

RUSSIAN ACADEMY OF SCIENCES
KOLA SCIENCE CENTRE



PGI
GEOPHYSICAL DATA

2013

OCTOBER

NOVEMBER

DECEMBER

POLAR GEOPHYSICAL INSTITUTE
MURMANSK, APATITY, **RUSSIA**

PGI

GEOPHYSICAL DATA

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This bulletin presents the preliminary ground-based optical, geomagnetic and cosmic ray data obtained by Polar Geophysical Institute in the fourth quarter of 2013. All-sky camera observations are published only for the quarters when observations were carried out. All data are available by request.

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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	446 272
November	442 662
December	437 621

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

Please visit <http://pgia.ru>

All-sky camera observations

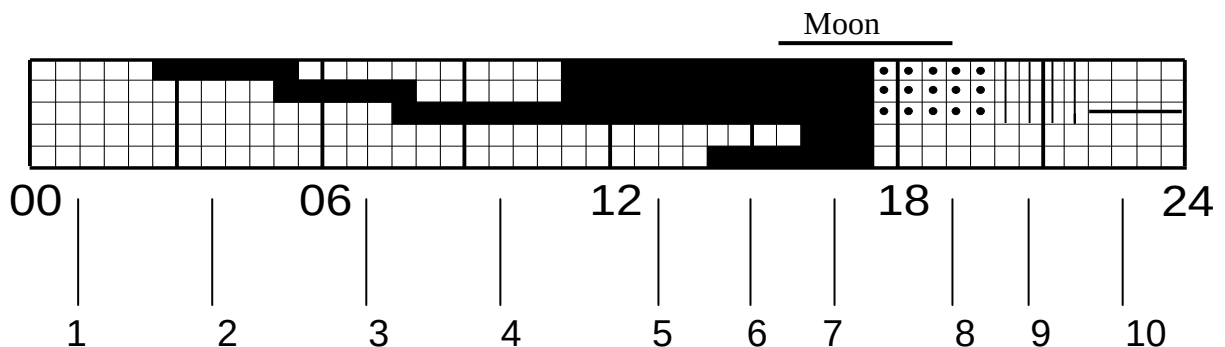
Calendar

Calendar shows the intervals of digital all-sky camera observations in Lovozero and Loparskaya, 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.



- 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 Lovozero and/or Loparskaya 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.

Attention, please!

Aurora observations in this issue are available from September 2013.

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

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

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GEOMAGNETIC K-INDICES, LOVOZERO(LOPARSKAYA)

October, 2013

Lower limit of K=9 is 1500 nT

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

GEOMAGNETIC K-INDICES, LOVOZERO(LOPARSKAYA)

November, 2013

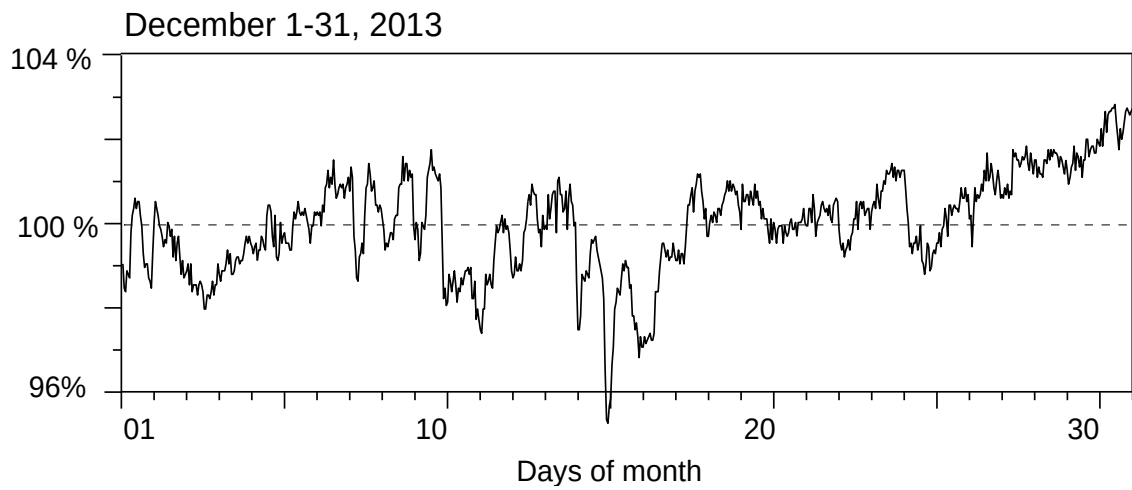
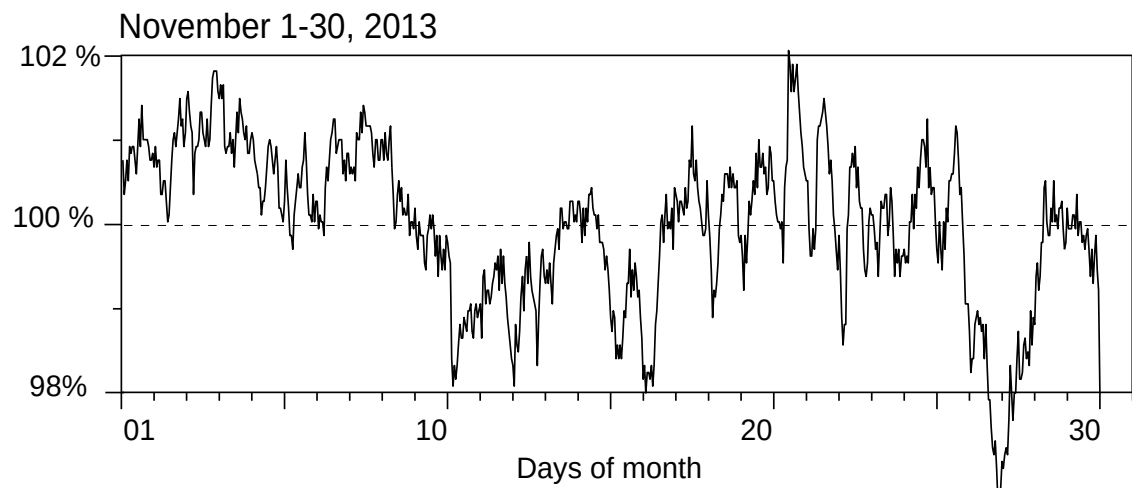
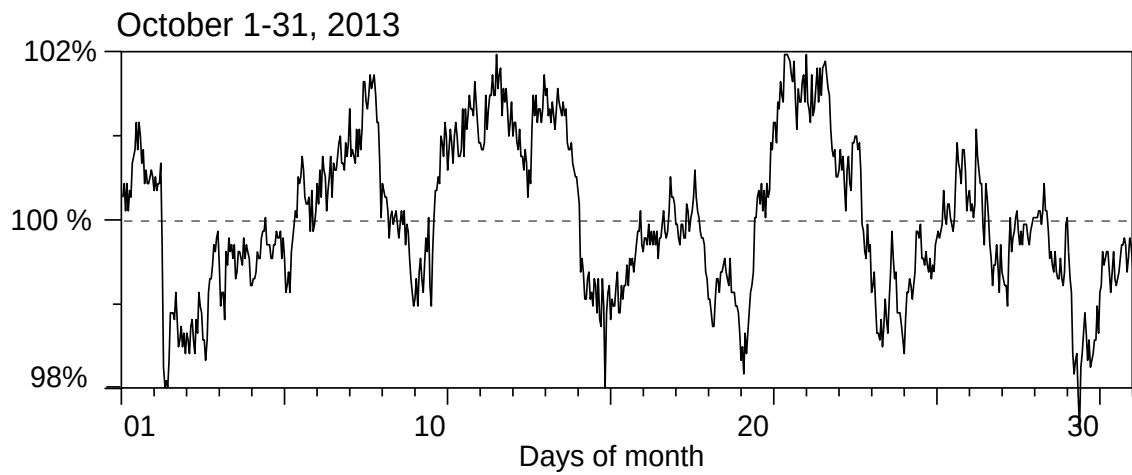
Lower limit of K=9 is 1500 nT

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

GEOMAGNETIC K-INDICES, LOVOZERO(LOPARSKAYA)
 December, 2013
 Lower limit of K=9 is 1500 nT

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

Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

September - December 2013

CALENDAR OF TV OBSERVATIONS

December 29 - 30

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

December 30 - 31

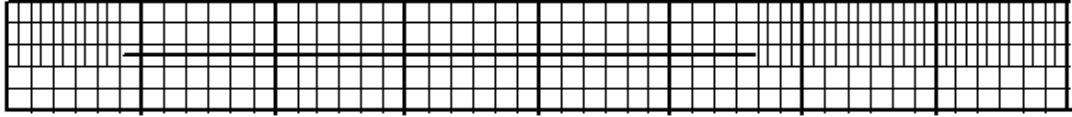
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December 31

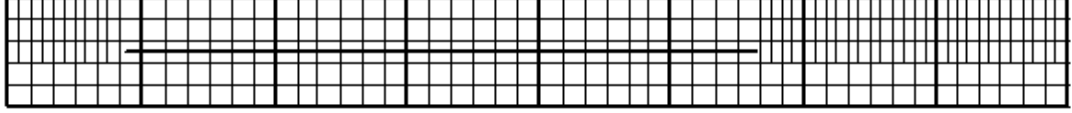
UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05	
LOZ																	

