

SOLAR WEATHER

5 OCT 2021



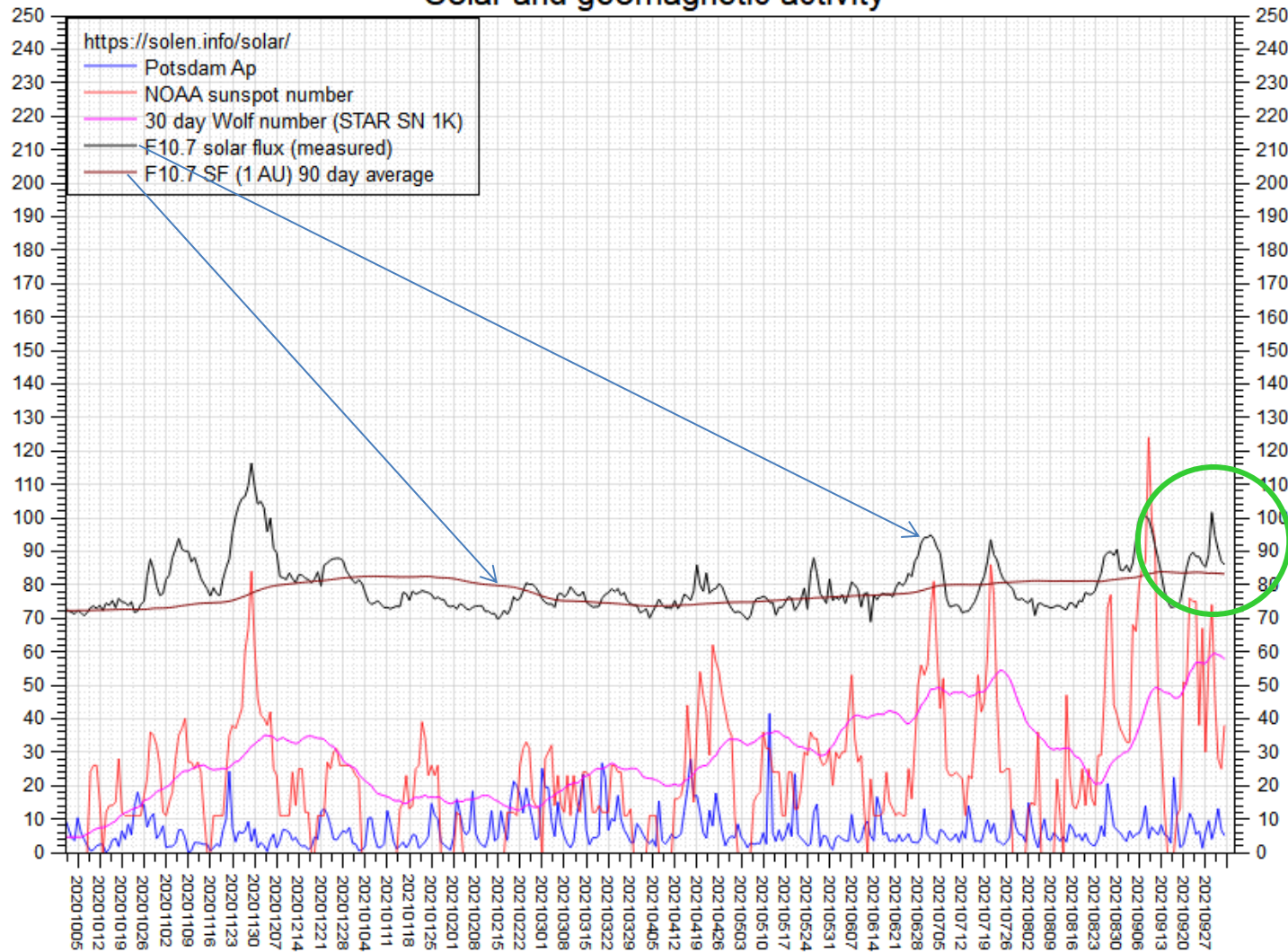
Lewis Thompson
W5IFQ

Taken by Greg Ash
on October 5, 2021
@ Fairbanks Alaska

Gregory Ash

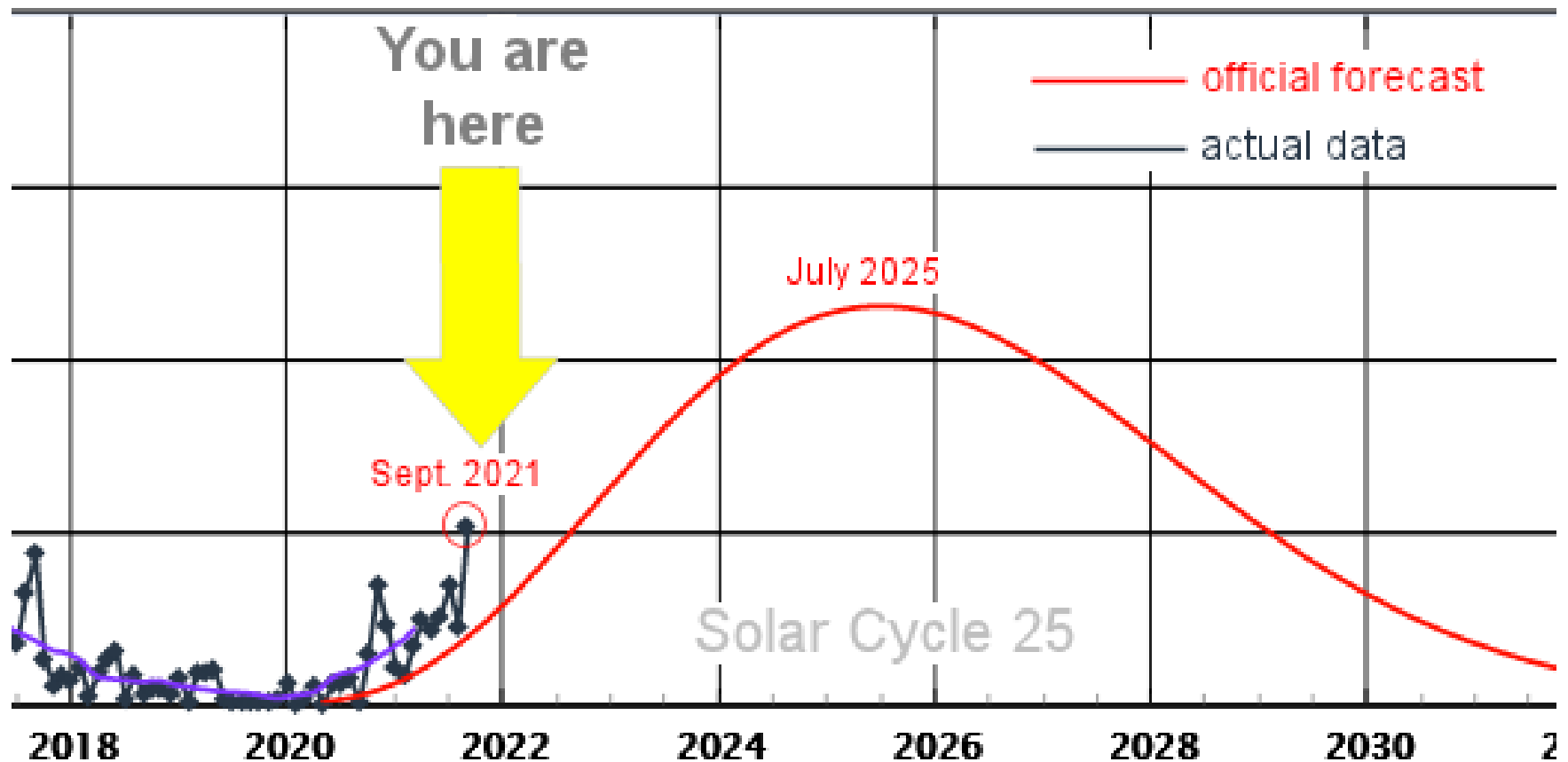
SOLAR FLUX INDEX – 2021

Solar and geomagnetic activity



SF 83.5 (17.7 decrease from one previous 27 day solar rotation)

