

POLAR GEOPHYSICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES



PGI
GEOPHYSICAL DATA

2022

OCTOBER

NOVEMBER

DECEMBER

MURMANSK, APATITY, RUSSIA

March, 2023

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 2022. 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	401 135
November	397 888
December	389 372

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

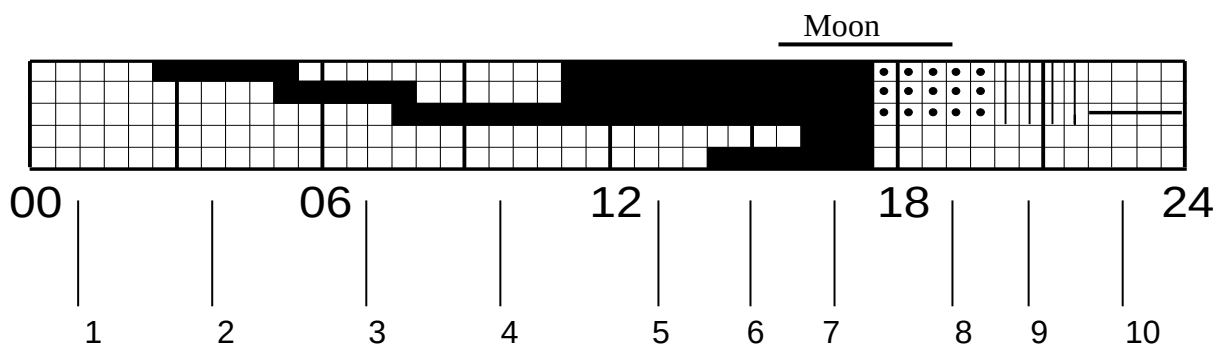
Calendar

Calendar shows the intervals of digital all-sky camera observations in Apatity, Lovozero and 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- aurora present in north range
- 3- weak aurora present in zenith range
- 4- aurora 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 Apatity, Lovozero and Verhnetulomsky 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>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
<i>Apatity</i>	APT	67.58° N	33.31° E	63.86° N	113.6° E

Please visit

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

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GEOMAGNETIC K-INDICES, LOVOZERO
October, 2022
Lower limit of K=9 is 1500 nT

Day	Time, UT								
	03	06	09	12	15	18	21	24	
1	000	000	001	111	100	110	111	100	Q
2	012	111	110	011	122	242	001	576	
3	665	311	110	111	155	411	267	341	
4	333	223	323	321	200	112	265	554	
5	332	112	111	121	122	332	346	764	
6	222	221	111	222	334	343	545	565	
7	532	222	111	312	234	300	021	000	
8	000	111	111	112	442	334	354	421	
9	354	433	211	344	554	436	567	741	
10	332	311	100	222	110	123	224	543	
11	331	101	110	110	100	001	212	433	
12	200	000	101	111	111	000	124	422	
13	210	100	001	111	110	011	332	234	
14	332	111	022	342	244	410	101	344	
15	543	221	101	111	210	033	366	421	
16	332	111	111	314	334	210	004	641	
17	110	111	010	111	011	330	000	000	
18	000	100	011	001	100	112	114	143	Q
19	111	011	000	011	100	000	000	022	
20	110	001	011	111	244	100	010	145	Q
21	100	001	001	111	100	000	000	122	
22	111	111	001	224	555	556	636	425	
23	531	111	201	111	102	443	246	644	
24	422	111	111	011	100	000	001	022	
25	000	000	001	111	110	440	000	000	
26	000	000	000	011	111	122	333	333	
27	321	110	001	112	244	443	210	220	
28	033	002	101	011	122	345	555	663	
29	455	332	243	345	234	432	554	653	
30	313	211	100	233	211	432	144	333	
31	201	211	001	011	234	453	344	444	

GEOMAGNETIC K-INDICES, LOVOZERO
November, 2022
Lower limit of K=9 is 1500 nT

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

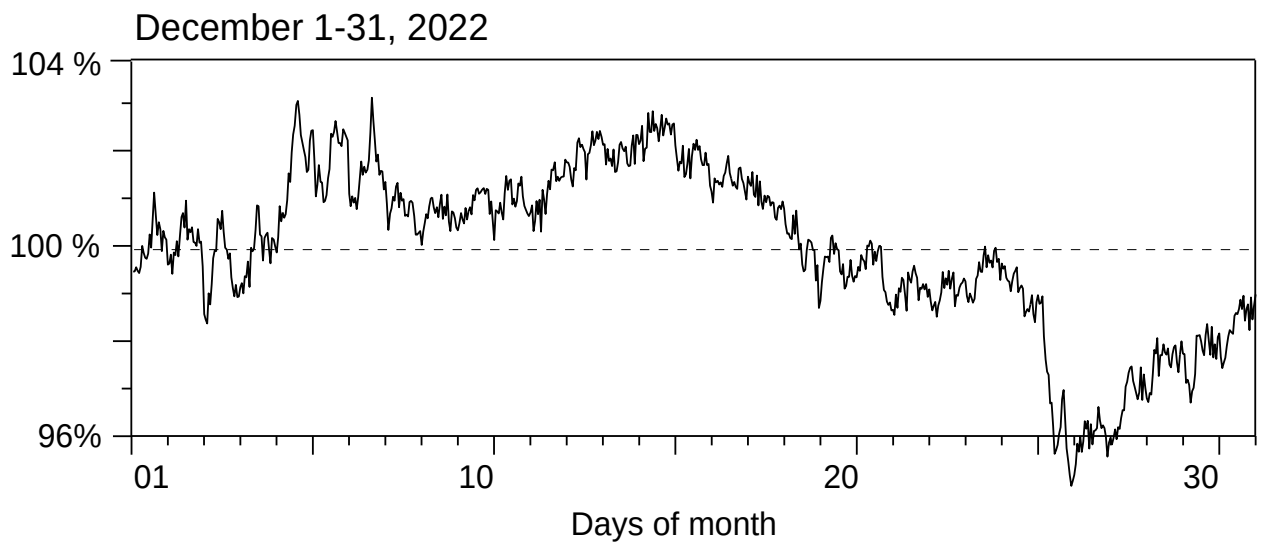
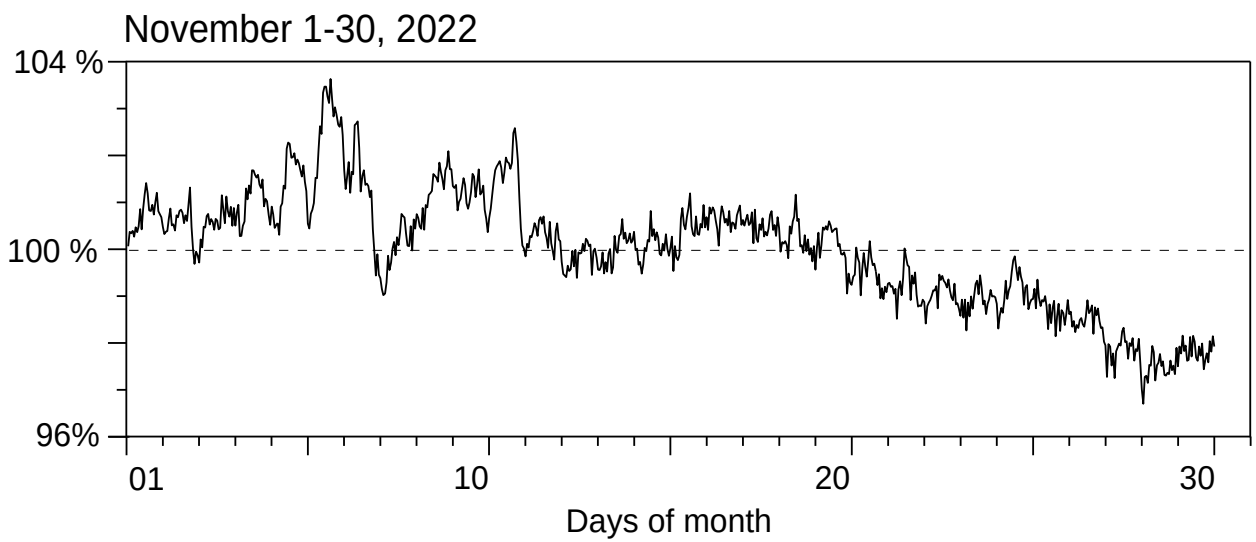
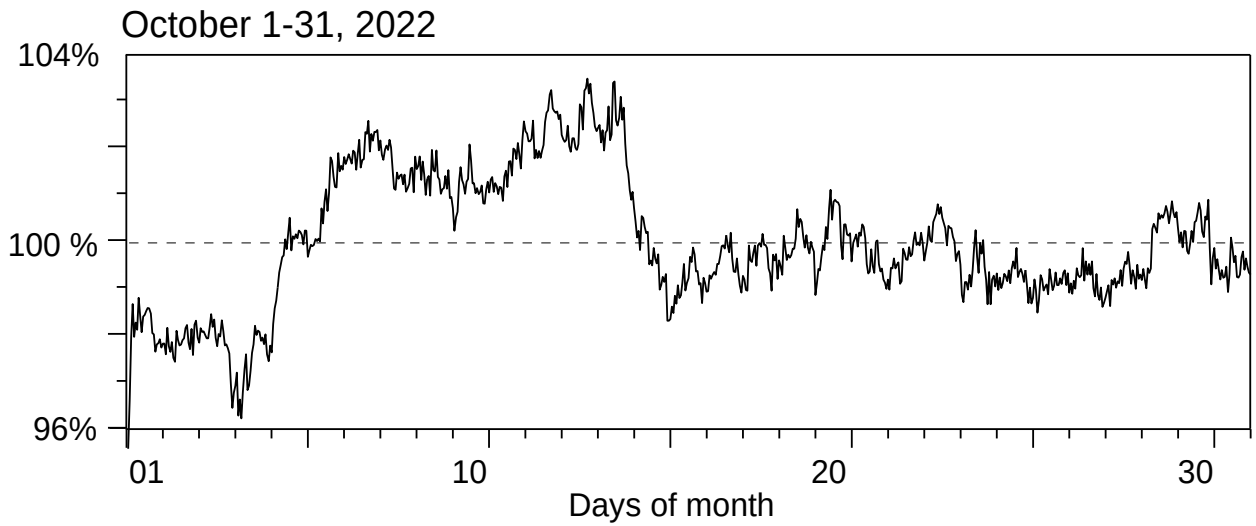
GEOMAGNETIC K-INDICES, LOVOZERO

December, 2022

Lower limit of K=9 is 1500 nT

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

Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

October - December 2022

CALENDAR OF TV OBSERVATIONS

October 15 - 16

[illegible]

October 16 - 17

[illegible]

October 17 - 18

[illegible]

October 18 - 19

[illegible]

October 19 - 20

[illegible]

October 20 - 21

[illegible]

October 21 - 22

[illegible]

CALENDAR OF TV OBSERVATIONS

November 29 - 30

[illegible]

November 30

[illegible]

CALENDAR OF TV OBSERVATIONS

December 15 - 16

[illegible]

December 16 - 17

[illegible]

December 17 - 18

[illegible]

December 18 - 19

[illegible]

December 19 - 20

[illegible]

December 20 - 21

[illegible]

December 21 - 22

[illegible]

CALENDAR OF TV OBSERVATIONS

December 22- 23

[illegible]

December 23 - 24

[illegible]

December 24 - 25

[illegible]

December 25 - 26

[illegible]

December 26 -27

[illegible]

December 27 - 28

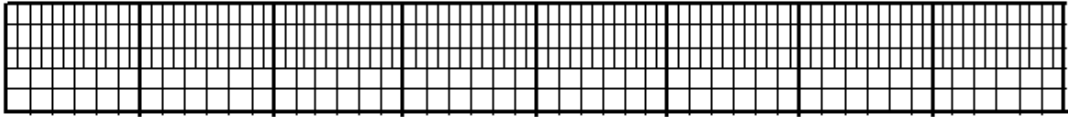
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December 28 - 29

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Apatity ascaplots

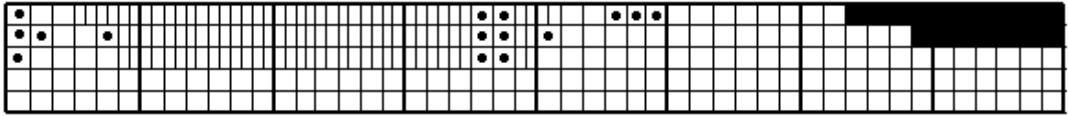
Oct. 01, 2022



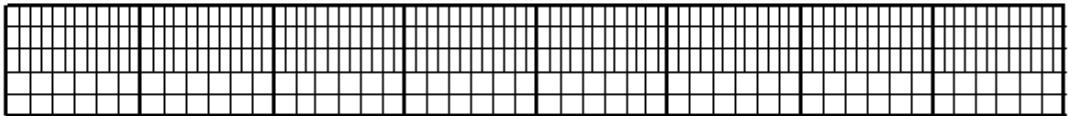
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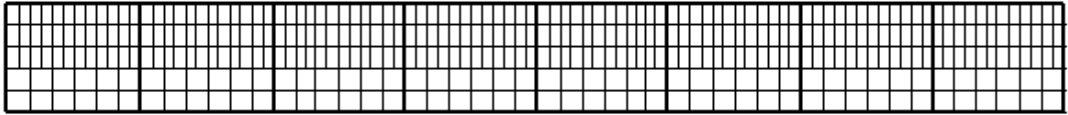
Oct. 03, 2021



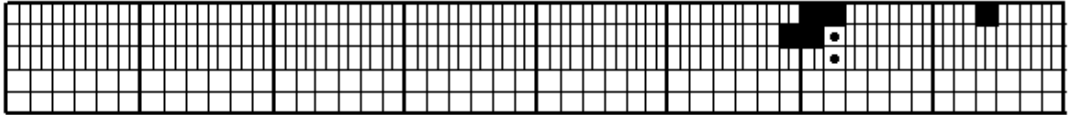
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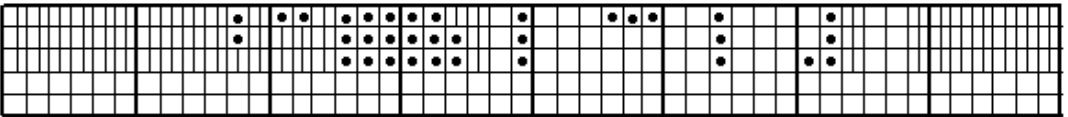
Oct. 05, 2022



Oct. 06, 2022



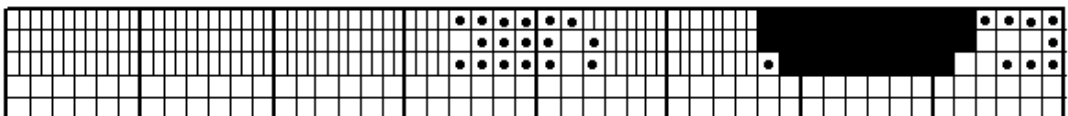
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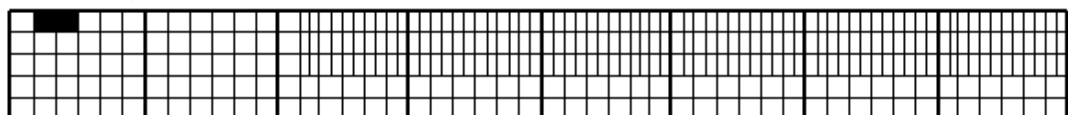
Oct. 08, 2022



Oct. 09, 2022



Oct. 10, 2022

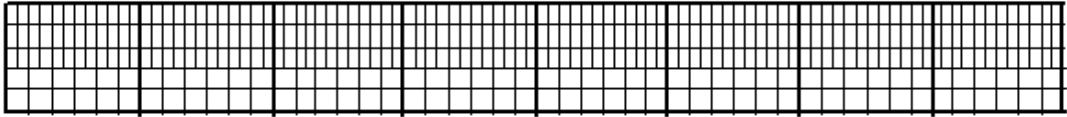


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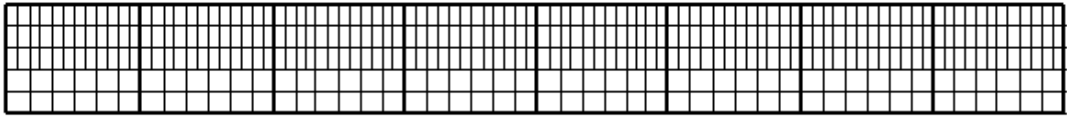
Universal Time

Apatity ascaplots

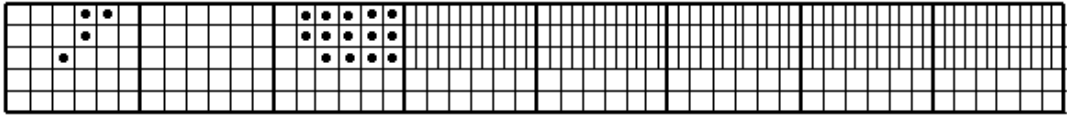
Oct. 11, 2022



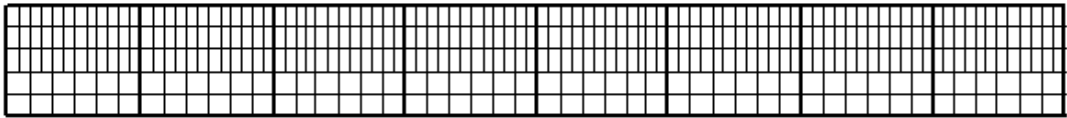
Oct. 12, 2022



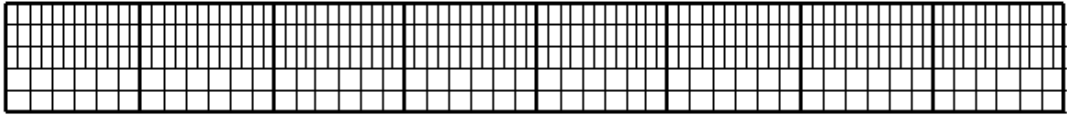
Oct. 13, 2022



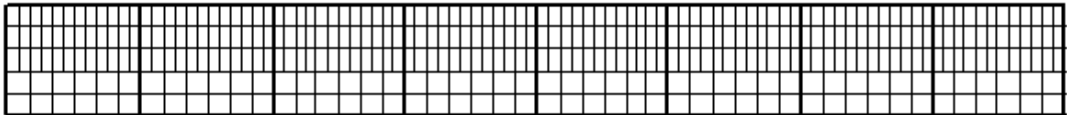
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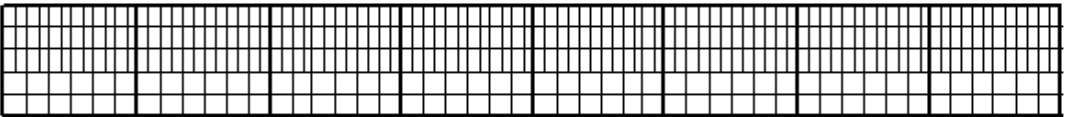
Oct. 15, 2022



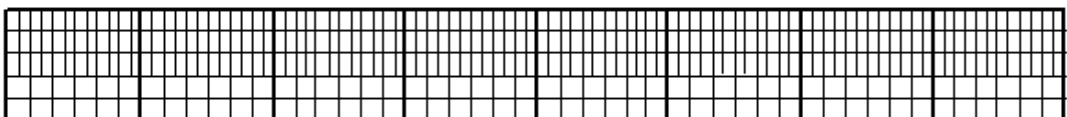
Oct. 16, 2022



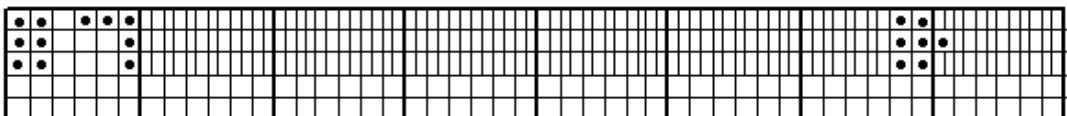
Oct. 17, 2022



Oct. 18, 2022



Oct. 19, 2022



Oct. 20, 2022

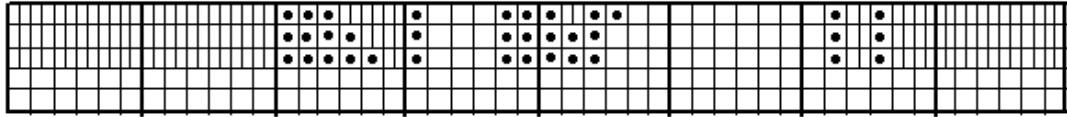


00 06 12 18 24

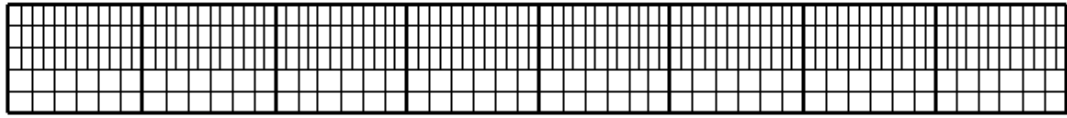
Universal Time

Apatity ascaplots

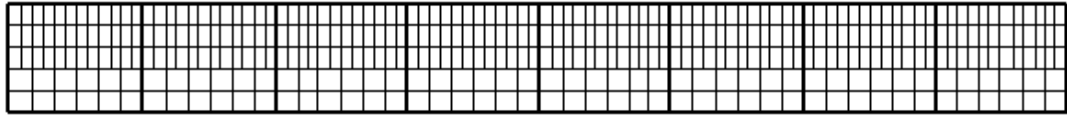
Oct. 21, 2022



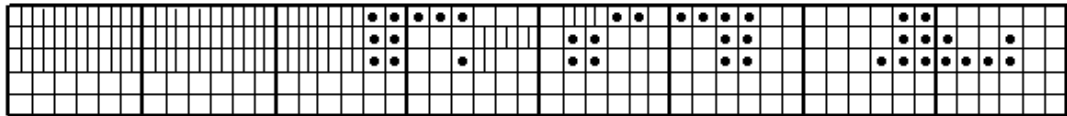
Oct. 22, 2022



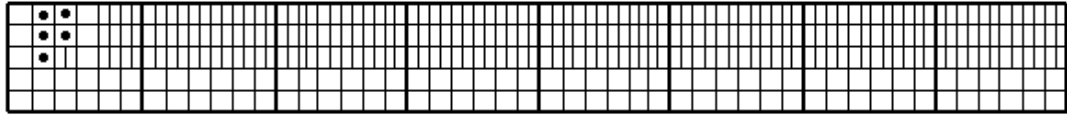
Oct. 23, 2022



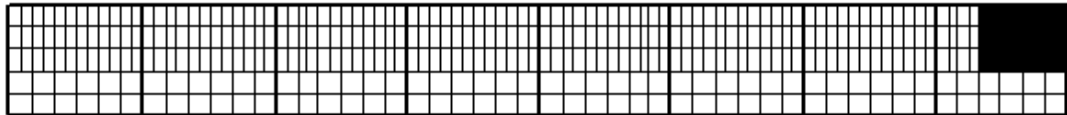
Oct. 24, 2022



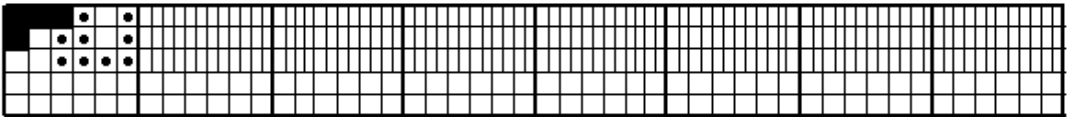
Oct. 25, 2022



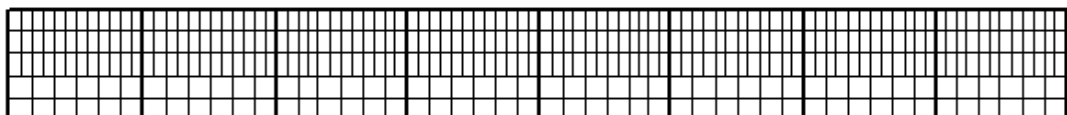
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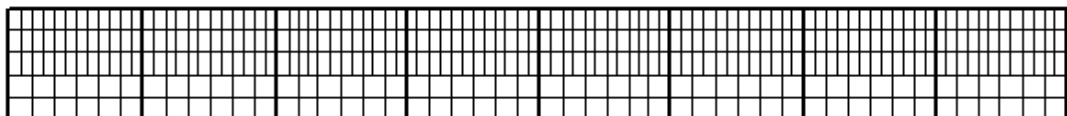
Oct. 27, 2022



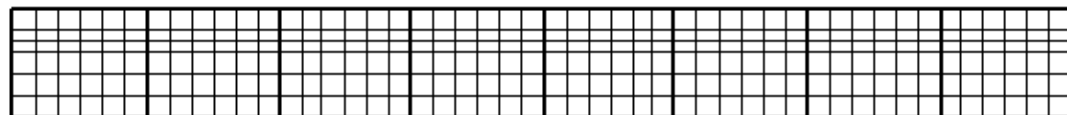
Oct. 28, 2022



Oct. 29, 2022



Oct. 30, 2022

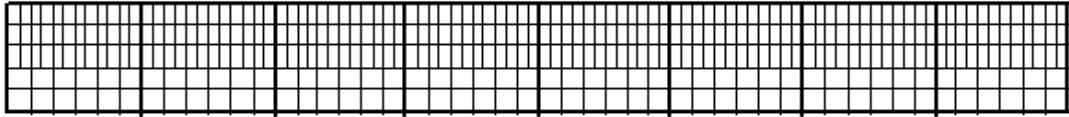


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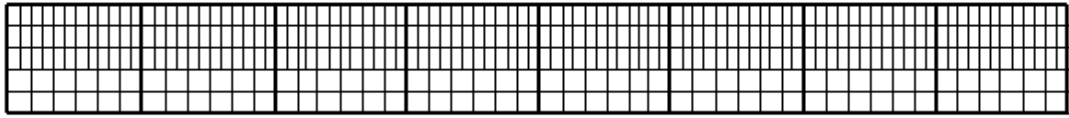
Universal Time

Apatity ascaplots

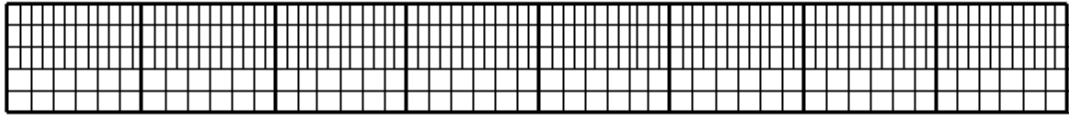
Nov. 01, 2022



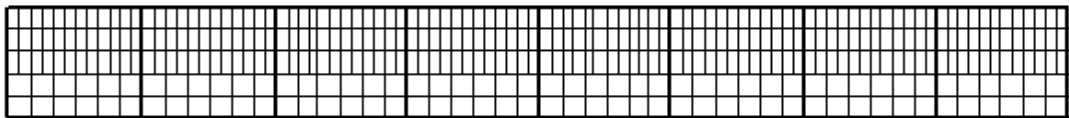
Nov. 02, 2022



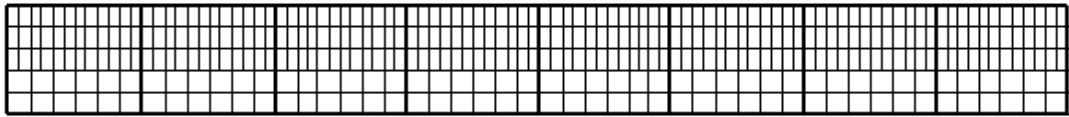
Nov. 03, 2022



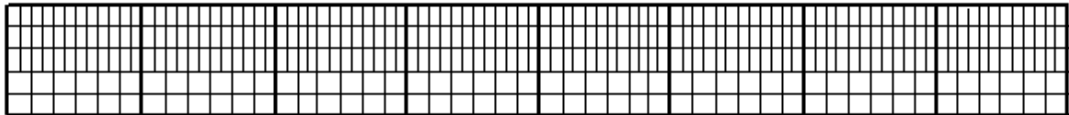
Nov. 04, 2022



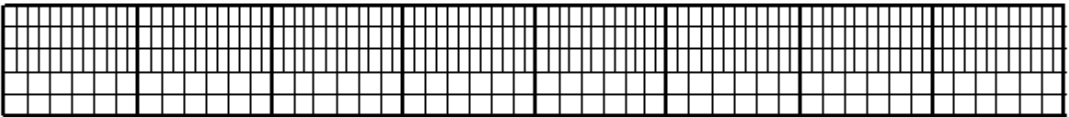
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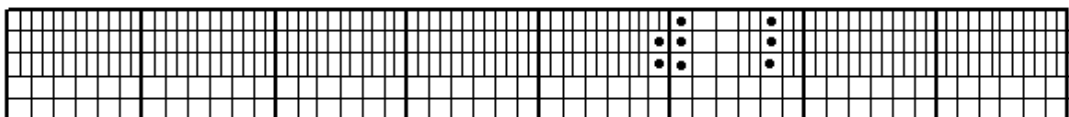
Nov. 06, 2022



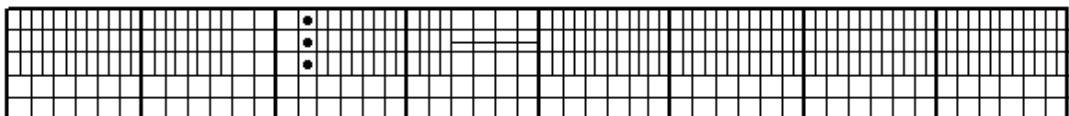
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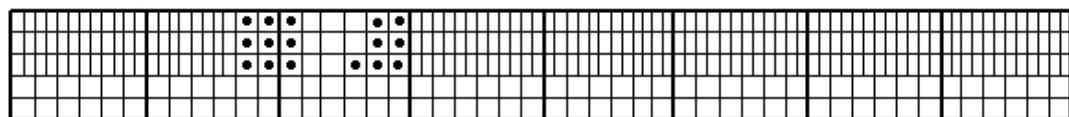
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Nov. 09, 2022



Nov. 10, 2022

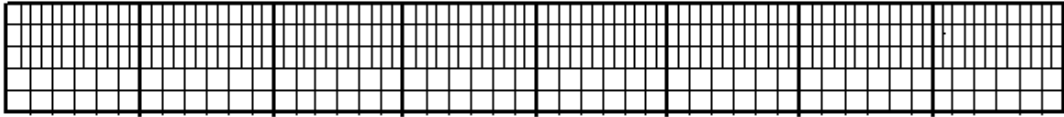


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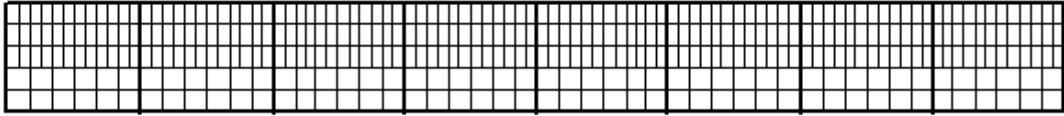
Universal Time

Apatity ascaplots

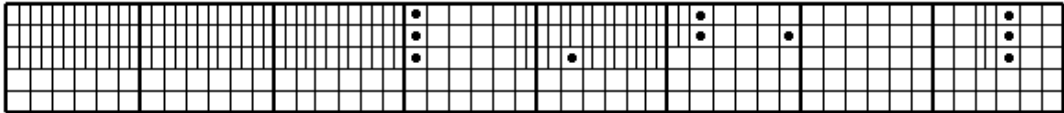
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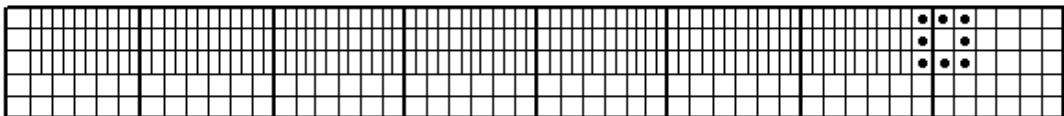
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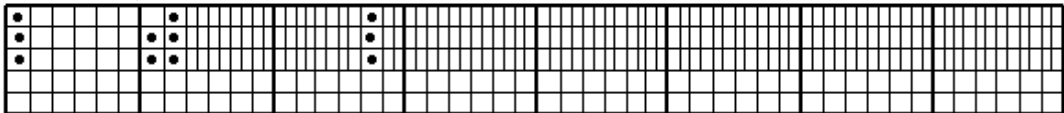
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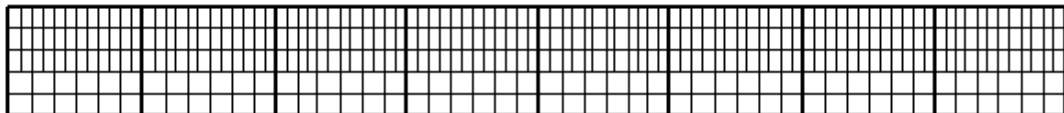
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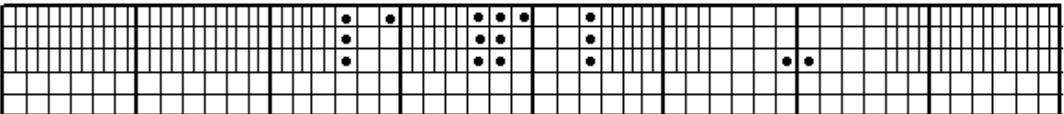
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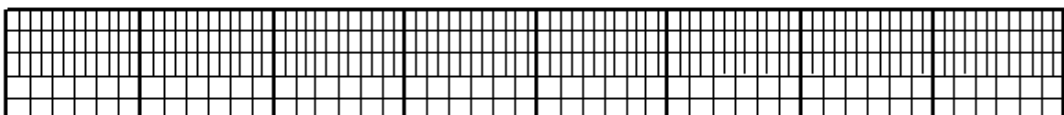
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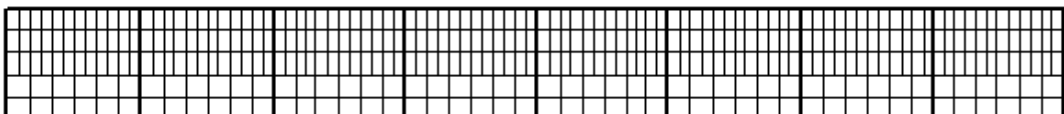
Nov. 17, 2022



Nov. 18, 2022



Nov. 19, 2022



Nov. 20, 2022

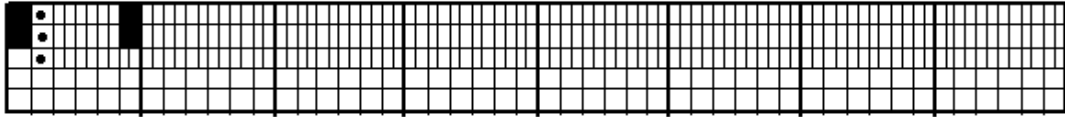


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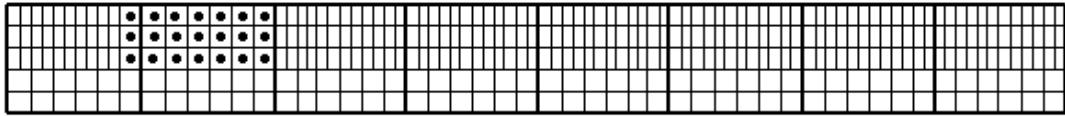
Universal Time

Apatity ascaplots

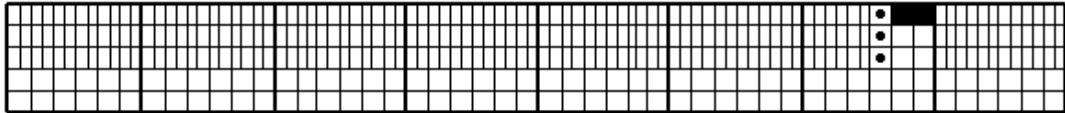
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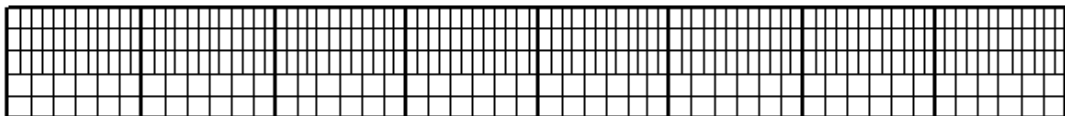
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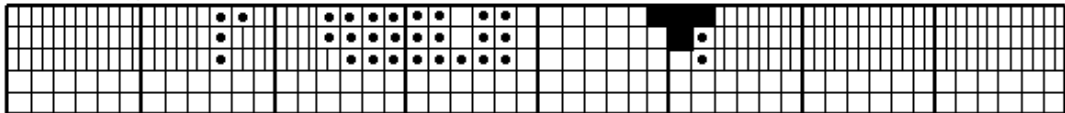
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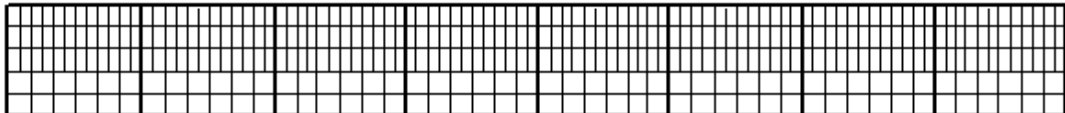
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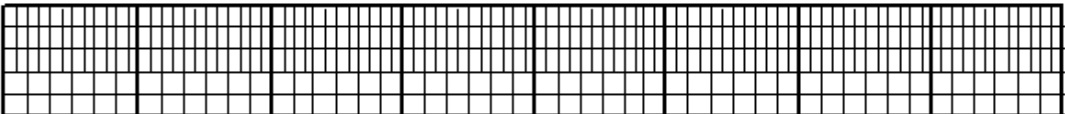
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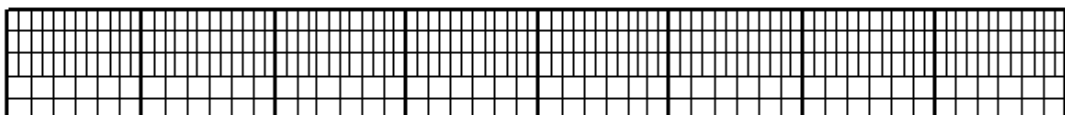
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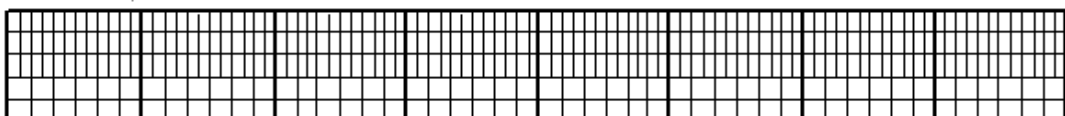
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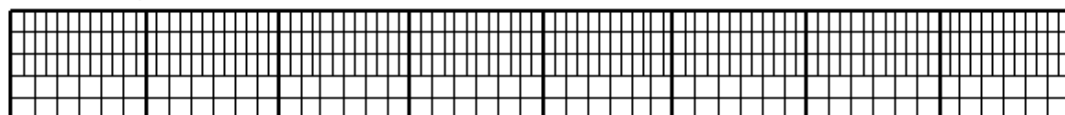
Nov. 28, 2022



Nov. 29, 2022



Nov. 30, 2022

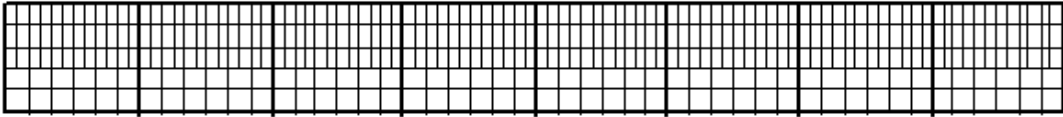


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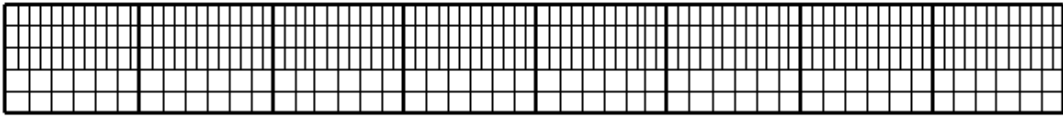
Universal Time

