Solar Influences Data analysis Center

Data Analysis Service supported by the FAGS

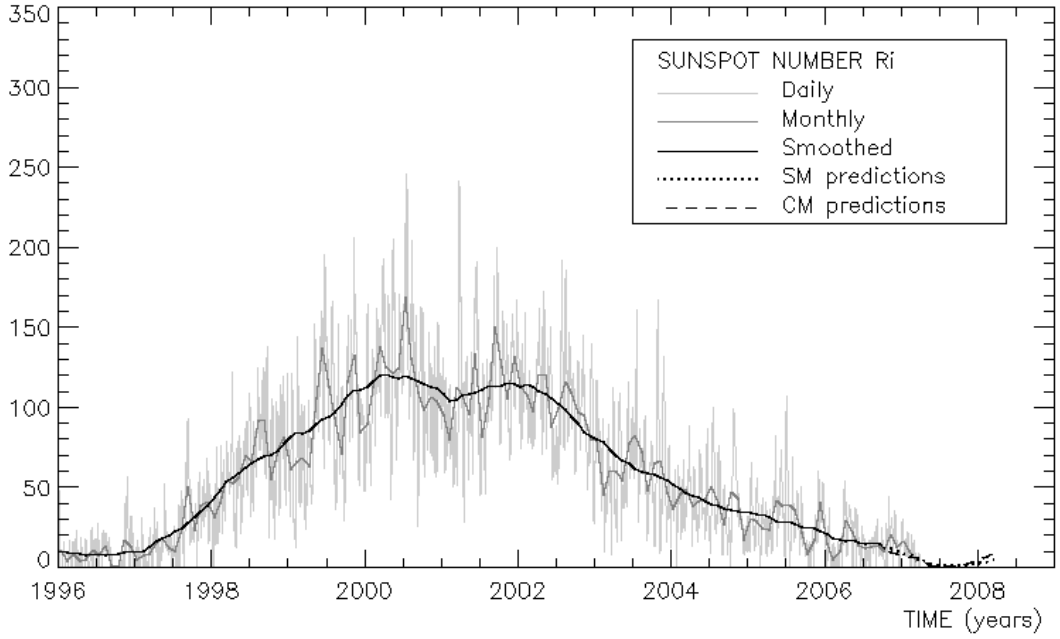
SUNSPOT BULLETIN

2007 n° 3

Provisional international and normalized hemispheric daily sunspot numbers for March 2007

computed at the *Royal Observatory of Belgium* using observations from an international network with the *Locarno Specola Solare* as reference station.

Date	R'_I	R'_N	R'_S
1	7	0	7
2	7	0	7
3	7	0	7
4	8	0	8
5	17	0	17
6	14	0	14
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	9	9	0
12	8	8	0
13	7	4	3
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	8	0	8
24	8	0	8
25	8	4	4
26	9	0	9
27	8	0	8
28	8	4	4
29	8	8	0
30	7	7	0
31	0	0	0
Monthly mean	**4.8**	**1.4**	**3.4**
Cooperating stations	**56**	**51**	**51**



Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for September 2006 : 15.6 (± 5%)

	SM	CM		SM	CM		SM	CM
2006 Oct	14	13	2007 Apr	10	5	2007 Oct	2	1
Nov	14	10	May	8	2	Nov	2	3
Dec	14	9	Jun	7	2	Dec	2	4
2007 Jan	13	8	Jul	5	2	2008 Jan	2	6
Feb	12	7	Aug	4	2	Feb	2	7
Mar	11	7	Sep	3	1	Mar	3	9

SM : SIDC classical method : based on an interpolation of Waldmeier's standard curves; the estimated error ranges from 7% (first month) to 35% (last month)
CM : Combined method : the combined method is a regression technique coupling a dynamo-based estimator with Waldmeier's idea of standard curves, due to K. Denkmayr.
ref. : **K. Denkmayr, P. Cugnon**, 1997 : "About Sunspot Number Medium-Term Predictions", in "Solar-Terrestrial Prediction Workshop V", eds G. Heckman et al., Hiraiso Solar Terrestrial Research Center, Japan, 103

Brussels, April 1, 2007 08:17 UT

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S.I.D.C. SUMMARY OF THE URSIGRAMS