Sunspot Counts: Predicted vs. Actual



SolarHam.org Forecast

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

SFI	SSN	AREA
84	29	410
▼ 2	▼ 9	▼ 30

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

3 Day Geomagnetic Forecast

October 5	October 6	October 7
2-3 (G0)	2-3 (G0)	2 (G0)
<i>Max Kp</i>		
M-Lat 05%	M-Lat 05%	M-Lat 01%
H-Lat 30%	H-Lat 30%	H-Lat 20%
<i>Probabilities</i>		

[Detailed Forecast](#)

Solar Flare Detection

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

Solar Flare Class | **Radio Blackout Level**

X	R5
M	R3
C	R1
B	R0
A	

X-Rays
A9.4
Current
D Layer
Solar SOFT

Current Solar Flare Threat | [Probability Details](#)

C-Flare: 35%	M-Flare: 05%	X-Flare: 01%	Proton: 01%
---------------------	---------------------	---------------------	--------------------

Flare Events (M1+) Past 48 Hours | [Event Report \(txt\)](#) | [Top 10 List \(txt\)](#)

No Noteworthy Events Detected.

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

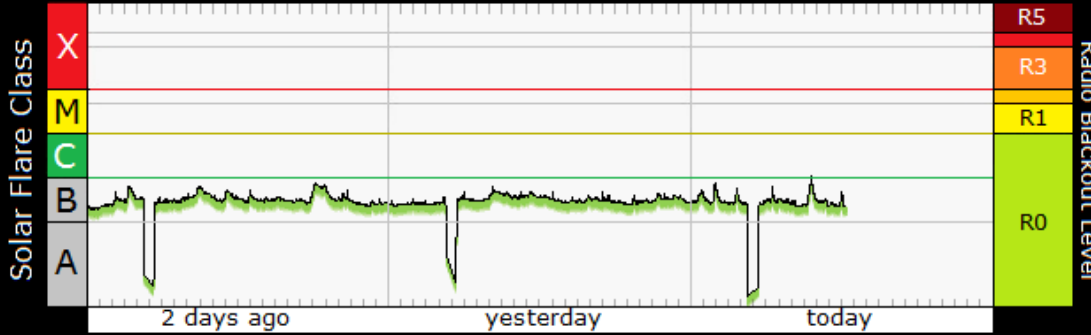
2880 **2882**

Solar Flare Detection

Data provided by NOAA/SWPC

GOES-16 X-Ray Flux

Click to expand data

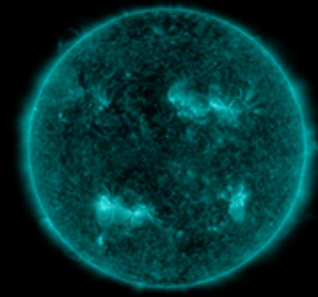


X-Rays
B2.2
Current

EVT
RPT

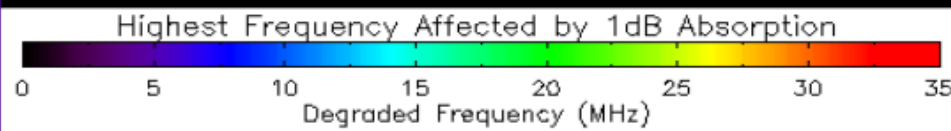
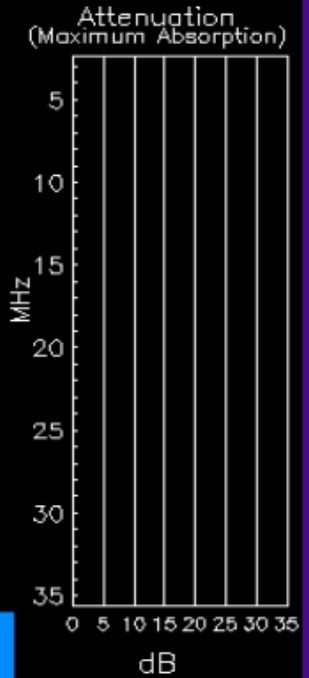
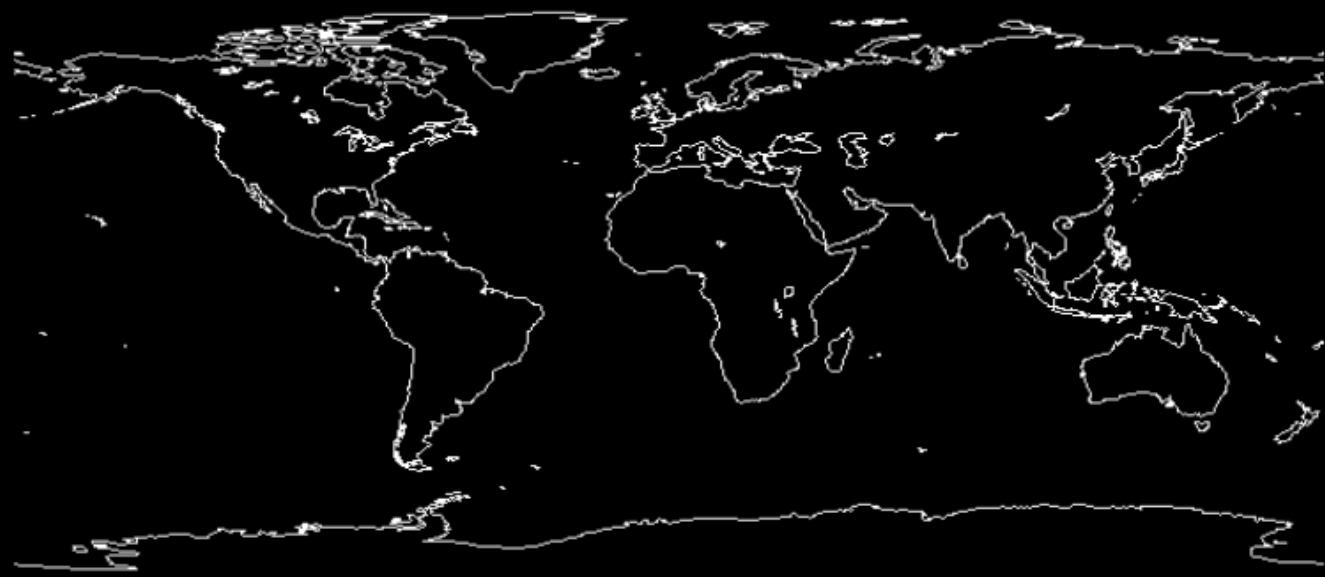
Solar
SOFT

AIA 131
(Latest)



SDO/AIA_131 2021-09-07 12:16:44 UT

D Region Absorption Predictions (D-RAP)



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 Summary for October 4, 2021

