May 08-12 2024 Space Weather Event

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Solar Terrestrial Centre of Excellence
SIDC – ROB

Royal Observatory of Belgium

Solar Influences Data analysis Centre
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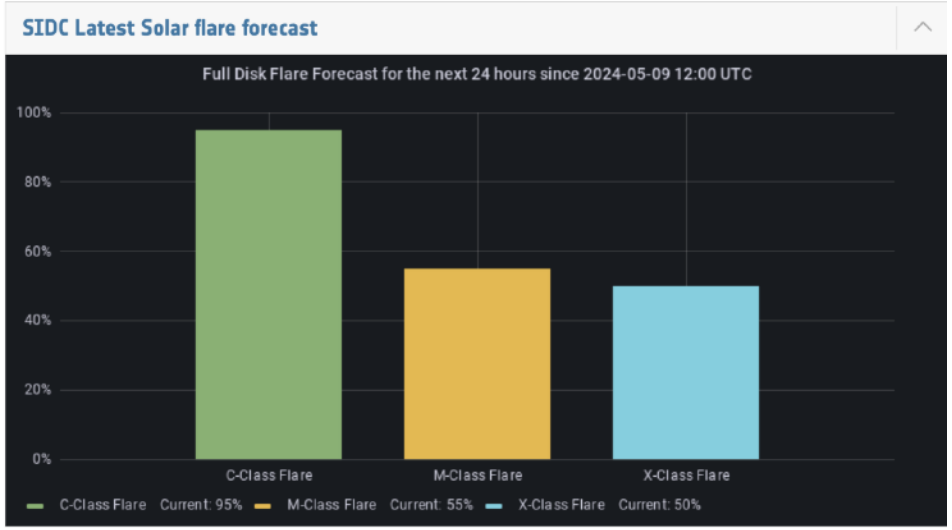
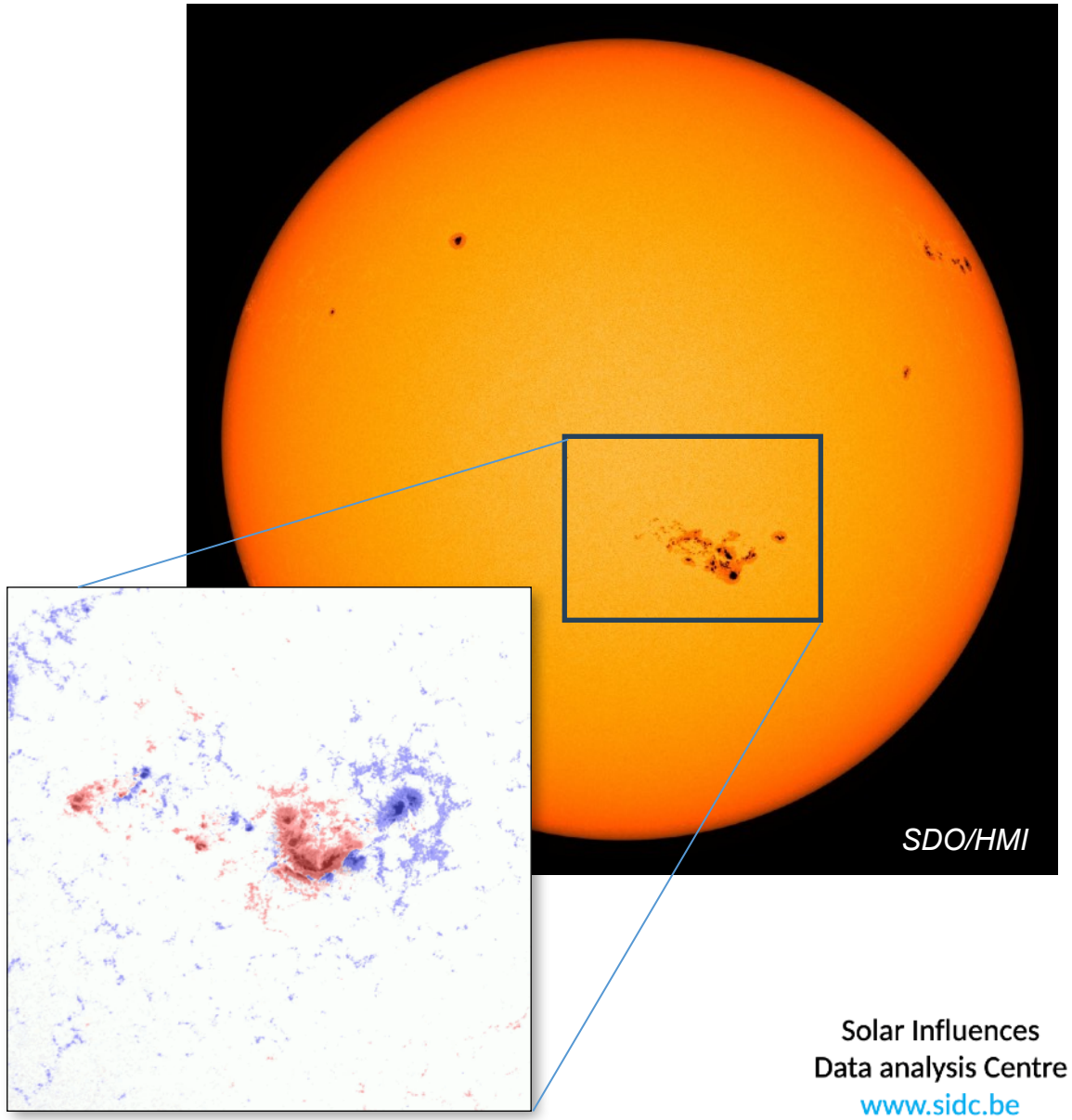
May 08-09 – Activity Increases

Increase in activity mainly due to NOAA AR 3664 – a complex region near the disk centre.

This region dramatically increased doubling in size and magnetic complexity since 6 May. Forecasted increasing probability for M-class and X-class flaring.

One of the largest sunspots so far this solar cycle and could easily be seen with the naked eye (using eclipse glasses).





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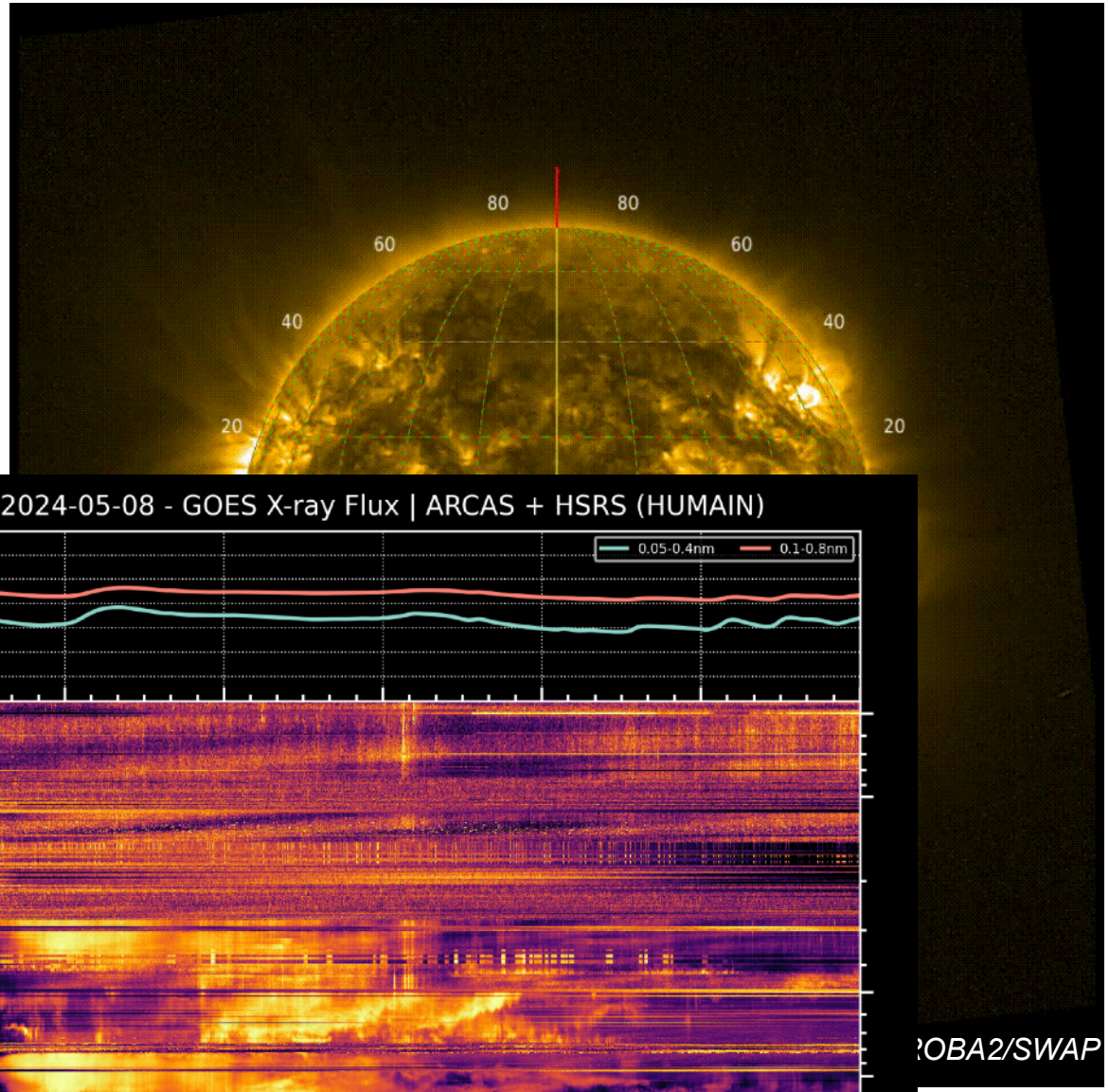
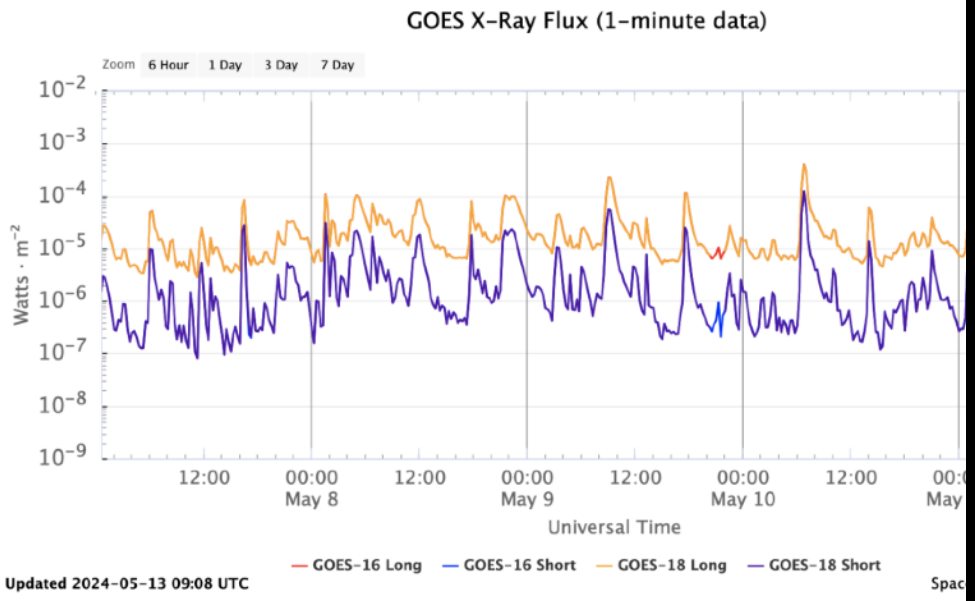
May 08-09

- This region produced multiple M and X-class flares with associated Coronal Mass Ejections (CMEs) on May 08 and 09.
- Radio bursts detected with events: prolonged disturbances at radio frequencies well after the X-class flares





ROBA2/SWAP

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May 08-09 – HF COM Impact

Official MOD HF-COM Advisories issued for each X-class flare by ACFJ

2024/87 HF COM (8.5.2024 01:48,)
2024/88 HF COM (8.5.2024 01:54)

2024/89 HF COM (8.5.2024 05:16)
2024/90 HF COM (8.5.2024 05:52)

2024/91 HF COM (8.5.2024 21:46)
2024/92 HF COM (8.5.2024 21:55)

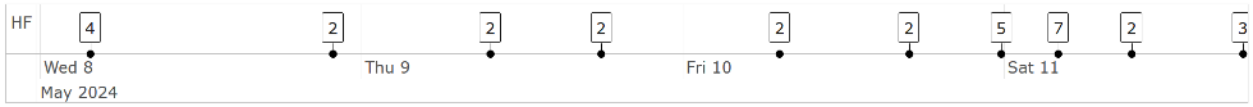
2024/93 HF COM (9.5.2024 09:06)
2024/94 HF COM (9.5.2024 10:06)