Lovozero ascaplots

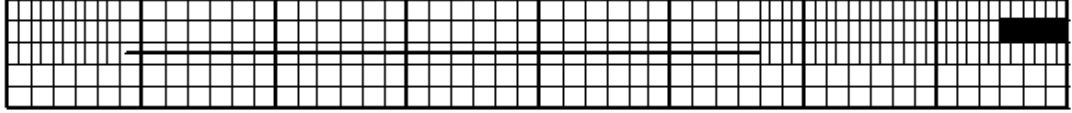
Sep. 01, 2013



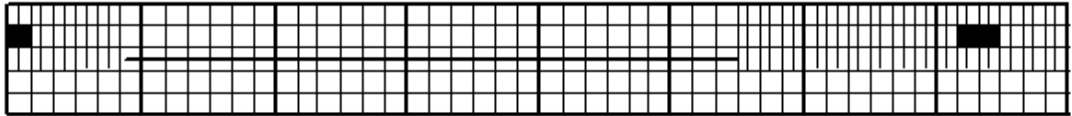
Sep. 02, 2013



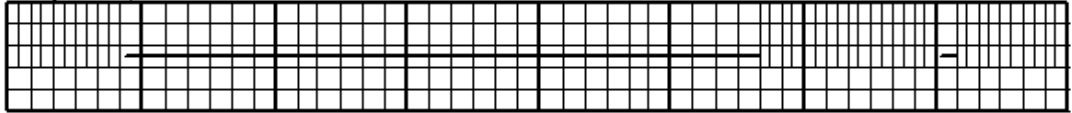
Sep. 03, 2013



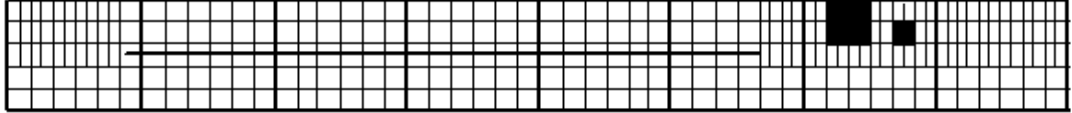
Sep. 04, 2013



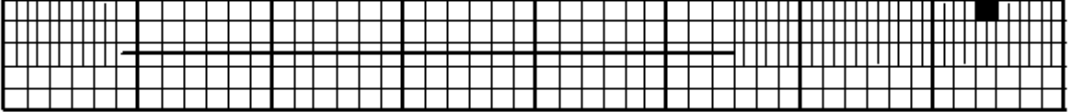
Sep. 05, 2013



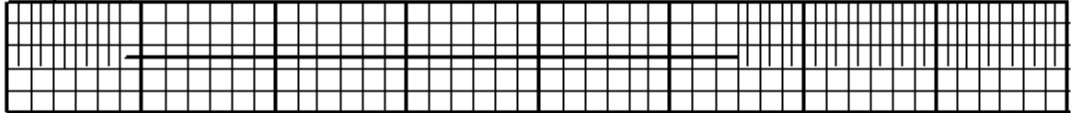
Sep. 06, 2013



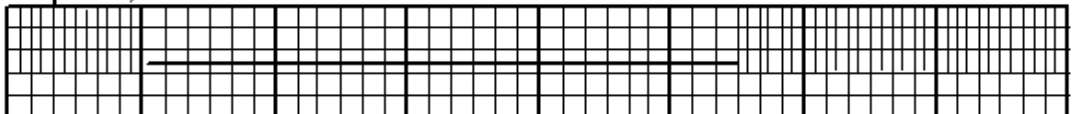
Sep. 07, 2013



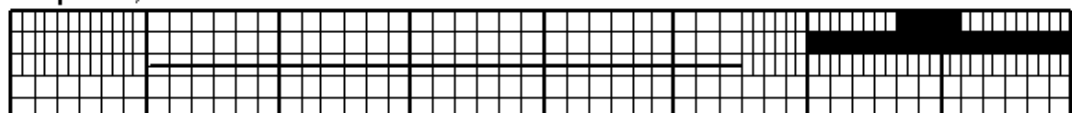
Sep. 08, 2013



Sep. 09, 2013



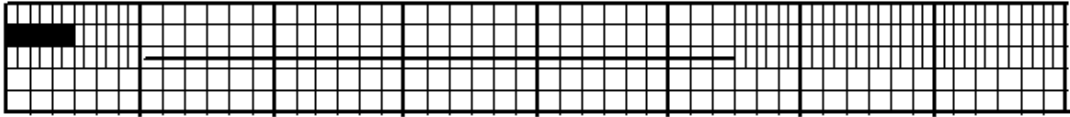
Sep. 10, 2013



00 06 12 18 24
Universal Time

Lovozero ascaplots

Sep. 11, 2013



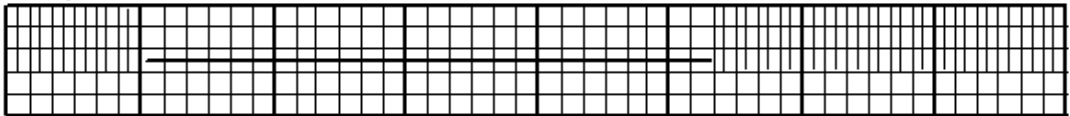
Sep. 12, 2013



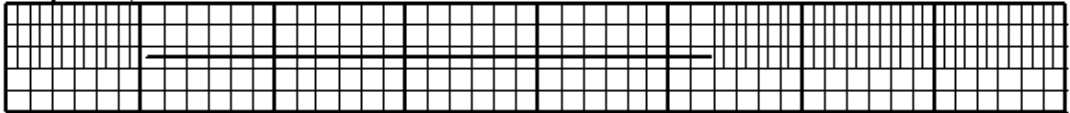
Sep. 13, 2013



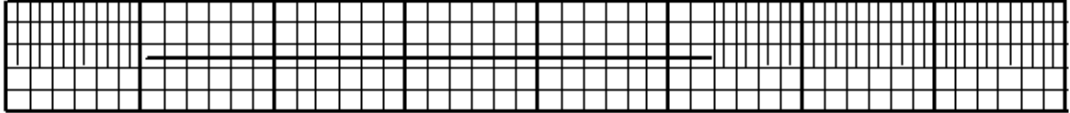
Sep. 14, 2013



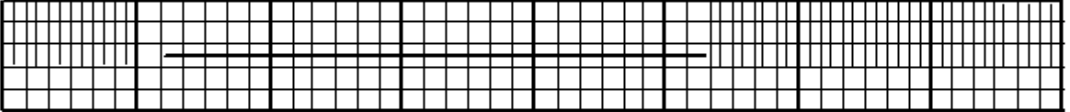
Sep. 15, 2013



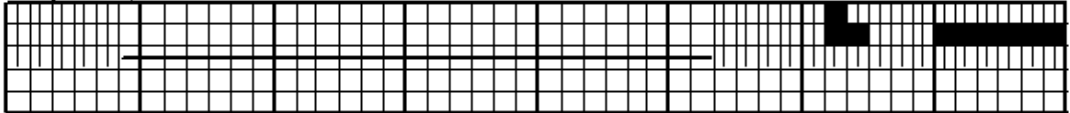
Sep. 16, 2013



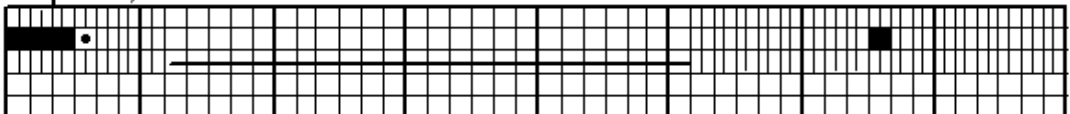
Sep. 17, 2013



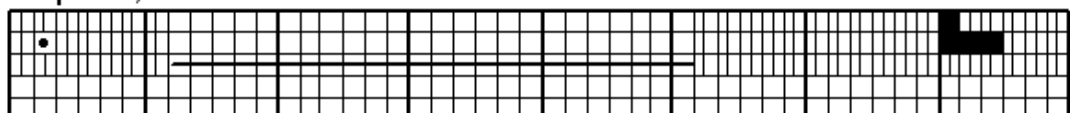
Sep. 18, 2013



Sep. 19, 2013



Sep. 20, 2013

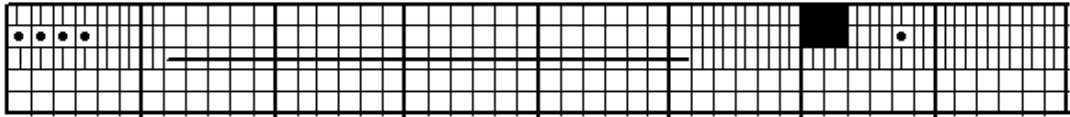


00 06 12 18 24

Universal Time

Lovozero ascaplots

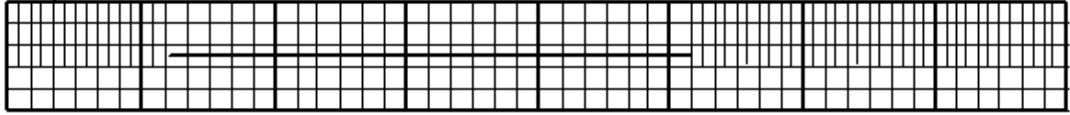
Sep. 21, 2013



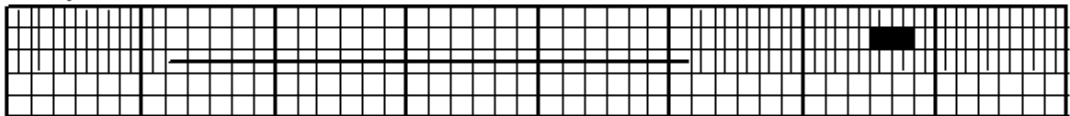
Sep. 22, 2013



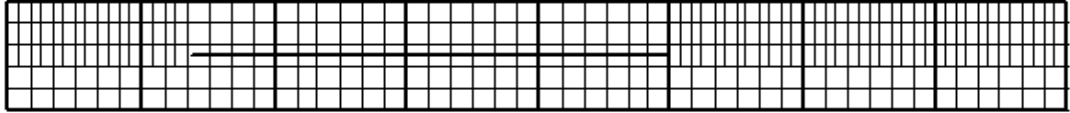
Sep. 23, 2013



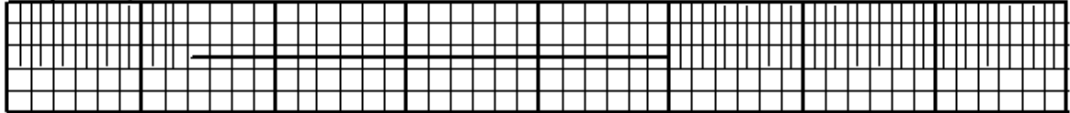
Sep. 24, 2013



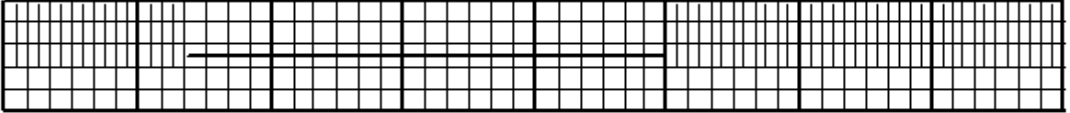
Sep. 25, 2013



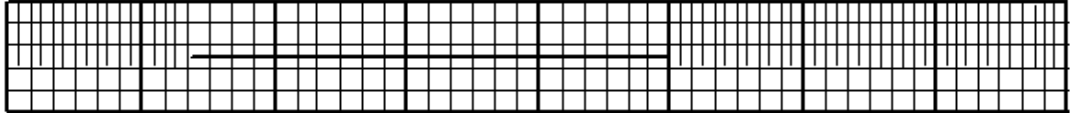
Sep. 26, 2013



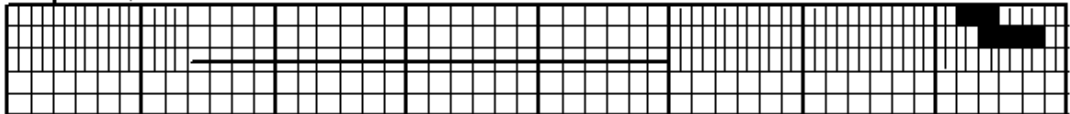
Sep. 27, 2013



Sep. 28, 2013



Sep. 29, 2013



Sep. 30, 2013



00

06

12

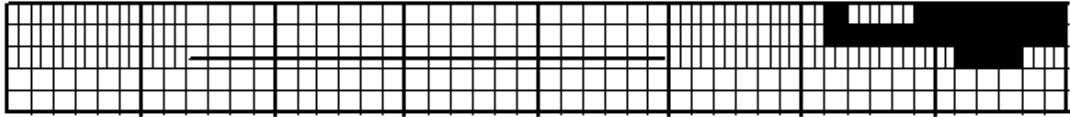
18

24

Universal Time

Lovozero ascaplots

Oct. 01, 2013



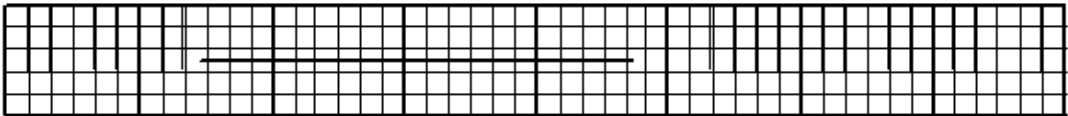
Oct. 02, 2013



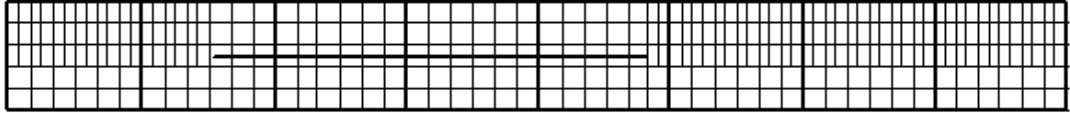
Oct. 03, 2013



Oct. 04, 2013



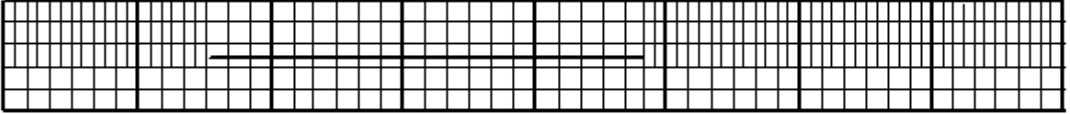
Oct. 05, 2013



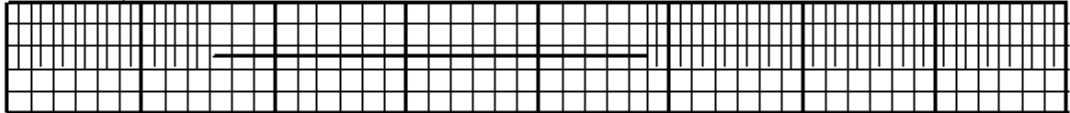
Oct. 06, 2013



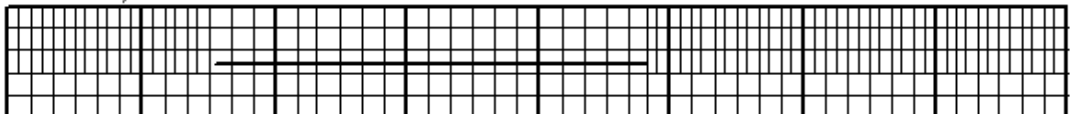
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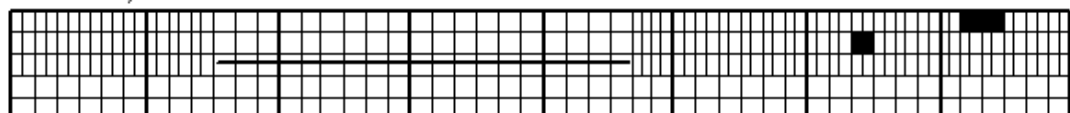
Oct. 08, 2013



Oct. 09, 2013



Oct. 10, 2013

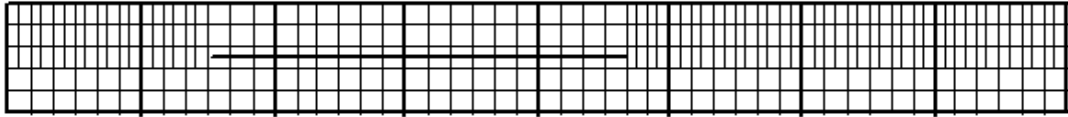


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Universal Time

Lovozero ascaplots

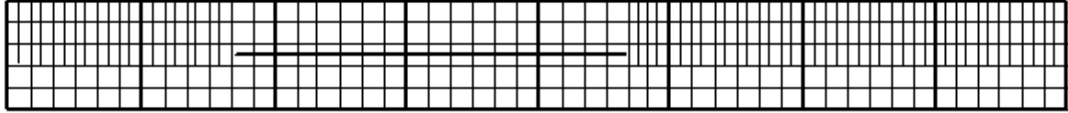
Oct. 11, 2013



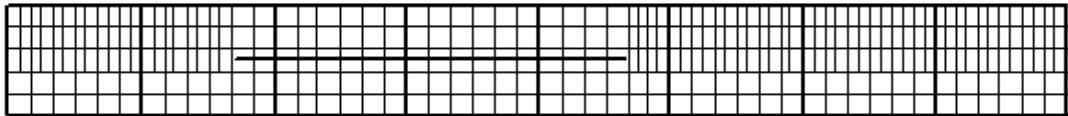
Oct. 12, 2013



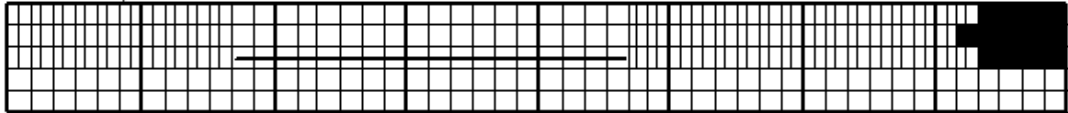
Oct. 13, 2013



Oct. 14, 2013



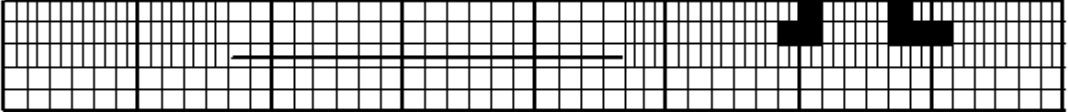
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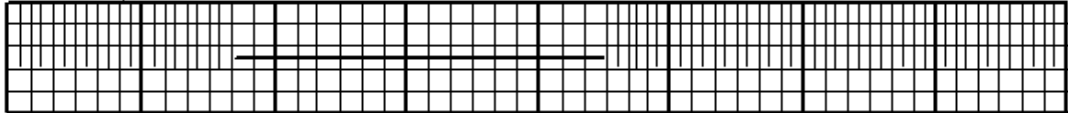
Oct. 16, 2013



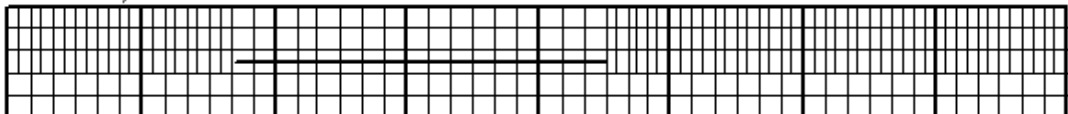
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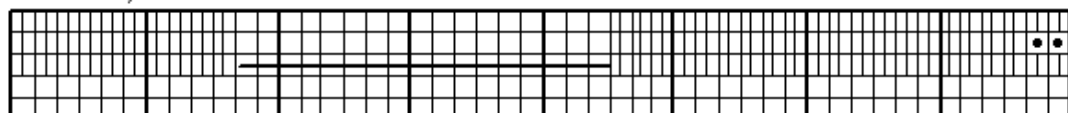
Oct. 18, 2013



Oct. 19, 2013



Oct. 20, 2013

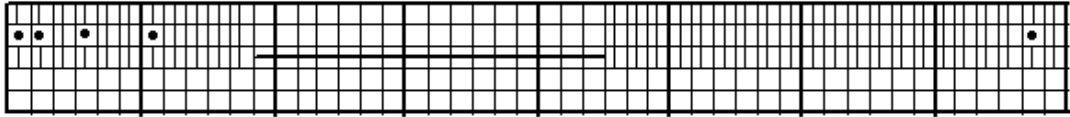


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Universal Time

Lovozero ascaplots

Oct. 21, 2013



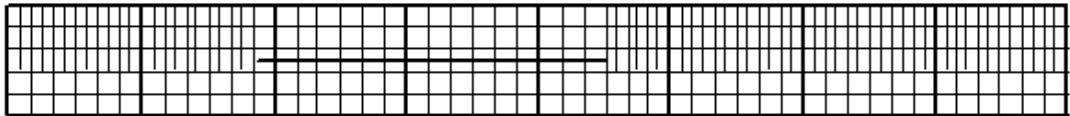
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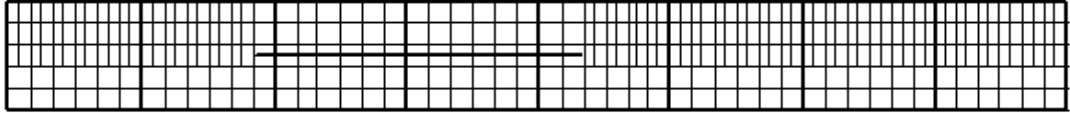
Oct. 23, 2013



Oct. 24, 2013



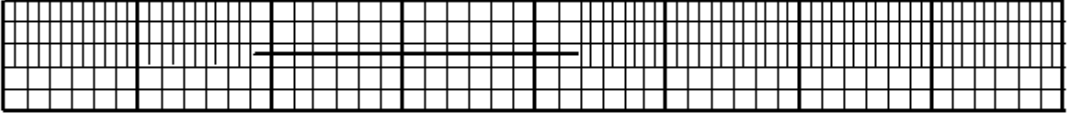
Oct. 25, 2013



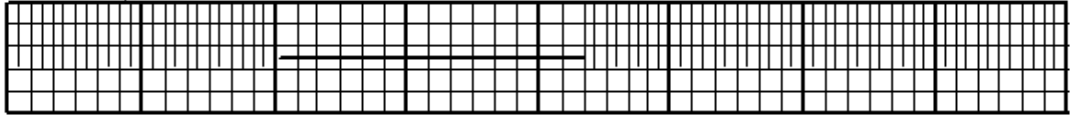
Oct. 26, 2013



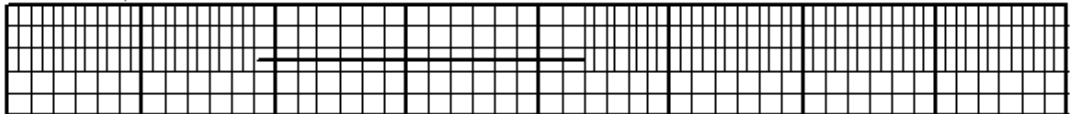
Oct. 27, 2013



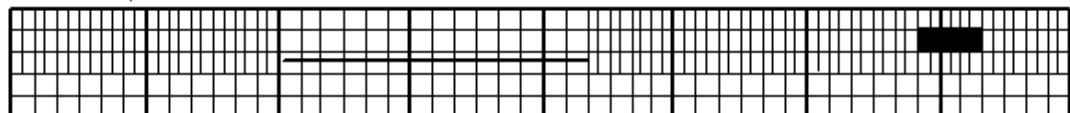
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Oct. 29, 2013



Oct. 30, 2013

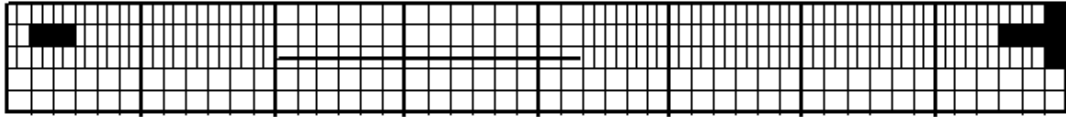


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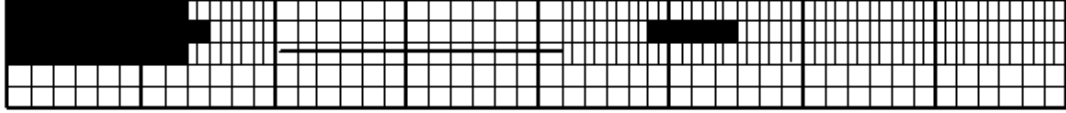
Universal Time

Lovozero ascaplots

Oct. 31, 2013



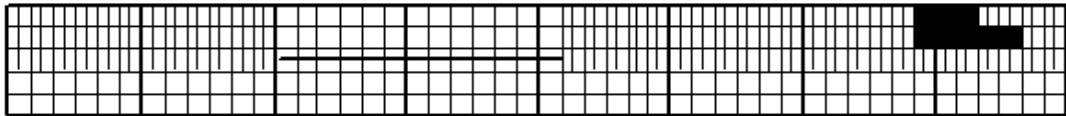
Nov. 01, 2013



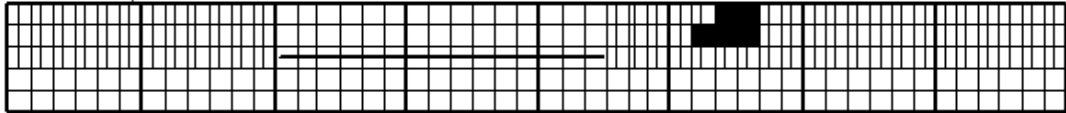
Nov. 02, 2013



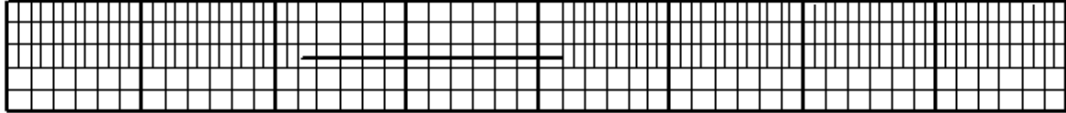
Nov. 03, 2013



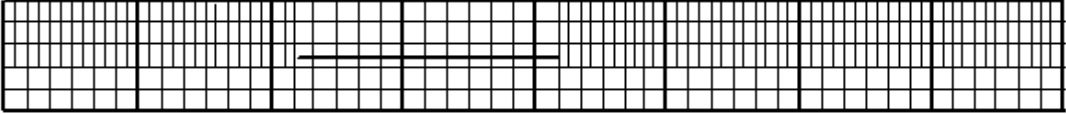
Nov. 04, 2013



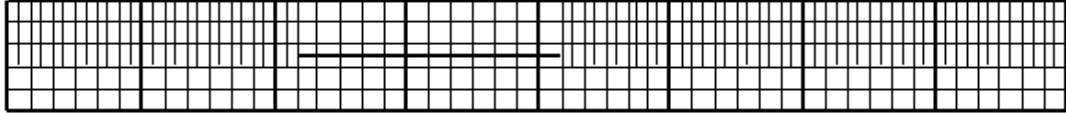
Nov. 05, 2013



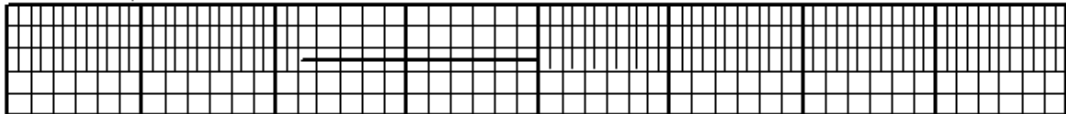
Nov. 06, 2013



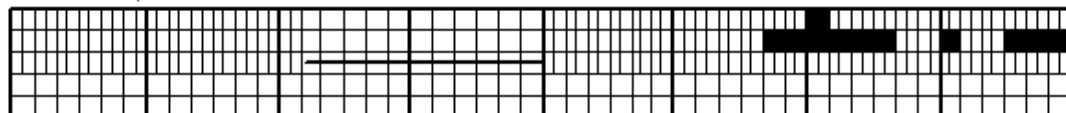
Nov. 07, 2013



Nov. 08, 2013



Nov. 09, 2013



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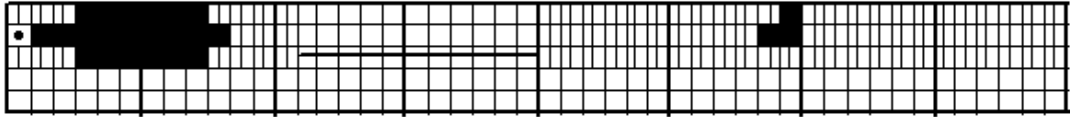
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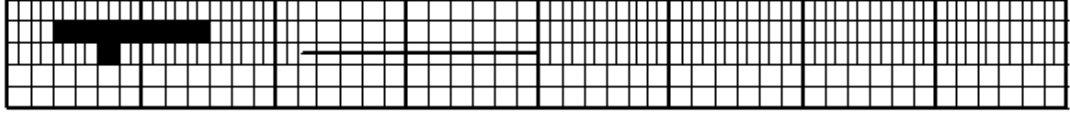
Universal Time

Lovozero ascaplots

Nov. 10, 2013



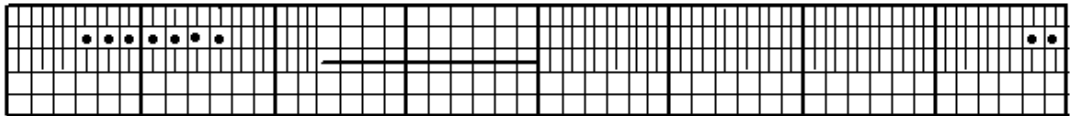
Nov. 11, 2013



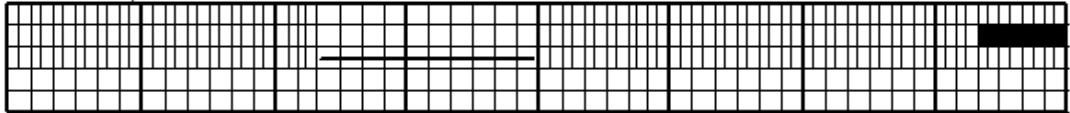
Nov. 12, 2013



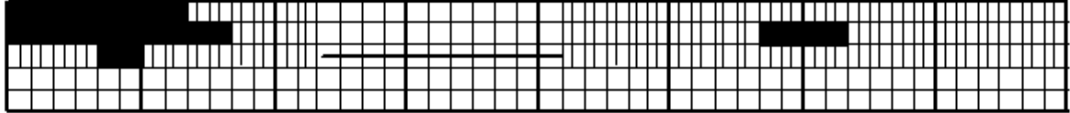
Nov. 13, 2013



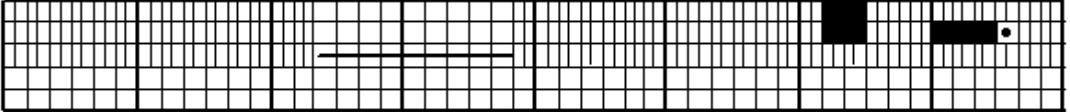
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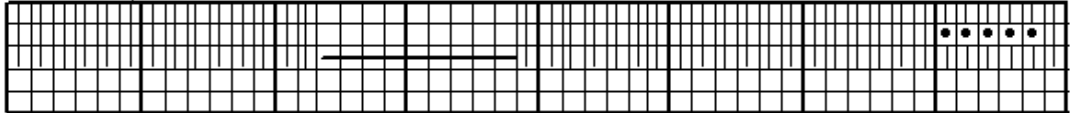
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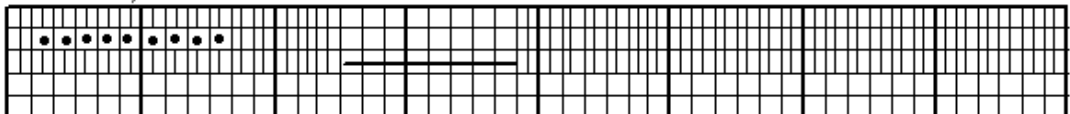
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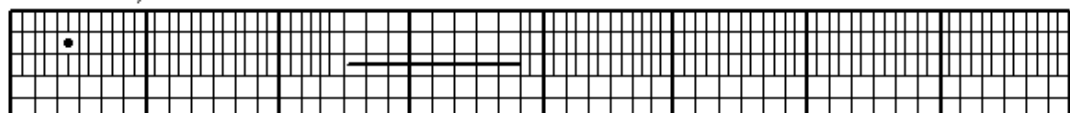
Nov. 17, 2013



Nov. 18, 2013



Nov. 19, 2013

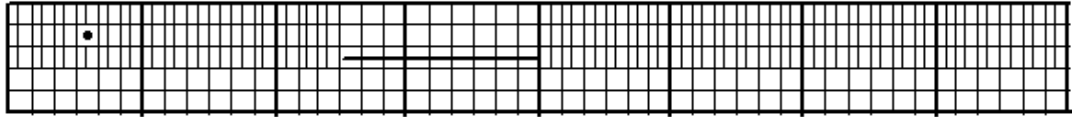


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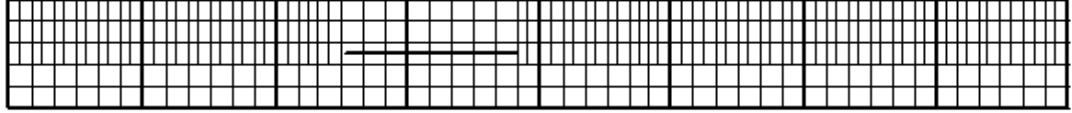
Universal Time

