

Publikasjoner fra
DET NORSKE INSTITUTT FOR KOSMISK FYSIKK
Nr. 29

THE AURORAL OBSERVATORY AT TROMSØ

($\varphi = 69^{\circ} 39'.8$ N, $\lambda = 18^{\circ} 56'.9$ E. Gr.)

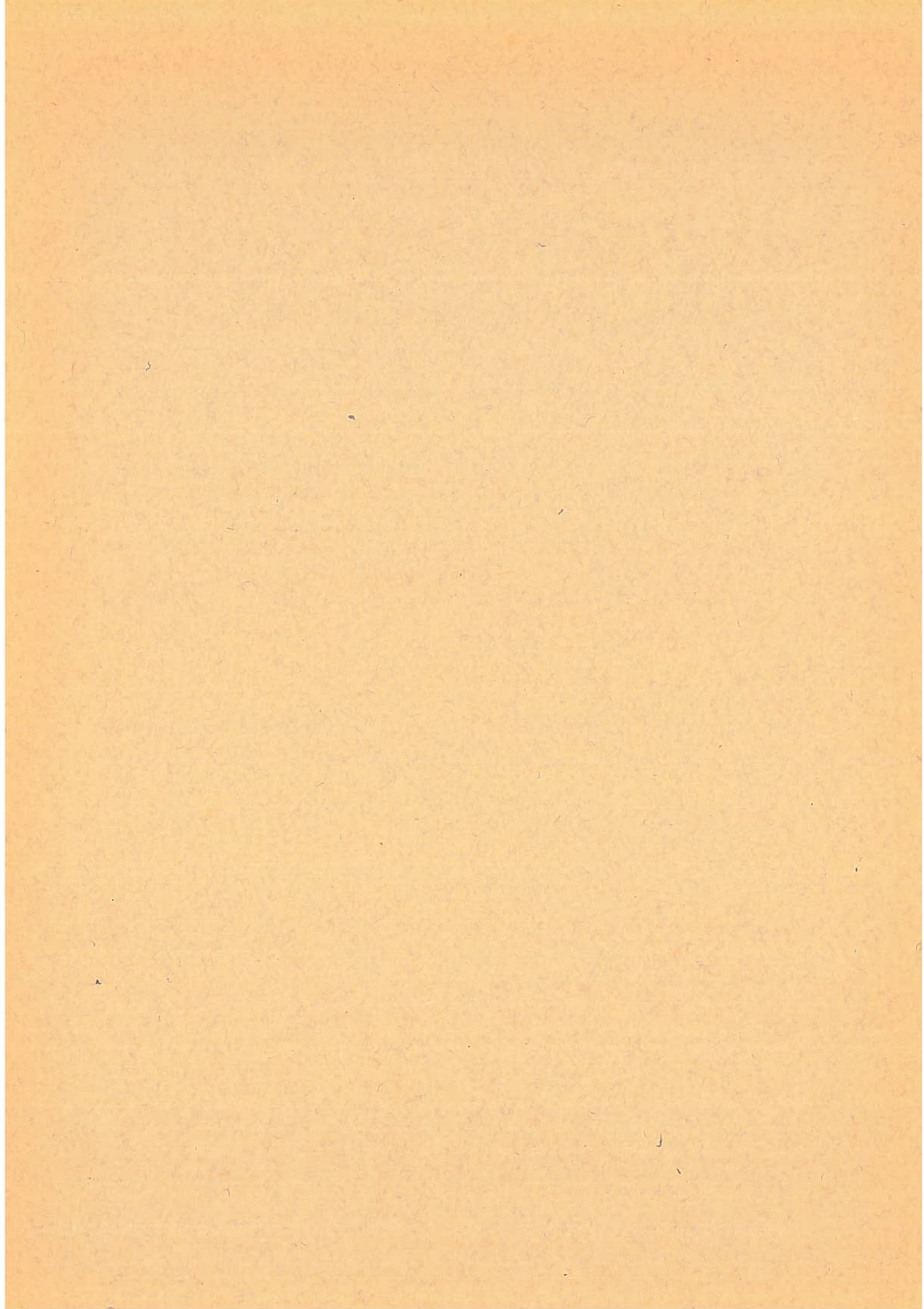
**RESULTS OF MAGNETIC OBSERVATIONS
FOR THE YEAR 1946**

BY

EINAR TØNSBERG and Mr. STEINAR BERGER

1949

A.S JOHN GRIEGS BOKTRYKKERI, BERGEN



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GENERAL REMARKS.

The insrrumental equipment used for the magnetic measurements is the same as that previously used, a description of which is given in No. 1 of the present series of publications.

The observations have been made by E. TØNSBERG. The reading of the hourly values and the calculation work have been performed by Mr. STEINAR BERGER.

SCALE VALUES.

The following scale-values have been determined:

D-curves:	1'.45	4.73 γ per mm
H-curves		5.13 γ per mm
V-curves		6.80 γ per mm

BASE-LINE VALUES.

The absolute measurements of Declination and Horizontal-Intensity resulted in the table given below of observed and adopted base-line values. The Vertical Intensity base-line value from the preceding years is still employed. The quiet mean Inclination value for the year was calculated to $77^\circ 30'.9$.

The temperature coefficient for the H-variometer is 7.3 γ per degree Celsius, and for the V-variometer — 1.3 γ per degree Celsius.

OBSERVED AND ADOPTED BASE-LINE VALUES FOR H AND D .

