

Georgi Dobrovolski Solar Observatory

NEW ZEALAND

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SUNSPOT RESULTS FOR **DECEMBER 2003**

All observations carried out by HOWARD BARNES .

Telescope : 76 mm refractor (f.l. 910 mm) k considered as 1 .

Observed by PROJECTION .

Full disc diameter = 145 mm approx .

WN = Wolf Number ; SN = Pettisindex ; BX = Beckindex ; CV = Classification Value ;

QC = Quality Count ; QC² = Squared Quality Count .

Q = Quietness [ie. steadiness] refer to Kiepenheuer scale .

S = Sharpness [ie. clarity] refer to Kiepenheuer scale .

T = Transparency where 1 = excellent , 5 = worthless .

DATE	UT*	g	f	WN	p	s	SN	BX	CV	QC	QC ²	Q	S	T	Ref.
01															
02															
03															
04	2015	5	21	71	7	8	78	346	71	14	42	2.0	2.5	2.0	4348-0
05	2105	4	24	64	8	10	90	470	82	12	40	1.5	2.5	2.5	4349-0
06															
07															
08															
09															
10															
11															
12															
13															
14															
15	2135	2	15	35	6	7	67	270	65	8	32	1.5	3.0	2.5	4350-0
16	1945	5	19	69	8	9	89	347	98	15	53	2.5	2.5	2.0	4351-0
17	1950	7	20	90	10	7	107	367	106	19	61	1.5	2.0	2.5	4352-1
18	2130	6	19	79	8	6	86	329	78	17	51	2.0	3.0	2.5	4353-1
19															
20															
21															
22															
23															
24	1925	4	35	75	9	13	103	1036	68	14	62	2.0	2.0	2.0	4354-1
25															
26															
27															
28															
29	1930	3	10	40	3	7	37	296	38	8	38	2.0	2.5	2.5	4355-1
30															
31	1935	1	6	16	1	3	13	48	9	3	9	2.0	2.0	2.5	4356-1
TOTALS	—	37	169	539	60	70	670	3509	615	110	388	17.0	22.0	21.0	—
NOBS	—	9	9	9	9	9	9	9	9	9	9	9	9	9	—
MNS	—	4.11	18.78	59.89	6.67	7.78	74.44	389.89	68.33	12.22	43.11	1.89	2.44	2.33	—

MEAN WEIGHT = 0.4523

MEAN CONDITION = 2.2222

TRUNCATED WOLF NUMBER = 53.78

* Stated times approximate Co-ordinated Universal Time / Temps Universel Coordonné (UTC).

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SUNSPOT DISTRIBUTION & INTER-SOL INDICES FOR DECEMBER 2003

All observations carried out by HOWARD BARNES .

Telescope : 76 mm refractor (f . l . 910 mm) .

Observed by PROJECTION . Full disc diameter = 145 mm approx .

IS = Inter-Sol Index .

gr = number of multi-spot groups .

grfp = number of umbræ within penumbræ within the groups (gr) .

grf = number of non-penumbral spots within the groups (gr) .

efp = number of single penumbral spots .

ef = number of single non-penumbral spots .

Q = Quietness [ie. steadiness] refer to Kiepenheuer scale .

S = Sharpness [ie. clarity] refer to Kiepenheuer scale .

T = Transparency where 1 = excellent , 5 = worthless .

DATE	UT	IS	gr	grfp	grf	efp	ef	Q	S	T	Ref.
01											
02											
03											
04	2015	24	3	11	8	2	0	2.0	2.5	2.0	4348-0
05	2105	26	2	12	10	2	0	1.5	2.5	2.5	4349-0
06											
07											
08											
09											
10											
11											
12											
13											
14											
15	2135	17	2	8	7	0	0	1.5	3.0	2.5	4350-0
16	1945	22	3	9	8	1	1	2.5	2.5	2.0	4351-0
17	1950	24	4	11	6	2	1	1.5	2.0	2.5	4352-1
18	2130	24	5	12	6	1	0	2.0	3.0	2.5	4353-1
19											
20											
21											
22											
23											
24	1925	38	3	22	12	0	1	2.0	2.0	2.0	4354-1
25											
26											
27											
28											
29	1930	11	1	3	5	0	2	2.0	2.5	2.5	4355-1
30											
31	1935	7	1	3	3	0	0	2.0	2.0	2.5	4356-1
TOTALS	—	193	24	91	65	8	5	17.0	22.0	21.0	—
NOBS	—	9	9	9	9	9	9	9	9	9	—
MNS	—	21.44	2.67	10.11	7.22	0.89	0.56	1.89	2.44	2.33	—

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SUNSPOT CENSUS BY CLASSIFICATION FOR DECEMBER 2003

All observations carried out by HOWARD BARNES .
Telescope : 76 mm refractor (f . l . 910 mm) .
Observed by PROJECTION . Full disc diameter = 145 mm approx .
IF 2 OR MORE REGIONS ARE OF THE SAME CLASSIFICATION , THEN SUNSPOT COUNTS
ARE SEPARATED BY SOLIDI (/) .

