

POLAR GEOPHYSICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES



PGI
GEOPHYSICAL DATA

2024

JULY

AUGUST

SEPTEMBER

MURMANSK, APATITY, RUSSIA

November, 2024

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 third quarter of 2024. All-sky camera observations are published only for the quarter 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:

July	5831.75
August	5705.59
September	5560.00

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

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

PLEASE NOTE:

Magnetometer in Lovozero was not in operation from 05 September 2024 because of some technical problems.

All-sky camera observations

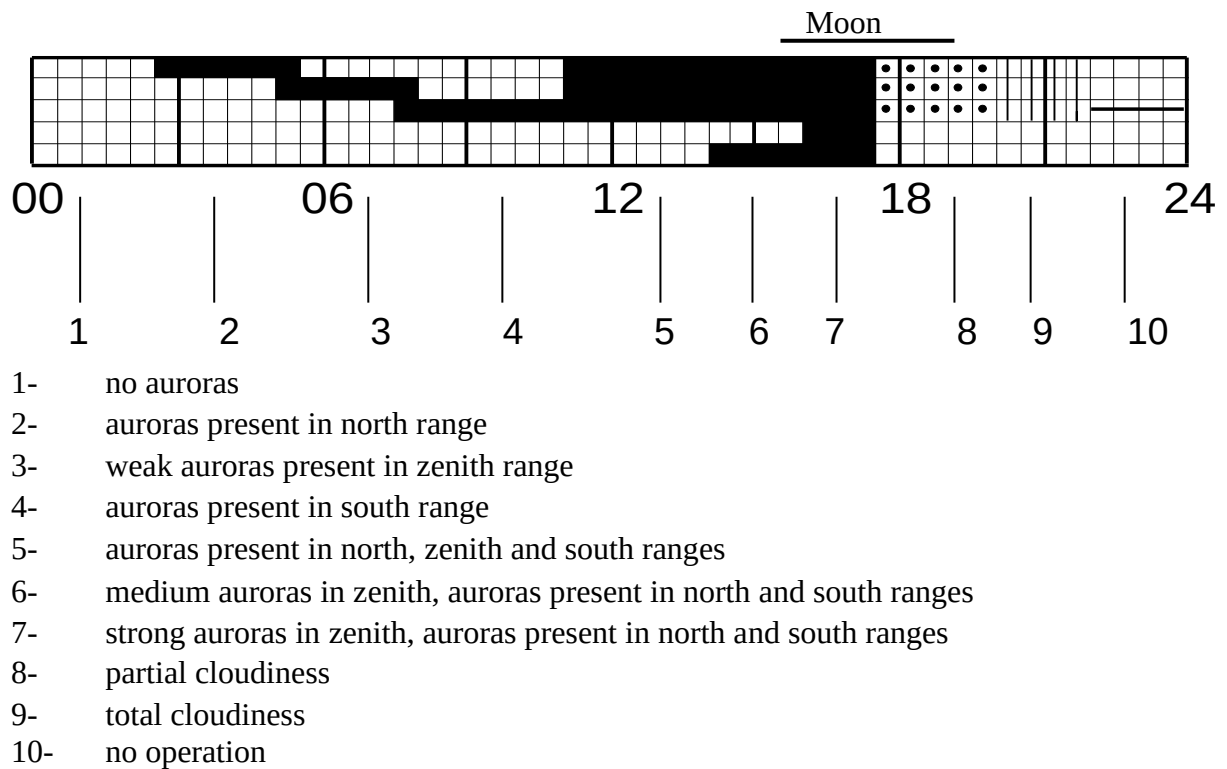
Calendar

Calendar shows the intervals of digital all-sky camera observations in Lovozero and Apatity, which are available during dark periods from 1400 to 0600 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.*



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 Apatity 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.

Coordinates of stations

Stations	Code	Geographic		Corr. Geomagnetic	
		Lat	Long	Lat	Long
<i>Loparskaya</i>	LOP	68.63° N	33.25° E	64.94° N	113.6° E
<i>Lovozero</i>	LOZ	67.97° N	35.02° E	64.17° N	115.3° E
<i>Apatity</i>	APT	67.58° N	33.31° E	63.86° N	113.6° E

Please visit also our Internet pages:

http://pgia.ru/lang/ru/archive_pgi

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GEOMAGNETIC K-INDICES, LOVOZERO(LOPARSKAYA)

July, 2024

Lower limit of K=9 is 1500 nT

Day	Time, UT								
	03	06	09	12	15	18	21	24	
1	2 1 2	2 2 2	2 2 2	1 1 2	2 3 3	3 3 3	2 1 1	0 1 2	
2	2 1 1	1 1 2	2 2 1	2 2 2	2 3 3	1 2 2	1 2 1	1 3 0	
3	1 2 2	2 2 2	2 2 2	2 1 1	2 1 1	0 1 1	1 1 1	1 1 1	Q
4	1 1 1	2 2 0	0 2 2	2 2 2	4 3 4	4 4 4	2 2 2	2 3 4	
5	4 3 2	2 2 2	0 0 1	1 1 2	3 1 2	1 2 3	3 2 2	1 1 1	
6	1 2 2	2 1 1	1 2 2	2 2 1	1 1 1	1 1 1	1 1 1	1 1 2	Q
7	2 2 2	2 2 1	1 2 2	1 1 1	1 1 2	2 2 2	2 2 2	4 5 4	
8	3 2 2	2 2 2	1 2 2	2 2 2	3 3 3	3 2 2	2 3 3	3 2 2	
9	2 2 2	2 1 1	1 1 1	1 2 1	3 2 2	2 3 3	3 3 2	2 3 2	
10	2 2 2	1 2 2	2 2 2	2 2	2 2 2	2 3 2	1 1 2	2 1 3	
11	4 3 1	1 2 2	2 1 1	1 2	2 2 2	2 2 2	2 2 2	2 2 2	
12	2 3 3	2 2 2	2 2 2	2 2 2	2 2 2	1 1 2	1 1 1	1 1 1	
13	1 1 1	2 2 1	1 1 0	1 1 1	2 2 2	2 1 1	2 2 2	1 0 1	Q
14	2 2 2	1 1 1	1 1 1	2 2 2	2 2 2	2 1 1	1 1 1	1 1 1	
15	1 1 1	1 1 2	2 1 2	2 2 2	2 2 2	3 3 2	3 2 2	1 2 6	
16	6 4 3	2 2 2	2 2 1	2 1 2	2 3 2	2 1 2	2 2 2	2 2 1	
17	2 2 2	2 2 2	1 1 0	1 2 2	3 3 3	3 2 2	2 2 2	0 0 1	
18	1 2 2	2 1 1	1 1 2	2 1 2	2 2 2	2 2 2	2 1 1	1 1 1	
19	1 1 1	1 1 2	2 1 1	1 1 2	2 2 1	2 1 1	2 3 3	1 1 1	
20	2 2 2	2 2 2	2 2 3	3 3 3	2 2 2	2 2 2	2 2 2	0 0 1	
21	1 1 1	1 2 2	2 1 1	1 1 2	2 2 2	2 2 2	3 2 2	2 2 3	
22	4 4 3	3 2 1	1 1 1	1 2 4	4 4 4	4 4 4	3 4 4	3 3 3	
23	2 2 2	2 2 1	1 0 1	1 1 2	2 2 1	1 0 0	1 1 2	2 1 2	
24	2 2 2	2 2 2	2 2 2	0 2 2	2 2 2	1 1 1	1 1 1	1 1 1	
25	1 1 1	2 2 2	2 1 2	2 2 2	2 2 2	3 4 4	3 3 3	2 5 5	
26	2 4 4	4 4 4	4 4 3	2 3 3	4 4 6	6 4 4	4 3 3	2 5 5	
27	3 2 2	2 2 2	2 2 1	1 2 3	3 4 5	4 2 0	1 1 2	1 0 1	
28	1 2 2	2 2 2	2 2 2	2 1 2	2 3 3	3 3 3	3 3 2	5 5 5	
29	4 4 4	2 2 2	1 2 2	2 1 3	2 2 1	1 1 1	2 2 2	3 3 2	
30	4 2 4	6 5 4	4 3 2	1 4 5	4 2 2	3 4 4	3 3 3	3 1 2	
31	2 2 2	2 2 1	1 1 1	1 1 1	1 3 3	3 4 4	3 4 5	4 4 4	

GEOMAGNETIC K-INDICES, LOVOZERO(LOPARSKAYA)

August, 2024

Lower limit of K=9 is 1500 nT

Day	Time, UT								
	03	06	09	12	15	18	21	24	
1	5 6 6	3 4 3	3 3 2	1 2 2	3 2 3	3 2 2	2 2 2	1 1 2	
2	2 2 2	3 4 2	3 2 2	2 2 2	2 2 3	3 3 2	2 2 1	2 2 3	
3	3 1 2	2 2 2	2 1 1	1 2 3	3 4 5	4 4 3	3 2 2	5 5 4	
4	3 2 3	5 4 3	2 3 3	4 5 6	6 6 5	6 6 5	4 3 3	6 5 4	
5	3 3 2	2 2 2	3 2 2	2 3 2	3 3 3	3 3 2	2 3 4	3 2 2	
6	3 3 2	2 2 2	2 2 2	2 2 2	1 1 1	1 2 2	2 1 1	0 1 1	
7	1 1 2	2 2 2	2 2 2	2 2 3	2 2 2	1 1 1	1 1 0	2 3 3	
8	3 3 2	2 3 3	2 2 2	2 2 2	2 2 1	1 1 1	1 1 1	0 0 0	
9	1 1 2	2 2 2	2 2 2	2 2 2	2 2 1	1 1 1	1 1 2	0 2 3	Q
10	1 1 2	2 3 3	1 1 1	2 2 2	2 2 2	3 3 3	3 1 1	1 0 1	
11	1 2 2	3 2 3	3 3 2	3 3 3	3 3 4	4 4 3	3 3 3	3 3 4	
12	8 6 6	7 8 7	6 5 4	4 6 6	5 5 5	6 5 5	3 3 4	5 6 5	
13	4 5 4	4 3 3	3 2 2	3 2 2	2 2 2	1 1 1	2 2 2	5 6 5	
14	5 6 5	5 3 2	3 2 2	2 1 1	1 1 2	2 2 2	2 1 1	3 3 2	
15	2 2 1	2 1 1	1 1 1	2 2 1	1 2 2	1 1 1	1 2 2	2 2 3	Q
16	4 5 5	3 2 2	2 2 2	1 2 3	2 3 3	2 3 2	1 0 0	0 0 0	
17	0 2 2	2 2 2	2 1 1	1 2 1	1 2 4	5 5 5	5 4 3	5 5 3	
18	3 3 3	3 3 3	3 2 2	3 2 2	2 2 3	2 2 2	3 3 3	1 1 1	
19	1 2 2	2 2 2	2 2 2	2 2 2	2 3 4	3 1 3	3 3 3	4 5 5	
20	4 3 3	3 2 1	2 2 2	2 2 2	4 4 4	3 3 4	2 1 1	3 3 4	
21	6 4 1	- 1 1	2 2 3	2 2 2	4 4 4	4 3 3	3 3 2	2 2 2	
22	2 4 5	2 2 2	2 1 2	2 2 2	2 2 0	3 3 2	2 2 1	1 5 5	
23	2 1 2	2 2 2	2 2 2	2 2 2	2 3 1	2 2 2	2 2 2	3 2 2	
24	4 4 2	2 2 2	2 2 2	2 3 3	3 4 4	4 4 3	1 1 3	5 5 4	
25	3 2 3	2 2 2	2 1 1	2 2 2	1 0 0	0 1 1	1 1 1	1 3 2	
26	2 1 1	2 1 2	1 1 1	1 1 2	2 2 2	3 3 2	1 1 0	0 0 0	Q
27	1 1 1	2 2 2	1 2 2	1 2 2	2 3 3	3 3 4	3 3 5	6 6 5	
28	5 6 6	6 5 4	4 3 3	3 2 2	3 4 5	4 3 4	3 3 2	2 3 3	
29	3 2 2	2 2 2	2 2 2	2 2 1	1 0 1	0 0 0	0 0 0	1 1 1	
30	1 1 2	2 2 2	2 2 2	2 2 3	5 6 6	5 4 3	3 4 7	6 5 6	
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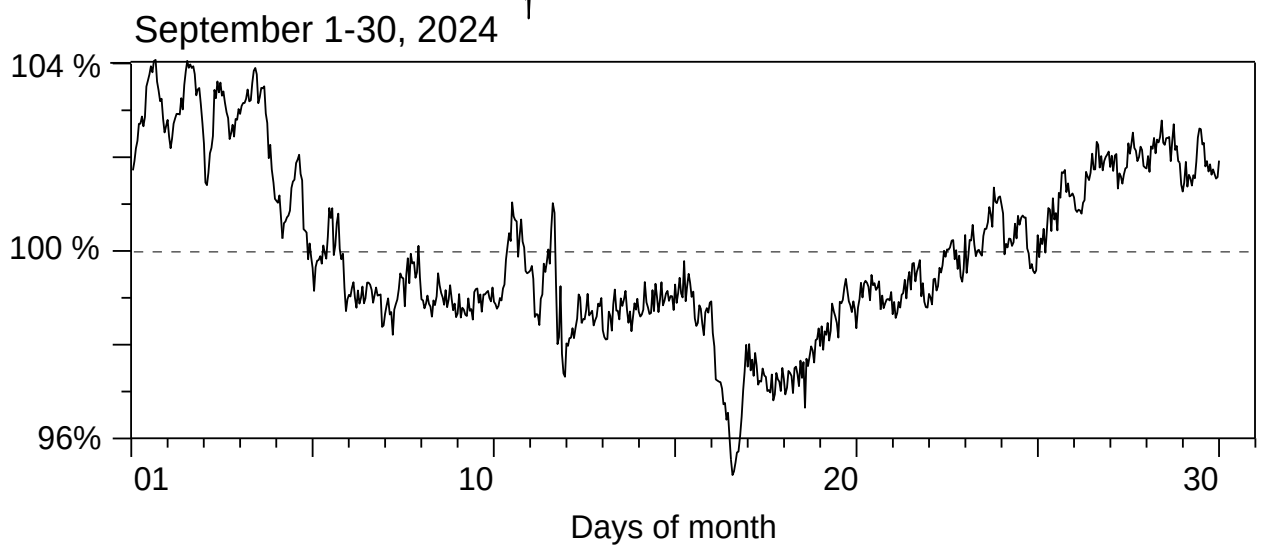
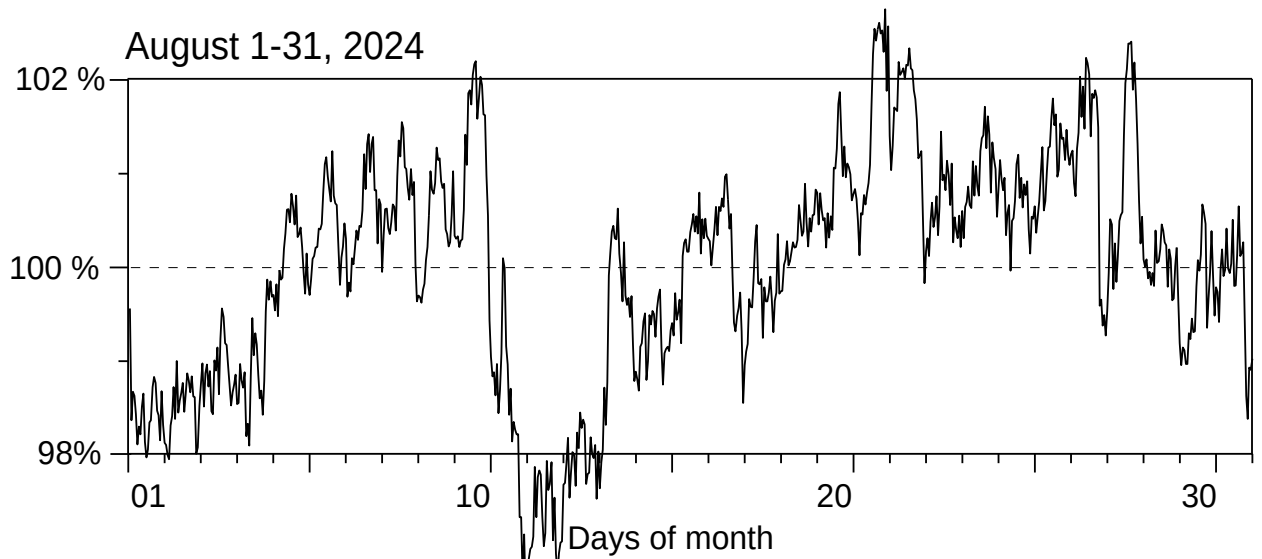
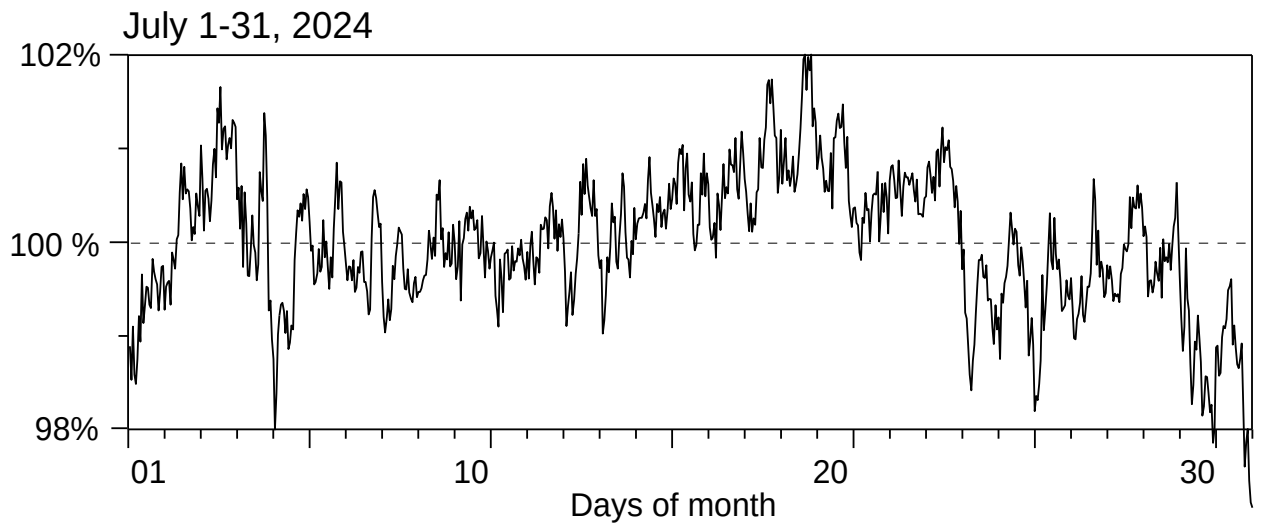
GEOMAGNETIC K-INDICES, LOVOZERO (LOPARSKAYA)

September, 2024

Lower limit of K=9 is 1500 nT

Day	Time, UT								
	03	06	09	12	15	18	21	24	
1	5 5 4	3 3 2	2 1 1	2 2 2	2 4 5	5 5 4	4 3 3	2 3 3	
2	3 3 3	2 2 2	2 2 1	2 2 2	2 3 4	4 4 3	4 3 2	2 2 0	
3	1 1 1	2 2 2	2 1 1	1 2 2	2 2 1	1 0 0	1 1 1	1 1 1	Q
4	0 1 1	1 1 1	1 2 2	2 3 3	3 4 3	2 2 2	2 2 1	0 2 3	
5	1 1 2	2 2 2	2 1 1	2 2 2	2 1 1	1 2 2	1 1 1	2 1 1	Q
6	1 1 1	1 1 1	2 1 2	2 2 3	3 1 1	1 1 1	1 1 2	1 3 1	
7	1 2 2	1 1 1	1 1 2	2 2 2	3 3 1	1 1 1	2 1 2	2 1 0	
8	1 1 1	2 2 2	2 2 2	2 2 2	2 3 1	1 2 1	2 2 2	1 4 3	
9	4 3 3	2 1 1	1 1 2	3 2 2	2 1 0	1 2 3	3 3 3	2 4 5	
10	5 2 2	2 1 2	2 1 2	2 2 2	2 1 1	1 0 0	1 1 2	3 2 0	
11	0 0 1	1 1 1	1 1 1	2 2 2	2 3 2	2 3 4	4 3 2	2 3 5	
12	4 1 1	2 2 3	3 3 3	5 5 4	6 6 6	4 4 3	4 7 7	5 5 6	
13	6 6 6	5 5 5	4 3 4	3 3 4	4 4 4	4 4 3	4 4 5	5 7 5	
14	5 5 3	4 4 2	2 1 2	2 4 5	4 4 3	1 1 0	0 5 5	5 6 5	
15	2 1 3	4 4 3	3 2 2	2 2 3	4 5 5	4 4 5	2 5 5	3 3 3	
16	4 6 5	3 2 2	3 2 2	2 5 5	5 5 4	3 1 1	0 0 1	4 5 5	
17	6 7 7	7 7 5	4 3 4	5 5 6	6 5 5	4 4 3	4 3 6	6 6 5	
18	5 5 5	2 2 2	2 2 2	2 2 2	2 1 2	2 3 4	0 0 1	0 5 6	
19	7 7 6	4 2 2	1 1 1	2 3 4	5 5 5	6 4 3	5 5 1	3 3 1	
20	1 1 1	1 1 1	2 2 1	2 2 2	2 0 1	0 0 2	3 2 3	6 6 5	
21	2 1 2	1 2 2	2 1 2	1 2 2	2 1 1	0 0 1	2 2 3	1 0 1	
22	1 1 1	1 2 1	1 1 2	1 2 2	1 1 2	2 2 1	0 0 0	0 0 2	Q
23	3 2 1	1 2 2	2 2 1	1 2 2	3 5 5	4 5 3	2 1 1	1 1 1	
24	2 2 2	2 2 2	2 2 1	1 1 4	4 4 4	4 3 2	2 5 5	2 4 7	
25	7 5 5	4 5 3	2 2 3	3 2 2	3 4 5	5 5 3	5 6 6	6 6 5	
26	6 4 3	4 3 2	2 1 2	0 1 2	4 5 4	3 2 2	2 3 5	4 1 0	
27	2 3 1	1 1 1	1 1 1	0 3 3	4 2 1	1 1 0	0 0 0	0 0 0	
28	0 0 1	1 1 2	2 2 2	1 1 1	2 2 2	4 4 4	3 2 2	2 3 5	
29	5 4 3	2 1 1	1 2 2	4 2 2	2 4 4	2 2 1	0 0 1	4 4 4	
30	4 5 5	3 2 2	2 2 2	2 2 1	1 1 0	1 2 3	1 2 4	5 5 2	

Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

September 2024

CALENDAR OF TV OBSERVATIONS

October 09-10

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

October 10-11

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

October 11-12

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

October 12-13

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

October 13-14

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

October 14-15

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

October 15-16

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

October 16-17

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

October 17-18

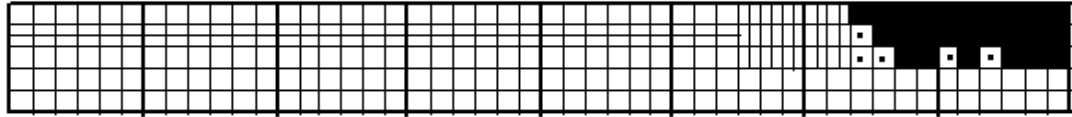
UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ				—	—	—	—	—	—	—	—	—				

