Space Weather Event Report
（2015.03.04@Fukuoka）

NICT space weather forecast between June, 2014 and March, 2015

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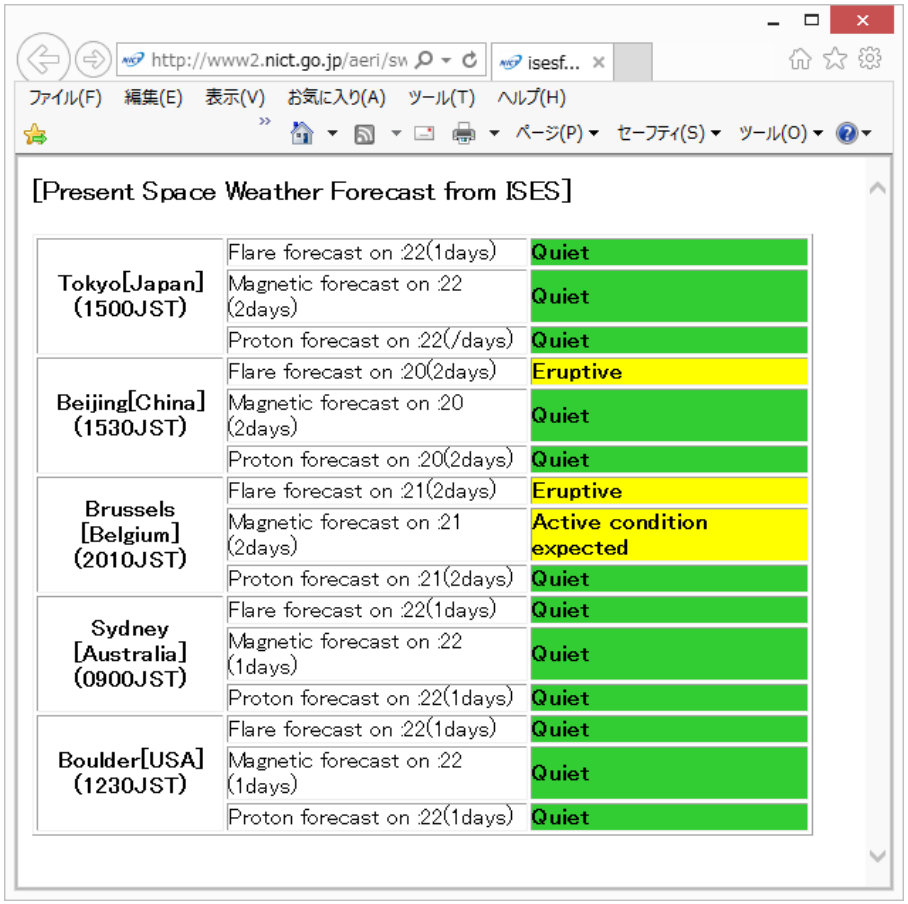
(NICT)

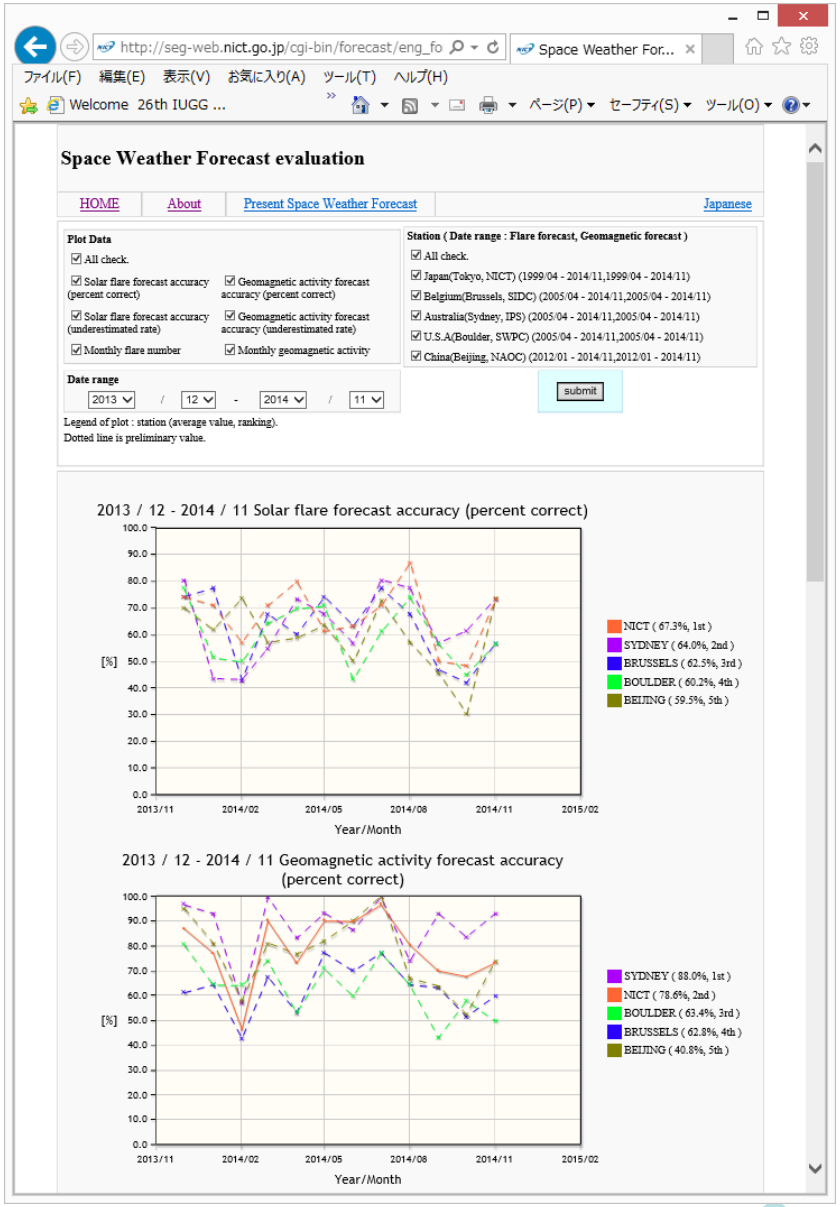
http://www2.nict.go.jp/aeri/swe/swx/swcenter/isesforecast_e.html

http://seg-web.nict.go.jp/cgi-bin/forecast/eng_forecast_score.cgi



[Present Space Weather Forecast from ISES]

Tokyo[Japan] (1500JST)	Flare forecast on :22(1days)	Quiet
	Magnetic forecast on :22 (2days)	Quiet
	Proton forecast on :22(/days)	Quiet
Beijing[China] (1530JST)	Flare forecast on :20(2days)	Eruptive
	Magnetic forecast on :20 (2days)	Quiet
	Proton forecast on :20(2days)	Quiet
Brussels [Belgium] (2010JST)	Flare forecast on :21(2days)	Eruptive
	Magnetic forecast on :21 (2days)	Active condition expected
	Proton forecast on :21(2days)	Quiet
Sydney [Australia] (0900JST)	Flare forecast on :22(1days)	Quiet
	Magnetic forecast on :22 (1days)	Quiet
	Proton forecast on :22(1days)	Quiet
Boulder[USA] (1230JST)	Flare forecast on :22(1days)	Quiet
	Magnetic forecast on :22 (1days)	Quiet
	Proton forecast on :22(1days)	Quiet



Space Weather Forecast evaluation

HOME | About | Present Space Weather Forecast | Japanese

Plot Data

All check.

Solar flare forecast accuracy (percent correct)

Geomagnetic activity forecast accuracy (percent correct)

Solar flare forecast accuracy (underestimated rate)

Geomagnetic activity forecast accuracy (underestimated rate)

Monthly flare number

Monthly geomagnetic activity

Station (Date range : Flare forecast, Geomagnetic forecast)

All check.

Japan(Tokyo, NICT) (1999/04 - 2014/11,1999/04 - 2014/11)

Belgium(Brussels, SIDC) (2005/04 - 2014/11,2005/04 - 2014/11)

Australia(Sydney, IPS) (2005/04 - 2014/11,2005/04 - 2014/11)

U.S.A(Boulder, SWPC) (2005/04 - 2014/11,2005/04 - 2014/11)

China(Beijing, NAOC) (2012/01 - 2014/11,2012/01 - 2014/11)

Date range: 2013 / 12 - 2014 / 11

submit

Legend of plot : station (average value, ranking).

Dotted line is preliminary value.

