

SOLAR WEATHER

5 SEP 2023

Lewis Thompson
W5IFQ



Taken by Thomas McCarthy on
October 30, 2022 @ Fairbanks
Alaska

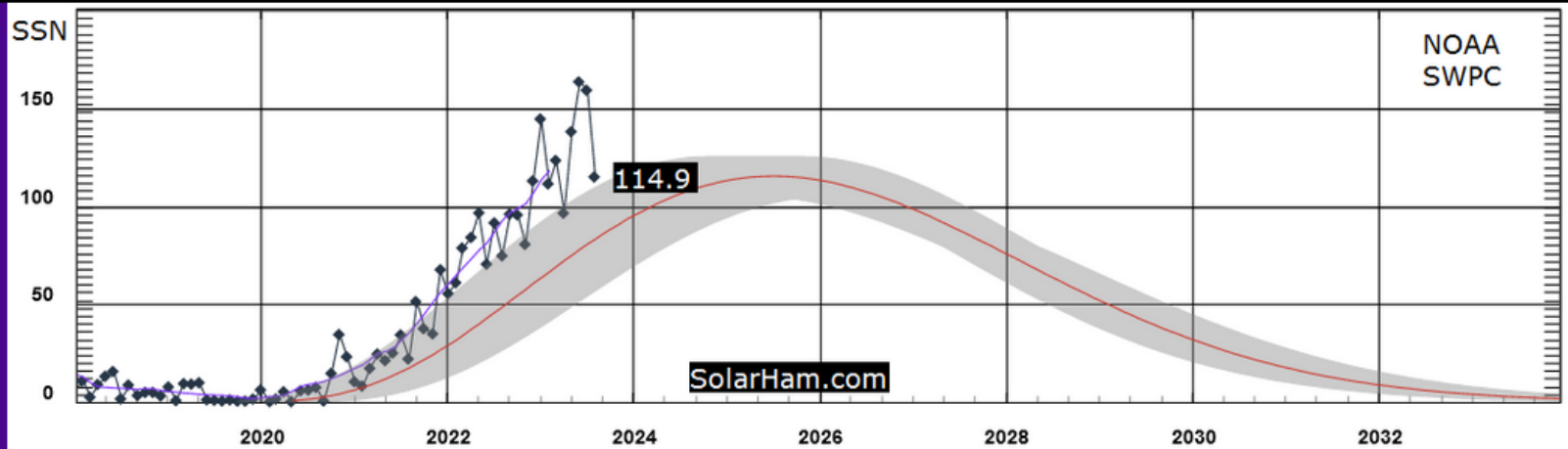
Taken by Christy
Liao on September
2, 2023 @ Iceland

Solar Cycle 25 Progression

(Updated September 3, 2023)

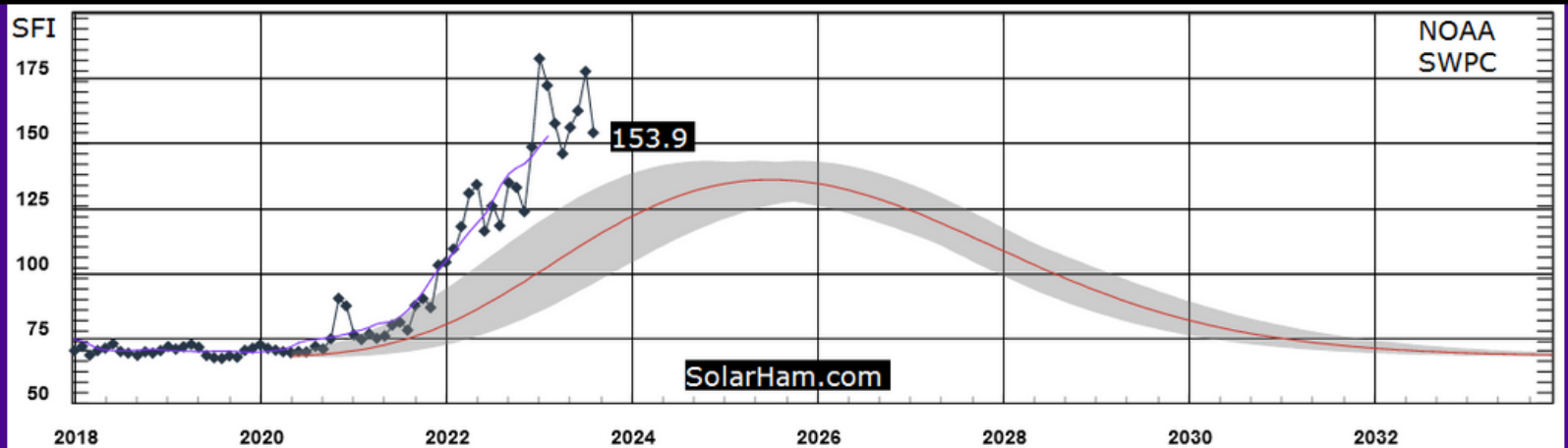
Sunspot Number Progression (August 2023)

Predicted SSN: 83.1 **Actual: 114.9** Latest **Smoothed Predicted SSN (2/2023): 66.3** **Actual: 117.9**



10.7cm Solar Flux Progression (August 2023)

Predicted SFI: 113.5 **Actual: 153.9** Latest **Smoothed Predicted SFI (2/2023): 102.2** **Actual: 152.5**



Present Conditions and Forecast



Solar Indices (Sept. 5 @ 00:35 UTC)

SFI	SSN	AREA
136	100	140
▲ 5	▲ 21	▼ 90

[WWV](#) | [Flux Data](#) | [Last 30 Days](#)

Cycle 25 Progression

3 Day Geomagnetic Forecast

Sept 5	Sept 6	Sept 7
3 (G0)	2-3 (G0)	3 (G0)
<i>Max Kp</i>		
M-Lat 15%	M-Lat 10%	M-Lat 10%
H-Lat 30%	H-Lat 20%	H-Lat 30%
<i>Probabilities</i>		

Detailed Forecast

Solar Flare Detection

Data provided by NOAA/SWPC **GOES-16 X-Ray Flux** [Click to expand data](#)

Radio Blackout Level
R5
R3
R1
R0

Current Solar Flare Threat

C-Flare: 99%	M-Flare: 25%
X-Flare: 05%	Proton: 01%

[Probability Details](#)