Apatity ascaplots

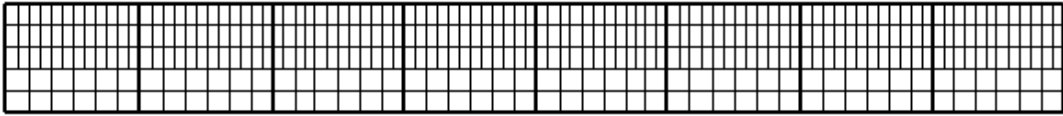
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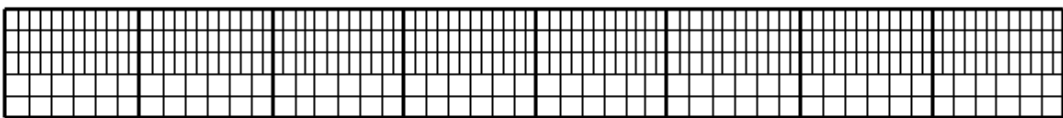
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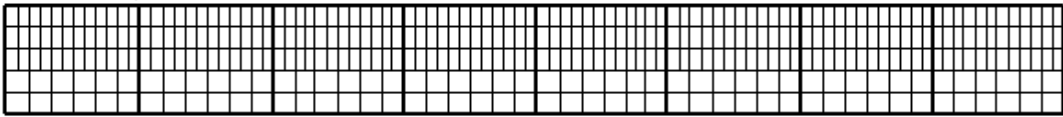
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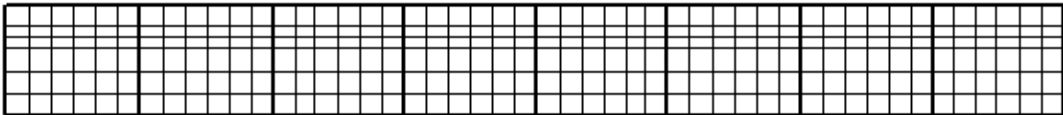
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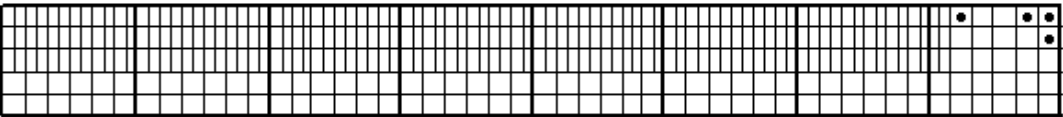
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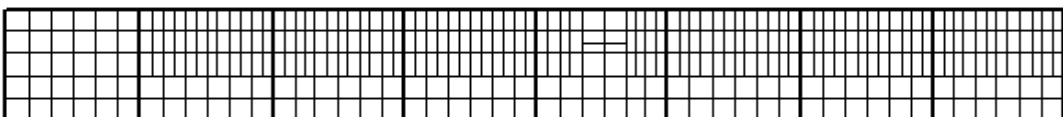
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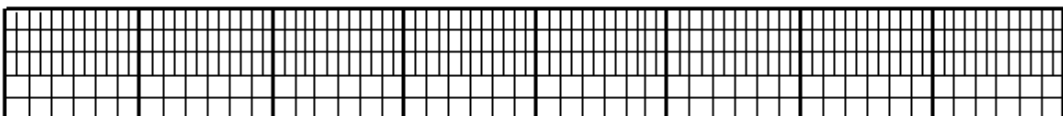
Dec. 07, 2022



Dec. 08, 2022



Dec. 09, 2022



Dec. 10, 2022

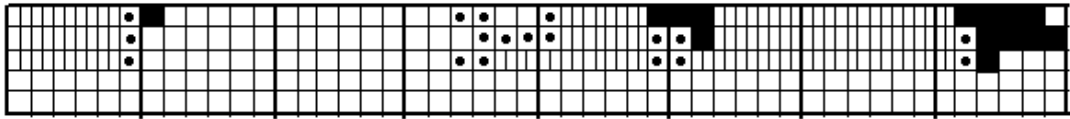


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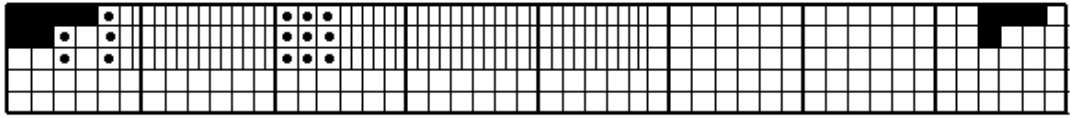
Universal Time

Apatity ascaplots

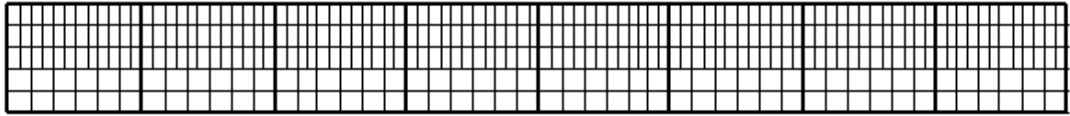
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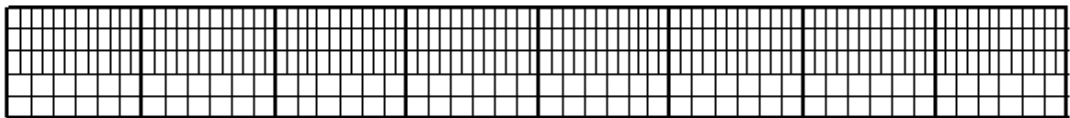
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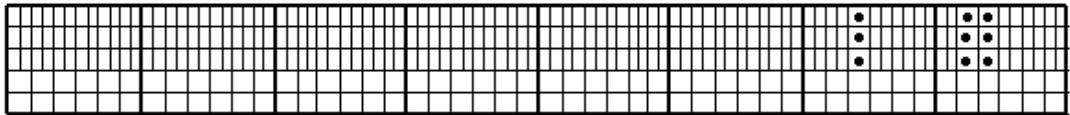
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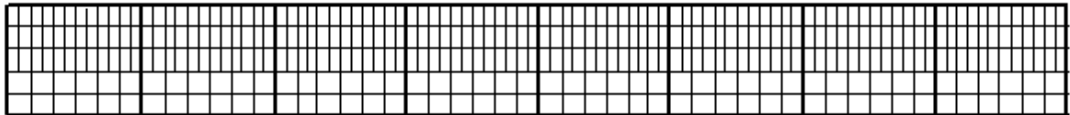
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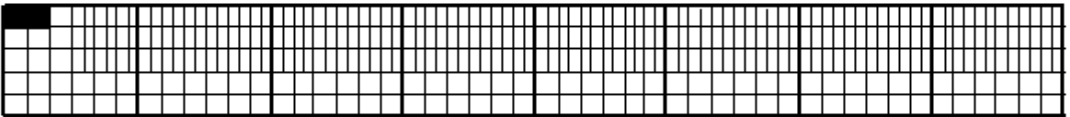
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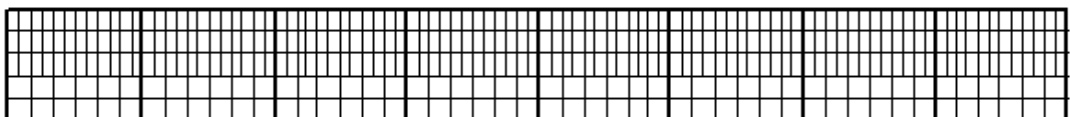
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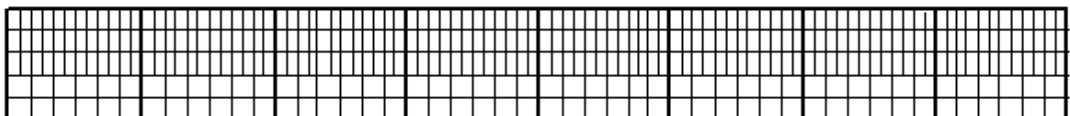
Dec. 17, 2022



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Dec. 19, 2022



Dec. 20, 2022

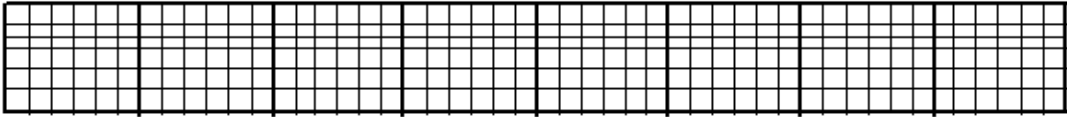


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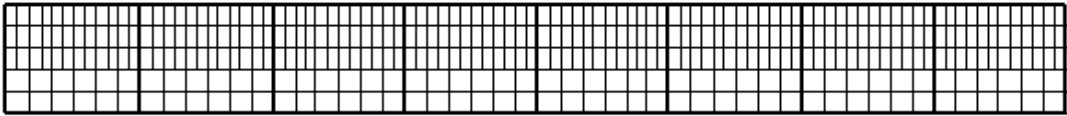
Universal Time

Apatity ascaplots

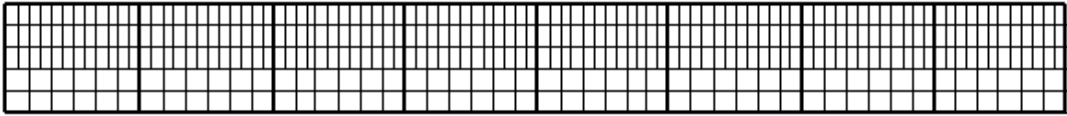
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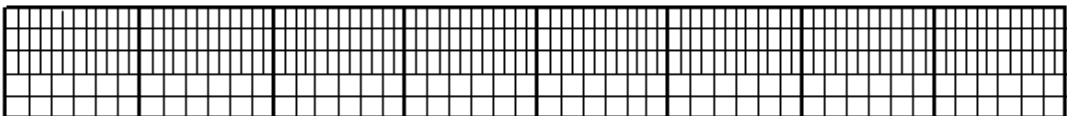
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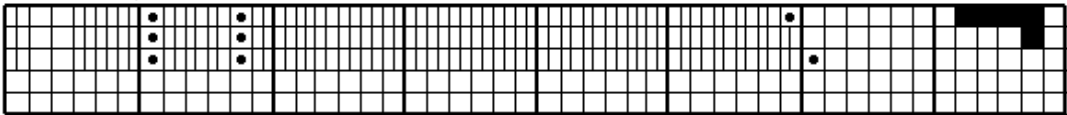
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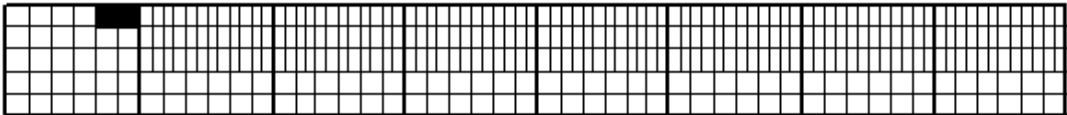
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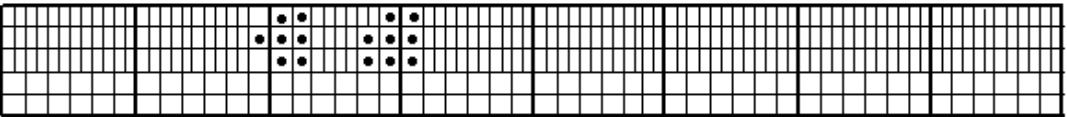
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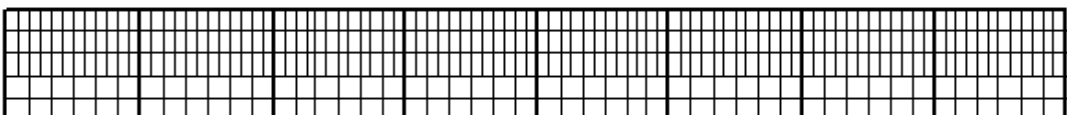
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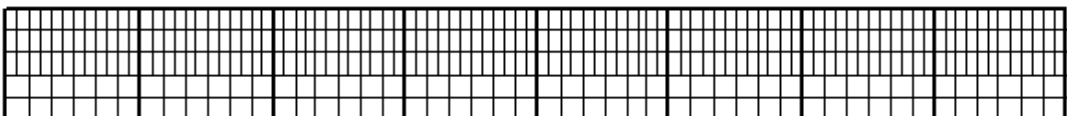
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Dec. 28, 2022



Dec. 29, 2022



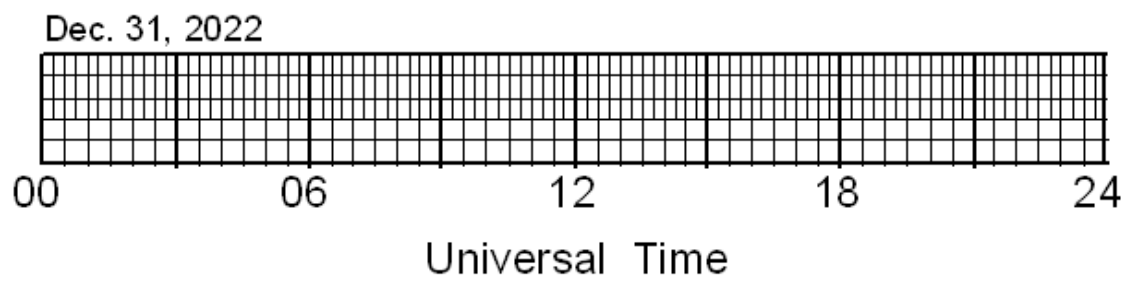
Dec. 30, 2022



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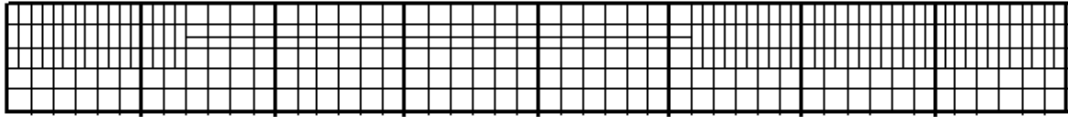
Universal Time

Apatity ascaplots

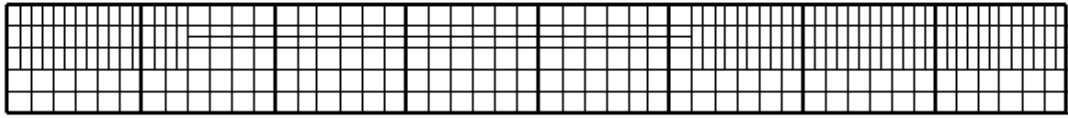


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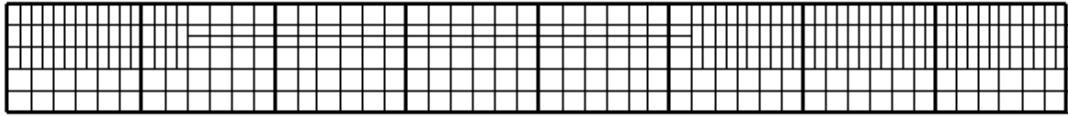
Oct. 01, 2022



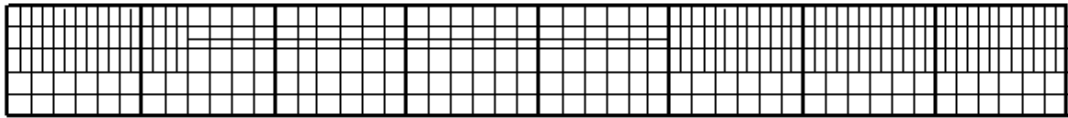
Oct. 02, 2022



Oct. 03, 2022



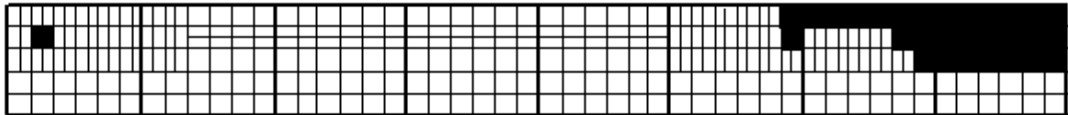
Oct. 04, 2022



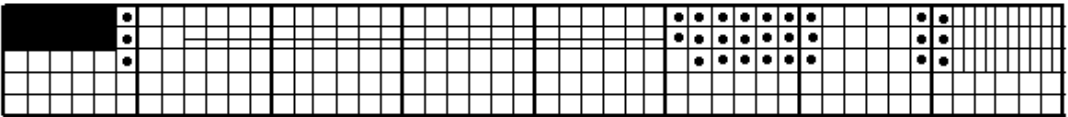
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Oct. 06, 2022



Oct. 07, 2022



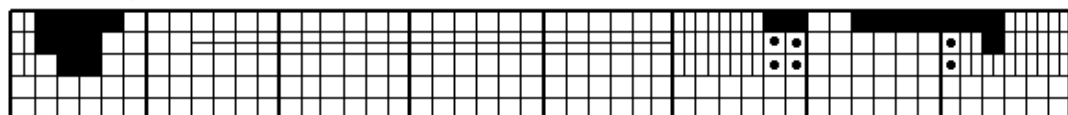
Oct. 08, 2022



Oct. 09, 2022



Oct. 10, 2022

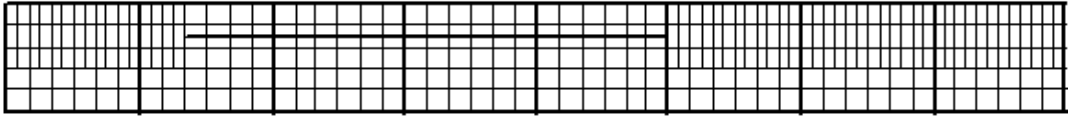


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Universal Time

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Oct. 11, 2022



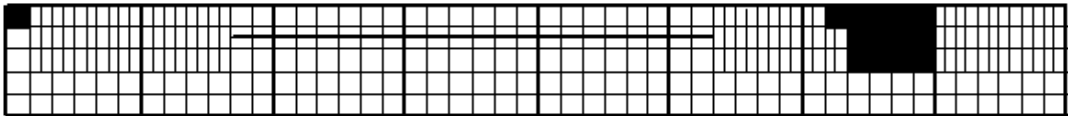
Oct. 12, 2022



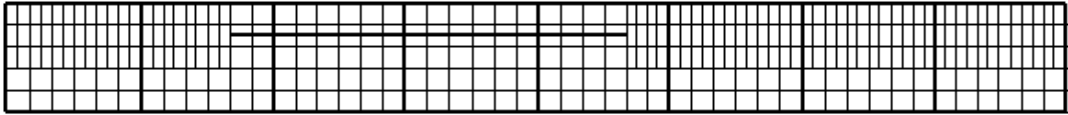
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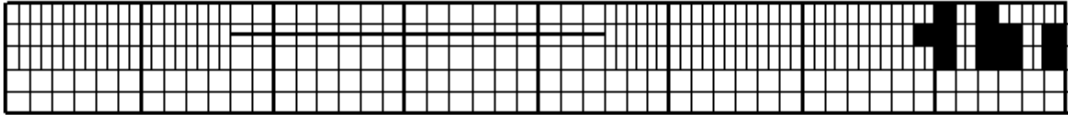
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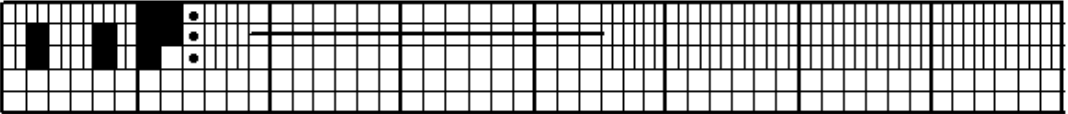
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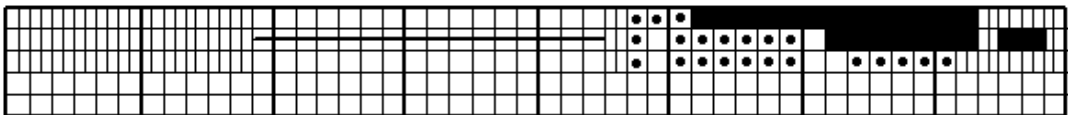
Oct. 28, 2022



Oct. 29, 2022



Oct. 30, 2022



Oct. 31, 2022



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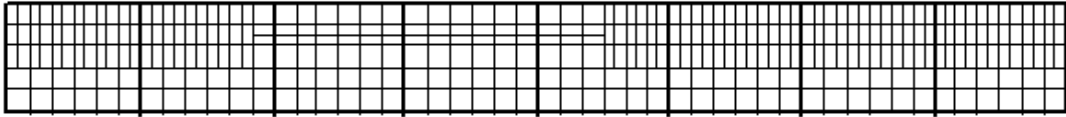
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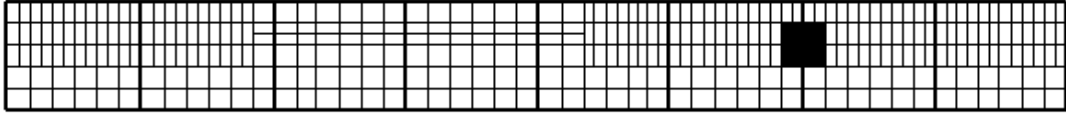
Universal Time

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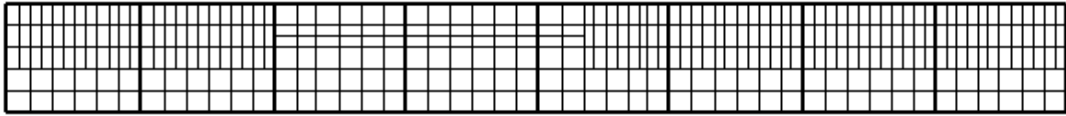
Nov. 01, 2022



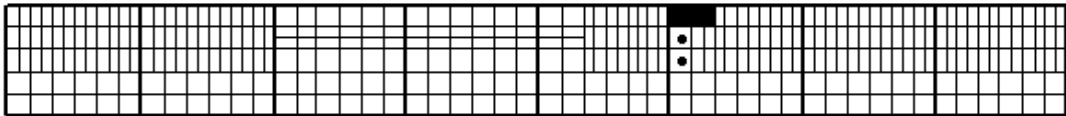
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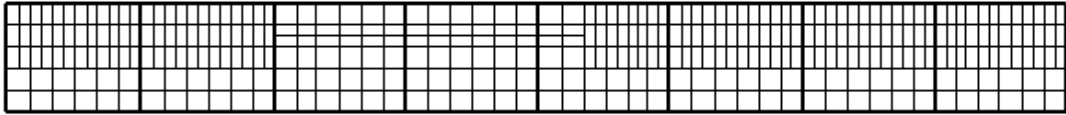
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Nov. 04, 2022



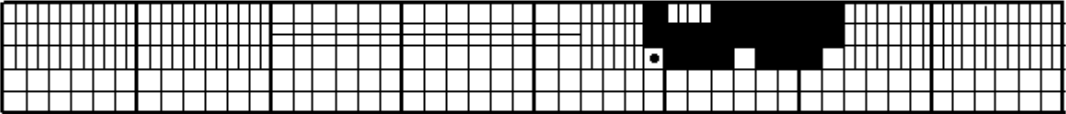
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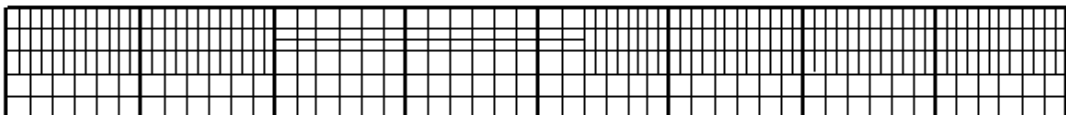
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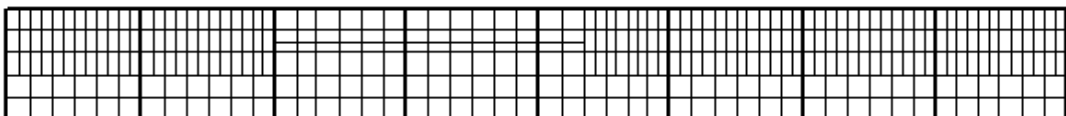
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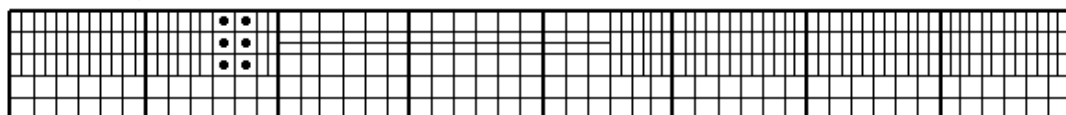
Nov. 08, 2022



Nov. 09, 2022



Nov. 10, 2022

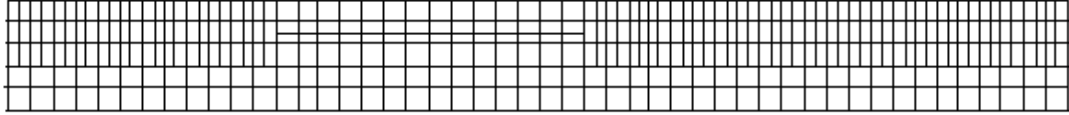


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Universal Time

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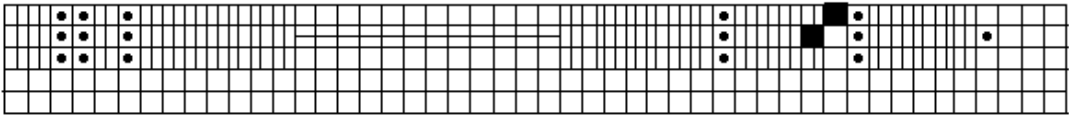
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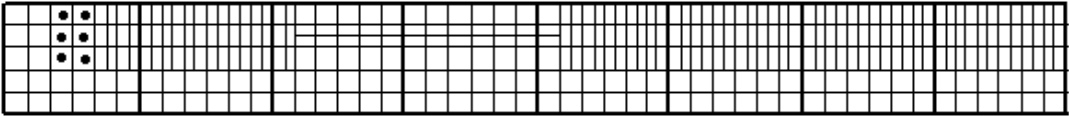
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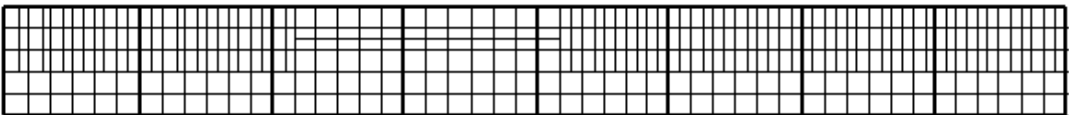
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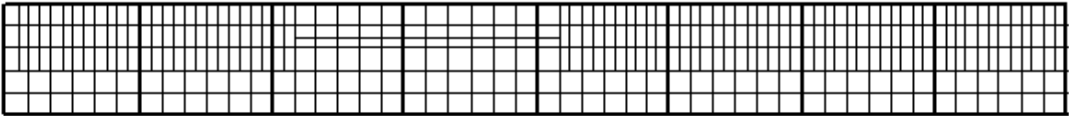
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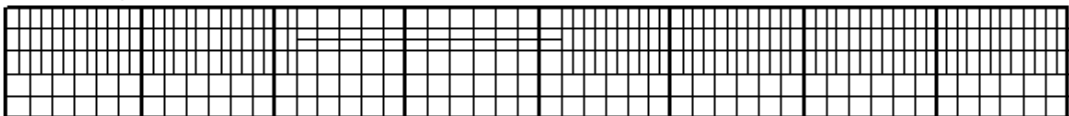
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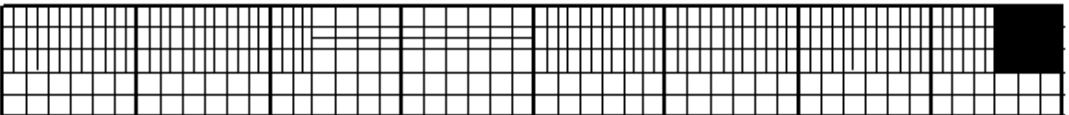
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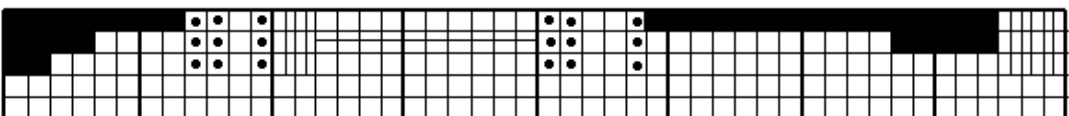
Nov. 17, 2022



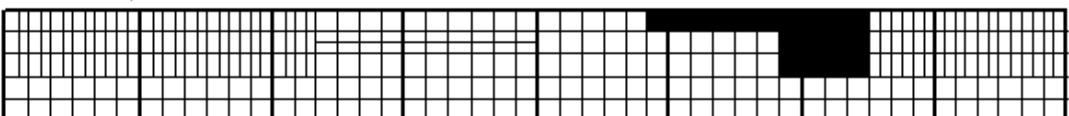
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Nov. 19, 2022



Nov. 20, 2022



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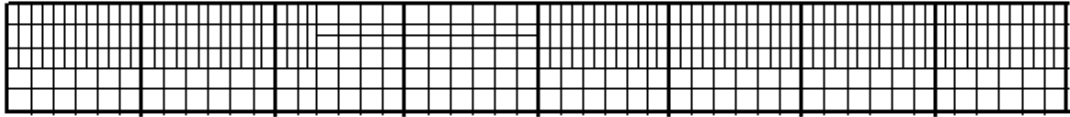
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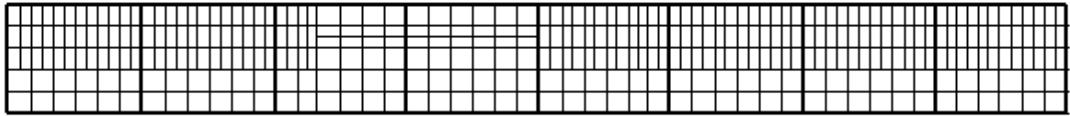
Universal Time

Lovozero ascaplots

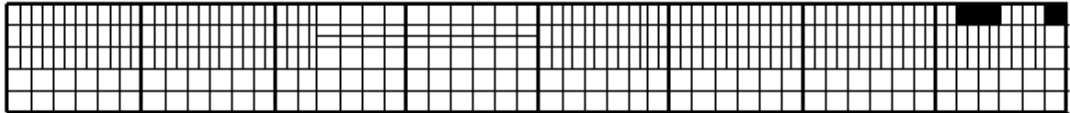
Nov. 21, 2022



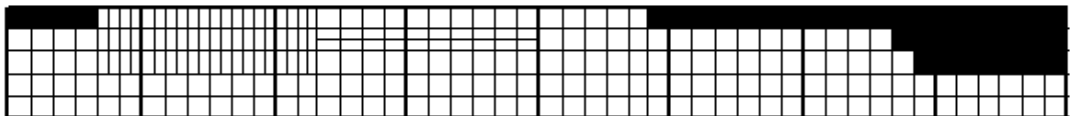
Nov. 22, 2022



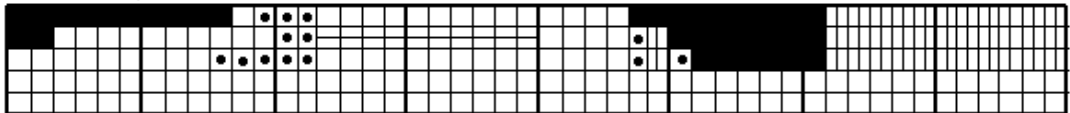
Nov. 23, 2022



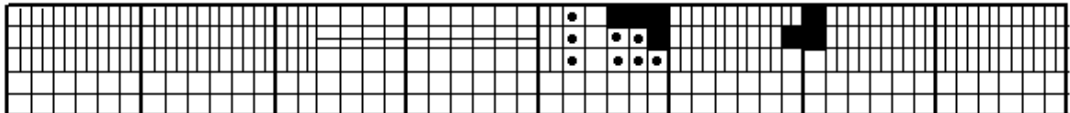
Nov. 24, 2022



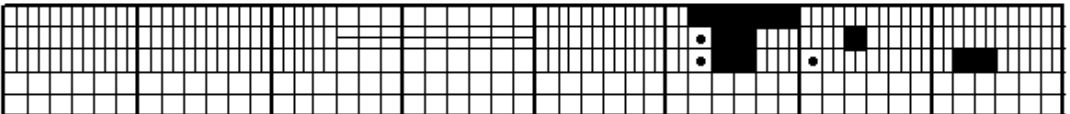
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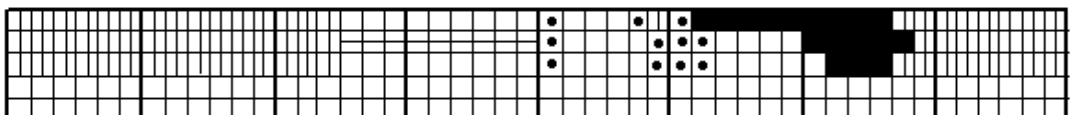
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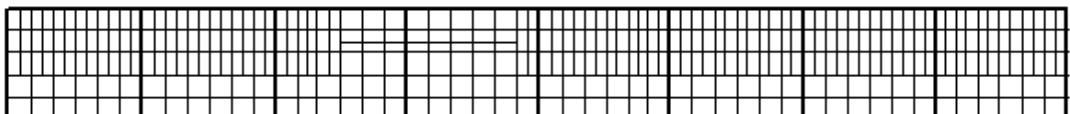
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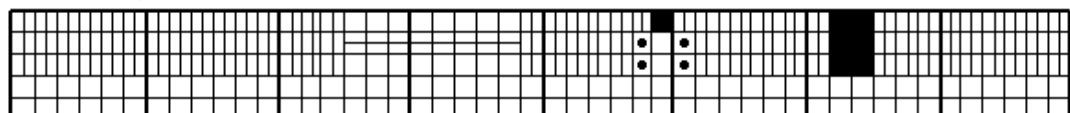
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Nov. 29, 2022



Nov. 30, 2022

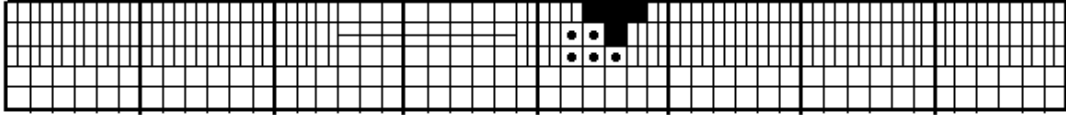


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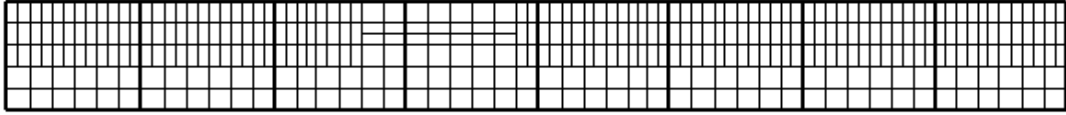
Universal Time

Lovozero ascaplots

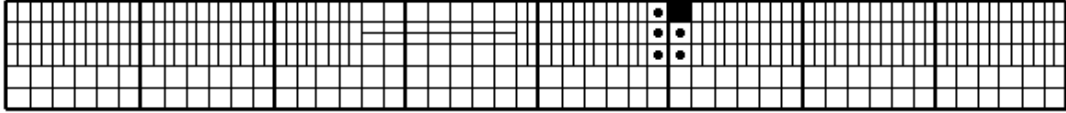
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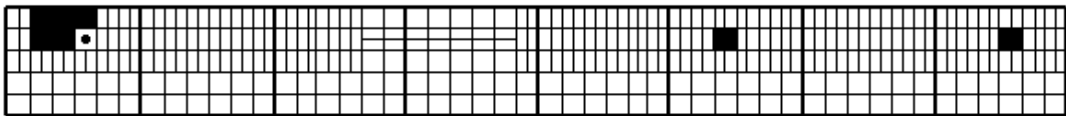
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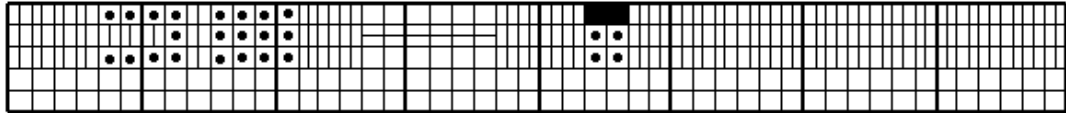
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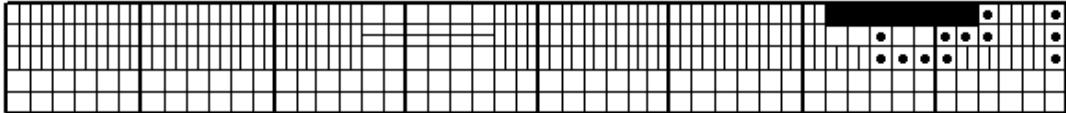
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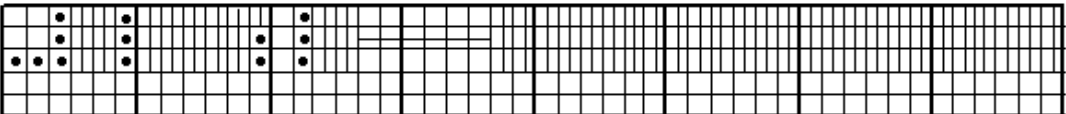
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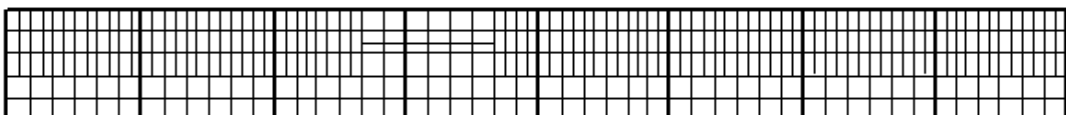
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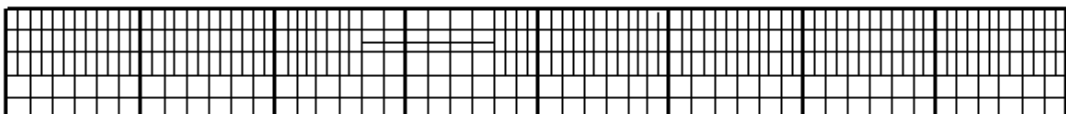
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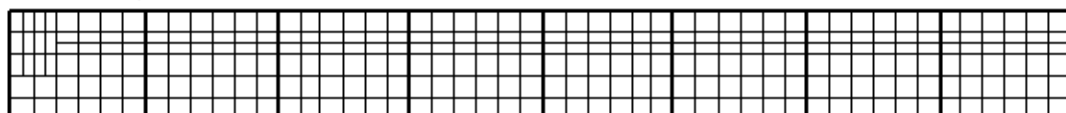
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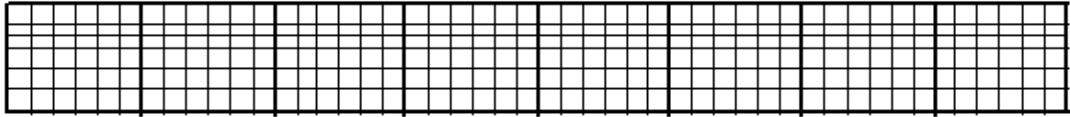


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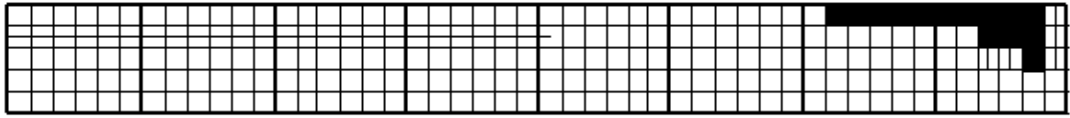
Universal Time

Lovozero ascaplots

Dec. 11, 2022



Dec. 12, 2022



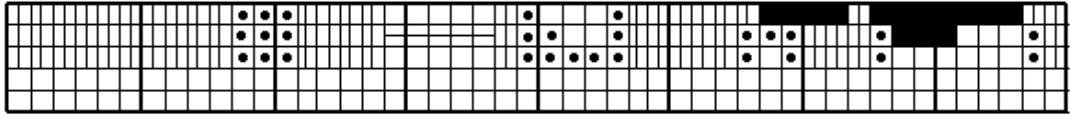
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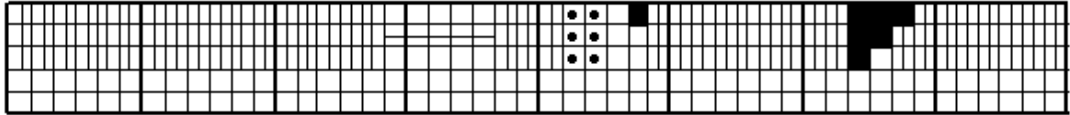
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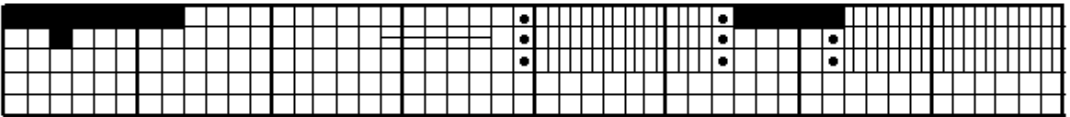
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Dec. 16, 2022



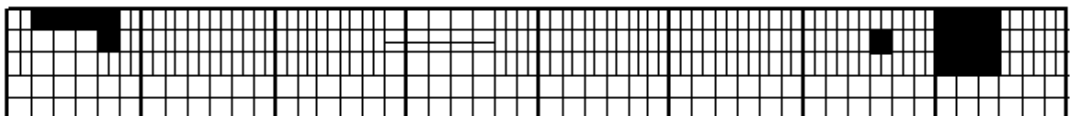
Dec. 17, 2022



Dec. 18, 2022



Dec. 19, 2022



Dec. 20, 2022

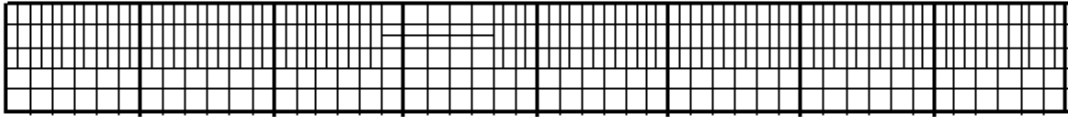


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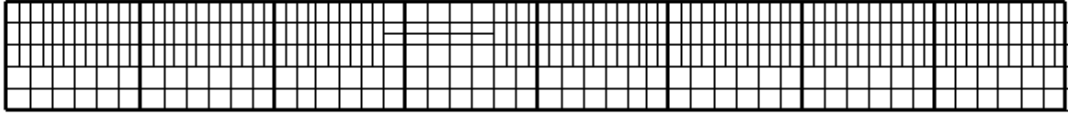
Universal Time

