VALUES OF THE MAGNETIC ELEMENTS AT THE OB-
SERVATORIES OF THE UNITED STATES COAST
AND GEODETIC SURVEY AT THE TIME OF
THE SOLAR ECLIPSE OF MAY 29, 1919.

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In order to supply data for a comparison of the magnetic condition of the Earth within and outside the eclipse belt at the time of the solar eclipse of May 29, 1919, values of the declination, horizontal intensity and vertical intensity have been derived from the magnetograms of the five magnetic observatories of the United States Coast and Geodetic Survey for every five minutes of the period from 10^h to 16^h 30^m Greenwich mean time. In reading the ordinates a graphical integration was made, so that a tabular value is approximately the average value for the 5-minute period of which the tabular time is in the middle.

Tables are given showing the diurnal variation of the magnetic elements for selected quiet days: May 29 to June 7 for Porto Rico, Cheltenham and Sitka; May 28-30, June 1-7 for Tucson; May 27-31 for declination and vertical intensity, and May 8, 16, 29, 30, 31 for horizontal intensity for Honolulu. A plus sign indicates eastward deflection of the north end of the needle, or increasing intensity.

It should be noted that inasmuch as our monthly tabulations of hourly values are based on the average ordinate for hourly periods beginning at midnight of the standard meridian time which falls nearest to the meridian of the observatory, the tabular values refer approximately to the middle of these hourly periods, that is, the first value in the tables applies to 0^h 30^m, the second to 1^h 30^m and so on.

TABLE I.—*Location of the observatories and mean values of the magnetic elements, May, 1919.*

Observatory	State	Latitude (North)	Longitude (West)	<i>Approximate magnetic elements</i>					
				D			H	Z	
		° ' "	° ' "	° ' "			γ	γ	
Vieques	Porto Rico..	18 08.8	65 26.9	3 39 W			27900	34820	
Cheltenham..	Maryland...	38 44.0	76 50.5	6 14 W			19170	55400	
Tucson.....	Arizona.....	32 14.8	110 50.1	13 48 E			26930	45660	
Sitka.....	Alaska.....	57 03.0	135 20.1	30 26 E			15580	55790	
Honolulu....	Hawaii.....	21 19.2	158 03.8	9 50 E			28860	23750	

TABLE 2.—*Magnetograph values of declination on May 29, 1919.*

G. M. T.	Porto Rico	Cheltenham	Tucson	Sitka	Honolulu
^h ^m	^o [']	^o [']	^o [']	^o [']	^o [']
10 00	3 37.6 W	6 10.8 W	13 47.7 E	30 23.0 E	9 49.7 E
05	37.4	10.6	47.8	23.1	49.7
10	37.2	10.5	47.8	23.1	49.7
15	37.1	10.3	47.8	23.2	49.8
20	37.0	10.1	47.9	23.3	49.8
25	36.8	09.8	47.9	23.4	49.8
30	36.6	09.7	48.0	23.5	49.9
35	36.5	09.6	48.0	23.6	49.9
40	36.3	09.5	48.0	23.6	49.9
45	36.2	09.4	48.1	23.6	49.9
50	36.2	09.4	48.1	23.6	49.9
55	36.1	09.4	48.2	23.6	49.9
11 00	36.1	09.3	48.2	23.7	50.0
05	35.9	08.9	48.3	23.8	50.0
10	35.7	08.8	48.3	23.9	50.0
15	35.5	08.6	48.4	24.0	50.0
20	35.4	08.4	48.4	24.0	50.1
25	35.3	08.2	48.5	24.1	50.1
30	35.2	08.0	48.5	24.2	50.1
35	35.2	07.9	48.6	24.5	50.1
40	35.2	07.6	48.6	24.3	50.1
45	35.2	07.6	48.7	24.5	50.2
50	35.2	07.6	48.7	24.8	50.2
55	35.2	07.6	48.7	24.8	50.2
12 00	35.2	07.6	48.8	24.7	50.3
05	35.2	07.4	48.8	24.7	50.3
10	35.2	07.2	48.9	24.9	50.3
15	35.3	06.9	48.9	25.0	50.3
20	35.3	06.7	48.9	25.2	50.3
25	35.3	06.7	48.9	24.7	50.3
30	35.4	06.7	49.0	24.7	50.2
35	35.5	06.6	49.3	25.0	50.3
40	35.7	06.6	49.6	25.1	50.3
45	35.9	06.7	49.7	25.7	50.4
50	36.0	07.1	49.8	26.0	50.4
55	36.1	07.3	49.9	26.3	50.4
13 00	36.2	07.5	50.1	26.5	50.4
05	36.3	07.2	50.3	27.2	50.5
10	36.5	07.5	...	28.1	50.6
15	36.7	07.9	50.5	28.7	50.6
20	36.7	08.2	50.5	28.3	50.6
25	36.8	07.7	50.9	28.4	50.6
30	37.0	07.9	51.0	28.8	50.6
35	37.1	08.1	51.1	29.1	50.7
40	37.2	08.2	51.3	29.2	50.7
45	37.4	08.5	51.5	29.6	50.8
50	37.6	08.7	51.7	29.6	50.8
55	37.7	08.9	51.8	29.8	50.8
14 00	37.8	09.1	51.9	30.0	50.8
05	38.0	09.1	51.9	30.1	50.9
10	38.2	09.3	52.0	30.1	50.9
15	38.4	10.0	51.9	30.1	51.0
20	38.5	10.2	52.0	30.1	51.0
25	38.7	10.1	52.2	30.2	51.0
30	38.9	10.5	52.1	30.3	51.0
35	39.1	10.7	52.1	30.4	51.0
40	39.2	10.9	52.1	30.5	51.1
45	39.3	11.2	52.3	30.8	51.2
50	39.4	11.4	52.3	31.0	51.2
55	39.5	11.7	52.1	30.4	51.2