2024/95 HF COM (9.5.2024 17:44)
2024/96 HF COM (9.5.2024 18:03)

2024/93 HF COM (9.5.2024 09:06, YMMC)

Message

STATUS	
DTG	20240509/0906Z
SWXC	ACFJ
ADVISORY NR.	2024/93
SWX Effect	HF COM MOD
OBS SWX	09/0900Z DAYLIGHT SIDE
FCST SWX + 6 HR	09/1500Z NOT AVBL
FCST SWX + 12 HR	09/2100Z NOT AVBL
FCST SWX + 18 HR	10/0300Z NOT AVBL
FCST SWX + 24 HR	10/0900Z NOT AVBL
RMK	SWX EVENT (SOLAR FLARE) INPR IMPACTING LOWER HF COM FREQ BAND ON THE DAYLIGHT SIDE. FURTHER PERIODIC LOSS OF HF COM ON THE DAYSIDE EXPECTED. HIGHER FREQ MAY BE LESS IMPACTED.
NXT ADVISORY	WILL BE ISSUED BY 20240509/1505Z=

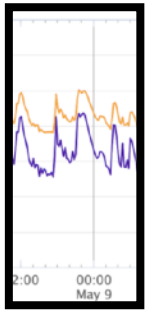


May 08-09 – HF COM Impact

Internal MOD HF-COM Advisories issued for each X-class flare by PECASUS

2024/103 HF COM (8.5.2024 01:48)
2024/104 HF COM (8.5.2024 02:30) - wait to flux to drop below M5

2024/105 HF COM (8.5.2024 05:12)
2024/106 HF COM (8.5.2024 09:38)



2024/107 HF COM (8.5.2024 21:48)
2024/108 HF COM (8.5.2024 23:37) - double-peaked flare, waiting for flux to sufficiently decrease

2024/109 HF COM (9.5.2024 09:00)
2024/110 HF COM (9.5.2024 10:01)

2024/111 HF COM (9.5.2024 17:50)
2024/112 HF COM (9.5.2024 18:23)

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SWX ADVISORY


DTG:              20240508/0542Z
SWXC:             PECASUS
ADVISORY NR:      2024/103
SWX EFFECT:       HF COM MOD
OBS SWX:          08/0148Z DAYLIGHT SIDE
FCST SWX +6 HR:   08/0800Z NOT AVBL
FCST SWX +12 HR:  08/1400Z NOT AVBL
FCST SWX +18 HR:  08/2000Z NOT AVBL
FCST SWX +24 HR:  09/0200Z NOT AVBL
RMK:              SPACE WEATHER EVENT (SOLAR FLARE) IN
                  PROGRESS. IMPACT ON LOWER HF COM
                  FREQUENCY BANDS EXPECTED ON THE DAYLIGHT
                  SIDE. HIGHER FREQUENCY BANDS MAY BE LESS
                  IMPACTED.
NXT ADVISORY:     WILL BE ISSUED BY 20240508/1137Z=
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SWX ADVISORY


DTG:              20240508/2149Z
SWXC:             PECASUS
ADVISORY NR:      2024/107
SWX EFFECT:       HF COM MOD
OBS SWX:          08/2148Z DAYLIGHT SIDE
FCST SWX +6 HR:   09/0400Z NOT AVBL
FCST SWX +12 HR:  09/1000Z NOT AVBL
FCST SWX +18 HR:  09/1600Z NOT AVBL
FCST SWX +24 HR:  09/2200Z NOT AVBL
RMK:              SPACE WEATHER EVENT (SOLAR FLARE) IN
                  PROGRESS. IMPACT ON LOWER HF COM
                  FREQUENCY BANDS EXPECTED ON THE DAYLIGHT
                  SIDE. HIGHER FREQUENCY BANDS MAY BE LESS
                  IMPACTED.
NXT ADVISORY:     WILL BE ISSUED BY 20240509/0348Z=
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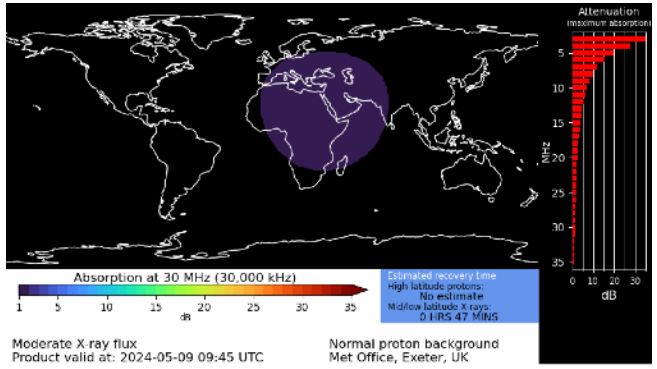

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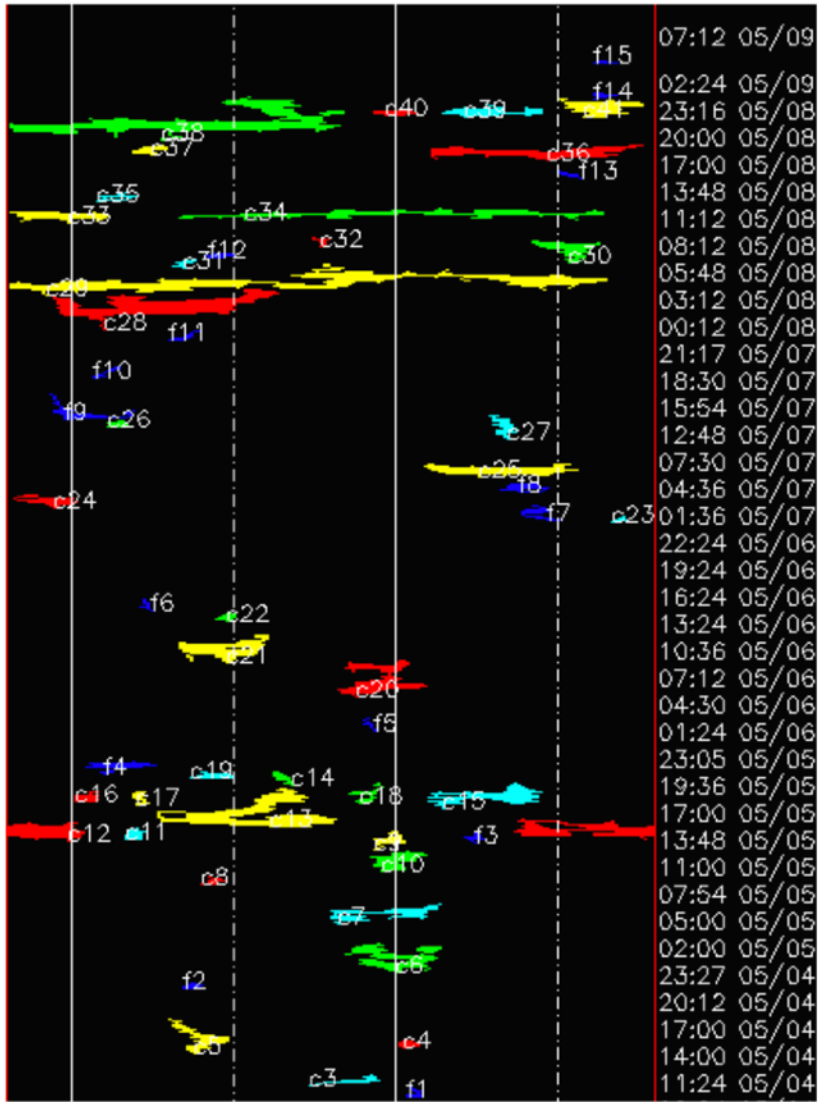
May 08-09 CME detections

# CME	t0	dt0	pa	da	v	dv	minv	maxv	halo?
0041	2024/05/09 00:12	02	114	046	0388	0340	0213	1179	
0040	2024/05/09 00:00	00	000	022	1493	0766	0325	1896	
0039	2024/05/09 00:00	01	054	054	1715	0908	0190	1952	
0038	2024/05/08 21:28	05	239	184	0552	0134	0276	0833	III
0037	2024/05/08 19:24	01	224	018	0481	0063	0385	0589	
0036	2024/05/08 19:24	02	079	116	0440	0050	0335	0568	II
0035	2024/05/08 14:36	01	206	022	0236	0005	0234	0245	
0034	2024/05/08 12:48	01	358	234	0446	0136	0204	0822	III
0033	2024/05/08 12:12	01	174	054	0473	0120	0285	0762	
0032	2024/05/08 07:00	01	319	008	0219	0034	0164	0229	
0031	2024/05/08 06:48	01	243	012	0303	0040	0252	0365	
0030	2024/05/08 06:00	02	095	036	0339	0067	0242	0416	
0029	2024/05/08 05:12	03	312	330	0443	0095	0236	0710	IV
0028	2024/05/08 03:24	04	233	124	0262	0075	0190	0473	II
0027	2024/05/07 14:24	03	060	014	0225	0290	0114	0771	
0026	2024/05/07 13:36	01	206	010	0174	0053	0117	0246	
0025	2024/05/07 07:36	01	059	084	0322	0087	0238	0606	
0024	2024/05/07 03:36	01	166	034	0347	0080	0194	0381	
0023	2024/05/07 02:00	01	125	008	0822	0006	0822	0833	
0022	2024/05/06 14:48	01	266	010	0139	0006	0127	0140	
0021	2024/05/06 12:48	03	265	048	0138	0046	0103	0252	
0020	2024/05/06 07:00	04	353	048	0420	0082	0328	0612	
0019	2024/05/05 22:00	01	258	022	0319	0132	0152	0615	
0018	2024/05/05 20:00	02	344	018	1554	0599	0249	1700	
0017	2024/05/05 20:00	01	219	008	1349	0223	1096	1562	
0016	2024/05/05 19:12	01	189	012	1764	0683	0297	1953	
0015	2024/05/05 19:12	03	050	062	0365	0686	0142	1953	
0014	2024/05/05 17:12	02	298	010	0393	0098	0196	0481	
0013	2024/05/05 17:00	04	278	098	0480	0121	0238	0694	II
0012	2024/05/05 15:36	03	127	120	0325	0100	0103	0529	II
0011	2024/05/05 15:24	01	216	010	0374	0107	0178	0440	
0010	2024/05/05 13:12	02	002	030	0348	0094	0140	0496	
0009	2024/05/05 12:48	02	357	016	0203	0024	0182	0244	
0008	2024/05/05 10:24	01	259	012	0221	0023	0195	0246	
0007	2024/05/05 06:48	02	355	060	0332	0119	0178	0624	
0006	2024/05/05 01:24	03	359	052	0408	0057	0267	0452	
0005	2024/05/04 16:24	04	251	032	0248	0022	0202	0282	
0004	2024/05/04 14:12	01	008	010	0474	0046	0381	0512	