October 18-19

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

Lovozero ascaplots

Sep. 09, 2024



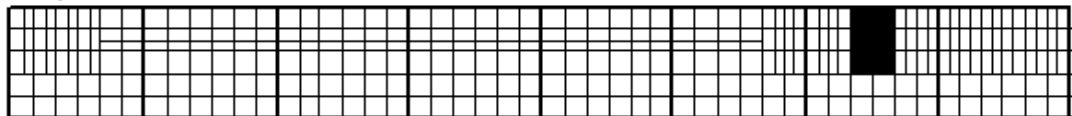
Sep. 10, 2024



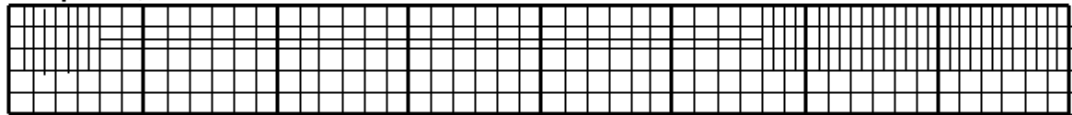
Sep. 11, 2024



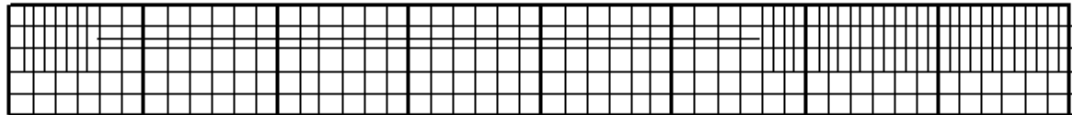
Sep. 12, 2024



Sep. 13, 2024



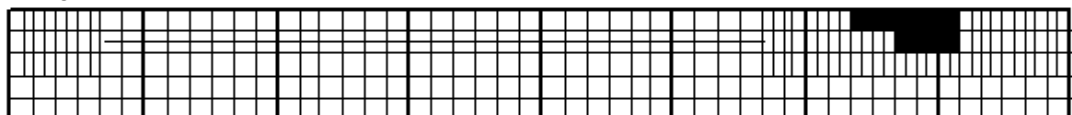
Sep. 14, 2024



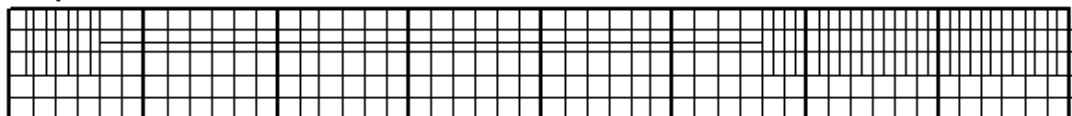
Sep. 15, 2024



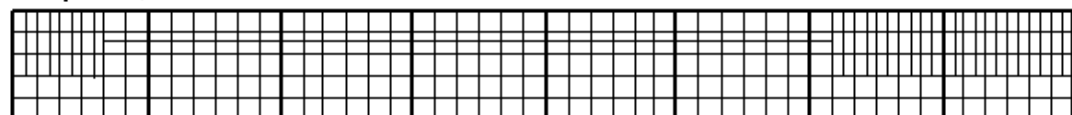
Sep. 16, 2024



Sep. 17, 2024



Sep. 18, 2024



00

06

12

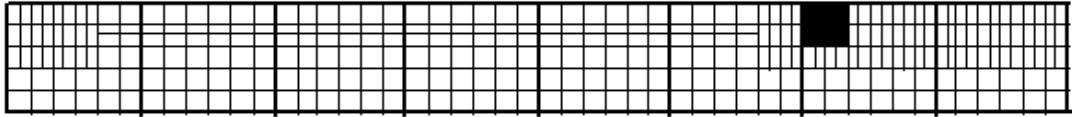
18

24

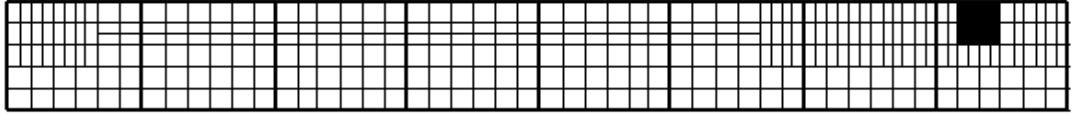
Universal Time

Lovozero ascaplots

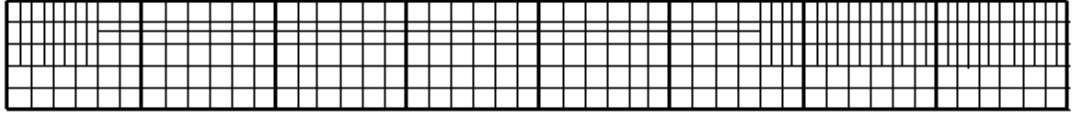
Sep. 19, 2024



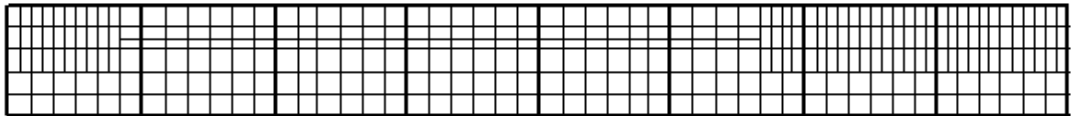
Sep. 20, 2024



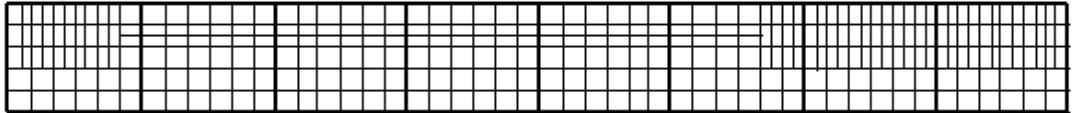
Sep. 21, 2024



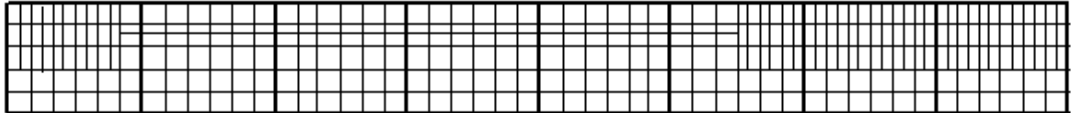
Sep. 22, 2024



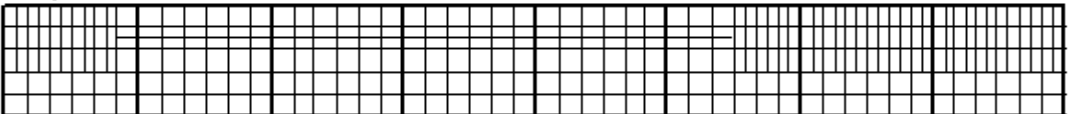
Sep. 23, 2024



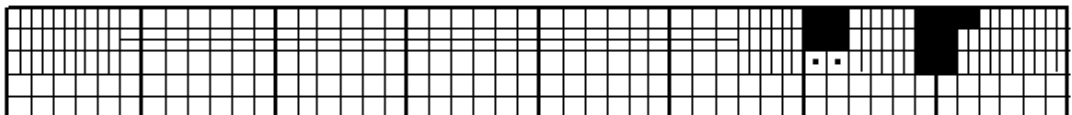