TABLE 2.—*Magnetograph values of declination on May 29, 1919—Continued.*

G. M. T.	Porto Rico	Cheltenham	Tucson	Sitka	Honolulu
^h ^m	[°] [']	[°] [']	[°] [']	[°] [']	[°] [']
15 00	3 39.7 W	6 12.0 W	13 51.9 E	30 30.6 E	9 51.2 E
05	39.9	12.5	51.9	30.8	51.3
10	40.0	12.9	51.9	31.1	51.3
15	40.1	13.4	51.9	31.4	51.3
20	40.2	13.5	51.9	31.8	51.3
25	40.3	14.1	51.8	32.2	51.4
30	40.3	14.5	51.7	32.6	51.5
35	40.4	14.9	51.5	33.0	51.6
40	40.4	15.2	51.3	33.0	51.7
45	40.5	15.3	51.1	33.1	51.8
50	40.6	15.5	50.9	33.2	52.0
55	40.7	15.7	50.8	33.1	52.2
16 00	40.9	16.1	50.7	33.2	52.3
05	41.0	16.5	50.5	33.2	52.4
10	41.1	16.9	50.3	33.2	52.5
15	41.1	17.5	50.0	33.2	52.6
20	41.2	18.3	49.8	33.6	52.9
25	41.2	18.6	49.5	34.1	53.2
30	41.3	19.0	49.4	34.1	53.3

TABLE 3.—*Diurnal variation of magnetic declination for May-June, 1919.*

Hour Std. Mer.	Porto Rico 60°	Cheltenham 75°	Tucson 105°	Sitka 135°	Honolulu 165°
^h ^h	[']	[']	[']	[']	[']
0-1	-0.1	0.0	+0.2	-1.1	0.0
1-2	0.0	+0.7	+0.2	-1.2	0.0
2-3	+0.3	+1.0	+0.4	-0.3	+0.3
3-4	+0.6	+1.4	+0.7	+0.9	+0.7
4-5	+0.9	+2.4	+1.4	+3.0	+1.3
5-6	+1.5	+4.7	+2.3	+5.4	+3.1
6-7	+3.1	+6.4	+4.1	+7.4	+4.1
7-8	+4.0	+7.1	+5.2	+9.4	+3.3
8-9	+3.5	+5.6	+4.7	+9.3	+1.5
9-10	+2.0	+3.7	+2.4	+6.9	-0.5
10-11	+0.4	-0.3	-0.6	+2.8	-2.0
11-12	-0.8	-3.6	-3.3	-0.9	-2.8
12-13	-1.7	-6.0	-4.0	-3.2	-2.6
13-14	-2.5	-6.2	-4.0	-5.2	-2.2
14-15	-2.5	-5.8	-3.3	-6.5	-1.2
15-16	-2.2	-4.3	-2.5	-7.2	-0.4
16-17	-1.4	-2.5	-1.2	-6.3	-0.2
17-18	-0.7	-1.3	-0.6	-5.1	-0.2
18-19	-1.0	-0.7	-0.4	-2.6	-0.2
19-20	-1.0	-0.8	-0.7	-1.0	-0.3
20-21	-0.9	-0.6	-0.7	-0.4	-0.5
21-22	-0.7	-0.5	-0.1	-1.0	-0.5
22-23	-0.4	-0.6	-0.2	-1.8	-0.4
23-24	-0.2	+0.1	-0.1	-1.1	-0.2

