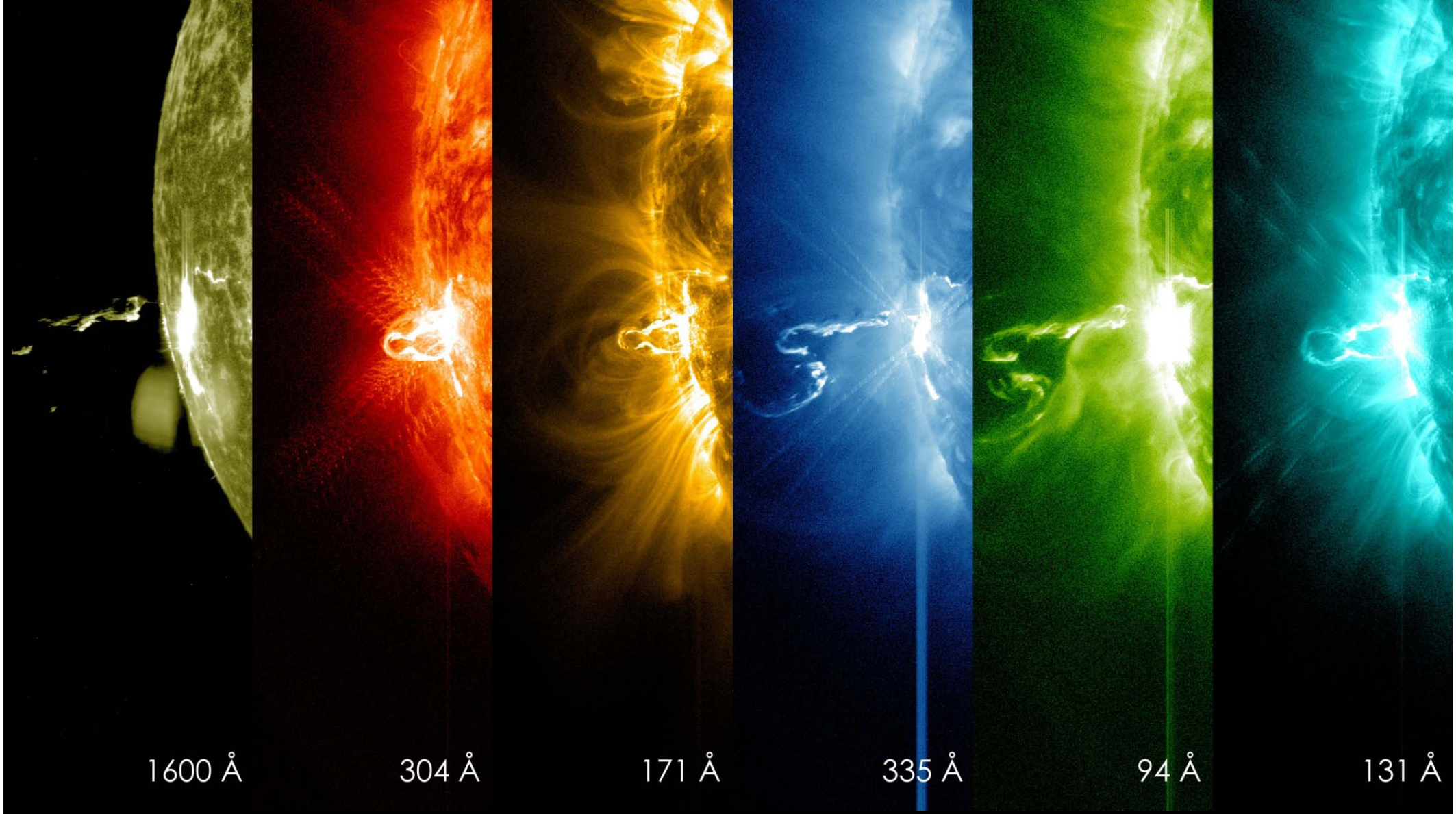
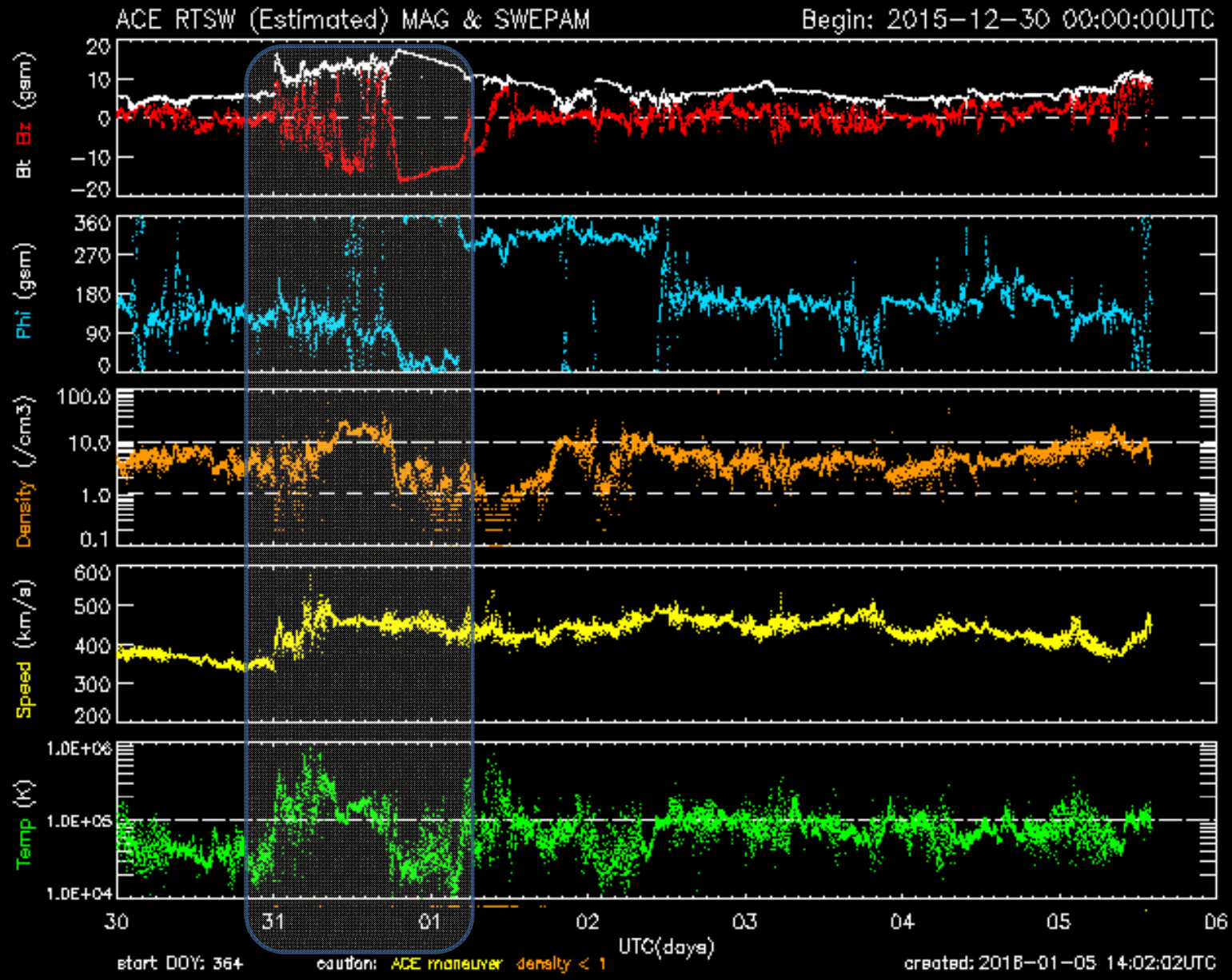


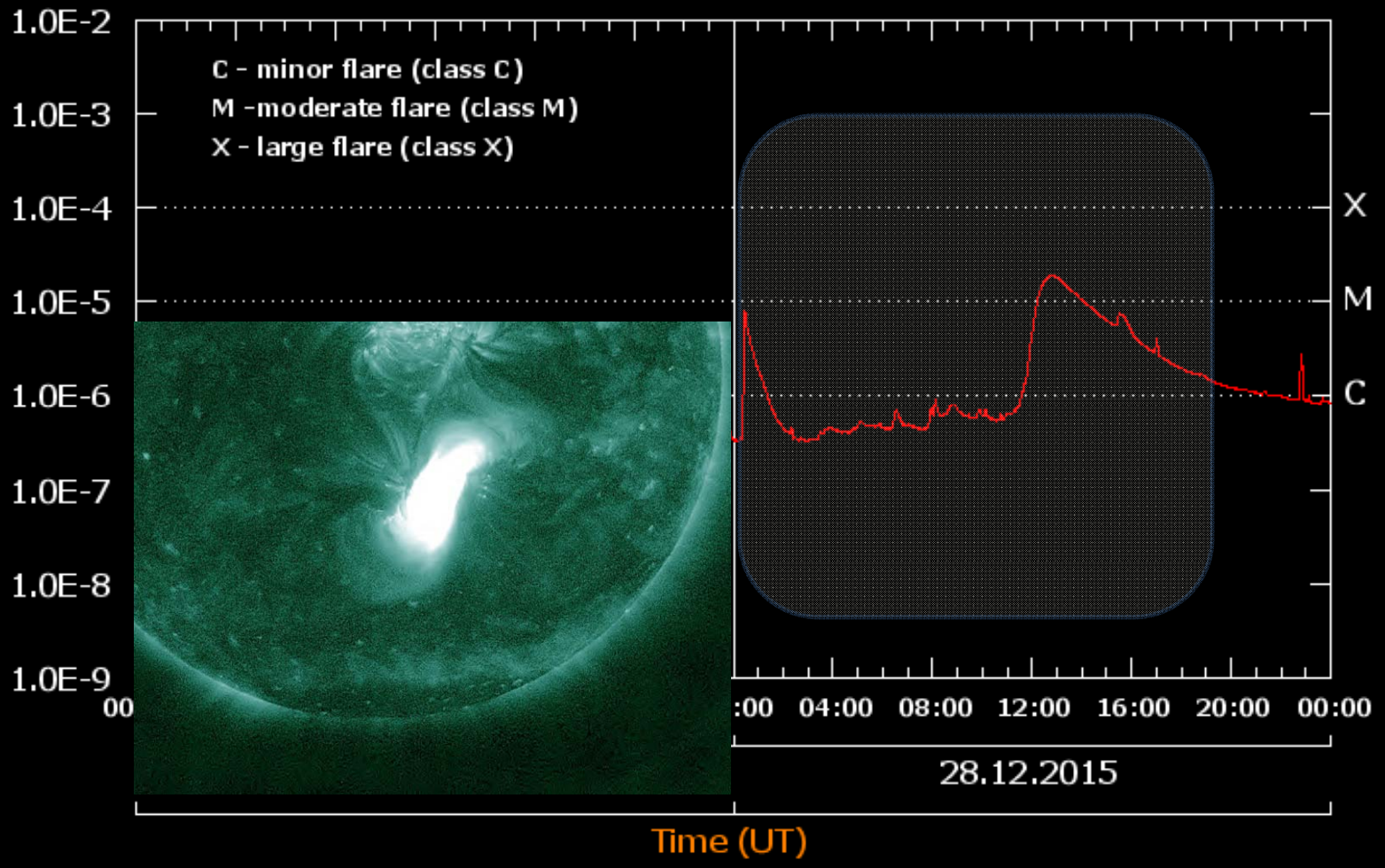
值週報告

102601203 大氣三 許政雄
102601024 大氣三 洪念芳

一周概況

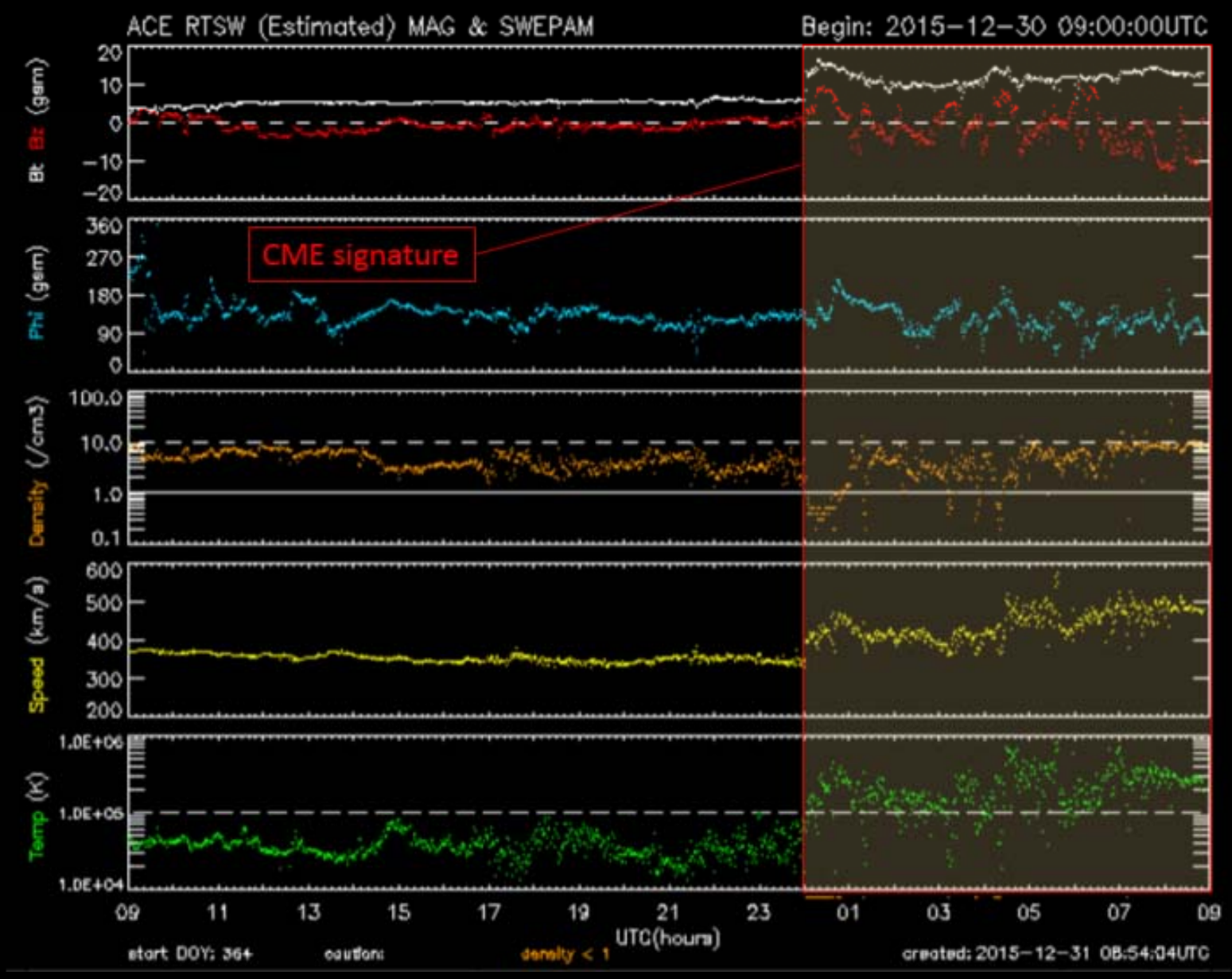

ACE RTSW (Estimated) MAG & SWEPAM
Begin: 2015-12-30 00:00:00UTC
Bt Bz (gsm)
20
10
0
-10
-20
Phi (gsm)
360
270
180
90
0
Density (/cm3)
100.0
10.0
1.0
0.1
Speed (km/s)
600
500
400
300
200
Temp (K)
1.0E+06
1.0E+06
1.0E+04
30
31
01
02
03
04
05
06
UTC(days)
start DOY: 364
caution: ACE maneuver density < 1
created: 2016-01-05 14:02:02UTC