Sep. 24, 2024



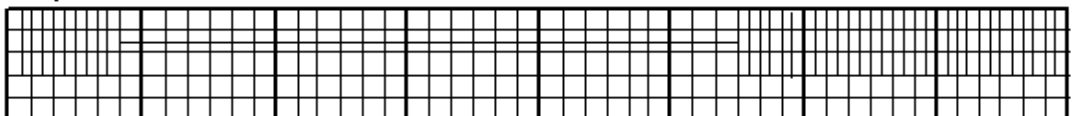
Sep. 25, 2024



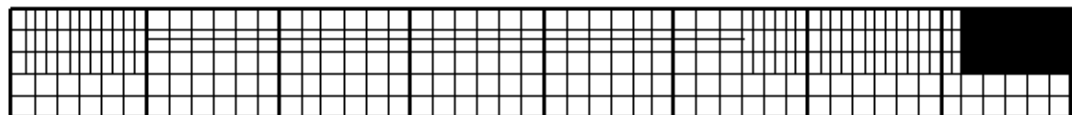
Sep. 26, 2024



Sep. 27, 2024



Sep. 28, 2024



00

06

12

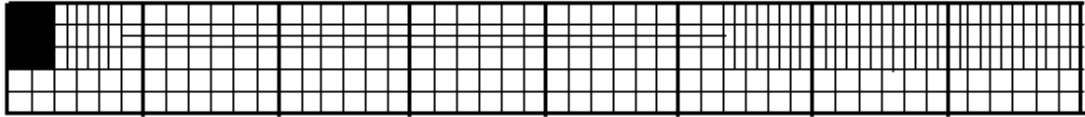
18

24

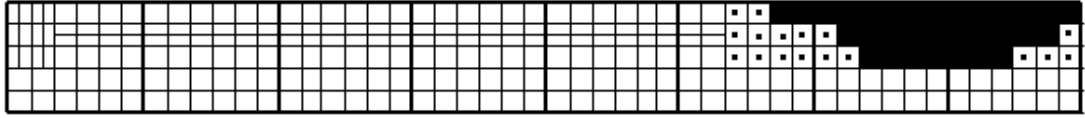
Universal Time

Lovozero ascaplots

Sep. 29, 2024



Sep. 30, 2024



00

06

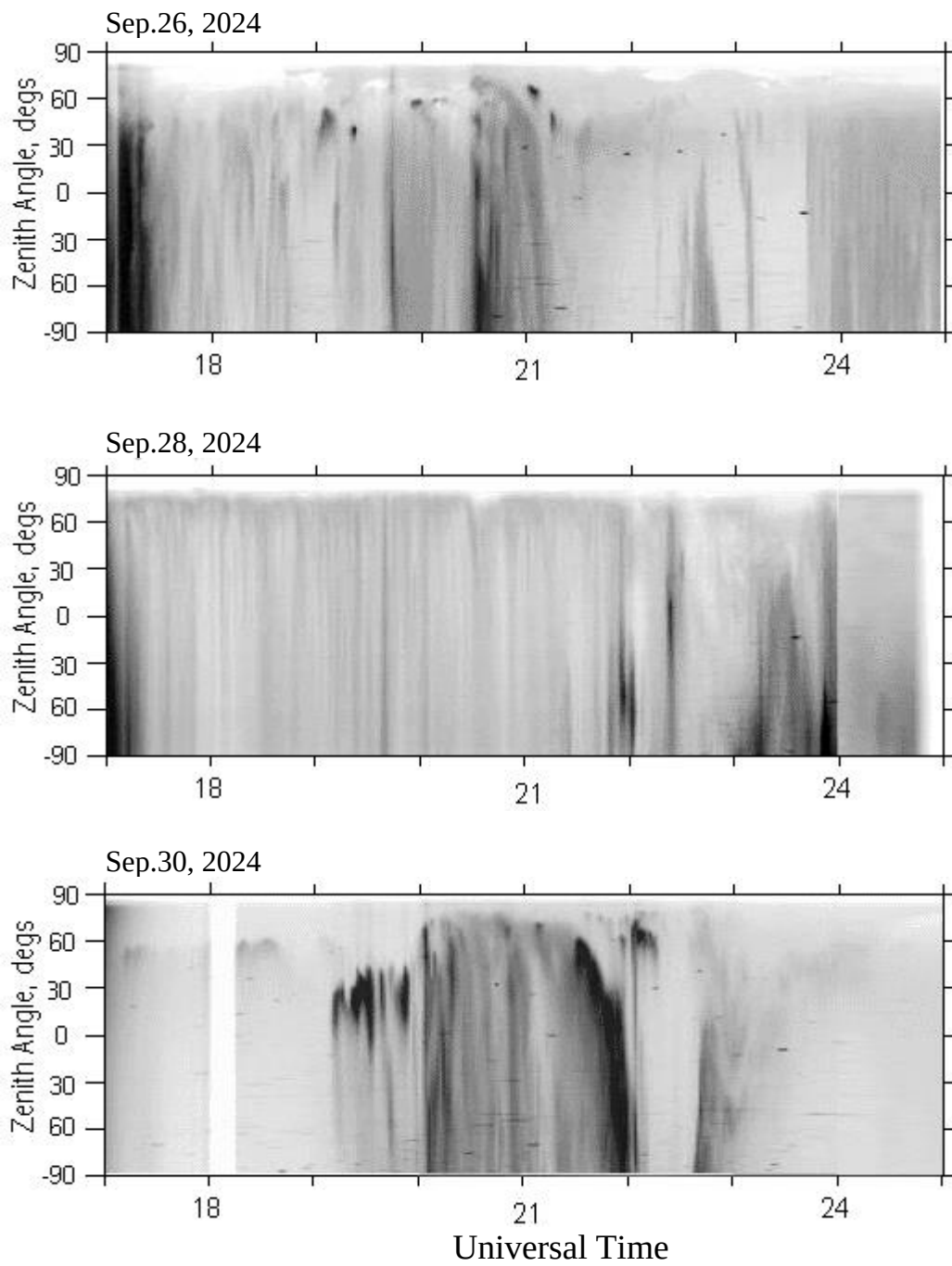
12

18

24

Universal Time

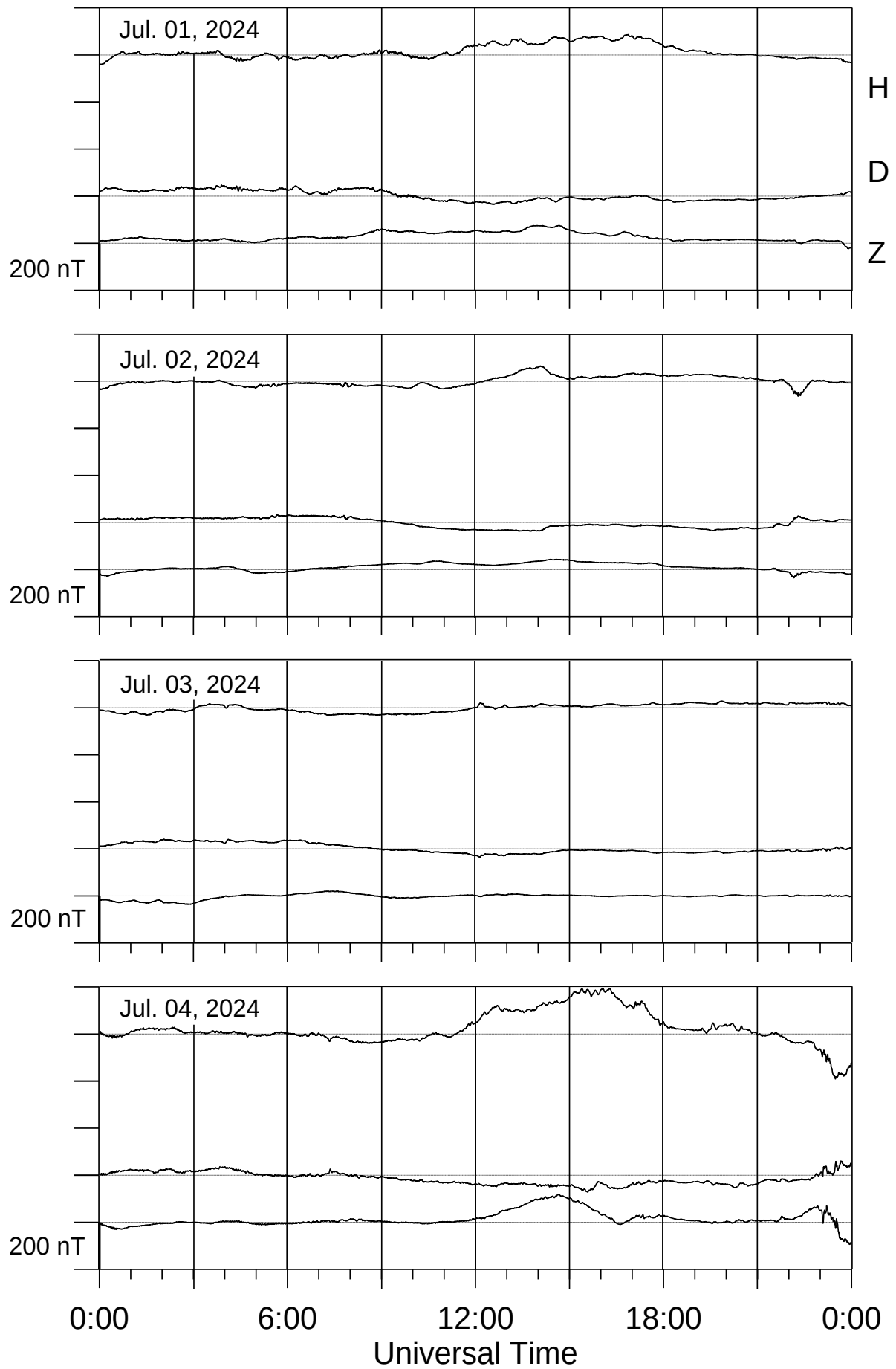
Lovozero TV keograms



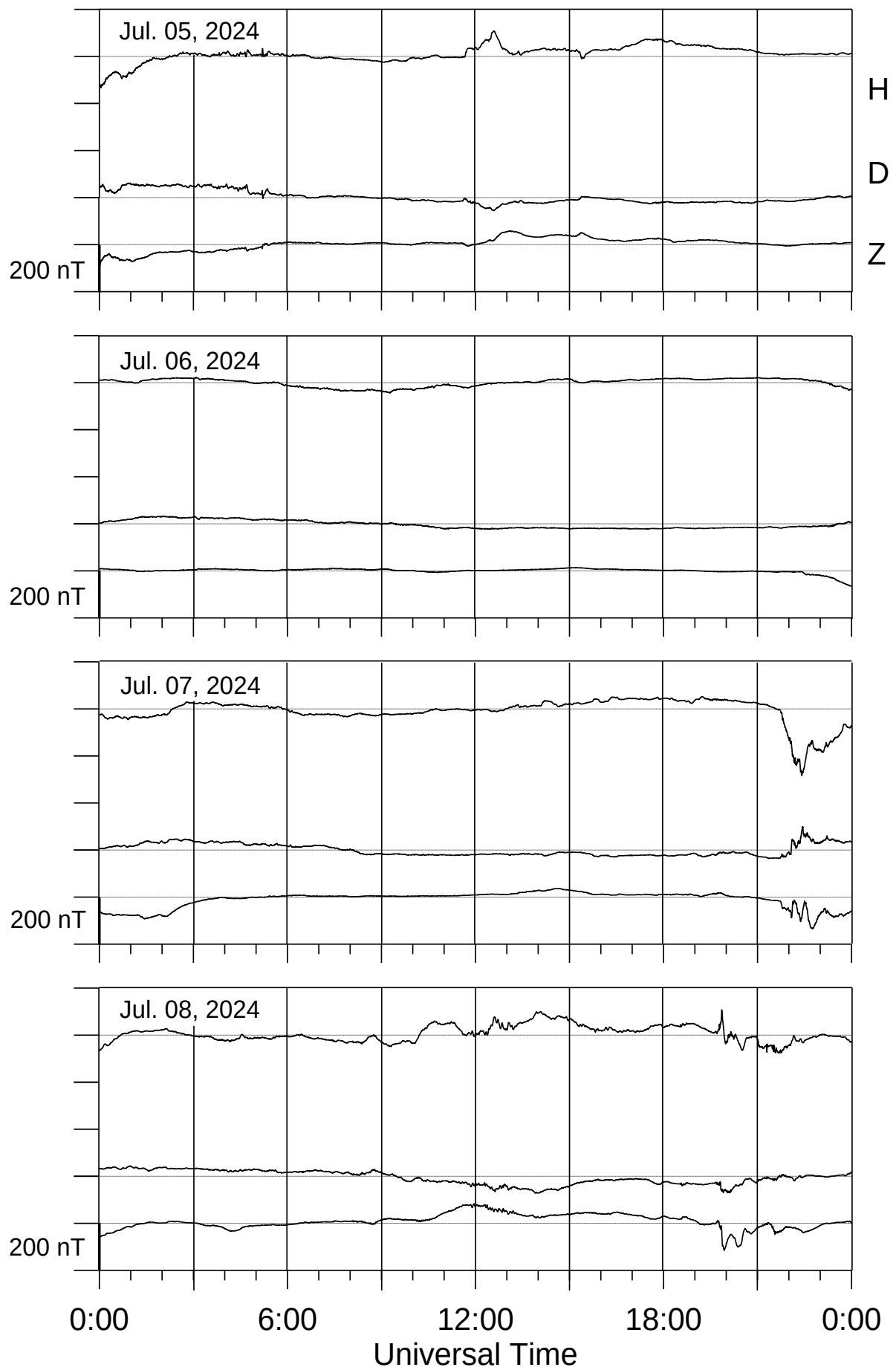
LOVOZERO MAGNETOGRAMS

July - September 2024

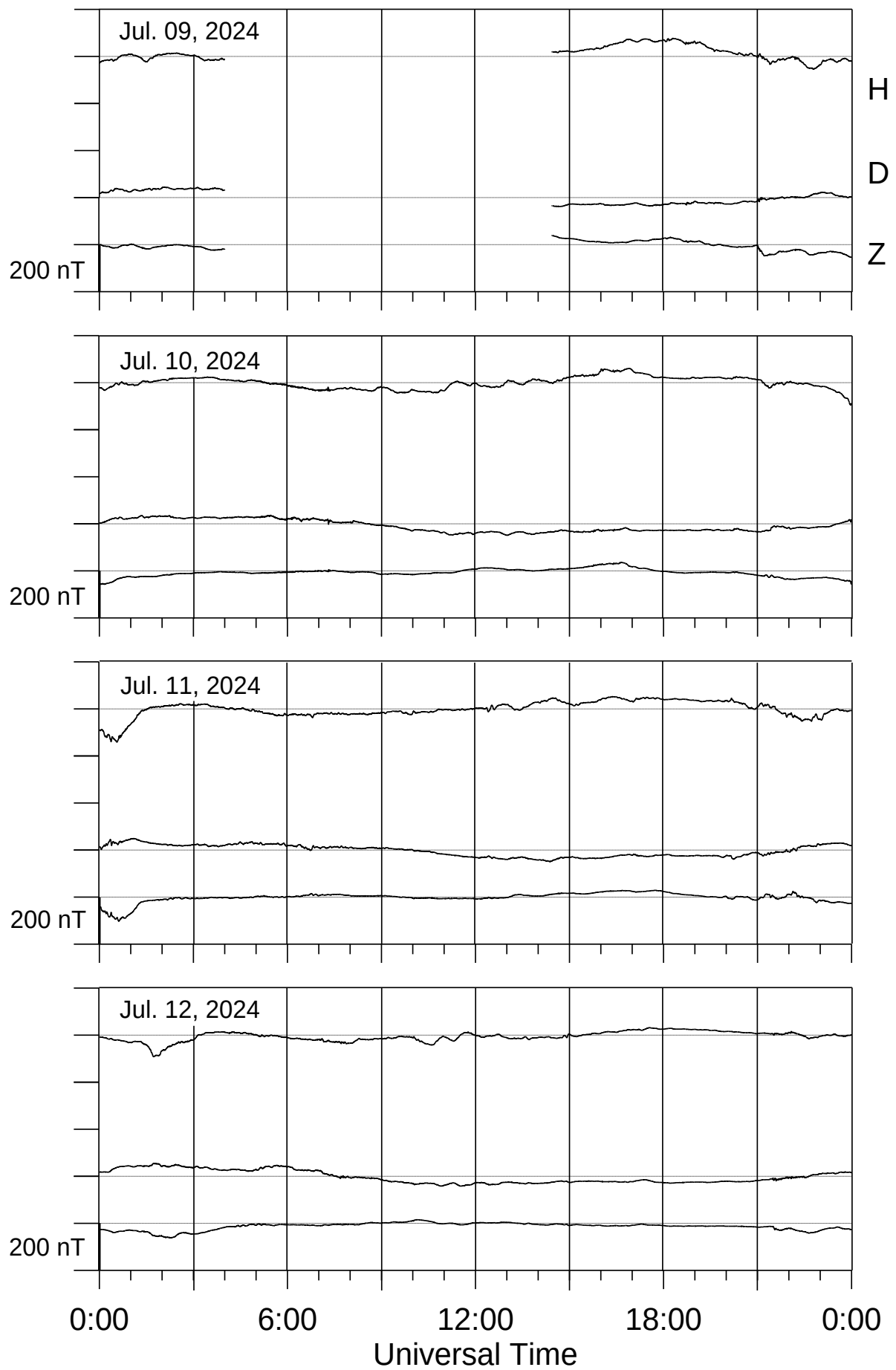
Lovozero magnetometer



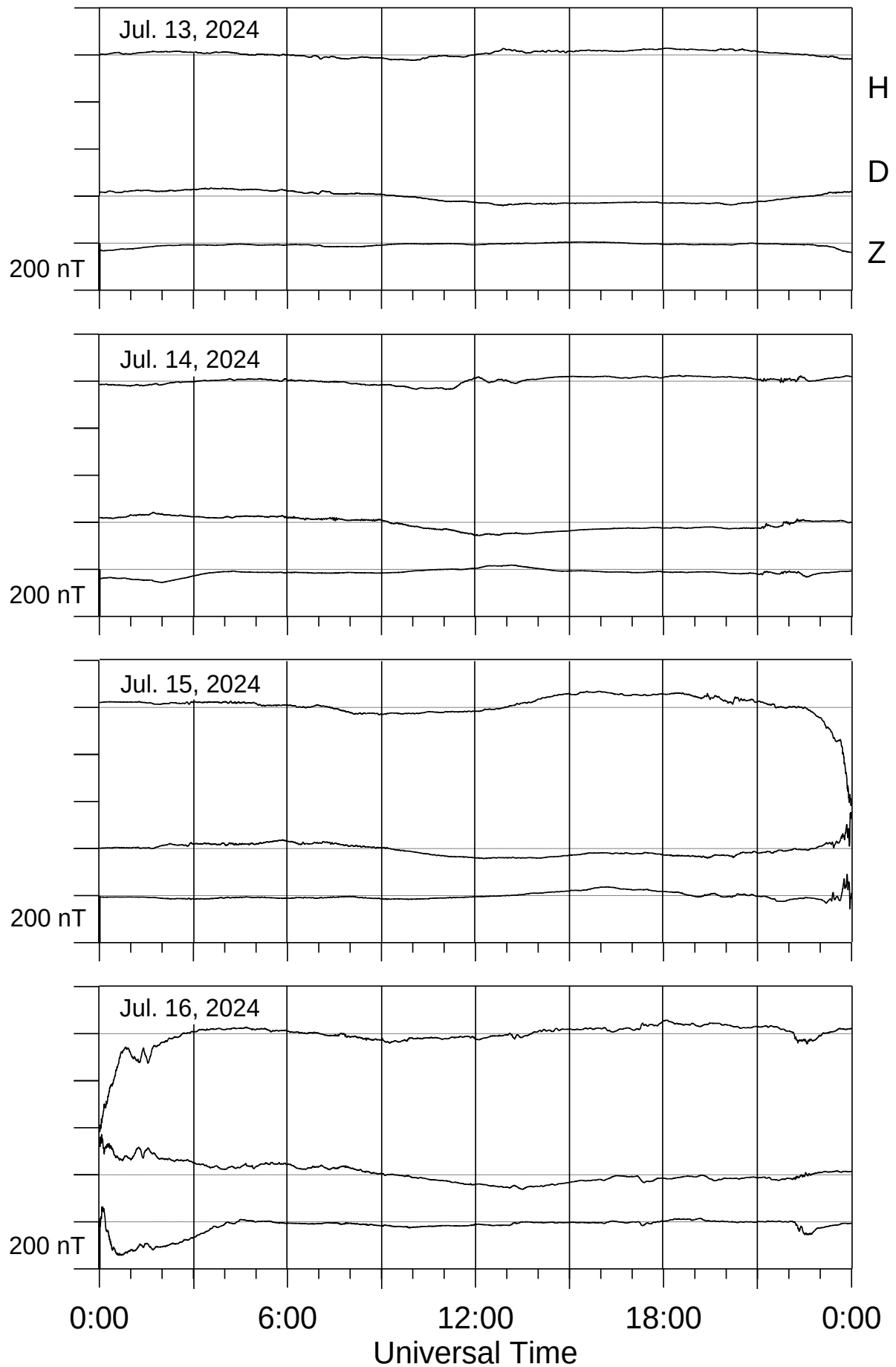
Lovozero magnetometer



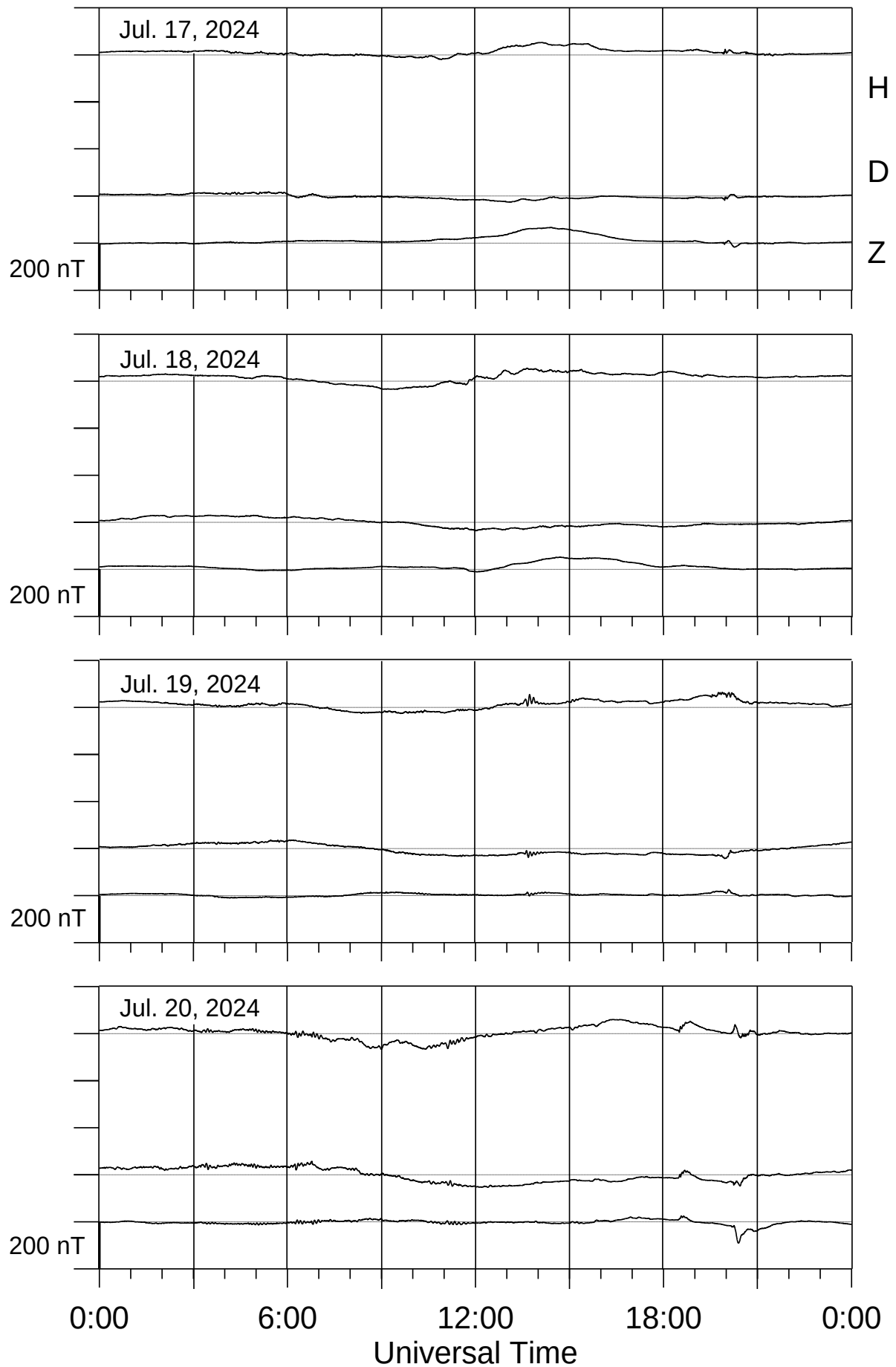
Lovozero magnetometer



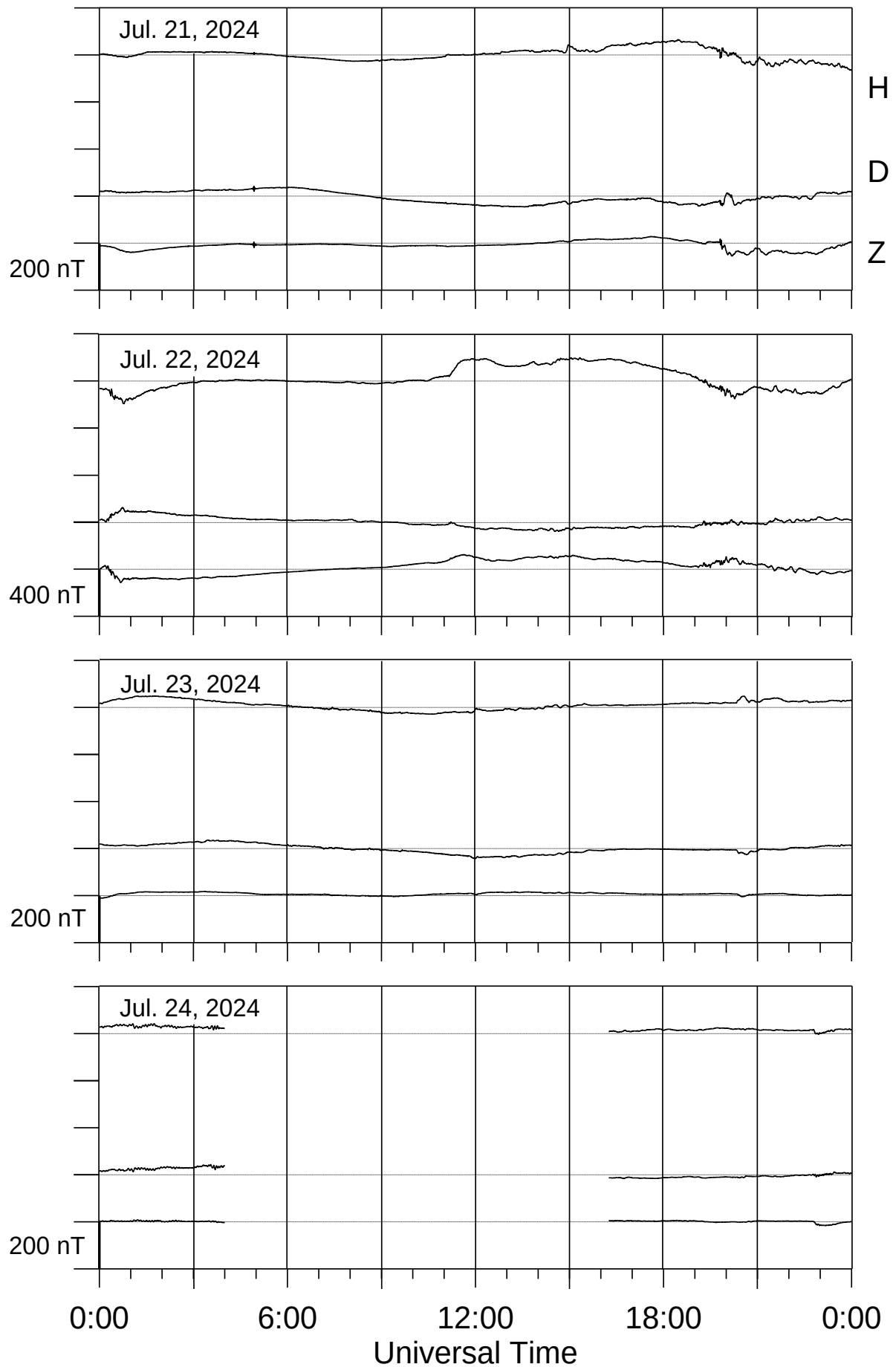
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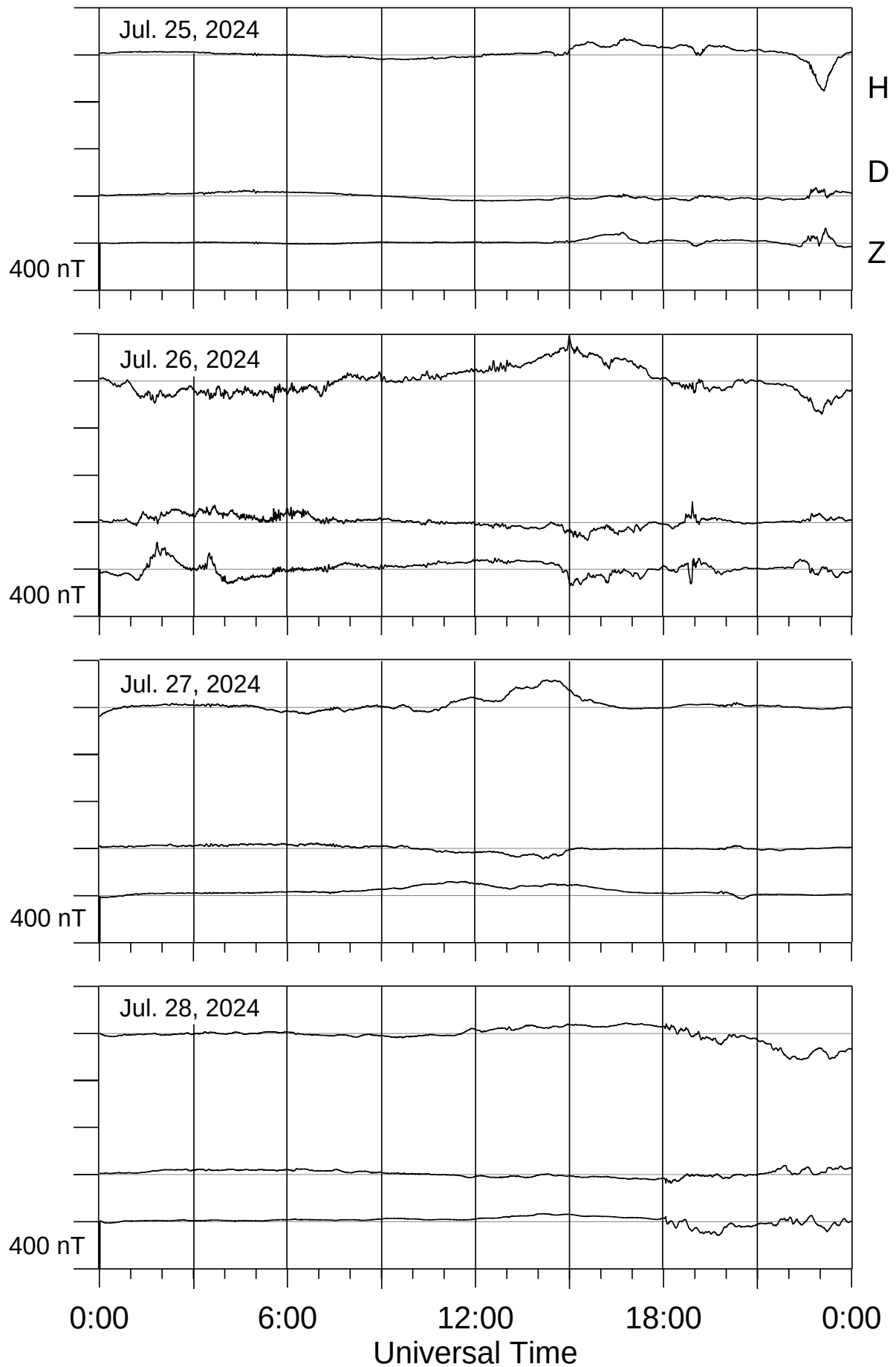
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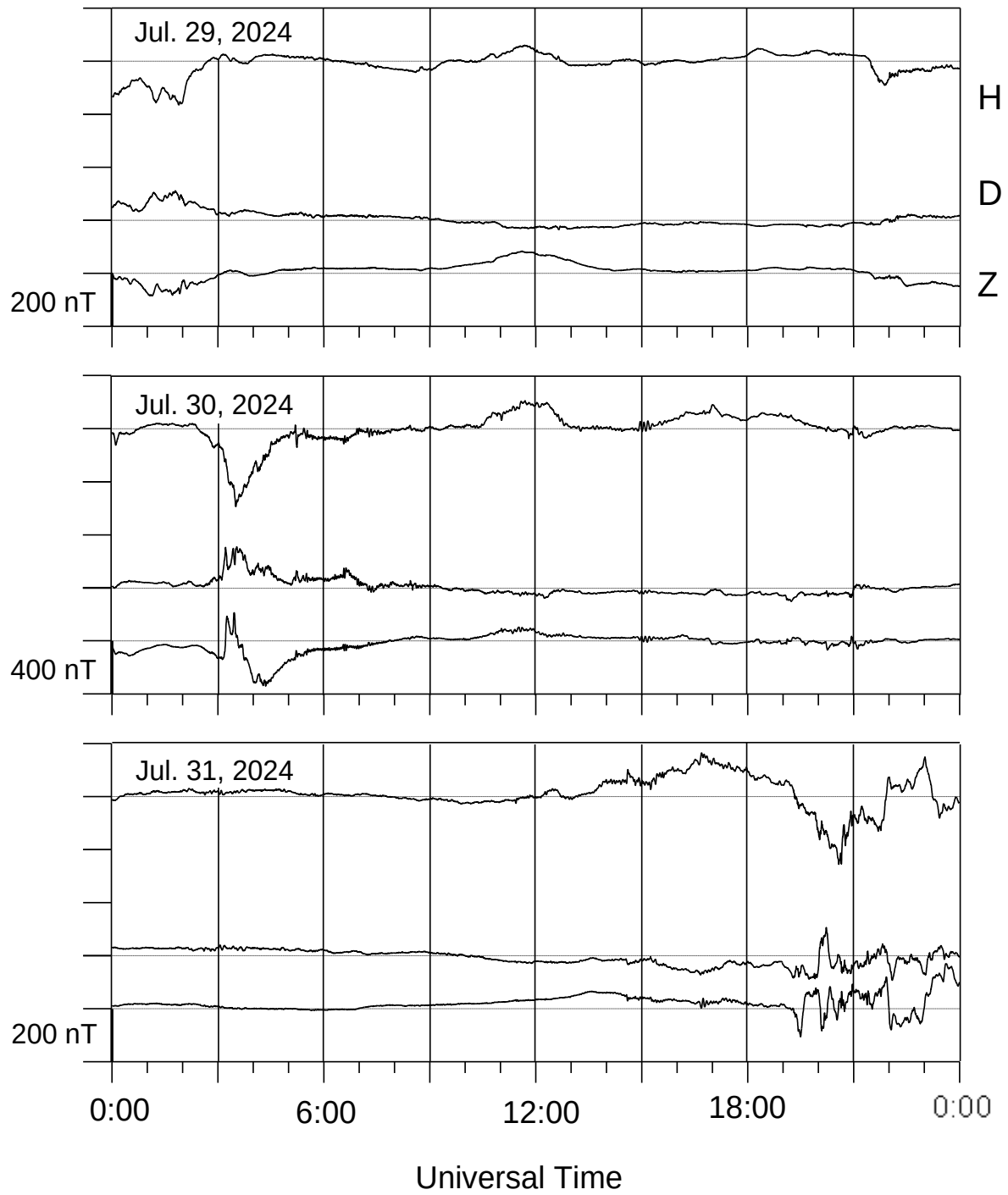