Active Regions Visible Today

2

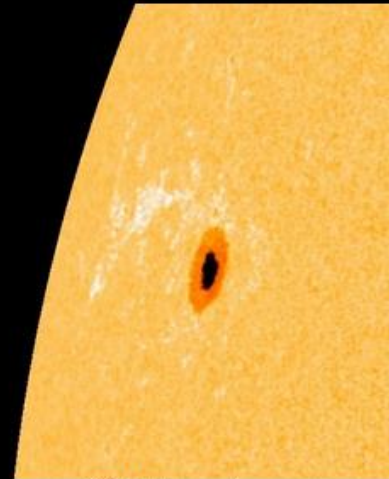
SESC Sunspot Number

29

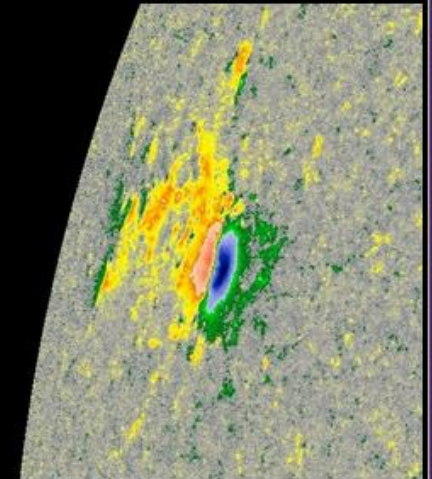
Total Sunspot Area

410

Region	Location	Spot Count	Area
AR 2882	N16E66	1	250
Magnetic Class		Spot Class	
ALPHA		HHX	
Flare Threat	C: 05%	M: 01%	X: 01%
Date Assigned: October 3, 2021			
<u>Noteworthy Events</u>			
none			

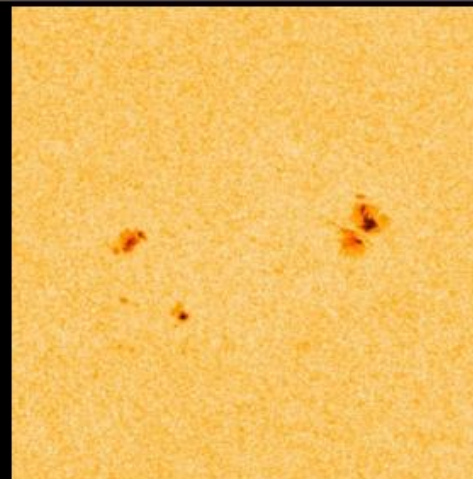


HMI Intensity

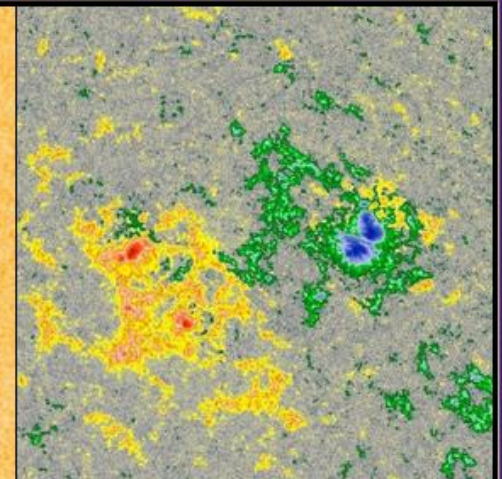


HMI Magnetogram

Region	Location	Spot Count	Area
AR 2880	N31W20	8	160
Magnetic Class		Spot Class	
BETA		ESO	
Flare Threat	C: 35%	M: 05%	X: 01%
Date Assigned: September 28, 2021			
<u>Noteworthy Events</u>			
none			