先來看看12/28的太陽閃焰



CONSTANT SOLAR EFFECTS ON EARTH

在約4天後(12/31) CME 到達ACE人造衛星



12/31發出的預警

SHOCK ARRIVAL AT ACE

G1

PRIMARY AREA of IMPACTS

Poleward of 60 deg geomagnetic latitu

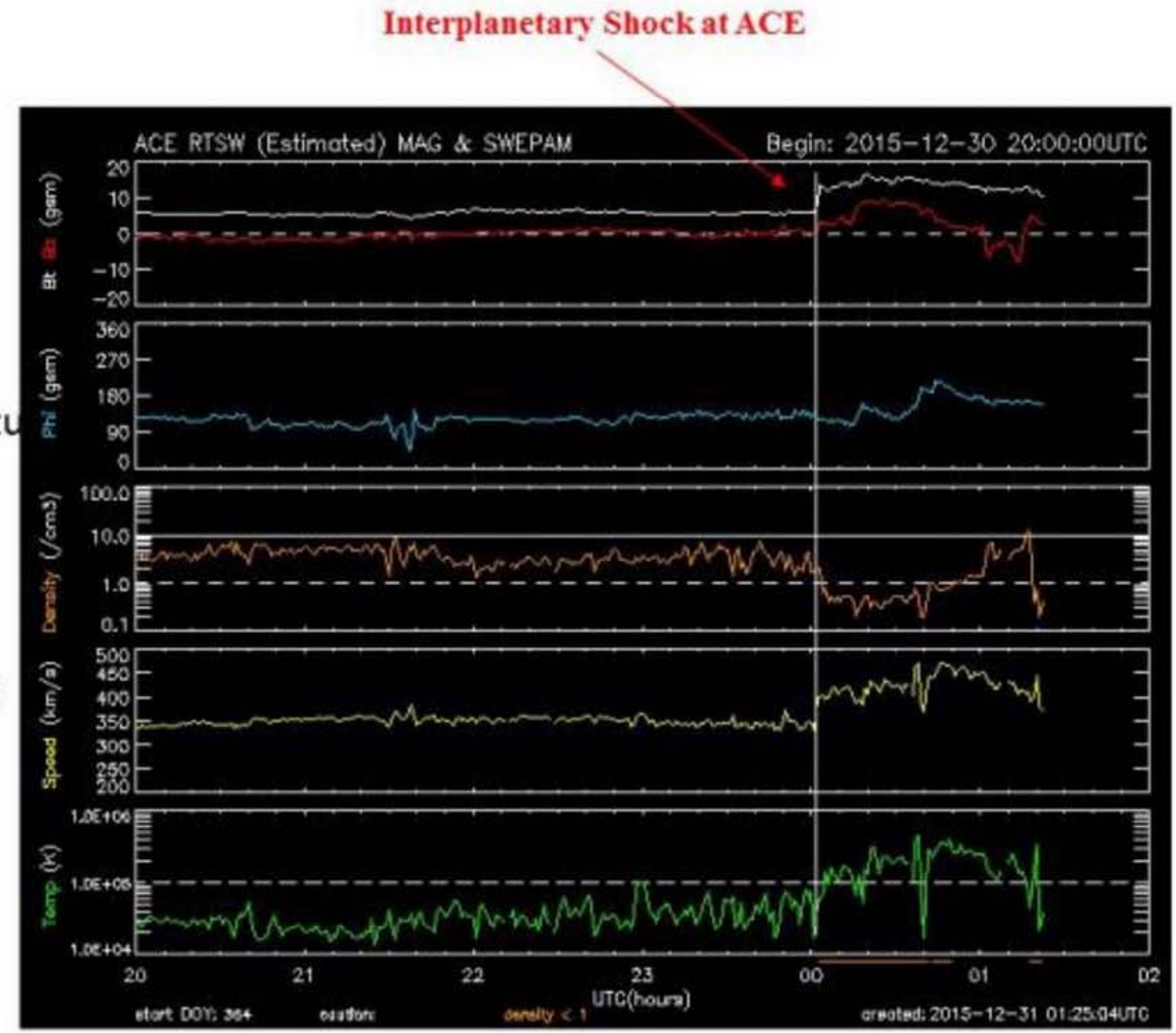
POSSIBLE EFFECTS

Power Systems: Weak power grid fluctuations

Spacecraft: Minor impact on satellite operations

Other: Aurora may be visible at high latitudes (i.e. northern Michigan and Maine)

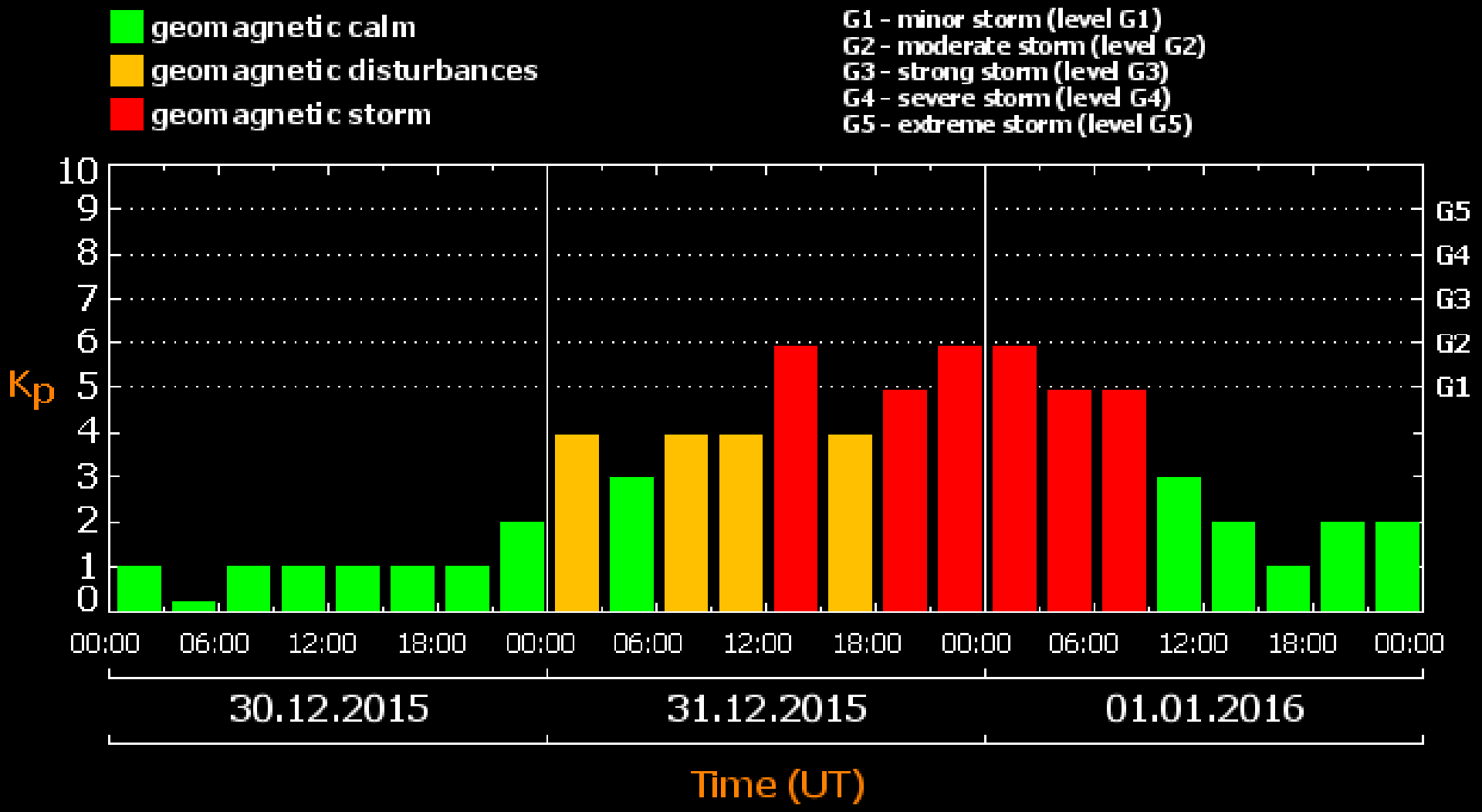
行星際震波抵達ACE



CME抵達地球後

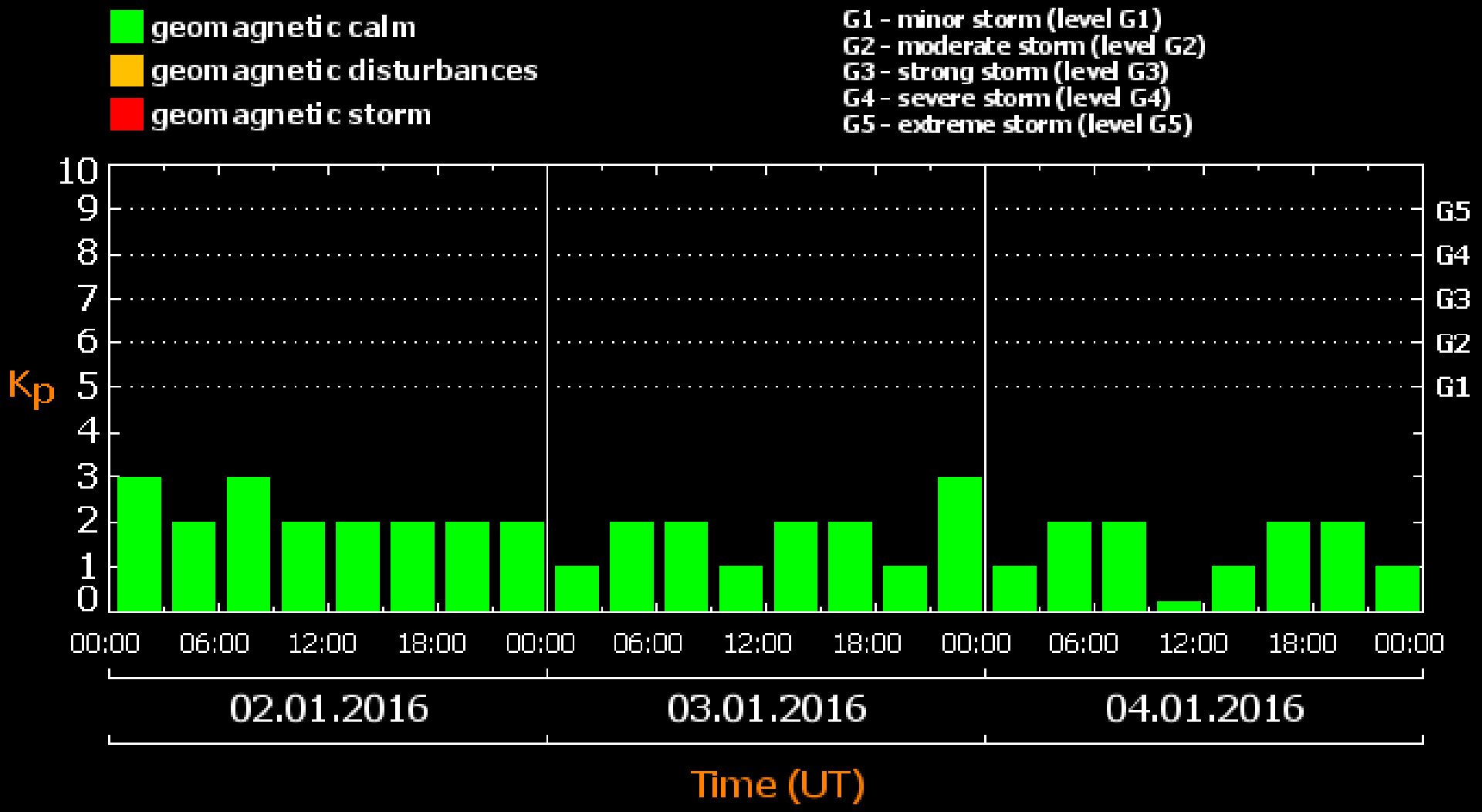
地表測站的部分

12/30~1/1 Kp指數



Kp指數是高緯度地磁指數
全球選取12個標準地磁台的數據取平均。

1/2~1/4 Kp指數



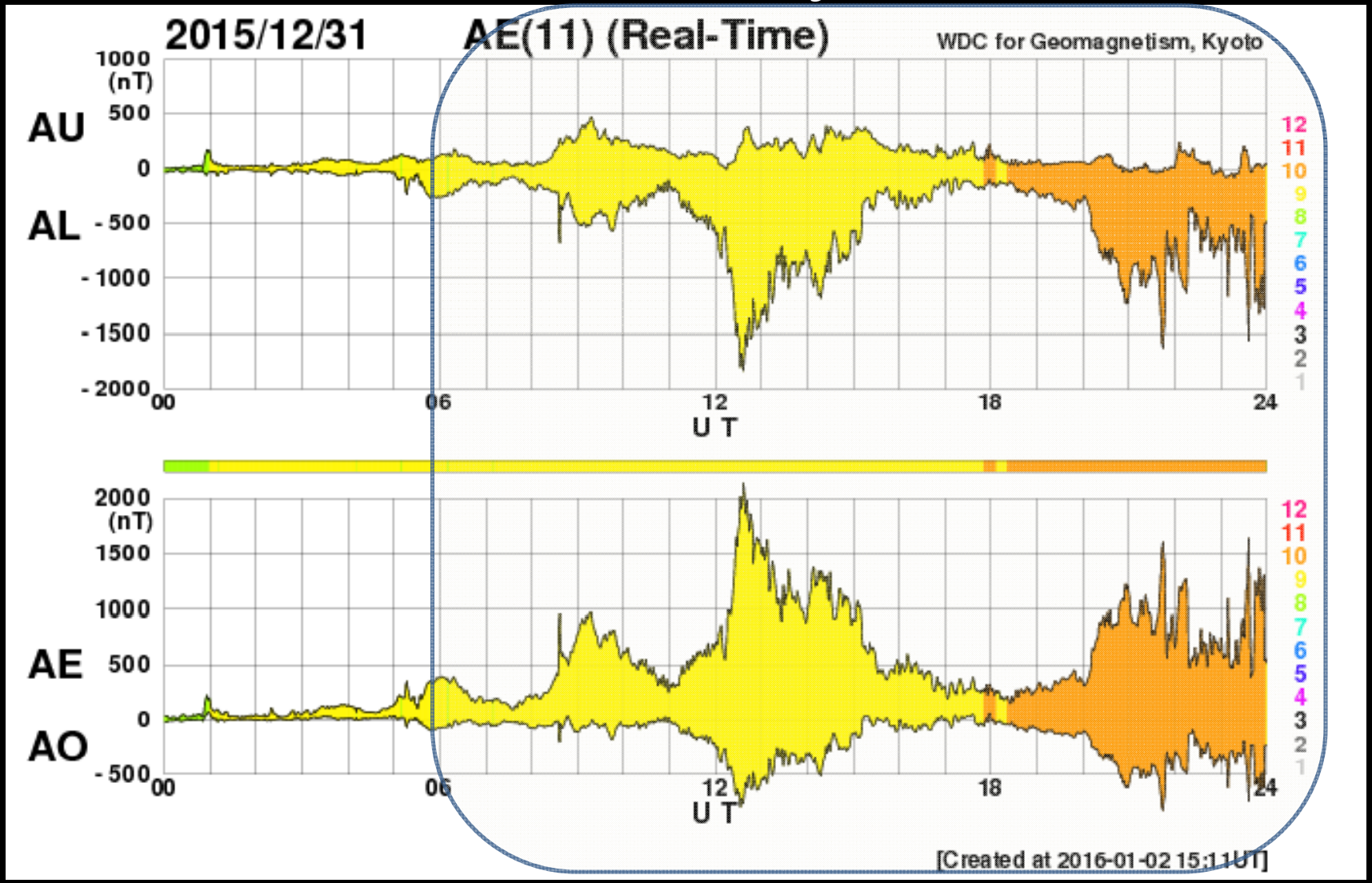
Kp指數是高緯度地磁指數
全球選取12個標準地磁台的數據取平均。


kp0
kp1
kp2
kp3
kp4
kp5
kp6
kp7
kp8
Iceland
Sweden
Norway
Finland
Baltic Sea
Estonia
Latvia
Lithuania
Denmark
Kingdom
Ireland
Poland
Belgium
Germany
Slovakia
Austria
Hungary
France
www.aurora-service.eu
Service
Aurora
It's all about the lights!