2013 / 12 - 2014 / 11 Solar flare forecast accuracy (percent correct)

NICT (67.3%, 1st)
SYDNEY (64.0%, 2nd)
BRUSSELS (62.5%, 3rd)
BOULDER (60.2%, 4th)
BEIJING (59.5%, 5th)

[%]

Year/Month

2013 / 12 - 2014 / 11 Geomagnetic activity forecast accuracy (percent correct)

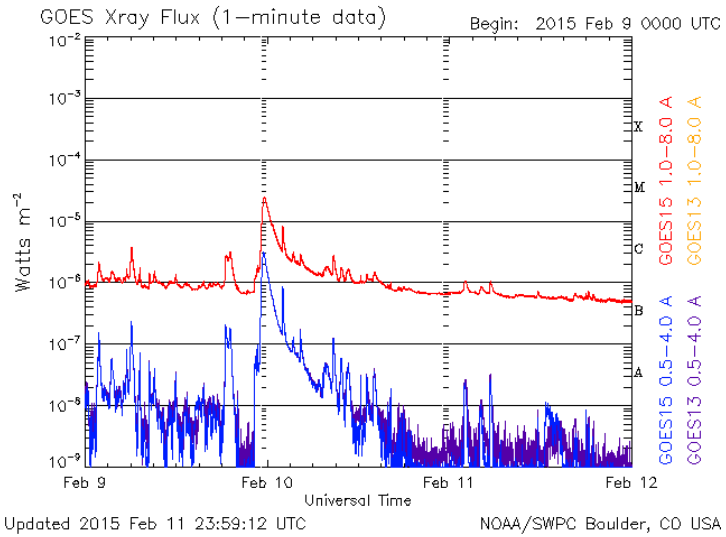
SYDNEY (88.0%, 1st)
NICT (78.6%, 2nd)
BOULDER (63.4%, 3rd)
BRUSSELS (62.8%, 4th)
BEIJING (40.8%, 5th)

[%]

Year/Month

Flare forecast of regional warning centers (RWCs) of International Space Environment Service (ISES)

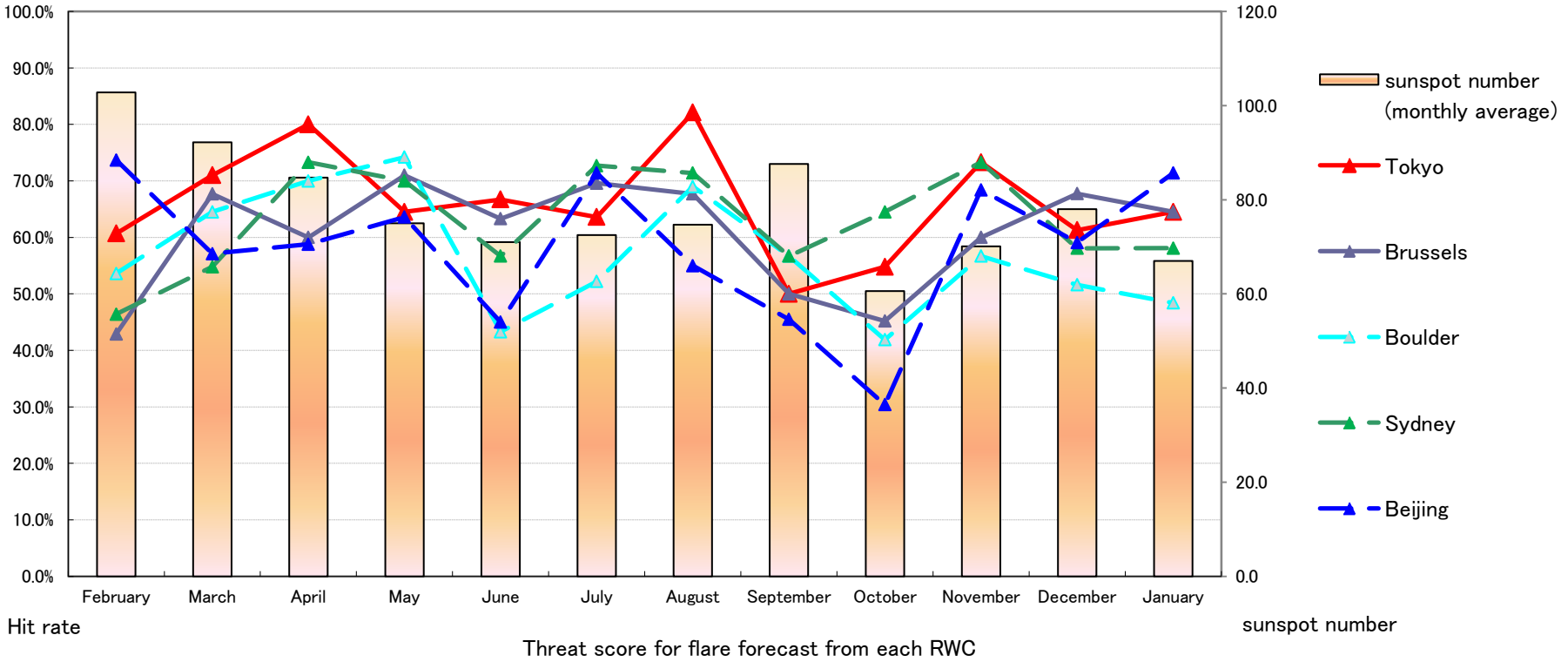
Flare forecast	Definition
Quiet	Probability of C class flares<50%
Eruptive	C class flares expected (Probability≥50%)
Active	M class flares expected (Probability≥50%)
Major flares expected	X class flares expected (Probability≥50%)
Proton flares expected	Proton flares expected (Probability ≥50%)
Warning condition	Activity levels expected to increase, but no numerical forecast given



Magnetic forecast of regional warning centers (RWCs) of International Space Environment Service (ISES)

Magnetic forecast	Definition
Quiet	
Active condition expected	A ≥20 or K=4
Minor magstorm expected	A ≥30 or K=5
Major magstorm expected	A ≥50 or K=6
Severe magstorm expected	A ≥100 or K=7
Warning condition	Activity levels expected to increase, but no numerical forecast given

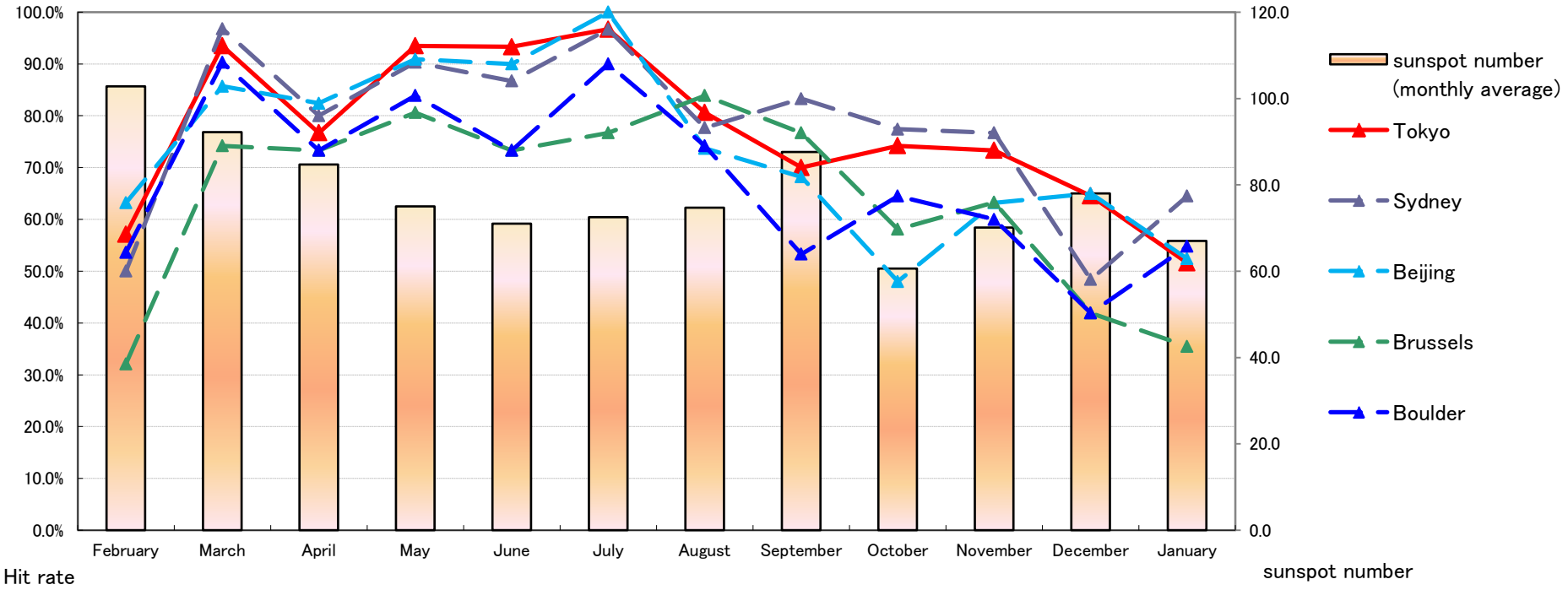
Hit rate of flare forecast



Threat score for flare forecast from each RWC

	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.
Persistence	60.0%	64.5%	77.4%	43.3%	45.2%	76.7%	51.6%	61.3%

