GEOPHYSICAL OBSERVATORY REPORTS

OF THE GEODETICAL AND GEOPHYSICAL RESEARCH INSTITUTE OF THE HUNGARIAN ACADEMY OF SCIENCES

YEAR

1975

OBSERVATORY OF NAGYCENK

SOPRON
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OBSERVATORY OF NAGYCENK

REPORT ON

I. EARTH CURRENTS
II. GEOMAGNETISM
III. ATMOSPHERIC ELECTRICITY
IV. IONOSPHERE
V. TECHNICAL PAPER

EDITED BY THE DIRECTOR
SOPRON

1976

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Director:

J. SOMOGYI

Felelős kiadó: Dr. Somogyi József

Győr-Sopron megyei Nyomda V. Soproni üzeme, 76.3726
Felelős vezető: Horváth Imre igazgató

PREFACE

This Report continues the series of Reports on the observation data of the Geophysical Observatory Nagycenk. The first four of them came out in the publication Acta Technica Hungarica; all the others in separate booklets.

Here it is worth noting — to sum it up briefly — that the Reports of 1957—1960 comprise the data of the earth current records only. The geomagnetic data were first given in the Report on 1961. In 1962 the observation network was completed by records of the atmospheric electric potential gradient and the point discharge, so that from 1962 on these data have also been published in the Reports. From 1967 on the measurement data of the ionospheric absorption are given as well. Exhange copies of the Reports may be obtained from the Geodetical and Geophysical Research Institute of the Hungarian Academy of Sciences (H—9401 Sopron, Pf. 5. Hungary).

J. Somogyi
Director

I. EARTH CURRENTS

In the present report of the Observatory, six kinds of tables are published in the section earth currents.

The coordinates of the Observatory are:

$$\varphi = 47°38' \qquad \gamma = 16°43'$$
$$\varphi' = 47{,}2° \qquad \Lambda = 98{,}3°$$

All times are given in this part in CET (i. e. GMT +1h), nearly (–7 min) corresponding to LT.

The tables published are the following:

I. The activity indices T of the general activity for each three hour interval of the local day, as well as the character figures of single frequency bands for whole days K_1–K_5.

The T-scale is linear; its scale corresponds to 1,8 mV/km. The monthly mean T-values are separately given for the North-South and East-West components. The scales for K_1–K_5 are as follows:

Frequency band	limits between K-values								
	0—1	1—2	2—3	3—4	4—5	5—6	6—7	7—8	8—9
1. Period 0— 2 min	2	4	7	13	18	23	29	41	54
2. Period 2— 6 min	9	13	18	23	29	24	41	56	90
3. Period 6—12 min	16	22	25	32	38	45	56	83	120
4. Period 12—24 min	34	43	54	70	85	101	124	151	202
5. Period 24—60 min	29	43	67	88	110	131	191	234	339

All these values are given in the table in units of 10^{-5} V/km.

Values in brackets mean extrapolated ones from incomplete material, where the lacking hours have been substituted by the average of recorded hours.

II. Monthly and yearly means, and means for disturbed and quiet days of the amplitudes of the former frequency bands and of the earth current field intensity. D and Q days are the same as in section Geomagnetism. The rows 1–5 contain the average amplitudes of the five bands in 10^{-5} V/km. Row 6 contains the hourly means of the earth current field intensity corrected for long period variations (equally in 10^{-5} V/km).

III. Results of harmonical analysis from monthly means of the earth current field intensity.

IV. Time of special events (common table from magnetic and earth current records).

V. Average amplitudes in 12 pulsation bands. Instead of the graphical representation of world-day averages in previous years, numerical data are presented on the average amplitudes of pulsations for (nearly complete) months. Averages are derived from manually processed earth-current records (6 mm/min) for three-hour intervals of the day. Such averages (expressed in μV/km) are published for each month and for the full year. As the bands where amplitudes are determined have different bandwidths, amplitudes are comparable in different bands only after a correction for bandwidth. Data for the same band are, however, directly comparable. Initial data are estimated amplitudes in half-hour intervals.

VI. Micropulsation indices for the year 1975. The indices have been determined from the occurrence frequency of different period micropulsations, striving at a possibly uniform distribution of days in each of the five possible indices (1–5).

The determination of these indices can be shortly explained as follows: The days are arranged according to the occurrence frequency of each band. Index 1 is attributed to the days with lowest fifth of occurrence frequencies (0 to 20 per cent), index 2 to days with occurrence frequencies in the second lowest fifth (20 to 40 per cent) etc., index 5 to days with highest occurrence frequen-

cies (80 to 100 per cent of days). It must be reminded that mainly in the lowest and highest bands the uniform distribution could not be achieved due to insufficient occurrence of these bands on the records.

The bands are the following:

P1	0	to	5 sec
P2	5	to	10 sec
P3	10	to	15 sec
P4	15	to	20 sec
P5	20	to	25 sec
P6	25	to	30 sec
P7	30	to	40 sec
P8	40	to	60 sec
P9	60	to	90 sec
P10	90	to	120 sec
P11	2	to	5 min
P12	5	to	10 min

For a detailed description of the method of determination of these indices, see:

L. HOLLÓ, M. TÁTRALLYAY and J. VERŐ: Experimental results with the characterization of geomagnetic micropulsations (Acta Geodaetica, Geophysica et Montanistica Hungarica, 7/1972/155).

Mrs. J. CZUCZOR, L. HOLLÓ, M. TÁTRALLYAY and J. VERŐ took part in the processing and compilation of the data.

Records were taken in the Observatory with three instruments of the types GMG T9 1956 and GMG T14/1961, with small modifications in order to meet the demands of the use in the observatory. A general description of the processing and compilation is found in the report of the Observatory from 1966, in German by A. ÁDÁM, J. VERŐ, A. WALLNER: Tellurische und erdmagnetische Messungen im Observatorium bei Nagycenk. Observatoriumsberichte des Geophysikalischen Forschungslaboratoriums der Ungarischen Akademie der Wissenschaften vom Jahre 1966, Sopron, 1967.

I.

Activity indices T and K_1—K_5

January

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	22221110	11	6	2	4	1	1
2.	11001010	4	4	1	4	0	0
3.	00211122	9	5	2	4	1	1
4.	32345946	36	7	3	6	2	6
5.	43346766	39	7	3	4	4	6
6.	21224469	30	6	2	5	3	5
7.	99733321	37	6	3	6	5	5
8.	45766796	50	9	6	6	3	7
9.	11233201	13	7	4	5	1	2
10.	11111000	5	5	1	4	0	0
11.	10000010	2	3	1	4	0	0
12.	20000012	5	3	0	4	0	1
13.	24423374	29	7	3	4	3	5
14.	33335572	31	7	3	5	5	6
15.	31133326	22	8	2	5	3	3
16.	54236836	37	7	3	5	5	6
17.	42335268	33	7	3	5	6	5
18.	54133724	29	5	2	4	3	5
19.	22233121	16	5	2	4	2	2
20.	22231243	19	6	3	4	1	4
21.	21011130	9	5	0	4	2	1
22.	00110342	11	5	1	4	1	2
23.	21112127	17	4	1	4	1	3
24.	22121121	12	6	1	4	2	2
25.	00010321	7	4	1	4	0	1
26.	21001010	5	4	1	4	0	1
27.	11532341	20	6	1	4	2	3
28.	53111122	16	6	2	4	3	3
29.	11113011	9	5	2	4	1	1
30.	11111114	11	6	1	4	3	3
31.	11022268	22	5	1	4	1	5

Monthly averages:

T (N)	2,306
T (E)	1,822
K_1	5,68
K_2	1,97
K_3	4,39
K_4	2,06
K_5	3,06

February

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	46568565	45	7	5	5	4	7
2.	63543452	32	8	4	5	4	5
3.	12323311	16	6	2	4	3	4
4.	12114332	17	6	2	4	2	2
5.	22235384	29	8	3	6	3	7
6.	21 23222	(16)	7	2	3	2	2
7.	12221243	17	4	2	4	3	3
8.	22111101	9	3	0	4	3	2
9.	41101122	12	5	1	4	3	3
10.	63533899	46	8	5	5	6	7
11.	75465597	48	9	5	7	7	7
12.	44447869	46	7	3	6	6	8
13.	44454499	43	7	4	6	4	7
14.	55443646	37	7	4	4	3	6
15.	22245577	34	8	3	5	5	6
16.	32675492	38	7	4	5	6	6
17.	33232333	22	6	1	4	3	3
18.	32312122	16	6	1	4	3	4
19.	21412224	18	7	2	4	1	3
20.	32111113	13	7	2	4	1	3
21.	11012421	12	4	0	4	2	2
22.	23123211	15	6	2	4	1	2
23.	32187735	36	7	2	5	4	6
24.	64335455	35	9	4	5	3	5
25.	45324321	24	7	2	4	3	3
26.	23332110	15	6	0	5	2	2
27.	01211101	7	6	1	4	1	0
28.	21122327	20	7	2	4	3	2

Monthly averages:

T (N)	3,152
T (E)	2,547
K_1	6.61
K_2	2,43
K_3	4,57
K_4	3,25
K_5	4,18

March

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	32333236	25	6	3	5	3	3
2.	32123123	17	6	2	4	2	2
3.	31133434	22	7	1	5	1	3
4.	25332111	18	7	3	4	1	1
5.	23243593	31	6	2	5	3	4
6.	22223654	26	6	1	4	3	2
7.	00000001	1	2	0	4	0	0
8.	00001001	2	4	0	4	0	0
9.	00011114	8	5	1	4	1	1
10.	95558999	59	8	4	6	7	8
11.	99655556	50	7	3	6	4	8
12.	54444759	42	7	1	4	5	6
13.	63245493	36	7	3	5	5	5
14.	22324576	31	7	3	4	2	5
15.	42233553	27	7	2	5	3	5
16.	21232323	18	6	2	5	1	1
17.	22212223	16	7	2	4	1	2
18.	51123634	25	5	1	4	3	4
19.	20112136	16	5	1	4	1	3
20.	22133223	18	6	1	4	1	5
21.	11010000	3	4	0	4	1	0
22.	01262122	16	3	0	4	2	0
23.	52221112	16	6	2	4	2	2
24.	20125553	23	7	3	5	3	5
25.	22112121	12	5	2	4	1	1
26.	01334242	19	7	3	5	3	3
27.	22215864	30	8	3	5	3	5
28.	33447695	41	8	5	6	6	5
29.	22322392	25	7	3	5	3	4
30.	32123212	16	8	2	4	2	2
31.	32323331	20	7	3	4	3	3

Monthly averages:

T (N)	2,778
T (E)	2,234
K_1	6,16
K_2	2,00
K_3	4,52
K_4	2,45
K_5	3,16

April

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	21211131	12	6	2	4	1	1
2.	11112113	11	6	3	4	1	0
3.	11111112	9	6	1	4	0	1
4.	11111112	9	5	2	4	1	1
5.	31111143	15	6	2	4	1	2
6.	11112217	16	5	2	5	1	3
7.	11123279	26	7	3	5	3	4
8.	53355994	41	7	4	6	3	6
9.	54576699	51	7	4	5	3	6
10.	43575366	39	7	4	5	3	5
11.	63336542	32	6	1	5	3	5
12.	12343439	29	6	2	5	2	4
13.	52423436	29	7	4	5	5	4
14.	33332422	22	6	2	5	2	3
15.	11111231	11	3	0	4	1	0
16.	21211110	9	5	0	4	0	1
17.	10112120	8	3	0	4	0	0
18.	01022111	8	3	0	4	1	1
19.	21111210	9	3	0	4	1	1
20.	10113378	24	4	0	4	2	5
21.	85238541	36	5	1	5	4	4
22.	22322225	20	5	2	4	2	1
23.	42333844	31	7	3	5	3	6
24.	53334323	26	6	2	5	3	1
25.	22221211	13	5	1	5	1	0
26.	51122122	16	6	1	4	1	2
27.	11220010	7	3	0	4	0	0
28.	31110011	8	4	2	4	1	0
29.	10011100	4	3	1	4	0	0
30.	01211011	7	3	1	4	1	0

Monthly averages:

T (N)	2,271
T (E)	1,862
K_1	5,17
K_2	1,67
K_3	4,47
K_4	1,67
K_5	2,23

May

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	11212111	10	2	0	4	1	0
2.	21223343	20	2	1	4	2	3
3.	32223313	19	3	1	4	2	3
4.	32212121	14	5	1	4	1	3
5.	63533366	35	7	2	4	4	6
6.	66534445	37	7	3	5	3	6
7.	32244443	26	6	1	5	3	4
8.	32223324	21	7	1	4	1	3
9.	42223332	21	6	0	4	2	3
10.	54223113	21	4	1	4	2	4
11.	01111100	5	5	2	4	0	0
12.	00000120	3	3	0	4	0	0
13.	01211047	16	4	0	4	2	0
14.	23121012	12	3	0	4	2	2
15.	10110000	3	3	0	4	0	0
16.	03466445	32	6	2	5	3	5
17.	33455420	26	7	2	5	3	3
18.	12331321	16	5	2	5	3	0
19.	32321199	30	6	2	6	3	4
20.	88642321	34	7	3	7	5	3
21.	22224223	19	7	2	5	3	3
22.	23435312	23	6	3	5	4	2
23.	12223111	13	5	1	4	1	2
24.	01112112	9	6	1	4	1	1
25.	11112655	22	5	1	4	3	4
26.	95112111	21	4	0	3	1	4
27.	22356241	25	5	1	4	4	3
28.	31100211	9	4	0	4	1	2
29.	22222333	19	4	0	4	2	2
30.	13111111	10	5	2	4	0	1
31.	12111120	9	6	2	3	0	0

Monthly averages:

T (N)	2,137
T (E)	1,935
K_1	5,00
K_2	1,19
K_3	4,32
K_4	2,00
K_5	2,45

June

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	21113695	28	4	1	5	3	4
2.	68666335	43	7	3	5	3	6
3.	43434233	26	7	3	4	1	5
4.	33221222	17	4	1	4	1	2
5.	32122243	19	6	1	4	1	3
6.	22223322	18	5	1	4	2	1
7.	21121117	16	6	1	5	0	2
8.	12111102	9	5	0	4	1	0
9.	03111011	8	5	1	4	1	1
10.	10101101	5	3	0	3	0	1
11.	31123133	17	4	1	4	2	3
12.	23578364	38	7	2	4	4	6
13.	33335343	27	6	2	5	3	4
14.	12323141	17	4	1	4	1	1
15.	11122334	17	4	2	4	2	2
16.	44423343	27	6	2	5	3	3
17.	21243223	19	5	2	4	2	3
18.	23423321	20	5	2	4	3	2
19.	42233232	21	5	1	4	3	3
20.	11221111	10	4	1	4	0	1
21.	12111212	11	5	1	4	1	2
22.	21111001	7	5	0	4	0	0
23.	11101122	9	4	2	4	0	0
24.	01010000	2	3	0	4	0	0
25.	02301112	10	3	1	5	1	0
26.	11222211	12	3	1	4	1	0
27.	11210112	9	4	1	4	1	0
28.	11111101	7	3	1	4	0	1
29.	22132869	33	5	3	4	1	6
30.	65733334	34	6	3	4	2	4

Monthly averages:

T (N)	1,929
T (E)	1,804
K_1	4,77
K_2	1,37
K_3	4,17
K_4	1,43
K_5	2,20

July

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	12231311	14	5	2	4	2	0
2.	32211111	12	5	1	4	0	1
3.	12232112	14	5	2	4	1	1
4.	11122125	15	5	2	4	1	0
5.	11212113	12	3	0	4	0	1
6.	11211153	15	3	1	4	2	1
7.	74203211	20	3	0	4	3	2
8.	45445450	31	4	1	4	3	4
9.	14145532	25	6	2	4	2	6
10.	12334433	23	7	2	4	3	3
11.	22946310	27	5	3	5	3	2
12.	11112222	12	5	3	4	0	0
13.	11312324	17	4	1	4	3	2
14.	32123225	20	6	2	4	3	3
15.	23223332	20	6	3	5	3	1
16.	33533232	24	5	2	4	3	2
17.	22233123	18	5	1	5	2	2
18.	32234323	22	6	1	4	2	3
19.	22211212	13	6	2	5	1	1
20.	33121111	13	4	0	4	0	2
21.	11122122	12	6	1	4	1	1
22.	11111223	12	4	2	4	2	2
23.	22211120	11	5	2	4	0	1
24.	20111111	8	3	0	4	0	1
25.	15645657	39	6	2	5	3	6
26.	33434524	28	6	2	5	3	2
27.	23433322	22	6	2	5	2	1
28.	32222122	16	6	2	4	1	1
29.	11221001	8	5	2	4	0	0
30.	11111101	7	4	1	4	0	0
31.	10112104	10	3	1	5	1	1

Monthly averages:

T (N)	1,976
T (E)	1,781
K_1	4,90
K_2	1,55
K_3	4,26
K_4	1,61
K_5	1,71

August

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	35231132	20	3	1	5	2	2
2.	22322321	17	4	2	5	2	1
3.	11111111	8	5	2	4	0	0
4.	11111112	9	4	1	4	0	2
5.	45875553	42	7	5	6	4	6
6.	33321111	15	6	2	4	1	1
7.	00111112	7	4	2	4	0	1
8.	29331121	22	3	1	5	2	2
9.	22112456	23	5	1	4	3	4
10.	33231220	16	3	0	4	1	2
11.	02122102	10	4	0	4	1	1
12.	00010100	2	3	0	4	0	0
13.	01011111	6	2	0	4	0	1
14.	14443011	18	4	1	4	2	3
15.	41234325	24	3	0	4	3	2
16.	11122111	10	4	0	4	2	0
17.	22212221	14	4	2	4	2	1
18.	02221021	10	4	1	4	1	0
19.	11111110	7	4	0	4	0	0
20.	00132533	17	4	0	4	2	2
21.	33422546	29	8	3	5	4	4
22.	52332221	20	6	1	5	2	3
23.	42223131	18	7	2	6	2	5
24.	10213122	12	5	0	5	2	3
25.	223 2203	(16)	6	1	5	3	3
26.	11121121	10	4	0	4	2	0
27.	32111001	9	4	0	3	0	1
28.	21111131	11	4	2	4	1	0
29.	69334236	36	7	2	5	4	4
30.	44321322	21	7	3	4	1	3
31.	11222122	13	5	2	4	1	1

Monthly averages:

T (N)	1,891
T (E)	1,332
K_1	4,61
K_2	1,19
K_3	4,35
K_4	1,61
K_5	1,87

September

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	01221141	12	3	0	4	0	1
2.	22111211	11	5	0	5	0	1
3.	10101110	5	4	0	4	1	0
4.	10110011	5	4	0	4	0	0
5.	00001111	4	3	0	4	1	0
6.	41153412	21	4	1	4	2	1
7.	31221101	11	5	1	4	1	0
8.	21011102	8	3	0	4	1	1
9.	21213463	22	4	2	5	2	3
10.	36343412	26	4	2	4	4	3
11.	34434535	31	4	1	4	2	3
12.	53234222	23	5	2	5	2	3
13.	25321105	19	4	1	4	2	1
14.	33233110	16	6	2	4	0	3
15.	11221123	13	5	0	4	0	1
16.	10111110	6	3	0	4	1	0
17.	11411233	16	4	2	4	1	3
18.	12245342	23	6	2	4	3	4
19.	22233211	16	5	2	4	1	2
20.	11112122	11	6	1	4	1	1
21.	31011121	10	4	0	4	1	1
22.	10111111	7	4	0	4	0	0
23.	31110101	8	5	2	4	0	1
24.	00100002	3	3	0	4	0	0
25.	11010010	4	3	0	4	1	0
26.	11223214	16	4	1	4	3	3
27.	73122211	19	4	1	4	1	2
28.	11221210	10	4	1	4	1	1
29.	21111010	7	5	0	4	0	0
30.	00111012	6	4	2	4	0	0

Monthly averages:

T (N)	1,550
T (E)	1,183
K_1	4,23
K_2	0,87
K_3	4,10
K_4	1,07
K_5	1,30

October

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	22021101	9	3	1	4	0	1
2.	10000012	4	3	2	3	0	1
3.	20115224	17	4	2	4	1	2
4.	42111031	13	6	1	4	0	3
5.	21111000	6	3	1	3	0	0
6.	22223394	27	4	2	4	2	5
7.	35345358	36	6	2	4	4	6
8.	54324469	37	6	1	5	4	7
9.	83555374	40	6	3	4	3	6
10.	33544353	30	5	1	4	4	3
11.	50112242	17	6	2	5	3	5
12.	12121461	18	4	1	5	2	3
13.	11111323	13	4	1	4	1	1
14.	00132223	13	4	2	3	2	2
15.	10133011	10	5	2	4	1	1
16.	12234251	20	8	4	5	3	1
17.	42121211	14	5	1	4	1	0
18.	00112111	7	4	1	4	1	0
19.	10011011	5	3	0	4	0	0
20.	11011003	7	3	1	4	1	0
21.	31011002	8	4	0	3	1	0
22.	11011102	7	4	1	4	1	0
23.	02011011	6	4	0	4	0	1
24.	11111110	7	6	2	4	0	0
25.	10111100	5	3	1	4	1	0
26.	10011132	9	3	0	4	0	1
27.	12001000	4	3	0	4	0	1
28.	20022353	17	4	0	5	1	1
29.	42220004	14	5	1	4	1	2
30.	30211114	13	4	0	4	1	1
31.	12321240	15	3	0	4	2	1

Monthly averages:

T (N)	1,734
T (E)	1,223
K_1	4,35
K_2	1,16
K_3	4,03
K_4	1,32
K_5	1,77

November

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	10011105	9	4	0	4	0	1
2.	21112299	27	4	0	5	1	4
3.	94668996	57	7	4	5	7	9
4.	65667778	47	7	4	6	7	6
5.	42324565	33	7	3	6	6	3
6.	43134410	20	6	2	4	2	3
7.	21132341	17	5	2	6	3	1
8.	10021202	8	5	1	4	1	0
9.	11243488	31	4	0	4	4	5
10.	32115359	29	3	1	5	4	3
11.	73342243	28	7	2	5	2	4
12.	23212211	14	6	2	4	2	0
13.	11120000	5	4	1	4	1	1
14.	01111121	8	7	2	4	0	0
15.	00010110	3	5	1	4	0	0
16.	40110001	7	3	0	4	0	2
17.	11225543	23	6	1	4	3	4
18.	41123101	13	4	0	4	1	0
19.	11211021	9	4	1	4	1	1
20.	21111223	13	7	3	4	1	2
21.	54331143	24	7	3	5	3	3
22.	14555999	47	6	1	4	6	5
23.	40310110	10	3	0	4	1	1
24.	11215662	24	5	2	4	1	3
25.	51213522	21	6	2	4	1	1
26.	11352111	16	5	1	4	1	1
27.	30001111	7	4	1	4	0	0
28.	30112111	10	4	1	4	2	1
29.	12235697	35	5	2	4	3	6
30.	39436695	45	7	3	5	6	5

Monthly averages:

T (N)	2,579
T (E)	2,088
K_1	5,10
K_2	1,53
K_3	4,40
K_4	2,33
K_5	2,50

December

Day	T	Sum	K_1	K_2	K_3	K_4	K_5
1.	43446975	42	7	4	5	3	6
2.	34355466	36	5	2	4	3	3
3.	41233412	20	7	3	4	2	1
4.	21124441	19	5	2	4	1	3
5.	11111132	11	4	1	4	1	0
6.	00013011	6	3	0	4	1	0
7.	20011111	7	4	1	4	0	1
8.	12111447	21	4	0	4	4	2
9.	52126300	19	4	0	4	1	4
10.	00122400	9	6	1	4	0	2
11.	01121112	9	4	1	4	1	1
12.	10011100	4	5	0	4	0	0
13.	00001111	4	4	1	4	1	0
14.	10111112	8	5	0	4	1	1
15.	22212112	13	5	0	4	0	2
16.	22332223	19	7	2	4	3	2
17.	33112213	16	7	2	4	1	1
18.	11112211	10	6	2	5	1	0
19.	12111310	10	5	2	4	0	1
20.	02010001	4	4	0	4	0	0
21.	00012321	9	4	0	4	1	1
22.	23121123	15	4	0	4	3	2
23.	12111123	12	4	0	4	1	0
24.	01000012	4	4	1	3	0	0
25.	23422312	19	5	1	5	4	4
26.	7 33798	(49)	6	2	4	3	8
27.	43343867	38	6	2	6	4	5
28.	52332223	22	6	2	5	2	2
29.	22333252	22	5	2	4	3	3
30.	32132221	16	5	2	4	2	2
31.	11111111	8	5	1	4	0	2