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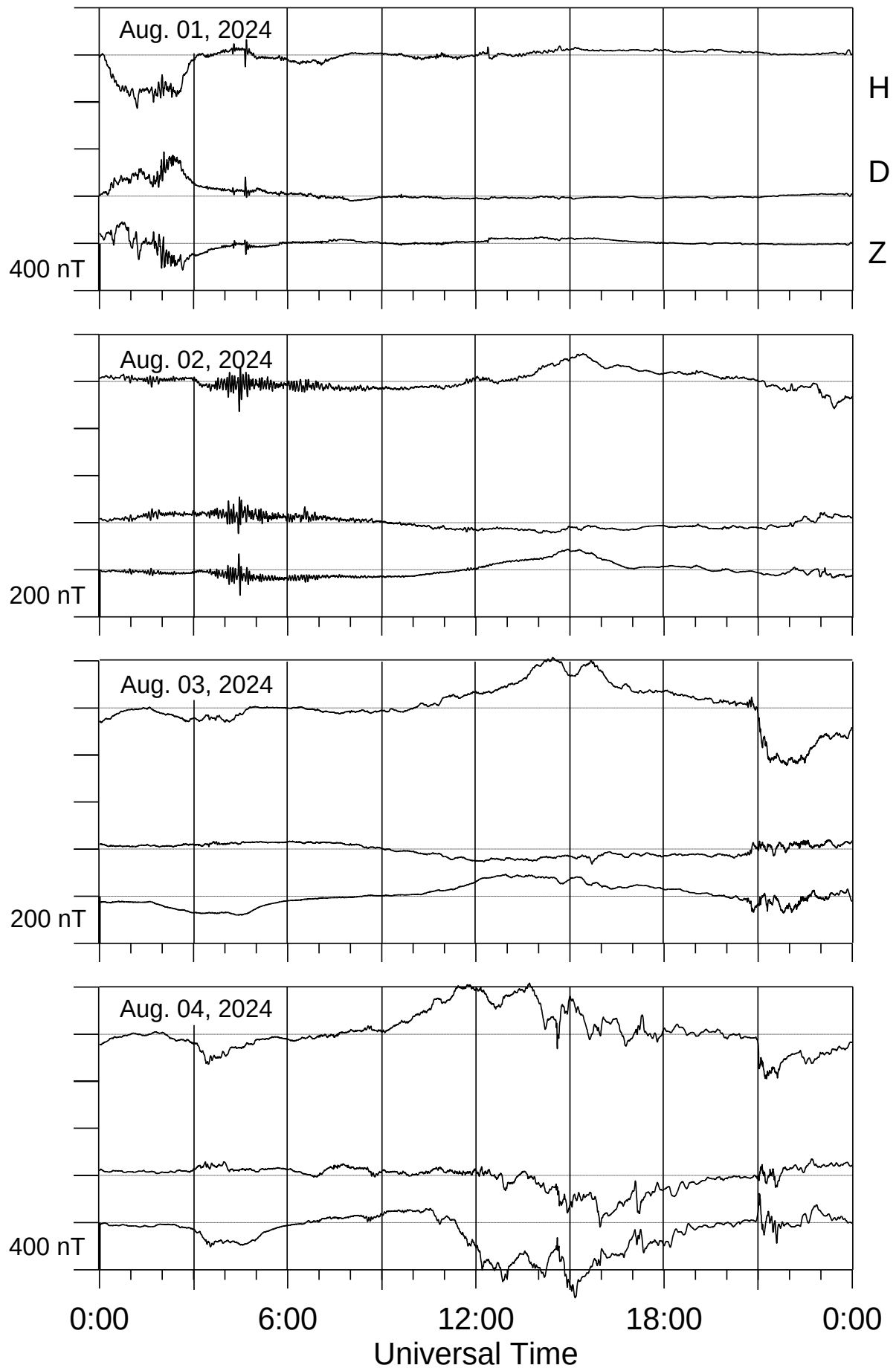
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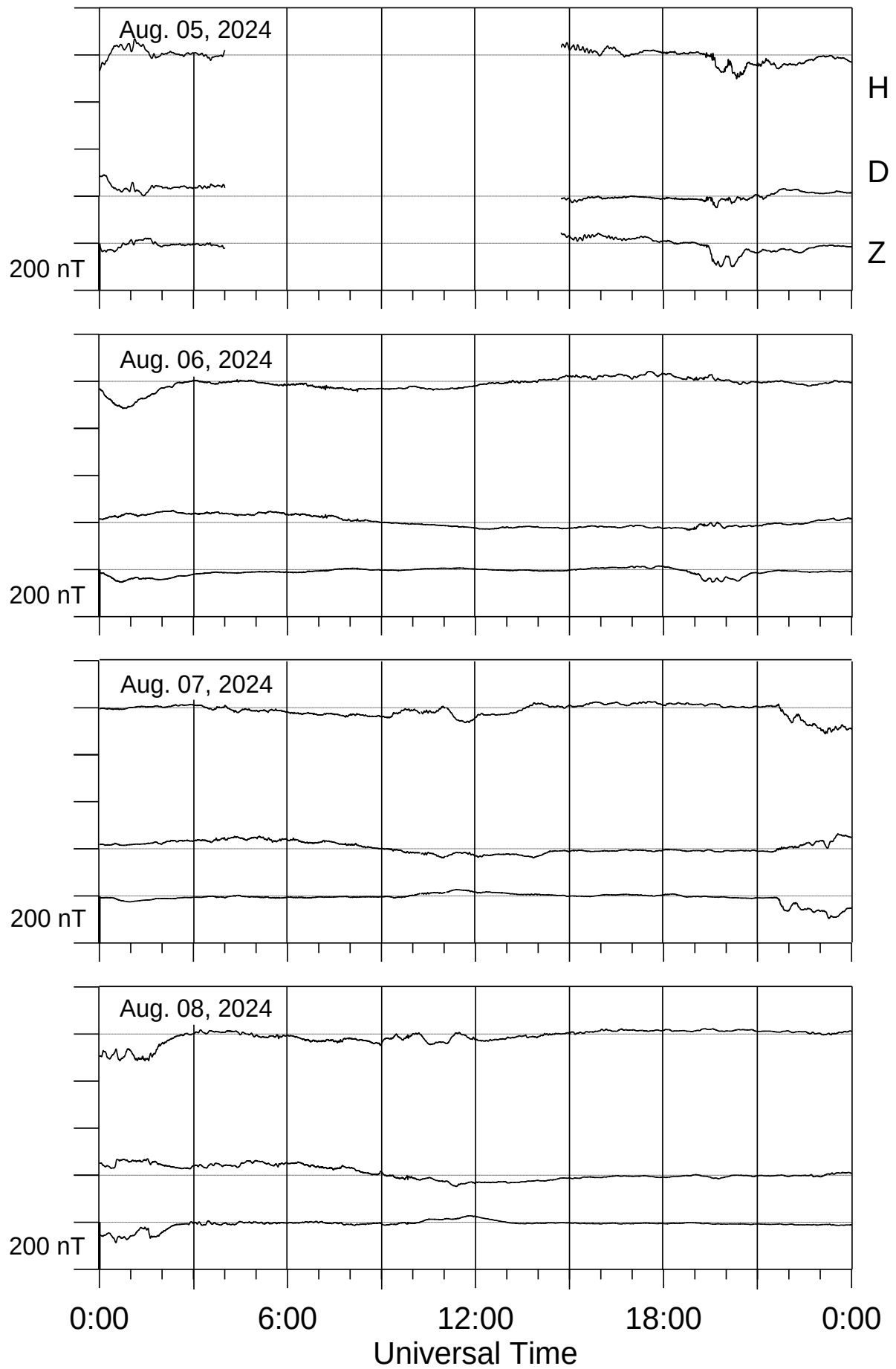
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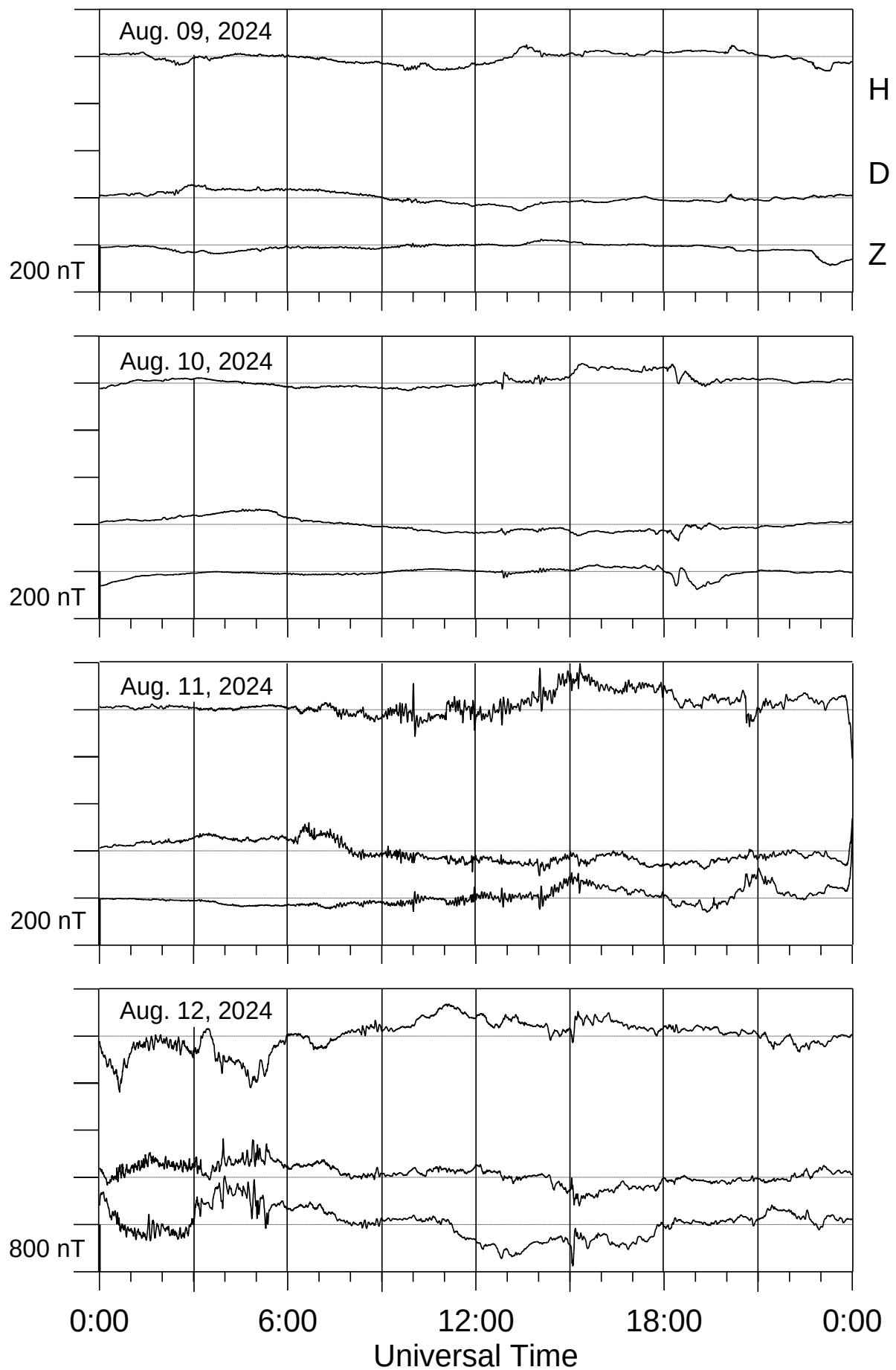
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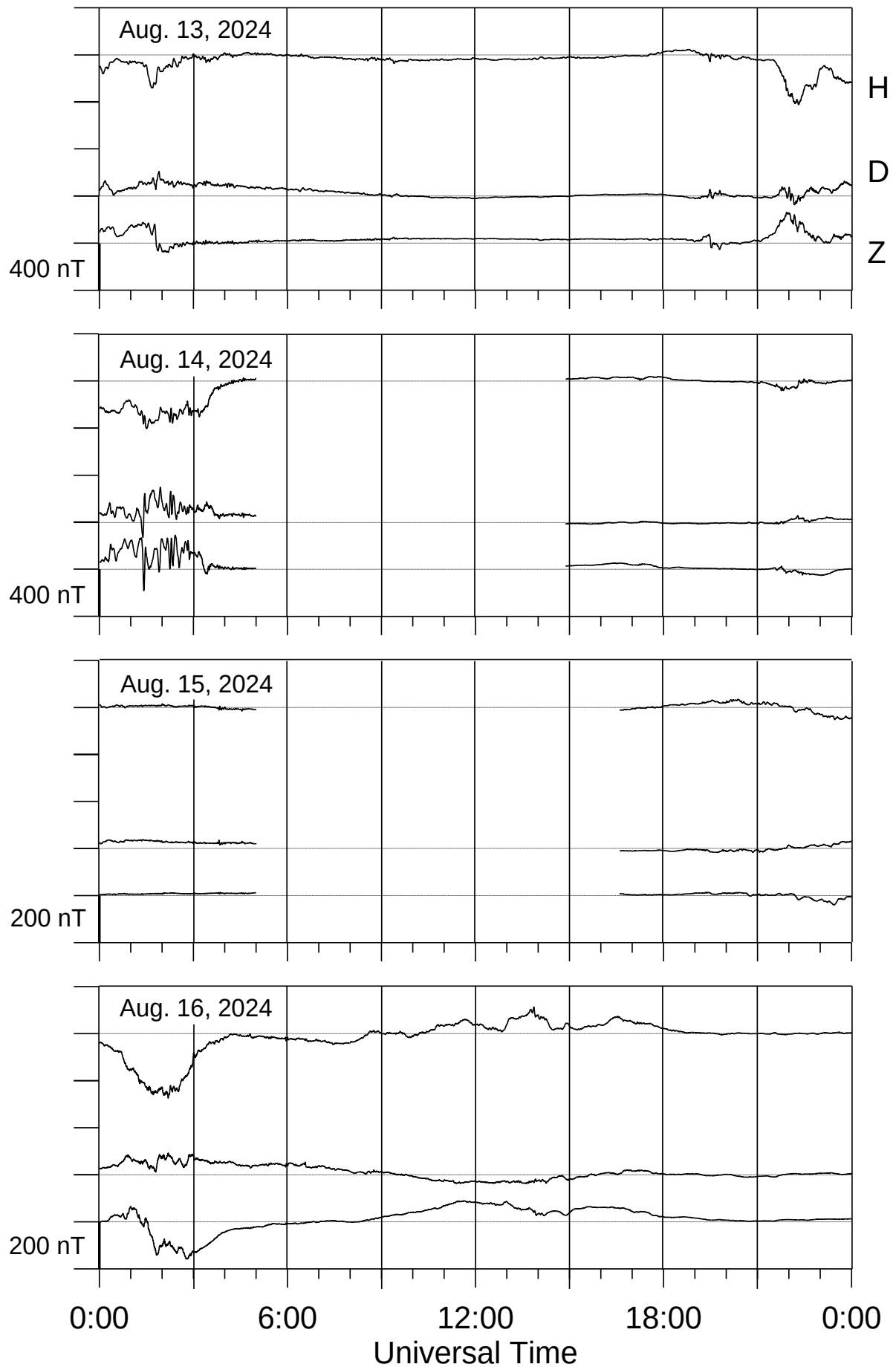
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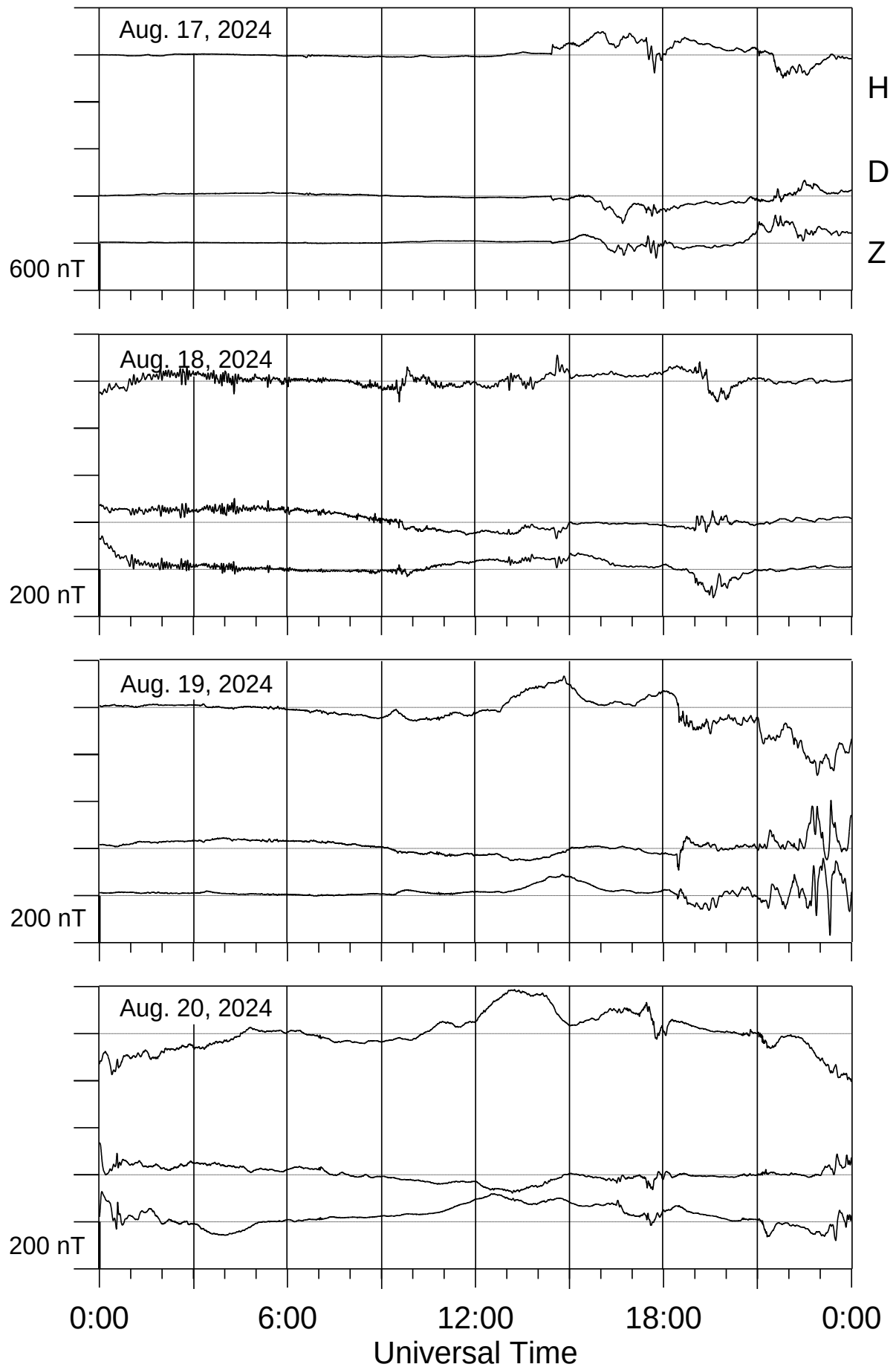
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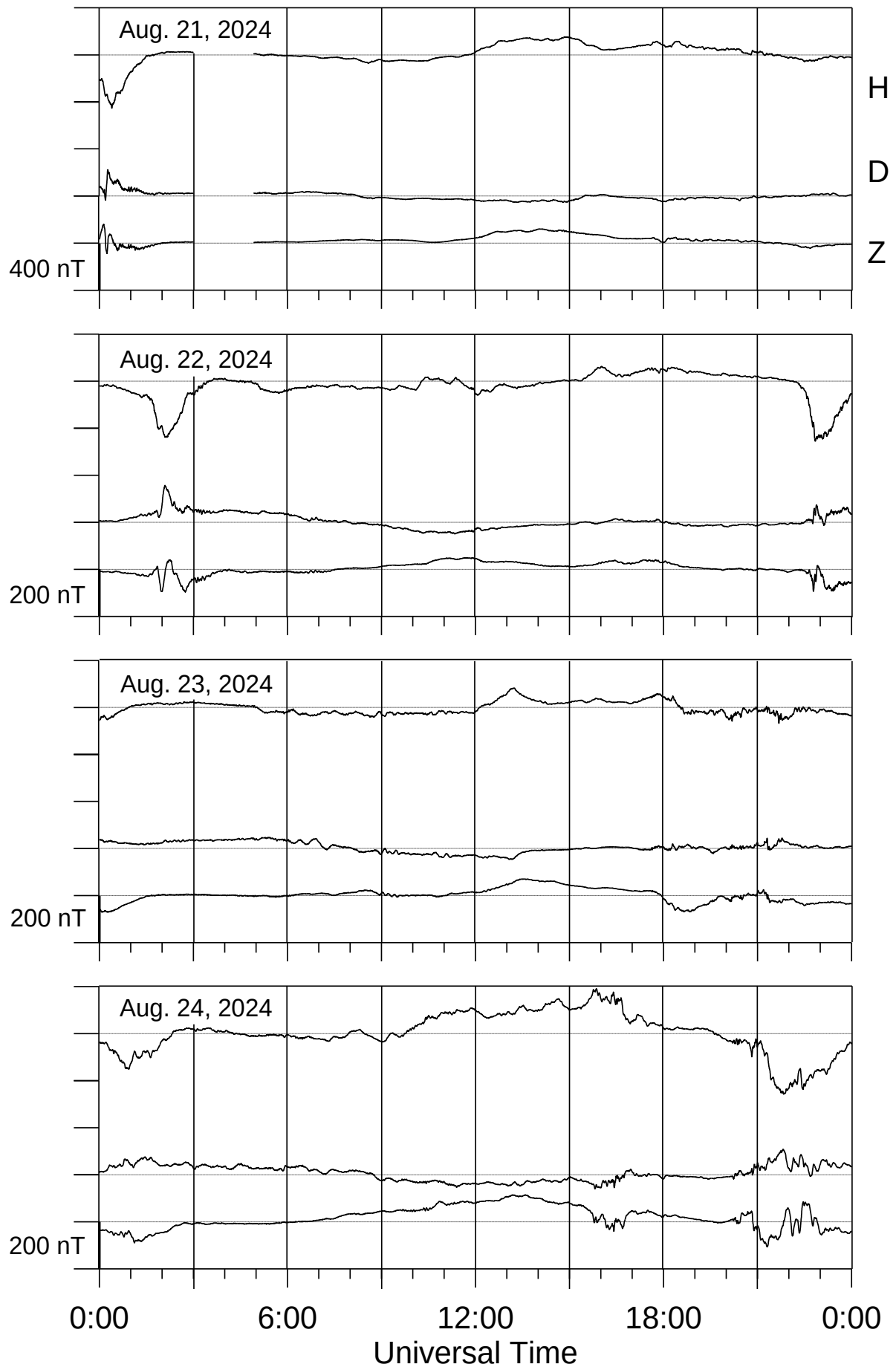
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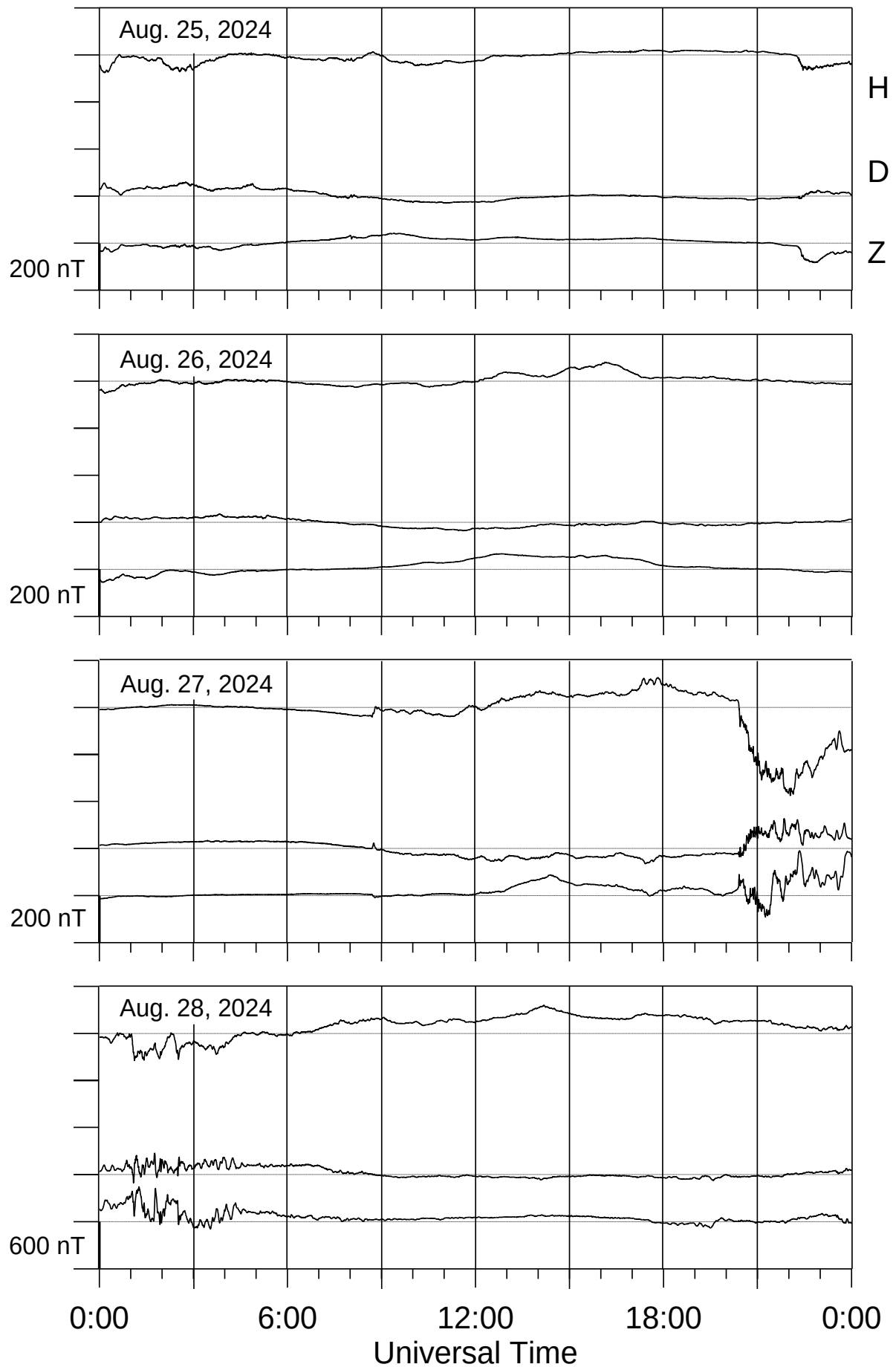
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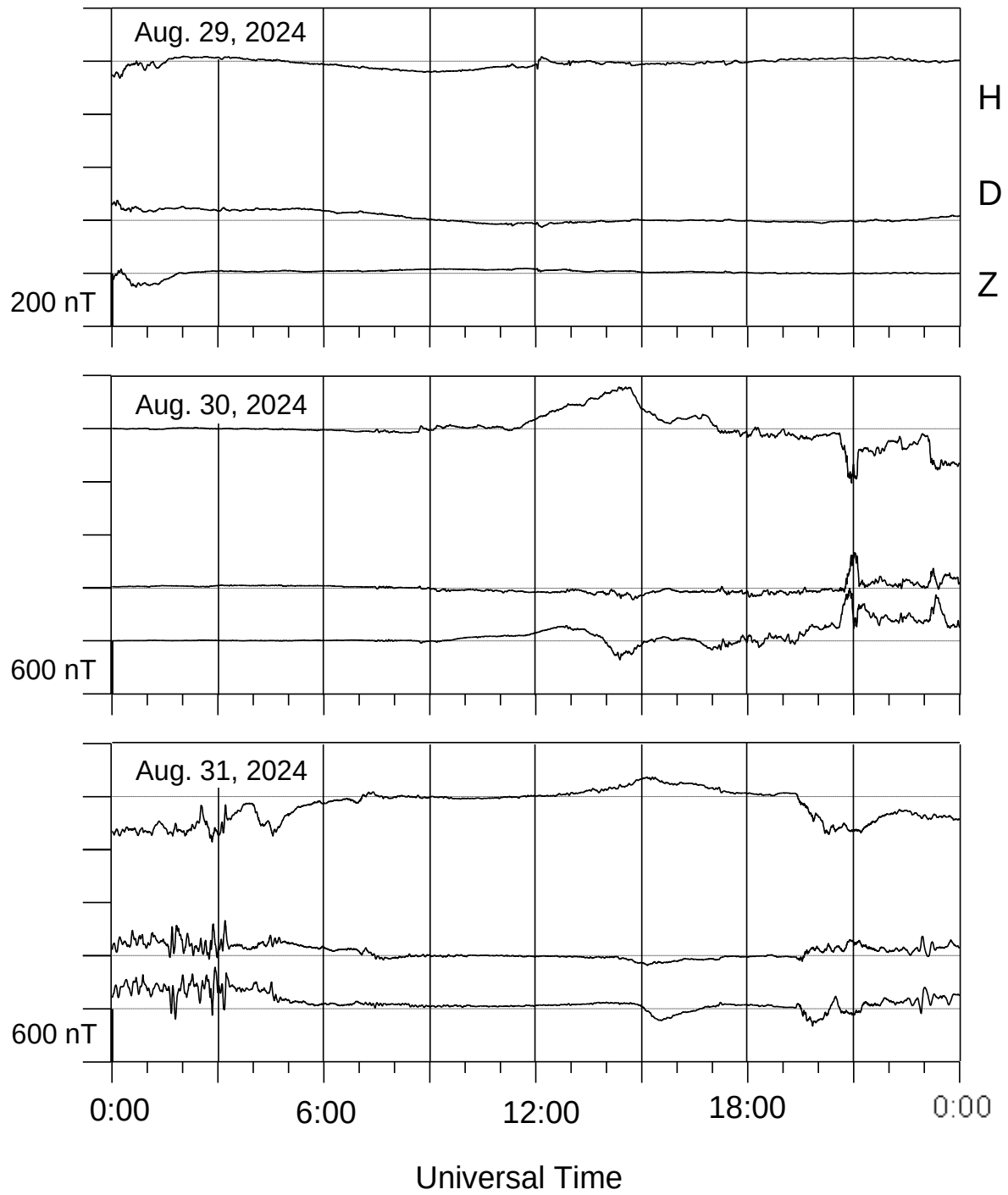
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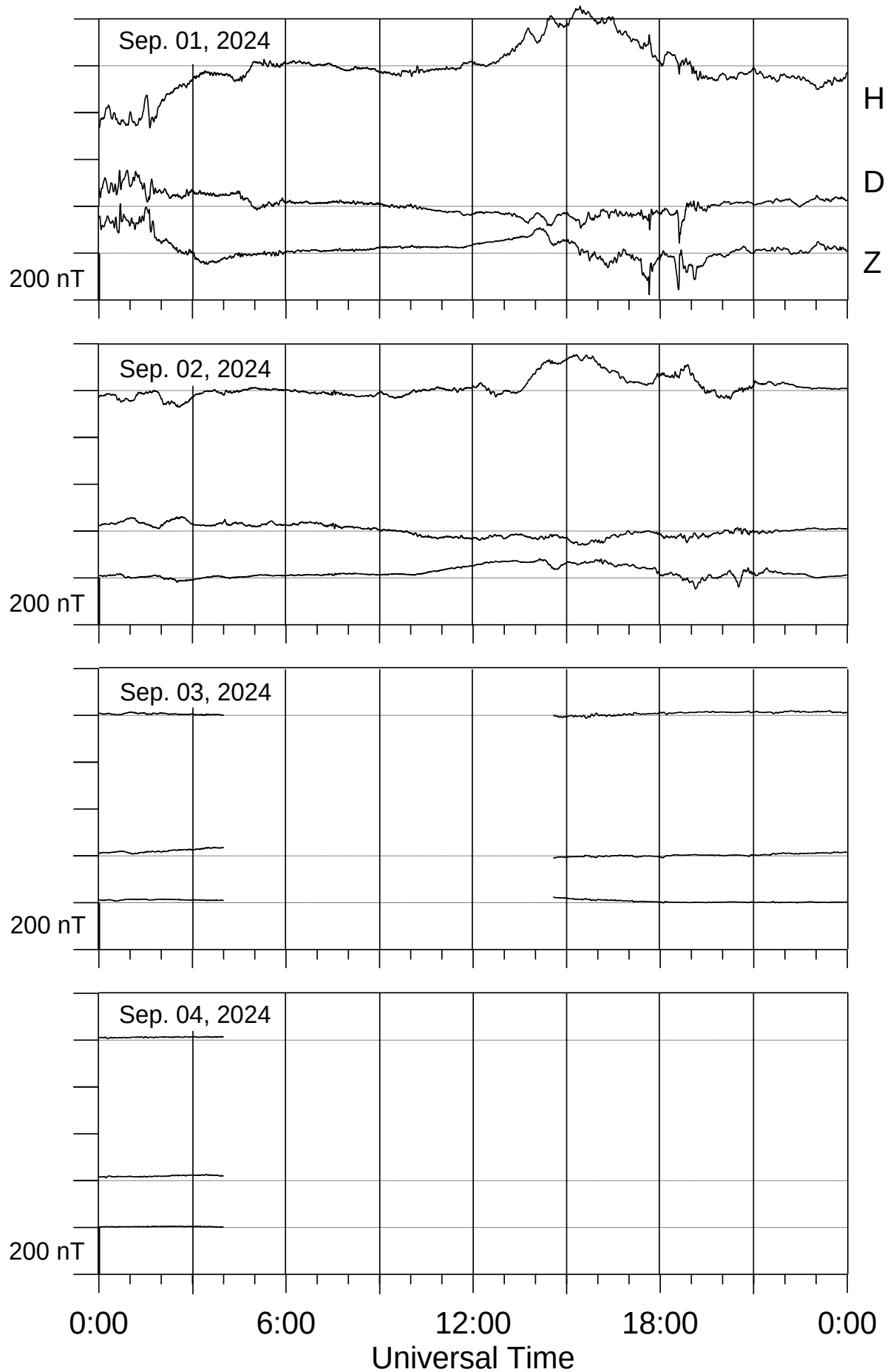
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Lovozero magnetometer