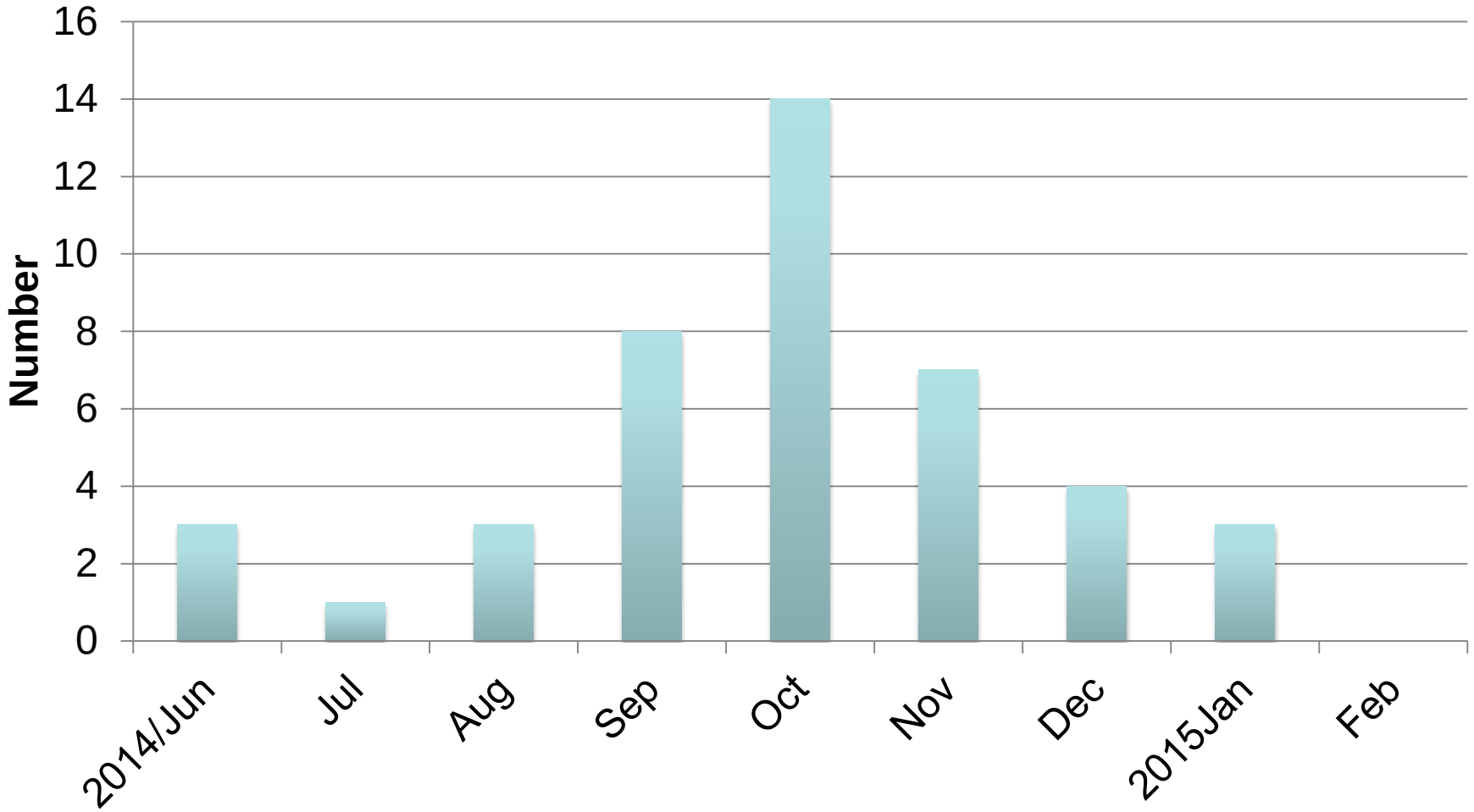
Hit rate of geomagnetic disturbance



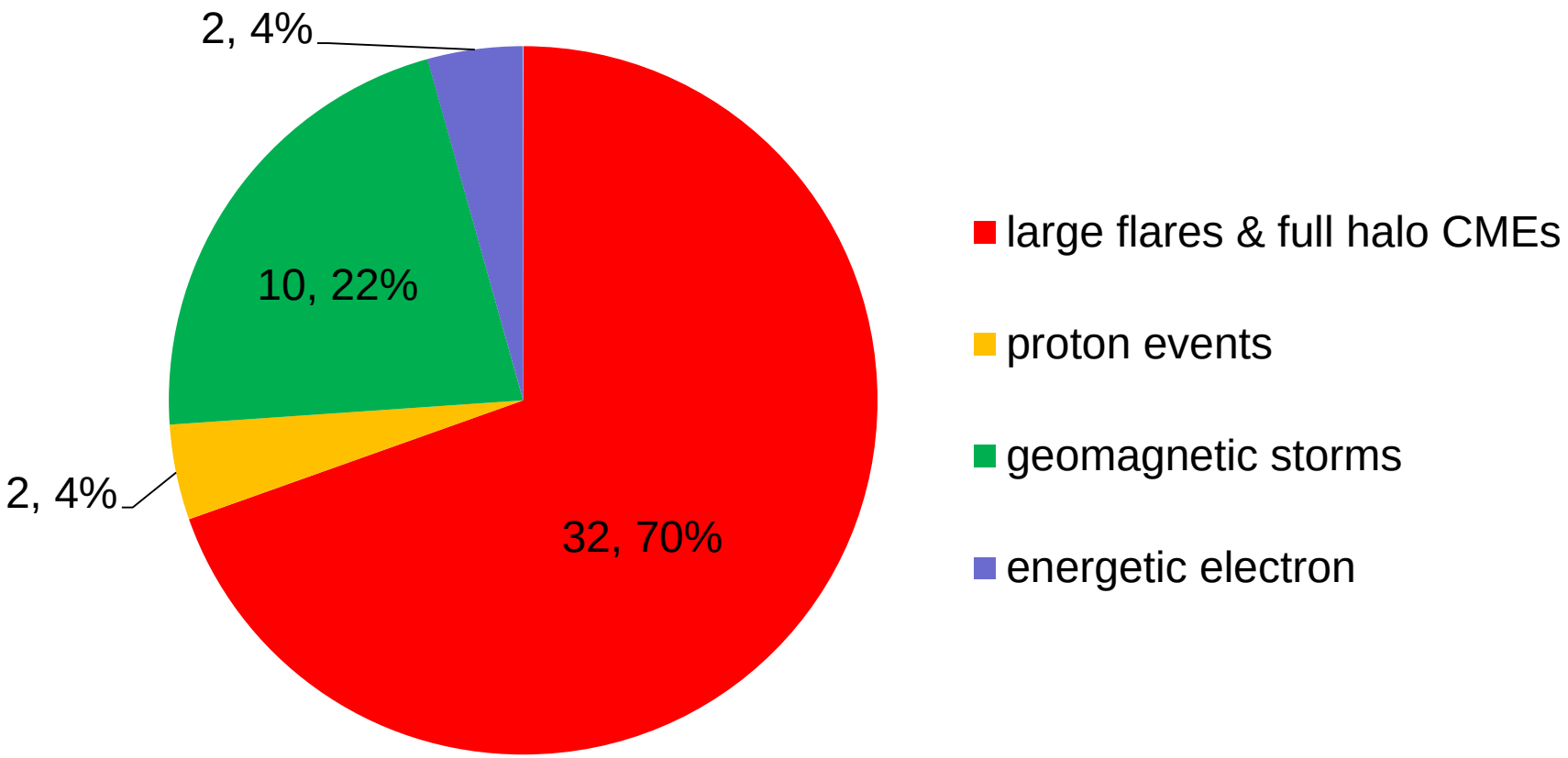
Hit rate for forecast of geomagnetic disturbance from each RWC

	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.
Persistence	90.0%	93.3%	83.9%	63.3%	61.3%	63.3%	61.3%	45.2%