Lovozero ascaplots

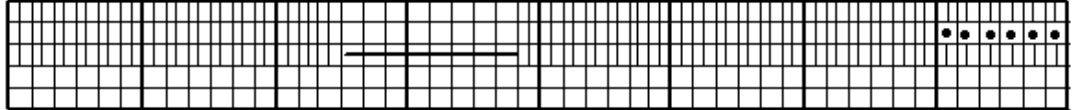
Nov. 20, 2013



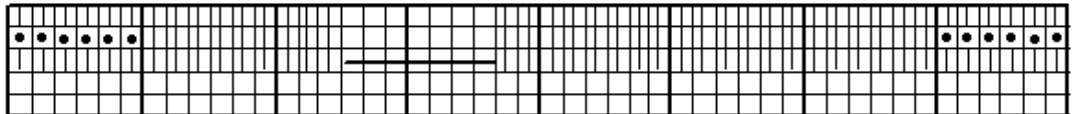
Nov. 21, 2013



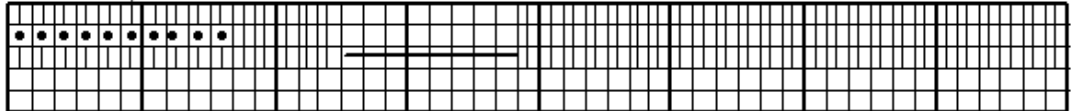
Nov. 22, 2013



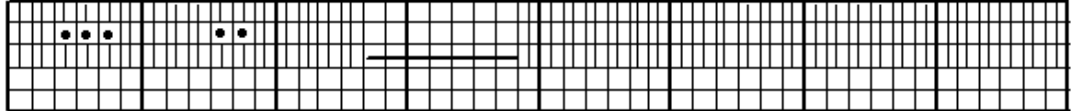
Nov. 23, 2013



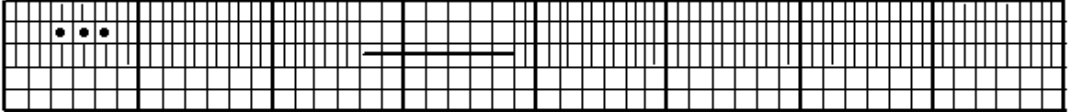
Nov. 24, 2013



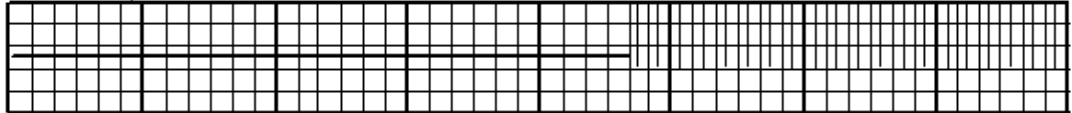
Nov. 25, 2013



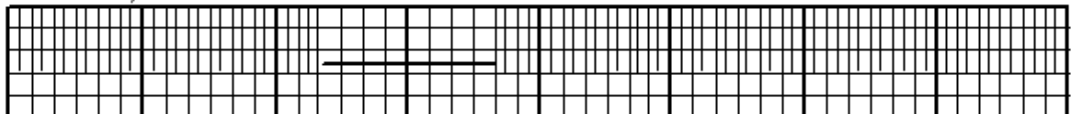
Nov. 26, 2013



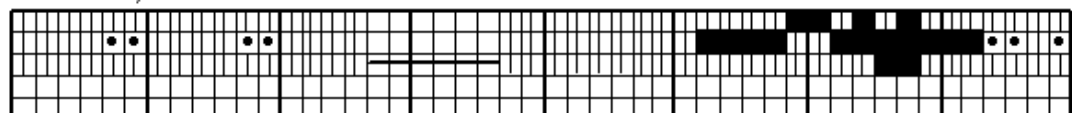
Nov. 27, 2013



Nov. 28, 2013



Nov. 29, 2013



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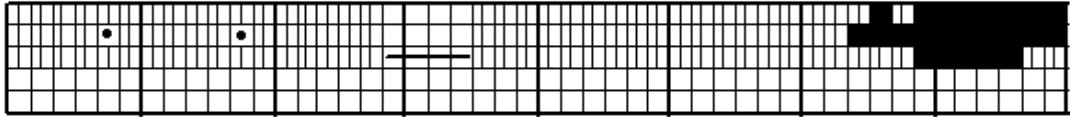
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Universal Time

Lovozero ascaplots

Nov. 30, 2013



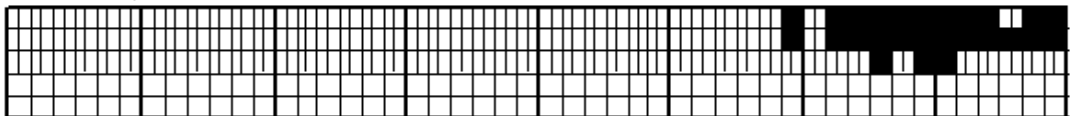
Dec. 01, 2013



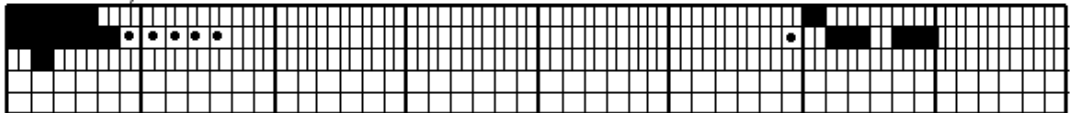
Dec. 02, 2013



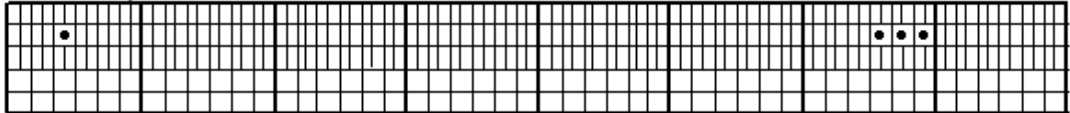
Dec. 03, 2013



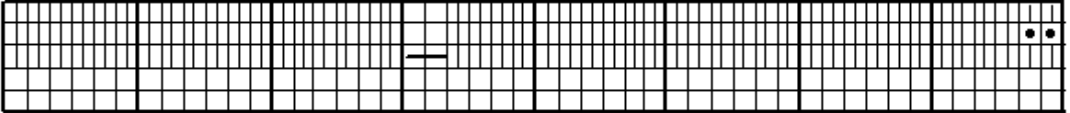
Dec. 04, 2013



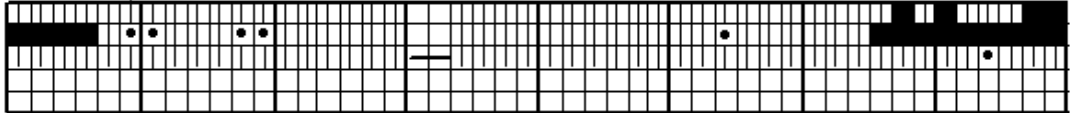
Dec. 05, 2013



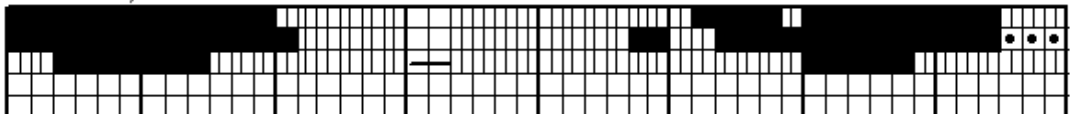
Dec. 06, 2013



Dec. 07, 2013



Dec. 08, 2013



Dec. 09, 2013

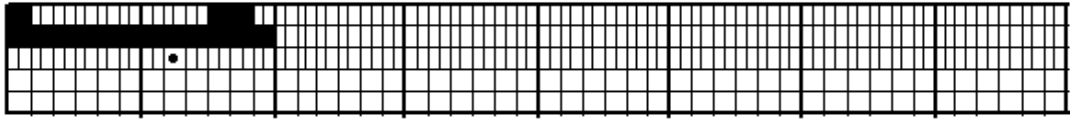


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Universal Time

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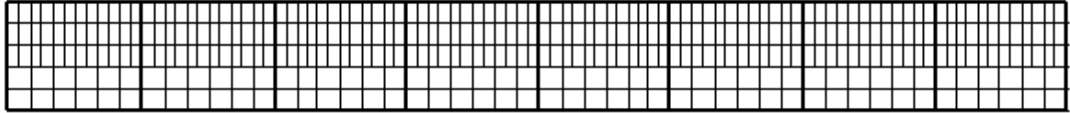
Dec. 10, 2013



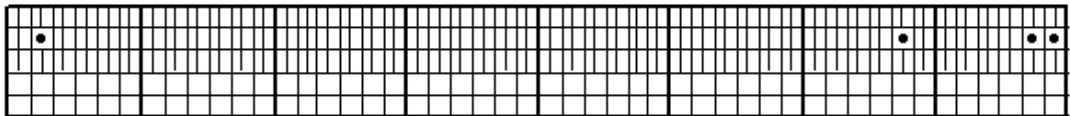
Dec. 11, 2013



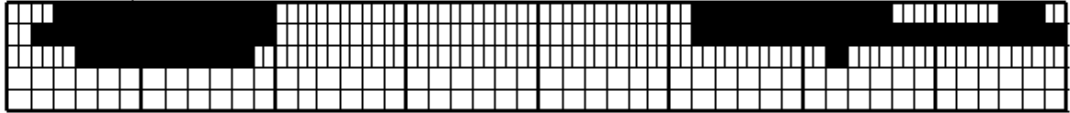
Dec. 12, 2013



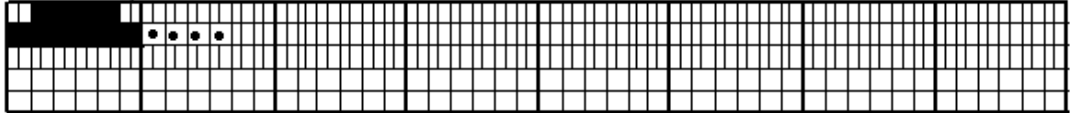
Dec. 13, 2013



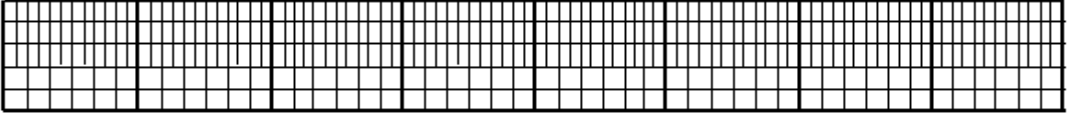
Dec. 14, 2013



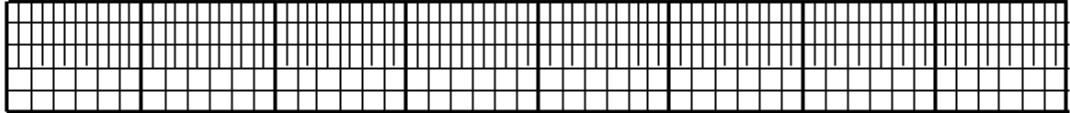
Dec. 15, 2013



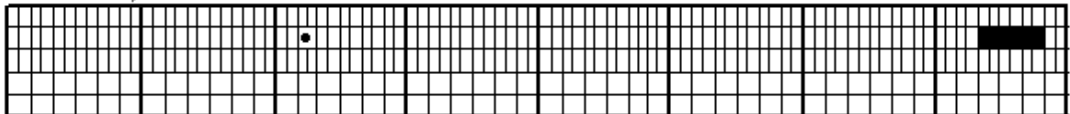
Dec. 16, 2013



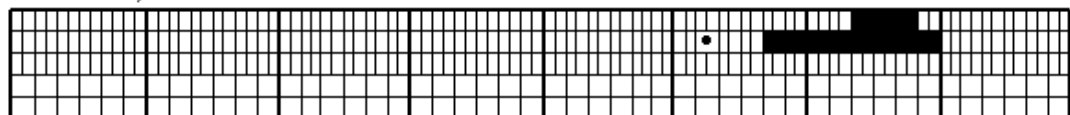
Dec. 17, 2013



Dec. 18, 2013



Dec. 19, 2013



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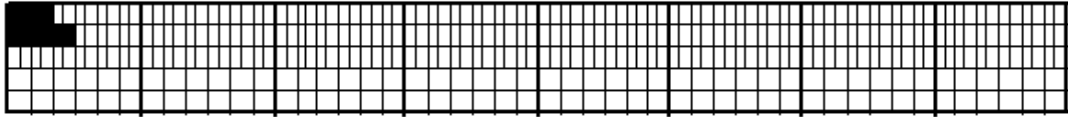
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Universal Time

Lovozero ascaplots

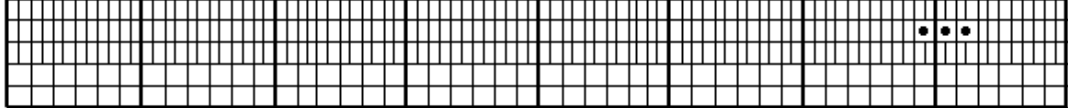
Dec. 20, 2013



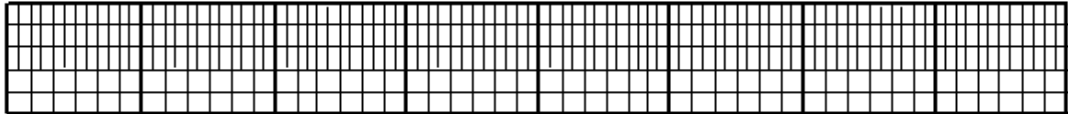
Dec. 21, 2013



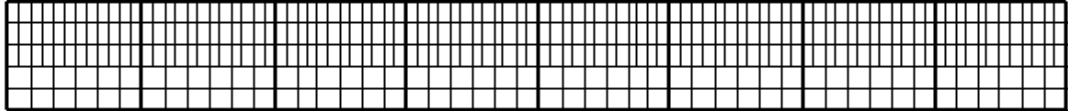
Dec. 22, 2013



Dec. 23, 2013



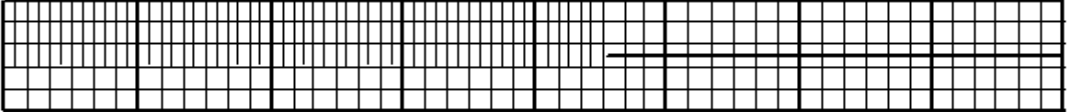
Dec. 24, 2013



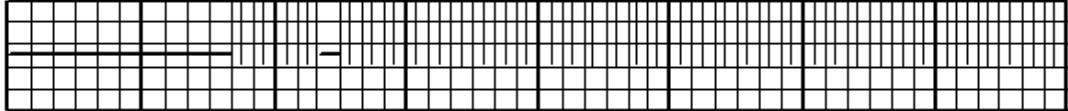
Dec. 25, 2013



Dec. 26, 2013



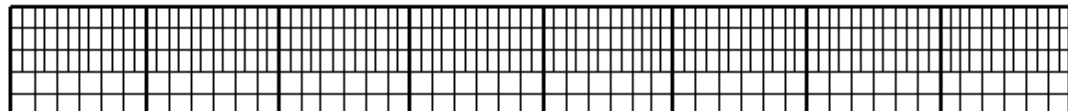
Dec. 27, 2013



Dec. 28, 2013



Dec. 29, 2013

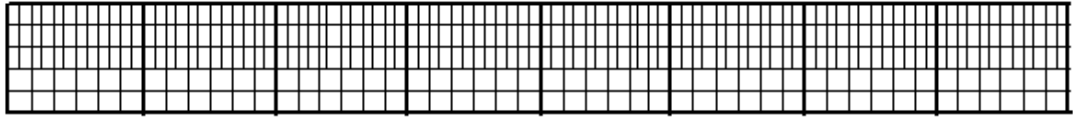


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Universal Time

Lovozero ascaplots

Dec. 30, 2013



Dec. 31, 2013



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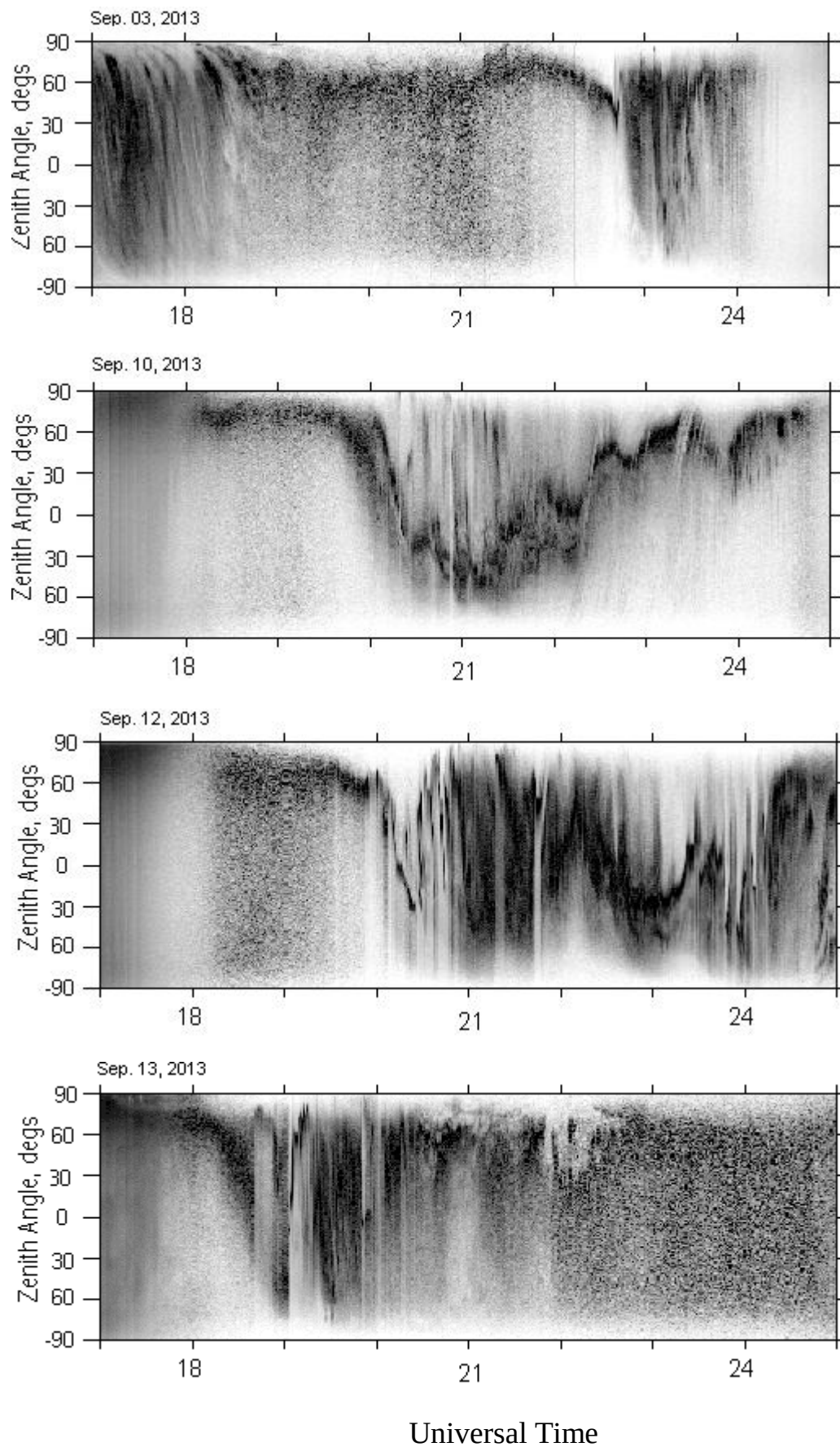
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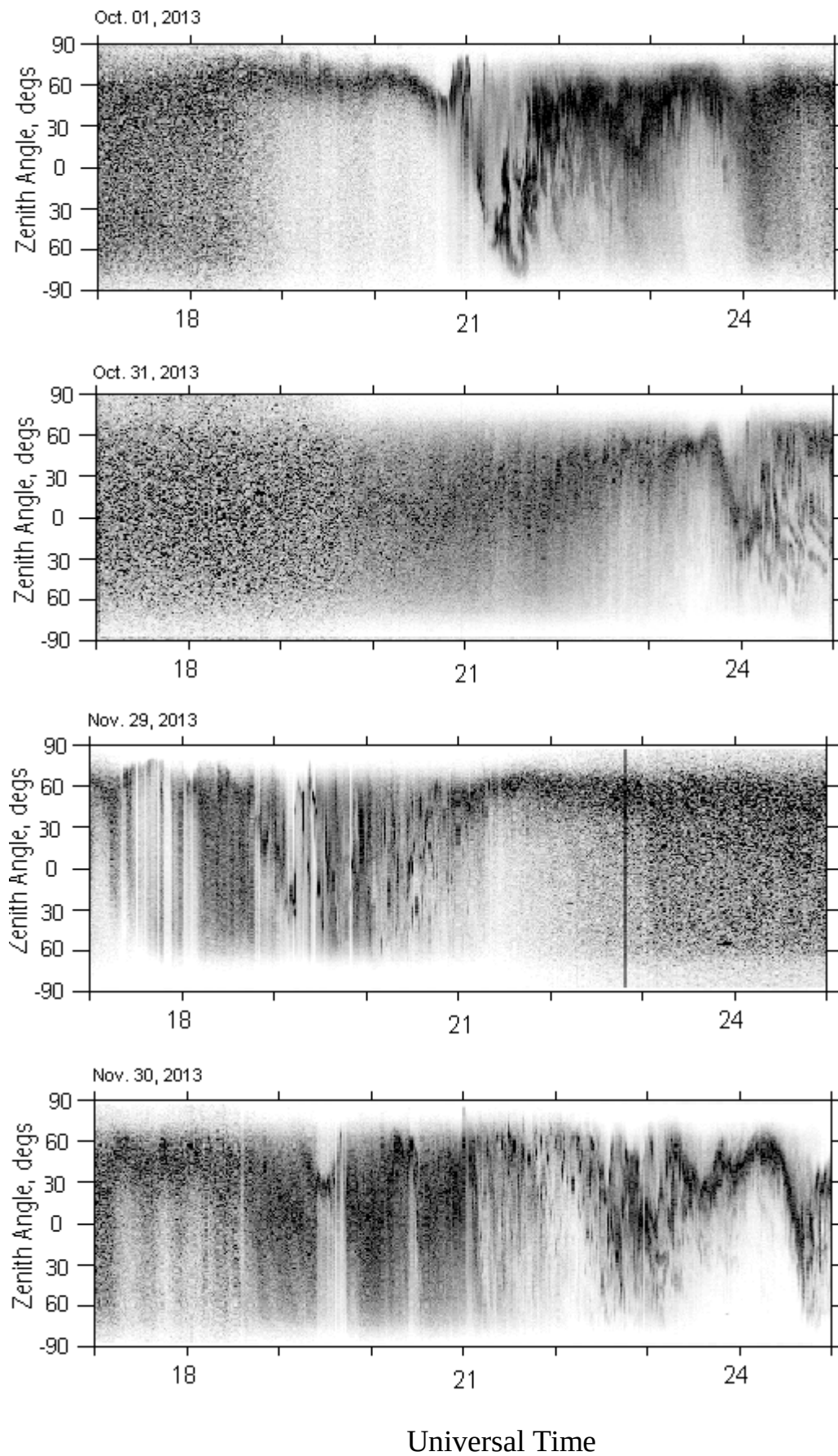
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Universal Time