Lovozero ascaplots

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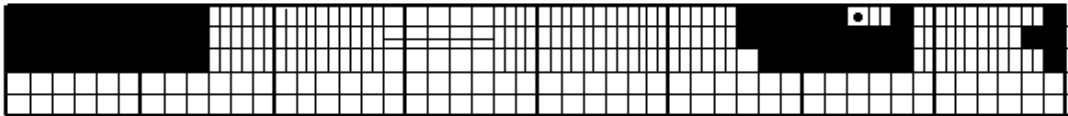
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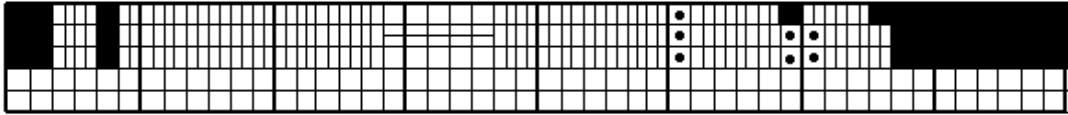
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Dec. 24, 2022



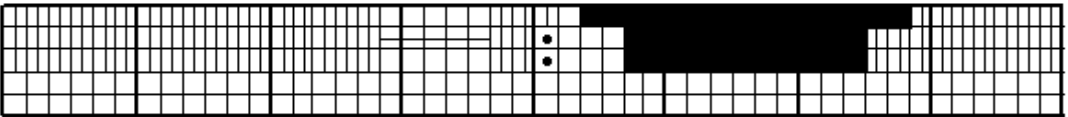
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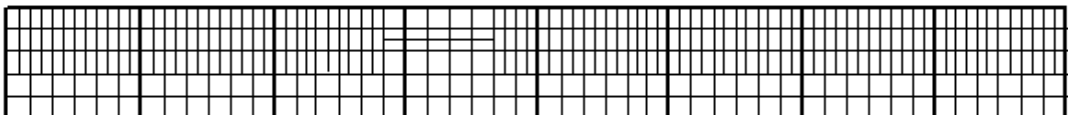
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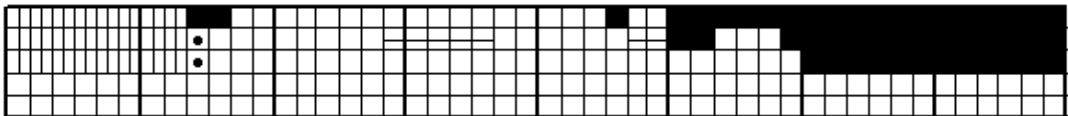
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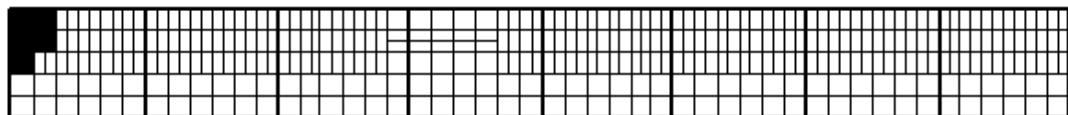
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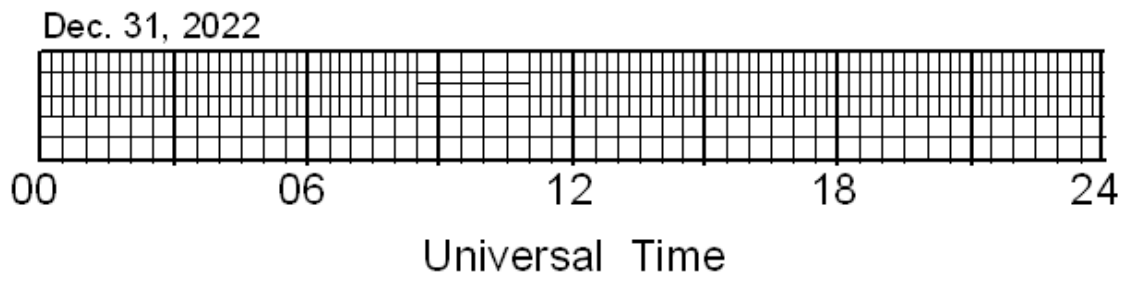
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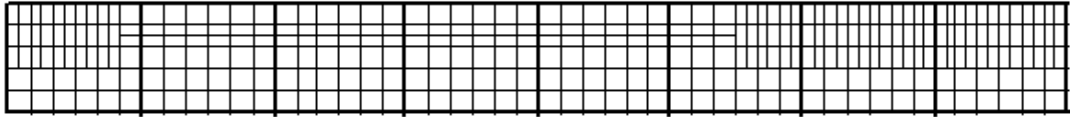
Universal Time

Lovozero ascaplots

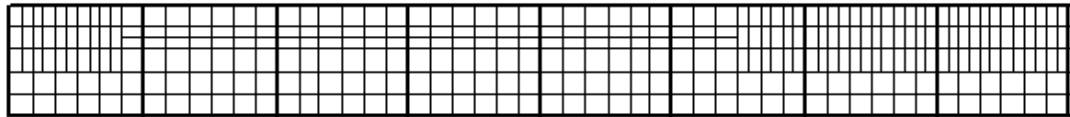


Verhnetulomsky ascaplots

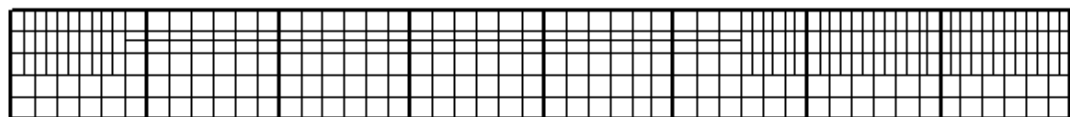
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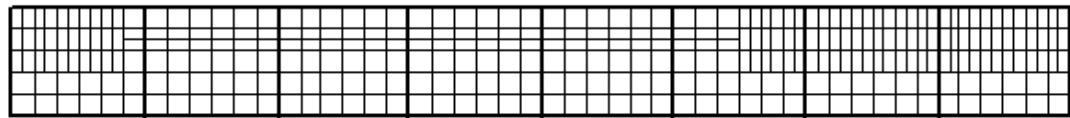
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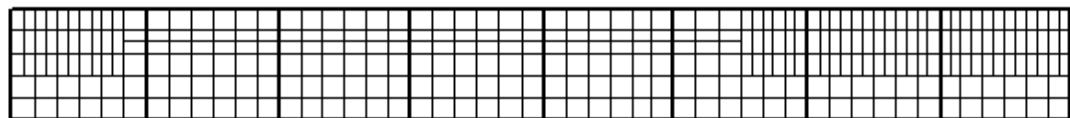
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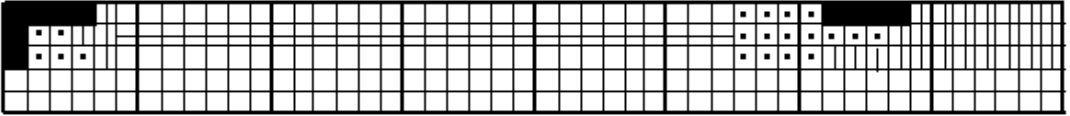
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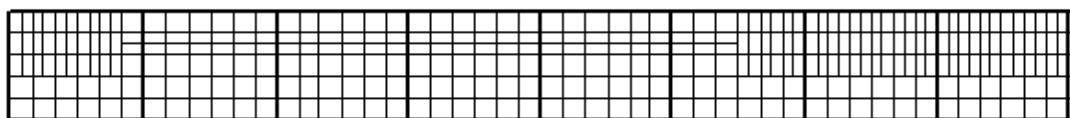
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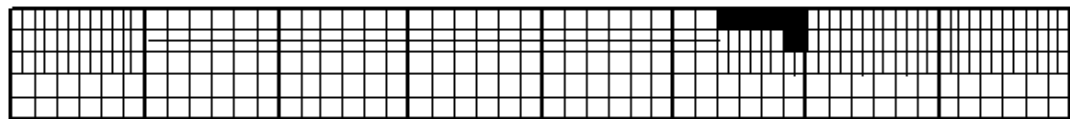
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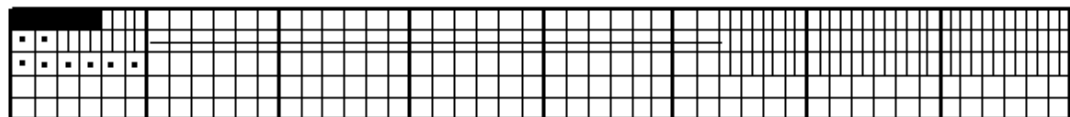
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Oct. 09, 2022



Oct. 10, 2022

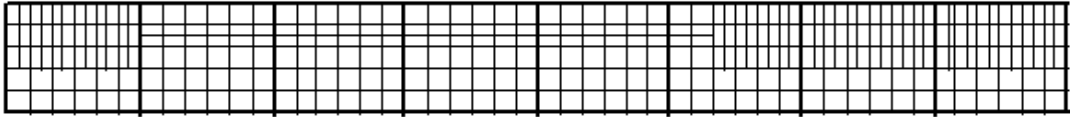


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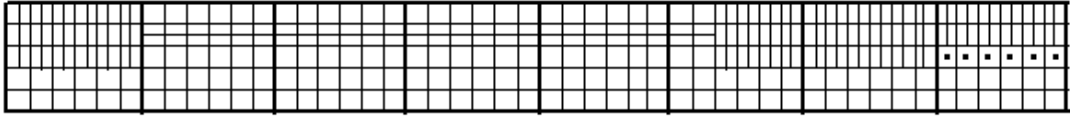
Universal Time

Verhnetulomsky ascaplots

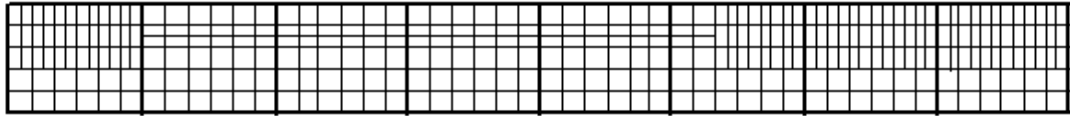
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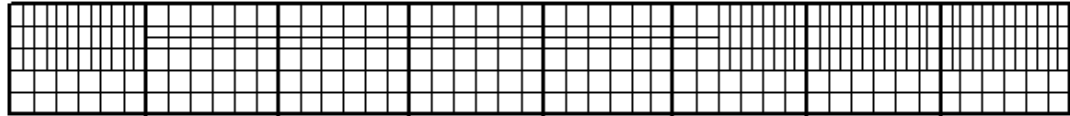
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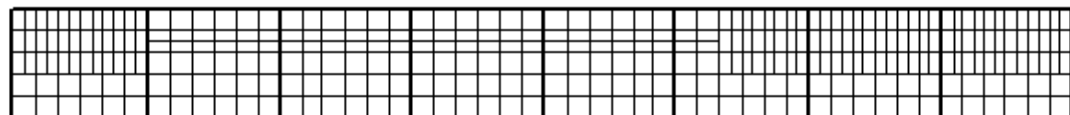
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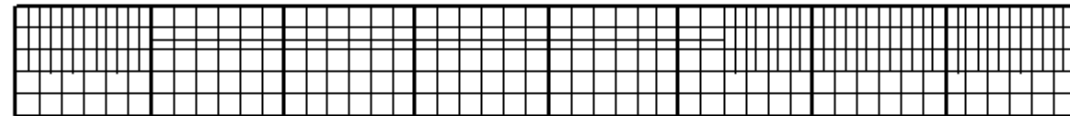
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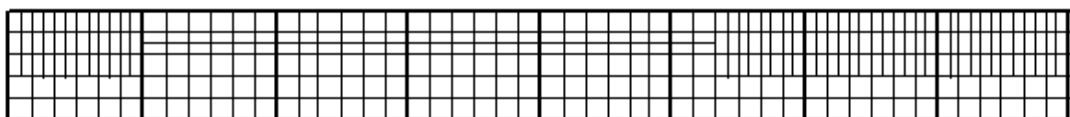
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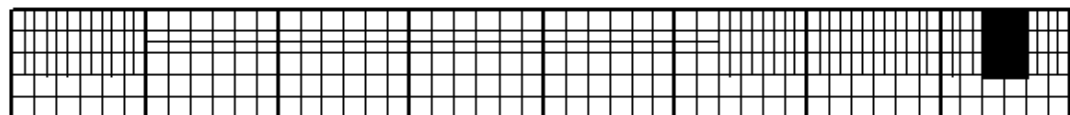
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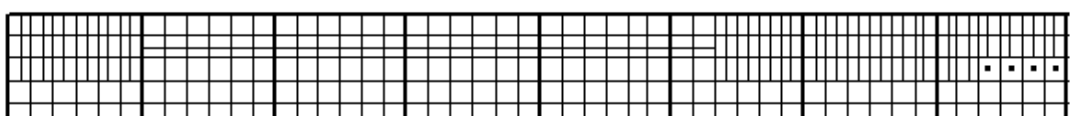
Oct. 17, 2022



Oct. 18, 2022



Oct. 19, 2022



Oct. 20, 2022



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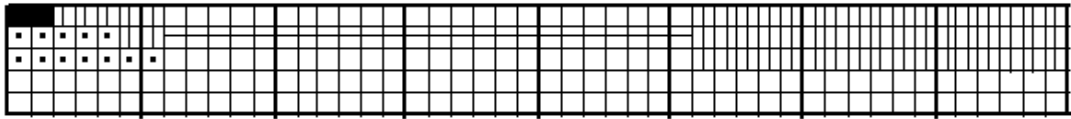
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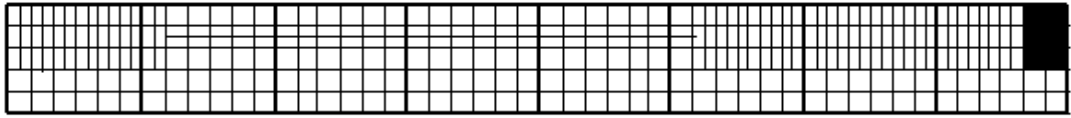
Universal Time

Verhnetulomsky ascaplots

Oct. 21, 2022



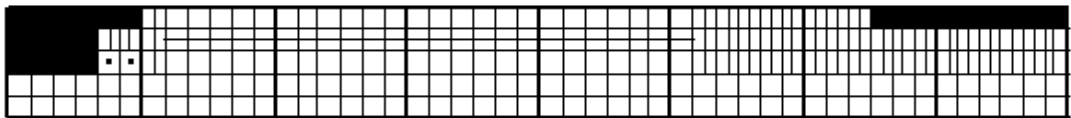
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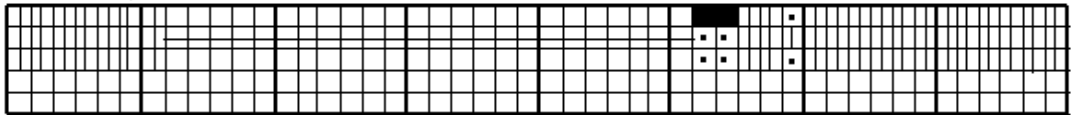
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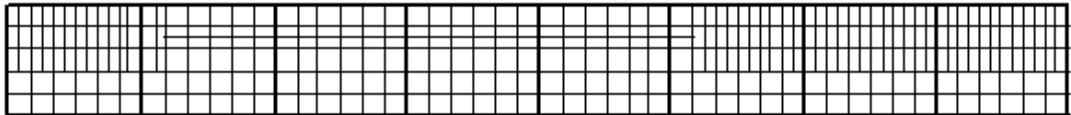
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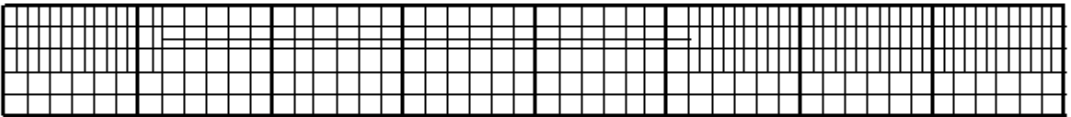
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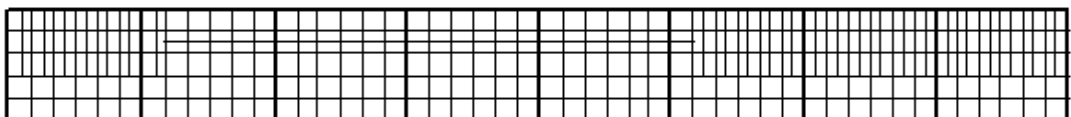
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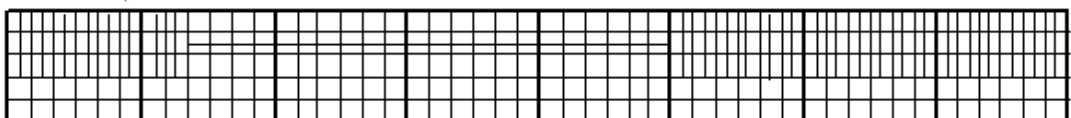
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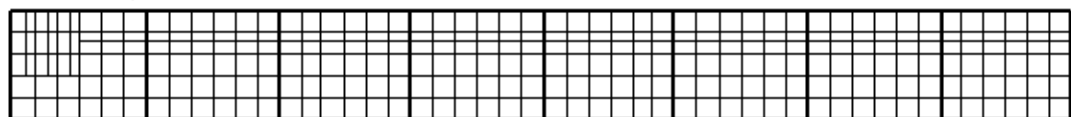
Oct. 28, 2022



Oct. 29, 2022



Oct. 30, 2022

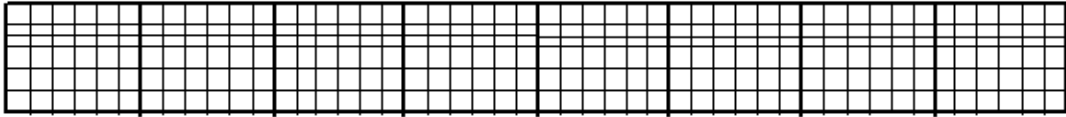


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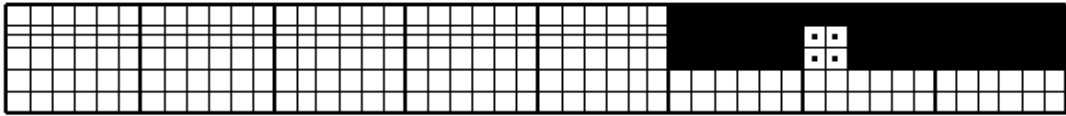
Universal Time

Verhnetulomsky ascaplots

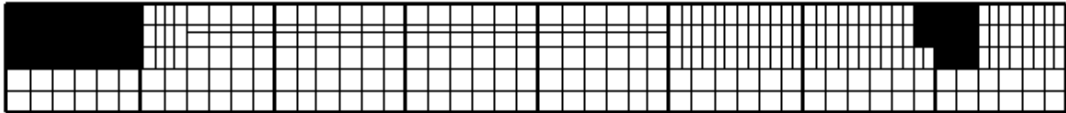
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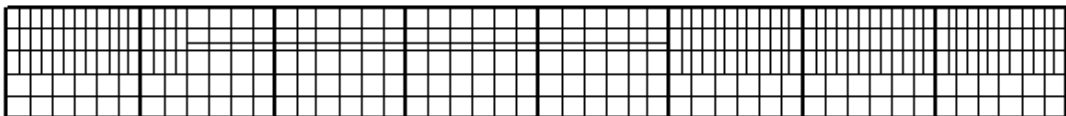
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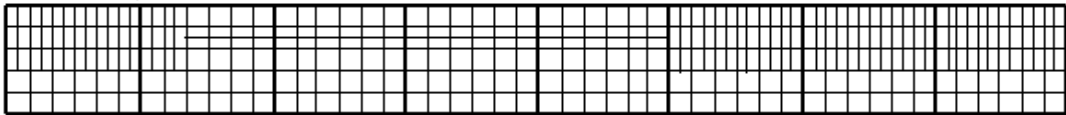
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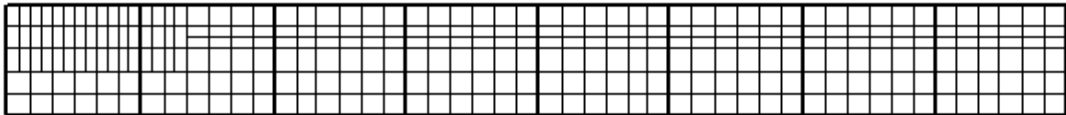
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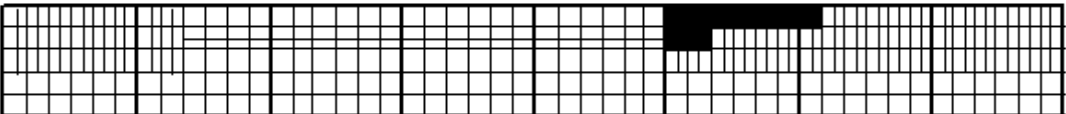
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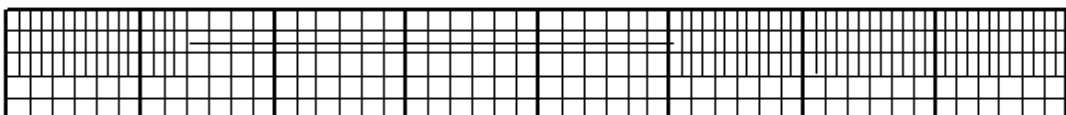
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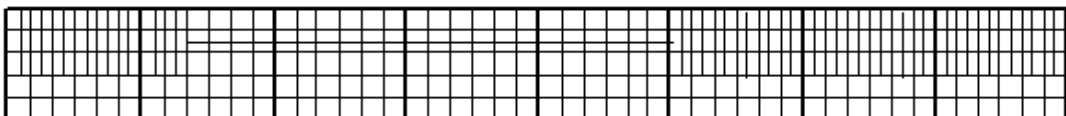
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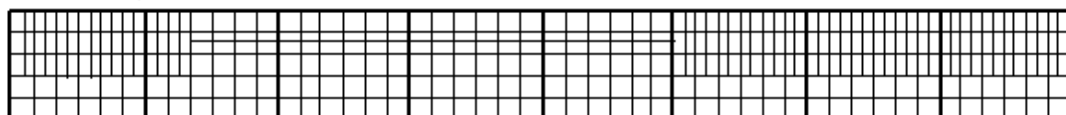
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Nov. 09, 2022



Nov. 10, 2022

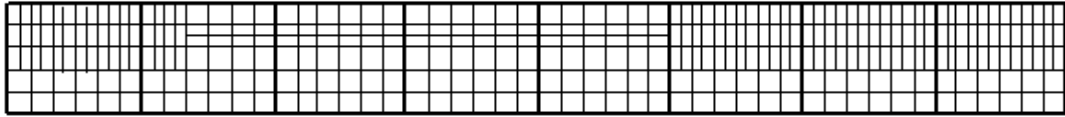


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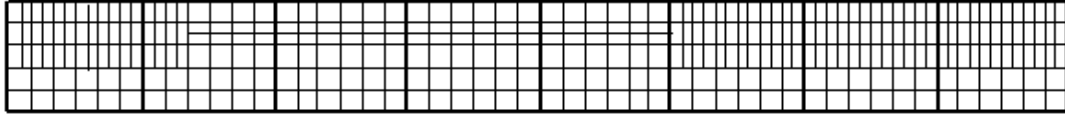
Universal Time

Verhnetulomsky ascaplots

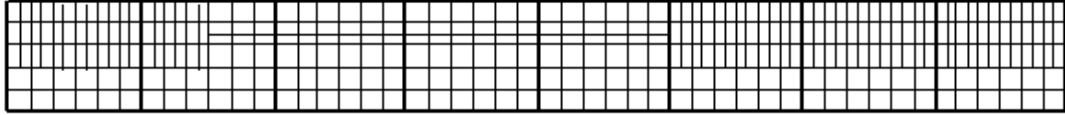
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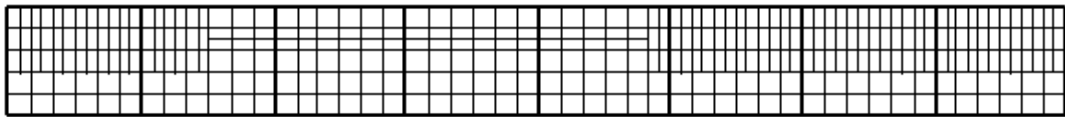
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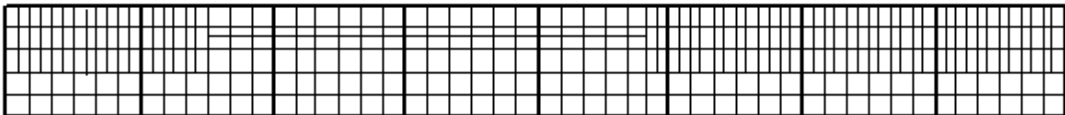
Nov. 13, 2022



Nov. 14, 2022



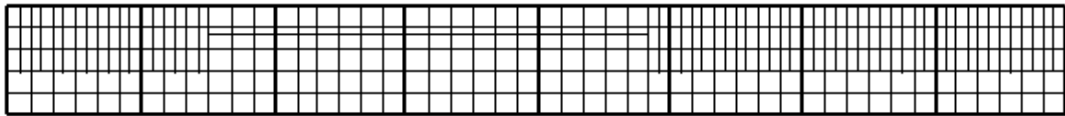
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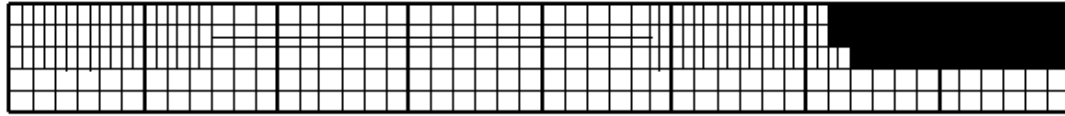
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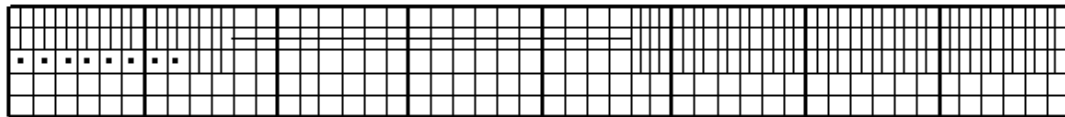
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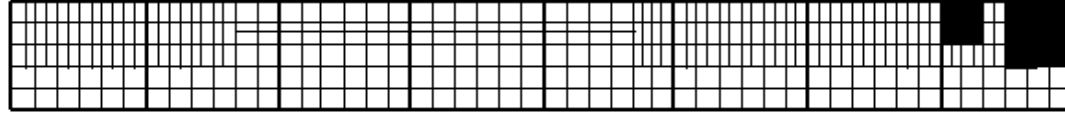
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Nov. 19, 2022



Nov. 20, 2022



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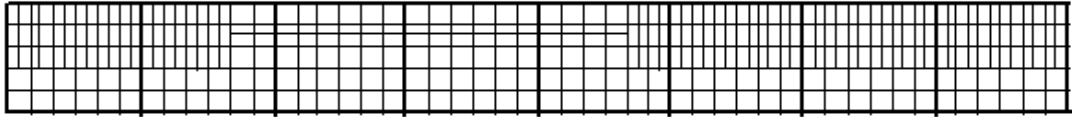
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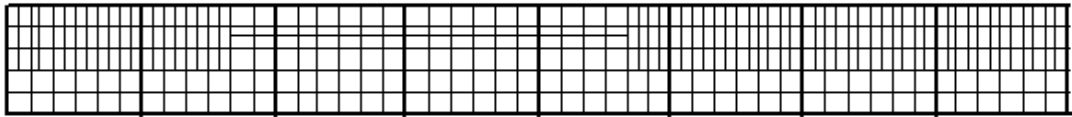
Universal Time

Verhnetulomsky ascaplots

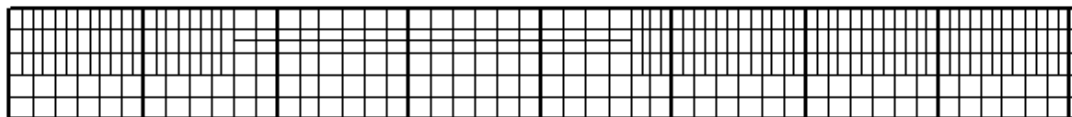
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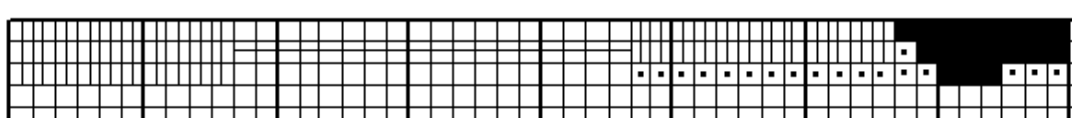
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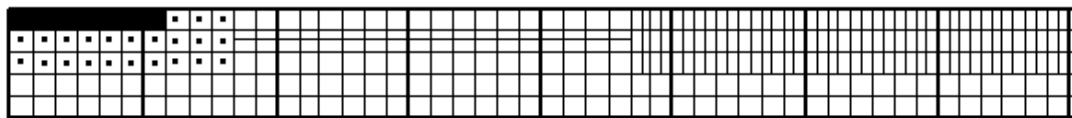
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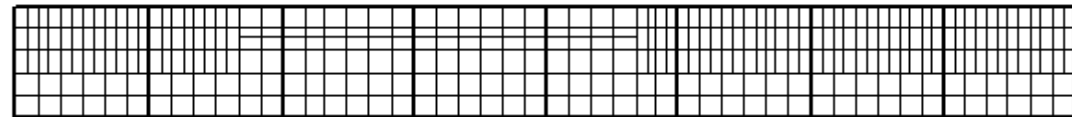
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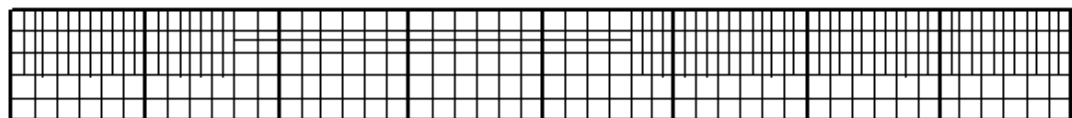
Nov. 25, 2022



Nov. 26, 2022



Nov. 27, 2022



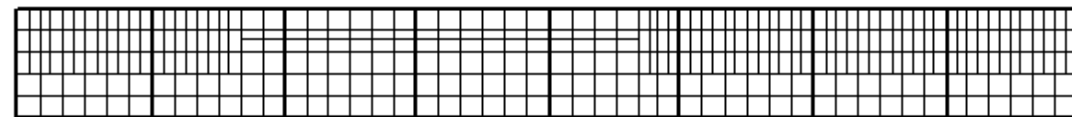
Nov. 28, 2022



Nov. 29, 2022



Nov. 30, 2022

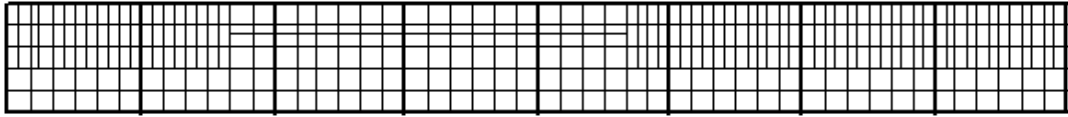


00 06 12 18 24

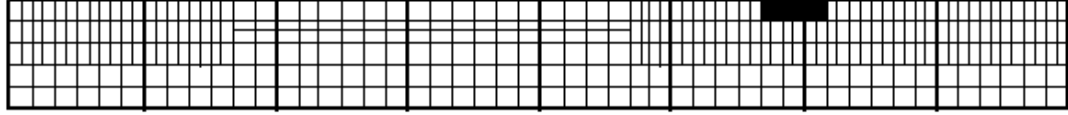
Universal Time

Verhnetulomsky ascaplots

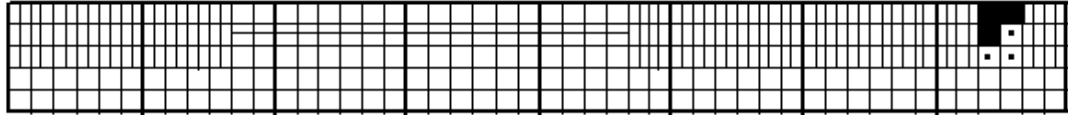
Dec. 01, 2022



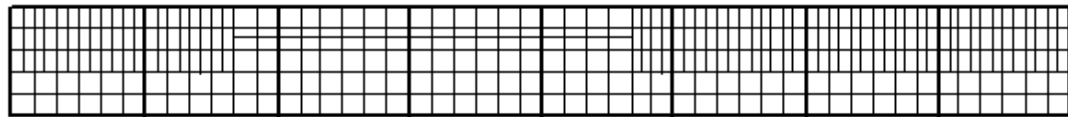
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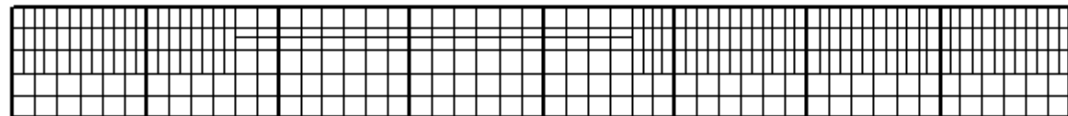
Dec. 03, 2022



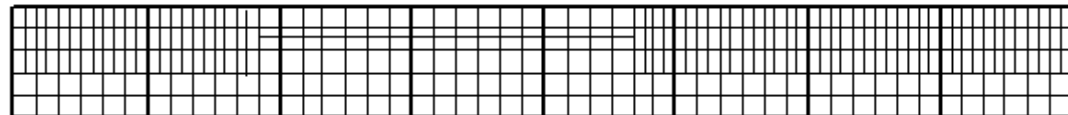
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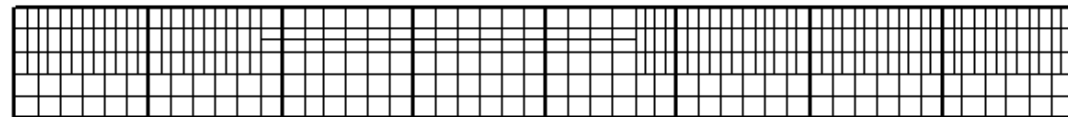
Dec. 05, 2022



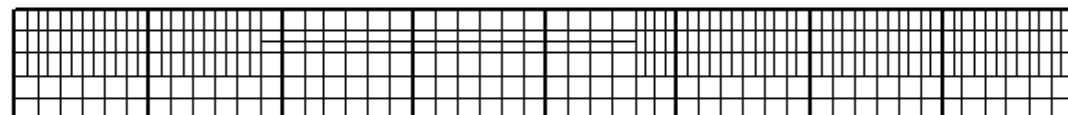
Dec. 06, 2022



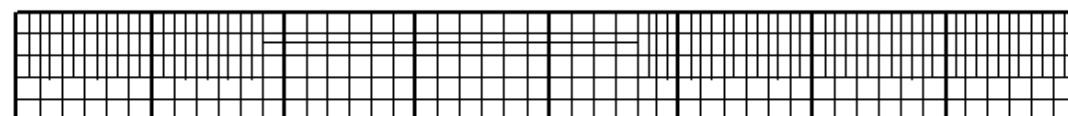
Dec. 07, 2022



Dec. 08, 2022



Dec. 09, 2022



Dec. 10, 2022



00

06

12

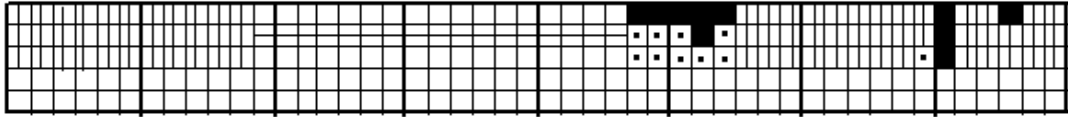
18

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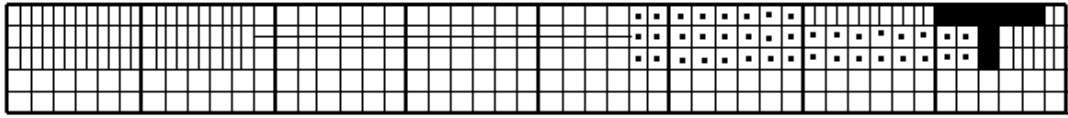
Universal Time

Verhnetulomsky ascaplots

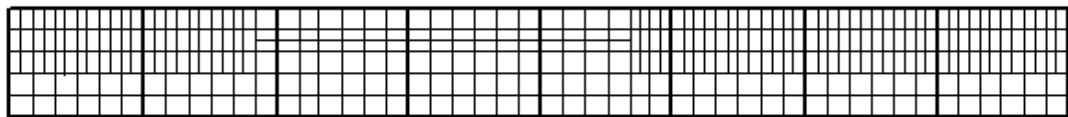
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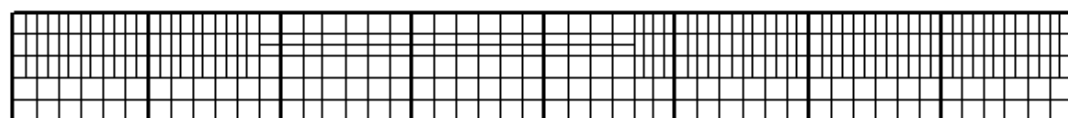
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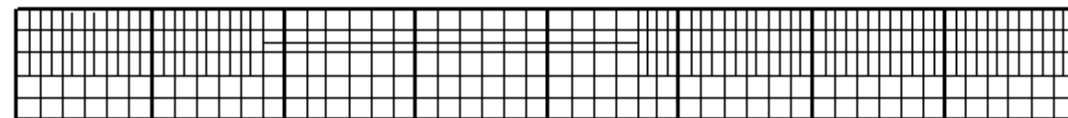
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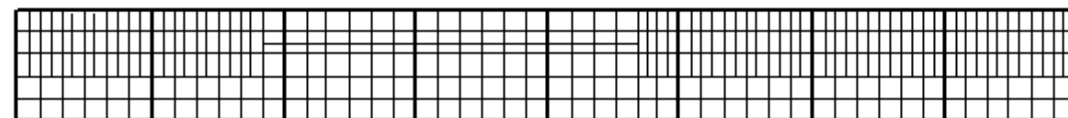
Dec. 14, 2022



Dec. 15, 2022



Dec. 16, 2022



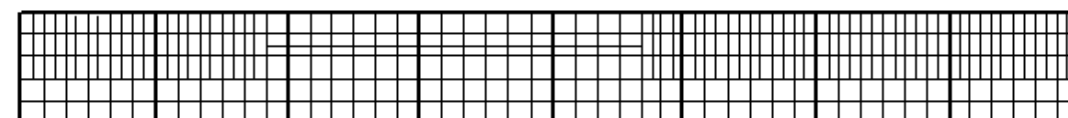
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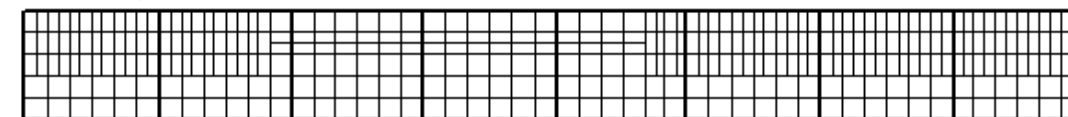
Dec. 18, 2022



Dec. 19, 2022



Dec. 20, 2022



00

06

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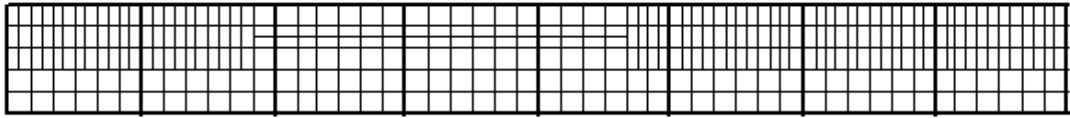
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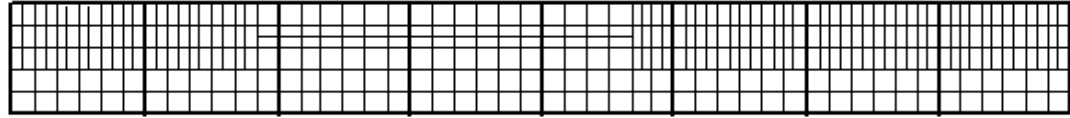
Universal Time

Verhnetulomsky ascaplots

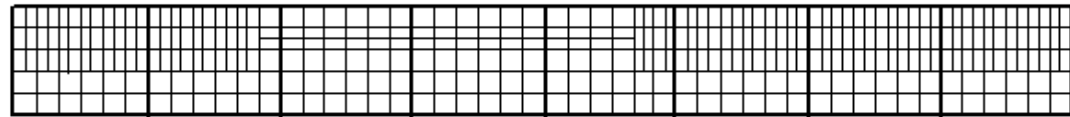
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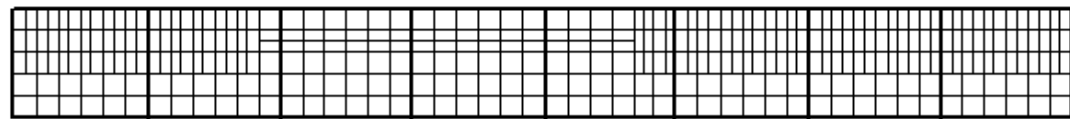
Dec. 22, 2022