Date	R'_i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
28	8	18	-	76	////	0	0/0	25	
1	7	17	-	75	////	0	0/0	12	
2	7	20	-	76	////	0	0/0	6	
3	7	18	-	73	////	0	0/0	2	
4	8	9	-	73	////	0	0/0	6	
5	17	8	-	72	////	0	0/0	16	
6	14	4	-	72	////	0	0/0	16	
7	0	1	-	73	////	0	0/0	16	
8	0	-	-	73	////	0	0/0	5	
9	0	-	-	72	////	0	0/0	3	
10	0	2	-	71	////	0	0/0	7	
11	9	4	-	71	////	0	0/0	10	
12	8	1	-	71	////	0	0/0	16	
13	7	0	-	71	////	0	0/0	27	
14	0	0	-	70	////	0	0/0	14	
15	0	-	-	69	////	0	0/0	3	
16	0	-	-	69	////	0	0/0	5	
17	0	0	-	69	////	0	0/0	7	
18	0	-	-	71	////	0	0/0	4	
19	0	-	-	70	////	0	0/0	3	
20	0	0	-	73	////	0	0/0	2	
21	0	-	-	73	////	0	0/0	2	
22	0	-	-	73	////	0	0/0	4	
23	8	2	-	73	////	0	0/0	13	
24	8	2	-	73	////	0	0/0	15	
25	8	0	-	74	////	0	0/0	11	
26	9	4	-	74	////	0	0/0	10	
27	8	1	-	73	////	0	0/0	14	
28	8	0	-	75	////	0	0/0	8	
29	8	1	-	74	////	0	0/0	3	
30	7	2	-	74	////	0	0/0	5	
31	0	2	-	73	////	1	0/0	6	

R'_i : provisional international sunspot numbers from the S.I.D.C.

PPSI : prompt photometric sunspot index from the S.I.D.C. in 10-5 w/m ^{2} : the quantity to be subtracted from the mean solar constant to account for the sunspot contribution.

600 : 600 Mhz solar flux from the station at Humain (Belgium).

2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UGEOI). The 10.7cm Flux data are a service of the National Research Council of Canada.

COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Terre Adélie).

SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams – UGEOR, evaluation : 1 x Sn+10 x "1"+100 x ">1".

XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams – UGEOR, UGEOI).

Ak : geomagnetic index from Wingst, Germany (origin : Ursigrams).

SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).

Note that due to problems of interferences saturating our receivers, no SEA could be detected this month.

SOLAR PHYSICS DEPARTMENT

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR MARCH 2007

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS TOTAL	NORTH	SOUTH	CENTRAL	PPSI 10-5 WM-2	QUAL	OBS
1	1330	1	1	11	0	11	11	2.3	3	AE
2	1415	2	3	23	0	23	23	2.4	3	AE
4	1035	1	2	12	0	12	0	1.2	3	FC
5	845	2	9	29	0	29	17	0.5	3	OB
7	1215	0	0	0	0	0	0	0.0	3	OB
8	1110	0	0	0	0	0	0	0.0	3	OB
10	1000	0	0	0	0	0	0	0.0	3	AE
11	1015	1	4	14	14	0	0	0.2	3	AE
12	1130	1	1	11	11	0	0	0.1	4	OB
13	1100	1	1	11	11	0	0	0.0	4	OB
14	1115	0	0	0	0	0	0	0.0	4	OB
15	1115	0	0	0	0	0	0	0.0	3	OB
16	950	0	0	0	0	0	0	0.0	2	OB
19	930	0	0	0	0	0	0	0.0	3	AE
20	1600	0	0	0	0	0	0	0.0	3	AE
21	930	0	0	0	0	0	0	0.0	3	AE
22	1030	0	0	0	0	0	0	0.0	3	AE
25	921	0	0	0	0	0	0	0.0	3	LR
26	830	1	6	16	0	16	0	0.3	3	AE
27	800	1	3	13	0	13	0	0.2	2	AE
28	1330	1	1	11	11	0	0	0.1	3	AE
29	745	1	2	12	12	0	0	0.2	3	AE
30	1200	1	2	12	12	0	0	1.0	3	AE
31	830	0	0	0	0	0	0	0.0	2	AE

The relative mean sunspot number is 7.3.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR MARCH 2007

K'= 0.811 (*)

1	9	7	0	13	9	19	0	25	0
2	19	8	0	14	0	20	0	26	13
3	***	9	***	15	0	21	0	27	11
4	10	10	0	16	0	22	0	28	9
5	24	11	11	17	***	23	***	29	10
6	***	12	9	18	***	24	***	30	10
								31	0

The normalised relative monthly mean sunspot number is 6.