12/31 高緯度電噴流指數

（ AE : Auroral Electrojet 極光電噴流 ）

顏色對照右方數字，表示該數據的測站數目



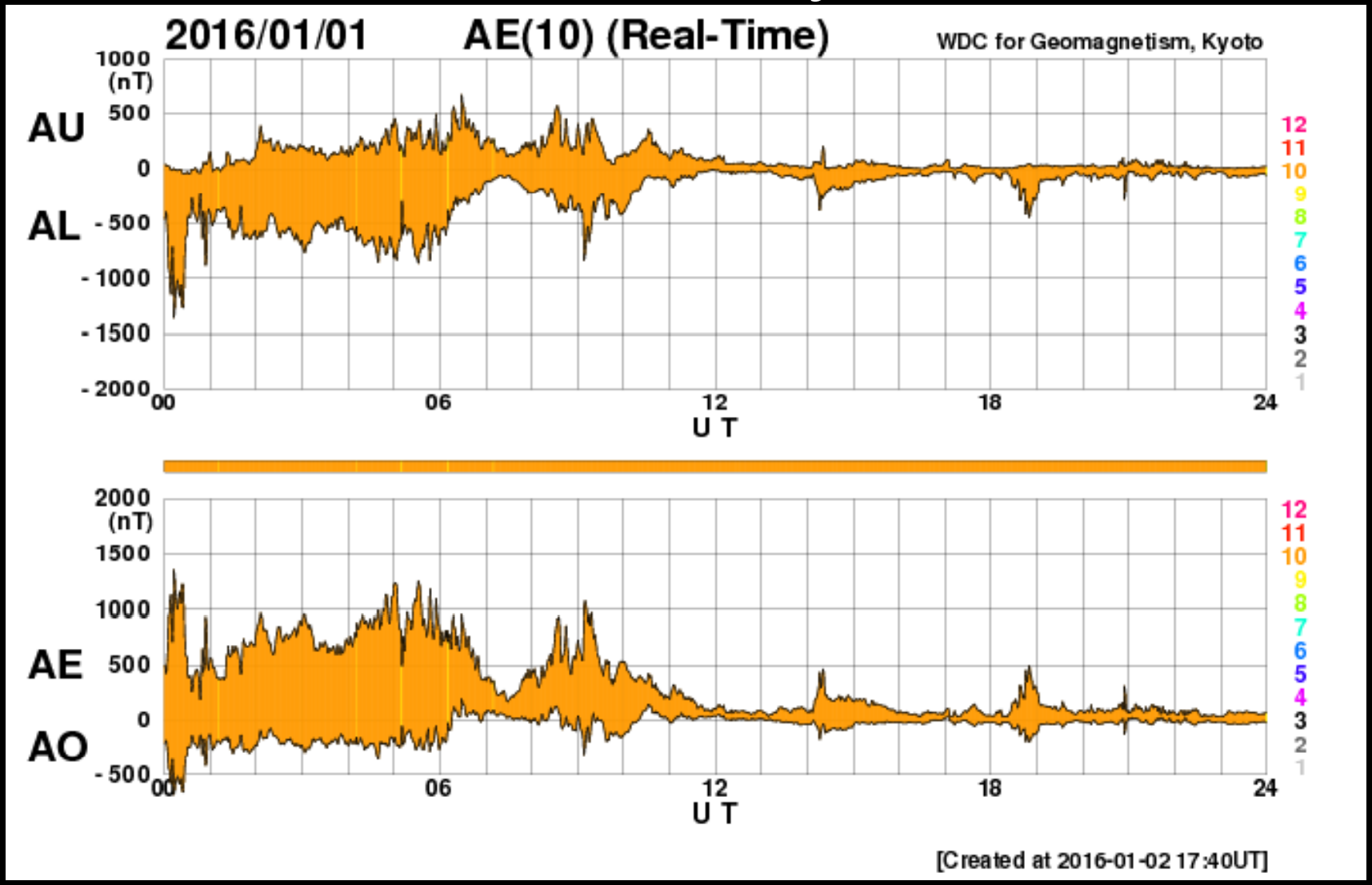
(AU.AL.AE.AO指數皆為描述極光電噴流強度的指數(即極區磁副暴的強度)

AE=(AU-AL) ， AO=(AU+AL)/2

1/1 高緯度電噴流指數

（ AE : Auroral Electrojet 極光電噴流 ）

顏色對照右方數字，表示該數據的測站數目



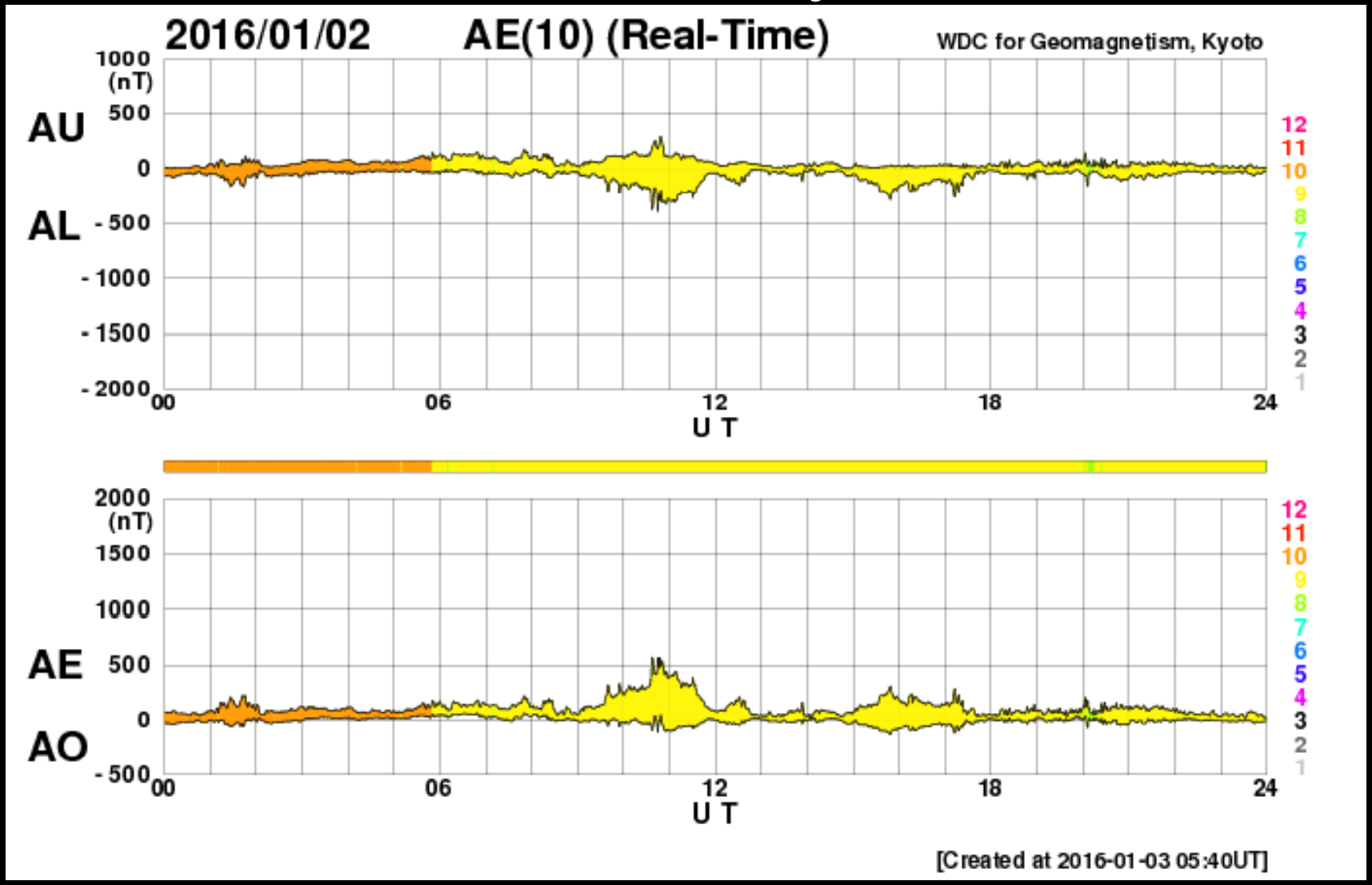
(AU.AL.AE.AO指數皆為描述極光電噴流強度的指數(即極區磁副暴的強度)

AE=(AU-AL) ， AO=(AU+AL)/2

1/2 高緯度電噴流指數

（ AE : Auroral Electrojet 極光電噴流 ）

顏色對照右方數字，表示該數據的測站數目



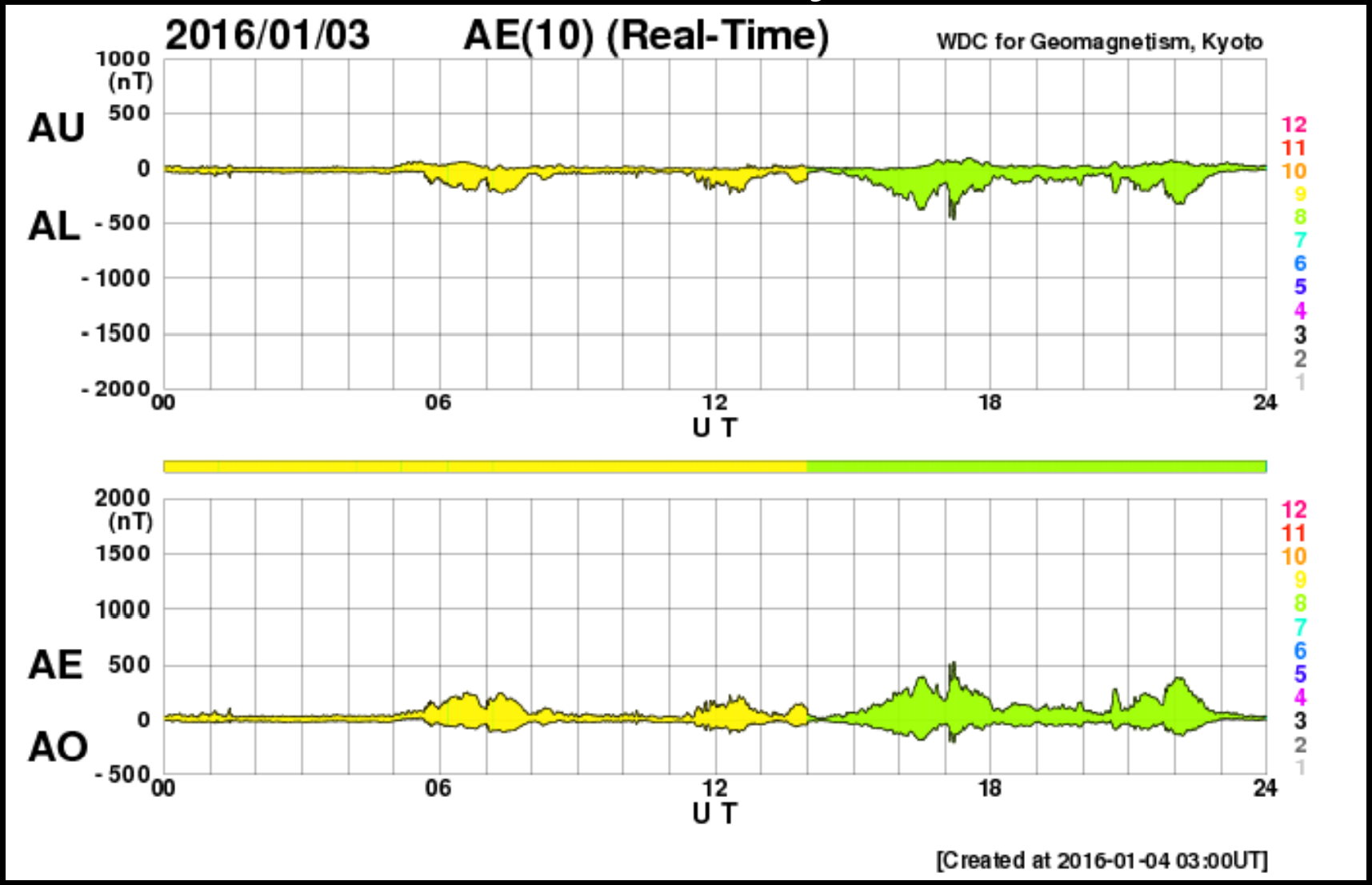
(AU.AL.AE.AO指數皆為描述極光電噴流強度的指數(即極區磁副暴的強度)

AE=(AU-AL) ， AO=(AU+AL)/2

1/3 高緯度電噴流指數

（ AE : Auroral Electrojet 極光電噴流 ）

顏色對照右方數字，表示該數據的測站數目



測站數目因當下的事件較少而減少

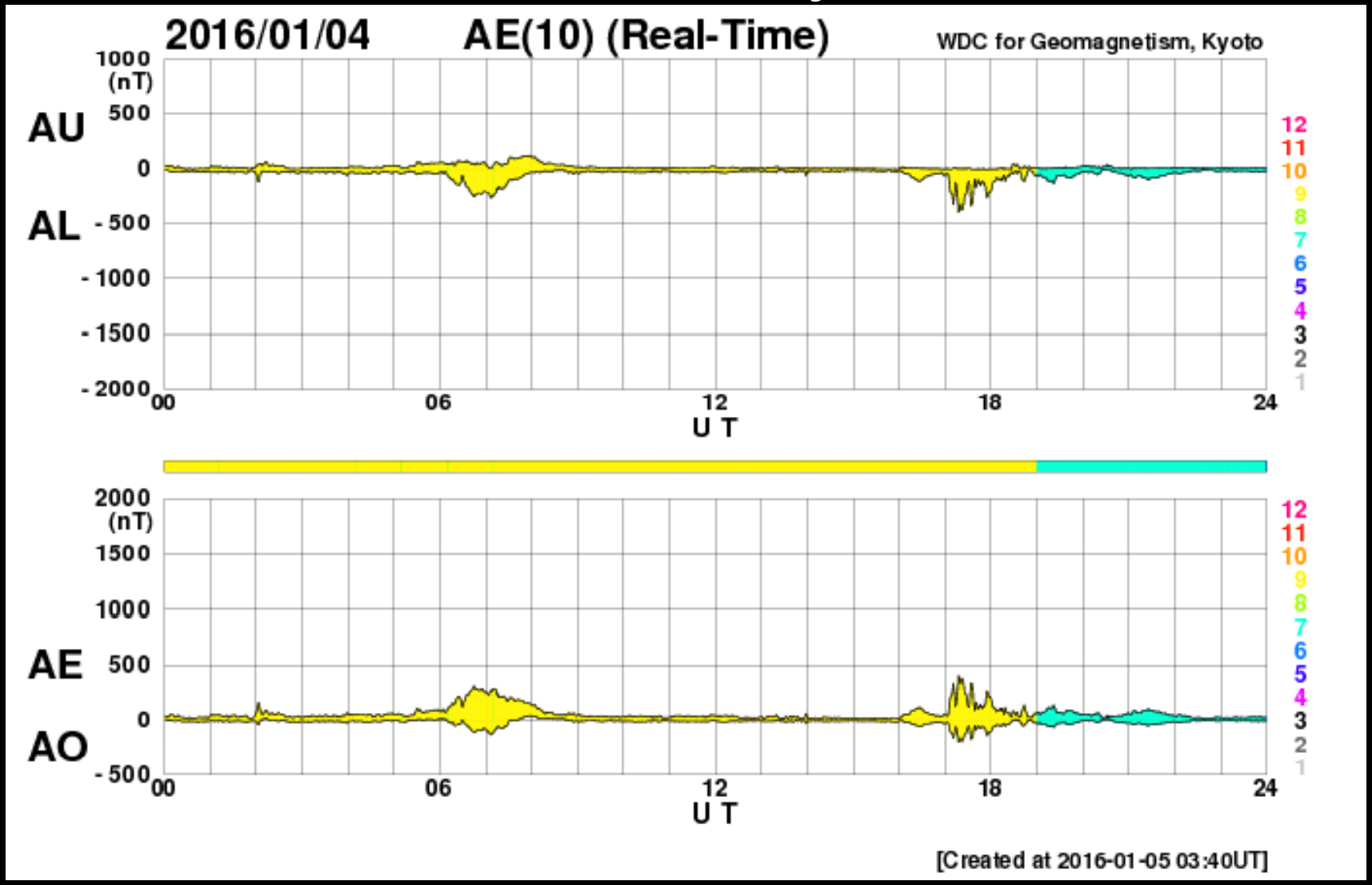
(AU.AL.AE.AO指數皆為描述極光電噴流強度的指數(即極區磁副暴的強度)