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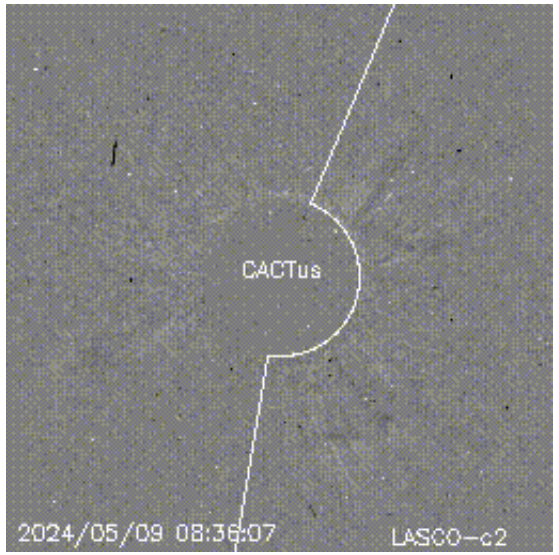
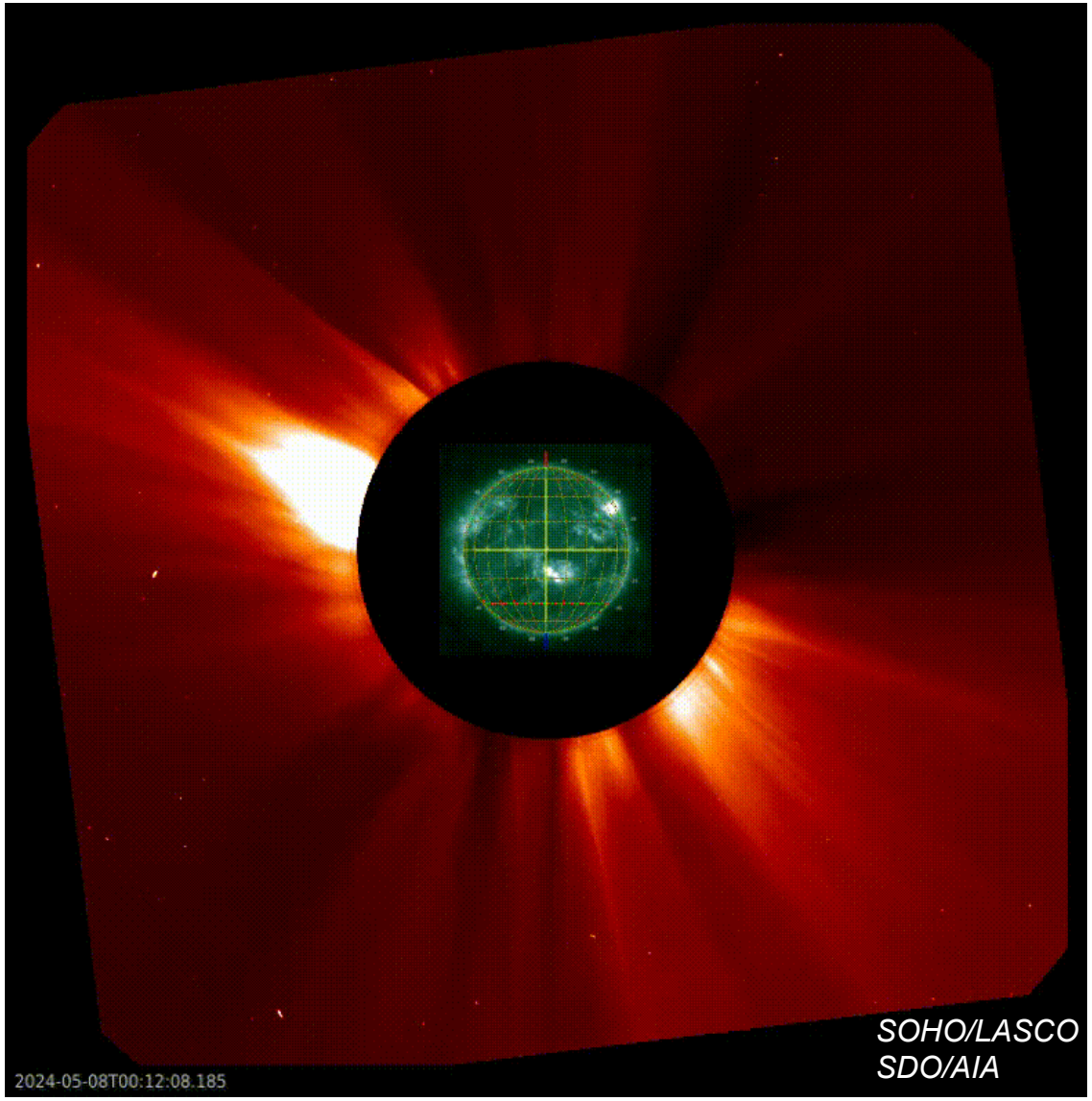
May 08-09

Multiple CMEs associated with the flares were predicted to have an Earth directed component.

An eruption associated with an **X2.2** flare early on May 09 was the fastest (over 1500 km/s) and models predicted that it would catch the first eruptions for a combined arrival late on May 10.



SIDC, Computer Aided CME tracking

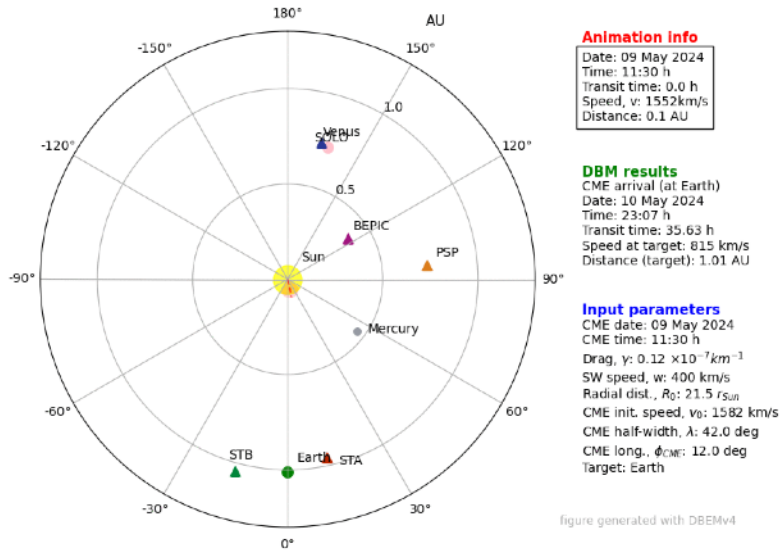


May 08-09 – Forecasted CME Arrivals

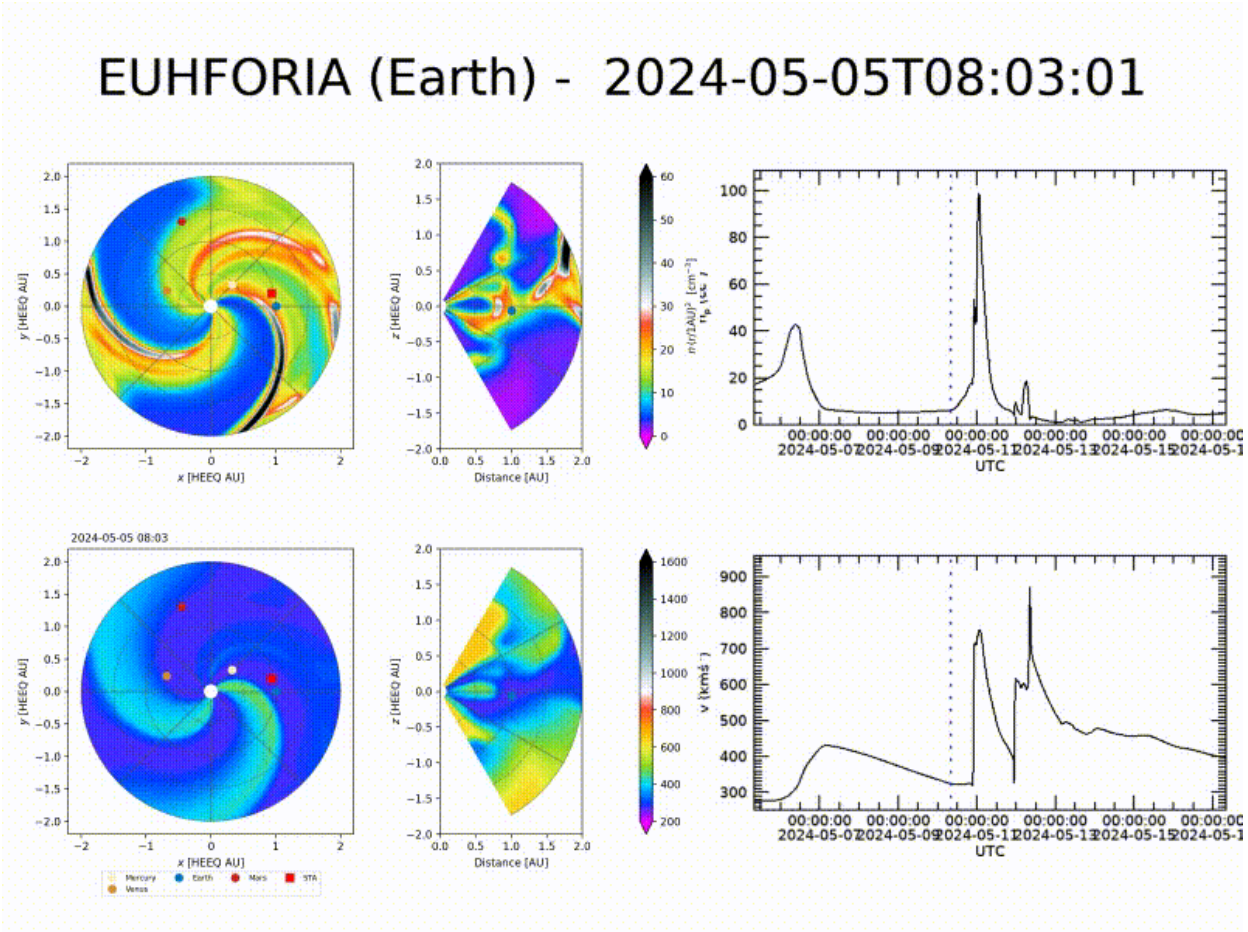
A strong geomagnetic event was anticipated at Earth

G2-G3/Moderate to Strong (Kp6-7) levels predicted as likely

Also predicted that it was possible to reach **G4**/Severe (Kp8).



RAL Space, The ESA Space Safety Programme.



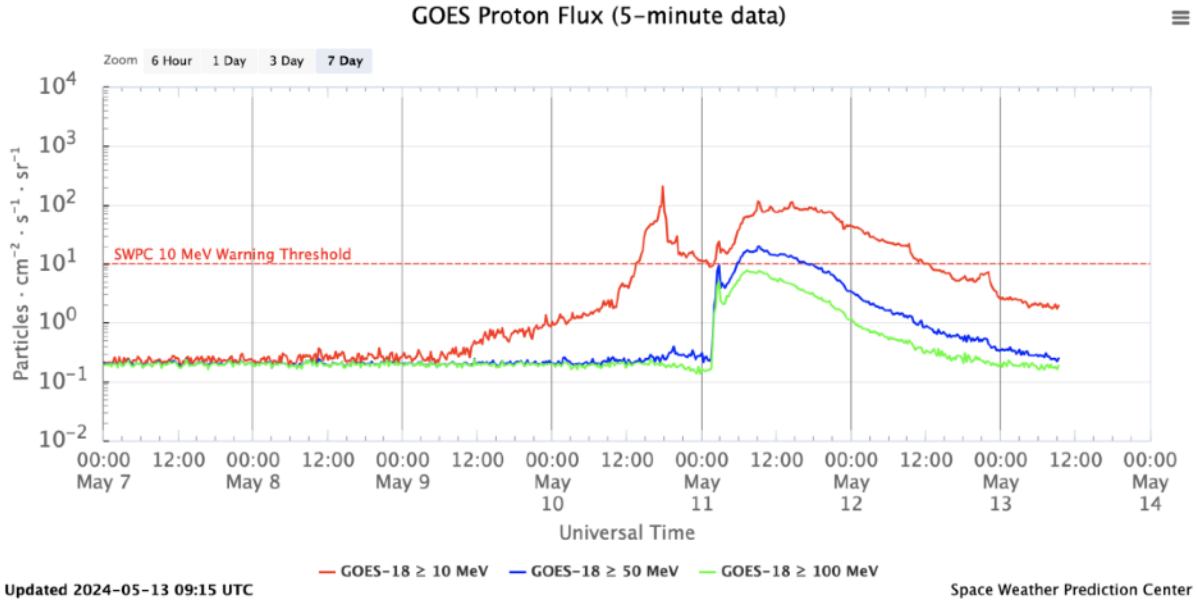
KU Leuven, RAL Space, UK Met Office and The ESA Space Safety Programme.

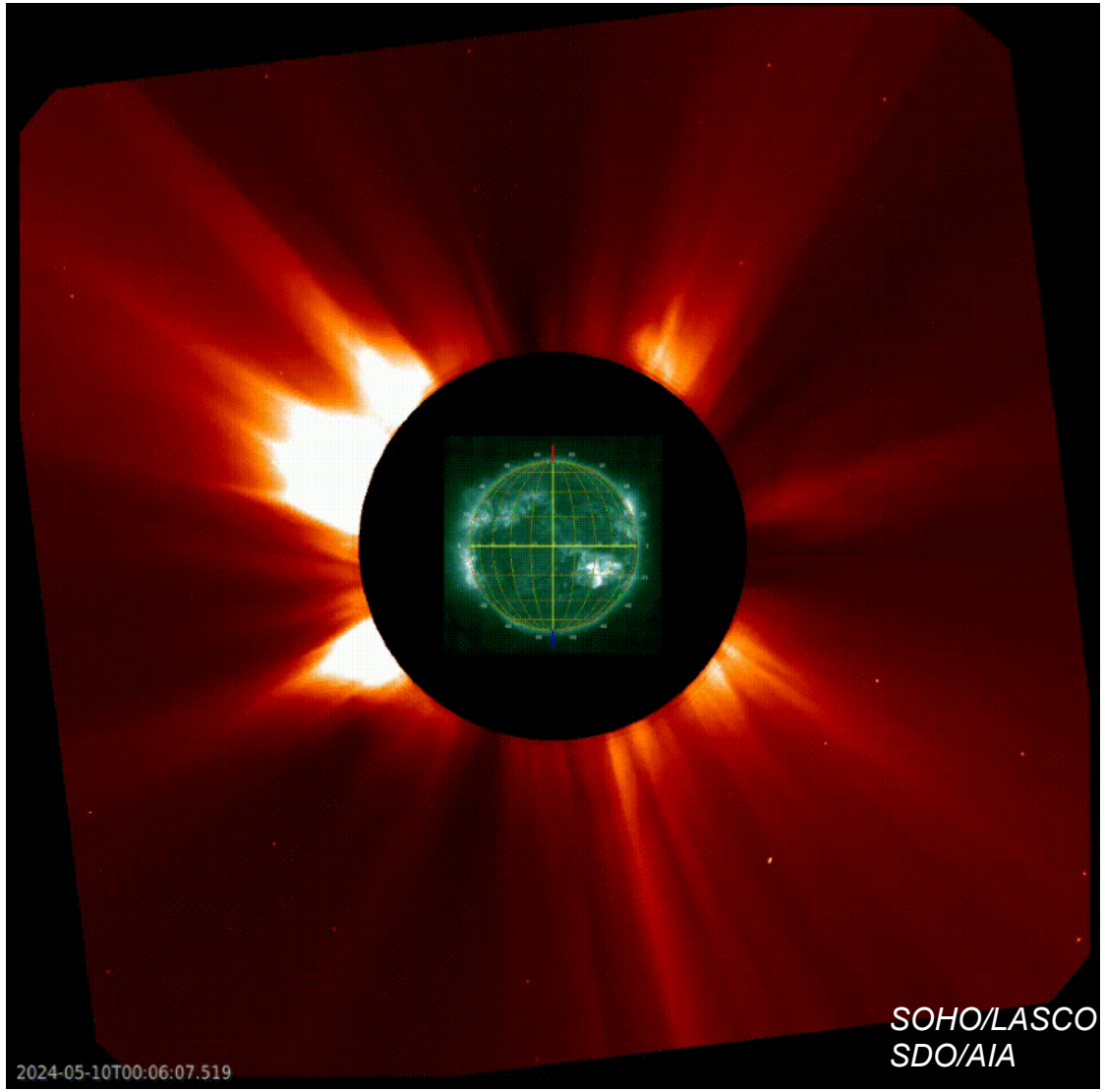
May 10-12 – HF COM

- NOAA AR 3664 Region continued to produce multiple X-class flares and associated eruptions:
- **X3.9, X5.8, X1.5, X1.0**

- MOD HF advisories issued for each X-class flare (Daylight side).