Date	D observed	D adopted	Date	H observed	H adopted
I 31	19 47'.1 W	1° 47'.4 W	I 3	11170 y	11170 y
VI 17	47.4	.4	31	73	70
V 6	47.8	.4	IV 17	70	70
VI 13	47.4	.4	V 2	70	70
VII 11	47.2	.4	VI 13	72	70
VIII 22	47.5	.4	VII 11	70	70
XII 30	47.4	.4	VIII 22	67	70

EXPLANATION OF TABLES.

For each of the components D , H , and V two series of tables are given. One series gives, in the usual way, the hourly mean values centered at half hours Gr. M. T. In these tables the column headed M gives the ordinary diurnal means. R designates the range, i. e. the difference between the maximum and minimum value measured on the magnetogram. The horizontal line marked M gives the monthly means of the hourly values, and the line marked OM gives the monthly means of the *quiet* hourly values. The second series of tables gives the hourly values of the Storminess («average perturbing force» or «activity»). As to the definition of the storminess and the method for separating it, we refer to Nos. 2 and 4 in the present series of publications. In the storminess tables the column headed M gives the diurnal means. The columns headed PS , NS and AS give the diurnal sum of the positive, negative and absolute storminess, respectively. The column headed CH gives the magnetic character numbers. We consider the diurnal sum of the absolute storminess as the best expression of the magnetic activity during a day, and we will use that quantity for defining the character numbers. Only the strongest perturbed component, the Horizontal Intensity, is used in characterisation. Character number 0 comprises diurnal sum of absolute storminess (AS) up to 400, character number 1 from 400 to 1200, and character number 2 figures higher than 1200. The horizontal line marked M contains the monthly means of the hourly values, and the two lines marked MPS and MNS give the monthly means of the positive and the negative storminess, respectively.

In D the storminess is reckoned positive towards magnetic west, in H positive towards magnetic north, and in V positive downwards.

In addition to the main tables resuming tables, figures, and vector diagrams are given at the end of the year-book.

Financial Statement D-1 W + Labels (amounts expressed in units of Millions)

Table 1: Financial Statement D-1 W + Labels (amounts expressed in units of Millions)

Table 2: Financial Statement D-1 W + Labels (amounts expressed in units of Millions)

Table 3: Financial Statement D-1 W + Labels (amounts expressed in units of Millions)

TABLES

Tromsø. Declination. D = 1° W + Tabular Quantities expressed in Tenths of Minutes. Gr. M. T.

Table for JANUARY 1946. HOURLY MEAN VALUES. Columns: DAY, 1-23, M, R. Rows: 1-31, M, QM.

Table for FEBRUARY. HOURLY MEAN VALUES. Columns: DAY, 1-23, M, R. Rows: 1-28, M, QM.

Table for MARCH. HOURLY MEAN VALUES. Columns: DAY, 1-23, M, R. Rows: 1-31, M, QM.

Tromsø.

Declination. Storminess. (+ W) Unit Gamma.

Gr. M. T.

JANUARY 1946.

HOURLY MEAN VALUES

Table for January 1946 showing hourly mean values for declination, storminess, and unit gamma. Columns include Day (1-31), M, PS, NS, AS, and summary rows (MPS, MNS).

FEBRUARY.

Table for February showing hourly mean values for declination, storminess, and unit gamma. Columns include Day (1-28), M, PS, NS, AS, and summary rows (MPS, MNS).

MARCH.

Table for March showing hourly mean values for declination, storminess, and unit gamma. Columns include Day (1-31), M, PS, NS, AS, and summary rows (MPS, MNS).

Tromsø. Declination. D = 1° W + Tabular Quantities expressed in Tenths of Minutes.

Gr. M. T.

Table for APRIL 1946. HOURLY MEAN VALUES. Columns: DAY, 1-25, M, R. Rows: 1-30. Summary row M: 246 246 240 252 249 277 294 298 328 359 390 414 412 446 476 467 461 442 439 414 372 304 264 267 347 679. Summary row QM: 350 334 322 314 307 302 304 314 324 347 372 394 406 309 406 309 400 397 394 390 384 378 372 364 364.

Table for MAY. HOURLY MEAN VALUES. Columns: DAY, 1-23, M, R. Rows: 1-31. Summary row M: 218 200 174 194 220 246 240 290 328 378 418 476 476 467 470 474 482 484 467 460 434 390 304 260 356 968. Summary row QM: 324 310 294 290 294 280 290 307 334 372 404 434 448 442 436 430 424 418 412 404 387 372 356 340 366.

Table for JUNE. HOURLY MEAN VALUES. Columns: DAY, 1-23, M, R. Rows: 1-30. Summary row M: 246 210 220 212 236 254 274 298 336 370 406 434 454 460 482 498 526 534 504 482 440 416 350 314 372 735. Summary row QM: 324 310 294 290 280 280 266 302 324 356 387 416 434 442 440 434 427 420 412 404 387 372 356 340 364.

Tromsø.

Declination. Storminess. (+ W) Unit Gamma.

Gr. M. T.

APRIL 1946

HOURLY MEAN VALUES

Table for April 1946 showing hourly mean values for declination, storminess, and unit gamma. Includes columns for Day (1-30), M, PS, NS, AS, and summary rows for M, MPS, and MNS.

MAY.

Table for May showing hourly mean values for declination, storminess, and unit gamma. Includes columns for Day (1-31), M, PS, NS, AS, and summary rows for M, MPS, and MNS.

JUNE.

Table for June showing hourly mean values for declination, storminess, and unit gamma. Includes columns for Day (1-30), M, PS, NS, AS, and summary rows for M, MPS, and MNS.

Tromsø. Declination. D = 1° W + Tabular Quantities expressed in Tenths of Minutes. Gr. M. T.

JULY 1946.

HOURLY MEAN VALUES

Table with columns DAY, 1-23, M, R. Contains hourly mean values for July 1946.