Global D-LAYER Absorption

Flare Events (M2+) Past 48 Hours | [Event Report](#) | [Top Solar Flares](#)

M2.0
3421

Visible Sunspot Regions

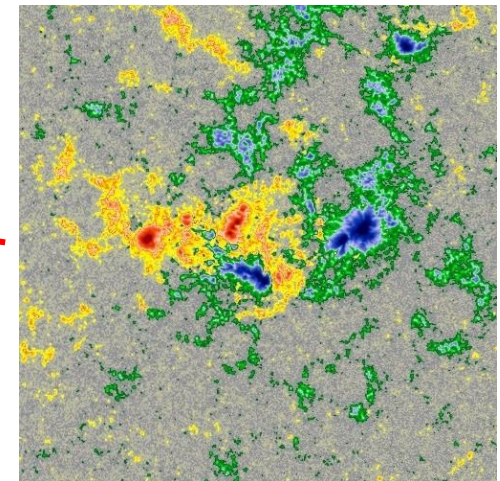
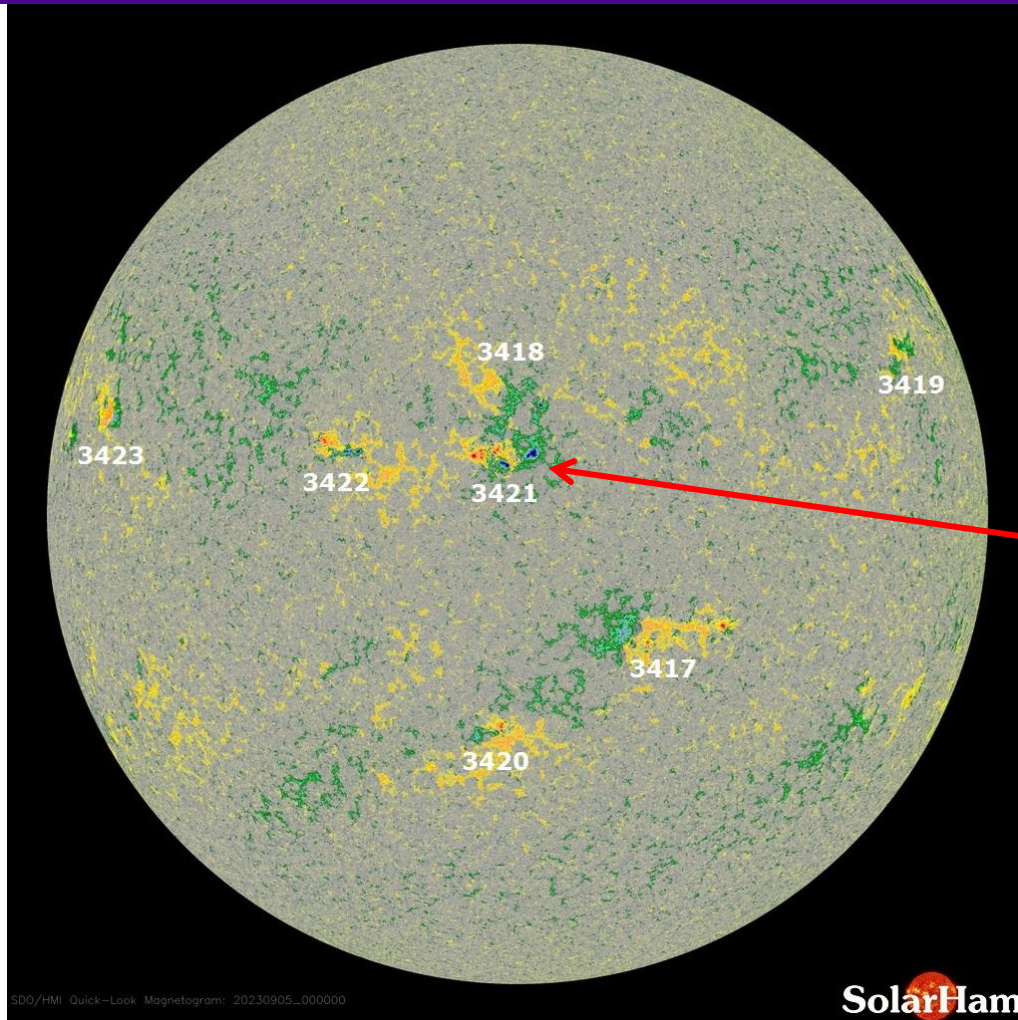
[Sunspot Summary](#) | [SRS \(txt\)](#)

3417	3418	3419	3420	3421	3422	3423
B	A	B	B	B	B	B

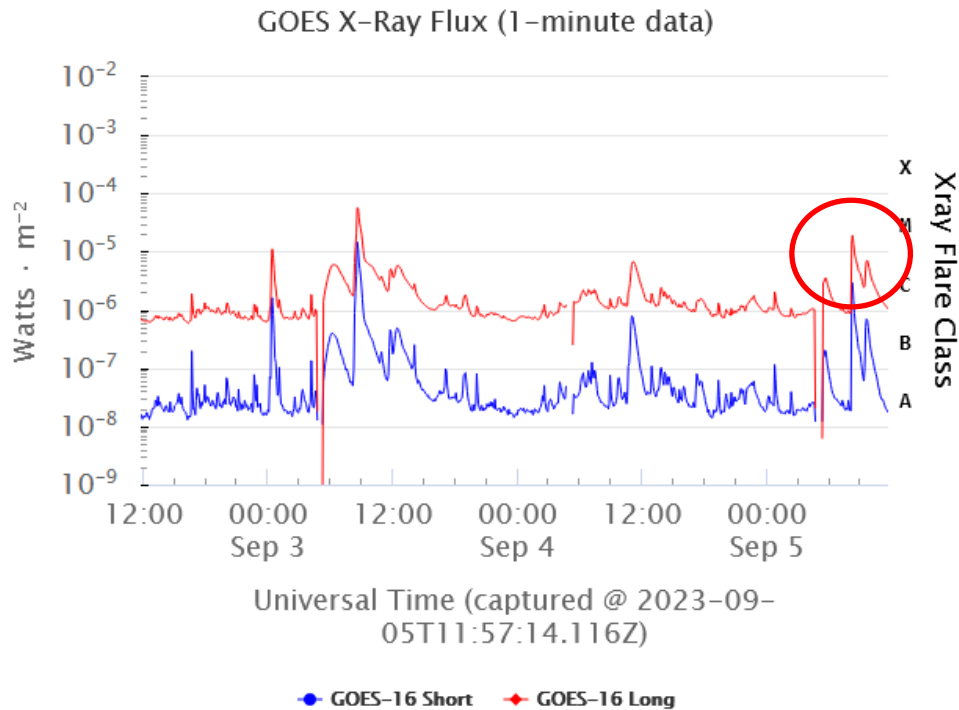
Solar Flare Activity

Magnetogram Image (Updated September 5, 2023)

