

A. ELECTROMAGNETIC FIELD OF THE EARTH

The coordinates of the Geophysical Observatory Nagycenk are the following:

$$\begin{aligned} \varphi &= 47^{\circ}38' & \lambda &= 16^{\circ}43' \\ \phi &= 47.2^{\circ} & \Lambda &= 98.3^{\circ} \\ L &= 1.9 \end{aligned}$$

Times are given in CET (i.e. UT + 1 h), nearly corresponding to LT (- 7 min)

Tables published in this part are the following:

1. 3-hour geoelectromagnetic activity indices T-M, corresponding to the greatest of five indices:

The electric activity indices T for the E_x and E_y component, having a linear scale with a step of 1.8 mV/km. The range of values is 0 to 9.

The magnetic activity indices M for the components D, H and Z have also a linear scale with a step of 7 nT in the same range. The electric and magnetic scales are determined so, that the averages are the same in a basic interval.

2. The indices K_1 and K_5 refer to complete days and express the activities in the period ranges 0-2 min (pulsations) and 24-60 min (substorms). The scales of K_1 and K_5 are as follows:

Period range	Limits between K/values								
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
K_1	2	4	7	13	18	23	29	41	54
K_5	29	43	67	88	110	131	191	234	339

These values are given in units of 10^{-5} V/km.

Values in brackets mean extrapolated ones from incomplete data,

where the lacking intervals were substituted by the average of recorded intervals.

The list of disturbed (D) and quite (Q) days selected by the following rule: A day is taken as disturbed on the basis of all magnetic and earth current activity indices, 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.

3. Daily variation of the three geomagnetic elements as monthly average. Values are differences in nT between the actual hourly average and the corresponding monthly mean. The monthly averages are given in absolute values (in the case of D the monthly mean is given in minute of arc).

4. Yearly means of the geomagnetic elements 1961 to 1987 in nT and minutes of arc. These values are the results of a reevaluation of previously published data, including corrections eliminating disturbances caused by construction works in the observatory. Corrected values are noted by asterisk.

5. List of special events, common table from magnetic and earth current records. Tables are given for SSC/s, SI/s and bays (substorms) and Pi2 pulsations.

6. Pulsation indices. The indices have been determined from occurrence frequency of different period pulsations, striving at a possibly uniform distribution of days in each of the five possible indices (1-5) in a basic interval.

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

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

The bands are the following:

P1	0	to	5 sec
P2	5	to	15 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. VERÓ Experimental results with the characterization of geomagnetic micropulsations (Acta Geod., Geoph. Mont. Hung 7/1972/15).

A detailed description of the processing and compilation is found in the Report of the Observatory for 1966 in German and in ÁDÁM, A., VERÓ, J., Cz. MILETITS, J., HOLLÓ, L. and WALLNER, Á: The geophysical observatory near Nagycenk. I. Electromagnetic measurements and processing of data (Acta Geod. Geoph. Mont. Hung., 16/1981/333).

1.

Three-hour electromagnetic activity indices (T-M)
1988.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5	
January					February				
1.	01101121	7	3	1	10000001	2	0	0	
2.	22187999	47	3	6	10010032	7	2	0	
3.	21221111	11	4	1	10010000	2	4	0	
4.	21111119	17	5	1	01011234	12	4	0	
5.	92234115	27	4	3	62365384	37	5	6	
6.	32363797	40	5	4	31222216	19	6	3	
7.	97323246	36	7	6	51111000	9	5	2	
8.	46125873	36	4	4	10011014	8	5	1	
9.	13111010	8	3	0	11122444	19	5	3	
10.	00001114	7	5	1	31314311	17	5	1	
11.	12411101	11	4	0	00122219	17	4	3	
12.	11179591	34	3	2	33232077	27	5	5	
13.	01112112	9	6	2	12313453	22	5	2	
14.	84922999	52	4	6	22254001	16	2	3	
15.	99953735	50	3	8	12233533	22	5	3	
16.	30111101	8	3	0	11224996	34	4	4	
17.	00000233	8	4	0	12042338	23	5	2	
18.	30111394	22	6	3	72262218	30	6	5	
19.	11332222	16	7	0	11111240	11	7	1	
20.	21232223	17	6	1	00011223	9	6	0	
21.	32211112	13	5	1	44662269	39	6	6	
22.	01112221	10	4	0	99969999	69	4	9	
23.	10010000	2	4	0	99732392	44	4	6	
24.	00001113	6	3	0	23122155	21	4	1	
25.	01101112	7	3	0	05222245	22	5	3	
26.	10111167	18	3	0	21111212	11	3	1	
27.	21112124	14	3	1	03111002	8	4	0	
28.	11111101	7	5	0	10011121	7	4	0	
29.	11010102	6	4	0	11021210	8	4	0	
30.	00000011	2	3	0					
31.	01001000	2	3	0					

$$T(N) = 1.571 \quad M_H = 1.70 \quad K_1 = 4.16$$

$$T(E) = 1.408 \quad M_D = 1.48 \quad K_5 = 1.65$$

$$M_Z = 0.88$$

$$T(N) = 1.818 \quad M_H = 1.78 \quad K_1 = 4.41$$

$$T(E) = 1.480 \quad M_D = 1.81 \quad K_5 = 2.41$$

$$M_Z = 0.33$$

1988.

Day	T-M	Sum	K_1	K_5
March				
1.	11011011	6	5	0
2.	20111106	12	5	1
3.	31211363	20	4	1
4.	98252491	40	6	4
5.	21112124	14	6	2
6.	87224768	44	5	7
7.	31111396	25	6	3
8.	55947521	38	5	3
9.	32354251	25	7	1
10.	11343338	26	5	2
11.	32236363	28	6	3
12.	11122224	15	6	1
13.	20111121	9	7	0
14.	21122348	23	7	4
15.	91353399	42	7	4
16.	35252242	25	7	2
17.	21233212	16	7	2
18.	21122122	13	6	1
19.	11111111	8	6	0
20.	11134001	11	5	0
21.	00011001	3	6	0
22.	20011001	5	4	0
23.	10112222	11	3	0
24.	13021102	10	4	1
25.	00114232	13	5	0
26.	33332599	37	5	5
27.	99335289	48	7	6
28.	32223497	32	5	4
29.	92373792	42	5	6
30.	59537239	43	6	5
31.	32132282	23	6	3

T-M	Sum	K_1	K_5
April			
21112244	17	6	3
41334332	23	5	3
12372499	37	7	6
68598999	63	5	9
94322158	34	7	6
98769632	50	7	5
23555341	28	8	3
11211321	12	6	2
72122111	17	6	3
11237323	22	7	3
21212420	14	7	2
23233663	28	7	4
23223425	23	7	2
13222212	15	7	2
11122122	12	5	1
10212110	8	4	1
11112311	11	3	1
21112112	11	3	2
13254221	20	4	2
00111143	11	4	2
11111112	9	4	1
55445998	49	5	7
98547214	40	6	6
21121122	12	6	1
10121311	10	4	0
02211113	11	3	1
01101133	10	2	1
31112221	13	3	3
11211001	7	5	1
11131123	13	4	2

T(N)= 2.016 M_H = 2.17 K_1 = 5.61
 T(E)= 1.855 M_D = 1.86 K_5 = 2.39
 M_Z = 0.33

T(N)= 2.150 M_H = 1.93 K_1 = 5.23
 T(E)= 1.887 M_D = 1.78 K_5 = 2.83
 M_Z = 0.30

1988.

Day	T-M	Sum	K ₁	K ₅	T-M	Sum	K ₁	K ₅	
May					June				
1.	11111102	8	3	2	12111121	10	5	1	
2.	01011123	9	4	1	12112122	12	5	0	
3.	10112123	11	4	1	01110011	5	4	0	
4.	32123225	20	5	3	01011100	4	4	0	
5.	11133213	15	3	3	11127344	23	3	1	
6.	99999969	69	7	9	52131211	16	3	2	
7.	11224236	21	8	5	12211112	11	3	0	
8.	33223234	22	8	2	31122112	13	4	1	
9.	21232211	14	8	2	00112333	13	3	2	
10.	42323311	19	8	2	23422211	17	3	2	
11.	11122211	11	6	2	22112211	12	5	1	
12.	22111111	10	6	1	01101010	4	3	0	
13.	11111110	7	5	1	22111001	8	2	0	
14.	00110110	4	4	0	24573236	32	4	3	
15.	03211112	11	3	2	31121113	13	6	0	
16.	22414711	22	3	4	22211111	11	3	0	
17.	12349934	35	5	3	12112371	18	3	2	
18.	98313311	29	4	3	31122992	29	6	2	
19.	32122201	13	5	2	33366892	40	7	4	
20.	11111213	11	5	1	44432100	18	7	1	
21.	22312312	16	7	3	10212201	9	5	0	
22.	62312210	17	7	2	15225231	21	7	2	
23.	02111223	12	6	1	23122224	18	4	2	
24.	20124222	15	4	1	59455644	42	6	3	
25.	12212124	15	3	1	44684663	41	6	4	
26.	15211210	13	4	1	93311295	33	5	3	
27.	01021011	6	3	0	65111334	24	3	3	
28.	01011110	5	2	0	11232311	14	5	1	
29.	01223312	14	4	1	17744576	41	6	5	
30.	14321113	16	4	2	44356652	35	6	5	
31.	32123112	15	4	2					

T(N)= 1.625 M_H= 1.45 K₁= 4.90
T(E)= 1.468 M_D= 1.14 K₅= 2.03
 M_Z= 0.23

T(N)= 1.828 M_H= 1.78 K₁= 4.53
T(E)= 1.696 M_D= 1.17 K₅= 1.67
 M_Z= 0.30

1988.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5
July					August			
1.	62233223	23	7	2	13212121	13	5	1
2.	22343231	20	7	1	11211122	11	5	1
3.	11122221	12	7	1	12111210	9	2	1
4.	12111110	8	7	0	10110001	4	3	0
5.	00110232	9	4	0	01112124	12	5	1
6.	45113513	23	5	0	22411111	13	4	0
7.	11113021	10	4	1	21222121	13	2	2
8.	11213231	14	2	0	01011011	5	3	1
9.	10000001	2	4	0	11537133	24	3	4
10.	11111221	10	3	0	21212245	18	4	2
11.	74547442	37	6	5	31122114	15	4	3
12.	23535634	31	5	4	54323625	30	5	4
13.	21110221	10	4	0	35444432	29	6	6
14.	22311114	15	7	1	92554611	33	7	5
15.	22222264	22	6	3	23435432	26	5	3
16.	34459343	35	6	6	13211121	12	5	2
17.	42123322	19	5	1	11011101	6	6	1
18.	13232211	15	4	1	12211212	12	5	2
19.	11333221	16	6	2	21121313	14	7	2
20.	11110111	7	4	0	12227832	27	7	6
21.	17586621	36	6	6	11110008	12	5	0
22.	44244665	35	3	4	49322122	25	5	6
23.	43331001	15	4	2	12122233	16	6	2
24.	11212112	11	5	2	23334326	26	7	6
25.	13211121	12	5	1	12375325	28	7	6
26.	31233644	26	6	2	34214423	23	7	3
27.	44312111	19	3	2	43232233	22	7	3
28.	11222234	17	7	1	12223124	17	7	3
29.	21122106	15	6	1	33233222	20	7	3
30.	22211112	12	5	1	44222122	19	7	4
31.	12222211	13	5	2	24211644	24	7	3

$T(N) = 1.685$	$M_H = 1.54$	$K_1 = 5.10$	$T(N) = 1.835$	$M_H = 1.61$	$K_1 = 5.32$
$T(E) = 1.669$	$M_D = 1.10$	$K_5 = 1.71$	$T(E) = 1.621$	$M_D = 1.25$	$K_5 = 2.77$
	$M_Z = 0.21$			$M_Z = 0.19$	