AUGUST.

Table with columns DAY, 1-23, M, R. Contains hourly mean values for August 1946.

SEPTEMBER.

Table with columns DAY, 1-23, M, R. Contains hourly mean values for September 1946.

Tromsø.

Declination. Storminess. (+ W) Unit Gamma.

Gr. M. T.

JULY 1946.

HOURLY MEAN VALUES

Table for July 1946 showing hourly mean values for Declination, Storminess, and Unit Gamma. Includes columns for Day, M, PS, NS, AS, and summary rows for MPS and MNS.

AUGUST.

Table for August 1946 showing hourly mean values for Declination, Storminess, and Unit Gamma. Includes columns for Day, M, PS, NS, AS, and summary rows for MPS and MNS.

SEPTEMBER.

Table for September 1946 showing hourly mean values for Declination, Storminess, and Unit Gamma. Includes columns for Day, M, PS, NS, AS, and summary rows for MPS and MNS.

Tromsø. Declination. D = 1° W + Tabular Quantities expressed in Tenths of Minutes. Gr. M. T.

Table for October 1946. Columns: DAY, 1-23, M, R. Rows: 1-31. Values range from 147 to 696.

Table for November. Columns: DAY, 1-23, M, R. Rows: 1-30. Values range from 147 to 840.

Table for December. Columns: DAY, 1-23, M, R. Rows: 1-31. Values range from 147 to 1088.

Tromsø.

Declination. Storminess. (+ W) Unit Gamma.

Gr. M. T.

OCTOBER 1946.

HOURLY MEAN VALUES

Table for October 1946 showing magnetic observations for Tromsø. Columns include Day (1-31), 24-hour values (1-24), M, PS, NS, AS.

NOVEMBER.

Table for November 1946 showing magnetic observations for Tromsø. Columns include Day (1-30), 24-hour values (1-24), M, PS, NS, AS.

DECEMBER.

Table for December 1946 showing magnetic observations for Tromsø. Columns include Day (1-31), 24-hour values (1-24), M, PS, NS, AS.

Tromsø. Horizontal Intensity. H = 11100 + Tabular Quantities expressed in Gamma. Gr. M. T. HOURLY MEAN VALUES

Table with columns for DAY (1-31), 1-23, M, R. Contains hourly mean values for January 1946.

FEBRUARY.

Table with columns for DAY (1-28), 1-23, M, R. Contains hourly mean values for February 1946.

MARCH.

Table with columns for DAY (1-31), 1-23, M, R. Contains hourly mean values for March 1946.

Tromsø.

Horizontal Intensity. Storminess (+ N). Unit Gamma.

Gr. M. T.

JANUARY 1946.

HOURLY MEAN VALUES

Table for January 1946 showing hourly mean values for magnetic intensity and storminess. Columns include Day (1-31), hours (1-24), and summary statistics (M, PS, NS, AS, CH). Values range from -80 to 300 Gamma.

FEBRUARY.

Table for February showing hourly mean values for magnetic intensity and storminess. Columns include Day (1-28), hours (1-24), and summary statistics (M, PS, NS, AS, CH). Values range from -86 to 300 Gamma.

MARCH.

Table for March showing hourly mean values for magnetic intensity and storminess. Columns include Day (1-31), hours (1-24), and summary statistics (M, PS, NS, AS, CH). Values range from -128 to 300 Gamma.

Tromsø. Horizontal Intensity. H = 11100 + Tabular Quantities expressed in Gamma.

Gr. M. T.

APRIL 1946

HOURLY MEAN VALUES

Table for April 1946 showing hourly mean values for horizontal intensity. Columns include Day (1-30), hours (1-24), and monthly totals (M, R).

MAY.

Table for May showing hourly mean values for horizontal intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R).

JUNE.

Table for June showing hourly mean values for horizontal intensity. Columns include Day (1-30), hours (1-24), and monthly totals (M, R).

Tromsø.

Horizontal Intensity. Storminess (+ N). Unit Gamma.

Gr. M. T.

Table for April 1946 showing hourly mean values for magnetic intensity and storminess. Columns include Day (1-30), M, PS, NS, AS, CH. Summary row M: -105 -106 -87 -63 -33 -26 -18 -13 1 19 25 47 54 65 52 61 26 13 -1 -42 -59 -100 -113 -115 -22 424 965 1388 1.3

Table for May showing hourly mean values for magnetic intensity and storminess. Columns include Day (1-31), M, PS, NS, AS, CH. Summary row M: -132 -140 -135 -92 -83 -51 -45 -18 14 30 40 58 72 66 67 80 77 57 7 -18 -46 -70 -114 -130 -21 633 1140 1773 1.5

Table for June showing hourly mean values for magnetic intensity and storminess. Columns include Day (1-30), M, PS, NS, AS, CH. Summary row M: -92 -101 -87 -70 -55 -30 -2 2 6 20 26 43 76 95 111 99 90 60 37 5 -35 -60 -73 -94 -1 733 746 1479 1.3

Tromsø. Horizontal Intensity. H = 11100 + Tabular Quantities expressed in Gamma. Gr. M. T. JULY 1946. HOURLY MEAN VALUES

Table with columns DAY, 1-23, M, R for July 1946. Rows 1-31. Summary row M: 1 25 30 46 60 71 81 79 75 83 101 135 155 166 163 215 196 175 137 126 89 51 -8 -42 93 540. Summary row QM: 100 101 102 100 97 92 85 78 70 65 67 75 65 93 98 100 101 102 103 103 103 102 101 100 93

AUGUST.