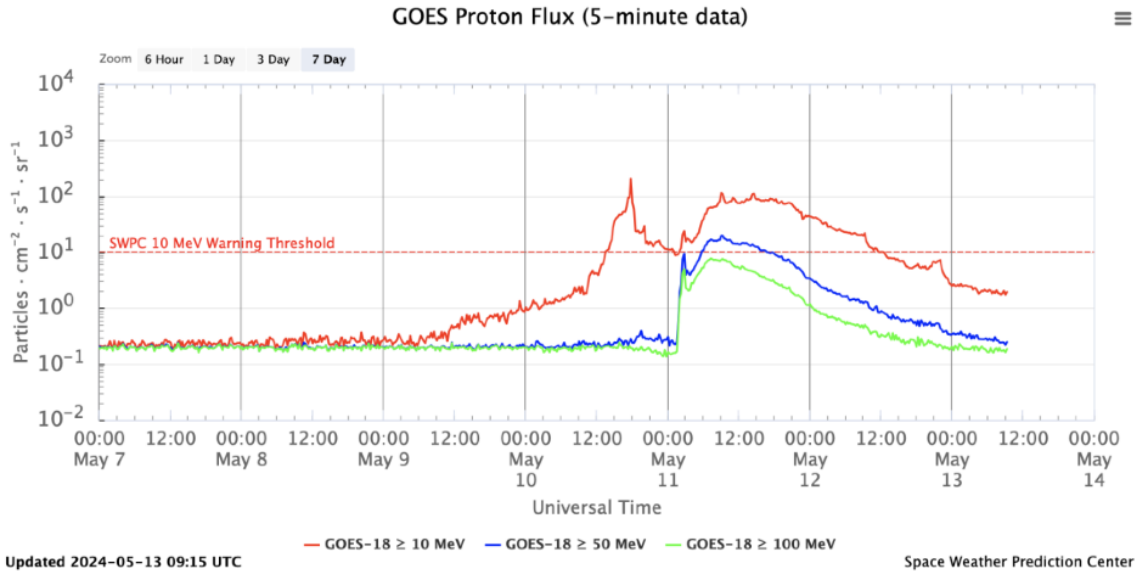
- This flaring activity also resulted in **proton flux increase**.

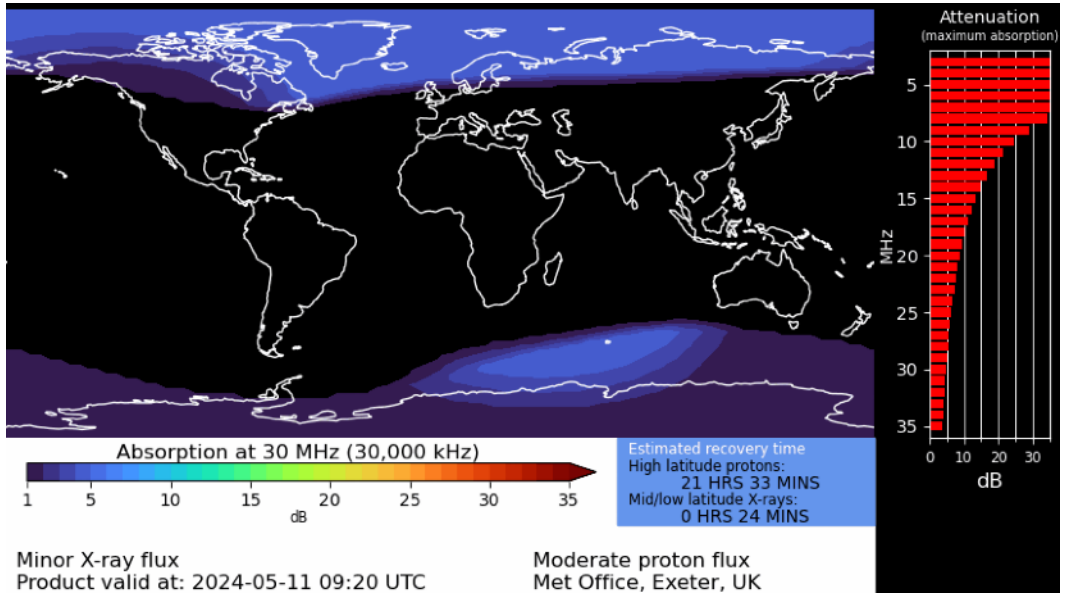




May 10-12 – HF COM

- Increased proton flux also caused **Polar Cap Absorption** – SEV HF Advisories for Polar regions issued by ACFJ at 17:55 UTC on June 10th





2024/100 HF COM (10.5.2024 15:45, YMMC)

Message

STATUS	
DTG	20240510/1545Z
SWXC	ACFJ
ADVISORY NR.	2024/100
SWX Effect	HF COM MOD
OBS SWX	10/1515Z HNH HS
FCST SWX + 6 HR	10/2200Z HNH HS
FCST SWX + 12 HR	11/0400Z HNH HS
FCST SWX + 18 HR	11/1000Z HNH HS
FCST SWX + 24 HR	11/1600Z HNH HS
RMK	SWX EVENT (HF IMPACTING LOW LATITUDES. STR DAYSIDE.
NXT ADVISORY	WILL BE ISSUED

2024/101 HF COM (10.5.2024 18:02, YMMC)

Message

STATUS	
DTG	20240510/1802Z
SWXC	ACFJ
ADVISORY NR.	2024/101
NR. RPLC	2024/100
SWX Effect	HF COM SEV
OBS SWX	10/1755Z HNH HSH W180 - E180
FCST SWX + 6 HR	11/0000Z HNH HSH W180 - E180
FCST SWX + 12 HR	11/0600Z HNH HSH W180 - E180
FCST SWX + 18 HR	11/1200Z HNH HSH W180 - E180
FCST SWX + 24 HR	11/1800Z HNH HSH W180 - E180
RMK	EVENT UPDATE. SWX EVENT (HF COM ABSORPTION) INPR IMPACTING LOWER HF COM FREQ BAND AT HIGH LATITUDES. STRONGEST EFFECTS ON THE DAYSIDE.
NXT ADVISORY	WILL BE ISSUED BY 20240510/2335Z=

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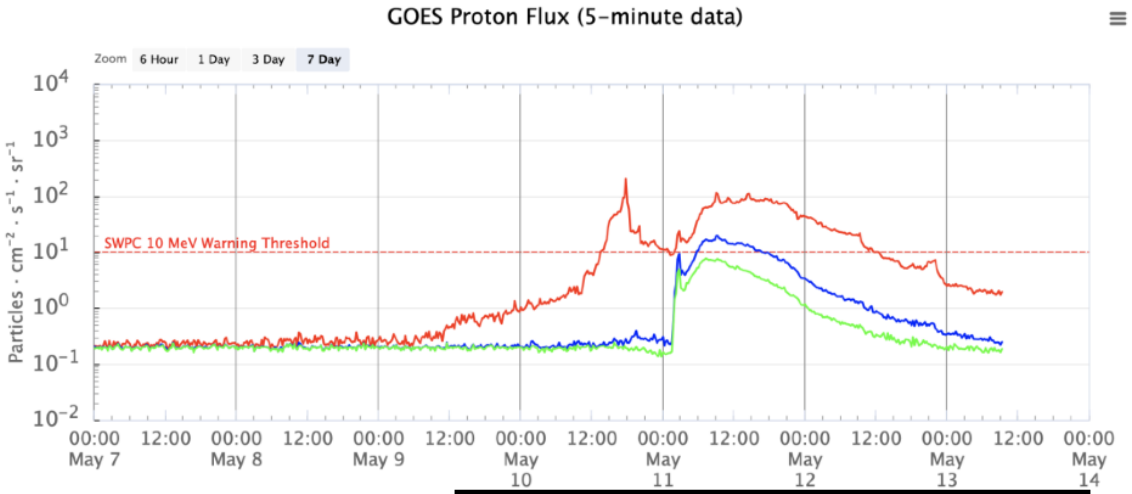
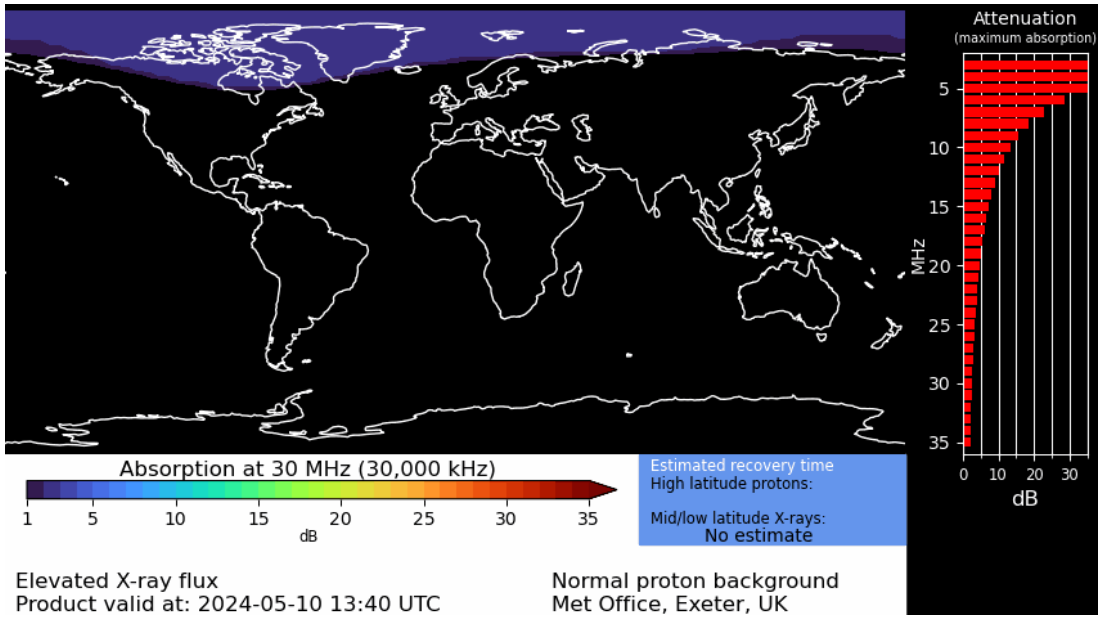
May 10-12 – HF COM

- Increased proton flux also caused **Polar Cap Absorption** – SEV HF COM for Polar regions observed at 15:20 UTC by DRAP models on June 10th





Updated 2024-05-13 09:15 UTC

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SWX ADVISORY

DTG:              20240510/1342Z
SWXC:             PECASUS
ADVISORY NR:      2024/115
SWX EFFECT:       HF COM MOD
OBS SWX:          10/1341Z HNH HSH W180 - E180
FCST SWX +6 HR:   10/2000Z HNH HSH W180 - E180
FCST SWX +12 HR:  11/0200Z HNH HSH W180 - E180
FCST SWX +18 HR:  11/0800Z HNH HSH W180 - E180
FCST SWX +24 HR:  11/1400Z HNH HSH W180 - E180
RMK:              SPACE WEATHER EVENT (HF COM POLAR CAP
                  ABSORPTION) IN PROGRESS. IMPACT ON LOWER
                  HF COM FREQUENCY BANDS EXPECTED AT HIGH
                  LATITUDES. STRONGER IMPACT ON THE
                  NORTHERN POLE.
NXT ADVISORY:     WILL BE ISSUED BY 20240510/1941Z=
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SWX ADVISORY