1988.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5
September					October			
1.	45654343	34	7	5	32123113	16	5	4
2.	32223224	20	7	3	21102100	7	3	1
3.	22222133	17	7	2	00111211	7	5	0
4.	11222111	11	4	2	00211119	15	3	3
5.	21111000	6	5	0	45543563	35	4	5
6.	10002131	8	3	1	77577994	55	5	8
7.	11111010	6	3	0	23122113	15	6	1
8.	01222124	14	4	2	11122231	13	5	2
9.	01111021	7	4	0	12244345	25	5	5
10.	20011124	11	3	2	45999999	63	8	9
11.	24537799	46	6	8	61233111	18	6	2
12.	94332333	30	7	6	11121011	8	3	2
13.	11122144	16	6	3	11311002	9	3	2
14.	42232212	18	5	2	11122201	10	7	2
15.	14113231	16	3	3	10122211	10	4	1
16.	12123310	13	5	1	12323162	20	4	4
17.	13227276	30	2	6	22644239	32	6	6
18.	94847237	44	5	6	43297957	46	7	9
19.	93532347	36	5	8	83433243	30	5	6
20.	23433154	25	7	6	32534844	33	5	7
21.	22524126	24	7	6	32212103	14	7	1
22.	23334721	25	3	6	11110010	5	4	0
23.	22323112	16	6	4	10132110	9	4	2
24.	11233114	16	5	2	12121101	9	5	2
25.	24221126	20	4	4	11221000	7	4	2
26.	11228121	18	4	3	11122123	13	4	2
27.	11121110	8	6	1	12133171	19	4	4
28.	11121112	10	4	1	23224001	14	4	3
29.	11111100	6	3	0	11111000	5	4	0
30.	00132241	13	3	3	00000015	6	3	1
31.					12246112	19	3	4

$T(N) = 2.067$ $M_H = 1.52$ $K_1 = 4.43$
 $T(E) = 1.562$ $M_D = 1.49$ $K_5 = 3.20$
 $M_Z = 0.21$

$T(N) = 2.024$ $M_H = 1.55$ $K_1 = 4.67$
 $T(E) = 1.383$ $M_D = 1.54$ $K_5 = 3.23$
 $M_Z = 0.20$

1988.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5
November					December			
1.	21011332	13	3	2	00022000	4	3	0
2.	83335996	46	6	8	01337535	27	4	3
3.	46378397	47	7	8	22232293	25	5	4
4.	21332350	19	6	4	14222322	18	5	2
5.	31114411	16	5	3	00111011	5	3	0
6.	03323124	18	5	5	11011000	4	5	0
7.	13223662	25	5	5	00000000	0	3	0
8.	51121393	25	5	8	10011112	7	3	1
9.	20332413	18	4	3	10100011	4	5	0
10.	13133511	18	6	4	31114310	14	3	2
11.	01422257	23	5	3	03233784	30	4	5
12.	51157833	33	5	5	38443412	29	4	5
13.	71224112	20	7	4	23343569	35	5	6
14.	13275323	26	6	6	12113257	22	4	5
15.	24344122	22	7	6	53221110	15	3	3
16.	12253577	32	5	6	32255949	39	5	6
17.	52345122	24	5	4	32247299	38	4	6
18.	01123245	18	5	2	84945266	44	4	3
19.	20112010	7	4	1	74343772	37	4	5
20.	00001101	3	3	0	11231111	11	4	1
21.	11211001	7	4	1	12132111	12	2	2
22.	21121011	9	3	1	33192241	25	3	4
23.	01100000	2	4	0	11121011	8	4	0
24.	11101011	6	3	1	11121001	7	3	0
25.	10111123	10	3	2	11125692	27	3	6
26.	44238774	39	6	4	34287644	38	4	6
27.	34224152	23	7	3	44345433	30	5	5
28.	01125543	21	4	3	11135173	22	5	4
29.	21121121	11	5	2	53265235	31	4	3
30.	31199993	44	5	7	22143342	21	3	2
31.					11142131	14	5	2

T(N)= 2.138	$M_H = 1.73$	$K_1 = 4.93$	T(N)= 2.206	$M_H = 1.86$	$K_1 = 3.90$
T(E)= 1.383	$M_D = 1.77$	$K_5 = 3.70$	T(E)= 1.516	$M_D = 1.72$	$K_5 = 2.94$
	$M_Z = 0.17$			$M_Z = 0.24$	

Three-hour electromagnetic activity indices (T-M)

1989.

Day	T-M	Sum	K ₁	K ₅	T-M	Sum	K ₁	K ₅
January					February			
1.	62313215	23	2	3	75266569	46	5	8
2.	10032122	11	4	1	33313196	29	3	6
3.	00121121	8	5	0	59667999	60	5	8
4.	11142124	16	3	1	84546328	40	6	6
5.	68453992	46	4	6	36535257	36	7	6
6.	22122111	12	4	2	53564445	36	7	8
7.	62143141	22	7	3	34366455	36	6	8
8.	01227764	29	6	7	93344122	28	5	6
9.	42244523	26	4	6	43333329	30	6	4
10.	42343231	22	4	3	43124100	15	4	2
11.	11126999	38	5	8	00223151	14	4	2
12.	94333223	29	7	6	21233377	28	4	6
13.	00114542	17	5	5	73446362	35	4	6
14.	31113149	23	6	5	23223701	20	7	2
15.	94459599	54	4	8	01111198	22	4	5
16.	96655996	55	5	8	35437214	29	4	6
17.	54466569	45	4	7	22131101	11	4	1
18.	51237113	23	2	4	11215432	19	3	1
19.	22221111	12	3	2	11223426	21	5	2
20.	21119998	40	4	8	33565682	38	6	3
21.	83455996	49	3	8	22244511	21	7	3
22.	95989644	54	5	8	12242225	20	5	4
23.	34454333	29	6	6	10112102	8	7	1
24.	32233263	24	6	4	22234201	16	4	5
25.	13133142	18	6	4	10232111	11	5	2
26.	11225131	16	5	3	10112000	5	4	2
27.	23244100	16	5	4	10112310	9	3	2
28.	03213391	22	3	3	12123156	21	6	3
29.	21132631	19	4	2				
30.	02324212	16	4	3				
31.	23125599	36	5	8				

T(N)= 2.883	M _H = 2.43	K ₁ = 4.52	T(N)= 2.540	M _H = 2.17	K ₁ = 5.00
T(E)= 2.203	M _D = 2.60	K ₅ = 4.71	T(E)= 1.710	M _D = 2.21	K ₅ = 4.29
	M _Z = 0.35			M _Z = 0.26	

1989.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5
March					April			
1.	42123422	20	5	3	44786798	53	6	7
2.	38765334	39	4	6	43336593	36	7	6
3.	24865965	45	5	7	43224255	27	7	5
4.	41137600	22	3	5	86555599	52	7	8
5.	14459374	37	6	5	99665387	53	7	8
6.	63255943	37	8	5	62224215	24	6	6
7.	52443213	24	6	3	12634454	29	6	4
8.	11131099	25	5	5	52224363	27	7	4
9.	95325345	36	5	7	42122493	27	5	3
10.	62334323	26	6	6	30112221	12	4	2
11.	22343225	23	5	4	11112942	21	5	1
12.	94422272	32	6	6	22411112	14	4	0
13.	99999999	72	9	7	22332254	23	3	2
14.	99999899	71	9	6	64523499	42	7	6
15.	99766783	55	8	6	99442212	33	3	5
16.	12999967	52	7	8	10124769	30	4	2
17.	85575778	52	7	8	70111115	17	5	2
18.	01122511	13	5	0	15231110	14	5	2
19.	14999962	49	7	6	10112221	10	5	0
20.	23233214	20	6	2	12222110	11	5	1
21.	63433135	28	5	6	11322120	12	6	0
22.	32432869	37	6	8	42112202	14	5	0
23.	92477893	49	7	8	21224524	22	5	2
24.	75422010	21	5	4	31122111	12	4	2
25.	10033193	20	6	3	43357799	47	6	9
26.	12134117	20	6	2	97977799	64	7	9
27.	52749989	53	6	6	98555996	56	7	8
28.	93899977	61	7	8	77666776	52	6	8
29.	99886799	65	7	9	33566676	42	7	7
30.	95855198	50	7	8	45544233	30	8	3
31.	99559999	64	7	8				

$T(N) = 4.201$	$M_H = 4.11$	$K_1 = 6.16$	$T(N) = 3.092$	$M_H = 3.01$	$K_1 = 5.63$
$T(E) = 3.440$	$M_D = 4.00$	$K_5 = 5.71$	$T(E) = 2.350$	$M_D = 2.78$	$K_5 = 4.13$
	$M_Z = 0.81$			$M_Z = 0.51$	

1989.

Day	T-M	Sum	K ₁	K ₅	T-M	Sum	K ₁	K ₅
May					June			
1.	31112233	16	6	2	23123222	17	6	3
2.	34333354	28	8	5	22355433	27	4	3
3.	43222133	20	7	3	33213633	24	7	2
4.	34323333	24	8	5	54112311	18	5	3
5.	99993214	46	5	7	22122213	15	6	3
6.	22142237	23	6	1	12113210	11	5	2
7.	11989999	55	7	8	99779102	44	5	6
8.	11221112	11	5	0	33233299	34	7	6
9.	11211101	10	4	0	99243354	39	3	8
10.	01111102	7	5	1	77959997	62	7	9
11.	11111212	10	4	0	35535332	29	7	6
12.	32322211	16	5	2	32422211	17	4	2
13.	11123830	19	5	1	12123385	25	5	3
14.	13321322	17	3	2	67599939	57	5	7
15.	12423232	19	5	2	46357983	45	5	7
16.	12312221	14	6	1	14410100	11	3	0
17.	22221111	12	6	0	00021232	10	4	1
18.	11212111	10	5	2	11222221	13	5	1
19.	01112222	11	5	0	12222112	13	3	1
20.	11257420	22	6	3	33448694	41	4	6
21.	02123111	11	3	1	11121111	9	6	0
22.	11113425	18	6	3	01111113	9	4	0
23.	22219998	42	8	7	11111114	11	4	1
24.	95889999	66	8	9	01235311	16	4	2
25.	64553453	35	6	6	12222111	12	5	2
26.	43334554	31	7	3	11223231	15	4	2
27.	53242333	25	6	5	21112112	11	4	0
28.	23324533	25	6	4	21111111	9	5	2
29.	42224323	22	6	2	32222212	16	2	2
30.	32321112	15	6	1	22211101	10	3	3
31.	31113232	16	4	2				

T(N)= 2.310	M _H = 2.15	K ₁ = 5.71	T(N)= 2.179	M _H = 2.30	K ₁ = 4.70
T(E)= 1.972	M _D = 1.79	K ₅ = 2.84	T(E)= 2.000	M _D = 1.65	K ₅ = 3.10
	M _Z = 0.30			M _Z = 0.40	

1989.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5
July					August			
1.	01332999	36	3	6	21111111	9	2	1
2.	33111000	9	2	1	21210101	8	5	2
3.	01010000	2	2	0	12222010	10	3	1
4.	01110200	5	3	0	00123311	11	4	1
5.	11112593	23	4	4	10001001	3	2	0
6.	23122331	17	7	4	10112143	13	5	3
7.	22312121	14	6	2	12222222	15	6	4
8.	10111101	6	3	0	13322111	14	6	3
9.	21111122	11	3	1	11122294	22	5	3
10.	26232323	23	3	3	45799528	49	5	6
11.	11121111	9	5	1	76455521	35	7	6
12.	01021111	7	3	1	31122302	14	4	2
13.	32322111	15	3	2	13114211	14	5	2
14.	01110112	7	3	1	47999547	54	7	9
15.	11111211	9	4	0	99749749	58	9	9
16.	11000000	2	3	0	99534246	42	8	8
17.	55322132	23	5	3	33322996	37	6	8
18.	35422321	22	4	6	85473457	43	6	8
19.	11211001	7	6	0	85422231	27	6	6
20.	11010111	6	3	1	22698931	40	4	6
21.	21112101	9	4	2	13122659	29	4	6
22.	11121212	11	4	1	94122111	21	3	4
23.	36346611	30	4	3	43226899	43	5	6
24.	21224222	17	7	2	33112212	15	4	2
25.	22243113	18	6	1	10312212	12	3	1
26.	33233332	22	4	4	12111101	8	3	1
27.	22221212	14	5	3	14548599	45	5	6
28.	23221212	15	5	0	71123239	28	3	6
29.	22222233	18	6	2	99975482	53	6	8
30.	22332221	17	6	2	26223363	27	5	6
31.	11111111	8	4	0	11101222	10	4	2

$T(N) = 1.448$ $M_H = 1.19$ $K_1 = 4.23$
 $T(E) = 1.161$ $M_D = 0.90$ $K_5 = 1.81$
 $M_Z = 0.22$

$T(N) = 2.778$ $M_H = 2.56$ $K_1 = 4.84$
 $T(E) = 2.424$ $M_D = 2.25$ $K_5 = 4.39$
 $M_Z = 0.45$

1989.

