

# QUARTERLY BULLETIN ON SOLAR ACTIVITY

Published by the Eidgen. Sternwarte in Zürich

with financial support from UNESCO

## I. SUNSPOTS

### Sunspot Relative-Numbers and Sunspot-Areas

Co-operating Observatories for Sunspot Relative-Numbers: Arcetri, Arosa, Athens, Beirut, Bucarest, Catania, Helwan, Herstmonceux, Ikoma-Nara, Istanbul, Kandilli, Kiev, Kislovodsk, Locarno, Madrid, Manila, Potsdam, Quezon City, Roma-Monte Mario, San Miguel, Santiago, Seoul, Skalnaté Pleso, Tashkent, Tokyo, Tortosa, Trieste, Uccle, Zürich.

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1967	Jan.	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	73	39	796	1321	611
	2	96	51	1694	—	1652
	3	124	63	2834	2855	—
	4	148	59	3450	3517	2503
	5	150	65	3660	—	3069
	6	148	70	3236	—	—
	7	134	70	2618	3231	—
	8	116	57	2020	2115	1527
	9	111	62	1674	—	1389
	10	111	51	—	2895	2095
	11	104	11	—	—	1412
	12	97	15	1844	—	—
	13	93	18	—	2084	—
	14	85	17	1830	2266	—
	15	60	31	1754	1972	1640
	16	56	22	1441	1676	1218
	17	59	35	1738	1629	—
	18	72	18	1526	1445	1044
	19	82	7	1249	—	968
	20	92	15	—	1570	—
	21	125	49	1736	1996	—
	22	140	48	1279	1550	—
	23	152	55	1449	1678	809
	24	122	37	1375	—	909
	25	133	76	1516	1620	—
	26	136	65	1651	1956	1158
	27	130	17	1768	2317	1744
	28	125	20	2055	2382	1785
	29	122	21	2055	—	1508
	30	132	20	1778	1613	1132
	31	110	30	1407	1677	897
Mean		110.9	39.2	1905	2062	1453

1967	Feb.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	93	33	1292	—	850
	2	88	34	1525	1447	1016
	3	92	44	1358	—	1006
	4	100	43	1436	1417	1118
	5	72	19	1629	—	1396
	6	89	35	—	1985	1364
	7	138	47	—	—	2056
	8	109	59	1909	2784	—
	9	112	63	1523	—	1685
	10	97	34	1357	1928	1045
	11	96	19	1055	—	844
	12	79	9	—	1070	501
	13	77	35	466	—	381
	14	58	23	244	484	254
	15	58	21	—	837	345
	16	60	8	689	751	545
	17	60	9	—	—	—
	18	70	24	572	—	485
	19	67	35	668	767	—
	20	74	31	677	—	—
	21	82	36	675	—	—
	22	86	26	1309	1481	1195
	23	84	0	1494	2040	1508
	24	100	9	2056	2523	2298
	25	106	10	3319	3576	2887
	26	123	17	3491	3854	3211
	27	186	60	3826	3852	3178
	28	166	56	4429	4603	3200
	Mean	93.6	30.0	1609	2082	1407

1967	Mar.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	172	64	4708	5378	—
	2	179	45	5019	5710	3720
	3	191	71	5350	5219	3325
	4	172	79	4341	4855	2669
	5	164	67	4220	3907	2226
	6	157	74	3697	—	—
	7	137	42	3186	2966	—
	8	98	49	2447	—	2306
	9	85	50	2308	—	2170
	10	92	42	2037	1771	—
	11	89	47	873	869	543
	12	69	12	568	581	291
	13	53	0	361	395	277
	14	50	7	281	389	—
	15	52	7	275	512	219
	16	58	13	464	668	419
	17	74	37	759	—	562
	18	75	32	923	—	886
	19	73	21	695	985	—
	20	86	26	872	1048	—
	21	92	23	1116	1289	1184
	22	108	41	1540	1568	1307
	23	111	31	2618	2464	1774
	24	121	29	2140	2455	1883
	25	131	34	2894	2811	1837
	26	137	47	2688	2823	2112
	27	122	61	2702	2632	1880
	28	129	55	2533	—	1802
	29	133	20	3879	—	2274
	30	132	36	2731	2805	1981
	31	125	20	2080	2230	—
	Mean	111.8	38.1	2268	2347	1637

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1967	April	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	105	22	1070	1247	816
	2	82	28	482	423	214
	3	63	24	149	—	52
	4	60	27	160	241	69
	5	68	14	312	382	128
	6	72	25	324	—	—
	7	86	40	409	719	258
	8	108	49	1139	1257	—
	9	88	19	1066	—	—
	10	68	19	980	1175	—
	11	62	7	1187	1193	764
	12	51	13	1060	830	511
	13	63	16	423	608	381
	14	48	15	583	725	520
	15	51	18	567	717	471
	16	32	8	395	398	433
	17	42	7	598	655	525
	18	58	8	842	828	691
	19	56	17	906	969	778
	20	52	0	943	1038	822
	21	64	12	—	1209	—
	22	76	17	1654	1434	—
	23	98	46	1215	1114	—
	24	83	41	800	—	636
	25	85	35	514	813	586
	26	66	14	—	480	316
	27	66	0	—	452	241
	28	81	16	571	—	658
	29	79	19	457	1075	581
	30	73	31	562	719	431
	Mean	69.5	20.2	717	828	473