Number of special reports from NICT

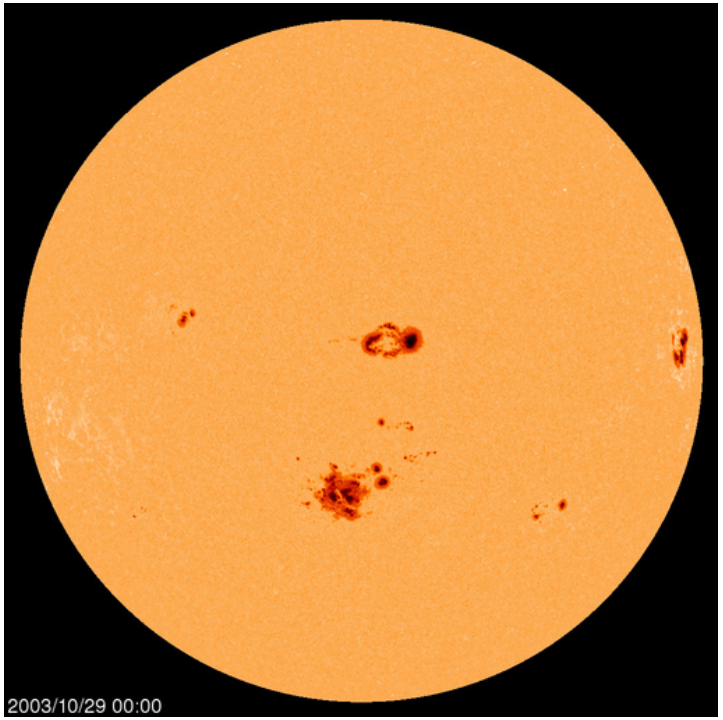


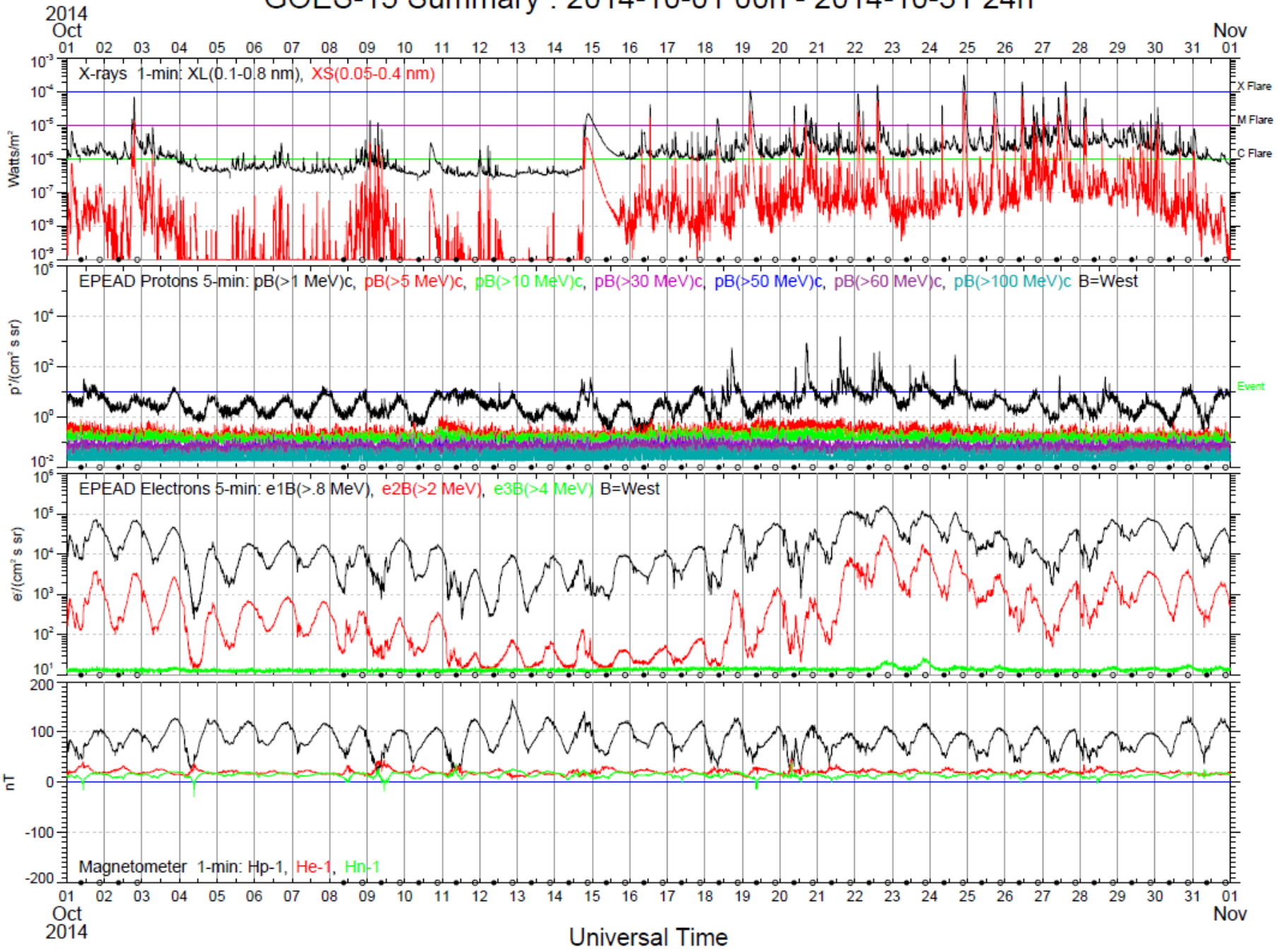
Contents of special reports（since Jun., 2014）



NOAA/AR12192 (SDO/HMI)

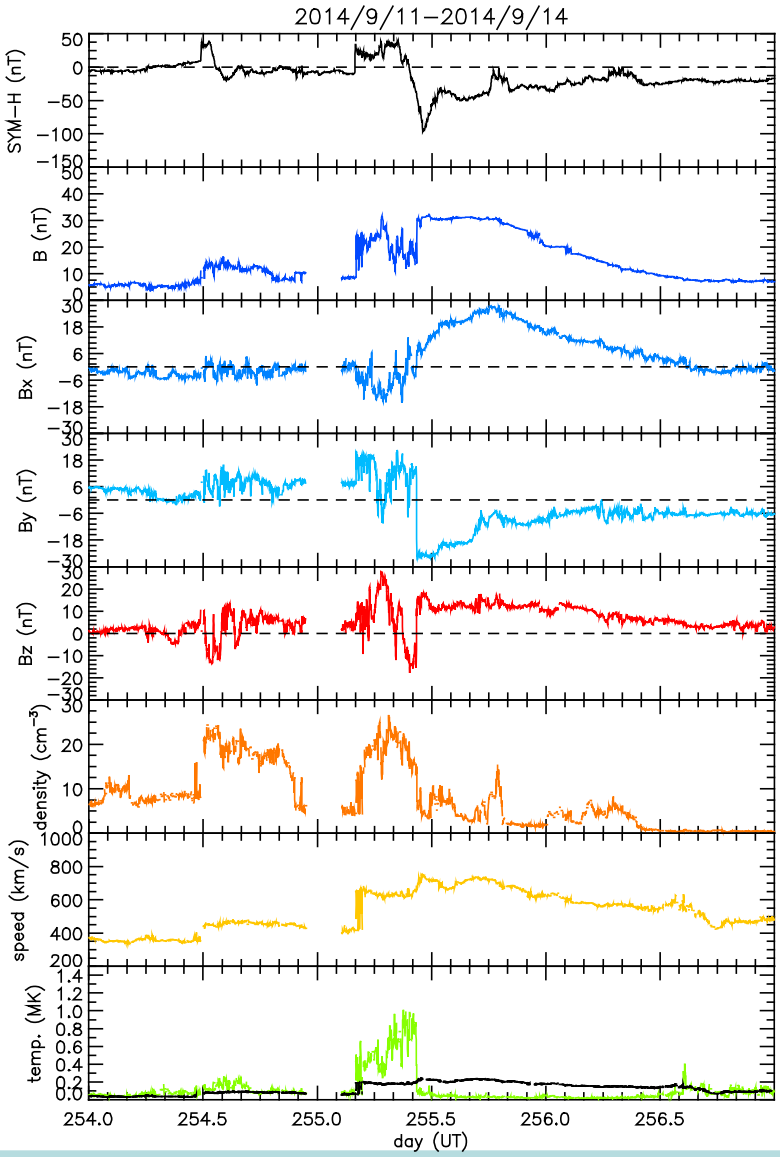
2003/10/29 (SOHO/MDI)



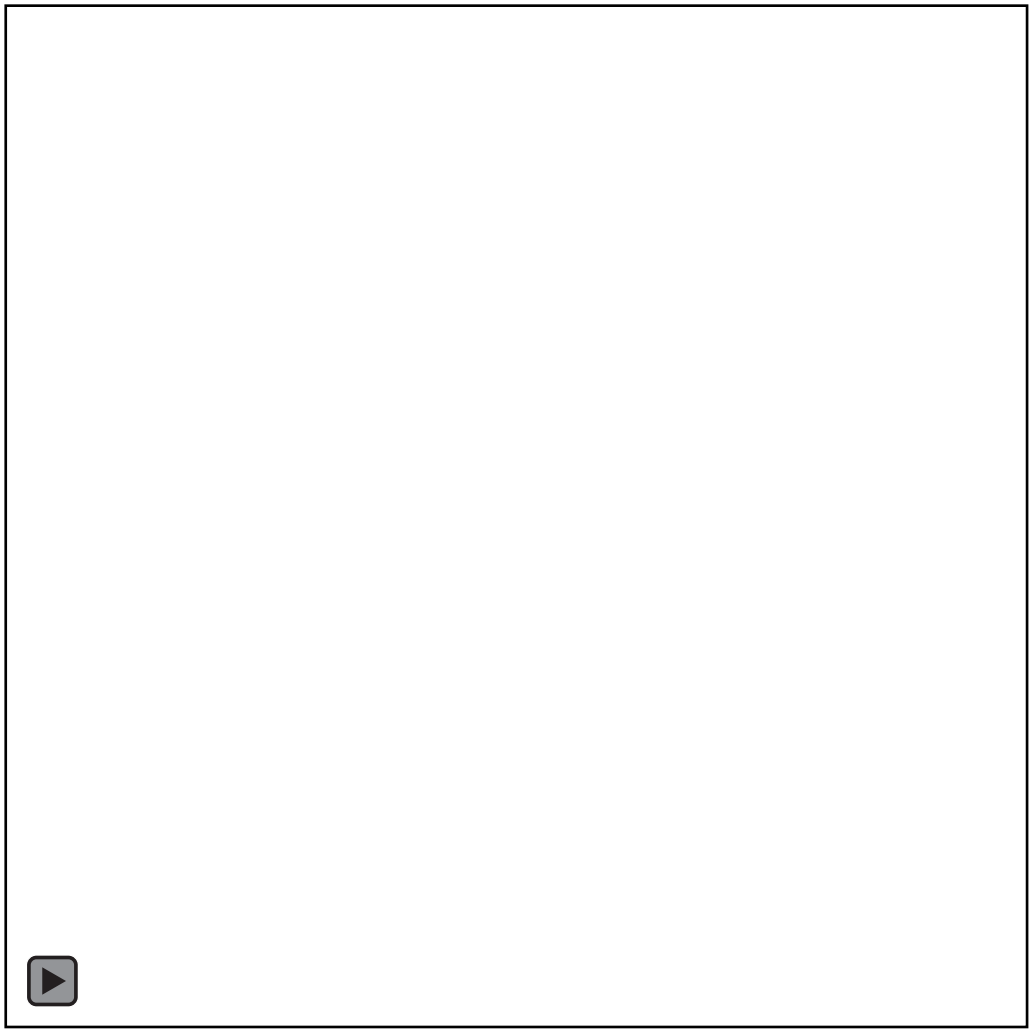

GOES-15 Summary : 2014-10-01 00h - 2014-10-31 24h
2014
Oct
Nov
X-rays 1-min: XL(0.1-0.8 nm), XS(0.05-0.4 nm)
Watts/m²
X Flare
M Flare
C Flare
EPEAD Protons 5-min: pB(>1 MeV)c, pB(>5 MeV)c, pB(>10 MeV)c, pB(>30 MeV)c, pB(>50 MeV)c, pB(>60 MeV)c, pB(>100 MeV)c B=West
p+/(cm² s sr)
Event
EPEAD Electrons 5-min: e1B(>.8 MeV), e2B(>2 MeV), e3B(>4 MeV) B=West
e/(cm² s sr)
nT
Magnetometer 1-min: Hp-1, He-1, Hn-1
Universal Time