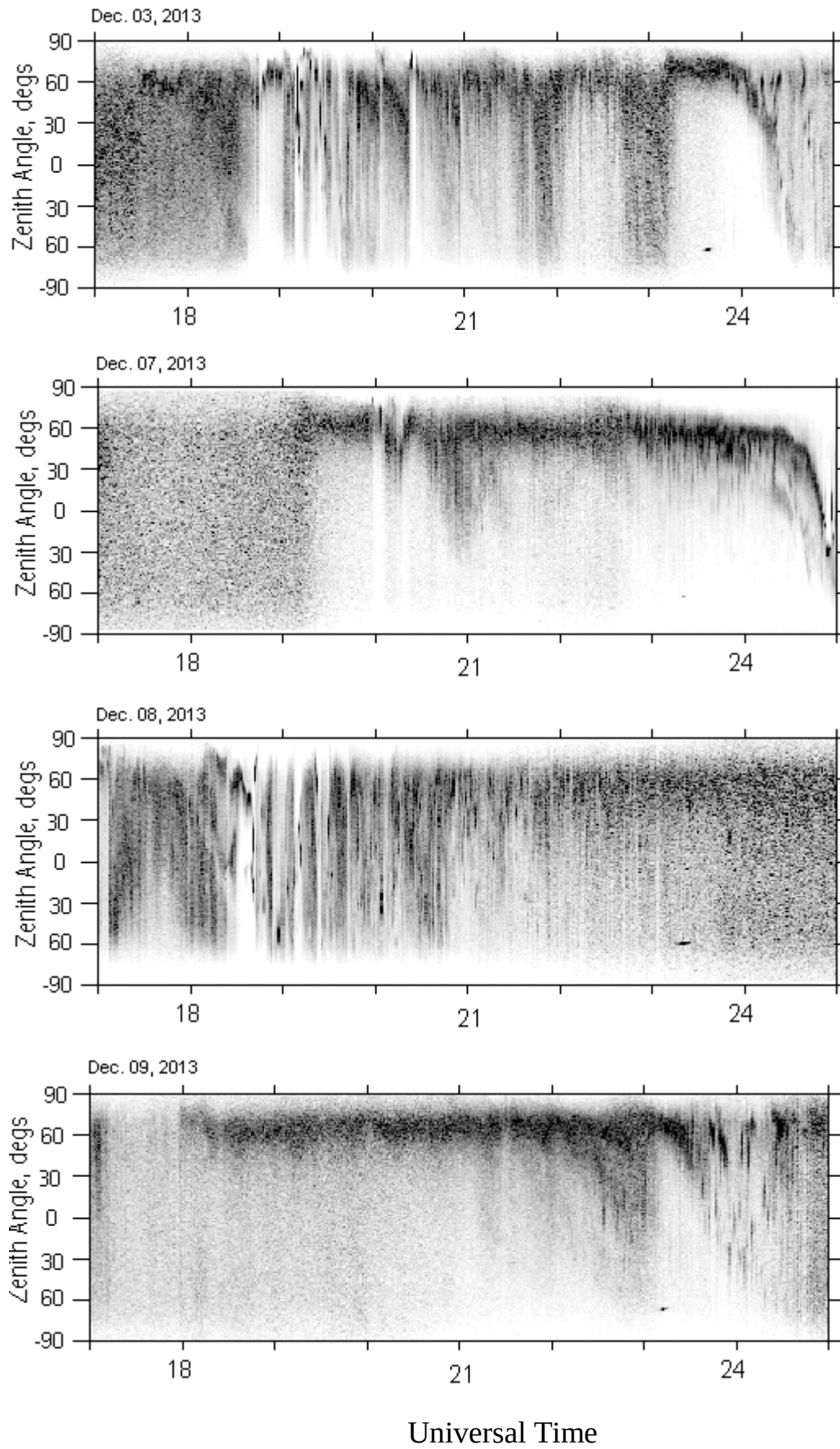
Lovozero TV keograms



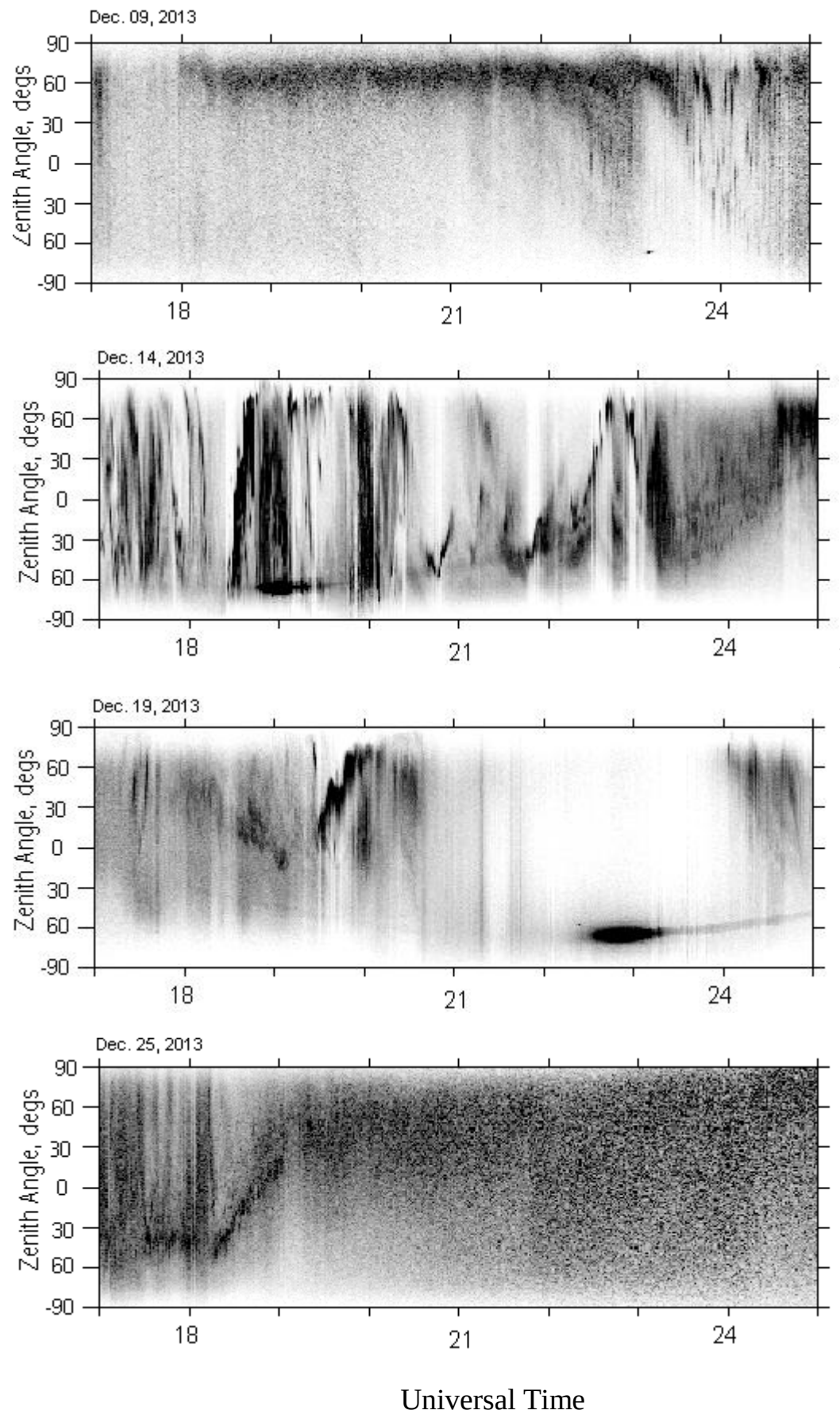
Lovozero TV keograms



Lovozero TV keograms



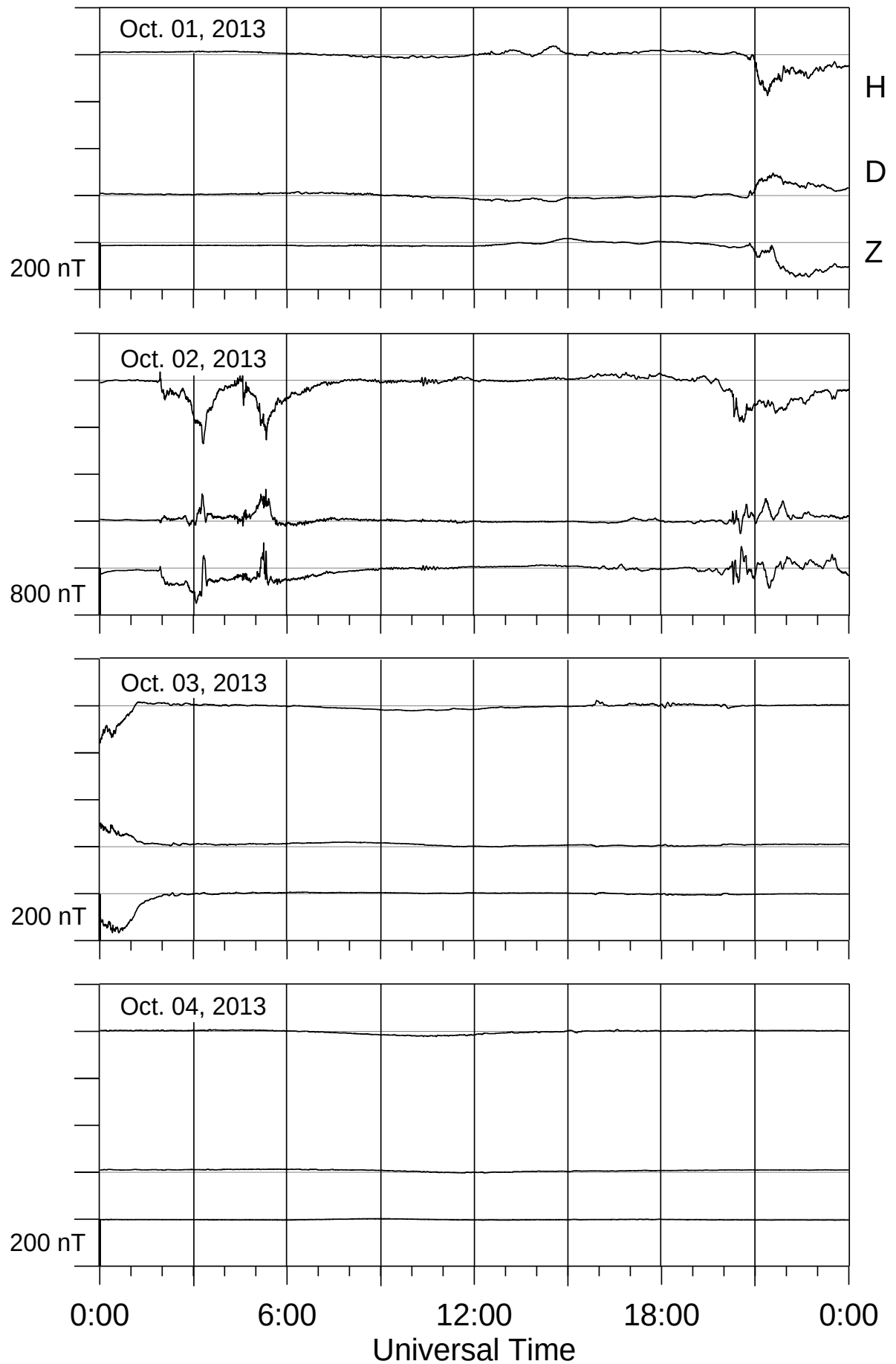
Lovozero TV keograms



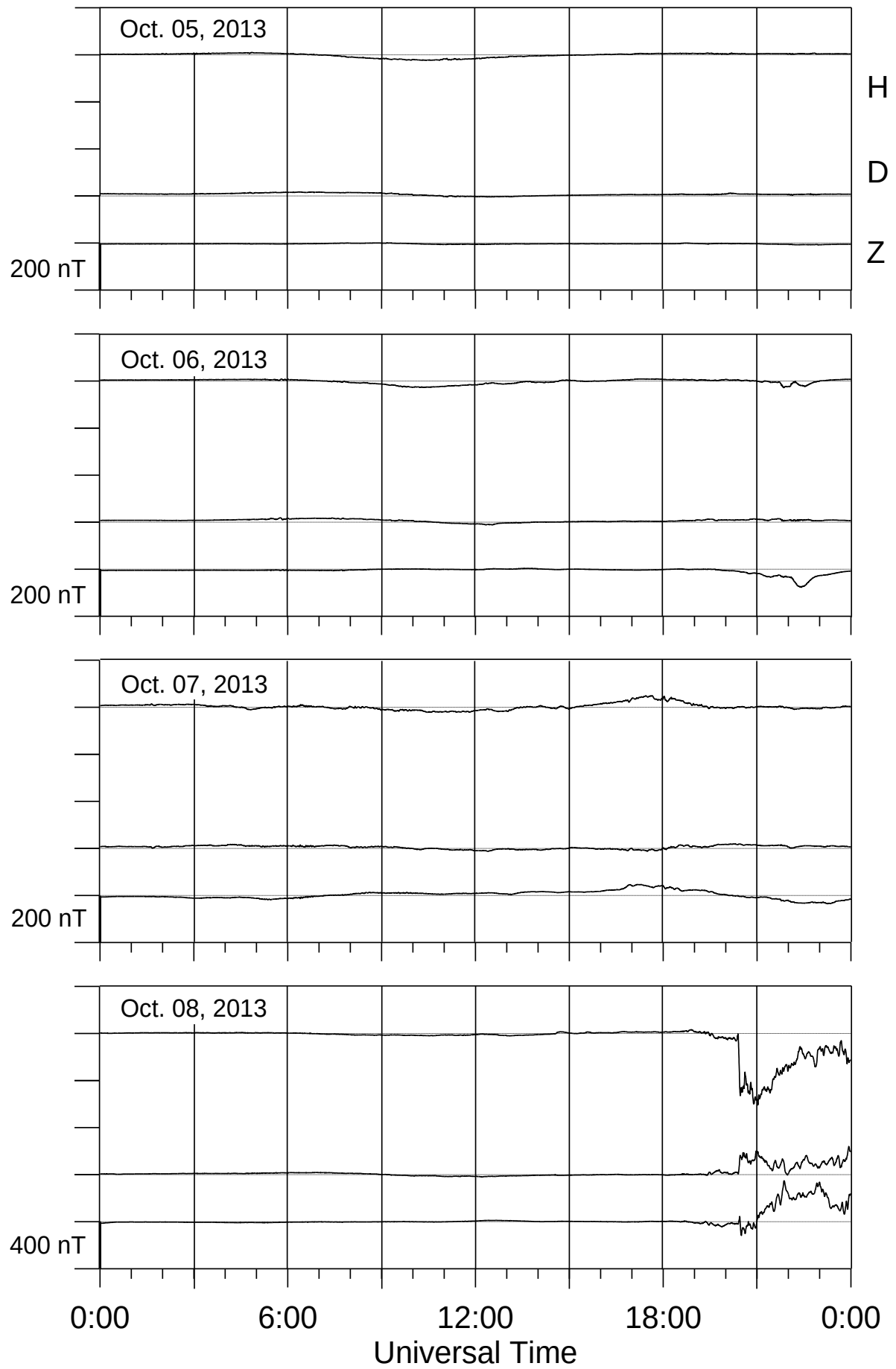
LOVOZERO MAGNETOGRAMS

October - December 2013

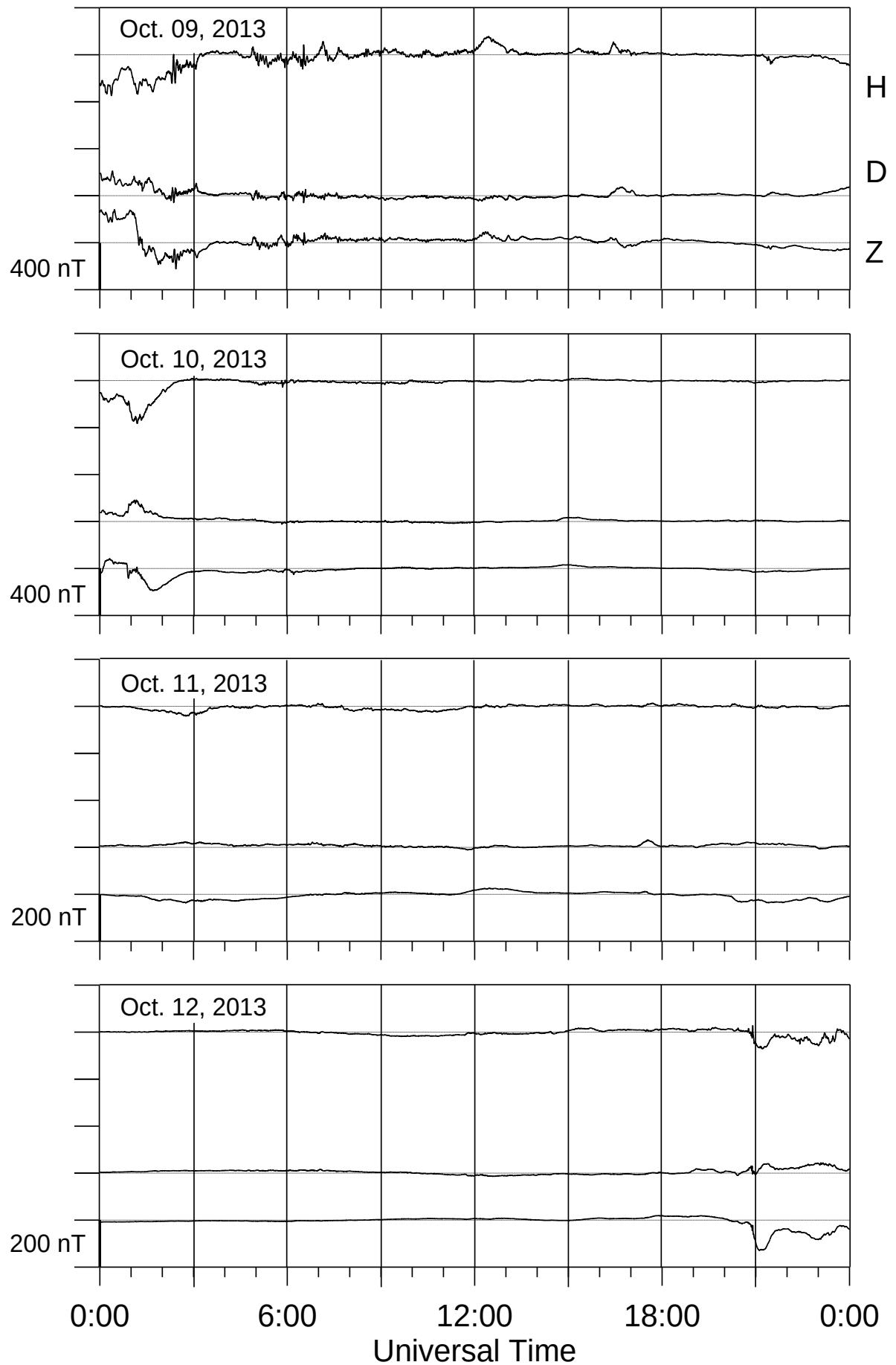
Lovozero magnetometer



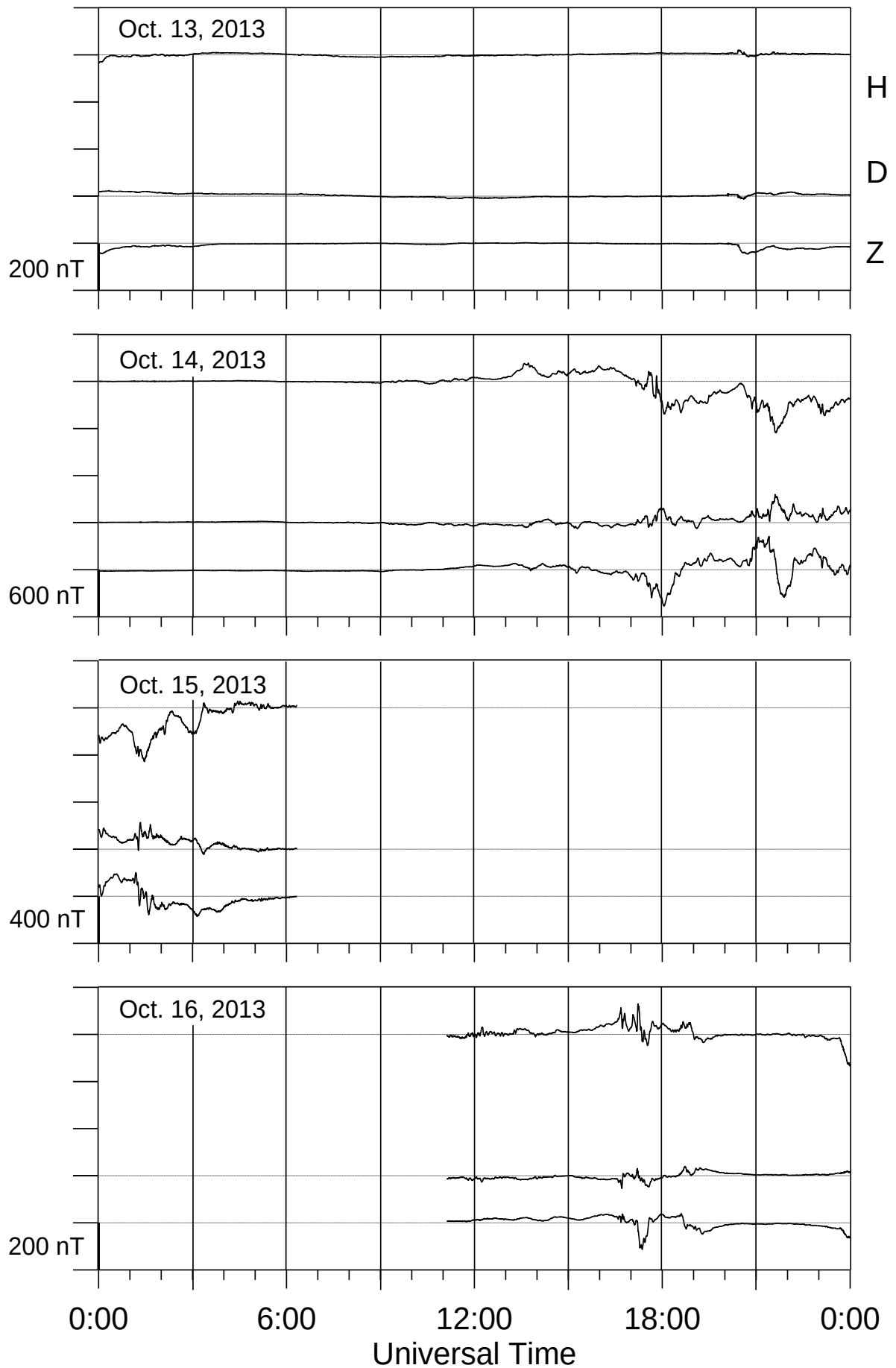
Lovozero magnetometer



