

POLAR GEOPHYSICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES



PGI
GEOPHYSICAL DATA

2025

OCTOBER

NOVEMBER

DECEMBER

MURMANSK, APATITY, RUSSIA
March, 2025

PGI
GEOPHYSICAL DATA

V. VOROBJEV, editor

V. Burnaeva and N. Kudriashova make-up editors

This bulletin presents the preliminary ground-based optical, geomagnetic and cosmic ray data obtained by Polar Geophysical Institute in the fourth quarter of 2025. All-sky camera observations are published only for the quarters when observations were carried out. All data are available by request.

Reviewer Orlov K.G.

Published since 1996

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DATA DESCRIPTION

Magnetic data

The magnetograms (H, D, and Z) are plotted as magnetic variations recorded in Loparskaya and Lovozero stations by the three component Bobrov type magnetometer with a sampling frequency of 10 samples per seconds. The instrument has a range ± 2620 nT and a resolution of 5 pT. Magnetic observations are gathered every second and registered in the digital form as the 10-sec averaged data. Digits in the plots at the left-hand side denote the scale of the records in nT/div. Timing is provided by the GPS.

Magnetic quiet values for H, D and Z components are shown by dotted line as a daily averaged magnetic activity level for three magnetically quiet days of each month. Quiet days are brand by the symbol Q in tables of geomagnetic K-indices.

Geomagnetic K-indices

The hourly K-indices indicate the level of geomagnetic field disturbance. The maximum deflection of two components H and D from the magnetic quiet value during one hour interval have been recalculated to the value of the local hourly K-index. The following scale has been used:

K-indices	Deflection in nT
0	0-15
1	15-30
2	30-60
3	60-120
4	120-210
5	210-360
6	360-600
7	600-990
8	990-1500
9	1500 and more

Cosmic ray data

The 18-NM-64-neutron monitor has been operating in Apatity since 1969. A plot of pressure corrected hourly data (count accumulated during one hour interval) is presented in units of percent with respect to the monthly mean intensity. Mean values are:

October	6237.2
November	5396.4
December	5431.7

The hourly data are sent to WDC-B2 (Moscow) and WDC-C (Japan).

Please visit <http://pgia.ru/lang/ru/data>

All-sky camera observations

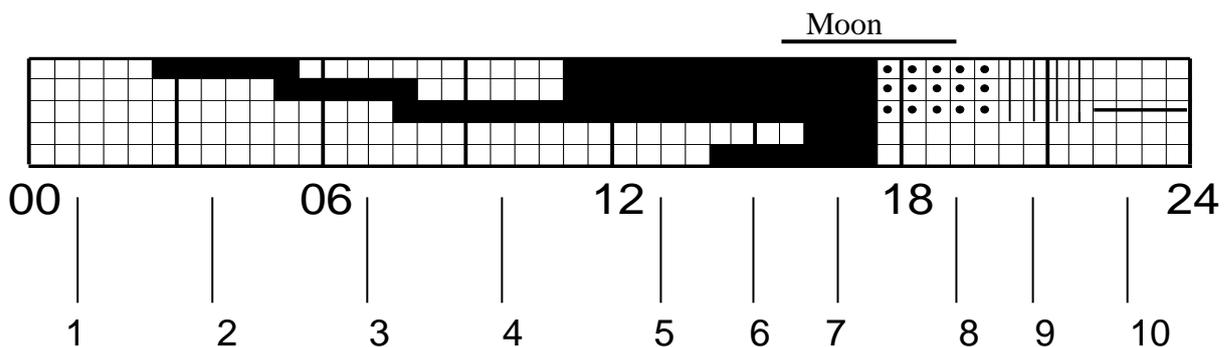
Calendar

Calendar shows the intervals of digital all-sky camera observations in Lovozero, Verhnetulomsky which are available during dark periods from 14:00 UT through midnight to 05:00 UT.

Ascaplots

All-sky camera observations are presented in this bulletin in the form of the standard five lines ascaplot. A detailed description of askaplots interpretation was published in: Annals of International Geophysical Year. V. XX. Part 1. P. 1-5. 1962.

Example of an ascaplot and the legend are given below. Top three lines give information on the existence of aurorae in north, zenith and south ranges of the sky, respectively. The fourth and fifth lines in the standard five lines ascaplot give the zenith range auroral intensity. We do not use all-sky camera observations to form a correct estimate of the auroral intensity.



- 1- no aurora
- 2- aurorae present in north range
- 3- weak aurorae present in zenith range
- 4- aurorae present in south range
- 5- aurorae present in north, zenith and south ranges
- 6- medium aurora in zenith, aurorae present in north and south ranges
- 7- strong aurora in zenith, aurorae present in north and south ranges
- 8- partial cloudiness
- 9- total cloudiness
- 10- no operation

Keograms

Black white keograms show the auroral display along the geomagnetic meridian of station. Here we present a few selected auroral events observed at Lovozero and Tumanny in night-time interval from 17:00 UT to 01:00 UT. Zenith angles are given along the vertical axis. Magnetic north is at the top of the figure.

PLEASE NOTE:

Magnetometer in Loparskaya was not in operation during this period because of some technical problems.

Coordinates of stations

Stations	Code	Geographic		Corr. Geomagnetic	
		Lat	Long	Lat	Long
<i>Tumanny</i>	TUM	69.14° N	35.82° E	65.24° N	116.7° E
<i>Loparskaya</i>	LOP	68.63° N	33.25° E	64.94° N	113.6° E
<i>Verhnetulomsky</i>	VTL	68.59° N	31.75° E	64.92° N	113.0° E
<i>Lovozero</i>	LOZ	67.97° N	35.02° E	64.17° N	115.3° E

Please visit

<http://pgia.ru/data/>

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GEOMAGNETIC K-INDICES, LOVOZERO

October, 2025

Lower limit of K=9 is 1500 nT

Day	Time, UT							
	03	06	09	12	15	18	21	24
1	6 6 6	5 4 4	3 3 3	3 3 3	5 4 4	5 5 5	5 5 6	5 5 5
2	6 7 8	7 6 6	---	---	- 4 3	1 1 2	4 6 6	6 6 5
3	5 5 6	5 4 4	4 3 3	3 3 2	3 3 3	3 3 3	5 5 4	4 4 5
4	5 5 4	3 2 3	2 2 2	3 3 3	4 4 2	2 3 3	4 5 4	3 3 3
5	2 4 2	1 1 2	1 1 1	1 1 2	2 2 1	0 0 0	0 0 0	1 1 0
6	0 0 0	0 0 0	0 0 1	1 1 0	0 1 1	1 2 1	1 2 1	4 4 3
7	4 4 2	2 2 0	0 2 2	1 2 3	3 4 4	5 3 2	2 5 5	5 5 4
8	4 4 4	4 3 1	1 1 1	1 1 2	3 3 4	4 4 3	3 3 1	0 0 0
10	4 4 3	0 0 1	1 1 1	1 1 2	1 1 0	0 0 0	2 2 3	4 2 2
11	2 1 0	1 1 1	1 1 2	1 1 2	3 3 3	5 3 2	3 3 3	4 4 4
12	4 4 5	5 3 3	4 3 2	2 3 3	3 4 4	5 4 4	7 6 5	5 6 6
13	6 4 5	5 3 3	3 2 3	2 2 2	2 1 1	2 1 2	2 5 5	5 4 4
14	3 3 0	0 1 2	2 1 1	1 0 1	1 2 1	2 1 1	0 0 0	3 4 3
15	3 3 3	2 2 1	1 1 2	2 1 1	2 1 1	0 0 0	0 1 0	0 0 2
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17	0 0 0	0 0 1	1 0 0	1 2 2	2 2 2	2 4 4	2 1 0	0 0 0
18	0 1 2	2 2 2	2 2 2	2 3 2	2 3 1	2 3 5	5 6 6	6 6 5
19	5 5 4	4 3 1	1 1 1	1 2 2	2 2 3	4 3 3	3 3 3	3 4 4
20	3 3 2	1 1 2	2 1 1	1 1 1	0 1 0	0 0 0	0 0 0	2 3 3
21	3 3 3	1 1 1	1 1 1	0 0 0	0 0 0	0 1 1	1 0 3	4 3 2
22	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 1 1	1 2 0	0 0 0
23	2 2 1	0 0 0	0 0 0	1 1 1	1 0 0	0 1 1	1 1 3	3 3 3
24	2 2 1	1 1 0	0 0 1	1 1 2	1 1 1	1 1 3	3 1 1	1 2 2
25	2 2 0	1 0 0	0 1 1	1 1 1	0 2 2	0 0 0	0 0 0	0 0 0
26	0 0 0	0 0 0	0 0 0	1 1 0	0 0 0	1 0 0	0 0 0	0 0 1
27	0 0 0	0 0 0	0 0 1	0 0 0	0 0 0	1 1 2	3 2 3	3 3 5
28	3 2 3	3 1 1	1 1 1	2 1 2	3 4 2	1 2 2	5 5 5	6 6 5
29	3 1 1	1 3 1	3 2 2	2 2 2	3 2 1	4 4 4	4 5 5	5 5 6
30	6 3 3	3 2 2	1 2 3	4 4 4	5 4 5	4 4 4	2 3 5	6 5 5
31	4 5 4	4 4 3	3 2 3	2 2 4	3 4 4	3 4 5	3 4 5	4 2 3

Q
Q
Q

GEOMAGNETIC K-INDICES, LOVOZERO

November, 2025

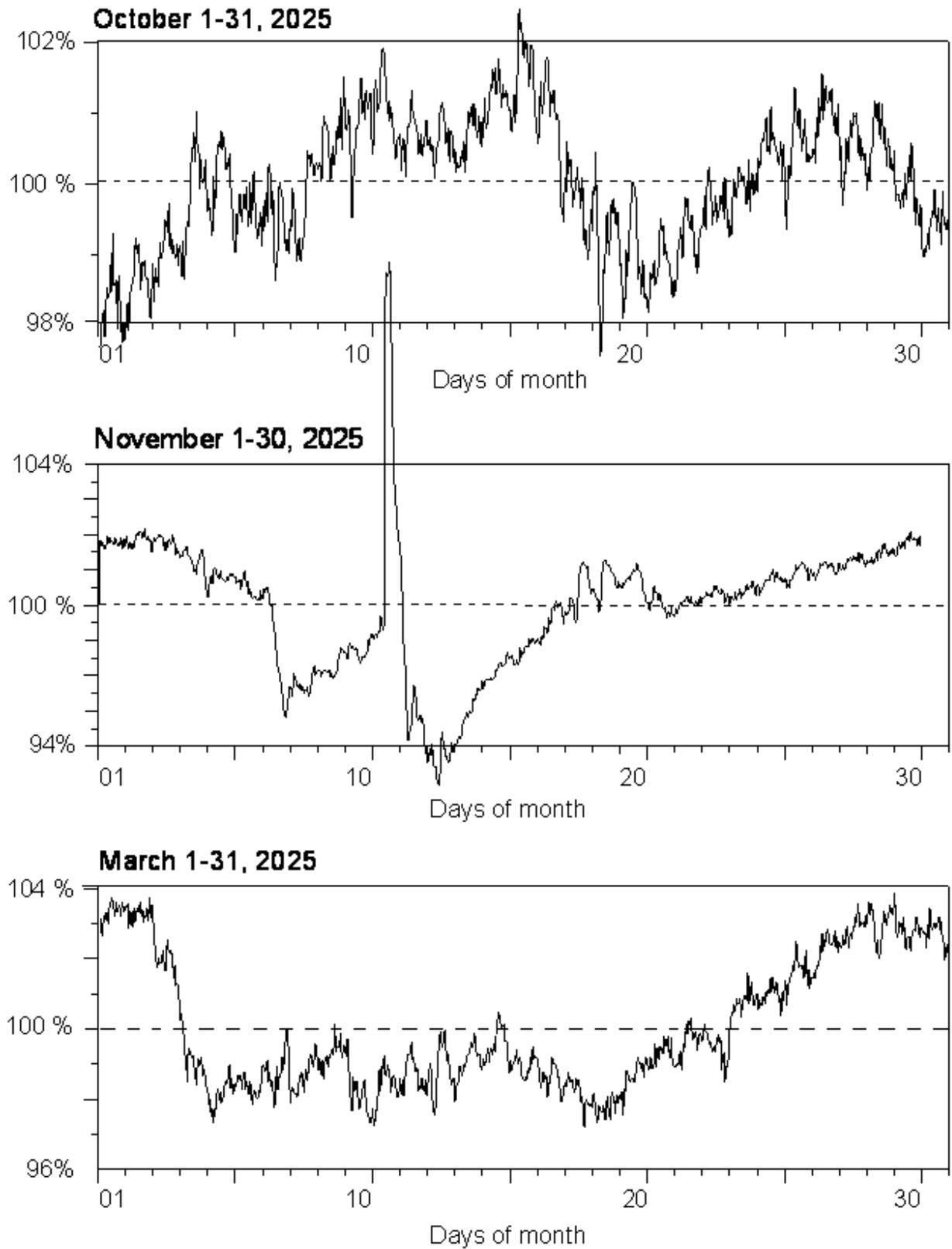
Lower limit of K=9 is 1500 nT

Day	Time, UT								
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2	4 5 5	2 2 2	2 1 1	2 3 3	2 2 2	3 4 4	4 1 4	5 3 4	
3	4 2 2	2 2 1	1 1 3	2 2 3	3 3 4	4 5 3	3 4 5	6 6 6	
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5	5 6 5	4 4 3	2 1 2	2 2 2	3 4 4	4 4 4	6 - -	- - -	
8	4 7 7	6 4 2	2 3 4	4 3 3	3 3 4	4 3 2	2 4 2	0 1 1	
9	1 0 0	0 1 0	1 0 1	1 0 0	1 1 2	0 1 1	1 1 1	1 5 5	
10	4 3 2	1 1 1	1 1 0	0 1 2	2 2 4	5 3 3	3 4 3	4 6 4	
11	3 3 2	1 1 1	1 1 1	1 1 1	0 1 1	1 1 1	1 0 0	0 3 4	
12	9 8 7	6 6 5	4 3 5	5 6 7	5 4 3	3 3 3	3 5 6	4 4 5	
13	7 7 6	6 6 3	4 4 3	3 3 1	2 0 3	2 2 2	2 3 2	1 1 1	
14	1 1 1	1 1 0	1 1 1	1 1 1	1 1 0	1 0 0	0 0 0	0 0 0	Q
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16	4 3 2	2 2 2	1 1 1	1 2 3	3 4 3	2 2 4	2 3 3	2 5 4	
17	4 4 4	1 1 1	1 1 0	0 0 1	1 1 1	0 1 1	1 0 2	2 0 0	
18	2 2 2	0 1 1	1 0 0	0 0 0	0 0 0	1 1 1	0 0 0	0 0 1	Q
19	1 0 0	0 0 0	0 0 0	0 0 1	1 1 1	1 1 1	1 1 2	1 0 0	Q
20	0 0 1	0 1 1	1 1 1	1 1 1	1 1 1	2 2 3	4 3 3	3 4 3	
21	3 2 1	1 2 1	1 1 1	1 1 1	1 1 2	3 4 3	2 3 3	2 0 1	
22	2 2 0	0 0 0	0 0 0	0 0 1	1 1 1	1 1 2	2 3 3	2 3 3	
23	4 1 0	1 1 1	1 1 1	1 1 1	2 4 4	3 4 3	3 1 4	4 2 1	
24	2 2 3	3 2 2	2 2 2	2 2 3	4 4 5	5 4 3	4 4 3	5 6 6	
25	5 5 5	3 3 3	3 3 3	4 4 3	4 5 4	5 4 5	5 6 6	5 4 4	
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30	5 3 3	3 3 2	2 1 1	1 2 2	2 1 1	2 3 2	3 2 3	4 3 3	

GEOMAGNETIC K-INDICES, LOVOZERO
 December, 2025
 Lower limit of K=9 is 1500 nT

Day	Time, UT								
	03	06	09	12	15	18	21		24
1	5 5 2	0 0 0	0 1 0	1 1 1	2 2 2	3 2 3	3 3 3	3 3 5	
2	4 3 2	1 1 1	0 0 0	1 0 0	1 1 1	1 1 2	3 2 2	2 3 3	
3	1 0 0	0 1 0	1 1 0	0 3 3	3 4 5	5 4 4	4 7 6	5 6 4	
4	4 5 5	5 3 3	3 2 3	3 2 3	2 4 3	4 3 4	4 5 5	3 2 2	
5	2 2 4	4 2 2	2 2 3	2 2 1	3 2 1	1 2 2	3 6 5	3 2 3	
6	2 3 3	3 2 2	2 2 3	2 2 2	1 2 3	2 1 1	1 2 2	2 1 1	
7	1 2 3	2 2 3	2 2 2	1 0 1	1 0 0	0 0 0	0 0 0	0 0 0	
8	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 1 1	0 0 0	Q
9	1 1 0	0 0 0	0 0 0	0 1 1	1 1 2	2 3 2	2 2 2	1 2 2	
10	3 3 3	0 0 0	1 1 1	2 1 1	2 2 3	4 3 3	3 4 5	6 8 7	
11	7 6 6	5 2 2	2 1 1	1 1 1	1 1 1	3 2 4	6 3 1	3 5 4	
12	3 4 3	3 3 3	2 1 2	1 2 2	2 4 5	5 5 5	5 5 4	3 6 5	
13	5 4 1	1 1 1	2 1 2	1 1 2	1 2 2	2 2 2	3 3 2	3 4 4	
14	2 3 2	1 0 1	0 0 0	0 1 1	1 0 0	0 0 1	2 2 0	0 0 0	
15	0 0 0	0 0 0	0 0 0	0 0 0	1 2 3	3 1 0	0 0 0	1 2 1	Q
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17	2 2 1	0 0 1	1 1 2	1 1 1	1 2 2	2 4 2	2 2 4	4 4 6	
18	6 3 3	1 2 1	1 1 2	2 2 2	1 1 1	2 4 4	2 2 3	4 1 1	
19	1 3 3	2 1 1	0 0 0	0 0 0	0 0 0	1 0 1	3 2 2	3 2 3	
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25	4 4 3	3 2 2	1 2 1	1 1 1	1 1 2	1 2 2	1 0 1	1 1 1	
26	0 0 0	1 1 2	1 0 1	1 1 1	1 2 1	2 2 0	0 0 0	0 1 1	Q
27	1 0 0	0 1 1	0 1 1	1 1 1	1 0 0	0 0 1	1 3 3	2 2 2	
28	3 1 1	0 0 0	0 0 0	0 1 2	2 1 2	3 2 1	0 0 3	3 2 2	
29	1 3 3	2 1 1	1 0 1	2 2 2	2 2 1	0 0 0	0 0 0	1 1 2	
30	0 0 0	0 0 0	0 0 0	0 0 1	2 3 3	4 4 3	3 2 1	0 0 2	
31	3 3 0	0 0 0	0 0 0	0 0 1	2 3 3	2 0 0	1 1 1	0 2 1	

Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

October - December 2025

CALENDAR OF ALL-SKY CAMERA OBSERVATIONS

October 09 -10

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 10 -11

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 11 - 12

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 12 - 13

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 13 - 14

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 14- 15

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 15 - 16

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

October 16 - 17

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM		—————														

CALENDAR OF ALL-SKY CAMERA OBSERVATIONS

October 25 - 26

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM																

October 26 -27

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM																

October 27 - 28

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM																

October 28 - 29

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM																

October 29 - 30

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																
TUM																

October30 - 31

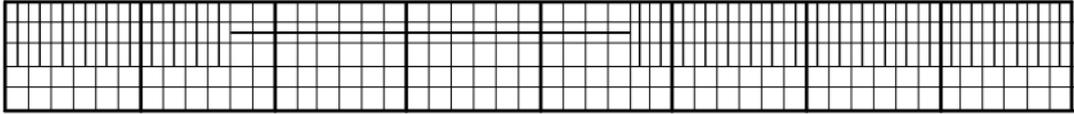
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LOZ																
TUM			_____													

October 31

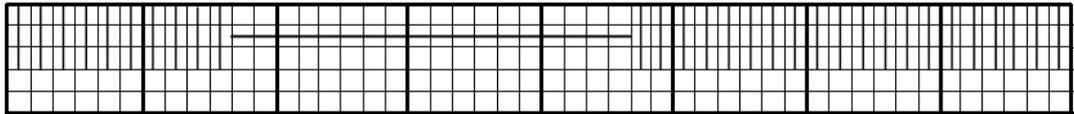
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LOZ																
TUM	_____															

Lovozero ascaplots

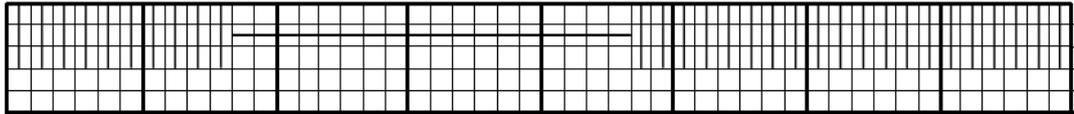
Nov. 01, 2025



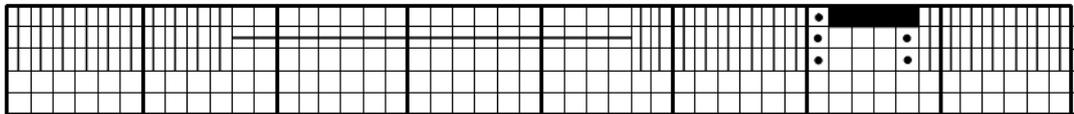
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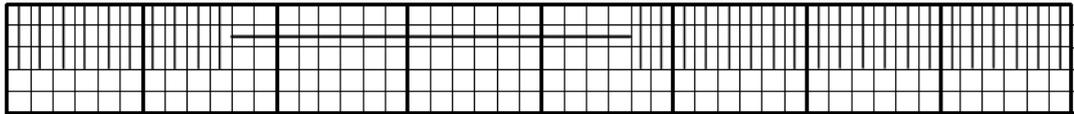
Nov. 03, 2025