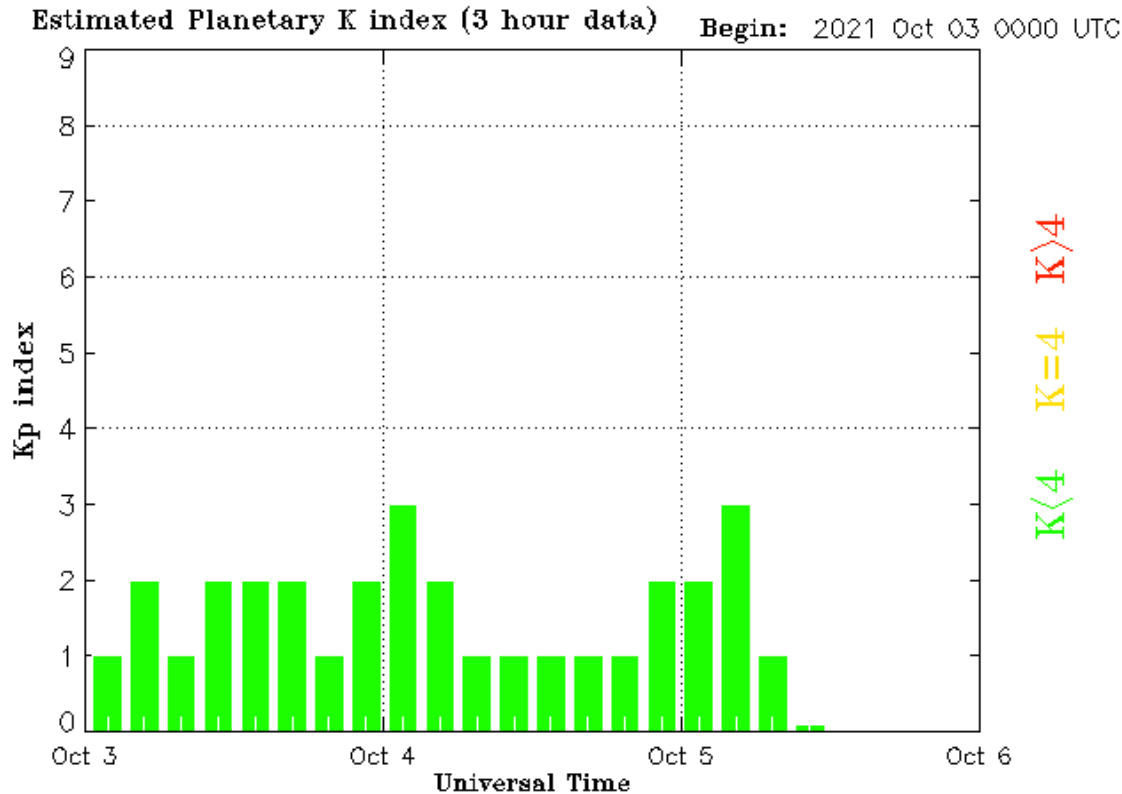


HMI Intensity



HMI Magnetogram

Planetary K index 3 – 5 OCT 2021



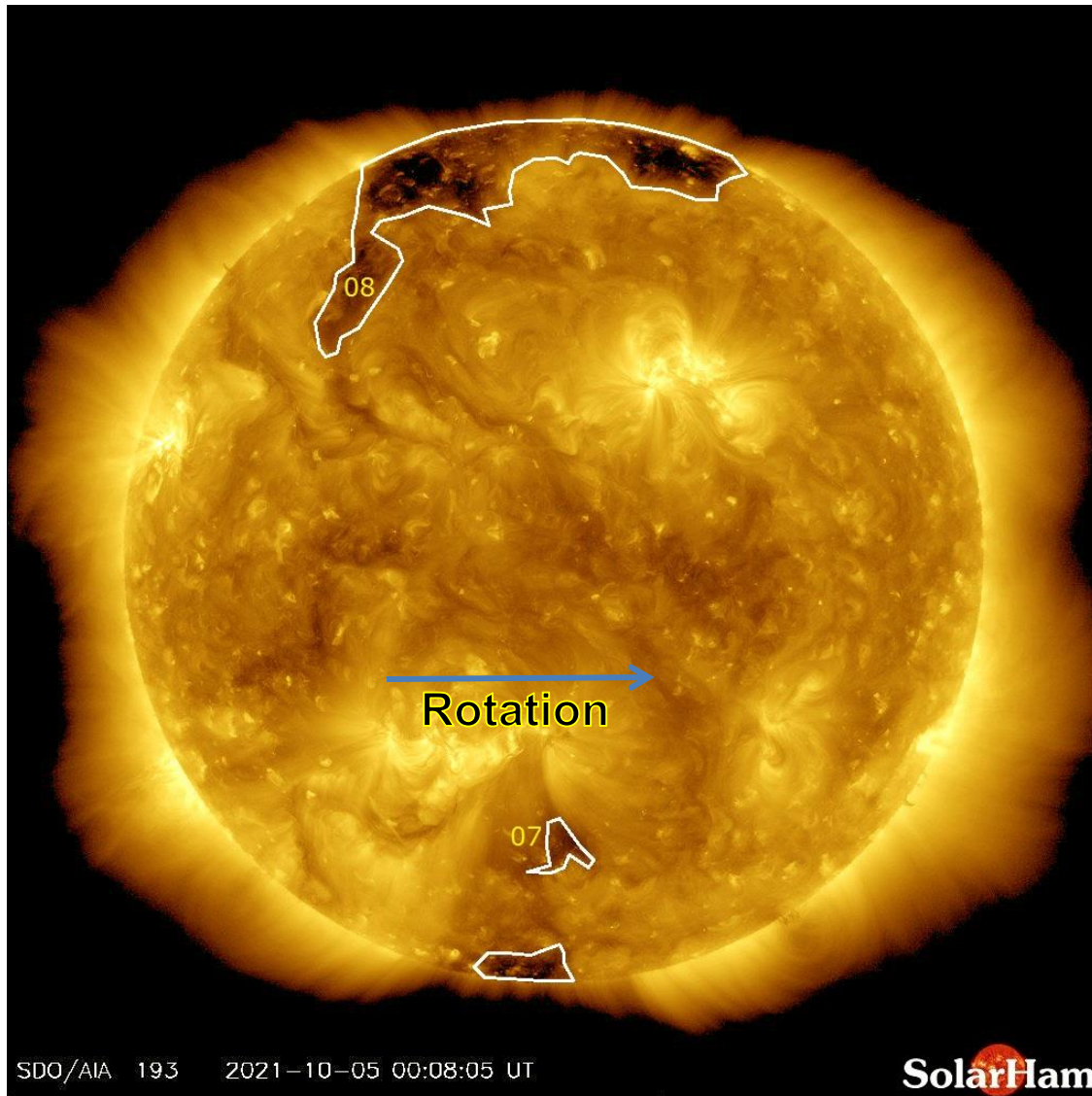
Generally, as planetary K-Index rises, critical frequency is suppressed.

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

Updated 2021 Oct 5 12:30:02 UTC

NOAA/SWPC Boulder, CO USA

Coronal Holes – 5 OCT 2021



Analysis

There are currently no large coronal holes directly facing Earth.

Geomagnetic Conditions: 5 OCT 2021

Solar wind:

$B_z = -0$ nT

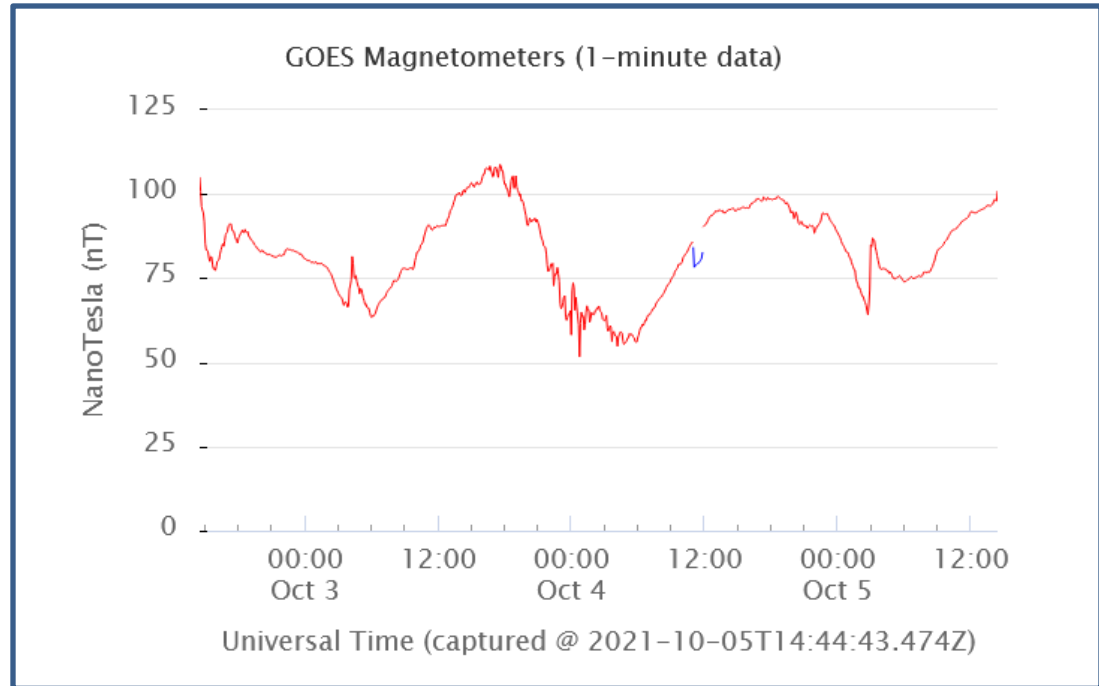
speed = 300 km/sec

density = 8.97 protons/cm³

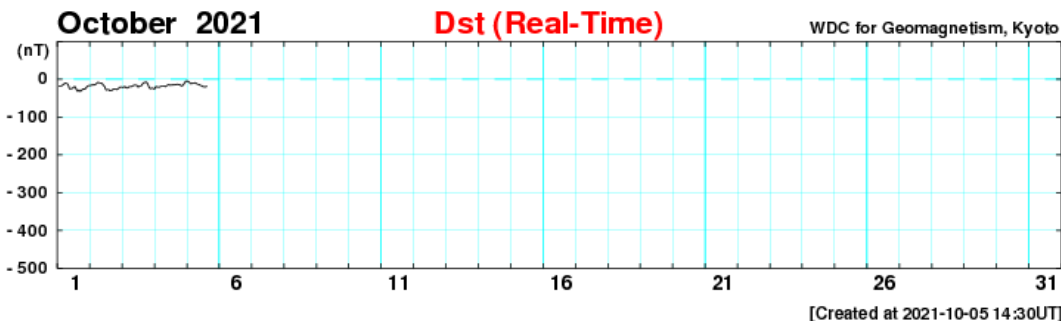
(From – NOAA DSCOVR
In L1, Lagrange Point)

Dst = -18 nT (Ring Field)