Day	T-M	Sum	K_1	K_5	T-M	Sum	K_1	K_5
September					October			
1.	11241210	12	2	1	33222412	19	4	2
2.	11113411	13	3	3	24543312	24	6	2
3.	01211102	8	5	1	00245263	22	3	5
4.	89995111	43	5	5	11121212	11	3	2
5.	36843111	27	5	6	21011201	8	5	1
6.	13235332	22	4	2	11251330	16	5	4
7.	21125994	33	4	6	52232223	21	4	4
8.	72633311	26	7	4	32533102	19	5	4
9.	41194214	26	4	4	33433212	21	4	4
10.	11212121	11	4	1	33675312	30	5	2
11.	00021002	5	5	0	21344111	17	5	2
12.	32436313	25	4	1	01334121	15	5	3
13.	12233224	19	5	5	10000000	1	3	0
14.	12225100	13	4	2	00001000	1	3	0
15.	35545479	42	4	7	00001122	6	2	2
16.	93332111	23	3	5	11247431	23	4	5
17.	20312112	12	3	1	33232031	17	3	3
18.	61394599	46	7	8	57133132	25	3	3
19.	99945320	40	4	8	98478011	38	5	6
20.	00001012	4	3	0	11479999	49	6	8
21.	02122100	8	5	2	89999999	71	5	9
22.	22875573	39	6	6	97335999	54	5	8
23.	10111110	6	7	1	43623225	27	4	4
24.	10122223	13	5	2	24433261	25	5	3
25.	20011111	7	5	1	55351101	21	4	3
26.	00568999	46	5	8	34122994	34	5	6
27.	52222300	16	3	2	73323174	30	6	3
28.	22112051	14	4	2	01132372	19	5	3
29.	11117121	15	4	2	12312178	25	7	3
30.	31212283	22	5	3	84456378	45	7	6
31.					62435451	30	5	4

T(N)= 2.279	$M_H = 2.01$	$K_1 = 4.47$	T(N)= 2.681	$M_H = 2.23$	$K_1 = 4.55$
T(E)= 1.858	$M_D = 1.78$	$K_5 = 3.30$	T(E)= 1.956	$M_D = 2.26$	$K_5 = 3.68$
	$M_Z = 0.33$			$M_Z = 0.38$	

1989.

Day	T-M	Sum	K ₁	K ₅	T-M	Sum	K ₁	K ₅	
November					December				
1	11332123	16	7	4	95554499	50	7	8	
2.	95322393	36	6	5	96562126	37	4	5	
3.	73249545	39	6	8	74484537	42	7	6	
4.	11377545	33	6	6	87525399	48	5	8	
5.	73672169	41	7	7	86421121	25	3	4	
6.	32333323	22	5	4	11112111	9	4	0	
7.	53259423	33	4	7	11122133	14	5	3	
8.	23269440	30	6	6	11113211	11	4	1	
9.	46366692	42	5	5	10111110	6	6	0	
10.	25325221	22	5	2	00000001	1	3	0	
11.	25653695	41	7	4	01122201	9	3	0	
12.	44733214	28	3	2	01112014	10	3	1	
13.	65868979	58	5	6	23111021	11	2	2	
14.	73232113	22	5	5	00023734	19	3	4	
15.	31121100	9	2	2	33122111	14	4	2	
16.	00022111	7	6	3	01134535	22	3	4	
17.	41299999	52	7	9	11123312	15	5	2	
18.	98943212	38	7	4	21122023	13	4	1	
19.	10132165	19	3	5	22112121	12	5	1	
20.	22223122	16	4	4	01110113	8	5	0	
21.	52476000	24	5	4	45012221	17	5	2	
22.	00132242	14	5	2	72259797	48	4	4	
23.	31012101	9	4	2	14473217	29	4	2	
24.	01221112	10	6	2	21245998	40	4	7	
25.	01000000	1	5	0	45243126	27	5	4	
26.	00033174	18	3	0	21246499	37	5	7	
27.	22135348	28	4	6	56357577	45	6	1	
28.	86645559	48	5	8	23223111	15	4	2	
29.	64386487	46	6	6	32469999	51	6	6	
30.	55133374	31	4	6	91573856	44	3	6	
31.					65555551	37	4	7	

T(N)= 3.000 M_H= 2.60 K₁= 5.03
 T(E)= 2.200 M_D= 2.59 K₅= 4.50
 M_Z= 0.47

T(N)= 2.488 M_H= 2.19 K₁= 4.35
 T(E)= 1.742 M_D= 2.15 K₅= 3.23
 M_Z= 0.33

2.
Disturbed and quiet days for 1988

Disturbed days		Quiet days	
January	-	1, 13, 22, 23, 25, 28, 29, 30, 31	
February	22	1, 3, 26, 28	
March	-	1, 13, 18, 19, 21, 22, 23	
April	4, 22	15, 16, 18, 21, 24, 29	
May	6	1, 11, 12, 13, 14, 27, 28	
June	24, 25	1, 2, 3, 4, 7, 11, 12, 13, 16, 21	
July	-	3, 4, 9, 10, 13, 20, 24, 30, 31	
August	-	2, 3, 4, 7, 8, 17, 18	
September	-	4, 5, 7, 9, 27, 28, 29	
October	6, 10	2, 3, 12, 14, 15, 22, 24, 25, 29	
November	-	19, 20, 21, 22, 23, 24, 29	
December	-	1, 5, 6, 7, 8, 9, 23, 24	

Disturbed and quiet days for 1989

Disturbed days	Quiet days
January 15, 16, 17, 21, 22	3, 6, 19
February 3, 6	23, 26
March 13, 14, 15, 17, 28, 29, 31	-
April 1, 4, 5, 26, 27, 28	19, 20
May 24	8, 9, 10, 11, 17, 18, 19
June 10, 14	18, 19, 21, 25, 27, 28, 30
July -	3, 4, 8, 9, 11, 14, 15, 16, 19 20, 21, 22, 27, 31
August 14, 15, 18	1, 2, 3, 5, 7, 26, 31
September 15	3, 10, 11, 20, 23, 25
October 21, 30	4, 5, 13, 14, 15
November 13, 28, 29	16, 24, 25
December 1, 3, 27	6, 9, 10, 11, 19

3. Hourly averages of magnetic

	0	1	2	3	4	5	6	7	8	9	10	11	12
January													
H	+0.3	-0.1	+0.7	+0.3	+2.8	+6.7	+7.5	+10.0	+11.0	+6.8	+2.0	+0.3	+0.3
D	+9.7	+6.5	+4.6	+2.5	-1.1	-2.8	-2.5	-2.8	-0.8	+1.8	-3.7	-10.3	-13.3
Z	+0.8	-0.1	-0.9	-0.9	-1.0	-1.7	-1.8	-2.5	-2.0	-3.8	-5.1	-4.5	-3.1
February													
H	+1.7	+5.4	+6.9	+5.5	+5.1	+6.1	+7.1	+11.3	+12.0	+7.0	+0.8	-5.1	-7.0
D	+7.9	+7.9	+1.1	-0.3	-3.0	-0.8	-0.5	+1.5	+8.0	+10.8	+5.1	-3.4	-12.2
Z	+1.5	+0.1	-0.1	-1.6	-1.9	-2.3	-2.3	-1.7	-0.5	-2.8	-5.5	-6.5	-6.8
March													
H	+5.8	+5.7	+4.1	+5.9	+7.6	+9.3	+10.4	+9.0	+3.9	-3.3	-10.5	-12.3	-9.7
D	+6.0	+6.6	+5.1	+2.9	+10.0	+2.6	+5.3	+12.1	+17.8	+15.8	+4.0	-12.4	-24.6
Z	+0.2	-0.1	-0.3	-0.1	-1.2	-1.1	+0.7	+2.6	+2.5	-1.2	-5.5	-8.3	-8.4
April													
H	+6.9	+6.1	+6.2	+6.0	+6.0	+6.9	+4.2	+0.5	-8.2	-14.1	-14.1	-9.0	-6.2
D	+5.9	+7.7	+7.2	+7.0	+8.2	+12.0	+20.3	+27.6	+28.4	+18.9	+0.9	-19.0	-33.5
Z	+3.7	+2.9	+2.2	+1.5	+2.2	+3.5	+5.0	+4.7	+1.1	-3.6	-10.0	-16.4	-18.1
May													
H	+5.0	+3.3	+3.4	+3.3	+2.3	+3.5	-0.2	-5.0	-8.1	-12.3	-7.5	+0.1	+3.5
D	+5.9	+7.2	+8.0	+10.2	+15.4	+23.9	+27.6	+28.0	+22.7	+12.3	-4.2	-19.7	-32.0
Z	+3.7	+2.8	+3.1	+3.9	+5.6	+6.4	+5.8	+4.3	+0.6	-5.2	-12.3	-17.3	-18.3
June													
H	+3.5	+3.4	+3.8	+4.3	+8.2	+8.8	+1.2	-6.7	-13.1	-17.1	-15.5	-7.5	+0.3
D	+3.8	+5.7	+7.0	+7.2	+13.5	+22.9	+29.7	+30.9	+29.3	+18.8	+0.4	-16.5	-30.5
Z	+2.8	+2.6	+2.6	+3.6	+4.0	+4.5	+3.1	+1.4	+0.3	-5.4	-11.2	-15.4	-15.7

elements (H,D,Z) for 1988

13	14	15	16	17	18	19	20	21	22	23	Monthly Averages
-1.5	-0.4	-0.3	-3.0	-6.8	-8.7	-8.7	-6.3	-6.3	-4.5	-2.1	21 046 nT
-13.0	-10.9	-7.4	-4.9	-3.2	+0.5	+5.0	+9.5	+13.4	+11.7	+11.6	1 ^o 24.3'
-1.2	+0.4	+1.2	+2.2	+2.6	+3.6	+4.5	+4.3	+3.8	+3.3	+1.9	42 716 nT
-6.1	-7.4	-9.0	-8.2	-10.5	-7.4	-3.2	-5.0	-1.8	+1.0	+0.8	21 048 nT
-18.4	-19.6	-11.4	-8.2	-5.0	+1.0	+0.3	+8.4	+11.3	+9.7	+9.8	1 ^o 25.0'
-5.5	-1.5	+2.5	+4.5	+5.3	+5.1	+4.9	+5.0	+4.6	+3.3	+2.2	42 718 nT
-5.1	-5.7	-4.9	-6.3	-7.2	-4.0	+0.6	-0.3	+1.6	+1.3	+4.1	21 053 nT
-29.0	-27.0	-16.0	-8.6	-4.3	-4.0	+4.6	+9.1	+8.1	+8.0	+7.9	1 ^o 25.4'
-7.2	-4.2	+0.1	+2.8	+4.0	+4.6	+5.0	+5.0	+4.3	+3.5	+2.3	42 719 nT
-2.9	-2.2	-3.1	-2.6	-2.1	-0.2	+2.9	+3.5	+3.4	+5.7	+6.4	21 053 nT
-39.6	-34.7	-23.9	-13.7	-3.5	-0.2	+2.7	+6.2	+3.5	+4.7	+6.9	1 ^o 26.1'
-14.1	-8.6	-1.6	+3.5	+6.1	+6.4	+6.9	+6.4	+5.9	+5.5	+4.9	42 721 nT
+0.6	-4.5	-7.7	-5.8	-1.0	-1.7	+3.4	+5.7	+6.0	+6.9	+6.8	21 059 nT
-35.0	-30.7	-23.2	-13.2	-4.8	-3.8	-2.3	+0.6	+2.1	+1.3	+3.7	1 ^o 26.0'
-16.0	-9.6	-2.6	+2.7	+6.4	+6.6	+6.3	+6.5	+6.2	+5.5	+4.9	42 719 nT
+1.0	-2.0	-1.8	-0.5	-0.4	+3.0	+7.6	+7.5	+5.2	+3.5	+3.3	21 066 nT
-35.9	-34.0	-27.8	-16.8	-7.4	-3.1	+0.2	-0.4	+1.4	+0.4	+1.2	1 ^o 26.1'
-14.3	-9.3	-3.2	+3.9	+7.0	+8.6	+8.1	+6.8	+5.7	+5.2	+4.3	42 722 nT