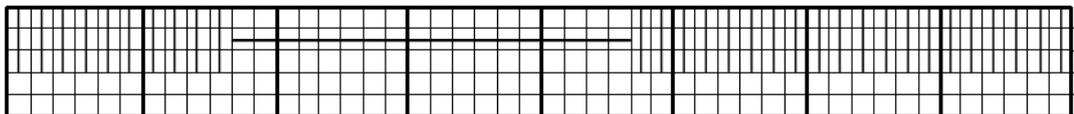
Nov. 04, 2025



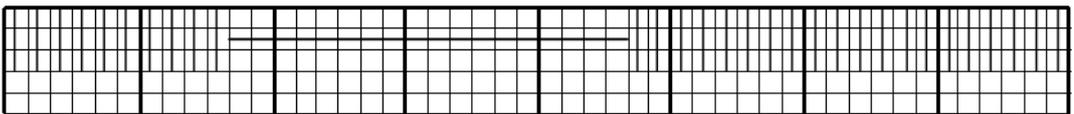
Nov. 05, 2025



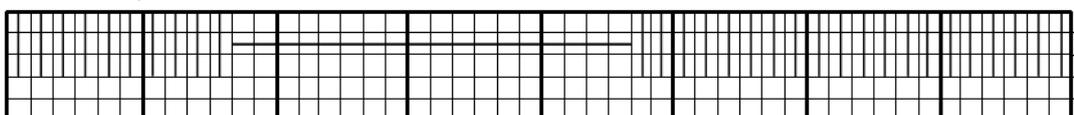
Nov. 06, 2025



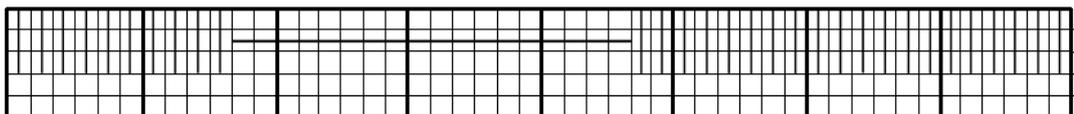
Nov. 07, 2025



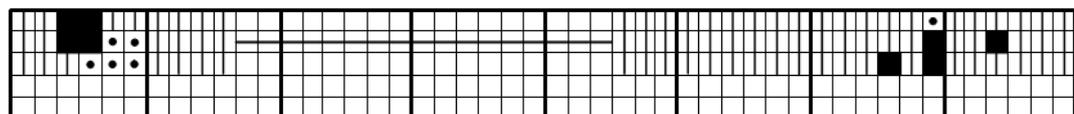
Nov. 08, 2025



Nov. 09, 2025



Nov. 10, 2025



00

06

12

18

24

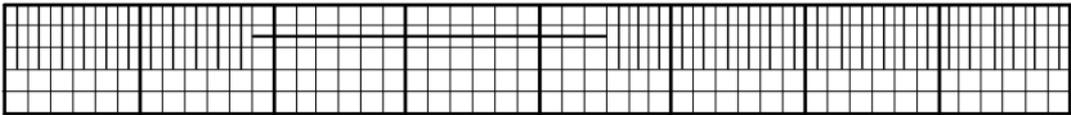
Universal Time

Lovozero ascaplots

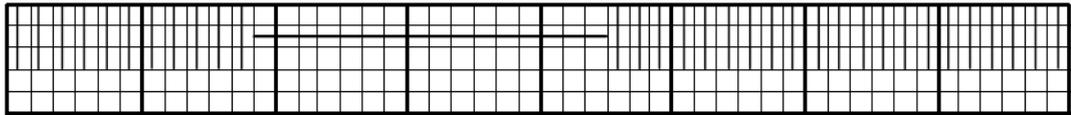
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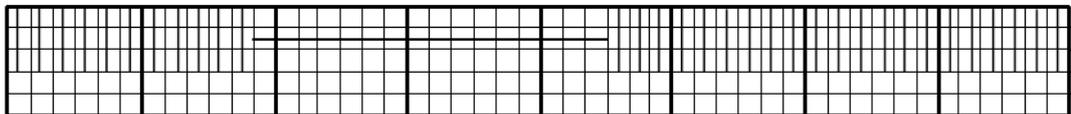
Nov. 12, 2025



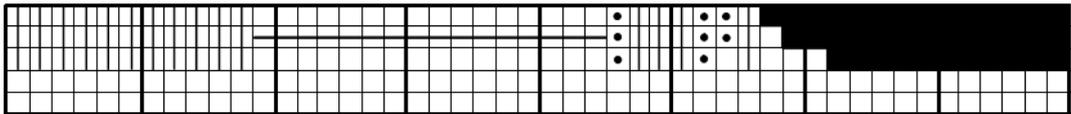
Nov. 13, 2025



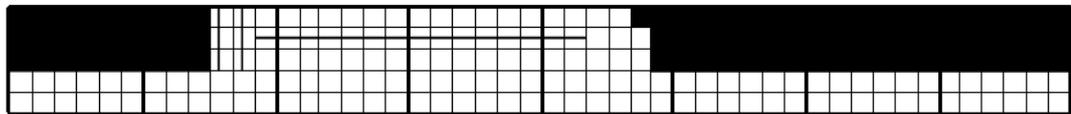
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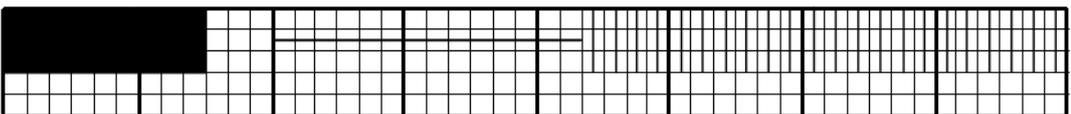
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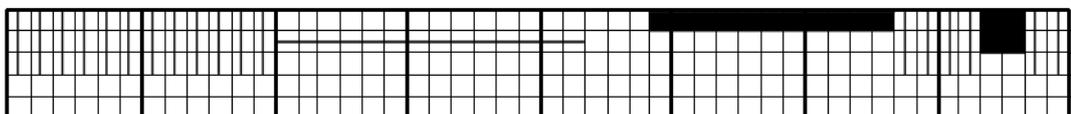
Nov. 16, 2025



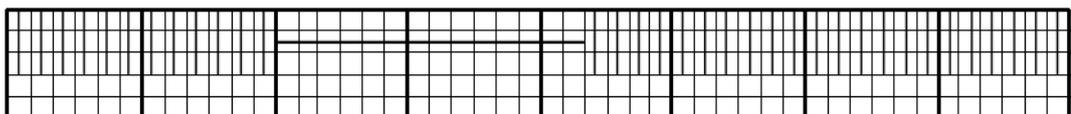
Nov. 17, 2025



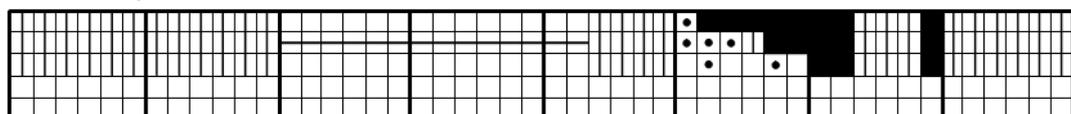
Nov. 18, 2025



Nov. 19, 2025



Nov. 20, 2025



00

06

12

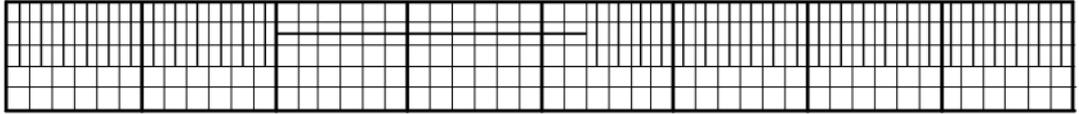
18

24

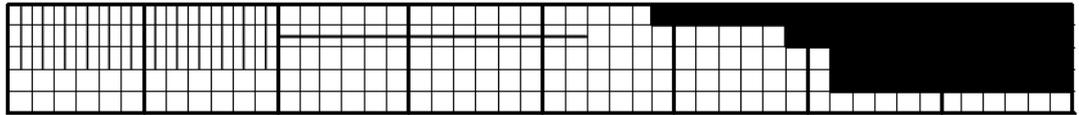
Universal Time

Lovozero ascaplots

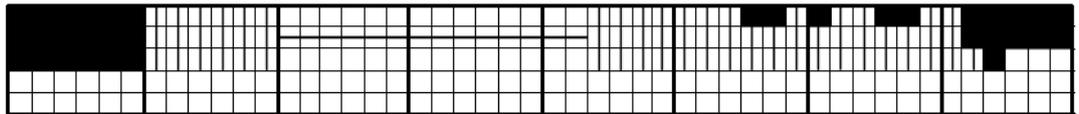
Nov. 21, 2025



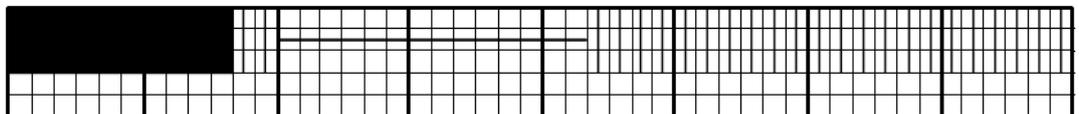
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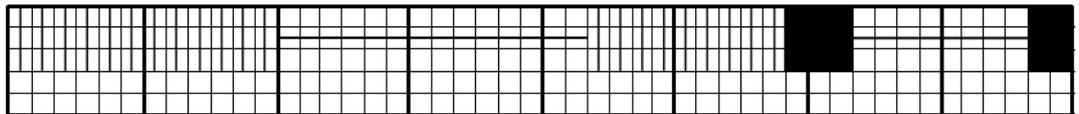
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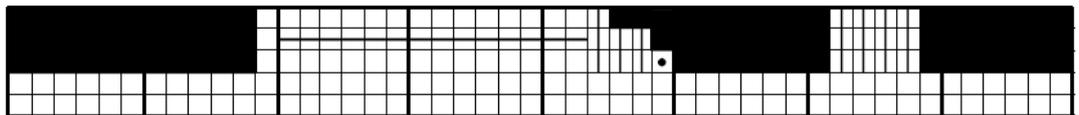
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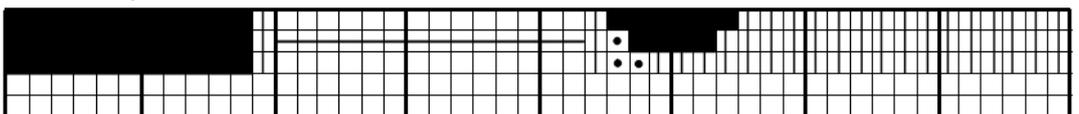
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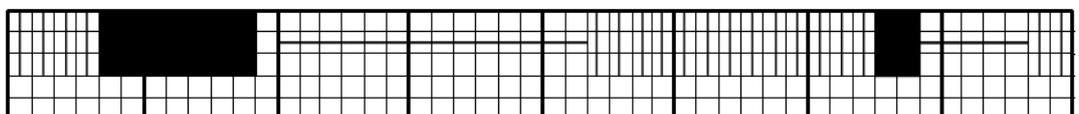
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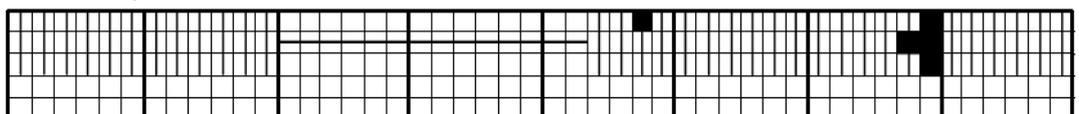
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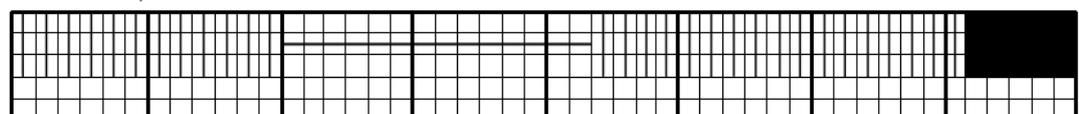
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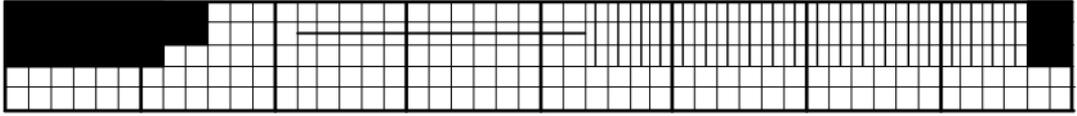
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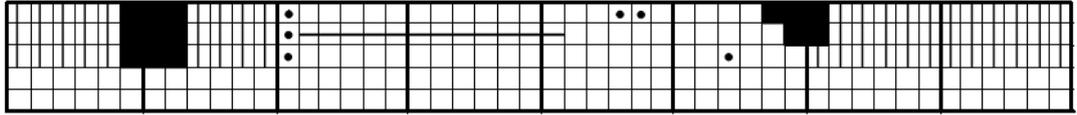
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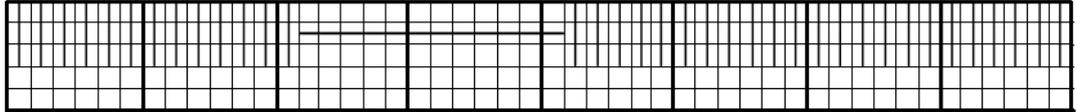
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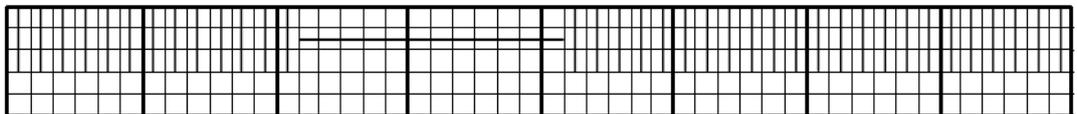
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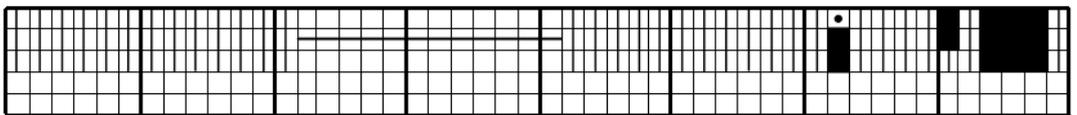
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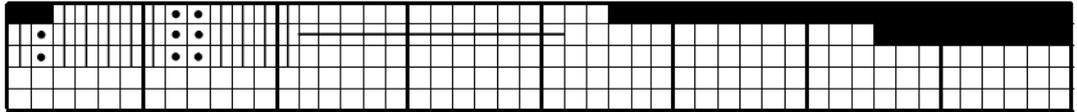
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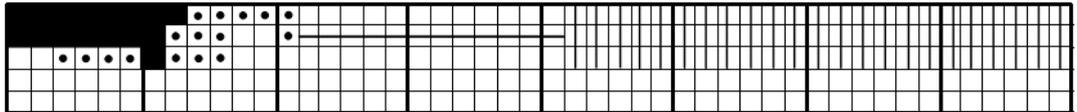
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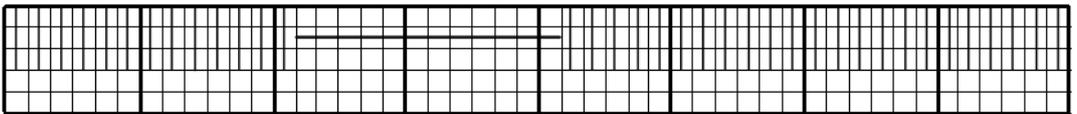
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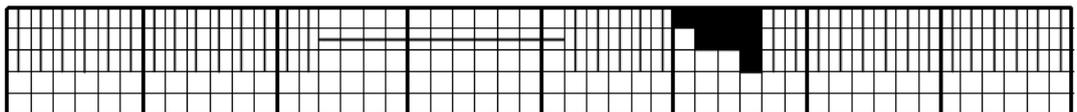
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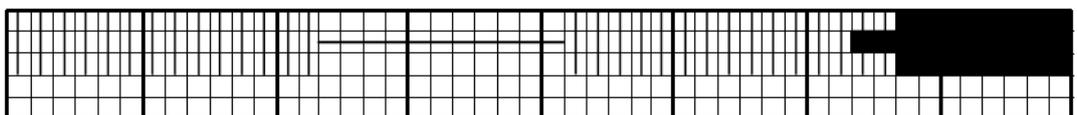
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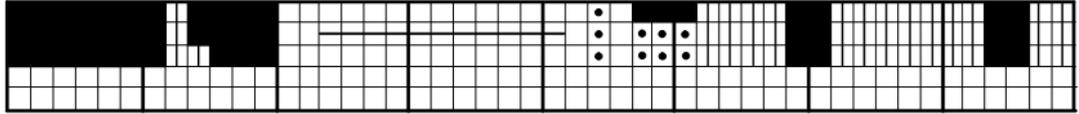
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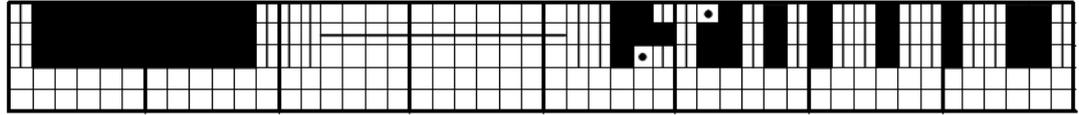
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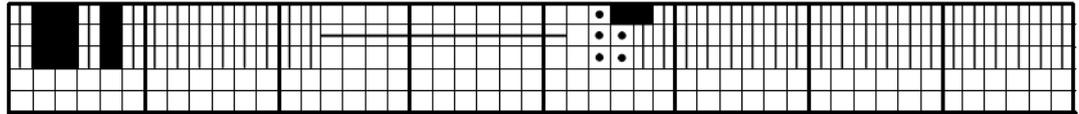
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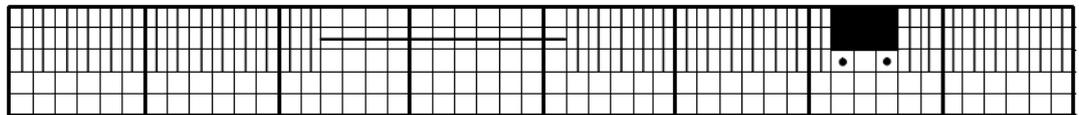
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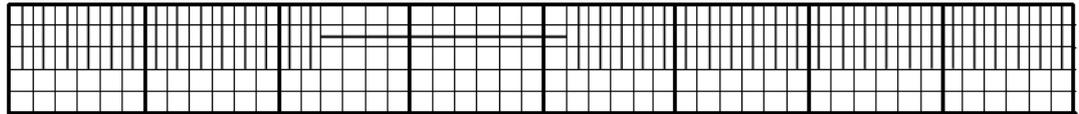
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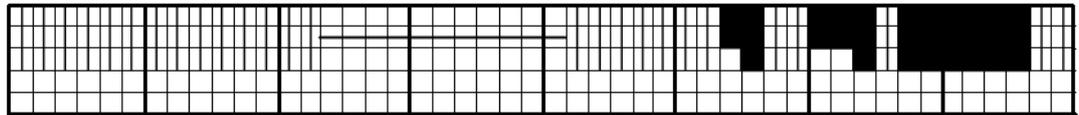
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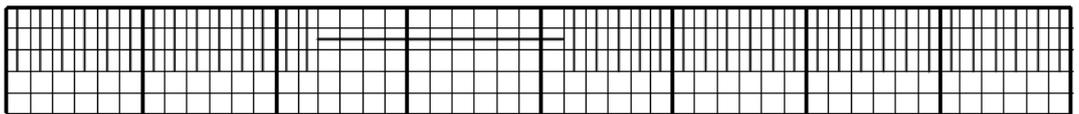
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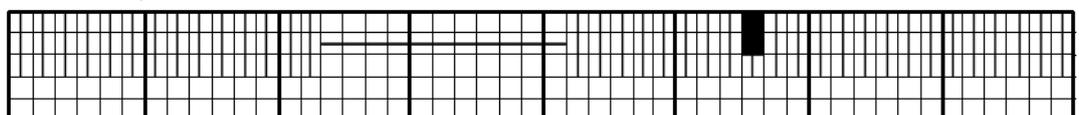
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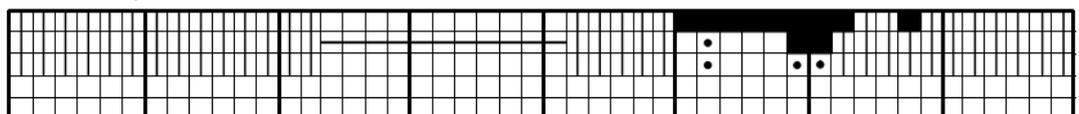
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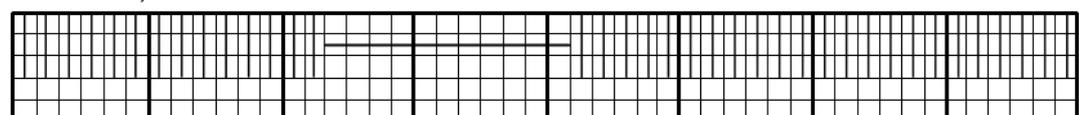
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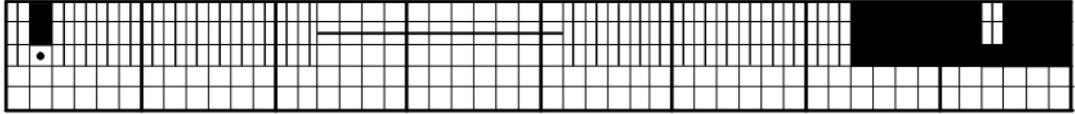
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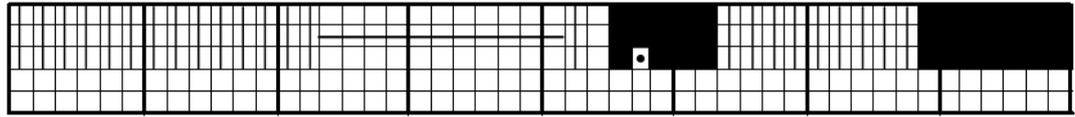
Universal Time