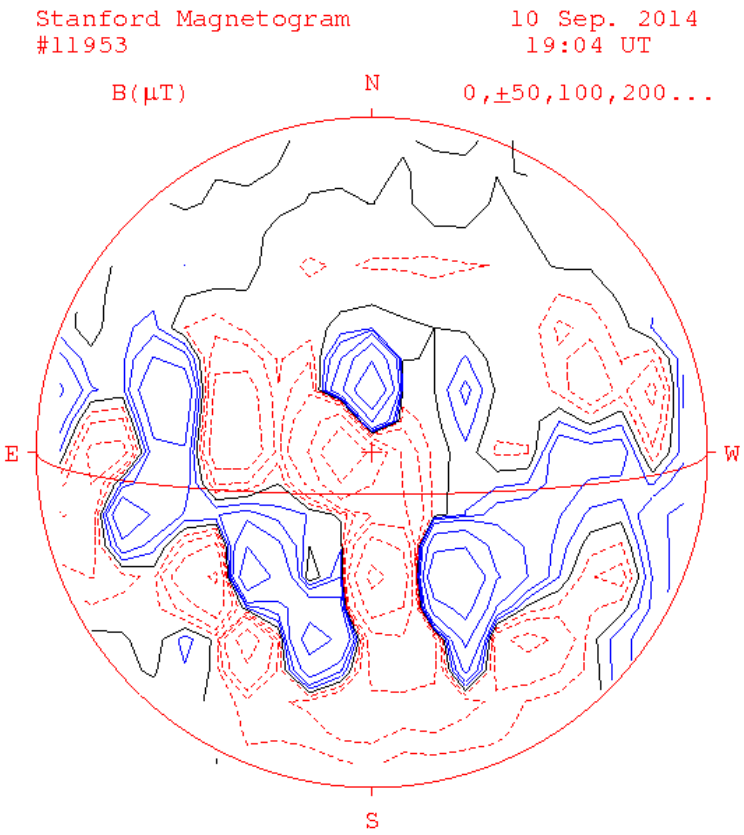
(B) South-wards IMF is important for occurrence of a intense geomagnetic storm

Problem: We need methods to predict southwards IMF.

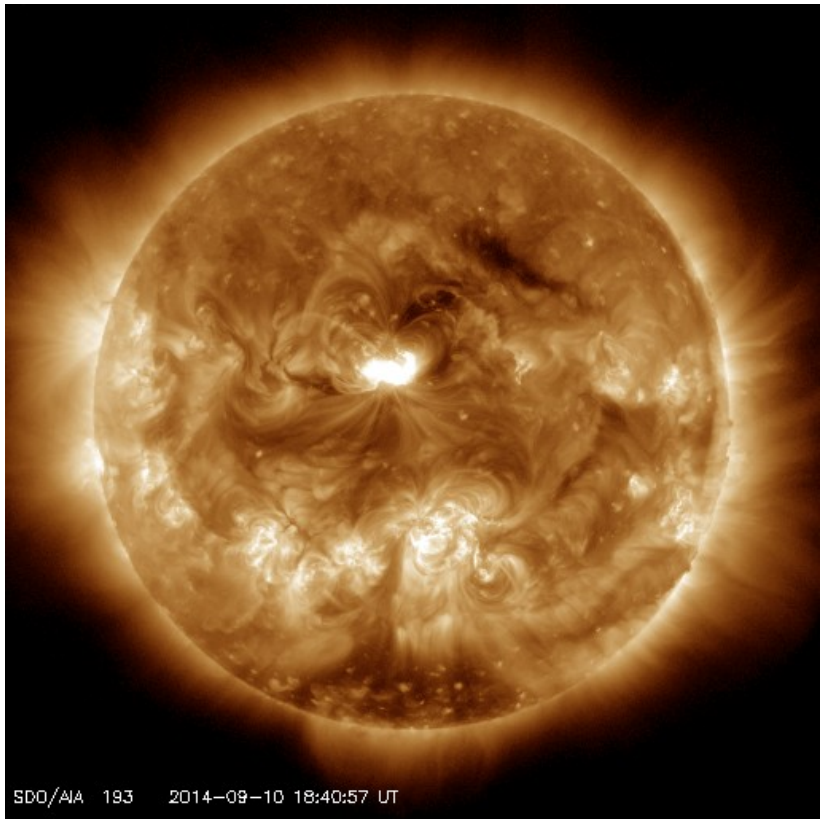


2014/09/10 (from SDO/AIA193)





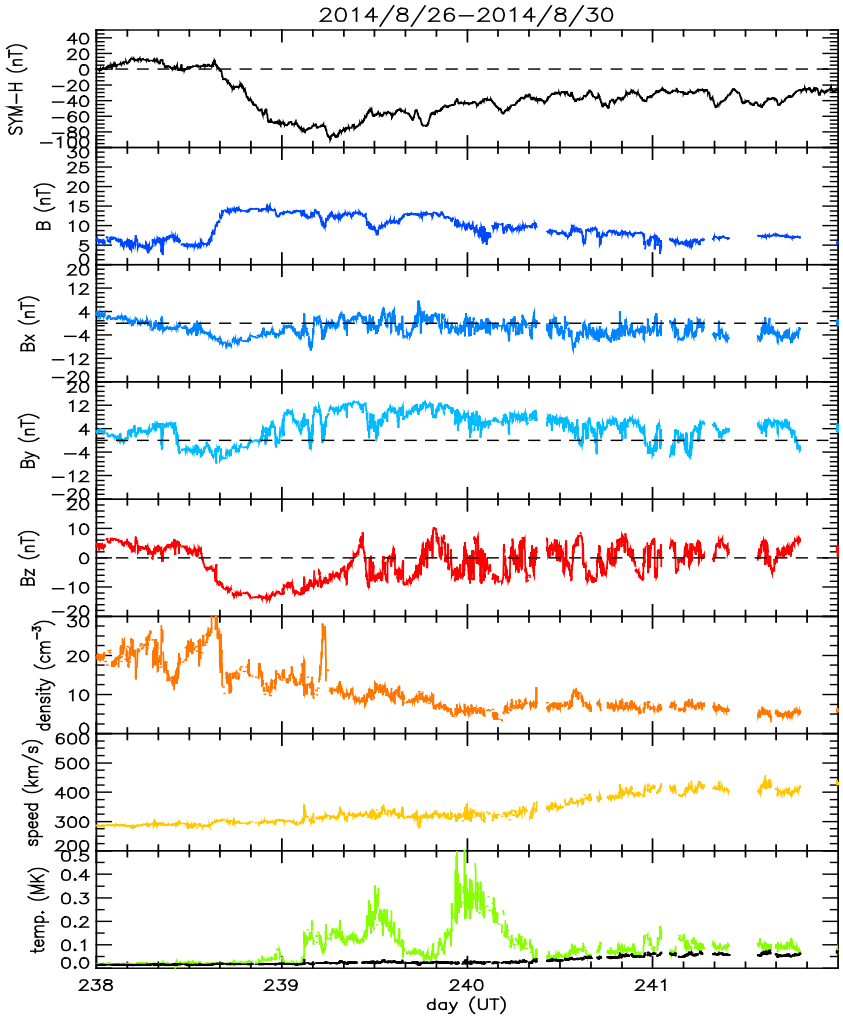
(from WSO)



