Solar Influences Data analysis Center

Data Analysis Service supported by the FAGS

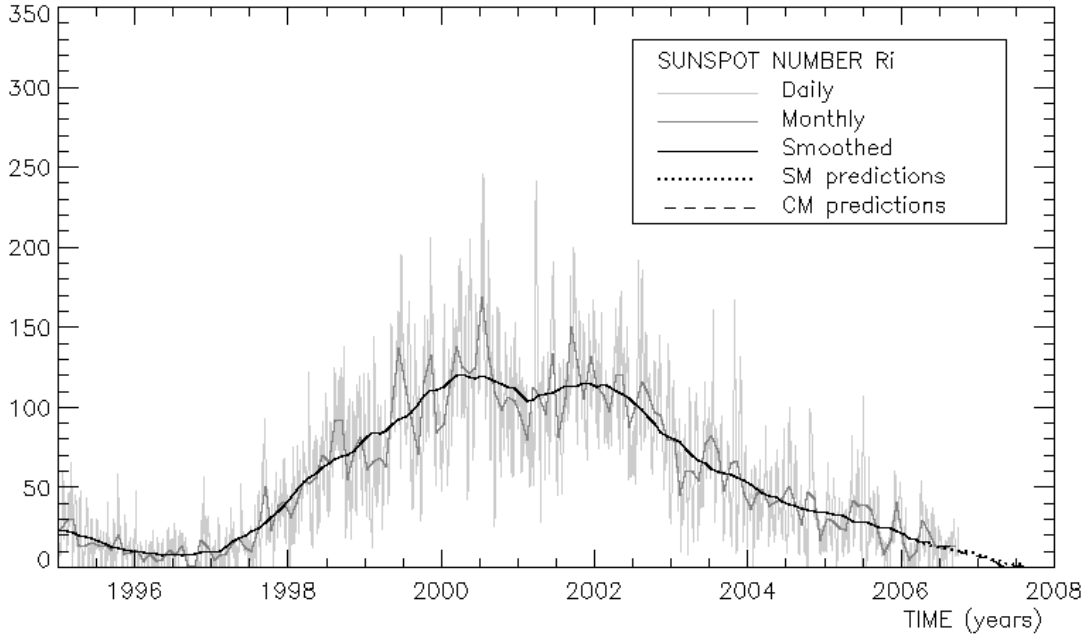
SUNSPOT BULLETIN

2006 n° 9

Provisional international and normalized hemispheric daily sunspot numbers for September 2006

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	21	0	21
2	10	0	10
3	0	0	0
4	0	0	0
5	16	0	16
6	24	0	24
7	29	0	29
8	29	0	29
9	30	0	30
10	30	0	30
11	27	0	27
12	19	0	19
13	18	0	18
14	9	0	9
15	9	0	9
16	8	0	8
17	15	0	15
18	7	0	7
19	8	0	8
20	8	0	8
21	8	0	8
22	11	0	11
23	8	0	8
24	9	0	9
25	8	0	8
26	10	5	5
27	7	4	3
28	8	0	8
29	24	0	24
30	25	0	25
Monthly mean	**14.5**	**0.3**	**14.2**
Cooperating stations	**49**	**43**	**43**



Predictions of the monthly smoothed Sunspot Number
using the last provisional value, calculated for March 2006 : 17.3 (± 5%)

	SM	CM		SM	CM		SM	CM
2006 Apr	18	17	2006 Oct	13	10	2007 Apr	8	2
May	15	16	Nov	12	9	May	7	2
Jun	17	15	Dec	12	8	Jun	6	2
Jul	16	14	2007 Jan	11	7	Jul	5	2
Aug	15	14	Feb	10	7	Aug	4	2
Sep	14	13	Mar	9	5	Sep	3	2

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, 2006 09:45 UT

Ed. Ronald Van der Linden, Ass. Ed. Petra Vanlommel
Editing contributions from various members of the SIDC team