Monthly averages:

T (N)	1,959
T (E)	1,512
K_1	5,00
K_2	1,19
K_3	4,16
K_4	1,52
K_5	1,90

II. *Average amplitudes for different periods*

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
											January	North
1.	12	10	9	9	12	15	13	23	29	26	22	24
2.	12	10	5	6	8	9	9	16	20	21	20	20
3.	36	36	34	37	37	36	36	37	37	42	38	38
4.	38	57	73	52	62	47	49	41	66	38	44	49
5.	98	77	53	62	53	37	47	36	33	39	52	36
6.	+7	—1	—36	—10	—29	—21	—9	+3	+5	—4	—24	—38
											January	East
1.	16	12	9	9	13	22	23	30	35	37	36	37
2.	10	9	6	7	5	6	8	16	18	24	23	24
3.	31	34	33	34	36	35	31	31	33	41	37	33
4.	28	60	41	35	34	33	26	37	43	33	38	37
5.	87	69	72	56	60	34	34	40	27	34	38	45
6.	+10	+5	—9	+4	+1	—7	—19	—9	—11	+22	+23	+14
											February	North
1.	12	10	14	13	14	17	19	30	28	24	26	26
2.	12	9	10	10	9	13	16	23	21	17	17	19
3.	33	34	39	39	37	39	38	41	46	39	40	40
4.	41	66	62	45	73	65	73	57	59	73	87	96
5.	163	114	134	145	75	47	55	55	57	45	78	51
6.	—27	—8	—14	+3	—3	—15	—34	+3	+32	+30	—5	—21
											February	East
1.	15	18	19	15	22	23	19	30	28	49	53	53
2.	7	7	6	7	7	10	18	22	23	21	21	23
3.	39	34	35	35	37	33	38	39	45	33	36	35
4.	35	40	39	35	54	39	59	31	37	53	57	46
5.	120	94	97	82	70	72	46	47	53	62	53	69
6.	—3	+7	+7	—4	+2	0	—20	—10	+5	+30	+55	+37

and hourly means of earth current elements

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
24	21	18	17	16	15	15	16	14	12	12	9	16.4
21	17	12	13	12	12	13	13	11	9	10	8	12,8
40	37	37	37	37	33	34	36	34	37	38	34	36.6
39	52	44	41	47	39	37	51	43	54	77	56	49.8
60	44	35	111	91	82	136	180	133	158	83	82	75.8
—23	+6	+8	+35	+5	+13	+29	+24	+13	+50	—10	+9	
Component												
46	42	38	37	26	20	23	21	15	18	16	14	24,8
22	27	23	20	13	8	7	9	4	10	8	6	13,0
31	26	25	30	35	33	33	34	37	38	33	34	33,3
28	30	26	34	30	38	35	57	46	46	47	56	38,3
41	75	51	88	60	90	78	117	139	177	100	80	70,5
+15	—9	+11	+3	—3	+6	+17	—38	—8	—23	+3	+3	
Component												
27	25	22	19	21	14	21	14	14	13	12	10	18,5
23	19	21	17	19	14	15	14	12	15	11	11	15,3
42	44	47	36	41	34	36	39	41	39	35	38	39,0
95	69	71	39	38	50	54	76	76	69	35	68	64,0
57	66	61	121	109	138	185	98	120	157	213	115	102,5
—23	—29	—1	+27	+29	+32	+15	—19	—9	+29	—3	+12	
Component												
55	57	55	53	43	35	31	16	17	21	18	17	31,7
32	27	32	24	21	13	16	13	12	14	10	11	16,5
36	46	33	31	38	30	39	35	30	34	34	39	36,0
48	41	41	41	48	59	50	51	46	42	59	61	46,3
80	81	94	130	68	105	190	114	159	154	162	77	95,0
+34	—10	—13	—3	—4	—16	—40	—19	—13	—27	—12	+17	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
												March North
1.	10	9	12	13	16	19	20	25	21	23	20	20
2.	10	6	8	9	12	12	16	18	17	19	16	17
3.	38	37	35	36	36	38	42	35	40	39	37	38
4.	44	55	57	38	44	49	52	47	66	50	51	54
5.	139	96	70	82	56	36	22	45	15	44	63	63
6.	+6	+24	+22	—14	+1	+9	+11	+28	+14	—18	—71	—110
												March East
1.	17	15	15	18	20	22	30	34	35	37	38	35
2.	5	5	8	7	6	8	10	16	16	14	18	20
3.	36	37	38	35	36	38	35	29	34	30	35	37
4.	50	60	40	33	44	31	31	44	35	33	36	43
5.	73	35	56	52	28	33	35	29	36	34	38	37
6.	+33	+10	+10	+8	+5	—11	—13	—8	+25	+40	+17	+5
												April North
1.	6	12	14	15	16	16	20	20	19	22	14	16
2.	6	12	11	10	8	14	14	18	15	15	9	8
3.	35	37	37	34	35	37	40	38	38	37	35	35
4.	52	53	48	44	35	36	37	42	43	36	34	62
5.	56	64	92	34	44	37	34	24	28	38	39	46
6.	+20	—10	—10	+10	—4	+4	+35	+49	+22	—46	—85	—127
												April East
1.	11	13	13	12	16	20	22	29	30	29	25	31
2.	8	10	10	4	8	8	12	10	16	20	19	20
3.	34	32	34	34	35	32	32	32	34	36	35	39
4.	47	40	49	32	39	35	28	29	31	35	35	47
5.	41	59	35	41	22	32	34	33	30	17	47	32
6.	+17	+3	+12	—1	0	+8	+4	+17	+7	+10	+22	—7

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
19	19	18	17	18	15	15	14	13	15	15	14	16,7
17	15	15	11	12	15	9	11	9	10	11	13	12,8
39	39	39	39	38	38	33	37	36	35	35	37	37,3
68	53	56	57	37	69	84	45	63	46	44	64	53,9
44	65	67	75	136	125	125	160	142	110	154	99	84,7
—80	—42	+12	+47	+81	+69	+20	—9	+17	+5	—17	—3	
Component												
40	38	42	39	32	26	21	20	17	20	20	20	27,1
21	19	20	18	17	10	9	11	8	10	10	13	12,5
38	38	39	33	42	34	39	39	37	34	30	35	35,8
35	32	31	50	41	51	55	48	47	42	68	67	43,6
45	57	59	59	95	123	145	121	106	118	92	106	67,2
—5	—26	—19	+10	+7	+9	—17	—31	+1	—5	—20	—23	
Component												
16	17	15	14	13	11	14	13	10	7	11	10	14,2
13	12	9	11	10	7	7	8	7	6	11	9	10,4
36	37	37	38	33	35	37	34	37	36	37	37	36,3
43	53	44	49	47	35	34	49	52	44	49	57	44,9
51	36	25	55	70	93	79	80	67	76	97	109	57,3
—120	—38	—4	+33	+59	+47	+43	+52	+13	+24	+22	+10	
Component												
32	34	28	27	30	23	22	11	8	11	13	16	21,1
20	24	18	15	11	16	12	6	6	10	14	11	12,8
37	36	41	39	35	36	37	37	34	37	37	38	35,5
41	34	36	38	33	37	53	49	44	46	46	65	40,4
52	53	23	40	79	123	79	121	81	69	109	62	54,8
—22	+4	+3	+5	—5	—13	—19	—27	—14	+10	—18	+3	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
												May North
1.	10	13	15	16	17	22	20	19	16	16	13	11
2.	10	10	12	11	11	20	17	14	15	8	7	5
3.	35	34	43	36	39	45	38	39	37	35	35	34
4.	48	44	59	46	35	52	48	55	54	35	45	43
5.	112	127	64	66	67	56	52	38	26	53	46	62
6.	+10	+6	+14	—14	+9	+39	+21	+25	+7	—69	—100	—122
												May East
1.	12	15	11	19	17	21	26	26	31	31	33	31
2.	5	7	8	8	7	8	10	15	13	13	16	14
3.	32	34	39	37	40	34	35	35	32	35	35	36
4.	39	52	52	39	27	35	34	30	35	28	54	37
5.	73	70	45	53	64	69	39	46	39	42	19	45
6.	—8	+7	—1	—10	—9	+7	+28	+28	+39	+9	—1	—19
												June North
1.	11	17	16	19	18	22	20	20	18	15	14	15
2.	9	11	11	14	13	17	17	17	13	14	8	10
3.	34	35	37	32	36	43	38	37	35	35	35	35
4.	23	33	48	37	43	46	49	40	29	45	35	46
5.	79	94	47	45	31	52	60	34	49	18	50	37
6.	+21	+2	+20	+20	+53	+69	+46	+29	—7	—82	—132	—154
												June East
1.	11	14	16	19	14	16	22	25	28	25	28	33
2.	9	9	5	8	4	5	11	14	16	12	16	17
3.	34	36	33	30	32	35	32	30	30	33	31	31
4.	28	36	32	29	28	34	34	29	22	30	34	43
5.	56	50	35	36	31	30	29	29	33	33	52	40
6.	+10	+4	+5	—6	—10	+16	+38	+43	+43	+64	+26	+6

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
12	10	12	8	5	5	6	12	12	8	8	8	12,3
11	7	6	5	2	3	5	8	12	6	6	5	9,0
39	37	34	34	37	36	35	30	40	38	32	35	36,5
56	53	46	45	42	31	34	42	55	37	85	57	47,8
49	45	57	55	41	62	51	79	47	127	74	114	65,4
—93	—47	+11	+49	+42	+35	+41	+21	+31	+24	+32	+28	
Component												
37	30	29	26	16	19	13	14	13	12	12	10	21,0
16	13	15	9	8	4	5	6	9	7	12	8	9,8
36	36	34	34	34	37	34	35	39	37	34	35	35,4
45	46	46	40	58	50	30	60	52	53	63	43	43,7
42	45	62	54	48	60	66	74	48	69	62	93	55,3
—4	+19	+15	+1	—13	—25	—24	—41	+5	+2	—12	+6	
Component												
15	10	10	8	4	4	6	7	12	14	15	8	13,3
12	11	9	5	3	4	4	3	8	11	13	10	10,3
34	37	35	36	32	35	36	26	32	34	33	34	34,8
35	50	53	40	38	24	37	57	32	33	50	42	40,2
48	57	40	43	46	67	77	56	104	85	70	85	57,3
—111	—54	—36	+29	+35	+57	+34	+64	+25	+5	+31	+37	
Component												
29	29	24	20	18	16	17	11	10	17	17	11	19,3
16	17	15	9	10	8	12	6	9	13	14	10	11.0
38	38	33	31	34	37	30	32	33	35	32	34	33.1
34	43	39	28	31	30	68	35	41	35	37	52	35,5
41	52	65	57	82	87	58	109	80	98	108	60	56,3
—10	—7	—38	—23	—41	—21	—48	—37	—9	—9	—17	+19	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
												July North
1.	9	12	15	19	20	22	21	20	19	17	16	14
2.	9	10	12	13	16	18	17	17	18	15	11	12
3.	35	34	37	36	37	40	34	38	38	35	35	36
4.	37	37	39	35	36	62	48	46	43	38	41	41
5.	52	74	59	37	44	21	39	26	23	28	34	47
6.	+27	+26	+7	+13	+32	+58	+41	+44	+3	—35	—79	—132
												July East
1.	8	10	12	18	20	22	26	28	29	31	28	28
2.	5	7	10	10	6	9	8	19	22	16	15	19
3.	33	33	34	32	32	35	32	31	33	32	33	34
4.	40	51	27	30	27	33	25	29	28	28	31	48
5.	46	28	48	29	33	30	31	23	35	39	38	26
6.	+3	—3	—10	—9	—14	—12	+19	+53	+49	+32	+37	+16
												August North
1.	12	10	14	15	18	21	21	24	23	19	18	16
2.	9	11	8	10	13	16	16	21	16	14	12	11
3.	35	35	36	35	39	37	41	41	40	36	37	37
4.	44	22	55	31	39	43	41	37	44	38	37	56
5.	59	114	50	87	59	41	28	18	25	26	32	42
6.	+21	—6	—9	—1	+12	+17	+41	+57	+8	—55	—105	—144
												August East
1.	10	9	11	8	15	16	24	28	29	26	29	29
2.	6	8	5	3	9	5	8	14	13	12	14	13
3.	35	33	35	32	33	33	33	34	34	33	34	32
4.	31	38	28	33	28	41	28	26	29	40	29	31
5.	35	35	45	53	37	41	27	19	17	13	32	40
6.	—1	—1	+4	+13	+21	+24	+56	+53	+82	+80	+29	—8

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
14	13	12	12	8	6	5	10	11	12	8	9	13.5
14	10	9	6	6	3	5	5	8	10	7	7	10,8
36	35	34	37	34	34	34	35	35	36	37	35	35,7
39	45	49	34	40	44	39	39	44	46	45	62	42,9
51	54	65	46	44	30	53	45	60	73	62	77	47,7
—137	—76	—32	+29	+46	+50	+31	+11	+7	+25	+15	+25	
Component												
27	24	26	24	22	14	11	10	11	12	8	9	19,1
16	18	16	15	11	10	6	9	7	9	7	4	11,4
31	35	34	34	31	34	35	34	34	36	35	33	33,3
34	34	45	24	41	42	45	37	44	49	32	55	36,6
46	70	53	73	52	53	59	67	43	43	72	63	45,8
+8	+14	—14	—16	—22	—30	—21	—35	—20	—11	—10	—3	
Component												
13	12	13	9	8	6	11	12	10	8	6	9	13,7
12	7	6	2	4	3	6	12	10	8	3	7	9,9
35	38	35	35	35	34	35	37	35	35	35	38	36,5
52	50	61	41	48	37	37	31	42	42	53	57	43,3
56	51	39	53	47	59	55	87	65	66	48	61	52,8
—118	—58	—4	+44	+67	+61	+37	+46	+28	+30	+19	+14	
Component												
28	26	23	20	14	10	10	12	9	8	7	9	17,1
10	13	11	8	5	5	5	11	8	6	6	9	8,6
35	34	35	34	34	33	33	36	33	32	31	33	33,5
38	41	36	38	34	55	48	30	41	45	38	51	36,5
50	38	41	45	59	44	34	53	60	47	58	33	39,8
—19	—22	—20	—24	—22	—32	—34	—52	—34	—37	—28	—27	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
												September North
1.	10	11	11	11	11	14	19	19	18	16	16	16
2.	10	10	8	7	6	6	13	16	11	8	9	10
3.	35	36	35	37	35	36	35	37	36	36	35	36
4.	33	36	43	28	29	32	31	35	41	39	42	51
5.	62	73	31	74	38	25	35	23	14	40	50	36
6.	—16	—10	+13	—41	—4	—3	+41	+62	+29	—28	—93	—152
												September East
1.	11	11	7	7	8	12	16	22	18	20	25	25
2.	10	10	8	4	3	4	7	10	11	6	11	10
3.	33	31	33	29	36	32	28	32	35	35	36	29
4.	31	28	35	31	31	30	33	32	28	32	34	35
5.	38	64	27	37	22	26	23	17	28	26	25	38
6.	—12	—19	+13	—10	—4	—14	+4	+43	+71	+78	+57	+17
												October North
1.	9	13	9	12	12	12	15	20	17	16	20	19
2.	11	10	7	8	7	6	8	18	15	12	14	12
3.	34	32	34	33	34	34	34	34	35	33	37	33
4.	37	46	42	32	40	39	34	52	43	39	47	55
5.	66	84	60	56	35	31	21	12	12	46	41	33
6.	0	—12	+3	+1	—3	—30	+17	+36	+72	+19	—78	—131
												October East
1.	8	12	7	12	9	15	12	14	17	23	32	30
2.	8	5	6	6	3	2	4	7	10	11	10	12
3.	30	31	34	28	33	34	30	32	30	35	27	33
4.	35	41	33	26	28	33	31	34	32	24	37	50
5.	52	46	28	48	30	30	32	28	26	34	30	16
6.	+19	—7	—13	—24	—6	—13	—4	+9	+35	+52	+37	+9

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
16	13	15	14	12	11	11	9	4	10	11	6	12,7
14	5	8	8	4	5	10	4	5	8	10	6	8,4
37	36	35	35	35	36	35	34	34	37	37	34	35,6
40	43	49	45	41	30	38	37	40	28	44	38	38,0
42	56	20	25	26	35	33	46	36	76	43	35	40,6
—120	—64	+13	+69	+94	+54	+51	+26	+17	+29	+30	+2	
Component												
25	22	20	19	17	10	10	5	4	10	14	8	14,4
9	11	8	8	10	6	7	5	5	5	10	4	7,6
32	34	35	36	34	37	32	32	34	32	28	34	32,9
39	32	41	40	31	32	35	35	35	37	38	36	33,8
28	46	26	30	48	31	46	60	43	49	62	38	36,6
—24	—28	—26	—1	—5	—19	—27	—34	—18	—23	—28	+7	
Component												
17	15	14	14	12	12	9	13	10	8	12	15	13,5
12	10	10	9	7	9	10	12	6	8	9	14	10,2
39	38	35	36	32	34	35	32	31	31	32	33	34,0
38	41	39	33	32	40	38	45	40	34	53	44	41,0
41	28	37	24	39	50	82	120	100	70	116	92	54,0
—107	—49	+32	+66	+46	+17	+43	+51	+3	+6	—4	—1	
Component												
24	20	24	21	19	16	12	12	12	8	15	15	16,2
13	10	10	8	9	6	4	8	5	6	10	12	7,7
28	37	32	29	32	31	30	30	31	31	33	32	31,4
47	41	30	31	34	39	49	34	33	52	38	24	35,7
22	14	34	29	33	34	59	106	73	39	82	97	42,6
—28	—37	—17	—1	—6	—15	—14	—7	+17	+13	—10	+8	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
											November North	
1.	9	10	10	10	16	16	17	25	26	22	17	22
2.	9	8	6	4	7	10	15	20	21	16	15	14
3.	34	36	35	32	37	35	37	35	38	38	37	38
4.	37	47	56	54	46	69	49	38	60	69	49	70
5.	110	68	67	54	37	21	27	44	24	13	50	43
6.	—20	—25	—38	—31	+8	—8	—11	+22	+59	+34	—18	—47
											November East	
1.	9	9	10	11	16	23	25	26	31	27	27	32
2.	7	4	4	4	5	10	11	10	19	19	13	15
3.	31	30	34	30	31	35	35	33	33	35	39	35
4.	45	26	28	40	41	45	35	36	49	33	43	42
5.	63	60	47	46	27	21	31	38	17	28	32	43
6.	+6	+5	+2	—2	—8	—11	—17	+3	+10	+28	+15	+1
											Dcember North	
1.	7	8	4	8	12	10	16	17	25	22	19	23
2.	6	5	2	4	8	6	8	9	17	19	16	19
3.	34	35	35	37	37	38	34	38	36	36	42	39
4.	30	41	43	49	46	46	49	43	54	40	55	36
5.	107	85	51	36	46	29	38	32	8	20	13	37
6.	—19	—23	—19	—22	—17	—3	—12	—8	+22	+30	—10	—29
											December East	
1.	8	8	5	8	14	20	22	22	29	32	34	34
2.	5	2	5	2	4	2	5	8	12	13	16	17
3.	32	31	32	29	34	37	33	33	32	30	32	33
4.	46	30	33	31	29	35	29	38	29	33	34	34
5.	56	63	51	35	32	28	26	22	40	23	30	36
6.	+4	+3	+3	—3	—11	—15	—20	—21	—8	+29	+29	+19

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
23	22	19	18	16	15	16	14	13	10	7	7	15,8
19	17	14	12	11	11	12	7	12	9	7	4	11,7
38	40	32	37	35	34	48	36	37	32	33	38	36,3
62	71	37	76	49	83	56	66	91	59	49	58	58,4
46	22	85	36	65	91	156	116	137	137	88	50	66,1
—57	—5	+16	+18	+29	+37	+45	+13	+23	—16	—2	—23	
Component												
35	38	30	29	25	18	22	16	19	12	8	11	21.2
19	16	14	13	10	7	10	10	11	10	5	6	10,5
34	37	27	32	29	37	37	29	35	34	29	35	33,2
43	39	39	38	43	53	55	59	56	49	41	49	42,8
43	59	73	60	64	97	92	88	114	109	86	103	60,0
—10	+18	—4	+11	+27	—2	—4	—10	—38	—26	+7	—3	
Component												
21	20	16	16	19	16	13	6	13	12	6	10	14,1
21	15	12	13	12	13	9	8	10	9	5	10	10,7
36	38	35	37	37	35	32	34	34	34	37	35	36,0
38	44	45	54	41	48	33	33	38	49	49	45	43,7
46	45	57	60	93	56	96	52	51	99	42	54	52,2
—30	+7	+29	+29	—9	—4	+14	+6	+28	+10	+32	—2	
Component												
38	36	31	29	31	19	16	10	15	13	8	13	20,6
18	17	14	13	13	9	5	5	6	9	6	13	9,1
31	33	28	32	28	33	31	33	35	34	30	31	32,0
27	41	28	31	33	38	34	38	33	33	45	37	34,1
44	33	66	75	98	62	84	45	60	96	63	57	51,0
+9	+16	+4	+20	—5	—4	—26	—4	—9	—16	+15	—9	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
											Year 1975. North	
1.	10	11	12	14	15	17	18	22	22	20	18	18
2.	9	9	8	9	10	12	14	17	17	15	13	13
3.	35	35	36	35	37	38	37	37	37	37	37	37
4.	39	45	52	41	44	49	47	44	50	45	47	55
5.	92	89	65	65	49	36	38	32	26	34	46	44
6.	+2	−2	−2	−8	+5	+10	+13	+26	+20	−14	−58	−91
											Year 1975. East	
1.	11	12	11	13	15	19	22	26	28	31	32	33
2.	7	7	7	6	6	6	9	14	16	15	16	17
3.	33	35	35	33	35	34	33	32	34	34	34	34
4.	38	42	36	33	34	35	33	33	33	33	39	41
5.	62	56	49	48	38	37	34	31	32	32	36	39
6.	+7	0	0	−3	−3	−3	+7	+19	+30	+35	+20	−3
											Quiet days North	
1.	6	7	11	12	13	16	18	19	18	17	15	16
2.	6	6	7	8	8	12	11	14	12	11	10	9
3.	34	36	36	34	35	36	33	35	34	35	34	34
4.	29	30	37	28	28	27	29	31	32	36	35	39
5.	34	28	12	30	20	26	23	17	15	12	20	24
6.	+7	+10	+3	+1	+9	+15	+20	+27	+24	−23	−81	−114
											Quiet days East	
1.	6	6	7	8	13	13	16	17	21	25	24	24
2.	5	5	4	5	3	4	5	7	10	10	10	11
3.	30	31	31	27	30	32	29	29	30	30	32	30
4.	28	30	27	28	23	22	21	26	26	28	26	33
5.	30	20	19	17	20	23	23	18	14	15	23	24
6.	+4	+2	+4	−6	−9	−4	+1	+20	+36	+40	+23	+3

12	13	14	15	16	17	18	19	20	21	22	23	Averages
Component												
18	16	15	14	13	11	12	12	11	11	10	11	14,6
16	12	11	9	8	8	9	9	9	9	9	9	11,0
38	38	36	36	35	35	36	34	35	35	35	37	36,2
51	50	50	46	42	44	43	48	51	45	53	54	47,3
49	47	49	58	67	74	94	93	89	103	91	81	63,0
—77	—35	+4	+37	+38	+34	+28	+22	+14	+17	+9	+8	
Component												
34	32	31	28	24	19	17	13	13	14	13	13	21,0
18	18	16	13	12	8	8	8	7	9	9	9	10,9
34	36	33	33	34	34	34	34	34	34	32	35	33,9
38	38	37	36	38	44	46	44	43	44	46	50	38,9
44	52	54	62	66	76	82	90	84	89	88	73	56,4
—13	—9	—10	+1	—2	—8	—16	—21	—9	—12	—8	+1	
Component												
14	11	11	10	8	7	6	9	10	9	6	7	11,5
11	7	6	6	4	5	6	7	9	8	6	7	8,2
34	36	34	33	33	33	33	32	34	34	33	33	34,1
32	34	34	33	33	29	26	32	33	29	33	35	31,8
23	17	15	18	16	22	22	26	21	28	22	23	21,4
—97	—45	+12	+40	+48	+32	+20	+16	+18	+23	+22	+13	
Component												
23	22	20	17	15	12	10	9	10	8	7	9	14,3
11	11	10	10	8	5	3	7	8	7	7	8	7,3
31	33	32	33	30	32	32	32	30	33	32	31	30,9
31	30	28	21	31	32	27	30	35	32	30	31	28,2
16	16	19	25	22	20	21	22	21	29	31	30	21,6
—14	—18	—12	—8	—8	—11	—16	—18	—4	—5	—1	+1	

Hour Parameter	0	1	2	3	4	5	6	7	8	9	10	11
												Disturbed days
1.	10	10	16	16	19	23	24	28	32	34	31	31
2.	12	11	12	10	15	15	22	27	29	33	22	28
3.	33	35	41	37	41	42	48	46	50	44	42	42
4.	40	73	86	60	85	85	78	61	73	77	75	110
5.	243	175	178	124	115	85	67	81	61	63	119	67
6.	+2	—51	—19	—15	+2	—34	+5	—45	+37	+9	—4	—58
												Disturbed days
1.	16	16	21	17	26	28	33	41	44	51	51	51
2.	7	6	8	5	14	14	13	28	30	38	35	37
3.	39	35	40	37	41	42	37	41	49	44	49	39
4.	50	67	73	50	79	59	64	48	41	42	52	53
5.	137	108	99	130	79	88	67	63	81	86	74	70
6.	+44	—10	—15	—4	+20	+24	—3	+20	+7	+40	+28	—5

12	13	14	15	16	17	18	19	20	21	22	23	Averages
North Component												
28	27	25	21	24	21	15	15	17	16	18	10	21,3
28	27	24	17	20	16	12	15	14	14	13	9	18,5
48	47	41	42	39	38	35	35	36	39	34	33	40,3
87	86	78	81	63	103	71	98	105	77	69	86	79,5
101	92	126	212	216	234	250	277	257	245	245	220	160,5
—52	—2	+3	+38	+45	+56	+21	—17	+2	+10	—24	+1	
East Component												
51	49	46	42	41	29	31	28	24	33	21	21	33,4
35	34	28	26	21	14	16	19	10	13	12	11	19,8
45	53	34	36	39	41	40	36	39	35	34	36	40,0
62	49	55	53	39	73	70	77	76	70	60	89	60,7
76	142	119	203	178	200	223	250	259	218	247	153	139,6
+25	—11	—22	—12	—5	—23	—24	—45	—5	—26	—16	+18	

III.