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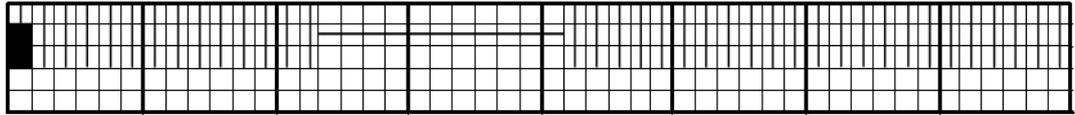
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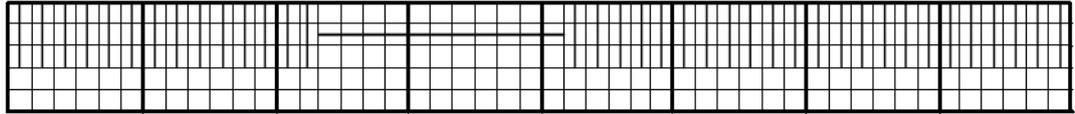
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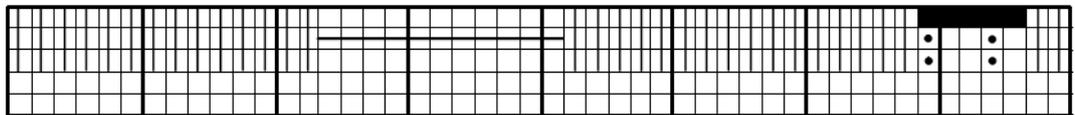
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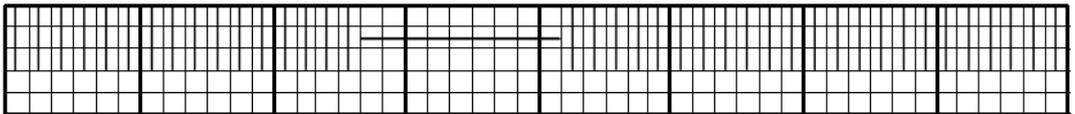
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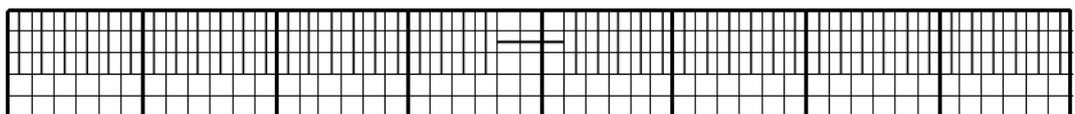
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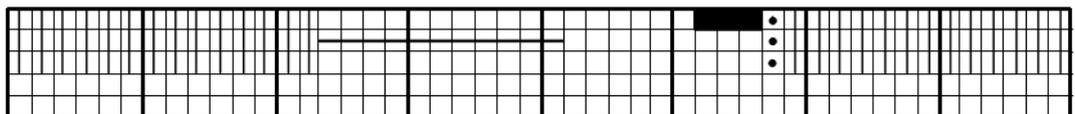
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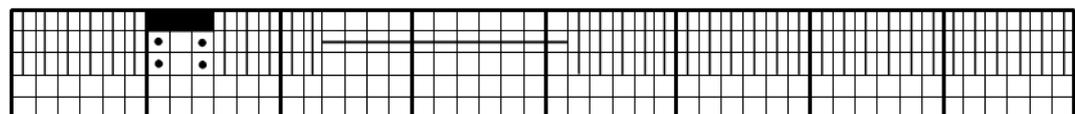
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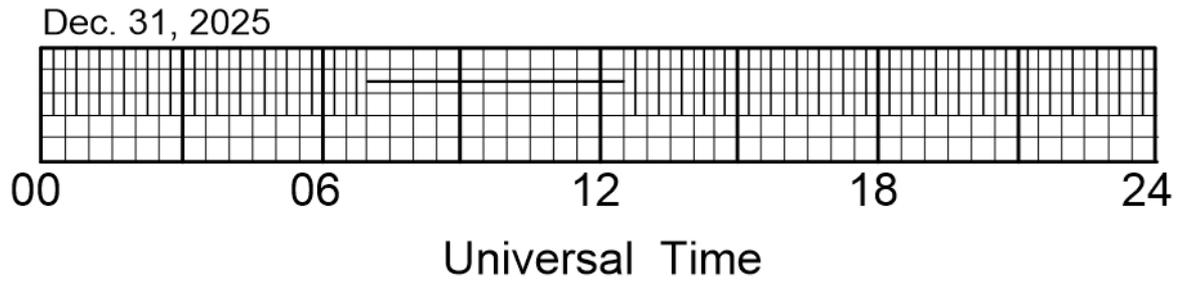


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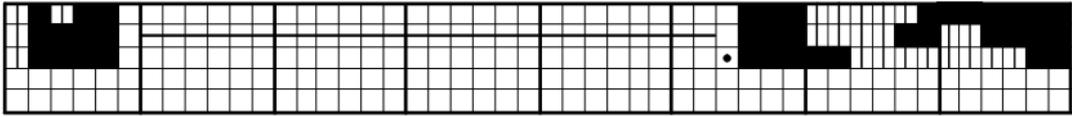
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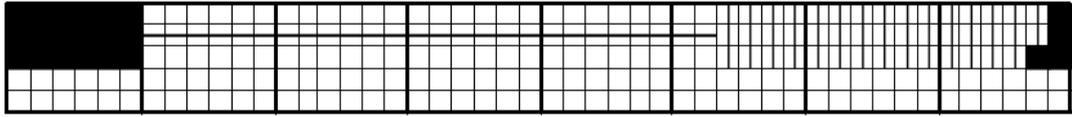


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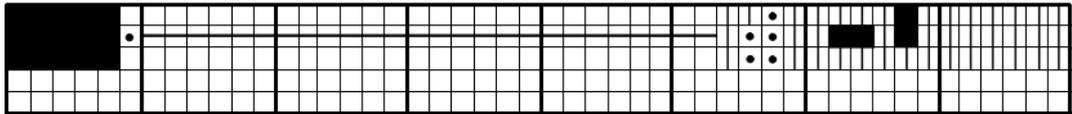
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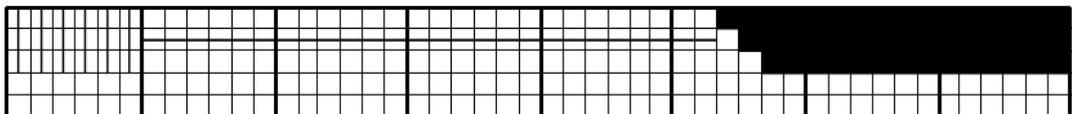
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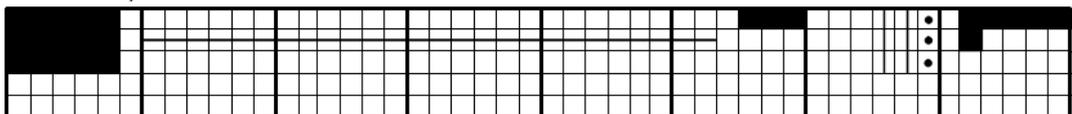
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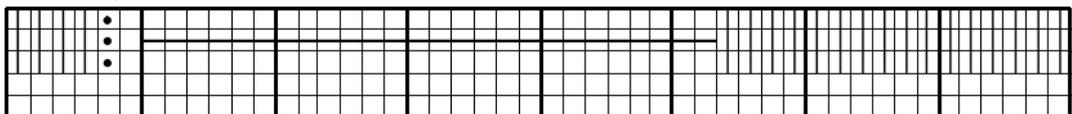
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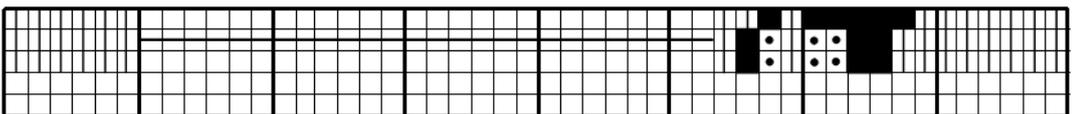
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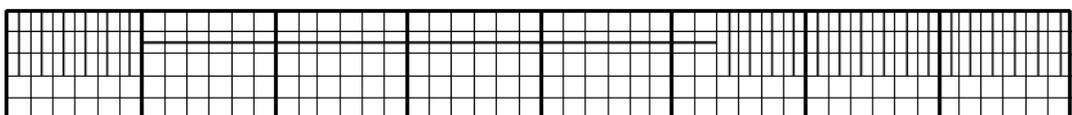
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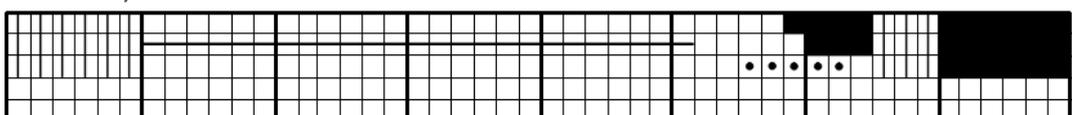
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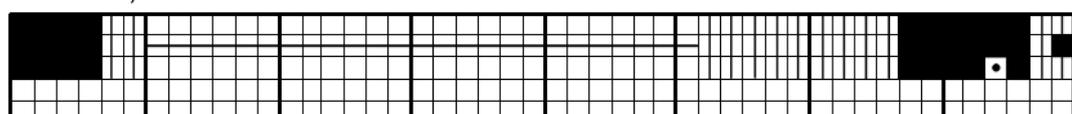
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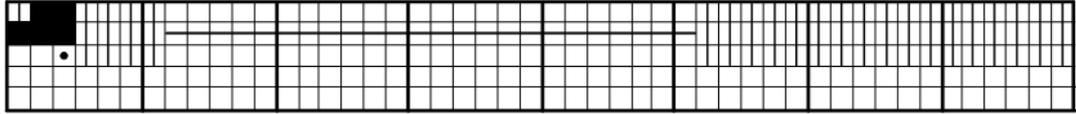
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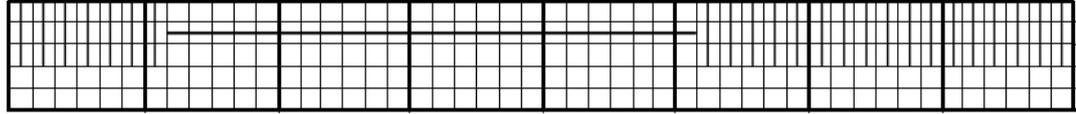
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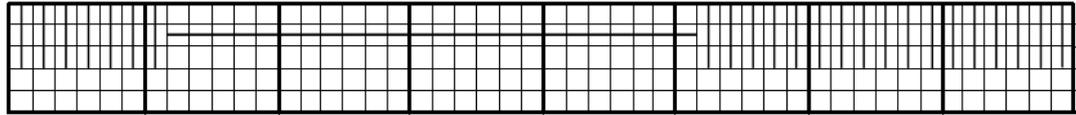
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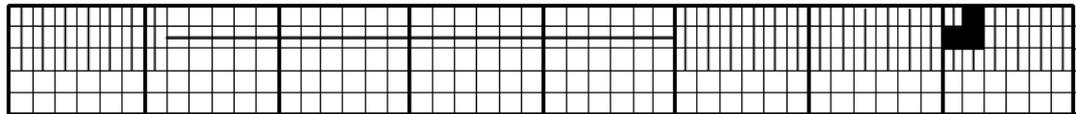
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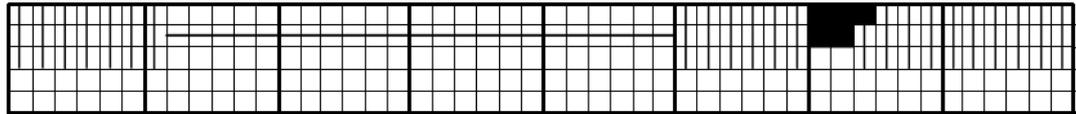
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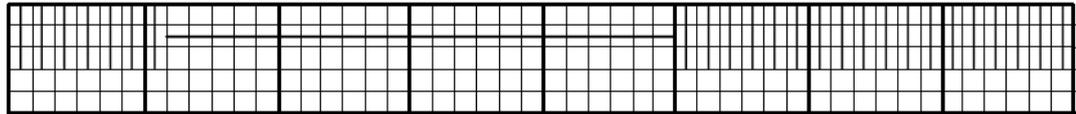
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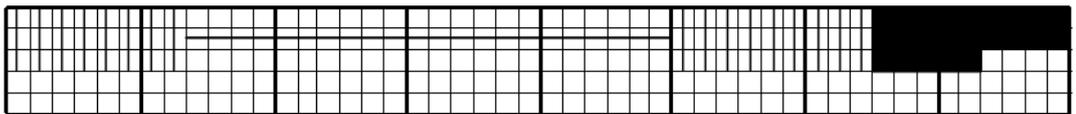
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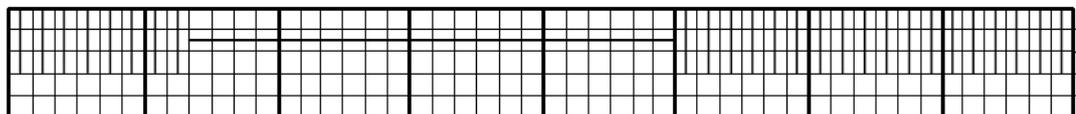
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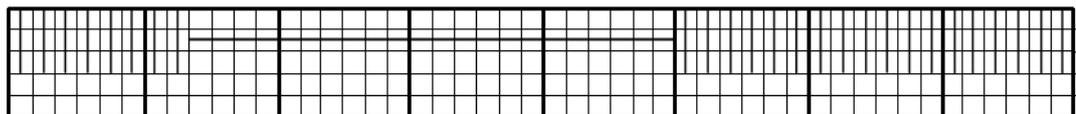
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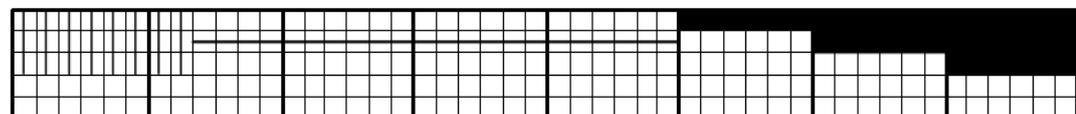
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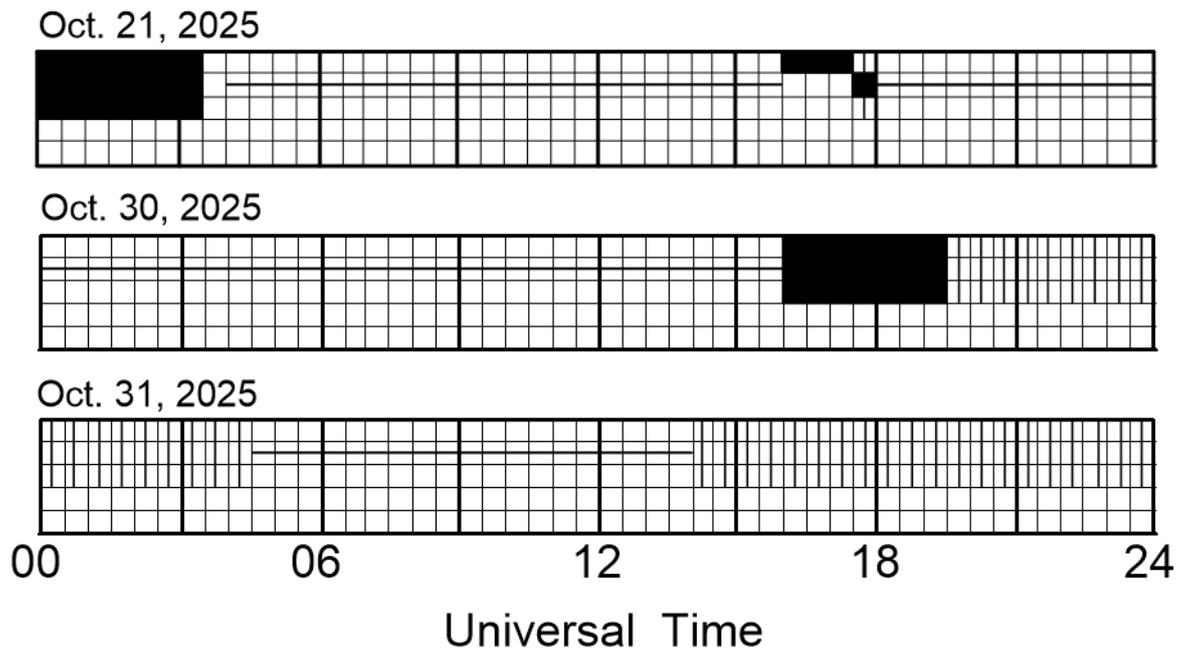
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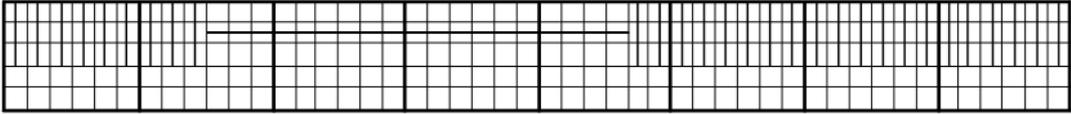
Universal Time

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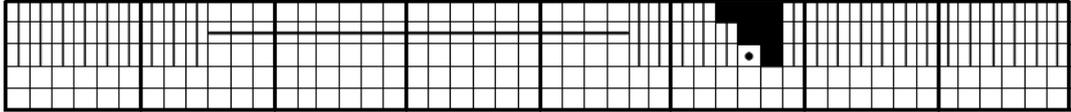


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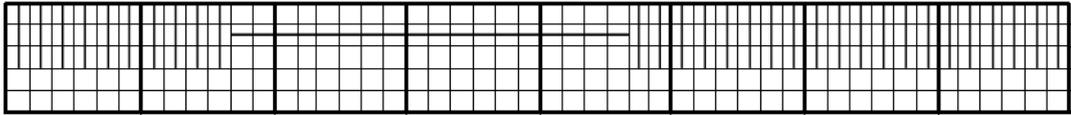
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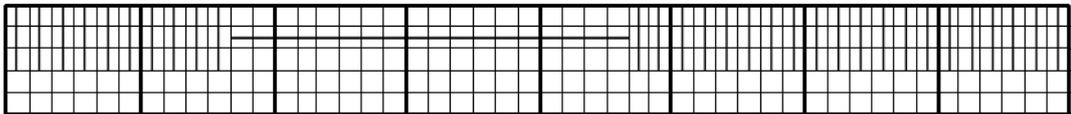
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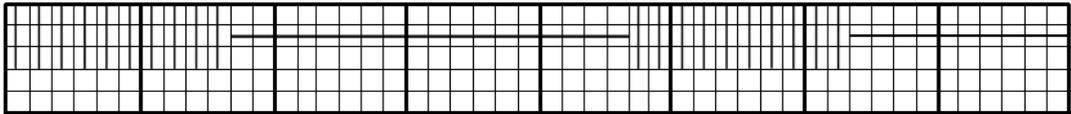
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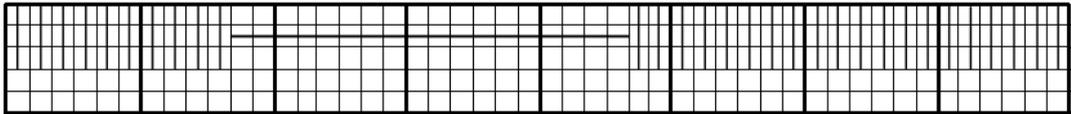
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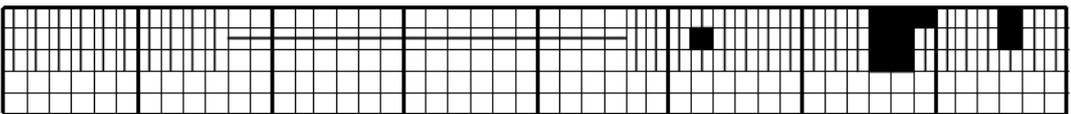
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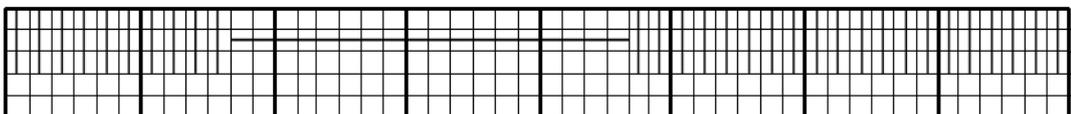
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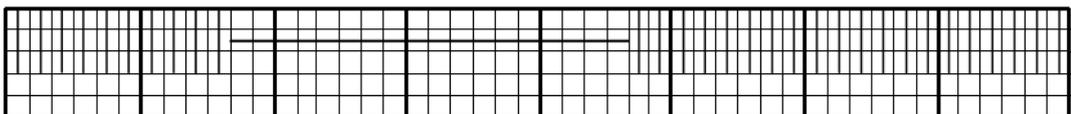
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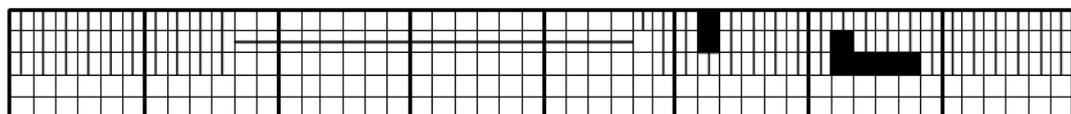
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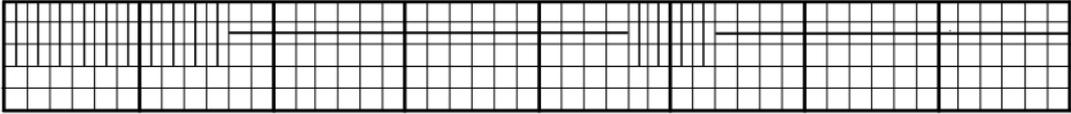
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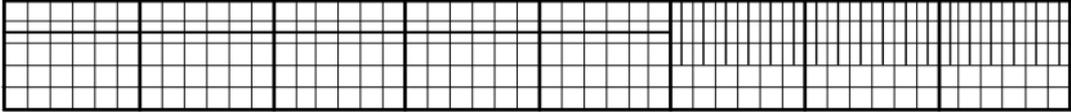
Universal Time