Table with columns DAY, 1-23, M, R for August. Rows 1-31. Summary row M: 49 44 54 76 86 89 85 86 83 86 89 95 116 137 145 149 154 144 128 102 73 68 51 45 93 297. Summary row QM: 100 102 102 100 98 94 88 80 70 67 70 80 90 95 98 100 101 102 102 102 101 100 99 98 93

SEPTEMBER.

Table with columns DAY, 1-23, M, R for September. Rows 1-30. Summary row M: -4 20 44 59 75 83 82 73 86 96 109 154 125 138 139 135 125 113 104 75 66 53 18 -3 78 418. Summary row QM: 100 100 100 99 98 96 94 92 90 87 85 87 90 95 98 100 102 104 105 104 103 102 101 100 97

Tromsø.

Horizontal Intensity. Storminess (+ N). Unit Gamma.

Gr. M. T.

JULY 1946.

HOURLY MEAN VALUES

Table for July 1946 showing hourly mean values for days 1-31. Columns include DAY, 1-23, M, PS, NS, AS, CH. Values range from -35 to 118.

AUGUST.

Table for August showing hourly mean values for days 1-31. Columns include DAY, 1-23, M, PS, NS, AS, CH. Values range from -120 to 118.

SEPTEMBER.

Table for September showing hourly mean values for days 1-30. Columns include DAY, 1-23, M, PS, NS, AS, CH. Values range from -103 to 105.

Tromsø. Horizontal Intensity. H = 11100 + Tabular Quantities expressed in Gamma. Gr. M. T.

Table for October 1946 showing hourly mean values for horizontal intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R). Values range from -160 to 365.

Table for November showing hourly mean values for horizontal intensity. Columns include Day (1-30), hours (1-24), and monthly totals (M, R). Values range from -145 to 200.

Table for December showing hourly mean values for horizontal intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R). Values range from -140 to 185.

Tromsø.

Horizontal Intensity, Storminess (+ N). Unit Gamma.

Gr. M. T.

OCTOBER 1946.

HOURLY MEAN VALUES

Table for October 1946 showing hourly mean values for days 1-31. Columns include Day, hours 1-25, M, PS, NS, AS, and CH. Values range from -76 to 320.

NOVEMBER.

Table for November showing hourly mean values for days 1-30. Columns include Day, hours 1-25, M, PS, NS, AS, and CH. Values range from -69 to 180.

DECEMBER.

Table for December showing hourly mean values for days 1-31. Columns include Day, hours 1-25, M, PS, NS, AS, and CH. Values range from -54 to 36.

Tromsø. Vertical Intensity. V = 50500 + Tabular Quantities expressed in Gamma.

Gr. M. T.

JANUARY 1946.

HOURLY MEAN VALUES

Table for January 1946 showing hourly mean values for vertical intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R). Values range from -40 to 60.

FEBRUARY.

Table for February showing hourly mean values for vertical intensity. Columns include Day (1-28), hours (1-24), and monthly totals (M, R). Values range from -40 to 110.

MARCH.

Table for March showing hourly mean values for vertical intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R). Values range from -40 to 100.

Tromsø.

Vertical Intensity. Storminess (+ Down). Unit Gamma.

Gr. M. T.

JANUARY 1946.

HOURLY MEAN VALUES

Table for January 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-31), hours (1-24), and summary statistics (M, PS, NS, AS).

FEBRUARY.

Table for February showing hourly mean values for vertical intensity and storminess. Columns include Day (1-28), hours (1-24), and summary statistics (M, PS, NS, AS).

MARCH.

Table for March showing hourly mean values for vertical intensity and storminess. Columns include Day (1-31), hours (1-24), and summary statistics (M, PS, NS, AS).

Tromsø. Vertical Intensity. V = 50500 + Tabular Quantities expressed in Gamma. Gr. M. T.

Table for APRIL 1946. Columns: DAY, 1-23, M, R. Rows: 1-30. Data values range from approximately -10 to 270.

Table for MAY. Columns: DAY, 1-23, M, R. Rows: 1-31. Data values range from approximately -40 to 270.

Table for JUNE. Columns: DAY, 1-23, M, R. Rows: 1-30. Data values range from approximately -40 to 270.

Tromsø.

Vertical Intensity. Storminess (+ Down). Unit Gamma.

Gr. M. T.

Table for APRIL 1946. Columns: DAY, 1-23, M, PS, NS, AS. Rows: 1-30, M, MPS, MNS.

Table for MAY. Columns: DAY, 1-23, M, PS, NS, AS. Rows: 1-31, M, MPS, MNS.

Table for JUNE. Columns: DAY, 1-23, M, PS, NS, AS. Rows: 1-30, M, MPS, MNS.

Tromsø. Vertical Intensity. V = 50500 + Tabular Quantities expressed in Gamma. Gr. M. T.

Table for July 1946 showing hourly mean values for vertical intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R). Values range from approximately -155 to 350.

Table for August showing hourly mean values for vertical intensity. Columns include Day (1-31), hours (1-24), and monthly totals (M, R). Values range from approximately -155 to 350.

Table for September showing hourly mean values for vertical intensity. Columns include Day (1-30), hours (1-24), and monthly totals (M, R). Values range from approximately -155 to 350.

Tromsø.

Vertical Intensity. Storminess (+ Down). Unit Gamma.

Gr. M. T.

JULY 1946.

HOURLY MEAN VALUES

Table for July 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-31), hours (1-24), and summary statistics (M, PS, NS, AS).

AUGUST.

Table for August 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-31), hours (1-24), and summary statistics (M, PS, NS, AS).

SEPTEMBER.

Table for September 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-30), hours (1-24), and summary statistics (M, PS, NS, AS).

