



## SUNSPOT BULLETIN

Supported by UNESCO and ICSU through the FAGS

1986 No. 12

WISHES++++HAPPY NEW YEAR++++BEST WISHES++++HAPPY NEW YEAR+

Provisional Sunspot - Numbers for DECEMBER 1986

Dependent on observations at Locarno Specola Solare,  
complemented by an international network and  
determined at the Observatoire Royal de Belgique.

Thirty one cooperating stations on 1987 January 1, 0930 UT

Day	R <sub>I</sub> '	Day	R <sub>I</sub> '
1	0	16	10
2	0	17	9
3	0	18	0
4	0	19	0
5	0	20	0
6	0	21	11
7	0	22	16
8	0	23	16
9	12	24	13
10	17	25	9
11	23	26	0
12	24	27	0
13	24	28	0
14	14	29	0
15	0	30	0
		31	0

MEAN = 6.4

Predictions of the smoothed  
monthly Sunspot - Numbers

Classical Method		S.I.D.C. Adjusted Values	
1987 Jan. 13	1987 Apr. 16	1987 Jan. 15	1987 Apr. 18
Feb. 14	May 17	Feb. 16	May 19
Mar. 15	Jun. 18	Mar. 17	Jun. 20

Precision on the sixth predicted value :  $\pm 5$ Classical estimated smoothed value for 1987 Sep. 21  $\pm 6$ Forecasted values are evaluated on the basis of the latest provisional monthly smoothed value ( 1986 June ) : 13.8  $\pm 5\%$ 

Brussels, January 1st, 1987

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S.I.D.C. SUMMARY OF URSIGRAMS  
1986 DECEMBER  $R'_{im} = 6.4$

Date	$R_i$	PPSI	600 UCC	2800 CTT	COS	X I	XFI	$A_k$
1	0	0	63	73	999	0	0/0	17
2	0	0	57	73	997	0	0/0	9
3	0	0	..	72	999	0	0/0	9
4	0	0	52	71	1007	0	0/0	10
5	0	0	..	72	..	0	0/0	3
6	0	0	52	71	1015	0	0/0	4
7	0	0	52	70	1007	0	0/0	8
8	0	0	50	71	1009	0	0/0	3
9	12	0	52	73	1014	0	0/0	6
10	17	7	54	75	1014	1	0/0	16
11	23	8	56	75	1018	0	0/0	10
12	24	5	58	73	1017	3	0/0	6
13	24	4	58	74	1009	0	0/0	12
14	14	3	57	74	1014	0	0/0	20
15	0	0	57	73	1009	0	0/0	4
16	10	3	58	73	1016	0	0/0	14
17	9	0	58	74	1013	0	0/0	7
18	0	0	..	74	1018	0	0/0	6
19	0	0	59	73	1010	0	0/0	6
20	0	0	58	73	1013	0	0/0	9
21	11	3	58	73	1017	7	0/0	19
22	16	9	..	74	1011	0	0/0	17
23	16	8	58	72	1012	0	0/0	22
24	13	7	61	72	1011	0	0/0	12
25	9	1	58	72	1010	0	0/0	12
26	0	0	58	72	1013	0	0/0	17
27	0	0	..	72	1019	0	0/0	10
28	0	0	54	72	1016	0	0/0	2
29	0	0	..	72	1020	0	0/0	3
30	0	0	..	72	1017	0	0/0	2
31	0	0				0	0/0	

SSC?

Four sunspot groups of high latitude, one on -2. Probable minimum phase between 1986 March and June.

- $R'_{im}$  : provisional International monthly Sunspot-Number from the S.I.D.C.
- $R'_i$  : provisional International daily Sunspot-Numbers from the S.I.D.C.
- PPSI : Prompt Photometric Sunspot Index from the S.I.D.C. in  $10^{-5} \text{ W.m}^{-2}$   
Quantity to subtract at the mean solar constant, due to the presence of the sunspots.
- 2800 : 2800 Mhz solar flux from the Ursigrams (origin: Herzberg Institute, Ottawa)
- 600 : 600 Mhz solar flux from Humain Station (Belgium). Unit:  $10^{(-22)} \text{ w.m}^2 \cdot \text{hz}^{(-1)}$ .
- COS : thousands of cosmic rays counts from the Ursigrams
- XFI : X-flare Index from the S.I.D.C. on the base of the Ursigrams. The sum of number of class C-flares + 10 x class M-flares of significative X-ray flux + 100 x X-flares with important X-ray flux.
- XI : X-flare Index from the Ursigrams (number of M-flares/number of X-flares)
- $A_k$  : geomagnetic Index of Wingst station from the Ursigrams (Ampli. fluct. in  $2nT$ ).
- sid : Sudden ionospheric disturbance ; ssc : sudden storm commencement
- sfe : solar flare effect ; // : two ribbons flare ; P : proton flare
- mst : magnetic storm ; II : radio-outburst ; pca : polar cap absorption
- aur : aurorae ; 1b , 2b ... : flare of class 1 or 2 (bright).

## OBSERVATOIRE ROYAL DE BELGIQUE

## DEPARTEMENT 4 RADIOASTRONOMIE ET PHYSIQUE SOLAIRE

## NOMBRES RELATIFS DE WOLF JOURNALIERS

PROVISOIRES

PROVISIONAL

## SUNSPOT RELATIVE NUMBERS

STATION UCCLE BELGIUM

DECEMBRE 1986

DATE	UT	NOMBRE DE GROUPES	NOMBRE DE TACHES	NOMBRE DE WOLF	NOMB REL ZONE CENTRALE	PPSI 10-6 WM-2	QUAL	OES
3	0853	0	0	0	0	0.	2	HB
4	1314	0	0	0	0	0.	2	VI
5	0923	0	0	0	0	0.	2	VI
7	1100	0	0	0	0	0.	3	AK
8	0856	0	0	0	0	0.	2	HB
9	1056	0	0	0	0	0.	1	VI
10	1040	2	7	27	0	17.	2	VI
11	0905	2	6	26	0	66.	1	VI
16	1155	1	2	12	12	25.	2	HB
17	0939	0	0	0	0	0.	2	VI
19	1111	0	0	0	0	0.	1	VI
21	0920	1	1	11	0	2.	2	HB
22	1405	1	5	15	0	58.	2	ST
23	0922	1	6	16	16	64.	3	VI
27	1040	0	0	0	0	0.	1	HB

LE SOLEIL A ETE OBSERVE 15 JOURS SUR 31 POSSIBLES  
LE NOMBRE RELATIF DE WOLF MOYEN EST DE 7.1

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS

U\* = K\*U FOR 1986 DECEMBER

K\* = 1.038 (\*)

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

THE SUN WAS OBSERVED 15 DAYS ON 31 POSSIBLE  
THE NORMALISED RELATIVE MONTHLY MEAN WOLF NUMBER IS 7

\* K\* IS THE MEAN OF THE MONTHLY K'S FOR THE LAST FIVE YEARS

UCCLE OBSERVATIONAL MAJOR SUNSPOTS FOR 1986 DECEMBER  
E AND F BRUNNER'S TYPE GROUPS

UCCLE EAST LIMB	DATE AND TYPE			WEST LIMB	
NO	DATE	IST OBS	CMP	LAST OBS	DATE

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR 1986 JANUARY

NO	NEW EAST LIMB	NEW CMP	NEW WEST LIMB
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NONE