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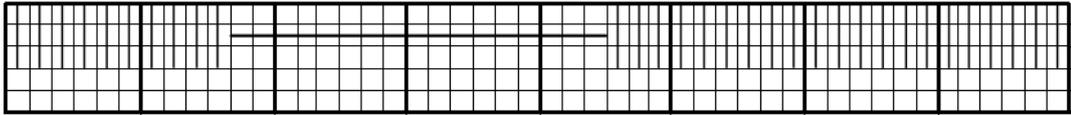
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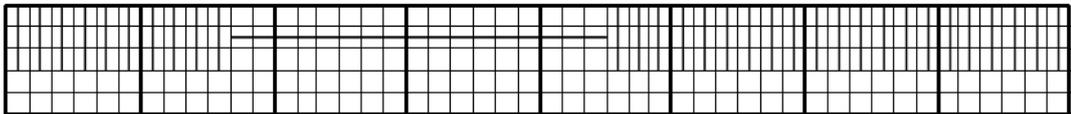
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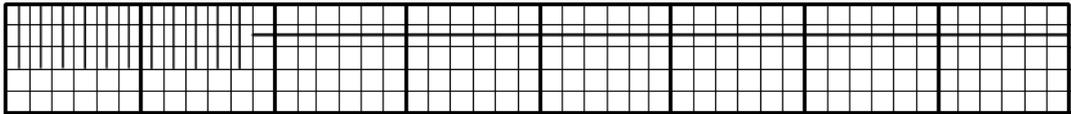
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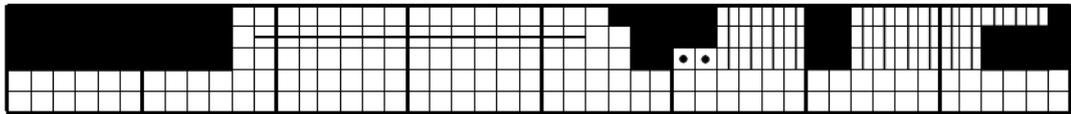
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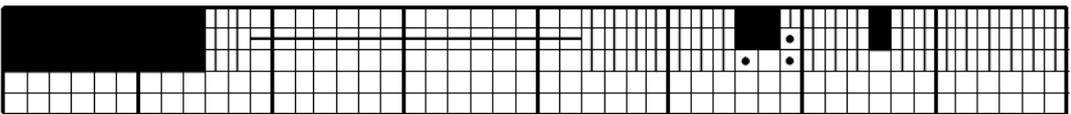
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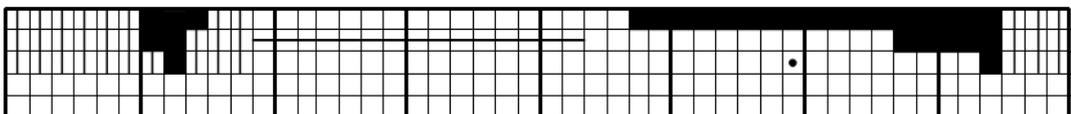
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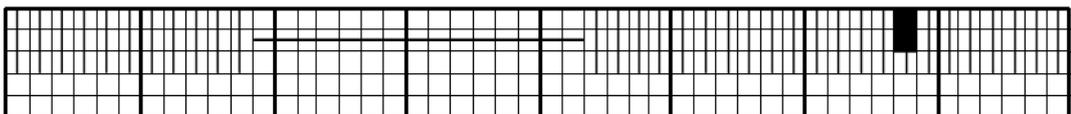
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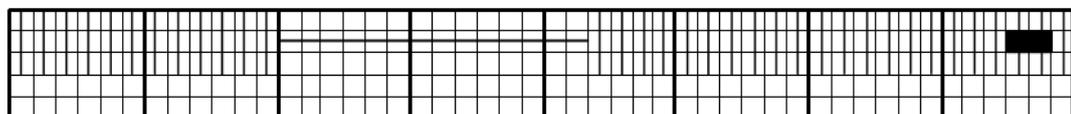
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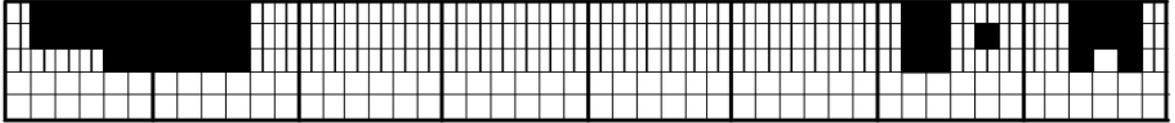
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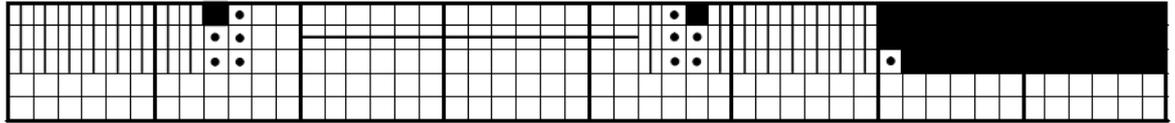
Universal Time

Tumanny ascaplots

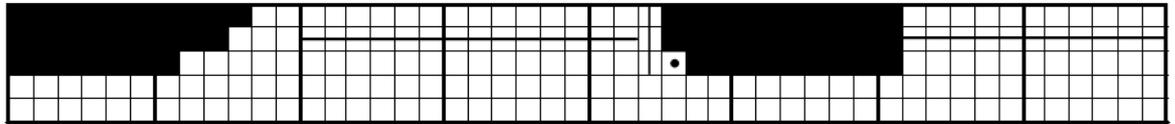
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Nov. 22, 2025



Nov. 23, 2025



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12

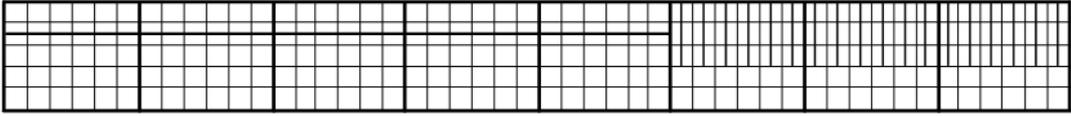
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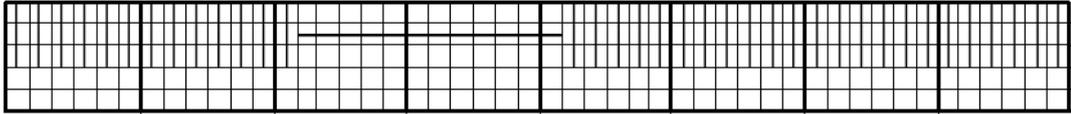
Universal Time

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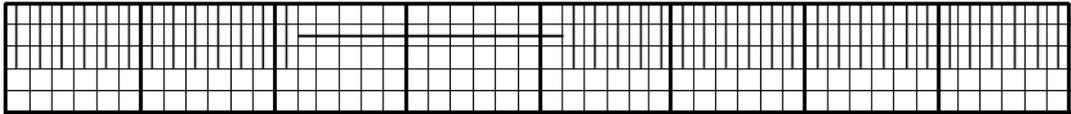
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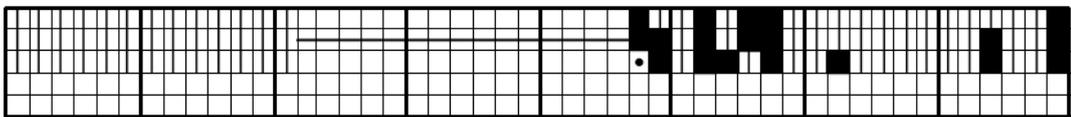
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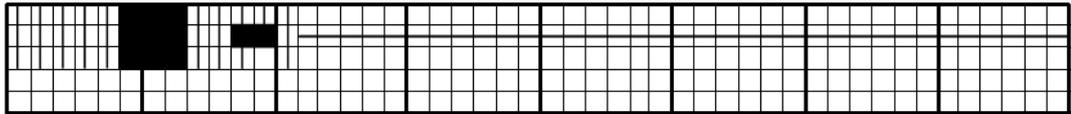
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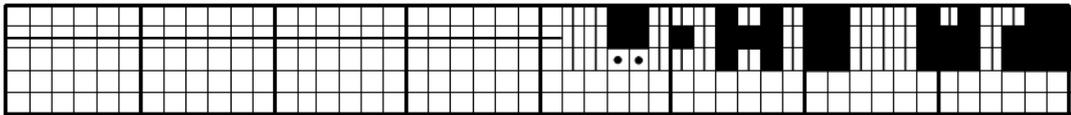
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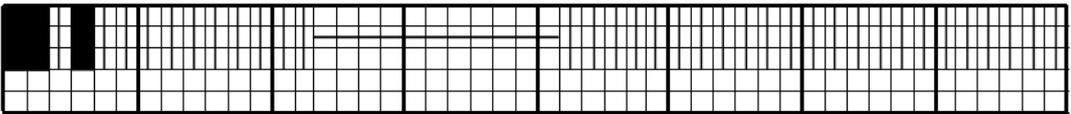
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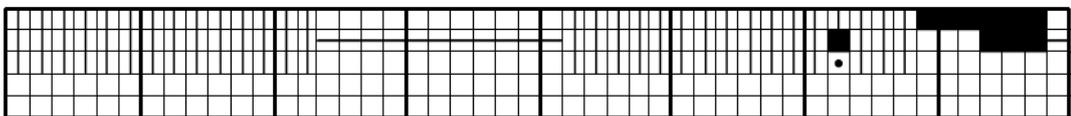
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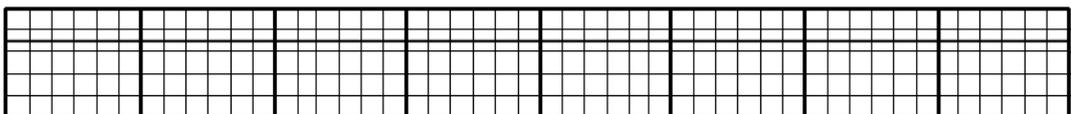
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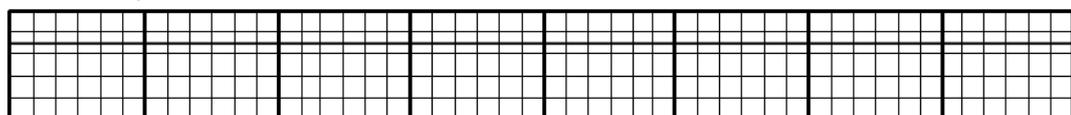
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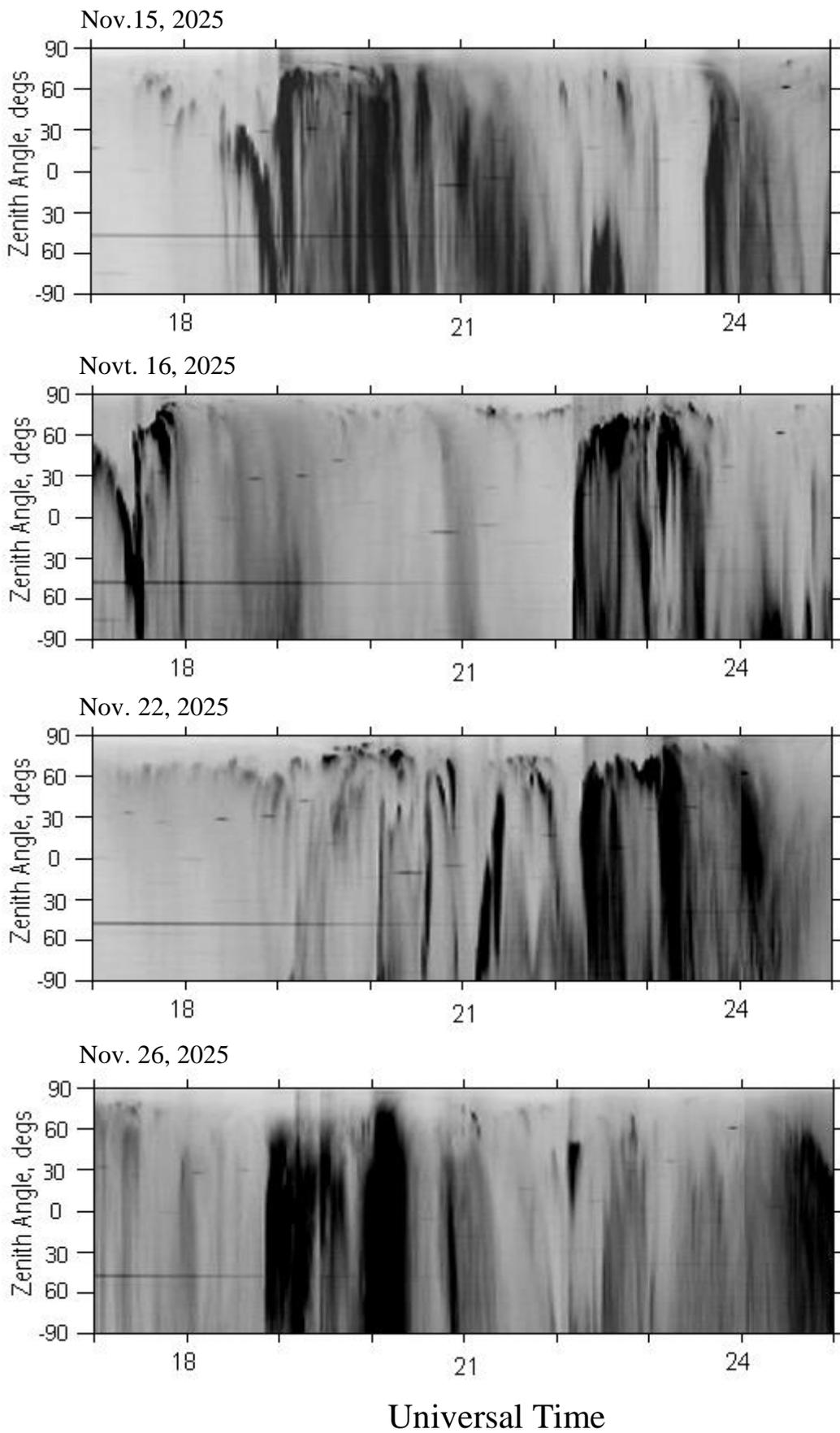
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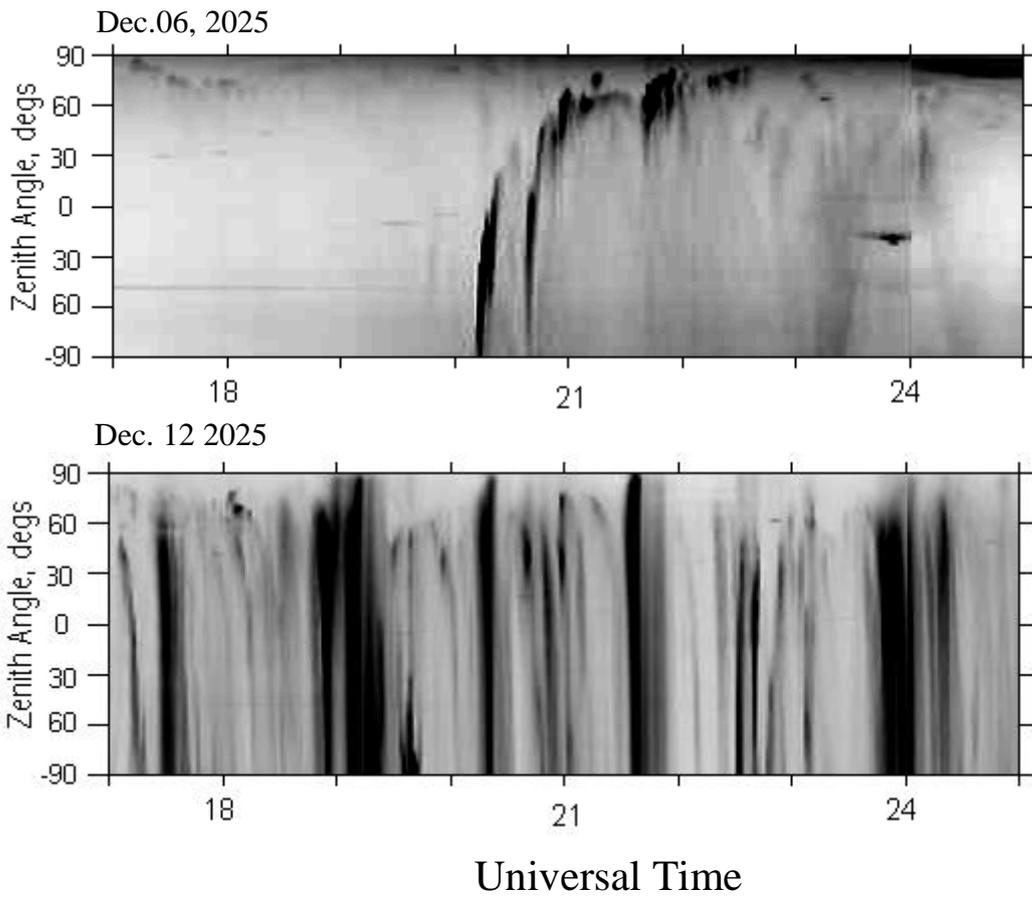
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Universal Time