Uses Zeeman effect to measure polarity of magnetic fields



Solar X-Ray Flux: 3- 5 SEP 2023



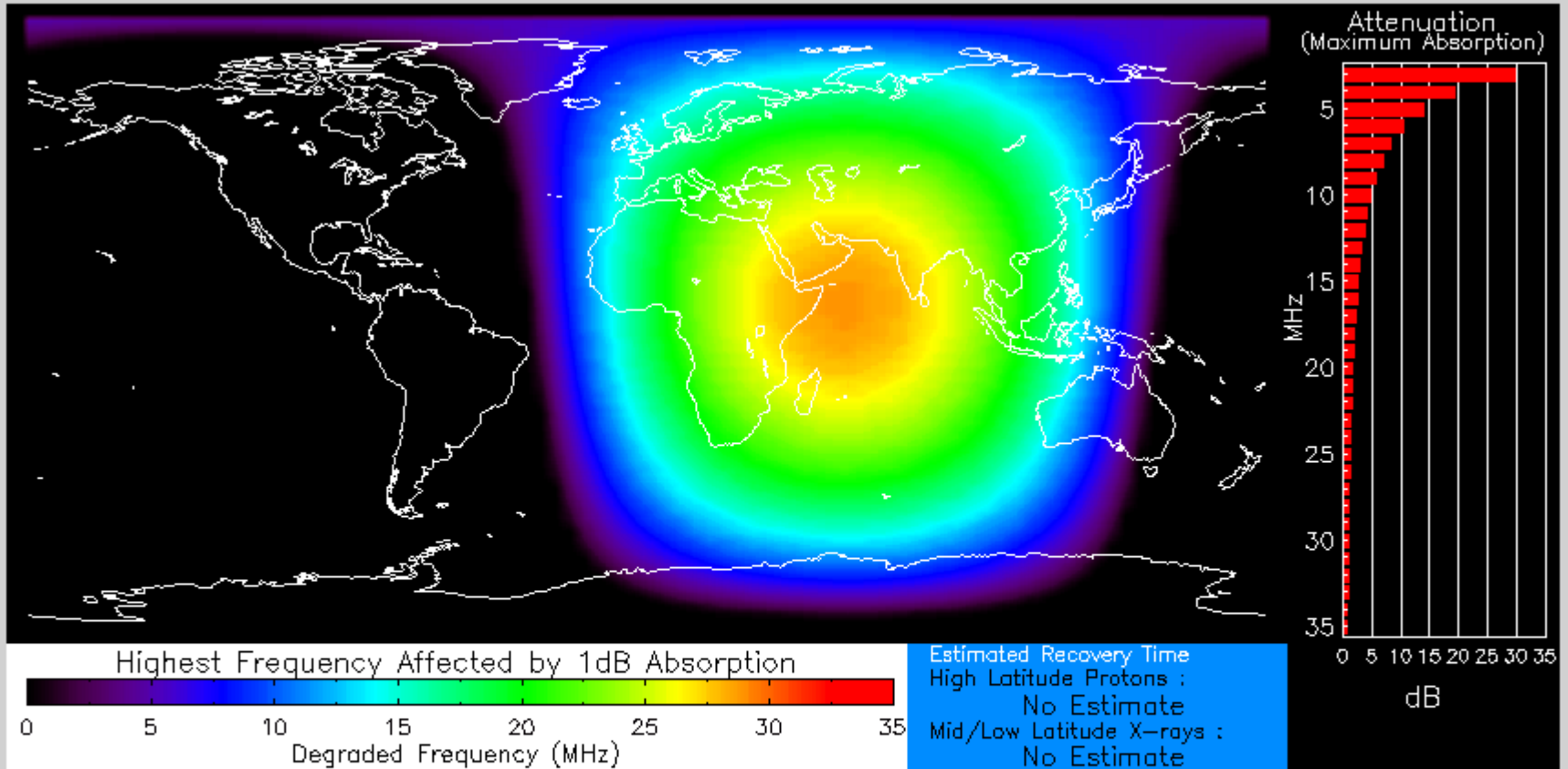
2023-09-05T11:57:14.116Z

The X-ray radiation that ionizes the D-layer is the 1.0 - 8.0 Å (red) plot. These measurements currently taken from the [GOES 16](#) satellite.

Flare Category	Effect
A1-B9	No or minor impact on HF
C1	Low absorption of HF signals
M1	Occasional 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

NOAA – Unusual D-Region

GLOBAL (1 DB ABS)