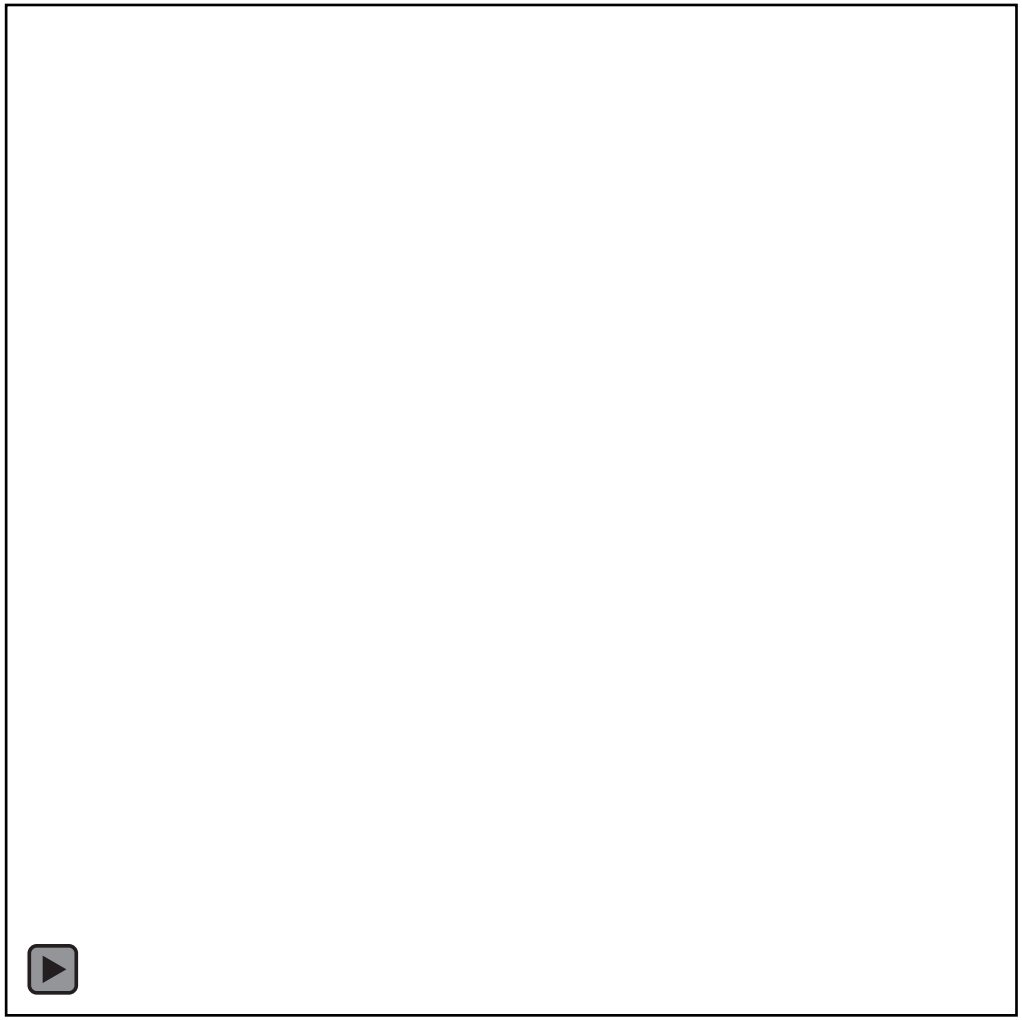
(from SDO/AIA193)

(A) Geomagnetic storm by a slow CME (approximately 300 km/s near the Earth)

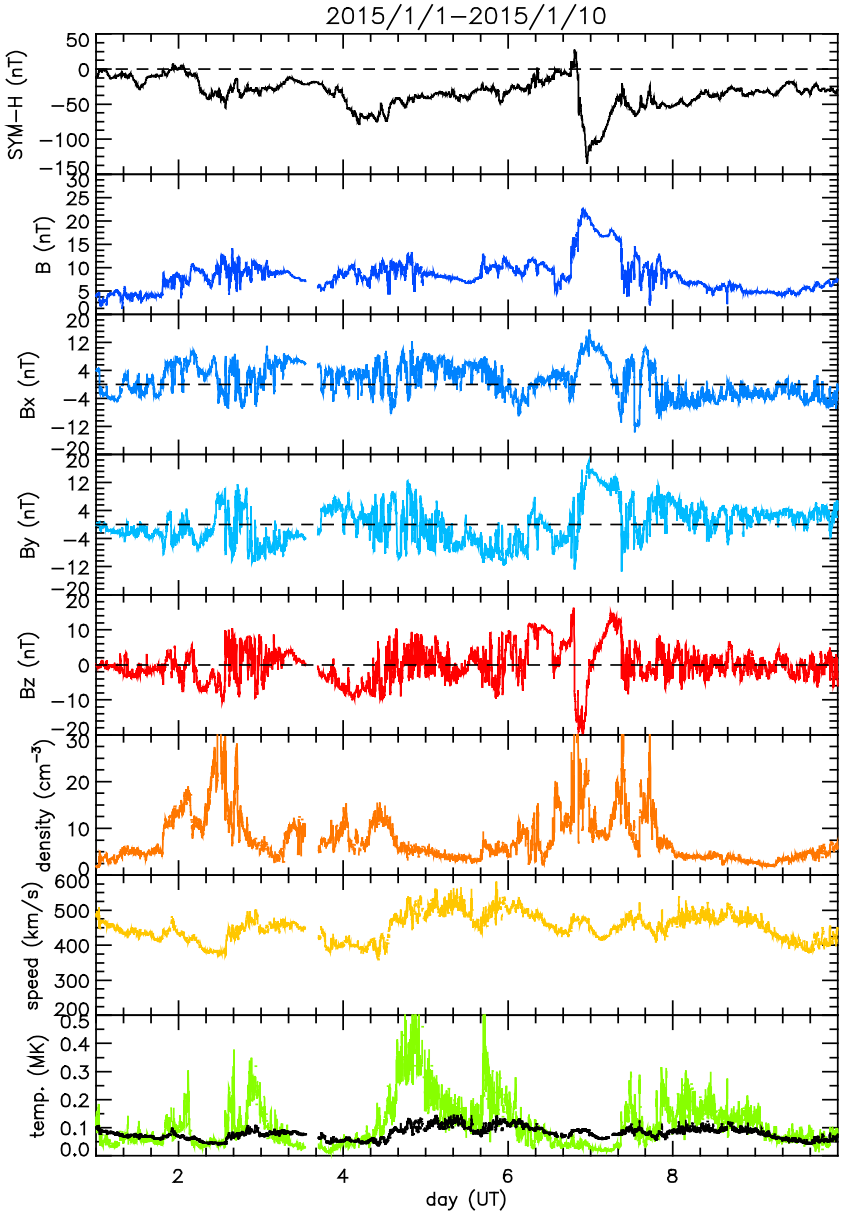
Problem: Signature of solar counter part is faint.



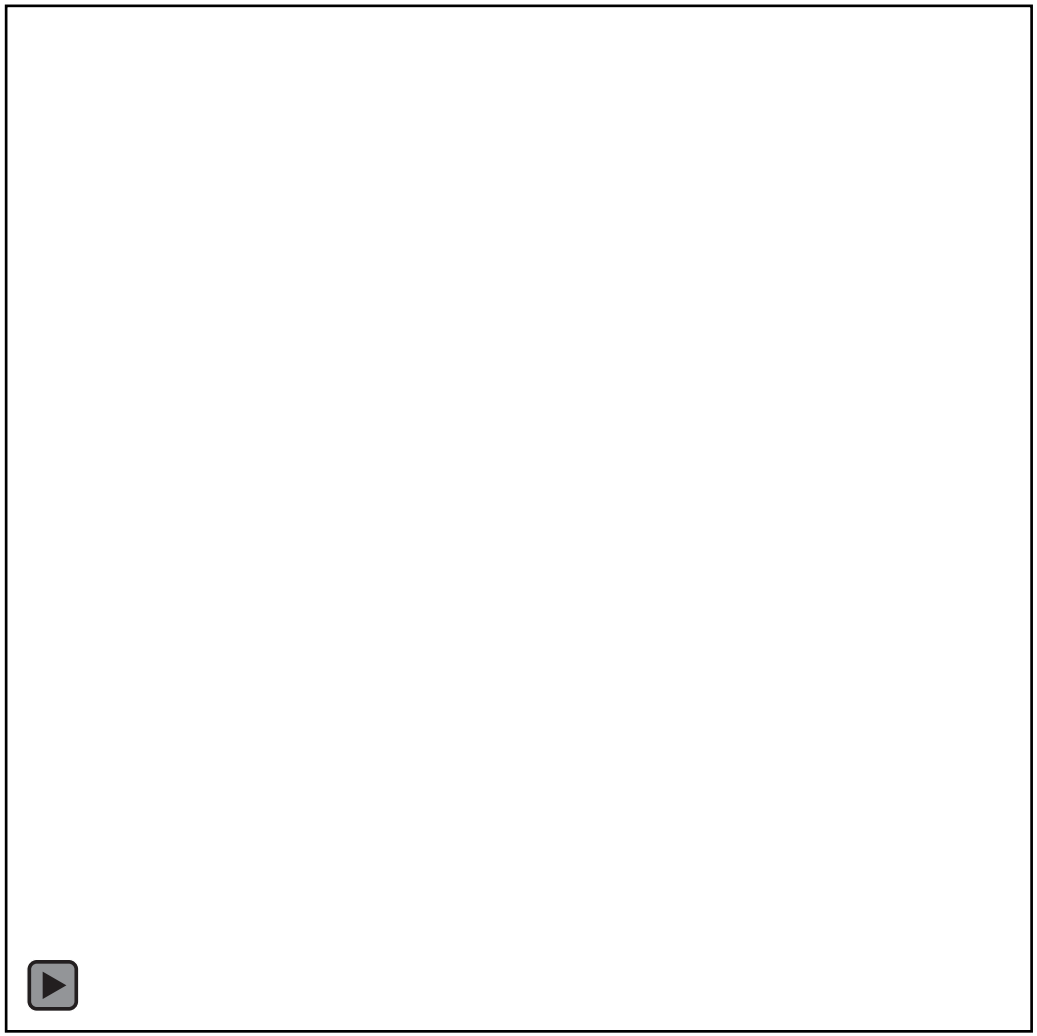
2014/08/22 (from SDO/AIA193)