TABLE 4.—*Magnetograph values of horizontal intensity on May 29, 1919.*

G. M. T.	Porto Rico	Cheltenham	Tucson	Sitka	Honolulu
^h ^m	^γ	^γ	^γ	^γ	^γ
10 00	27910	19174	26935	15591	28870
05	910	174	935	591	870
10	910	174	935	591	870
15	910	174	935	591	870
20	910	174	935	591	869
25	910	175	935	591	870
30	910	175	935	591	870
35	910	176	936	591	870
40	909	176	936	591	869
45	909	176	936	591	869
50	909	176	936	591	869
55	909	176	936	591	869
11 00	909	176	936	591	869
05	909	176	936	591	869
10	909	177	937	591	870
15	909	177	937	591	869
20	909	176	937	591	869
25	909	176	937	591	870
30	909	176	938	592	870
35	910	176	939	594	871
40	909	176	940	594	871
45	909	176	940	594	871
50	910	175	940	594	871
55	909	174	940	594	871
12 00	909	174	941	595	871
05	909	173	941	595	871
10	909	172	941	596	871
15	909	172	941	595	871
20	909	171	941	595	871
25	909	169	942	596	871
30	910	166	942	595	871
35	910	166	942	595	871
40	911	164	943	593	870
45	911	164	943	593	870
50	911	163	943	594	870
55	911	162	943	594	870
13 00	912	161	943	593	871
05	913	161	943	593	871
10	914	162		595	871
15	915	163	944	599	871
20	915	160	944	601	871
25	916	159	943	597	871
30	916	160	944	598	871
35	916	160	944	599	871
40	916	160	943	598	872
45	916	159	943	599	871
50	915	159	942	598	871
55	914	159	943	599	871
14 00	915	159	943	599	871
05	915	159	942	599	871
10	915	157	941	598	871
15	915	156	941	598	871
20	916	157	941	598	871
25	916	157	940	598	872
30	917	157	940	596	872
35	918	156	940	594	871
40	919	156	939	596	872
45	920	156	939	595	872
50	921	156	938	594	873
55	921	155	938	592	873

TABLE 4.—*Magnetograph values of horizontal intensity, May 29, 1919.*—Cont'd.

G. M. T.	Porto Rico	Cheltenham	Tucson	Sitka	Honolulu
^h ^m	^γ	^γ	^γ	^γ	^γ
15 00	27921	19154	26937	15590	28873
05	921	154	937	588	873
10	921	153	936	587	872
15	922	154	935	587	872
20	922	154	935	587	872
25	922	154	934	587	872
30	922	156	934	587	872
35	922	157	933	587	872
40	922	157	932	586	872
45	922	157	932	584	872
50	922	157	931	580	873
55	922	157	931	578	873
16 00	921	157	931	578	873
05	920	158	931	577	874
10	919	159	932	575	874
15	918	160	934	576	874
20	918	161	936	578	875
25	918	164	937	580	875
30	918	166	938	581	875

TABLE 5.—*Diurnal variation of horizontal intensity for May-June, 1919.*

Hour Std. Mer.	Porto Rico 60°	Cheltenham 75°	Tucson 105°	Sitka 135°	Honolulu 165°
^h ^h	^γ	^γ	^γ	^γ	^γ
0-1	-7	-2	-5	+5	-5
1-2	-9	-2	-4	+6	-4
2-3	-10	-2	-2	+9	-4
3-4	-10	-2	0	+13	-4
4-5	-9	-1	+2	+15	-2
5-6	-8	+1	+6	+15	+1
6-7	-4	-2	+6	+14	+3
7-8	+2	-13	+2	+11	+5
8-9	+8	-24	+1	+3	+6
9-10	+14	-32	+4	-5	+7
10-11	+16	-23	+6	-12	+9
11-12	+20	-7	+8	-16	+14
12-13	+19	+8	+9	-18	+17
13-14	+15	+19	+8	-18	+15
14-15	-9	+23	+3	-12	+9
15-16	0	+21	-2	-11	+3
16-17	-6	+16	-7	-8	-6
17-18	-7	+7	-8	0	-12
18-19	-6	+5	-6	-2	-12
19-20	-5	+2	-3	0	-12
20-21	-6	+2	-6	0	-10
21-22	-5	+4	-5	+2	-9
22-23	-5	+2	-5	+5	-6
23-24	-6	+1	-4	+5	-2

