



Center

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SUNSPOT BULLETIN

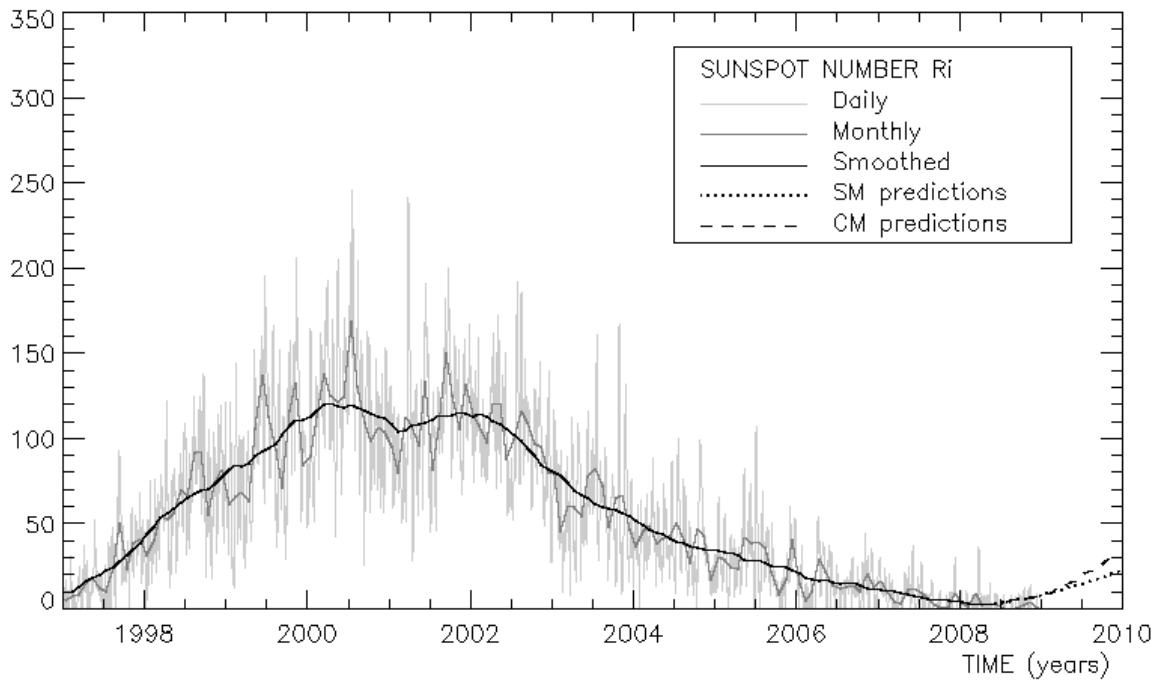
2009

n° 7

Provisional international and normalized hemispheric daily sunspot numbers for July 2009

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	0	0	0
2	0	0	0
3	0	0	0
4	16	0	16
5	16	0	16
6	16	0	16
7	13	0	13
8	13	0	13
9	11	0	11
10	9	0	9
11	0	0	0
12	0	0	0
13	0	0	0
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	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	8	8	0
31	0	0	0
Monthly mean	3.5	0.3	3.2
Cooperating stations	63	56	56



Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for January 2009 : $1.8 (\pm 5\%)$

	SM	CM		SM	CM		SM	CM			
2009	Feb	2	2	2009	Aug	13	8	2010	Feb	20	19
	Mar	2	3		Sep	14	9		Mar	22	21
	Apr	2	4		Oct	15	11		Apr	23	24
	May	10	5		Nov	17	12		May	25	26
	Jun	11	6		Dec	18	15		Jun	0	28
	Jul	12	7	2010	Jan	19	17		Jul	0	32

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, August 1, 2009 08:27 UT

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

Date	R' _i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
30	0	///	-	68	////	0	0/0	5	
1	0	1	-	68	////	0	0/0	4	
2	0	///	-	67	////	0	0/0	3	
3	0	6	-	67	////	0	0/0	6	
4	16	23	-	71	////	3	0/0	6	
5	16	34	-	72	////	0	0/0	8	
6	16	42	-	70	////	1	0/0	6	
7	13	37	-	71	////	1	0/0	6	
8	13	34	-	71	////	0	0/0	6	
9	11	23	-	69	////	0	0/0	8	
10	9	5	-	68	////	0	0/0	11	
11	0	0	-	68	////	0	0/0	6	
12	0	0	-	68	////	0	0/0	4	
13	0	///	-	67	////	0	0/0	15	
14	0	///	-	67	////	0	0/0	11	
15	0	///	-	67	////	0	0/0	6	
16	0	0	-	67	////	0	0/0	3	
17	0	///	-	66	////	0	0/0	1	
18	0	///	-	67	////	0	0/0	3	
19	0	0	-	68	////	0	0/0	2	
20	0	///	-	68	////	0	0/0	7	
21	0	///	-	68	////	0	0/0	5	
22	0	0	-	68	////	0	0/0	19	
23	8	1	-	68	////	0	0/0	10	
24	0	///	-	68	////	0	0/0	7	
25	0	0	-	69	////	0	0/0	6	
26	0	0	-	68	////	0	0/0	3	
27	0	///	-	68	////	0	0/0	4	
28	0	///	-	69	////	0	0/0	5	
29	0	///	-	68	////	0	0/0	4	
30	8	1	-	68	////	0	0/0	5	
31	0	///	-	69	////	0	0/0	5	