1967	May	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	81	29	838	1021	694
	2	79	39	931	—	1041
	3	62	30	969	1282	—
	4	62	15	811	1019	695
	5	68	32	948	—	689
	6	49	17	684	833	738
	7	41	10	573	589	595
	8	18	9	511	537	478
	9	25	0	513	525	425
	10	17	0	381	446	371
	11	25	0	333	363	263
	12	34	7	324	344	233
	13	34	0	278	322	143
	14	40	8	196	255	163
	15	43	10	198	586	—
	16	44	15	252	—	—
	17	44	25	340	548	293
	18	55	26	332	570	330
	19	70	23	498	829	471
	20	80	23	1007	1403	758
	21	99	7	1495	2120	1624
	22	118	8	3068	3729	2738
	23	145	41	3746	3838	—
	24	159	52	4214	4833	3972
	25	164	90	4078	5267	—
	26	174	85	5049	5576	4773
	27	194	64	4421	6063	3979
	28	197	77	4489	5273	3565
	29	164	48	3100	4081	3150
	30	150	41	2785	3520	2899
	31	147	56	2285	3298	—
	Mean	86.5	28.6	1602	2110	1403

1967	June	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	138	26	1940	2582	1765
	2	118	45	1718	2730	1958
	3	102	69	2524	2443	2267
	4	104	54	2201	—	2213
	5	90	23	1630	2305	1700
	6	80	22	1171	1486	990
	7	59	23	787	1009	566
	8	43	16	440	542	—
	9	26	17	167	185	53
	10	21	12	42	89	21
	11	20	12	33	92	36
	12	19	0	64	168	93
	13	19	0	106	—	88
	14	20	0	80	99	51
	15	35	7	147	160	82
	16	41	0	168	—	123
	17	57	7	333	342	226
	18	64	17	462	—	391
	19	67	25	450	635	332
	20	84	35	354	—	445
	21	79	40	680	1057	555
	22	83	42	797	1143	724
	23	80	14	984	998	824
	24	99	53	976	1629	1123
	25	96	35	1416	1814	1201
	26	79	43	1391	1671	1300
	27	61	36	1255	1384	—
	28	80	29	1595	1614	1366
	29	65	25	1375	1512	1489
	30	89	20	1315	1385	1269
	Mean	67.3	24.9	887	1163	830

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1967	July	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	85	18	1256	1318	1116
	2	89	22	1080	1351	1203
	3	92	43	1314	1601	1262
	4	95	50	1393	1670	—
	5	98	61	1430	1705	1360
	6	97	40	1223	—	1180
	7	82	20	888	898	835
	8	82	33	716	—	601
	9	84	24	391	577	—
	10	67	40	206	370	147
	11	53	34	205	324	105
	12	60	18	193	211	62
	13	53	16	157	—	85
	14	70	21	258	437	214
	15	87	29	572	853	360
	16	80	36	475	—	440
	17	75	52	297	591	260
	18	78	24	233	—	127
	19	62	9	137	—	100
	20	42	8	218	144	83
	21	63	14	194	201	162
	22	73	21	757	—	—
	23	93	43	1411	1448	1216
	24	98	22	2205	2556	2207
	25	108	21	2804	3739	3244
	26	118	19	3853	4080	4018
	27	123	50	4341	—	4460
	28	157	89	4865	5378	4760
	29	155	112	4969	5750	4342
	30	165	99	4282	5219	4209
	31	152	91	4770	4923	4230
Mean		91.5	38.0	1519	1971	1514