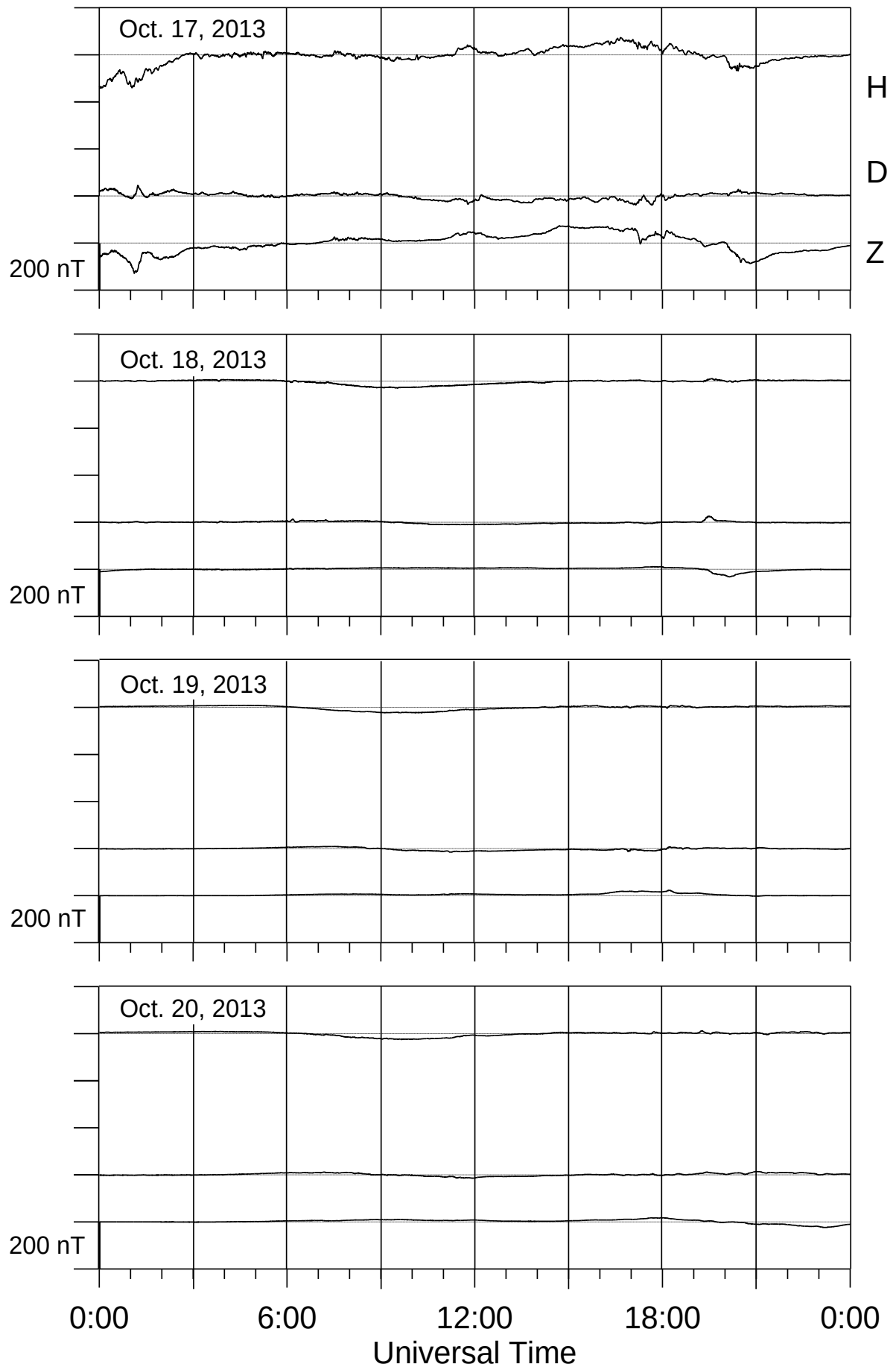
Lovozero magnetometer



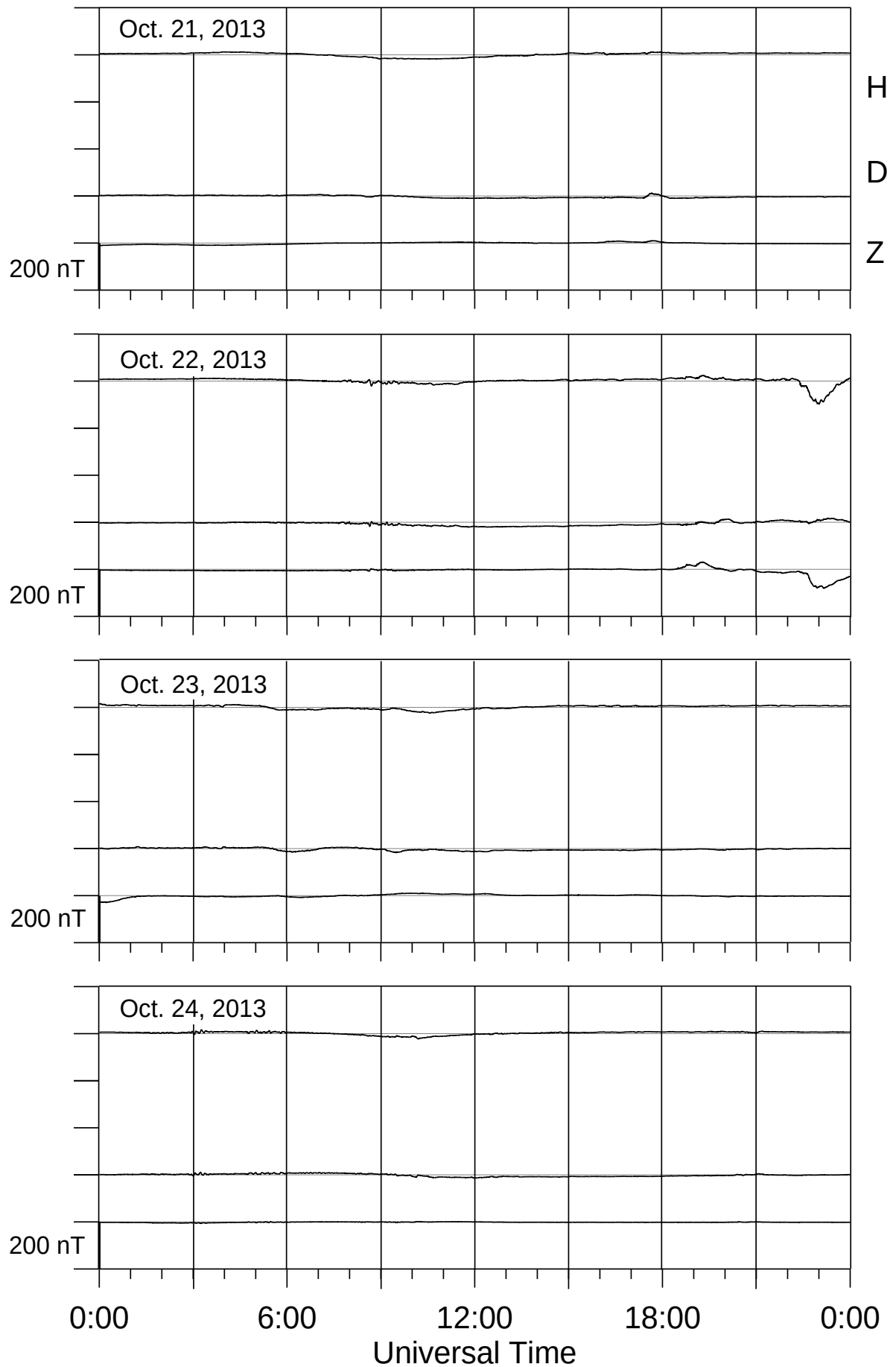
Lovozero magnetometer



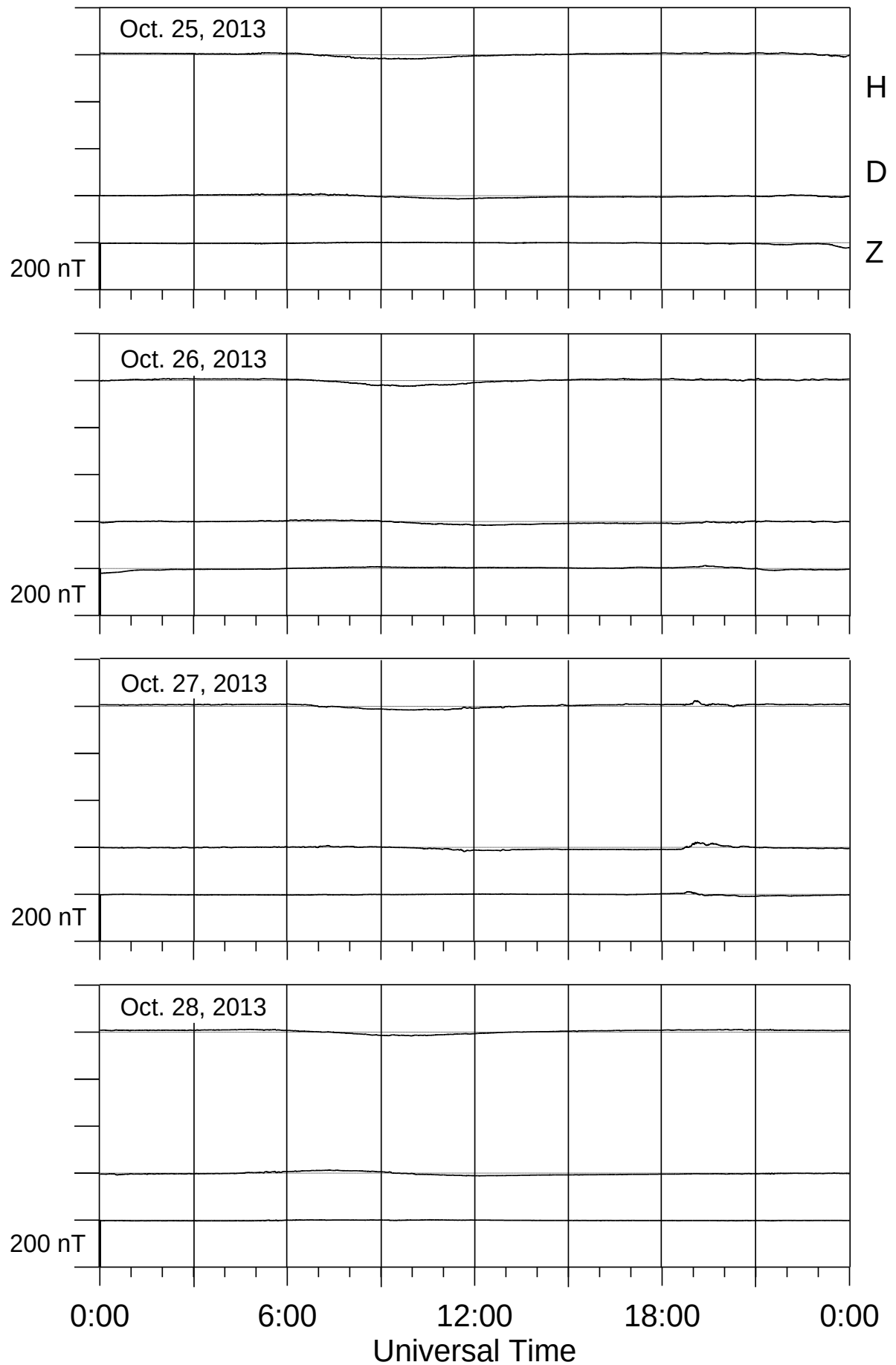
Lovozero magnetometer



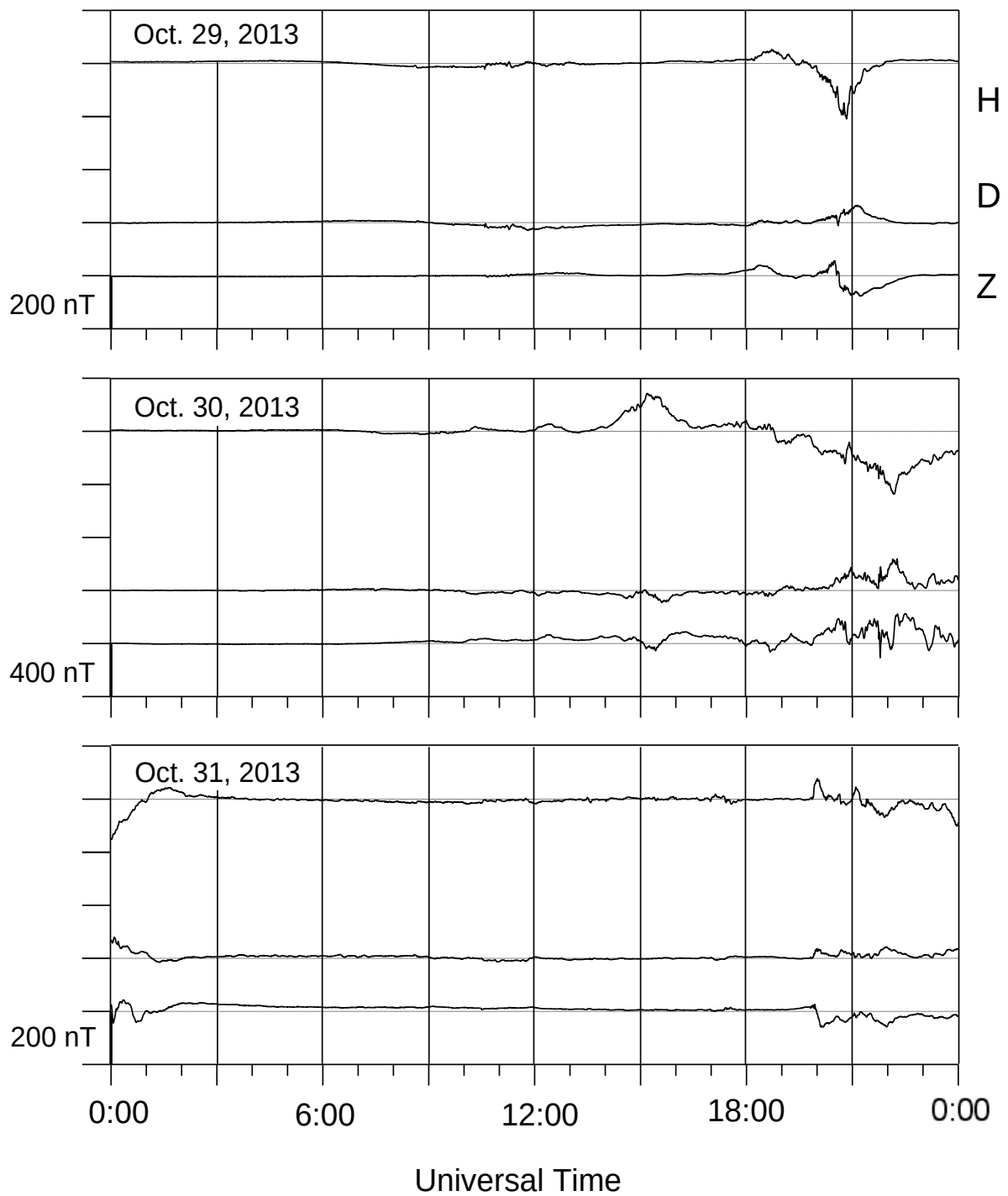
Lovozero magnetometer



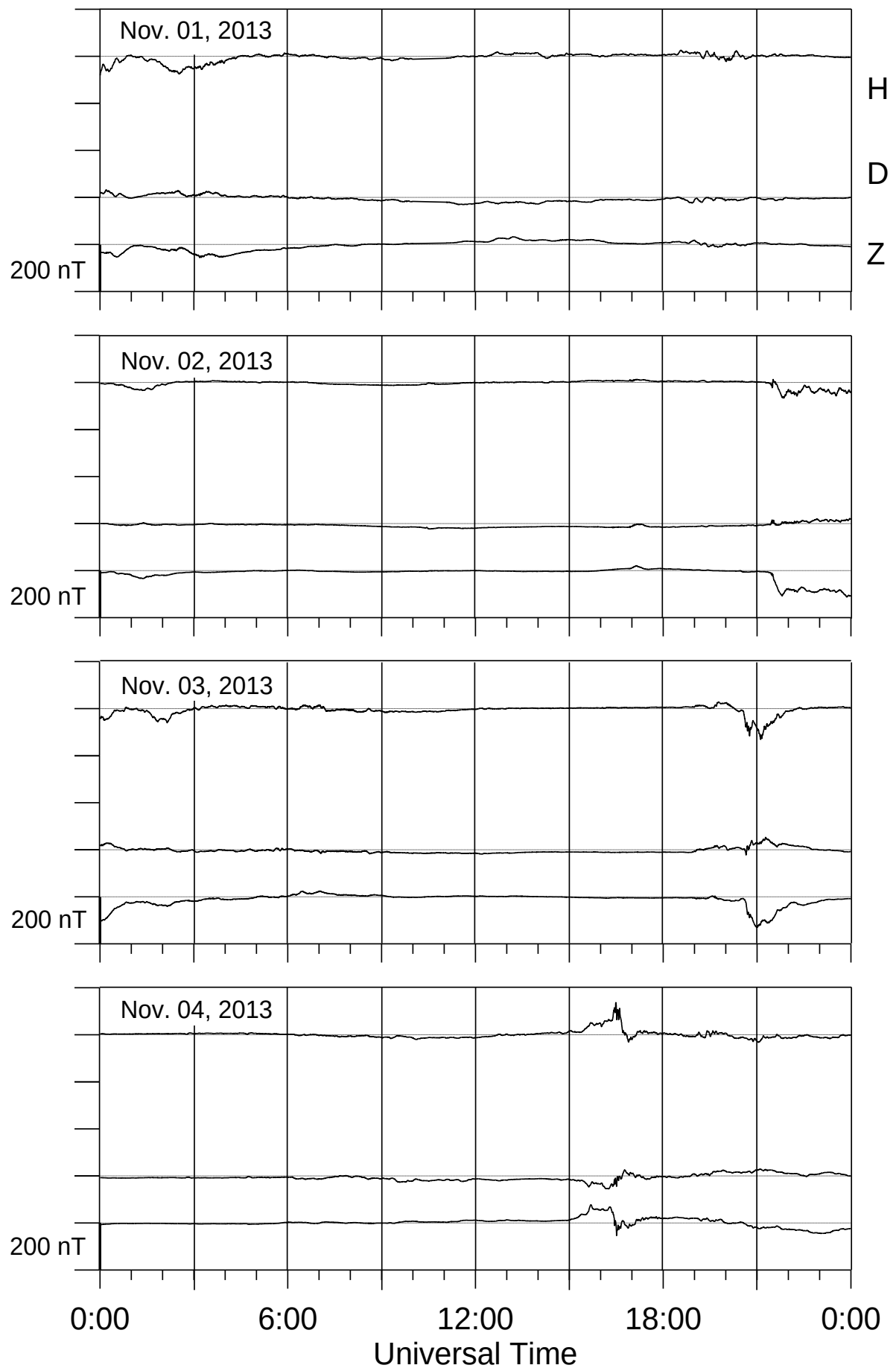
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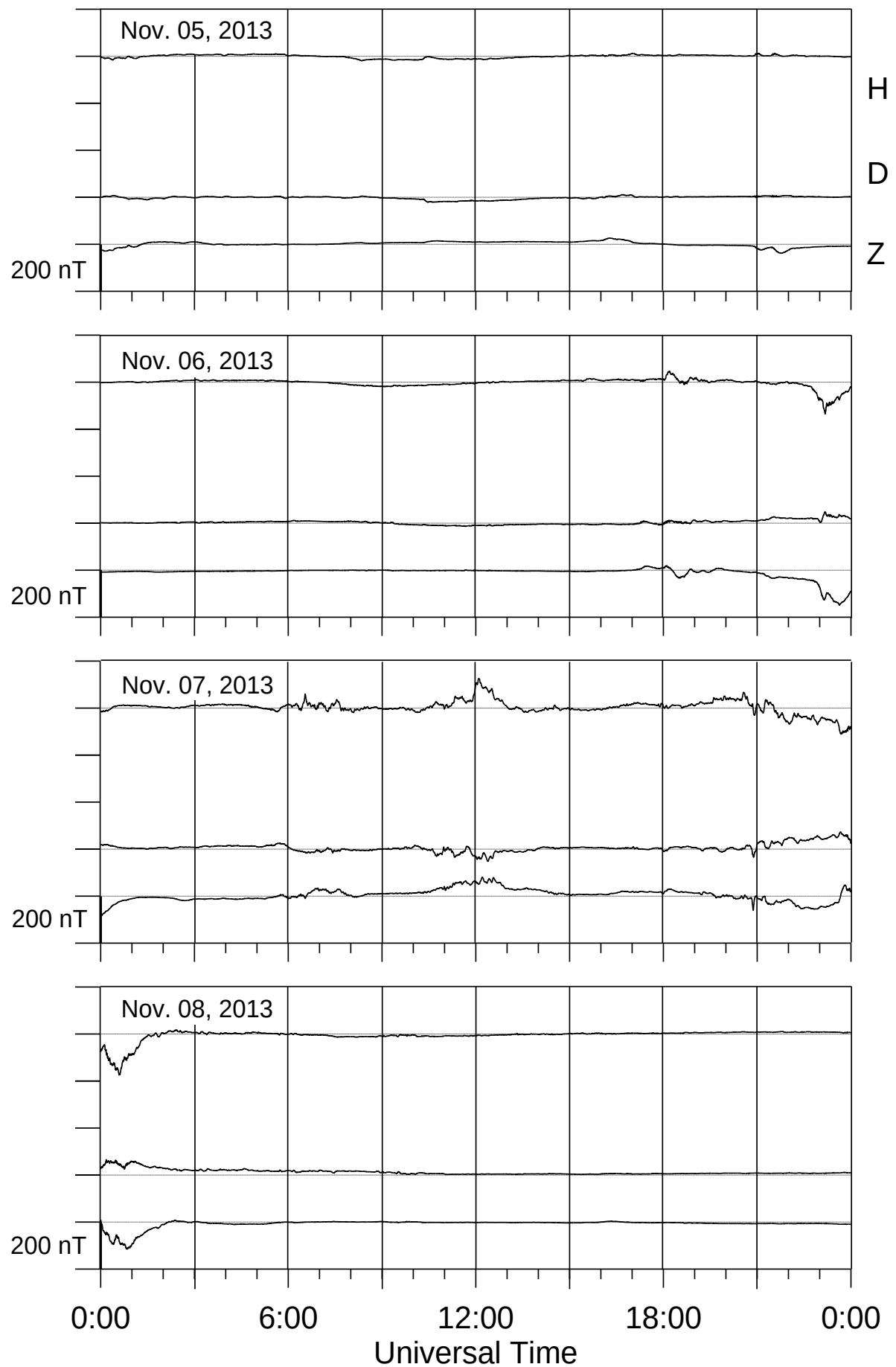
Lovozero magnetometer