Results of harmonical analysis of the daily variations

	A_1	φ_1	A_2	φ_2	A_3	φ_3	A_4	φ_4	A_5	φ_5	A_6	φ_6
					North Component							
January	20	172	10	243	10	136	9	341	4	128	2	45
February	8	200	9	254	15	81	17	252	8	225	4	50
March	24	132	39	305	33	106	12	310	5	331	10	30
April	37	124	346	284	32	124	12	336	6	190	4	193
May	42	121	40	296	31	141	8	335	2	142	1	274
June	56	105	58	297	26	148	5	50	8	168	5	118
July	46	96	49	290	33	118	6	252	5	80	5	355
August	43	122	53	287	36	130	10	334	1	211	4	125
September	36	136	54	284	45	122	18	310	5	289	5	282
October	22	134	41	282	37	108	30	320	15	155	6	182
November	13	220	28	261	17	95	11	306	14	159	7	38
December	12	199	11	217	11	157	14	296	10	140	6	306
Year	23	127	31	285	23	121	10	310	4	151	1	27
Q	31	117	35	291	30	127	15	307	3	158	3	24
D	12	217	23	274	25	106	10	276	8	214	5	96
					East Component							
January	6	284	9	82	8	34	8	182	4	149	2	308
February	17	321	17	109	10	4	9	198	5	45	5	128
March	9	350	3	111	16	45	9	258	5	27	10	63
April	10	1	3	85	73	111	5	284	5	50	3	327
May	15	343	3	162	14	155	10	346	2	303	5	5
June	31	357	18	173	11	99	2	350	2	32	4	21
July	26	331	16	161	9	104	5	14	4	262	1	169
August	46	348	13	227	15	86	8	300	3	151	5	19
September	30	332	18	187	21	64	13	267	2	123	4	162
October	7	348	20	183	13	66	9	259	10	69	4	91
November	9	290	6	61	13	73	4	230	4	182	1	315
December	9	270	14	97	5	18	7	249	4	80	2	294
Year	13	342	6	182	11	83	5	275	2	103	2	62
Q	13	349	11	178	11	72	6	281	1	73	1	27
D	20	353	9	126	6	99	9	163	8	109	12	81

IV.

Special phenomena
(magnetic and earth current date)
SSC-s

Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	End of Storm
01.	08.	0.30	9,0	22	+	+	+	—	01.08. 22.00
03.	09.	23.45	12,0	50	+	+	+	— (b?)	03.15. 22.00
04.	11.	13.30	12,0	42	—	—	—	+	03.21. 21.00
05.	16.	4.15	6,5	18	+	+	+	—	05.17. 19.00
	19.	20.45	20,0	45	+	+	+	—	20. 19.00
	27.	7.30	4,0	18	+	+	+	—	28. 04.00
07.	06.	18.30	10,0	22	+	+	+	—	07.07. 03.00
	31.	23.15	8,0	22	+	+	+	—	08.01. 10.00
08.	08.	4.15	14,5	32	+	+	+	—	08. 12.00
10.	03.	12.15	11,0	14	+	+	+	—	10.04. 03.30
	14.	7.15	2,0	10	+	+	+	— (?)	no storm
11.	03.	18.45	22.0	110	—	+	+	+	11.05. 05.00 (in storm)
	23.	7.30	7,0	16	+	+	+	— (si?)	no storm

		Bays			*Pi-s*						
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
01.	02.	20.30	2,5	12	+	+	+	+	2,5	+	+
	04.	15.00	12	85	—	+	—	+	tr		
		16.30	23	140	—	+	+	+	tr		
	05.	16.30	13,5	80	—	—	—	+			
		19.00	10	65	—	+	+	+	tr		
		21.15	12,5	50	+	+	+	—	tr		
	06.	23.00	23	145	—	+	+	+	tr		
	07.	1.30	>27	180	—	+	+	+	tr		
	08.	20.00	25	160	+	+	+	—			
	09.	22.15	2,5	10	—	+	+	+	2	+	+
	12.	0.45	2,5	15	+	+	+	—	2,5	+	+
	13.	23.00	7	50	+	+	+	—	tr		
	14.	14.45	12	85	—	—	—	+	tr		
		19.15	18	70	+	+	+	+			
	16.	0.30	8	40	—	+	+	+	tr		
		16.00	12	85	—	+	+	+			
	17.	18.15	10	70	—	+	+	+	tr		
	18.	15.00	9	70	—	—	—	+			
		20.45	8	60	+	+	+	—	tr		
	20.	2.45	3,5	23	+	+	+	—	2,5	+	+
		19.00	7	32	—	+	+	+	tr		
	22.	22.30	6,5	32	—	+	+	+	tr		
	23.	21.00	10	80	—	+	+	+	tr		
	26.	0.45	3,5	18	+	+	+	+	2	+	+
	28.	2.00	10	60	+	+	+	—	tr		
	29.	23.15							2	+	+
	30.	21.15	8	35	—	+	+	+	tr		
	31.	17.30	9	65	—	—	—	+	tr		
		21.00	10	75	—	+	+	+	tr		
02.	01.	0.45	4,5	12	—	—	—	+			
	02.	0.00	10	90	+	+	+	—	tr		
		20.15	11	80	—	+	+	+	tr		
	04.	23.30	3,5	18	+	+	+	—	2,5	+	+
	05.	18.15	18	80	—	+	+	+			
		22.00	9	30	+	+	+	—	2,5	—	+
	07.	21.30	6,5	30	—	+	+	+	2	+	+

Bays					*Pi-s*						
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
02.	09.	2.15	6,5	42	+	+	+	—	tr		
	10.	0.15	9	35	+	+	—	—	3,5	+	+
		15.15	>15	90	—	—	+	—	tr		
		17.45	12	90	—	—	—	+			
	11.	18.30	25	170	+	+	+	+			
	12.	17.30	18	120	—	+	+	+	tr		
	13.	20.45	20	85	+	+	+	+			
	15.	19.45	16	70	—	+	+	+			
		23.30	9	40	+	+	+	—	2	+	+
	19.	23.00	6,5	22	+	+	+	—	2,5	+	+
	20.	22.30	6,5	22	+	+	+	—	2,5	+	+
	22.	1.15	3,5	12	+	+	+	—	2,5	+	+
		2.15	4,5	14	+	+	+	—	2	+	+
		3.00	6,5	17	+	+	+	—	2,5	+	+
	23.	2,15	3,5	30	+	+	+	—	2	+	+
		23.45	6,5	30	—	+	+	+	2,5	+	+
	24.	2,30	6,5	40	+	—	—	—	3,5	+	+
		22,00	8	50	+	+	+	+	tr		
	28.	21.15	12	75	—	+	+	+	tr		
03.	01.	22.30	7	50	+	+	+	—	2.5	+	+
	02.	23.15	6,5	22	+	+	+	—	2,5	+	+
	05.	17.45	20	30	+	+	+	+	tr		
	10.	0.00						(pg)	5		
		19.30	>30	220	—	+	+	+	tr		
	12.	21.15	16	95	+	+	+	—	tr		
	13.	19.15	>30	220	+	+	+	+	tr		
	14.	23.30	11	75	—	+	+	+	tr		
	16.	23.45	3,5	18	+	+	+	—	2,5	+	+
	17.	23.45	8	60	+	+	+	—	3,5	+	+
	18.	17.00	9	70	—	—	—	+			
	19.	20.15	6,5	35	+	+	+	+	tr		
		22.00	12,5	75	+	+	+	+	tr		
	23.	0.45	6,5	25	+	+	+	—	4,5	+	+
		23.00	4,5	15	+	+	+	—			
	28.	19.15	16	85	—	+	+	+			
	29.	18.15	14,5	65	+	+	—	+			

		Bays			*Pi-s*						
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
03.	30.	1.30	4,5	20	+	0	+	—	tr		
	31.	17.00	5.5	30	—	—	—	+	tr		
04.	05.	21.45	5,5	18	+	+	+	—	3,5	+	+
	06.	22.15	>11	80	—	+	+	+	tr		
	07.	23.30	25	85	+	+	+	—	tr		
	08.	15.45	22	70	+	+	+	+	tr		
		17.30	>22	110	—	+	+	+	tr		
		20.30	>18	75	—	+	+	+	tr		
	09.	18.15	>18	85	—	+	+	+			
		22.15	18	90	+	+	+	—	tr		
	10.	19.00	12,5	55	+	+	+	+			
		22.30	12	70	+	+	+	—	tr		
	11.	2.00	10	50	+	—	+	—			
	13.	23.15	13,5	45	+	+	+	—	tr		
	18.	11.30	4	13	—	—	—	+			
	19.	0.15							2,5	+	—
	21.	2.30	16	85	+	—	+	—			
	22.	22.45	10	40	—	+	+	+	tr		
	23.	17.00	12,5	80	—	+	—	+	tr		
		21.15	9	42	+	+	+	—	tr		
	26.	0.45	3,5	40	+	+	+	—	3,5	+	+
		22.45							4,5	+	+
	28.	0.15	3,5	8	+	+	+	—	3,5	+	+
05.	02.	20.45	10	50	—	+	+	+	tr		
	03.	23.00	5,5	18	+	+	+	—	2	+	+
	05.	0.45	12,5	50	+	—	—	—	tr		
	06.	17.00	8	45	+	+	+	+			
	08.	21.30	7	32	+	+	+	—	2	+	+
	10.	0.15	9	45	+	+	+	—	tr		
		22.30	6,5	32	+	+	+	—	2,5		
	13.	20.30	4,5	18	—	+	+	+	4,5	—	+
		21.45							12,5	—	—
	14.	22.15	5,5	22	+	+	+	—	tr		
	16.	23.30	12	60	+	+	+	—	tr		
	18.	0.30							3,5	+	+
	24.	23.00							2,5	+	+

		Bays			*Pi-s*						
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
05.	26.	2.45	12,5	45	+	+	+	—	tr		
	27.	2.30	5,5	14	—	—	+	—			
		14.30	11,5	22	—	—	—	+			
		19.30	6,5	22	+	+	+	—			
	30.	22.45							2,5	+	+
	31.	19.30							3,5	+	+
06.	01.	1.15	3,5	14	+	+	+	—	2,5	+	+
	02.	22.30	7	45	+	+	+	—	tr		
	05.	19.00	5,5	30	—	+	+	+	2,5	+	+
	07.	22.30	8	22	+	+	+	+	3,5	+	+
	08.	23.15							2,5	+	+
	09.	3.30							3,5	+	+
	11.	0.45	4,5	14	+	+	+	—	3,5	+	+
		13.00	7	22	—	—	+	—			
		20.45	6,5	18	+	+	+	—	3,5	+	+
	12.	22.00	8	45	+	+	+	+	tr		
	17.	21.30	5.5	20	—	+	+	+	2	+	+
	19.	1.45							2,5	+	+
	21.	22.15							4,5	+	+
	22.	0.15	3,5	22	+	+	+	—	2	+	+
	23.	20.15							3,5	+	+
		20.45							3,5	+	+
		22.15							4,5	+	+
		23.45							2,5	+	+
	25.	5.30						(pg)	3,5		
		23.00							2,5	+	+
	27.	23.15	3,5	14	+	+	+	—	2,5	+	+
	28.	22.45	3,5	10	+	+	+	—			
	29.	21.15	18	95	+	+	+	—	tr		
	30.	23.00	8	42	+	+	+	—	tr		
07.	05.	21.30							4,5	+	+
	06.	22.30							3,5	+	+
	07.	1.30	12	50	+	+	+	—	2,5	+	+
	08.	11.45	11,5	30	+	+	+	—			
	10.	21.45	7	32	+	+	+	—			
	12.	19.00							2,5	+	+

		Bays			*Pi-s*						
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
07.	13.	21.30	6,5	28	—	—	+	+	tr		
	17.	11.45	6,5	25	—	—	—	+			
	22.	19.30							5,5	+	+
	24.	1.15	4,5	18	+	+	+	—	2,5	+	+
	25.	23.15	12,5	38	—	—	+	—	tr		
	26.	21.45	8	42	—	+	+	+	tr		
	29.	23.15							2,5	+	+
	30.	22.45	3,5	10	+	+	+	—	2	+	+
08.	01.	20.30	5,5	12	—	—	—	+			
	03.	20.15							2	+	+
	05.	2.00	7	30	+	+	+	—	2	+	+
	10.	18.30	3,5	18	—	+	—	+	tr		
	11.	21.30	2,5	15	+	+	+	0	2	+	+
	14.	3.00	9	35	+	+	+	—	tr		
	15.	21.00	5,5	40	—	+	+	+	tr		
	17.	17.30	4,5	22	—	+	+	+			
	18.	20.00	3,5	14	+	+	+	+	tr		
	23.	19.15	5,5	?	—	+	?	?	4,5	—	+
	24.	19.30	6,5	?	—	+	?	?	tr		
		23.15	3,5	?	+	+	?	?	4,5	+	+
	25.	21.30	5,5	22	—	+	+	+	2,5	+	+
	27.	0.15	4,5	16	+	+	+	—	tr		
	28.	0.45	4,5	12	+	+	+	—	2,5	+	+
		19.45							3,5	+	+
	29.	1.00	9	55	+	+	+	—	tr		
		22.45	9	38	—	+	+	+	3,5	+	+
09.	01.	18.15	6,5	40	—	+	+	+	tr		
	04.	2.15							2,5	+	+
	05.	20.15							2,5	+	+
	07.	21.15							2	+	+
	07.	23.45	3,5	10	+	+	+	+	2,5	+	+
	08.	0.15	5.5	18	+	+	+	—	2.5	+	+
	09.	1,00	3,5	32	—	+	+	—	tr		
		18.30	8	45	—	—	—	+	tr		
	11.	0.45	5,5	45	+	+	+	—	tr		
	12.	1.00	5,5	45	+	+	+	—	tr		

		Bays							*Pi-s*		
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
09.	13.	22.30	4,5	28	—	+	+	+	tr		
	15.	21.30	6,5	35	—	+	+	+	tr		
	18.	21.45	6,5	45	+	+	+	—	tr		
	20.	22.00	4,5	35	—	+	+	+	tr		
	21.	1.00	5,5	16	+	0	+	—	2,5	+	+
	23.	1.30	3,5	22	+	+	+	—	2	+	+
	26.	0.00							2,5	+	+
		21.00	7	50	—	+	+	+	tr		
	27.	0.30	10	65	+	+	+	—	tr		
	28.	18.15	4,5	15	—	—	—	+			
	29.	0.00	3,5	20	—	+	+	+	2,5	+	+
	30.	23.45	4,5	20	+	+	+	—	2,5	+	+
10.	02.	22.15	4,5	18	+	+	+	—	4,5	+	+
		23.30							2,5	+	+
	03.	1.30							3,5	—	—
	04.	19.30	5,5	22	—	+	+	+	tr		
	06.	19.30	15,5	90	+	+	+	+	tr		
		23.15	5,5	22	+	+	+	—	tr		
	07.	2.30	5,5	60	+	+	+	—	tr		
		22.15	>18	80	+	+	+	+	tr		
	08.	22.00	>20	125	+	+	+	—	tr		
	09.	0.45	11	50	+	—	—	—	2,5	+	+
		23.15	7	55	+	+	+	—	tr		
	11.	20.00	12,5	22	+	—	+	+	3,5	+	+
	12.	16.15	8	40	—	+	+	+	tr		
		19.00	6,5	55	—	+	+	+	tr		
	13.	14.45	4,5	25	—	—	—	+			
		21.30	6,5	35	+	+	+	+	2,5	+	+
	20.	23.30	4,5	40	+	+	+	—	4,5	+	+
	23.	3.30	3,5	25	+	+	+	—	tr		
		20.45							3,5	—	—
	26.	17.45	4,5	32	—	+	+	+	tr		
	28.	20.00	5,5	60	—	+	+	+	tr		
	29.	23.00	4,5	45	+	+	+	—	2	+	+
	30.	22.00	3,5	30	+	+	+	+	2,5	+	+

		Bays			*Pi-s*						
Month	Day	CET (GMT+1h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	E(mV/km)	Ex	Ey
11.	01.	23.45	4,5	45	+	+	+	—	2,5	+	+
	02.	20.30	>23,5	160	+	—	—	—	tr		
		23.45	>18	105	+	+	+	—	tr		
	04.	18.30	12,5	75	+	+	+	+			
	05.	2.00	6,5	25	+	+	+	—	tr		
	06.	16.30	6,5	22	—	—	—	+	tr		
	07.	2.30							2,5	+	+
		18.00	4,5	50	—	+	+	+	tr		
	10.	23.00	12,5	100	+	+	+	—	tr		
	16.	0.15	8	30	+	+	+	—	2,5	+	+
	20.	1.00	2,5	14	+	+	+	—	2	+	+
	21.	2.00	8	75	+	+	+	—	tr		
		11.00	7	14	+	—	—	+	(si?)		
		20.30	7	50	—	+	+	+	tr		
	22.	17.30	>18	145	+	+	+	+	tr		
	23.	1.00	9	55	+	+	+	+	tr		
	27.	1.00	5,5	18	+	+	+	—	2,5	+	+
	28.	1.30	3,5	15	+	0	+	—	2,5	+	+
	29.	3.00	3,5	16	+	+	+	—	2	+	+
		20.45	14,5	80	+	+	+	+	tr		
	30.	3.15	12,5	60	+	+	+	—			
12.	01.	16.15	16	85	—	+	+	+	tr		
		20.45	14.5	65	+	+	+	—	tr		
	02.	20.00	6,5	60	—	+	+	+	tr		
		22.00	7	65	—	+	+	+	tr		
	05.	18.15	4,5	18	—	+	+	+	2,5	+	+
		20.45	3,5	30	—	+	+	+	tr		
	07.	0.00	3,5	22	+	+	+	—	2	+	+
	10.	15.00	6,5	45	—	—	—	+			
	16.	22.15	4,5	18	+	+	+	—	tr		
	17.	22.45	4,5	22	+	+	+	—	2,5	+	+
	20.	23.45							2,5	+	+
	23.	21.45	3,5	22	—	+	+	+	4.5	+	+
	25.	2.00	4,5	15	0	+	+	—	3.5	+	+
	26.	0.15	7	40	+	+	+	—	tr		
		0.45	18	60	+	+	+	—			
		18.30	>9	95	—	+	+	+	tr		
		21.00	18	100	+	+	+	—	tr		
	27.	16.45	14,5	110	—	+	+	+	tr		
		20.45	12,5	75	+	+	+	—	tr		
	29.	19.45	9	72	—	+	+	+	tr		

Further Pi-traces (earth currents)

Month	Day	CET	Month	Day	CET	Month	Day	CET
01.	02.	19.45	03.	21.	0.45	05.	18.	19.30
	11.	18.45		23.	19.45		20.	23.45
	17.	21.30		25.	22.00		24.	9.45
	18.	12.15			22.45			19.15
	19.	14.30		26.	23.15			19.30
		22.45			23.30			22.30
	20.	18.30		27.	0.45		29.	2.30
	23.	0.30		29.	20.00			17.45
		1.15		31.	1.00			22.30
	24.	21.45	04.	01.	22.15	06.	02.	21.30
	27.	0.15		02.	3.15		03.	1.30
	28.	21.30			19.30			20.45
	30.	0.00			22.15		04.	0.00
		1.00		03.	1.15			0.45
02.	04.	22.30			1.30			21.30
		23.00			2.00			21.45
	06.	0.45			21.30		05.	0.00
		1.45		04.	1.45			22.00
		15.00			21.00		07.	0.00
		22.00			21.30			21.15
	09.	23.45		05.	1.30			21.30
	11.	2.00		14.	2.00		10.	6.00
	14.	20.45		16.	0.45			16.45
		21.30		17.	1.30		15.	2.45
	16.	18.00		19.	0.30			22.15
		20.00		23.	19.00		20.	21.15
	19.	1.15			19.30		21.	1.00
		20.45		25.	22.45		22.	0.30
	20.	20.15			22.30			0.45
		23.30		26.	1.30			21.45
	22.	23.30			22.00			22.00
	24.	0.30			23.15		23.	1.15
	25.	21.30		28.	21.30			21.45
	27.	23.00			22.00		24.	10.00
		23.45			22.30		25.	21.30
	28.	1.45		30.	20.15			22.45
03.	02.	1.45			21.15		26.	0.45
	05.	22.45			22.45		28.	0.15
		23.15	05.	01.	22.00			0.30
	08.	21.15		04.	19.00		29.	1.15
	09.	20.45		05.	22.00		30.	18.45
	16.	23.30		06.	22.15			20.30
	17.	0.00		17.	0.15			22.30
		19.30			1.30	07.	03.	8.45

Month	Day	CET
07.	04.	21.15
		21.30
	05.	21.15
	09.	22.00
	12.	0.30
		4.15
		21.30
	14.	21.30
	15.	23.15
	16.	20.45
	19.	20.15
	20.	19.15
		20.15
	23.	18.45
		19.30
	24.	0.30
		20.00
		21.30
	26.	20.45
	28.	21.15
		21.45
	30.	0.30
		21.45
		22.45
	31.	2.15
		2.45
		15.15
		22.30
08.	04.	2.45
		20.45
	06.	23.45
	09.	18.30
		22.15
		22.30
	12.	21.15
	15.	1.15
	17.	2.30
		4.15
		4.30
	20.	17.30
		23.30
	21.	22.00
	23.	3.30
		4.00
		20.15
	25.	0.30
	25.	1.00
	26.	0.45
		1.30
		19.30
	27.	1.15
		23.45
	28.	0.00
		2.15
		2.30
		20.15
	29.	0.00
		23.45
	30.	4.30
		23.45
	31.	1.15
		19.45
09.	02.	1.45
		2.30
		2.45
		17.45
	04.	1.45
		21.00
		22.00
	05.	5.00
		19.45
	06.	0.15
		0.30
		0.45
		22.15
	08.	22.30
	10.	0.30
		17.00
	13.	22.00
		23.30
	14.	0.00
		0.15
		2.15
		2.45
		3.15
	15.	0.30
		3.00
	17.	2.15
	19.	23.45
	21.	0.45
		18.45
		19.30
09.	22.	20.00
	23.	21.45
		22.30
		23.45
	24.	21.30
	25.	19.00
	27.	2.45
		23.30
	28.	1.45
	29.	18.15
		23.15
	30.	1.15
		21.15
		21.45
		22.45
10.	01.	0.30
	02.	19.00
	03.	23.30
	04.	0.15
		0.30
		18.45
		19.30
		20.15
	05.	0.30
		1.15
		20.00
	06.	0.00
		0.45
	09.	20.00
	11.	19.45
		22.00
		22.15
	12.	1.00
	13.	17.45
	14.	22.15
		22.30
		22.45
		23.00
		23.15
	15.	19.00
		22.45
	16.	1.45
	20.	0.45
		13.30
		22.30
	21.	23.15