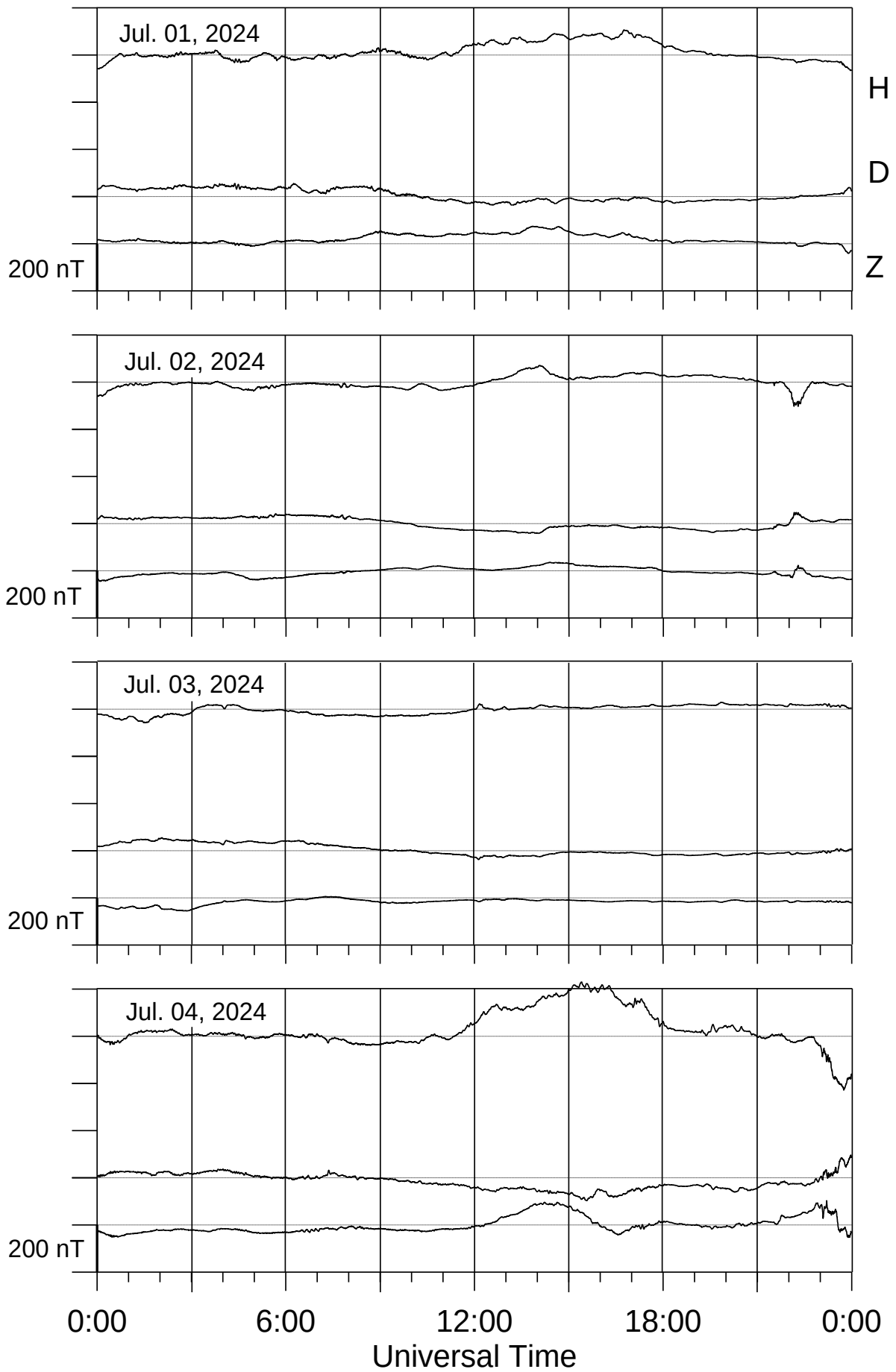
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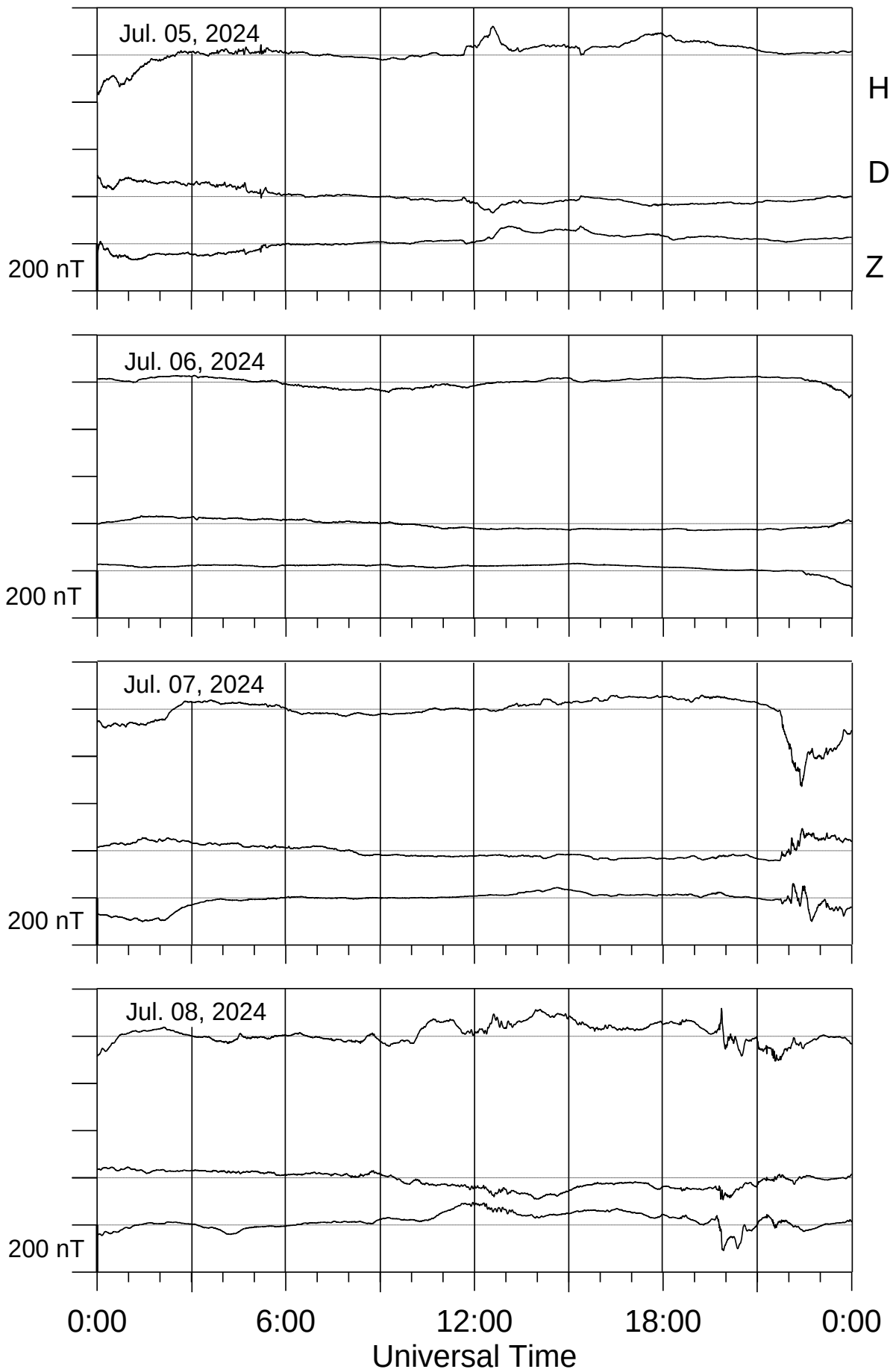
LOPARSKAYA MAGNETOGRAMS