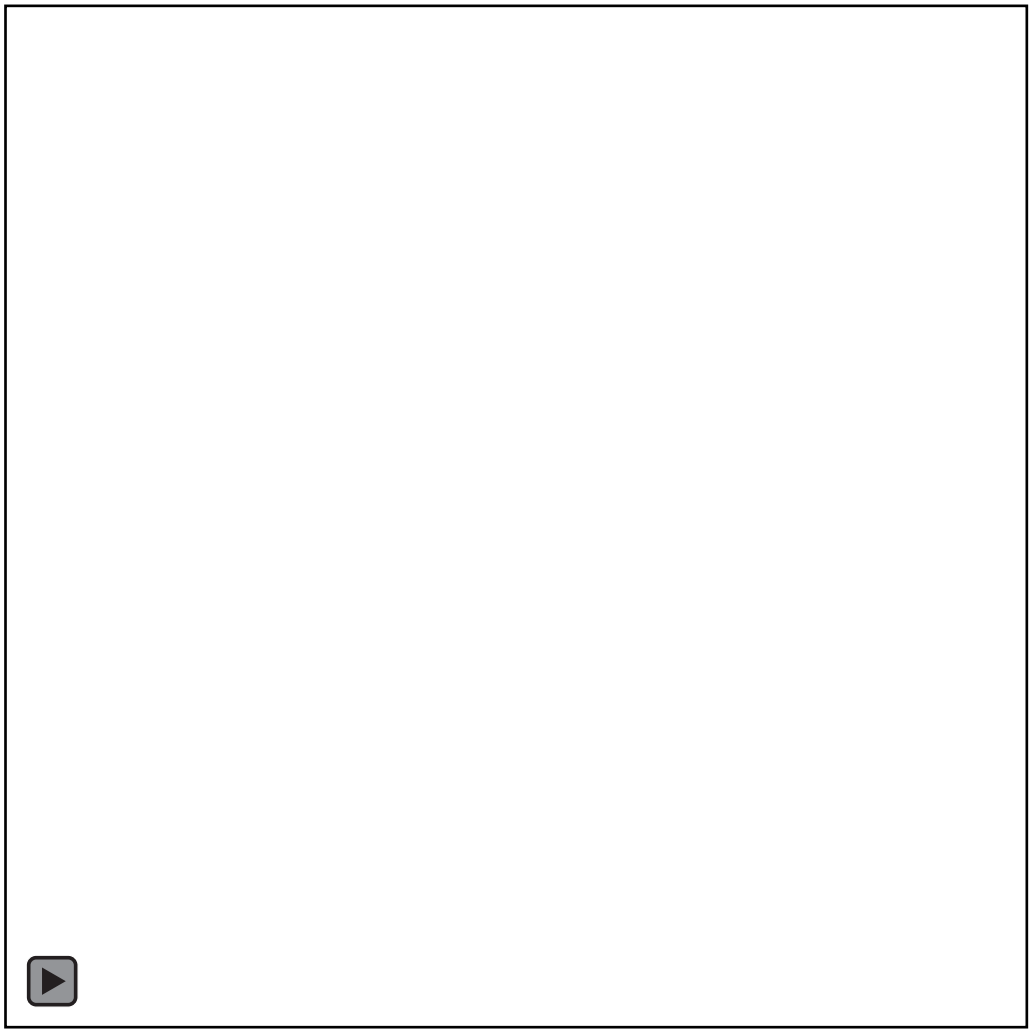
Slow CME in stream from coronal hole



2015/01/03-05 (from SDO/AIA193)

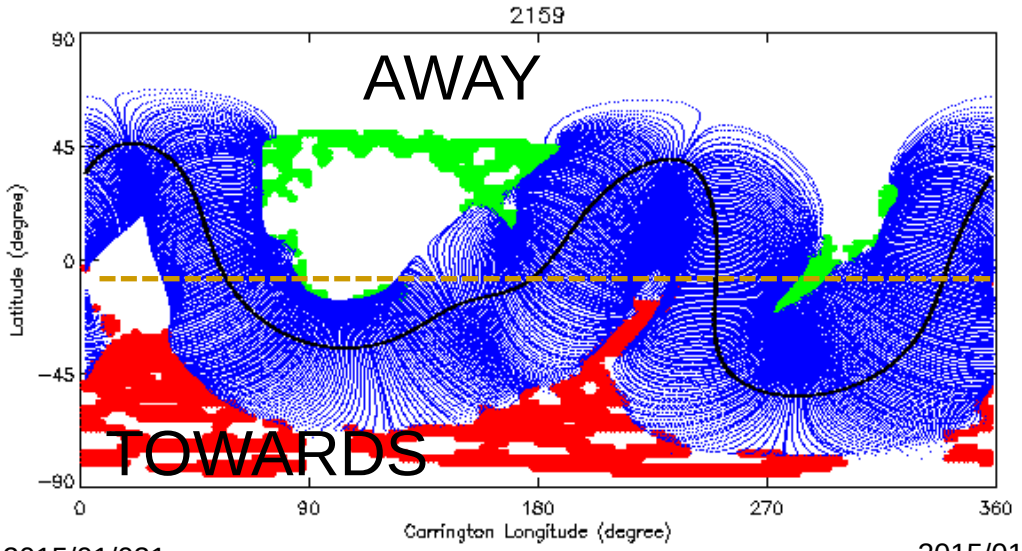


2015/02/02



Problem of the Potential Field Source Surface Model (PFSS) model?

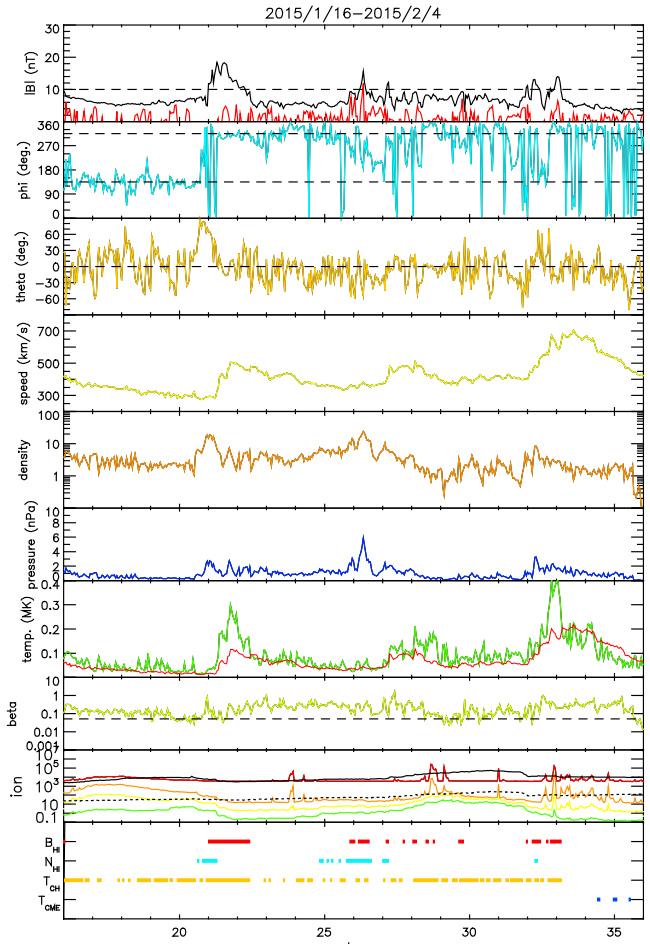
Sector of IMF did not match prediction by PFSS model.