- 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 : $1 \times \text{Sn} + 10 \times "1" + 100 \times ">1"$).
- 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 2009

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH			
1	750	0	0	0	0	0	0.0	3	OB
2	750	0	0	0	0	0	0.0	2	OB
3	730	0	0	0	0	0	0.0	3	OB
4	815	1	16	26	0	26	1.3	3	OB
5	1130	1	14	24	0	24	1.2	2	OB
6	1210	1	15	25	0	25	4.6	3	SV
7	740	1	9	19	0	19	4.1	1	SV
8	950	1	10	20	0	20	10.8	3	SV
9	640	1	3	13	0	13	7.8	3	SV
10	720	1	2	12	0	12	0.9	3	SV
12	945	0	0	0	0	0	0.0	1	SV
13	718	0	0	0	0	0	0.0	3	OL
14	700	0	0	0	0	0	0.0	3	OL
15	647	0	0	0	0	0	0.0	4	OL
16	700	0	0	0	0	0	0.0	4	OL
17	840	0	0	0	0	0	0.0	3	OL
18	855	0	0	0	0	0	0.0	3	OL
19	700	0	0	0	0	0	0.0	4	OL
20	845	0	0	0	0	0	0.0	3	AE
21	900	0	0	0	0	0	0.0	3	AE
22	1330	1	1	11	0	11	0.4	2	AE
23	1245	1	2	12	0	12	0.4	3	AE
24	930	0	0	0	0	0	0.0	3	AE
25	930	0	0	0	0	0	0.0	3	AE
26	815	0	0	0	0	0	0.0	2	AE
27	730	0	0	0	0	0	0.0	3	OB
28	800	0	0	0	0	0	0.0	3	OB
29	730	0	0	0	0	0	0.0	3	OB
30	750	0	0	0	0	0	0.0	2	OB
31	940	0	0	0	0	0	0.0	3	OB

The relative mean sunspot number is 5.4.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JULY 2009

$K'= 0.755$ (*)

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

The normalised relative monthly mean sunspot number is 4.

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

The Sun has been observed 30 days on 31 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR JULY 2009
E AND F BRUNNER'S TYPE GROUPS

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR AUGUST 2009
NONE

MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

I. Solar Activity

The highlight of July 2009 was the appearance of a flaring new solar cycle sunspot group. After the disappearance of the group, the solar activity was again reduced to minor levels.

A bright spot visible in EIT195 rotated over the east limb in the southern hemisphere on Jun 30. The spot was not yet identified at that moment as a sunspot group on the photosphere or as an active coronal region. On Jul 03, the coronal bright spot got a sunspot group label (Catania 14) and a NOAA active region number (AR 1024). The new cycle sunspot group dominated the X-ray flux from Jul 03 to Jul 10. It produced a large series of A-, B-flares. The largest event occurred on Jul 05 at 07h13 with a C2.7 flare, nicely imaged by Kanzelhoehe Observatory (images available through the Solar Weather Browser, download on <http://sidc.be/SWB>). The flare was followed immediately by a EUV dimming (see EIT195 data). On Jul 06, the group produced a second C-flare, C1. From Jul 07, the group declined continuously. On Jul 11, it disappeared at the West limb.

For the rest of the month, there were no noticeable flaring activity or sunspot groups worth mentioning.

Three coronal holes (CH) transiting the solar disk, were noticed in terms of geomagnetic disturbances. We mention the date the CH reaches the solar central meridian (CM):

- An extension of the North polar CH, Jul 06,
- A small, northern, high-latitude CH, Jul 09,
- A small, northern, high-latitude CH, Jul 19.

II. Geomagnetic Activity

Three periods with geomagnetic disturbances were noticed. During one period, the disturbances went to the red level: minor storm conditions.

The co-rotating interaction region associated with the extension of the North polar CH arrived on Jul 09. The solar wind stream peaked on Jul 10 at 450 km/s. This resulted in temporary unsettled conditions on Jul 09-10.

From July 13, the Earth was under the influence of a fast solar wind emanating from the small, high-latitude CH passing the CM on Jul 09. The wind speed reached the maximum value of 550 km/s. Two Kp=4 periods were measured. Unsettled conditions were present until July 15.

The largest geomagnetic disturbance this month was seen on Jul 22: two periods with minor storm conditions (Kp=6 and Kp=5). The deviation of the total interplanetary magnetic field strength from quiet values was the most pronounced on these dates: the total magnetic field strength went up to 20 nT, Bz was strongly negative, but only during a relative short time period. This explained the only short time interval with storm conditions.