AE=(AU-AL) ， AO=(AU+AL)/2

1/4 高緯度電噴流指數

（ AE : Auroral Electrojet 極光電噴流 ）

顏色對照右方數字，表示該數據的測站數目



測站數目因當下的事件較少而減少

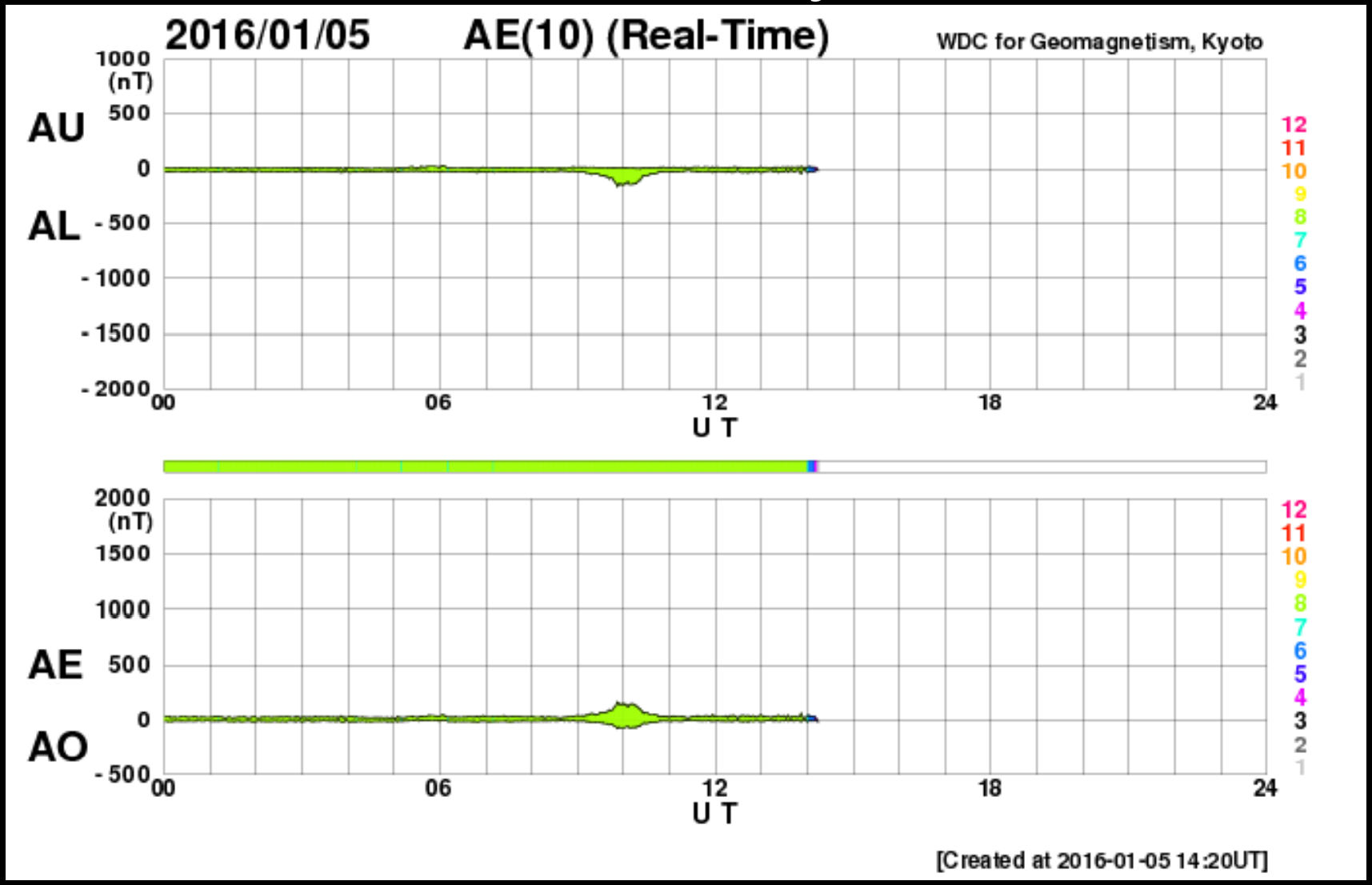
(AU.AL.AE.AO指數皆為描述極光電噴流強度的指數(即極區磁副暴的強度)

AE=(AU-AL) ， AO=(AU+AL)/2

1/5 高緯度電噴流指數

（ AE : Auroral Electrojet 極光電噴流 ）

顏色對照右方數字，表示該數據的測站數目

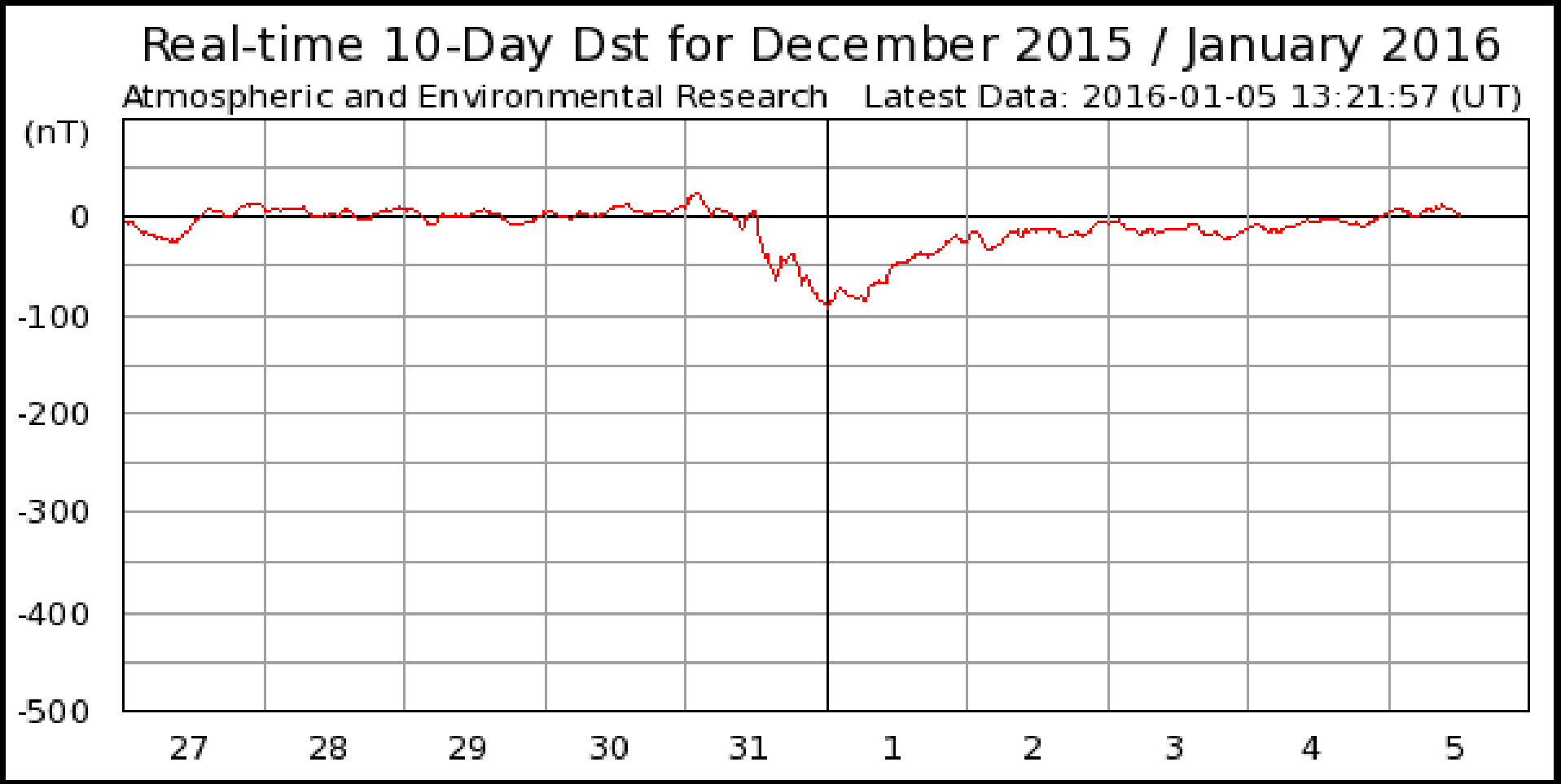


測站數目因當下的事件較少而減少

(AU.AL.AE.AO指數皆為描述極光電噴流強度的指數(即極區磁副暴的強度)

