Solar Influences Data analysis Center

Data Analysis Service supported by the FAGS

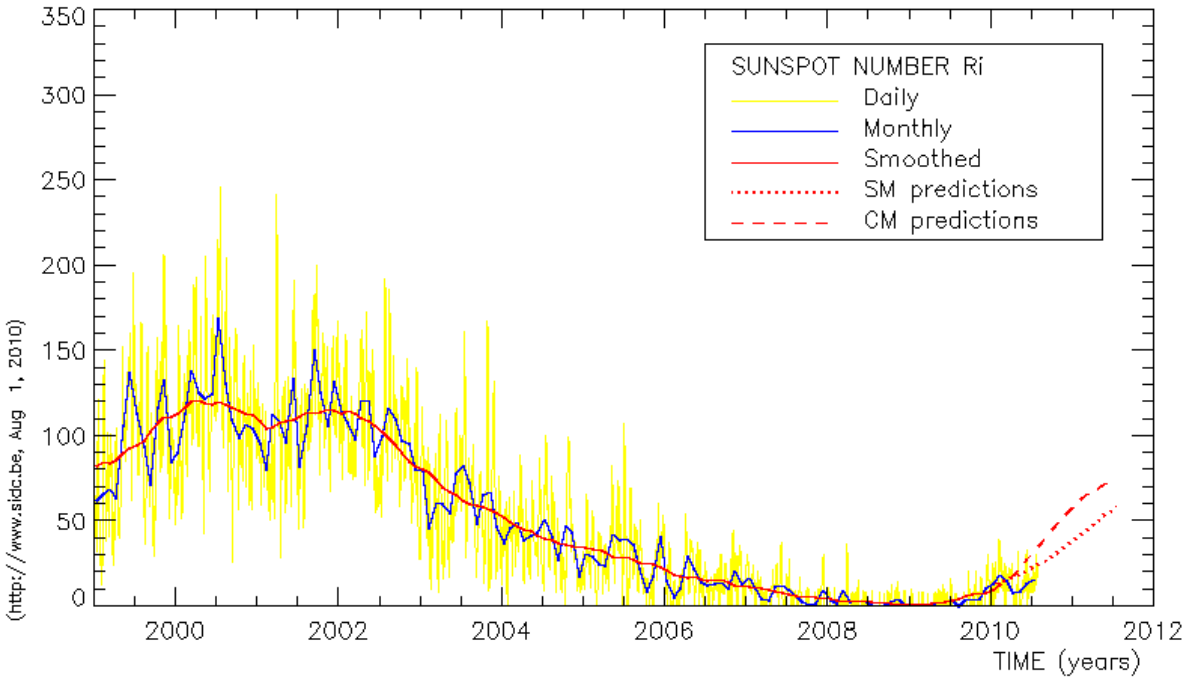
SUNSPOT BULLETIN

2010 n° 7

Provisional international and normalized hemispheric daily sunspot numbers for July 2010

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	8	0	8
2	8	0	8
3	8	0	8
4	9	0	9
5	17	9	8
6	16	8	8
7	8	0	8
8	8	0	8
9	11	11	0
10	14	14	0
11	23	23	0
12	22	15	7
13	19	12	7
14	11	11	0
15	16	16	0
16	10	10	0
17	9	9	0
18	9	9	0
19	9	9	0
20	19	8	11
21	22	0	22
22	23	0	23
23	28	0	28
24	30	8	22
25	25	8	17
26	21	0	21
27	12	0	12
28	22	8	14
29	24	8	16
30	20	10	10
31	17	9	8
Monthly mean	**16.1**	**6.9**	**9.2**
Cooperating stations	**67**	**61**	**61**



Predictions of the monthly smoothed Sunspot Number
using the last provisional value, calculated for January 2010: 9. (± 5%)

	SM	CM		SM	CM		SM	CM
2010 Feb	11	12	2010 Aug	20	37	2011 Feb	34	64
Mar	12	16	Sep	22	42	Mar	37	66
Apr	13	19	Oct	24	47	Apr	40	68
May	15	23	Nov	26	52	May	43	71
Jun	16	27	Dec	28	56	Jun	46	73
Jul	18	32	2011 Jan	31	60	Jul	50	75

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

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

Date	R'_i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
30	8	2	-	74	////	0	0/0	18	
1	8	17	-	73	////	0	0/0	15	
2	8	17	-	73	////	0	0/0	10	
3	8	21	-	72	////	0	0/0	7	
4	9	12	-	72	////	0	0/0	5	
5	17	15	-	73	////	0	0/0	4	
6	16	10	-	73	////	0	0/0	3	
7	8	14	-	74	////	0	0/0	2	
8	8	1	-	76	////	0	0/0	3	
9	11	1	-	80	////	1	0/0	6	
10	14	4	-	80	////	0	0/0	3	
11	23	12	-	83	////	0	0/0	8	
12	22	14	-	80	////	1	0/0	6	
13	19	13	-	79	////	0	0/0	3	
14	11	14	-	78	////	0	0/0	13	
15	16	15	-	76	////	0	0/0	11	
16	10	9	-	77	////	0	0/0	5	
17	9	3	-	79	////	0	0/0	2	
18	9	4	-	77	////	0	0/0	2	
19	9	3	-	80	////	0	0/0	6	
20	19	6	-	87	////	5	0/0	9	
21	22	23	-	89	////	27	0/0	6	
22	23	30	-	88	////	3	0/0	4	
23	28	34	-	86	////	2	0/0	12	
24	30	32	-	85	////	1	0/0	7	
25	25	27	-	85	////	0	0/0	8	
26	21	18	-	84	////	0	0/0	9	
27	12	12	-	83	////	2	0/0	22	
28	22	10	-	85	////	1	0/0	14	
29	24	20	-	85	////	0	0/0	8	
30	20	18	-	83	////	2	0/0	9	
31	17	28	-	82	////	1	0/0	7	