Month	Day	CET
10.	22.	21.30
		22.15
		23.30
	24.	20.30
		21.45
	25.	0.30
		2.00
	26.	1.00
		23.30
	27.	3.00
		23.00
	28.	1.30
	29.	0.30
		1.00
		1.45
		23.30
	30.	21.45
	31.	17.45
11.	01.	23.00
		23.15

Month	Day	CET
11.	01.	23.30
	06.	0.30
	07.	3.00
	08.	21.15
	10.	23.45
	11.	23.30
	13.	0.30
	15.	19.45
	19.	20.30
	20.	14.00
		16.45
		21.15
	21.	21.00
	25.	1.00
		1.30
	28.	0.00
		2.30
	29.	2.15
	30.	19.30
12.	03.	23.45

Month	Day	CET
12.	04.	0.45
		22.30
	07.	20.30
		21.00
		23.45
	08.	23.00
	12.	17.45
	13.	23.45
	14.	0.00
	15.	2.45
	16.	21.15
	18.	22.15
	20.	23.15
	22.	0.30
	23.	21.15
	24.	21.00
		22.30
	25.	0.45
	30.	23.45

SI-s

Month	Day	CET (GMT+1 h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy	
01.	07.	16.15	5,5	12	—	—	—	+	
	08.	0.45	6,5	14	+	—	—	—	
	27.	6.45	6,5	12	+	+	+	—	
02.	11.	6.00	6,5	12	+	—	—	—	
	24.	4.30	3,5	12	+	+	+	—	
	25.	19.30	4,5	10	+	+	+	—	
03.	09.	17.45	3,5	12	—	—	—	+	
	11.	4.30	12,5	30	+	+	+	—	
	22.	10.15	5,0	12	+	+	+	—	
		11.15	11,0	25	—	—	—	+	
		22.15	2,5	10	—	—	—	+	
04.	30.	6.45	2,5	5	—	0	—	+	
05.	01.	6.00	4.5	8	+	+	+	—	
	06.	2.30	6,5	9	+	—	—	—	
	12.	19.45	3,5	10	+	—	+	+	
	25.	17.45	8,0	14	—	—	—	+	
06.	06.	12.15	7,0	10	—	—	—	+	
	13.	22.45	5,5	12	—	—	—	+	
	14.	19.00	5,5	10	+	+	+	—	
	16.	1.00	6,5	12	—	—	—	+	
07.	07.	5.45	7,0	10	+	0	—	+	
	10.	6.00	7,0	10	+	+	+	—	
	15.	3.30	5,5	12	+	+	+	—	
	25.	3.30	5,5	18	+	+	+	—	(ssc?)
	27.	4.45	4,5	8	+	+	+	+	
	28.	18.00	5,5	10	—	—	—	+	
	31.	14.30	5,5	10	+	+	+	—	
08.	01.	9.45	5,5	14	+	+	+	—	
	08.	9.00	6,5	14	+	0	+	—	
	20.	11.00	6.5	14	—	—	—	+	
	25.	6.30	4,5	?	—	—	?	?	
	29.	4.15	9,0	18	—	—	—	+	
09.	06.	11.45	9,0	20	—	—	—	+	
	14.	13.30	4,5	6	—	—	—	+	
10.	03.	22.45	2,5	8	—	—	—	+	

SI-s

Month	Day	CET (GMT+1 h)	Amplitude in E(mV/km)	H(gamma)	Ex	Ey	Hx	Hy
10.	11.	18.00	7,0	10	—	—	—	+
	17.	5.45	3,5	12	+	+	+	—
	21.	23.00	2,5	8	—	—	—	+
11.	07.	9.45	5,5	13	+	+	+	—
	10.	12.00	9.0	18	—	—	—	+
	22.	0.00	7.0	22	+	+	+	—
	24.	6.30	3,5	8	—	—	—	+
	25.	16.00	6,5	20	—	—	—	+
12.	09.	6.45	3,5	7	—	—	—	+
	15.	7.45	3,5	7	—	—	—	+
	27.	4.15	6,5	14	—	—	—	+

„Needles"

Month	Day	CET (GMT+1 h)	Amplitude in E(mV/km)	Ex	Ey
01.	03.	8.45	2,5	+	—
	15.	0.15	2,5	+	+
	27.	0.45	2,5	—	—
02.	01.	16.15	5,5	—	—
	10.	8.30	7,0	—	—
	11.	9.15	4,5	—	0
	14.	8.30	6,5	—	—
	19.	7.45	7,0	+	—
	25.	19.30	4,5	+	+
	28.	16.30	3,5	—	—
03.	05.	18.30	5,5	+	+
04.	18.	20.15	2,5	+	+
	19.	10.45	3,5	+	+
05.	01.	7.15	3,5	—	+
	22.	14.15	4,5	—	+
06.	08.	5.15	2,5	—	—
	25.	13.30	2,5	—	—
07.	04.	18.45	3,5	+	—
	07.	8.45	2,5	+	—
	09.	9.15	2,5	—	—
	14.	15.00	3,5	+	+
	21.	19.15	3,5	—	—
	23.	6.30	3,5	—	—
08.	17.	8.30	2,5	+	—
	28.	4.45	2,5	—	+
09.	17.	7.45	6,5	—	—
10.	03.	14.00	3,5	—	—
		15.45	2,5	—	—
	09.	17.45	3,5	—	—
11.	03.	7.15	5,5	—	—
12.	08.	15.15	2,5	+	+
	31.	18.30	2,5	+	—

V.

Average amplitudes in 12 pulsation bands

(monthly averages for 3 hour interval in μ V/km)

January

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	126—200	300—600 sec
0— 3	2	2	7	9	11	12	35	103	182	255	136	166
3— 6	2	2	1	24	33	46	131	99	42	29	119	104
6— 9	0	0	6	193	76	108	240	77	27	14	280	167
9—12	0	0	11	240	221	115	225	121	104	22	88	103
12—15	0	0	0	164	326	237	364	92	105	40	30	0
15—18	0	0	0	72	159	136	147	143	60	45	106	120
18—21	0	1	2	15	40	42	145	95	158	84	140	53
21—24	0	0	14	14	15	16	68	157	315	157	95	93
Average	1	1	5	90	109	88	163	111	125	82	126	101

February

0— 3	0	0	10	24	9	9	47	267	249	72	83	129
3— 6	2	0	50	133	106	56	93	79	39	11	95	123
6— 9	0	0	70	278	380	194	110	64	11	29	175	104
9—12	0	1	26	457	672	222	158	86	12	29	159	163
12—15	1	6	8	446	929	370	260	84	12	6	124	76
15—18	0	0	0	222	506	426	215	48	96	51	209	68
18—21	0	1	0	23	105	176	110	183	136	47	170	153
21—24	1	0	7	15	18	20	58	320	380	147	158	98
Average	1	1	21	200	342	185	132	142	117	49	147	115

March

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	120—200	300—600 sec
0— 3	2	1	9	19	25	11	42	148	230	55	62	340
3— 6	1	0	20	74	98	76	63	68	54	19	149	192
6— 9	0	0	34	190	277	153	151	90	16	5	80	46
9—12	0	0	27	277	257	173	163	105	40	8	47	137
12—15	0	0	8	431	311	191	146	113	52	58	207	37
15—18	1	0	0	132	195	198	323	182	41	29	106	175
18—21	2	1	0	11	33	47	160	248	83	42	175	187
21—24	0	0	23	22	90	4	30	366	279	69	109	180
Average	1	0	15	145	161	107	136	166	99	36	117	163

April

0— 3	0	3	5	15	12	20	79	94	184	83	108	191
3— 6	2	5	12	53	51	70	109	77	101	24	113	210
6— 9	0	5	63	130	189	131	235	100	39	6	94	29
9—12	0	2	20	282	210	146	168	60	98	55	75	131
12—15	0	1	18	275	370	146	95	88	173	60	131	134
15—18	0	2	4	122	240	121	213	166	140	68	225	123
18—21	1	1	0	6	23	26	99	225	198	66	255	194
21—24	2	0	0	2	9	10	66	168	246	202	169	303
Average	1	2	15	107	133	82	132	123	148	71	147	163

May

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	120—200	300—600 sec
0— 3	3	8	12	18	9	16	78	154	160	70	130	463
3— 6	3	12	57	78	59	42	85	151	119	24	168	185
6— 9	0	1	56	155	305	182	140	161	18	54	156	63
9—12	1	0	55	292	308	204	120	85	63	30	133	62
12—15	0	1	9	179	286	170	151	159	59	40	163	361
15—18	1	1	2	35	130	154	170	206	120	59	197	168
18—21	1	3	4	15	20	34	45	160	244	135	174	380
21—24	10	14	3	21	6	8	74	159	229	81	130	293
Average	2	5	24	97	137	100	108	155	128	62	156	248

June

0— 3	1	4	9	10	6	10	35	208	148	154	105	313
3— 6	0	4	45	76	63	76	109	129	91	47	36	204
6— 9	0	2	81	204	125	62	206	131	84	32	127	109
9—12	0	0	13	130	222	198	170	131	72	55	140	275
12—15	1	0	12	102	129	234	209	282	78	21	234	176
15—18	0	1	2	19	43	41	147	209	185	128	310	232
18—21	0	4	3	0	18	13	57	122	160	195	205	477
21—24	9	16	1	6	15	3	15	150	410	155	194	255
Average	1	4	21	69	79	80	119	170	153	98	168	255

July

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	120—200	300—600 sec
0— 3	0	1	4	5	14	15	33	155	220	86	75	215
3— 6	4	2	37	48	82	82	109	159	91	32	44	196
6— 9	0	16	4	210	180	149	145	77	94	36	73	52
9—12	0	1	12	188	248	180	196	196	69	32	169	142
12—15	0	1	1	87	148	152	123	204	138	74	237	162
15—18	1	2	1	28	66	79	186	220	116	86	190	135
18—21	0	2	1	1	44	8	49	168	119	178	225	333
21—24	0	0	6	3	1	1	9	112	279	254	185	279
Average	1	3	8	74	101	86	108	162	139	95	150	187

August

0— 3	4	0	0	19	15	6	17	133	167	175	90	220
3— 6	5	2	6	30	72	67	73	165	92	38	86	210
6— 9	0	0	4	187	239	183	225	114	57	34	84	83
9—12	0	0	0	157	295	155	168	71	86	43	132	121
12—15	0	0	6	67	253	226	183	107	82	57	130	116
15—18	0	4	0	35	86	65	104	129	81	38	131	148
18—21	7	0	0	3	10	3	37	109	176	173	209	209
21—24	1	2	3	6	12	8	22	106	187	107	138	258
Average	2	1	2	61	119	87	102	118	116	84	125	172

September

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	120—200	300—600 sec
0— 3	1	1	2	12	16	18	33	193	178	112	113	109
3— 6	4	0	0	37	44	59	108	92	67	29	96	62
6— 9	6	0	1	34	172	243	158	77	46	42	27	44
9—12	0	0	7	46	234	248	176	116	84	47	102	147
12—15	0	0	1	34	254	193	170	99	81	71	146	124
15—18	1	2	1	7	50	120	193	116	103	69	192	97
18—21	4	2	2	4	11	24	43	72	173	81	180	132
21—24	1	0	6	0	9	2	20	143	129	256	277	136
Average	2	1	2	21	96	110	111	114	108	89	143	108

October

0— 3	2	7	6	13	11	6	39	94	133	135	150	150
3— 6	0	4	24	34	43	53	60	27	62	41	79	73
6— 9	0	0	12	99	114	101	71	48	49	23	109	137
9—12	0	0	4	120	195	126	148	111	25	46	103	73
12—15	1	0	0	89	203	126	75	111	48	53	190	97
15—18	0	0	0	27	114	128	170	120	38	56	149	73
18—21	1	1	7	11	31	67	76	125	138	112	160	137
21—24	0	1	9	8	4	5	33	204	156	207	156	146
Average	0	2	8	50	89	76	84	105	82	85	137	111

November

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	120—200	300—600 sec
0— 3	0	1	10	8	7	29	67	66	30	129	163	235
3— 6	3	0	32	76	72	70	77	75	21	25	137	295
6— 9	1	0	38	207	240	177	87	61	19	57	236	271
9—12	1	1	28	263	149	116	87	90	35	44	408	242
12—15	0	0	12	297	228	191	234	140	78	117	112	104
15—18	6	0	1	43	187	177	229	159	143	79	110	229
18—21	10	10	5	30	23	85	163	265	131	132	145	139
21—24	0	0	3	5	6	13	63	91	196	92	204	245
Average	3	2	16	114	113	106	125	118	88	85	189	220

December

0— 3	0	0	5	11	15	14	58	50	148	79	77	110
3— 6	1	0	2	43	54	69	93	102	59	16	43	150
6— 9	3	0	4	77	154	138	184	70	29	34	133	191
9—12	0	2	2	191	228	245	269	118	41	27	91	149
12—15	0	0	3	224	287	252	176	173	132	37	114	43
15—18	1	0	15	53	137	161	287	202	120	48	80	68
18—21	0	0	3	24	20	84	109	174	106	120	138	116
21—24	1	0	4	37	1	3	13	128	215	236	138	139
Average	1	0	5	81	109	118	146	128	109	77	102	120

Yearly average

LT	Periods											
	1—5	5—10	10—15	15—20	20—25	25—30	30—40	40—60	60—90	90—120	120—200	300—600 sec
0— 3	1	2	7	14	13	14	47	137	172	116	108	223
3— 6	2	2	24	59	65	64	91	102	71	28	98	169
6— 9	1	2	31	164	205	152	162	90	41	31	129	107
9--12	0	1	17	221	270	178	170	108	59	36	136	147
12—15	0	1	6	200	307	206	179	139	86	53	155	121
15—18	1	1	2	65	158	150	200	159	103	63	166	137
18—21	2	2	2	12	31	51	91	163	152	114	181	209
21—24	2	3	6	12	16	8	39	176	250	163	163	203
Average	1	2	12	92	131	102	122	134	117	76	142	165

VI.

Micropulsation indices for the year 1975.

Activity indices for the micropulsations
(P1 to P12) Year 1972.

	January	February	March	April
1.		215343214453	112552334223	111433443113
2.		112553211244	111433552113	311223444513
3.		111155411233	111344432111	113423325422
4.		112353212314	112543231223	211333235421
5.		111253324111	122332453212	112233245311
6.		111134343112	112434152132	111332114343
7.	322521211345	111121432154	112532111244	211553111245
8.	135542341233	111431241334	111354311242	124542333125
9.	112434511121	111124412441	112132441442	153453231124
10.	112233543231	115544444233	435544343124	123541231123
11.	111111555211	112211111111	555554233232	115333433113
12.	111133451341	124555352112	123444311111	133543312114
13.	125554212223	144555441111	334545542112	13545431123 3
14.	113554344211	123532232112	113544321111	223455432111
15.	113554341112	124553231131	115444541112	122345543111
16.	233554232112	112543122142	115512342112	113455452111
17.	112543221211	112542312111	111421454113	123453235533
18.	111432333241	111443332232	112323335221	
19.	111332534313	113453231214	112433341122	312421112153
20.	111323553112	414443245211	113522233121	241433213444
21.	111112554231	113521144233	112121454224	155412331141
22.	112223344431	212432324411	112211112455	112423543122
23.	111422234223	143553224212	211424422333	112543232132
24.	112433444221	111553131111	212551111454	114444522141
25.	111123235521	111554321122	215433444221	111532334423
26.	511211244451	115544421214	111522342223	112222355412
27.	112521315442	111125531312	312542332232	111111245534
28.	111334425331	113542211431	115533233154	111331135342
29.	111124343332		115544341123	111111134245
30.	111332234531		115344541122	112111222454
31.	114322324443		111355353112	

	May	June	July	August
1.	111322234544	252321245545	112433354121	112142113455
2.	122422214451	245455311235		111352111255
3.	112353234214	111255342414	111344222424	111223322451
4.	111345313133	111332354233	111214534224	111121113551
5.	545543241125	114421354112	112111144535	114541113444
6.	144445321214	112522254215	111211115554	111233535213
7.	225423341124	111433354213	111212115355	111122345543
8.	125534351112	111112554342	555122234343	211122211255
9.	112453332124	111321443343	125522143313	222433343214
10.	232224442244	244211255541	113523441134	312312344452
11.	111332355421	555531111321		442133322111
12.	111222454411	245545433214	111112345431	453211555211
13.	433555533311	114421234214	111234324433	553224442111
14.	124333245211	115411541145	232444311123	
15.	142212443111	211122224453	542354445212	111231134441
16.	144433214333	115522133235	342355345211	311354311124
17.	125552241112	423434333244	343255414211	111342244533
18.	111111255344	112432534115	111133143342	111222343444
19.	243533124224	111323522335	111332224225	411112453333
20.	135224413245	112323355223	112134534232	531321442442
21.	112354242214	111113334334	111533454343	223551232113
22.	111454333145	221112533313	111511454423	111453232133
23.	111144452324	111111353522	111244342432	211444443412
24.	111132443331	111111132553	112112244352	111124533323
25.	511421124453	113311133552	141552131344	111223542314
26.	555531111145	112411334424	122444341124	11114542424 3
27.	115511111255	111111355343	111533352134	111123335511
28.	111123344333	113111324444	122334433312	213322314544
29.	311421324352	254422223343	111111554222	255454233241
30.	111112454333	255411344245	112223445431	111125544211
31.	112123354514		112112125553	111353444412

	September	October	November	December
1.	211223311245	111133242552	111112345414	112543431144
2.	111155332333	111211113551	213542132443	133554332445
3.	111133444531	114411422551	315532111352	111235531124
4.	111111125553	211454443214	115533222354	212354522331
5.	111122344455	111122254432	115533111133	111114553334
6.	511321124453	121344124443	112324531233	511122334153
7.	111243413421	114543221213	111223541414	211122235344
8.	321112534451	225532221234	112111355212	112334315143
9.	213321235552	145553321135	515432232445	111443131344
10.	222253122242	114443311144	134431113242	211134552411
11.	113355232225	111344443212	124554232113	112144331235
12.	234335422133	111144411135	123455421111	111113441242
13.	111324541114	332222231232	133355311111	111123553431
14.	211325531224	144532211111	122223552211	111532212441
15.	433543344222	123454332111	111234543111	111221113451
16.	354323554111	132553213111	111111254455	111553313533
17.	343552112211	112444312212	112434211355	112343344311
18.	233553221111	111113535344	112521111145	122221354311
19.	222354332312	111111113555	111531211444	111333354431
20.	112255522334	112122211352	112455133412	111113554511
21.	112145425422	111145223421	125355422215	111343513442
22.	111244342415	112321113554	544532132455	111145324524
23.	112121343352	123321224353	115512111155	111113555421
24.	111111242552	111334533521	111344332255	112113544521
25.	111111122455	111222333435	114545521114	113531123144
26.	111243311553	112211231554	112323441145	115312344412
27.	121442234334	112243113534	111111155452	112453222144
28.		112224123454	111322222452	115541221124
29.	111112352251	132233244242	522442213554	
30.	111111155541	111133434344	113532233323	
31.		211152113454		111133544111

II. GEOMAGNETISM

Processing of the geomagnetic records of the Observatory near Nagycenk is similar to that of the earth currents. (For details see Á, Wallner: „Über die erdmagnetischen Arbeiten im Observatorium bei Nagycenk und über deren Auswertung" Acta Techn. Hung. T. 47. 431—444; and „Observatoriumsberichte des Geophysikalischen Forschungslaboratoriums der Ungarischen Akademie der Wissenschaften vom Jahre 1966" Sopron, 1967). The following four kinds of tables are published:

I. The activity indices M of the general activity for each three-hour interval. The M-scale is linear, corresponding to 7 nT.

Values in brackets mean extrapolated ones (in the case of incomplete observations).

II. The list of disturbed (D) and quiet (Q) days selected by the following rule: A day is taken as disturbed on the basis of all magnetic and earth current activity indicees, if the greatest of the simultaneous character figures decreases only in one of the three hour intervals to 3, in the other intervals they are greater. A day is taken as quiet, if the greatest of all activity indices has not reached 3. Five activity indices (two of the earth currents and three of the magnetism) are always taken into account.

III. Differences of hourly means from monthly averages in nT for all three magnetic elements. The mounthly averages are given as absolute values (therefore as minutes of arc in D)

IV. Results of harmonical analysis from the monthly, yearly, Q and D day means of the daily variations.

Times are given throughout in this part in CET. Recording of magnetic variations in the observatory is made with two sets of LaCour-variometers.

The data of the tables were collected by Á. WALLNER.

I.

Three-hour magnetic activity indices (M)

	January M	Sum	February M	Sum	March M	Sum
1.	24100011	9	49539597	51	42442558	34
2.	10012021	7	93363497	44	32111033	14
3.	00121122	9	23322331	19	30113435	20
4.	53427989	47	11202242	14	23112101	11
5.	72438999	51	32124496	31	34299998	53
6.	21125699	35	21111224	14	31344887	38
7.	99533321	35	13142565	27	00010102	4
8.	34359996	48	21121201	10	00110100	3
9.	10132121	11	43200234	18	00111103	7
10.	10032000	6	84323999	47	99489999	66
11.	10000100	2	99236799	54	99676758	57
12.	20001013	7	55458999	54	55333699	43
13.	26546597	44	64333599	42	93134399	41
14.	48639994	52	64353879	45	72435599	44
15.	62121247	25	32324597	35	93132693	36
16.	73118979	45	73454793	42	21295742	32
17.	92397189	48	81132354	27	43132234	22
18.	93265837	43	64313154	27	91123949	38
19.	22212132	15	21133335	21	20003269	22
20.	33121044	18	31021002	9	31132337	23
21.	10011131	8	21001421	11	20000000	2
22.	00010354	13	22002111	9	00132212	11
23.	21113428	22	31199953	40	53221112	17
24.	12013222	13	54012538	28	10038974	32
25.	00111441	12	45436412	29	22112122	13
26.	30100001	5	23221110	12	11264386	31
27.	01242773	26	00110200	4	22124995	34
28.	94211112	21	11111358	21	33797896	52
29.	10012021	7			23532392	29
30.	10012115	11			31122112	13
31.	20014699	31			42122551	22
Monthly means:	$M_H = 2,63$ $M_D = 2,23$ $M_Z = 0,16$		$M_H = 3,27$ $M_D = 2,58$ $M_Z = 0,17$		$M_H = 3,14$ $M_D = 2,61$ $M_Z = 0,32$	

	April M	Sum	May M	Sum	June M	Sum
1.	31211120	11	10121121	9	10124996	32
2.	10011103	7	11236355	26	88984459	55
3.	21100112	8	44324622	27	31124232	18
4.	11122113	12	33222133	19	33122222	17
5.	31111062	15	74632499	44	32123144	20
6.	21122429	23	79443735	42	22123331	17
7.	20117299	31	22147885	37	21021104	11
8.	83345999	50	42123227	23	10102101	6
9.	75435999	51	52124453	26	12101100	6
10.	58467399	51	99333214	34	00001101	3
11.	87239854	46	00011000	2	20254154	23
12.	42384689	44	00101020	4	23249598	42
13.	45962446	40	00112036	13	32423341	22
14.	45422554	31	34322114	20	11223141	15
15.	30121232	14	00111000	3	11132835	24
16.	31120110	9	03669559	43	33333434	26
17.	00022331	11	62268520	31	41144325	24
18.	01023121	10	11112331	13	32112321	15
19.	10000210	4	42211199	29	31112343	18
20.	10024399	28	98693620	43	11111111	8
21.	99248572	46	22113325	19	13121234	17
22.	22312236	21	11134421	17	21110011	7
23.	52256967	42	11322121	13	01101121	7
24.	53232323	23	00111111	6	01010000	2
25.	21121100	8	11112687	27	01211121	9
26.	51122131	16	96312111	24	10222110	9
27.	01122000	6	21238341	24	00101111	5
28.	10011010	4	21001320	9	00112101	6
29.	00011000	2	11322233	17	11234989	37
30.	00022111	7	11211100	7	87344356	40
31.			10022010	6		
Monthly means:	$M_H = 2{,}53$ $M_D = 1{,}91$ $M_Z = 0{,}27$		$M_H = 2{,}55$ $M_D = 1{,}55$ $M_Z = 0{,}31$		$M_H = 2{,}12$ $M_D = 1{,}23$ $M_Z = 0{,}22$	