Tromsø. Vertical Intensity. V = 50500 + Tabular Quantities expressed in Gamma. HOURLY MEAN VALUES

Gr. M. T.

OCTOBER 1946.

Table for October 1946 showing vertical intensity data for each day from 1 to 31. Columns include day, hours 1-24, and monthly totals M and R.

NOVEMBER.

Table for November 1946 showing vertical intensity data for each day from 1 to 30. Columns include day, hours 1-24, and monthly totals M and R.

DECEMBER.

Table for December 1946 showing vertical intensity data for each day from 1 to 31. Columns include day, hours 1-24, and monthly totals M and R.

Tromsø.

Vertical Intensity. Storminess (+ Down). Unit Gamma.

Gr. M. I.

OCTOBER 1946.

HOURLY MEAN VALUES

Table for October 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-31), 23 intensity/storminess values, M, PS, NS, AS, MPS, and MNS.

NOVEMBER.

Table for November 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-30), 23 intensity/storminess values, M, PS, NS, AS, MPS, and MNS.

DECEMBER.

Table for December 1946 showing hourly mean values for vertical intensity and storminess. Columns include Day (1-31), 23 intensity/storminess values, M, PS, NS, AS, MPS, and MNS.

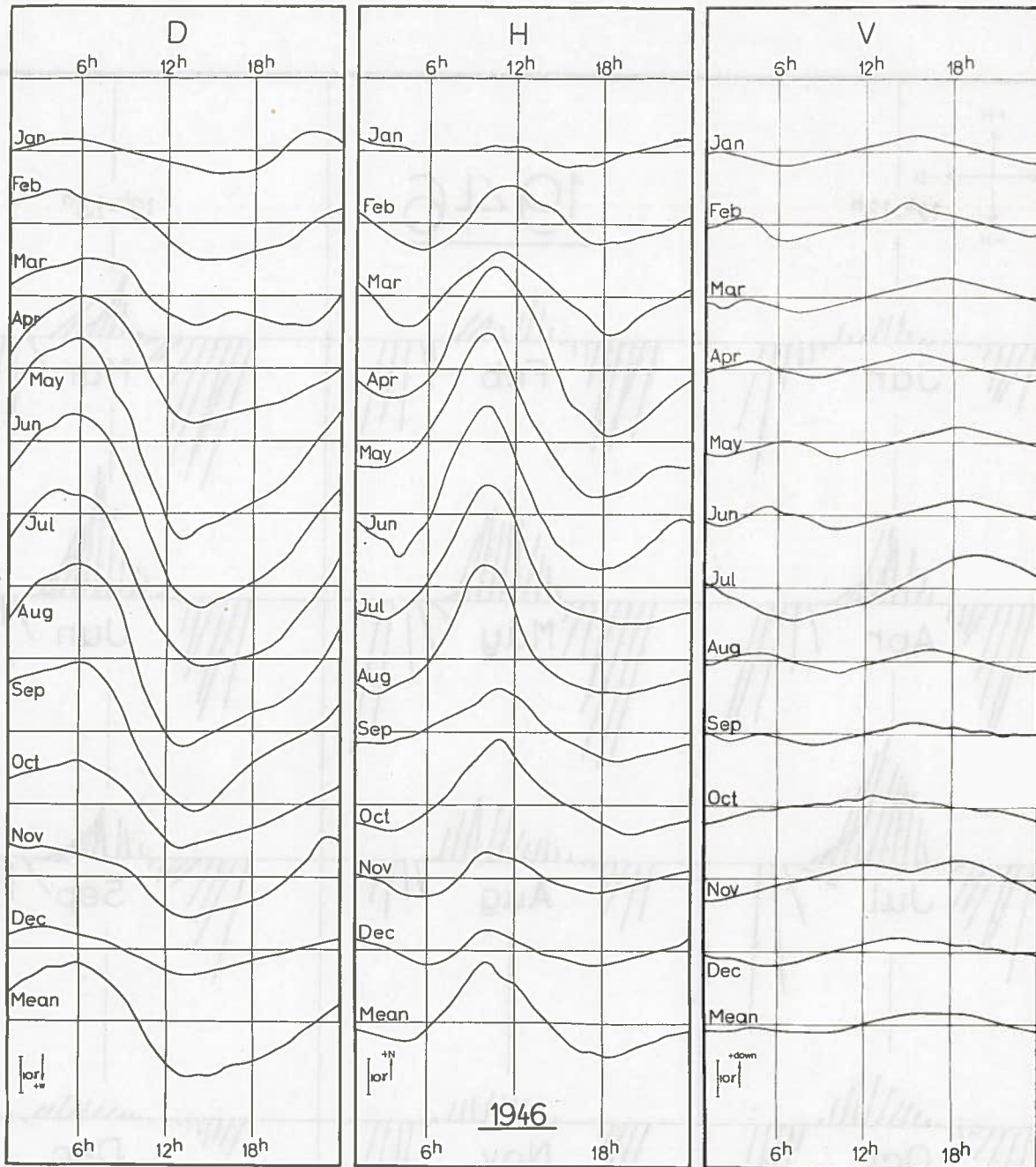


Fig. 1. The Quiet Diurnal Variation, smoothed Values.