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 JULY 2010

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS TOTAL	NORTH	SOUTH	CENTRAL	PPSI 10-5 WM-2	QUAL	OBS
1	800	1	1	11	0	11	11	2.0	2	AE
2	800	1	1	11	0	11	11	2.1	2	AE
3	850	1	1	11	0	11	11	2.0	3	OB
4	830	1	1	11	0	11	0	1.8	3	OB
6	1030	2	2	22	11	11	0	1.2	4	OB
7	800	1	1	11	0	11	0	0.7	3	OB
8	830	1	1	11	0	11	0	0.3	3	OB
9	655	1	1	11	11	0	0	0.1	3	SV
10	800	1	6	16	16	0	0	0.5	3	OB
11	800	1	7	17	17	0	0	9.7	3	OB
12	1030	2	7	27	16	11	0	4.0	1	SV
13	645	1	4	14	14	0	0	4.8	3	SV
14	610	1	5	15	15	0	15	5.6	3	SV
15	810	1	3	13	13	0	13	21.7	2	SV
16	1045	1	1	11	11	0	11	2.1	2	SV
17	915	1	1	11	11	0	0	1.9	2	SV
18	645	1	1	11	11	0	0	1.5	3	SV
19	830	2	4	24	13	11	13	1.6	3	AE
20	800	3	8	38	23	15	0	2.1	2	AE
21	900	1	10	20	0	20	0	8.9	2	AE
22	1215	1	23	33	0	33	0	13.4	2	AE
23	845	2	23	43	11	32	0	16.2	2	AE
24	1000	4	21	61	22	39	28	19.2	3	AE
26	916	3	20	50	22	28	0	19.0	2	OL
27	1340	1	5	15	0	15	0	4.2	2	OL
28	800	3	14	44	11	33	0	4.0	3	OL
29	750	2	12	32	11	21	0	9.4	4	OL
30	715	2	10	30	12	18	0	3.9	3	OL
31	820	2	6	26	15	11	0	20.3	4	OL

The relative mean sunspot number is 22.4.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR JULY 2010

K'= 0.755 (*)

1	8	7	8	13	11	19	18	25	***
2	8	8	8	14	11	20	29	26	38
3	8	9	8	15	10	21	15	27	11
4	8	10	12	16	8	22	25	28	33
5	***	11	13	17	8	23	32	29	24
6	17	12	20	18	8	24	46	30	23
								31	20

The normalised relative monthly mean sunspot number is 17.

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

The Sun has been observed 29 days on 31 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR JULY 2010
E AND F BRUNNER'S TYPE GROUPS

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR AUGUST 2010
NONE

MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

I. Solar Activity

Solar activity was moderate: several C-flares occurred, but without significant consequences.

On Jul 08, some flaring activity was observed from behind the east limb. On Jul 09, the returning sunspot group Catania 97 (in the new numbering) appeared on the solar disk. Another group appeared in the neighborhood of Catania 97 and was numbered Catania 98 on Jul 10. In the NOAA numbering, both groups were labeled as one active region: NOAA AR 1087. This complex group (beta-gamma on Jul 15-17) was responsible for C-flares on Jul 08, 09, 13, 14 and 17. There were no noticeable consequences for the Earth's environment.

Remarkable was the dimming and the EUV wave visible on Jul 16 near NOAA plage area 1088 situated in the southern hemisphere. No flare occurred at the time of the event. There was no evidence of a CME in STEREO A and B/COR1 and COR2 images. We can conclude that the associated CME was very faint or did not succeed to reach the COR-field of view.

On Jul 20, Catania 04/NOAA AR 1089, with a beta-configuration, rotated onto the disk in the east. The X-ray radiation of this group peaked three times in the C-level, on Jul 20, 26 and 28.

II. Geomagnetic Activity

Geomagnetic activity was moderate. Two active and one minor storm periods were observed.

During the first 6 days of the month, the Earth was in the aftermath of the influence of a coronal hole (CH) of which the co-rotating interaction region (CIR) arrived on Jun 29. The response of the Earth's magnetic field was limited: Kp reached the value 4 once, on Jul 01, and decreased from 3 to 2 on Jul 03.

Jul 14 was marked by the arrival of a magnetically compressed CIR preceded by a small shock arrival. This magnetic structure was associated with the northern or southern CH, both with the same longitude. The north-south component of the magnetic field carried by the solar wind was for a short time strongly negative, which resulted in a Kp of 5 late on Jul 14. Kp became 4 during the first 3-hour interval of Jul 15, decreasing from 3 to 2 and then 1 for the rest of the day. The geomagnetic influence was limited in time.

Jul 27 was characterized by another arrival of a fast CH stream. The fast wind, reaching values up to 700 km/s on Jul 28, was emanating from an extension of the northern polar CH. The geomagnetic conditions were a few times active on Jul 27 and 28.

III. Highlight: esww7 poster release

7TH EUROPEAN SPACE WEATHER WEEK

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