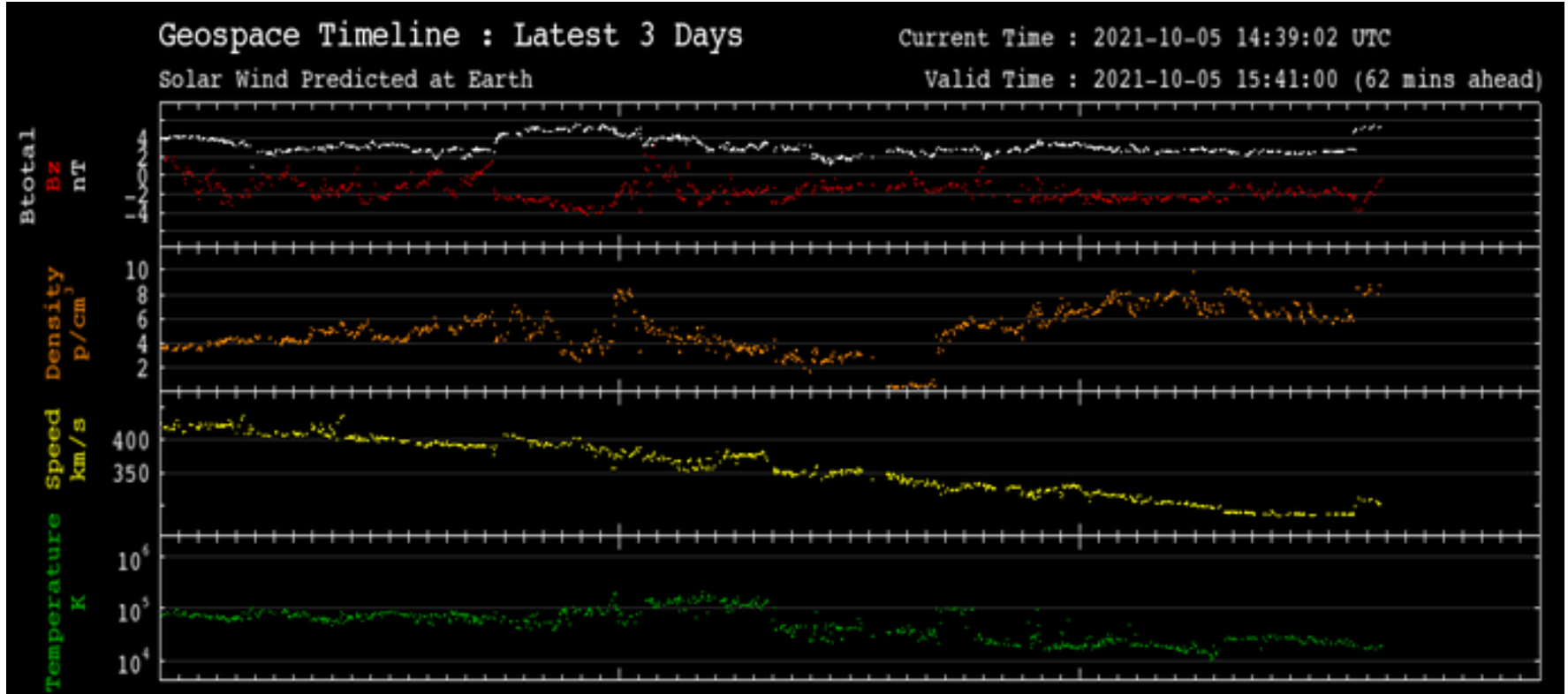
(From – Data Analysis Center
For Geomagnetism and Space
Magnetism – Kyoto University)