	July M	Sum	August M	Sum	September M	Sum
1.	22261323	21	33421132	19	00122151	12
2.	41211202	13	11122212	12	22112211	12
3.	12121122	12	20102111	8	10001110	4
4.	11012014	10	02011122	9	00011001	3
5.	11123112	12	46755683	44	00212112	9
6.	01011043	10	33421000	13	42123523	22
7.	82225222	25	00001321	7	31022101	10
8.	44346870	36	46241111	20	20011203	9
9.	15398943	42	21122487	27	42324775	34
10.	12335534	26	23353120	19	37444624	34
11.	31937220	27	01133102	11	84357935	44
12.	01011222	9	01011111	6	64348424	35
13.	01113445	19	01101110	5	35257005	27
14.	32223415	22	28224011	20	35337000	21
15.	22234432	22	51236435	29	00010014	6
16.	23134321	19	00012111	6	11001000	3
17.	11124123	15	12221222	14	11221537	22
18.	41263422	24	01122120	9	22024454	23
19.	22211223	15	10111110	6	10133121	12
20.	22131011	11	00123936	24	10021234	13
21.	00122222	11	64322658	36	31021021	10
22.	10111223	11	422321	(19)	00011000	2
23.	11411010	9			20012000	5
24.	31002011	8			00111000	3
25.	25977967	52	2303	(16)	00011000	2
26.	54152717	32	10012010	5	12112446	21
27.	12132223	16	32110100	8	73133432	26
28.	34112121	15	20021012	8	11112410	11
29.	00011102	5	78466335	42	20121000	6
30.	12111201	9	53541311	23	00011002	4
31.	10112104	10	10022022	9		
Monthly means:	$M_H = 2{,}17$ $M_D = 1{,}20$ $M_Z = 0{,}24$		$M_H = 1{,}84$ $M_D = 1{,}23$ $M_Z = 0{,}19$		$M_H = 1{,}63$ $M_D = 1{,}13$ $M_Z = 0{,}16$	

	October M	Sum	November M	Sum	December M	Sum
1.	12021100	7	10121105	11	54467995	49
2.	10011002	5	62127499	40	44295398	44
3.	00023167	19	95869999	64	51023313	18
4.	73121032	19	97399997	62	21234541	22
5.	41122000	10	42376587	42	11112223	13
6.	22444595	35	43124400	18	00114231	12
7.	59644389	48	12122351	17	20000112	6
8.	77336499	48	10011202	7	14101979	32
9.	93379487	50	14256999	45	93016511	26
10.	74723373	36	50023279	28	00111700	10
11.	40112142	15	82132134	24	10011022	7
12.	22232680	25	23111222	14	00010000	1
13.	01111324	13	20110000	4	00000110	2
14.	10233234	18	00010011	3	00102114	9
15.	20122011	9	00010000	1	13101212	11
16.	11022181	16	41110001	8	32121324	18
17.	31112211	12	00127957	31	23101223	14
18.	00012111	6	41021100	9	11001112	7
19.	00011011	4	11210032	10	01001310	6
20.	11011116	12	11011354	16	03000000	3
21.	82111002	15	92251055	29	00003641	14
22.	10012003	7	33399997	52	34011123	15
23.	03010012	7	81300110	14	11010103	7
24.	11101100	5	00003894	24	00000013	4
25.	00011000	2	71104422	21	42224433	24
26.	10011131	8	00266011	16	94352999	50
27.	32010000	6	20100011	5	52331999	41
28.	10021184	17	20123101	10	73211135	23
29.	73330015	22	02474999	44	31325292	27
30.	61212115	19	49439798	53	42112112	14
31.	23421471	24		53	22001112	9
Monthly means:	$M_H = 1{,}90$ $M_D = 1{,}60$ $M_Z = 0{,}30$		$M_H = 2{,}81$ $M_D = 2{,}11$ $M_Z = 0{,}40$		$M_H = 1{,}97$ $M_D = 1{,}51$ $M_Z = 0{,}17$	

II.

Disturbed and quiet days for 1975.

	Disturbed days	Quiet days
January	4, 5, 8, 14	2, 3, 11
February	1, 11, 12, 13, 14	8, 27
March	10, 11, 12	7, 8, 21, 25
April	9, 10, 13	3, 19, 25, 27, 29, 30
May	6	1, 11, 12, 15, 24, 31
June	2, 30	8, 10, 20, 22, 22, 24, 26, 27, 28
July	—	12, 21, 29, 30
August	5	3, 4, 12, 13, 16, 17, 18, 19, 26, 31
September	11	2, 3, 4, 5, 16, 22, 24, 25, 29, 30
October	7, 9	1, 2, 18, 19, 24, 25
November	3, 4, 22, 30	8, 13, 14, 15
December	1, 2	7, 11, 12, 13, 18, 31

III.

Hourly averages of magnetic elements
(H, D, Z)

	0	1	2	3	4	5	6	7	8	9	10	11	12
													January
H	—0,9	—1,7	+3,4	+2,2	+3,4	+4,3	+7,2	+8,0	+6,8	+1,9	—0,8	—0,6	—0,1
D	+8.1	+8,8	+3,1	+1,3	—2,9	—5,8	—5,9	—3,8	—0,5	—2,1	—6,1	—11,3	—14,5
Z	+0,3	—0,4	—1,1	—1,7	—2,1	—2,1	—2,3	—2,3	—1,6	—1,3	—2,1	—3,0	—1,7
													February
H	+2,1	+4,3	+2,1	+3,0	+2,7	+2,0	+5.7	+8,3	+7,7	+5,2	+0,3	—5,5	—8,7
D	+6,4	+2.5	+0,7	—1,2	+2,0	+0,1	—2,5	—2,1	+2,3	+2,9	—2,5	—8,9	—12,9
Z	+0,9	+0,1	—0,5	—1,5	—1,9	—1,8	—2,1	—2,2	—1,6	—2,9	—4,0	—4,0	—2,1
													March
H	+11,4	+7,8	+5,7	+4,8	+2,9	+3,4	+3,4	+1,9	—0,1	—7,5	—9,0	—7,4	—6,3
D	+0,3	+0,8	+1,2	+0,6	+0,4	+0,8	+1.2	+2,0	+2,2	+1.2	—0,6	—3,0	—4,4
Z	—2,6	—3,0	—3,0	—2,7	—2,2	—1,7	—0,1	+0,6	—0,1	—2,3	—5,0	—6,1	—5,5
													April
H	+7,9	+5,6	+4,3	+3,5	+4,4	+4,3	+1,7	—1,2	—7,5	—10,5	—11,5	—7,0	—0,6
D	+8.6	+7,7	+3,3	+4,5	+5,0	+5,8	+10,1	+16,0	+19,8	+13,1	—1,7	—17,2	—23,9
Z	+1,1	+1,0	+0,7	+0,3	+1,2	+1,6	+2,8	+3,4	+0,1	—3,0	—7,9	—11,7	—12,5

13	14	15	16	17	18	19	20	21	22	23	Monthly Average
—0,2	—1,3	—5,4	—4,3	—6,0	—9,3	—4 8	—1,3	—0,3	—0,2	+0,1	21058 nT
—10,6	—8,5	—2,1	—1,4	+0.2	+3,4	+7,5	+8.6	+13,4	+10,4	+10,7	+0°15,0'
—0,1	+1,0	+1,5	+1,7	+2,3	+4,0	+3,9	+3,0	+2,1	+1,6	+0,4	42370 nT
—6,3	—4,6	—5,9	—7,5	—9,9	—5,8	—1,3	—1,1	+2,1	+7,9	+3,2	21060 nT
—13.2	—11.9	—7,4	—2,6	+2,1	+9,8	+5,7	+4,7	+7,6	+10,6	+7,8	+0°16,6'
—0,8	+0,8	+2,2	+2,5	+3,4	+4,1	+3,9	+3,4	+2,7	+1,1	+0,3	42372 nT
—3,6	—2,3	—5,7	—9,0	—12,8	—6,1	—0,6	+3.8	+5,7	+7.9	+11.7	21060 nT
—4,5	—3.8	—2,5	—0,7	+0,8	+1,2	+1,2	+1,6	+1.6	+1,3	+1,1	+0°17,8'
—3,8	—1,0	+3,0	+5,5	+6,3	+6,3	+6.1	+4,6	+3,6	+2,2	+0,9	42379 nT
—1.1	—0,9	—3,2	—4,5	—3,8	—0.3	+2,2	+3,2	+3,3	+4.8	+6,9	21039 nT
—29,2	—25.5	—19,1	—11,0	—5,6	+0,7	+6,2	+6,8	+8,6	+12.3	+9,7	+0°18,1'
—9,0	—4,4	—0,6	+2,8	+4,4	+5,3	+5,5	+5,6	+5,2	+4,6	+3,5	42373 nT

	0	1	2	3	4	5	6	7	8	9	10	11	12
													May
H	+6,9	+4,7	+3,8	+3,9	+5,0	+3,6	—1,5	—6,3	—11,2	—10,6	—7,5	—0,7	+2,5
D	+7,6	+7,6	+8,1	+7,9	+9,7	+13,4	+16,5	+18,1	+16,1	+7,9	—3,6	—14,8	—23,7
Z	+2,5	+2,0	+1,7	+2,1	+2,2	+2,2	+2,8	+2,4	—0,9	—4,2	—8,6	—11,8	—12,6
													June
H	+6,9	+6,4	+6,3	+5,9	+7,0	+5,1	+0,4	—6,6	—14,8	—16,4	—13,5	—7,8	—4,7
D	+6,5	+4,5	+6,2	+8,3	+14,4	+17,6	+21,0	+21,1	+21,4	+12,9	—1,1	—14,3	—24,2
Z	+1,9	+1,6	+1,3	+1,4	+2,0	+2,5	+1,8	+1,3	—0,4	—3,1	—7,3	—9,8	—10,6
													July
H	+6,9	+6,1	+6,8	+6,5	+5,8	+6,2	+1,3	—7,1	—13,1	—12,9	—12,9	—9,4	—6,2
D	+5,8	+7,3	+6,4	+8,0	+11,5	+18,2	+19,9	+20,5	+17,3	+13,8	+4,3	—10,5	—22,0
Z	+1,3	+1,0	+0,4	+0,8	+1,6	+1,7	+0,9	+0,8	—0,3	—2,3	—6,1	—9,5	—9,8
													August
H	+8,1	+7,9	+8,8	+6,6	+7,1	+4,8	+2,2	—3,6	—11,9	—14,7	—14,3	—10,2	—5,7
D	+4,3	+2,6	+5,4	+6,8	+7,4	+10,5	+13,8	+17,9	+17,8	+10,4	—0,3	—12,1	—20,7
Z	+1,5	+1,1	+0,3	+0,3	+0,8	+1,2	+1,5	+2,0	+1,3	—1,0	—4,1	—7,0	—7,5

13	14	15	16	17	18	19	20	21	22	23	Monthly Average
—1,9	—7,2	—7,6	—5,4	—3,1	+0,5	+5,3	+6,1	+6,0	+7,8	+6,9	21078 nT
—26,7	—23,0	—16,7	—12,6	—7,7	—3,4	—0,2	+2,1	+4,1	+5,7	+7,6	+0°18,1'
—9,6	—5,2	—0,7	+2,5	+4,2	+4,8	+5,2	+5,5	+5,3	+4,6	+3,6	42371 nT
—6,0	—4,5	—4,9	—2,1	—1,3	+2,9	+7,8	+6,9	+3,5	+10,2	+7,3	21084 nT
—27,7	—27,0	—22,7	—14,5	—6,1	—5,0	—2,1	+0,2	+0,3	+4,3	+6,0	+0°18,2'
—9,1	—5,0	—0,3	+2,8	+4,4	+5,3	+5,0	+4,6	+4,1	+3,1	+2,5	42374 nT
—7,3	—4,0	—6,4	—2,9	—0,5	+3,0	+5,4	+8,6	+8,6	+8,7	+8,8	21075 nT
—27,1	—26,5	—21,3	—14,0	—7,9	—4,5	—3,4	—2,4	+0,5	+2,3	+3,8	+0°18,6'
—7,7	—4,7	+0,1	+3,6	+4,7	+5,3	+4,9	+4,2	+3,7	+3,0	+2,4	42380 nT
—3,5	—2,6	—2,9	—3,7	—1,3	+2,3	+4,0	+5,1	+5,6	+5,8	+6,1	21080 nT
—22,8	—22,0	—16,3	—9,6	—4,4	—1,3	+1,3	+2,1	+3,3	+2,6	+3,3	+0°15,5'
—6,5	—4,3	—1,7	+2,0	+3,1	+3,0	+3,1	+3,2	+2,9	+2,6	+2,2	42383 nT

	0	1	2	3	4	5	6	7	8	9	10	11	12
													September
H	+6,1	+9,2	+5.7	+5,9	+6,3	+7,7	+6,0	+1,0	—9,6	—15,8	—17,2	—13,4	—7,3
D	+5,2	+3,5	+5.7	+1,8	+3,3	+4,9	+12,8	+20.2	+22,4	+16.3	+3.3	—13,3	—25.7
Z	+1,2	+0,1	—0,2	—0,3	—0,4	+0,7	+2,4	+3,3	+3,7	+0,1	—5,4	—9,2	—3,4
													October
H	+6,6	+4.6	+5.0	+7,7	+6,8	+9,0	+7.4	+3,2	—5,2	—12.0	—13.9	—12,3	—7,1
D	+5.6	+3,4	+2.9	+3.1	+1,9	—1,1	+2,3	+8,9	+14,7	+14,3	+2 6	—13,4	—23,4
Z	+0,5	+0,1	+0,1	—0,4	—0,3	+0,1	+1.1	+2,7	+2,7	—1,6	—7,7	—9,6	—7,3
													November
H	+4.5	+4.6	+6,0	+7,2	+6,7	+10,2	+12,4	+11,9	+7,6	+1,8	—1,7	—5,1	—3,5
D	+5,7	+1,1	—3,5	—6,3	—3,9	—3.3	—2,9	—0,5	+5,1	+4,5	—2,4	—11,8	—16,6
Z	—0,3	—0,7	—1,3	—2,0	—2,0	—1,4	—1,5	—1,0	—2,0	—4,0	—6,9	—7,2	—5,2
													December
H	+1,5	+0.1	+0,6	+1,1	+1,6	+4,6	+6,4	+8,8	+9,6	+6.6	+2,6	—0,7	—1,1
D	+5.8	+4,0	+0.2	—2,2	—4,7	—4,4	—3,8	—3,9	—0,1	+0.7	—3,6	—6,8	—10.7
Z	—0,9	—1,5	—1,4	—1,3	—0,9	—0,4	—0,7	—1,4	—3,5	—4,4	—4,4	—3,4	—2 4

13	14	15	16	17	18	19	20	21	22	23	Monthly Average
—1,6	+1.2	—2,3	—5,1	—4,5	—1.4	+3,1	+4,5	+5,7	+8,9	+6,9	21083 nT
—28,8	—25,3	—16,9	—9,0	—3,8	—1,7	+1,9	+2,0	+5,1	+8,6	+7,5	+0°19,0′
—5,8	—2,6	+0,7	+2,5	+3,0	+3,1	+3,2	+2,9	+2,6	+1,5	+1,3	42384 nT
—1,3	—1,3	—3,7	—4,5	—1,9	—1,0	+0,6	+2,0	+0,9	+4,8	+5,6	21080 nT
—24,6	—18,7	—10,8	—5,3	—4,5	+2,0	+7,7	+8,0	+8,1	+9,0	+7,3	+0°19,8′
—4,0	—0,7	+1,9	+2,5	+3,0	+3,4	+3,5	+3,1	+3,1	+2,4	+1,4	42385 nT
—4,7	—5,4	—5,5	—11,2	—13,7	—12,8	—9,5	—5,4	+2,7	+0,9	+2,0	21063 nT
—16,8	—10,4	—8,2	—5,3	+0,5	+9,3	+13,9	—15,4	+14,9	+12,0	+9,5	+0°21,4′
—1,7	+1,4	+2,1	+4,0	+6,0	+6,7	+6,5	+5,0	+2,6	+1,9	+1,0	42391 nT
—3,9	—5,3	—8,2	—8,1	—5,4	—4,7	—1,8	—2,2	—0,1	—1,5	—0,5	21079 nT
—10,1	—4,3	—2,0	+0,3	—0,2	+4,4	+3,6	+7,4	+9,1	+11,3	+10,0	+0°21,2′
+0,3	+2,7	+4,0	+4,0	+4,1	+2,7	+2,6	+2,6	+1,7	+1,1	+0,8	21078 nT

	0	1	2	3	4	5	6	7	8	9	10	11	12
													1975. Yearly
H	+5,6	+5,0	+4,9	+4,9	+5,0	+5,4	+4,4	+1,5	−3,5	−7,1	−8,3	−6,7	−4,1
D	+5,8	+4,5	+3,3	+2,7	+3,7	+4,7	+6,9	+9,5	+10,9	+8.0	−1,0	−11,5	−19 0
Z	+0,6	+0,1	−0,3	−0,4	−0,2	+0,2	+0,6	+0,8	−0,2	−2,5	−5,8	−7,7	−7,1
													Quiet
H	+1.5	+0,7	+0,1	+0,8	+1,6	+2,0	+1,4	−1,3	−5,0	−8,2	−8,4	−5.2	−1,2
D	+5,0	+4,7	+4,7	+5,1	+6,5	+9,3	+12,1	+15,5	+17,2	+12,9	+1,8	−11.2	−20,6
Z	+2,2	+2,0	+1,8	+1,9	+2,2	+2,7	+2,8	+2,7	+0,9	−1,4	−5,4	−6,4	−8,3
													Disturbed
H	+13,4	+12,5	+17,3	+18,2	+13,2	+10,0	+10,9	+3,2	−3,4	−11,0	−12,4	−13,4	−15,0
D	+8,7	+1,2	+0,8	−4,6	−5,2	−8,5	−7,1	−1.5	+2,2	−1.0	−7,6	−15,7	−20,5
Z	−3,5	−3,8	−5,3	−6,9	−6,6	−5,0	−3,9	−2,4	−1,8	−3,0	−5,0	−5,0	−2,6

13	14	15	16	17	18	19	20	21	22	23	Monthly Average
means											
—3,4	—3,2	—5,1	—5,7	—5,4	—2,7	+0,9	+2.5	+4,2	+5,5	+5,4	21072 nT
—20.2	—17,2	—12.2	—7,1	—3,1	+1,2	+4,5	+4.7	+6.4	+7.5	+7,0	+0°18,5'
—4,8	—1,8	+1.0	+3.0	+4.1	+4.5	+4.4	+4.0	+3,3	+2,5	+1.7	42380 nT
days											
+0,5	—0,4	—1,1	—0,9	—0,6	+1,5	+3,7	+4.5	+4.8	+4.7	+4.5	21030 nT
—22,3	—19,1	—13,3	—7,5	—3,8	—3,4	—1,8	+0,4	+2,1	+2,7	+3,0	+0°18,5'
—6,3	—3.6	—0,9	+1.0	+1.7	+1,9	+2,0	+2.2	+2.3	+2.1	+1,9	42380 nT
days											
—16,2	—13,5	—14,9	—14,7	—15,6	—9,6	+1,9	+1.6	+8,2	+16,2	+14,0	21054 nT
—18,9	—12,6	—6,9	—0,3	+11,0	+16,7	+16,3	+15,1	+14.1	+14,1	+10,2	+0°19.3
+0,3	+3,3	+5,7	+8,2	+9,8	+9,3	+7,8	+5.8	+3,8	+1.2	—0,4	42381 nT

IV.

Results of harmonical analysis of the daily variations

	A_1	φ_1	A_2	φ_2	A_3	φ_3	A_4	φ_4	A_5	φ_5	A_6	φ_9
					Horizontal Intensity							
January	5.1	6	1,0	200	2,0	187	1.0	336	1,0	278	0,4	103
February	6,2	40	3,1	192	2,1	136	1,9	308	0,6	161	0,9	247
March	8,4	75	2,2	110	3,3	184	1,9	14	0,7	107	1,0	165
April	6,2	96	2,0	22	2,7	216	2,0	67	0,3	149	0,5	125
May	6,8	103	1,7	88	3,9	266	2,3	115	0,4	316	0,7	109
June	10,1	109	2,1	349	3,7	247	1.5	117	0,7	348	0,4	211
July	10.0	105	1,8	337	3,0	246	1.2	122	0,4	33	0,4	302
August	9,0	101	3,4	353	2,6	233	1.6	64	0,3	356	0,3	249
September	9,0	94	3,3	346	4,7	202	2.2	39	0,2	16	0,7	267
October	7,3	80	3,6	330	3,4	195	1.9	59	0,7	191	0,3	233
November	10,0	24	0.7	176	3,2	175	1,3	336	0,8	331	0,1	262
December	5,6	8	3,2	200	0,5	105	1,0	22	0,4	196	0,4	45
Year	6,4	77	0,6	346	2,4	211	1.0	48	0,1	300	0,2	200
Q	4,1	121	0,9	315	2,6	216	1.0	68	0,4	238	0,2	144
D	17,5	68	0,1	208	2,7	214	0,6	313	0,4	272	2,1	215
					Declination							
January	9,6	114	3,1	191	2,3	77	2,1	292	0,4	102	0,2	32
February	7,3	103	0,5	215	2,5	51	1,5	198	1,7	160	0,8	332
March	1,9	75	1,9	235	0,9	59	0,3	278	0,2	256	0,1	320
April	14,5	61	12,0	220	5,6	75	2,1	285	1,2	154	0,1	75
May	15,6	49	9,1	233	3,9	87	0,8	293	0,3	73	0,3	198
June	17,4	39	11,0	234	4,0	80	0,7	199	0,9	168	0,6	46
July	16,8	35	9,9	230	4,0	66	1,1	183	0,7	53	0,8	323
August	12,5	43	9,7	232	3,8	70	1,0	290	0,5	214	0,3	113
September	12,9	47	11,9	220	6,7	75	2,1	270	0,6	233	0,5	232
October	9,5	69	9,7	215	5,3	61	3,7	277	1,5	125	0,6	169
November	8,9	117	8,9	208	2,0	68	1,5	295	2,0	116	0,4	338
December	6,9	121	3,4	185	2,3	94	1,5	255	0,6	109	0,5	274
Year	9,7	63	7,8	222	3,5	71	1,2	269	0,7	130	0,1	280
Q	11,6	40	8,3	230	4,8	74	1,7	266	0,3	92	0,5	21
D	12,5	127	8,1	222	4,3	56	0,9	292	1,6	178	0,4	271

	A_1	φ_1	A_2	φ_2	A_3	φ_3	A_4	φ_4	A_5	φ_5	A_6	φ_6
					Vertical Intensity							
January	2,8	167	0,7	257	0,2	70	0,4	347	0,4	136	0,2	319
February	3,2	160	1,1	288	0,4	106	0,5	359	0,1	135	0,2	42
March	3,9	164	3,5	263	1,2	114	0,4	276	0,3	247	0,2	174
April	5,5	111	4,6	264	2,0	115	0,7	298	0,1	193	0,2	266
May	6,1	107	4,3	271	1,7	114	0,6	286	0	338	0,1	225
June	5,1	109	4,0	271	1,4	96	0,4	261	0,1	77	0,1	75
July	4,6	115	3,8	270	1,5	92	0,6	249	0,2	139	0,2	48
August	3,4	104	2,9	257	1,4	93	0,3	261	0,1	231	0,2	50
September	2,8	108	3,4	262	2,2	107	1,0	321	0,3	171	0,3	58
October	3,1	122	3,0	272	2,1	125	1,3	330	0,6	201	0,2	65
November	4,5	156	2,7	282	0,8	122	0,8	10	0,5	172	0,1	330
December	3,0	170	1,8	315	1,1	172	0,1	243	0,1	18	0,2	216
Year	3,6	129	2,9	270	1,3	113	0,5	314	0,2	180	0,1	34
Q	3,8	90	2,8	274	1,5	111	0,5	305	0,1	130	0,2	13
D	6,7	188	2,8	267	1,2	105	0,5	4	0,3	228	0,3	358

III. ATMOSPHERIC ELECTRICITY

Atmospheric electricity data have been published since 1962. Table I contains the hourly average values of the potential gradient expressed in V/m. Hourly averages have been taken only from hours having a recording period of 30 minutes or more. If values were available only for part of an hour the average is entered in square brackets [ ]. These data have been used in the determination of the monthly and daily means. Values uncertain for some reason are entered in round bracktes ( ) and have not been used in calculating of monthly and daily means. Daily means of each day with 24 hours of recording are entered. Howover, loss of a maximum of one hour's data out of twelve (for example, on account of instrument maintenance or calibration) has not precluded entering this mean value. In hours marked by S the value of the potential gradient exceeded permanently or several times the measuring limits of the equipment making the determination of an hourly average impossible. The directions of the deviations are marked by signs.

