

Center

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SUNSPOT BULLETIN

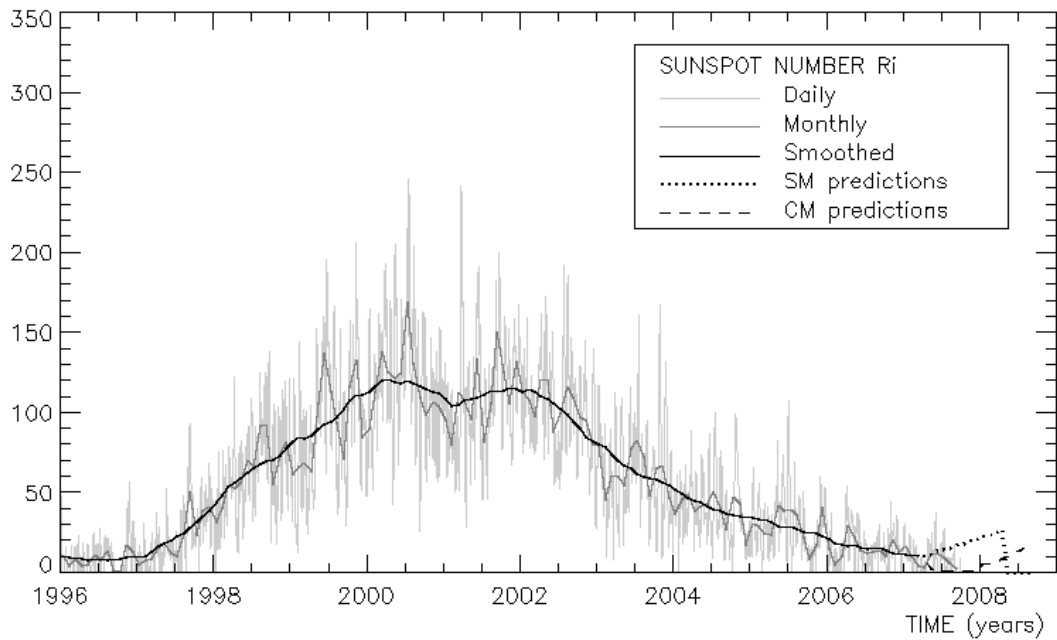
2007

n° 9

Provisional international and normalized hemispheric daily sunspot numbers for September 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	14	0	14
2	8	0	8
3	8	0	8
4	8	4	4
5	8	0	8
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
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	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	9	5	4
29	9	5	4
30	9	5	4
Monthly mean	2.4	0.6	1.8
Cooperating stations	55	47	47



Predictions of the monthly smoothed Sunspot Number
using the last provisional value, calculated for March 2007 : 10.8 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2007 Apr	**	7	2007 Oct	**	1	2008 Apr	**	9
May	**	3	Nov	**	2	May	**	11
Jun	**	2	Dec	**	3	Jun	**	13
Jul	**	2	2008 Jan	**	5	Jul	**	14
Aug	**	2	Feb	**	6	Aug	**	17
Sep	**	2	Mar	**	7	Sep	**	20

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, October 1, 2007 08:37 UT

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

Date	R' _i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	17	12	-	71	////	1	0/0	8	
1	14	9	-	71	////	0	0/0	13	
2	8	9	-	69	////	0	0/0	28	
3	8	10	-	68	////	0	0/0	13	
4	8	4	-	68	////	0	0/0	6	
5	8	6	-	68	////	0	0/0	16	
6	0	1	-	67	////	0	0/0	16	
7	0	////	-	67	////	0	0/0	2	
8	0	0	-	67	////	0	0/0	8	
9	0	0	-	67	////	0	0/0	2	
10	0	0	-	67	///	0	0/0	3	
11	0	////	-	66	////	0	0/0	3	
12	0	////	-	66	////	0	0/0	2	
13	0	////	-	66	////	0	0/0	2	
14	0	////	-	67	////	0	0/0	7	
15	0	////	-	68	////	0	0/0	7	
16	0	0	-	67	////	0	0/0	3	
17	0	////	-	67	////	0	0/0	4	
18	0	////	-	67	////	0	0/0	4	
19	0	////	-	67	////	0	0/0	4	
20	0	////	-	67	////	0	0/0	6	
21	0	////	-	67	////	0	0/0	2	
22	0	////	-	67	////	0	0/0	4	
23	0	0	-	66	////	0	0/0	19	
24	0	////	-	66	////	0	0/0	4	
25	0	0	-	66	////	0	0/0	11	
26	0	////	-	67	////	0	0/0	4	
27	0	1	-	67	////	0	0/0	2	
28	9	12	-	67	////	0	0/0	28	
29	9	15	-	68	////	0	0/0	31	
30	9	13	-	65	////	0	0/0	14	

- 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/m² : 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 SEPTEMBER 2007