From – GOES 16
In geostationary orbit

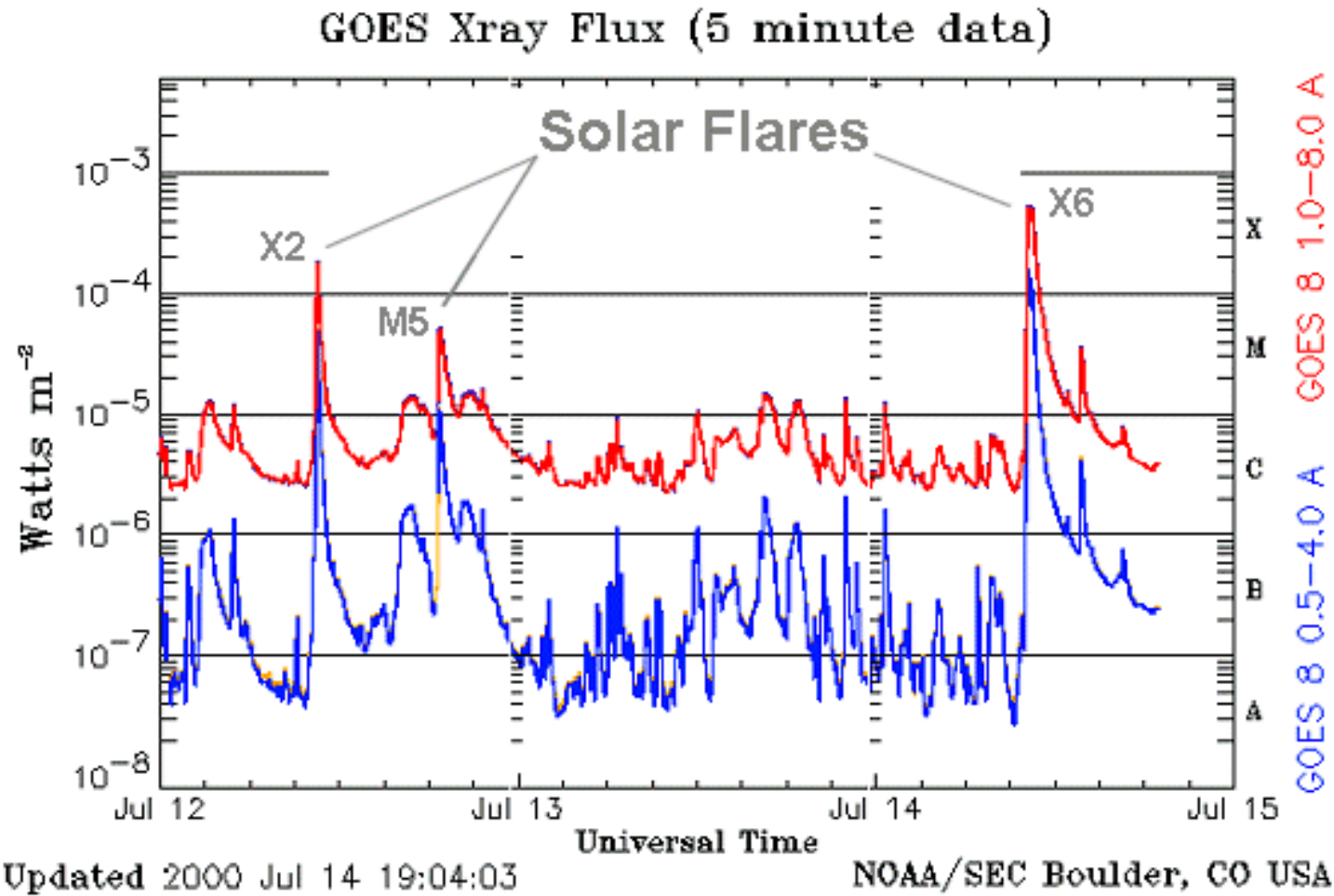


Real Time Solar Wind

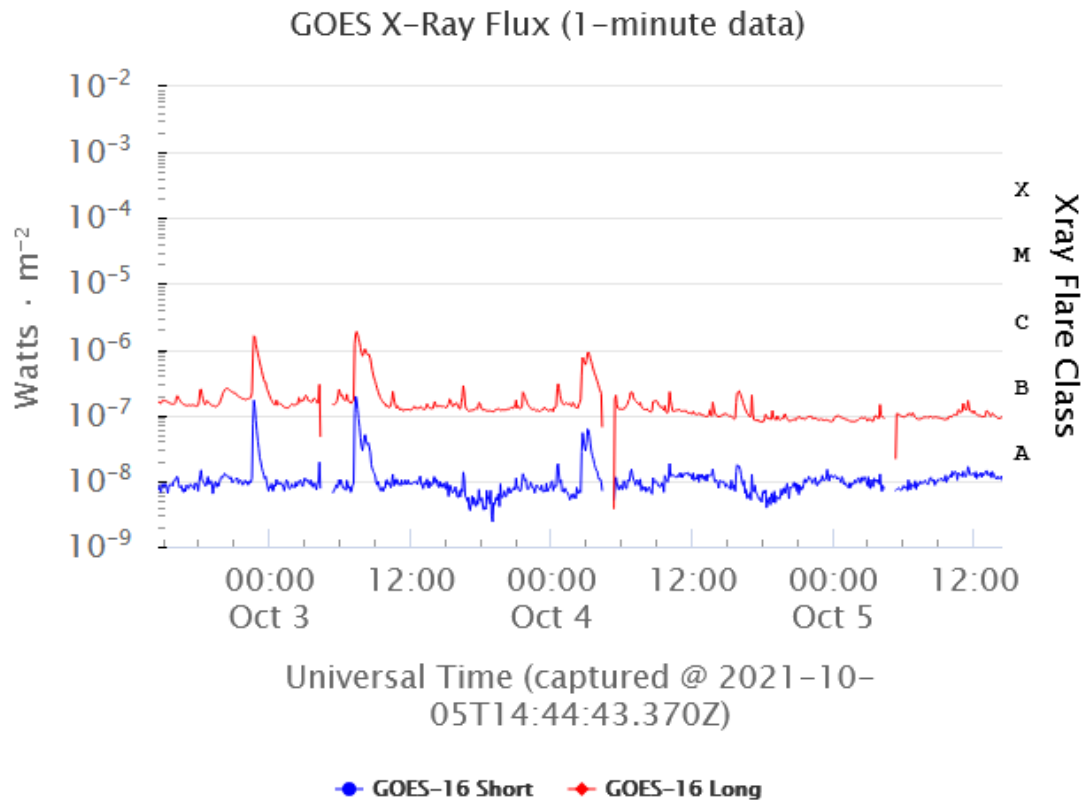


Solar Flare Classification – Intensity

(Why is This Important?)



Solar X-Ray Flux: 3 – 5 OCT 2021



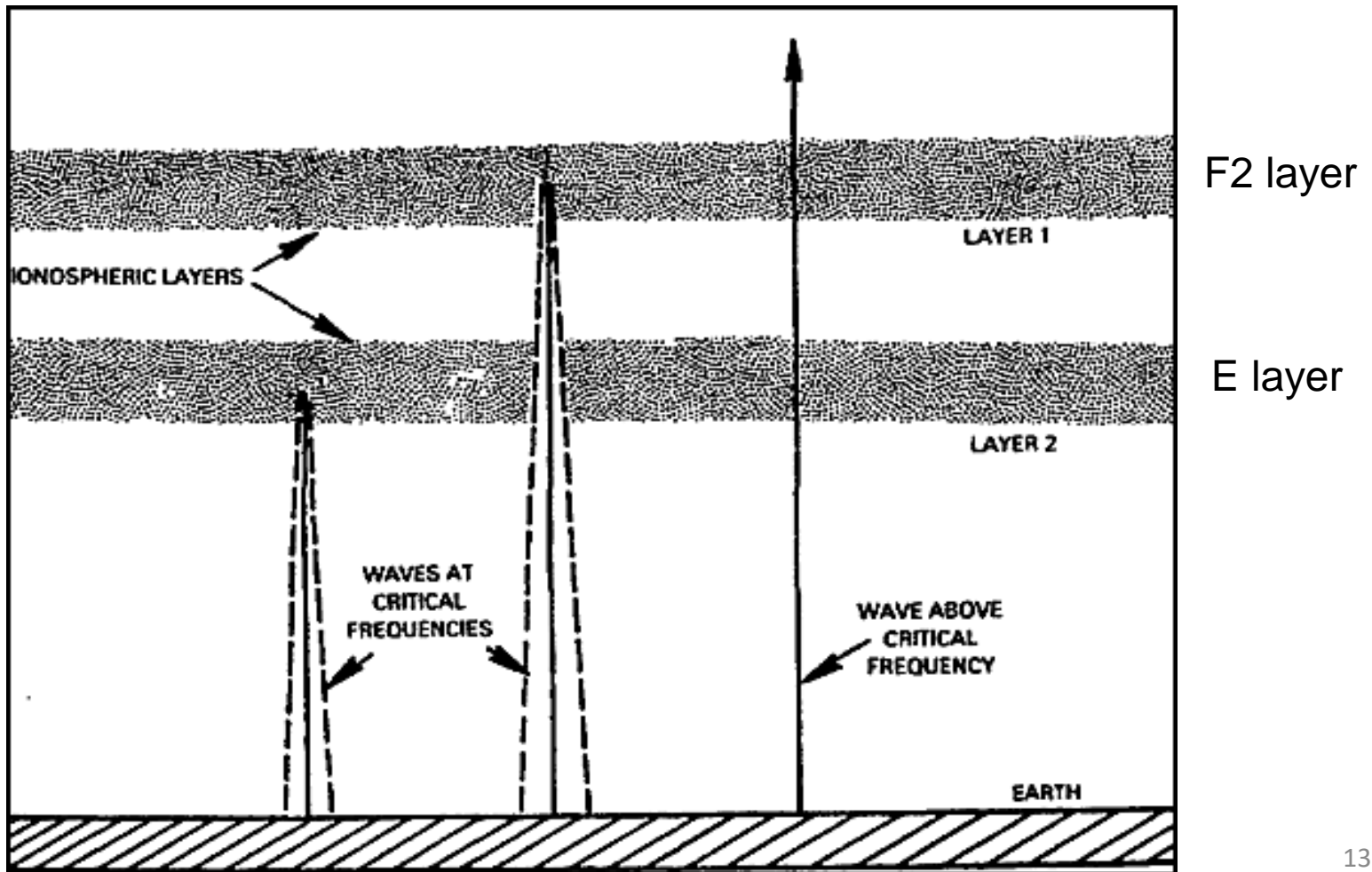
2021-10-05T14:44:43.370Z

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](#) 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