AE=(AU-AL) ， AO=(AU+AL)/2

12/31~1/5 Dst指數

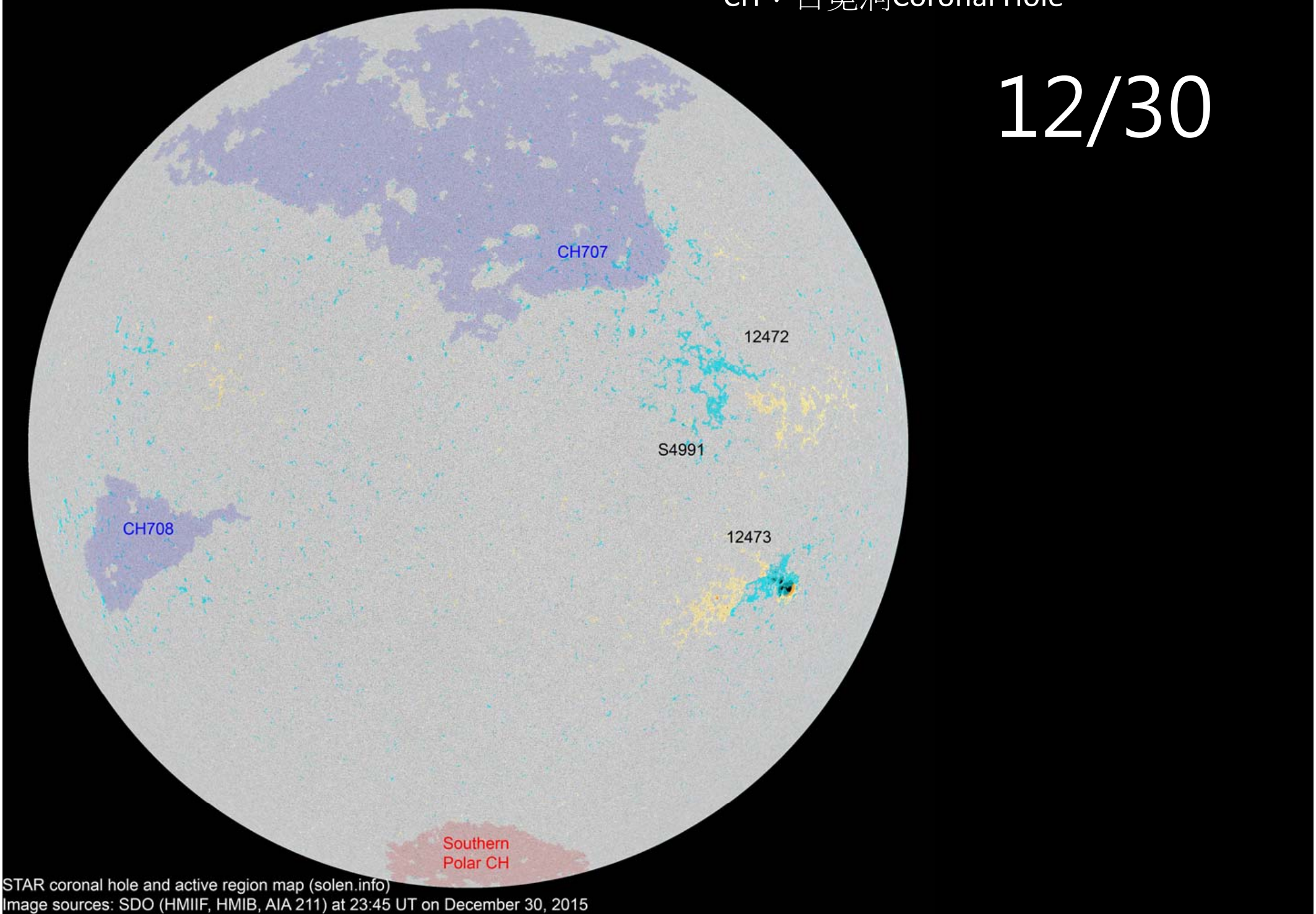


Dst低緯度地磁指數：Disturbance storm time index

一周的日冕洞與黑子

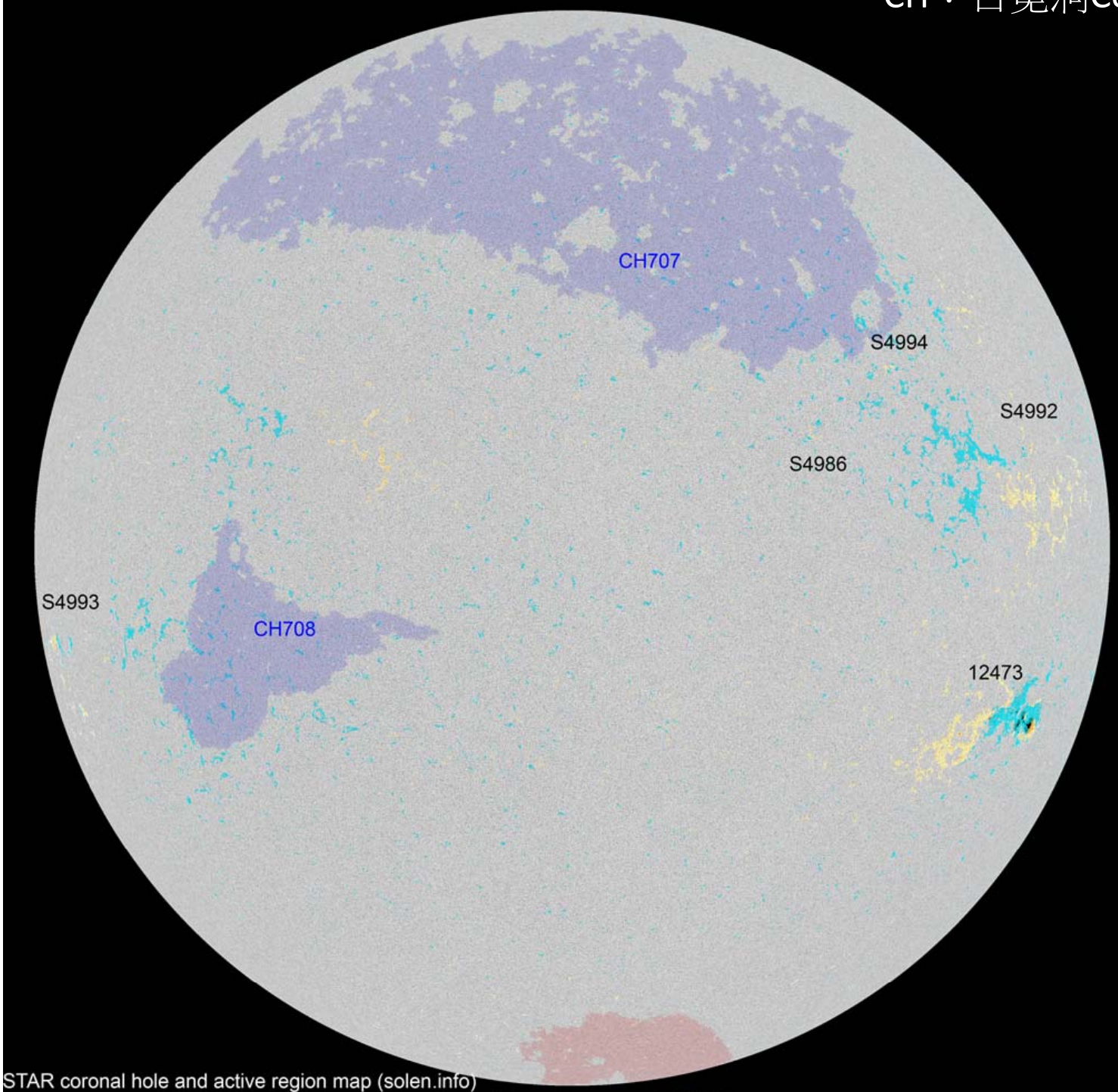
CH：日冕洞Coronal Hole

12/30



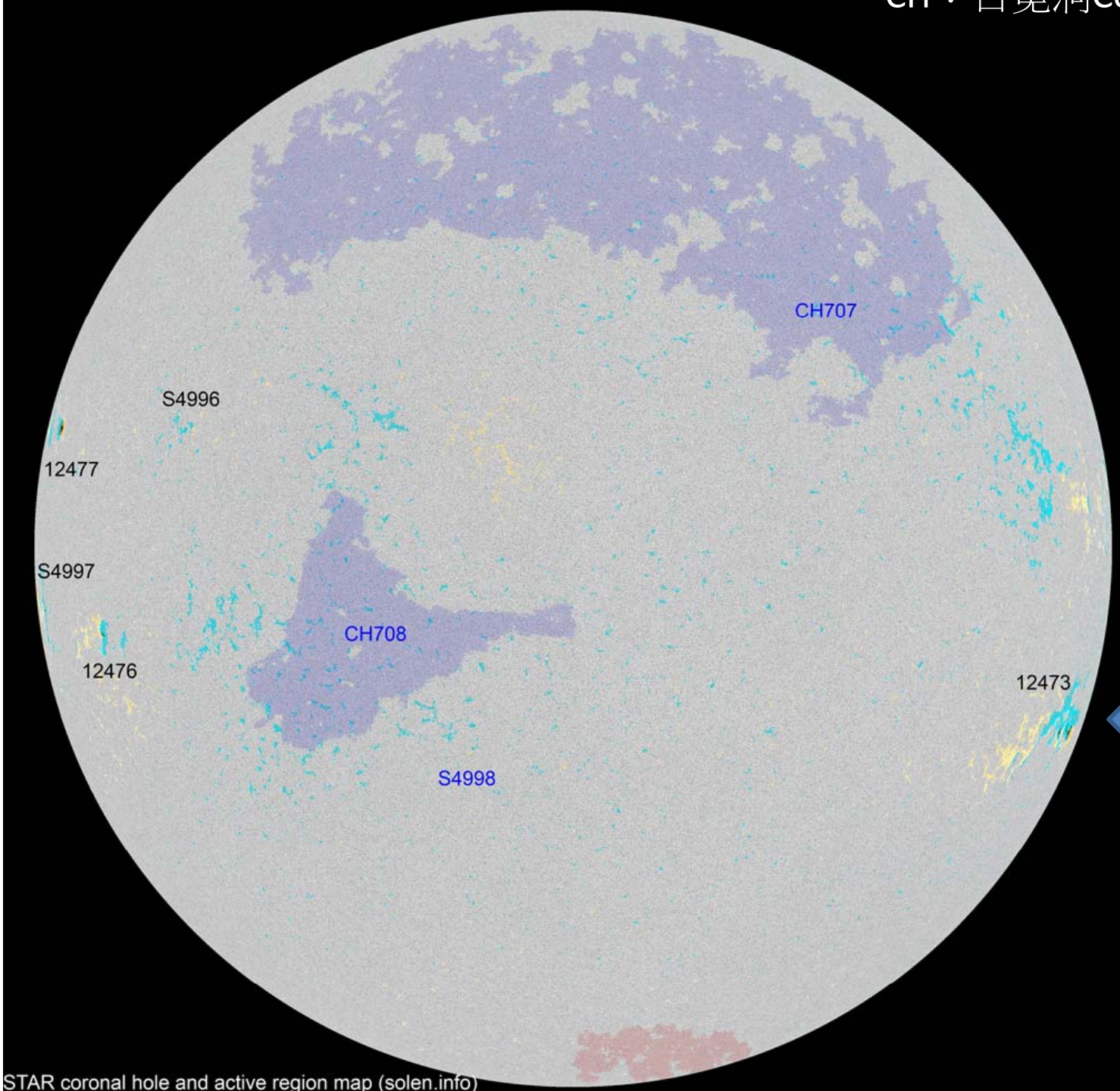
CH：日冕洞Coronal Hole

12/31



CH：日冕洞Coronal Hole

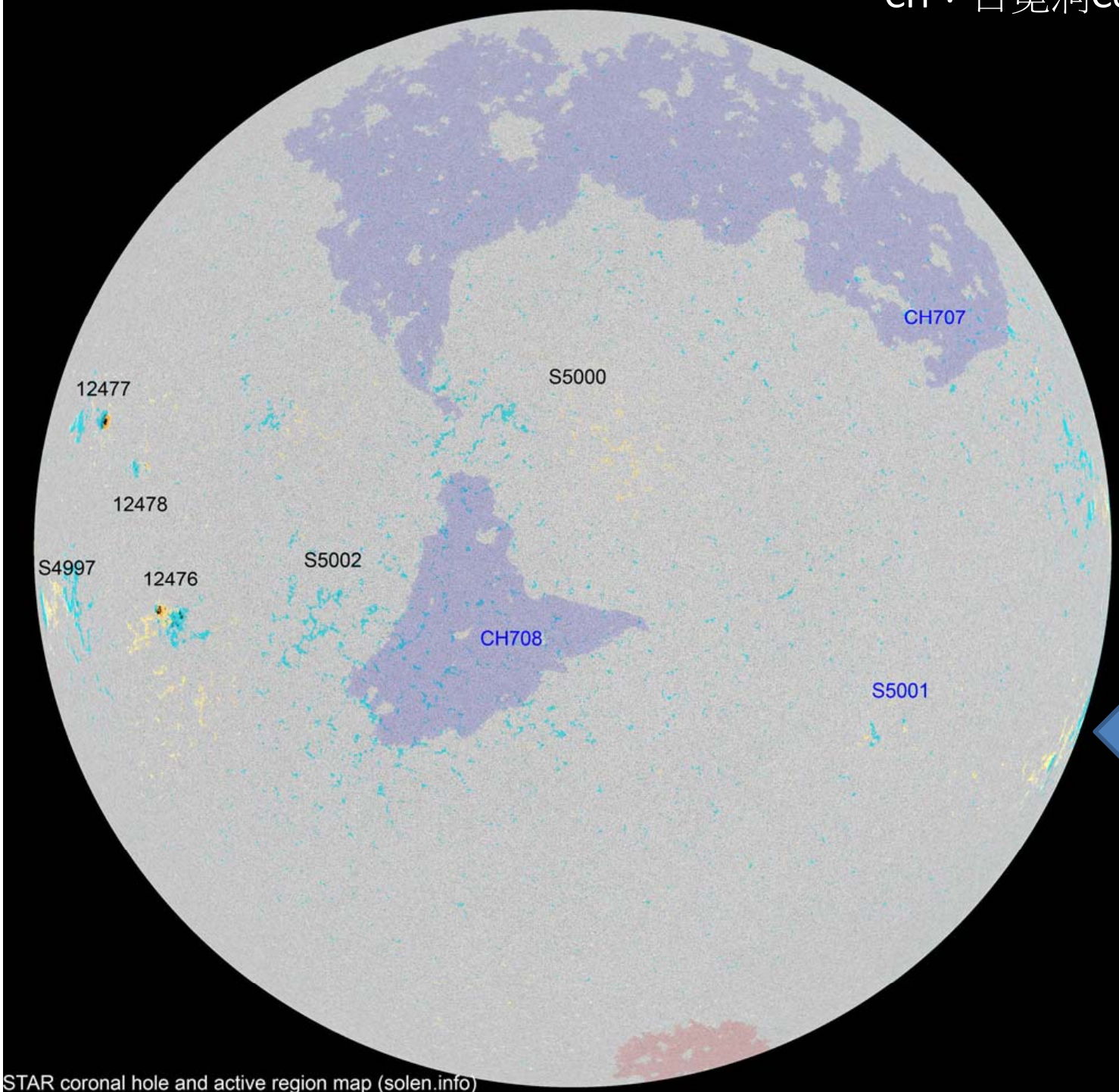
01/01



12473黑子群

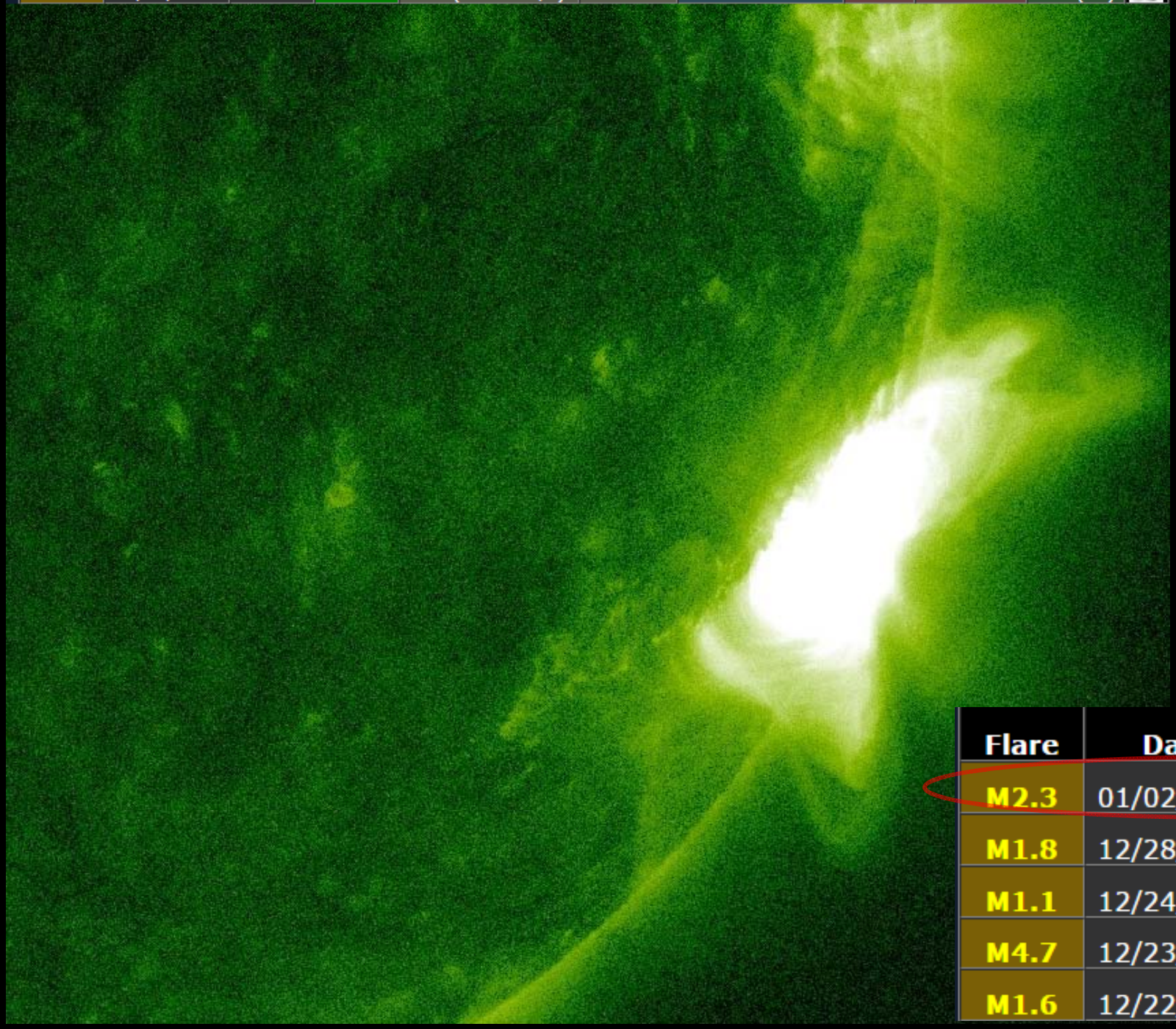
CH：日冕洞Coronal Hole

01/02



12473黑子群
發生閃焰

Flare	Date	Time	Region	Type II Radio Emission	Type IV	10cm Radio Burst	CME	Earth Directed?	Proton Event	Img
M2.3	01/02/2016	00:11	2473	YES (1019 km/s)	YES	NO	YES	NO	YES (S1)	



Flare	Date	Time	Region
M2.3	01/02/2016	00:11	2473
M1.8	12/28/2015	12:45	2473
M1.1	12/24/2015	02:12	2473
M4.7	12/23/2015	00:40	2473
M1.6	12/22/2015	03:34	2473