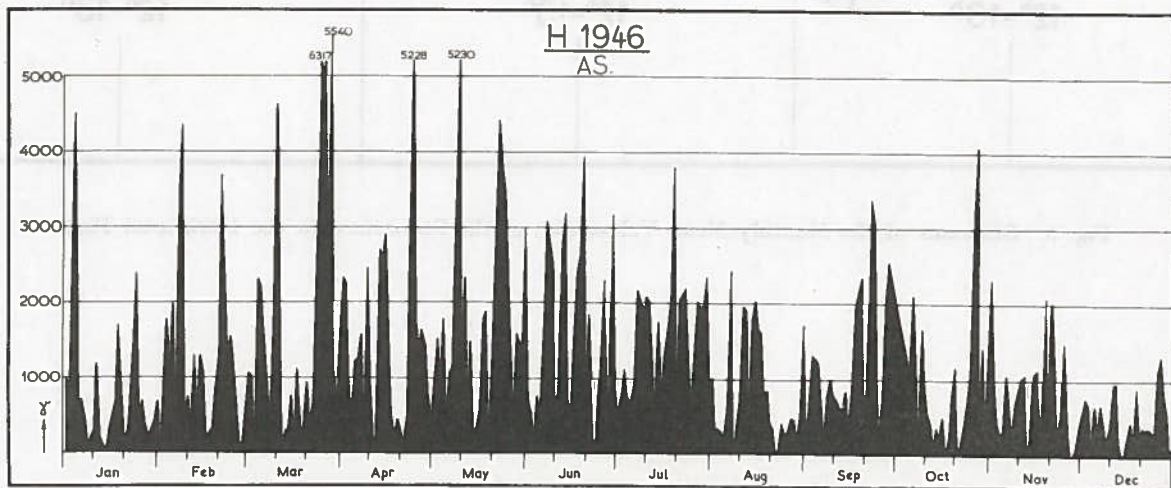


Fig. 2. The Diurnal Sum of the Absolute Storminess of H.

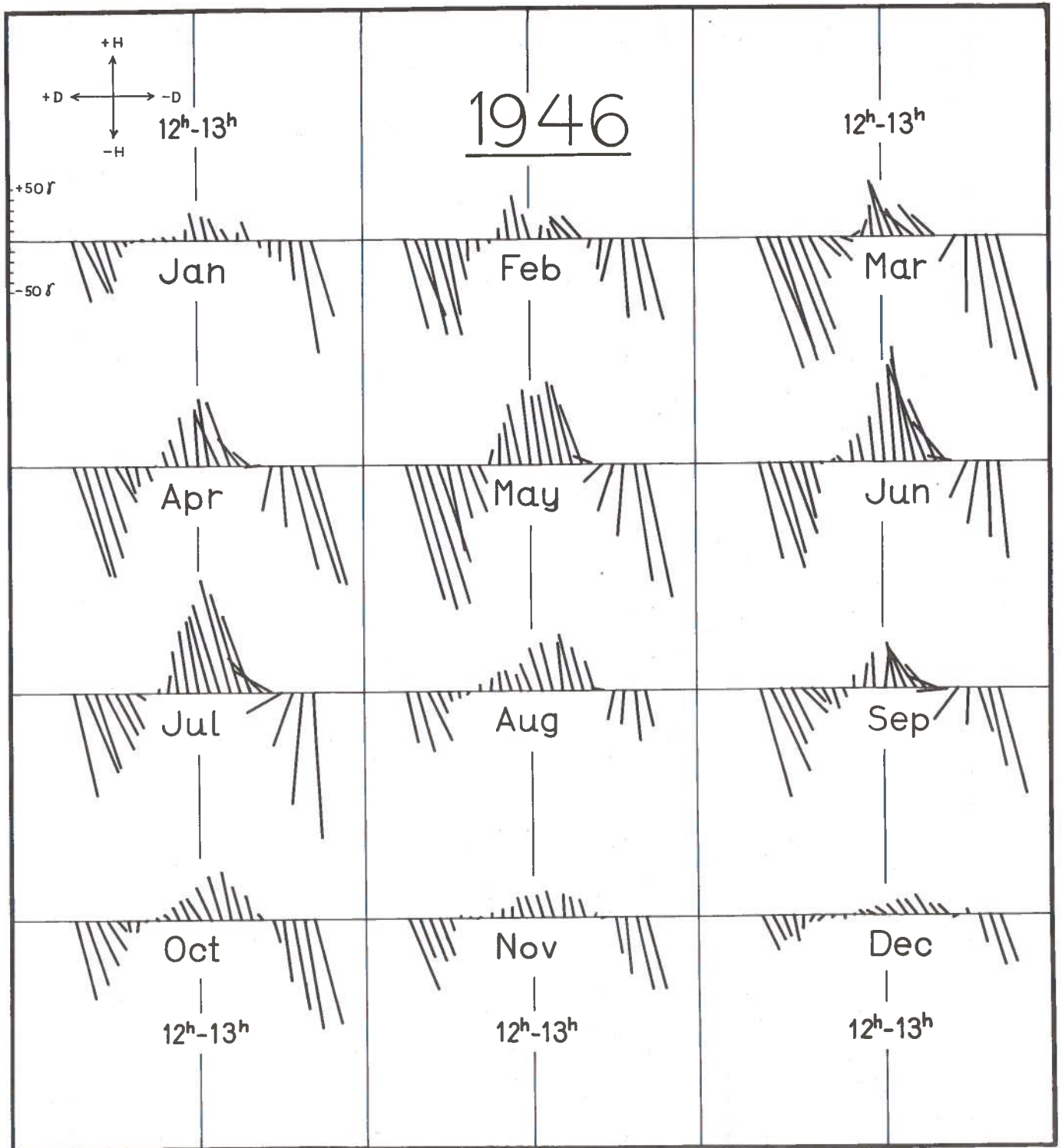


Fig. 3. Diagrams of the Monthly Mean Values (M) of the Storminess in the Horizontal Plane.