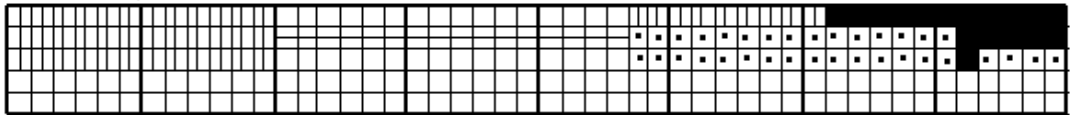
Dec. 23, 2022



Dec. 24, 2022



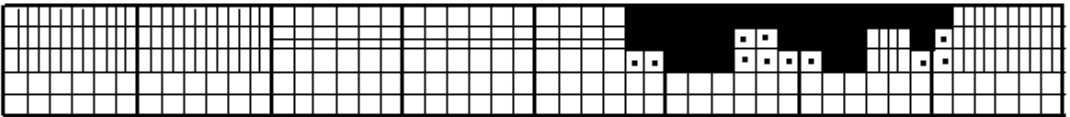
Dec. 25, 2022



Dec. 26, 2022



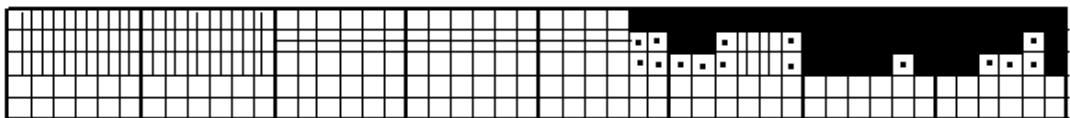
Dec. 27, 2022



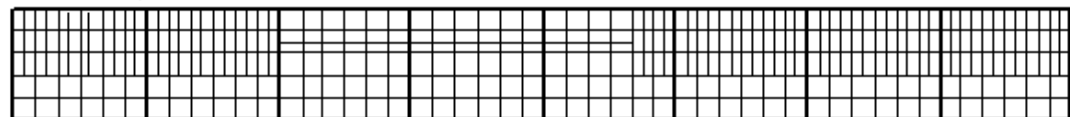
Dec. 28, 2022



Dec. 29, 2022



Dec. 30, 2022

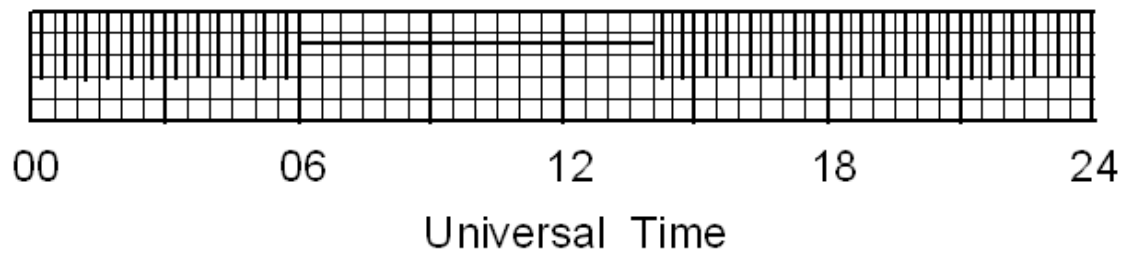


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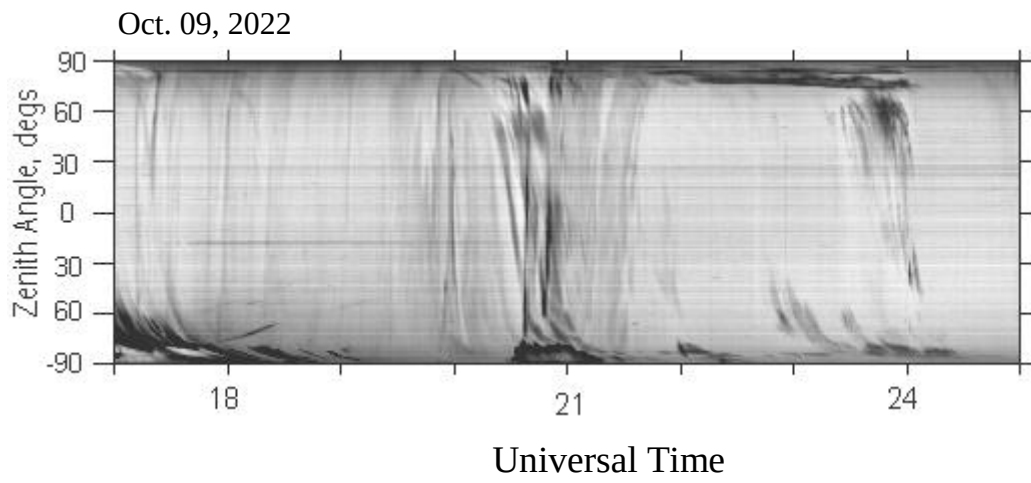
Universal Time

Verhnetulomsky ascaplots

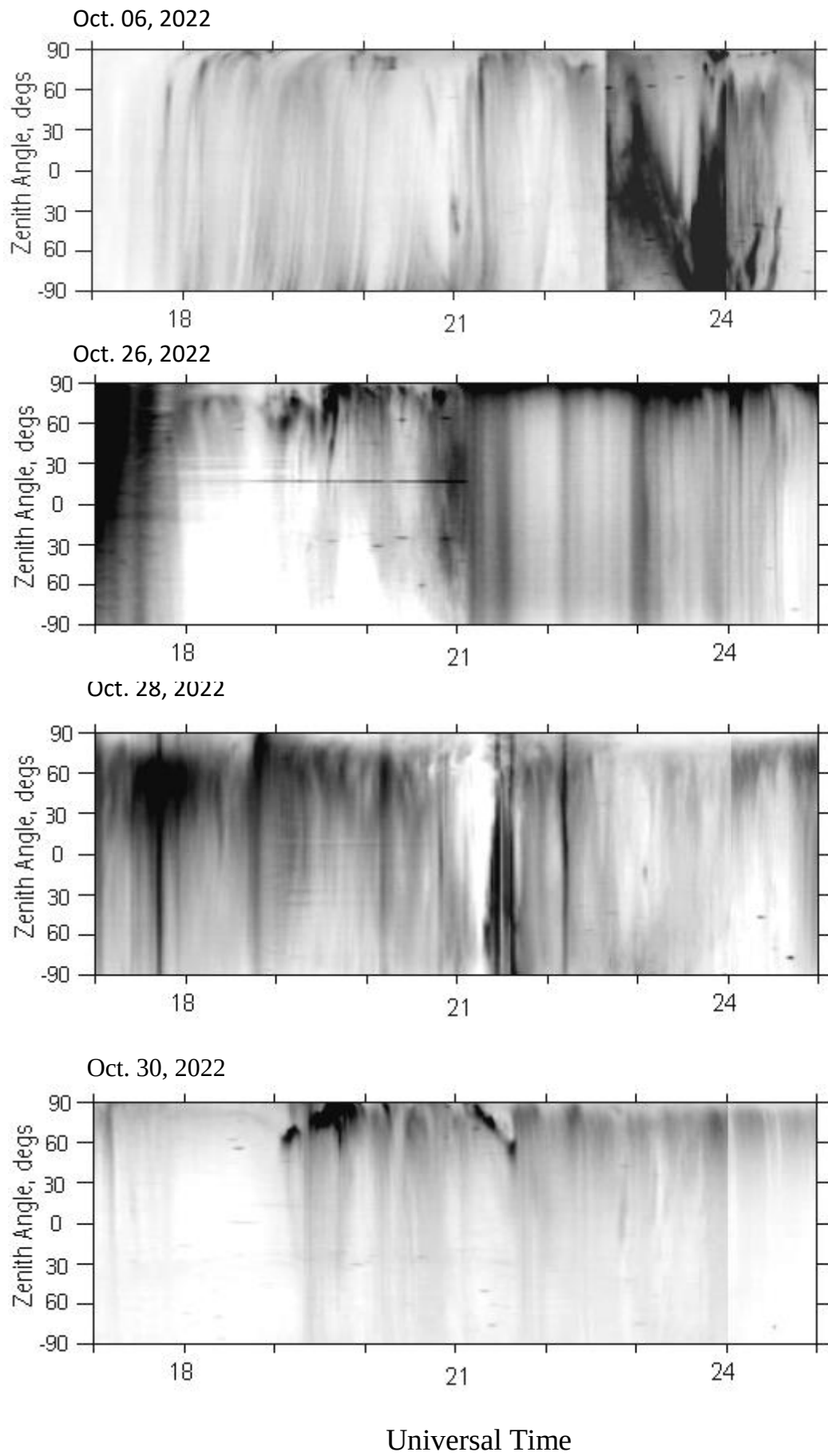
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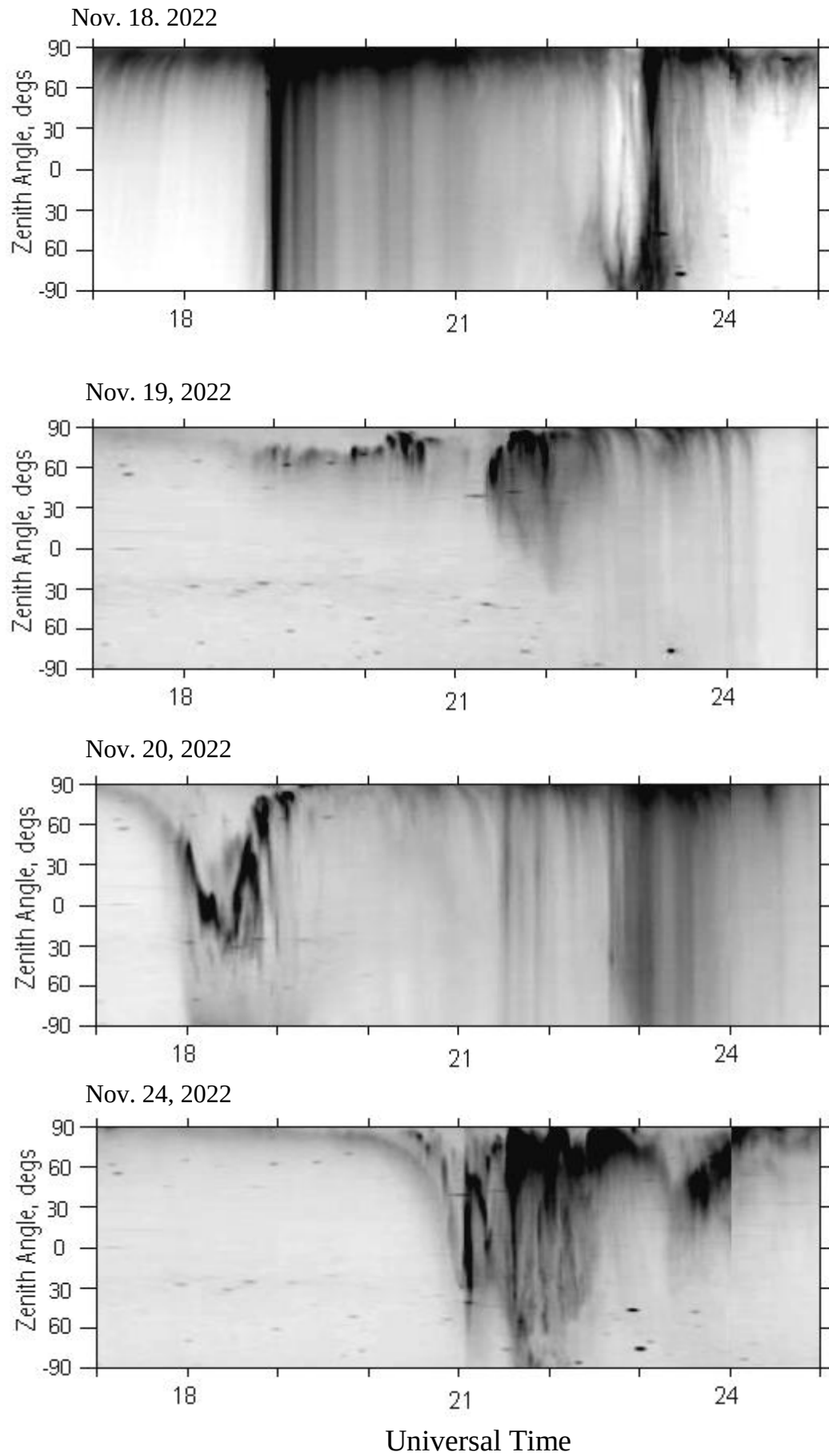
Apatity TV keograms



Lovozero TV keograms

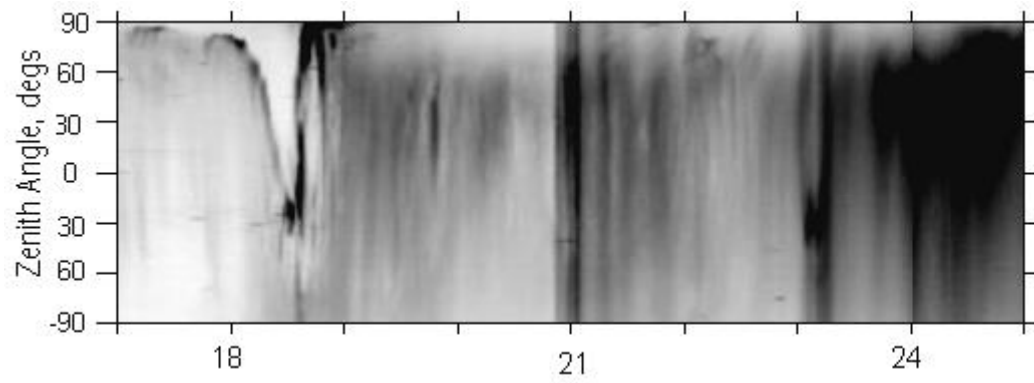


Lovozero TV keograms

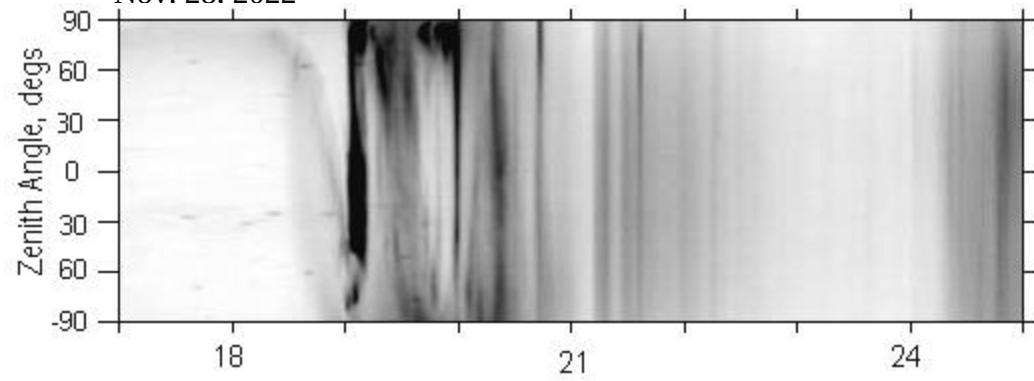


Lovozero TV keograms

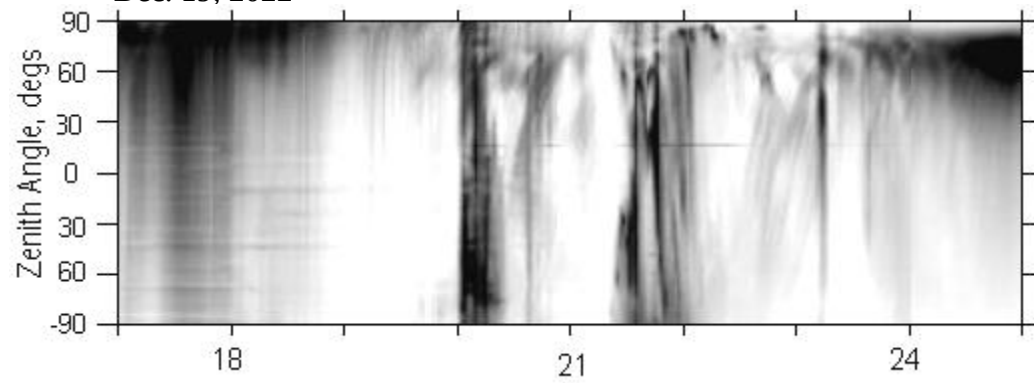
Nov. 25, 2022



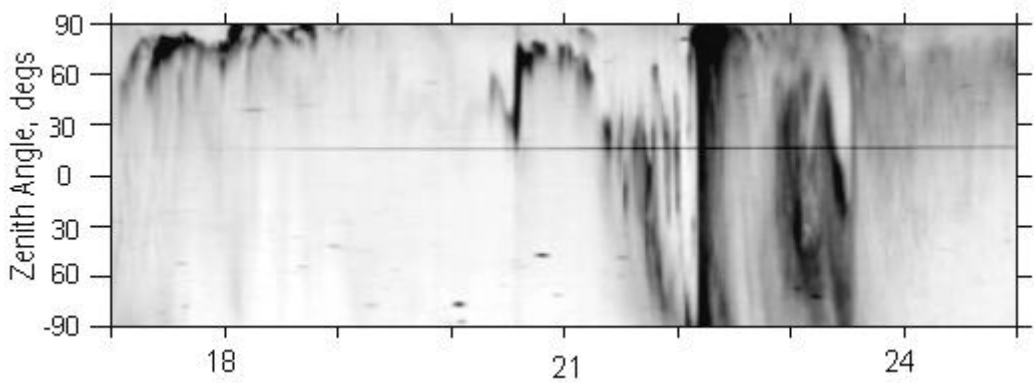
Nov. 28, 2022



Dec. 19, 2022

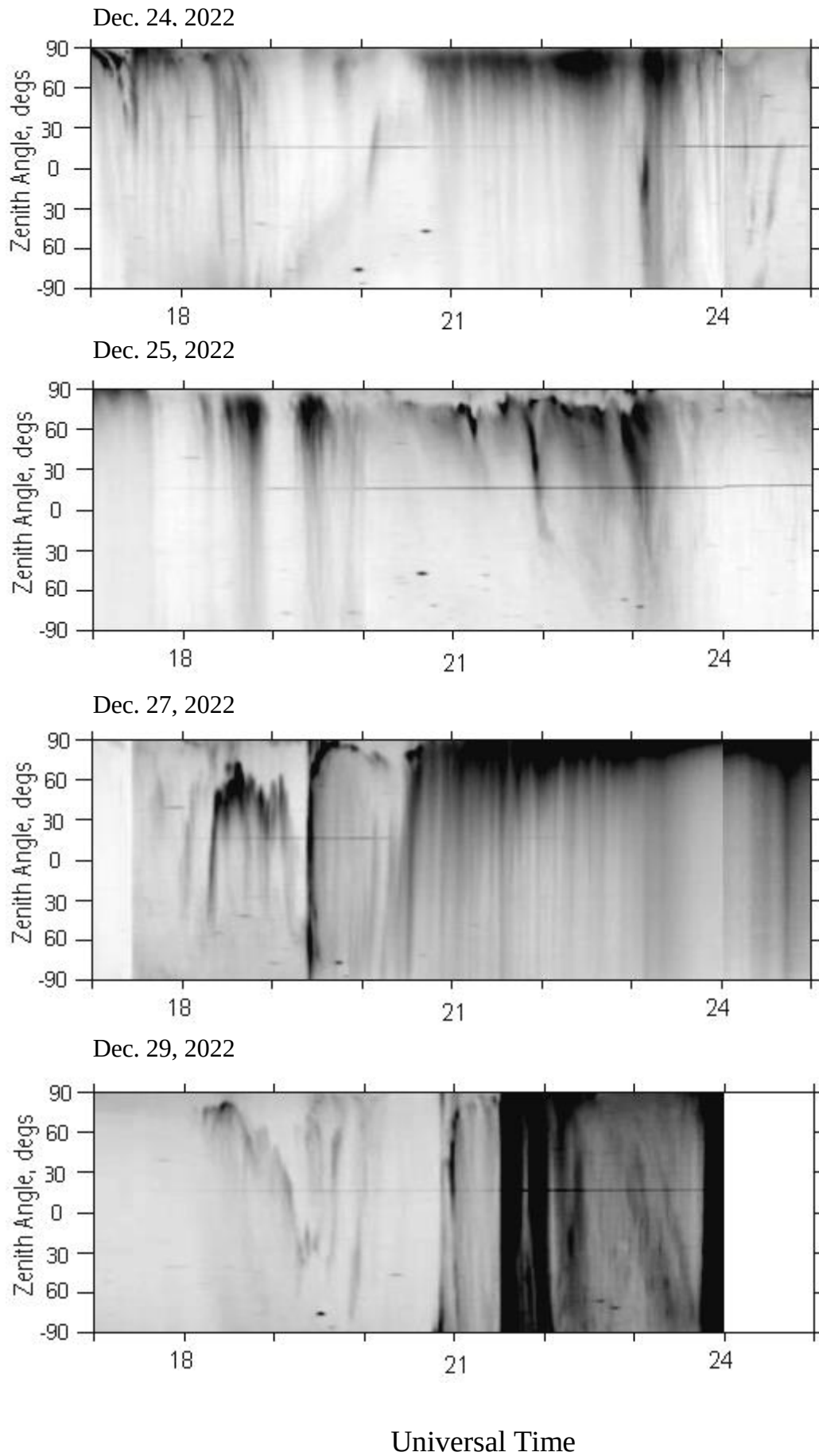


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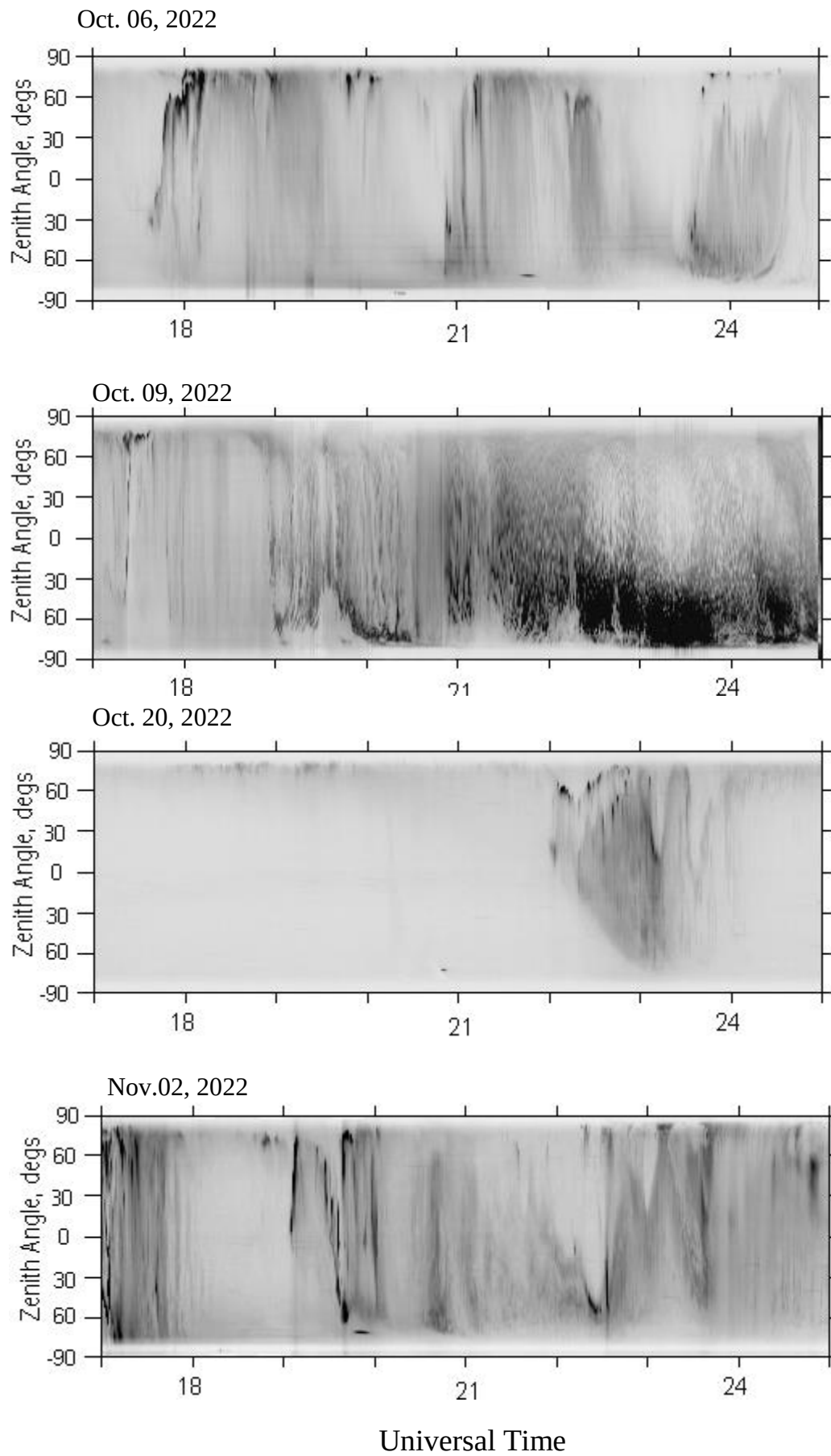


Universal Time

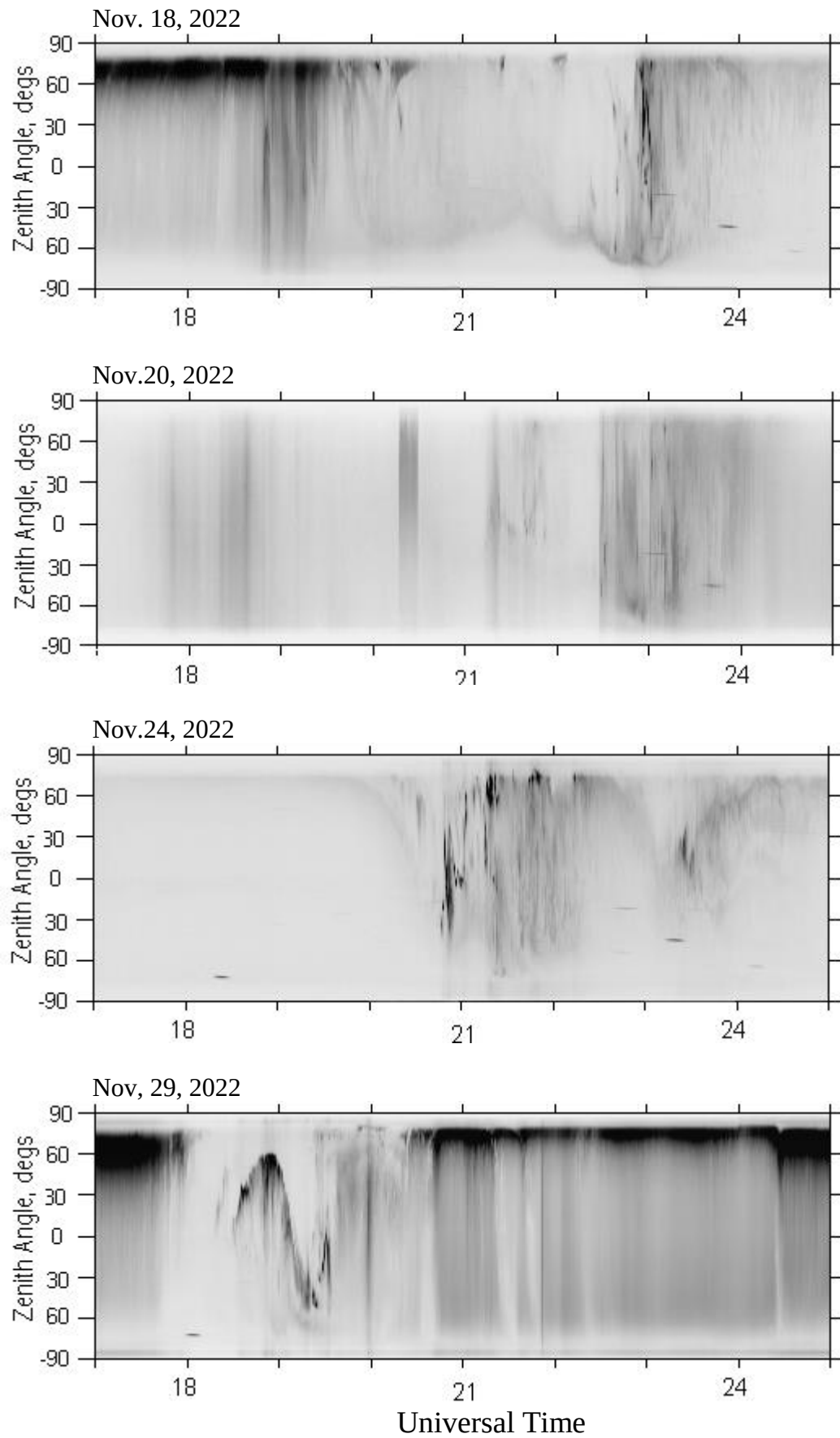
Lovozero TV keograms



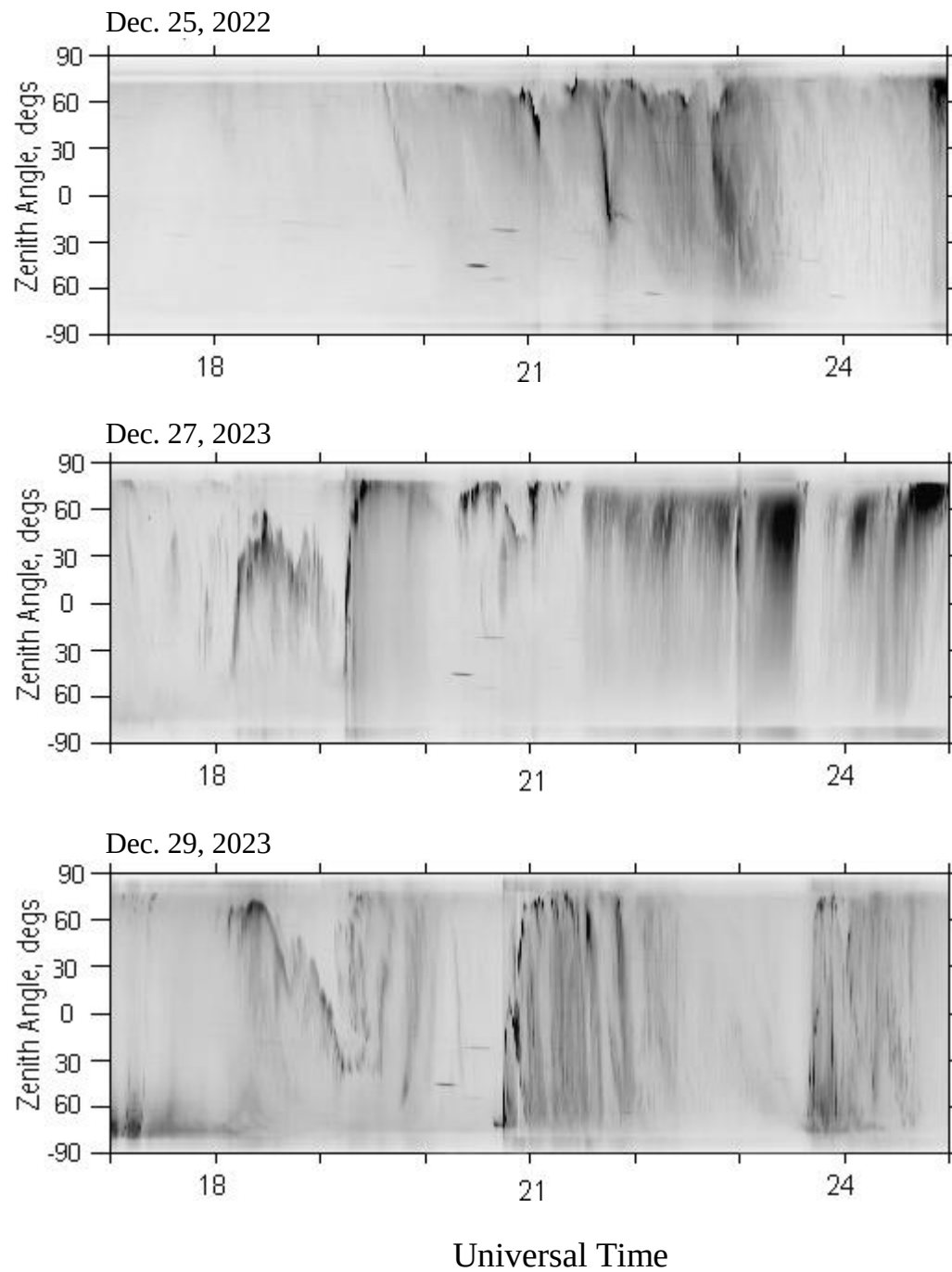
Verhnetulomsky TV keograms



Verhnetulomsky TV keograms



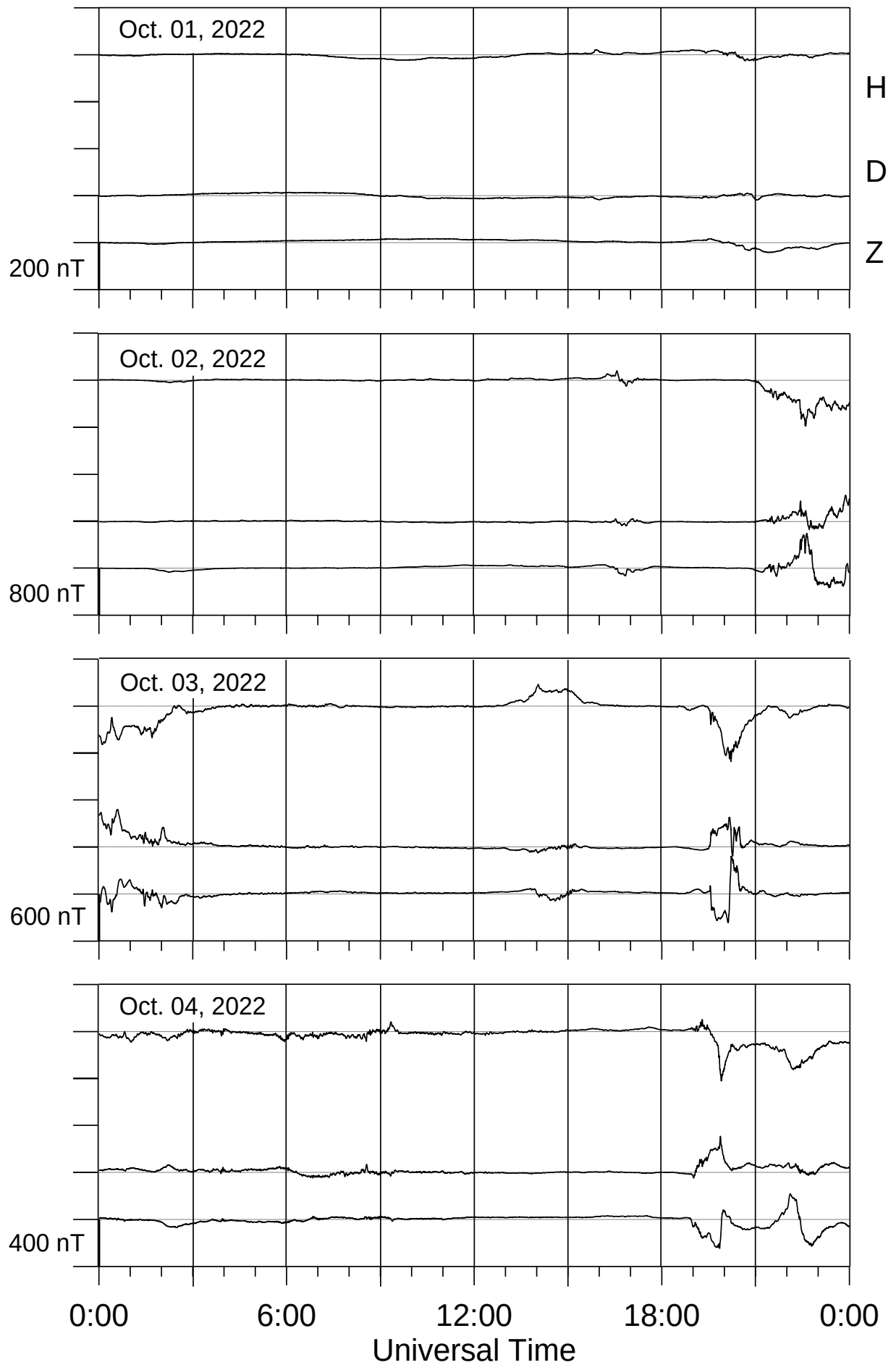
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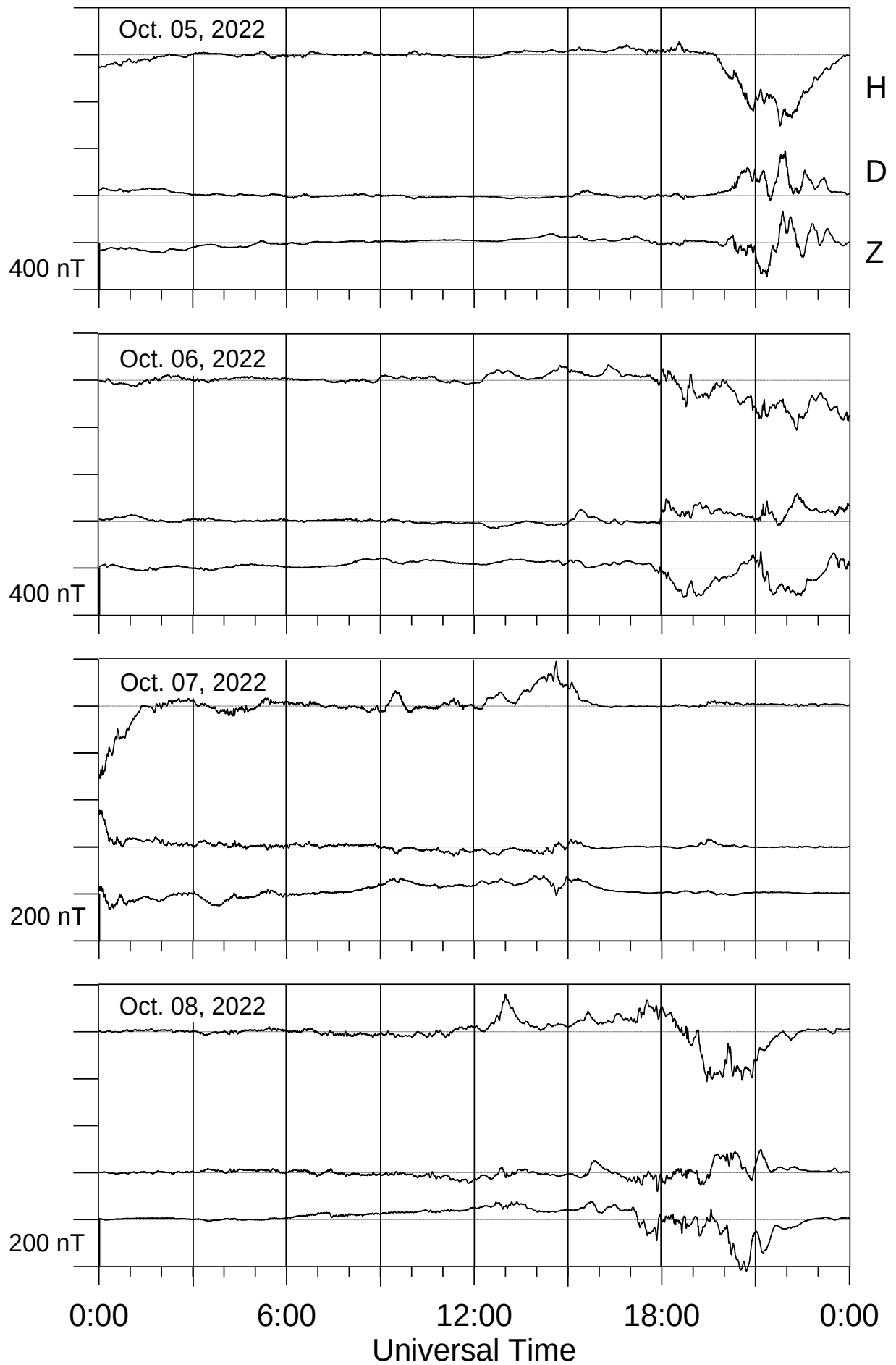
LOVOZERO MAGNETOGRAMS