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

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

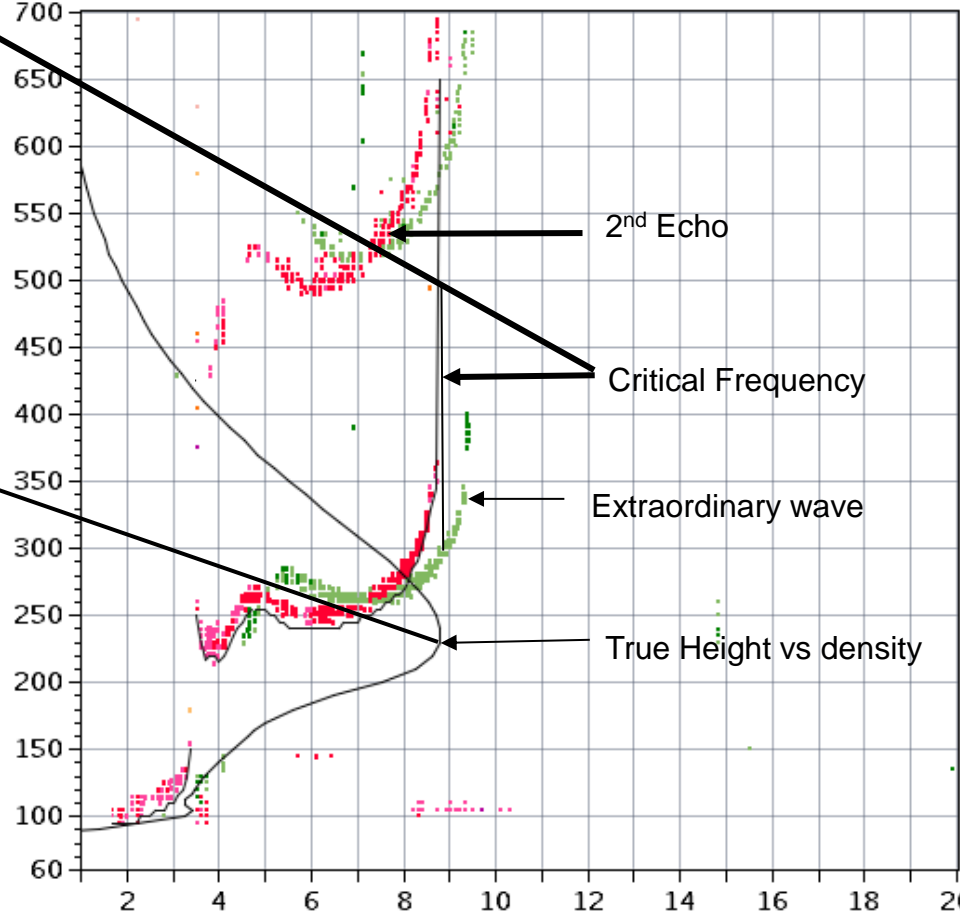


Ionogram Interpretation



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	



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

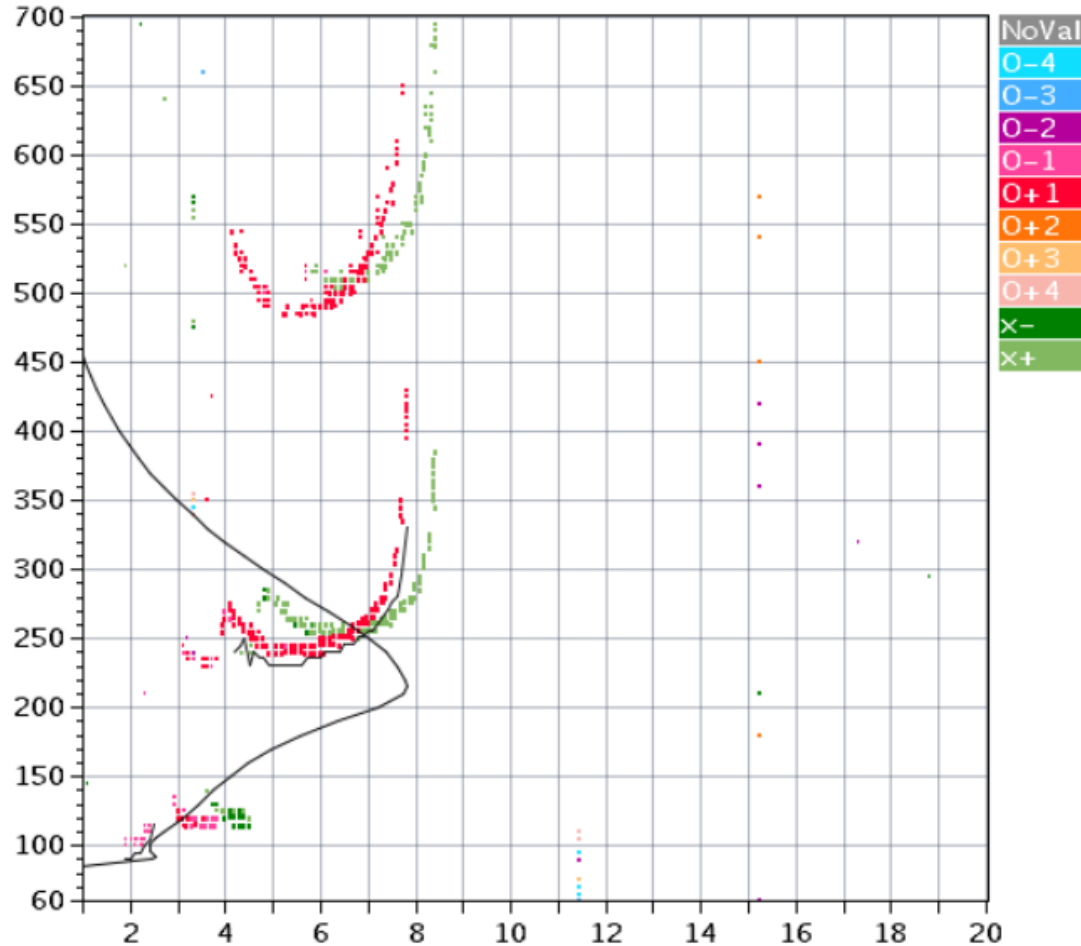
Austin Ionogram – 5 OCT 1450Z



Statio YYYY DAY DDD HMMSS P1 FFS S AXII PPS IGA PS
 Austin 2021 Oct05 278 145005 MMM 1 045 100 32+ A1

foF2	7.800
foF1	N/A
foF1p	4.00
foE	2.52
foEp	2.80
fxI	8.50
foEs	3.80
fmin	1.90
<hr/>	
MUF(D)	28.83
M(D)	3.70
D	3000.0
<hr/>	
h`F	231.0
h`F2	N/A
h`E	95.0
h`Es	109.0
<hr/>	
hmF2	215.5
hmF1	N/A
hmE	92.0
yF2	47.6
yF1	N/A
yE	9.0
B0	61.5
B1	1.36
<hr/>	
C-level	21

Auto:
 Artist4.5
 200311



D 100 200 400 600 800 1000 1500 3000 [km]
 MUF 8.4 8.5 9.0 9.7 10.8 12.4 17.0 28.8 [MHz]