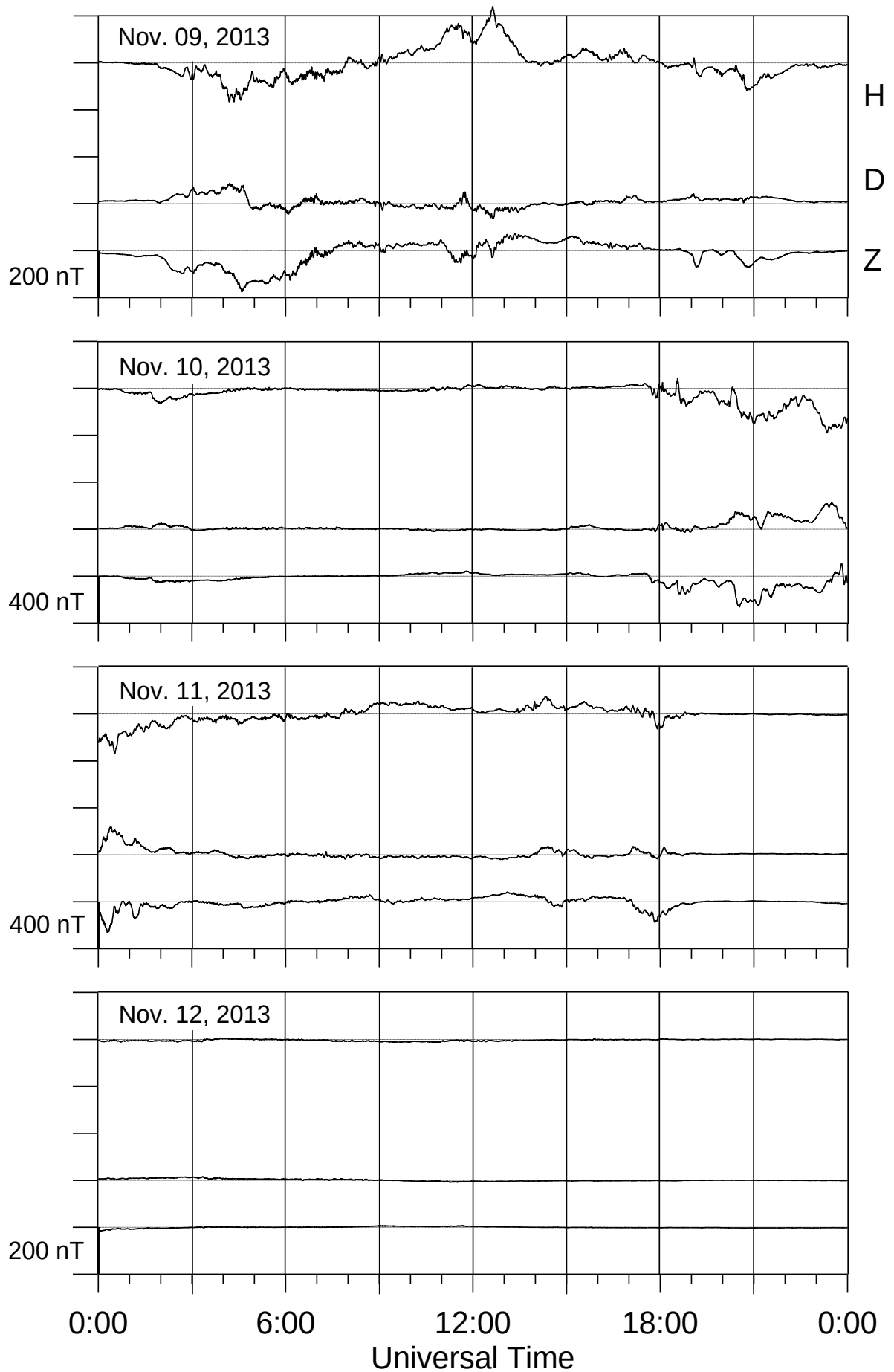
Lovozero magnetometer



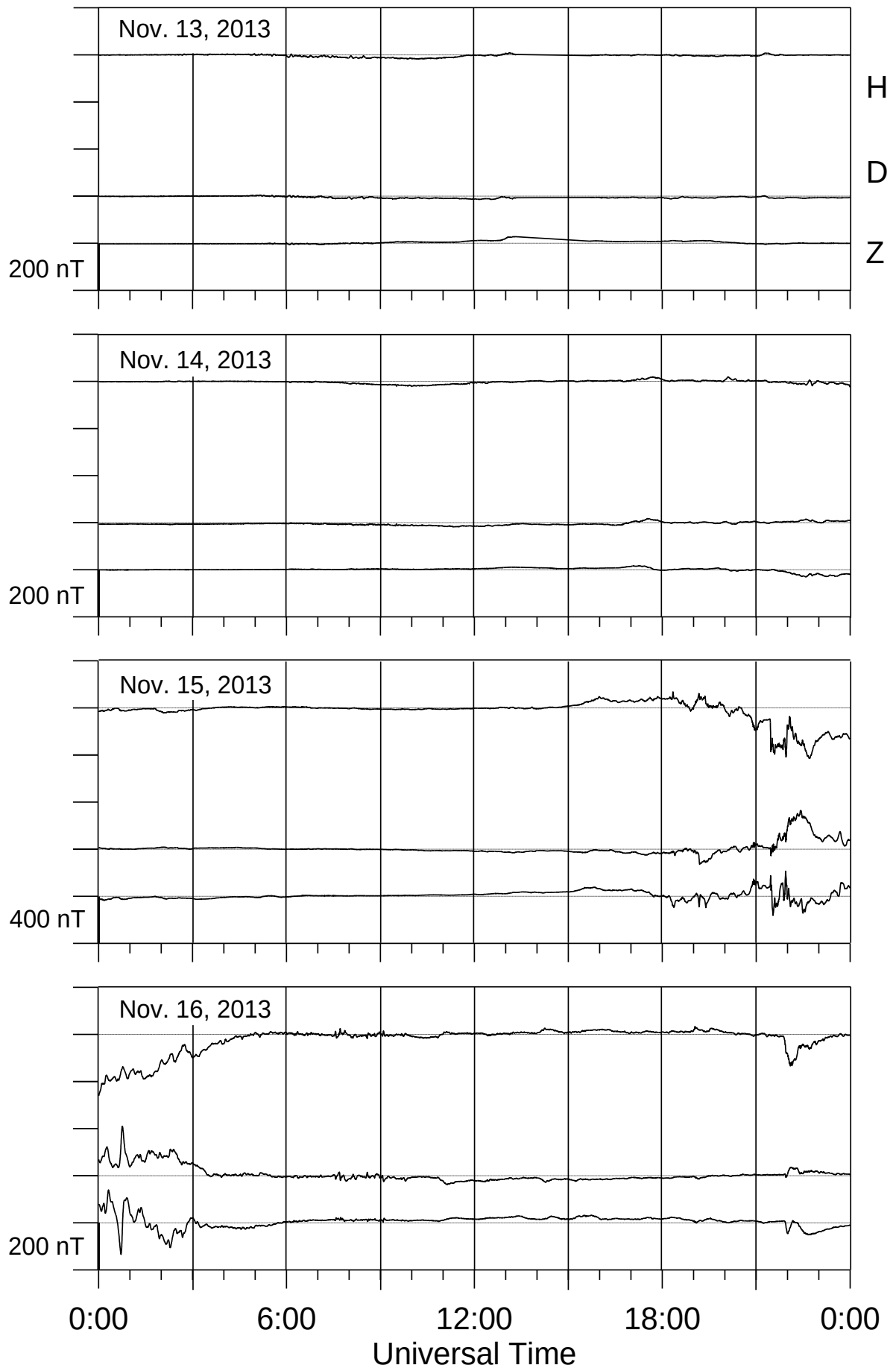
Lovozero magnetometer



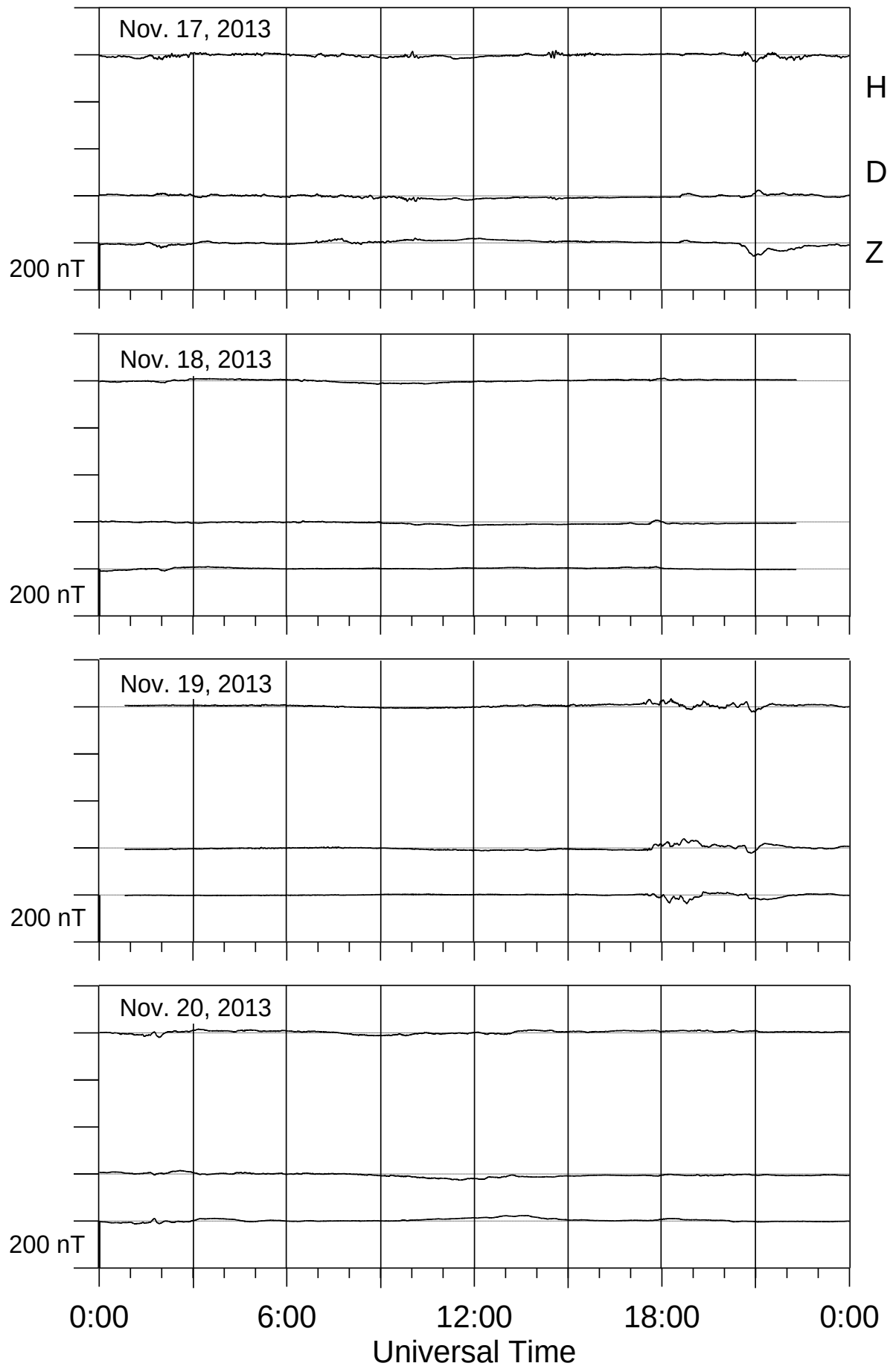
Lovozero magnetometer



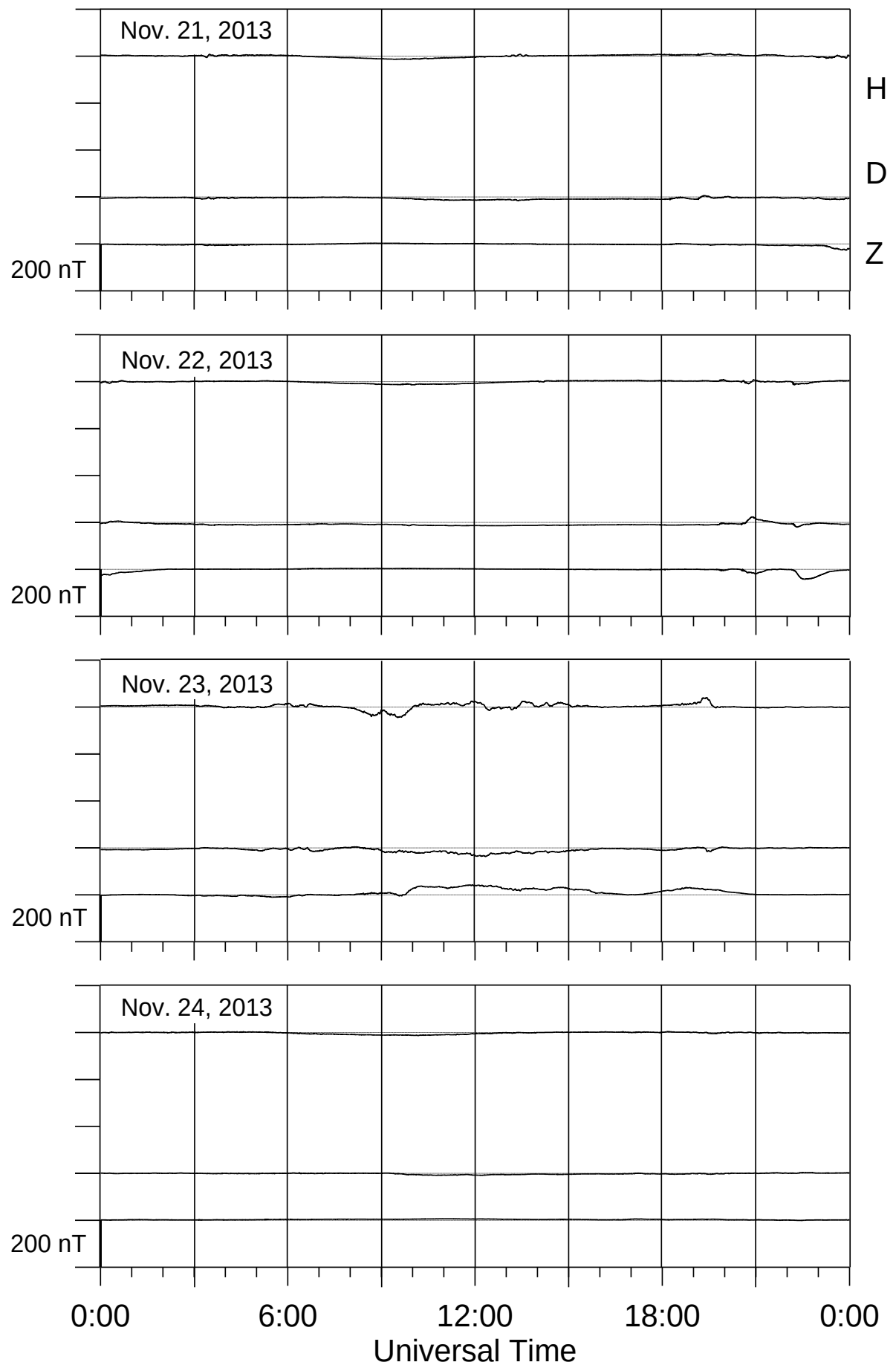
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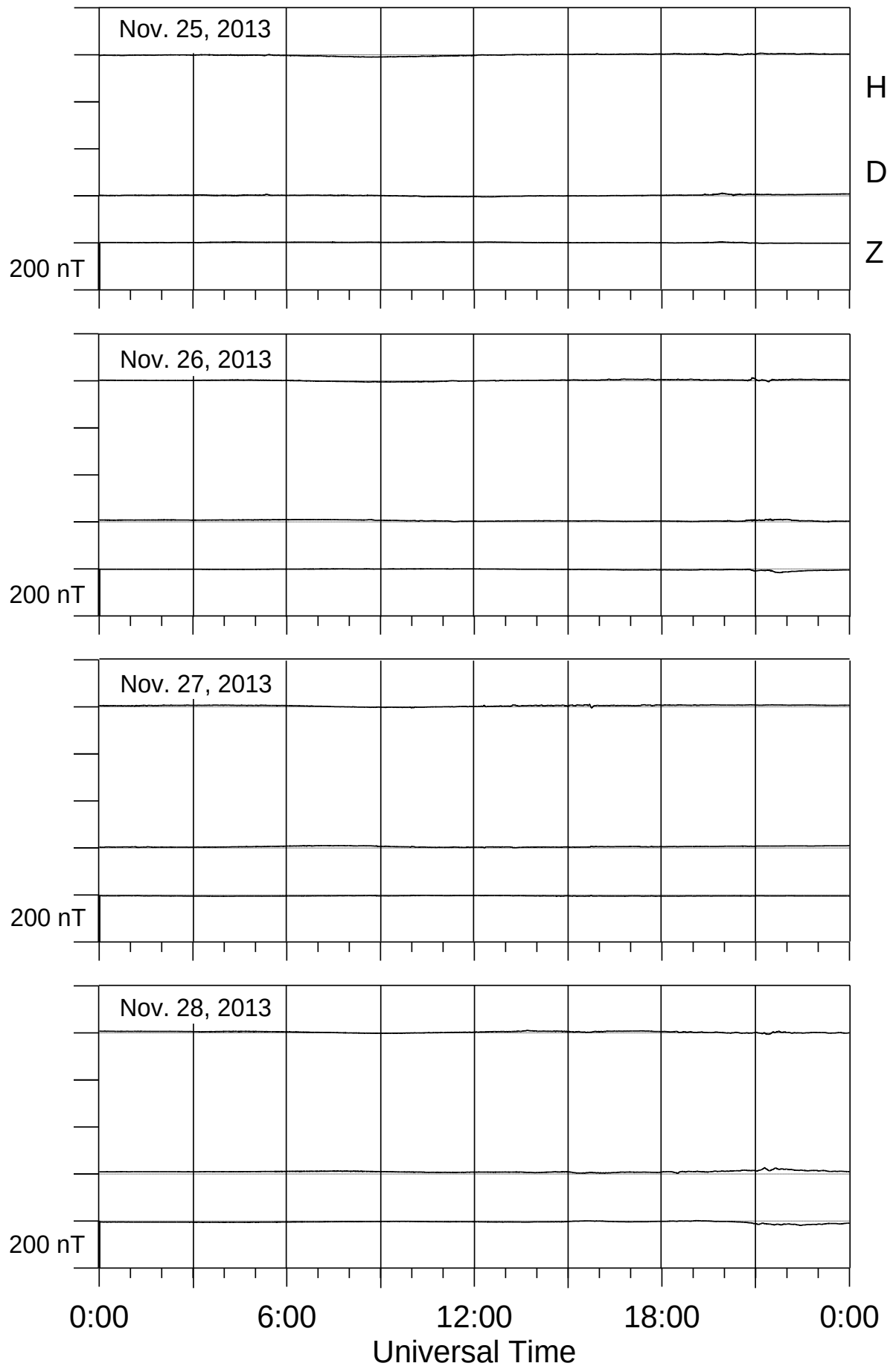
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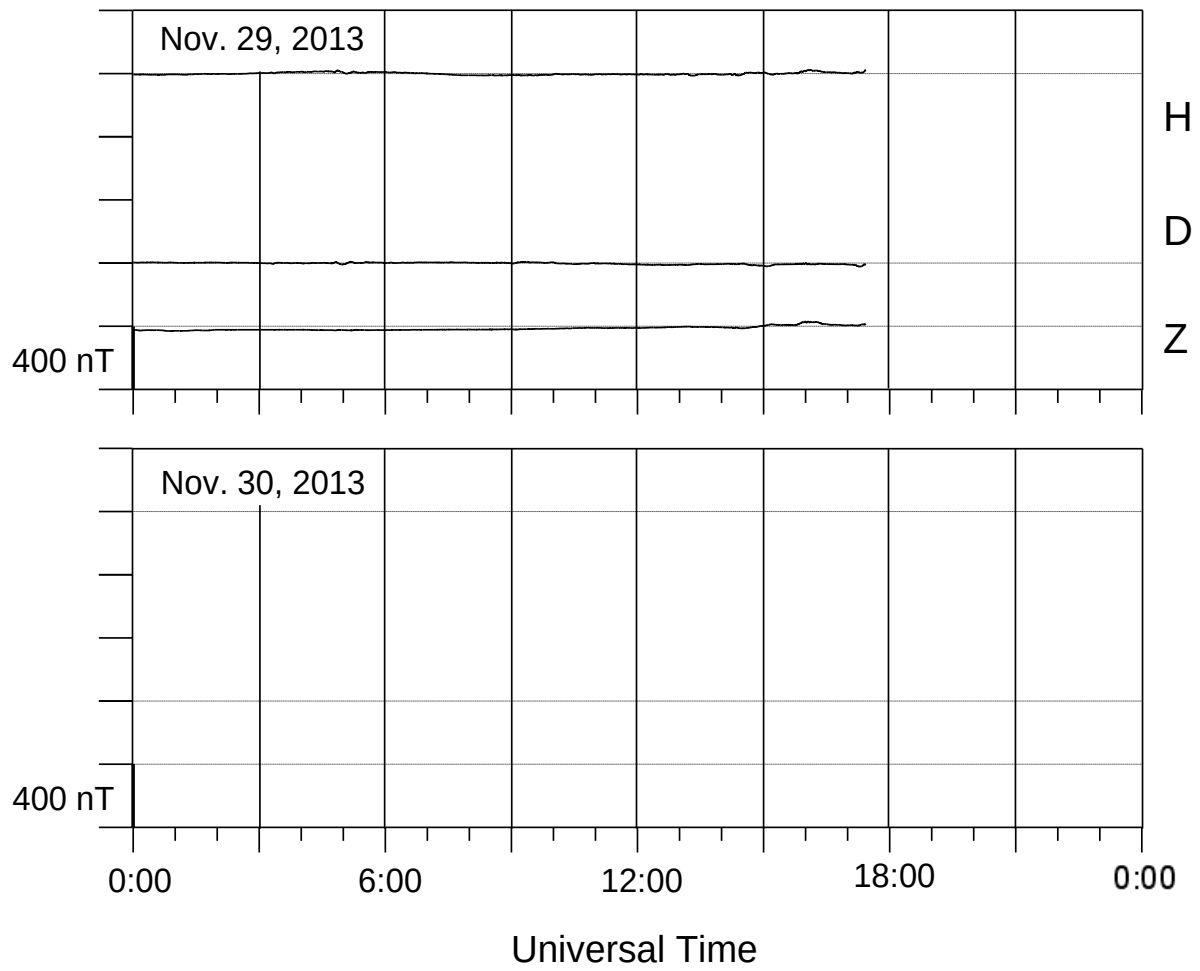
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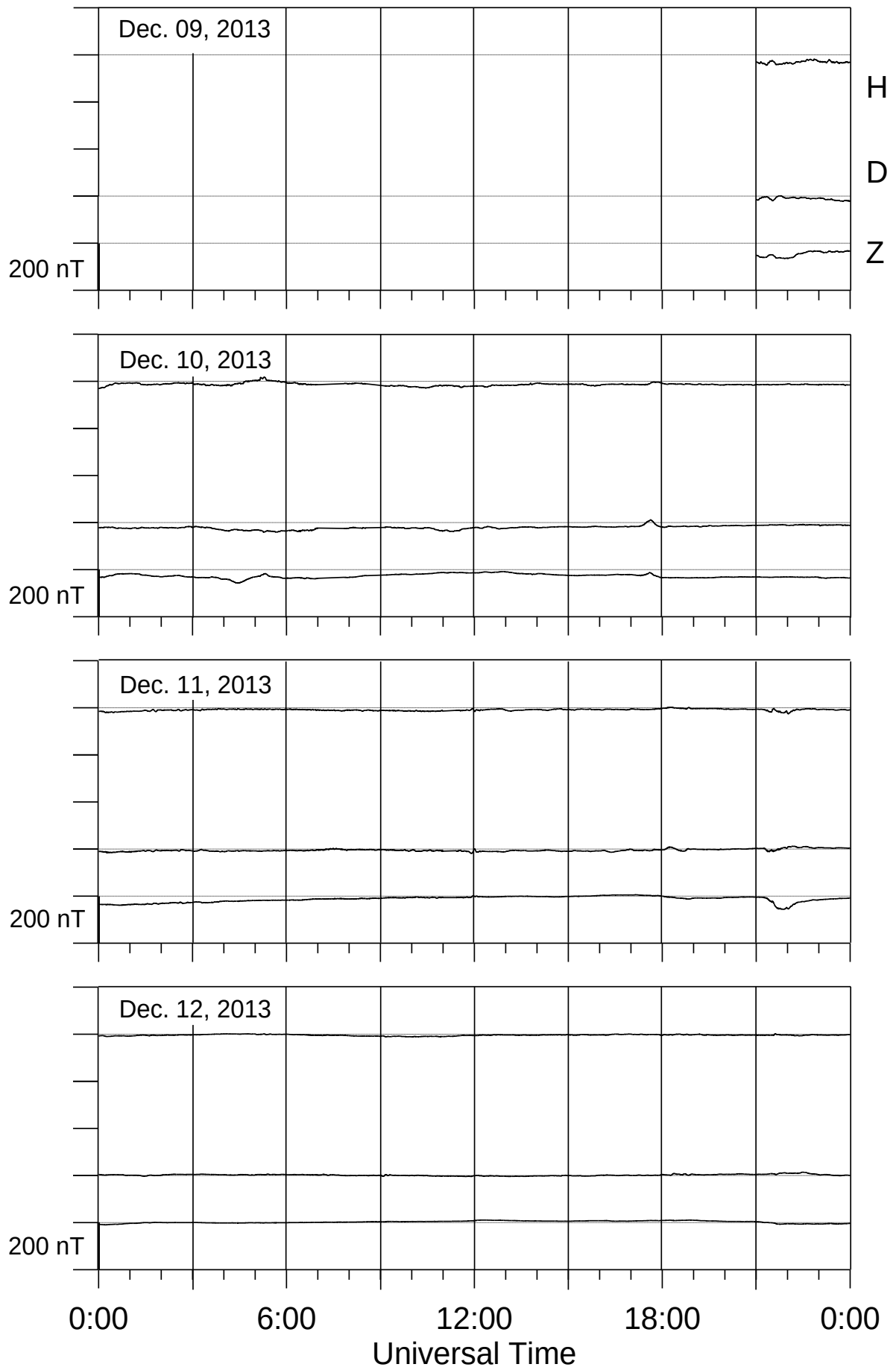