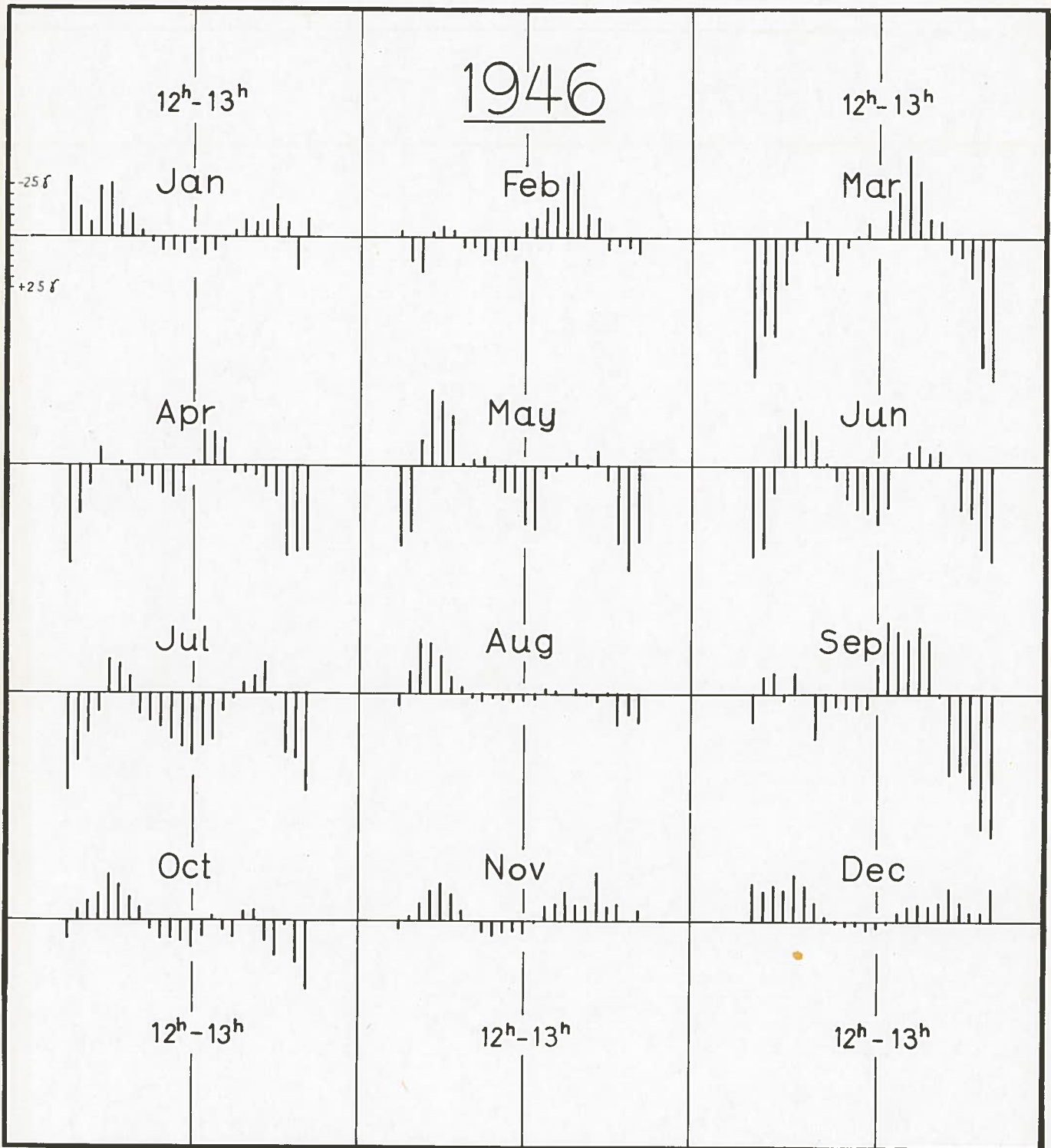
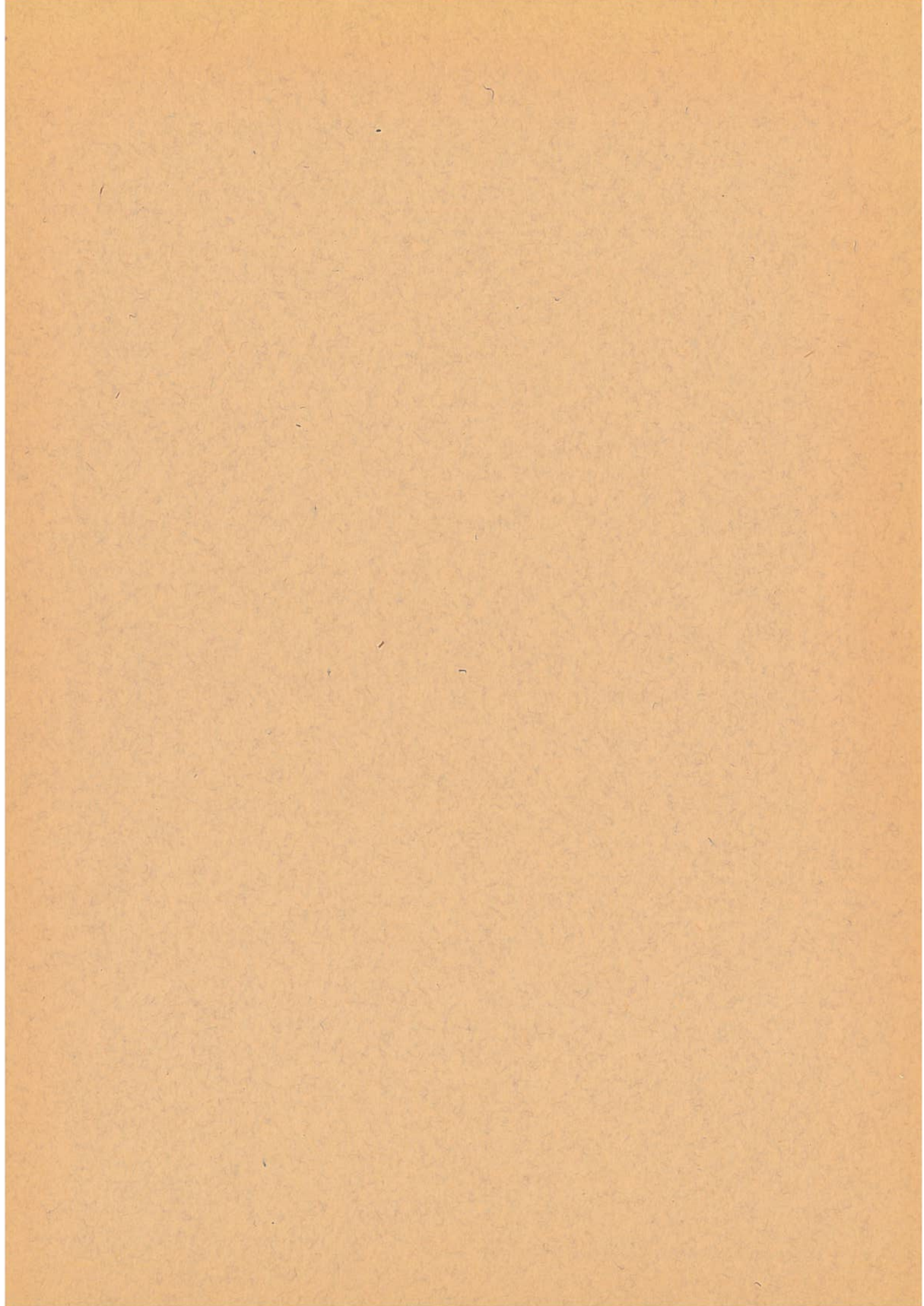