2015/01/031

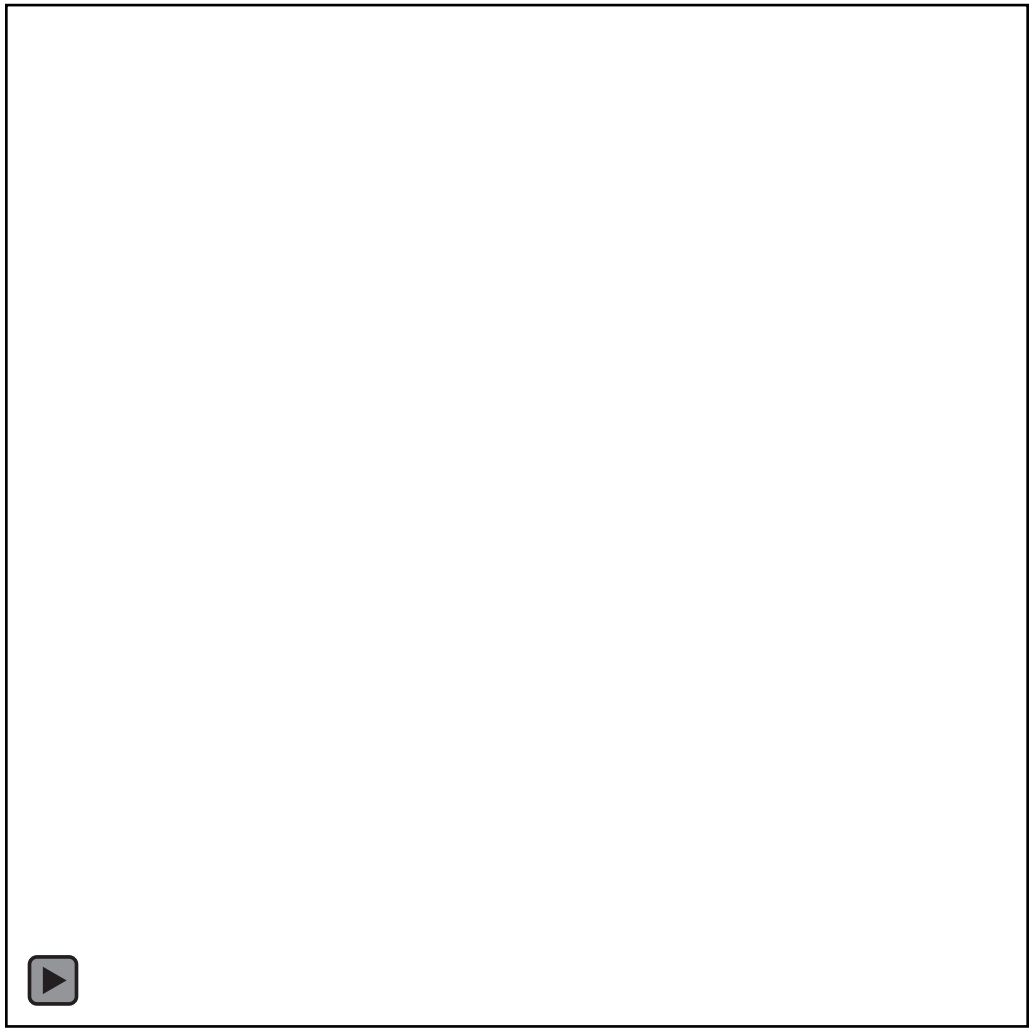
2015/01/17

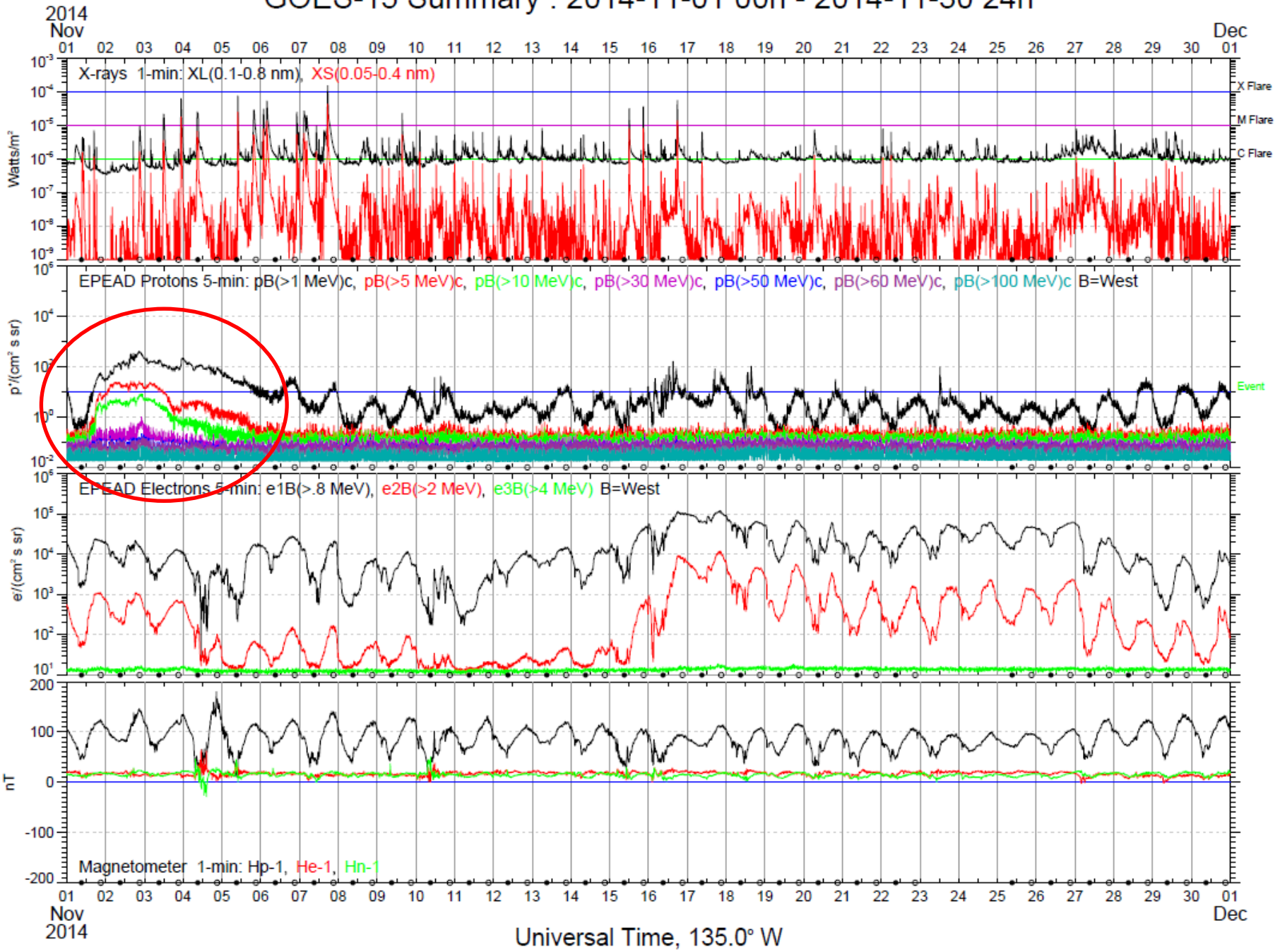
2015/01/04

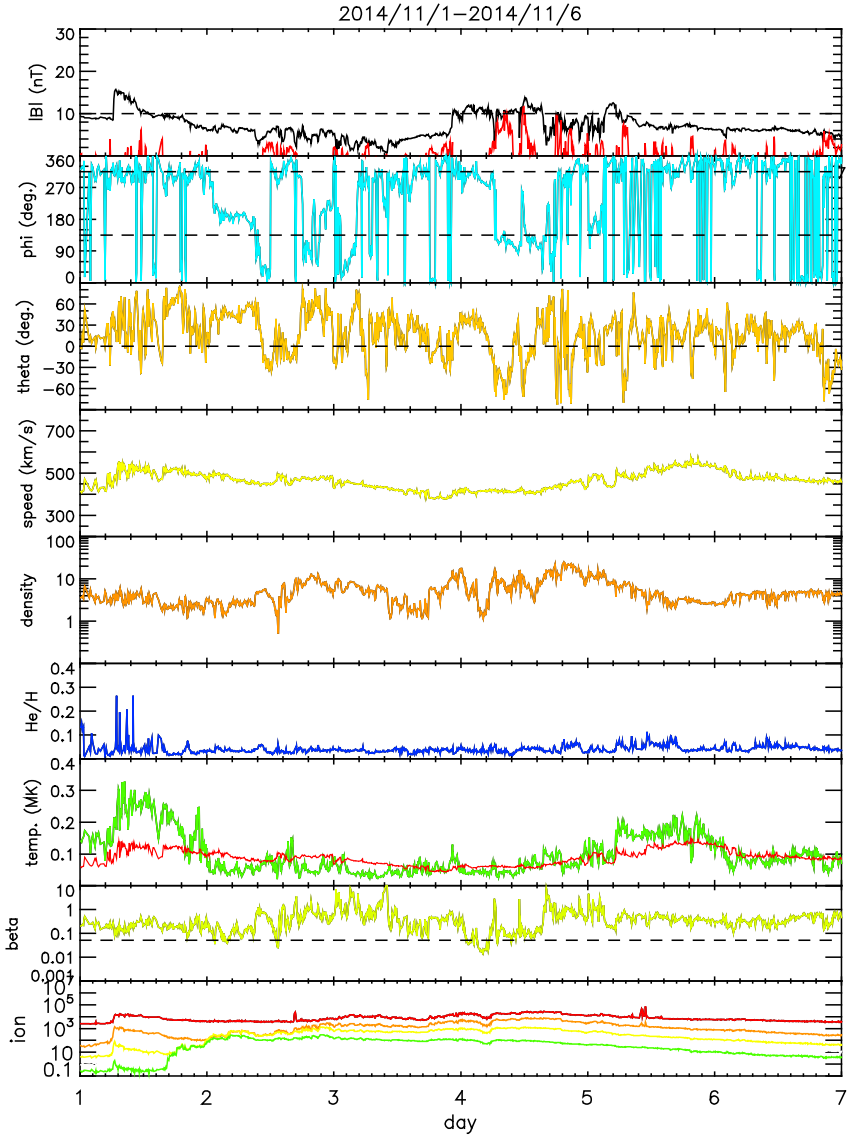


(From GONG project)

2014/11/01 (from SDO/AIA304)
Event associated with filament eruption




GOES-15 Summary : 2014-11-01 00h - 2014-11-30 24h
2014 Nov
Dec
X-rays 1-min: XL(0.1-0.8 nm), XS(0.05-0.4 nm)
X Flare
M Flare
C Flare
Watts/m²
EPEAD Protons 5-min: pB(>1 MeV)c, pB(>5 MeV)c, pB(>10 MeV)c, pB(>30 MeV)c, pB(>50 MeV)c, pB(>60 MeV)c, pB(>100 MeV)c B=West
p⁺/(cm² s sr)
Event
EPEAD Electrons 5-min: e1B(>.8 MeV), e2B(>2 MeV), e3B(>4 MeV) B=West
e⁻/(cm² s sr)
nT
Magnetometer 1-min: Hp-1, He-1, Hn-1
Nov 2014
Dec
Universal Time, 135.0° W


2014/11/1–2014/11/6
|B| (nT)
phi (deg.)
theta (deg.)
speed (km/s)
density
He/H
temp. (MK)
beta
ion
day

We hope that we can get some hints when we make space weather forecast through the session today.