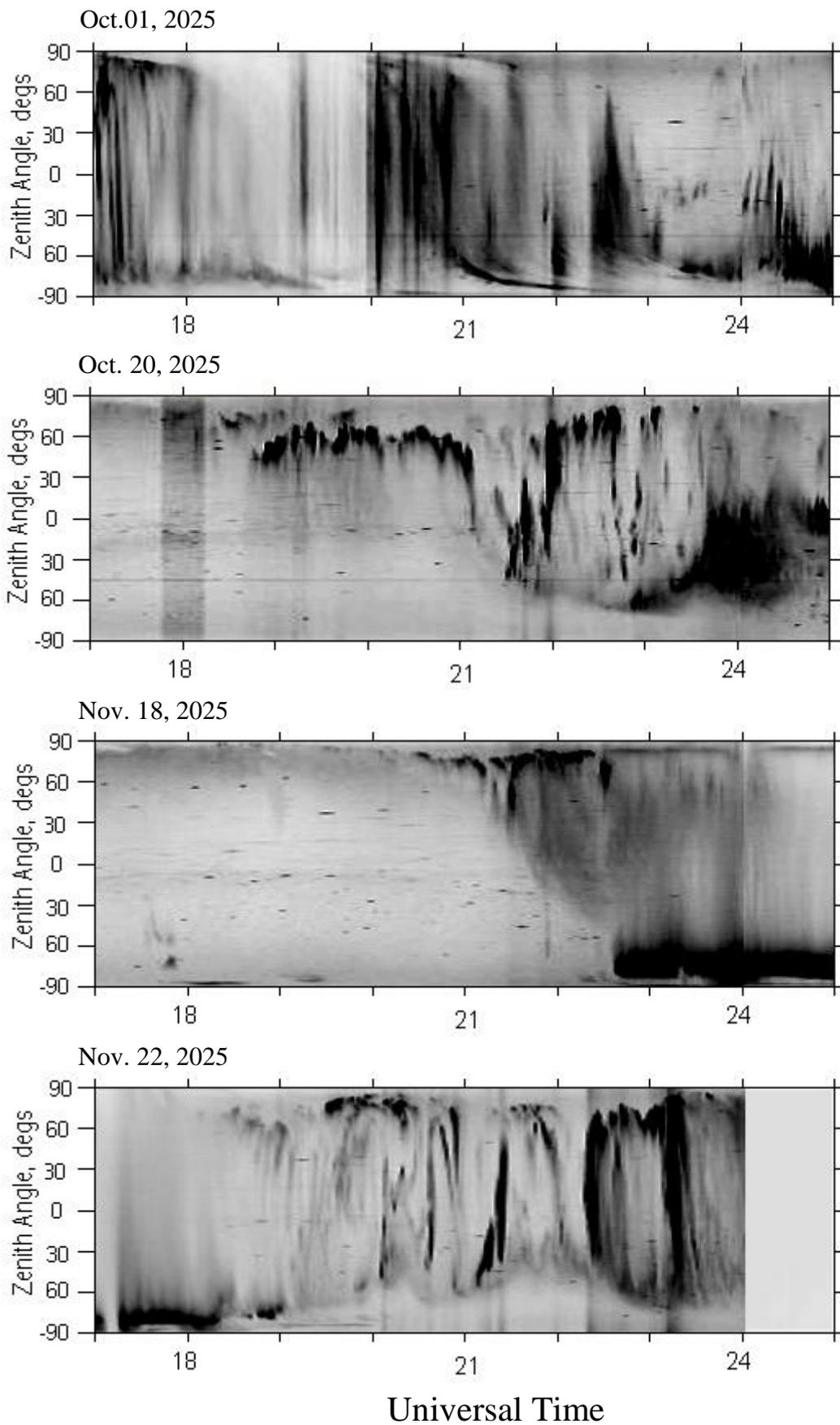
Lovozero TV keograms



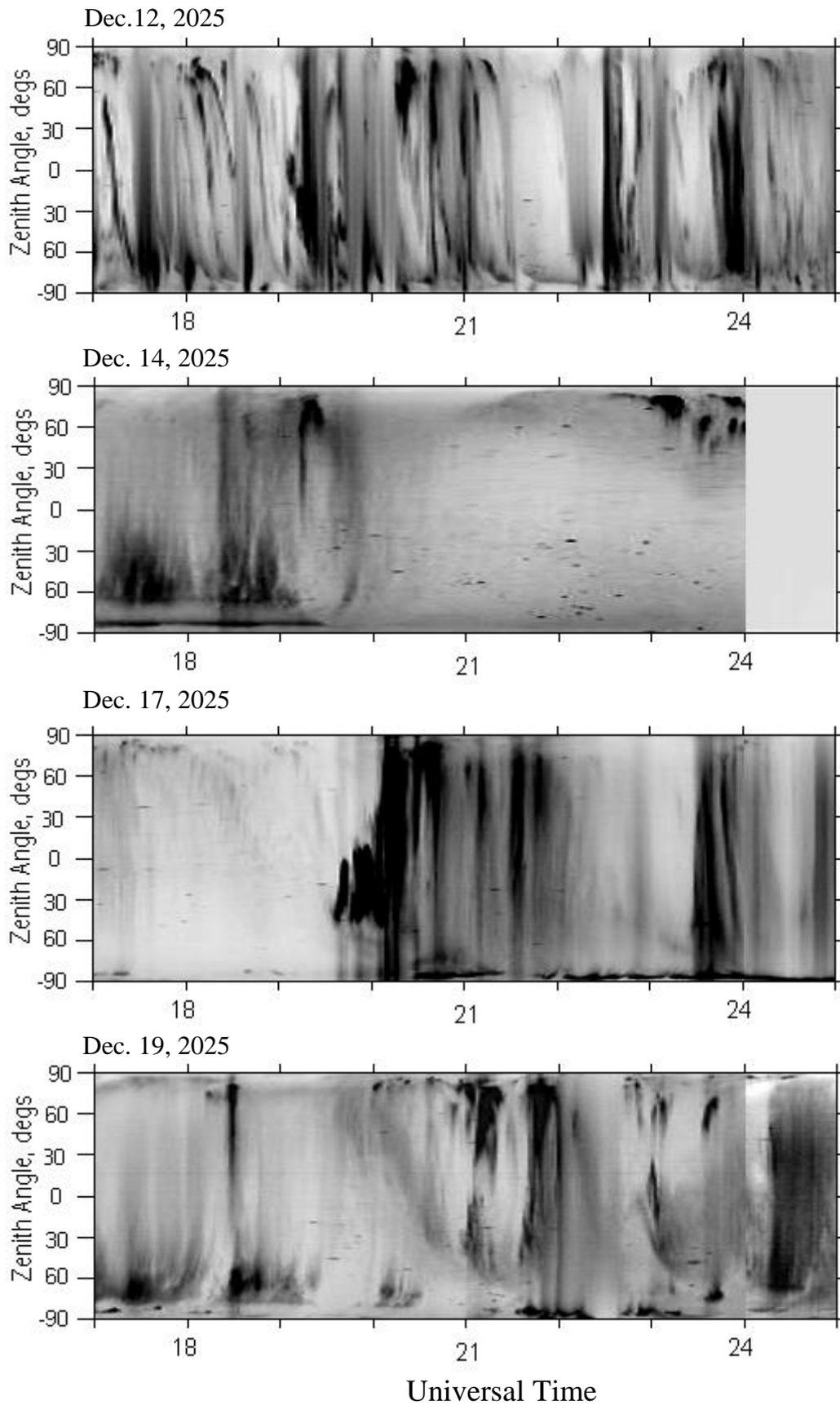
Lovozero TV keograms



Tumanny TV keograms



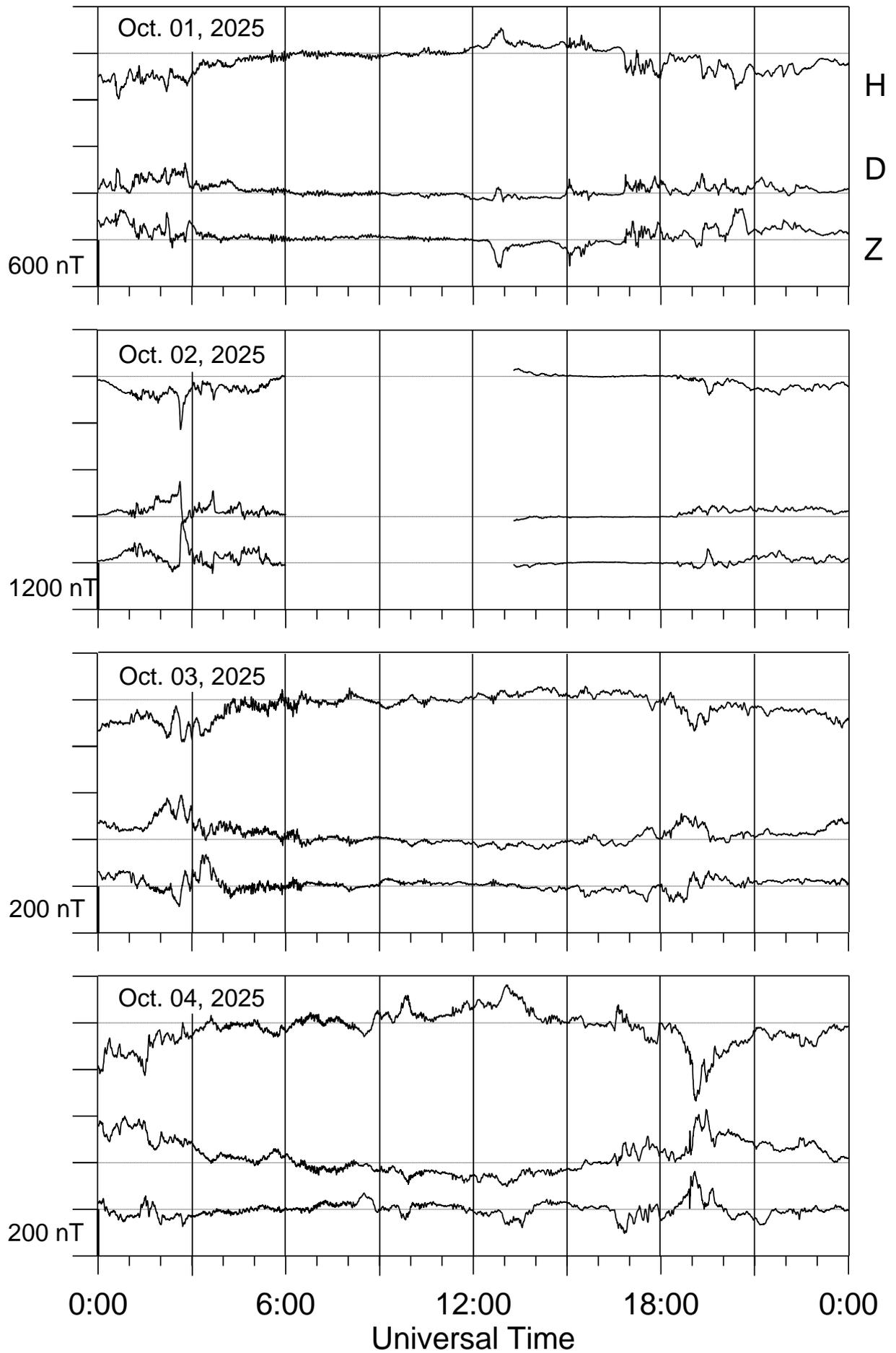
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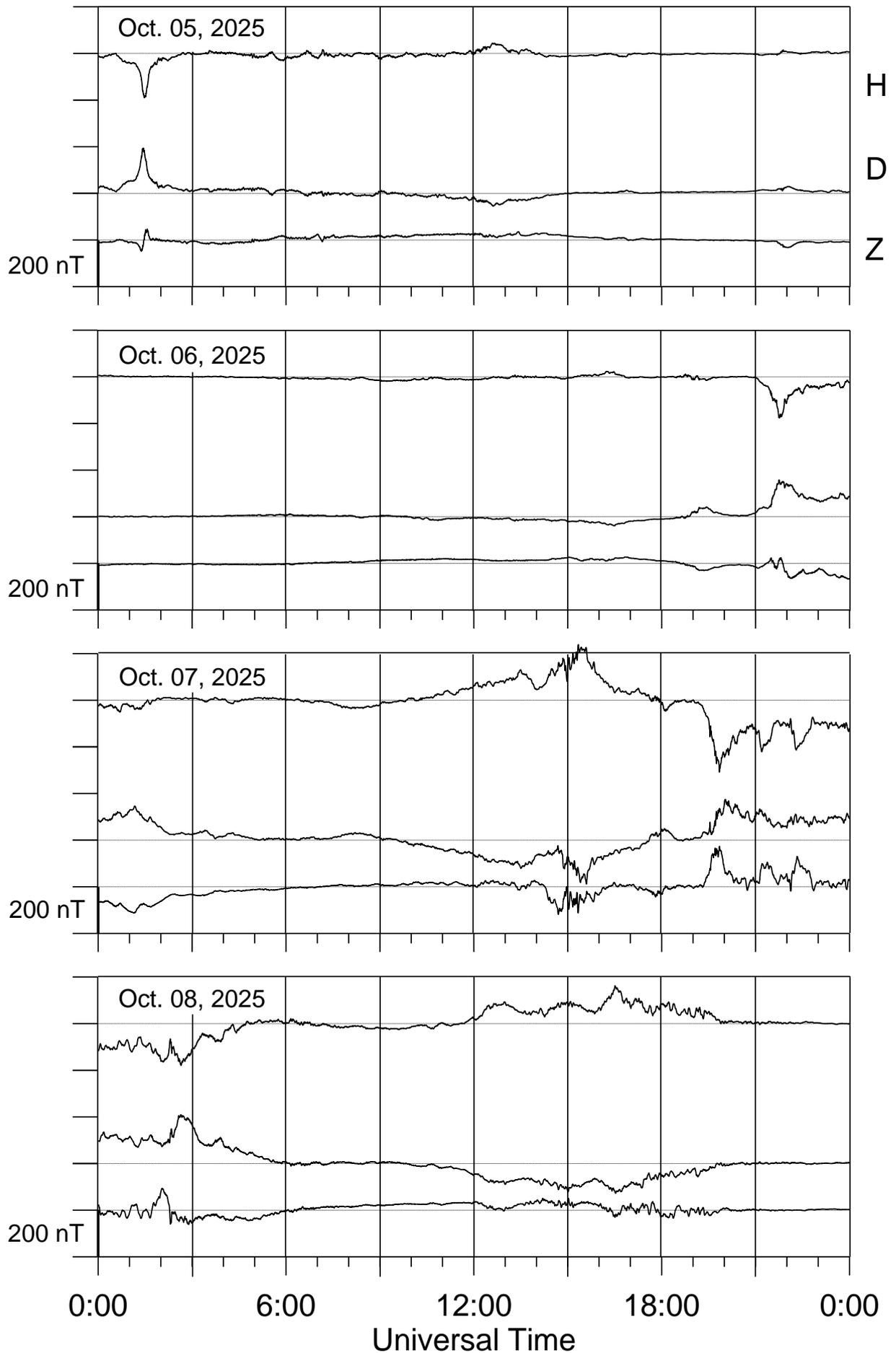
LOVOZERO MAGNETOGRAMS