July - September 2024

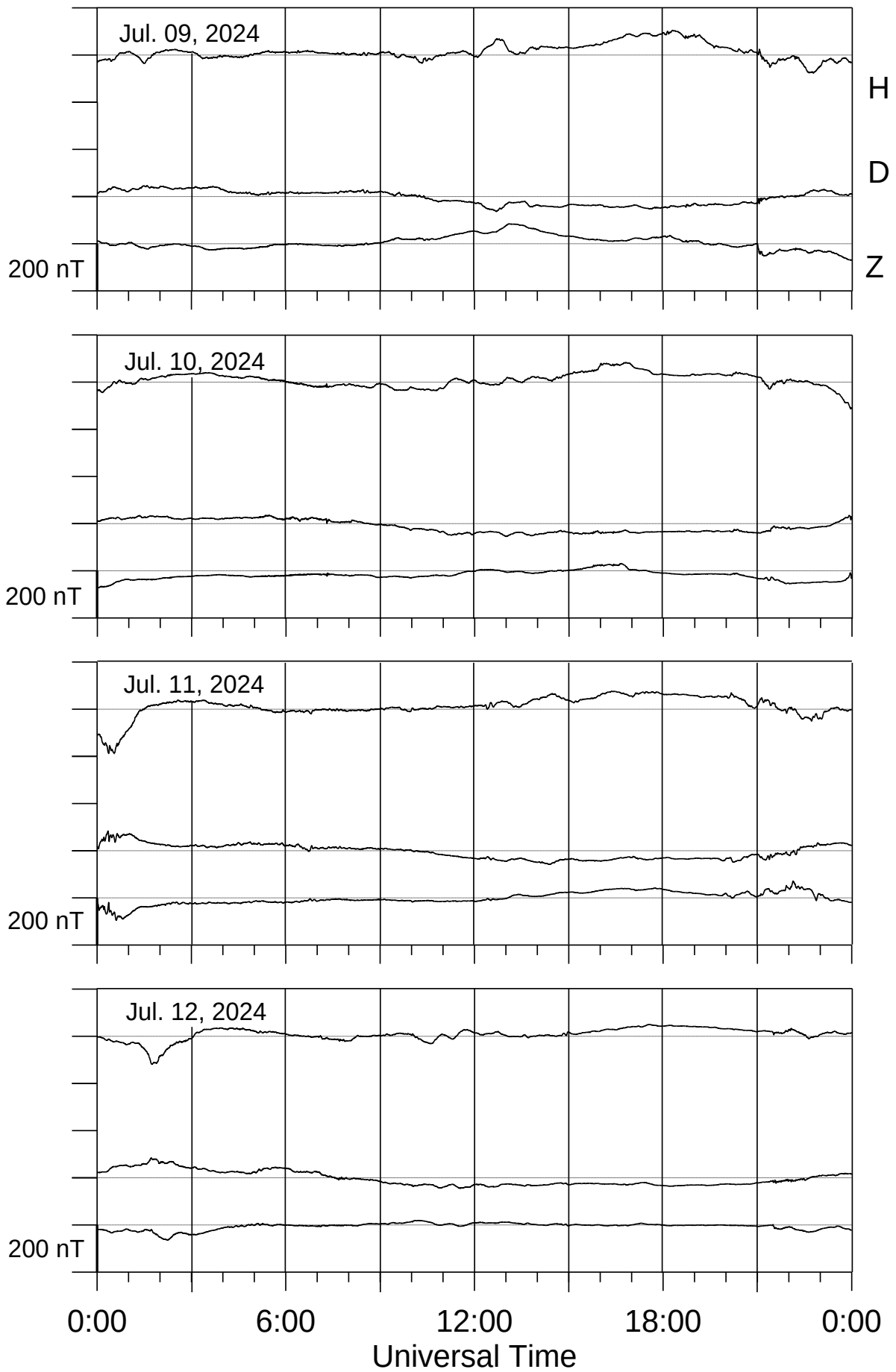
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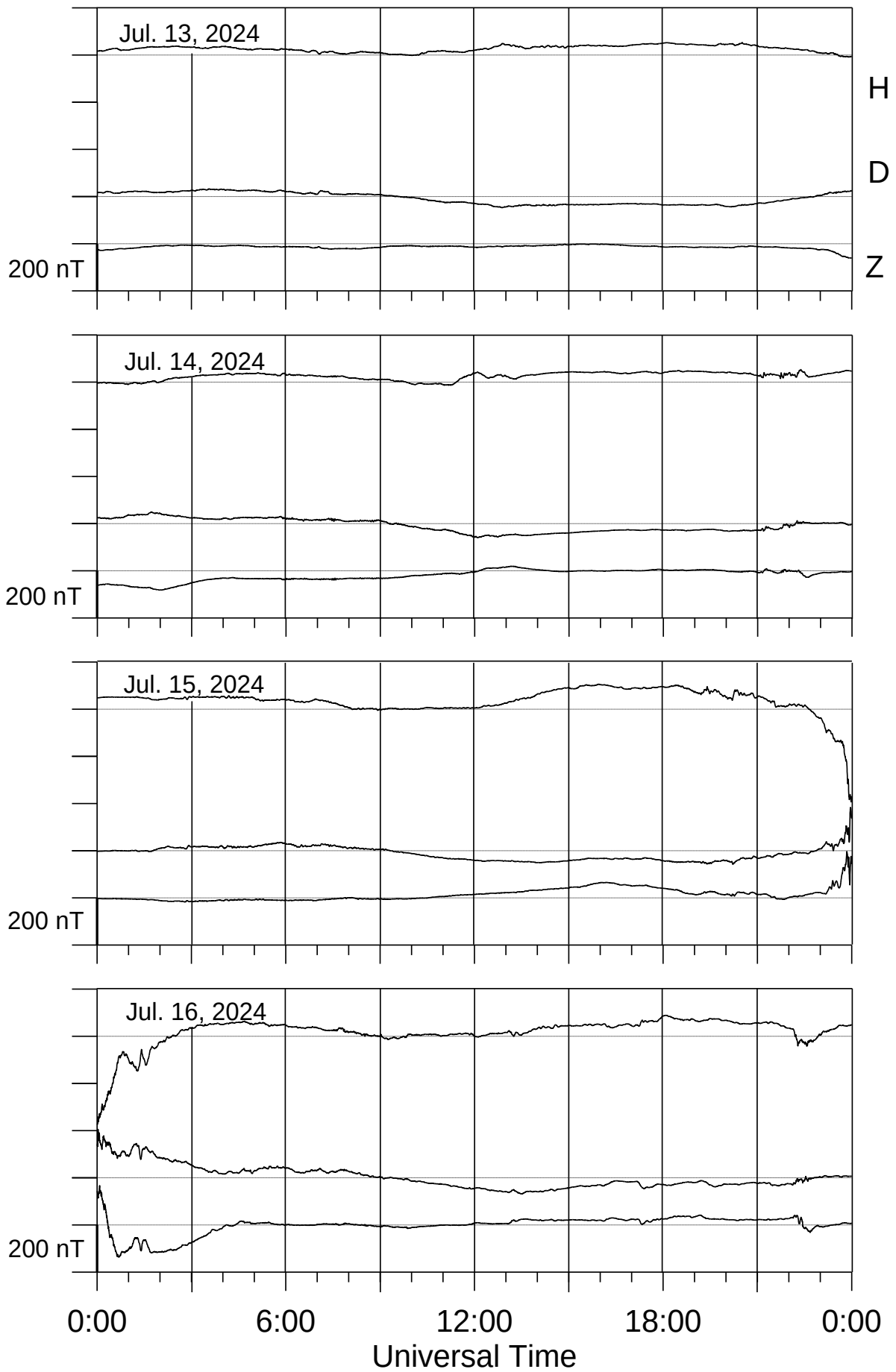
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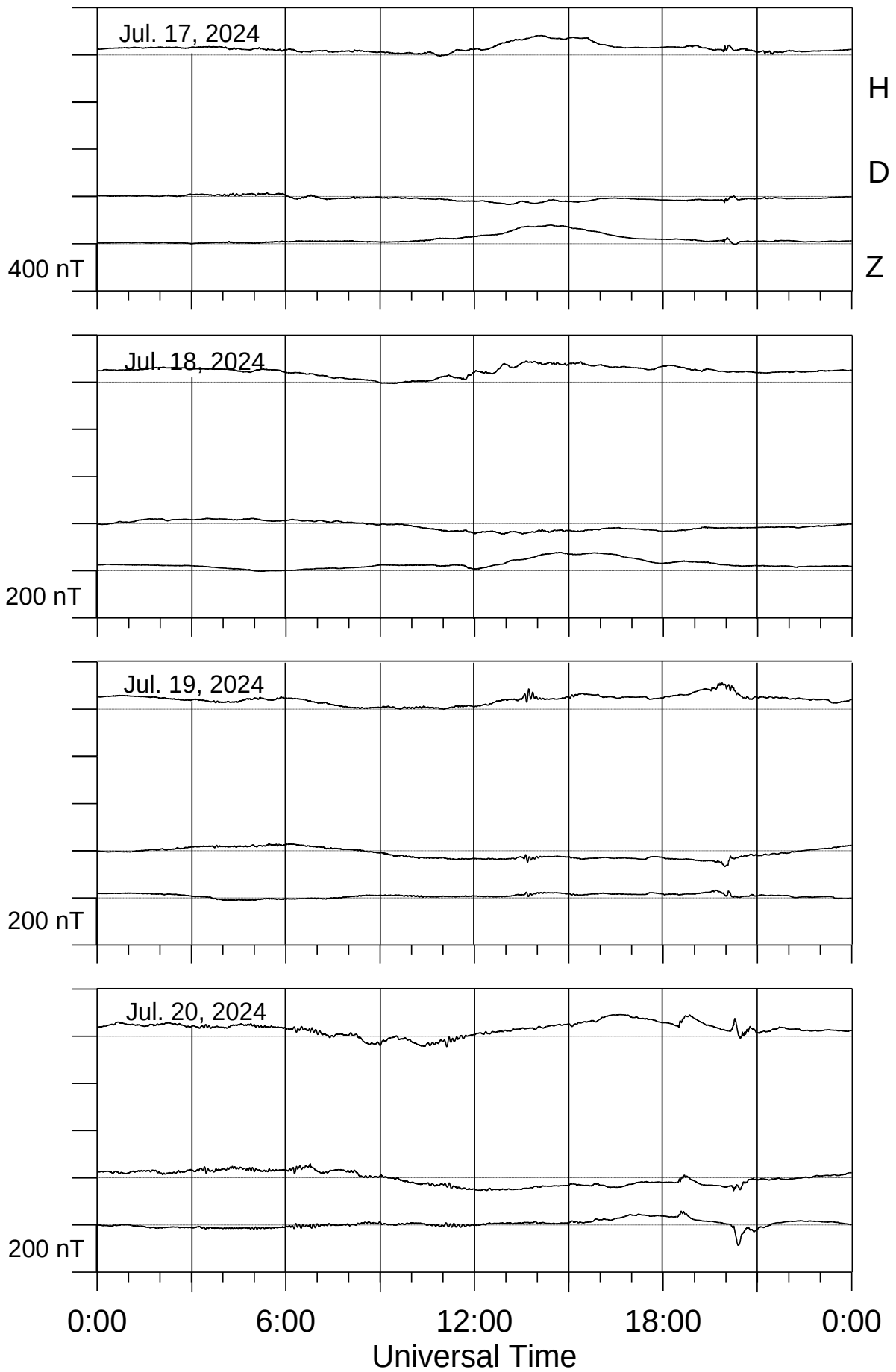
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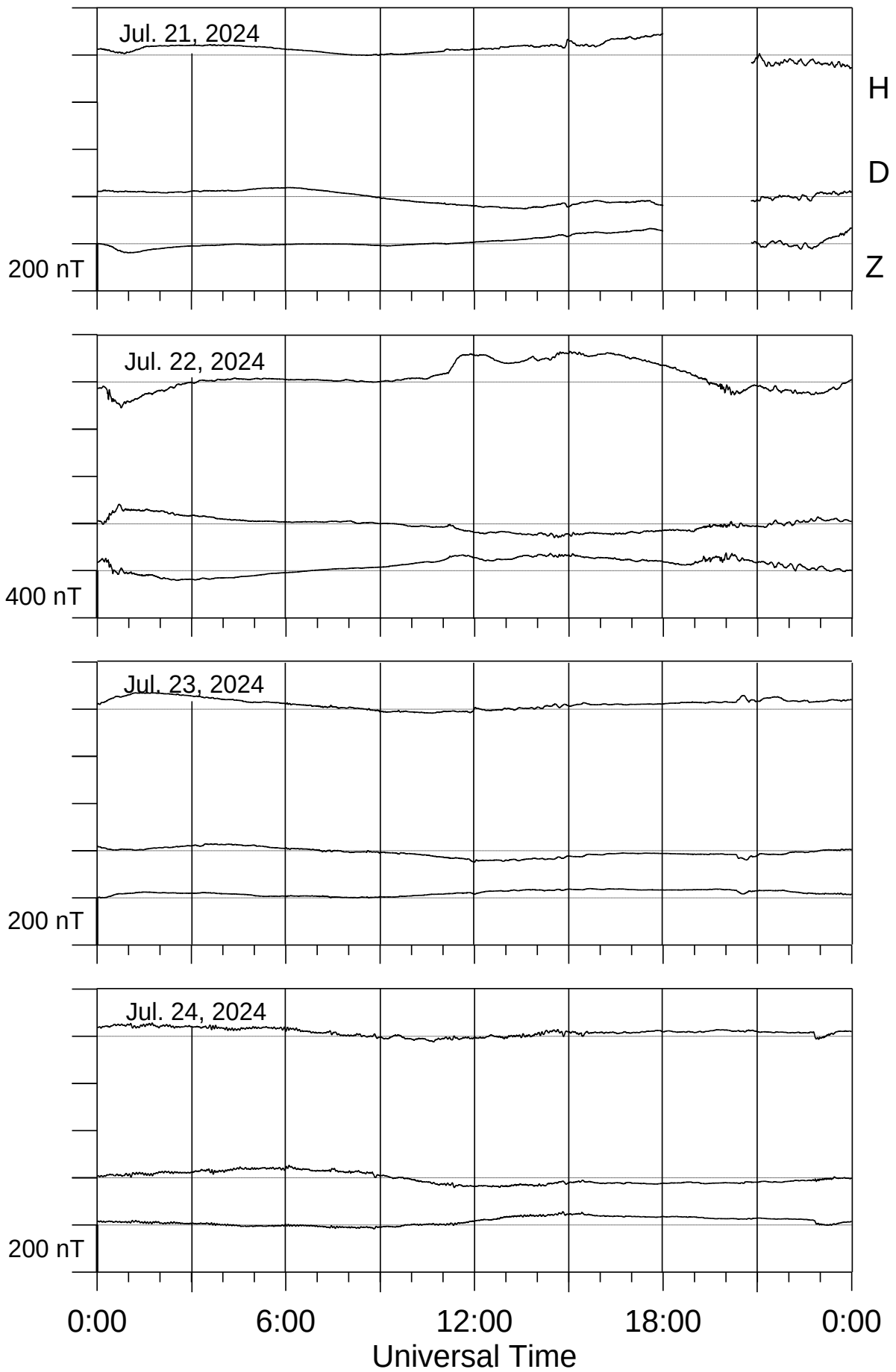
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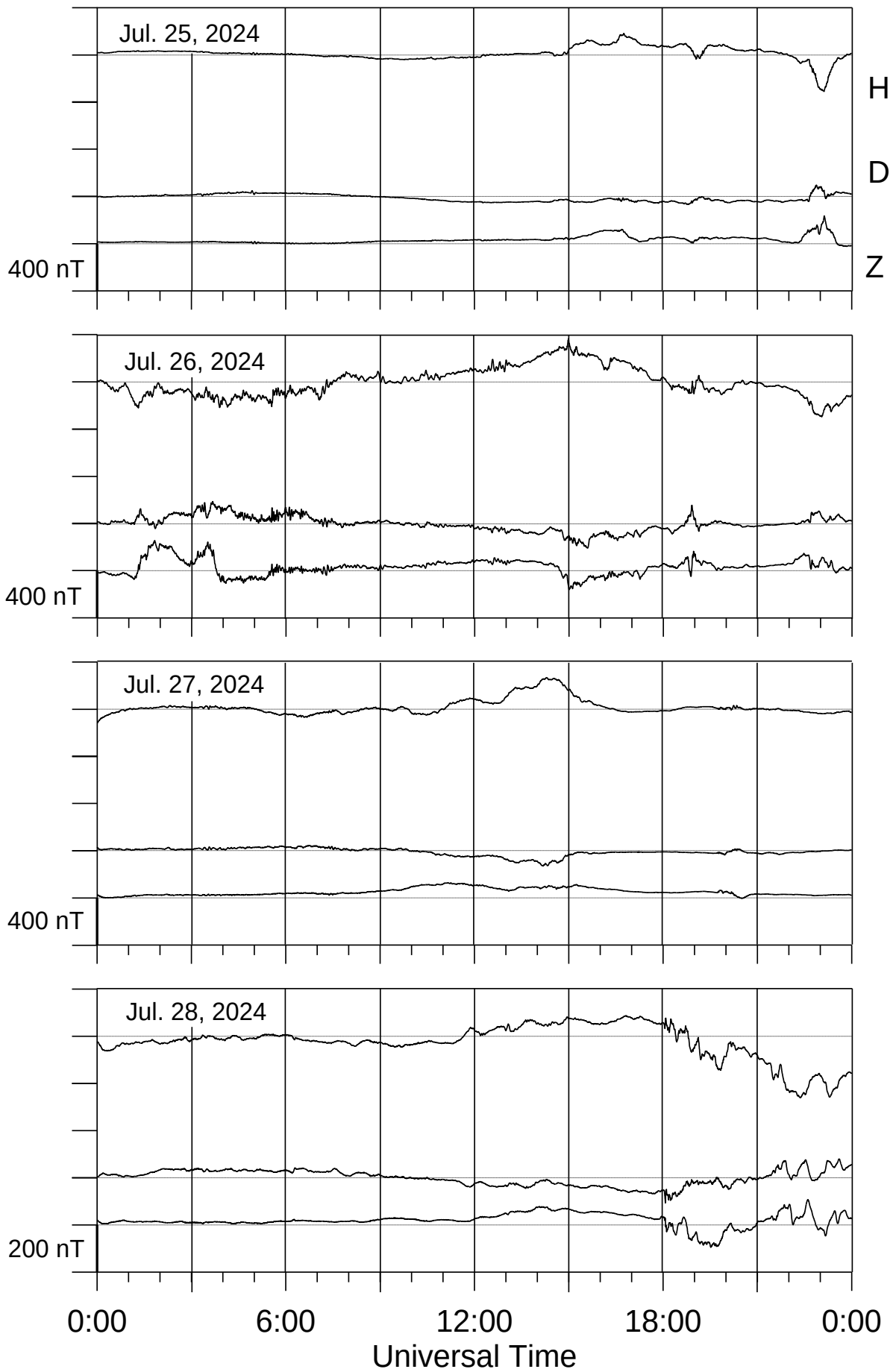
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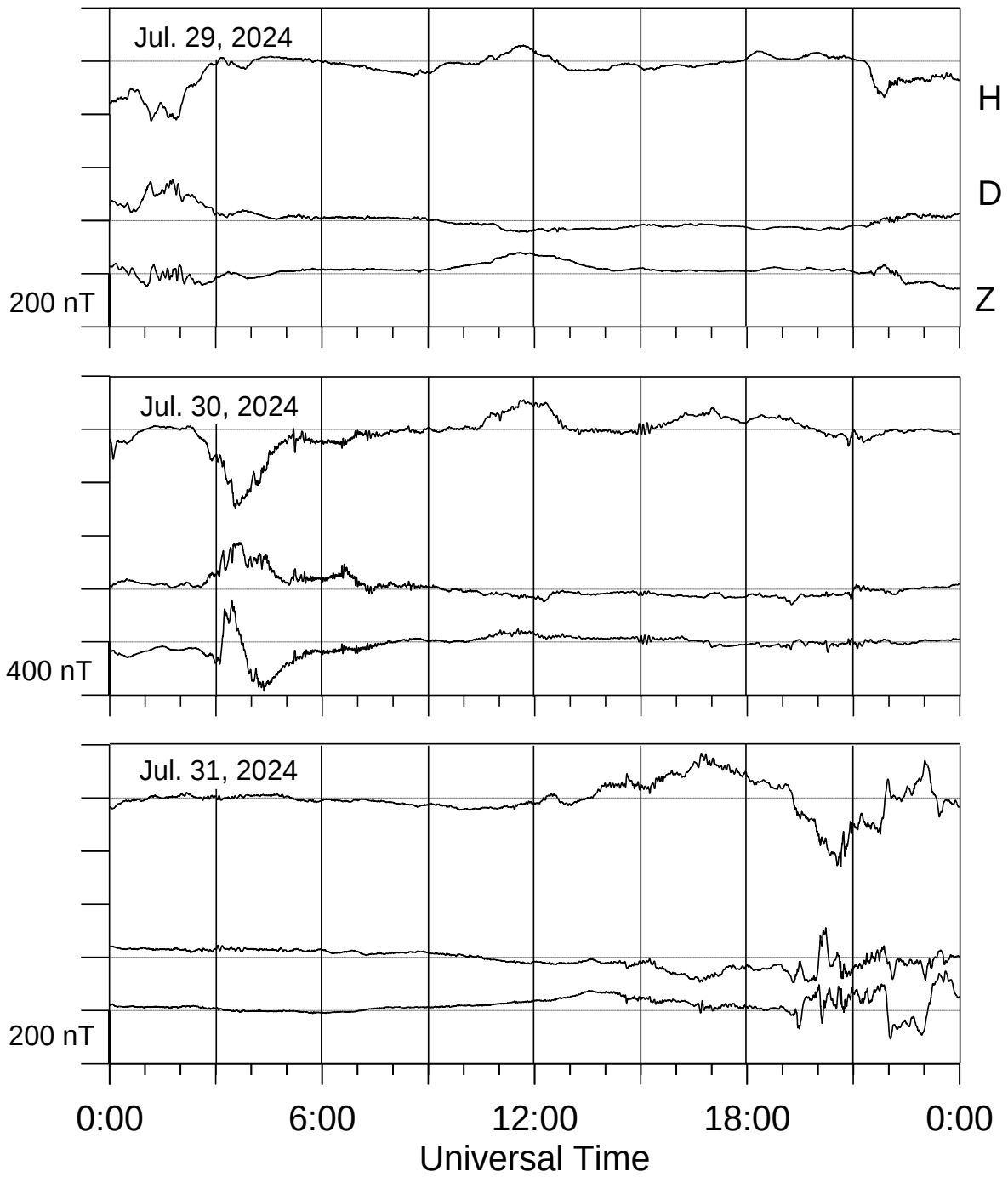
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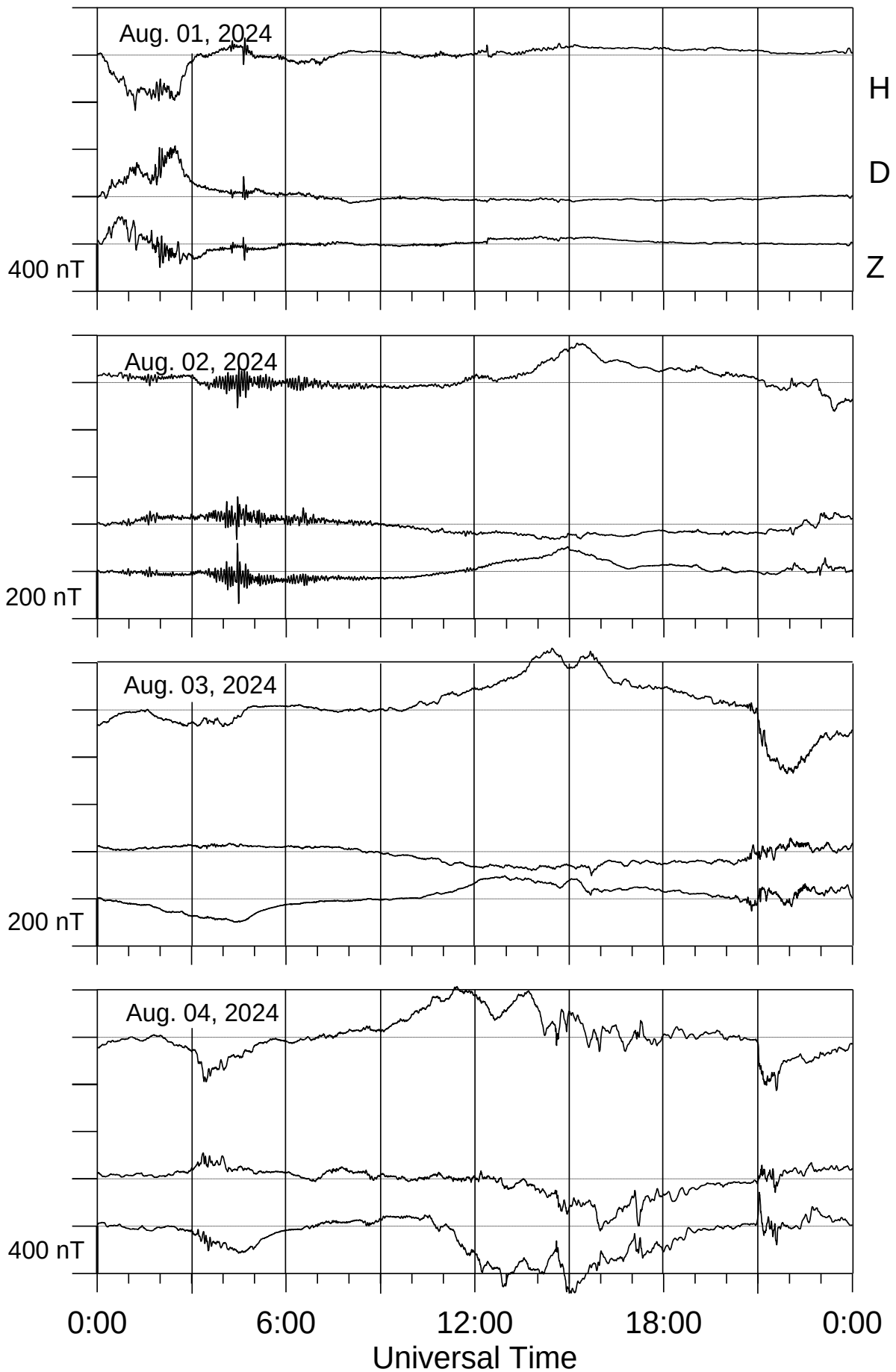
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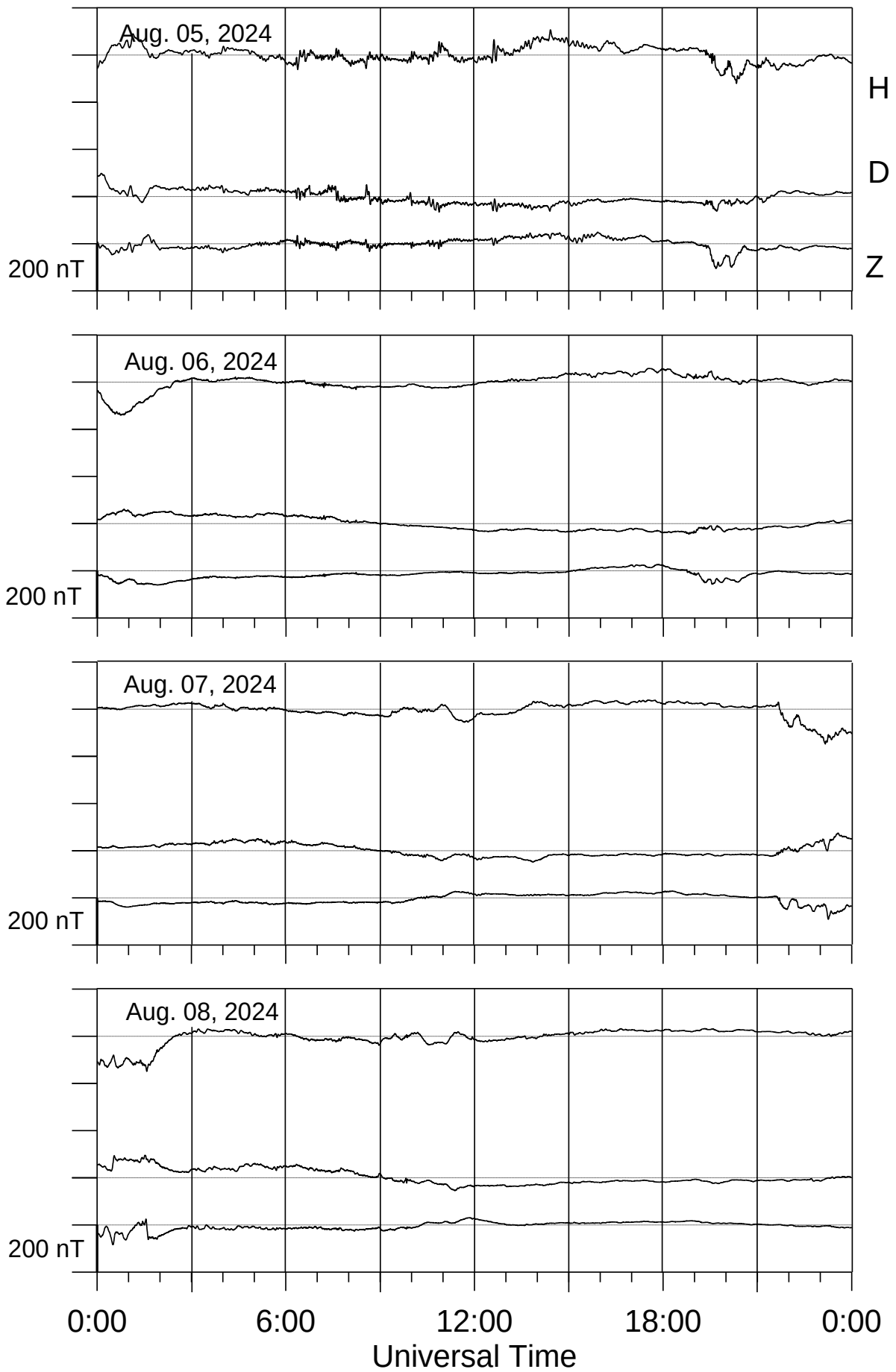