Minor X-ray flux
Product Valid At : 2023-09-05 08:13 UTC

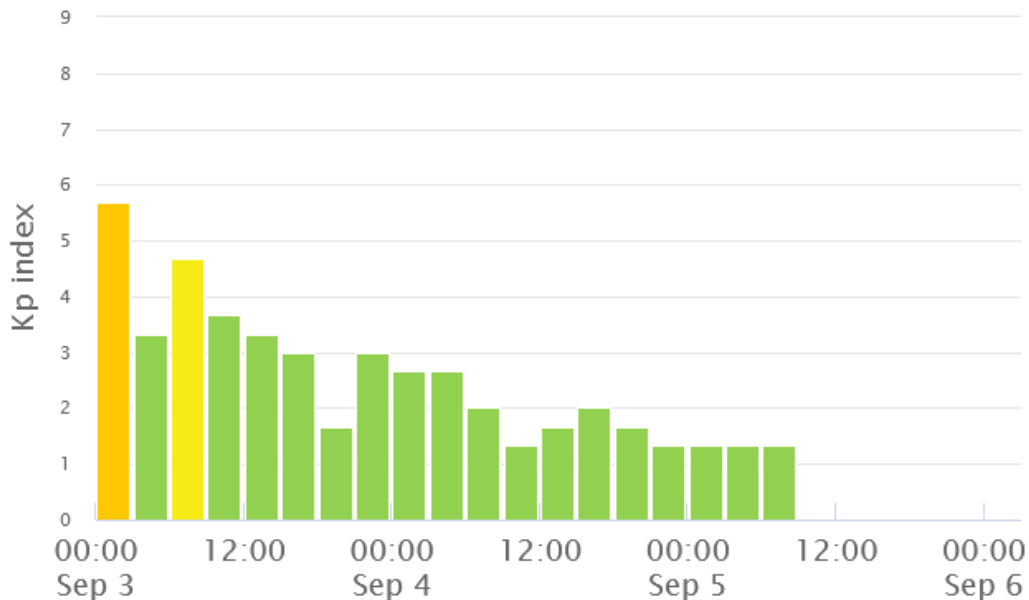
Normal Proton Background
NOAA/SWPC Boulder, CO USA



Earth's Geomagnetic Activity

Estimated Planetary K index (3 hour data)

Begin: Sun, 03 Sep 2023 00:00:00 GMT



Universal Time (captured @ 2023-09-05T11:57:14.046Z)

2023-09-05T11:57:14.046Z

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

Geomagnetic Conditions: 5 SEP 2023

Solar wind:

$B_z = 0$ nT

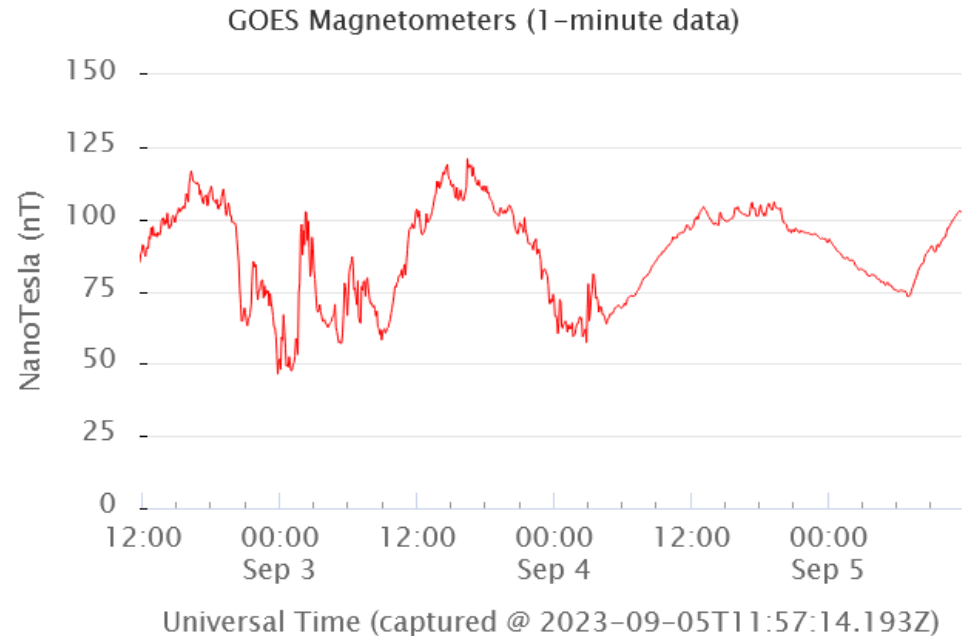
speed = 398 km/sec

density = 3.04 protons/cm³

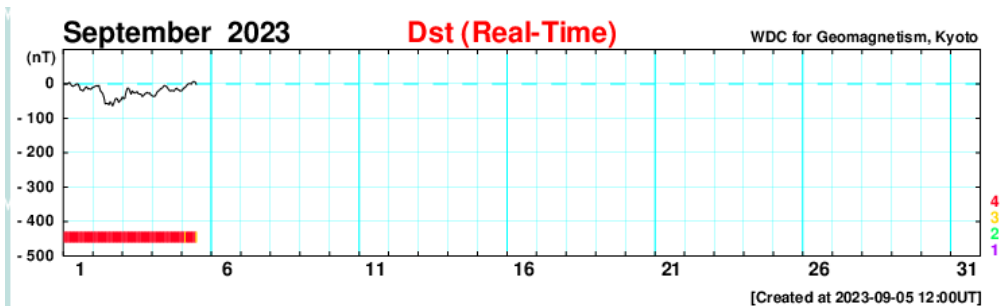
(From – NOAA DSCOVR
In L1, Lagrange Point)

Dst = -2 nT (Ring Field)