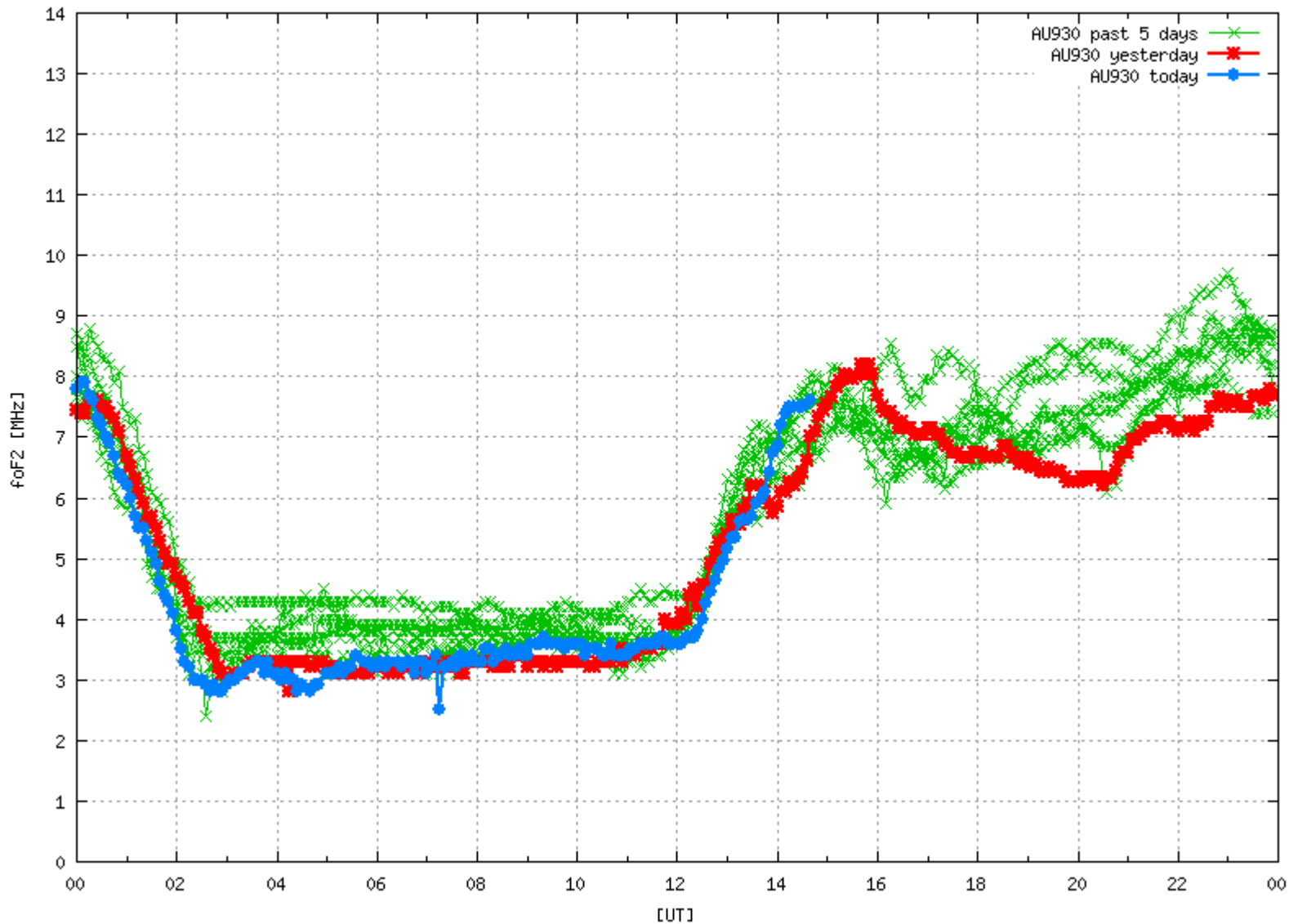
AU930_2021278145005.MMM / 190fx128h 100 kHz 5.0 km / DGS-256 AU930 130 / 30.4 N 262.3 E

IonCPng v. 1.3.11

foF2 Trend – Austin Ionosonde

foF2 plot for station AUSTIN (AU930) at 2021-10-05 14:45:02 UTC

NOAA National Geophysical Data Center



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.

Solar Weather Data

The screenshot shows the website for Region 6 Army MARS. The header includes the text "Region 6 Army MARS" and a navigation menu with items: Home, What is MARS?, Join, Contact Us, Solar Weather, and Login. A red arrow points from the word "Menu" to the navigation menu. Another red arrow points from the text "Solar Weather" to the "Solar Weather" menu item. Below the header, the main content area features the text "REGION 6 ARMY MARS" and "Military Auxiliary Radio System" over a background image of a radio tower. Below this is a section titled "WHO WE ARE" with a paragraph of text describing the MARS organization.

Solar Weather

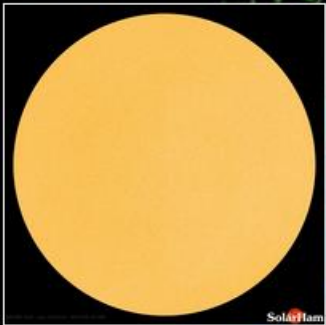
Other Solar Weather Links of Interest

All Ionosondes

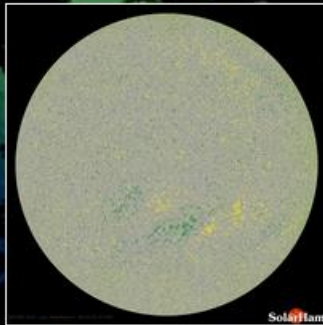
- • [DIDBase](#) - Select Station List then EGLIN then year/month/day/time for Ionosonde plot.
- [NOAA Solar Weather](#) - Solar Weather plots of Kp and X-Ray and other solar emissions.
- [Solen Solar Weather](#) - Good general solar forecast from an individual.
- [Solar Ham](#) - SolarHam provides real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

Space Weather for January 5, 2021

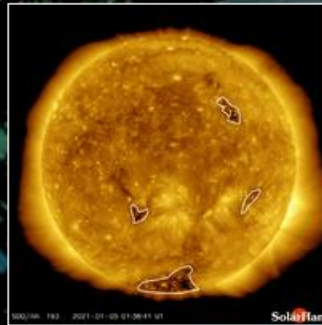
UTC Time 17:46:22 Tuesday



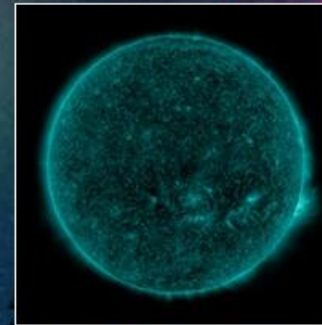
HMI Intensity
Analysis | Latest | Movie



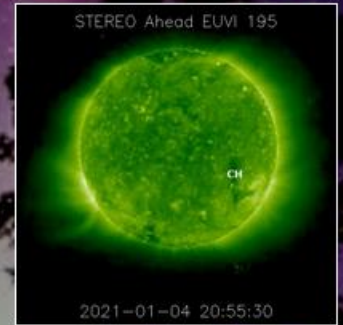
HMI Magnetogram
Latest | Movie



Coronal Holes
Analysis | Movie



AIA 131 (Latest)
Movie



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** — —

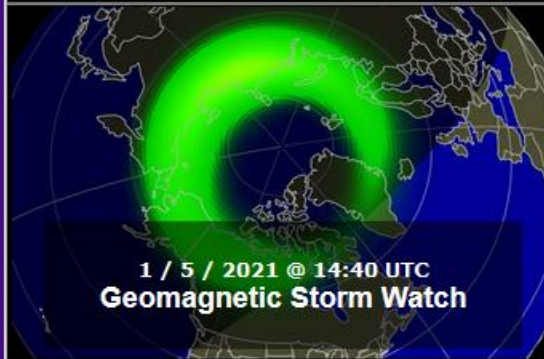
[WWV](#) | [Flux Data](#) | [Last 30 Days](#)

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](#)



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

Current Conditions

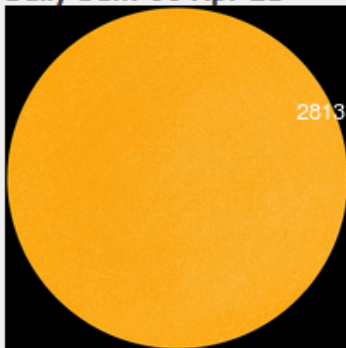
Solar wind

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

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