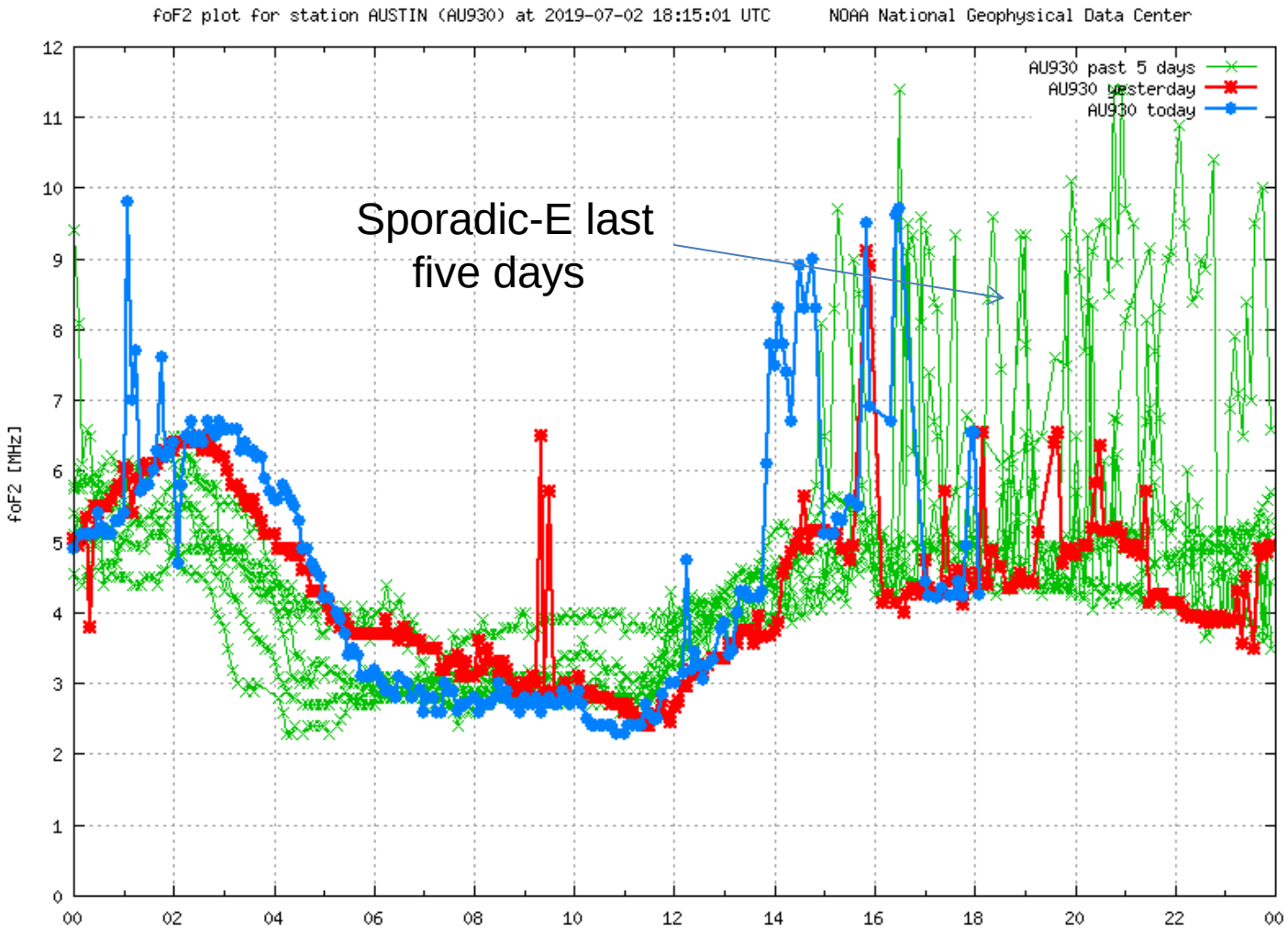


Verification of foF2 Trending Chart

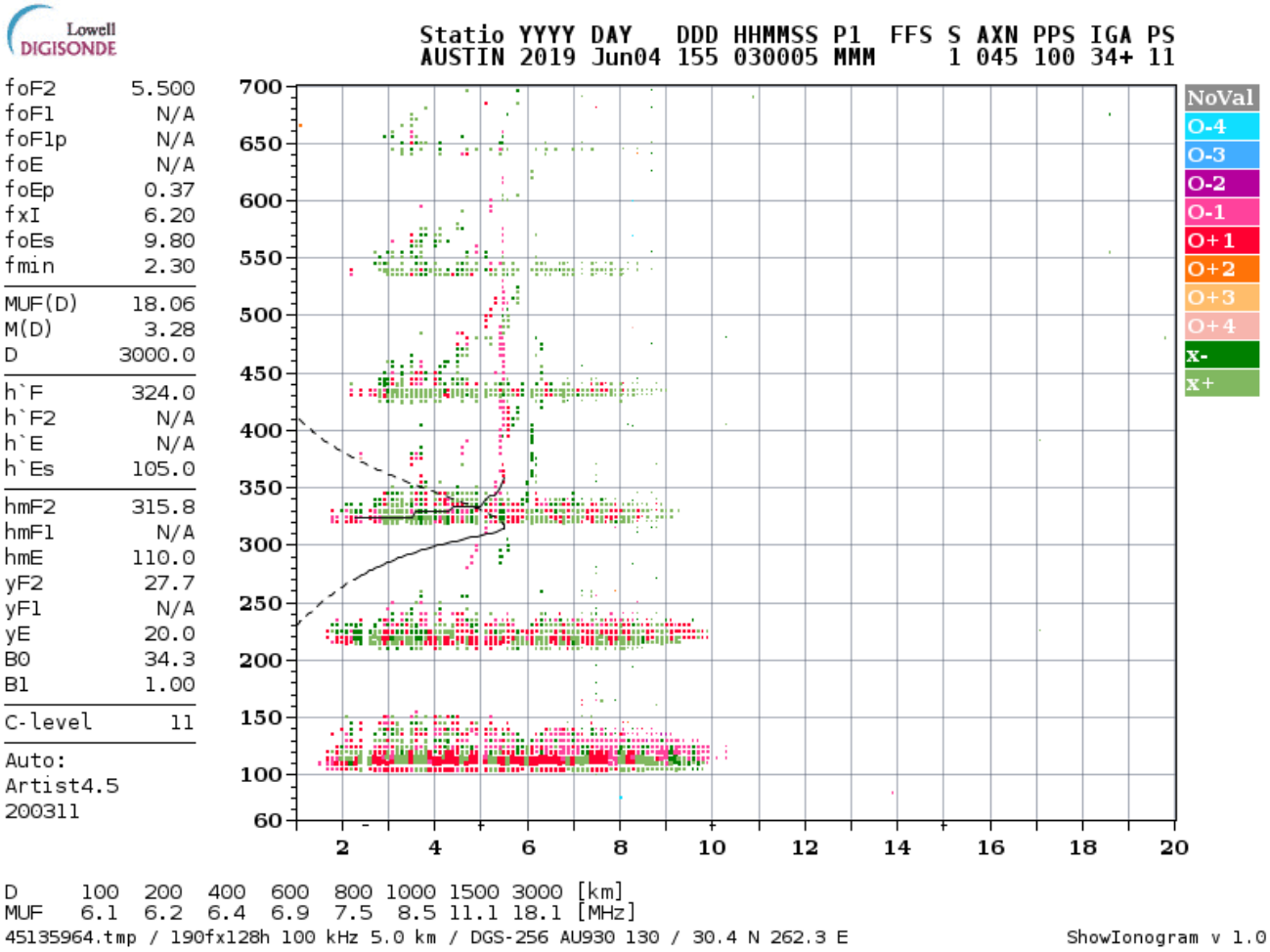
- When it is important to have the correct Critical Frequency (foF2) and you see an unexpected trend, check actual Ionogram.
- The Ionosonde can be “fooled” by echo drop out due to exclusion of certain transmit frequencies by US government.