TABLE 6.—*Magnetograph values of vertical intensity on May 29, 1919.*

G. M. T.	Porto Rico	Cheltenham	Tucson	Sitka	Honolulu
^h ^m	^γ	^γ	^γ	^γ	^γ
10 00	34829	55414	45663	55805	23742
05	830	414	663	804	743
10	829	413	663	804	743
15	829	413	663	803	743
20	828	413	663	803	743
25	828	413	663	802	743
30	827	413	663	803	744
35	827	414	663	802	744
40	827	414	663	802	744
45	827	414	663	802	744
50	827	414	663	802	745
55	827	414	663	802	745
11 00	827	414	663	802	745
05	827	414	663	801	745
10	827	414	663	801	746
15	826	414	663	801	746
20	826	413	663	801	746
25	826	413	663	801	746
30	827	412	663	801	746
35	826	413	664	801	746
40	826	413	664	802	746
45	826	413	664	802	746
50	827	413	664	802	746
55	827	413	664	803	746
12 00	826	412	664	804	746
05	826	411	664	803	746
10	826	411	664	804	746
15	827	410	664	803	746
20	827	410	665	803	746
25	826	410	665	804	746
30	825	410	665	804	746
35	824	410	665	804	746
40	824	410	665	803	746
45	824	410	665	802	746
50	825	409	665	802	746
55	825	408	666	802	746
13 00	825	408	666	802	746
05	824	407	667	801	747
10	825	406		801	747
15	826	406	668	801	747
20	826	406	668	802	747
25	824	405	669	804	746
30	825	406	669	804	746
35	825	405	669	803	747
40	825	405	668	803	747
45	826	405	668	802	746
50	826	404	668	802	746
55	826	405	667	802	746
14 00	826	405	667	803	747
05	827	404	667	802	747
10	827	404	667	802	747
15	827	403	667	802	746
20	829	403	666	801	747
25	829	403	666	801	747
30	830	403	665	800	747
35	830	404	665	800	746
40	830	404	665	800	746
45	830	404	665	800	747
50	830	403	664	800	747
55	831	403	663	799	747

TABLE 6.—*Magnetograph values of vertical intensity on May 29, 1919.*—Continued.

G. M. T.	Porto Rico	Cheltenham	Tucson	Sitka	Honolulu
^h ^m	^γ	^γ	^γ	^γ	^γ
15 00	34830	55402	45663	55798	23747
05	830	403	663	797	747
10	830	402	662	796	747
15	829	402	662	796	747
20	829	401	661	795	747
25	829	400	661	794	748
30	829	400	661	794	749
35	829	400	660	793	749
40	828	400	659	793	750
45	828	400	658	793	750
50	827	400	658	792	751
55	827	400	657	792	751
16 00	827	401	656	792	752
05	827	401	655	791	753
10	827	402	654	789	753
15	827	403	654	789	754
20	827	403	654	789	755
25	827	403	652	788	756
30	828	403	652	789	757

TABLE 7.—*Diurnal variation of vertical intensity, May-June, 1919.*

Hour Std. Mer.	Porto Rico 60°	Cheltenham 75°	Tucson 105°	Sitka 135°	Honolulu 165°
^h ^h	^γ	^γ	^γ	^γ	^γ
0-1	0	0	+4	+5	+4
1-2	-1	-1	+5	+3	+4
2-3	-1	+1	+5	+3	+4
3-4	-1	+1	+5	+5	+5
4-5	-1	+5	+6	+6	+8
5-6	0	+5	+7	+2	+14
6-7	-1	+3	+10	-6	+13
7-8	-3	+1	+8	-12	+5
8-9	-4	-2	+2	-15	-5
9-10	-4	-7	-7	-16	-12
10-11	-2	-10	-13	-16	-14
11-12	0	-11	-14	-15	-12
12-13	+2	-8	-13	-11	-7
13-14	+4	-5	-10	-6	-3
14-15	+4	0	-8	-2	+1
15-16	+4	+5	-5	+3	+1
16-17	+2	+7	-1	+8	0
17-18	+1	+6	+2	+12	-2
18-19	+1	+5	+3	+10	-2
19-20	0	+3	+2	+9	-2
20-21	+1	+2	+2	+8	-2
21-22	0	+1	+3	+9	-1
22-23	0	+1	+3	+9	0
23-24	0	-1	+4	+8	+2