	0	1	2	3	4	5	6	7	8	9	10	11	12
July													
H	+6.1	+6.2	+6.5	+7.7	+9.0	+8.2	+3.0	-6.7	-14.2	-19.1	-19.4	-13.4	-6.4
D	+4.9	+5.7	+7.7	+9.5	+14.2	+22.4	+30.2	+34.1	+31.1	+20.1	+2.5	-15.9	-31.6
Z	+3.3	+2.7	+2.3	+3.1	+4.2	+4.8	+3.1	+2.6	+0.1	-3.8	-9.2	-15.2	-16.7
August													
H	+5.5	+5.7	+6.4	+7.4	+8.6	+6.9	+0.6	-6.3	-17.3	-21.2	-18.4	-11.1	-2.6
D	+5.8	+8.3	+7.6	+9.0	+10.6	+20.3	+26.4	+29.9	+27.5	+15.1	-2.3	-18.3	-32.4
Z	+2.0	+1.7	+1.4	+1.5	+2.3	+3.2	+3.4	+3.7	+2.6	-0.8	-5.9	-11.0	-11.7
September													
H	+5.2	+5.8	+7.3	+7.0	+6.5	+6.2	+2.9	-6.7	-17.2	-22.3	-19.4	-12.4	-5.0
D	+9.6	+8.6	+8.7	+6.2	+9.4	+13.4	+20.8	+27.6	+26.9	+17.3	-0.9	-21.2	-33.8
Z	+2.1	+1.4	+0.8	+0.9	+1.2	+2.7	+4.4	+5.6	+3.5	-0.1	-6.5	-11.4	-10.9
October													
H	+5.4	+6.7	+6.6	+8.6	+10.2	+10.6	+11.5	+7.0	-0.4	-8.8	-13.7	-13.5	-13.9
D	+8.6	+6.8	+5.4	+5.2	+3.5	+4.0	+7.0	+16.7	+23.5	+22.3	+7.5	-12.6	-24.9
Z	+2.2	+1.4	+1.0	+0.3	-0.1	+0.2	+1.8	+3.7	+3.9	-1.3	-8.8	-11.3	-10.2
November													
H	+5.2	+3.1	+5.7	+6.1	+7.1	+10.4	+12.6	+12.3	+7.6	+3.0	-4.2	-9.5	-10.4
D	+10.5	+7.0	+4.0	+1.7	-0.2	-1.0	+0.3	+3.5	+10.6	+10.8	+4.5	-6.3	-17.2
Z	+1.0	+0.6	-0.6	-0.9	-1.2	-1.4	-1.9	-0.6	+0.6	-2.5	-6.6	-7.7	-6.9
December													
H	+4.0	+3.3	+3.1	+5.0	+7.9	+7.8	+10.2	+12.2	+12.2	+5.8	-5.5	-11.2	-8.4
D	+7.2	+5.4	+3.4	+1.9	+1.1	-0.2	+1.8	+1.9	+5.4	+7.8	+2.3	-3.8	-11.2
Z	+1.7	+0.7	+0.4	-0.5	-1.1	-1.0	-0.8	-1.8	-1.1	-3.3	-5.4	-5.1	-5.6
1988 Yearly means													
H	+4.5	+4.5	+4.6	+5.6	+6.8	+7.6	+5.9	+2.6	-2.7	-8.0	-10.5	-8.7	-5.5
D	+7.1	+6.9	+5.8	+5.2	+6.8	+9.7	+13.8	+17.0	+19.2	+14.3	+1.3	-13.3	-24.8
Z	+2.1	+1.4	+1.0	+0.9	+1.1	+1.5	+1.7	+1.8	+0.9	-2.8	-7.7	-10.9	-11.1

13	14	15	16	17	18	19	20	21	22	23	Monthly Averages
-5.8	-5.1	-2.3	+1.4	+2.8	+2.0	+6.8	+9.0	+8.8	+7.6	+7.3	21 064 nT
-38.2	-34.4	-29.1	-18.3	-7.7	-4.1	-2.5	-3.0	-1.4	+0.5	+3.3	1° 26.8'
-14.4	-9.2	-3.6	+4.7	+7.1	+7.6	+6.5	+6.2	+5.4	+4.4	+3.7	42 723 nT
+2.1	+3.3	+0.7	-0.8	+0.2	+0.4	+3.7	+6.9	+7.0	+5.4	+6.9	21 060 nT
-36.8	-33.4	-26.3	-14.4	-4.8	-2.1	-2.9	+0.7	+3.0	+4.5	+5.0	1° 27.0'
-9.5	-6.4	-2.5	+1.8	+3.7	+3.4	+3.5	+3.9	+3.6	+3.4	+2.7	42 720 nT
+0.3	+1.8	+2.1	-0.9	-1.7	+3.6	+7.3	+8.2	+7.8	+6.9	+6.7	21 054 nT
-36.3	-28.9	-19.0	-11.9	-9.5	-6.9	-2.0	-0.1	+3.1	+7.7	+11.2	1° 27.5'
-8.1	-4.2	-1.1	+1.2	+2.0	+2.2	+2.8	+3.2	+3.1	+2.7	+2.5	42 723 nT
-9.4	-5.9	-6.3	-8.2	-5.1	-2.7	-0.2	+2.2	+5.4	+7.6	+6.3	21 046 nT
-30.5	-27.5	-17.0	-12.6	-9.9	-7.1	-0.4	+4.3	+7.4	+10.0	+10.3	1° 28.0'
-7.5	-3.2	+0.4	+2.3	+3.4	+4.1	+4.3	+4.5	+3.8	+3.0	+1.9	42 732 nT
-10.6	-10.1	-10.7	-9.9	-8.0	-3.8	-1.5	+0.9	-0.1	+1.4	+3.4	21 041 nT
-18.3	-15.6	-13.0	-9.3	-8.1	-4.7	+0.7	+9.3	+9.4	+11.2	+10.2	1° 28.2'
-4.0	-0.9	+1.9	+3.7	+4.3	+4.1	+4.6	+4.7	+4.3	+3.2	+2.2	42 731 nT
-7.8	-6.4	-9.9	-9.1	-7.3	-4.4	-0.5	-0.6	-2.1	-1.4	+3.1	21 033 nT
-14.8	-15.3	-12.0	-8.5	-7.9	-3.1	+1.3	+4.4	+11.6	+13.3	+8.0	1° 28.8'
-3.9	-2.4	+0.7	+3.1	+3.4	+3.9	+4.2	+4.2	+3.9	+3.5	+2.3	42 743 nT
-3.8	-3.8	-4.4	-4.5	-4.0	-2.0	+1.5	+2.6	+2.9	+3.4	+4.4	21 052 nT
-28.8	-26.0	-18.9	-11.7	-6.3	-3.1	+0.4	+4.1	+6.1	+6.9	+7.4	1° 26.6'
-8.8	-5.0	-0.7	+3.0	+4.6	+5.0	+5.1	+5.0	+5.0	+3.9	+3.0	42 724 nT

Hourly averages of magnetic

	0	1	2	3	4	5	6	7	8	9	10	11	12
January													
H	+3.8	+4.3	+4.1	+6.9	+8.7	+10.6	+14.3	+18.0	+19.2	+11.9	-1.6	-7.9	-9.4
D	+13.0	+12.1	+6.1	+1.5	-0.2	-2.2	-2.4	-0.3	+10.2	+16.5	+10.9	+1.7	-12.3
Z	+1.7	+0.3	-0.5	-1.6	-2.3	-2.3	-2.1	-2.2	-0.1	-3.6	-6.6	-6.2	-9.1
February													
H	+3.1	+1.1	+3.8	+5.5	+5.8	+7.7	+8.7	+11.6	+9.2	+0.3	-7.5	-10.7	-11.1
D	+14.7	+12.1	+11.6	+9.2	+6.5	+3.8	+3.4	+7.6	+16.5	+17.1	+8.3	-5.3	-15.8
Z	+2.7	+2.3	+1.5	+0.6	+0.1	+0.2	-0.1	+1.5	+2.8	-0.4	-3.8	-6.9	-9.3
March													
H	+7.0	-3.5	+0.6	+9.3	+10.6	+11.0	+14.0	+8.4	+3.1	-5.7	-4.7	-6.1	-13.2
D	+17.8	+20.1	+14.5	+8.0	+6.9	+3.7	+4.8	+14.7	+21.8	+22.7	+11.1	-12.3	-27.5
Z	-4.7	-6.4	-6.2	-7.5	-4.2	-3.9	-2.2	+1.3	+1.1	-3.7	-9.2	-13.2	-14.1
April													
H	+9.3	+7.5	+8.2	+6.1	+6.5	+5.1	+5.8	+1.2	-8.8	-16.6	-16.3	-11.8	-8.0
D	+7.1	+8.0	+8.2	+9.9	+12.9	+11.0	+17.8	+29.6	+32.9	+25.9	+10.4	-14.1	-35.4
Z	+4.6	+3.2	+2.1	+1.5	+1.5	+3.0	+5.8	+6.3	+3.8	-2.9	-10.0	-19.4	-24.2
May													
H	+5.7	+7.0	+6.4	+3.4	+3.7	+1.1	-2.5	-10.4	-16.6	-18.1	-14.3	-3.6	+3.7
D	+1.2	+3.7	+10.3	+12.3	+18.4	+27.1	+34.2	+35.5	+32.5	+18.9	-1.7	-21.3	-36.1
Z	+4.6	+3.5	+2.6	+3.2	+4.7	+6.5	+5.5	+4.5	+1.1	-4.9	-12.0	-19.1	-21.5
June													
H	+8.7	+6.8	+8.4	+8.9	+9.1	+7.5	-1.4	-11.7	-21.2	-26.1	-22.8	-13.2	-5.6
D	+1.1	+3.3	+6.1	+10.9	+18.5	+30.5	+42.5	+45.1	+39.5	+21.1	+2.0	-19.7	-36.7
Z	+4.0	+3.5	+2.7	+2.7	+4.6	+5.7	+5.0	+2.8	-1.2	-6.5	-12.9	-18.6	-19.6

elements (H,D,Z) for 1989

13	14	15	16	17	18	19	20	21	22	23	Monthly Averages
-9.7	-10.8	-9.9	-11.6	-10.9	-10.8	-12.1	-7.4	-2.6	+1.3	+1.6	21 036 nT
-21.7	-23.6	-22.8	-17.5	-14.4	-11.6	+1.2	+7.4	+12.5	+18.1	+17.8	1 ⁰ 29.6'
-8.4	-4.3	+0.8	+3.0	+3.8	+5.9	+8.7	+9.1	+7.5	+5.6	+2.9	42 748 nT
-10.9	-9.6	-6.7	-6.8	-3.7	-1.9	+1.3	+2.3	+1.9	+2.4	+4.2	21 042 nT
-23.7	-24.5	-20.9	-14.3	-17.1	-11.6	-6.8	+1.3	+4.5	+9.2	+14.2	1 ⁰ 29.7'
-9.6	-5.8	-2.0	-0.4	+0.8	+2.6	+4.3	+4.8	+5.1	+5.0	+4.0	42 751 nT
-12.2	-5.2	-5.2	-6.8	-8.6	-3.5	+0.7	+7.5	+4.9	-3.0	+0.6	21 023 nT
-40.1	-42.4	-31.4	-21.0	-10.2	-6.4	-0.1	+4.2	+11.5	+12.6	+17.0	1 ⁰ 31.1'
-11.4	-5.5	+2.3	+10.4	+14.3	+14.8	+14.6	+13.2	+11.2	+9.5	-0.5	42 763 nT
-6.6	-7.7	-6.6	-2.9	-2.8	+3.9	+3.7	+8.8	+7.6	+7.0	+7.4	21 037 nT
-42.7	-39.4	-31.9	-20.8	-9.1	-1.4	+4.3	+3.7	+1.8	+4.1	+7.2	1 ⁰ 31.2'
-20.8	-13.2	-3.9	+3.7	+8.2	+9.7	+10.6	+9.5	+8.3	+7.1	+5.5	42 759 nT
+2.9	-1.5	-0.1	+1.1	-1.1	+3.3	+4.5	+7.3	+5.9	+6.7	+5.9	21 056 nT
-42.7	-37.7	-31.2	-20.0	-6.8	-0.7	+1.5	-0.3	-0.5	+2.0	+1.4	1 ⁰ 30.9'
-19.3	-12.7	-4.7	+3.4	+7.0	+8.5	+8.4	+8.6	+8.3	+7.3	+6.5	42 750 nT
-2.6	-1.3	-0.2	+0.8	+2.8	+5.1	+9.7	+10.7	+11.5	+8.0	+8.1	21 055 nT
-45.1	-46.3	-38.8	-16.8	-9.3	-1.0	-1.0	-0.5	-1.5	-3.2	-0.7	1 ⁰ 30.8'
-17.3	-12.3	-2.5	+5.4	+8.4	+11.3	+9.7	+7.6	+6.9	+6.0	+4.6	42 758 nT