Fig. 4. Diagrams of the Monthly Mean Values (*M*) of the Storminess of the Vertical Intensity.



Publikasjoner fra Det norske Institutt for Kosmisk Fysikk.

1. The Auroral Observatory at Tromsø by The Executive Committee. 1932.
2. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1930 by LEIV HARANG, O. KROGNESS and E. TØNSBERG. Bergen 1933.
3. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1931 by LEIV HARANG and E. TØNSBERG. Bergen 1933.
4. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1932 by LEIV HARANG and E. TØNSBERG. Bergen 1934.
5. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1933 by LEIV HARANG and E. TØNSBERG. Bergen 1934.
6. Norwegian Publications from the International Polar Year 1932—33. No. 2. Work on Terrestrial Magnetism, Aurora and Allied Phenomena, under the auspices of Det Norske Institutt for Kosmisk Fysikk. Bergen 1935.
7. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1934 by LEIV HARANG and E. TØNSBERG. Bergen 1935.
8. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1935 by LEIV HARANG and E. TØNSBERG. Bergen 1936.
9. O. KROGNESS and K. F. WASSERFALL: Results from the Magnetic Station at Dombås. 1916—33. Det Magnetiske Byrå, 1936.
10. K. F. WASSERFALL: Some of the Most Characteristic Features of Magnetic Elements. Det Magnetiske Byrå. 1937.
11. The Auroral Observatory at Tromsø. Results of Radio Echo Observations for the Years 1935 and 1936 by LEIV HARANG. Bergen 1937.
12. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1936 by LEIV HARANG and E. TØNSBERG. Bergen 1937.
13. B. TRUMPY and K. F. WASSERFALL: Results from the Magnetic Station at Dombås 1934—36. Det Magnetiske Byrå. 1938.
14. The Auroral Observatory at Tromsø. Results of Radio Echo Observations for the Year 1937 by LEIV HARANG. Bergen 1938.
15. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1937 by LEIV HARANG and E. TØNSBERG. Bergen 1938.
16. K. F. WASSERFALL: Contribution to the Study of the Variation in Magnetic Elements. Det Magnetiske Byrå. 1939.
17. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1938 by LEIV HARANG and E. TØNSBERG. Bergen 1939.
18. B. TRUMPY and K. F. WASSERFALL: Results from the Magnetic Station at Dombås 1937 and 1938. Det Magnetiske Byrå 1940.
19. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1939 by LEIV HARANG and E. TØNSBERG. Bergen 1941.
20. B. TRUMPY and K. F. WASSERFALL: Results from the Magnetic Station at Dombås 1938. Det Magnetiske Byrå 1941.
21. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1940 by LEIV HARANG and E. TØNSBERG. Bergen 1943.
22. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1941 by LEIV HARANG and E. TØNSBERG. Bergen 1943.
23. B. TRUMPY and K. F. WASSERFALL: Results from the Magnetic Station at Dombås 1940 and 1941. Det Magnetiske Byrå 1944.
24. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1942 by LEIV HARANG and E. TØNSBERG. Bergen 1944.
25. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1943 by LEIV HARANG and E. TØNSBERG. Bergen 1946.
26. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1944 by LEIV HARANG and E. TØNSBERG. Bergen 1947.
27. The Auroral Observatory at Tromsø. Results of Magnetic Observations for the Year 1945 by LEIV HARANG and E. TØNSBERG. Bergen 1948.
28. B. TRUMPY and K. F. WASSERFALL: Results from the Magnetic Station at Dombås 1942 and 1945. Det Magnetiske Byrå, Bergen 1949.