

## Center

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**SUNSPOT BULLETIN**

2007

n°10

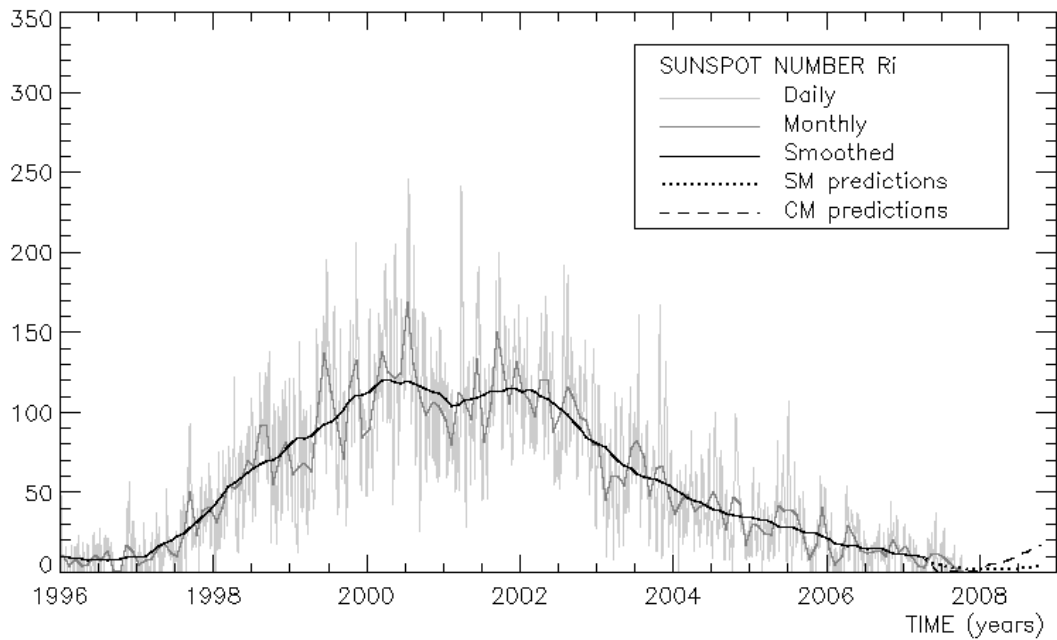
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**Provisional international and normalized hemispheric daily sunspot numbers for October 2007**


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computed at the *Royal Observatory of Belgium* using observations from an international network with the *Locarno Specola Solare* as reference station.

Date	R' <sub>I</sub>	R' <sub>N</sub>	R' <sub>S</sub>
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	11	0	11
7	9	0	9
8	7	4	3
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	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
<b>Monthly mean</b>	<b>0.9</b>	<b>0.1</b>	<b>0.8</b>
<b>Cooperating stations</b>	<b>64</b>	<b>55</b>	<b>55</b>



**Predictions of the monthly smoothed Sunspot Number**  
using the last provisional value, calculated for April 2007 : 9.9 ( $\pm 5\%$ )

	SM	CM		SM	CM		SM	CM			
2007	May	9	6	2007	Nov	4	1	2008	May	2	8
	Jun	7	1		Dec	4	2		Jun	2	10
	Jul	7	1	2008	Jan	3	3		Jul	2	12
	Aug	7	1		Feb	3	5		Aug	3	13
	Sep	6	2		Mar	3	6		Sep	3	16
	Oct	5	1		Apr	2	7		Oct	3	18

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

**R'<sub>i</sub>** : provisional international sunspot numbers from the S.I.D.C.  
**PPSI** : prompt photometric sunspot index from the S.I.D.C. in  $10^{-5} \text{ w/m}^2$  : 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 OCTOBER 2007

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH			
5	1010	0	0	0	0	0	0.0	4	OB
6	745	1	6	16	0	16	22.9	2	FC
9	1200	0	0	0	0	0	0.0	2	AE
10	1400	0	0	0	0	0	0.0	2	AE
13	1210	0	0	0	0	0	0.0	3	FC
14	1125	0	0	0	0	0	0.0	3	FC
15	1030	0	0	0	0	0	0.0	3	OB
16	1040	0	0	0	0	0	0.0	2	OB
18	810	0	0	0	0	0	0.0	3	LR
20	910	0	0	0	0	0	0.0	3	LR
21	925	0	0	0	0	0	0.0	2	LR
22	1345	0	0	0	0	0	0.0	3	AE
23	1245	0	0	0	0	0	0.0	3	ST
24	845	0	0	0	0	0	0.0	1	ST
28	814	0	0	0	0	0	0.0	2	OB
30	1245	0	0	0	0	0	0.0	3	OB
31	1120	0	0	0	0	0	0.0	4	OB

The relative mean sunspot number is 0.9.

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

$K' = 0.831$  (\*)

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

The normalised relative monthly mean sunspot number is 1.

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

The Sun has been observed 17 days on 31 possible.

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

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR NOVEMBER 2007  
NONE

## MONTHLY SUMMARY OF SOLAR AND GEOMAGNETIC ACTIVITY

### **I. Solar Activity**

*Solar activity was minimal. The only relevant features present were coronal holes.*

The monthly sunspot number was 0.9, the lowest number of the current minimum in the solar cycle. Only on Oct 06, 07 and 08, two tiny sunspots were visible in Brussels. The provisional international sunspot number was zero for the other days. The 10cm flux did not exceed the value of 69 sfu (solar flux units).

A small trans-equatorial coronal hole (CH) crossed the central meridian (CM) on Oct 07. Another CH passed the CM on Oct 15. This hole was recurrent and equatorial. On Oct 21, a third clear strong southern CH was visible in EIT195 close to the CM. A polar southern CH with parts reaching latitudes of 15° transited the CM on Oct 25.

### **II. Geomagnetic Activity**

*All disturbances were linked to coronal holes. The distortion of the geomagnetic field during those periods was limited both in time and strength.*

The precursor of the fast solar wind emanating from a U-shaped southern CH passing the CM on Sep 29 arrived on Oct 02. This precursor is a co-rotating interaction region (CIR) with compressed density and magnetic field lines. The CH was recurrent and decaying and could only introduce isolated unsettled conditions on Oct 03 and 04. After this unsettled period, the solar wind speed declined to only 250 km/s on Oct 11, a quite exceptional low value. On Oct 12, the wind speed rose to 350 km/s due to a recurrent weak solar wind stream related to the first CH mentioned in the section Solar Activity. This hole was not geo-effective. The compressed CIR associated with the second CH mentioned above arrived on Oct 17. The solar wind speed rose to 700 km/s leading to several but confined intervals of active to minor storm conditions during Oct 18-20. On Oct 25, we jumped into the fast coronal wind stream related to the CH passing the CM on Oct 21. The Bz-component of the interplanetary magnetic field was negative for several hours. The Kp index estimated by Boulder, reached once the value of 6 and 5. Until Oct 27, we had unsettled to active conditions. The last disturbance that was linked to the polar CH began late on Oct 29. Because of the high latitude of the hole, this disturbance was not expected. On Oct 29, we experienced an isolated minor storm period. We turned almost immediately to quiet conditions for the remaining days.

### **III. Noticeable solar events**

No M- or X-class flares occurred.

### **IV. Halo CME list**

No CME alert was sent