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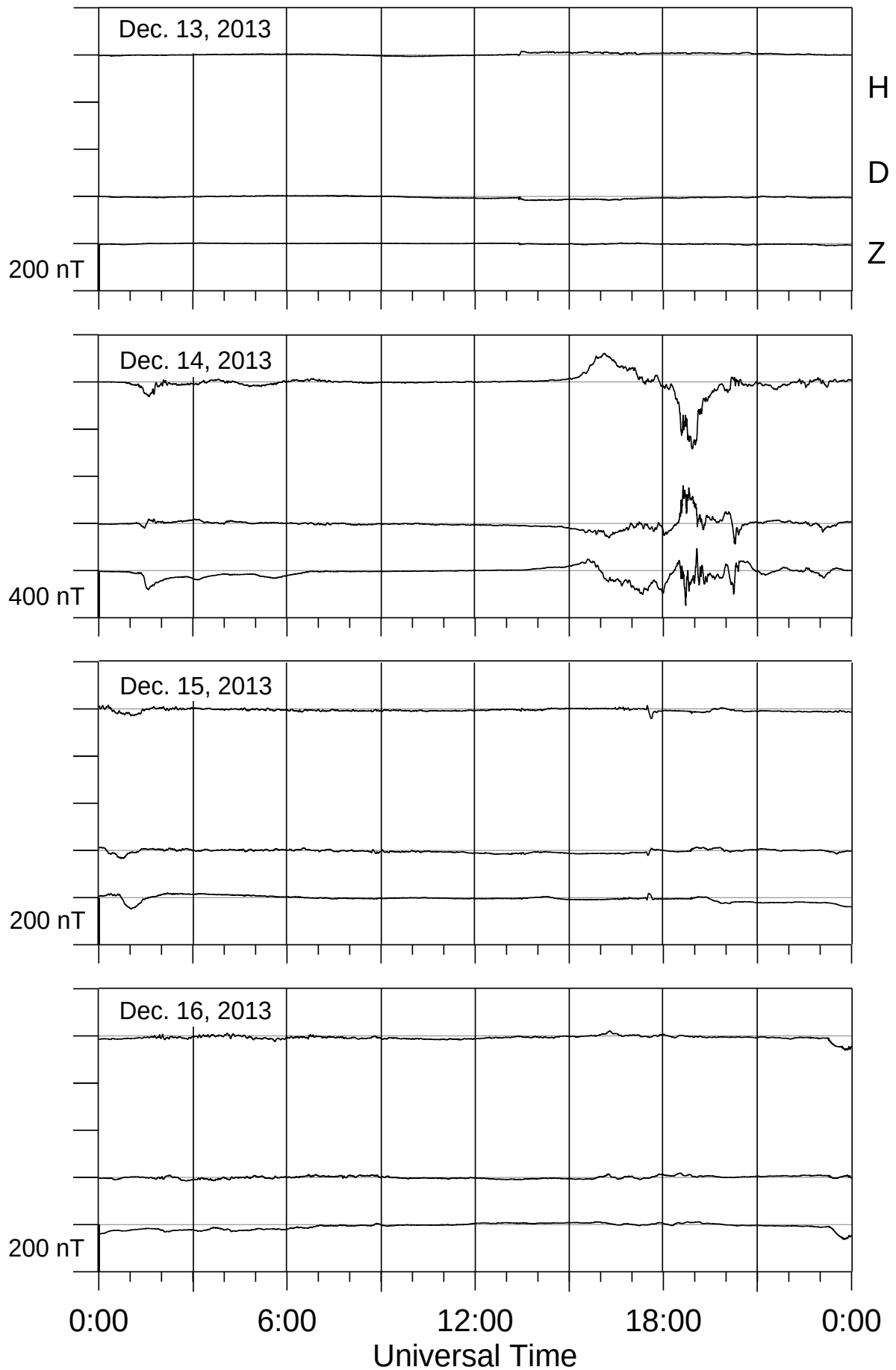
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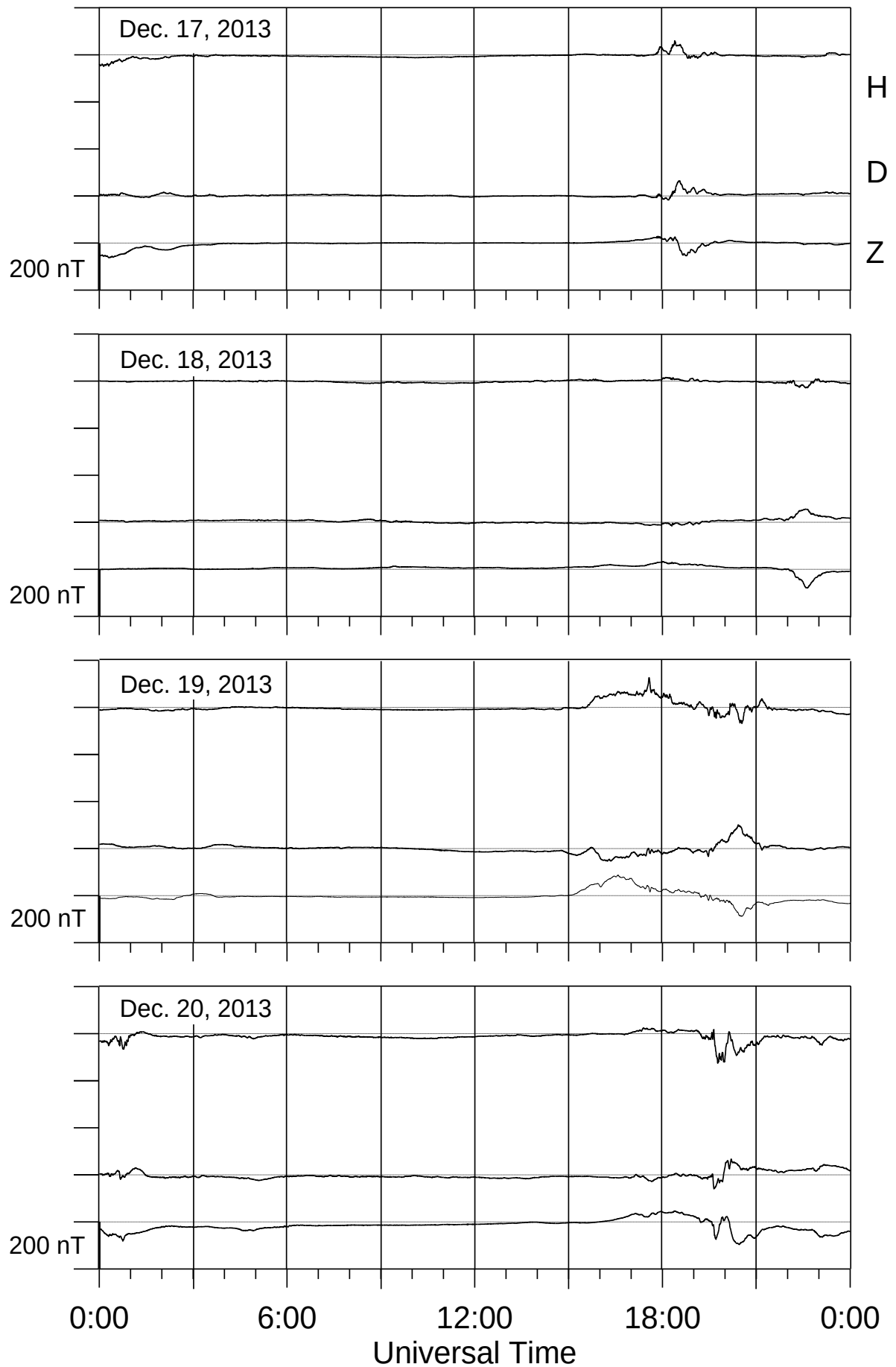
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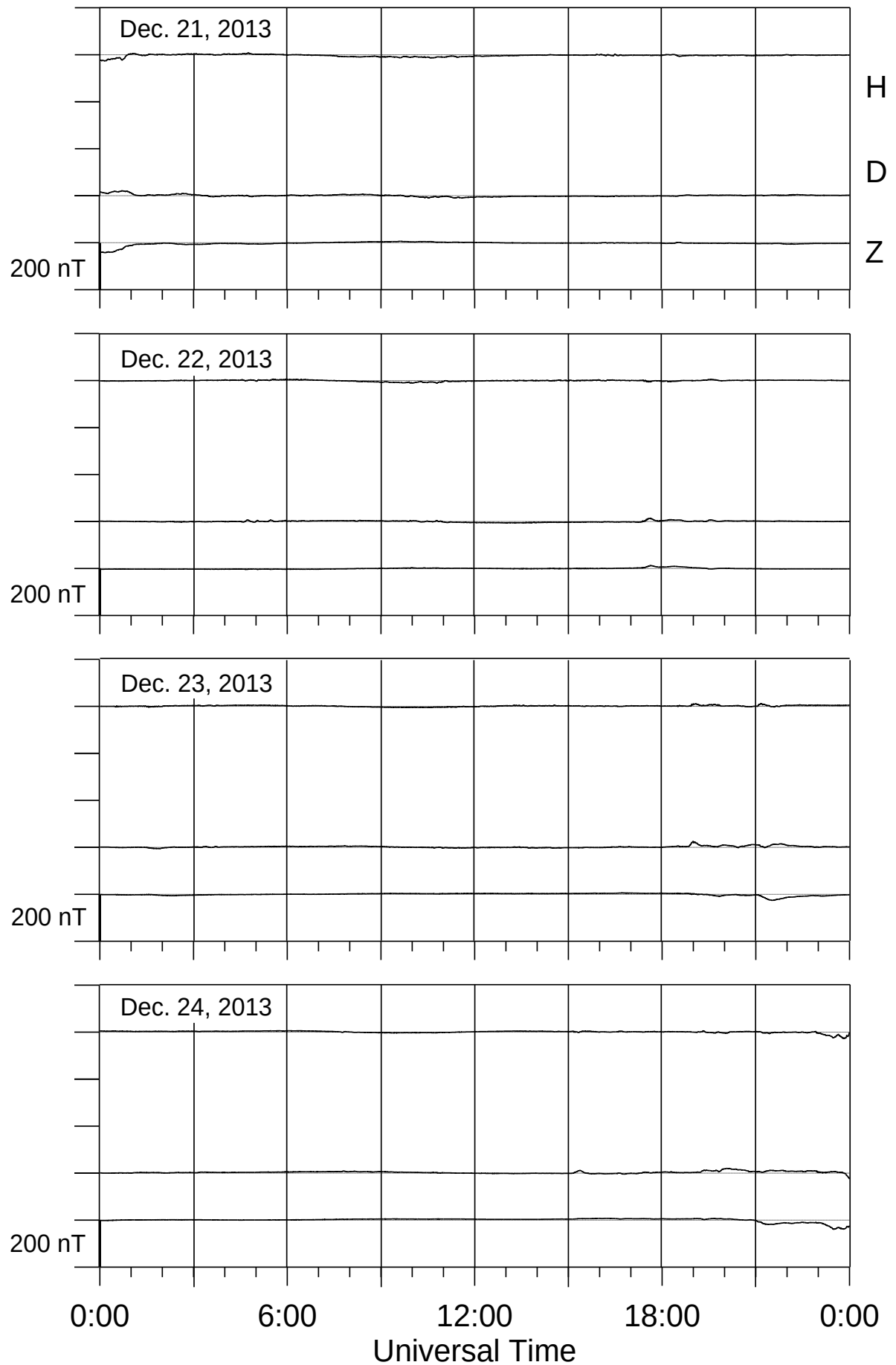
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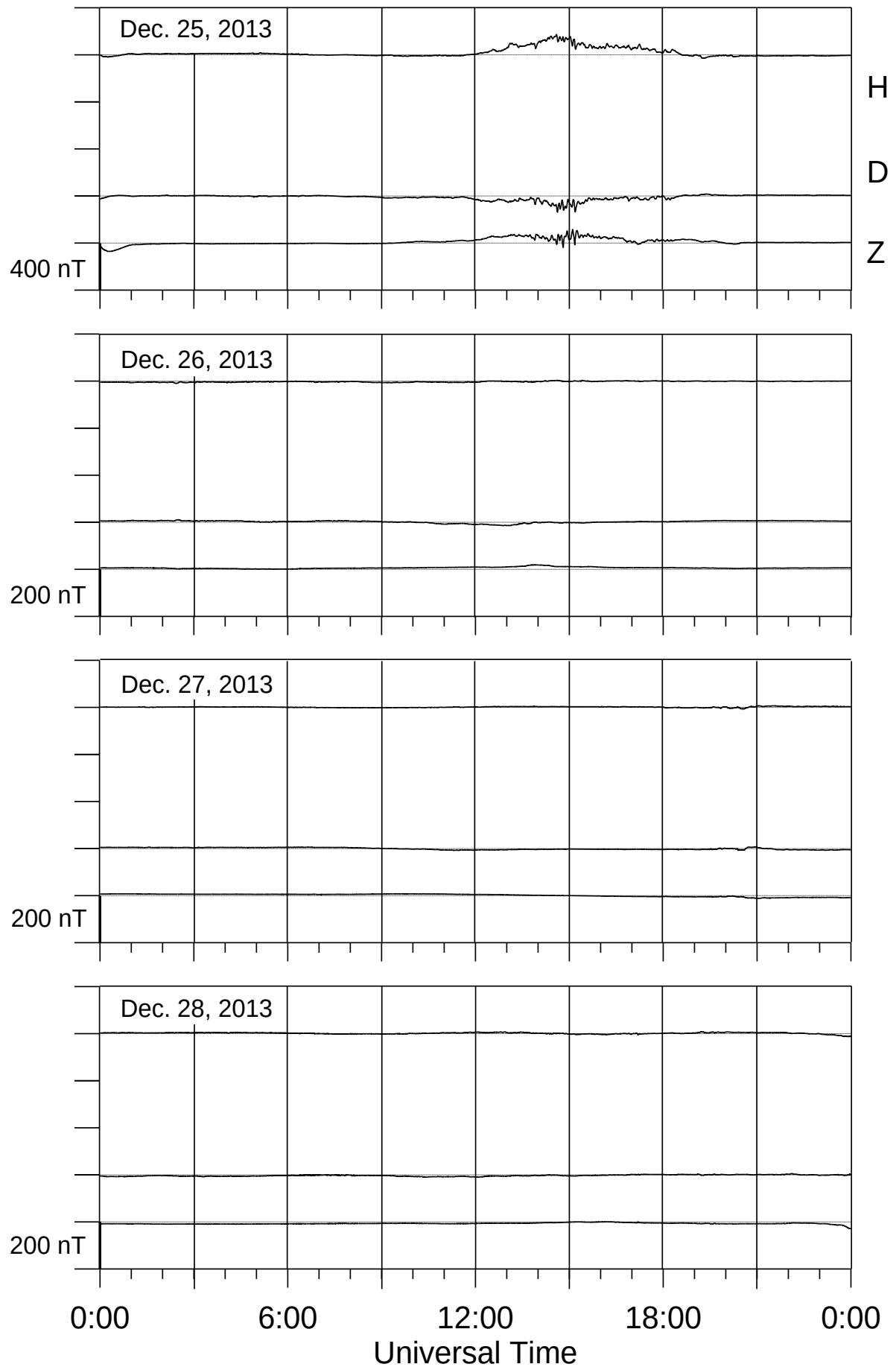
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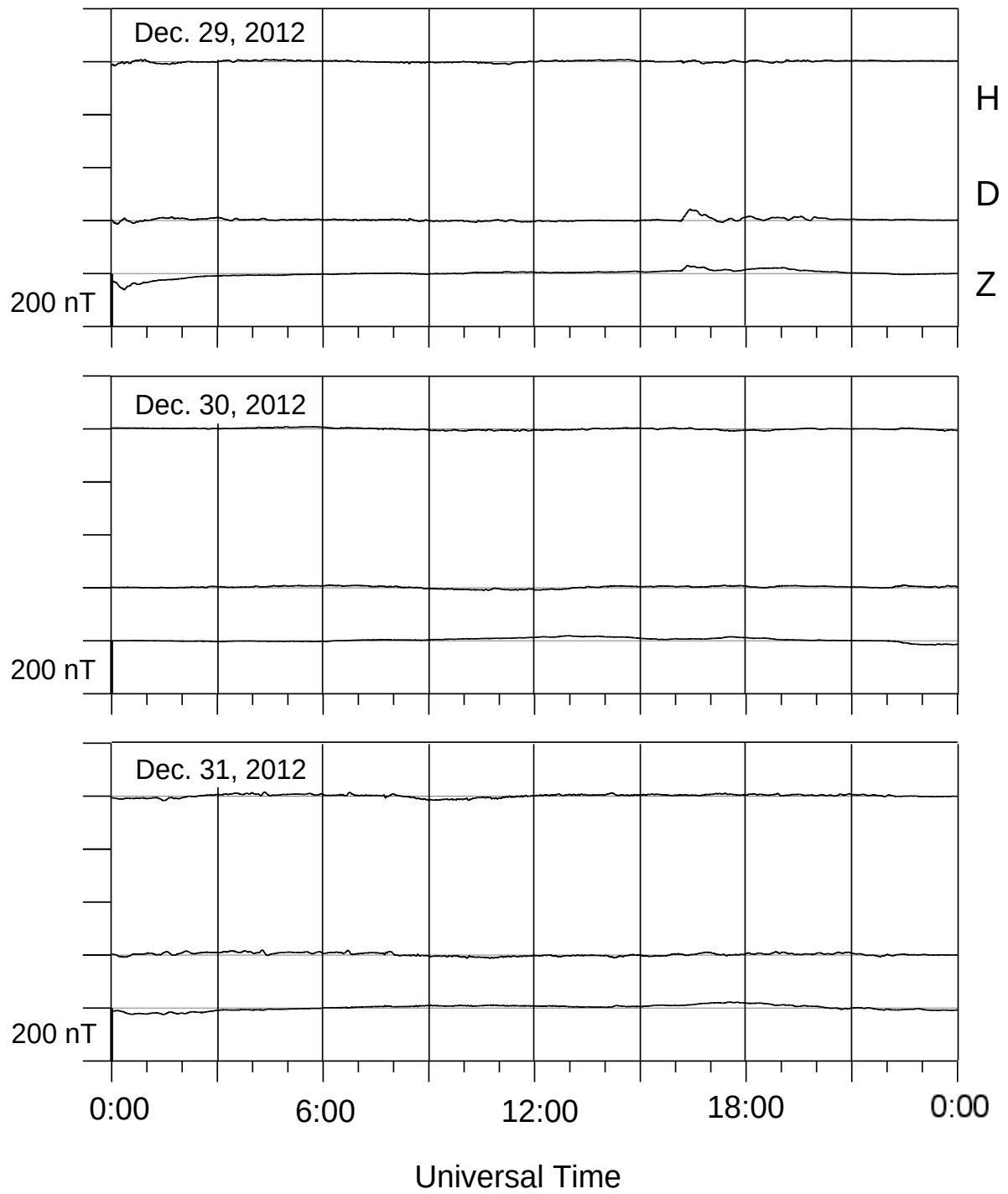
Lovozero magnetometer