foF2 Trend for Sporadic-E

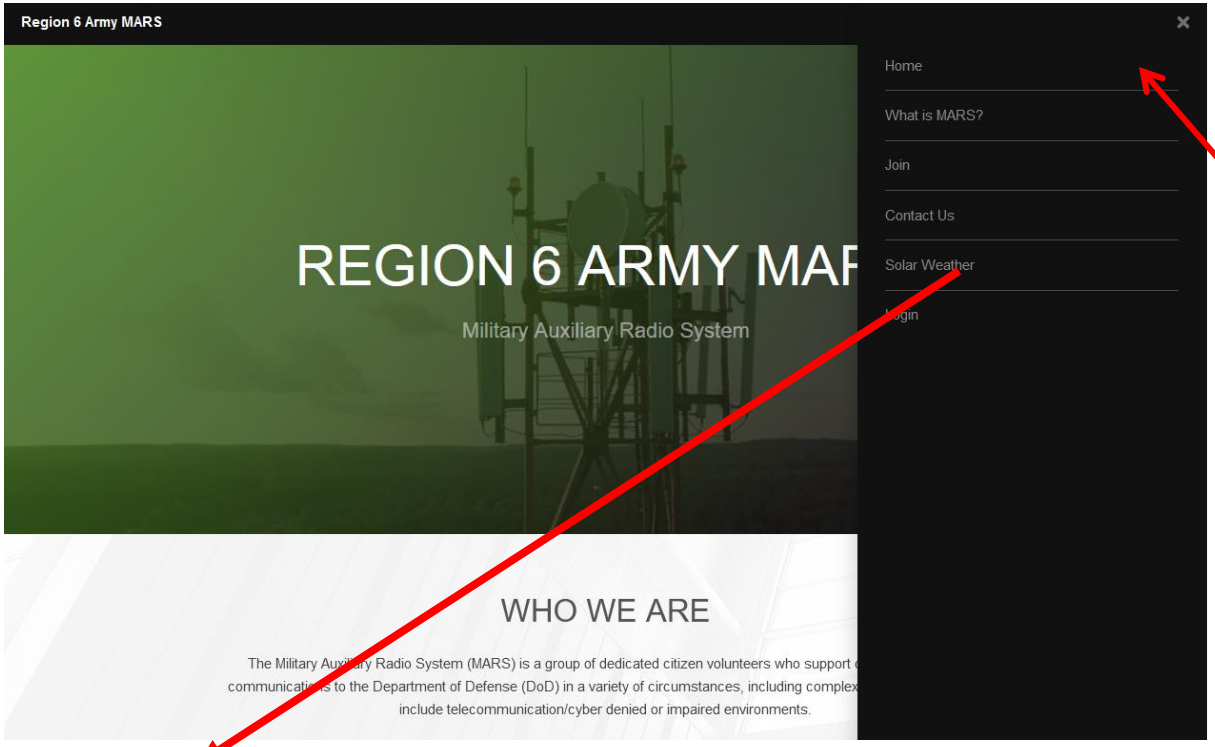
This is a graph of real-time data from the Austin, TX ionosonde in comparison with historic data from the same site. Updated every 15 minutes.