	0	1	2	3	4	5	6	7	8	9	10	11	12
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July

H	+4.9	+5.7	+5.2	+7.4	+10.7	+11.2	+4.3	-9.8	-20.2	-25.0	-23.6	-15.0	-5.4
D	+2.9	+4.9	+7.0	+8.2	+13.8	+23.5	+32.9	+39.1	+38.0	+28.0	+8.5	-13.4	-29.8
Z	+3.8	+3.7	+3.8	+4.6	+6.8	+8.0	+7.0	+5.8	+2.7	-3.0	-10.1	-16.6	-19.1

August

H	+12.0	+11.0	+8.0	+8.5	+11.1	+7.6	+2.6	-11.9	-26.5	-34.9	-32.3	-20.3	-8.6
D	+4.2	+8.6	+8.9	+9.2	+13.4	+26.9	+37.5	+43.4	+41.1	+25.0	+1.6	-21.7	-39.8
Z	+3.1	+2.0	+1.9	+1.9	+3.4	+6.6	+6.5	+5.4	+1.3	-4.5	-10.1	-15.4	-18.3

September

H	+8.1	+7.6	+8.4	+8.4	+9.6	+5.6	+0.2	-7.1	-20.1	-25.4	-22.8	-11.4	-4.4
D	+9.9	+11.7	+14.4	+14.9	+14.4	+17.9	+26.2	+30.2	+29.8	+14.9	-6.1	-26.3	-38.7
Z	+3.2	+3.5	+3.1	+2.6	+2.0	+2.8	+4.2	+4.5	+2.0	-2.8	-8.8	-13.2	-13.9

October

H	+8.1	+8.2	+7.7	+8.2	+11.3	+13.6	+12.8	+5.6	-5.1	-13.2	-18.6	-18.6	-12.4
D	+10.1	+11.3	+10.6	+6.1	+3.6	+3.5	+7.3	+18.0	+27.7	+25.9	+10.4	-9.8	-27.4
Z	+1.2	+0.4	-0.9	-0.8	-1.9	-1.6	+0.1	+2.7	+3.7	-1.1	-9.5	-13.7	-13.1

November

H	+4.3	+4.8	+4.7	+6.7	+8.2	+9.3	+9.6	+11.7	+7.2	-1.6	-8.5	-9.0	-6.6
D	+11.4	+12.0	+10.8	+9.0	+5.6	+4.0	+4.0	+8.0	+17.1	+16.0	+7.1	-6.5	-19.8
Z	+3.1	-0.5	+0.2	-0.8	-1.6	-2.0	-1.6	-0.4	+0.1	-3.4	-8.1	-10.0	-10.3

December

H	+1.8	+0.2	-0.4	+0.9	+3.4	+5.4	+8.0	+10.9	+13.5	+6.8	-1.8	-5.7	-4.3
D	+17.5	+13.0	+9.0	+0.2	+2.2	+0.6	+0.6	+1.8	+6.6	+8.2	+2.7	-5.1	-14.2
Z	+2.0	+1.4	+0.8	-0.1	-0.7	-1.8	-1.6	-2.1	-2.0	-6.0	-7.4	-6.6	-6.9

1989 Yearly means

H	+6.4	+5.1	+5.4	+6.7	+8.2	+8.0	+6.4	+1.4	-5.5	-12.3	-14.6	-11.1	-7.2
D	+9.2	+10.1	+9.8	+8.3	+9.7	+12.5	+17.4	+22.7	+26.1	+20.0	+5.4	-12.8	-27.8
Z	+2.5	+1.4	+1.0	+0.6	+1.1	+1.8	+2.2	+2.5	+1.3	-3.5	-9.0	-13.2	-14.9

13	14	15	16	17	18	19	20	21	22	23	Monthly Averages
-0.3	+0.3	+0.4	+3.7	+5.2	+7.2	+5.6	+7.0	+7.1	+6.8	+6.6	21 066 nT
-38.0	-39.4	-33.9	-24.7	-11.4	-4.2	-2.0	-3.5	-4.4	-2.0	-0.1	1° 30.2'
-18.4	-14.3	-6.5	+1.4	+5.1	+7.1	+7.1	+6.3	+5.9	+4.7	+4.2	42 750 nT
-2.8	+2.4	+3.9	+3.7	+3.7	+5.5	+10.5	+13.6	+10.3	+11.1	+11.8	21 050 nT
-45.0	-42.6	-33.1	-18.8	-5.4	-2.7	-4.2	-3.5	-1.3	-1.9	+0.2	1° 31.0'
-15.8	-11.5	-2.7	+5.1	+8.0	+7.3	+6.7	+0.9	+6.8	+6.4	+5.0	42 757 nT
-0.6	+1.5	+2.1	+2.3	+2.7	+4.1	+6.3	+5.8	+6.4	+6.6	+6.1	21 042 nT
-40.5	-31.2	-22.1	-14.5	-8.8	-5.2	-3.7	+0.3	+1.6	+5.3	+5.6	1° 32.3'
-11.4	-7.3	-4.1	-1.2	+1.8	+4.3	+6.0	+6.5	+6.6	+5.1	+4.5	42 761 nT
-5.3	-5.6	-6.4	-7.5	-5.1	+1.8	+1.7	+1.0	+3.3	+6.7	+7.8	21 035 nT
-35.6	-34.4	-21.8	-12.8	-9.2	-7.7	-3.4	+4.4	+5.6	+8.1	+9.5	1° 32.6'
-8.8	-4.8	+2.5	+5.1	+6.4	+7.0	+6.9	+6.5	+5.7	+4.3	+2.9	42 762 nT
-4.7	-4.4	-3.4	-3.7	-4.3	-7.1	-9.5	-5.4	-1.8	+1.0	+2.5	21 026 nT
-25.1	-25.6	-20.2	-17.8	-18.9	-14.2	-2.6	+4.1	+9.9	+15.1	+16.6	1° 33.7'
-8.1	-3.6	-0.5	+0.9	+2.7	+5.8	+9.7	+9.6	+8.5	+6.5	+3.8	42 785 nT
-4.4	-6.0	-6.0	-6.5	-5.7	-2.9	-2.8	-3.2	-2.5	-0.4	+1.7	21 022 nT
-19.6	-21.0	-16.2	-7.6	-11.1	-10.6	-3.8	+1.4	+11.4	+16.9	+17.1	1° 33.1'
-5.8	-2.3	+0.6	+1.6	+2.5	+3.8	+5.7	+7.5	+7.8	+5.7	+3.9	42 786 nT
-4.8	-4.0	-3.2	-2.8	-2.3	+0.4	+1.6	+4.0	+4.3	+4.5	+5.4	21 041 nT
-35.0	-34.0	-27.0	-17.2	-11.0	-6.4	-1.7	+1.6	+4.3	+7.0	+8.8	1° 31.3'
-12.9	-8.1	-1.7	+3.2	+5.8	+7.4	+7.4	+7.5	+7.4	+6.2	+4.0	42 761 nT

4.
Yearly means of geomagnetic elements

Year	D ° ' ,	H nT	Z nT	I ° ' ,	X nT	Y nT	Z nT
1961	-0 23.6	20816	42077	63 40.7	20816	- 143	46944
1962	-0 19.6	20827	42093	63 40.5	20827	- 119	46964
1963	-0 14.3	20839	42116	63 40.4	20839	- 87	46990
1964	-0 10.5	20845	42126	63 40.4	20845	- 64	47001
1965	-0 08.1	20877	42137	63 38.6	20877	- 49	47025
1966	-0 06.8	20888	42156	63 38.5	20888	- 41	47047
1967	-0 06.0	20903	42179	63 38.3	20903	- 36	47074
1968	-0 03.0	20921	42196	63 37.7	20921	- 18	47098
1969	0 00.2	20942	42214	63 36.9	20942	1	47123
1970	0 02.8	20964	42235	63 36.1	20964	17	47152
1971	0 04.3	20992	42262	63 35.2	20992	26	47188
1972	0 06.5	21011	42286	63 34.7	21011	40	47218
1973	0 10.2	21028	42317	63 34.6	21028	62	47254
1974	0 13.6	21046	42350	63 34.5	21046	83	47291
1975	0 18.5	21072	42380	63 33.8	21072	113	47330
1976	0 23.8	21084	42413	63 34.0	21084	146	47365
1977	0 28.8	21106	42443*	63 33.6*	21105	177	47401*
1978	0 34.6	21108	42473*	63 34.4*	21107	212	47429*
1979	0 41.4	21113*	42496*	63 34.8*	21112*	254	47452*
1980	0 46.3	21107*	42512*	63 35.8*	21105*	284	47463*
1981	0 52.4	21097*	42530*	63 37.0*	21095*	322	47475*
1982	0 57.5	21078	42549	63 38.8	21075	353	47484
1983	1 02.7	21078	42581	63 39.8	21074	384	47512
1984	1 08.1	21075	42601	63 40.7	21071	417	47529
1985	1 12.7	21073	42625	63 41.7	21068	446	47550
1986	1 17.8	21065	42660	63 43.1	21060	477	47577
1987	1 21.9	21067	42689	63 44.0	21061	502	47604
1988	1 26.6	21052	42723	63 46.0	21045	530	47628
1989	1 31.3	21041	42761	63 48.0	21034	559	47657

5.
Special phenomena
(magnetic and earth current data)
SSC-s
1988

Month	Day	CET (UT+1h)	Amplitude in H(nT)	Hx	Hy	End of storm
01.	04.	21.15	34	+	+	no storm
	06.	17.30	28	+	-	01.07 04.00
	14.	00.30	28	+	-	01.15 09.00
02.	12.	22.30	42	+	-	no storm
	21.	03.00	32	+	-	02.21 12.00
03.	07.	18.30	35	+	-	03.08 04.00
04.	03.	17.30	12	+	-	04.04 22.00
05.	06.	05.30	55	+	-	05.06 23.00
06.	05.	13.15	28	+	-	no storm
	24.	01.30	28	+	-	06.24 07.00
	29.	05.15	32	+	-	06.29 09.00
07.	05.	17.00	12	+	-	07.06 06.00
	21.	04.15	42	+	-	07.21 18.00
08.	09.	06.15	12	-	-	08.09 14.00
	20.	13.00	45	+	-	08.20 17.00
08.	21.	23.30	55	+	-	08.22 06.00
	25.	10.30	35	+	+	08.25 23.00
09.	17.	19.45	40	+	-	09.18 14.00
	28.	21.45	12	+	-	no storm
10.	04.	21.15	28	+	-	10.05 14.00
	06.	01.45	52	+	-	10.06 23.00
	10.	03.30	38	+	-	10.10 23.00
	30.	21.00	32	+	-	no storm
11.	11.	08.45	18	+	-	no storm
	30.	09.00	35	+	-	11.30 21.00
12.	11.	19.30	28	+	-	no storm
	12.	04.00	38	+	-	12.12 07.00
	17.	19.30	55	+	-	12.18 09.00