October - December 2022

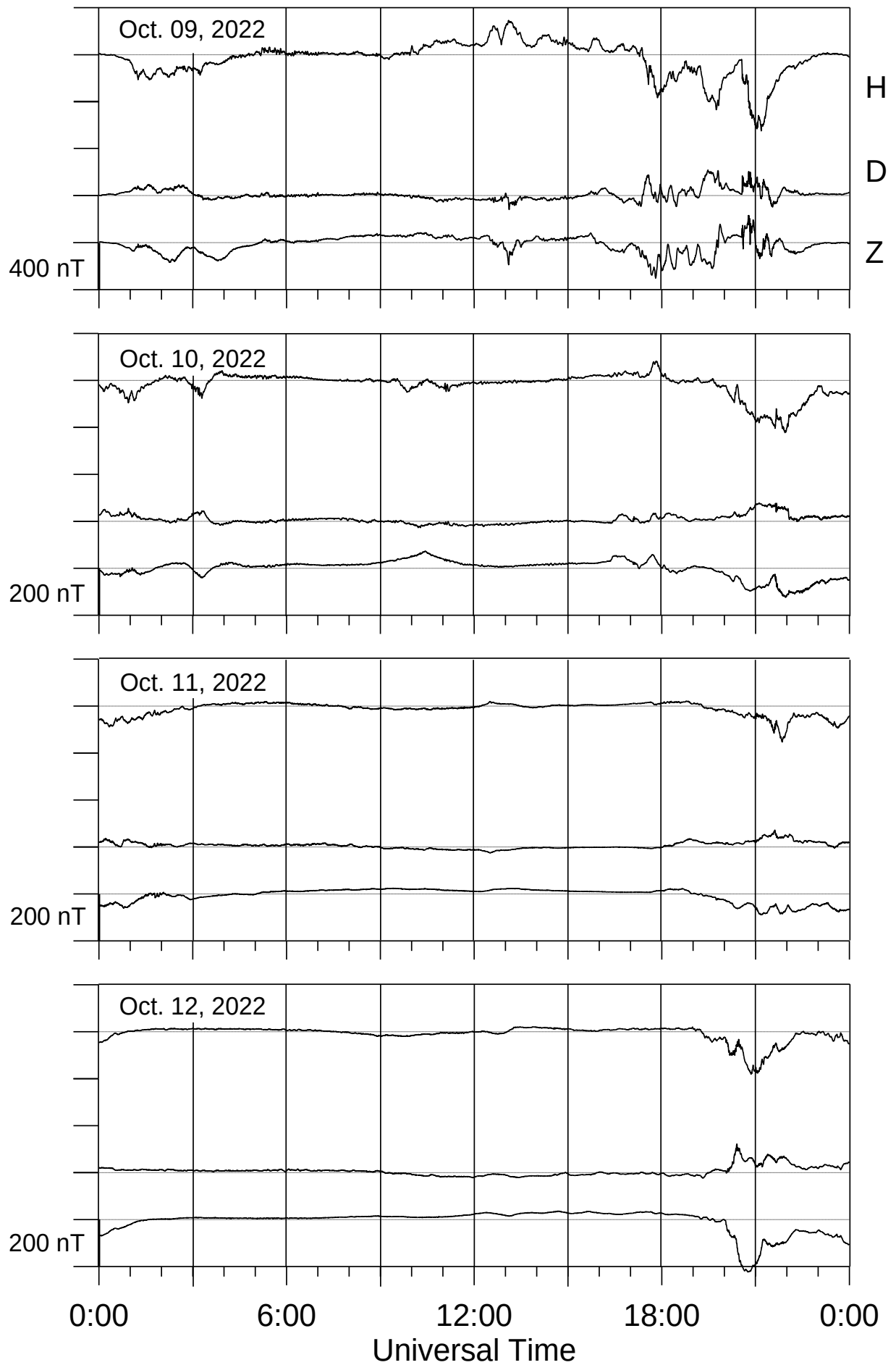
Lovozero magnetometer



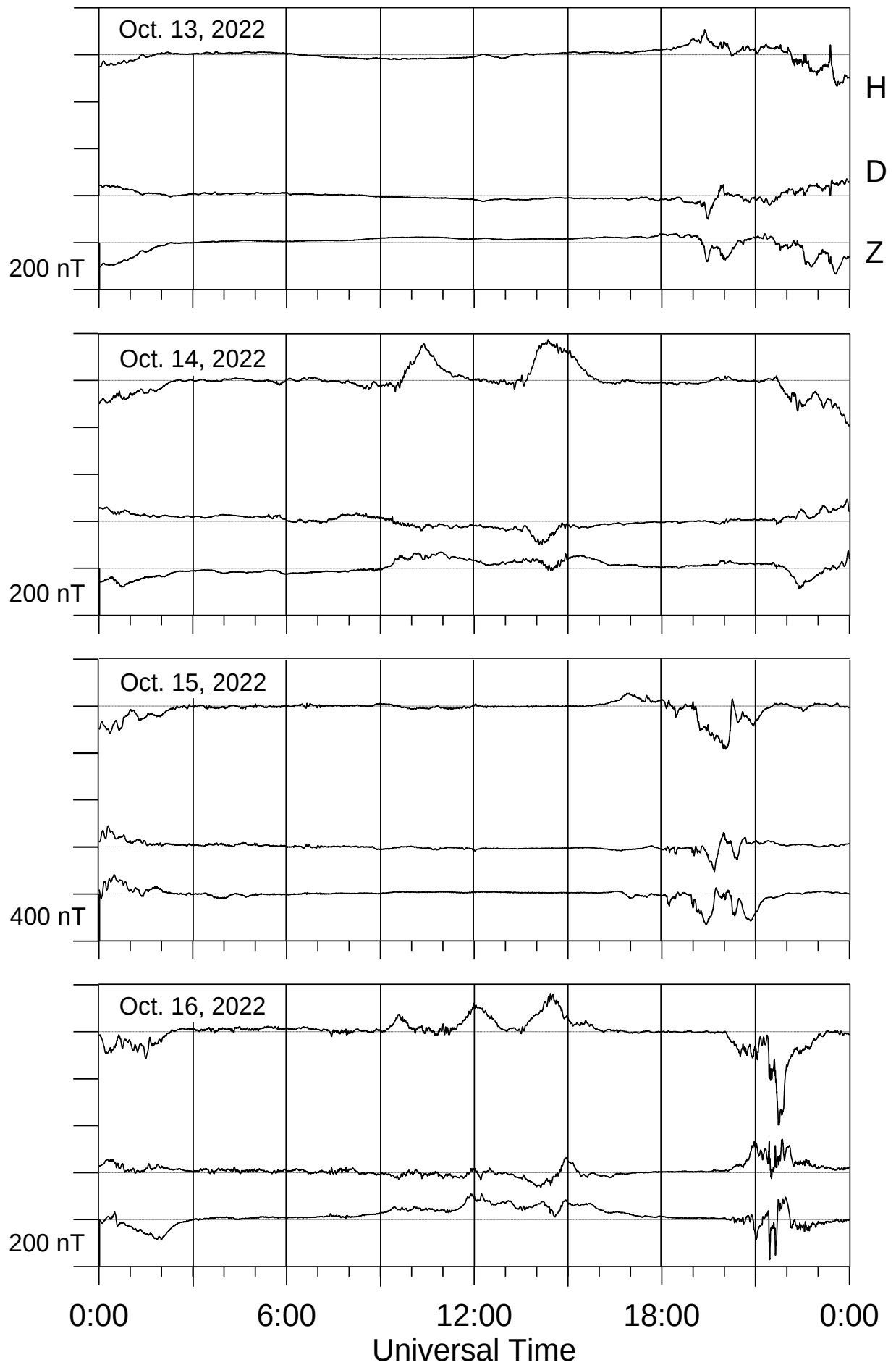
Lovozero magnetometer



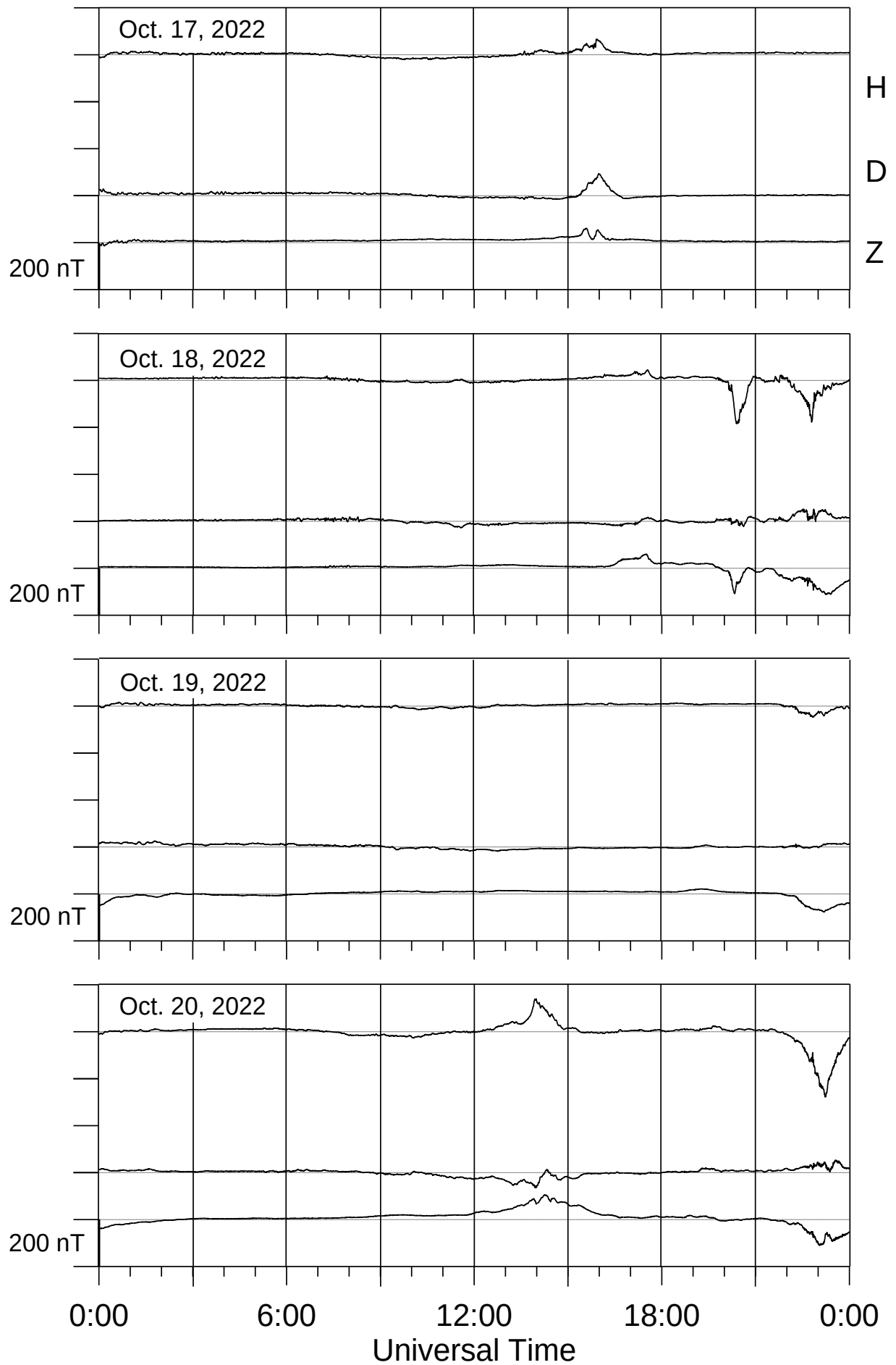
Lovozero magnetometer



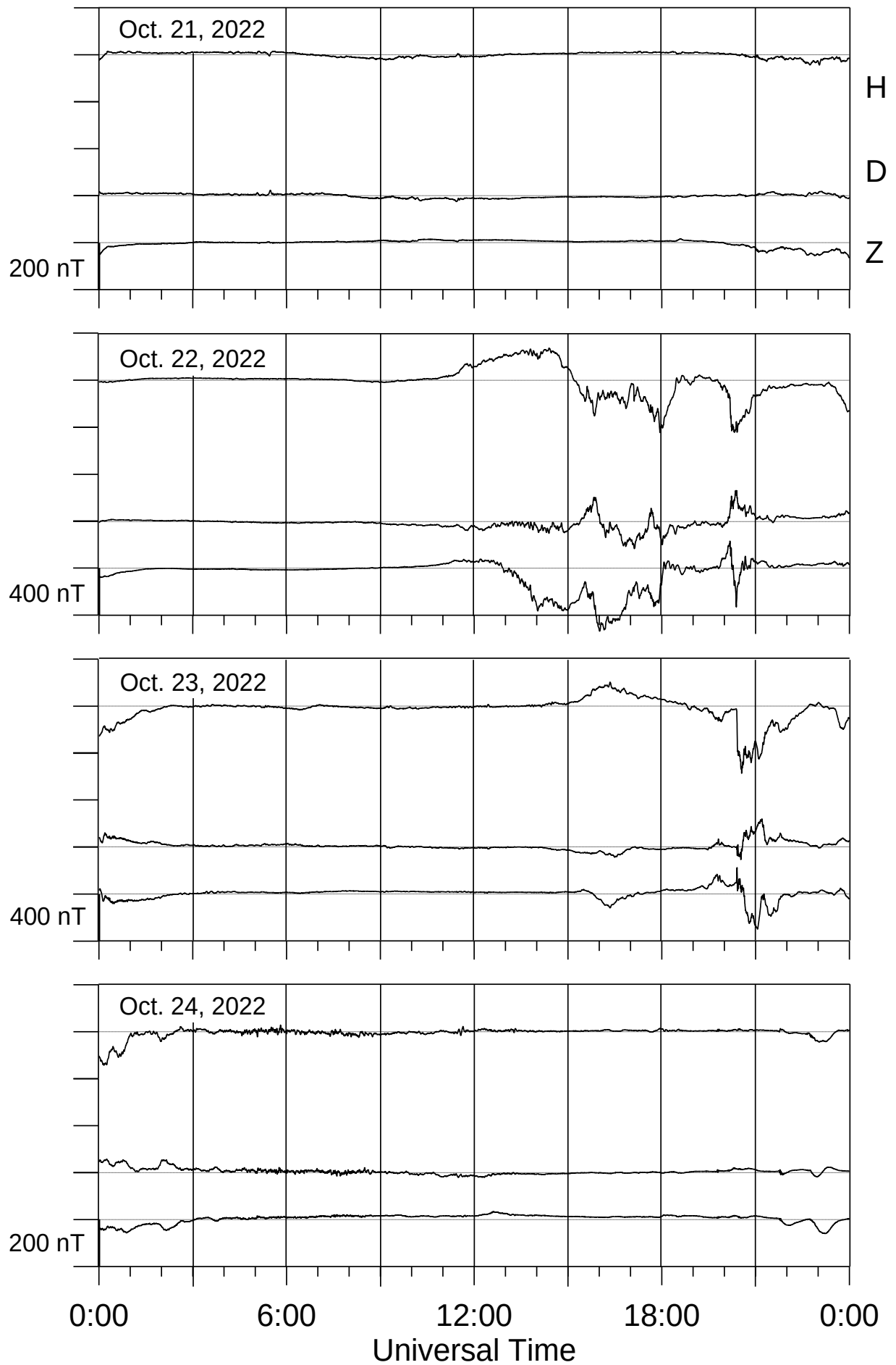
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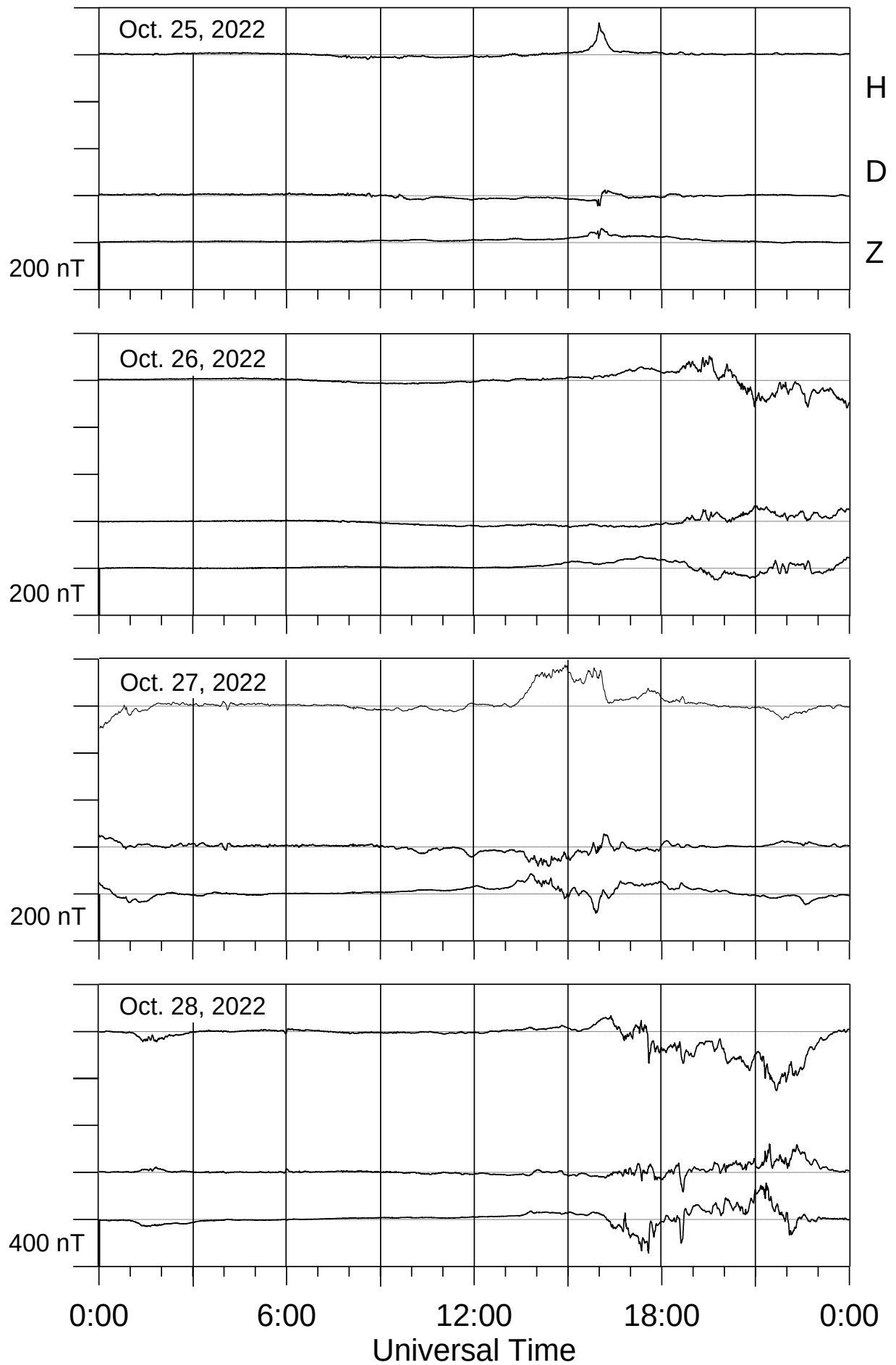
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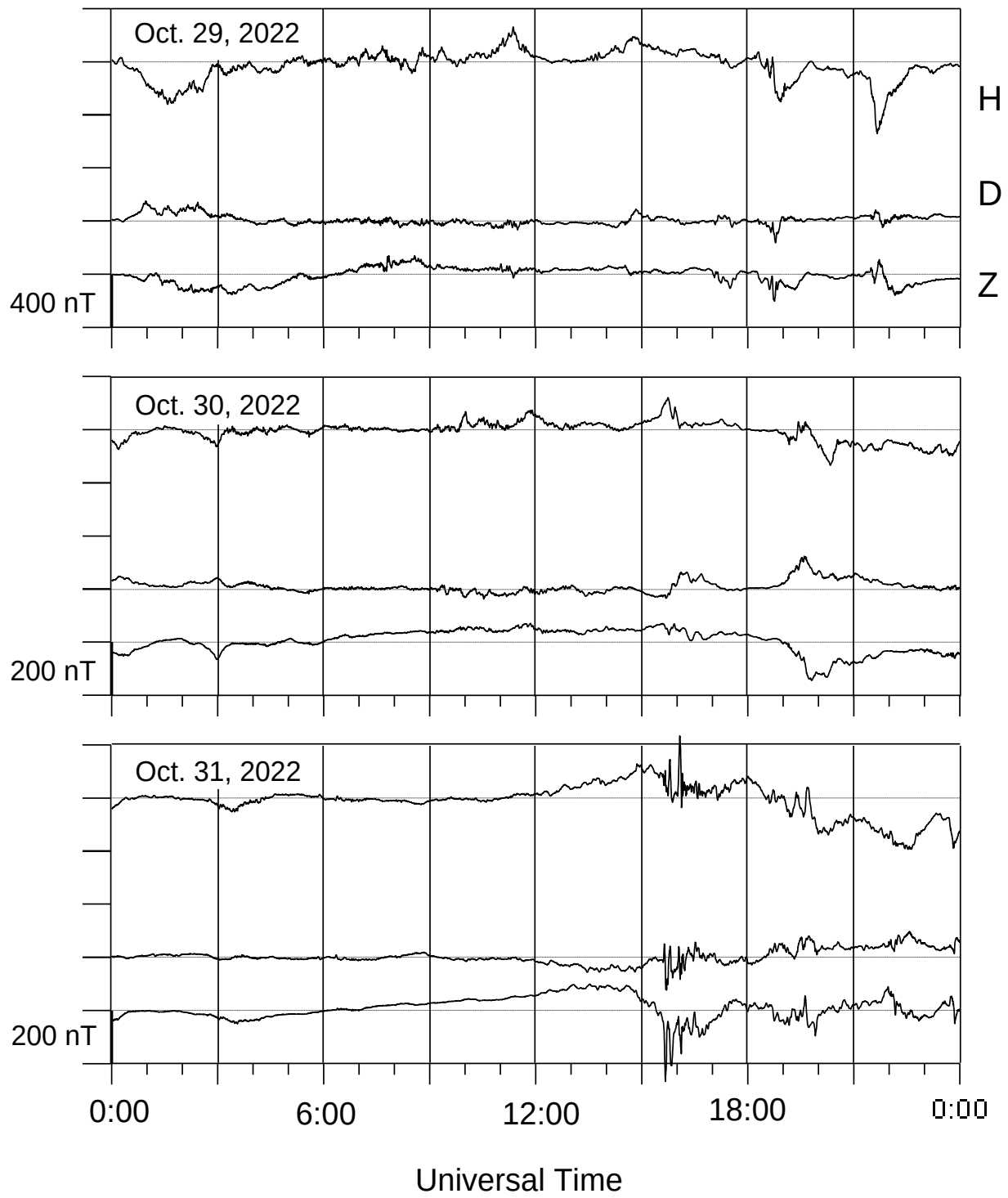
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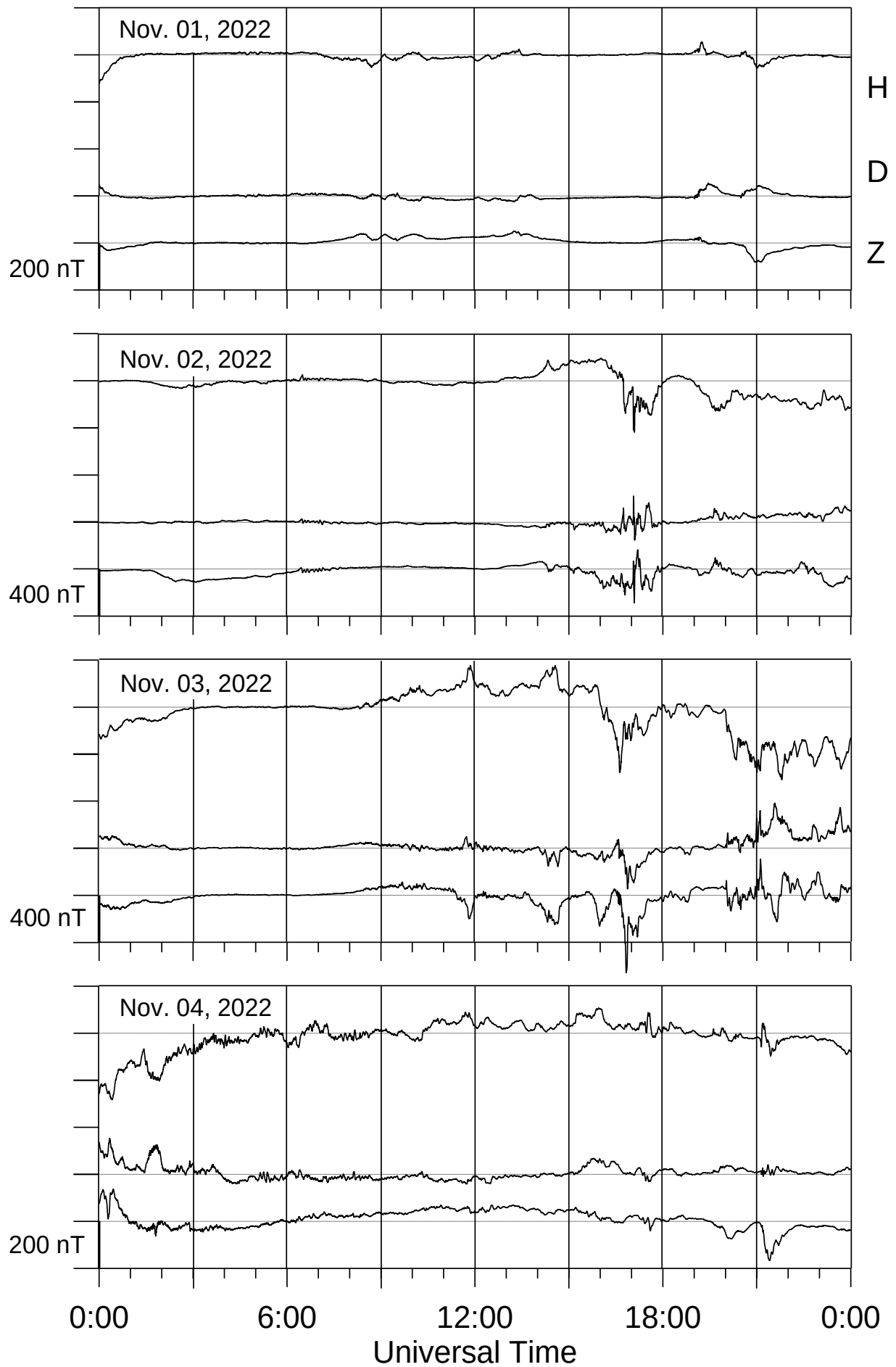
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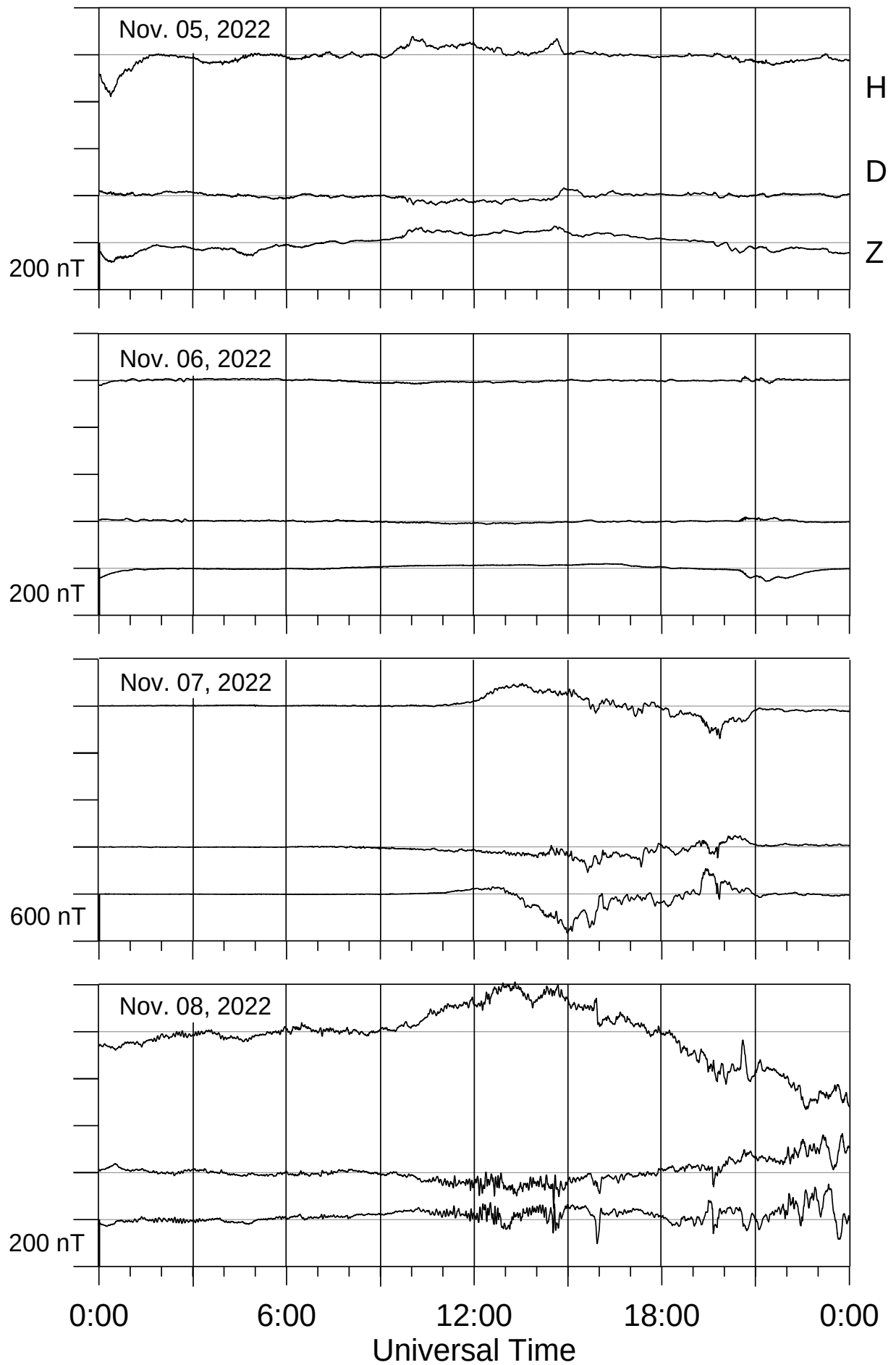
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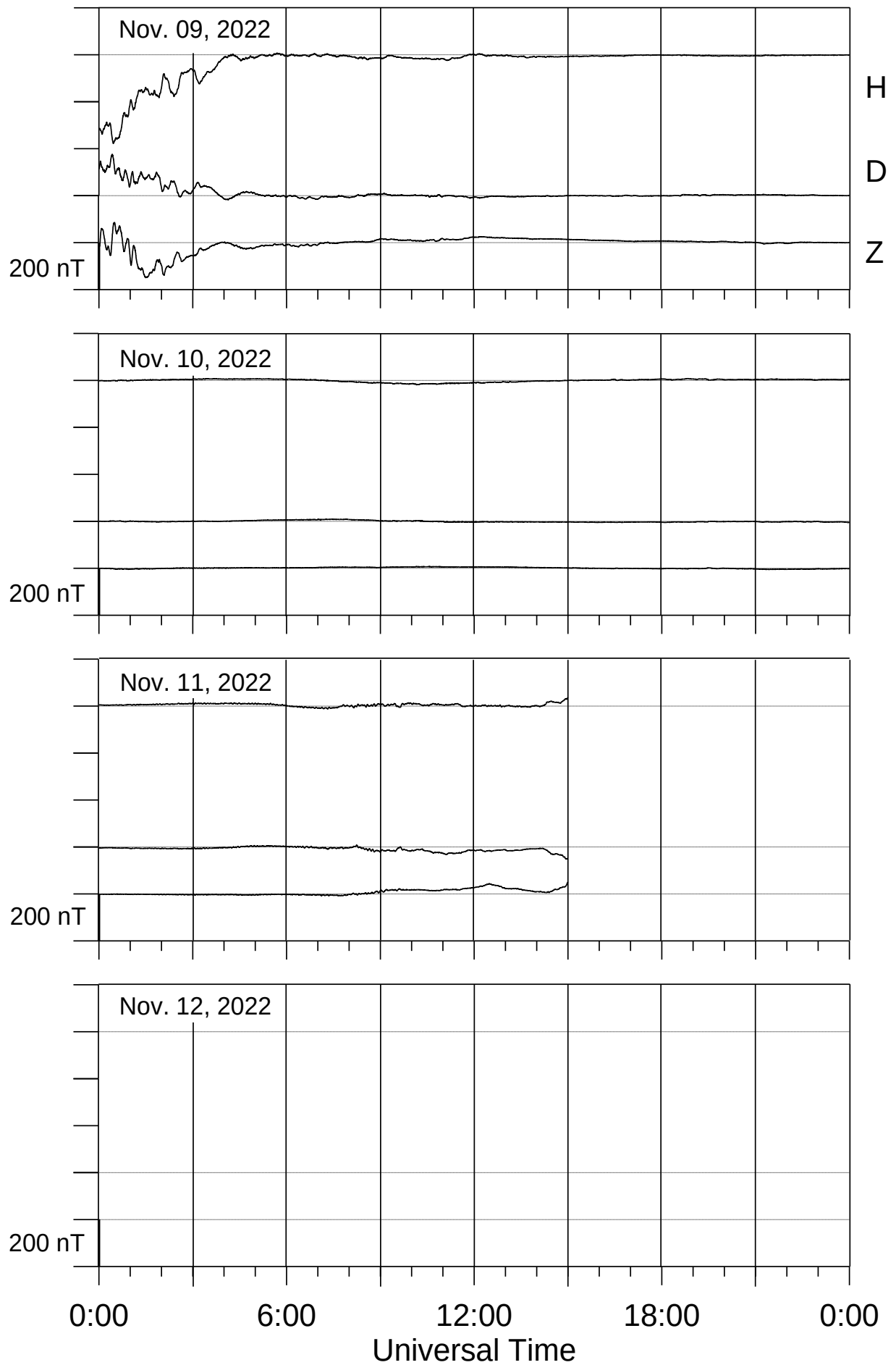
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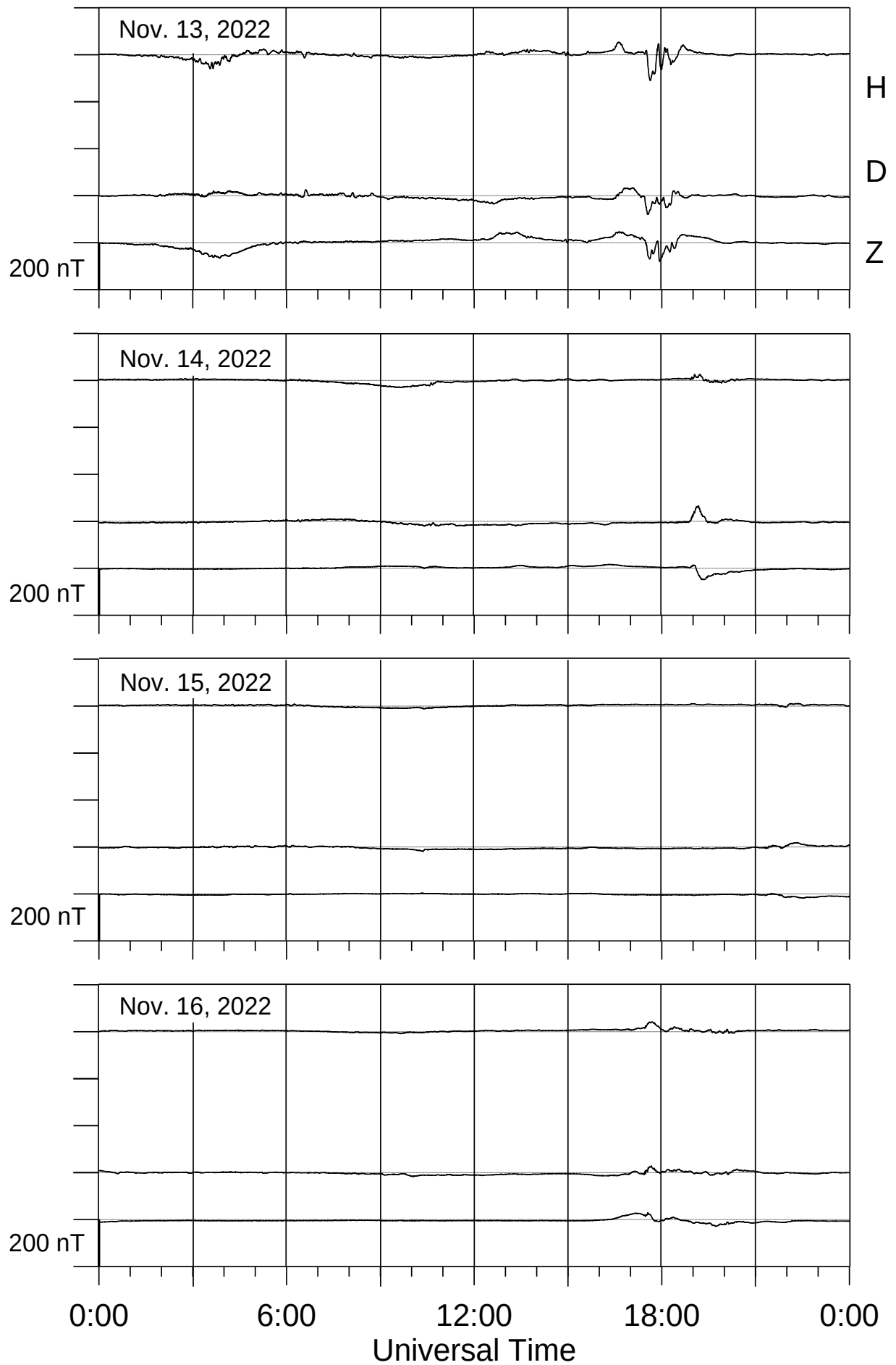
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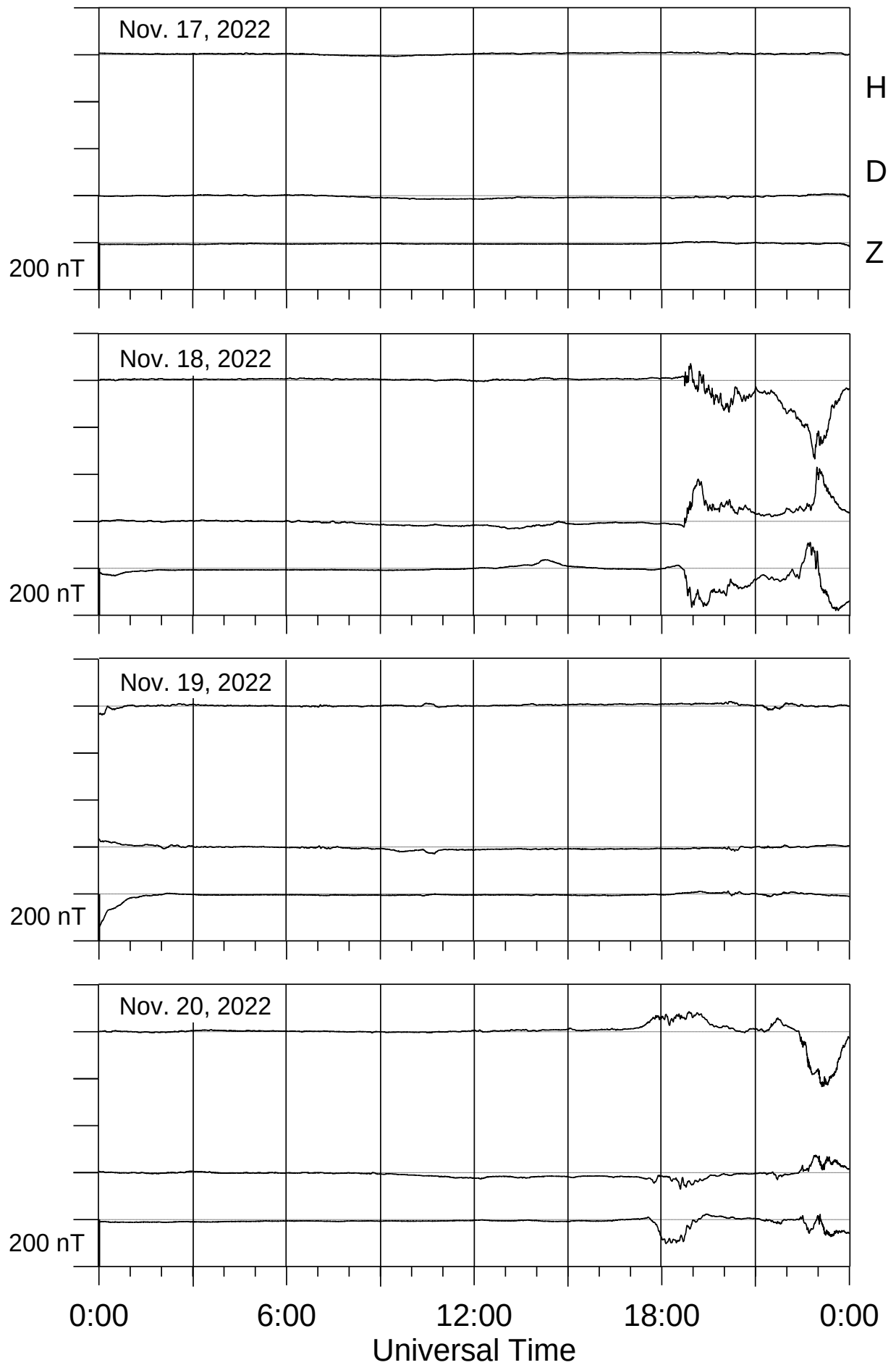
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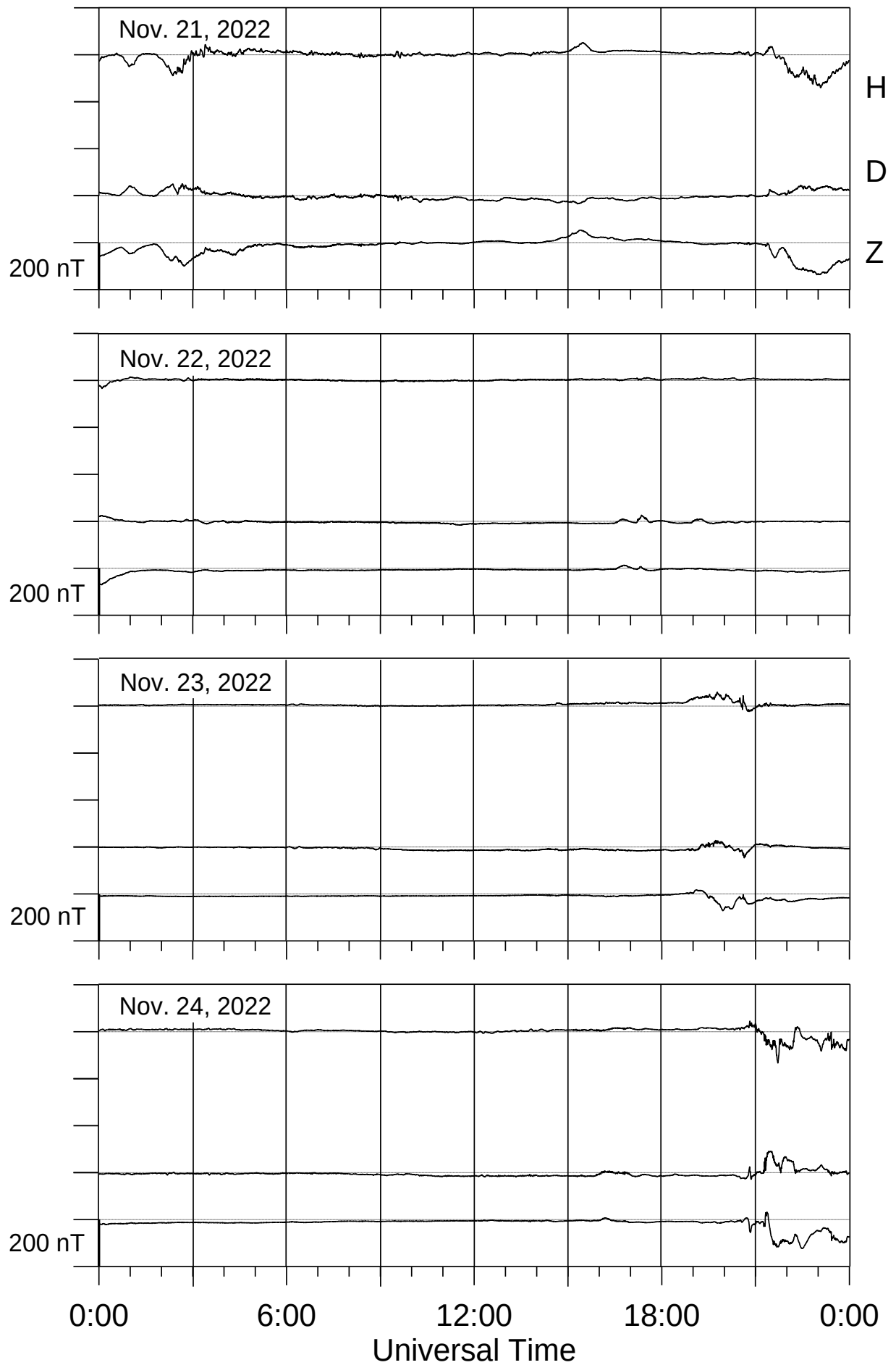
Lovozero magnetometer