DTG:              20240510/1608Z
SWXC:             PECASUS
ADVISORY NR:      2024/116
NR RPLC:          2024/115
SWX EFFECT:       HF COM SEV
OBS SWX:          10/1520Z HNH HSH W180 - E180
FCST SWX +6 HR:   10/2200Z HNH HSH W180 - E180
FCST SWX +12 HR:  11/0400Z HNH HSH W180 - E180
FCST SWX +18 HR:  11/1000Z HNH HSH W180 - E180
FCST SWX +24 HR:  11/1600Z HNH HSH W180 - E180
RMK:              SPACE WEATHER EVENT (HF COM POLAR CAP
                  ABSORPTION) IN PROGRESS. IMPACT ON LOWER
                  HF COM FREQUENCY BANDS EXPECTED AT HIGH
                  LATITUDES. STRONGER IMPACT ON THE
                  NORTHERN POLE.
NXT ADVISORY:     WILL BE ISSUED BY 20240510/2120Z=
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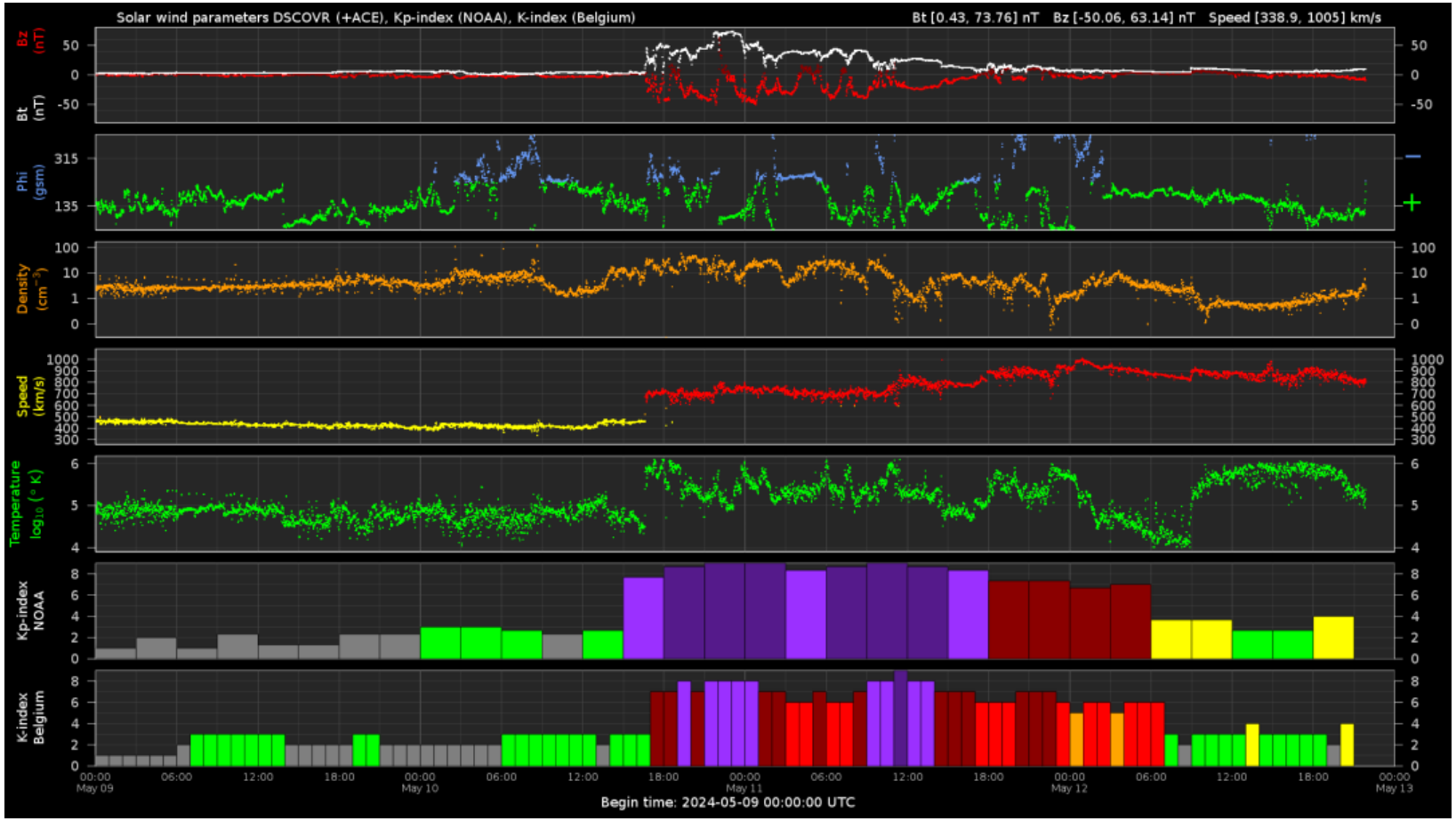
May 10-12: Geomagnetic Storm

- A shock was detected in the solar wind data around 16:42 UTC on May 10 indicating arrival of the CME(s).
- Extreme values of the magnetic field and strong solar wind speed.
- **G5 Extreme Levels** (Kp 9) reached on May 10 and May 11.
- **Strongest Geomagnetic storm recorded since 2003.**
- The solar wind remained enhanced over May 11, magnetic field decreasing slowly, producing a sustained geomagnetic storm.



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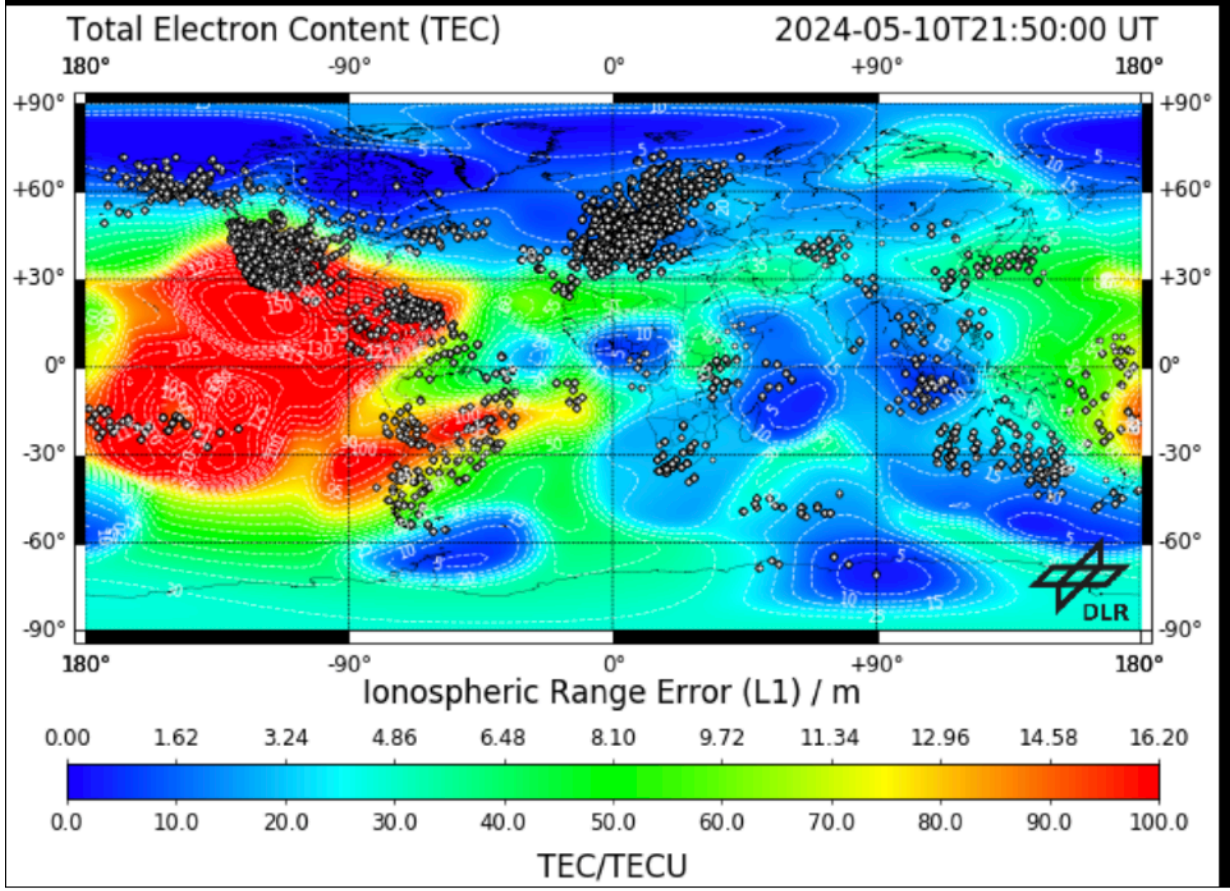
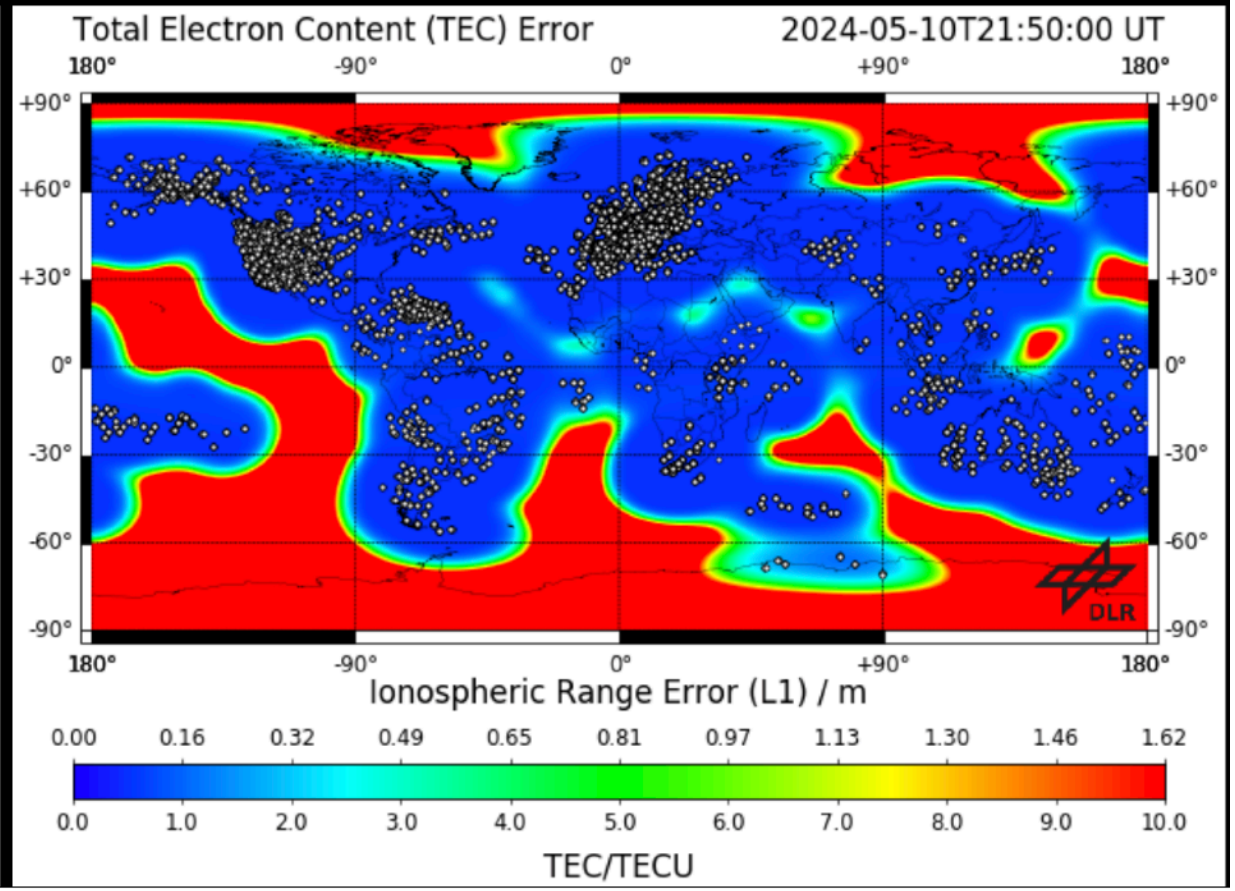
May 10-12 – GNSS, disturbed VTEC