SSC-s
1989

Month	Day	CET (UT+1h)	Amplitude in H(nT)	Hx	Hy	End of storm	
01.	05.	00.00	30	+	-	01.05	10.00
		14.30	22	+	-	01.05	23.00
	07.	00.45	25	+	-	01.07	06.00
	11.	13.00	18	+	-	01.12	03.00
	20.	12.30	28	+	-	01.21	01.00
03.	02.	03.45	28	+	-	03.02	14.00
	08.	18.45	72	+	-	03.09	04.00
	13.	02.30	85	+	-	03.15	23.00
	16.	06.30	45	+	+	03.16	22.00
	19.	05.30	25	+	-	03.19	21.00
	26.	23.45	60	+	-	cont'd	
	27.	14.45	105	+	-	03.28	03.00
04.	11.	15.30	45	+	-	04.11	20.00
	13.	23.30	28	+	-	04.14	07.00
05.	05.	00.45	85	+	-	05.05	12.00
	07.	06.15	55	+	+	05.07	23.00
	13.	15.45	32	+	-	no storm	
06.	23.	14.54	108	+	-	05.25	10.00
		00.15	75	+	-	06.07	14.00
	08.	19.00	32	+	-	06.09	06.00
		20.45	80	+	-	in storm	
		18.45	52	+	-	no storm	
07.	01.	08.15	14	+	+	no storm	
		16.45	58	+	-	07.01	23.00
	17.	03.00	42	+	-	no storm	
08.	09.	19.30	40	+	-	08.10	15.00
	14.	02.45	25	+	-	08.16	06.00
	21.	15.15	32	+	-	08.22	03.00
	23.	01.45	25	+	-	08.24	04.00
	27.	14.30	65	+	-	08.28	02.00
09.	04.	01.30	55	+	-	09.04	12.00
	07.	17.45	80	+	-	09.08	03.00
	12.	13.30	25	+	-	09.12	17.00
	15.	01.45	15	+	-	09.16	07.00
	17.	08.45	14	+	+	no storm	
	18.	11.30	50	+	-	09.19	15.00
	26.	06.45	12	+	-	09.28	03.00
	30.	18.15	32	+	-	10.01	04.00
10.	18.	01.45	30	+	-	no storm	
	26.	10.30	60	+	-	10.27	02.00

SSC-s
1989

Month Day	CET (UT+1h)	Amplitude in H(nT)	Hx	Hy	End of storm	
11. 02.	01.30	38	+	-	11.02	10.00
08.	12.30	65	+	-	11.08	20.00
09.	02.00	30	+	-	11.09	22.00
11.	15.15	35	+	-	11.12	05.00
17.	10.30	65	+	-	11.18	12.00
27.	22.30	55	+	-	11.29	05.00
12. 01.	18.45	100	+	-	12.02	12.00
29.	07.45	50	+	-	12.30	02.00

1988

SI-s

Month	Day	CET (UT+1h)	Amplitude in H(nT)	Month	Day	CET (UT+1h)	Amplitude in H(nT)
01.	08.	01.45	16				
02.	14.	00.45	14				
		12.30	18				
03.	03.	02.30	14				
	08.	03.00	32				
	20.	12.30	14				
	24.	10.00	11				
	27.	14.45	25				
04.	17.	18.00	12				
	19.	10.00	25				
	23.	11.15	14				
05.	05.	11.30	8				
	16.	06.45	16				
	24.	11.30	13				
	29.	15.45	15				
06.	06.	16.45	10				
	23.	10.15	12				
	24.	11.30	22				
	25.	14.30	25				
	30.	10.00	18				
07.	16.	04.00	12				
08.	11.	23.15	18				
09.	16.	14.45	15				
10.	03.	16.00	12				
	07.	04.15	13				
	26.	09.15	14				
	31.	04.00	14				
11.	02.	06.15	12				
	09.	07.30	7				
	14.	05.30	22				
12.	12.	16.30	18				

1989

SI-s

Month	Day	CET (UT+1h)	Amplitude in H(nT)	Month	Day	CET (UT+1h)	Amplitude in H(nT)
01.	04.	09.45	18				
	31.	12.15	22				
03.	28.	18.00	38				
04.	11.	17.15	22				
	13.	00.30	12				
05.	13.	17.45	40				
	20.	16.45	22				
06.	03.	12.15	12				
		20.45	15				
	04.	12.15	20				
	06.	14.30	15				
	14.	02.00	40				
	16.	09.30	22				
	17.	23.15	8				
	22.	23.30	8				
07.	23.	15.30	36				
09.	01.	09.15	22				
	09.	10.00	38				
	28.	01.00	15				
10.	25.	02.45	28				
12.	04.	12.15	18				
	22.	02.00	25				

1988

Bays			Pl-s	Bays			Pl-s		
Month	Day	CET (UT+1h)	Amplitude in H(nT)		Month	Day	CET (UT+1h)	Amplitude in H(nT)	
01.	01.	23.00		+	02.	02.	20.30		+
	02.	00.30		+		04.	22.15		+
		21.30	60			05.	01.45	48	+
	05.	00.00	80	+			18.00	72	
		22.30	42	+			23.30	30	+
	07.	21.15	32	+		06.	23.30		+
		22.00		+			23.45	50	+
	08.	07.45		+		08.	21.00	42	+
	10.	21.00		+		11.	21.30	62	+
	11.	14.15		+		12.	19.15	55	+
	12.	20.15	55	+		15.	20.15		+
	13.	20.30		+		16.	00.30		+
	14.	06.00		+			17.45	105	+
	15.	22.30		+			20.30		+
		23.30		+		17.	22.15	68	+
	17.	22.30		+		18.	01.45		+
		23.45	40	+			02.00		+
	18.	19.30	100	+			21.30	45	+
		23.00		+		19.	19.45	32	+
		23.15		+		20.	20.30		+
		23.30		+			21.30		+
	19.	21.30		+			23.30		+
	20.	21.00		+		21.	21.45	45	
		22.00		+		22.	00.45	130	+
	21.	20.15		+			17.30	110	
		20.45		+		23.	00.30	140	
	23.	02.00		+			19.30	60	+
	24.	22.00		+		24.	20.00		+
		22.45	22	+		25.	03.15	32	+
	26.	20.30		+			20.30		+
		20.45	60	+			21.15		+
		21.30		+		27.	23.00		+
	27.	01.45		+		28.	20.15		+
		18.45		+			23.30		+
		21.30	30	+		29.	00.15		+
	28.	22.45		+			16.45		+
		23.15		+			17.30		+
	29.	22.00		+			20.00		+
		22.30		+	03.	01.	02.15		+
	30	16.30		+			18.45		+
		20.30		+			22.45		+
02.	01.	00.45		+		02.	00.15		+
		01.00		+			23.00	50	+
		23.15		+		03.	23.15		+
		23.30		+		04.	02.45	72	+

1988

Bays			P1-s		Bays			P1-s	
Month	Day	CET (UT+1h)	Amplitude H(nT)		Month	Day	CET (UT+1h)	Amplitude H(nT)	
03.	04	19.00	62	+	03.	23.	22.15		+
	05.	19.30		+			22.45		+
		19.45		+			23.15		+
		21.30		+	24.	01.00			+
		22.15		+			23.00		+
06.	01.00		52		26.	01.30			+
	03.00		52	+		01.45			+
	16.30			+		23.30	115		+
	16.45			+	27.	02.00		125	
	19.00			+		21.30			+
	20.30			+		22.30			+
06.	20.45		50	+	28.	19.00		100	
07.	01.45		22	+	29.	00.00		42	+
09.	01.00			+		18.30		100	+
10.	20.15			+	30.	22.00		80	+
	22.45			+		22.30			+
11.	20.30		40	+	31.	19.30		60	+
	21.00			+		22.15			+
12.	16.45			+	04.	01.	23.30		+
	21.45			+		02.	22.45		+
	22.00			+		03.	20.00	280	+
13.	00.30			+		04.	20.30	180	+
13.	00.45			+		05.	22.30		+
14.	00.30			+		06.	00.30	72	+
	00.45			+		08.	18.30		+
	01.00			+		09.	01.30	48	+
	02.00			+		22.45			+
	23.30		98	+	10.	22.30			+
15.	19.45			+	11.	17.30		32	+
	20.00			+	12.	00.00			+
	20.30		80	+		17.30		48	+
16.	23.30			+		20.30			+
17.	23.30			+	13.	22.00			+
18.	02.30			+		22.15			+
	02.45			+		23.00	45		+
	19.45			+	14.	15.15			+
	22.30			+		19.15			+
19.	20.15			+		23.30			+
	21.00			+	15.	02.30			+
20.	01.45			+	18.	00.00		22	+
	23.30			+	19.	18.30			+
21.	23.30			+	20.	02.15			+
22.	00.00			+		23.00			+
	21.15			+	22.	00.15		30	+
	21.45			+	23.	14.30			+

1988

Bays			P1-s	Bays			P1-s
Month	Day	CET (UT+1h)	Amplitude in H(nT)	Month	Day	CET (UT+1h)	Amplitude in H(nT)
04.	23.	21.30		05.	24.	21.15	
		23.15			25.	00.30	
	24.	16.00				19.00	
		20.45				20.15	
	25.	19.45				20.45	
	26.	22.00				22.15	
		22.30		27.	20.15		
	28.	00.30			22.45		
		00.45		28.	02.30		
		11.30		29.	21.45		
	30.	23.00		30.	21.00		
05.	01.	10.00		31.	23.30		
		22.30		06.	02.	19.15	
	02.	22.15	30		02.	19.30	
	03.	00.00				20.00	
		19.30				21.30	
	04.	02.45		03.	21.30		
		21.15	42	04.	16.45		
	06.	00.30	145	07.	23.00		
		17.00	140		23.30	30	
		21.30	65	08.	17.15		
08.	23.00		35		20.30		
10.	23.00				20.45		
12.	01.30				21.30		
	22.30			09.	21.00		
	23.15				23.00		
	23.45				23.30		
13.	00.45			10.	08.30		
14.	19.30				16.45		
15.	02.15			11.	00.15		
	17.30		+(pg?)	13.	04.00		pg
	23.15			14.	21.15		
16.	17.30	40			22.00	35	
	22.30			15.	01.30	20	
17.	20.15				22.45	25	
18.	02.15	82		16.	20.15		
20.	01.00				20.30		
21.	03.45			17.	13.30		
	21.30				20.30		
22.	00.30	45		18.	20.45		
23.	18.45				21.00		
	23.15			19.	00.45		
24.	14.30				01.15		
	20.00				02.15		
	20.30				19.15	68	

1988

Bays			Pi-s	Bays			Pi-s
Month	Day	CET (UT+1h)	Amplitude in H(nT)	Month	Day	CET (UT+1h)	Amplitude in H(nT)
06.	20.	01.30		08.	02.	20.45	
	22.	01.15			04.	21.45	
		02.15				23.30	
	23.	22.30			07.	00.30	
		22.45				02.15	
		23.15				19.45	
	26.	00.30	30(si?)			20.45	
		01.30	35			58	
		22.45			09.	13.30	
	28.	02.00			10.	01.30	
02.30			20.15				
22.30			23.15				
07.	02.	20.30		12.	22.15		
	03.	17.15		14.	00.45		
		22.00			02.15	50	
		23.15			15.	00.45	
	04.	01.15		16.	20.00	25	
		19.45			18.	00.30	
		18.45			23.30		
	07.	19.30		19.	22.30		
		20.15			23.15		
		20.30			21.	21.00	
	08.	20.15		22.	22.30		
		20.45			20.30		
		22.30			20.45		
	11.	22.30			22.30		
	12.	23.15	30		23.	20.30	
	14.	21.30			22.15		
	15.	02.30			22.30	30	
	16.	01.30		27.	00.45		
		22.00	15		02.30	22	
04.30			28.		00.30		
19.	21.15		09.	02.	22.00		
23.	20.15			03.	19.45		
27.	00.45	32			04.	21.45	
28.	21.30	35			22.15		
	21.45				05.	01.00	
30.	20.15			06.	01.00		
	22.15				10.	00.30	
	22.45				11.	00.15	
31.	00.30			01.30			
	00.15			18.15		100	
	19.00		14.	02.45			
20.15		15.		03.30	30		
08.	01.	01.30		17.	02.45		
		19.30					