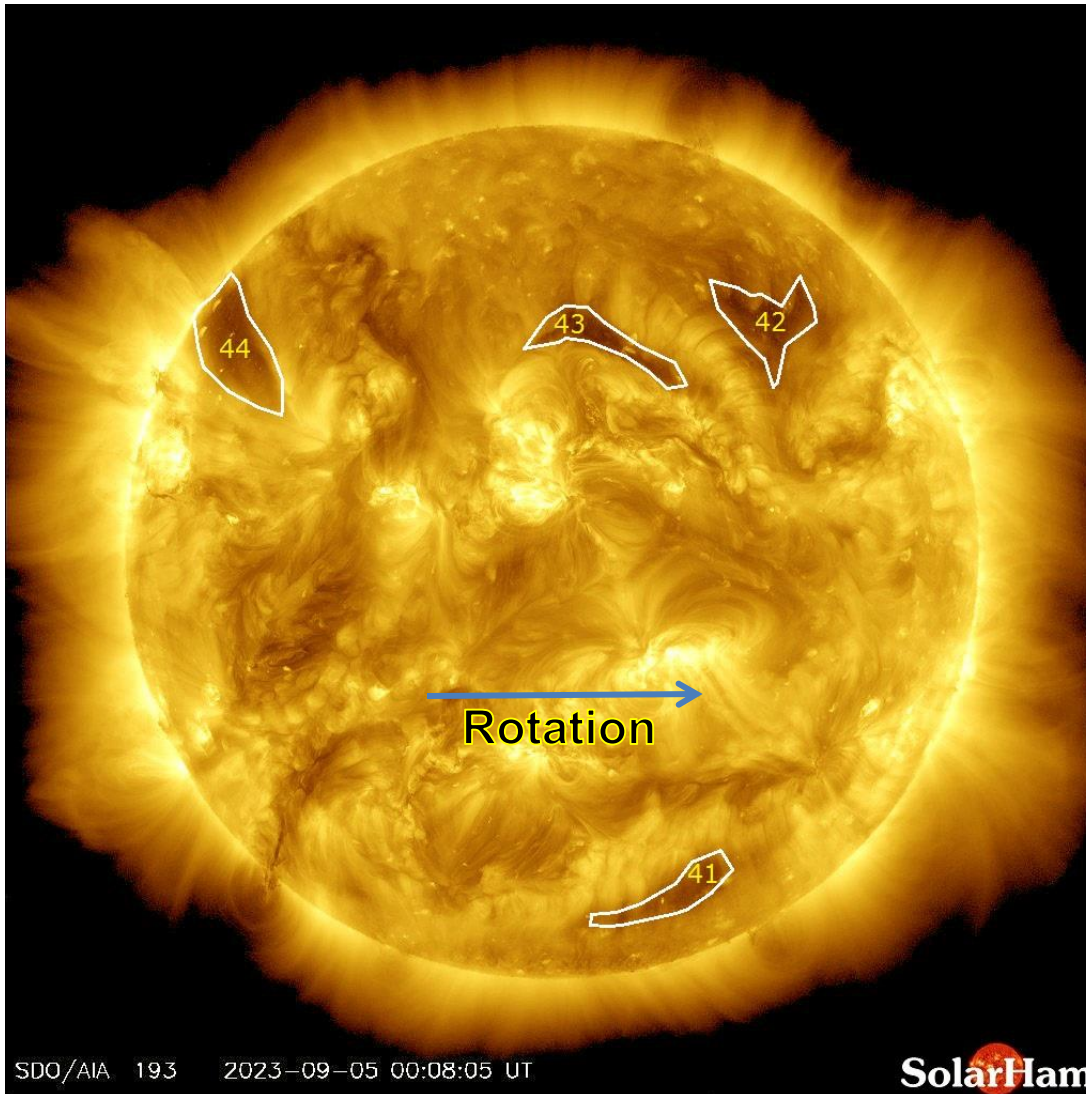
(From – Data Analysis Center
For Geomagnetism and Space
Magnetism – Kyoto University)



From – GOES 16
In geostationary orbit



Coronal Holes – 5 SEP 2023



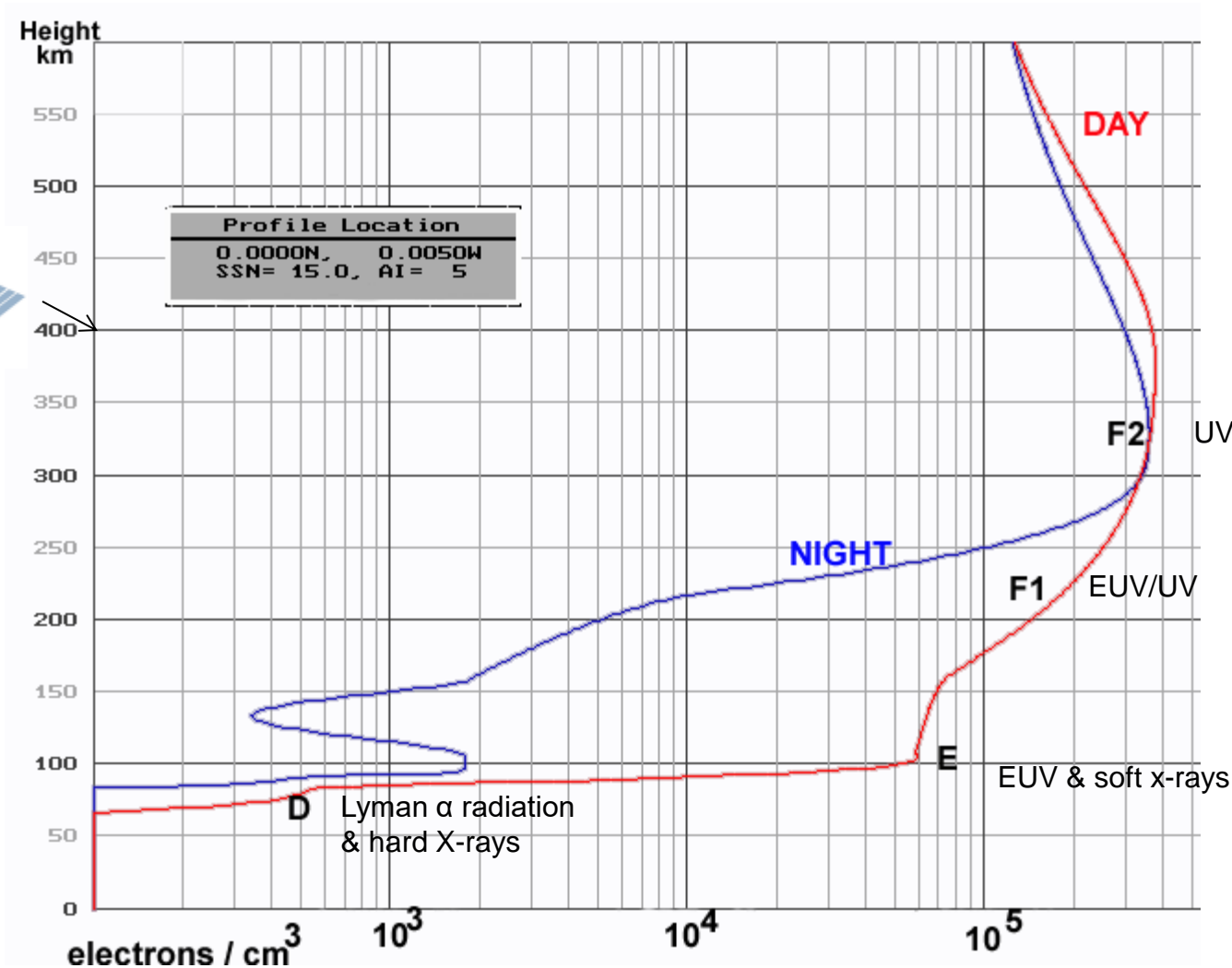
Analysis

There are currently no large coronal holes facing Earth.