October - December 2025

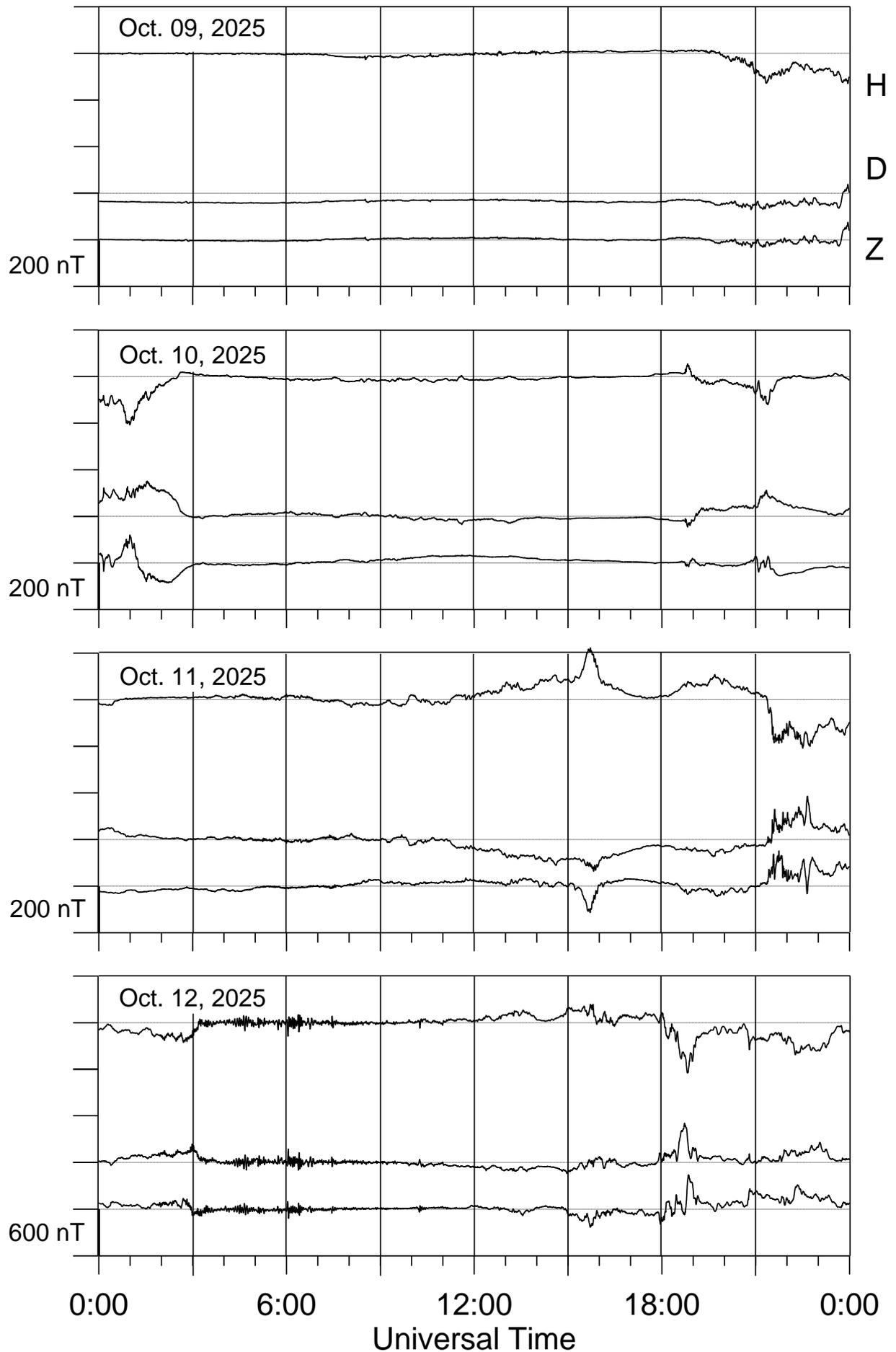
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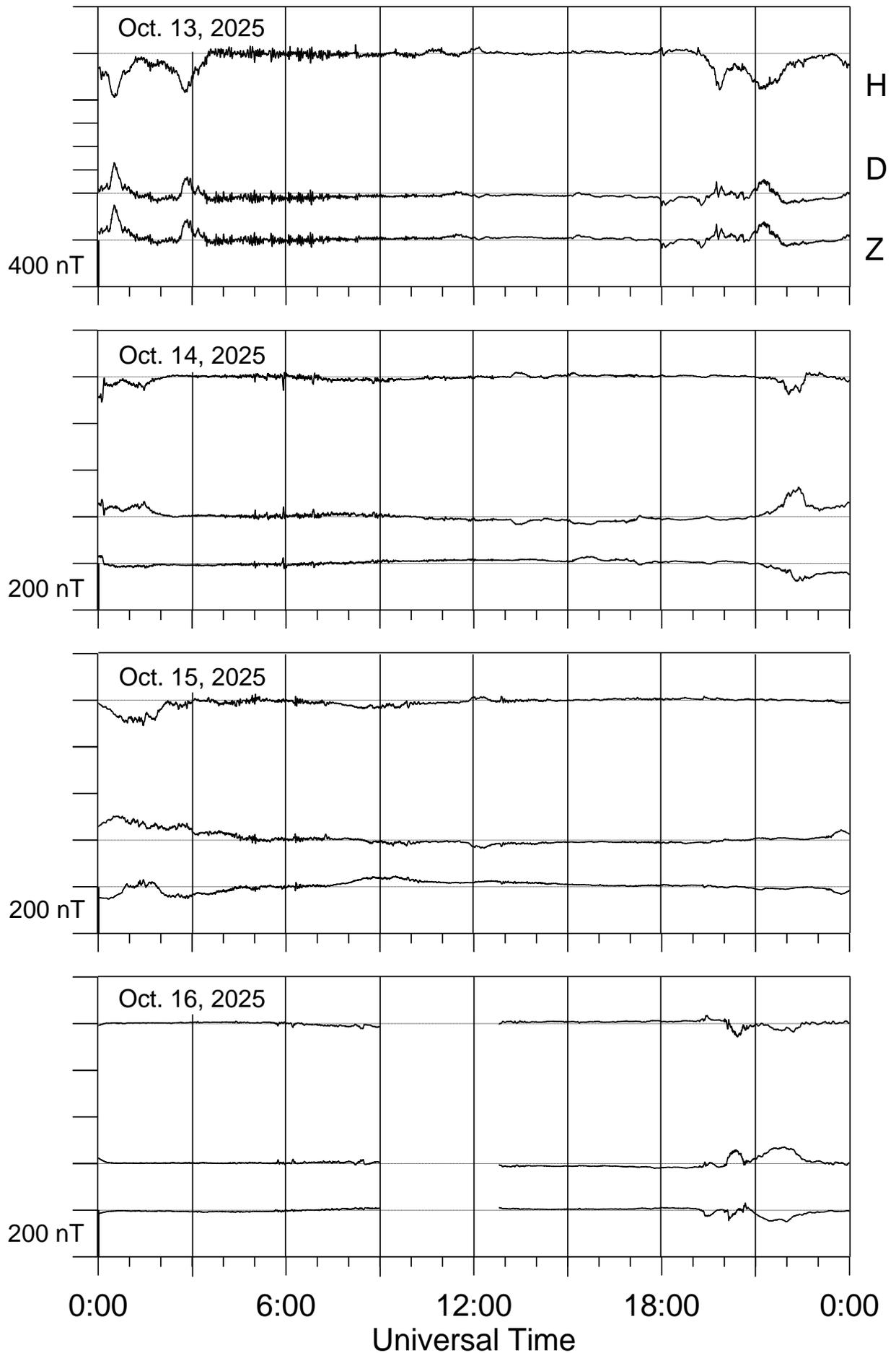
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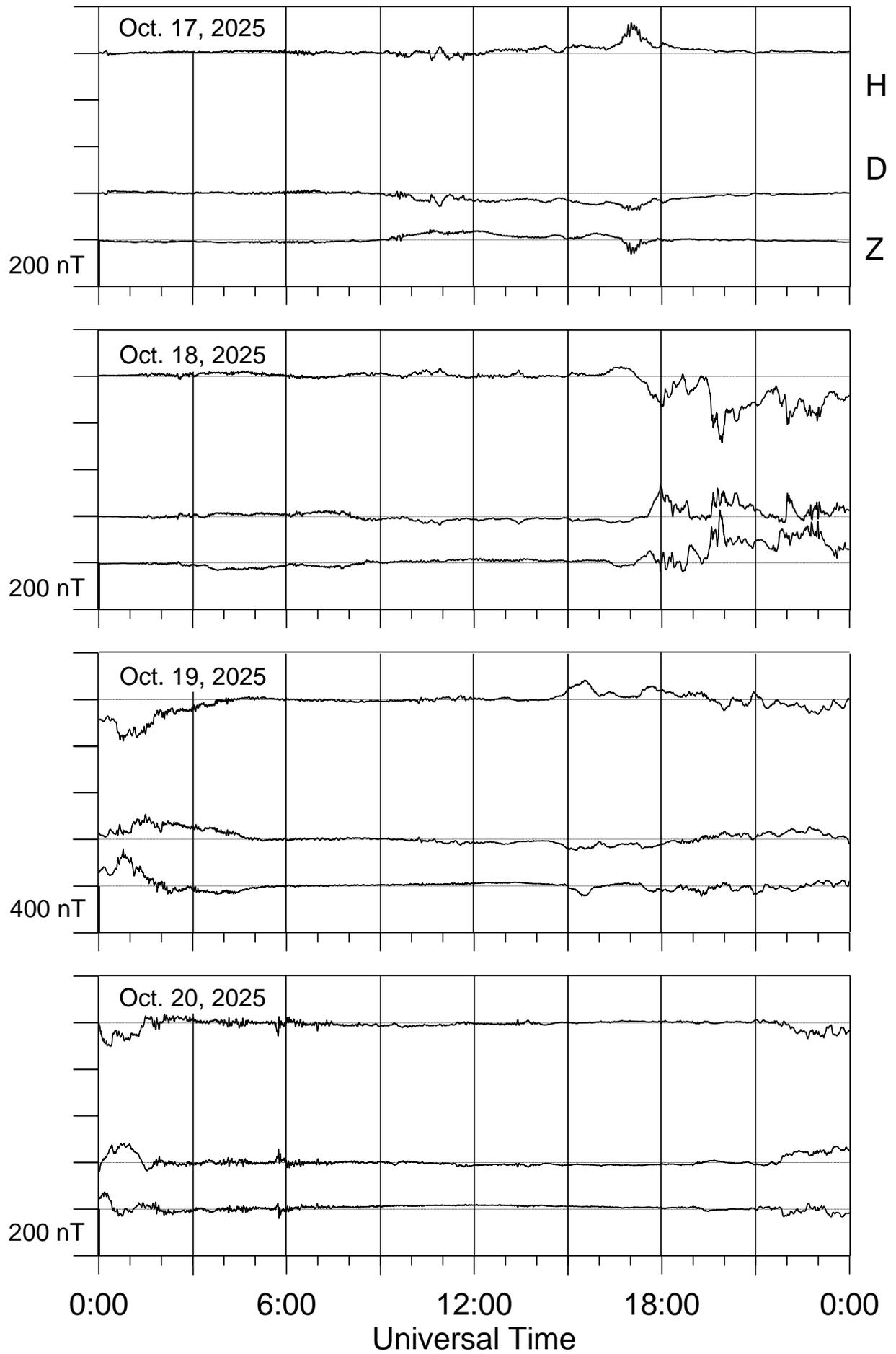
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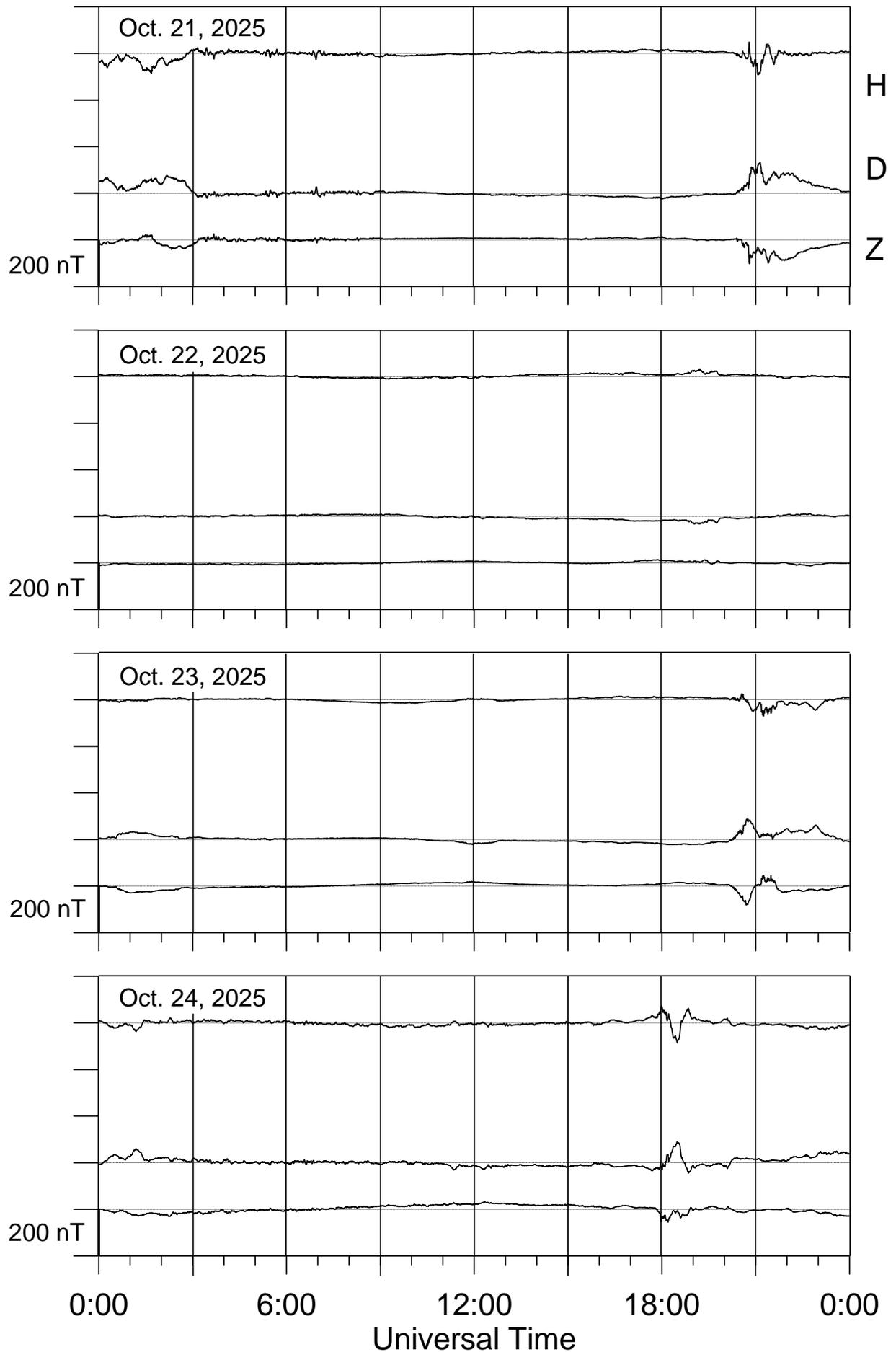
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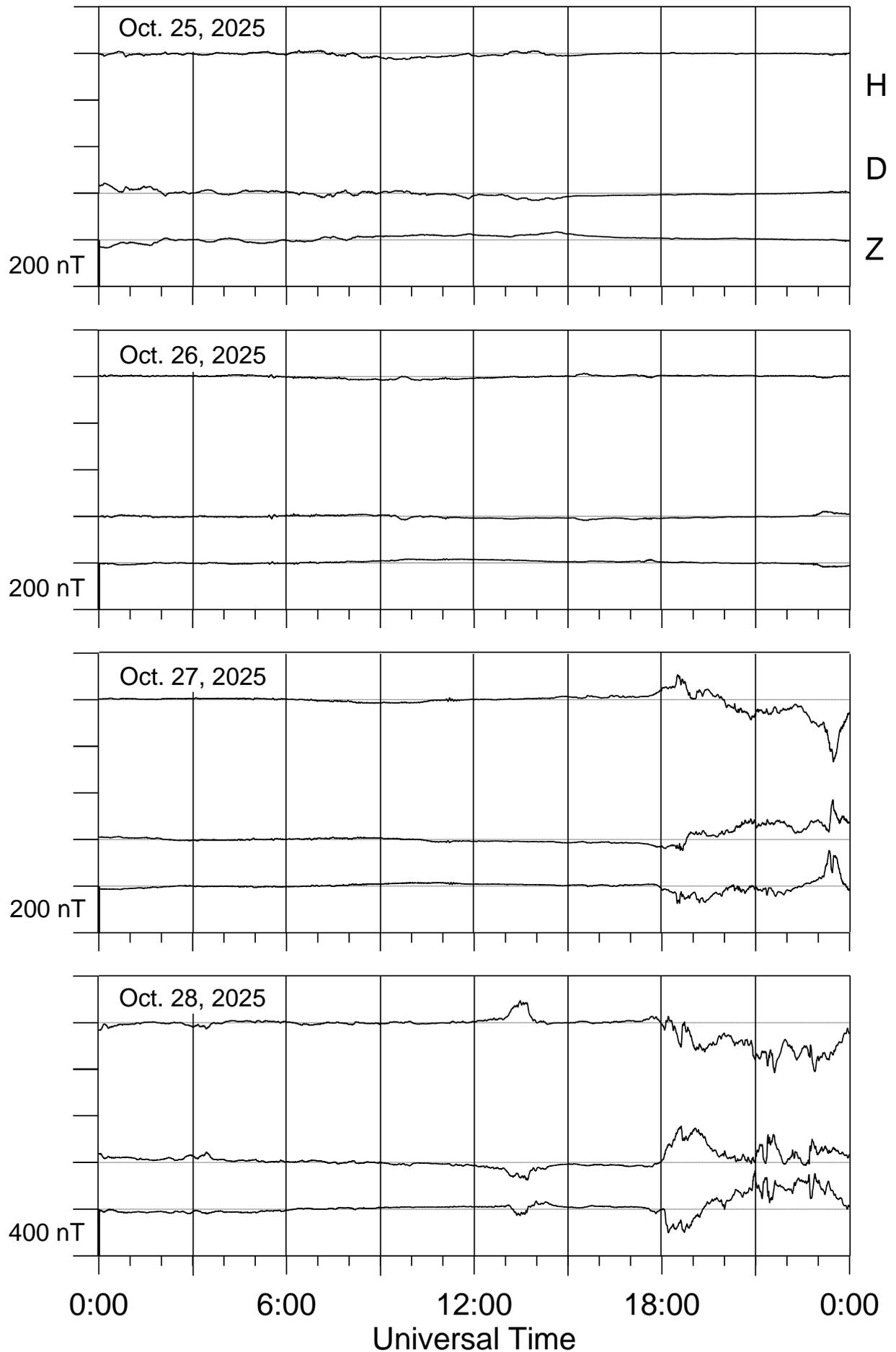
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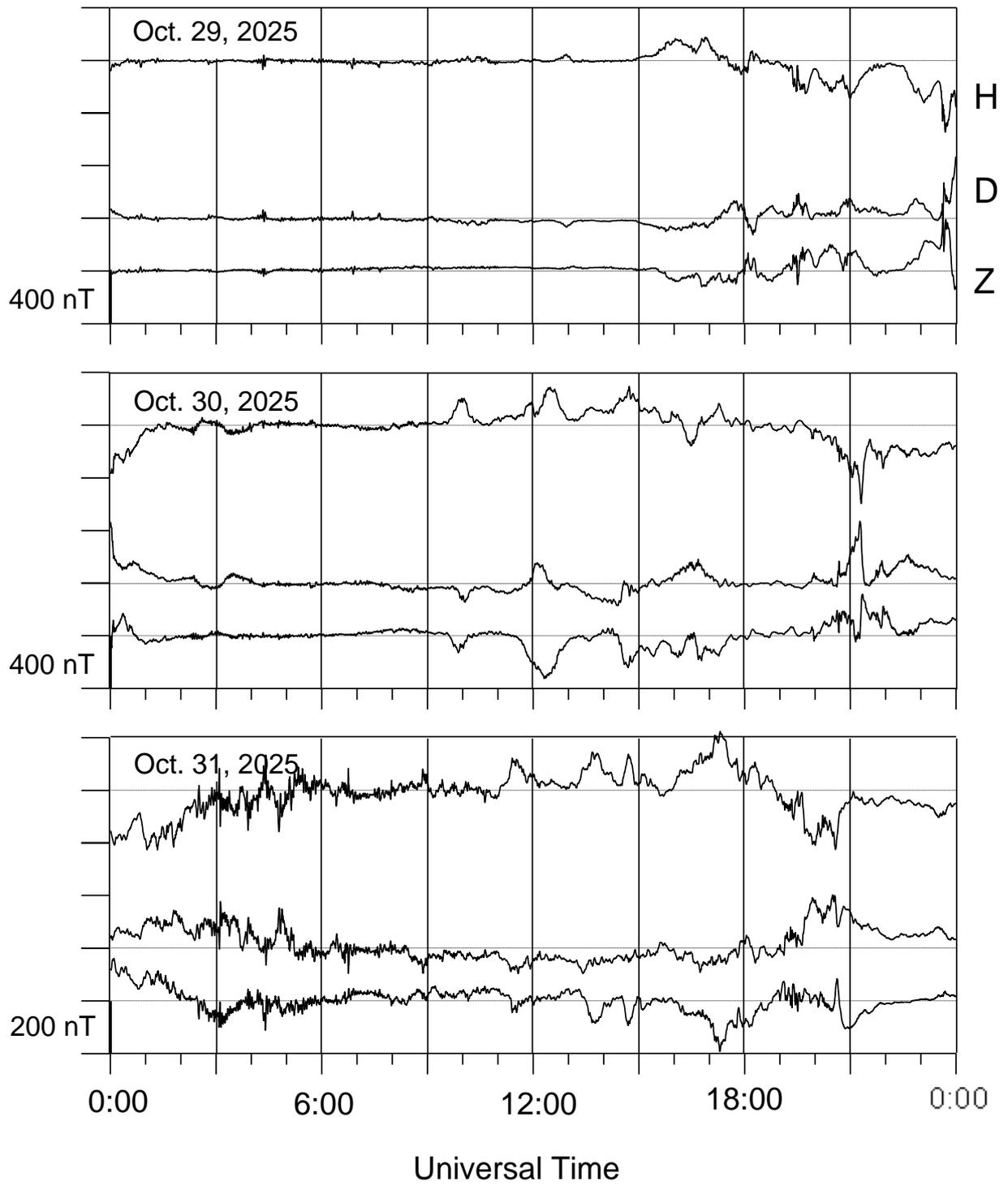
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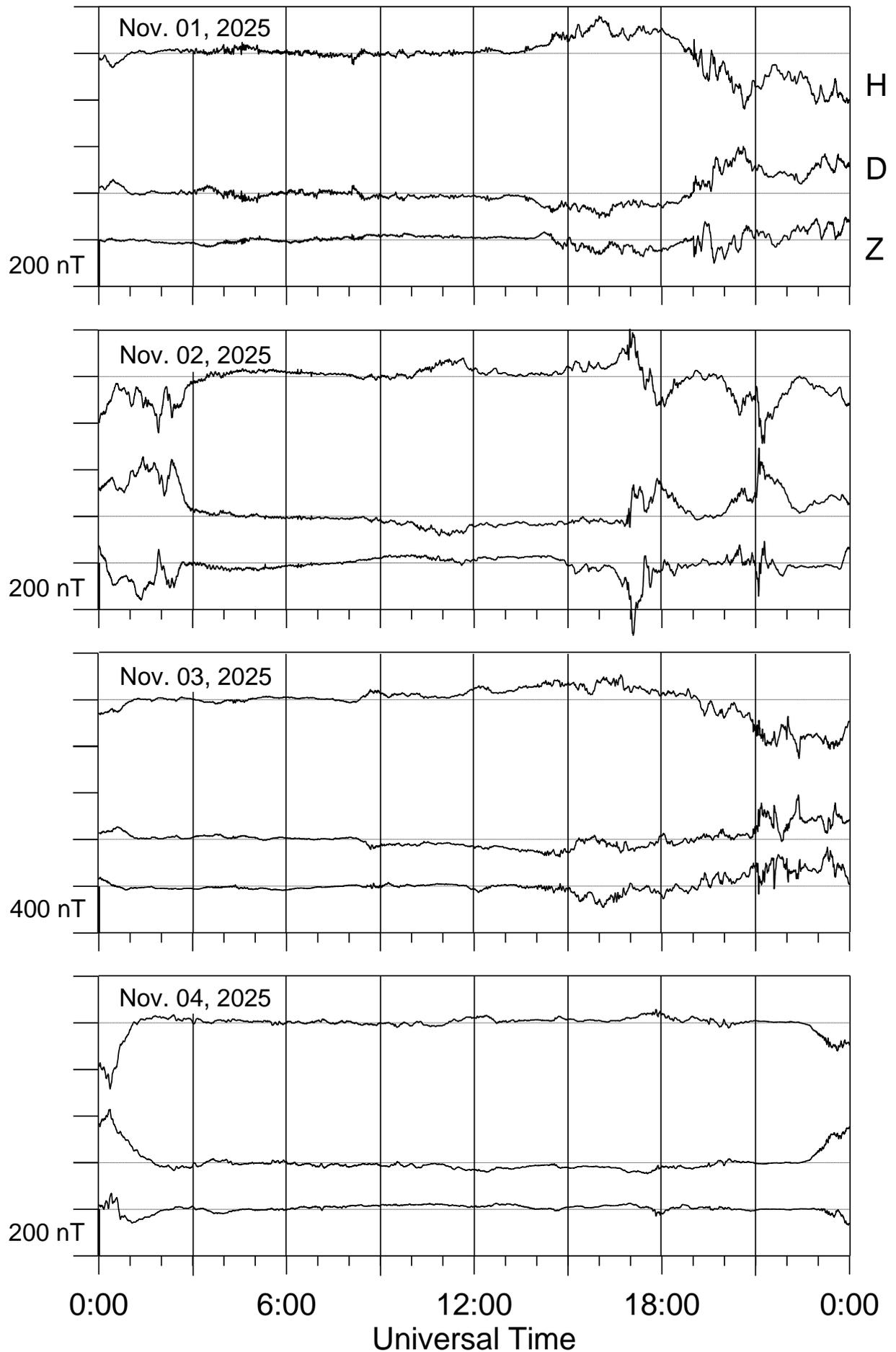