1988

Bays				Pi-s		Bays				Pi-s	
Month	Day	CET (UT+1h)	Amplitude H(nT)			Month	Day	CET (UT+1h)	Amplitude H(nT)		
09.	18.	02.00	105	+		11.	02.	01.45	78	+	
	19.	21.45	70	+				19.30		+	
	21.	21.15	45	+		03.	00.45			+	
	23.	02.00		+				01.45		+	
	24.	21.45		+				20.00	85	+	
		23.00				04.	18.45			+	
	25.	03.00	40	+				19.30	35	+	
		22.30	40	+		05.	00.45			+	
	26.	21.45		+				02.00		+	
	26.	22.30		+		06.	05.15		42		
	27.	19.30		+				20.45		+	
10.	01.	20.45		+		07.	22.45		45	+	
	02.	00.30		+		08.	19.45		85	+	
	03.	20.45		+		09.	00.30			+	
	05.	18.45			pg			22.30	28	+	
	07.	22.00	22	+		10.	03.15		25	+	
	08.	01.45		+		11.	00.45			+	
		02.30		+				01.15		+	
	09.	03.30		+				22.45		+	
	10.	00.30		+		12.	10.00			pg	
	12.	20.30		+		13.	00.00		42		
	13.	03.15		+		14.	03.30			+	
	14.	23.30		+		15.	02.00			+	
		23.45		+				22.30		+	
	15.	00.30		+				23.15		+	
	16.	18.30	38			16.	21.45			+	
	17.	21.00		+		17.	22.45			+	
	18.	11.00	58			18.	20.30		38		
		20.30		+		20.	22.30			+	
		21.15		+				23.15		+	
		22.15		+		21.	00.15			+	
	19.	19.45		+				01.30		+	
	20.	17.00	55			22.	23.45			+	
		19.30		+		23.	20.30			pg	
		23.45		+		25.	02.00			+	
	21.	00.00		+		26.	20.30		42	+	
		21.30		+		27.	18.15		42		
		22.15	28	+				22.15		+	
		23.15		+				22.30		+	
	23.	01.00		+		28.	14.00		38		
	26.	22.30		+				19.30		+	
	27.	18.45	42					21.45		+	
	28.	22.00		+		29.	19.45		22	+	
		22.45		+				23.30		+	
11.	01.	17.30	23	+		30.	00.15			+	

1988

Bays			Pl-s	Bays			Pl-s	
Month	Day	CET (UT+1h)	Amplitude in H(nT)		Month	Day	CET (UT+1h)	Amplitude in H(nT)
12.	02.	23.15						+
		23.45						+
	03.	18.15	90					+
		23.00						+
	04.	03.30	32					+
		16.45	25					+
		22.45						+
		23.15						+
	05.	23.00						+
	08.	04.15						+
		23.15						+
	13.	20.30	42					+
	16.	02.30	25					+
		21.45	62					+
	17.	20.30	160					+
	18.	18.45	50					+
		23.15						+
		23.30						+
	19.	20.00	72					+
	20.	22.15						+
	22.	02.00						+
		09.30	70					(ssc?)
	23.	23.30						+
	24.	20.30						+
	26.	00.15						+
		23.30						+
	28.	20.30						+
	31	23.30						+

1989

Bays			P1-s		Bays			P1-s			
Month	Day	CET (UT+1h)	Amplitude in H(nT)		Month	Day	CET (UT+1h)	Amplitude in H(nT)			
01.	01.	00.45	42	+	02.	09.	21.15		+		
		21.00	42	+			21.30	65	+		
		21.30		+			10.	01.30	35	+	
	02.	20.00		+		11.	19.30		+		
		03.	19.30				+	19.45		+	
			20.30				+	12.	23.30		+
	21.30		+	13.		02.00			+		
	07.	18.30	28				14.	16.15	52(s1?)	+	
		21.30		+		15.	03.30		+		
	09.	20.45		+			20.00	70	+		
	11.	22.30	135	+		19.	23.30		+		
	14.	23.15		+		20.	18.30	65			
	15.	22.00	115	+		22.	21.30	30			
	16.	22.30		+			22.15			+	
	17.	00.45		+		23.	22.45		+		
		02.00		+			23.00			+	
	18.	20.45	65	+		24.	00.15		+		
		01.30		+			21.30			+	
		22.00		+			27.	01.15		+	
	20.	00.30		+		02.00			+		
		01.30		+		28.	22.15		+		
	22.	02.15	85	+			03.	01.15		+	
		13.45	95			02.00			+		
	23.	22.45		+		20.00	42	+			
		23.15		+		06.	02.45	25	+		
	24.	23.00		+			23.15		+		
		25.	23.15			+	07.	23.15	22	+	
	21.15			+		09.		22.15		+	
	26.	21.45		+		10.	02.00		+		
		22.30		+			11.	22.00		+	
	27.	23.15		+		12.	00.15		+		
18.00		38	+	02.00			+				
28.	02.45		+	14.	20.00	220	+				
28.	19.15	65	+		17.	21.00	40	+			
29.	02.45		+	20.	21.15		+				
	02.30		+		01.15		+				
31.	02.45	30	+	21.	01.15		+				
	23.30	85	+		23.30	30	+				
02.	01.	19.45	115		22.	02.00		+			
		23.15		+		21.30	80	+			
	03.	04.00		pg	23.30	105	+				
		23.45		+	24.	00.00		+			
	05.	23.45		+		25.	18.45	65	+		
	08.	02.30		+	22.30			+			
	09.	00.45		+	26.	00.15		+			

1989

Bays			Pi-s	Bays			Pi-s		
Month	Day	CET (UT+1h)	Amplitude in H(nT)		Month	Day	CET (UT+1h)	Amplitude in H(nT)	
03.	26.	22.45		+	04.	28.	00.15		+
	28.	19.00		+		28.	21.45		+
	29.	01.45	65	+		29.	20.30		+
		19.15	95	+			21.00		+
	30.	19.00	90	+		30.	07.00		pg
	31.	00.00	125	+			13.15		pg
04.	01.	19.45		+	05.	02.	20.15	38	+
	02.	18.00	70	+		03.	21.00		+
	03.	21.00	32	+		04.	02.45		+
	04.	00.15	70	+		06.	22.15	50	+
		19.00		+		07.	19.30	80	+
		19.30	90	+			21.45	100	+
		22.30	85	+		08.	22.15		+
	05.	02.00	90			10.	23.30		+
		20.45	55	+		11.	22.15		+
	06.	21.00	35	+		13.	23.00		+
	07.	22.30		+		14.	21.45		+
	08.	19.45		+			22.45		+
	09.	01.45	35	+		15.	00.15		+
		20.15	90	+		16.	16.15		+
	10.	15.15		+		17.	20.45		+
		20.30		+			21.00		+
	10.	22.45		+		18.	23.15		+
	13.	19.30	35	+		19.	21.15		+
	14.	01.00		+		20.	00.15		+
		23.45	75	+		22.	02.00		+
	16.	22.45	65	+			22.00	40	+
	17.	01.00	60	+		24.	17.45	100	+
		22.00	38	+			23.00	68	+
	18.	03.45	40	+		26.	23.30		+
	20.	01.15		+		27.	00.15		+
		10.00		+			22.30		+
		22.30		+		29.	01.30	30	+
	22.	21.15		+			20.30		+
	23.	20.15		+		30.	00.15		+
	24.	02.00		+		31.	00.30		+
	25.	00.00	14	+			22.30		+
		19.00	95	+			23.30		+
		22.00		+	06.	01.	00.30		+
	26.	00.00		+			23.00		+
		01.15		+		03.	16.45		+
		20.00	120	+		04.	01.00	40	+
		22.00	115	+		05.	21.30		+
	27.	00.30	75	+		09.	16.30		+
	28.	00.00		+			23.45		+

1989

Bays			Pi-s	Bays			Pi-s
Month	Day	CET (UT+1h)	Amplitude in H(nT)	Month	Day	CET (UT+1h)	Amplitude in H(nT)
06.	11.	20.00		07.	23.	17.45	
		22.15	+		25.	17.45	+
	12.	21.45	+			21.00	+
	14.	21.30	45			23.15	+
		22.15	+		26.	00.15	+
		22.45	+		28.	23.15	+
	15.	19.15	62		29.	21.45	+
	18.	22.15	+	08.	03.	18.15	+
	19.	20.00	+			19.15	+
		23.45	+			23.30	+
	20.	00.15	+		05.	23.00	+
		01.15	+		06.	00.00	+
		02.00	+			19.45	+
	22.	19.30	+		06.	20.15	+
	23.	02.30	pg		07.	21.00	+
		22.00	+			21.45	+
	26.	19.30	+		08.	22.00	+
	27.	22.30	+		09.	00.30	+
	28.	02.00	+		10.	21.45	55
	29.	20.30	+		11.	02.30	60
		21.15	+		12.	01.30	+
	30.	01.15	+			22.00	+
07.	04.	15.45	+			22.45	+
	05.	02.45	+		14.	22.15	70
		21.00	+		15.	02.30	95
		22.15	+		16.	21.15	30
	08.	20.15	+			22.30	+
	09.	15.45	+			23.00	+
		22.15	+		17.	15.30	55
		23.00	+		18.	00.30	80
	13.	00.30	+			21.30	+
		01.00	+		19.	00.30	+
		22.00	+		21.	22.30	85
	14.	19.30	+			23.00	+
		21.45	+		22.	01.30	65
	15.	21.00	+		23.	21.30	72
		22.30	+			14.15	+
	17.	19.15	+			14.30	+
		23.30	+		29.	19.45	65
	18.	03.00	30		30	00.00	+
	19.	01.45	+			17.45	42
	21.	00.15	+			21.30	25
		21.45	+		31.	17.30	+
	23.	01.00	+			22.30	+
		01.30	+	09.	02.	03.00	+

1989

Bays			P1-s	Bays			P1-s
Month	Day	CET (UT+1h)	Amplitude in H(nT)	Month	Day	CET (UT+1h)	Amplitude in H(nT)
09.	03.	23.15		10.	09.	00.45	
	04.	22.45			10.	00.30	
	09.	00.15			11.	00.45	
		21.30	40			01.45	
		21.45				22.00	
	11.	13.15				22.30	
		23.00			12.	04.15	
	13.	22.15	35			18.45	
	14.	12.00	28		17.	20.30	
	15.	21.15	110		19.	00.00	
		23.30	65			01.00	80
	16.	00.45				13.30	60
	18.	01.30	45			20.30	
	20.	23.00			20.	20.00	450
	22.	00.15				22.45	190
		00.30			21.	19.15	
		04.30			22.	00.15	
		18.30	60			03.30	
		22.15				18.45	105
		23.15			22.	19.30	125
	24.	00.00			23.	20.45	
		01.00			25.	23.45	
		21.00			26.	05.00	32
		21.45				23.30	
		22.15			27.	19.45	55
	25.	18.15				21.45	
		20.00				23.15	
		21.15			28.	00.30	
		22.30				18.30	
	26.	20.30	80		29.	02.00	
		22.30				02.30	
	28.	18.45	35			20.00	50
	29.	23.30			31.	20.00	
	30.	01.30		11.	01.	00.15	
10.	02.	22.15				22.30	
		23.45			02.	23.30	
	03.	19.45	45(s1?)			23.45	
	04.	22.15			05.	00.30	50
		22.45				21.30	35
	05.	00.15			08.	20.00	
		21.45			11.	00.45	
	06.	11.00	35		13.	23.00	70
	07.	00.30	30		14.	04.15	25
		22.00				21.00	
	08.	01.00				22.45	