Ionospheric Conditions



Gravity
↓



Solar Radiation
↓

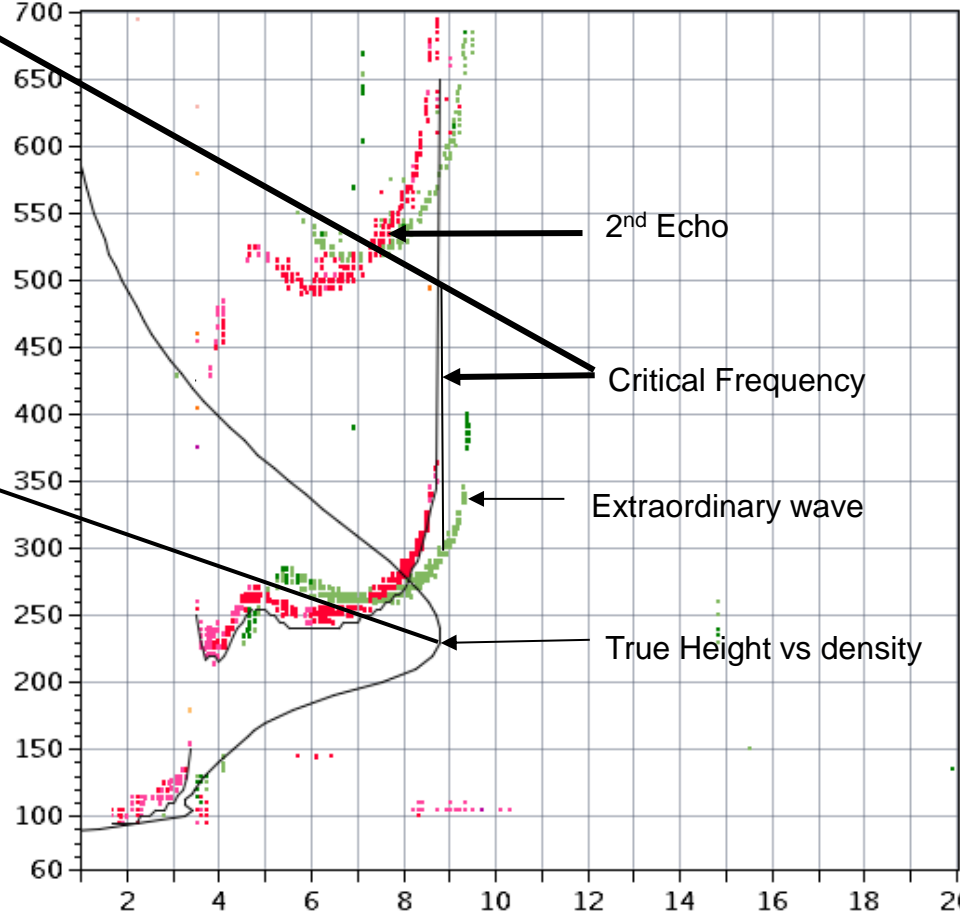
Monoatomic oxygen

Ionogram Interpretation



Statio YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
 Austin 2013 Jan03 003 185505 MMM 1 045 100 32+ A1

foF2	8.804
foF1	4.75
foF1p	4.62
foE	3.42
foEp	3.29
fxI	9.50
foEs	3.40
fmin	1.70
<hr/>	
MUF(D)	31.04
M(D)	3.53
D	3000.0
<hr/>	
h`F	215.0
h`F2	240.0
h`E	95.0
h`Es	95.0
<hr/>	
hmF2	235.5
hmF1	164.4
hmE	105.0
yF2	69.0
yF1	35.4
yE	16.2
B0	70.6
B1	2.28
<hr/>	
C-level	11
<hr/>	
Auto:	
Artist4	
200207	



NoVal
 O-4
 O-3
 O-2
 O-1
 O+1
 O+2
 O+3
 O+4
 x-
 x+

D 100 200 400 600 800 1000 1500 3000 [km] ← Oblique propagation MUF Chart
 MUF 9.4 9.5 10.0 10.8 12.0 13.7 18.5 31.0 [MHz] i.e. 31 MHz to 3000 km

Austin Ionosonde – 5 SEP 1310Z (0810 CDT)



Statio YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
 Austin 2023 Sep05 248 131005 MMM 1 045 100 33+ A1

foF2 7.250
 foF1 N/A
 foFlp N/A
 foE 2.42
 foEp 2.37
 fxI 8.60
 foEs 2.80
 fmin 1.00