01/02發出的預警

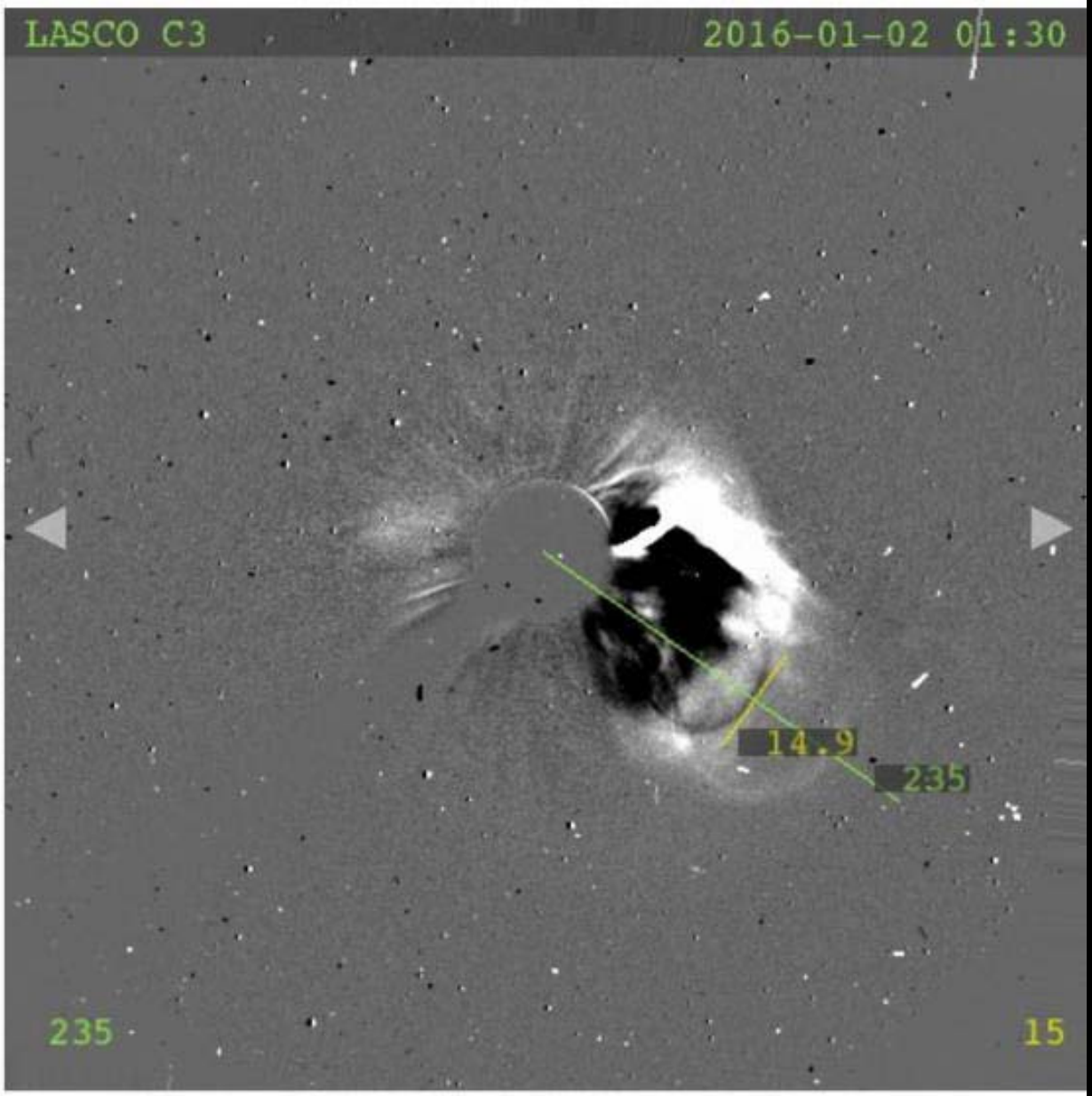
G2

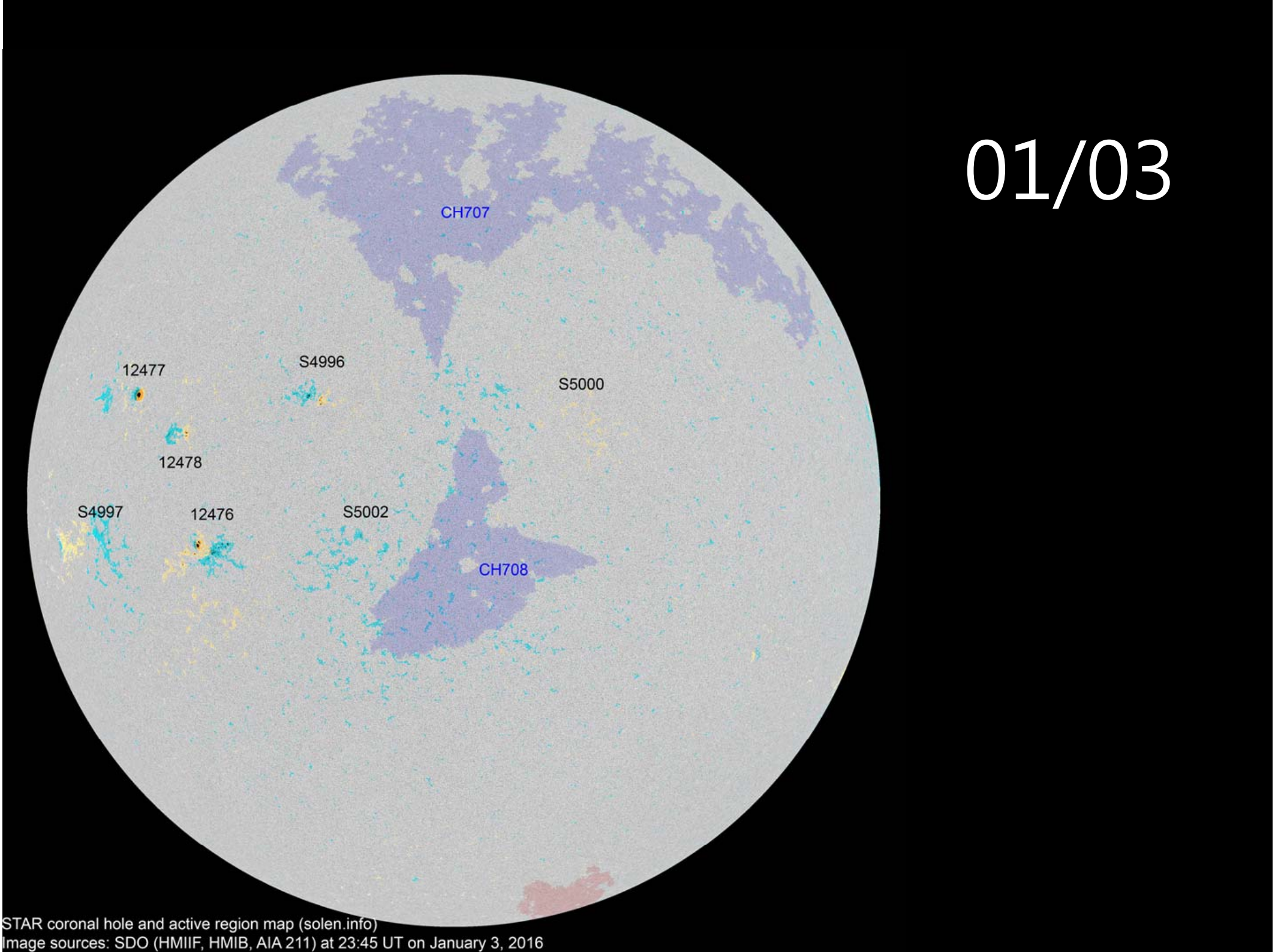
PRIMARY AREA of IMPACTS

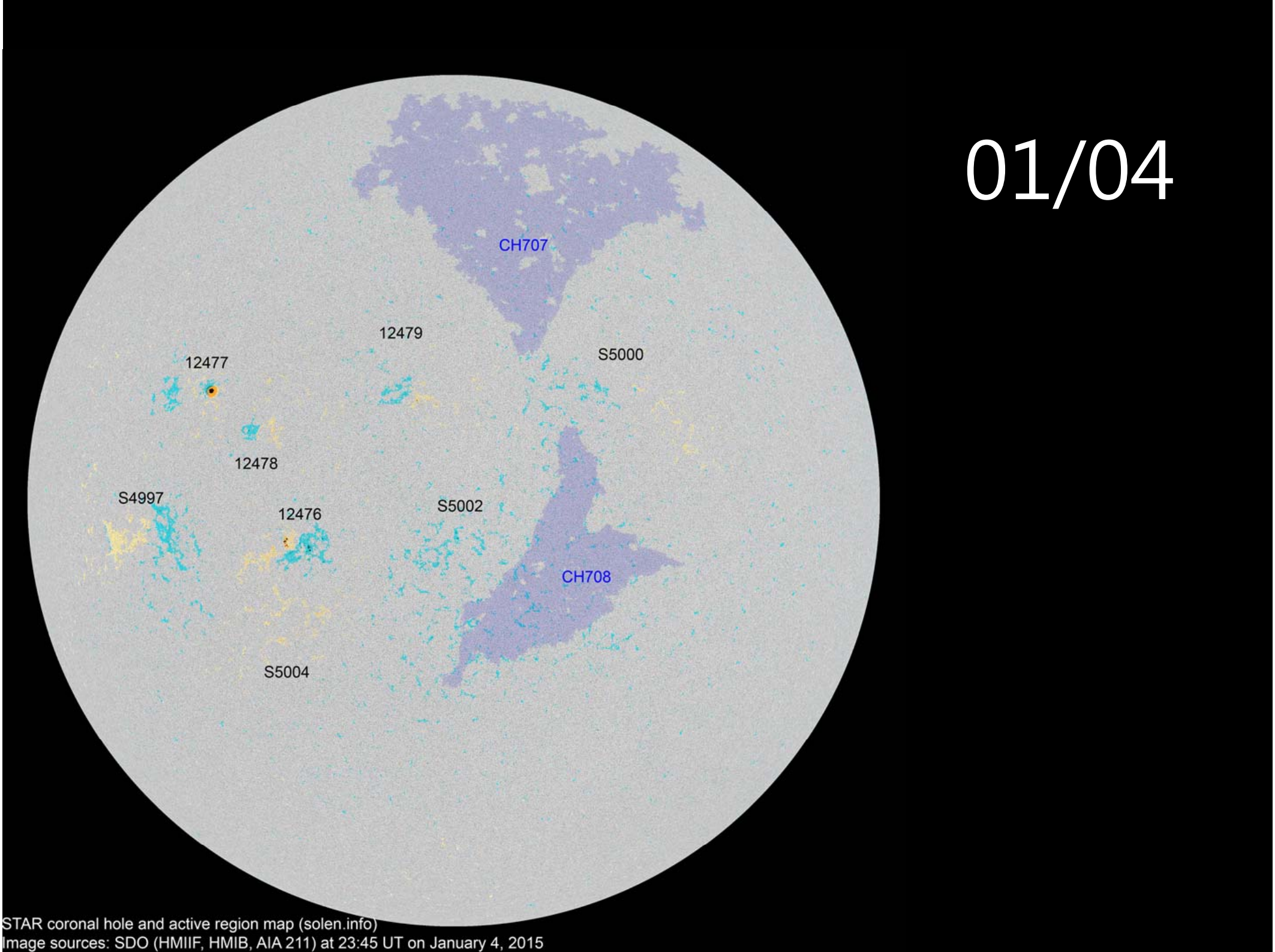
Poleward of 55 deg geomagnetic latitude

POSSIBLE EFFECTS

Power Systems: Power grid fluctuations or voltage alarms
Spacecraft: Orientation irregularities. Increased drag on low-Earth orbiters
Radio: HF propagation can fade
Other: Aurora may be visible as low as New York to Wisconsin to Washington state




01/03
CH707
12477
S4996
S5000
12478
S4997
12476
S5002
CH708
STAR coronal hole and active region map (solen.info)
Image sources: SDO (HMIIF, HMIB, AIA 211) at 23:45 UT on January 3, 2016


01/04
CH707
12479
12477
S5000
12478
S4997
12476
S5002
CH708
S5004
STAR coronal hole and active region map (solen.info)
Image sources: SDO (HMIIF, HMIB, AIA 211) at 23:45 UT on January 4, 2015

01/05 因為日冕洞朝著地球的預警

G1

PRIMARY AREA of IMPACTS

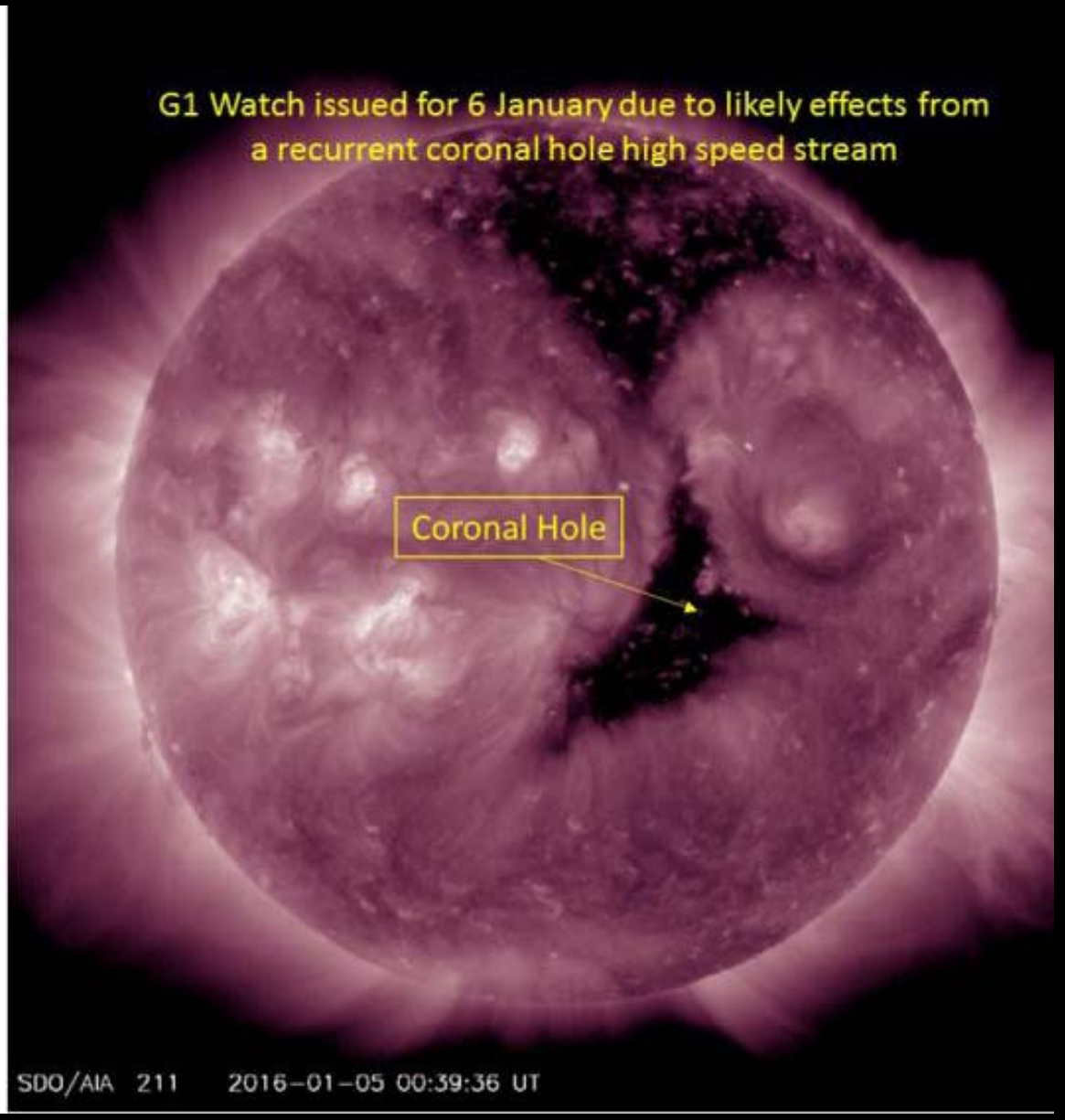
Poleward of 60 deg geomagnetic latitude

POSSIBLE EFFECTS

Power Systems: Weak power grid fluctuations

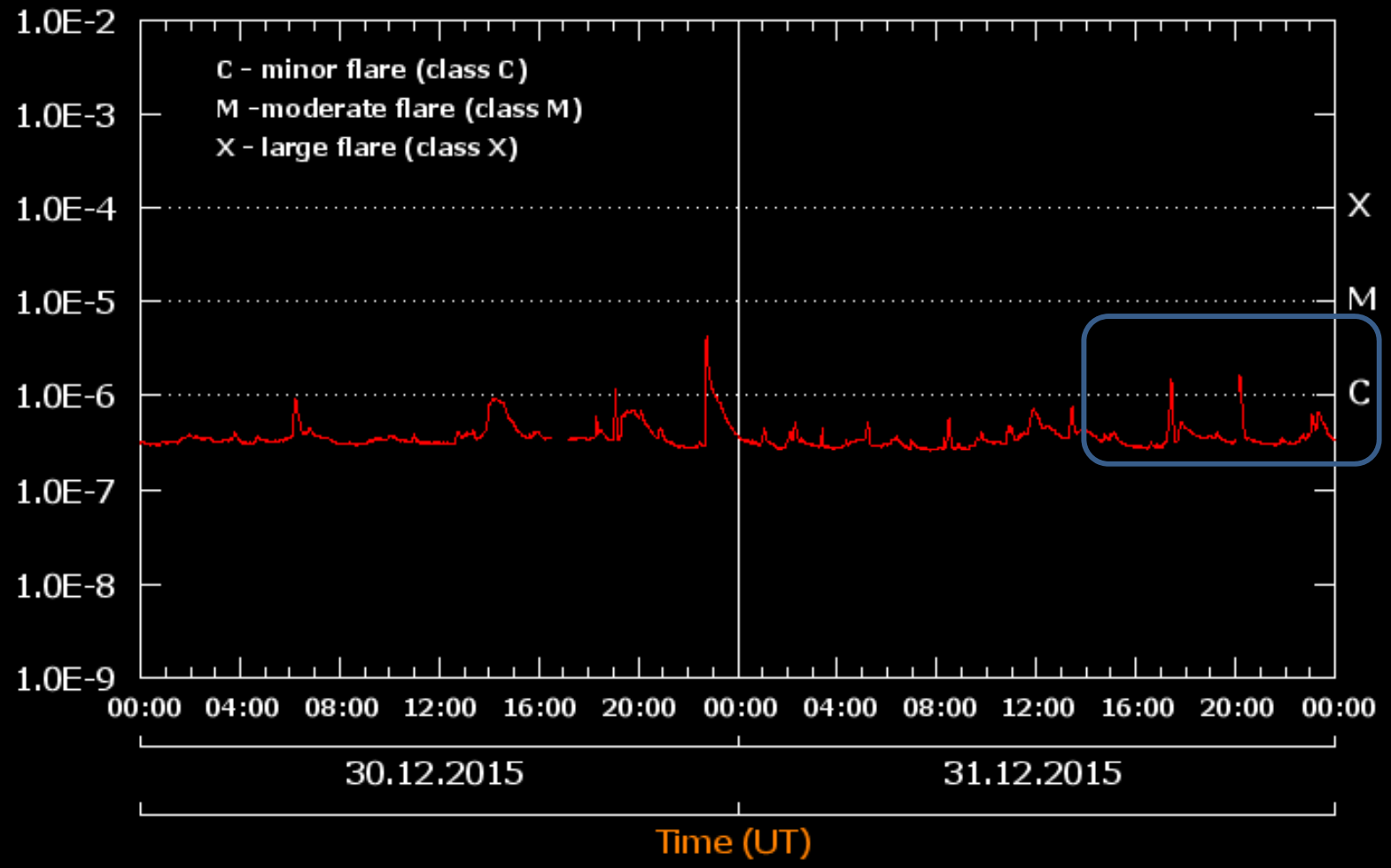
Spacecraft: Minor impact on satellite operations

Other: Aurora may be visible at high latitudes (i.e. northern Michigan and Maine)



一周的太陽閃焰活動

12/31

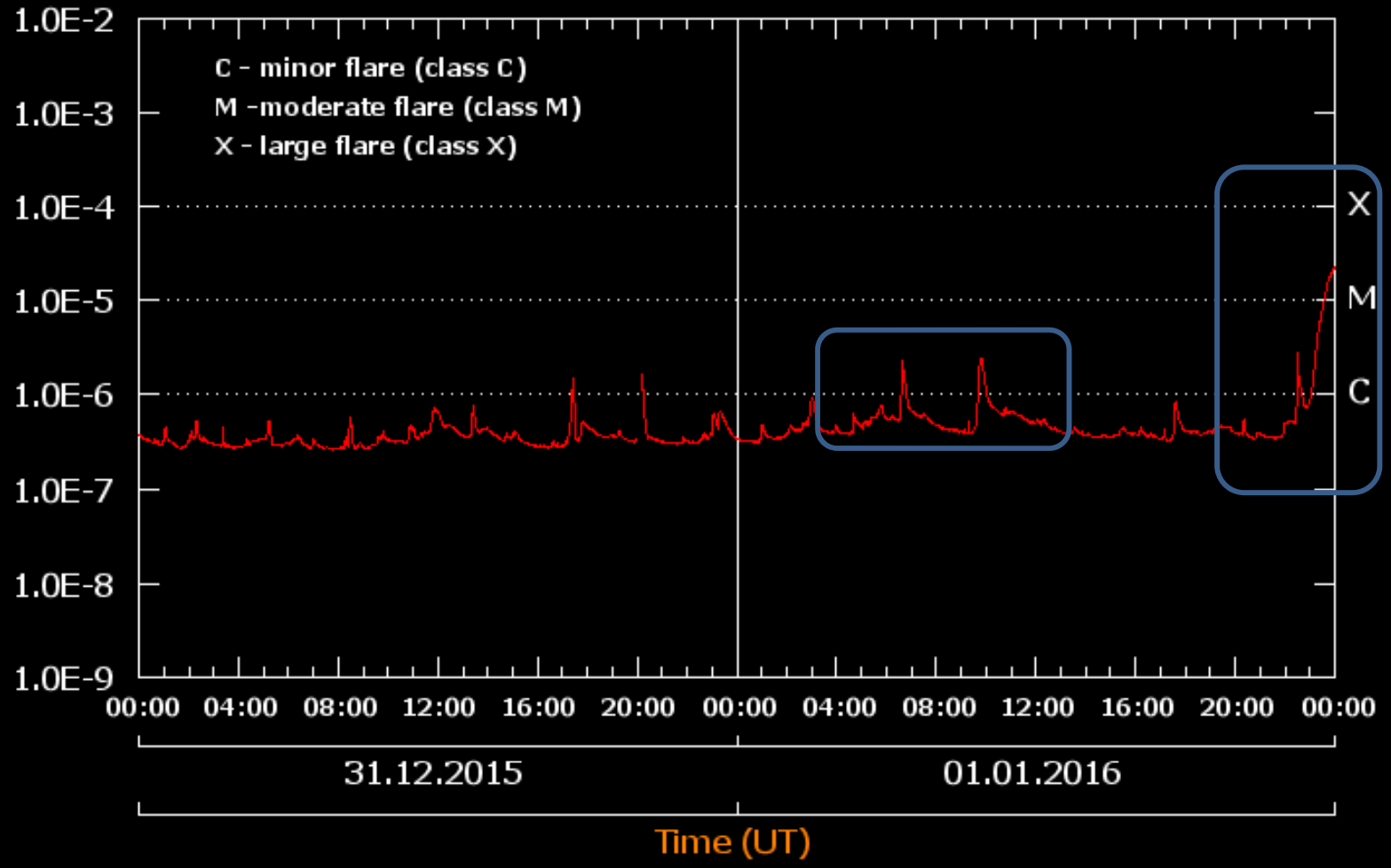


Solar flares today

Today, **2 solar flares** were observed:

	Active region	Begin, UT	Max, UT	End, UT
Flare of class C1.4	2473	17:19:00	17:25:00	17:28:00
Flare of class C1.6	2473	19:57:00	20:11:00	20:15:00

01/01

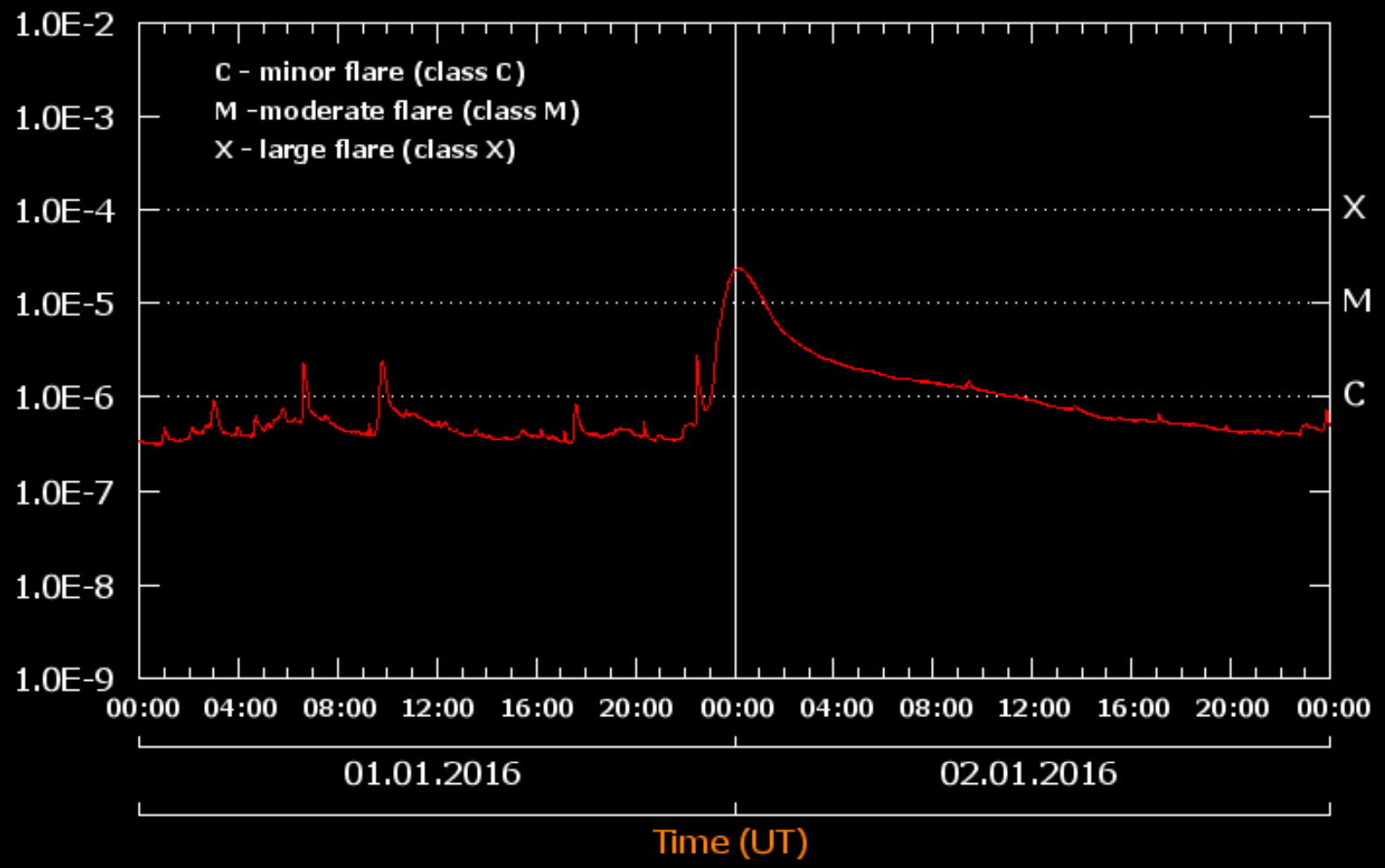


Solar flares today

Today, **4 solar flares** were observed:

	Active region	Begin, UT	Max, UT	End, UT
Flare of class C2.3	2473	06:33:00	06:38:00	06:43:00
Flare of class C2.4	2473	09:36:00	09:48:00	09:56:00
Flare of class C2.7	2473	22:25:00	22:30:00	22:33:00
Flare of class M2.3	2473	23:10:00	00:11:00	01:01:00

01/02



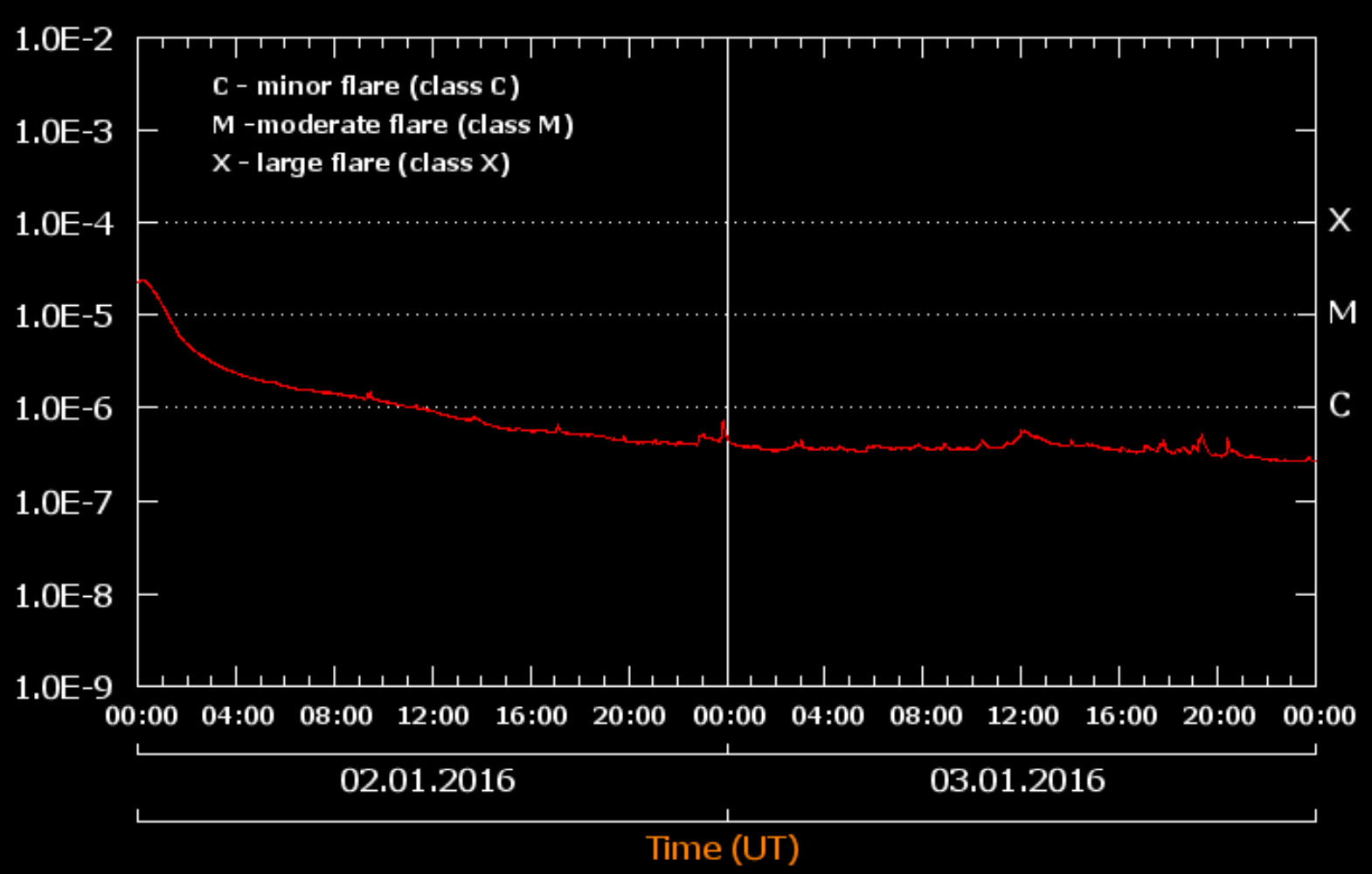
Solar flares today

No solar flares of C, M and X-class were observed today

發生在昨天，但最大值在1/2

Flare	Date	Time	Region
M2.3	01/02/2016	00:11	2473

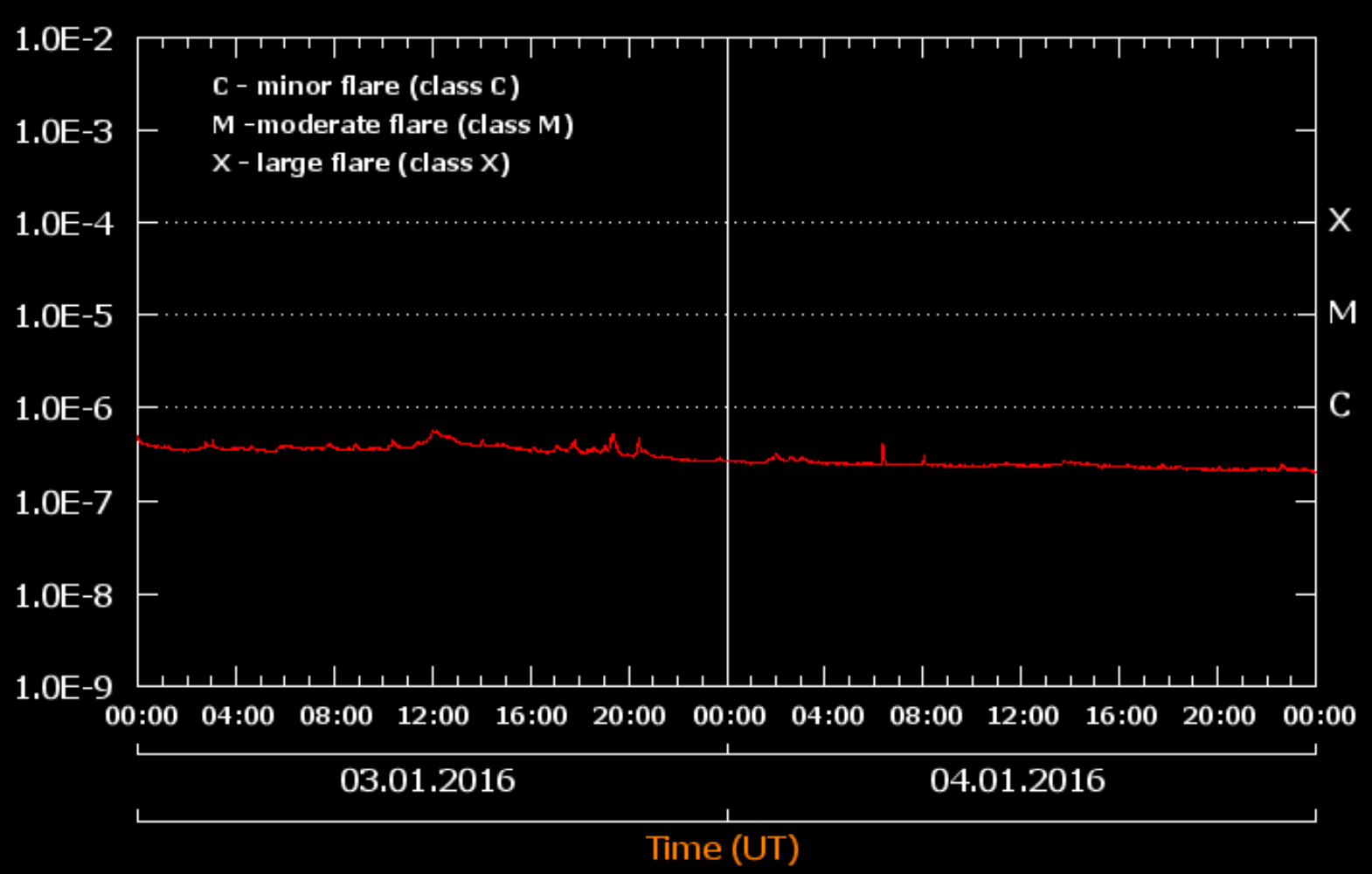
01/03



Solar flares today

No solar flares of C, M and X-class were observed today

01/04



Solar flares today

No solar flares of C, M and X-class were observed today

不同波段下觀測到的太陽
(1/2的太陽為例)

看日冕洞和CME

AIA 193

位置：日冕

波長：193Å(埃)

溫度：克氏125萬度

較亮的區域為太陽表面活耀的區域，也可以是太陽閃焰或是日冕物質拋射事件發生的區域。較暗的地區為日冕洞，是輻射較弱的區域，卻是太陽風的主要來源。

似左方

AIA 335

位置：日冕表層

波長：355Å(埃)

溫度：克氏280萬度

與AIA 193的觀測類似，但是能更突顯日冕活耀的區域。

AIA 171

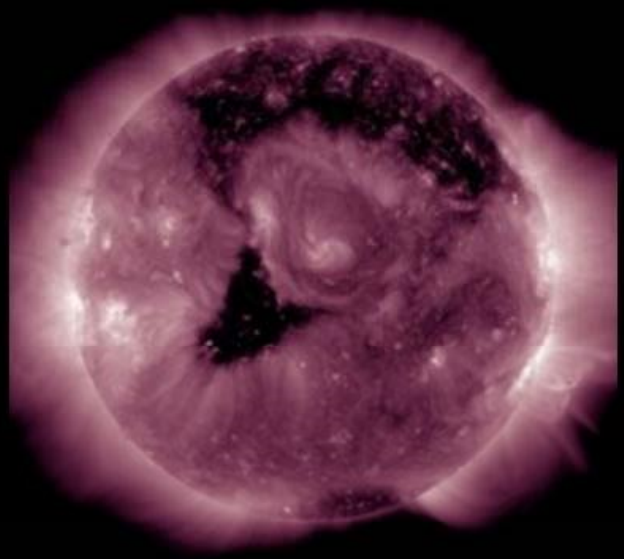
位置：日冕底層

波長：171Å(埃)

溫度：克氏100萬度

這個波段可以清楚的觀察到電漿受到太陽磁場作用所形成的環形結構。較亮的區域表示磁場靠近太陽表面，相對磁力也比較強。

看電漿受磁場作用
所形成的環形結構



AIA 211

位置：日冕表層

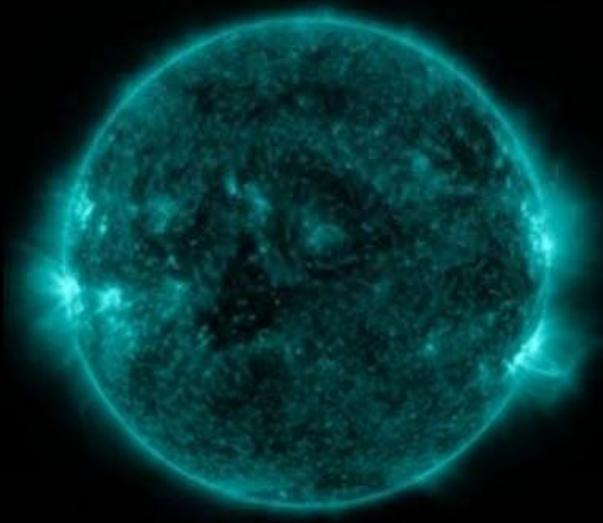
波長：211Å(埃)