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
3	1150	1	5	15	0	15	0	1.2	3	OB
4	840	0	0	0	0	0	0	0.0	3	OB
7	1230	0	0	0	0	0	0	0.0	2	OB
9	1640	0	0	0	0	0	0	0.0	2	LR
11	1245	0	0	0	0	0	0	0.0	2	OB
12	1033	0	0	0	0	0	0	0.0	3	OB
13	1100	0	0	0	0	0	0	0.0	3	OB
14	1100	0	0	0	0	0	0	0.0	3	OB
15	1000	0	0	0	0	0	0	0.0	2	OB
16	705	0	0	0	0	0	0	0.0	3	OB
17	815	0	0	0	0	0	0	0.0	3	AE
18	845	0	0	0	0	0	0	0.0	2	AE
19	900	0	0	0	0	0	0	0.0	2	AE
20	1400	0	0	0	0	0	0	0.0	2	AE
21	1205	0	0	0	0	0	0	0.0	2	DB
22	845	0	0	0	0	0	0	0.0	2	DB
23	1010	0	0	0	0	0	0	0.0	3	OB
24	800	0	0	0	0	0	0	0.0	2	AE
25	1430	0	0	0	0	0	0	0.0	3	AE
26	815	0	0	0	0	0	0	0.0	3	AE
27	900	0	0	0	0	0	0	0.0	2	AE
28	1130	1	7	17	17	0	17	6.0	3	AE
30	900	1	8	18	18	0	18	6.1	2	AE

The relative mean sunspot number is 2.2.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR SEPTEMBER 2007

$K' = 0.844$ (*)

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

The normalised relative monthly mean sunspot number is 2.

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

The Sun has been observed 23 days on 30 possible.

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

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR OCTOBER 2007
NONE

MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

I. Solar Activity

The Sun took it easy; many indices showed a low activity level. The only features dominating the solar disk were coronal holes. This is not surprising since we are close to solar minimum.

Three all-quiet alerts were issued for a total of 15 days. The provisional international sunspot number was zero for 22 days, the monthly mean sunspot number (mmsn) was 2.4. The last mmsn smaller than 2.4 dates from the previous cycle: in Sep and Oct 1996, the mmsn was respectively 1.6 and 0.9. Flaring activity was extremely low. Only two B-flares occurred on Sep 03 and 04; they were generated by Catania sunspot group 55 (NOAA AR 0969), located at that moment behind the west limb. A new sunspot group, Catania 56 (NOAA AR 0970), which emerged in the magnetograms on Aug 31 at 30° east, kept quiet and produced only two A-flares, one on Sep 04 and one on Sep 07. The third sunspot group visible this month, was Catania nr 57 (NOAA AR 0971) which suddenly appeared near the central meridian on Sep 25. It was not able to produce any flaring activity. The background X-ray radiation was completely below the instruments sensitivity from Sep 08 onwards. The tranquillity in this period is also reflected by the fact that the value for the 10cm flux stayed between 66 and 68 sfu (solar flux units).

Several groups of coronal holes came into view this month. A first hole passed the central meridian (CM) on Aug 27. On Sep 02, a small southern coronal hole was present at 0° longitude. Again a southern coronal hole crossed the CM on Sep 10. It was clearly visible in EIT 195. The next hole was trailing closely behind this one. A very faint hole passed the CM on Sep 14. The first part of a large equatorial coronal hole crossed the CM on Sep 17. The last hole of the month was southern and crossed the CM on Sep 24.

II. Geomagnetic Activity

Only coronal holes did disturb the magnetic field of earth. Looking at the ACE solar wind data, 5 distinct periods of geomagnetic disturbances can be identified related to the coronal holes mentioned above.

A first compressed co-rotating interaction region (CIR) arrived on Aug 31 indicating the delayed starting time of the slow increase of the solar wind speed up to 700 km/s. The estimated Kp index (NOAA, Boulder) reached a minor storm level on Sep 02. While the solar wind speed decreased, a next CIR associated with the Sep 02 coronal hole, arrived and the solar wind speed increased rapidly to 600 km/s on Sep 06. The geomagnetic conditions became unsettled to active on Sep 05-07. The next coronal hole influence was seen on Sep 14. The disturbances were only minor. On Sep 20, another period of geomagnetic disturbances started. The north-south component of the interplanetary magnetic field was negative for a long time but only strong enough to induce active conditions lasting from Sep 20 until Sep 24. The disturbance associated with the last coronal hole mentioned above was twofold: one CIR arrived on Sep 27, the second CIR arrived on Sep 28. This high speed wind stream disturbed the Earth's magnetic field rather strongly for 3 days from Sep 27 onwards. Kp reached once the value of 6, i.e. a major storm, on Sep 27, and five times the value of 5.

III. Noticeable solar events

No M- or X-class flares occurred.

IV. Halo CME list

No CME alert was sent