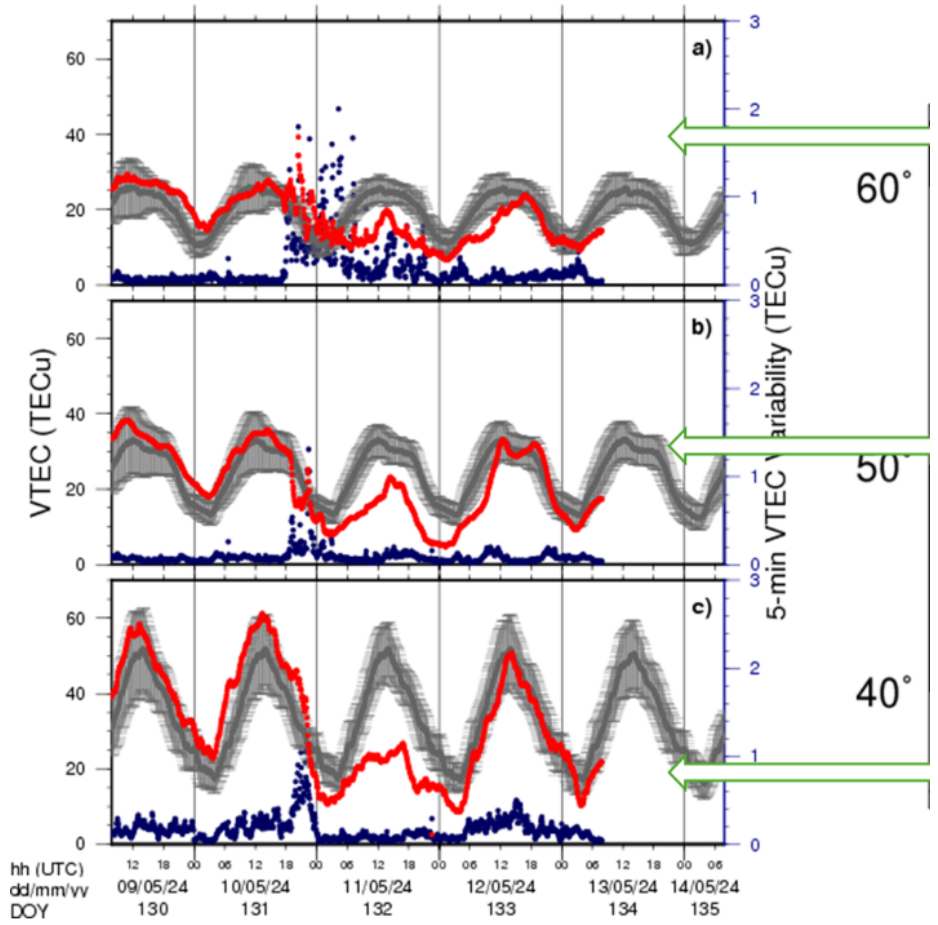
GNSS/Vertical TEC Map Nowcast - DLR

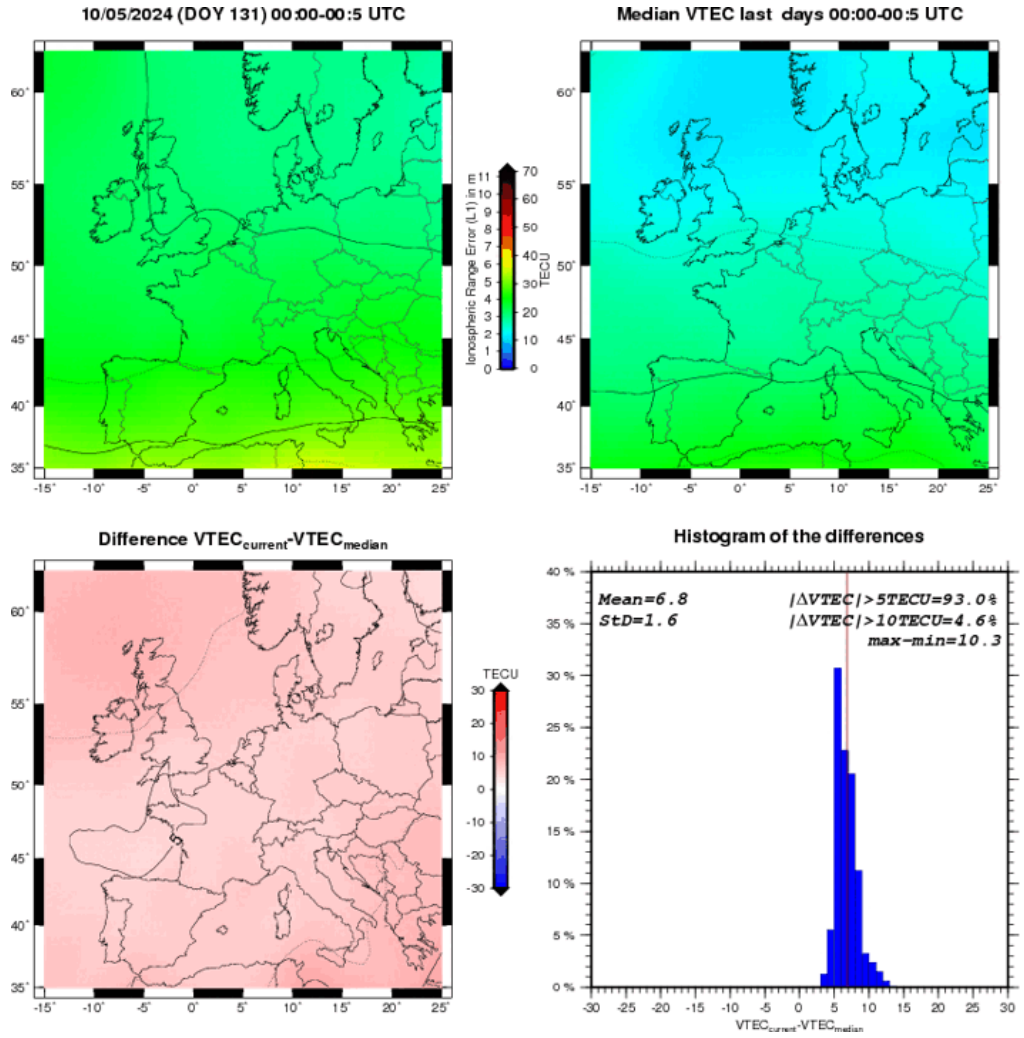


GNSS/Vertical TEC Error Map - DLR



May 10-12 – more on GNSS over Europe





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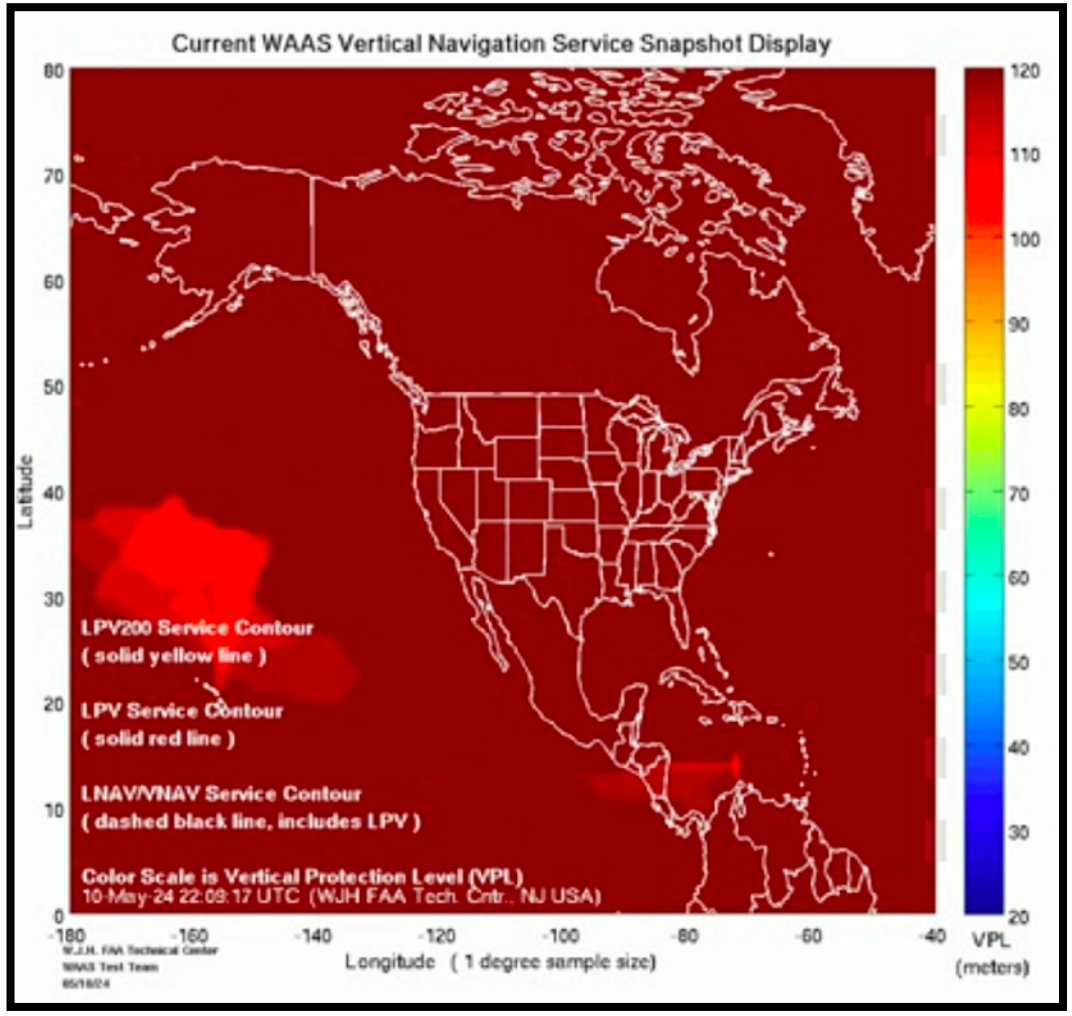
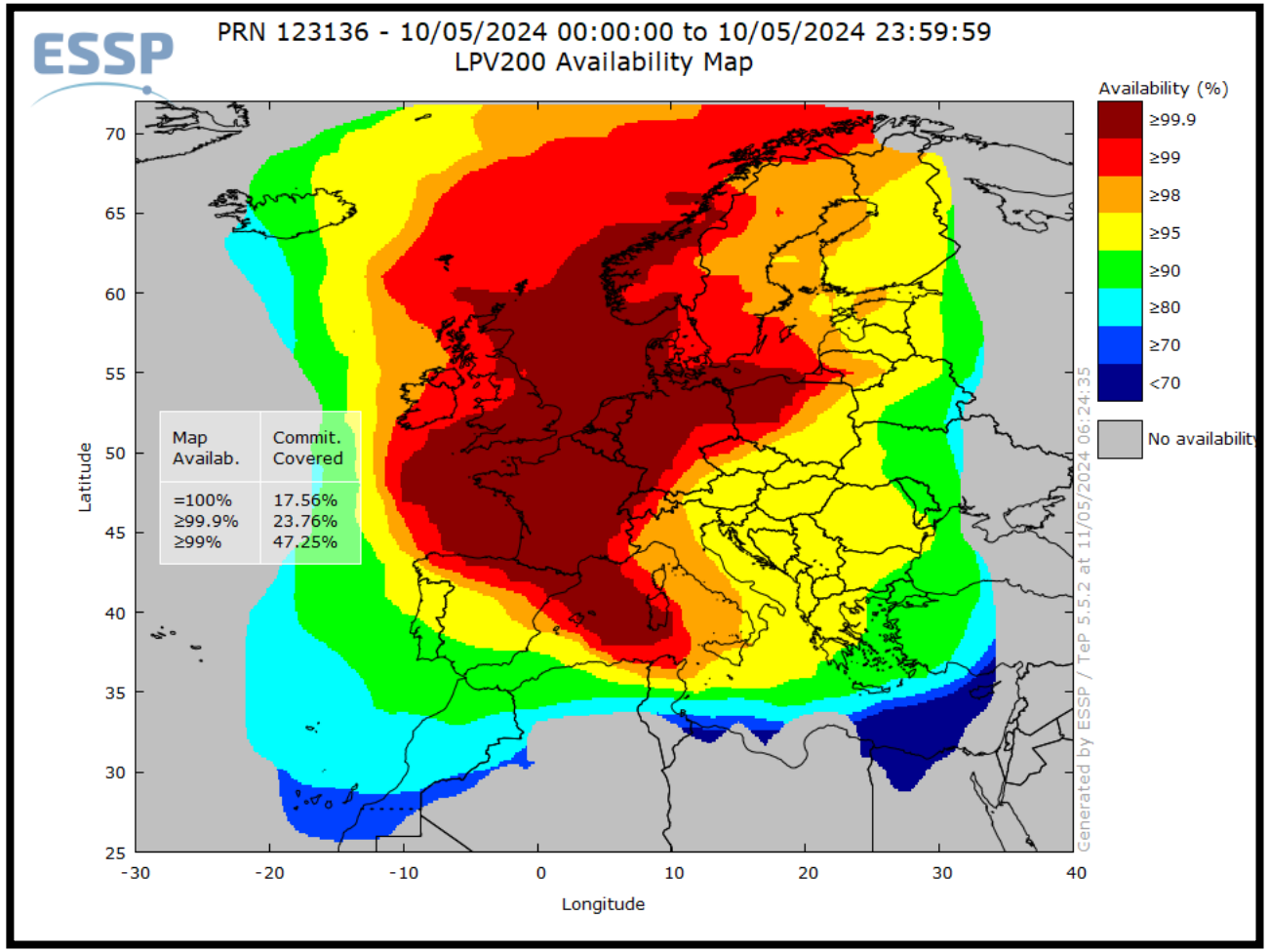
May 10-11 – WAAS and ESSP impacted