溫度：克氏200萬度

與AIA 193的觀測類似，但是能更突顯日冕活耀的區域。

似左上

看太陽閃焰的結構



AIA 131

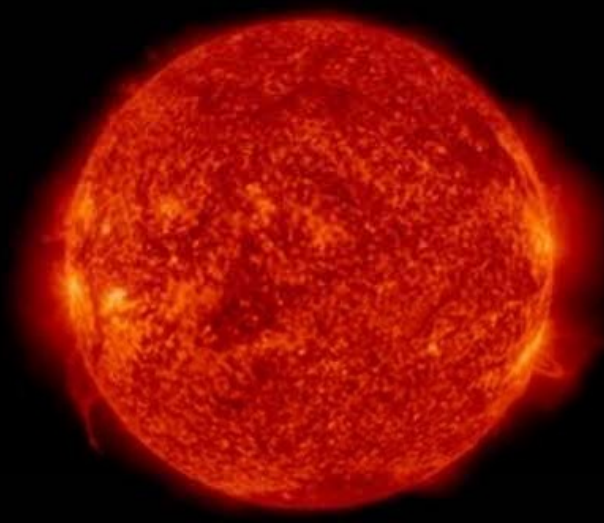
位置：太陽閃焰

波長：131Å(埃)

溫度：克氏1千萬度

在這個波段的觀測，可以觀測到太陽閃焰的細微結構與發展。

看電漿濃度



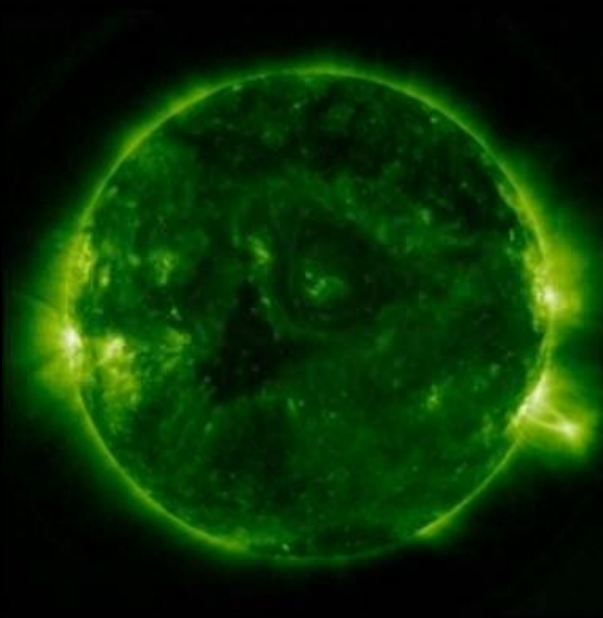
AIA 304

位置：彩球層上部

波長：304Å(埃)

溫度：克氏5萬度

所觀測到的區域可稱為是太陽的表面，其中較亮的區域表示電漿濃度較高。



AIA 094

位置：太陽閃焰

波長：94Å(埃)

溫度：克氏600萬度

在這個波段的觀測，可以觀測到太陽閃焰的細微結構與發展。

似上方

AIA 1700

位置：光球層

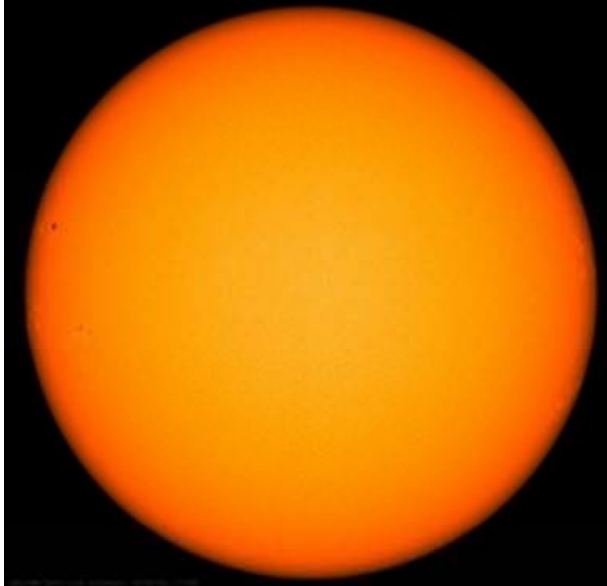
波長：1700Å(埃)

溫度：克氏6000度

在這個波段的觀測，可以觀測到太陽光球層，較亮的區域是磁力線比較集中的地方，通常都比較靠近太陽黑子附近。

看太陽黑子

看太陽黑子



HMI

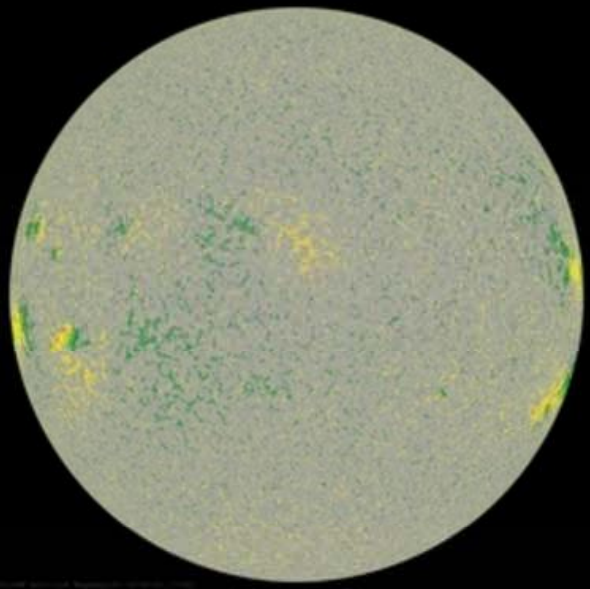
位置：光球層

波長：6173Å(埃)

溫度：克氏6000度

在這個波段的觀測，可以觀測到太陽光球層，較亮的區域是磁力線比較集中的地方，通常都比較靠近太陽黑子附近。

看太陽表面磁場方向



HMI Magnetogram

位置：光球層

波長：6173Å(埃)

溫度：克氏6000度

在這個波段的觀測，可以觀測到太陽表面的磁場方向，綠色的表示北向(出太陽表面)磁場，黃色代表南向(近太陽表面)的磁場方向。

參考資料

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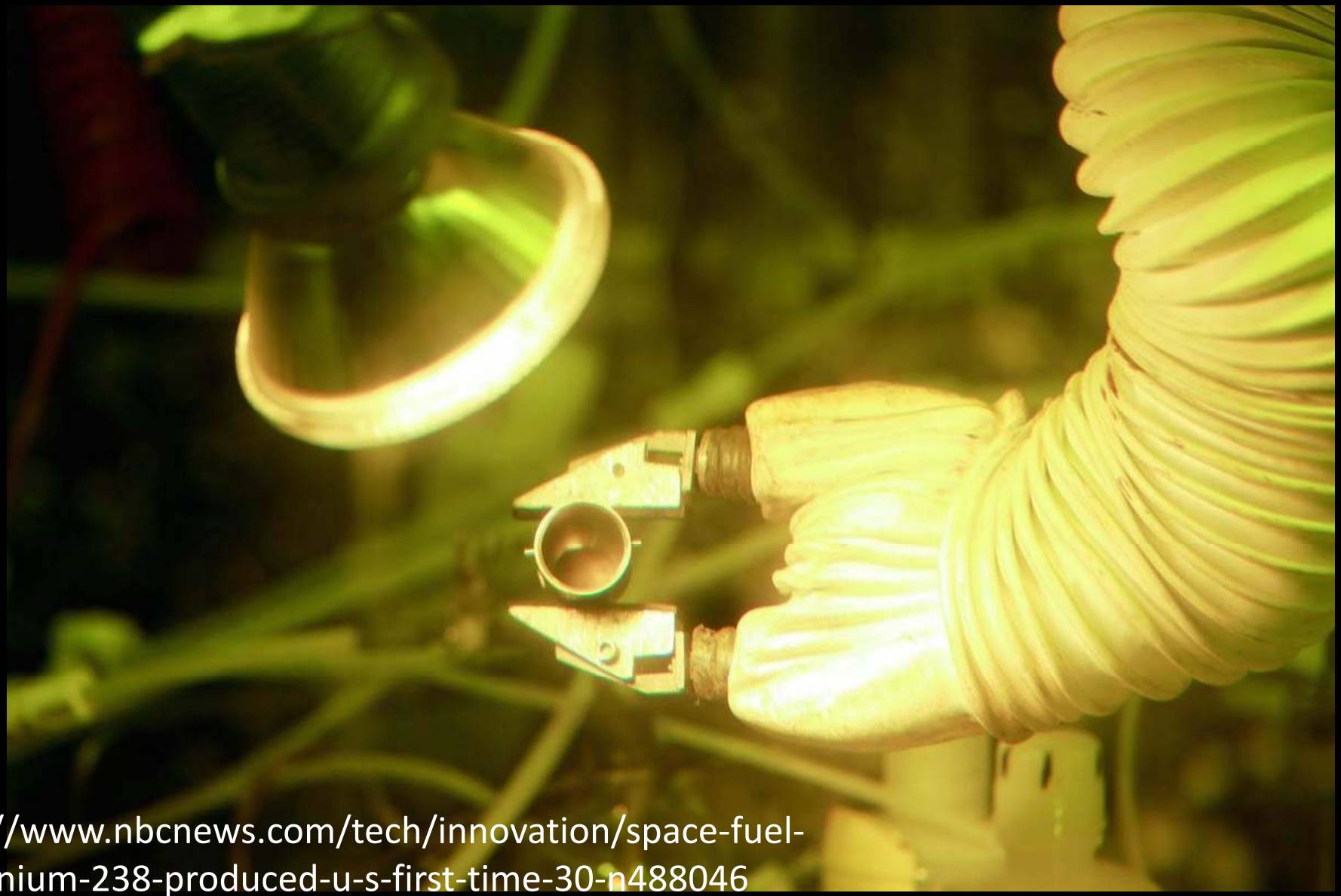
Space Fuel: Plutonium-238 Produced in U.S. for First Time in 30 Years

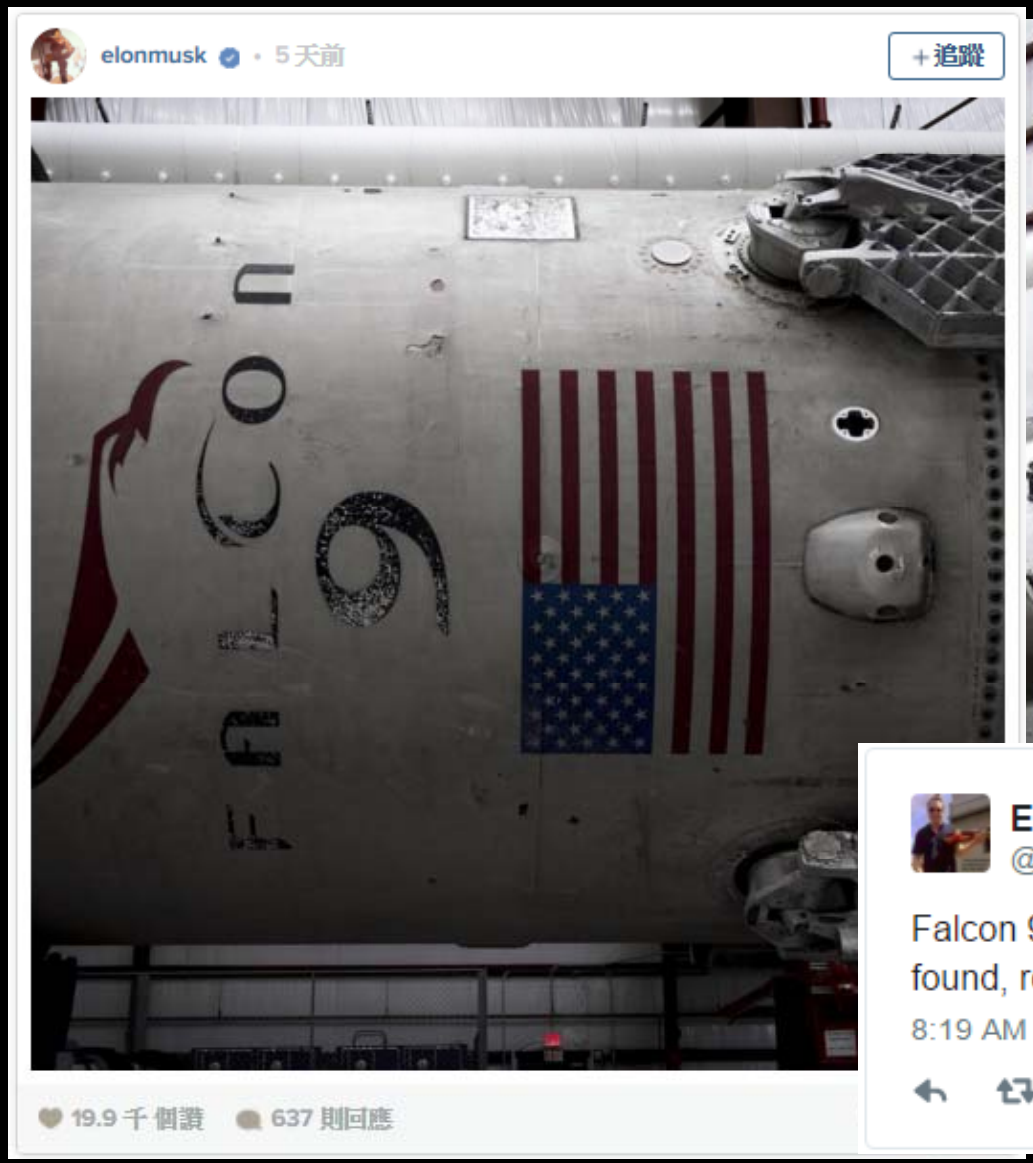


http://www.nbcnews.com/tech/innovation/space-fuel-plutonium-238-produced-u-s-first-time-30-n488046

Mars Orbiter Catches a Crater Full of Cracks

http://ne
catches-a

SpaceX Reports No Damage to Falcon 9 First Stage After Landing



Elon Musk
@elonmusk
Follow

Falcon 9 back in the hangar at Cape Canaveral. No damage found, ready to fire again. instagram.com/p/_-d28bQEc9/

8:19 AM - 1 Jan 2016

5,361 10,652

SPACEX TESTS A REUSABLE ROCKET
FALCON 9 FLY-BACK BOOSTER

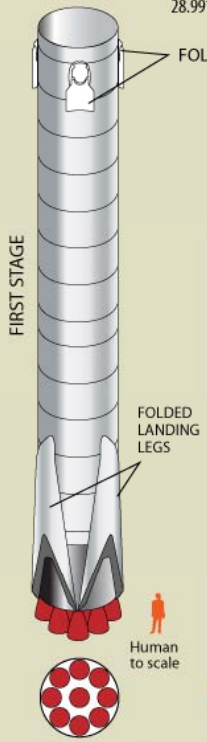
SpaceX is developing the capability for its Falcon 9 booster rocket to fly back to a safe landing for refueling and reuse. This would cut launch costs tremendously. In previous government and private rocket launches, spent boosters were discarded into the ocean or into space (with some exceptions, such as the space shuttle solid fuel boosters, which were recovered and reused).

Powered by one Merlin 1D engine, the second stage can be restarted multiple times to place payloads into orbit.

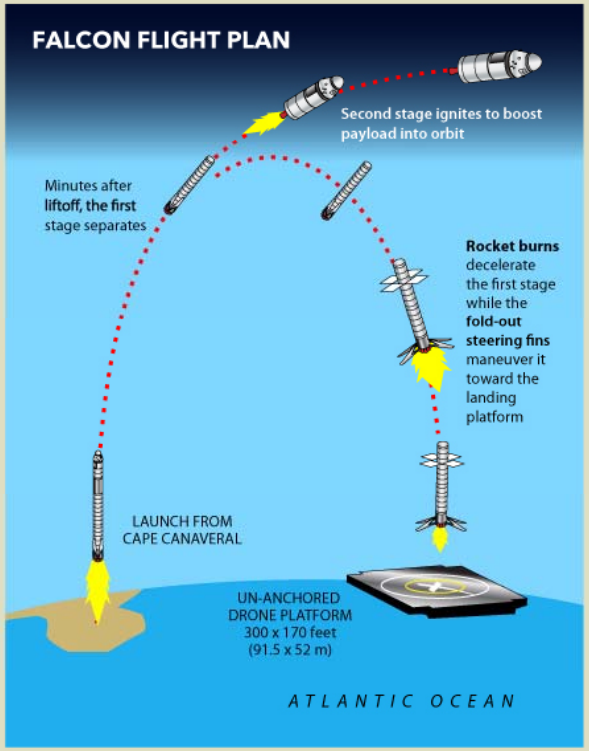
FALCON 9 v1.1

- Height: 224.4 feet (68.4 meters)
- Diameter: 12 feet (3.7 m)
- Mass: 1.1 million lbs. (505,846 kilograms)
- Fuel: Kerosene with liquid oxygen oxidizer
- Payload to low Earth orbit: 28,991 lbs. (13,150 kg)

Attempt to land a Falcon 9 booster on Jan. 10, 2015, ended in a crash after the booster ran out of hydraulic fluid for the steering fins.



Arrangement of 9 Merlin 1D engines in the first stage



SOURCE: SPACEX

SPACE.COM

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