Table II gives the hourly means of the quantities of positive and negative charges transported by point-discharge for each month. The values are expressed in 10^{-6} Asec/hour.

All data are presented in universal time (GMT).

Tables were compiled by F. MÄRCZ. Both the equipments and the methods of measurement of potential gradient and point-discharge have been described in the paper by P. BENCZE and F. MÄRCZ: „Atmosphärisch-elektrische und ionosphärische Messungen im Observatorium bei Nagycenk", Observatoriumsberichte des Geophysikalischen Forschungslaboratoriums der Ungarischen Akademie der Wissenschaften vom Jahre 1966, Sopron, 1967.

I.

Hourly means of the potential gradient

January

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	60	110	60	70	70	—10	—20	—10	—40	—S	—S	—S	—120
2.	100	110	110	90	80	110	100	100	90	80	110	—	160
3.	160	170	130	130	120	120	120	150	180	200	170	120	120
4.	+S	+S	+S	+S	+S	180	170	120	110	140	+S	+S	150
5.	80	40	30	70	60	80	80	70	70	90	60	70	80
6.	110	80	70	70	60	70	110	130	—	150	200	+S	140
7.	70	30	40	60	70	100	110	100	140	+S	140	140	100
8.	60	20	30	60	60	70	110	100	100	140	+S	140	140
9.	+S	30	—S	+S	80	40	140	210	210	200	140	170	190
10.	120	180	190	170	150	200	220	200	+S	220	190	+S	+S
11.	100	90	90	70	100	90	130	190	210	+S	200	180	190
12.	150	100	70	60	70	50	+S	130	160	180	190	200	190
13.	110	100	70	130	140	20	30	+S	+S	—	+S	140	130
14.	+S	+S	140	80	60	40	60	40	—50	—	—	100	70
15.	70	50	20	10	40	50	60	+S	60	70	10	—20	—10
16.	—	—	—	—	80	20	20	70	100	70	70	110	130
17.	110	130	140	110	110	+S	150	200	160	120	60	50	+S
18.	80	110	110	120	110	60	70	60	50	70	70	60	130
19.	40	40	50	60	50	40	50	80	+S	80	100	80	30
20.	50	40	40	40	50	50	50	80	—	60	70	140	150
21.	—60	—60	—40	20	10	—30	—?0	—40	—10	—70	—30	50	70
22.	130	100	80	90	50	90	100	60	100	150	150	150	110
23.	—10	—40	—50	—50	—40	—40	—	—	—	—	30	30	30
24.	100	120	110	70	110	80	130	180	150	70	80	50	30
25.	80	100	100	90	70	60	80	100	90	80	110	80	100
26.	—20	30	50	100	80	±S	60	80	90	100	130	110	100
27.	90	80	40	30	40	50	80	80	—	100	100	120	150
28.	40	40	—S	—S	+S	+S	30	40	100	100	100	100	100
29.	60	60	90	30	30	—S	±S	±S	±S	40	10	100	100
30.	60	60	80	80	60	60	90	120	130	140	+S	1?0	100
31.	100	40	30	40	60	0	0	60	0	—20	30	20	20
Means	76	70	70	70	70	61	83	100	96	102	100	100	99
Number of days	27	28	27	27	29	27	28	27	23	25	25	26	20

13	14	15	16	17	18	19	20	21	22	23	Daily means
—50	—70	—40	—90	20	80	50	+S	110	110	100	—
150	160	150	170	170	160	160	200	200	180	180	136
130	130	200	120	130	120	130	130	90	130	130	139
140	140	60	30	90	110	120	110	90	80	70	—
80	120	100	100	150	200	170	120	90	110	80	92
140	140	140	160	170	140	+S	170	180	70	110	—
90	80	70	+S	140	110	70	70	70	60	60	87
+S	120	130	+S	+S	100	60	80	±S	60	60	—
200	200	+S	100	110	130	110	160	130	150	120	—
180	150	140	160	140	140	120	100	110	110	110	—
180	190	140	130	210	170	160	100	160	140	150	147
190	170	130	60	160	130	+S	+S	150	130	130	—
120	+S	+S	80	110	140	+S	+S	+S	+S	+S	—
110	100	50	30	40	40	30	30	50	50	60	—
—20	—20	—50	—30	0	—	—	—	—	—	—	—
130	150	150	120	110	90	80	80	70	70	60	—
130	80	160	+S	+S	230	+S	100	40	40	60	—
120	150	160	170	160	+S	+S	+S	+S	0	50	—
40	90	130	110	130	150	+S	100	110	70	50	76
140	120	110	100	110	100	100	70	70	0	50	78
100	140	170	160	100	80	0	120	100	130	130	43
80	50	70	70	50	30	60	70	60	30	—10	80
30	30	40	70	70	60	70	90	70	30	70	—
100	120	130	140	150	100	140	100	70	130	130	108
90	70	70	70	90	100	100	100	100	+S	20	85
100	100	100	100	100	110	110	110	130	100	100	90
160	130	100	90	70	60	80	110	100	40	50	85
110	110	130	140	120	150	140	70	60	40	60	—
100	100	110	100	110	140	120	140	100	100	100	—
170	150	160	120	130	150	130	100	100	100	100	109
30	40	120	190	150	100	+S	+S	190	120	30	—
109	108	108	99	113	118	100	105	104	85	83	
30	30	29	28	29	29	23	25	27	28	29	

February

Hour GMT Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	10	100	80	170	210	150	—10	—80	—10	0	110	10	40
2.	—50	—50	—60	—40	—70	—40	—10	10	30	10	10	40	10
3.	100	80	30	30	30	70	90	80	—	70	30	—20	30
4.	20	—50	70	70	40	80	120	160	170	170	220	200	190
5.	50	50	70	50	60	60	80	90	60	40	30	30	30
6.	140	110	90	—	—	—	—	—	+S	+S	+S	+S	+S
7.	+S	170	+S	+S	+S	+S	+S	130	+S	230	160	160	160
8.	70	60	60	50	80	80	130	130	170	170	180	170	170
9.	140	90	100	100	100	120	130	110	120	150	140	130	120
10.	140	130	130	160	140	160	130	140	—	—	150	—	—
11.	130	130	120	130	140	170	190	210	230	210	190	220	180
12.	170	190	170	80	20	—10	80	80	40	10	60	120	170
13.	+S	+S	+S	+S	+S	+S	50	50	—20	60	130	+S	110
14.	20	50	60	70	40	30	20	90	+S	100	140	40	40
15.	10	20	20	30	30	30	30	30	80	50	80	60	90
16.	0	0	40	50	50	50	70	80	80	100	150	180	200
17.	90	100	100	100	80	100	100	80	—	100	100	100	140
18.	90	110	110	100	100	100	100	110	140	140	130	130	130
19.	100	80	50	50	60	70	70	80	70	60	60	70	110
20.	—10	—10	—50	—30	—10	0	0	0	0	—	—	+S	+S
21.	20	40	30	20	20	30	100	140	210	210	140	120	110
22.	60	70	50	90	50	60	100	120	160	190	160	180	150
23.	130	110	110	140	130	150	110	120	140	160	170	200	200
24.	80	70	80	80	60	60	60	60	—	—	130	130	170
25.	70	70	40	40	70	70	80	120	130	140	150	160	170
26.	20	—10	—10	—30	40	30	40	100	20	60	120	100	80
27.	—60	10	70	70	70	80	120	130	120	130	130	140	160
28.	+S	70	40	70	60	60	+S	140	170	170	140	140	130
Means	62	66	62	66	64	70	79	93	100	114	123	117	124
Number of days	25	27	26	25	25	25	25	27	21	24	26	24	25

13	14	15	16	17	18	19	20	21	22	23	Daily means
70	40	80	110	100	10	—80	—50	—10	10	—10	44
80	70	80	30	—60	—50	—30	—30	—10	—10	60	—3
50	110	90	140	200	120	20	70	80	50	20	68
210	200	170	170	160	170	160	110	90	70	50	126
80	90	30	90	80	70	100	110	110	110	120	70
+S	+S	+S	+S	+S	+S	+S	+S	+S	+S	+S	—
180	160	100	130	120	80	100	70	110	120	80	—
150	200	160	180	180	160	170	220	190	200	160	145
140	130	110	100	110	150	160	170	200	180	150	131
100	100	60	80	100	130	+S	130	120	150	110	—
170	210	170	170	160	200	190	200	210	210	170	180
200	110	160	50	—	60	+S	170	+S	+S	+S	—
120	160	130	140	100	30	120	100	100	20	30	—
60	0	60	50	20	—70	20	40	50	70	30	45
100	40	30	120	60	70	70	—30	30	10	—20	43
170	210	+S	180	+S	180	180	170	100	80	60	—
140	110	130	130	120	130	120	110	110	100	80	107
110	120	110	100	110	110	100	80	80	90	90	108
110	90	90	—S	±S	±S	±S	±S	+S	—20	—30	—
110	120	140	130	110	140	150	120	90	20	0	—
120	130	110	180	200	190	130	110	110	100	90	111
110	100	60	60	120	160	180	140	100	100	100	111
200	200	+S	140	190	180	180	190	130	110	100	152
170	200	190	200	170	170	+S	140	70	70	100	—
190	150	150	130	160	70	70	+S	20	—10	20	94
90	140	170	190	+S	+S	+S	170	60	40	—40	—
200	+S	+S	+S	+S	+S	+S	+S	170	150	150	—
140	150	140	150	120	+S	140	120	120	120	100	—
133	128	113	126	120	107	107	110	97	82	68	
27	26	24	25	22	23	21	24	25	26	26	

March

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	70	60	40	30	40	120	130	140	120	160	200	170	160
2.	80	100	70	80	110	110	130	170	+S	+S	+S	+S	+S
3.	40	20	60	110	80	90	100	140	—	150	150	140	150
4.	70	50	20	—20	—40	20	—70	—70	—20	20	70	70	60
5.	70	70	60	50	60	70	70	100	120	110	100	90	90
6.	60	70	60	20	70	120	90	120	130	130	120	60	70
7.	30	40	50	40	40	30	60	80	90	90	80	100	110
8.	—20	0	50	60	60	70	90	90	90	100	70	60	30
9.	—10	—20	—30	0	20	40	60	70	50	100	100	110	120
10.	70	—	—	—	—	—	—	—	—	130	150	150	150
11.	30	30	0	10	10	10	20	30	0	50	80	110	150
12.	10	10	—10	—20	—10	0	30	50	70	100	100	80	±S
13.	70	50	30	20	0	—20	0	30	30	30	70	100	100
14.	+S	0	—10	10	0	0	30	0	—10	—10	—10	0	—10
15.	70	70	70	110	+S	+S	+S	+S	90	30	30	50	60
16.	160	+S	+S	+S	+S	70	40	60	10	60	30	100	110
17.	50	30	20	—30	—10	0	0	0	—	0	—10	—20	—30
18.	30	30	10	0	40	70	120	+S	—S	±S	+S	—10	30
19.	110	110	110	150	100	90	70	70	100	30	—	—	60
20.	120	130	130	130	120	100	80	50	70	100	—	100	70
21.	—10	—20	—10	—20	—20	—20	50	100	140	120	110	90	—30
22.	100	70	70	70	70	70	100	120	140	120	130	120	120
23.	30	10	30	30	30	30	50	60	70	—	80	90	110
24.	100	120	120	110	150	110	80	90	—	100	100	110	100
25.	50	30	30	—10	20	30	—S	±S	±S	40	40	30	40
26.	40	30	50	50	50	40	50	60	50	40	—	70	60
27.	40	40	40	40	50	70	80	100	110	70	60	50	50
28.	90	60	80	120	120	90	—70	—100	—30	70	80	80	60
29.	—	—	—	—	—	—	+S	+S	50	100	90	50	70
30.	—80	—S	±S	±S	±S	±S	130	±S	—S	—30	+S	+S	20
31.	—40	—40	—70	—60	—30	—10	30	0	40	50	30	30	80
Means	49	43	40	40	43	52	57	62	66	74	82	79	74
Number of days	29	27	27	27	26	27	27	25	23	28	25	28	29

13	14	15	16	17	18	19	20	21	22	23	Daily means
140	130	110	100	90	120	130	160	130	130	110	116
130	110	90	130	130	130	130	120	110	70	100	—
130	110	70	50	100	110	90	60	30	10	40	88
50	60	70	70	70	70	70	70	70	20	10	33
70	70	70	70	70	40	0	—80	10	30	0	59
80	120	90	70	90	110	80	70	70	70	50	84
100	70	70	70	30	—10	—40	—60	—60	—90	—70	35
30	40	60	70	70	100	100	—10	0	0	—20	50
120	110	90	70	60	70	70	70	80	80	70	63
160	120	100	70	60	70	60	30	+S	+S	10	—
160	160	140	130	60	50	30	30	20	0	0	55
±S	—10	+S	+S	60	30	10	70	110	70	110	—
+S	±S	50	70	80	90	60	70	30	50	80	—
0	10	—10	0	30	0	30	50	—20	—10	—10	3
140	100	100	110	120	130	150	110	+S	110	140	—
100	100	110	90	100	80	60	50	80	60	60	—
0	10	—10	—40	20	50	50	60	50	40	70	13
60	70	110	120	70	±S	±S	170	170	160	100	—
40	70	70	110	150	150	170	160	170	150	100	—
50	60	50	30	20	—30	+S	10	—40	—30	—10	60
—S	30	110	140	150	150	180	160	120	100	100	75
120	100	120	120	100	130	100	100	70	70	40	99
90	150	70	60	100	120	150	160	170	110	160	85
120	130	150	170	120	130	120	100	100	60	50	110
50	60	70	40	100	100	90	70	70	70	30	—
80	80	80	70	80	130	80	70	70	50	40	62
60	70	90	70	80	50	70	70	60	70	50	64
80	70	70	70	30	±S	—S	±S	±S	±S	±S	—
80	70	90	110	100	70	70	60	50	—S	±S	—
+S	130	90	—20	—S	—60	—80	—10	10	—70	—120	—
90	100	130	110	110	140	120	100	80	80	80	48
86	83	83	78	82	80	77	70	65	52	47	
27	30	30	30	30	29	28	30	28	28	29	

April

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	100	80	60	70	60	130	130	120	—	150	140	110	130
2.	90	70	50	40	70	70	80	90	70	70	80	90	110
3.	40	50	50	60	40	±S	—S	70	100	80	80	90	60
4.	60	60	50	70	60	80	80	100	120	110	70	90	70
5.	50	50	50	70	80	70	80	90	100	110	110	100	80
6.	60	20	10	20	30	50	50	70	70	60	100	110	60
7.	50	30	40	+S	—20	20	50	60	—	—	40	50	20
8.	110	100	110	120	100	70	110	110	80	70	80	70	50
9.	40	40	10	40	50	70	70	70	50	20	20	50	—10
10.	50	40	40	40	50	40	40	—	—	—S	—10	—S	—S
11.	—S	+S	±S	±S	—S	70	—	—	—	—	—	—	—
12.	50	50	40	30	50	70	60	40	60	10	—30	—60	40
13.	40	50	60	50	40	40	40	40	30	50	60	70	80
14.	—S	—S	0	+S	80	—90	—S	—S	—	0	70	80	100
15.	130	90	90	90	60	60	60	20	0	—	—	70	70
16.	—60	0	120	160	140	130	180	120	80	100	100	70	80
17.	50	50	50	50	50	60	70	60	70	90	80	80	60
18.	70	20	30	70	60	50	20	40	90	90	70	70	70
19.	70	80	70	40	50	70	50	90	170	140	120	110	110
20.	60	50	50	50	50	80	90	120	120	120	120	140	170
21.	40	40	40	50	50	50	50	40	—	10	30	70	50
22.	40	20	20	20	30	0	—10	60	90	100	90	90	—
23.	40	40	20	—30	10	30	—50	—	—	—	—	40	40
24.	10	30	30	—30	—10	30	20	30	50	60	60	50	60
25.	70	80	50	70	50	±S	—S	70	70	60	70	70	80
26.	10	20	30	30	10	—10	+S	70	+S	90	±S	±S	—S
27.	60	40	40	50	30	—10	60	90	110	100	90	90	90
28.	30	50	30	30	30	40	50	80	—	100	110	90	90
29.	30	30	30	50	40	60	50	70	70	60	60	70	70
30.	30	30	30	30	30	60	70	50	50	50	50	60	60
Means	51	47	45	50	47	50	60	72	79	76	72	75	73
Number of days	28	28	29	27	29	28	25	26	21	25	26	27	26

13	14	15	16	17	18	19	20	21	22	23	Daily means
140	120	70	120	130	130	130	150	120	90	90	112
100	100	90	60	30	50	30	70	70	70	60	71
70	70	70	60	50	70	60	70	70	50	60	—
70	70	40	50	70	70	70	60	50	40	40	69
70	80	50	70	70	80	80	+S	200	120	60	84
—	—	—	—	—	70	70	70	70	+S	90	—
70	130	160	130	110	110	130	120	170	90	30	—
30	—40	60	60	70	70	70	50	30	50	50	70
40	30	40	60	40	50	100	90	60	70	50	48
—S	40	80	130	10	±S	±S	±S	±S	±S	±S	—
—	50	+S	50	70	50	70	70	70	50	50	—
90	60	60	60	60	80	50	40	40	40	50	43
100	100	120	80	90	90	100	90	+S	130	±S	—
110	80	110	110	90	90	80	120	150	110	140	—
60	50	—S	±S	—20	—S	—S	—S	50	30	—30	—
90	80	90	80	60	40	+S	40	40	50	60	80
50	60	50	50	50	50	40	50	60	10	40	55
90	90	90	70	80	130	130	160	160	110	90	81
120	130	140	130	130	120	140	130	80	60	70	101
160	170	150	130	90	60	70	50	50	60	50	94
90	80	80	90	60	70	50	60	70	60	50	56
—	—	—	—	—	60	60	70	70	70	60	—
40	50	60	90	110	160	160	130	60	30	30	—
60	70	60	60	60	70	60	60	40	40	80	44
90	70	70	80	+S	60	50	40	—S	—20	+S	—
+S	—S	+S	±S	70	50	40	50	70	60	50	—
90	90	100	110	120	90	80	60	70	70	40	73
90	100	110	120	120	120	100	80	70	60	40	76
60	60	60	70	50	60	40	50	40	40	30	52
70	70	70	60	50	50	40	30	50	30	30	48
82	76	83	97	71	79	78	76	77	60	54	
25	27	25	26	27	28	27	27	27	28	27	

May

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	30	20	0	—10	0	—10	—20	—50	—30	—30	40	70	80
2.	60	50	40	40	40	30	60	70	70	60	70	70	70
3.	30	30	20	20	30	40	40	60	90	80	80	80	90
4.	—10	—10	—20	—10	—10	10	10	0	0	0	0	10	10
5.	—20	—10	20	30	30	10	20	50	—	—	20	70	50
6.	10	20	20	10	20	30	30	40	50	50	30	30	30
7.	50	60	50	30	50	60	60	70	70	60	60	60	60
8.	40	40	40	30	50	60	30	+S	+S	60	±S	+S	+S
9.	—10	—10	20	30	30	30	30	30	+S	+S	+S	±S	+S
10.	60	50	40	30	50	70	90	70	60	20	30	60	30
11.	40	30	30	30	10	110	100	40	50	50	50	50	50
12.	—	—	—	—	—	—	—	—	—	50	60	60	50
13.	—50	—50	10	20	20	30	50	50	—	0	0	30	40
14.	10	20	30	20	30	50	40	40	60	100	90	90	80
15.	10	0	0	10	10	30	40	80	70	70	80	90	100
16.	30	30	30	30	30	40	30	50	70	80	90	90	100
17.	±S	+S	30	50	+S	30	0	±S	100	60	70	80	90
18.	10	10	10	10	10	30	30	30	40	70	60	60	70
19.	30	10	10	10	20	30	30	60	—	90	90	110	110
20.	10	10	20	20	30	20	40	—	—	—	—	—	100
21.	40	0	30	40	40	50	30	—	110	110	90	90	90
22.	30	20	10	20	20	30	40	50	70	80	80	80	+S
23.	—60	±S	—S	—20	+S	80	40	0	20	30	70	70	30
24.	50	40	40	30	40	40	60	80	80	90	110	120	140
25.	—30	—60	—70	—30	—90	+S	140	180	170	120	20	30	90
26.	50	30	50	50	60	60	140	110	—	60	30	50	60
27.	20	20	10	—10	0	10	20	30	30	30	50	60	60
28.	—10	0	—10	—10	20	10	0	—	—	—	—	—	—
29.	—	—	—	—	—	—	—	—	30	30	30	30	30
30.	30	30	20	20	30	20	30	50	—	±S	70	80	90
31.	+S	—S	10	30	40	110	+S	160	170	130	90	70	50
Means	17	15	18	18	23	40	43	56	66	60	58	63	69
Number of days	27	26	28	29	27	28	28	24	21	26	27	27	27

13	14	15	16	17	18	19	20	21	22	23	Daily means
80	80	70	60	70	60	60	60	50	70	60	34
80	70	80	90	110	90	50	50	60	40	40	62
90	110	110	50	50	30	10	10	0	10	0	48
0	10	—10	0	10	10	—10	0	20	10	0	1
30	30	20	40	40	40	30	40	30	30	20	—
30	30	50	60	70	60	80	80	60	60	60	42
60	60	70	60	50	40	40	30	30	30	30	52
+S	+S	+S	70	40	0	70	50	30	10	30	—
40	30	30	40	40	50	50	50	30	50	60	—
50	60	90	90	60	70	70	40	30	40	50	55
60	60	70	70	70	—	—	—	—	—	—	—
70	60	40	40	30	±S	±S	—50	—120	80	90	—
80	90	100	100	100	60	70	30	30	30	20	37
80	90	80	70	50	50	+S	±S	±S	±S	10	—
100	100	—	80	70	50	40	50	40	50	30	52
100	80	100	100	80	50	30	30	30	30	10	56
90	90	100	100	70	40	30	30	30	20	30	—
60	60	70	60	60	50	30	30	30	30	30	40
120	130	130	120	70	40	20	30	20	10	10	57
100	90	90	80	70	70	70	60	60	50	30	—
90	100	100	80	40	30	20	20	20	—10	30	54
±S	±S	±S	±S	±S	—90	30	20	—10	—S	0	—
30	30	30	40	30	30	70	60	80	70	50	—
140	130	140	120	90	100	100	80	40	80	50	83
10	60	80	60	30	40	40	50	90	110	70	48
70	70	60	60	60	70	70	80	80	60	40	64
50	50	30	40	50	40	10	20	20	0	30	28
—	—	—	—	—	—	—	—	—	—	—	—
30	40	30	30	30	30	30	30	30	30	30	—
±S	±S	80	±S	100	70	+S	—70	—40	—S	±S	—
50	±S	±S	+S	40	40	—60	+S	±S	±S	—S	—
66	70	71	67	58	44	40	34	29	40	34	
27	26	26	27	29	28	26	27	27	25	27	

June

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1	—20	—40	—40	—40	0	10	—20	90	+S	+S	100	20	—50
2.	70	70	+S	—110	—S	—S	30	+S	—	70	90	90	60
3.	60	70	60	60	60	70	60	60	60	50	50	60	50
4.	30	20	30	40	50	60	60	60	60	80	60	60	60
5.	30	30	20	40	40	20	60	70	90	60	+S	20	60
6.	40	30	50	50	40	60	80	100	100	70	90	70	60
7.	60	60	60	60	60	60	60	20	60	50	50	30	40
8.	70	60	40	30	20	+S	+S	—70	—10	+S	10	20	0
9.	—S	±S	—50	—40	—60	—80	—130	—110	—	20	30	—80	±S
10.	—130	20	90	110	80	20	120	+S	170	110	80	70	70
11.	10	10	10	10	30	90	130	130	100	100	80	80	70
12.	20	20	20	30	20	70	60	60	70	60	60	70	70
13.	10	20	10	20	40	110	100	70	70	40	30	40	60
14.	10	10	10	20	20	20	20	30	60	70	70	80	80
15.	10	10	10	10	20	60	50	50	40	20	20	20	10
16.	10	20	20	—10	10	10	40	50	—	—	—	10	0
17.	70	50	50	40	20	—10	—10	—40	+S	+S	110	100	140
18.	50	50	20	—10	—20	—S	±S	—S	±S	±S	110	60	90
19.	60	50	70	70	70	70	100	100	120	100	110	100	60
20.	40	0	0	—40	20	0	20	—20	+S	20	70	30	—20
21.	50	50	40	30	30	40	40	40	50	80	90	80	90
22.	70	50	70	70	70	100	90	100	80	120	110	110	110
23.	20	20	10	10	30	40	—	—	—	—	100	100	100
24.	—	—	—	—	—	—	—	—	110	120	130	100	—
25.	80	30	20	—10	—10	120	90	70	20	30	0	+S	±S
26.	70	90	100	100	120	130	140	170	170	140	110	110	100
27.	10	40	50	60	60	80	80	70	90	100	100	100	110
28.	10	10	0	20	60	50	40	80	100	100	90	100	100
29.	40	40	50	70	80	110	150	160	160	160	160	130	110
30.	+S	±S	+S	+S	10	10	—40	30	—	70	60	+S	+S
Means	31	33	30	25	35	51	55	55	84	77	78	64	63
Number of days	27	27	27	28	28	26	26	25	21	24	28	28	26