Fax 32-(0)2-373 02 24 Tel 32-(0)2-373 04 91
e-mail : arille@oma.be, ronald@oma.be
ftp anonymous : omaftp.oma.be, directory dist/astro/sidcdata
http://sidc.oma.be

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

Date	R'_i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	22	107	-	83	////	0	0/0	10	
1	21	9	-	77	////	0	0/0	21	
2	10	3	-	76	////	0	0/0	9	
3	0	0	-	77	////	0	0/0	8	
4	0	0	-	79	///	0	0/0	0	
5	16	8	-	80	////	0	0/0	14	
6	24	26	-	84	////	0	0/0	10	
7	29	34	-	87	////	0	0/0	10	
8	29	43	-	87	////	0	0/0	5	
9	30	55	-	86	////	0	0/0	2	
10	30	53	-	87	////	0	0/0	4	
11	27	47	-	85	////	1	0/0	7	
12	19	36	-	84	////	0	0/0	6	
13	18	38	-	83	////	0	0/0	4	
14	9	23	-	83	////	1	0/0	4	
15	9	16	-	80	////	0	0/0	2	
16	8	8	-	79	////	0	0/0	5	
17	15	4	-	78	////	0	0/0	16	
18	7	2	-	74	////	0	0/0	26	
19	8	3	-	73	////	0	0/0	12	
20	8	3	-	71	////	0	0/0	5	
21	8	3	-	71	////	2	0/0	3	
22	11	7	-	72	////	2	0/0	3	
23	8	6	-	70	////	0	0/0	16	
24	9	4	-	70	////	1	0/0	23	
25	8	1	-	70	////	1	0/0	10	
26	10	0	-	71	////	0	0/0	9	
27	7	1	-	72	////	0	0/0	3	
28	8	2	-	73	////	0	0/0	6	
29	24	8	-	77	////	0	0/0	7	
30	25	14	-	78	////	1	0/0	16	

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 SEPTEMBER 2006

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS TOTAL	NORTH	SOUTH	CENTRAL	PPSI 10-5 WM-2	QUAL	OBS
1	830	2	12	32	0	32	0	0.7	3	LR
2	1005	1	7	17	0	17	0	1.1	3	OB
4	1045	0	0	0	0	0	0	0.0	2	OB
5	1300	2	6	26	0	26	0	4.1	3	OB
6	1020	3	5	35	0	35	0	8.6	4	OB
7	1340	3	19	49	0	49	19	36.9	4	OB
8	1315	2	19	39	0	39	22	25.9	4	OB
9	1005	3	17	47	0	47	32	30.5	3	FC
10	1248	3	17	47	0	47	30	29.1	3	FC
11	800	3	11	41	0	41	13	29.8	4	OB
12	1345	2	7	27	0	27	16	27.2	4	OB
13	750	2	9	29	0	29	0	24.5	3	OB
14	900	1	3	13	0	13	0	19.3	4	OB
15	1200	1	3	13	0	13	0	12.7	3	OB
16	1130	1	3	13	0	13	0	6.8	3	LR
18	1145	1	1	11	0	11	0	0.2	2	AE
19	1100	1	1	11	0	11	0	0.2	3	AE
20	1300	1	3	13	0	13	0	0.3	3	AE
21	1500	1	3	13	0	13	13	0.4	3	AE
22	830	1	11	21	0	21	21	0.4	3	AE
25	730	1	1	11	0	11	0	0.3	3	FC
26	1310	3	5	35	12	23	0	0.4	3	AE
27	1200	1	1	11	11	0	0	0.1	3	AE
28	1415	3	8	38	12	26	0	0.7	3	AE
29	1430	4	11	51	11	40	0	5.6	3	AE
30	1050	3	10	40	0	40	0	12.1	3	FC

The relative mean sunspot number is 26.3.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR SEPTEMBER 2006

K'= 0.844 (*)

1	27	7	41	13	24	19	9	25	9
2	14	8	33	14	11	20	11	26	30
3	***	9	40	15	11	21	11	27	9
4	0	10	40	16	11	22	18	28	32
5	22	11	35	17	***	23	***	29	43
6	30	12	23	18	9	24	***	30	34

The normalised relative monthly mean sunspot number is 22.