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May 10-12 – GNSS Internal Advisories

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0000051301
FNXX01 LFPW 101836
SWX ADVISORY
DTG: 20240510/1833Z
SWXC: ACFJ
ADVISORY NR: 2024/199
SWX EFFECT: GNSS MOD
OBS SWX: 10/1815Z HNH HSH W180 - E180
FCST SWX +6 HR: 11/0100Z NOT AVBL
FCST SWX +12 HR: 11/0700Z NOT AVBL
FCST SWX +18 HR: 11/1300Z NOT AVBL
FCST SWX +24 HR: 11/1900Z NOT AVBL
RMK: SWX EVENT (SCINTILLATION) INPR POSSIBLY IMPACTING
GNSS PER. COULD LEAD TO DEGRADATION OF TIMING AND
POSITIONING PER. INTST GENERALLY STRONGER ON THE NIGHTSIDE.
NXT ADVISORY: WILL BE ISSUED BY 20240511/0033Z=
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SWX ADVISORY


DTG:                20240510/1855Z
SWXC:               PECASUS
ADVISORY NR:        2024/368
SWX EFFECT:         GNSS SEV
OBS SWX:            10/1855Z EQN EQS E030 - E060
FCST SWX +6 HR:     11/0100Z NOT AVBL
FCST SWX +12 HR:    11/0700Z NOT AVBL
FCST SWX +18 HR:    11/1300Z NOT AVBL
FCST SWX +24 HR:    11/1900Z NOT AVBL
RMK:                SPACE WEATHER EVENT (IONOSPHERIC
                    DISTURBANCE) IN PROGRESS. IMPACT ON GNSS
                    PERFORMANCE POSSIBLY LEADING TO LOSS OF
                    GNSS SIGNALS AND/OR DEGRADATION OF
                    TIMING AND POSITIONING PERFORMANCE.
NXT ADVISORY:       WILL BE ISSUED BY 20240511/0055Z=
```

May 10-12 – GNSS Internal Advisories

```
0000056701
FNXX01 LFPW 102134
SWX ADVISORY
DTG: 20240510/2129Z
SWXC: ACFJ
ADVISORY NR: 2024/200
SWX EFFECT: GNSS MOD
OBS SWX: 10/2115Z EQN EQS W120 - W060
FCST SWX +6 HR: 11/0400Z NOT AVBL
FCST SWX +12 HR: 11/1000Z NOT AVBL
FCST SWX +18 HR: 11/1600Z NOT AVBL
FCST SWX +24 HR: 11/2200Z NOT AVBL
RMK: SWX EVENT (IONOSPHERIC DISTURBANCE) INPR POSSIBLY
IMPACTING GNSS PER. COULD LEAD TO DEGRADATION OF TIMING
AND POSITIONING PER. INTST MAY VARY ACROSS THE REGION AND
WITH TIME BUT GENERALLY STRONGER ON THE DAYSIDE.
NXT ADVISORY: WILL BE ISSUED BY 20240511/0029Z=
```

```
SWX ADVISORY


DTG:              20240510/2135Z
SWXC:             PECASUS
ADVISORY NR:      2024/369
SWX EFFECT:       GNSS MOD
OBS SWX:          10/2133Z EQN EQS W150 - W060
FCST SWX +6 HR:   11/0400Z NOT AVBL
FCST SWX +12 HR:  11/1000Z NOT AVBL
FCST SWX +18 HR:  11/1600Z NOT AVBL
FCST SWX +24 HR:  11/2200Z NOT AVBL
RMK:              SPACE WEATHER EVENT (IONOSPHERIC
                  DISTURBANCE) IN PROGRESS. IMPACT ON GNSS
                  PERFORMANCE POSSIBLY LEADING TO LOSS OF
                  GNSS SIGNALS AND/OR DEGRADATION OF
                  TIMING AND POSITIONING PERFORMANCE.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/0333Z=
```

May 10-12 – GNSS Internal Advisories

```
SWX ADVISORY


DTG:              20240511/0930Z
SWXC:             PECASUS
ADVISORY NR:      2024/371
NR RPLC:          2024/369
SWX EFFECT:       GNSS MOD
OBS SWX:          11/0325Z HNH MNH E015 - E045
FCST SWX +6 HR:   11/1000Z NOT AVBL
FCST SWX +12 HR:  11/1600Z NOT AVBL
FCST SWX +18 HR:  11/2200Z NOT AVBL
FCST SWX +24 HR:  12/0400Z NOT AVBL
RMK:              SPACE WEATHER EVENT (IONOSPHERIC
                  DISTURBANCE) IN PROGRESS. IMPACT ON GNSS
                  PERFORMANCE POSSIBLY LEADING TO LOSS OF
                  GNSS SIGNALS AND/OR DEGRADATION OF
                  TIMING AND POSITIONING PERFORMANCE.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/0925Z=
```

```
SWX ADVISORY


DTG:              20240511/1630Z
SWXC:             PECASUS
ADVISORY NR:      2024/373
SWX EFFECT:       GNSS MOD
OBS SWX:          11/1230Z HNH MNH E000 - E045
FCST SWX +6 HR:   11/1900Z NOT AVBL
FCST SWX +12 HR:  12/0100Z NOT AVBL
FCST SWX +18 HR:  12/0700Z NOT AVBL
FCST SWX +24 HR:  12/1300Z NOT AVBL
RMK:              SPACE WEATHER EVENT (IONOSPHERIC
                  DISTURBANCE) IN PROGRESS. IMPACT ON GNSS
                  PERFORMANCE POSSIBLY LEADING TO LOSS OF
                  GNSS SIGNALS AND/OR DEGRADATION OF
                  TIMING AND POSITIONING PERFORMANCE.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/1830Z=
```

Closed at

11/0925Z NO SWX EXP

and

11/1642Z NO SWX EXP

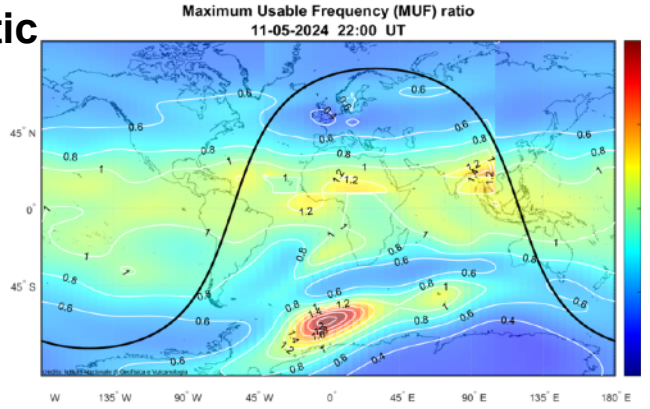


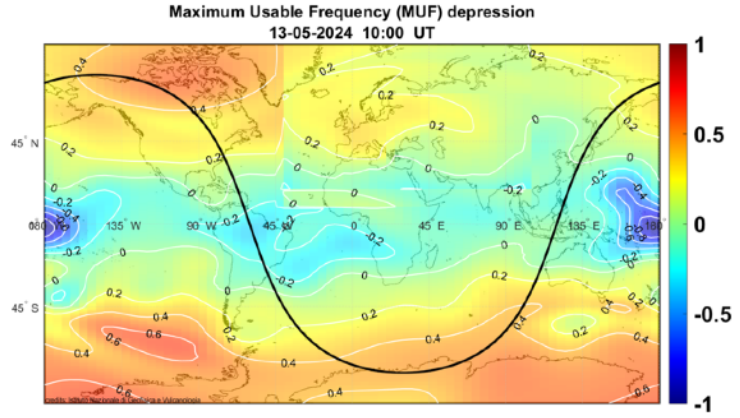
Solar Influences
Data analysis Centre
www.sidc.be

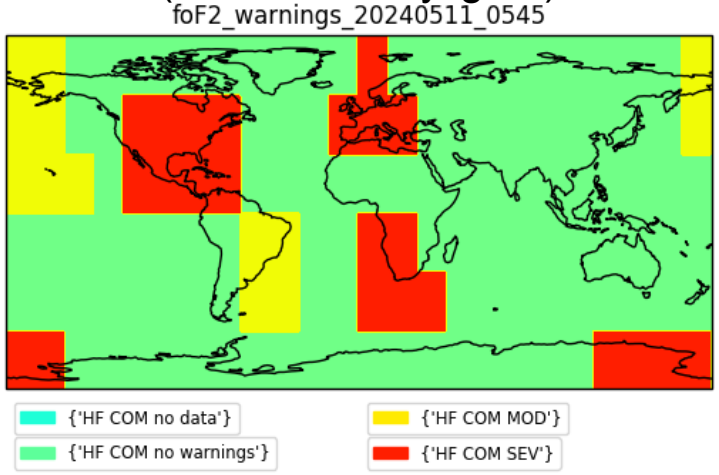
May 10-12 – more on HF COM

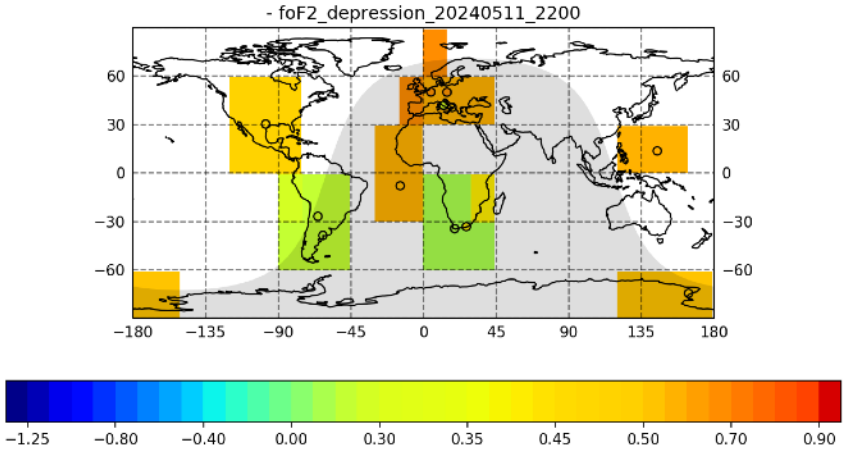
- **Generally disturbed Ionosphere and Geomagnetic field.**

- **HF COM Advisories issues due to:**
- Post Storm depression
- Auroral Absorption (Kp > 8, 9)
- Polar Cap Absorption (proton flux increase, poles)
- Short wave fadeout (X flares – Daylight,)









Solar Influences
Data analysis Centre
www.sidc.be

May 10-12 – more on HF COM

```
0000057301
FNXX02 YMMC 102125
SWX ADVISORY
DTG:              20240510/2125Z
SWXC:             ACFJ
ADVISORY NR:      2024/102
SWX EFFECT:       HF COM MOD
OBS SWX:          10/2112Z HNH MNH E000 - E075
FCST SWX +6 HR:   11/0400Z NO SWX EXP
FCST SWX +12 HR:  11/1000Z NO SWX EXP
FCST SWX +18 HR:  11/1600Z NO SWX EXP
FCST SWX +24 HR:  11/2200Z NO SWX EXP
RMK:              SWX EVENT (MAX USABLE FREQ DEPRESSION) IN
                  HF COM FREQS. ISOL AREAS OF SEV HF COM DE
                  POSS.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/0320Z=
```

OBS SWX: 10/2332Z NO SWX EXP

```
0000051601
FNXX02 YMMC 110054
SWX ADVISORY
DTG:              20240511/0054Z
SWXC:             ACFJ
ADVISORY NR:      2024/106
SWX EFFECT:       HF COM SEV
OBS SWX:          11/0042Z EQS MSH HSH E000 - E000
FCST SWX +6 HR:   11/0700Z NO SWX EXP
FCST SWX +12 HR:  11/1300Z NO SWX EXP
FCST SWX +18 HR:  11/1900Z NO SWX EXP
FCST SWX +24 HR:  12/0100Z NO SWX EXP
RMK:              SWX EVENT (MAX USABLE FREQ DEPRESSION) INPR ON HYR
                  HF COM FREQS.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/0650Z=
```

OBS SWX: 11/0502Z NO SWX EXP

May 10-12 – more on HF COM