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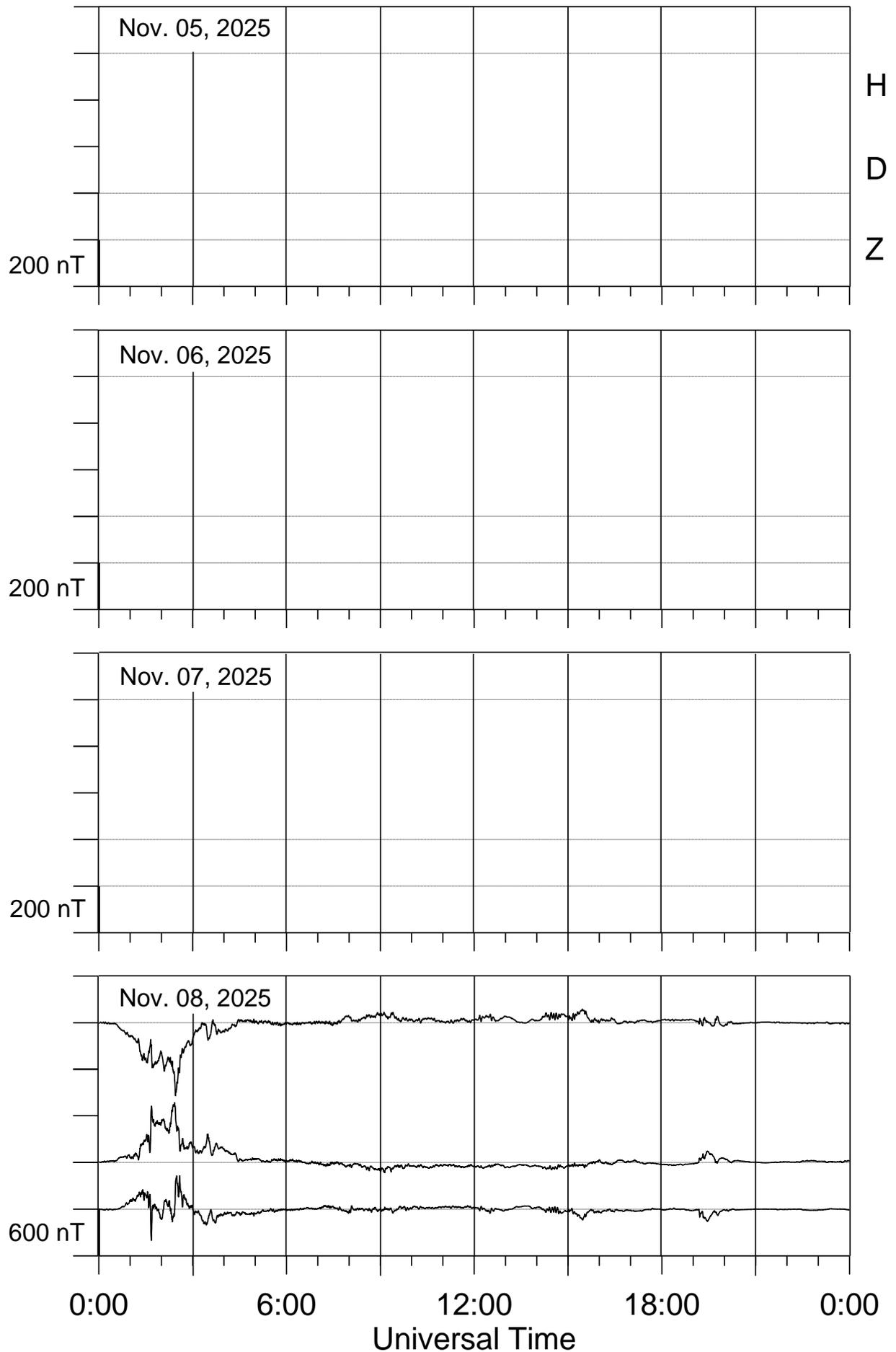
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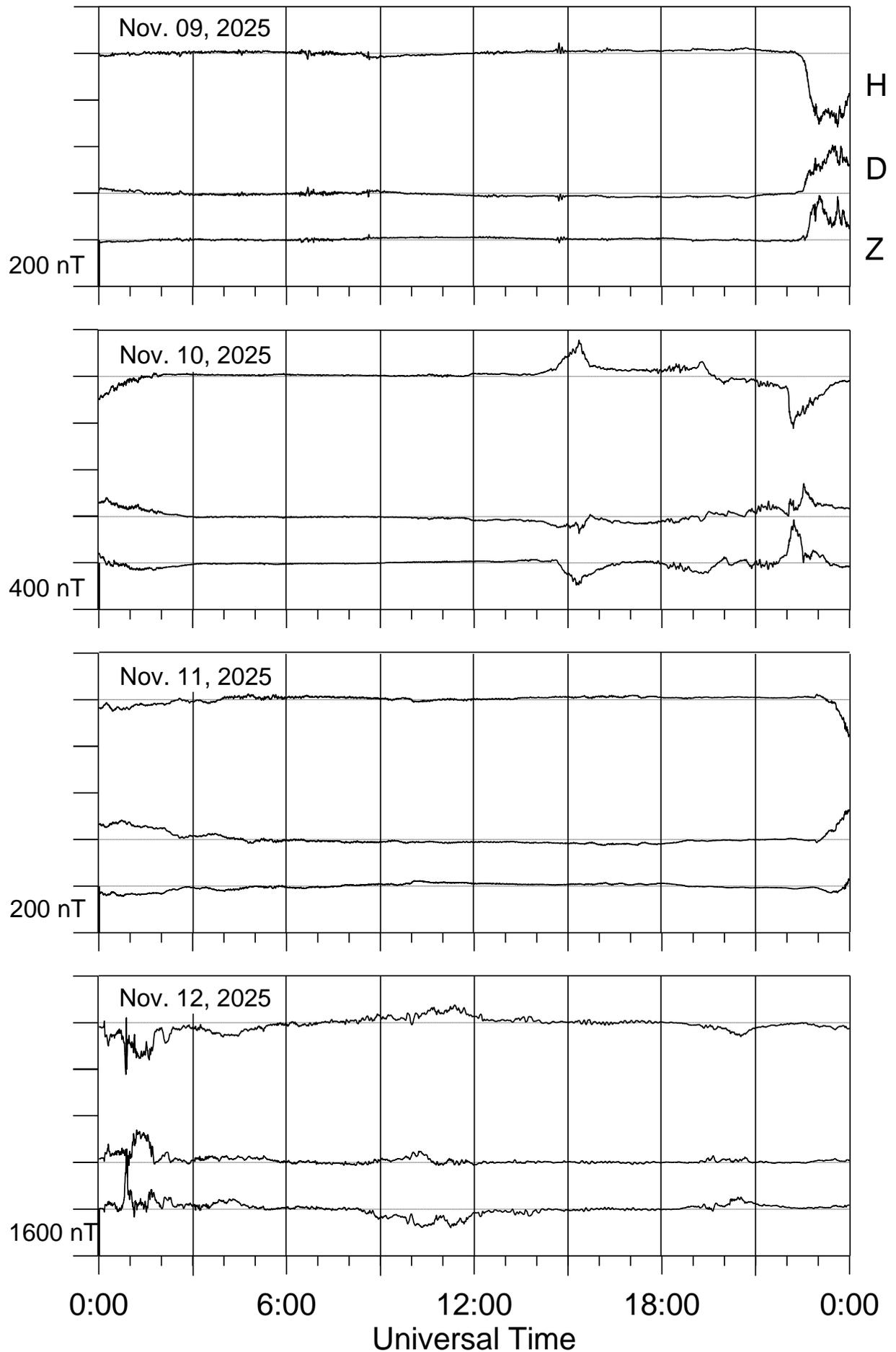
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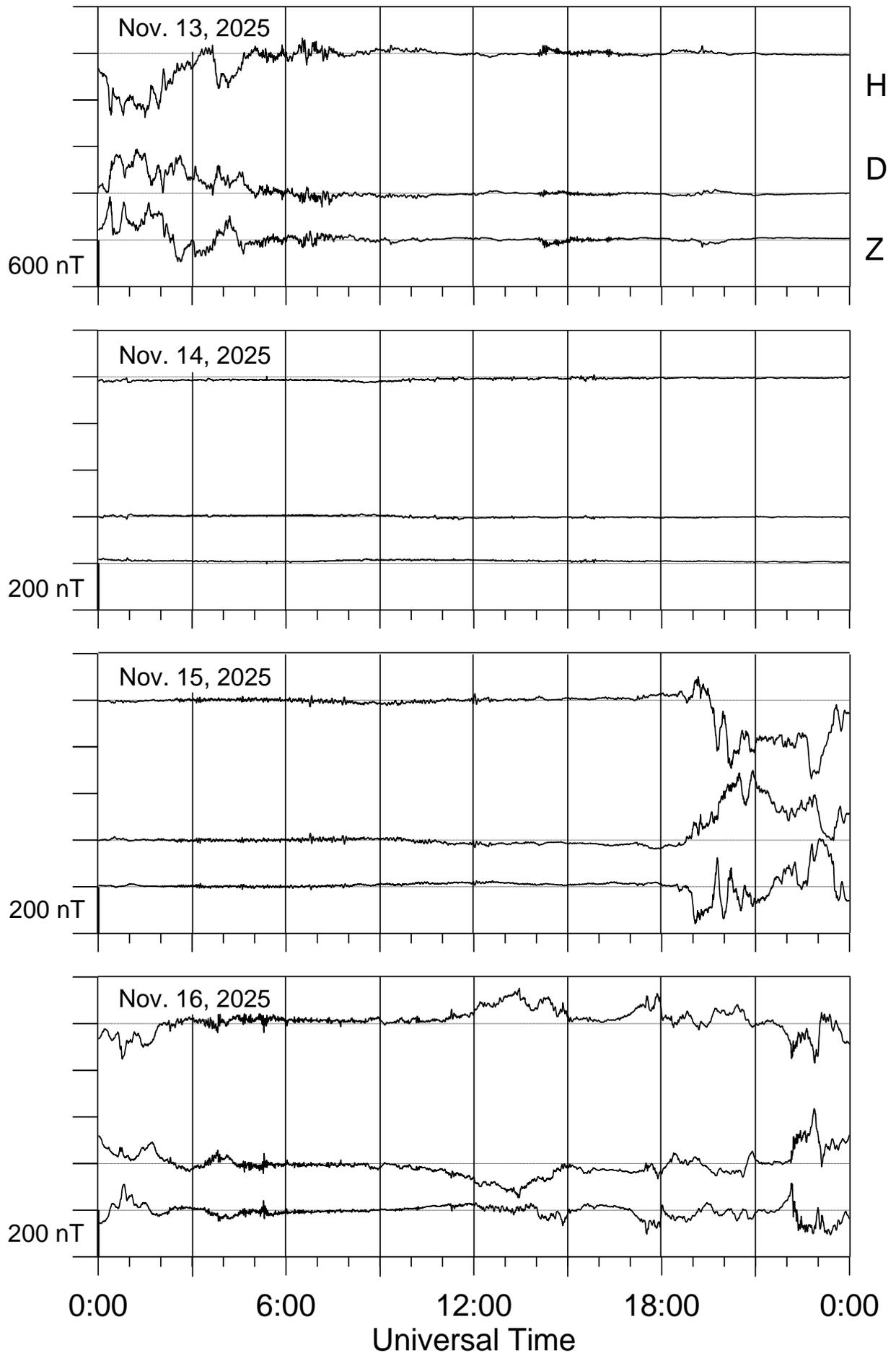
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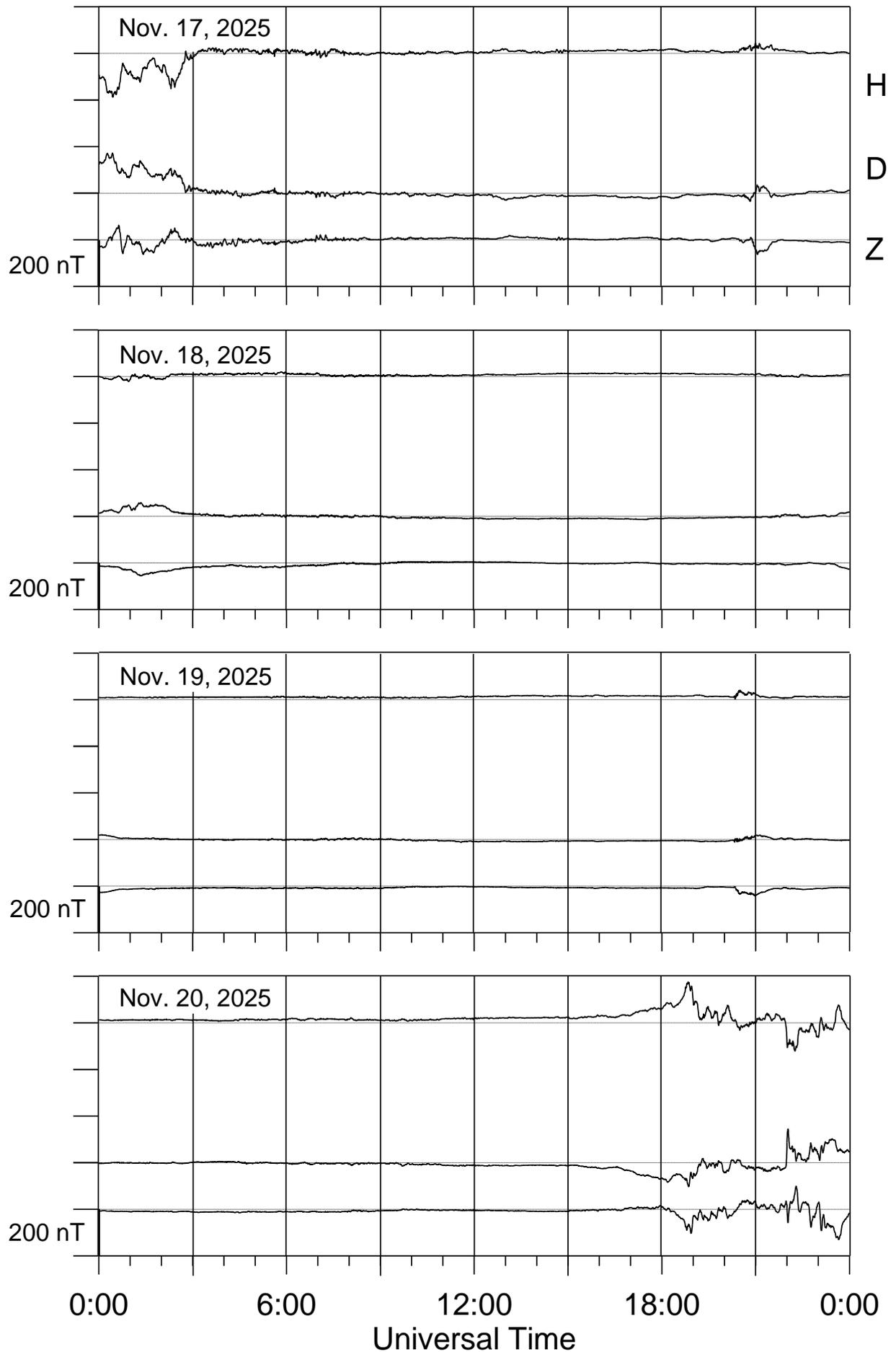
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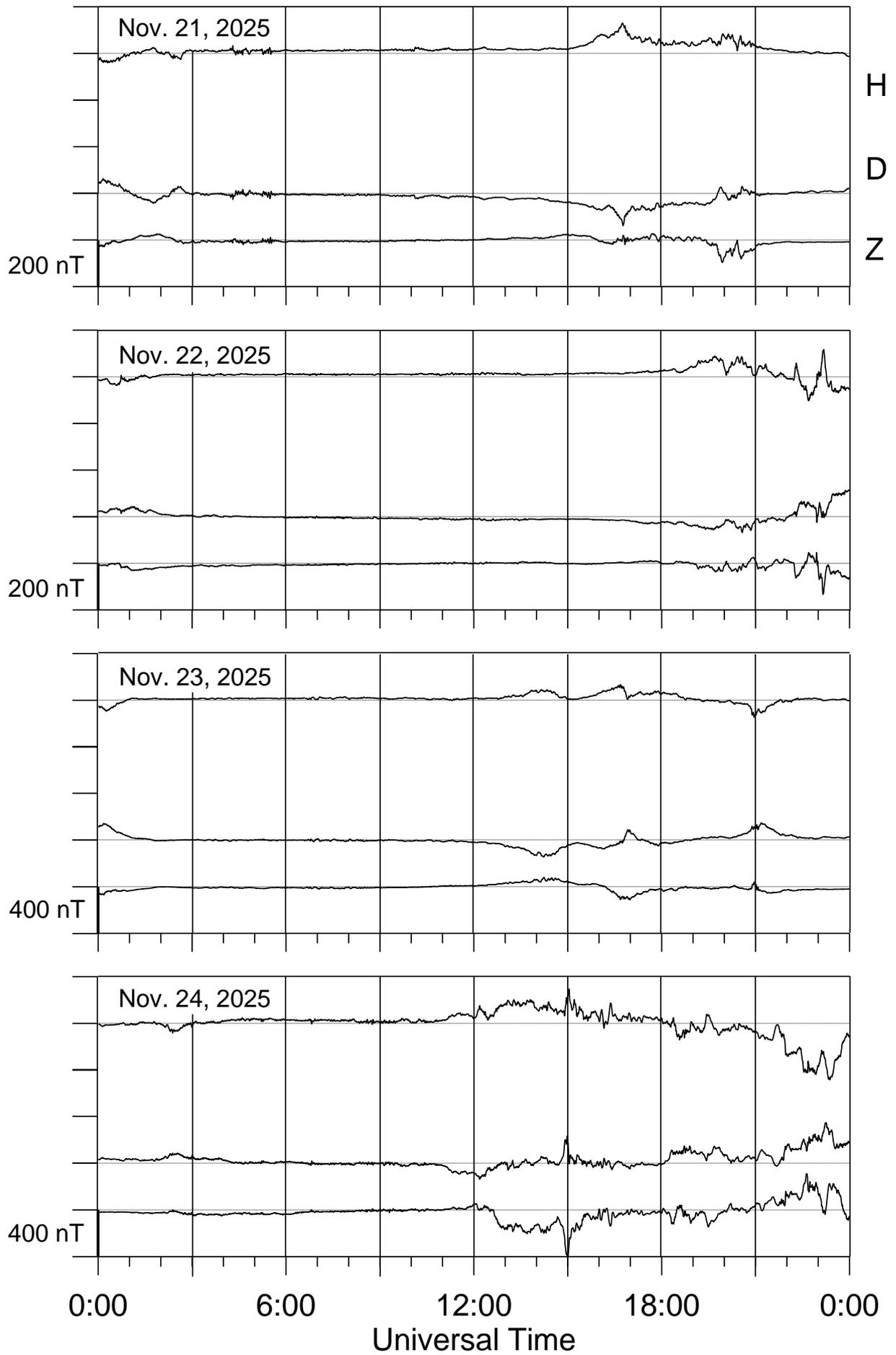
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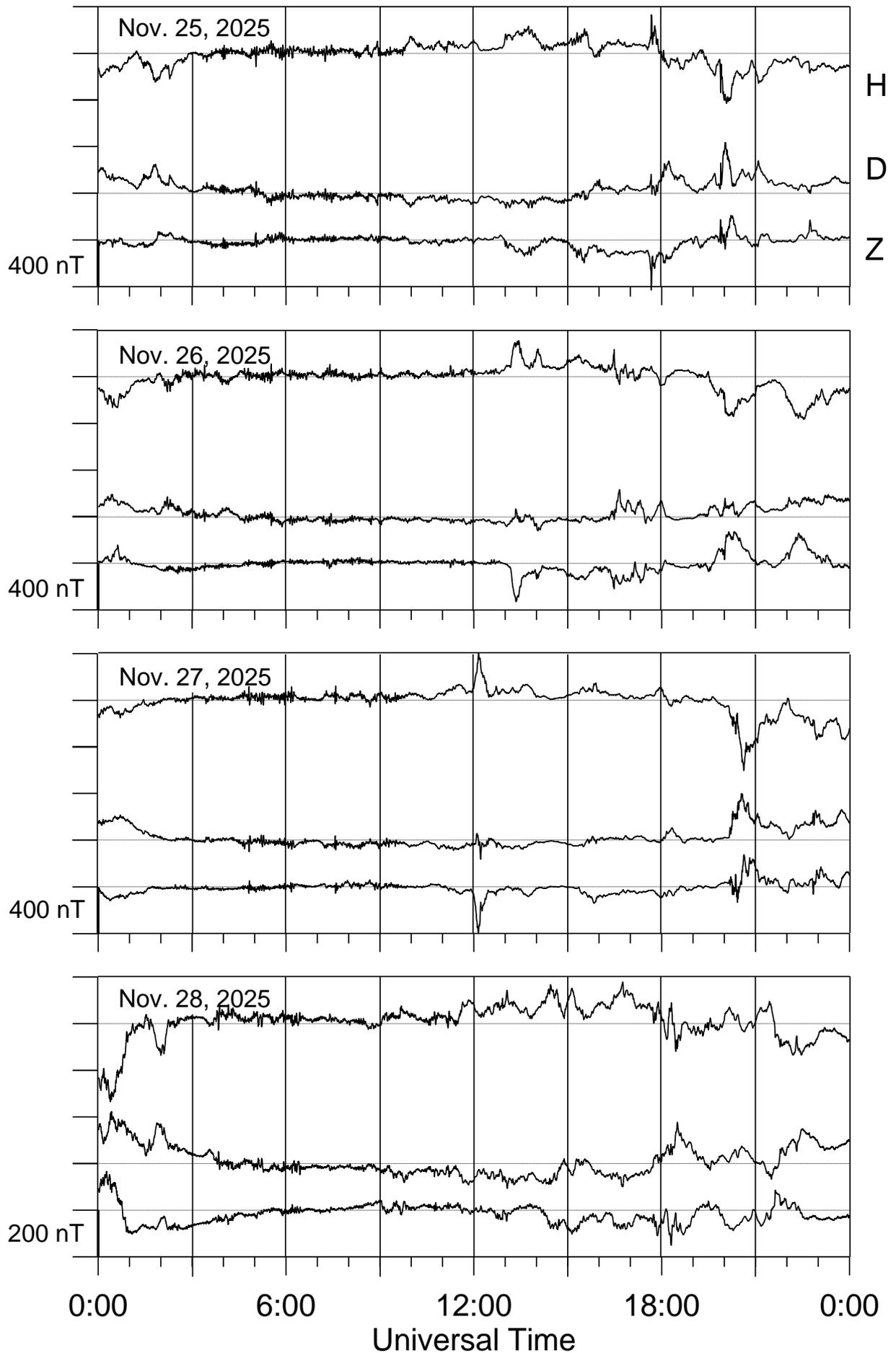
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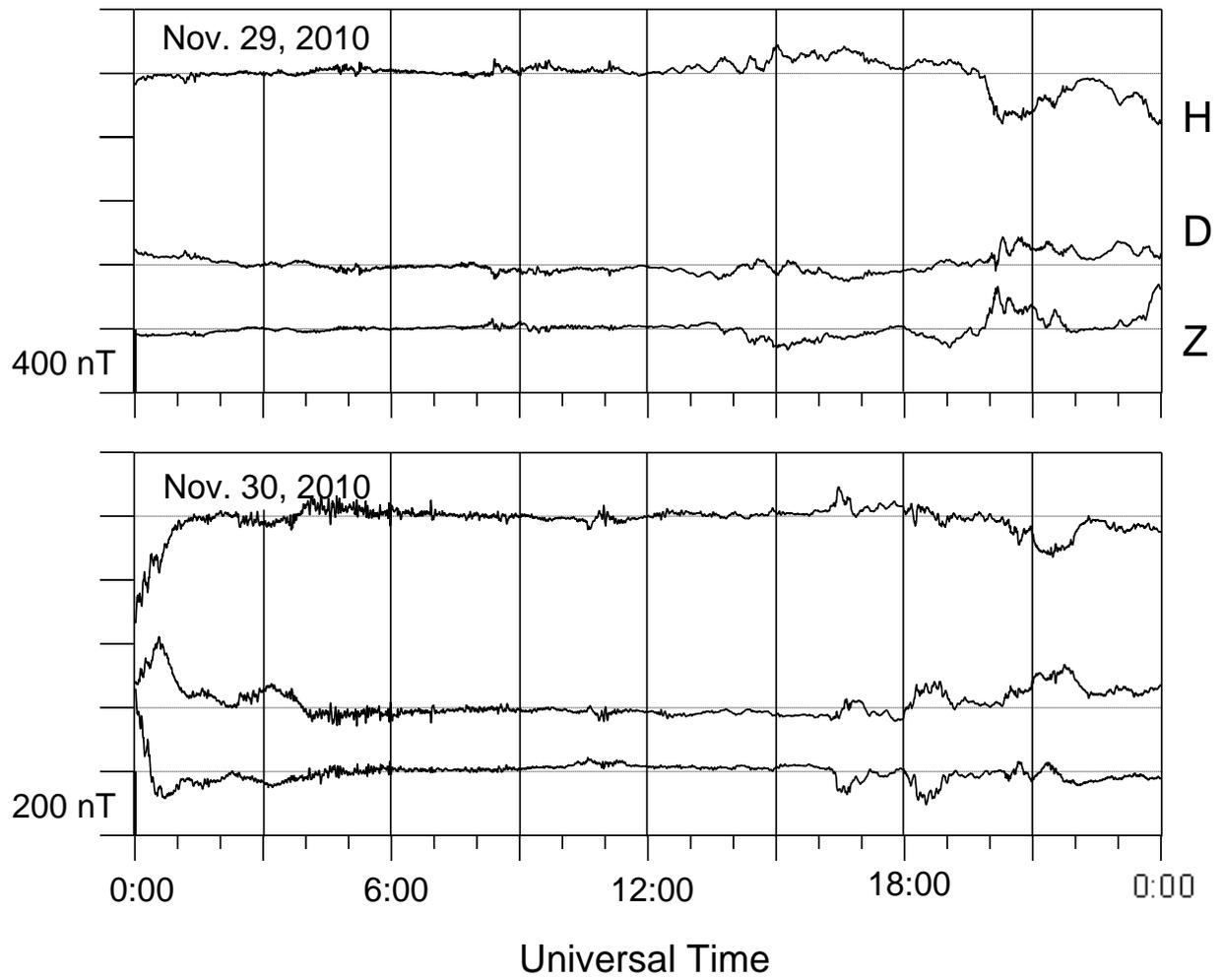
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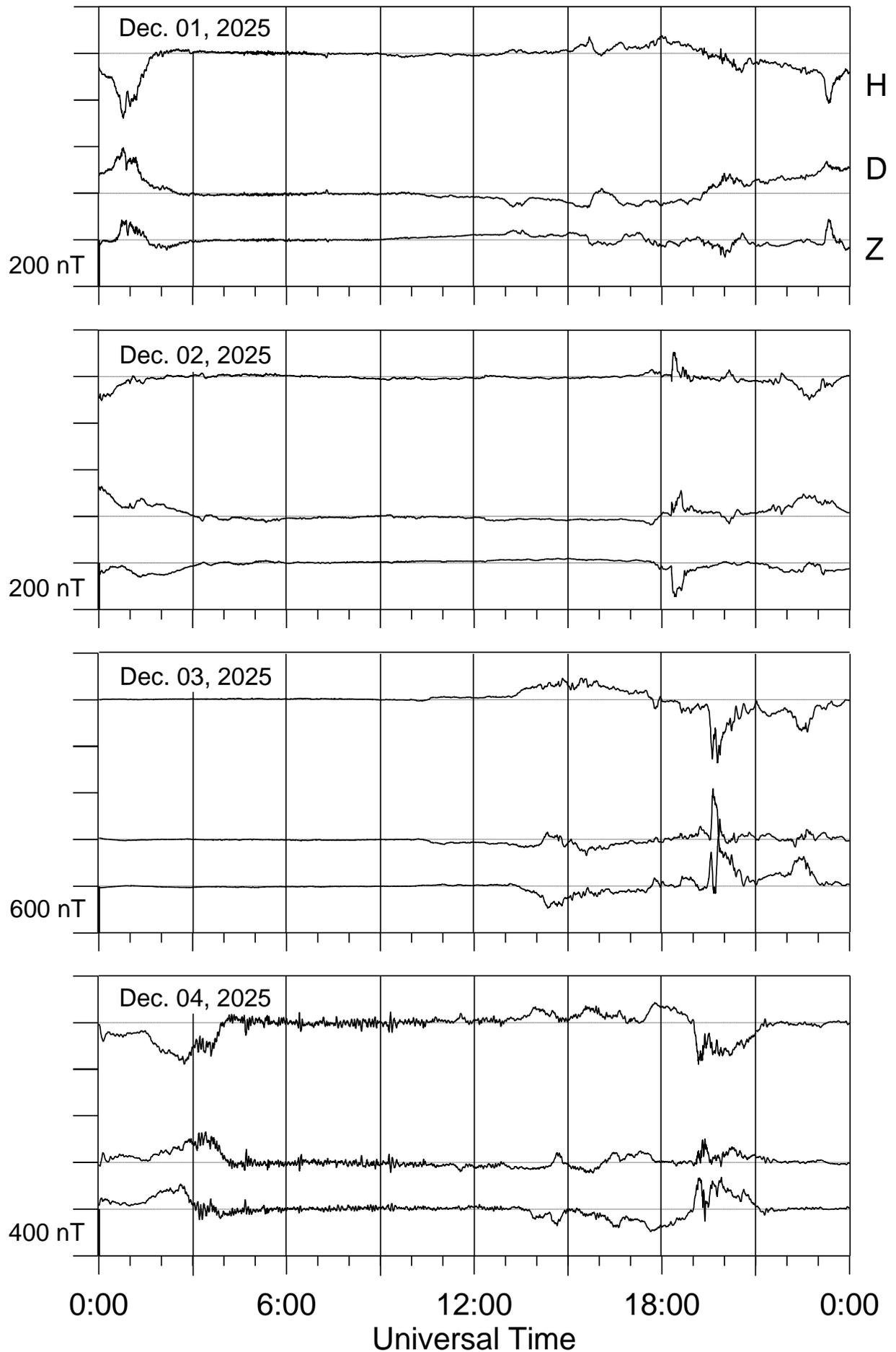
