

Center

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SUNSPOT BULLETIN

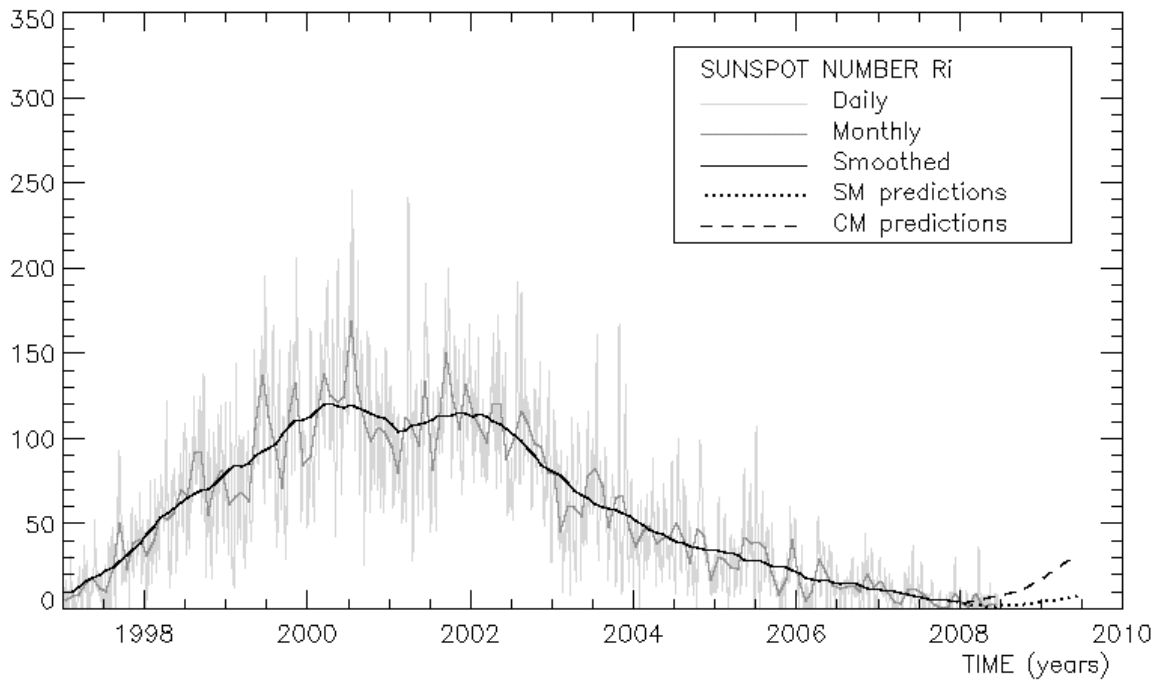
2008

n° 6

Provisional international and normalized hemispheric daily sunspot numbers for June 2008

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	0	0	0
5	9	0	9
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	9	0	9
11	8	0	8
12	0	0	0
13	8	0	8
14	0	0	0
15	7	4	3
16	7	0	7
17	7	0	7
18	8	0	8
19	7	0	7
20	8	0	8
21	8	0	8
22	8	0	8
23	0	0	0
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	0	0	0
Monthly mean	3.1	0.1	3.0
Cooperating stations	62	52	52



Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for December 2007 : $4.9 (\pm 5\%)$

		SM	CM			SM	CM			SM	CM
2008	Jan	4	3	2008	Jul	2	9	2009	Jan	4	19
	Feb	4	4		Aug	2	10		Feb	4	22
	Mar	5	5		Sep	2	11		Mar	4	24
	Apr	4	6		Oct	2	12		Apr	5	27
	May	3	7		Nov	3	14		May	6	30
	Jun	3	8		Dec	3	17		Jun	6	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

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

Date	R' _i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	0	///	-	67	////	0	0/0	14	
1	0	///	-	67	////	0	0/0	12	
2	0	///	-	67	///	0	0/0	8	
3	0	///	-	66	///	0	0/0	7	
4	0	///	-	65	////	0	0/0	4	
5	9	///	-	66	////	0	0/0	4	
6	0	///	-	66	///	0	0/0	8	
7	0	///	-	66	///	0	0/0	18	
8	0	///	-	65	///	0	0/0	12	
9	0	///	-	66	///	0	0/0	4	
10	9	///	-	66	///	0	0/0	4	
11	8	///	-	66	////	0	0/0	4	
12	0	///	-	67	///	0	0/0	6	
13	8	///	-	67	////	0	0/0	3	
14	0	///	-	67	///	0	0/0	19	
15	7	///	-	67	///	0	0/0	20	
16	7	///	-	65	////	0	0/0	15	
17	7	///	-	66	////	0	0/0	14	
18	8	///	-	65	////	0	0/0	10	
19	7	///	-	65	////	0	0/0	8	
20	8	///	-	65	////	0	0/0	12	
21	8	///	-	65	////	0	0/0	5	
22	8	///	-	65	////	0	0/0	4	
23	0	///	-	65	///	0	0/0	4	
24	0	///	-	66	////	0	0/0	6	
25	0	///	-	66	////	0	0/0	14	
26	0	///	-	65	///	0	0/0	17	
27	0	///	-	66	///	0	0/0	12	
28	0	///	-	66	///	0	0/0	6	
29	0	///	-	67	////	0	0/0	12	
30	0	///	-	67	////	0	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 : $1 \times \text{Sn} + 10 \times \text{"1"} + 100 \times \text{">1"}$).
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 JUNE 2008