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

The Sun has been observed 26 days on 30 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR SEPTEMBER 2006
E AND F BRUNNER'S TYPE GROUPS

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR OCTOBER 2006
NONE

MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

I. Solar Activity

Once again, flaring activity was low this month. There were in total 5 C-flares, but no M- or X-flare. Several sunspot groups transited the solar disk, all of them staying relatively calm.

The most striking event was the birth of Catania sunspot group 85 (NOAA AR 0915) on Sep 29 in the west. The group evolved immediately to a magnetic beta configuration. Its flaring activity was however rather low and did not exceed the B7.2-level.

The CCD bake-out that started in August lasted until Sep 16. Since during this period SOHO/EIT was not available, recurrence was often used to predict coronal hole influences based on solar wind data and the geomagnetic K-index of previous rotation. On Sep 21, a small recurrent coronal hole passed the central meridian. A second and a third hole, both southern, passed the central meridian on Sep 26 and Sep 29.

Further, the CACTus software detected a rather big CME on Sep 26 coming out of the field of view of LASCO/C2 at 01:31UT. This plasma cloud was associated with a limb dimming on the eastern side of the solar disk and had a rather low speed of 314 km/s. At almost the same time, another event took place. A dimming was visible in EIT195 at 00:11UT in the neighbourhood of NOAA AR 0910, located at S25E35. LASCO/C3 shows a very faint full halo CME, almost not detectable. This halo CME was not reported by CACTus, nor by real-time SOHO-LASCO operations.

II. Geomagnetic Activity

At four times, on Sep 04, 10, 16 and 23, a clear sign of a co-rotating interaction region (CIR) was visible on ACE data. A fifth disturbance was initiated by a CME arrival.

A CIR is the compressed, dense plasma between the slow and fast solar wind emanating from a coronal hole. The magnetic field imbedded in the CIR is strong compared with the magnetic field carried with the coronal hole wind. Early on Sep 04, the Bz component of the interplanetary magnetic field (IMF) made an excursion to negative values up to -10nT leading to a minor geomagnetic storm. The duration of this storm was short as a few hours later the strength of the IMF decreased together with the density of the solar wind taking away the potential storm conditions. The coronal hole influence of Sep 10 was rather minimal, Kp reached only a maximum value of 3. The CIR of Sep 16 and the typical trailing coronal hole wind signature was stretched over a longer time period. On Sep 18, the storm reached its maximum with 3 times an estimated Kp index of 5. ACE data from Sep 23 up to a few days later, showed a typical coronal hole signature: as soon as the solar wind speed starts to increase, the density drops. The solar wind caused a minor geomagnetic storm on Sep 24.

The last geomagnetic disturbance, on Sep 30 and Oct 01, was atypical for solar minimum. Early on Sep 30, the faint full halo CME of Sep 26 arrived. ACE measured the arrival. Once the shock had passed, the total IMF carried by the plasma cloud itself became almost 20nT. One could clearly see the slow rotation of the Bz component from positive to negative values. The last phase of the rotation led to a minor storm. The influence of the coronal hole passing the central meridian on Sept. 26 was masked by the arrival of the CME. From 08:00UT on Oct 01, a coronal hole signature was visible in the solar wind measurements with e.g. decreased density and a high temperature level.

III. Noticeable solar events

No M- or X-class flare occurred

IV. Halo CME list

onset time	e-mail time CACTus	da	e-mail time LASCO	e-mail time FF	Ass. Events	consequences
09/08 00:12	-	-	09/08 20:20	-	-	-

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
FF: Fearless Forecast (a NOAA trial service)
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