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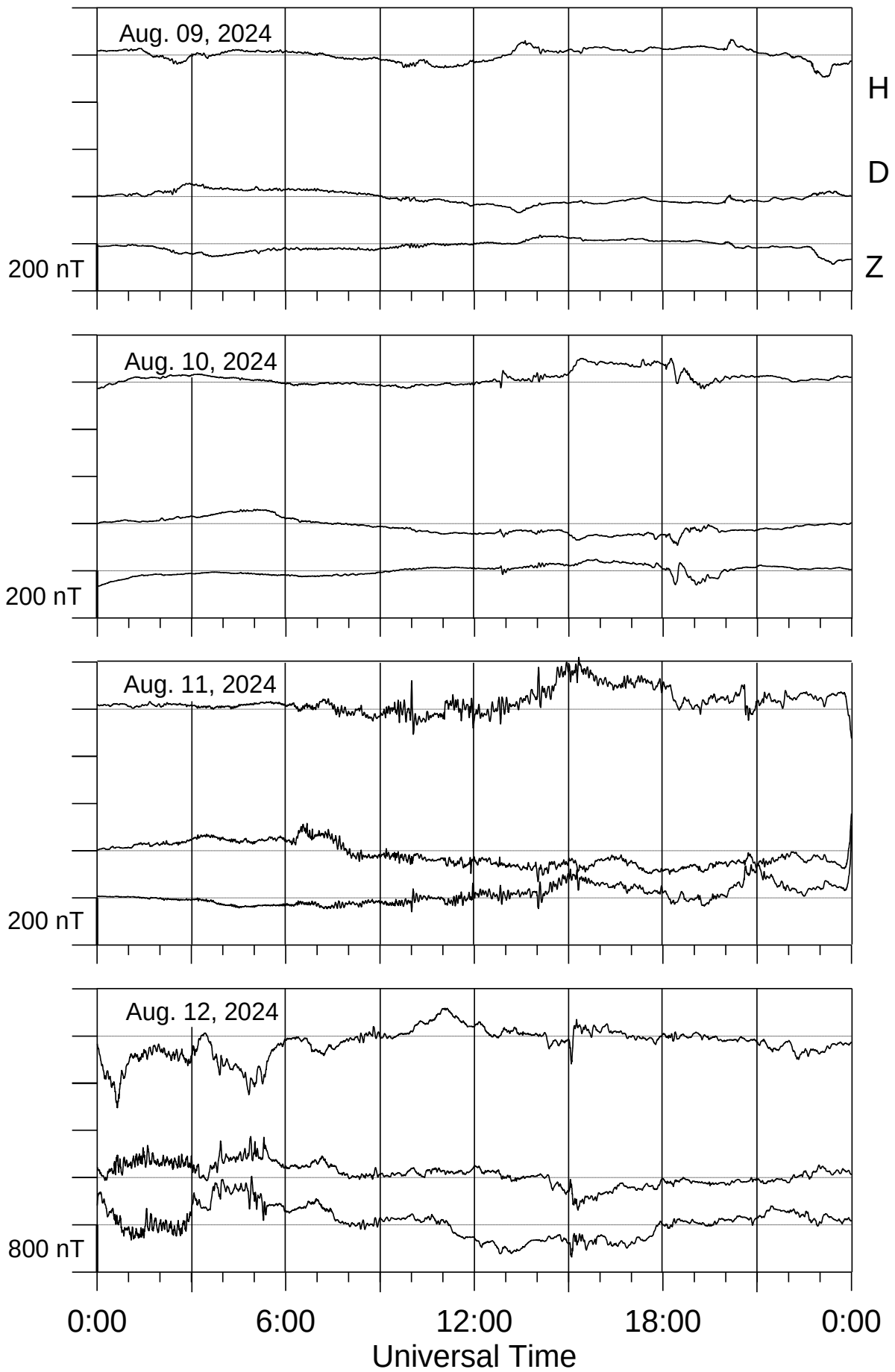
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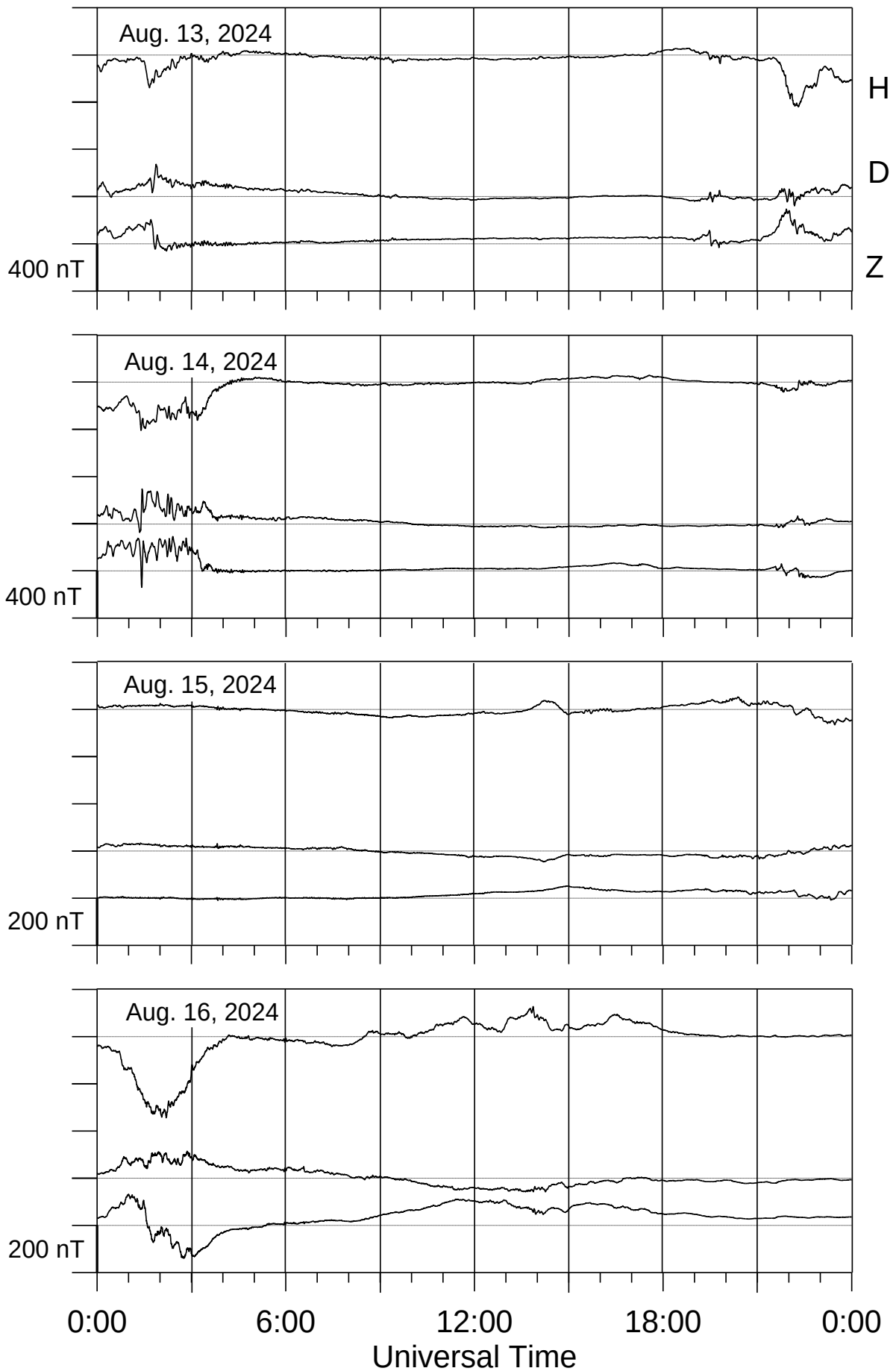
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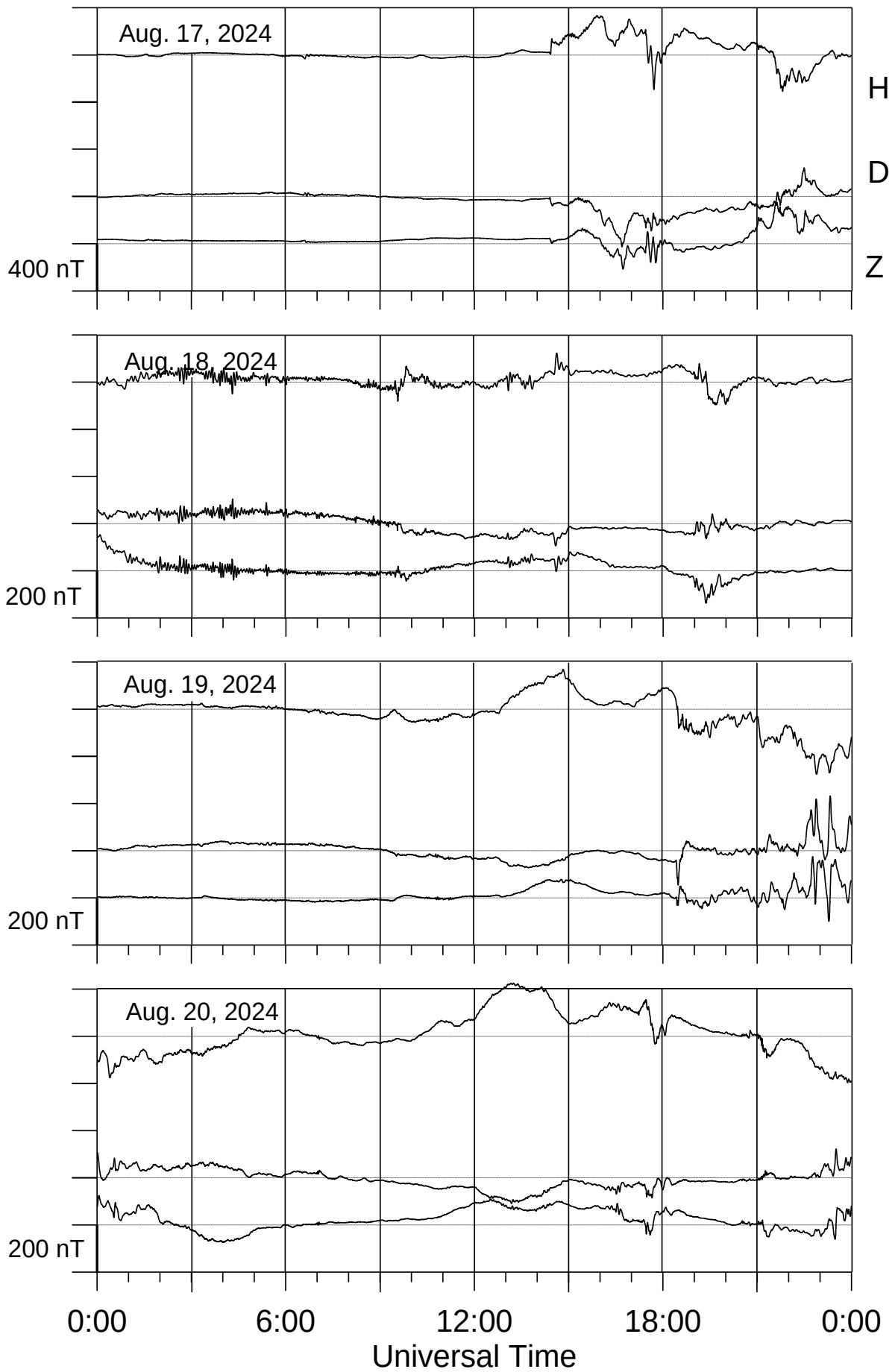
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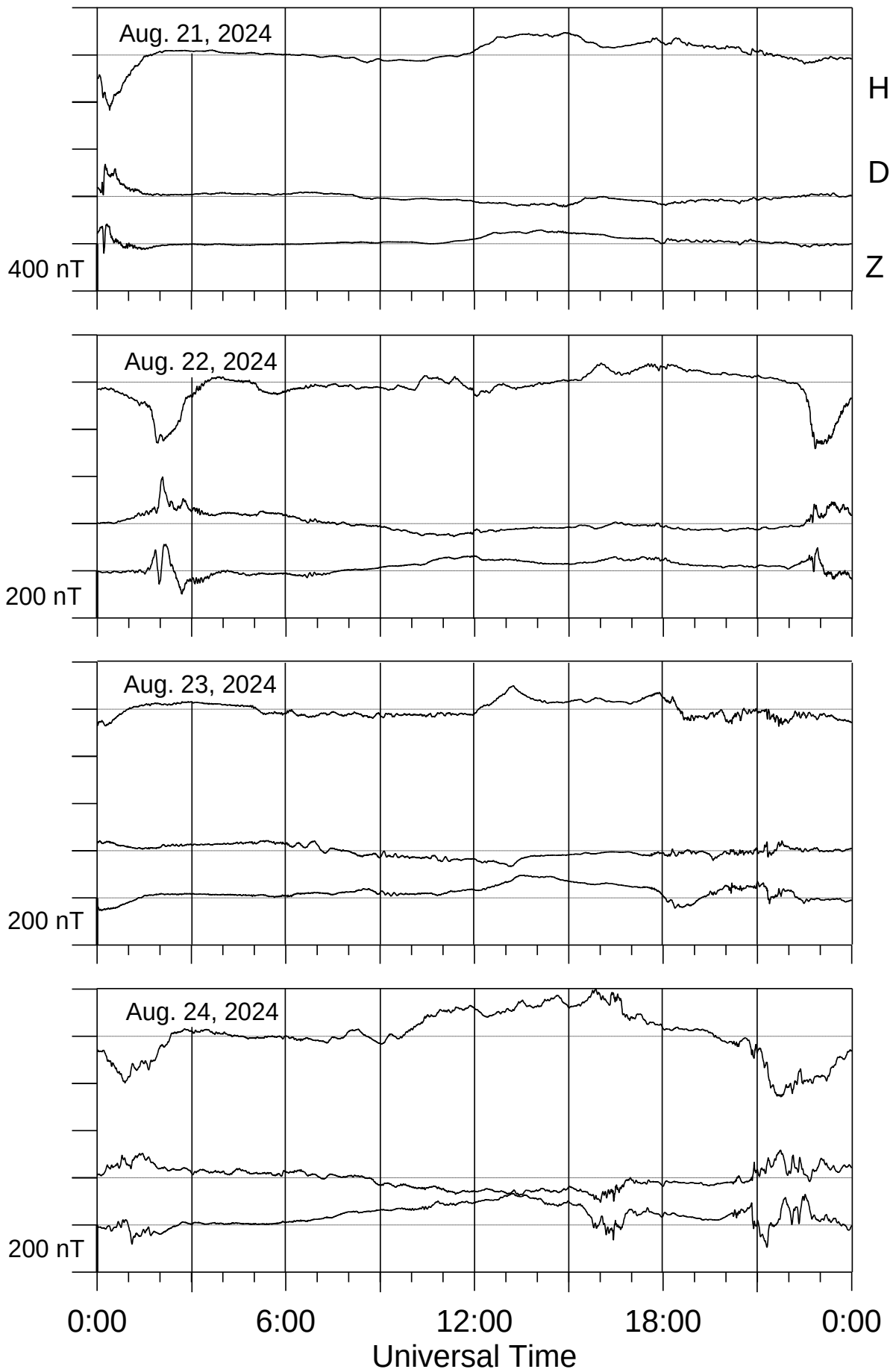
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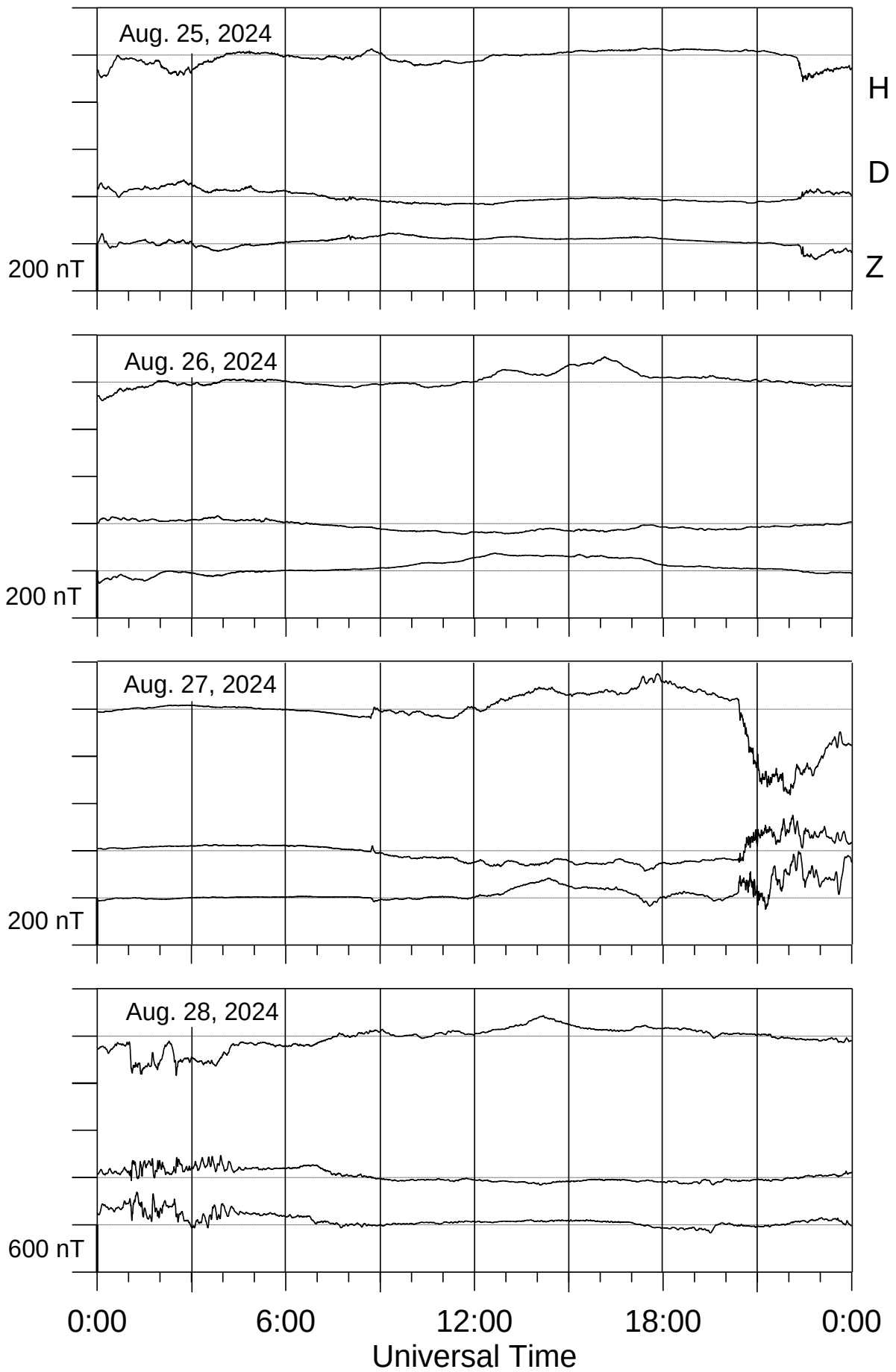
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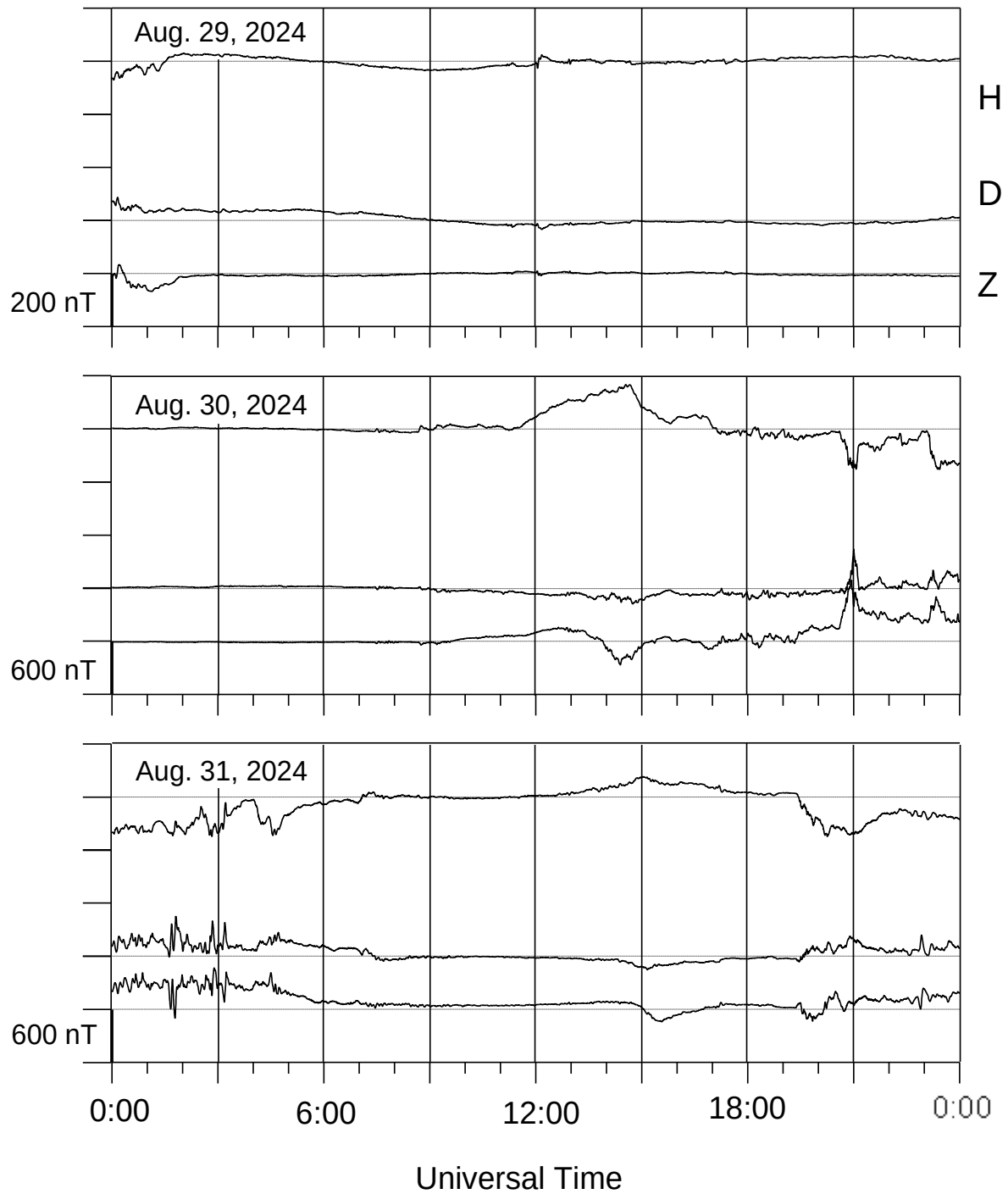
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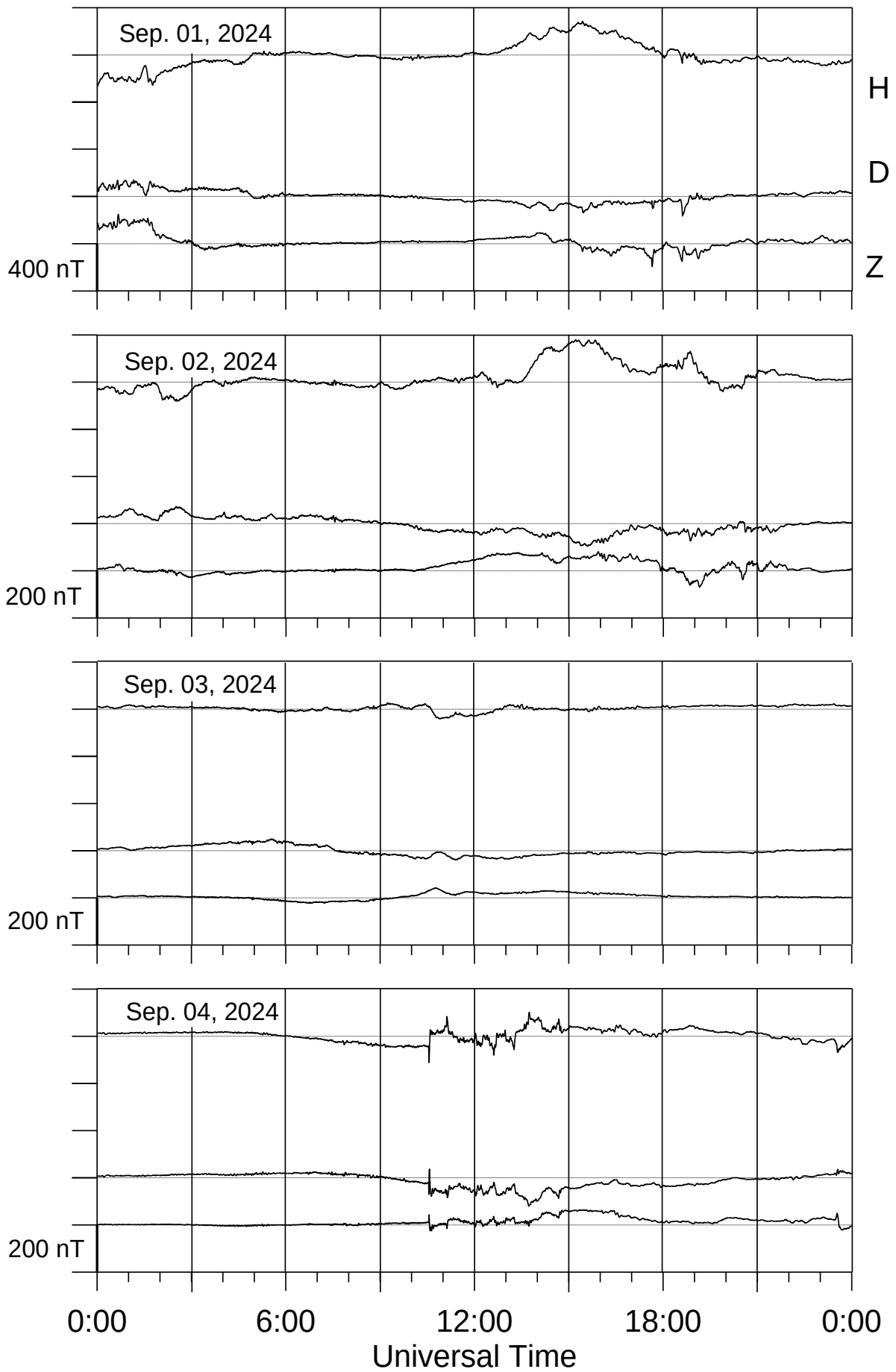