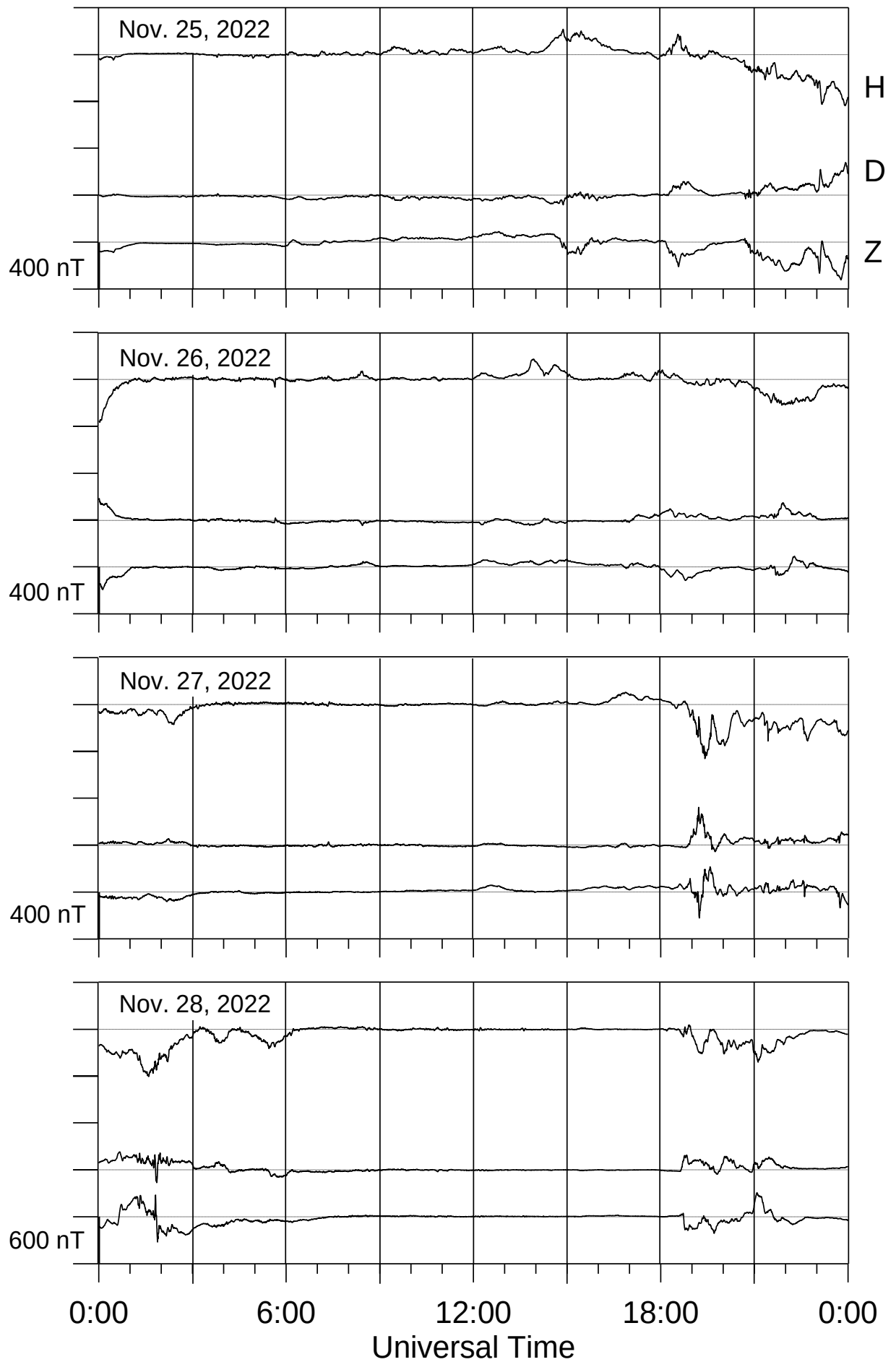
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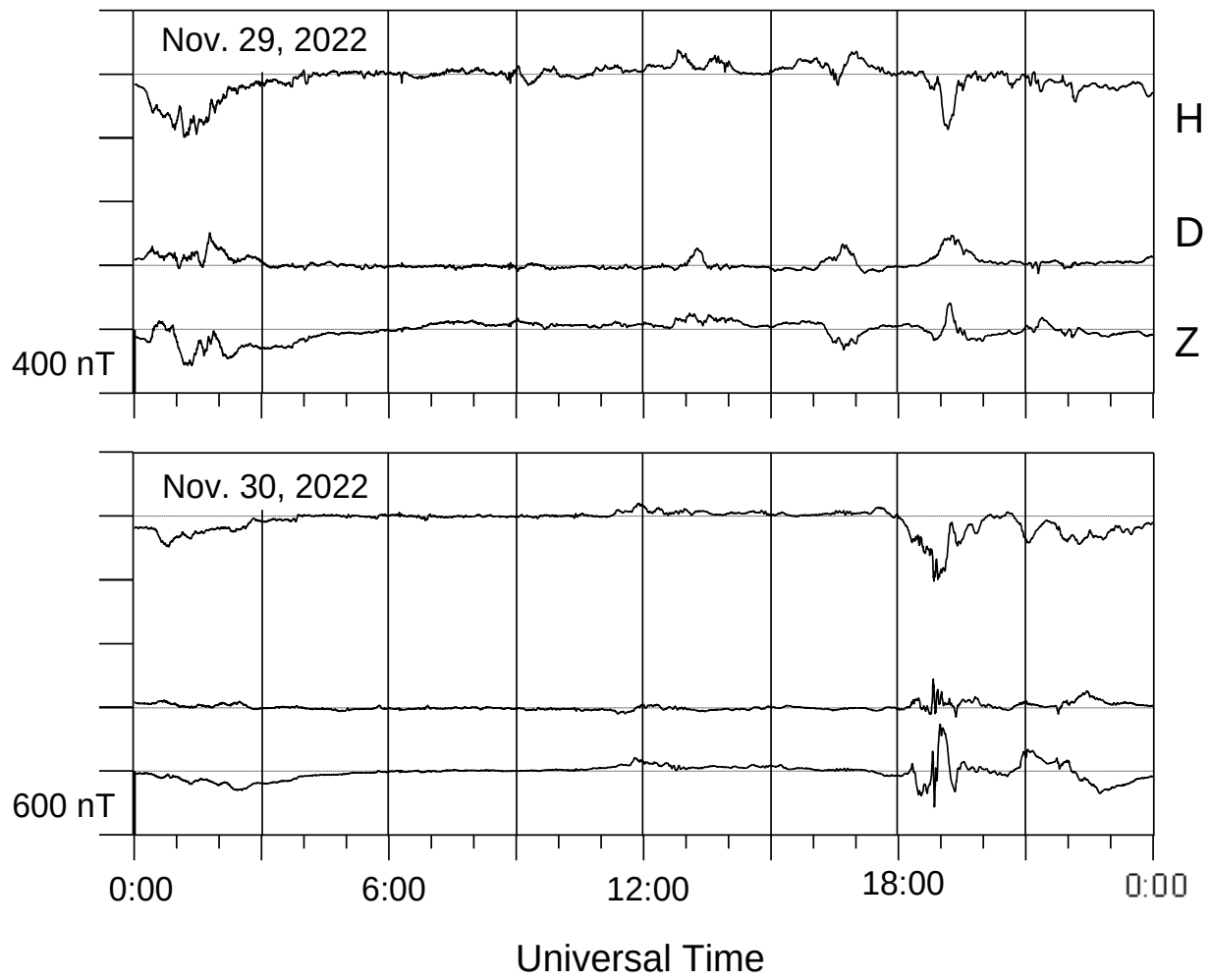
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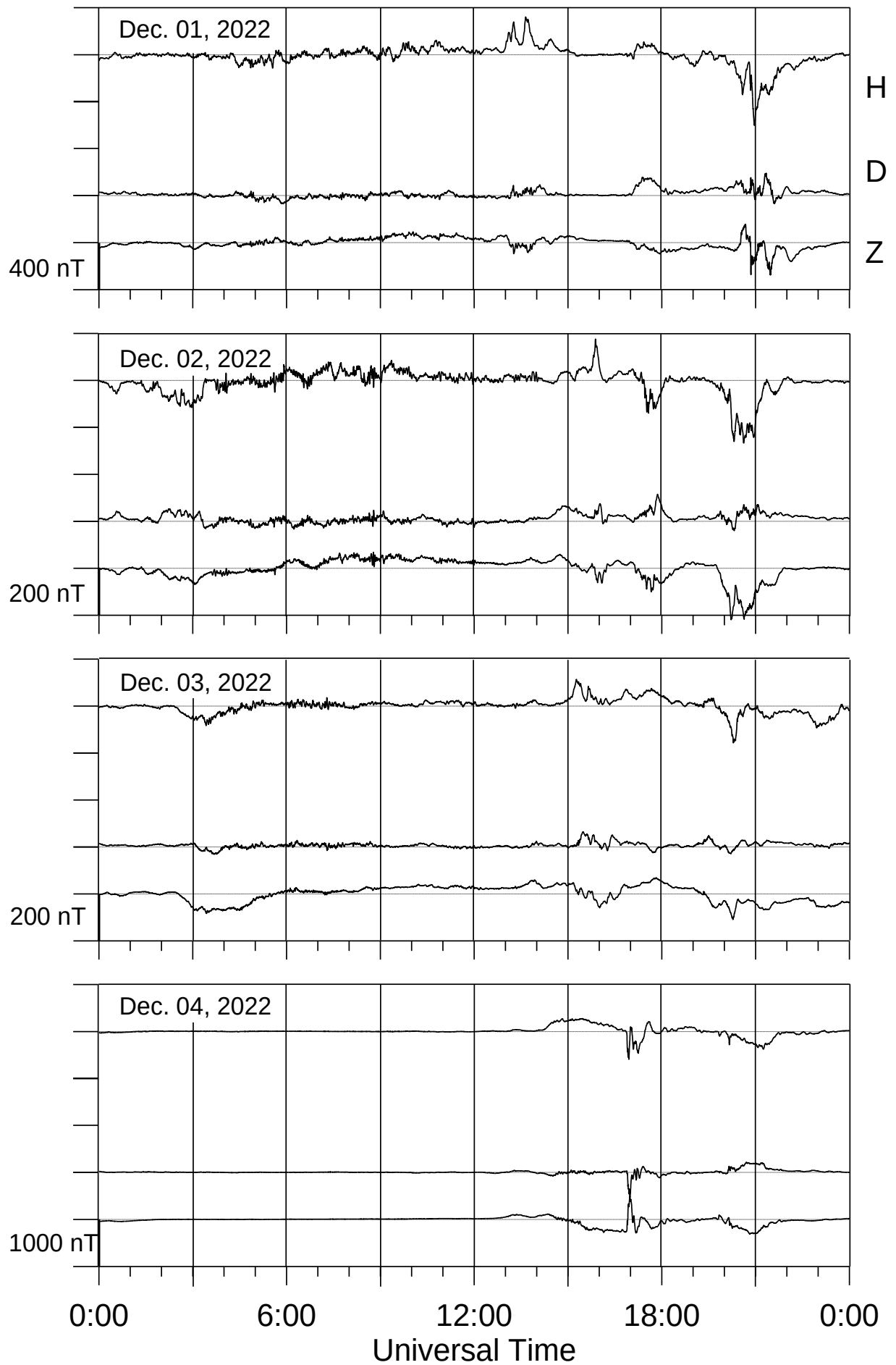
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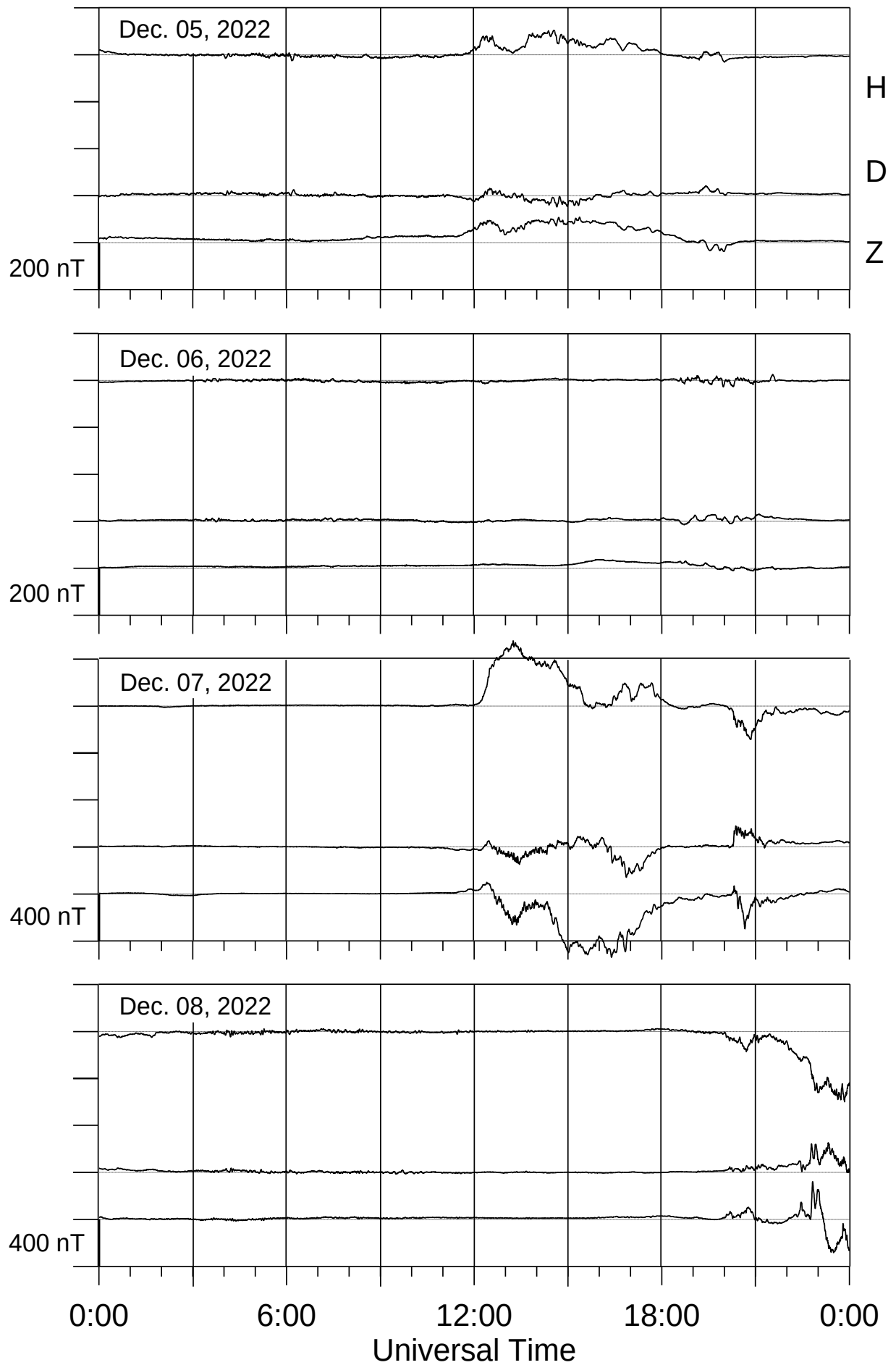
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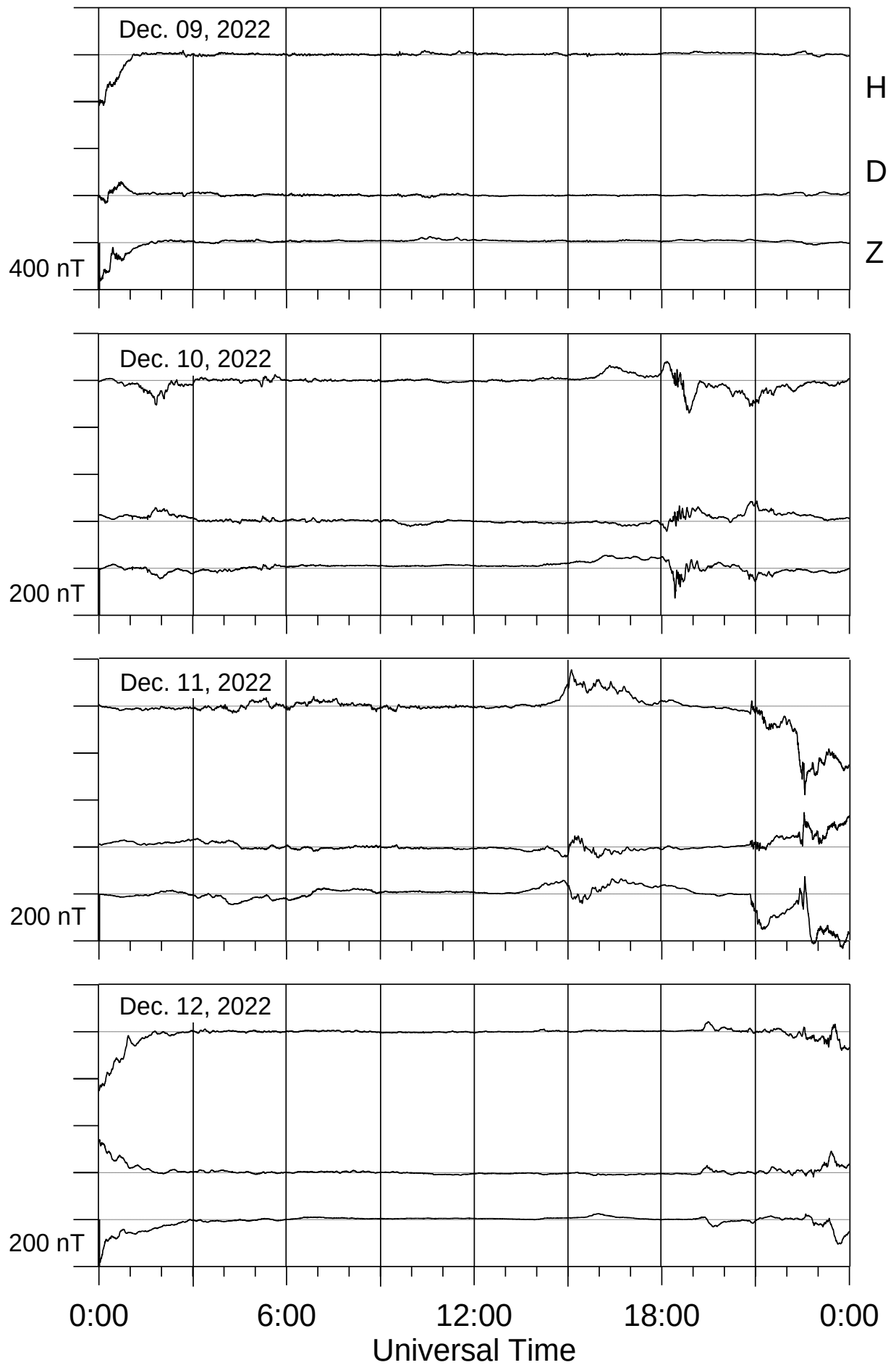
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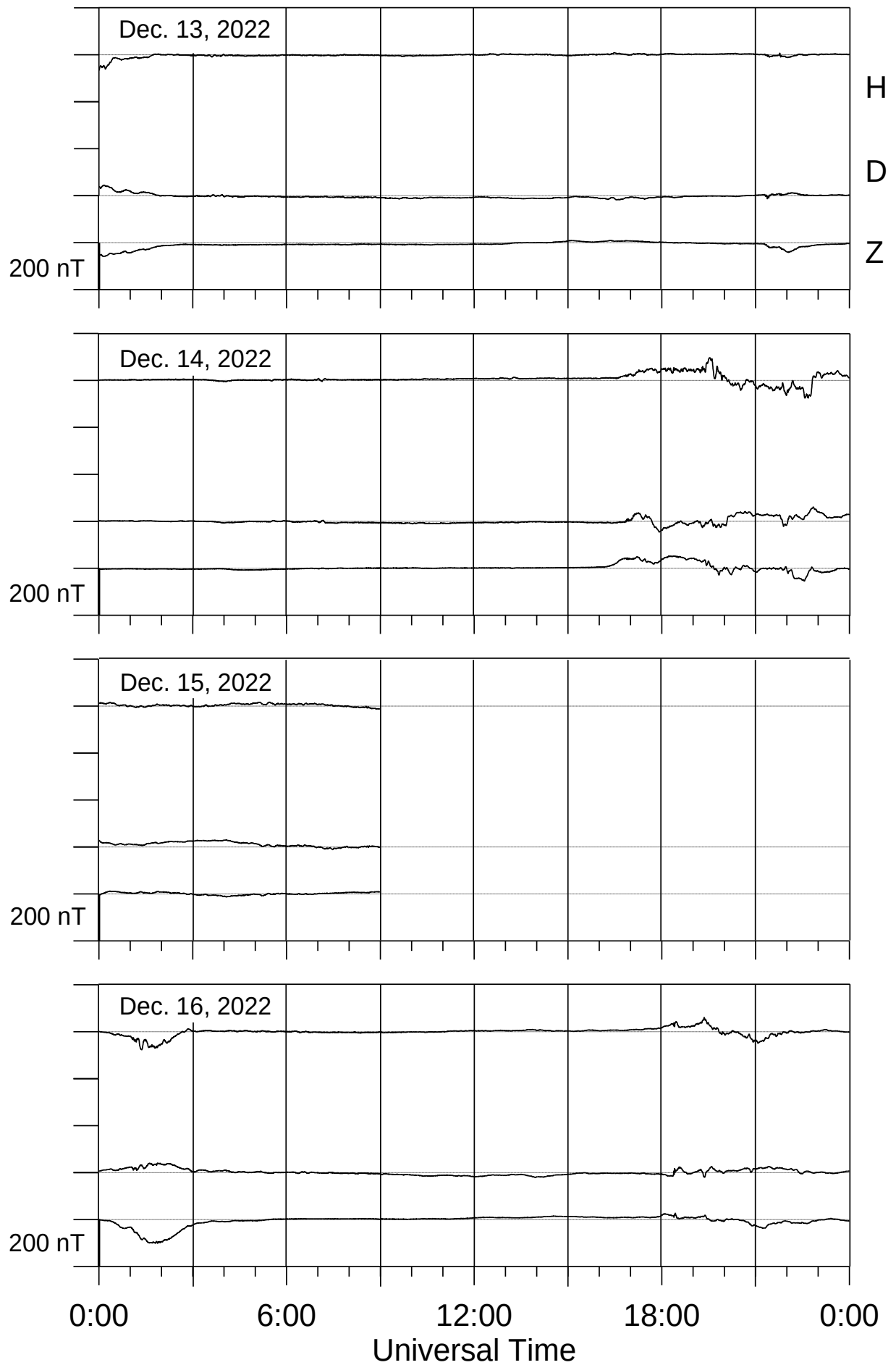
Lovozero magnetometer



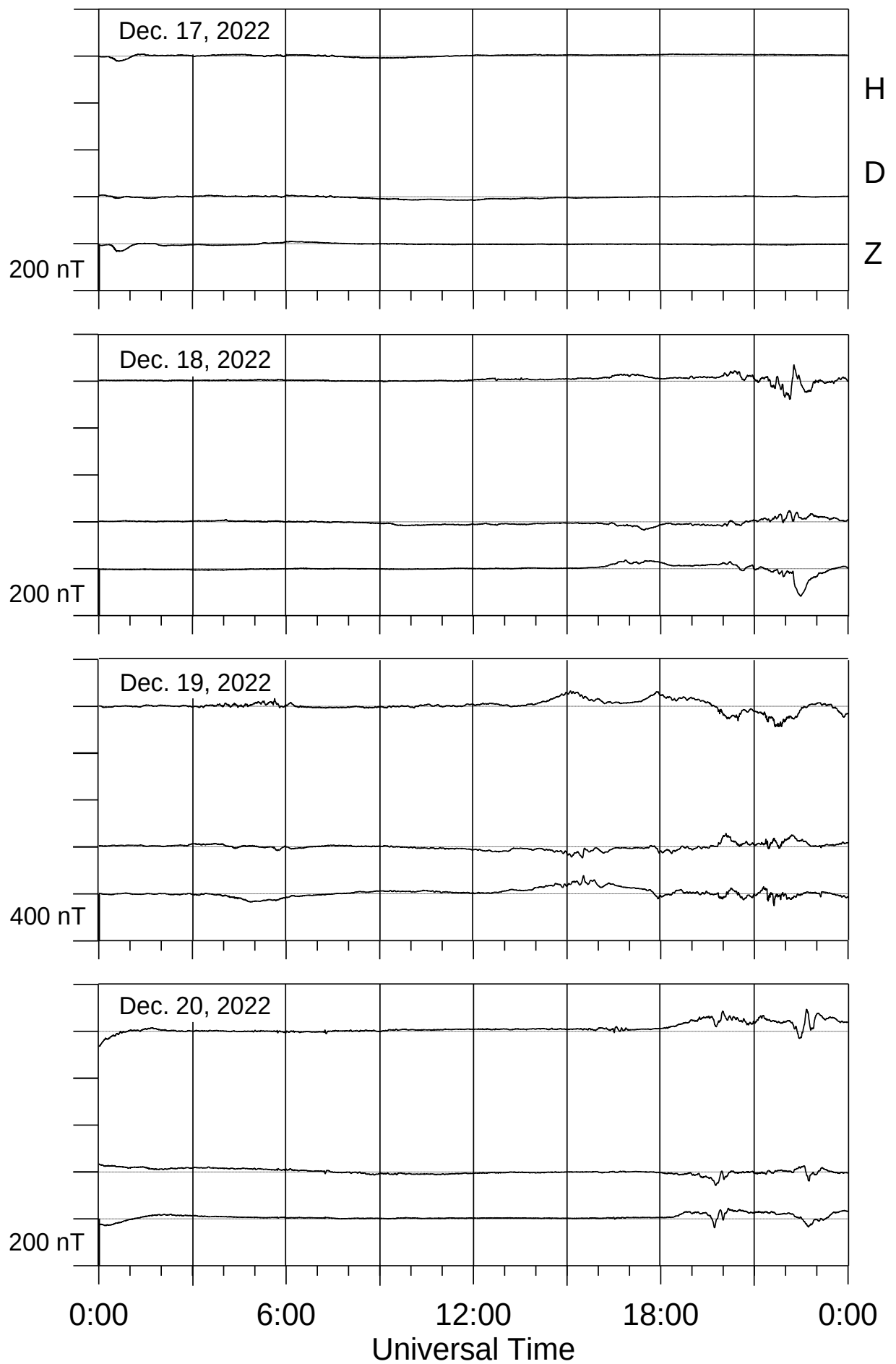
Lovozero magnetometer



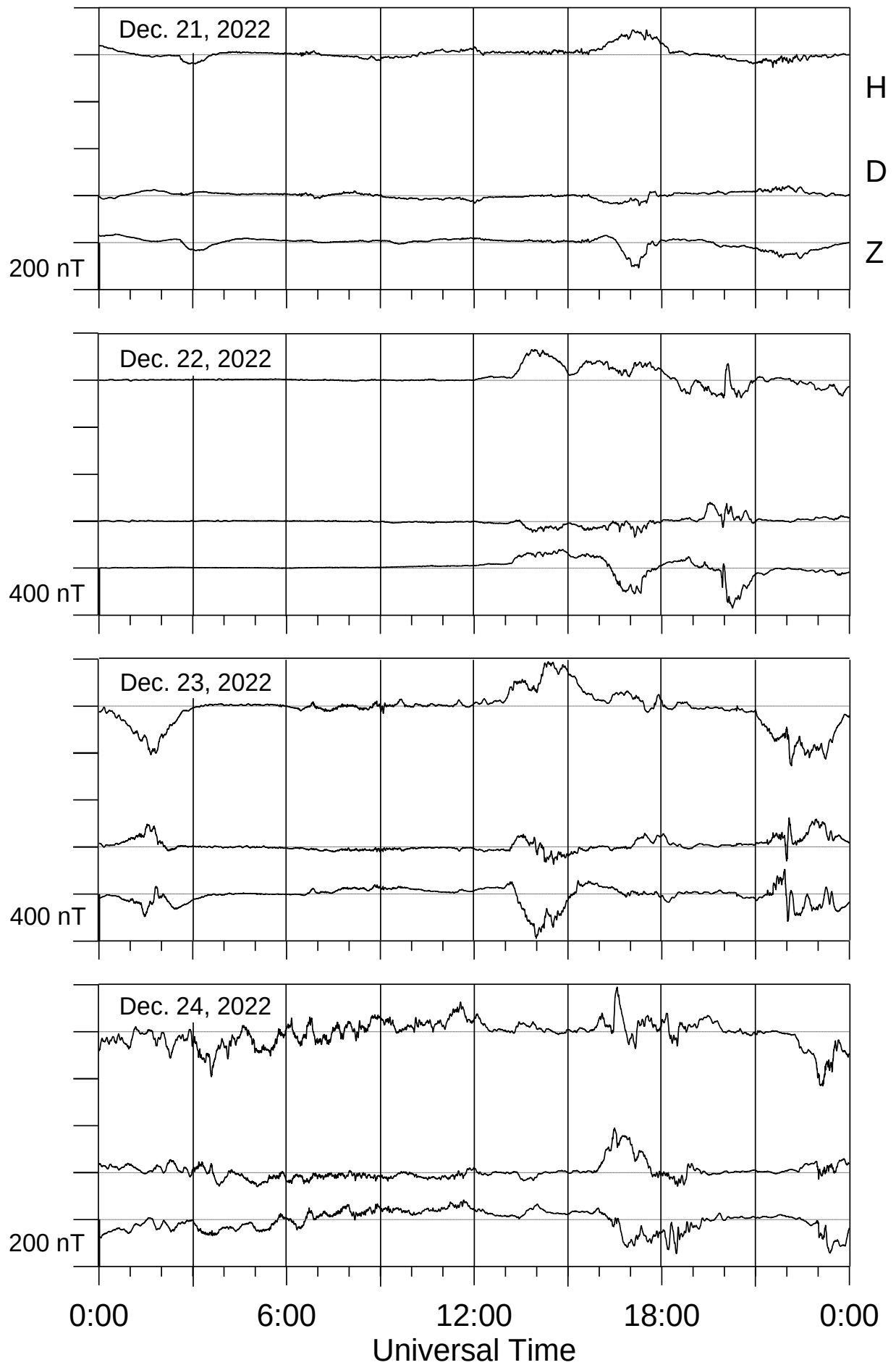
Lovozero magnetometer



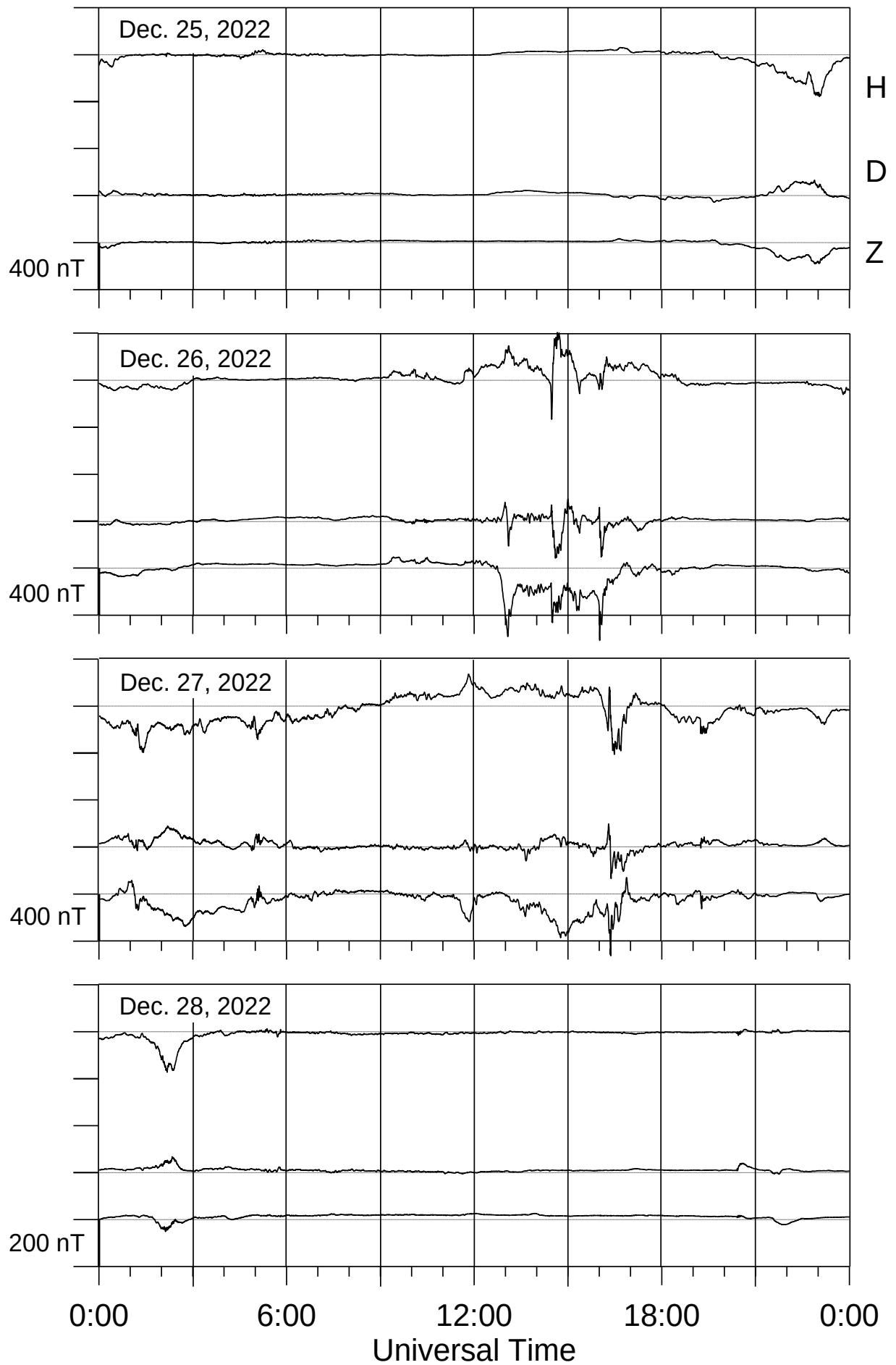
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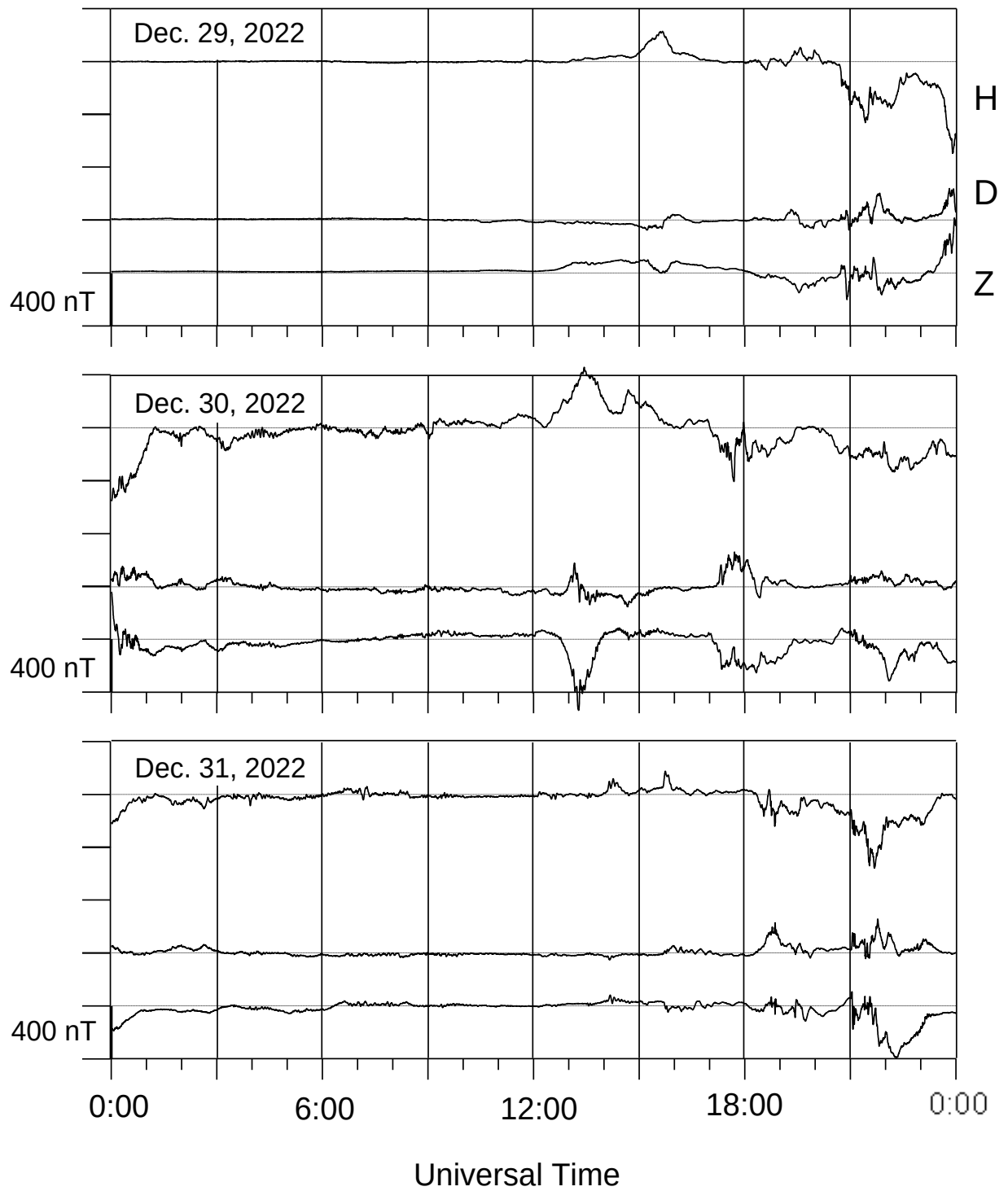
Lovozero magnetometer