Austin Ionosonde Blanketing Sporadic-E



Solar Weather Data



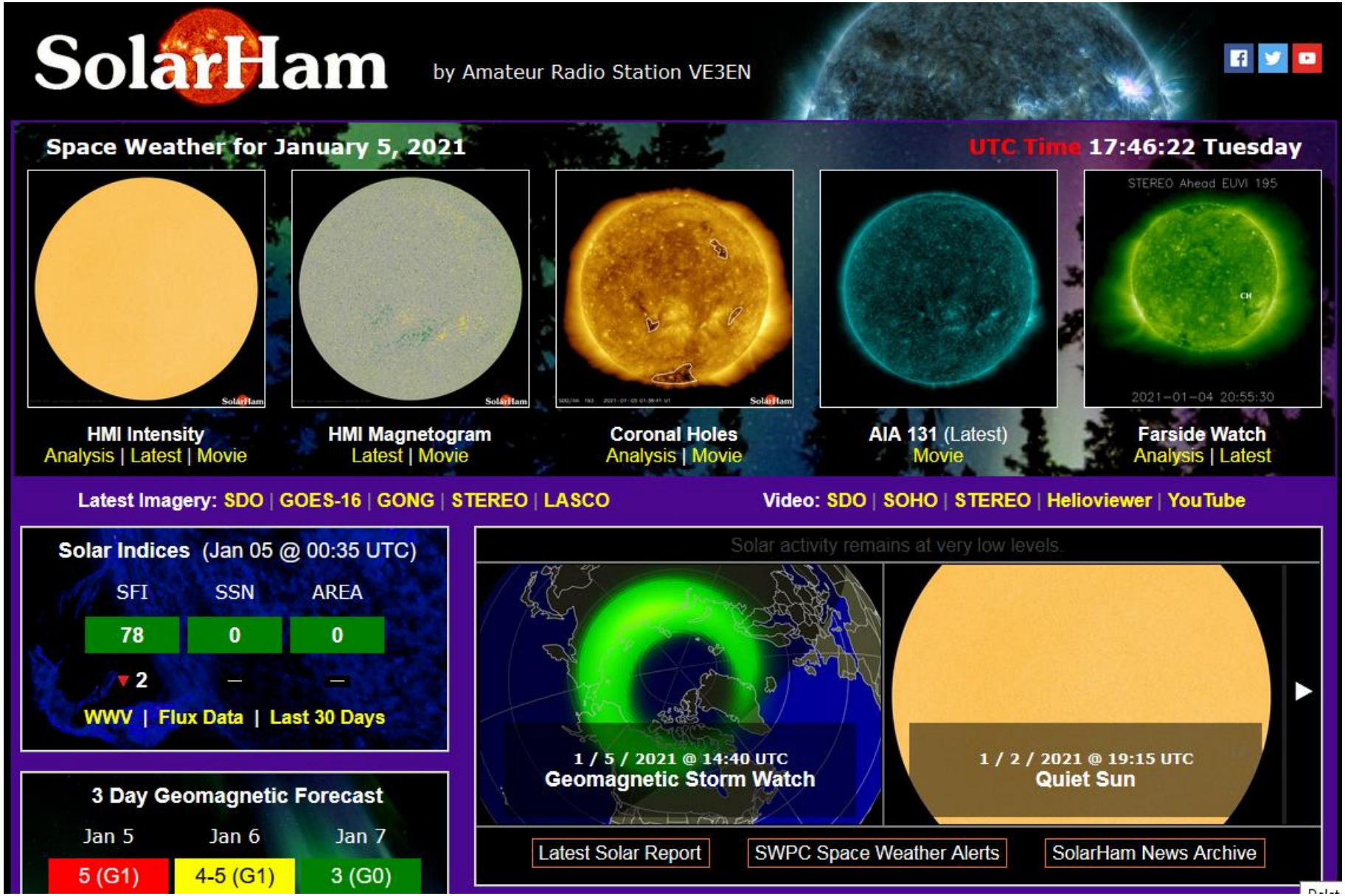
Menu

Solar Weather

Other Solar Weather Links of Interest

All Ionosondes →

- DIDBase - Select Station List then EGLIN then year/month/day/time for Ionosonde plot.
- NOAA Solar Weather - Solar Weather plots of Kp and X-Ray and other solar emissions.
- Solen Solar Weather - Good general solar forecast from an individual.
- Solar Ham - SolarHam provides real time solar news, as well as consolidated data from various sources.


SolarHam
by Amateur Radio Station VE3EN
Space Weather for January 5, 2021
UTC Time 17:46:22 Tuesday
HMI Intensity
Analysis | Latest | Movie
HMI Magnetogram
Latest | Movie
Coronal Holes
Analysis | Movie
AIA 131 (Latest)
Movie
STEREO Ahead EUVI 195
2021-01-04 20:55:30
Farside Watch
Analysis | Latest
Latest Imagery: SDO | GOES-16 | GONG | STEREO | LASCO
Video: SDO | SOHO | STEREO | Helioviewer | YouTube
Solar Indices (Jan 05 @ 00:35 UTC)
SFI
SSN
AREA
78
0
0
▼ 2
–
–
WWV | Flux Data | Last 30 Days
3 Day Geomagnetic Forecast
Jan 5
Jan 6
Jan 7
5 (G1)
4-5 (G1)
3 (G0)
Solar activity remains at very low levels.
1 / 5 / 2021 @ 14:40 UTC
Geomagnetic Storm Watch
1 / 2 / 2021 @ 19:15 UTC
Quiet Sun
Latest Solar Report
SWPC Space Weather Alerts
SolarHam News Archive

spaceweather.com

News and information about the Sun-Earth environment

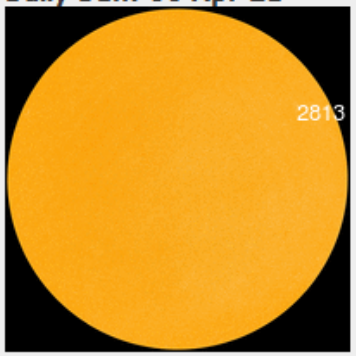
https://www.spaceweather.com/

Current Conditions

Solar wind
speed: **314.8** km/sec
density: **9.9** protons/cm^3
more data: ACE, DSCOVR
Updated: Today at 1225 UT

X-ray Solar Flares
6-hr max: **A1** 1027 UT Apr06
24-hr: **A1** 1515 UT Apr05
explanation | more data
Updated: Today at: 1230 UT

Daily Sun: 06 Apr 21



Sunspot AR2813 is decaying, and poses no threat for strong flares.
Credit: SDO/HMI

FLYING TO THE VOLCANO: Iceland's Geldingadalur volcano has turned into an popular tourist attraction---especially since auroras were sighted above the glowing lava. Early this morning, Tuesday, April 6th, Brian Emfinger saw auroras before he even reached the Reykjanes peninsula:

QUESTIONS?

Lewis Thompson

W5IFQ@att.net

512-587-9944