13	14	15	16	17	18	19	20	21	22	23	Daily means
—40	—10	—30	—20	0	—10	0	—10	40	30	50	—
60	60	50	60	60	10	20	30	60	60	80	—
60	60	40	30	60	40	50	10	50	40	40	52
60	60	60	60	50	60	60	60	50	40	30	53
70	20	40	80	+S	30	20	10	10	0	30	38
80	100	100	90	80	90	80	90	90	70	60	74
50	50	60	60	60	+S	60	120	140	90	70	62
0	20	50	30	—20	—10	0	20	20	10	±S	—
—S	90	20	—10	20	20	—50	—20	60	20	100	—
70	±S	±S	30	60	70	90	60	20	20	20	—
70	80	70	70	60	40	60	30	20	30	40	59
±S	±S	60	100	70	70	70	60	30	30	20	—
60	70	80	90	40	30	40	30	30	20	10	47
70	70	70	70	40	20	20	0	0	—20	—30	34
0	10	20	20	20	20	20	10	20	—10	—20	18
10	30	50	50	20	50	70	20	40	50	50	—
140	160	170	170	130	90	60	60	50	50	50	—
60	70	70	70	60	80	90	80	70	60	50	—
70	60	70	60	60	60	70	90	60	50	30	73
10	10	20	+S	+S	40	50	60	60	50	50	—
100	120	130	140	130	110	70	70	80	90	80	76
130	110	120	120	70	50	50	50	50	40	20	82
—	—	—	—	—	—	—	—	—	—	—	—
—	—	±S	±S	+S	—S	±S	+S	60	70	70	—
10	30	50	100	90	80	60	70	110	100	100	56
100	110	120	140	160	130	100	50	50	20	20	106
100	100	100	100	70	40	30	20	10	20	10	65
—	—	—	70	50	—20	—160	—100	—30	0	40	—
±S	±S	30	40	80	80	30	—20	90	120	+S	—
+S	+S	+S	+S	—50	70	—60	120	±S	+S	+S	—
58	64	65	70	56	50	36	38	48	41	41	
23	23	25	26	26	27	28	28	28	28	26	

July

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	±S	+S	+S	50	—40	—60	+S	70	150	90	130	70	40
2.	40	—10	—30	—10	--50	0	0	80	120	80	—30	+S	140
3.	50	50	50	50	60	80	100	110	160	150	120	110	70
4.	20	20	20	30	50	70	80	110	140	130	90	80	70
5,	130	70	60	80	—S	±S	+S	+S	20	—60	150	90	90
6.	40	50	60	50	50	70	80	90	130	140	120	110	120
7.	60	60	70	60	100	100	90	110	—	120	120	110	100
8.	40	30	50	40	50	40	20	—	110	110	110	120	120
9.	30	30	30	40	70	80	—	60	50	30	30	30	—S
10.	30	30	30	30	30	30	30	30	40	50	60	50	—S
11.	0	20	30	30	20	20	70	+S	—	120	120	110	130
12.	50	50	60	+S	±S	±S	±S	+S	50	30	—S	±S	±S
13.	30	20	10	10	—10	10	30	40	40	50	40	80	80
14.	0	0	0	30	50	100	90	80	—	110	90	100	90
15.	30	30	40	60	70	100	110	130	140	130	120	100	100
16.	40	30	30	0	40	60	90	110	120	80	50	50	60
17.	—40	—20	—40	—10	10	20	20	70	120	—	60	50	—S
18.	30	10	10	10	0	0	30	50	70	0	—S	80	±S
19.	20	+S	±S	±S	10	50	±S	±S	±S	—S	±S	40	30
20.	30	20	20	30	50	80	80	60	50	50	50	50	50
21.	40	30	40	40	50	100	90	140	—	50	60	40	50
22.	40	30	40	50	50	50	60	90	110	110	120	120	120
23.	30	40	40	40	40	80	80	80	110	120	110	100	90
24.	40	40	40	40	50	50	50	70	80	100	110	110	110
25.	—S	20	—40	—100	—10	—30	—S	—S	110	130	+S	90	60
26.	50	50	50	50	50	70	70	60	70	90	50	80	70
27.	30	40	40	30	50	60	60	70	110	100	80	110	120
28.	30	20	0	10	10	20	30	40	—	30	30	50	40
29.	20	20	20	30	50	50	60	70	100	120	140	100	100
30.	30	30	30	30	30	50	70	70	90	100	80	70	60
31.	50	60	60	60	70	70	80	100	110	120	110	70	+S
Means	34	30	28	30	34	49	63	80	96	86	86	82	84
Number of days	29	29	29	29	29	29	25	25	25	29	27	29	25

13	14	15	16	17	18	19	20	21	22	23	Daily means
—	—	—	—10	—40	—40	0	—40	50	—40	10	—
60	40	40	40	40	30	30	—20	30	50	50	31
80	80	80	110	110	80	70	60	50	30	20	80
60	70	90	90	80	70	+S	80	±S	+S	+S	—
110	120	130	140	180	220	160	100	80	70	60	—
120	70	120	90	110	120	130	100	90	100	80	93
100	110	110	110	100	80	70	80	80	70	40	89
120	110	110	110	70	40	50	30	30	30	30	68
—S	50	60	70	70	60	40	40	40	30	30	—
±S	+S	±S	±S	±S	±S	±S	—20	—70	—80	—50	—
140	130	120	110	90	70	50	40	50	30	30	—
±S	—50	10	—30	—10	10	±S	—50	—60	80	30	—
90	100	120	120	120	70	50	50	30	30	10	51
80	80	70	50	40	40	40	30	40	40	40	56
120	±S	+S	20	±S	±S	±S	±S	±S	20	20	—
70	50	90	120	±S	±S	70	80	40	—50	—40	—
±S	±S	±S	—S	40	30	40	50	40	20	20	—
—S	90	100	70	10	+S	—	—	—	0	0	—
10	20	30	40	50	40	40	50	40	40	40	—
60	70	60	60	60	50	60	70	80	60	50	54
30	40	50	70	80	90	90	60	50	40	40	60
120	120	120	130	110	70	50	50	40	40	30	80
70	70	60	60	50	60	50	40	50	50	50	65
120	200	110	100	50	0	±S	±S	±S	—S	±S	—
60	60	—30	60	40	—10	—30	50	50	50	40	—
70	60	60	70	50	60	60	50	50	40	40	59
80	70	70	80	60	40	50	50	50	40	40	64
70	60	60	70	70	60	60	50	50	20	20	39
100	110	110	110	70	50	30	40	50	40	30	68
70	70	70	90	70	70	70	60	70	60	50	62
±S	±S	±S	70	20	40	50	60	50	60	70	—
84	77	78	76	64	56	55	44	43	33	30	
24	26	26	29	28	27	25	28	27	29	29	

August

Day / Hour GMT	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	70	60	60	60	70	80	80	110	120	110	110	100	110
2.	60	40	50	40	40	50	30	60	80	80	—S	±S	40
3.	40	50	60	70	70	70	70	—	—	—	—	—	—
4.	—	—	—	—	—	—	—	—	—	70	70	100	80
5.	60	50	50	60	70	70	70	100	110	110	110	+S	100
6.	80	80	80	60	60	60	80	90	110	120	120	120	120
7.	40	40	50	40	50	80	60	90	120	120	120	130	±S
8.	30	40	30	60	0	50	+S	110	110	110	110	80	±S
9.	20	20	20	30	30	40	40	60	70	90	100	100	100
10.	30	30	30	30	30	30	30	50	80	80	100	100	100
11.	0	0	0	0	0	30	30	50	60	—	70	100	90
12.	—10	—10	—10	0	0	20	30	(30)	40	70	±S	±S	±S
13.	30	30	40	40	40	40	40	50	60	60	70	60	40
14.	100	90	100	70	60	110	120	110	110	—	—	—	90
15.	40	40	40	40	40	20	30	40	—	—	50	60	50
16.	40	50	80	110	100	130	80	70	40	±S	±S	±S	±S
17.	—30	—30	—10	20	10	50	50	100	90	80	70	60	60
18.	50	40	30	40	30	30	60	50	—	70	100	±S	±S
19.	30	30	40	20	30	90	50	80	100	110	80	30	10
20.	30	50	40	50	50	70	100	90	120	120	110	100	80
21.	60	40	30	40	50	50	100	110	130	110	—	—	—
22.	30	40	40	50	50	50	50	60	—	—	70	70	70
23.	30	30	40	50	70	130	190	190	170	120	150	140	120
24.	50	50	50	50	50	50	90	50	90	120	110	90	50
25.	—S	±S	±S	—S	—	—	—	—	—	—	—	—	—
26.	50	50	70	70	70	90	90	110	—	—	—	—	110
27.	40	40	40	30	30	10	0	—	—	—	—	—	90
28.	30	+S	+S	50	70	110	(110)	—	—	—	120	150	130
29.	30	30	50	90	120	50	70	—	—	150	100	100	110
30.	140	90	70	60	50	40	80	80	60	110	90	110	80
31.	20	20	40	40	40	70	70	70	80	80	70	20	—S
Means	41	39	43	47	48	61	66	83	93	100	95	91	83
Number of days	29	28	28	29	29	29	27	24	21	21	22	20	22

13	14	15	16	17	18	19	20	21	22	23	Daily means
+S	+S	+S	+S	±S	30	+S	+S	+S	50	60	—
+S	+S	—20	—20	—20	—20	—20	—20	40	50	60	—
—	—	—	—	—	—	—	—	—	—	—	—
—10	+S	+S	100	100	90	80	80	80	80	70	—
100	110	110	120	+S	80	70	100	80	80	70	86
120	120	110	120	+S	—S	70	90	70	80	70	—
±S	±S	±S	90	±S	±S	±S	90	90	50	30	—
20	+S	110	110	130	100	90	80	60	40	30	—
100	100	100	90	40	30	30	30	30	30	30	55
100	100	110	70	30	30	20	10	10	10	10	51
80	100	70	30	20	10	20	10	0	10	0	34
50	60	100	100	60	40	60	60	50	50	50	—
50	50	40	0	40	190	250	250	160	140	120	79
80	70	80	70	50	50	40	40	40	30	40	—
50	50	40	50	—S	±S	0	20	40	50	40	—
+S	70	70	90	40	40	10	0	0	0	—10	—
70	70	70	70	40	40	30	—10	±S	±S	50	—
±S	±S	±S	40	0	30	30	—40	—40	—30	—40	—
80	70	80	70	60	70	110	70	60	50	50	61
110	100	90	100	70	60	60	60	70	50	50	76
100	100	90	70	50	50	50	40	40	30	30	—
70	70	70	50	50	50	50	40	40	40	40	—
110	110	120	130	110	90	90	80	70	50	60	98
±S	±S	110	30	—S	—S	0	0	—20	±S	+S	—
—	—	—	—	—	110	+S	0	—50	80	70	—
90	80	60	50	50	30	60	70	70	60	50	—
100	100	110	80	80	100	120	100	30	30	+S	—
110	80	70	80	50	+S	±S	+S	130	60	—50	—
120	70	120	—30	110	130	110	90	60	120	160	—
90	100	80	70	50	70	80	50	50	40	30	74
±S	±S	20	60	50	50	40	30	40	50	30	—
81	85	80	68	55	62	60	51	46	49	43	
22	21	25	28	23	25	26	28	28	28	28	

September

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	40	50	50	50	50	60	—	120	—	110	110	120	110
2.	50	40	40	80	+S	+S	+S	170	80	70	60	60	70
3.	50	50	60	70	70	70	110	40	—	—	—	—	70
4.	80	80	50	50	120	—	—	—	—	—	—	—	120
5.	30	30	30	50	50	70	—	—	90	60	70	±S	±S
6.	30	40	50	40	40	60	120	170	160	120	80	100	+S
7.	50	50	60	70	70	120	140	120	110	120	80	30	70
8.	30	40	40	30	30	40	60	—	—	120	100	90	90
9.	70	60	50	40	50	70	70	70	70	60	70	70	60
10.	50	70	90	140	140	+S	+S	170	100	110	100	110	120
11.	80	80	80	90	80	90	90	70	80	70	90	80	100
12.	70	60	70	50	80	40	+S	±S	(±S)	—S	±S	70	80
13.	±S	+S	—10	50	70	70	110	120	110	80	50	100	70
14.	40	50	50	60	60	70	80	90	70	40	40	40	30
15.	20	10	30	50	40	40	40	60	—	50	60	50	50
16.	30	40	40	50	50	50	70	70	110	130	140	120	140
17.	60	70	80	50	80	110	+S	+S	+S	200	170	160	140
18.	90	70	60	50	90	50	70	30	—	—	—	100	130
19.	70	70	50	50	50	50	60	50	70	110	90	100	100
20.	70	50	40	40	40	120	160	180	100	70	90	70	80
21.	40	30	40	40	30	50	40	60	110	100	110	100	100
22.	50	40	40	40	50	30	20	30	—	30	40	30	50
23.	30	50	50	30	30	20	50	60	30	40	50	50	60
24.	10	20	20	10	60	100	120	140	100	100	100	100	90
25.	50	50	60	70	30	30	30	30	—	—	—	—	—
26.	—10	—30	—30	—70	—50	—70	—30	10	—20	30	30	10	30
27.	50	40	30	30	30	30	50	50	50	70	70	90	90
28.	—50	—30	—10	—30	60	70	50	100	90	100	100	100	120
29.	50	60	40	40	90	100	+S	+S	—	150	150	160	130
30.	40	50	60	50	50	80	170	110	50	50	50	60	70
Means	44	44	44	46	57	60	76	88	82	88	84	83	88
Number of days	29	29	30	30	29	27	22	24	19	25	25	26	27

13	14	15	16	17	18	19	20	21	22	23	Daily means
120	110	20	40	40	50	40	30	30	40	30	—
50	+S	90	60	60	40	50	50	50	50	50	—
70	100	±S	80	50	60	60	70	50	50	50	—
160	140	170	+S	+S	60	80	80	50	40	30	—
±S	±S	±S	±S	10	0	30	40	50	50	40	—
90	60	40	50	50	50	60	50	50	40	40	69
70	90	170	170	150	120	120	100	90	60	50	95
80	100	130	130	150	190	210	130	100	70	60	—
60	60	50	50	50	50	50	50	70	50	50	58
110	90	70	70	60	50	50	50	70	80	90	—
100	100	70	70	90	80	80	60	70	70	60	80
70	80	70	70	90	100	70	50	70	30	±S	—
60	70	60	70	70	70	70	70	60	60	60	—
30	40	30	30	40	40	40	30	20	40	20	45
50	50	30	40	50	60	+S	+S	60	30	40	—
140	170	140	110	100	120	90	100	120	90	70	95
140	160	120	90	130	170	150	120	120	120	100	—
130	120	110	80	70	70	70	80	60	60	50	—
90	90	70	80	80	80	80	70	70	60	50	73
80	80	60	60	70	70	50	50	40	30	40	73
120	110	90	80	60	60	60	50	50	50	40	68
60	80	80	90	70	80	80	80	60	30	30	52
40	50	30	—10	10	0	0	10	20	20	20	31
80	70	60	50	40	30	40	50	30	50	40	63
—	10	30	40	30	0	20	0	—30	—10	—20	—
30	50	40	±S	—S	0	30	20	30	30	50	—
100	60	50	40	30	—10	20	0	—60	—40	—40	35
110	100	70	70	70	100	90	50	60	50	30	61
120	110	60	100	100	100	80	60	70	50	40	—
50	40	30	30	30	30	50	50	40	40	40	55
86	85	73	68	66	64	66	57	52	46	42	
28	28	28	27	28	30	29	29	30	30	29	

October

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	30	40	60	50	60	50	70	90	70	30	50	70	70
2.	50	50	60	50	60	80	90	90	80	70	100	100	110
3.	10	10	20	40	50	50	70	130	170	170	130	120	90
4.	50	50	50	50	60	60	90	120	80	70	70	70	50
5.	40	40	40	40	40	50	50	70	80	80	110	(100)	90
6.	40	30	40	50	40	40	50	50	—	30	30	30	70
7.	40	30	50	50	40	40	(70)	80	80	60	50	50	50
8.	60	50	60	60	70	70	110	120	90	80	40	60	80
9.	50	40	40	40	50	50	50	50	80	70	80	100	80
10.	40	40	30	30	20	0	30	50	50	40	40	40	30
11.	40	40	40	50	50	50	70	60	70	60	70	90	100
12.	80	80	60	60	50	90	110	100	110	110	110	100	100
13.	120	70	—	—	—	—	—	—	—	—	—	—	—
14.	—	—	—	—	—	—	—	—	—	—	—	±S	±S
15.	30	30	40	50	50	50	50	60	—	60	70	90	90
16.	50	10	+S	40	0	70	—20	—10	30	50	80	100	90
17.	±S	—S	0	30	60	60	70	50	+S	+S	—	—	—
18.	—	—	—	—	—	—	—	—	—	—	—	—	—
19.	—	—	—	—	—	—	—	—	—	—	—	—	—
20.	—	—	—	—	—	—	—	—	—	—	—	—	—
21.	—	—	—	—	—	—	—	—	—	—	—	—	—
22.	—	—	—	—	—	—	—	—	—	—	—	—	70
23.	60	60	60	50	70	50	50	60	—	100	70	60	70
24.	30	30	70	70	90	110	110	100	90	90	90	100	110
25.	100	80	60	50	70	80	100	110	100	90	120	150	150
26.	110	90	60	60	50	60	60	80	110	120	130	150	170
27.	100	90	90	70	70	50	80	100	—	150	150	160	180
28.	110	120	100	90	110	120	130	130	150	130	100	120	170
29.	120	120	100	140	160	(160)	180	130	100	170	210	160	+S
30.	+S	+S	120	80	+S	+S	+S	+S	+S	+S	120	100	80
31.	—	—	—	50	70	+S	+S	+S	+S	+S	+S	120	80
Means	62	55	57	56	60	61	76	83	91	87	92	97	95
Number of days	22	22	22	24	23	21	21	22	17	21	22	22	23

13	14	15	16	17	18	19	20	21	22	23	Daily means
70	60	70	60	70	70	60	50	50	40	40	58
120	140	150	110	80	70	60	50	40	30	10	77
100	90	60	70	50	70	±S	+S	60	70	50	—
50	60	70	80	80	80	80	70	50	50	50	66
90	90	70	90	100	70	80	70	60	50	40	67
100	50	70	100	130	100	70	70	50	30	30	57
50	50	40	50	+S	—S	50	60	50	50	—S	—
70	80	90	90	90	100	90	80	50	50	40	74
80	80	70	80	80	50	50	50	30	30	30	59
40	50	50	50	60	60	60	50	50	40	50	42
100	110	90	70	80	80	80	100	140	130	100	78
100	90	90	90	70	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
±S	±S	—S	110	100	80	100	70	50	40	40	—
80	50	50	50	80	80	60	50	90	60	100	62
90	90	90	100	110	120	120	120	110	40	—S	67
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
120	140	130	150	110	110	120	100	90	70	60	—
80	90	100	70	100	100	100	90	70	30	50	71
110	100	70	100	100	100	100	90	90	100	80	89
180	170	150	150	150	170	170	160	150	100	90	121
170	150	230	220	110	70	70	100	90	120	120	113
190	130	120	130	210	+S	+S	200	100	100	120	—
210	+S	170	190	220	250	200	200	150	120	90	147
+S	+S	+S	+S	+S	+S	+S	+S	+S	+S	+S	—
100	130	+S	+S	+S	+S	+S	+S	+S	80	30	—
130	140	120	50	+S	+S	+S	+S	+S	60	30	—
106	97	98	98	104	96	91	92	77	65	60	
23	22	22	23	21	19	19	20	21	23	21	

November

Hour GMT Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	60	10	—30	—40	—40	—10	—60	—10	—70	—70	—80	—50	—10
2.	30	—30	—10	—20	—10	20	10	—60	10	—10	20	70	50
3.	20	30	40	30	50	30	70	30	—	20	20	30	30
4.	60	70	70	70	70	70	70	80	70	50	40	40	50
5.	50	60	60	60	60	50	70	70	60	30	30	50	50
6.	60	40	50	70	70	70	70	60	30	20	20	10	20
7.	20	40	30	30	20	40	50	70	90	120	120	70	70
8.	80	80	70	70	100	90	80	80	150	80	70	90	110
9.	70	70	60	70	80	100	90	70	—	30	60	160	100
10.	70	+S	130	+S	70	—70	—10	10	20	10	10	30	20
11.	40	30	+S	±S	+S	110	120	110	90	—	120	50	80
12.	80	80	50	90	100	100	110	+S	110	80	110	90	120
13.	0	40	30	40	50	40	30	30	0	0	—40	—40	—40
14.	—30	—20	—50	—S	—S	±S	—S	—S	—S	+S	—70	60	—S
15.	120	110	60	80	90	120	110	100	160	170	110	120	120
16.	70	70	70	50	60	40	60	60	40	0	—20	—20	0
17.	—20	—40	—40	—20	—30	10	0	50	—	40	10	—70	—10
18.	—20	50	10	+S	50	50	—90	20	90	—	—	—	—
19.	—	—	—	—	—	—	—	—	—	80	70	80	80
20.	30	50	60	70	60	80	50	60	30	30	60	—60	—S
21.	70	60	50	130	100	110	80	80	+S	100	120	80	50
22.	40	40	20	50	70	60	0	50	±S	+S	90	70	+S
23.	60	50	50	40	50	70	100	90	90	120	70	70	80
24.	40	40	50	100	70	70	70	40	—	—	70	90	140
25.	10	0	—40	30	140	150	100	130	70	130	170	190	220
26.	140	140	+S	120	150	160	190	200	200	—	230	230	+S
27.	—30	0	10	30	20	20	40	30	20	10	20	—50	0
28.	—140	—110	—10	—120	—20	30	50	80	90	20	50	70	70
29.	80	20	—50	—110	—70	—50	—50	70	40	20	60	60	90
30.	70	—10	20	50	0	40	—	—	—	—	—	—	—
Means	39	35	28	39	50	57	52	62	66	47	55	54	62
Number of days	29	28	27	25	27	28	27	26	21	23	28	28	24

13	14	15	16	17	18	19	20	21	22	23	Daily means
10	10	10	30	10	40	70	100	10	10	0	—4
60	30	50	50	50	20	20	20	0	10	20	17
20	20	10	20	20	20	60	70	80	70	70	37
70	70	70	100	90	90	100	90	80	60	70	71
40	40	50	50	50	80	100	80	70	70	70	58
10	10	50	70	70	30	50	60	50	30	20	43
80	70	100	90	80	70	50	50	60	60	90	65
130	100	90	80	90	80	120	110	100	80	80	92
+S	110	30	70	+S	160	100	110	20	100	50	—
20	20	20	60	70	90	100	70	70	70	10	—
120	130	240	210	100	170	170	140	+S	+S	70	—
+S	120	110	110	120	110	90	80	90	50	50	93
—50	—50	—40	—30	—50	—30	—40	—20	—50	—40	20	—10
—S	—S	—S	—S	—S	—70	70	10	0	±S	+S	—
120	110	100	110	110	130	130	110	90	60	60	108
—10	0	—10	0	50	50	40	40	20	—20	—10	26
10	10	60	0	40	10	40	+S	±S	0	—10	—
—	—	—	—	—	—	—	—	—	—	—	—
70	80	60	60	110	130	110	100	90	60	50	—
+S	+S	80	70	50	90	130	100	±S	±S	±S	—
60	100	110	110	120	150	+S	120	80	70	50	91
±S	70	70	80	90	130	160	140	160	120	110	—
80	70	60	70	70	70	60	50	50	0	30	65
70	0	—50	—50	—90	0	40	20	90	120	90	—
230	230	160	+S	+S	150	160	150	120	+S	150	—
+S	180	180	150	160	140	90	60	60	30	10	—
20	50	40	60	80	40	40	—10	—70	—50	20	14
60	110	100	70	70	210	220	180	110	90	90	57
150	110	120	120	40	60	70	150	120	80	50	49
—	—	—	—	0	30	20	50	30	40	50	—
62	69	69	68	62	76	85	80	59	47	50	
22	26	27	26	26	29	28	28	26	25	27	