```
SWX ADVISORY


DTG:              20240510/1858Z
SWXC:             PECASUS
ADVISORY NR:      2024/117
SWX EFFECT:       HF COM MOD
OBS SWX:          10/1856Z EQS MSH E000 - E045
FCST SWX +6 HR:   11/0100Z NOT AVBL
FCST SWX +12 HR:  11/0700Z NOT AVBL
FCST SWX +18 HR:  11/1300Z NOT AVBL
FCST SWX +24 HR:  11/1900Z NOT AVBL
RMK:              SPACE WEATHER EVENT (MAXIMUM USABLE
                  FREQUENCY DEPRESSION) IS IN PROGRESS.
                  IMPACT ON HIGHER HF COM FREQUENCY BANDS
                  EXPECTED.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/0056Z=
```

```
SWXC:             PECASUS
ADVISORY NR:      2024/118
NR RPLC:          2024/117
SWX EFFECT:       HF COM MOD
OBS SWX:          10/2144Z HNH MNH EQN W015 - E045
FCST SWX +6 HR:   11/0400Z NOT AVBL
FCST SWX +12 HR:  11/1000Z NOT AVBL
FCST SWX +18 HR:  11/1600Z NOT AVBL
FCST SWX +24 HR:  11/2200Z NOT AVBL
RMK:              SPACE WEATHER EVENT (MAXIMUM USABLE
                  FREQUENCY DEPRESSION) IS IN PROGRESS.
                  IMPACT ON HIGHER HF COM FREQUENCY BANDS
                  EXPECTED.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/0344Z=
```

```
SWXC:             PECASUS
ADVISORY NR:      2024/125
NR RPLC:          2024/123
SWX EFFECT:       HF COM SEV
OBS SWX:          11/0938Z HNH MNH EQN EQS MSH HSH W180 - E180
FCST SWX +6 HR:   11/1600Z NOT AVBL
FCST SWX +12 HR:  11/2200Z NOT AVBL
FCST SWX +18 HR:  12/0400Z NOT AVBL
FCST SWX +24 HR:  12/1000Z NOT AVBL
RMK:              SPACE WEATHER EVENT (MAXIMUM USABLE
                  FREQUENCY DEPRESSION) IS IN PROGRESS.
                  IMPACT ON HIGHER HF COM FREQUENCY BANDS
                  EXPECTED.
NXT ADVISORY:     WILL BE ISSUED BY 20240511/1538Z=
```

Closed on

```
OBS SWX:
14/0757Z NOT AVBL
```

Royal Observatory of Belgium

Solar Influences Data analysis Centre
www.sidc.be

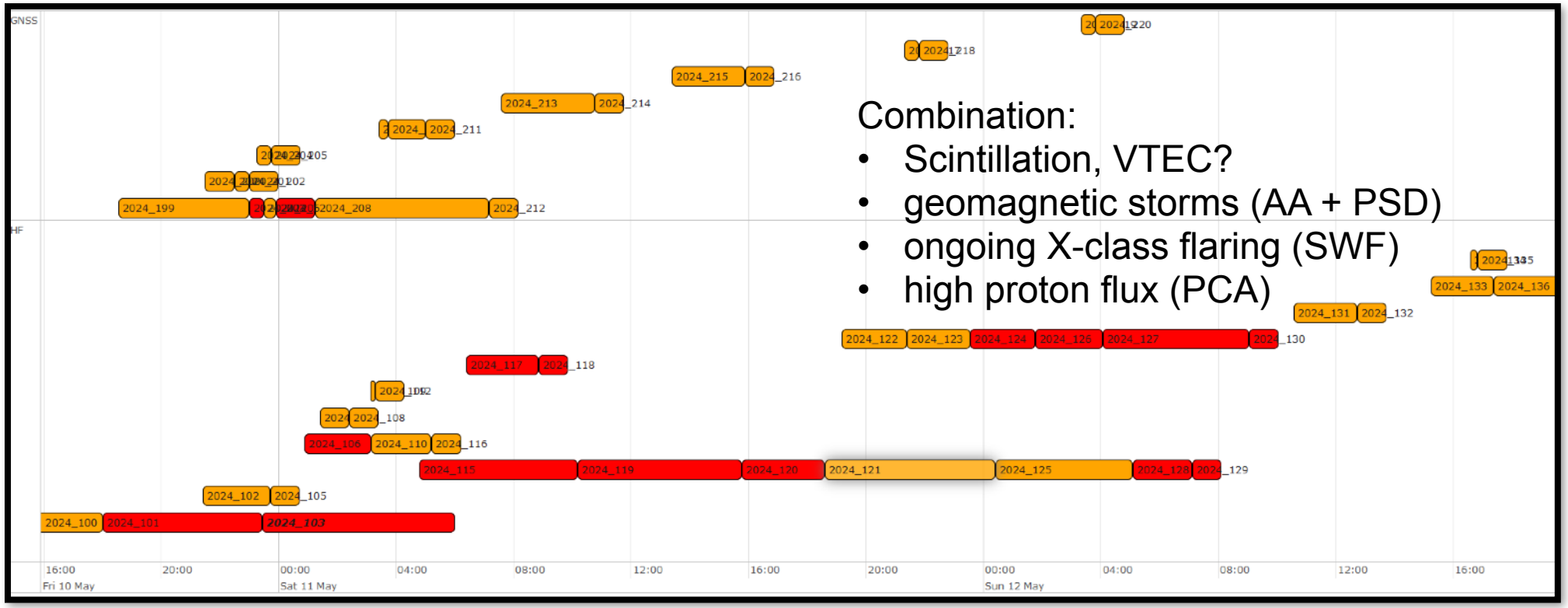
May 10-12 – HF COM and GNSS

GNSS: 22 advisories
HF-COM: 32 advisories

} issued between 10 May 18:30 and 13 May 00:00

GNSS

HF



Combination:

- Scintillation, VTEC?
- geomagnetic storms (AA + PSD)
- ongoing X-class flaring (SWF)
- high proton flux (PCA)

ICAO Space Weather Advisory browser, produced by SIDC via the ESA SWE Portal

May 10-12 – Issued Space Weather Alerts

Presto: 19 — issued between 8 May 16:00 and 11 May 16:00

CME arrival alerts: 9 — issued between 9 May 23:39 and 11 May 16:00

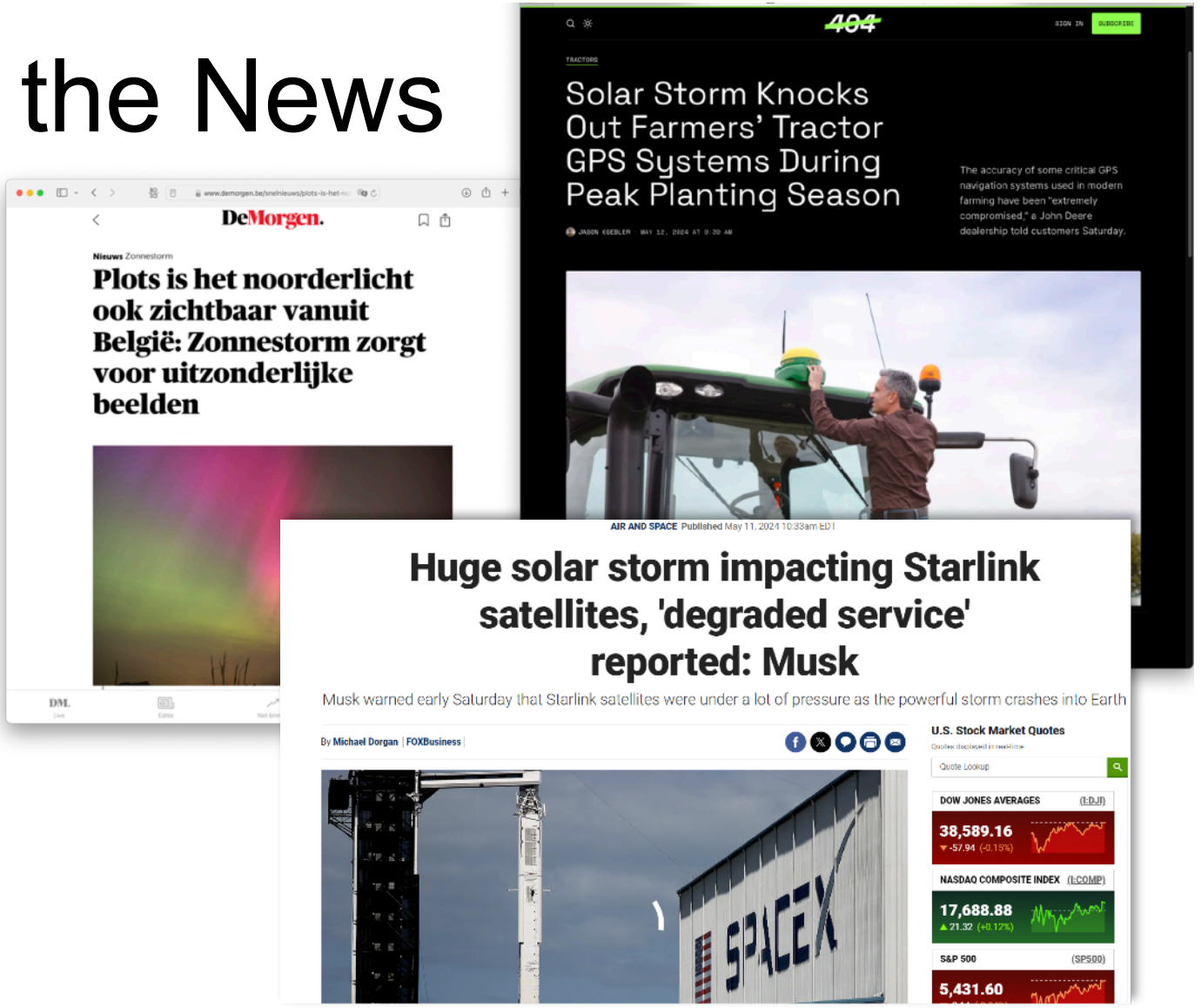
issue time	alert text
2024-05-11T16:02:45Z	An X1.5 flare has occurred with a peak time 11:44 UTC on May 11, produced by NOAA AR 3664. Moderately disturbed radio communications have been observed related to this flaring activity.
2024-05-11T15:25:27Z	Geomagnetic conditions reached extreme storm levels (K_Bel=9) locally over Belgium from 11:00 UTC to 12:00 UTC on May 11, and it is currently at major storm levels (K_Bel=7). Major to extreme storm levels are expected to continue in the coming days.
2024-05-11T11:34:05Z	A bright partial halo coronal mass ejection (CME) was first observed on SOHO/LASCO-C2 images around 01:36 UTC on May 11. This CME is associated with an X5.8 flare, which peaked at 01:23 UTC, produced by NOAA AR 3664. Associated type II and type IV radio emissions were detected at 01:13 UTC and 01:24 UTC, respectively. This CME has a speed of about 1050 km/s. The corresponding ICME is expected to impact the Earth on the evening of May 12.
2024-05-11T08:10:55Z	An X5.8 flare has occurred with a peak time 01:23 UTC on May 11, produced by NOAA AR 3664. Type II and type IV radio emissions were detected at 01:13 UTC and 01:24 UTC, respectively, during the flaring activity. Moderately disturbed radio communications have been observed related to this flaring activity. The greater than 10 MeV GOES proton flux was shortly (01:10 UTC - 02:10 UTC) below the 10 pfu threshold level. It started to increase again from 02:10 UTC and it continues to increase. Both the greater than 50 MeV GOES proton flux and the greater than 100 MeV GOES proton flux began to increase from 01:40 UTC. The greater than 50 MeV GOES proton flux crossed the 10 pfu threshold level at 05:50 UTC and it is increasing. The greater than 100 MeV GOES proton flux is just below the 10 pfu threshold level and it is increasing. The proton flux is expected to remain elevated as more particle events are possible in the coming days.

2024-05-08 22:36:00UTC	Partial halo	LASCO C2	A partial halo coronal mass ejection (CME) was first observed on SOHO/LASCO-C2 images around 22:36 UTC on May 08. This CME is associated with a X1.0 flare, which peaked at 21:40 UTC, produced by NOAA AR 3664. It has a projected width of about 184 deg and a projected speed of about 552 km/s (as measured by the Cactus tool). With its source region closer to the central meridian, the corresponding ICME is expected to impact the Earth late on May 10 or early on May 11.
2024-05-09 09:24:00UTC	Partial halo	LASCO C2	A partial halo coronal mass ejection (CME) was first observed on SOHO/LASCO-C2 images around 09:24 UTC on May 09. This CME is associated with an X2.3 flare, which peaked at 09:13 UTC, produced by NOAA AR 3664. It has a projected width of about 180 deg and a projected speed of about 1000 km/s. Associated type II and type IV radio emissions were detected at 09:02 UTC and 09:10 UTC, respectively, during the flaring activity. The corresponding ICME is expected to impact the Earth late on May 10 or early on May 11.

Space Weather in the News

- As the largest storm in over 20 years this event has been followed by multiple media outlets, particularly due to the Aurora which could be seen further south than usual.

- Large-scale attempt to gather information from industries on possible observed impacts.



THANK YOU!