1989

Bays			Pl-s	Bays			Pl-s	
Month	Day	CET (UT+1h)	Amplitude in H(nT)		Month	Day	CET (UT+1h)	Amplitude in H(nT)
10.	14.	23.00		+				
	15.	02.00		+				
	17.	01.15	35	+				
	19.	19.45		+				
11.	19.	23.30		+				
	21.	01.45	50	+				
		12.00	45					
	23.	02.15		+				
	24.	20.45		+				
	26.	23.15		+				
	29.	21.15		+				
	30.	00.15		+				
		19.30		+				
		23.30		+				
12.	03.	20.45		+				
	04.	01.45		+				
		02.45		+				
		21.30		+				
		22.30	55	+				
	07.	21.45		+				
	08.	23.15		+				
	10.	21.00		+				
	11.	21.00		+				
	14.	16.15		+				
		17.00	35	+				
		21.30	32	+				
	15.	01.45		+				
	16.	21.30	35	+				
	17.	22.00		+				
	18.	02.30		+				
		22.15		+				
		23.30		+				
	20.	21.30		+				
	21.	02.00	38	+				
	24.	17.30		+				
		20.30	60	+				
		23.30	45	+				
	25.	21.45		+				
	26.	20.30	90					
	27.	09.00		pg				
		20.30		+				
	29.	21.30	300	+				
	30.	00.00	120	+				
		23.30		+				

6.
Activity indices for the micropulsations
(P1 to P12)
1988. January-December

Day	January	February	March	April
1.		115542434521	115545424521	114554552111
2.	115445555554	115455543331	115443344343	115444554331
3.	115555552224	113455533211	11555543325	112454452235
4.	114355554413	114354543241	115553425545	115543255354
5.	115454554454	115444324223	113453454422	115552441143
6.	115455555355	113455522111	115434555224	115543244354
7.	113455541134	115355542111	115445555324	115444444225
8.	115444123215	115444554111	115552143135	114345445311
9.	112455531111	113355543121	113554334225	115553144522
10.	112335551112	115554312321	113355454124	
11.	115552221124	115554541143	113453554321	
12.	115355542143	115545544124	113455543224	
13.	112455522111	115544431245	114554444111	112454444313
14.	115444544355	115444453423	115552544143	113255354221
15.	115433555554	115554131344	113555332245	115444534241
16.	113333554111	115554443124	111355534124	115455232351
17.	113235551111	115544244122	114454534332	111344545144
18.	113555441121	115555344114	113344555311	115454242322
19.	115554222114	115245521111	113435555511	114443444233
20.	113554454112	113455535231	115344455322	114433355523
21.	113555442111	115552454555	115334552331	114554325411
22.	113445541221	115444555353	115445521351	115324555411
23.	115234541121	115553553223	115432555331	115453455124
24.	115235543311	115455551121		113434455221
25.	115532455221	115555542112		115343555312
26.		115444555111	115453455153	113432455522
27.		115534555111	115554434232	115522434534
28.		115444455311	115554343121	115532255513
29.		115445555211	115553333135	113444455322
30.	115344444311		115552444123	115444425435
31.	115443224121		115542541114	

1988

Day	May	June	July	August
1.	112234544541	112433545541	113454445125	112554345513
2.	112444545321	112234555551	115552555345	111444255521
3.	113433335521	112123554551	114454535411	115423455532
4.	114454445114	113422555423	112145555511	113334555541
5.	114533444534	114421445555	111234554424	111444434333
6.	114443345355	114543242423	112433345445	115544455533
7.	115551135223	113532355521	113432555511	112443455554
8.	113534444224	113454345531	112443455522	111445442355
9.	115454233212	115443252534	112444535411	111534445453
10.	115554234221	112454552534	112523455521	115544355225
11.	112554455335	111155455311	115431335535	112554342424
12.	112445455521		111545355335	114553453155
13.	111345553511	115434325151	112455335221	112454345325
14.	111424555331	113434344545	112554444522	112452455433
15.	111432553453	114434455321	114554455422	113432455455
16.	112432445542	112444444511	113555334225	112433455523
17.	113343454543	113422555521	111453555225	112454454513
18.	112543554321	112553355522	113445555112	111444355532
19.	112444554211	113454345334	112245455444	113554255522
20.	111453555522	113553552311	112223555421	114534353524
21.	114553445222	113445454341	115532255545	111333555521
22.	111552455312	113543245445	112332455524	113445355245
23.	113454443422	112533555514	113542555424	113444555324
24.	112454535521	113442455535	111433555511	112555432233
25.	112343555541	115533145245	112554344321	115544344145
26.	112334545521	111443345513	112552355524	113544542345
27.	114324555542	112432554411	115542255224	111355555112
28.	115434454341	113433545512	113554354232	115255255222
29.	113534533354	115433355454	111554455512	111554433523
30.	113452344455	112454355235	112255555323	111255555211
31.	113543323542		113554355521	112542355422

Day	September	October	November	December
1.	115454245155		112324555333	111335354324
2.	112454552232		114443455544	111355554145
3.	112554554212		112445545544	111345554525
4.	111335554522		111255552111	111345555122
5.	111234555521		111454555111	113334555211
6.	112323555521	115433554355	113355445521	112335554111
7.	111444454324	111225555523	115344555211	111334553311
8.	112343455531	111345555211	111435455422	111453455521
9.	111444554111	112425544432	111334555412	111255455141
10.	111553455542	114442345355	111244555412	112553335523
11.	115532345455	111335544421	112343555425	113444555345
12.	111455554318	111334555531	111354455545	115554434355
13.	111355553212	112443445521	112354544322	111454555545
14.	111444455324	112244555421	111455442114	112454355233
15.	111435455111	112344455523	112455544225	111445455541
16.	112355542112	112453455424	111345555544	111235545545
17.	112445353454	113444334435	111355355445	114355435555
18.	114453355454	112345555523	111235555223	111344455255
19.	112554433145	111245455525	111145555111	112343555555
20.	113553333223	111344555214	111334555222	111145553424
21.	112554344325	111345555223	111335555422	112445554344
22.	113444445354	112245554211	111434555533	113454454335
23.	112455245343	111455555211	112134555241	111224554311
24.	111345545412	111355442325	112445554422	113355532521
25.	111245554411	111355454221	113434555552	115533355544
26.	111345553424	111345355352	112445455535	112534455355
27.	111355455521	112455455521	111225555424	111255555424
28.	111354353134	112455435221	111334555543	112445555522
29.		111123555521	111444555521	115533544443
30.		112134555553	1124445554245	115523555534
31.		113543454355		115553554242

Activity indices for the micropulsations
(P1 to P12)
1989. January-December

Day	January	February	March	April
1.	11425555511	115313454555	115444555543	112452455255
2.	115544555211	115334554555	115152455555	111454555445
3.	115534555132	115424354555	115342555554	113255453544
4.	115544545325	114534544555	114253555552	115554255455
5.	115323555555	114433555455	115253555555	111355555245
6.	115544555542	115444555554	115254555544	113355555442
7.	115535454443	114453555355	112153555552	113354555335
8.	115522455455	115533455545	114243555354	112255555544
9.		115344555444	115233555555	112244555541
10.		115354555551	113154555554	112255555321
11.		112145555542	115254455344	115335455544
12.	114422555533	115454545554	114252555555	113354555555
13.	112424595541	115432555554	111111134243	112443455555
14.	114323555543	115553555532	115331245555	112354255555
15.	113224555553	115334555443	115444555455	111133555554
16.	115522255554	115233555555	115233555455	111354455554
17.	112325555553	114334555544	114233555555	115145555541
18.	113223555541	115334555553	115254555444	115255555552
19.	113534555232	115433555553	113352555555	112355455244
20.	115424555553	115352544255	112134455555	111335455552
21.	115334355555	115254455235	115245455555	115253555542
22.	112544553455	112454555444	115355455553	112254355554
23.	113544453254	115354755532	115434555555	115452455554
24.	112455555553	115354555531	112354555251	115455255551
25.	115455555122	115354555321	112255455554	115342255555
26.	115555554412	115155555122	115454555423	111423455555
27.	115344551553	114255555552	115333455555	113244555555
28.	113453555552	115354555352	114444355555	114543355555
29.	114444554343		111333555455	115553355355
30.	113345455343		113454455255	112255555245
31.	115544455332		112335455555	

1989

Day	May	June	July	August
1.	115553355544	114452455552	112342255552	111442555554
2.	113455355542	114552355553	111333455551	112551555552
3.	115354455433	112552255545	113433555541	113253555554
4.	112255555451	112255445524	115124555512	112252555543
5.	112344455554	114453255531	113352455554	111333555551
6.	114444555544	114455555533	111552355544	111454555551
7.	112353455552	115333555555	111453555544	111451445542
8.	113342555553	113453555555	111223555542	112451355555
9.	113433555545	113224555555	113442555555	112252355554
10.	115254555541		111242555555	111223555555
11.	115354555552		111253555551	111223555555
12.	113455345553	111255555553	113233555544	111242555542
13.	114455455543	111355554554	111352254555	111343555542
14.	115443455555	111423355555	111142455553	111332555555
15.	113453455553	112134355555	112454554554	111141555554
16.	115453455551	111414555514	111342555551	111254555545
17.	113354455552	111255455524	111451255554	111153555525
18.	113353255553	112355455555	111132555553	111252455555
19.			111154455522	111252555545
20.	114234455352		113352355552	111152455555
21.	115451455553	111555355443	112452554552	111122355555
22.	113551445553	111454355543	111452555553	111251455554
23.	115452455443	112455255553	111352355555	114231355555
24.	115333455555	111553255551	111453455454	111351255554
25.	111334555555	112455255554	111553455524	111251155554
26.	112453555555	113552455555	111543455555	111141355554
27.	112352455551	112533455524	111341555555	111251355555
28.	114554455543	111355455541	111561555524	111142555555
29.	111453355533	111233255551	111551455531	111222555555
30.	111455555451	111143255541	111344555511	111241555551
31.	112454355523		111244555522	111152455554

1989

Day	September	October	November	December
1.	11122155553	111242555542	111144555544	112342555555
2.	11145135553	113152555555	115114554555	111121255555
3.	111151355533	111131555554	112141355555	111133355555
4.	111132455555	111144355554	112133555555	111134355554
5.	112254355545	111345555552	111134555555	111124555552
6.	111253455555	111243355553	111124555535	111134555551
7.	111144455555	111144555551	112142555555	111342555552
8.	112133555535	111442555554	111331555555	111343555554
9.	111153555551	111231555555	111131555555	111155555541
10.	111243455552	111143555555	111123555555	111152455551
11.	111255555521	111135555552	115522555555	111342355554
12.	113332515555	111141555554	111224555555	111431255551
13.	112433555553	111341555553	111122255555	111341355552
14.	111345555522	114232455551	112542355553	111222455533
15.	111332454555	111243455553	111431555555	111351255554
16.	111222455554	112223455552	111151555552	111131455552
17.	111232555554	112242555553	111233555554	111142555533
18.	111232555555	111123555553	111242555555	111153555542
19.	111122555555	111122555555	111121455553	111244255523
20.	112241555541	111133455555	111143555541	111143555542
21.	111152455553	111141355555	111452555532	111152455543
22.	111134355552	111123555555	111152555531	112212455555
23.	111254455532	111144555555	111151555551	112123555555
24.	111234555523	111353355555	111254455552	111331455555
25.	112135455544	111142555555	111154555511	111253555555
26.	112132255554	111252455555	111153455555	112343455554
27.	112231555554	111242555552	114131455555	111321455555
28.	111151554554	111152455543	111211355555	111152555555
29.	112242355555	111254555543	111221255555	112122355555
30.	111151455554	113441455555	111132455554	111111355555
31.		111151455554		111121555555