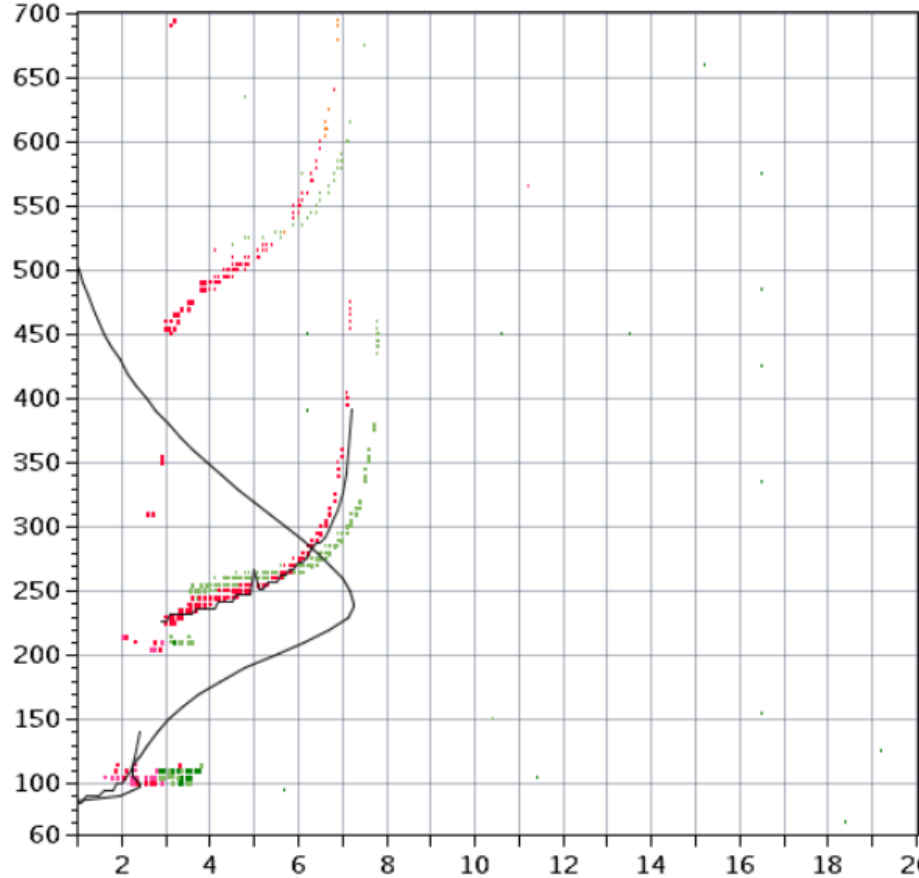
MUF(D) 24.70
 M(D) 3.43
 D 3000.0

h`F 227.0
 h`F2 N/A
 h`E 85.0
 h`Es 100.0

hmF2 238.3
 hmF1 N/A
 hmE 97.6
 yF2 57.3
 yF1 N/A
 yE 13.2
 B0 68.8
 B1 1.55

C-level 11

Auto:
 Artist4.5
 200311

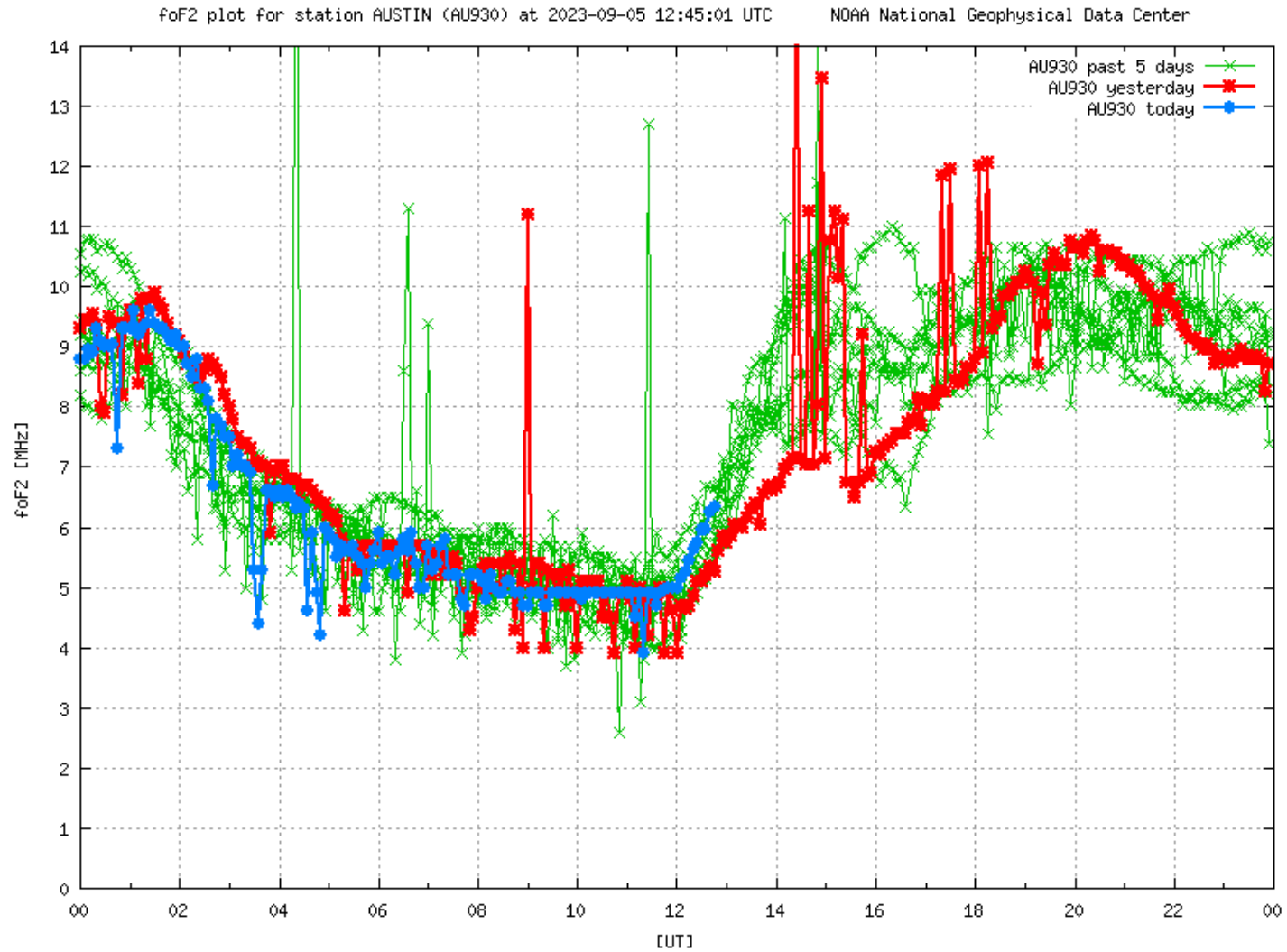


NoVal
 O-4
 O-3
 O-2
 O-1
 O+1
 O+2
 O+3
 O+4
 X-
 X+

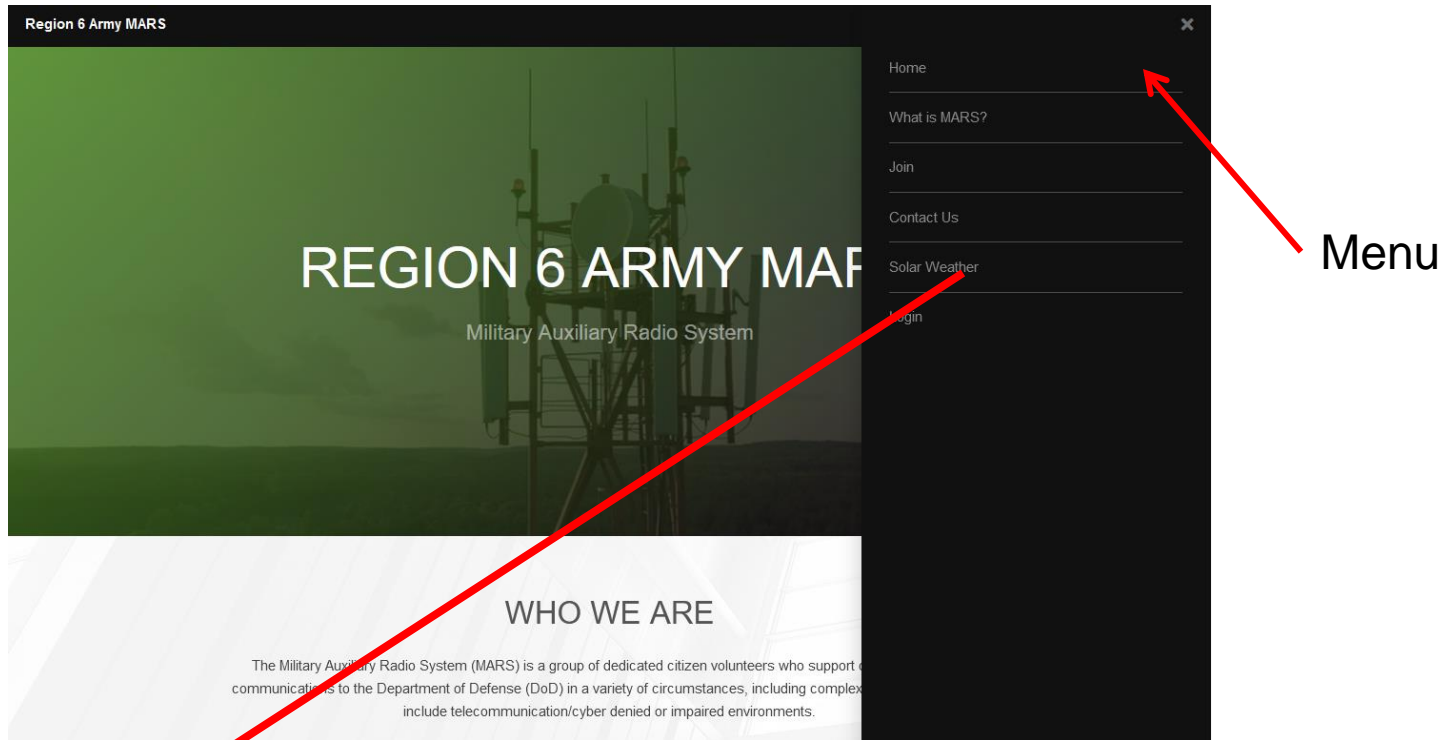
D 100 200 400 600 800 1000 1500 3000 [km]
 MUF 7.8 7.9 8.3 9.0 9.8 11.2 14.9 24.7 [MHz]

AU930 2023248131005.MMM / 150fx:120h 100 kHz 5.0 km / DGS-256 AU930 130 / 30.4 H 262.3 E IonCPng v. 1.3.11

foF2 Trend – Austin Ionosonde



Solar Weather Data



Solar Weather

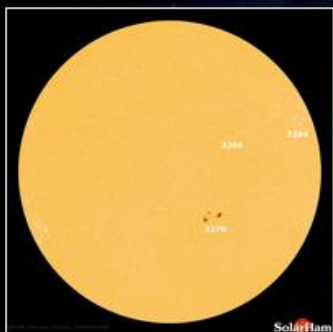
Other Solar Weather Links of Interest

All Ionosondes

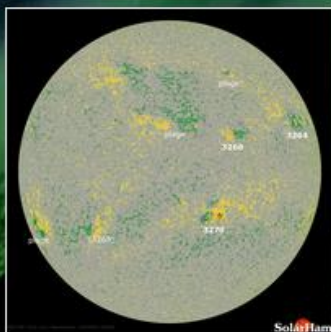
- [DIDBase](#) - Select Station List then EGLIN then year/month/day/time for Ionosonde plot.
- [NOAA Solar Weather](#) - Solar Weather plots of Kp and X-Ray and other solar emissions.
- [Solen Solar Weather](#) - Good general solar forecast from an individual.