(*) K' is the mean of the monthly K' for the last five years.

The Sun has been observed 24 days on 31 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR MARCH 2007
E AND F BRUNNER'S TYPE GROUPS

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR APRIL 2007
NONE

MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

I. Solar Activity

There is again little to say about the flaring activity besides that is was calm. This is not exceptional since we are approaching solar minimum.

Flaring activity was virtually absent this month. The background X-ray radiation stayed below the A-level for the complete month. Only at the end of the month from Mar 28, the X-ray background rose to the lower part of the A-band and three small B-flares occurred. The Estimated International Sunspot Number (EISN) was zero for 15 days from Mar 07 onwards. The 10cm flux fluctuated only between 71 and 76 sfu.

A recurrent coronal hole was visible in the TRACE 171 mosaic. EIT was not available during the first part of the month. The coronal hole had changed shape compared with the previous rotation when it was mainly located between two sunspot groups. Part of the hole was now located in front of the first sunspot group. This first part passed the central meridian (CM) at the end of February. The western part of a second small southern recurrent hole, a third, narrow, and a last, small, equatorial hole reached the CM on Mar 09, 21 and 28 respectively.

II. Geomagnetic Activity

Several periods of some small geomagnetic disturbances were observed; all of these were induced by coronal holes.

During the first day of the month, we were in the aftermath of a coronal hole of previous month inducing active geomagnetic conditions on late Feb 27 to early Mar 01, with minor storms at high latitudes.

The next geomagnetic disturbance was caused by the recurrent coronal hole visible in the TRACE 171 mosaic, i.e. the coronal hole first mentioned in the section 'Solar activity'. The co-rotating interaction region (CIR) arrived late on Mar 03. The strength of the interplanetary magnetic field (IMF) increased mildly, leading to unsettled conditions. Early on Mar 06, an additional increase of the IMF strength was measured by ACE. The second part of the hole located between two sunspot groups became geo-effective leading to a brief period of minor storm conditions. The influence diminished on Mar 07 and ended early Mar 08.

The fast stream from the second hole mentioned above was first evident in ACE data from midway through Mar 12. The solar wind reached its maximum speed of ~700km/s during Mar 13-14. However, apart from an initial epoch where the IMF was strongly southward and prompted minor storm conditions (with Kp=5 and K=5 at both Dourbes and Niemegk), the field strength for the most part remained modest and mainly northward.

On Mar 23 the solar wind speed started to rise, indicating the arrival of another interaction region between the slow and fast solar wind flows associated with the third equatorial coronal hole. The magnetic field in the interaction region contained intervals of southward interplanetary magnetic field, so two minor storm intervals (Kp = 5) were reported on Mar 24. The fast flow arrived on Mar 25 leading to active geomagnetic conditions (Kp = 4) during 6 hours on Mar 25 and one period on Mar 26.

Late on Mar 31, the magnetic field measured by ACE increased in strength. This magnetic field was associated with the fast solar wind emanating from the coronal hole last mentioned above. This resulted in active to minor storm conditions from Apr 1 to 2.

III. Noticeable solar events

No M- or X-class flares occurred.

IV. Halo CME list

onset time	e-mail time CACTus	da	e-mail time LASCO	Ass. Events	onset time NEMO	consequences
03/08 04:00	03/08 19:10	200	-	False alert	-	-

Onset time: Utime first visible in C2 field of view
CACTus: Computer Aided CME Tracking (software developed by the SIDC)
LASCO: SOHO-LASCO Operations, G. Stenborg
NEMO: Novel EIT wave Machine Observing (software developed by the SIDC)

e-mail time CACTus/LASCO/FF: Utime alert e-mail sent by group
da: angular width of CME, measured by CACTus
Ass. Events: Associated Events, Long Duration Event (LDE), flare class