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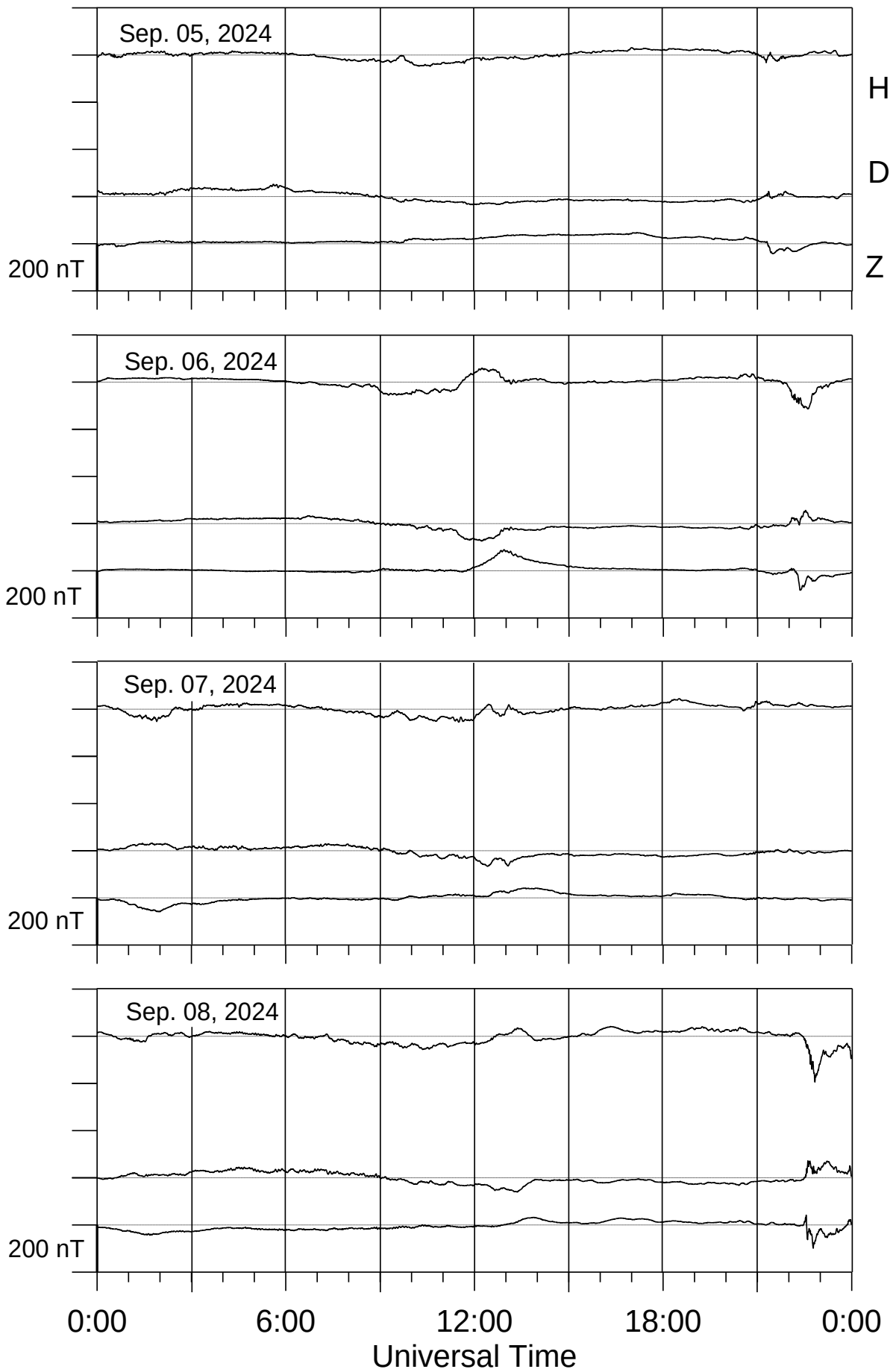
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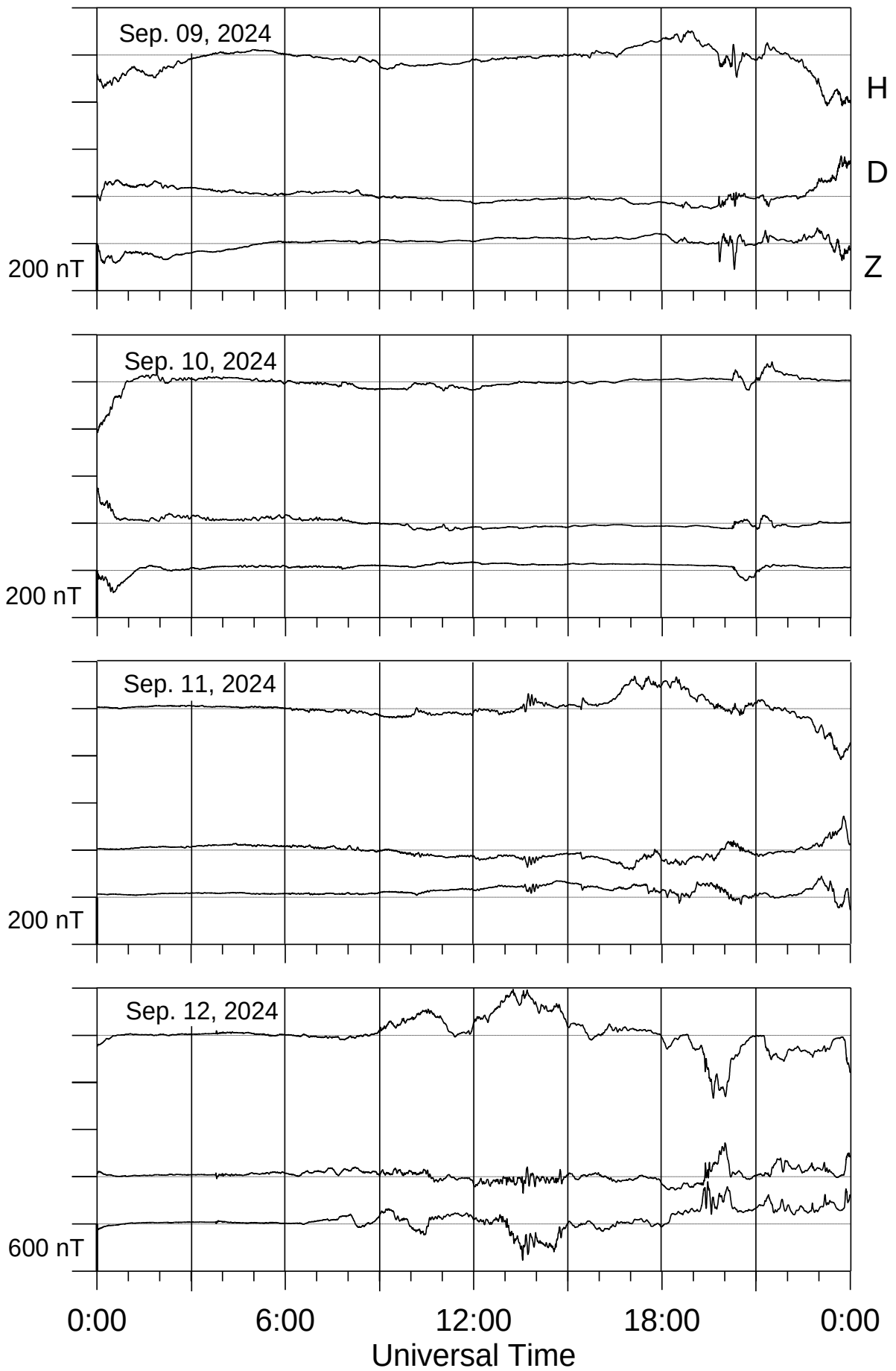
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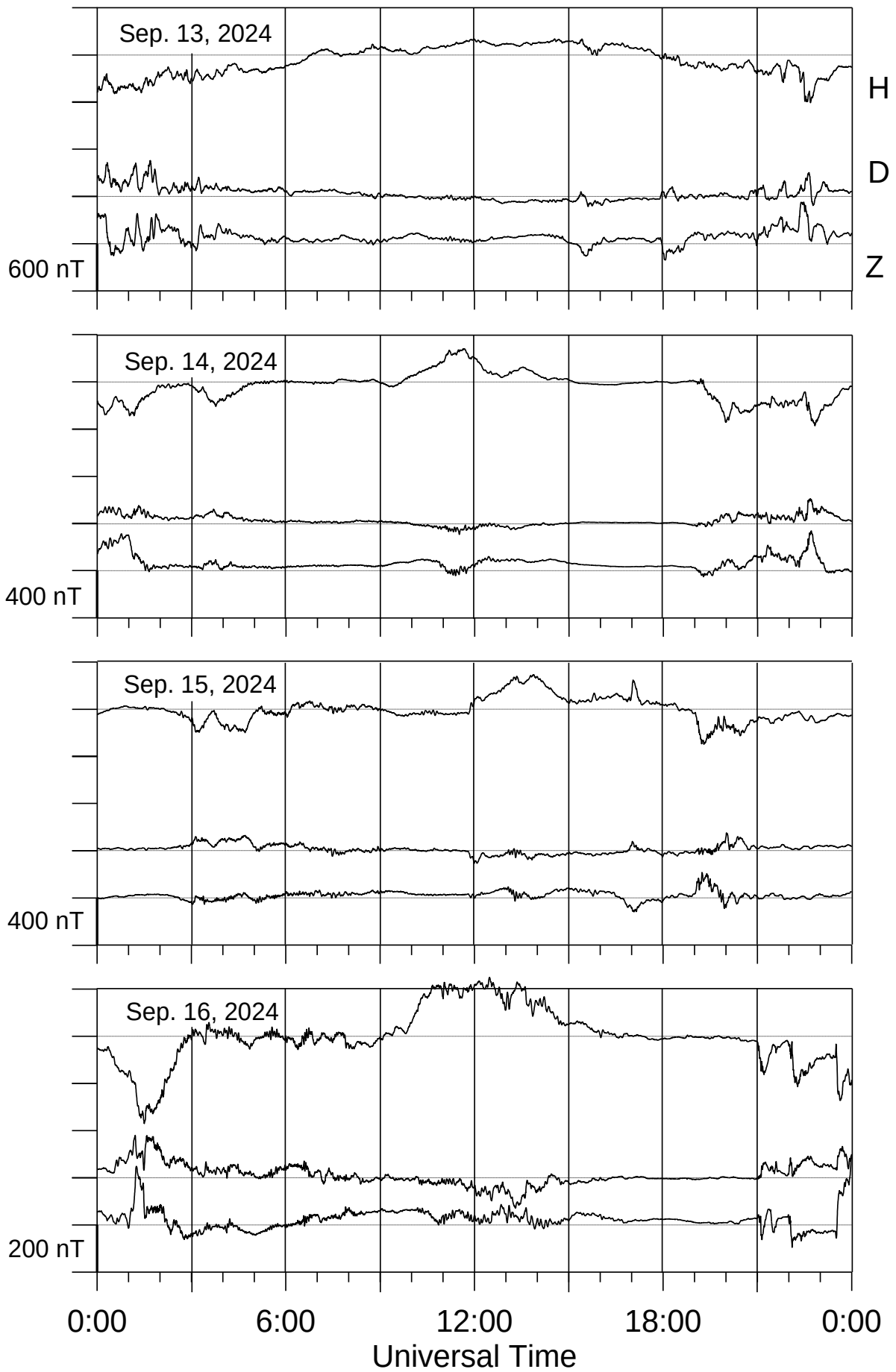
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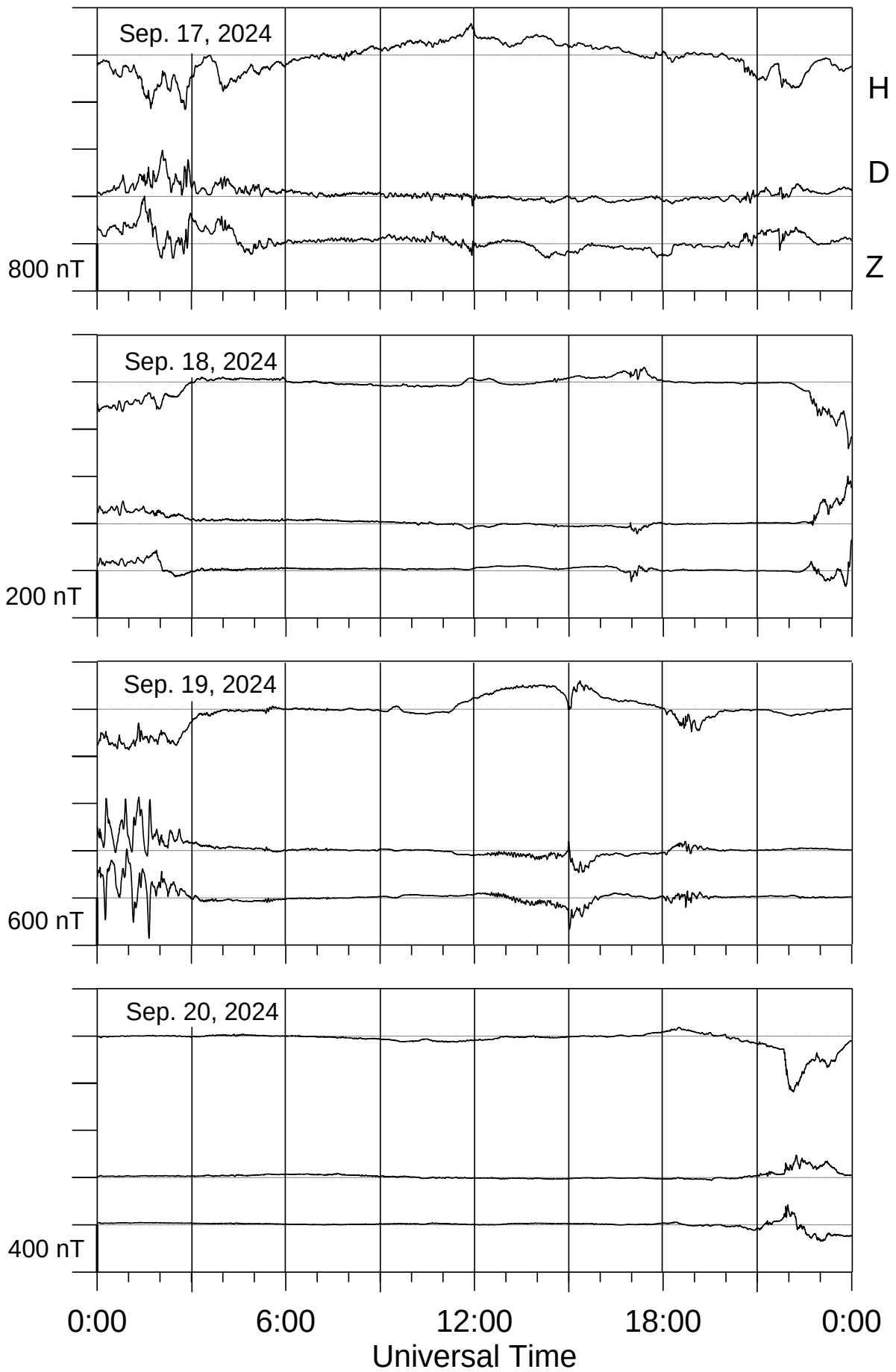
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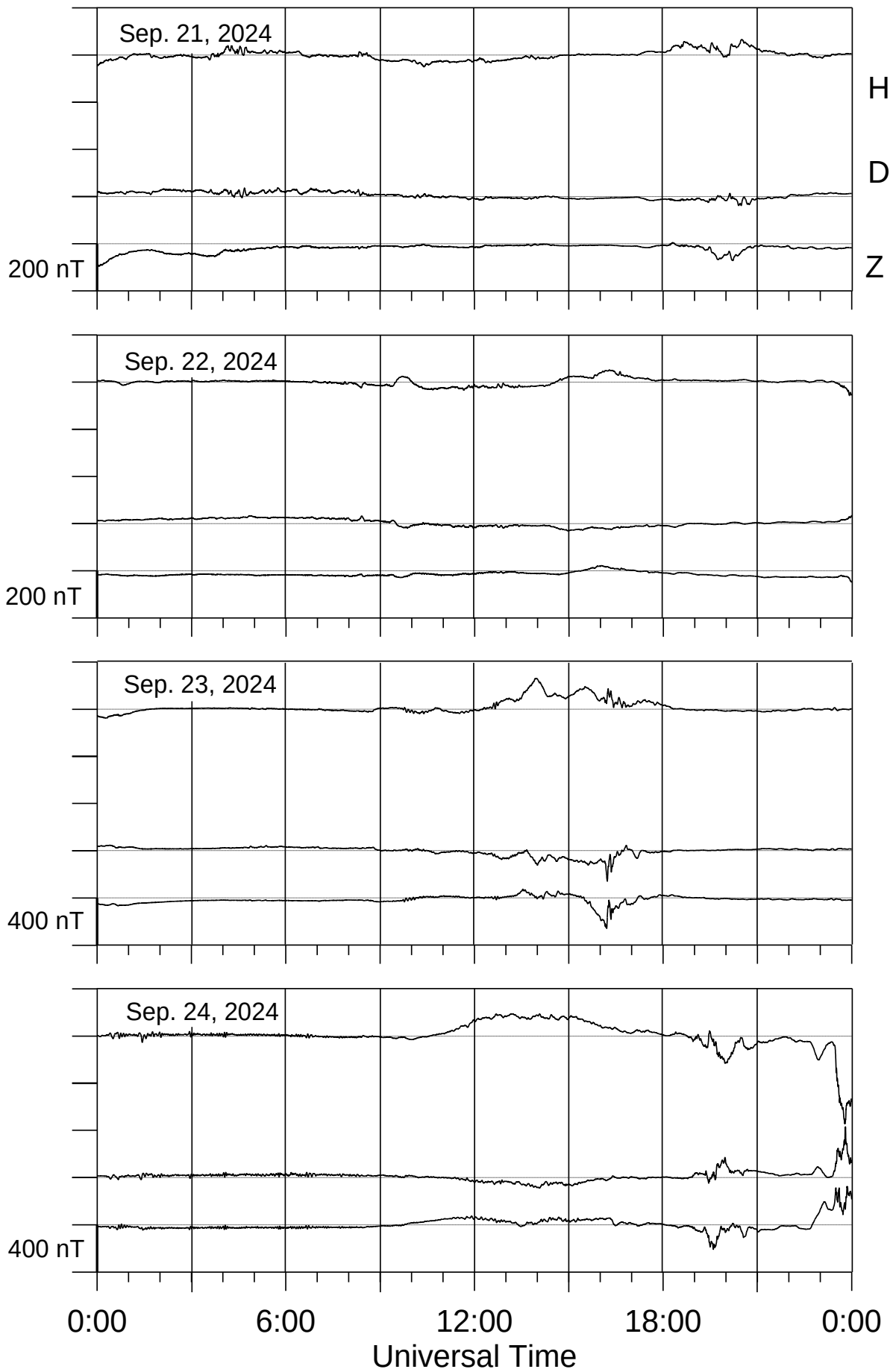
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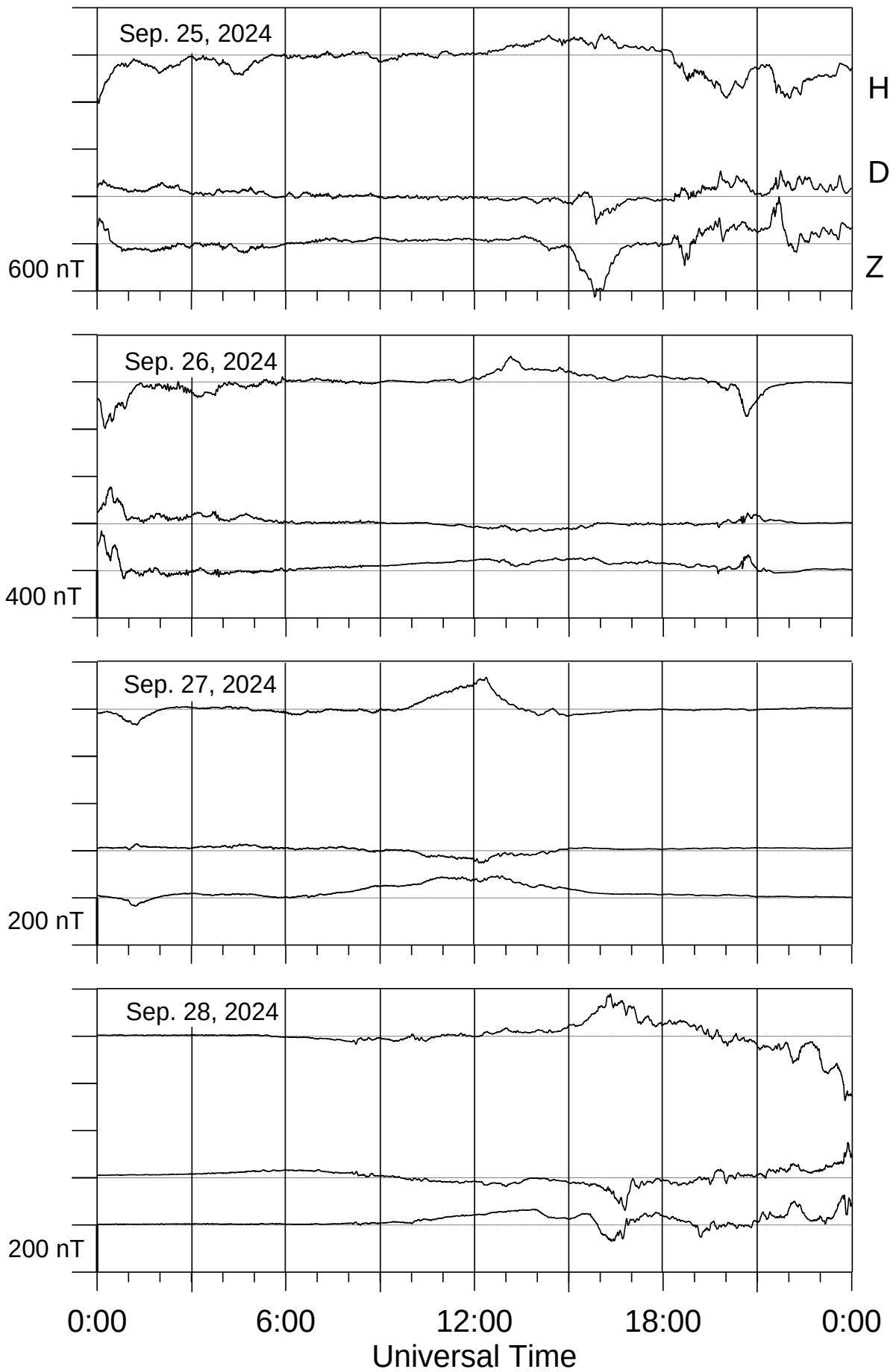
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Loparskaya magnetometer



Loparskay magnetometer