December

Hour GMT / Day	0	1	2	3	4	5	6	7	8	9	10	11	12
1.	50	50	70	90	80	90	90	50	—	—30	—10	60	±S
2.	70	70	70	0	70	60	90	80	—	—	—	50	0
3.	—50	—100	—160	—140	—	—	—	—	—	20	0	—30	—50
4.	+S	130	120	90	90	80	(40)	—20	30	30	40	40	80
5.	70	50	40	90	90	120	70	60	130	150	160	120	130
6.	80	90	90	100	110	130	130	130	150	120	120	70	130
7.	—S	100	100	110	110	120	140	200	190	180	170	150	140
8.	110	110	140	140	100	80	50	40	—	110	100	110	100
9.	70	100	90	100	100	110	160	+S	150	100	100	100	110
10.	70	90	90	60	60	70	100	100	160	180	160	120	150
11.	80	70	90	80	90	90	80	100	100	120	160	130	170
12.	—130	—120	—130	—130	—170	—140	—	—	—	—	—	—	—
13.	—50	—50	—100	—20	0	10	—20	0	30	10	40	50	30
14.	70	80	90	100	90	80	70	80	100	100	120	110	110
15.	50	20	20	20	—10	—50	—	—	—	—	—	—	—
16.	—50	—50	—40	—50	—70	—50	—50	—	—	—	—100	—90	—80
17.	50	40	20	80	120	160	—	—	—	—	—	—	—
18.	—	—	—	—	—	—	—	—	40	70	30	—10	—60
19.	80	90	100	110	110	90	110	120	110	120	120	130	180
20.	190	120	120	70	90	90	70	70	80	80	70	90	70
21.	200	200	0	—60	30	70	70	50	90	90	110	100	110
22.	120	100	110	90	100	100	120	120	—	150	130	130	110
23.	140	160	200	160	150	90	90	70	120	150	170	160	100
24.	100	60	30	60	80	90	80	60	60	80	100	120	100
25.	80	80	70	70	60	60	100	100	100	100	120	110	120
26.	60	30	50	+S	+S	30	30	10	50	0	30	90	50
27.	—S	—50	30	40	50	40	40	30	30	20	50	50	70
28.	100	80	100	100	100	90	110	120	100	130	+S	160	160
29.	+S	+S	+S	+S	+S	+S	+S	+S	—	+S	+S	+S	+S
30.	+S	+S	180	140	130	90	110	140	100	+S	100	+S	+S
31.	0	30	50	+S	50	30	90	0	+S	70	90	—20	+S
Means	62	56	57	56	67	65	80	74	96	90	87	81	85
Number of days	25	28	29	27	27	28	24	23	20	24	25	26	24

13	14	15	16	17	18	19	20	21	22	23	Daily means
±S	—S	—200	—60	—110	—120	40	70	130	90	90	—
0	—60	—100	—120	—70	—130	—210	—180	—130	—70	—80	—
—30	—60	—80	—50	—60	—110	—40	140	140	180	110	—
120	(120)	110	110	140	130	90	110	100	110	70	—
100	130	130	90	+S	+S	+S	+S	140	100	90	—
130	40	60	80	80	(+S)	±S	±S	±S	±S	80	—
+S	180	140	180	150	140	180	+S	130	110	120	—
90	100	50	70	70	100	100	100	100	70	80	92
120	120	110	+S	160	150	120	110	100	70	70	110
170	210	130	170	170	160	170	180	140	110	90	130
140	110	120	160	140	80	—20	—130	—40	—70	—100	73
—	—	—	—	0	—50	—40	—60	—40	—80	—50	—
50	90	70	60	60	100	70	110	100	100	70	34
120	+S	150	100	70	70	80	90	90	100	50	92
—	—	—	—	—	—60	—20	—30	—10	—50	—50	—
—110	—140	—140	—190	—160	—50	—40	—70	70	70	60	—
—	—	—	30	—130	—S	±S	+S	±S	±S	±S	—
—100	—60	—70	—30	80	140	140	140	110	130	120	—
230	240	+S	270	+S	+S	+S	+S	+S	+S	+S	—
80	60	80	120	180	170	120	90	130	110	130	103
120	160	170	140	190	170	130	120	160	140	120	112
100	80	120	160	+S	210	200	160	180	150	140	131
70	100	100	160	170	160	200	+S	200	120	100	137
100	120	150	150	160	+S	+S	200	200	100	100	—
100	100	100	120	140	110	110	100	70	60	60	93
60	100	150	+S	210	110	80	±S	±S	+S	30	—
90	100	100	120	130	160	160	140	130	140	100	51
160	180	200	200	160	120	160	+S	+S	+S	+S	—
+S	+S	+S	+S	+S	+S	+S	+S	+S	+S	+S	—
+S	+S	+S	+S	+S	+S	60	70	20	50	30	—
40	50	70	30	+S	+S	—20	+S	—20	—120	—10	—
81	85	69	83	80	77	73	70	88	69	60	
24	23	25	25	24	23	25	21	25	25	27	

II. *Hourly means of the quantities of positive and negative*

Hour GMT / Month		0	1	2	3	4	5	6	7	8	9	10	11
January	+	0	0	0	0	0	0	0	22	0	3	0	0
	—	4	0	0	0	0	0	0	0	0	0	0	0
February	+	0	0	0	0	0	0	0	0	8	0	0	0
	—	0	0	0	0	0	0	0	0	0	0	0	0
March	+	50	35	24	0	8	3	0	4	6	0	0	0
	—	50	45	24	3	18	0	0	2	4	1	0	0
April	+	0	4	0	0	0	0	0	0	0	0	5	27
	—	0	0	0	0	0	0	0	0	0	0	5	3
May	+	15	12	0	0	0	0	0	3	0	21	46	17
	—	10	12	11	0	0	0	0	62	0	26	20	17
June	+	10	4	0	0	0	0	0	0	29	0	0	0
	—	0	12	0	0	0	10	0	58	23	0	0	0
July	+	34	0	36	2	0	8	22	58	108	2	7	4
	—	4	0	63	0	8	10	58	97	33	1	4	61
August	+	0	9	6	0	0	0	0	0	0	0	23	11
	—	0	3	23	0	0	0	0	0	0	0	115	0
September	+	54	0	0	0	0	0	0	16	0	0	5	4
	—	29	0	0	0	0	0	0	5	0	0	0	14
October	+	0	0	0	0	0	0	0	0	0	0	1	1
	—	0	0	0	0	0	0	0	0	0	0	1	2
November	+	0	0	1	0	0	0	0	0	18	0	0	0
	—	0	0	0	1	0	0	0	0	3	0	0	0
December	+	0	0	0	0	0	0	0	0	0	0	0	0
	—	0	0	0	0	0	0	0	0	0	0	0	0

charges transported by point-discharge for each month

12	13	14	15	16	17	18	19	20	21	22	23	Means
0	0	0	0	0	0	0	0	0	3	0	0	1,2
0	0	0	0	0	0	0	0	0	5	0	0	0,4
0	0	0	0	0	0	0	0	0	0	0	0	0,3
0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	1	49	36	114	49	29	17,1
0	7	1	0	0	0	0	6	186	61	70	56	22,3
0	0	0	0	8	11	0	0	0	0	0	0	2,5
0	0	2	0	2	0	0	0	0	0	0	0	0,5
7	53	57	57	45	0	21	17	23	46	4	37	20,0
13	28	96	61	19	0	15	4	91	49	25	14	23,9
3	53	20	2	11	14	0	15	20	0	0	57	9,9
19	81	14	14	12	22	0	100	34	0	0	0	16,6
102	51	2	7	9	1	21	9	37	40	0	0	23,3
80	35	0	7	0	79	99	11	70	34	0	21	32,3
0	14	16	9	91	38	0	0	0	0	15	0	9,7
0	46	36	10	20	62	1	0	0	0	0	0	13,2
10	24	7	11	34	0	0	0	0	0	0	0	6,9
33	44	8	49	98	0	0	0	0	0	0	0	11,7
1	3	0	0	0	39	0	24	3	0	0	1	3,0
3	0	0	0	0	26	0	39	4	0	0	0	3,1
0	0	0	0	0	0	0	0	0	5	18	0	1,8
0	0	0	0	0	0	0	0	0	60	22	0	3,6
0	2	0	0	0	0	0	1	15	43	49	58	7,0
0	4	0	0	0	0	0	1	11	54	31	17	4,9

IV. IONOSPHERE

The following tables give the values of mean ionospheric absorption at oblique incidence (A3) for certain zenith distances of the Sun ($\varkappa$) expressed in declibels (dB). The sky wawe of the transmitter Ćeskoslovensko (f=272 kc/s) has been recorded since January 1967. The geographical coordinates of the reflection point are 48,4°N, 17,1°E. Individual values have been determined by taking the average of 20 minute intervals, centered on the times of ground sunset (SS) and ground sunrise (SR) in the reflection point, as well as the average of the period ranging from $\varkappa = 100°$ to 23 00 GMT (Night).

Since the location of transmitter Ćeskoslovensko has unfavourably been changed, the absorption measurement at 272 kc/s and the publication of data are suspended from April 1975.

The tables were compiled by F. MÄRCZ. The equipment and the method have been described in the paper by P. BENCZE and F. MÄRCZ: „Atmosphärisch-elektrische und ionosphärische Messungen im Observatorium bei Nagycenk". Observatoriumsberichte des Geophysikalischen Forschungslaboratoriums der Ungarischen Akademie der Wissenschaften vom Jahre 1966, Sopron, 1967.

Mean Ionospheric Absorption L' (dB) at Oblique Incidence (A3)
f = 272 kc/s

January

Date of the night	SS	Night	SR
1/ 2	31,0	26,6	40,5
2/ 3	33,2	24,2	44,0
3/ 4	34,5	27,8	28,5
4/ 5	36,1	30,1	38,0
5/ 6	33,2	30,1	x
6/ 7	33,2	27,2	30,1
7/ 8	32,0	x	x
8/ 9	27,8	25,6	31,0
9/10	32,0	24,2	27,2
10/11	22,7	x	27,8
11/12	27,8	x	30,1
12/13	36,1	23,1	x
13/14	32,0	24,2	23,4
14/15	31,0	27,2	34,5
15/16	36,1	23,8	x
16/17	34,5	22,7	32,0
17/18	38,0	24,2	26,6
18/19	32,0	22,4	x
19/20	30,1	20,9	x
20/21	32,0	18,4	29,3
21/22	36,1	23,4	27,8
22/23	x	x	x
23/24	32,0	25,1	26,1
24/25	x	x	x
25/26	x	x	x
26/27	x	x	x
27/28	48,0	27,2	23,4
28/29	x	x	x
29/30	50,0	24,2	26,1
30/31	34,5	24,2	27,8
31/ 1	40,5	19,9	26,6
Median values	33,2	24,2	28,2

	February		
Date of the night	SS	Night	SR
1/ 2	33,2	17,5	22,4
2/ 3	34,5	18,7	22,4
3/ 4	40,5	22,4	26,1
4/ 5	x	x	x
5/ 6	50,0	22,1	x
6/ 7	27,8	19,1	31,0
7/ 8	19,7	22,7	20,2
8/ 9	24,2	19,7	22,1
9/10	x	x	x
10/11	31,0	25,6	33,2
11/12	34,5	24,2	28,5
12/13	36,1	19,7	32,0
13/14	36,1	19,3	25,1
14/15	24,2	22,4	36,1
15/16	50,0	22,1	26,6
16/17	36,1	21,8	44,0
17/18	36,1	23,4	27,2
18/19	40,5	27,8	32,0
19/20	38,0	26,1	36,1
20/21	38,0	24,6	32,0
21/22	44,0	23,8	28,5
22/23	40,5	29,3	32,0
23/24	38,0	26,6	32,0
24/25	33,2	26,1	28,5
25/26	31,0	22,7	29,3
26/27	31,0	23,1	34,5
27/28	36,1	24,2	31,0
28/ 1	33,2	25,1	32,0
Median values	36,1	22,9	31,0

March

Date of the night	SS	Night	SR
1/ 2	36,1	25,6	33,2
2/ 3	33,2	23,1	29,3
3/ 4	40,5	22,4	x
4/ 5	32,0	25,1	28,5
5/ 6	33,2	24,2	30,1
6/ 7	36,1	26,6	27,2
7/ 8	29,3	x	30,1
8/ 9	30,1	22,4	28,5
9/10	29,3	21,2	33,2
10/11	33,2	26,1	32,0
11/12	29,3	23,4	27,8
12/13	34,5	25,6	31,0
13/14	26,6	26,6	33,2
14/15	36,1	25,1	36,1
15/16	38,0	x	38,0
16/17	36,1	22,7	26,1
17/18	34,5	21,5	40,5
18/19	50,0	24,2	32,0
19/20	28,5	22,4	36,1
20/21	25,1	21,8	29,3
21/22	27,2	21,2	24,2
22/23	28,5	x	29,3
23/24	31,0	23,8	30,1
24/25	33,2	23,1	33,2
25/26	36,1	x	x
26/27	40,5	20,9	30,1
27/28	33,2	22,4	29,3
28/29	x	x	x
29/30	x	x	x
30/31	x	x	x
31/ 1	x	x	x
Median values	33,2	23,1	30,1

V. TECHNICAL PAPER

A new equipment for the measurement of ionospheric absorption

P. Bencze, J. Horváth and F. Märcz

The measurement of ionospheric absorption with the method A3 started in the Geophysical Observatory Nagycenk in 1966 [1]. Method A3 of the measurement of ionospheric absorption is based on the recording of the field strength of once reflected waves, propagating from a distant transmitter by oblique incidence. As the data are required for the investigation of the lower ionosphere, transmitters in the long and middle wave band have been chosen [2]. The number of stations is limited by the conditions of applicability of the method A3. Thus, only few stations are available. The measurements began with the recording of the reflected wave field strength of the transmitters Ćeskoslovensko (272 kHz) and Budapest (539 kHz). At that time standard measuring receivers, available in commerce, have been applied. Later it became inevitable to stop the recording of the transmitter Budapest, because of the steady alteration of the transmitter's power. Meanwhile the search for other appropriate transmitters began.

The field strength of several stations has been regularly measured by means of a field strength meter to study the receiving conditions at the observatory. The wearing out of the standard measuring receivers necessitated the construction of new equipments. Besides the fulfilment of conditions mentioned above and a site free of disturbances, the reliable measurement of ionospheric absorption requires a very stable receiver. As it is known, the field strength of the reflected wave decreases in day-time by several orders of magnitude as compared to its night-time value. This is the case especially in summer, when the sky wave is highly attenuated in day-time due to ionospheric absorption.

To enable the measurement of ionospheric absorption even in day-time, thus, a receiver of high sensitivity, as well as of high and stable amplification is needed. These conditions can be best satisfied by a heterodyn receiver. From the point of view of stable operation, the most essential part of such a receiver is the beat oscillator. The new equipment has been constructed by considering these principles.

The first unit of the receiver (1) (Fig. 1) is a radiofrequency amplifier, which is feeded by the voltage induced in the antenna. The input and output circuits of the radio frequency amplifier are tuned to the carrier frequency of the transmitter, which assure a band width of 300 Hz. The output voltage of this unit is mixed in the converter (2) with the voltage from the beat oscillator (5), the frequency of which is chosen to give the intermediate frequency of 30 kHz. An active analog multiplier circuit constitutes the converter, and the beat frequency is produced by a digital crystal oscillator. A thermostat, surrounding the oscillator, the temperature of which is held constant to 0,1 °C by special electronics (6), assures a frequency stability better than 10^{-6} Hz/°C. The temperature of the thermostat (50°C) has been selected so that it should be always greater than the ambient temperature. The output voltage of the converter is amplified in the intermediate-frequency amplifier (3). The band width of this unit is smaller than 100 Hz and thus enables the almost complete elimination of modulation. This is the reason why the frequency of the beat oscillator must be stabilized.

The subsequent part of the equipment consists of two channels. One of these is designed for the recording of night-time absorption, while the other is suitable to the measurement of day-time absorption. The last unit of the first channel is the demodulator unit (4), where the intermediate frequency is rectified. It consists of an active demodulator and a high pass filter. The latter provides for the removal of the rest modulation. An indicator, built into this unit, enables to find quickly the zero position turning the loop aerial. A compensograph connected to the output of the first channel produces continuous records of the field strength variations of the reflected wave.

In the second channel of the receiver first a converter (8) provides for the production of a separate intermediate frequency (5,8 kHz). This frequency arises from the mixing of the former intermediate frequency (30 kHz) and the beat frequency, supplied by the digital crystal oscillator and subsequently produced in a digital-frequency divider (7). The intermediate-frequency voltage is amplified by a selective, active RC amplifier stage (9), whose band width is 10 Hz. Since this channel is used for the registration of the weak field strength of the reflected wave in day-time, an additional amplification is needed. The gain of channel No 2 is three orders of magnitude higher than that of channel No 1. At the end of the second channel a demodulator (10), similar to that used in the first channel, provides for the rectification of the signal. The output voltage is recorded in this case with a dot printer.

A power supply unit (11) produces the stable voltages necessary for the operation of the equipment.

Fig. 2. shows a record of the output voltage of channel No 1. illustrating the variation of the reflected wave field strength around sunrise. The illustration shows the record from the beginning of transmission in the morning at 04 30 UT to 09 30 UT, when the scaling has been made. At 08 20 the gain was increased to enable the determination of day-time absorption.

The equipment is built with integrated circuits.

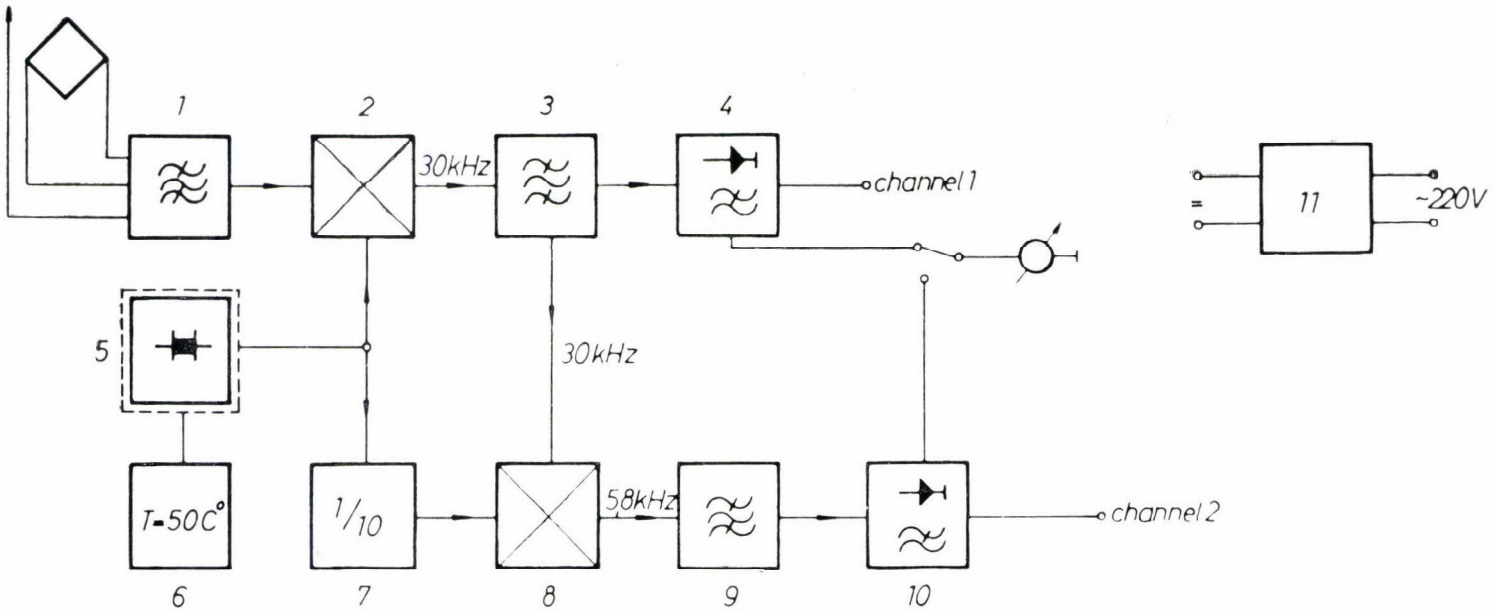
1
2
3
4
30kHz
channel 1
11
~220V
5
30kHz
T-50C°
1/10
58kHz
channel 2
6
7
8
9
10

Fig. 1.

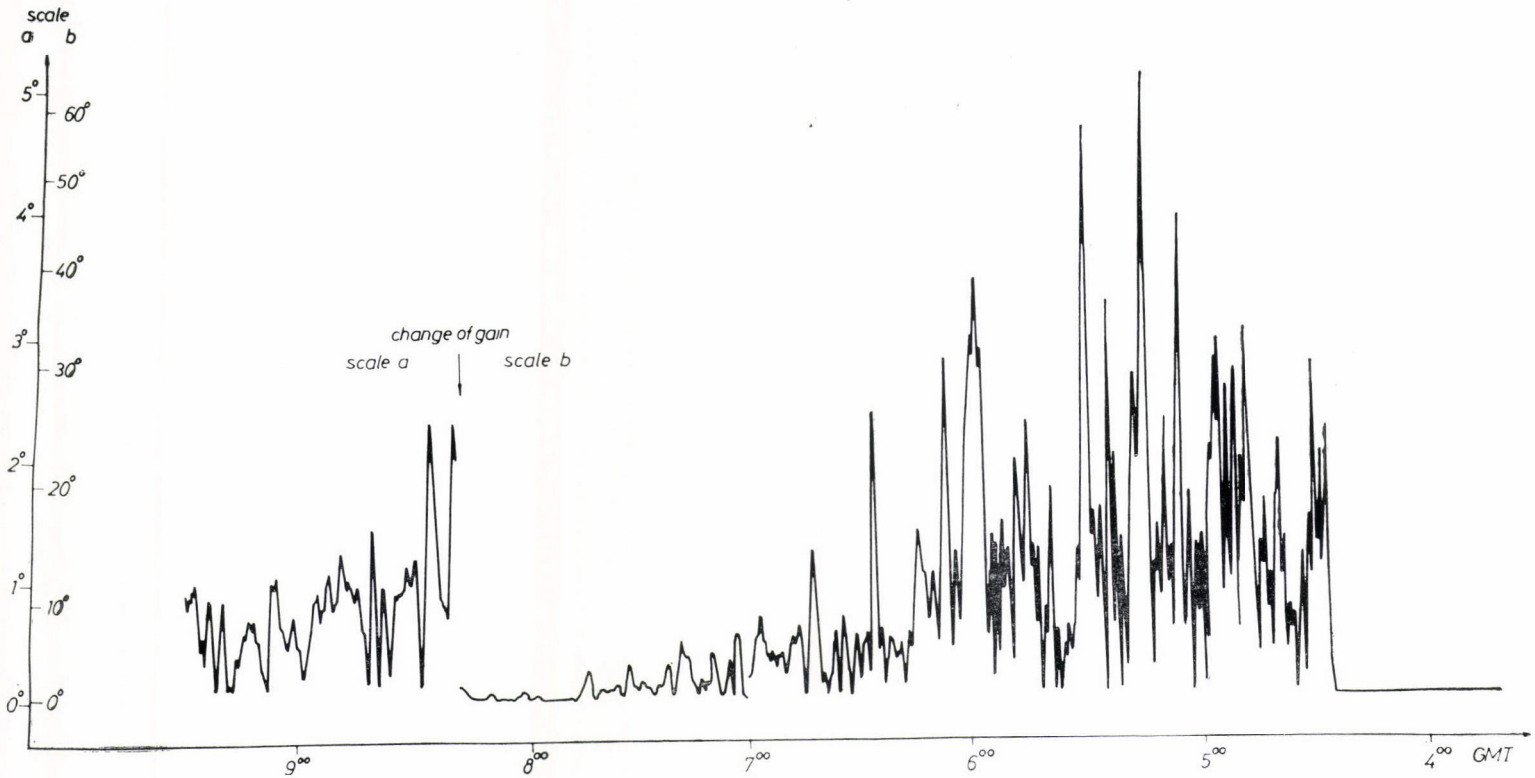
scale
a b
5°
60°
50°
4°
40°
3°
30°
2°
20°
1°
10°
0°
0°
change of gain
scale a
scale b
9^00
8^00
7^00
6^00
5^00
4^00
GMT

Fig. 2.

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