Lovozero magnetometer



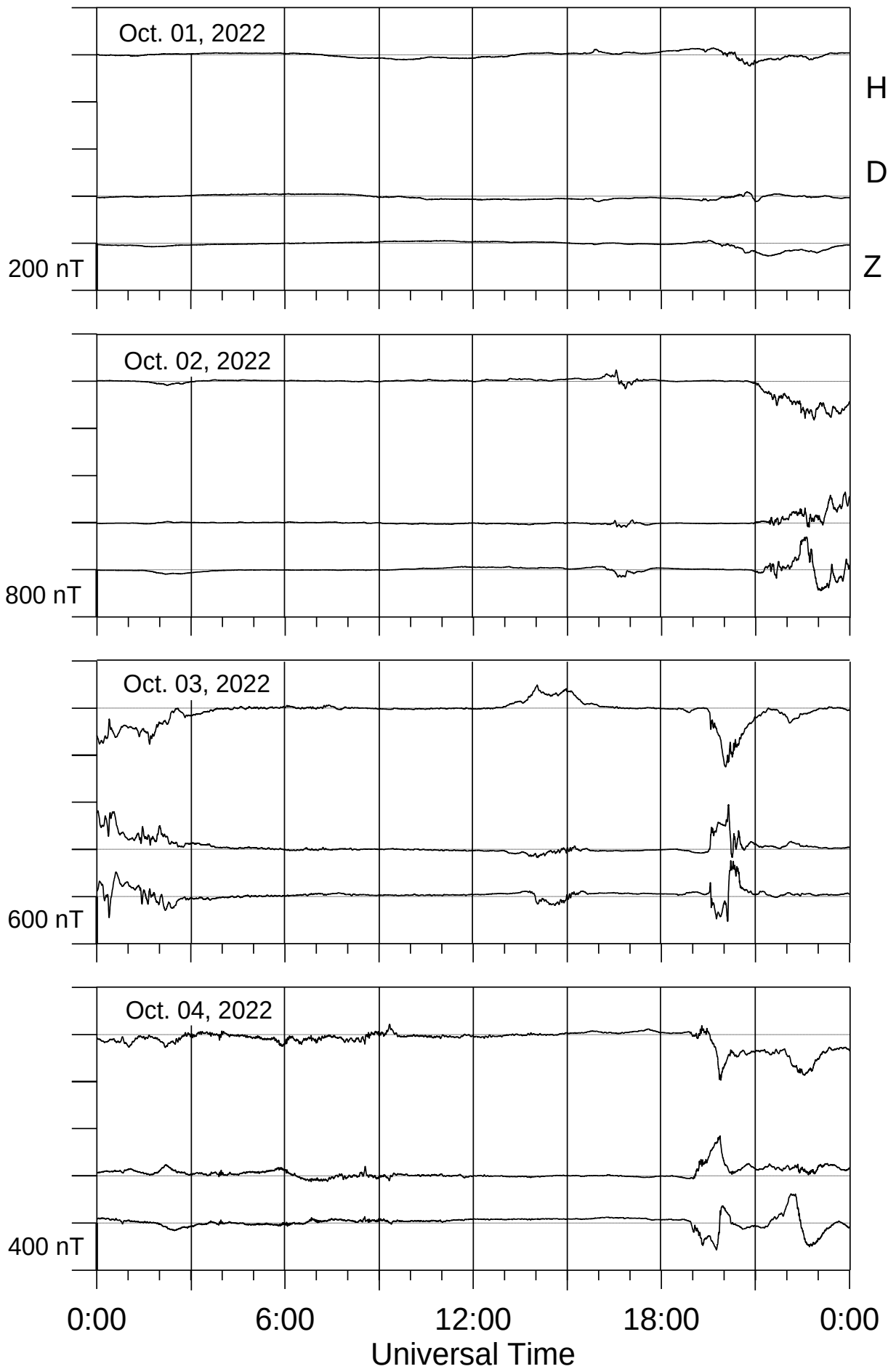
Lovozero magnetometer



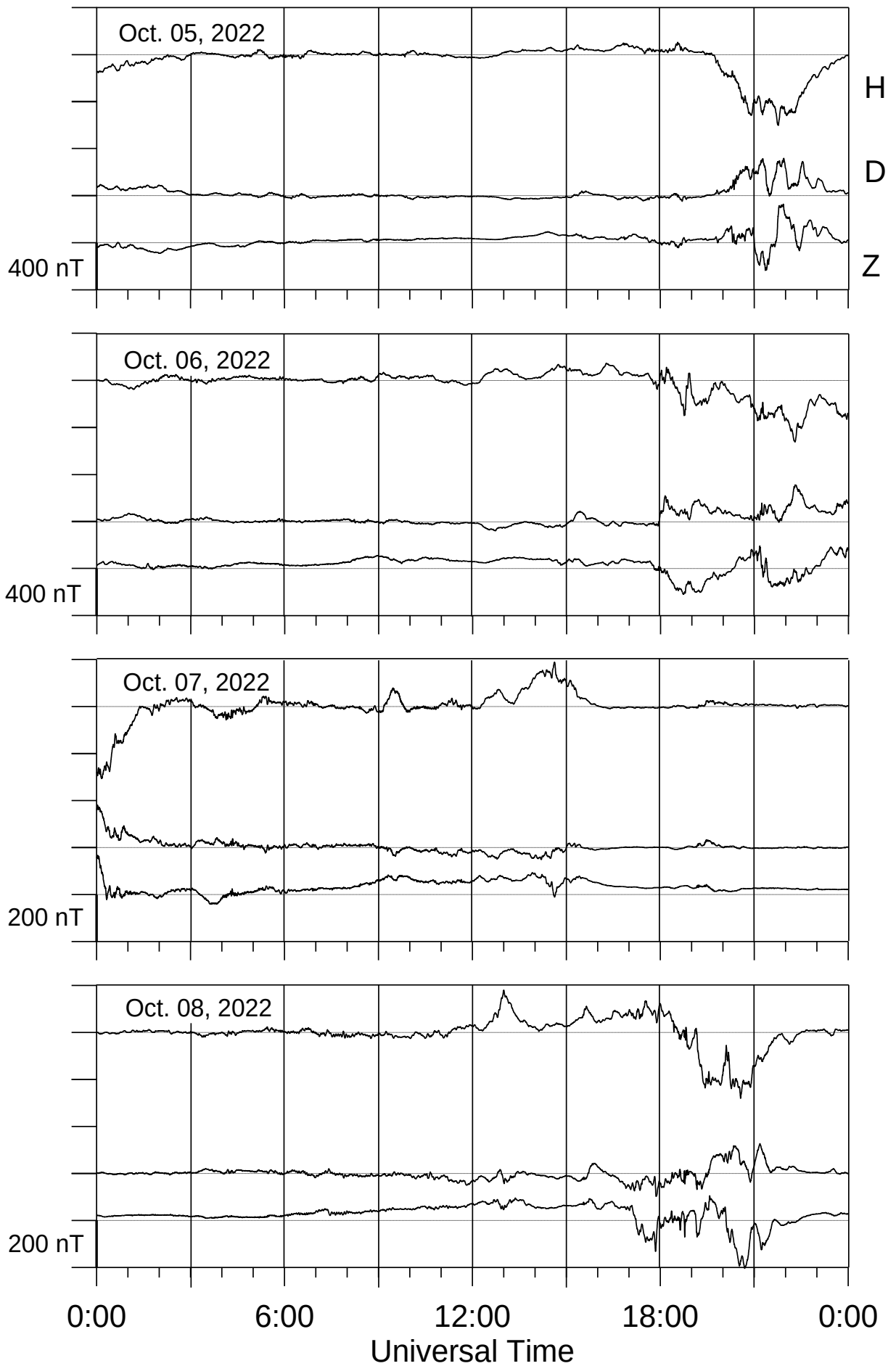
LOPARSKAYA MAGNETOGRAMS

October - December 2022

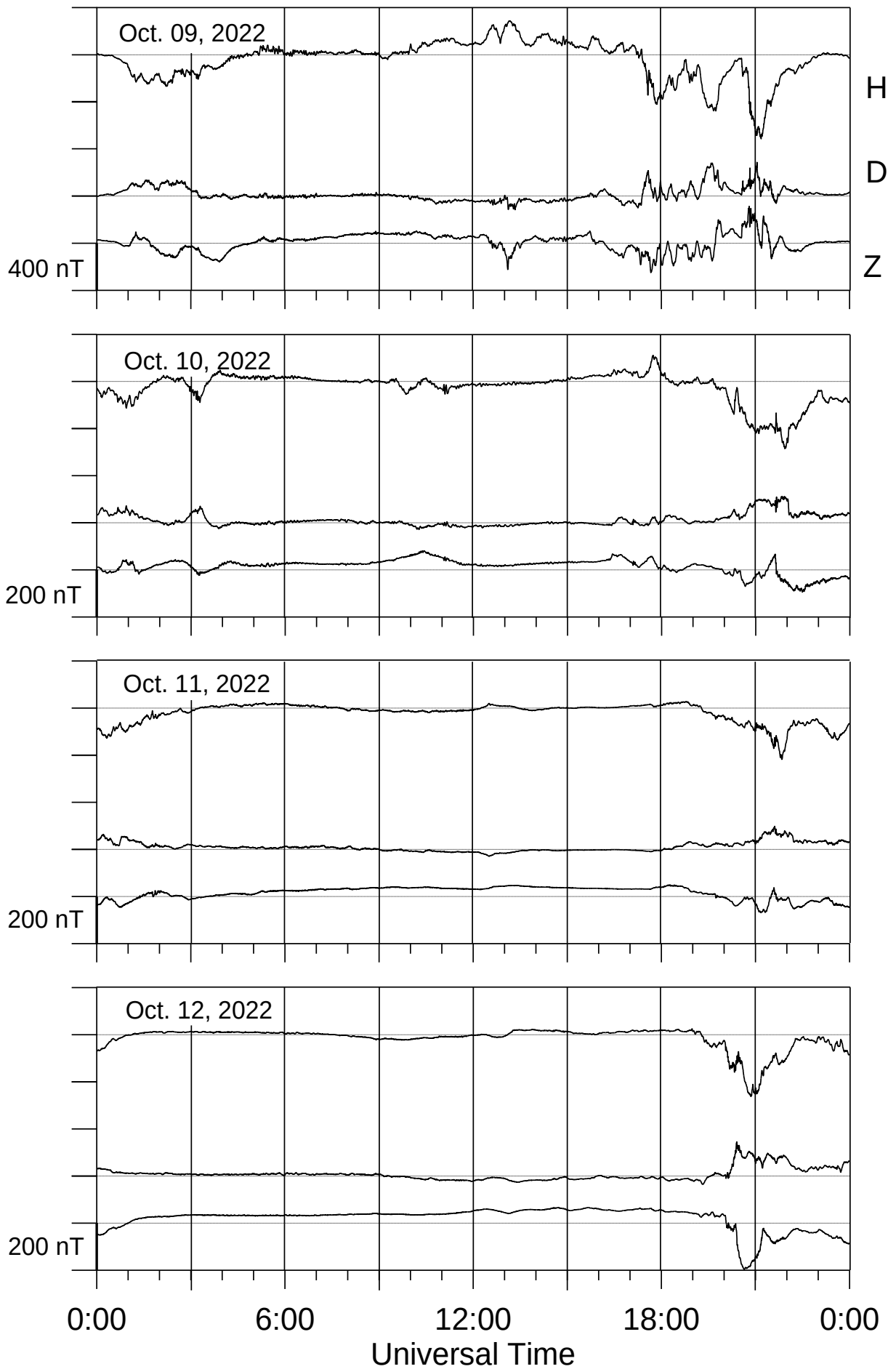
Loparskaya magnetometer



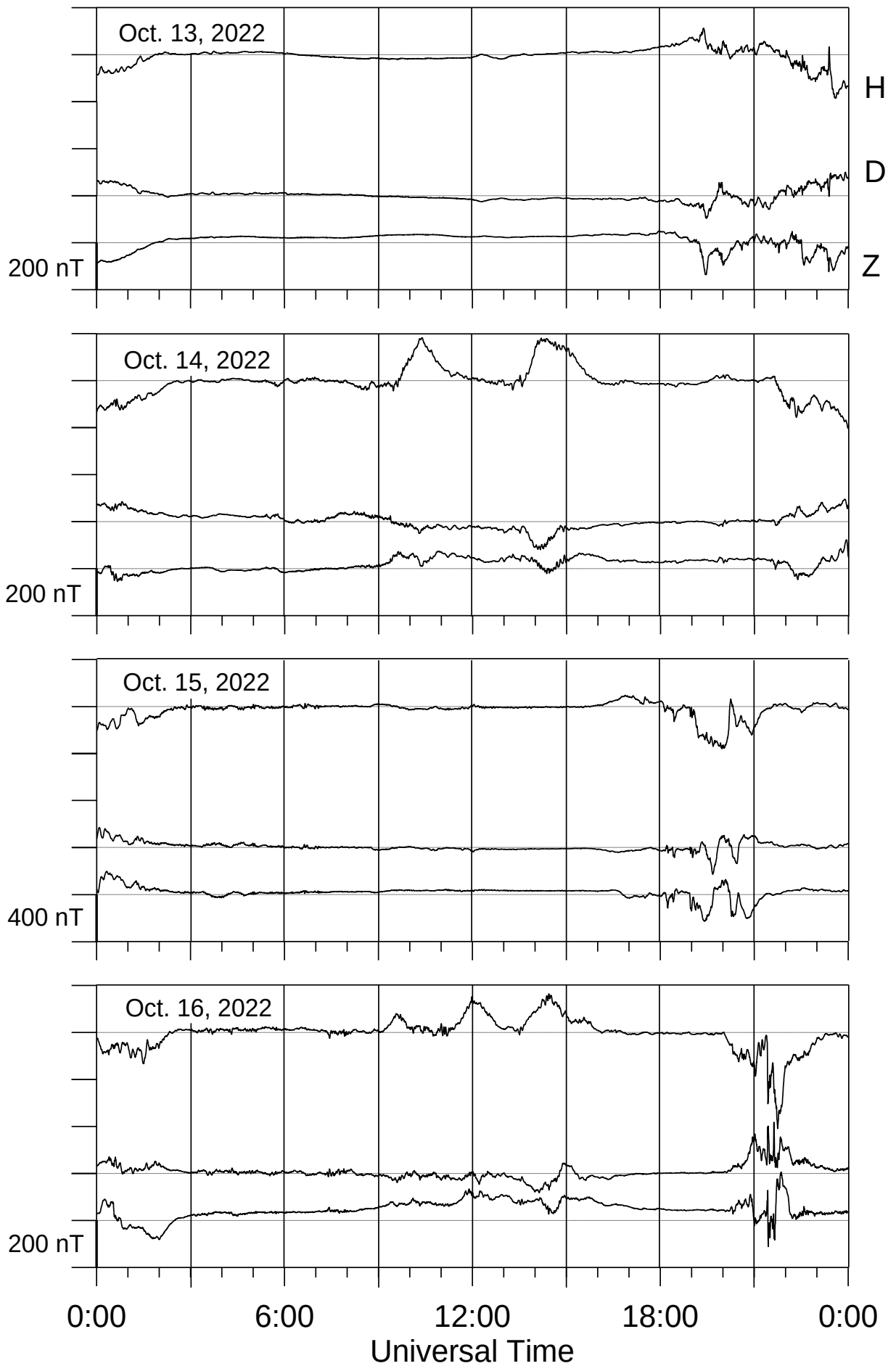
Loparskaya magnetometer



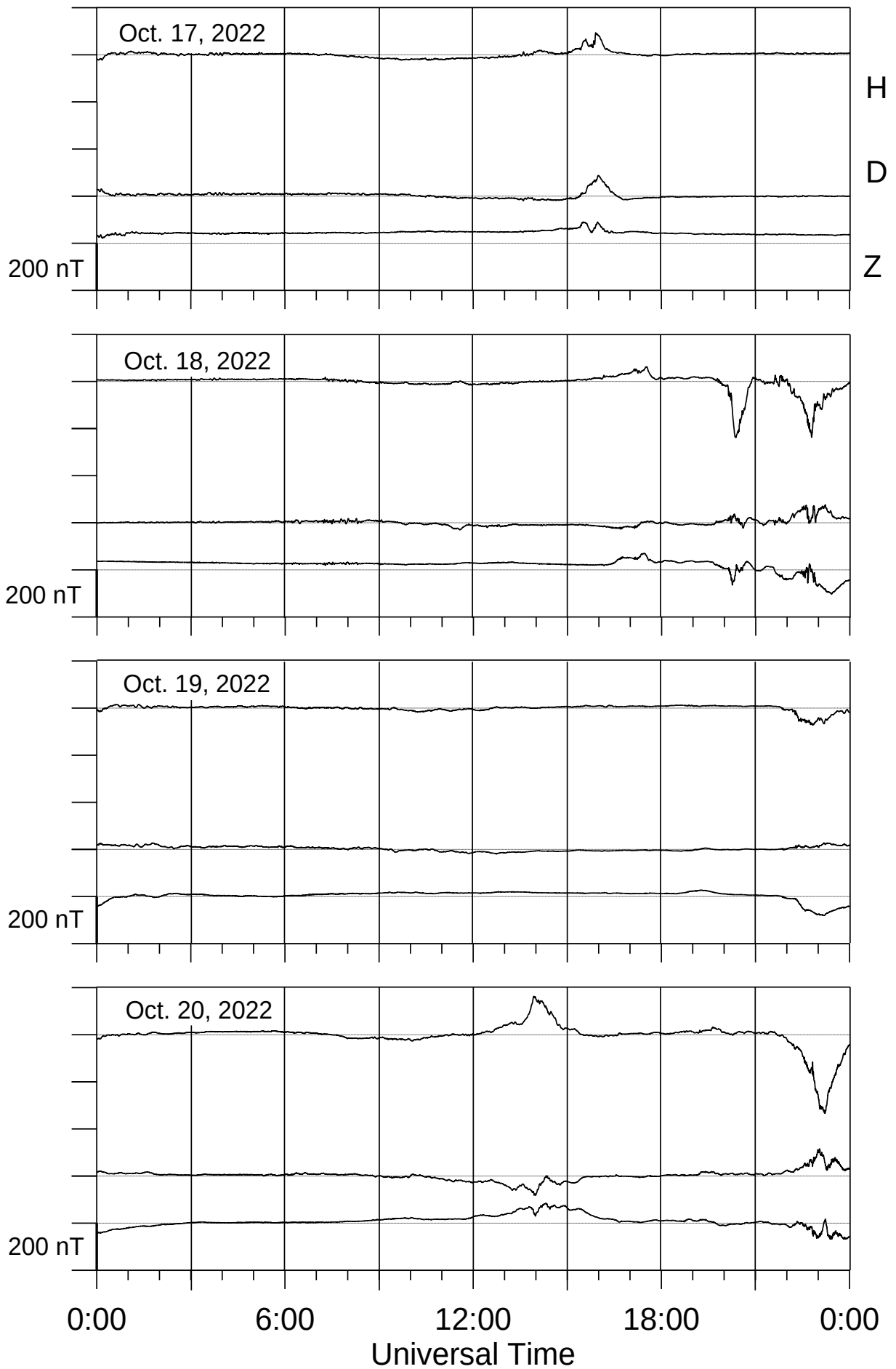
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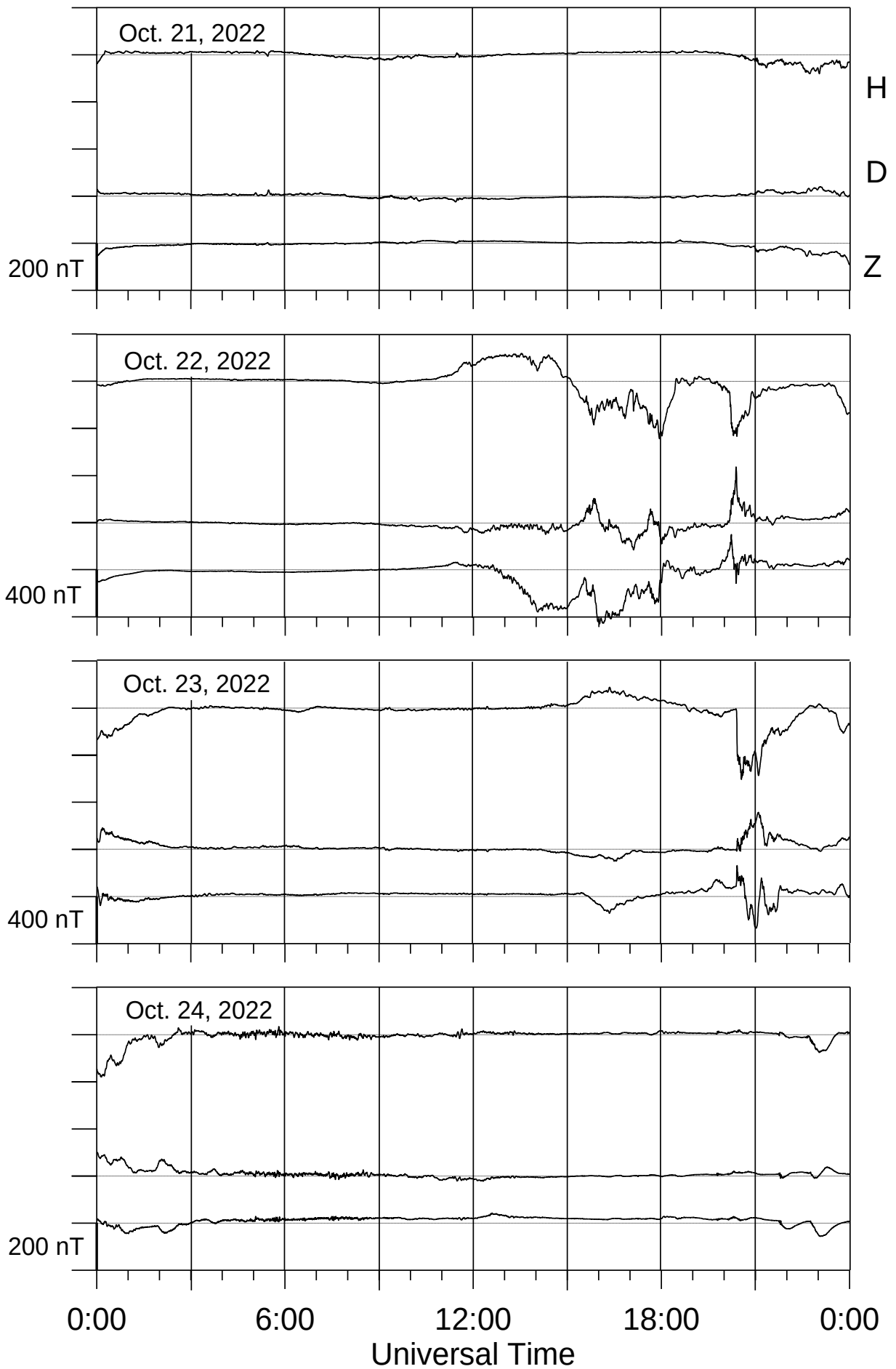
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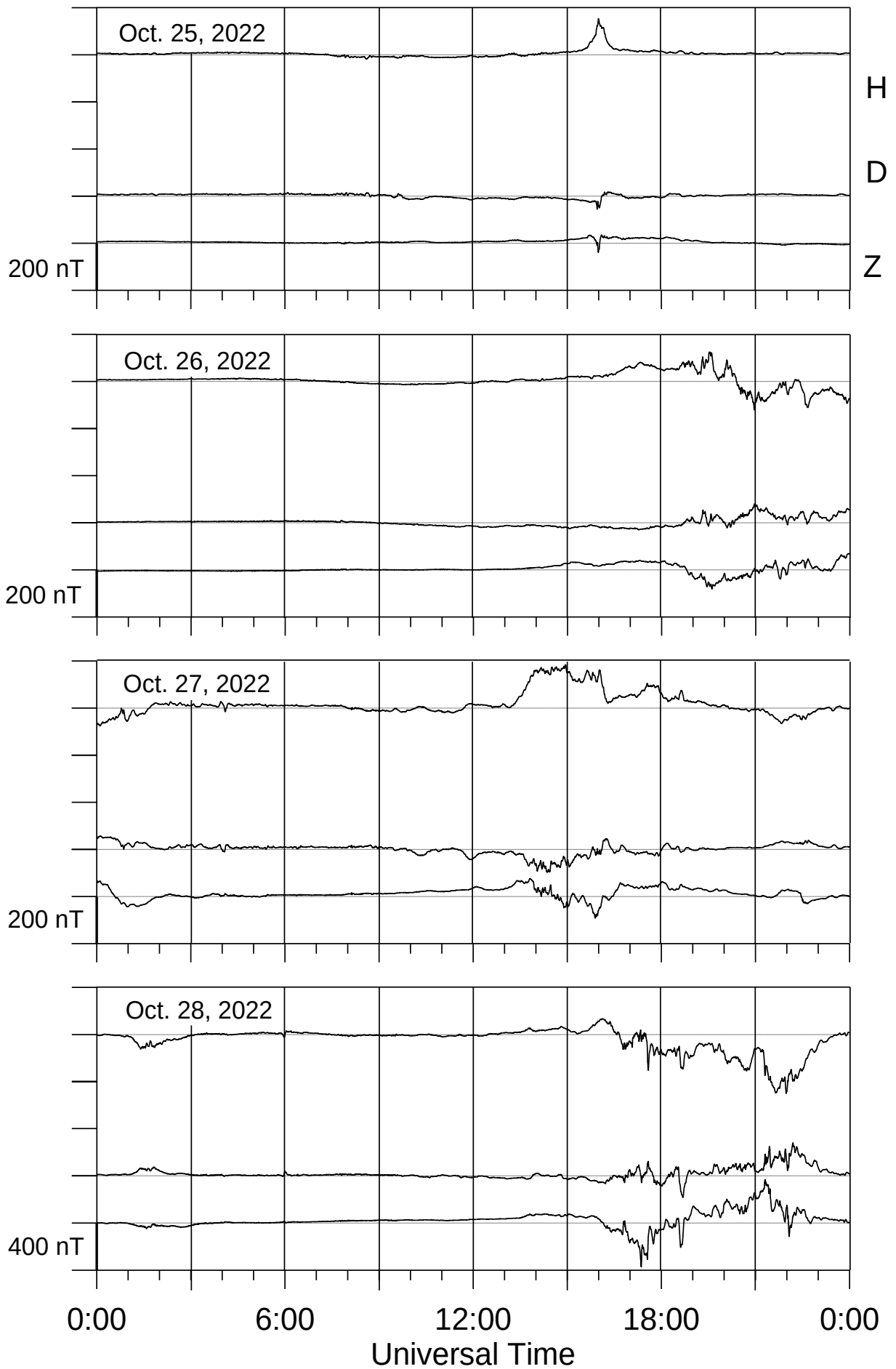
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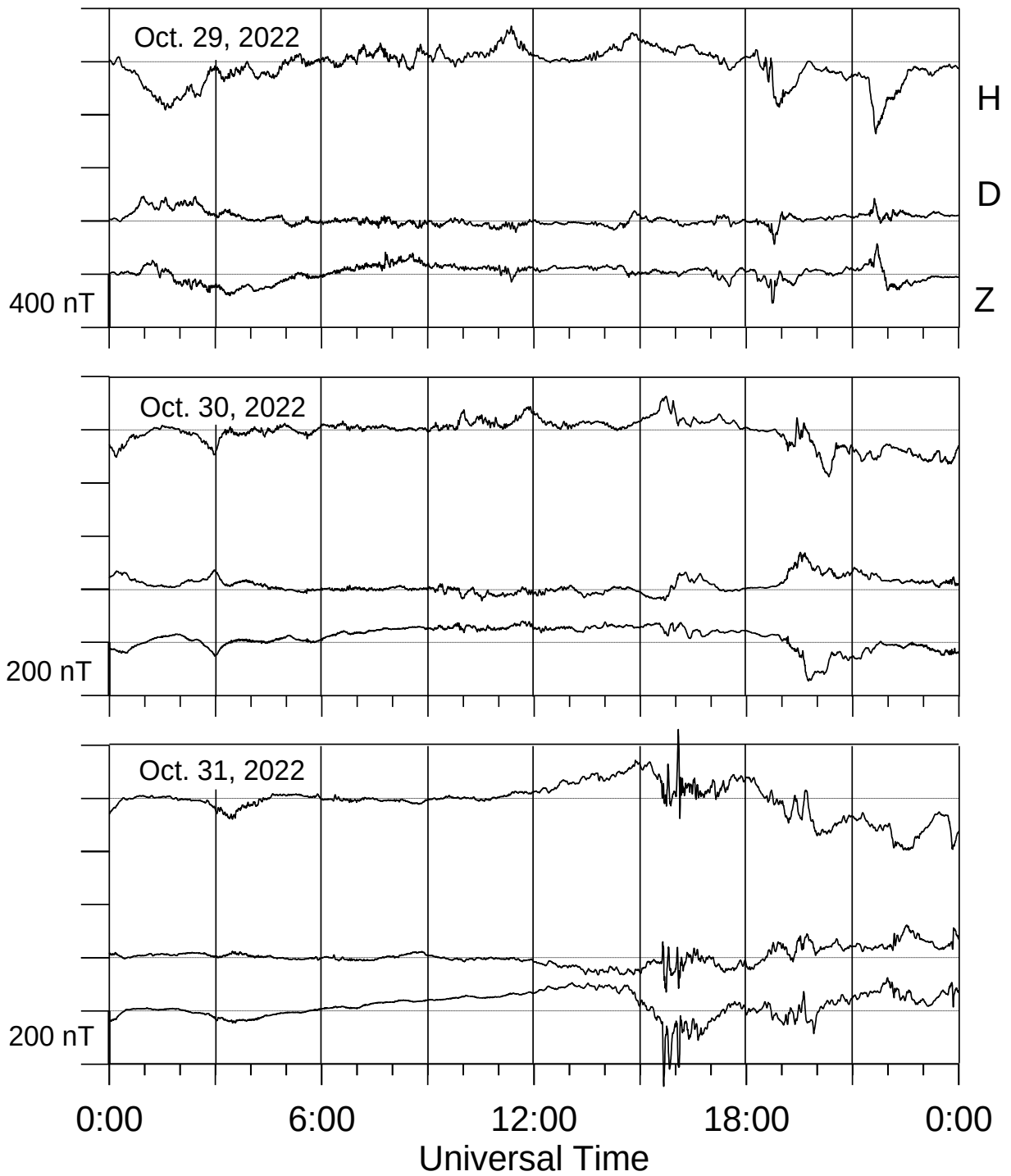
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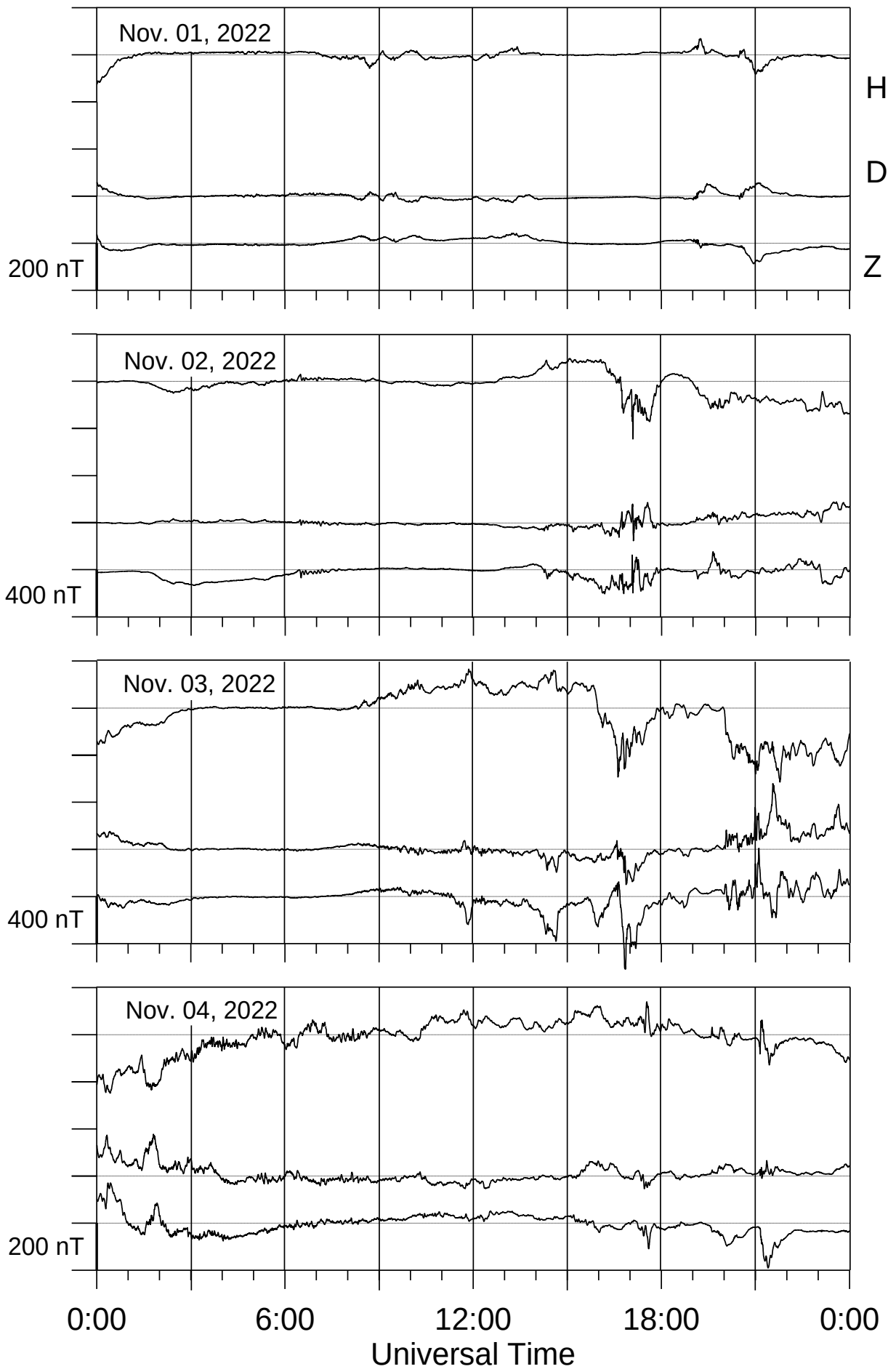
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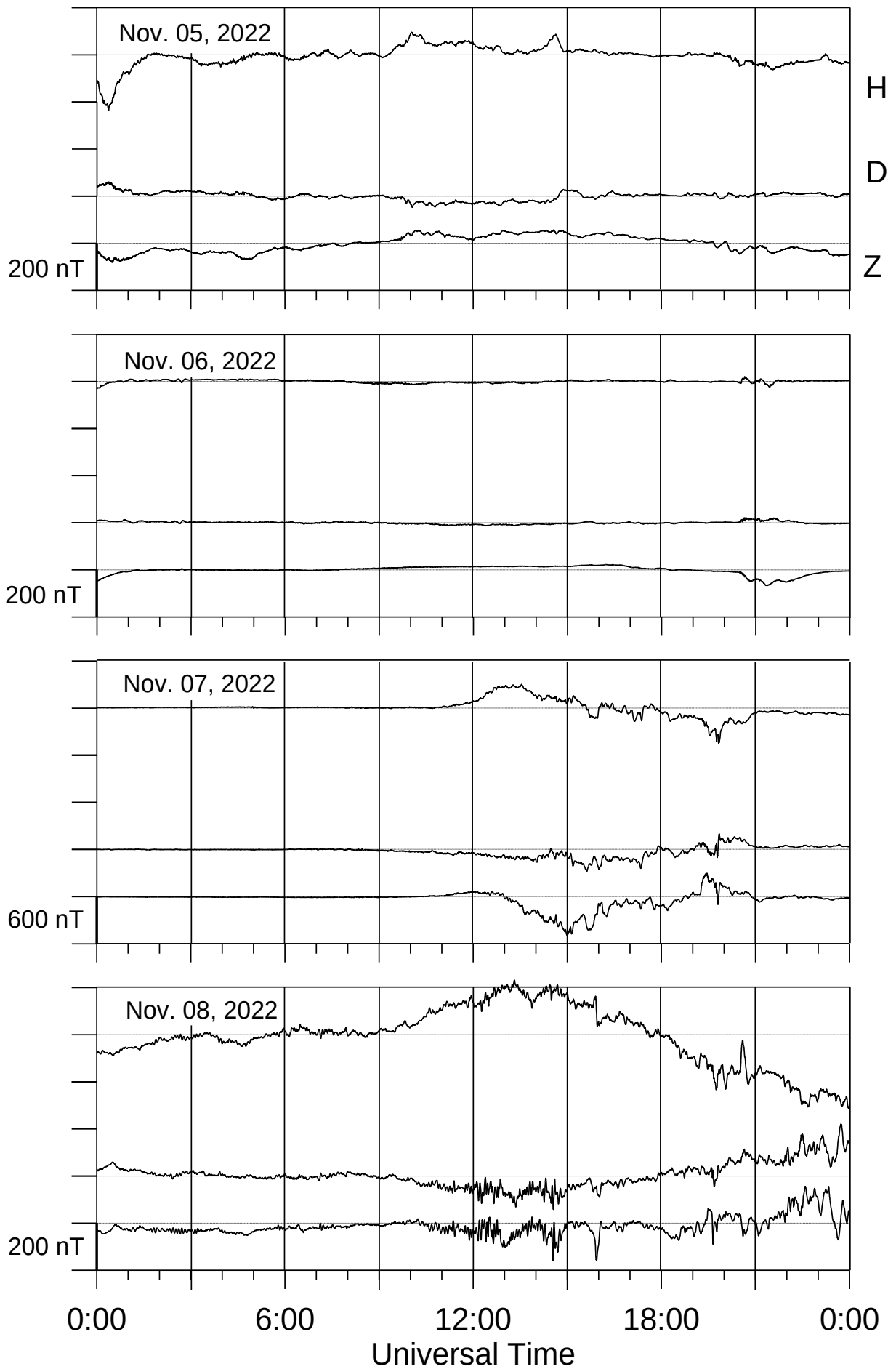
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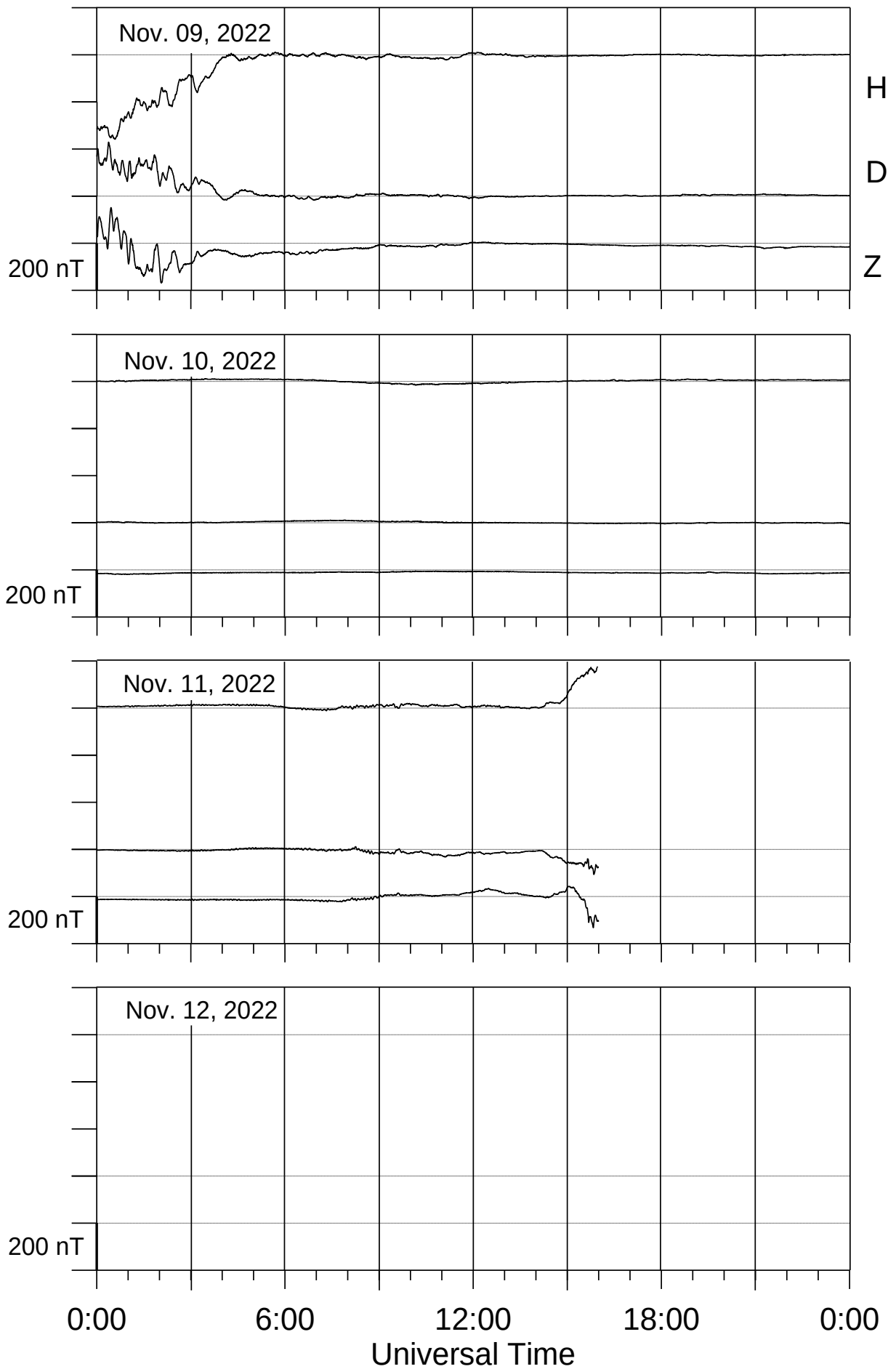
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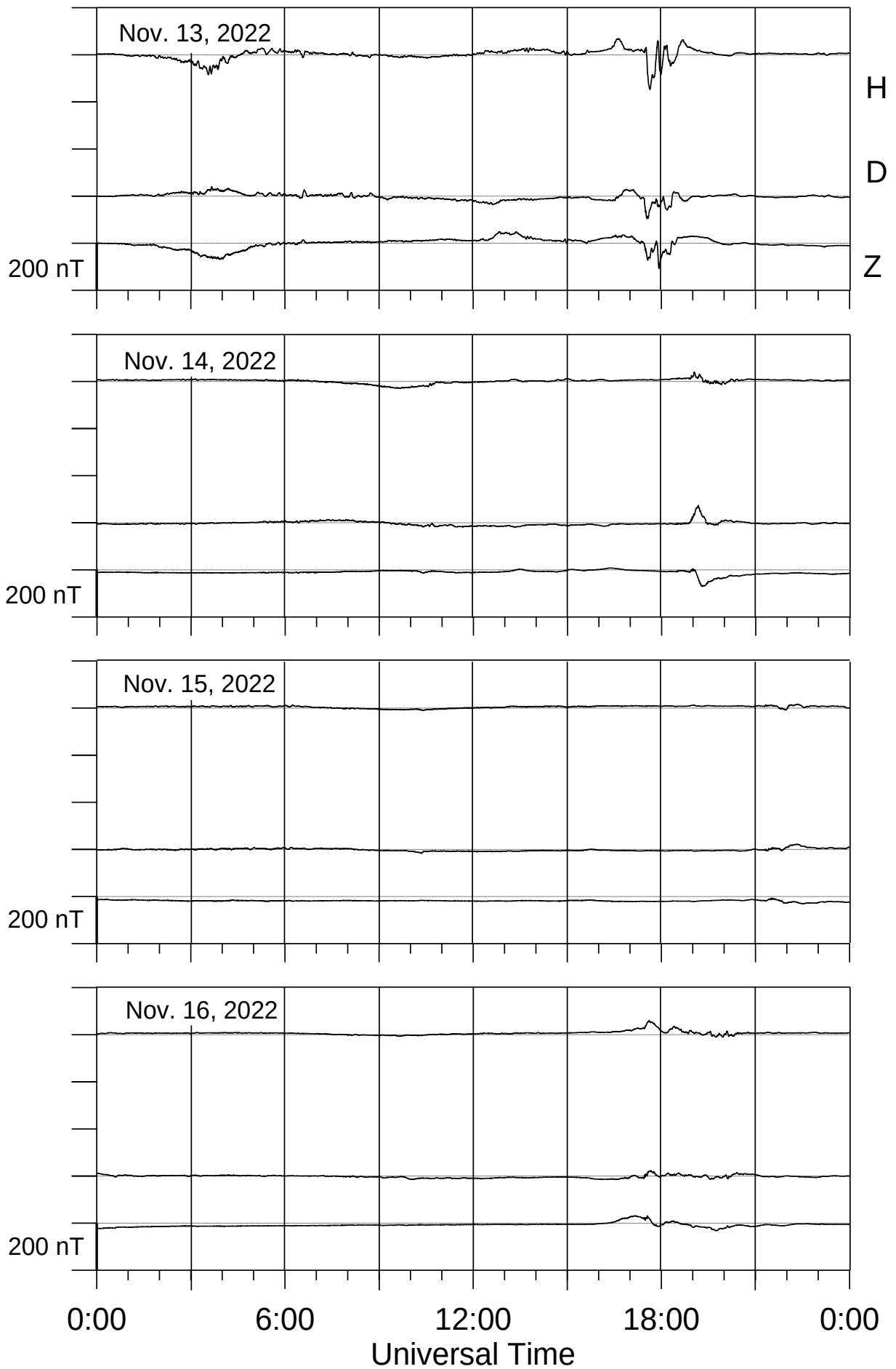