DATE	UT	A		B		C		D		E		F		G		H		J	
		g	f	g	f	g	f	g	f	g	f	g	f	g	f	g	f	g	f
01																			
02																			
03																			
04	2015	0	0	0	0	2	3/4	1	12	0	0	0	0	0	0	0	0	2	1/1
05	2105	0	0	0	0	0	0	2	9/13	0	0	0	0	0	0	0	0	2	1/1
06																			
07																			
08																			
09																			
10																			
11																			
12																			
13																			
14																			
15	2135	0	0	0	0	0	0	2	6/9	0	0	0	0	0	0	0	0	0	0
16	1945	1	1	0	0	0	0	3	3/6/8	0	0	0	0	0	0	0	0	1	1
17	1950	1	1	0	0	0	0	3	2/4/8	0	0	0	0	0	0	0	0	3	1/1/3
18	2130	0	0	0	0	3	2/2/3	1	9	0	0	0	0	0	0	0	0	2	1/2
19																			
20																			
21																			
22																			
23																			
24	1925	1	1	0	0	1	3	1	6	0	0	1	25	0	0	0	0	0	0
25																			
26																			
27																			
28																			
29	1930	2	1/1	0	0	0	0	0	0	0	0	1	8	0	0	0	0	0	0
30																			
31	1935	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	—	5	5	0	0	7	23	13	95	0	0	2	33	0	0	0	0	10	13
REGIONAL PERCENTAGES																			
A	B	C	D	E	F	G	H	J	SIGMAg										
13.5	0.0	18.9	35.1	0.0	5.4	0.0	0.0	27.0	37										
NOBS = 9				$\overline{p/g}$ mean = 1.6680						$\overline{f/g}$ mean = 5.0675									
				$\overline{p/g}$ mean = 1.6216						$\overline{f/g}$ mean = 4.5676									
GROUP COMPLEXITY INDEX (GCI) = 6.1892																			

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SMOOTHED RESULTS OF OBSERVED VALUES FOR THE LAST 12 MONTHS (OBTAINABLE) USING THE WALDMEIER & BARNES-13 METHODS.

DATA BELOW ARE PRELIMINARY. FINAL VALUES WILL BE PUBLISHED IN THE GDSO ANNUAL REPORTS.

WALDMEIER METHOD

MONTH	$g(S^w)$	$WN(S^w)$	$SN(S^w)$	$BX(S^w)$	$CV(S^w)$	$QC(S^w)$	$IS(S^w)$
2002 JULY	8.49	141.03	180.68	1341.4	165.59	27.02	62.07
AUGUST	8.26	135.98	172.48	1261.2	158.58	25.99	59.16
SEPTEMBER	7.97	130.68	165.10	1197.0	153.84	24.94	56.49
OCTOBER	7.67	125.50	158.44	1141.3	149.33	23.91	54.09
NOVEMBER	7.24	118.58	149.12	1070.6	141.32	22.49	51.12
DECEMBER	6.87	113.99	143.55	1054.5	134.37	21.39	50.07
2003 JANUARY	6.70	111.33	139.67	1025.9	130.98	20.89	49.03
FEBRUARY	6.53	106.90	133.21	945.1	126.45	20.28	46.09
MARCH	6.16	99.23	122.66	846.7	117.87	19.05	41.83
APRIL	5.74	92.23	112.48	790.1	110.05	17.81	38.75
MAY	5.42	87.47	105.66	754.5	103.31	16.84	37.04
JUNE	5.20	83.92	100.90	711.4	98.43	16.12	35.52

BARNES-13 METHOD

MONTH	$g(S^{B13})$	$WN(S^{B13})$	$SN(S^{B13})$	$BX(S^{B13})$	$CV(S^{B13})$	$QC(S^{B13})$	$IS(S^{B13})$
2002 JULY	8.65	146.84	189.67	1462.8	173.66	27.66	66.36
AUGUST	8.43	143.01	183.85	1415.2	168.42	26.78	64.62
SEPTEMBER	8.13	137.03	175.09	1329.4	161.27	25.65	61.34
OCTOBER	7.75	128.96	163.61	1214.9	152.05	24.25	56.83
NOVEMBER	7.29	119.51	150.09	1080.1	140.95	22.64	51.58
DECEMBER	6.88	110.96	137.75	957.8	130.18	21.17	46.90
2003 JANUARY	6.54	103.97	127.63	856.1	121.91	19.99	43.03
FEBRUARY	6.23	98.09	119.76	784.5	115.93	18.98	40.04
MARCH	5.92	93.26	113.82	746.3	111.23	18.09	38.13
APRIL	5.66	90.19	110.04	745.1	107.96	17.43	37.52
MAY	5.46	88.68	108.35	769.9	105.72	16.96	37.93
JUNE	5.29	87.55	107.34	794.9	104.28	16.62	38.39

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OBSERVED ANNUAL MEANS OF SUNSPOT DATA FOR

2003

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Observed by PROJECTION . Full disc diameter = 145 mm approx .

Q = Quietness [ie. steadiness] refer to Kiepenheuer scale .

S = Sharpness [ie. clarity] refer to Kiepenheuer scale .

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<i>g</i>	=	5.18
<i>f</i>	=	33.64
<i>Wolf Number</i>	=	85.49
<i>Truncated Wolf Number</i>	=	74.55
<i>p</i>	=	9.11
<i>s</i>	=	12.04
<i>Pettisindex</i>	=	103.09
<i>Beckindex</i>	=	761.80
<i>Classification Value</i>	=	100.16
<i>Quality Count</i>	=	16.20
<i>Squared Quality Count</i>	=	59.76
<i>Inter-Sol Index</i>	=	37.31
<i>Mean Weight</i>	=	0.4870
<i>Q</i>	=	1.68
<i>S</i>	=	2.26
<i>T</i>	=	2.36
<i>Mean Condition</i>	=	2.1031
<i>Total Number of Observations</i>	=	152