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
2	724	0	0	0	0	0	0.0	4	OL	
3	853	0	0	0	0	0	0.0	3	OL	
8	957	0	0	0	0	0	0.0	2	OL	
9	720	0	0	0	0	0	0.0	2	OB	
10	745	1	2	12	0	12	0	0.5	3	OB
11	1008	1	1	11	0	11	0	0.2	2	OB
13	1100	0	0	0	0	0	0.0	2	OB	
14	950	0	0	0	0	0	0.0	1	OL	
15	732	0	0	0	0	0	0.0	2	OL	
16	1330	1	1	11	0	11	0	0.1	3	OL
17	705	1	1	11	0	11	0	0.2	4	OL
18	630	1	1	11	0	11	0	0.3	3	OL
19	1430	1	1	11	0	11	11	0.3	3	OL
20	706	1	1	11	0	11	11	0.4	3	OL
21	810	1	1	11	0	11	11	0.4	3	OB
22	814	1	1	11	0	11	11	0.4	3	OB
23	800	0	0	0	0	0	0.0	3	SV	
24	730	0	0	0	0	0	0.0	3	SV	
25	1220	0	0	0	0	0	0.0	1	SV	
26	745	0	0	0	0	0	0.0	2	SV	
27	810	0	0	0	0	0	0.0	1	SV	
28	1110	0	0	0	0	0	0.0	2	SV	
29	900	0	0	0	0	0	0.0	2	SV	
30	800	0	0	0	0	0	0.0	3	OL	

The relative mean sunspot number is 4.2.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JUNE 2008

$K' = 0.741$ (*)

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

The normalised relative monthly mean sunspot number is 3.

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

The Sun has been observed 24 days on 30 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR JUNE 2008
E AND F BRUNNER'S TYPE GROUPS

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR JULY 2008
NONE

MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

I. Solar Activity

Flaring conditions were quiet. The X-ray background flux was below the measurement threshold of GOES during the whole period (!). The highest value for the 10cm flux was only 67 sfu (solar flux units).

No labeled active regions or sunspots were visible until June 9. On that day, a bright magnetic structure appeared at the Eastern limb. The region was labelled on June 11 by NOAA as AR 0998. This active region (without Catania number) produced an A4.6 flare peaking at 23:31 UT on June 14. This very small flare was in fact the largest of the period. A small dimming was seen in the close neighbourhood of the region. The flare was accompanied by a narrow slow CME which was not geoeffective. By June 15, the active region had degraded to a plage. From June 16 onwards, a new active region rotated over the east limb: NOAA AR0999 with a magnetic alpha configuration. From June 24 onwards, also this active region had decayed into an H-alpha plage.

- June 03: a new small Northern coronal hole with high latitude,
- June 11: a Northern Y-shaped coronal hole,
- June 19: a small faint Northern coronal hole.
- June 23: a recurrent Northern coronal hole

II. Geomagnetic Activity

Whereas solar activity was minimal during the period, geomagnetic activity was present under the influence of recurrent coronal holes.

During the first few days of June 2008, we were in the aftermath of a coronal hole inducing active conditions during the previous month. Early June 6, the co-rotating interaction (CIR) associated with the first hole mentioned in the previous section, arrived. The compression of the magnetic field was small. The solar wind emanating from the coronal hole itself had a maximum speed of 500 km/s which was reached on June 07. The small compression, small Bz component of the interplanetary magnetic field and low wind speed led to only unsettled conditions. The CIR of the second coronal hole was clearly visible in in situ ACE-data. The strength of the total magnetic field increased to almost 20 nT. Bz became negative, not for a long period, but it went down to values of almost -20nT. The particle flux reached the value of 10 particles per cm³. This together with the fact that the solar wind speed started to increase fast after the arrival of the CIR, induced a minor storm for 3 intervals of 3 hours late June 14, early June 15. A less intense CIR arrived June 19. This CIR is possibly associated with the last part of the Y-shaped coronal hole and produced a period of active conditions on June 20.

Geomagnetic activity was quiet to unsettled during the last week of June. A recurrent coronal hole triggered brief unsettled conditions at the Dourbes station (K=4) and at planetary levels (Kp=4) early on June 25, and on June 26. ACE solar wind measurements indicated a co-rotating interaction region in advance of the recurrent coronal hole high-speed stream.