1967	Aug.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	139	67	3708	4441	2970
	2	126	47	2961	3007	2261
	3	113	33	1647	2016	1663
	4	95	0	1001	—	—
	5	103	10	1402	700	1081
	6	106	10	1723	—	—
	7	98	9	1701	2419	1952
	8	119	56	2088	2458	2142
	9	107	35	2105	1909	1604
	10	91	30	1786	1941	1530
	11	94	45	1669	1761	1655
	12	77	25	1612	1162	—
	13	75	23	1325	1653	1253
	14	66	24	1098	1400	1128
	15	61	18	932	1257	1065
	16	77	24	932	1314	1102
	17	95	43	1165	1988	1331
	18	114	33	1250	1990	1550
	19	110	15	1124	1865	1306
	20	113	0	1150	1720	—
	21	120	0	1293	2164	1484
	22	123	0	—	3039	2050
	23	122	24	1532	2906	1948
	24	122	70	1823	3261	2015
	25	130	105	2278	3022	1945
	26	125	106	1994	2222	1626
	27	121	68	1823	2515	1703
	28	119	17	1164	2473	1100
	29	111	16	1334	1888	1066
	30	121	13	1229	1385	840
	31	129	14	869	—	771
	Mean	107.2	31.6	1591	2138	1561
1967	Sep.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	123	0	721	1359	750
	2	115	20	933	—	931
	3	119	46	1081	1528	913
	4	121	67	960	1232	—
	5	125	52	1045	—	667
	6	120	47	676	—	593
	7	109	38	613	698	459
	8	104	32	594	749	513
	9	99	9	679	—	701
	10	95	14	1081	1115	—
	11	77	18	827	1193	838
	12	79	27	869	1202	790
	13	65	24	798	1067	—
	14	51	18	657	786	—
	15	36	18	590	668	567
	16	39	14	599	652	—
	17	44	13	594	774	574
	18	50	0	678	795	577
	19	59	17	657	1020	—
	20	63	18	588	812	626
	21	67	36	598	748	—
	22	62	25	392	609	400
	23	55	14	217	366	225
	24	51	13	165	252	91
	25	61	0	191	229	161
	26	53	0	365	335	239
	27	50	7	636	—	383
	28	71	18	710	586	477
	29	66	28	757	755	607
	30	74	35	820	—	680
	Mean	76.8	22.3	670	814	555

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1967	Oct.	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	76	36	948	1069	766
	2	77	30	1320	1636	1269
	3	95	36	1271	1613	1240
	4	98	22	1204	1397	—
	5	103	26	965	1335	992
	6	98	36	852	1366	—
	7	92	27	572	1137	—
	8	76	25	424	537	294
	9	80	34	318	571	418
	10	82	31	573	870	—
	11	90	37	767	1028	631
	12	65	26	640	1006	849
	13	55	18	721	1117	735
	14	63	7	451	765	513
	15	47	0	338	525	306
	16	41	0	275	312	198
	17	38	9	190	143	109
	18	50	25	196	239	—
	19	62	24	205	411	169
	20	83	37	509	818	449
	21	80	30	868	984	—
	22	85	54	1030	1179	746
	23	101	61	933	1162	647
	24	93	69	996	1383	679
	25	114	78	—	1397	700
	26	125	48	1328	1661	1000
	27	125	46	1763	2267	1520
	28	156	62	1664	2498	—
	29	137	40	1993	2019	—
	30	132	48	1675	1738	1271
	31	116	38	1475	1753	1342
Mean		88.2	34.2	882	1159	732

1967	Nov.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	115	51	1626	—	—
	2	122	65	1420	1723	—
	3	113	63	1201	—	1209
	4	110	37	1263	1207	—
	5	91	24	651	—	—
	6	51	7	666	808	517
	7	48	0	360	559	—
	8	27	7	—	—	—
	9	34	8	—	159	140
	10	41	0	254	351	—
	11	38	15	300	373	—
	12	56	21	466	718	—
	13	77	45	877	1363	—
	14	95	32	1202	1674	1220
	15	98	34	1405	1781	—
	16	119	48	1839	1969	—
	17	121	77	1727	2022	1582
	18	134	66	1631	1988	—
	19	131	60	1694	2282	—
	20	116	49	2036	2409	—
	21	95	49	1824	2534	—
	22	92	24	2047	2552	1998
	23	103	39	1765	2549	1886
	24	108	39	2453	2063	1948
	25	128	42	2227	2485	1751
	26	109	25	1660	—	1687
	27	105	25	1872	—	—
	28	112	34	2015	—	—
	29	117	29	1723	2195	—
	30	123	27	1190	1529	—
	Mean	94.3	34.7	1407	1621	1394

1967	Dec.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	131	35	948	1350	722
	2	126	15	450	921	403
	3	89	7	—	701	415
	4	79	12	393	674	—
	5	79	30	414	679	—
	6	89	16	656	—	—
	7	126	37	1690	1569	—
	8	131	46	1166	—	1094
	9	117	73	1162	1751	934
	10	114	67	922	—	701
	11	132	86	929	—	—
	12	135	65	—	—	—
	13	137	42	1061	1716	—
	14	140	22	1220	1459	1060
	15	151	36	—	2252	1196
	16	160	93	2104	2589	—
	17	172	76	1987	—	1683
	18	170	68	3223	4137	3478
	19	129	0	2544	4288	3542
	20	141	28	3747	4756	—
	21	130	39	2712	3978	—
	22	105	58	2189	2939	—
	23	101	36	1260	1773	—
	24	91	27	1240	—	983
	25	111	49	1450	—	—
	26	142	68	1817	—	—
	27	140	77	2559	—	—
	28	165	68	2740	3768	2912
	29	141	73	2925	3666	—
	30	124	43	2676	—	2692
	31	119	49	2459	2431	2407
	Mean	126.4	46.5	1737	2370	1615