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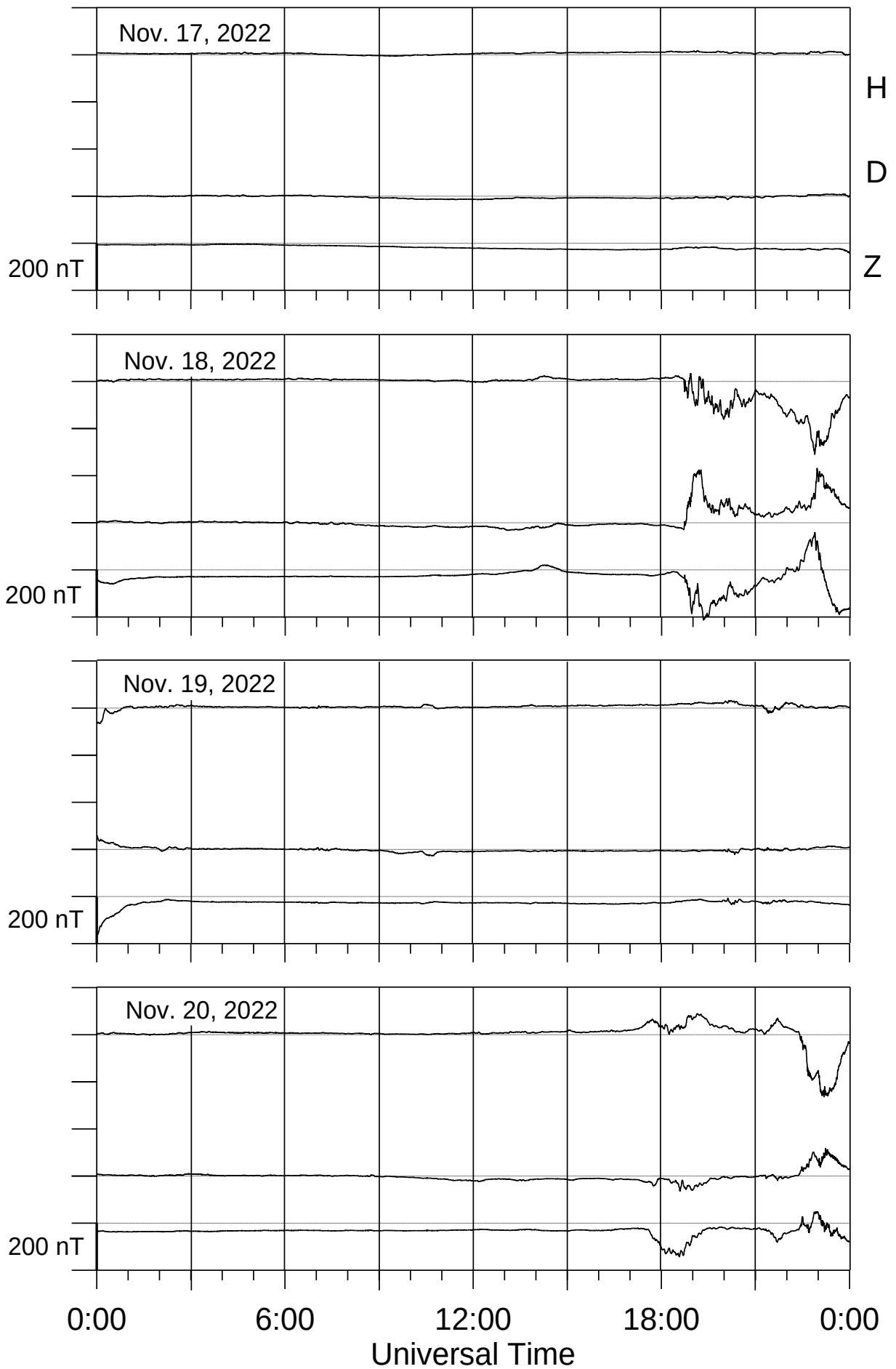
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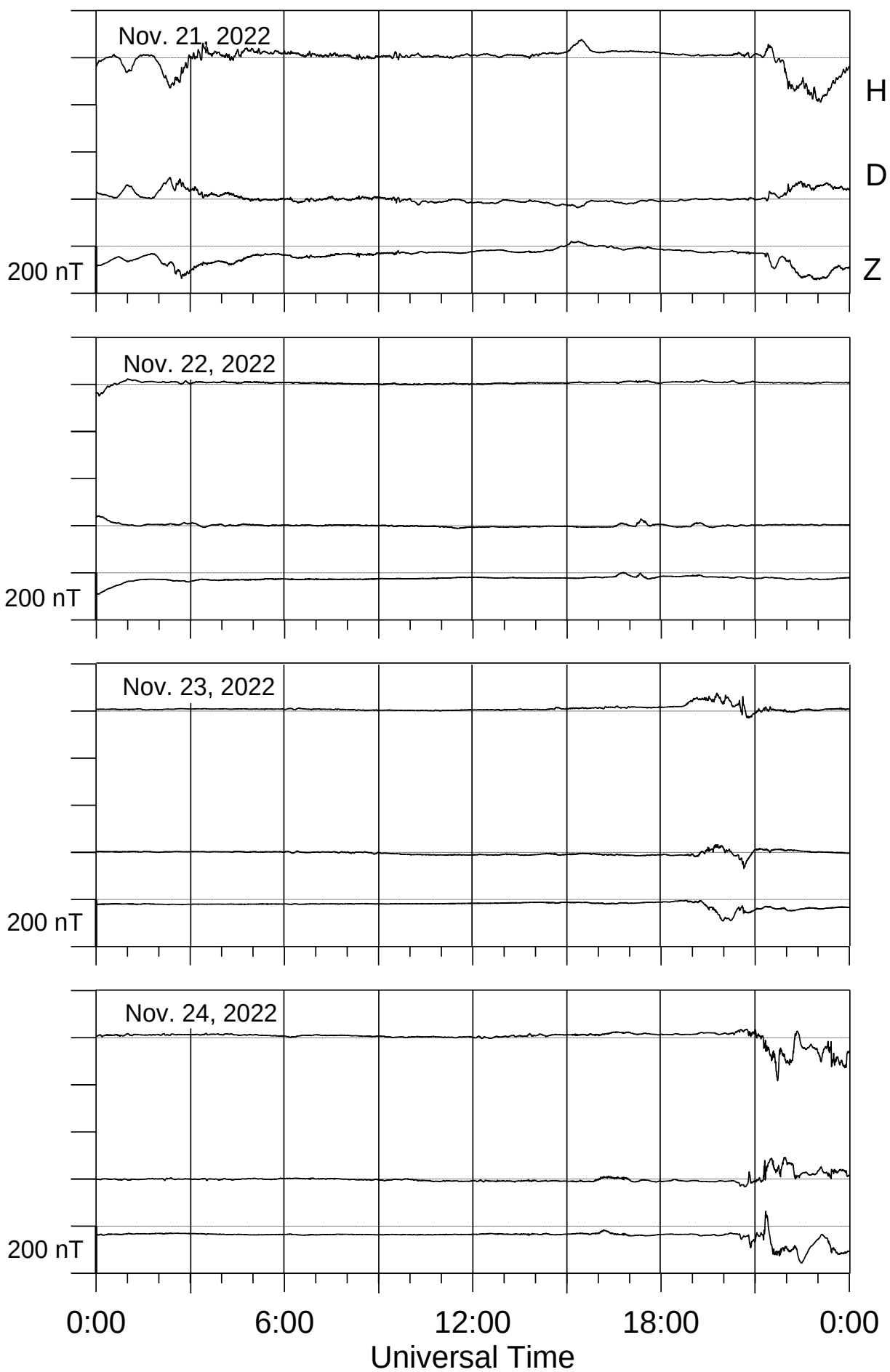
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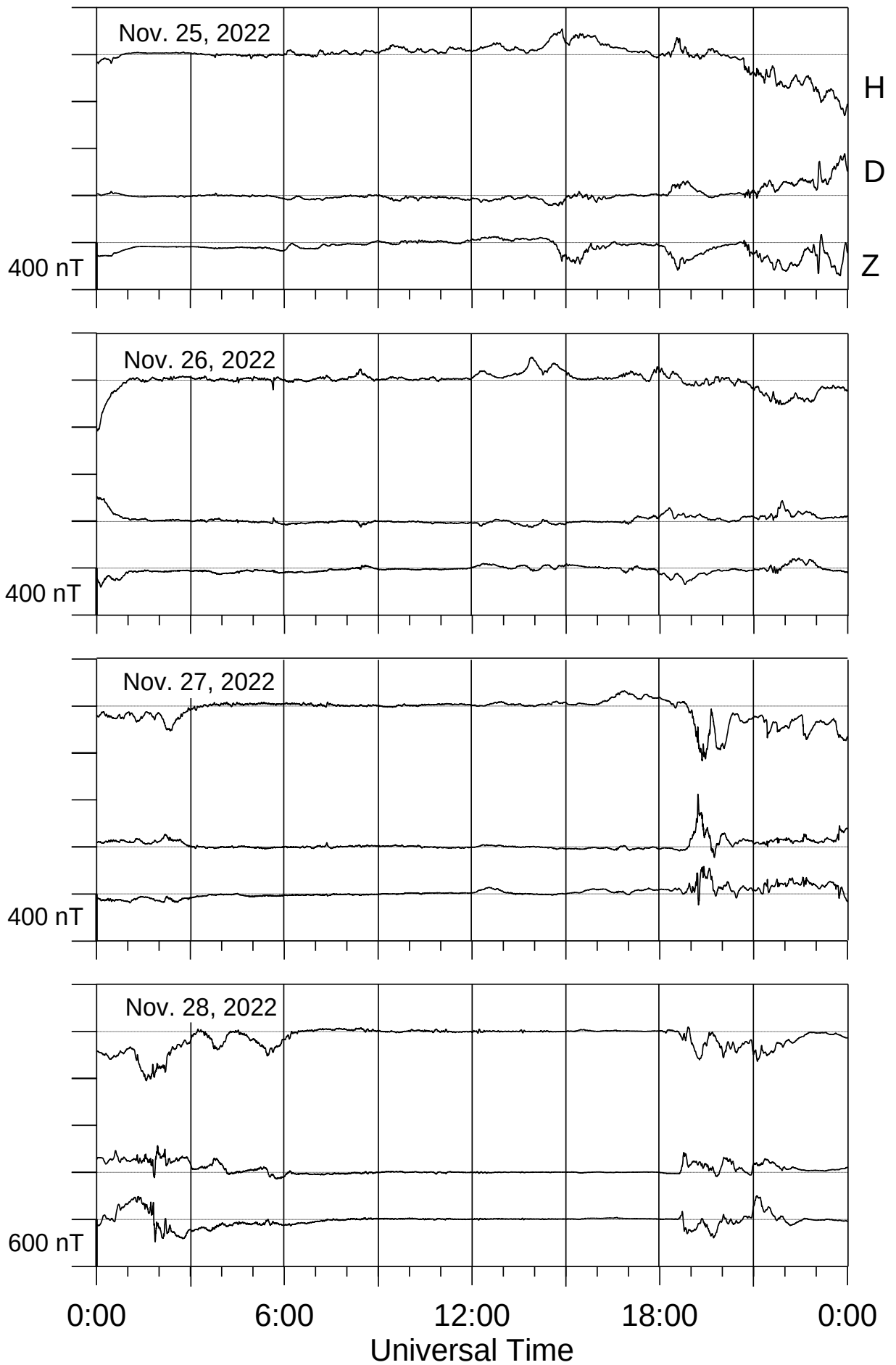
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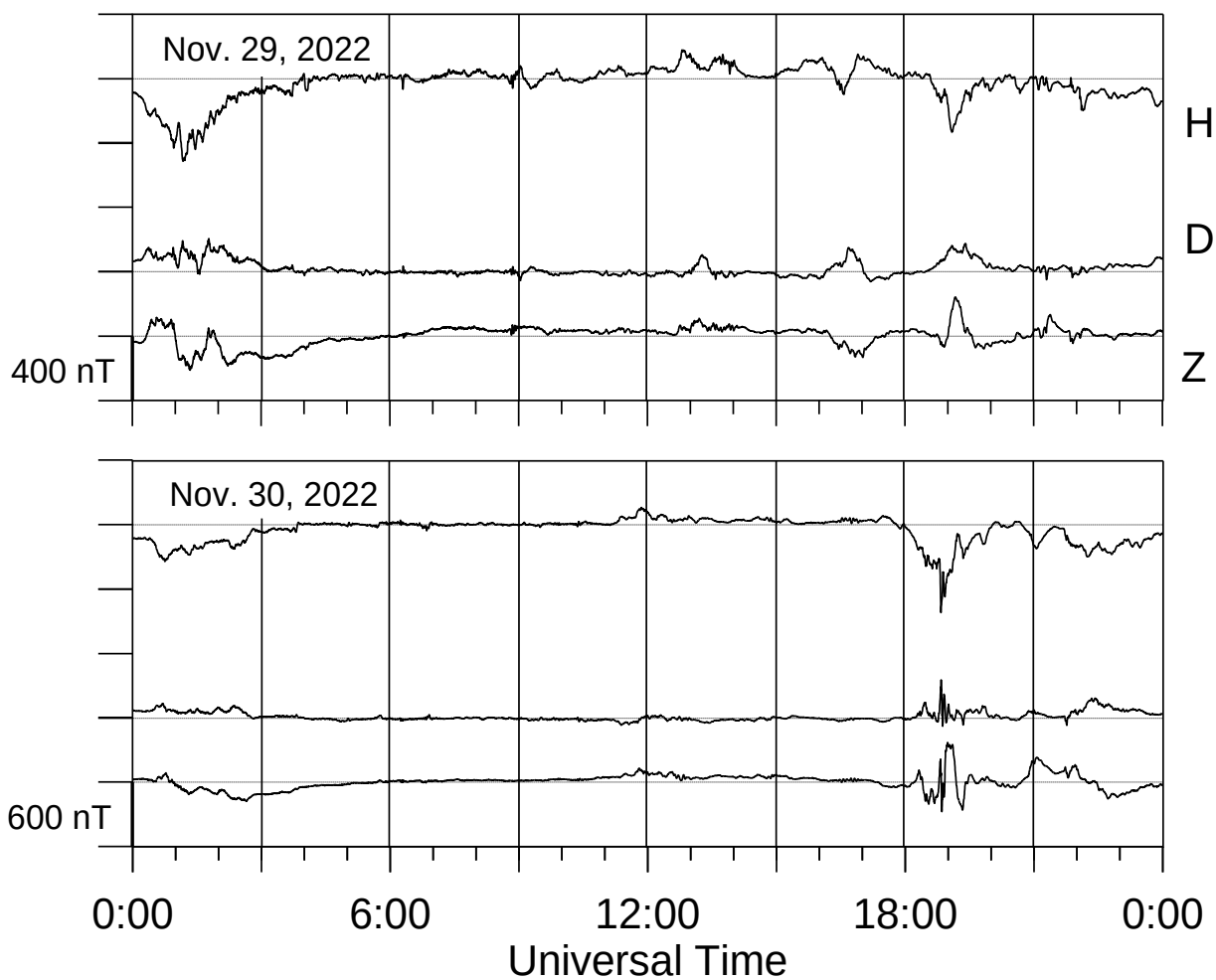
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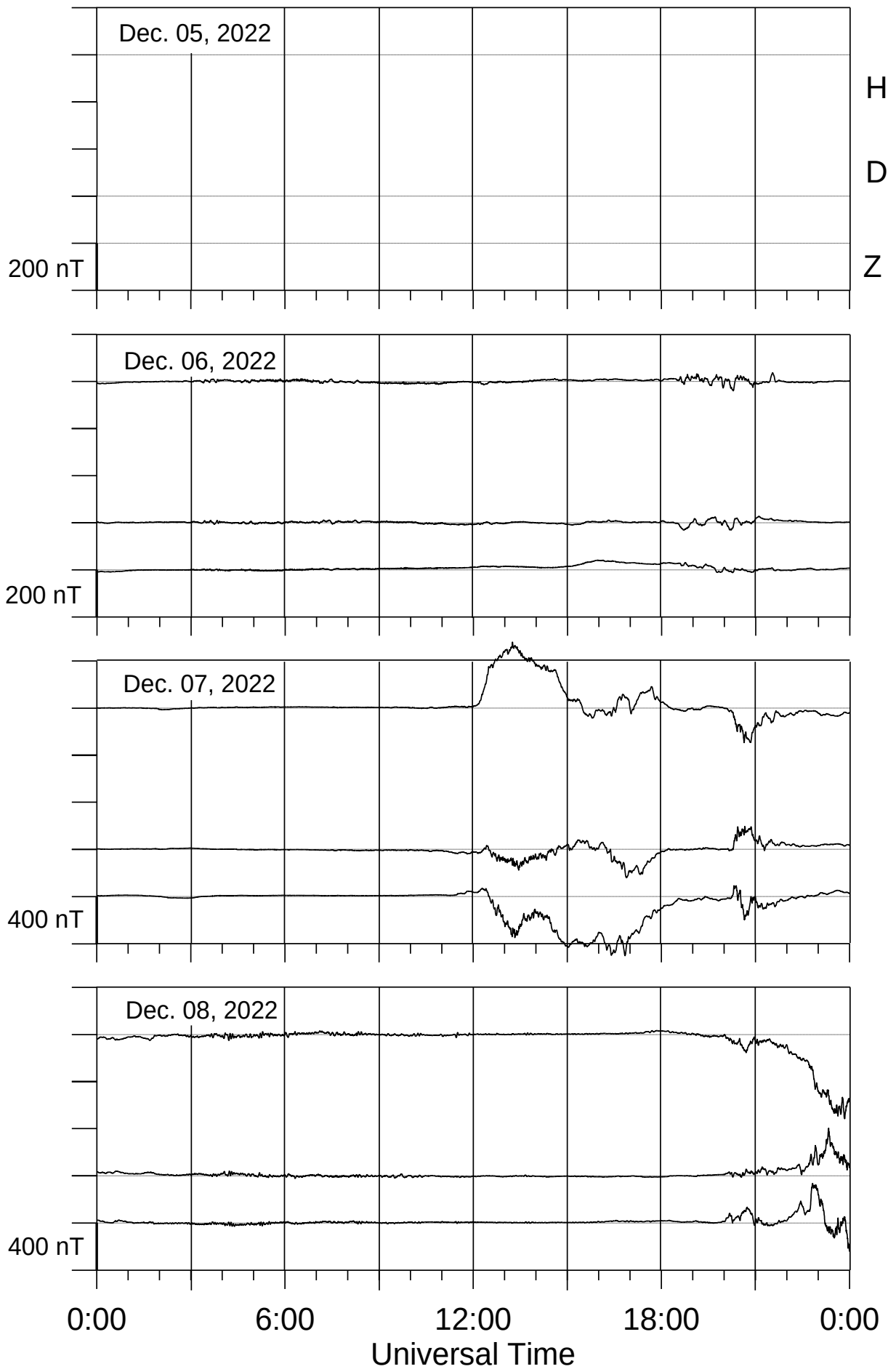
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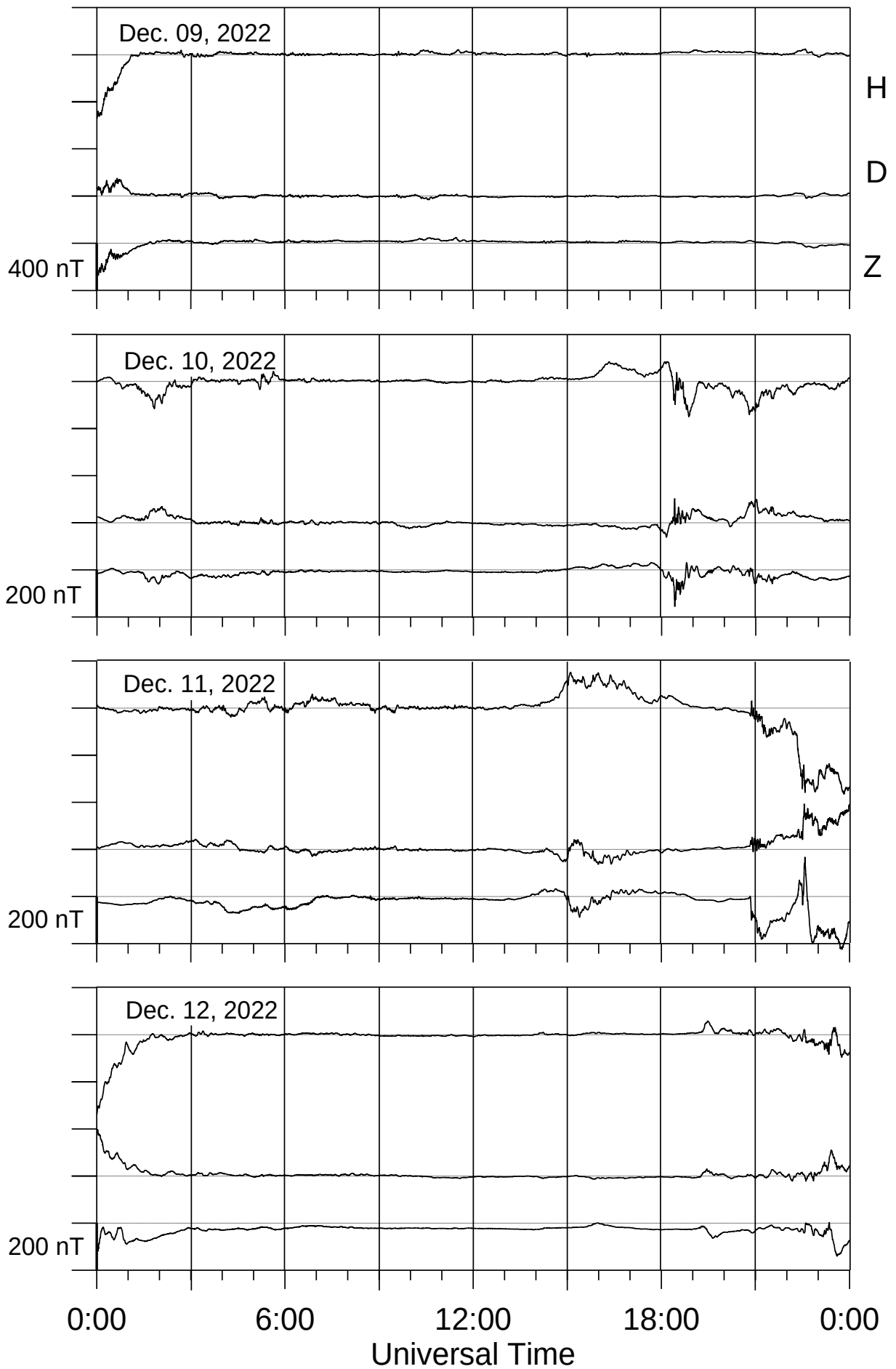
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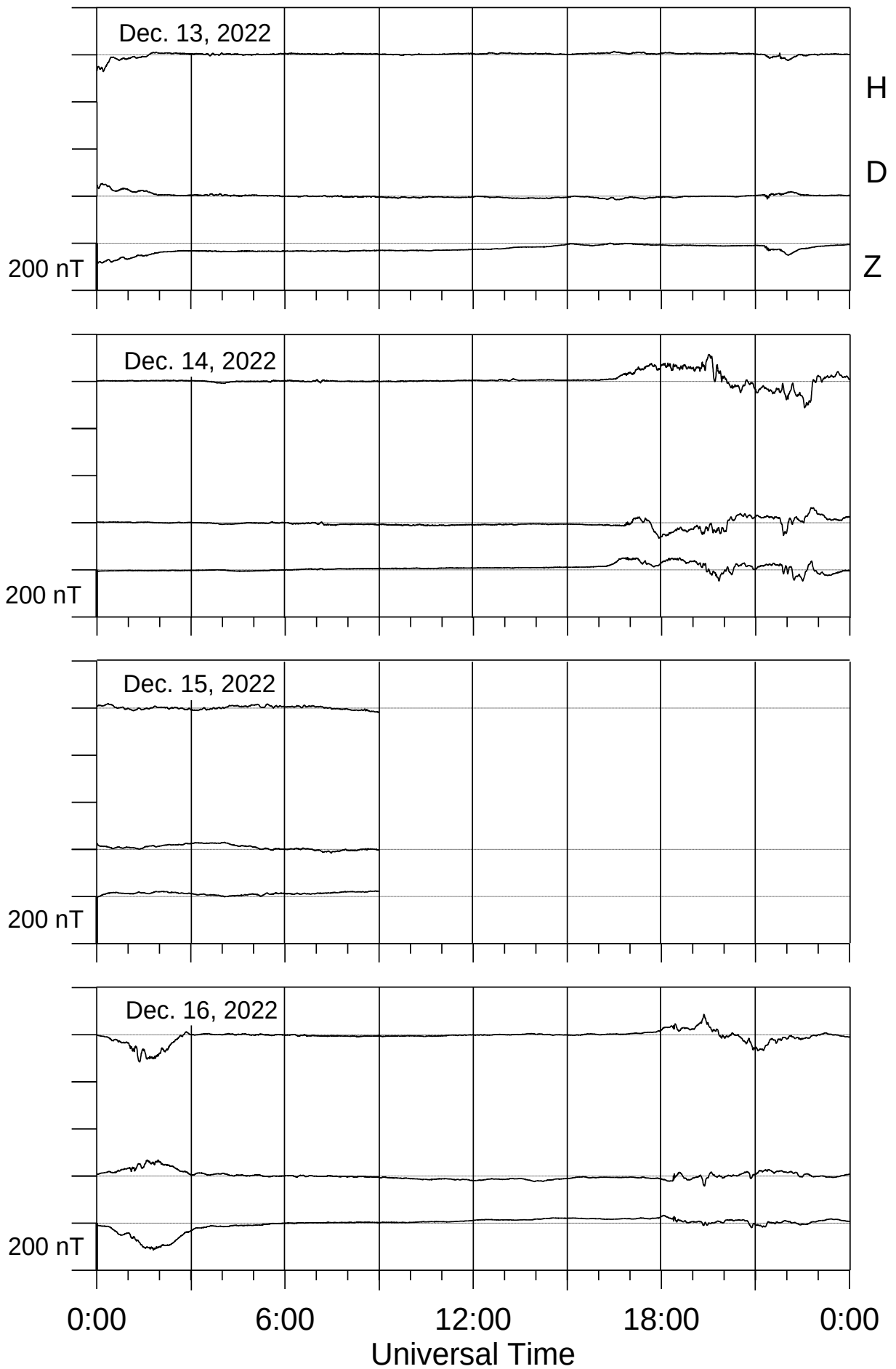
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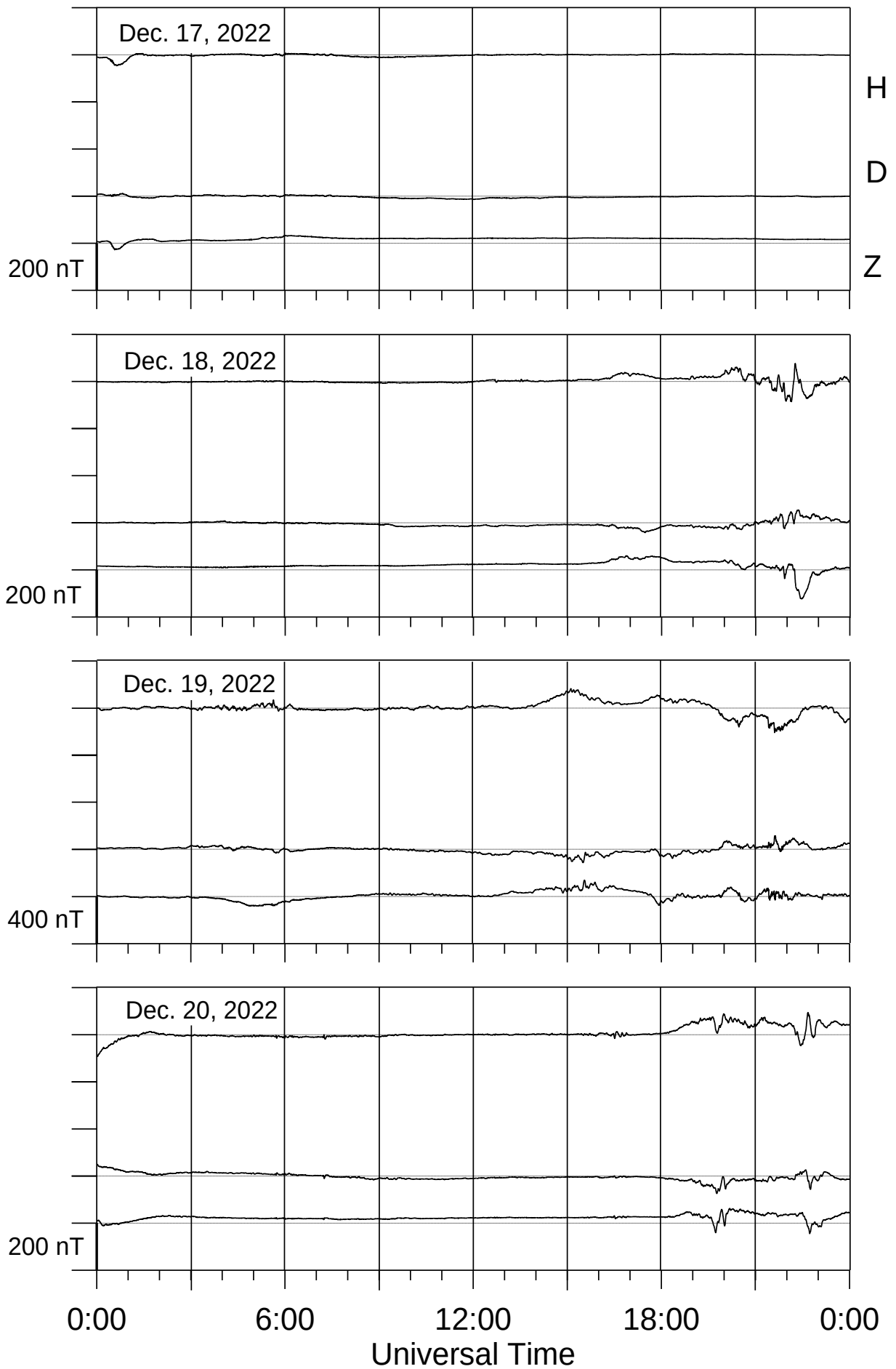
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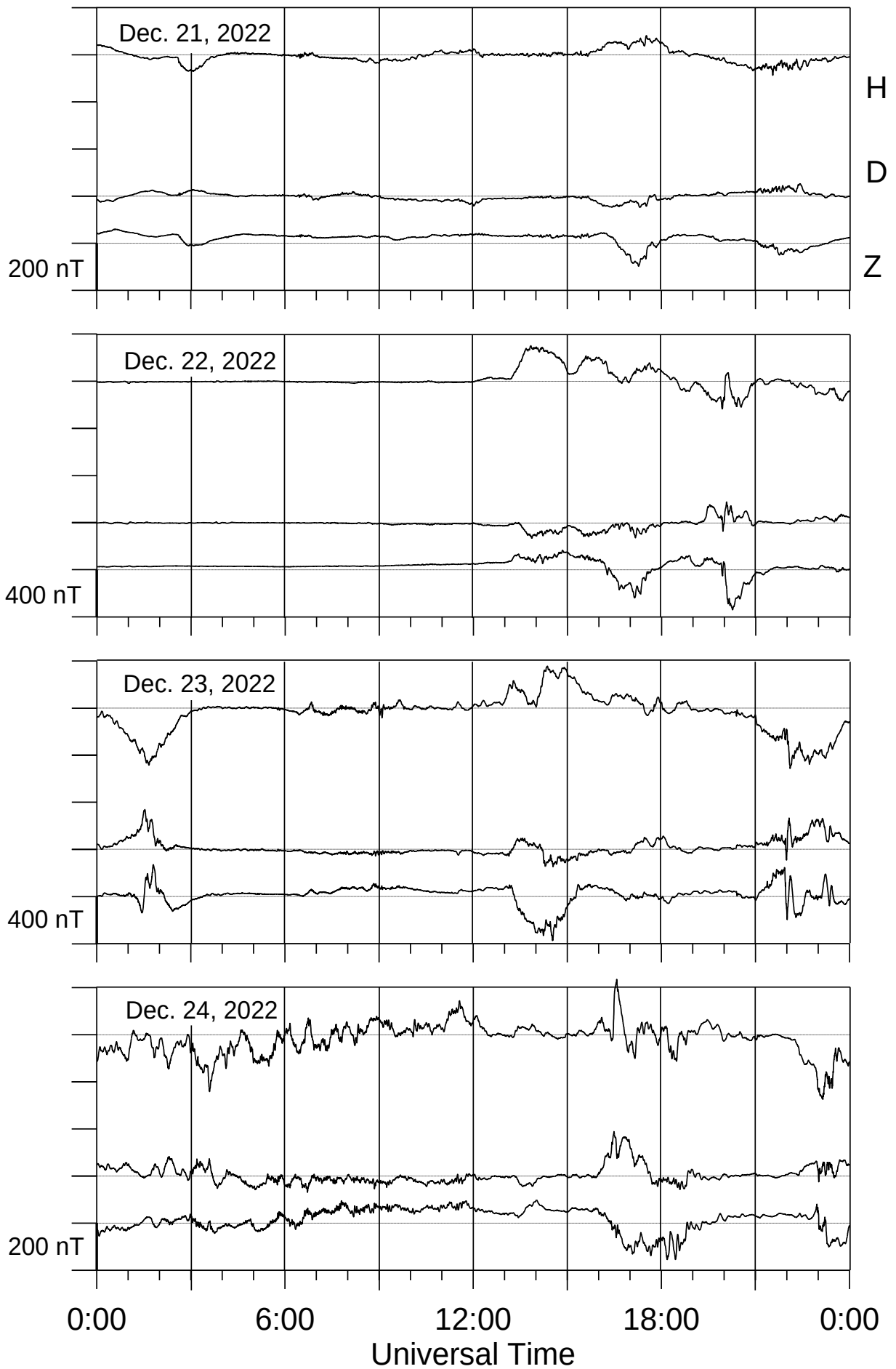
Loparskaya magnetometer



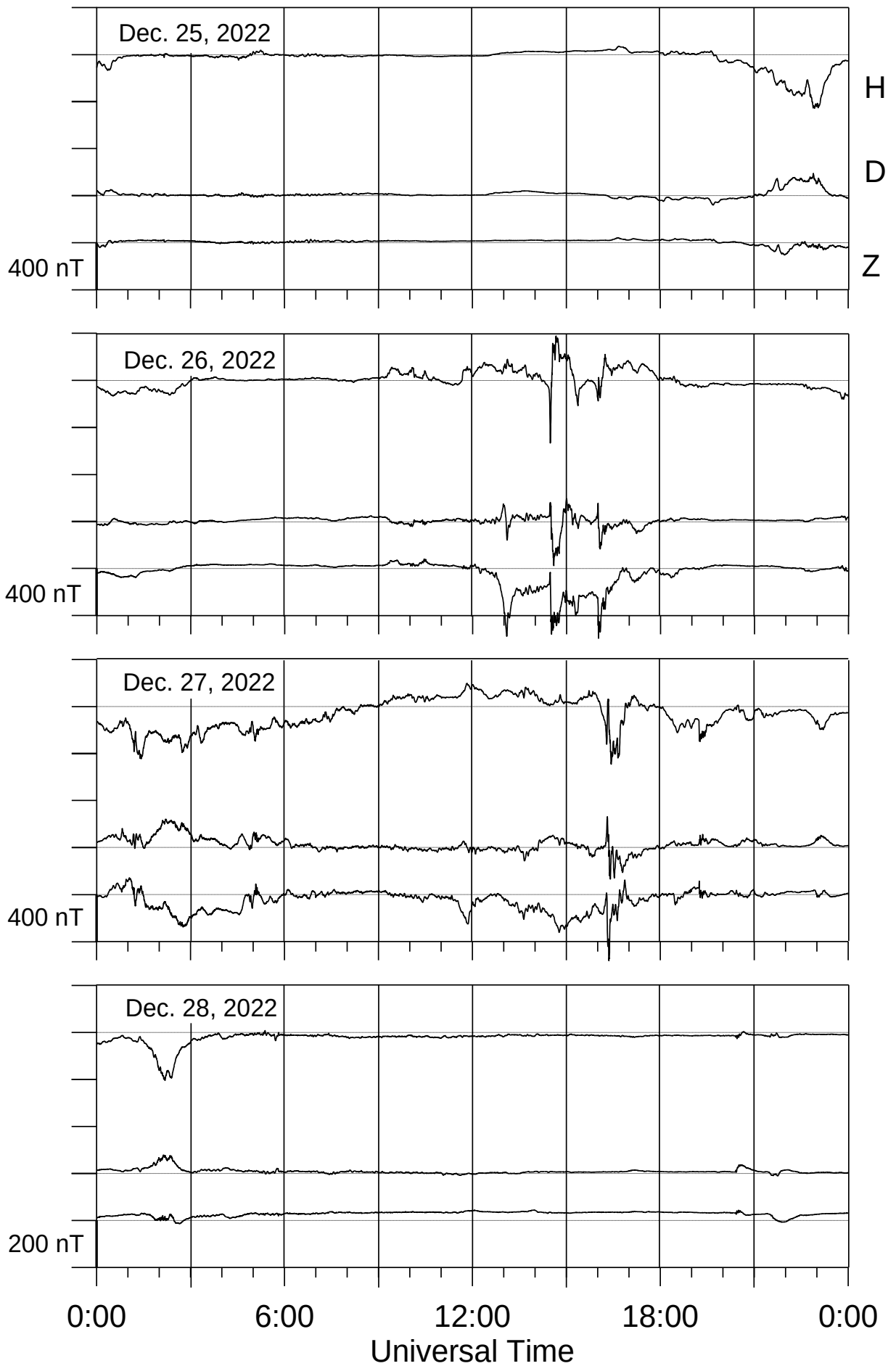
Loparskaya magnetometer



Loparskaya magnetometer



Loparskaya magnetometer



Loparskaya magnetometer