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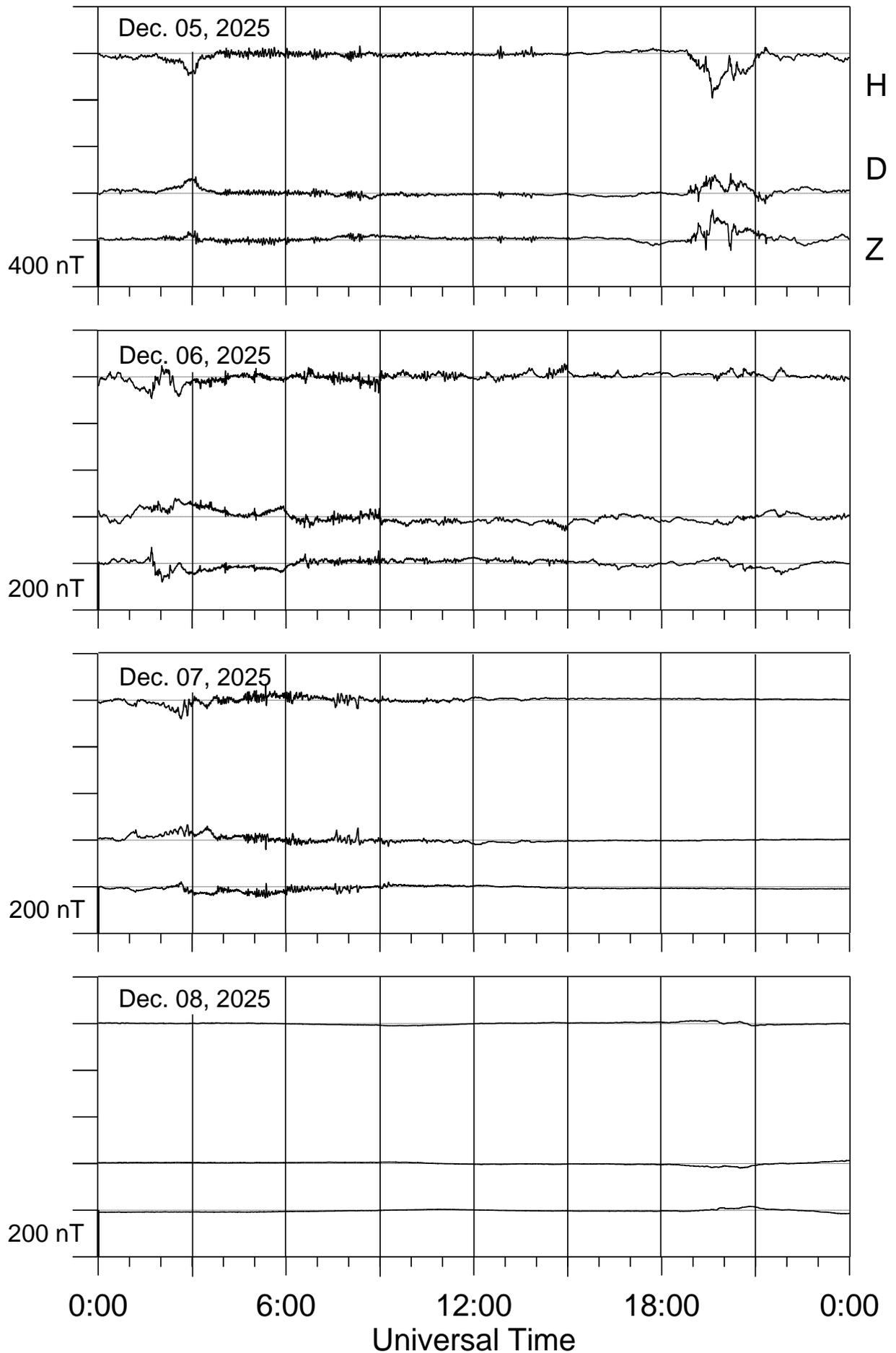
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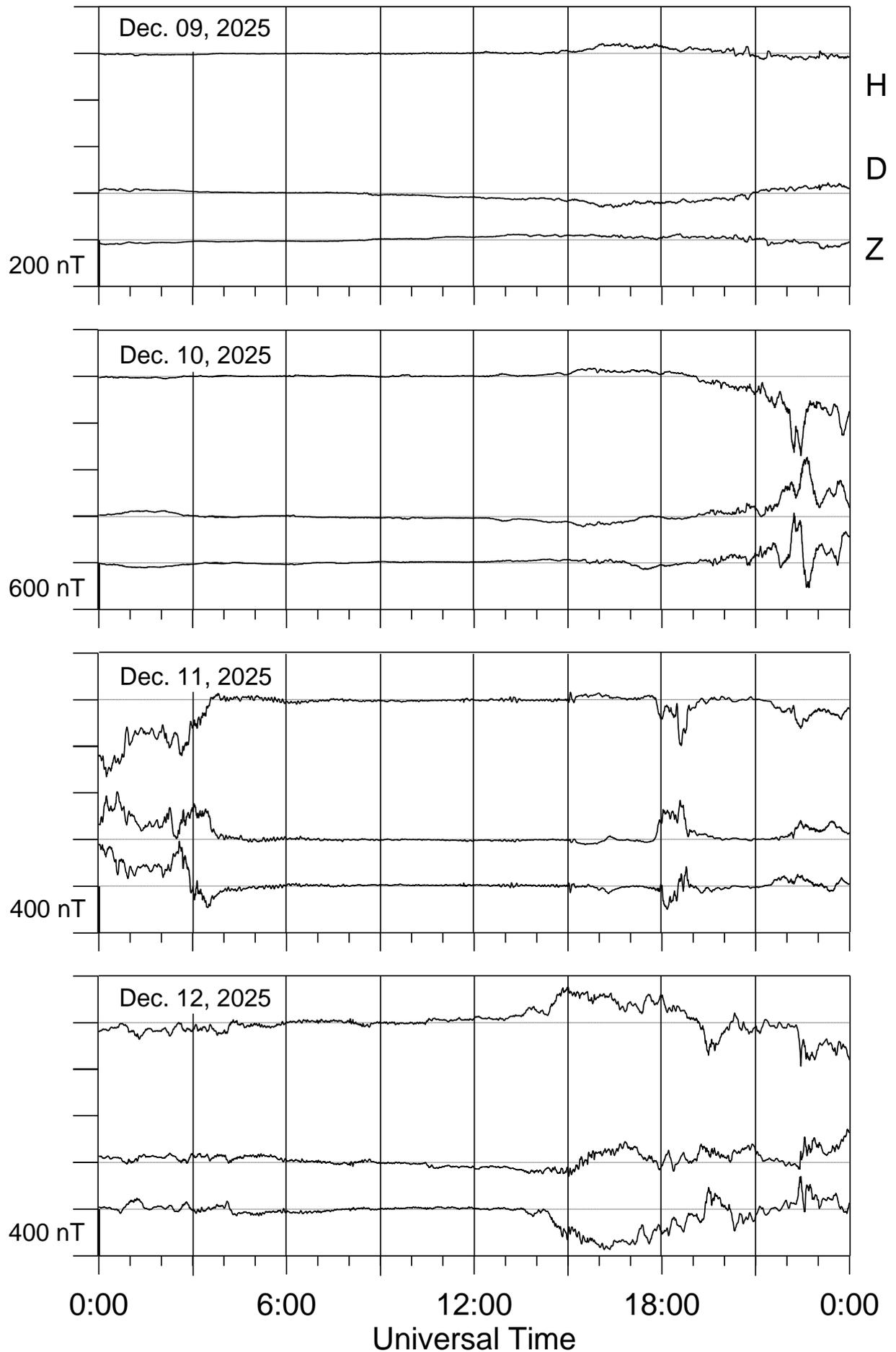
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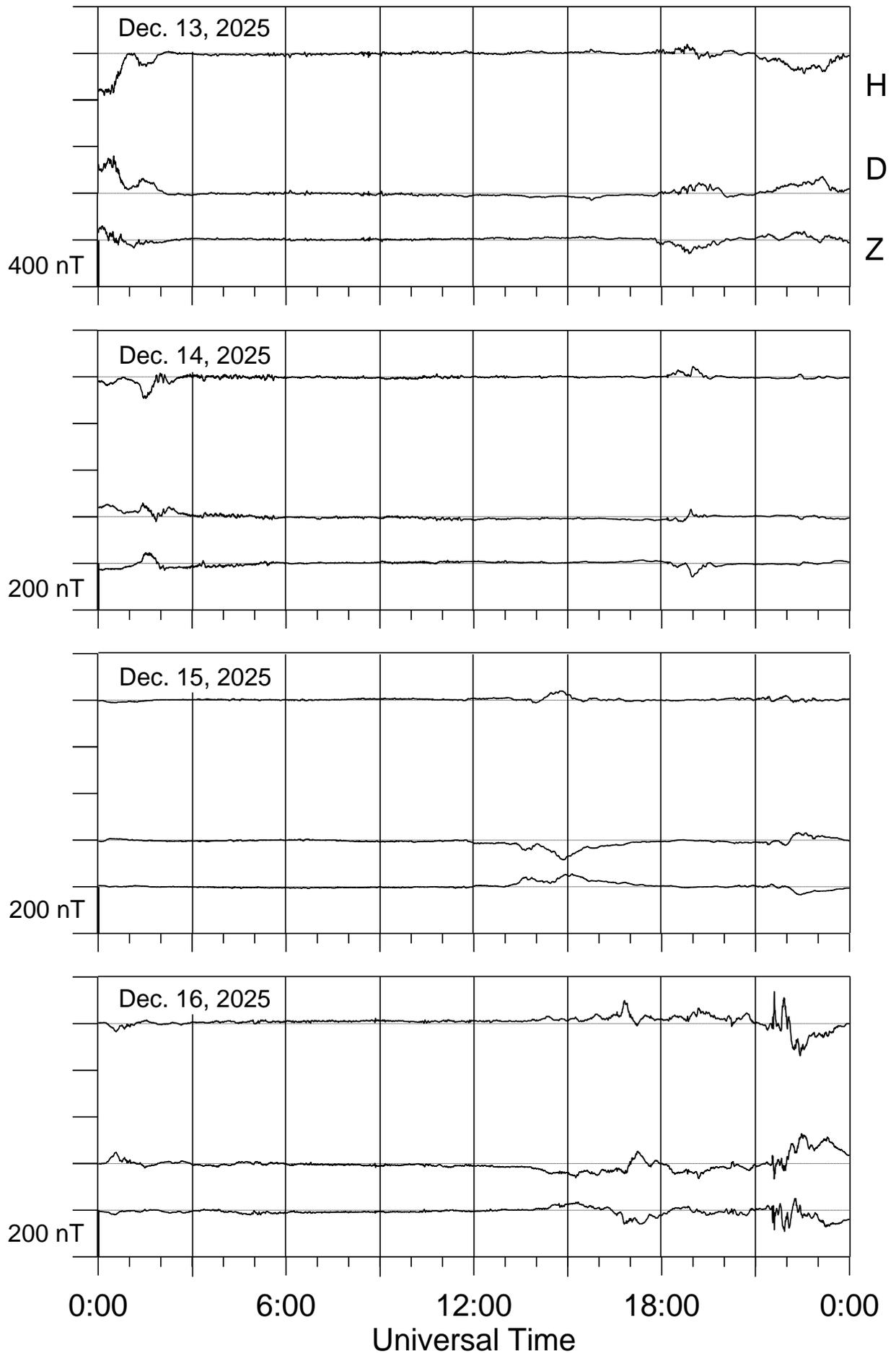
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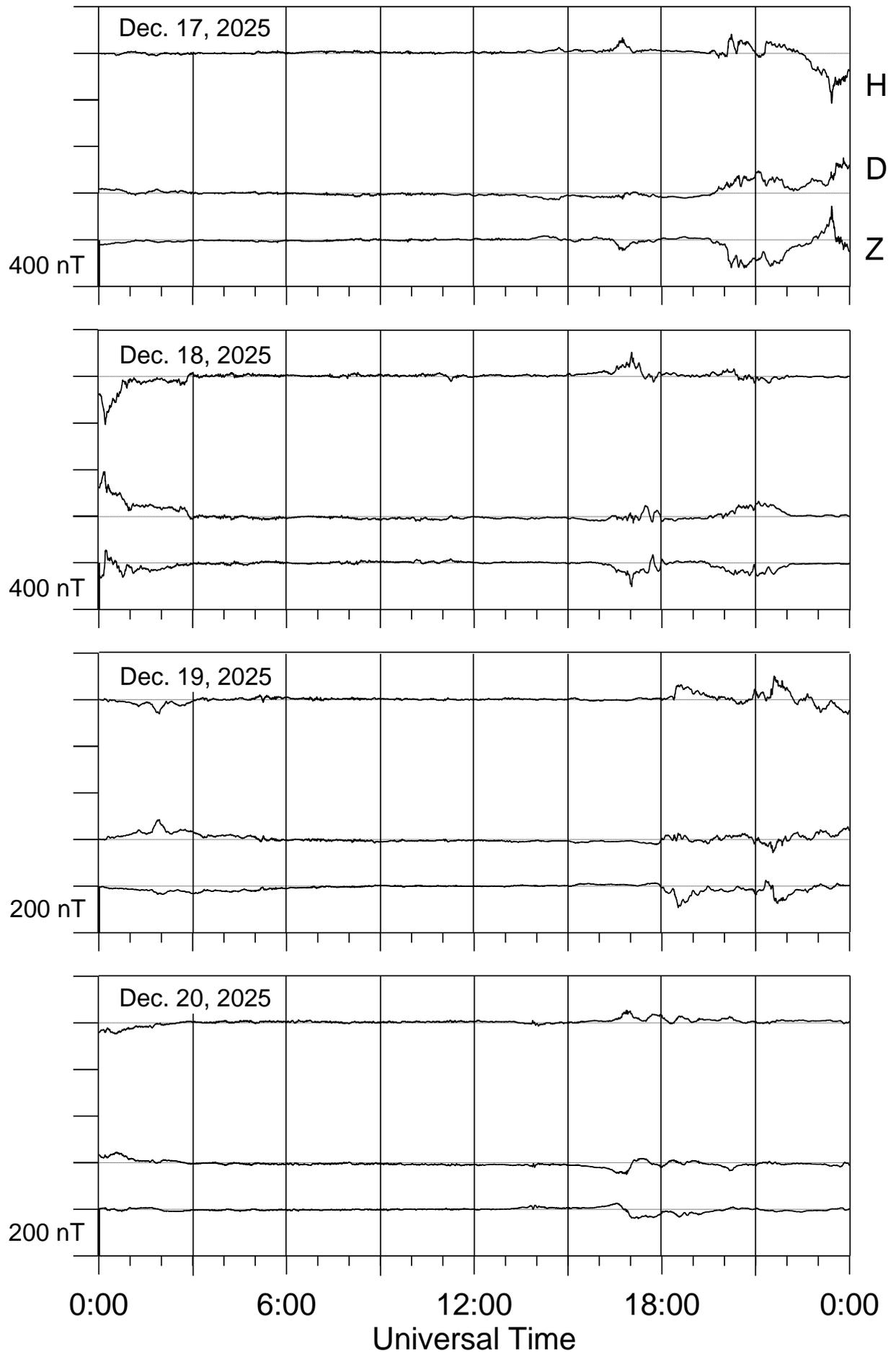
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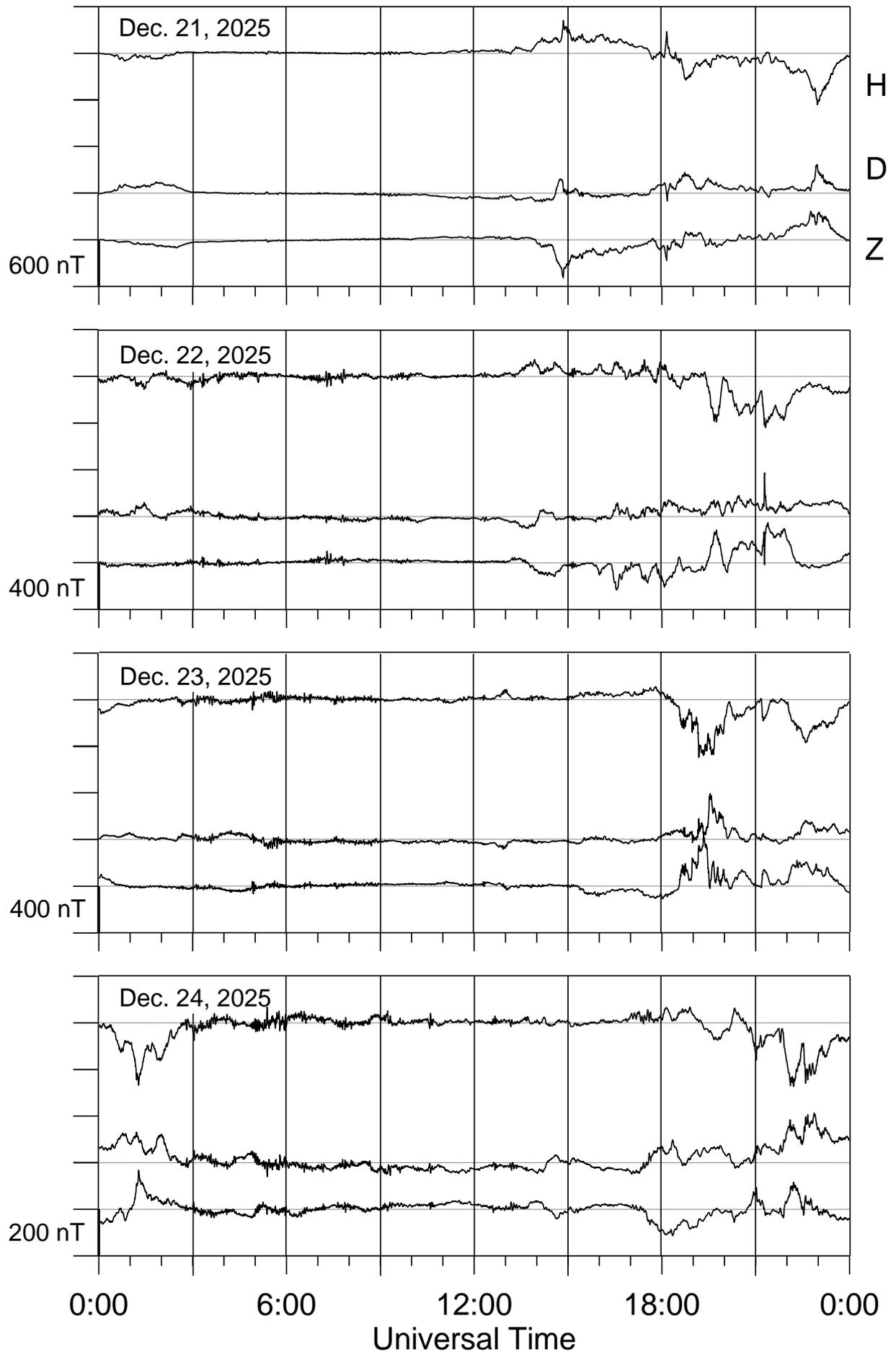
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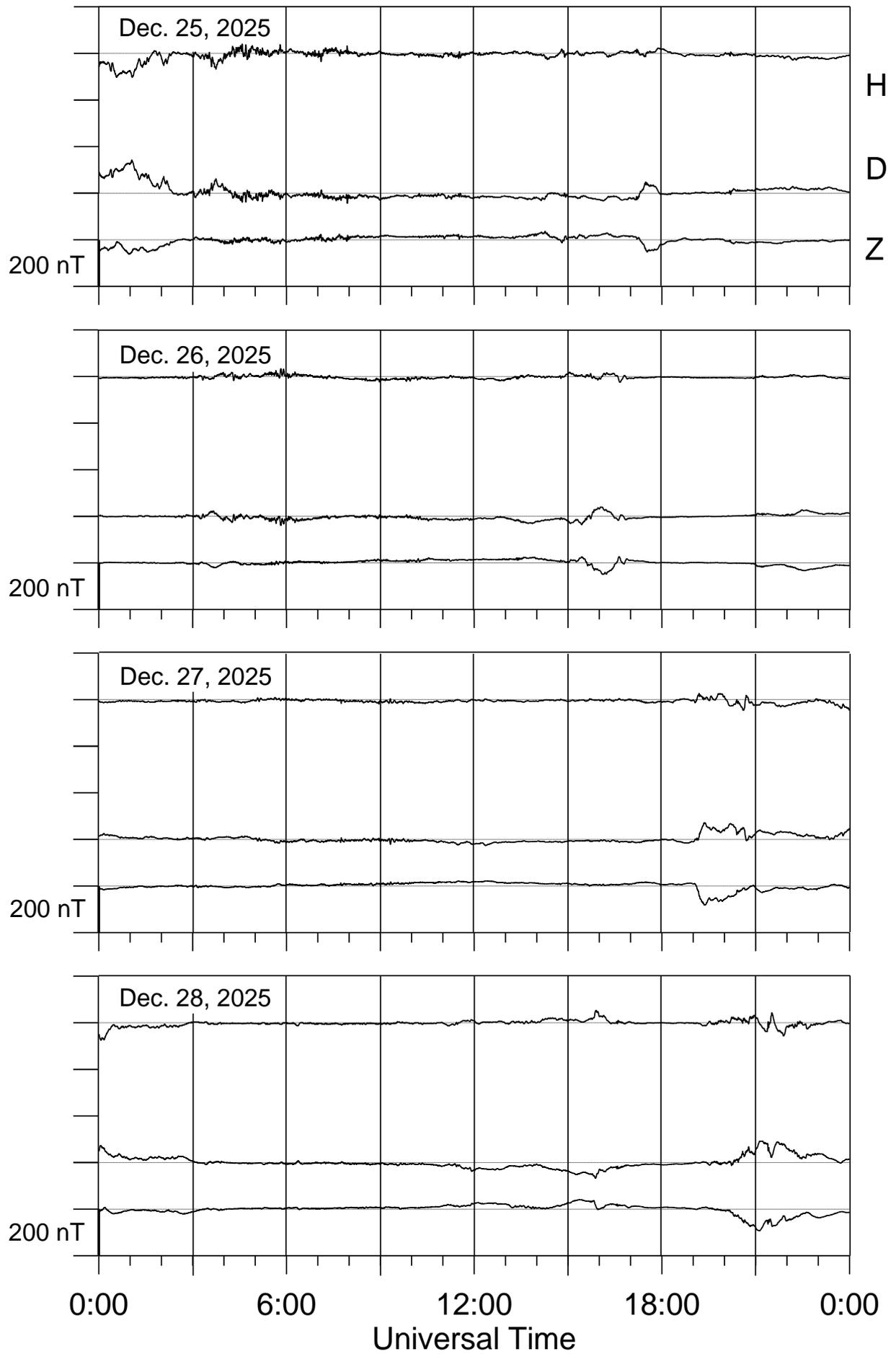
Lovozero magnetometer



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