- [Solar Ham](#) - SolarHam provides real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

Space Weather for April 4, 2023

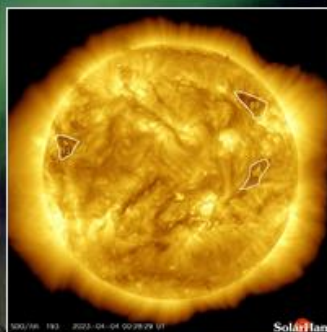
UTC Time 13:17:34 Tuesday



HMI Intensity
Latest | Movie | HARP



HMI Magnetogram
Latest | Movie



Coronal Holes
Analysis | Movie



AIA 131 (Latest)
Movie



SUVI 304 (Latest)
Movies

Latest Imagery: [SDO](#) | [AIA](#) | [GOES-16](#) | [GONG](#) | [STEREO](#) | [LASCO](#)

Video: [SDO](#) | [SOHO](#) | [STEREO](#) | [Helioviewer](#) | [YouTube](#)

[Solar Report](#)

[Space Weather Alerts](#) >

[Real Time Solar Wind](#)

[Protons and Electrons](#)

[Satellite Environment](#) >

Solar Indices (Apr. 4 @ 00:35 UTC)

SFI	SSN	AREA
134	56	420
▲ 7	▲ 2	▲ 210

[WWV](#) | [Flux Data](#) | [Last 30 Days](#)

[Cycle 25 Progression](#)

Solar Flare Detection

Data provided by NOAA/SWPC

GOES-16 X-Ray Flux

[Click to expand data](#)



<https://www.spaceweather.com/>

Current Conditions

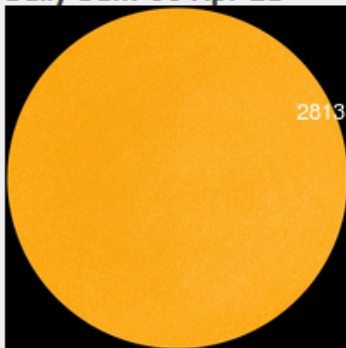
Solar wind

speed: **314.8** km/sec
density: **9.9** protons/cm³
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