Lovozero magnetometer



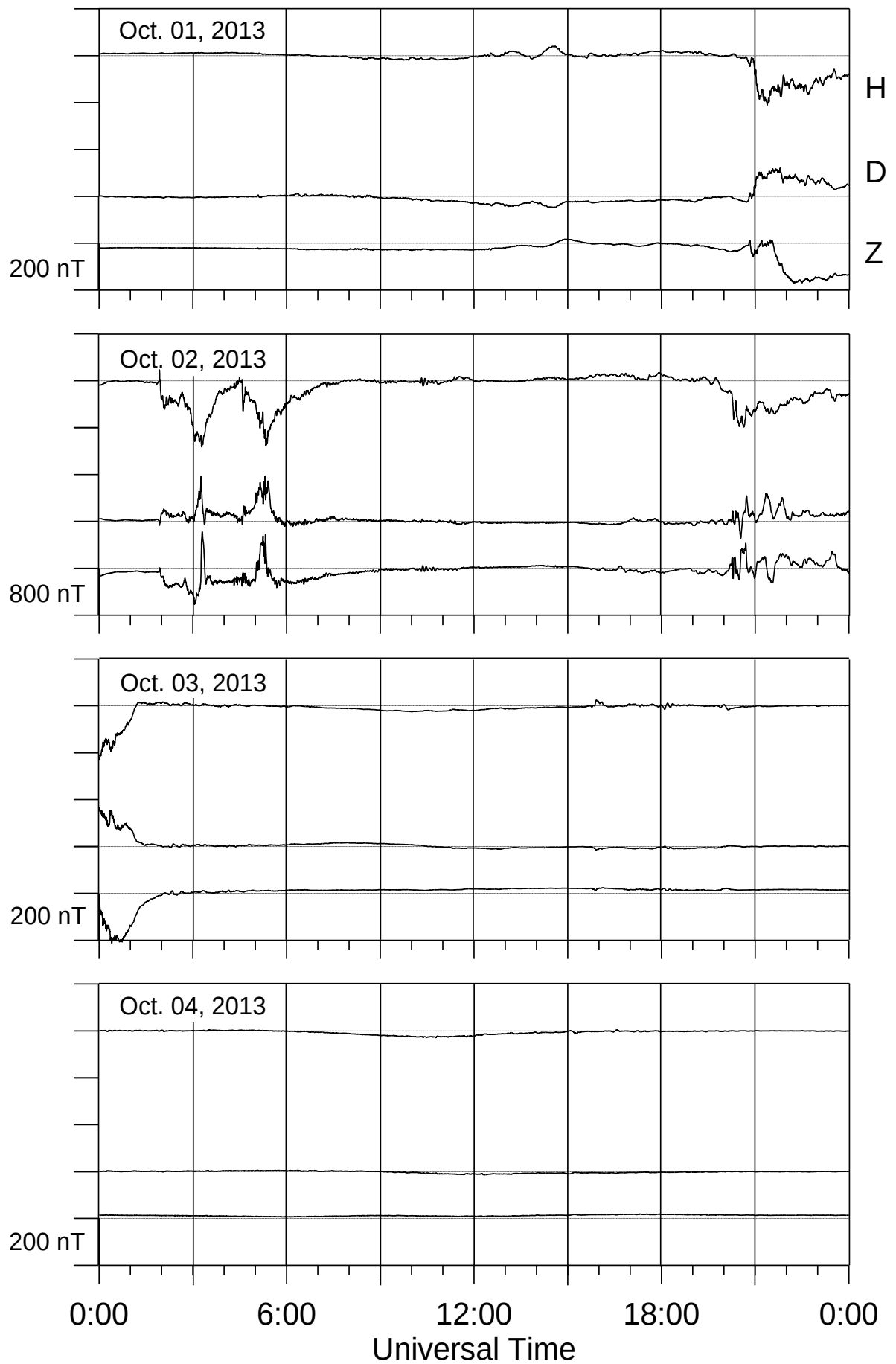
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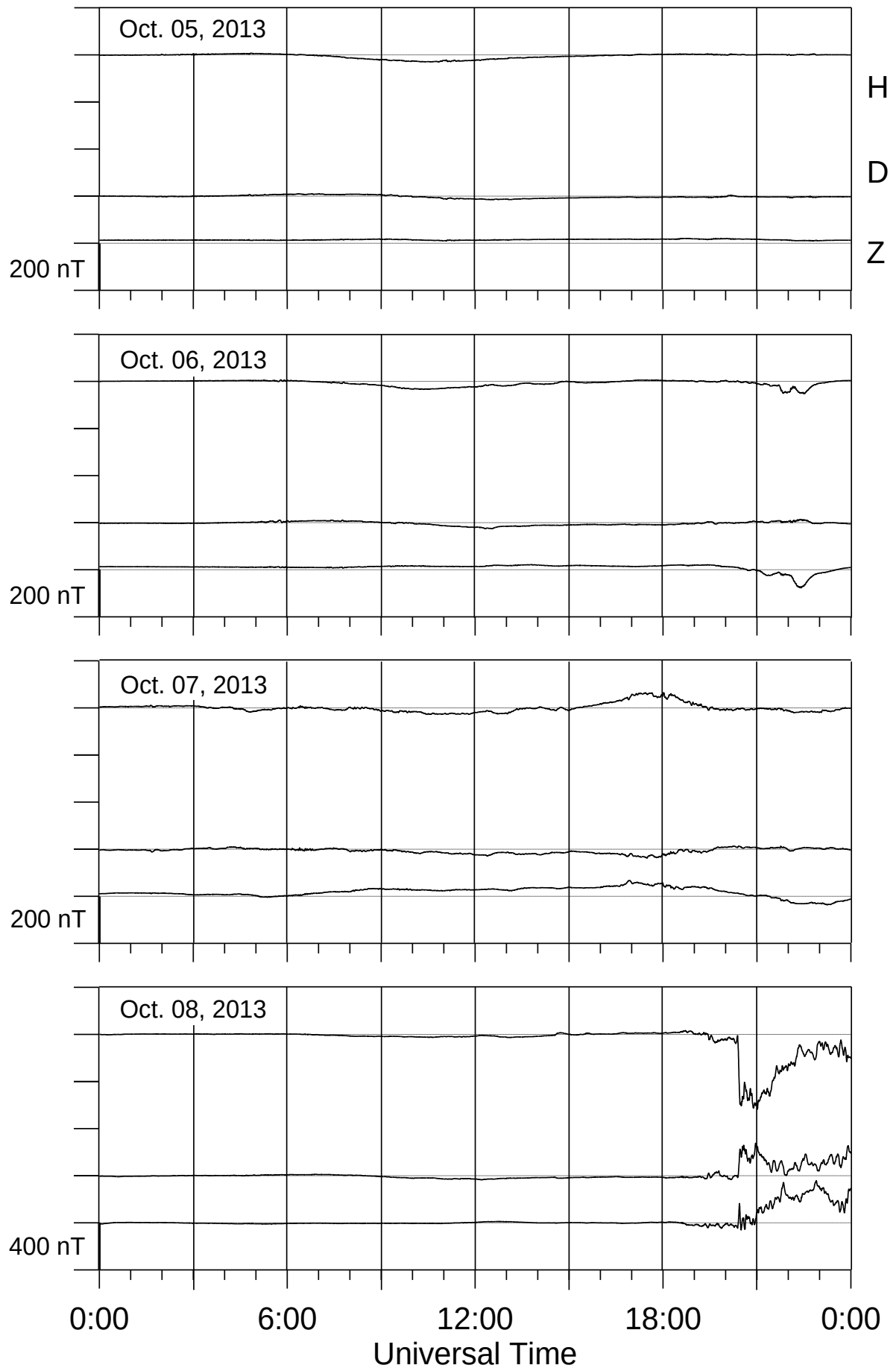
LOPARSKAYA MAGNETOGRAMS

October - December 2013

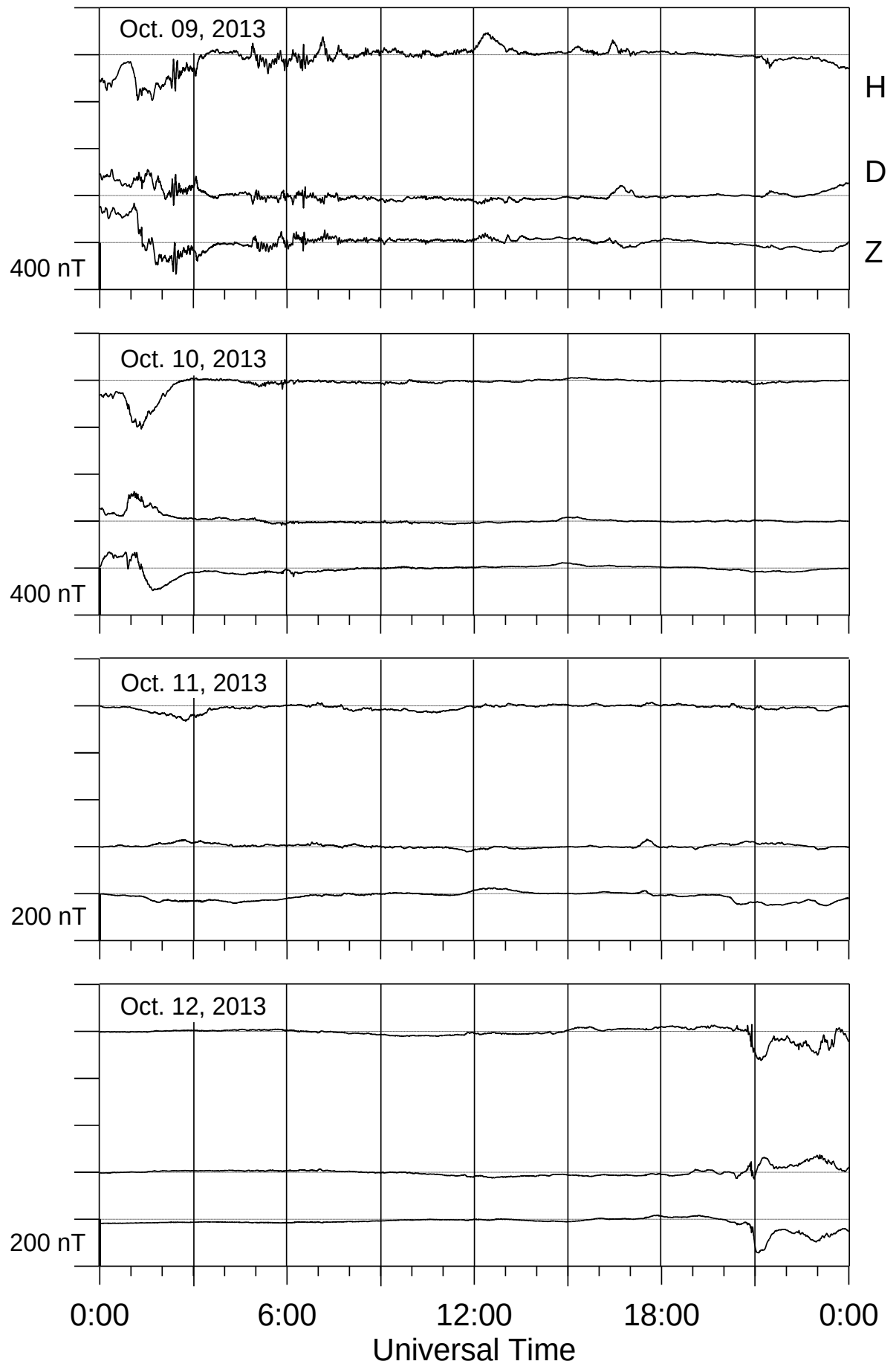
Loparskaya magnetometer



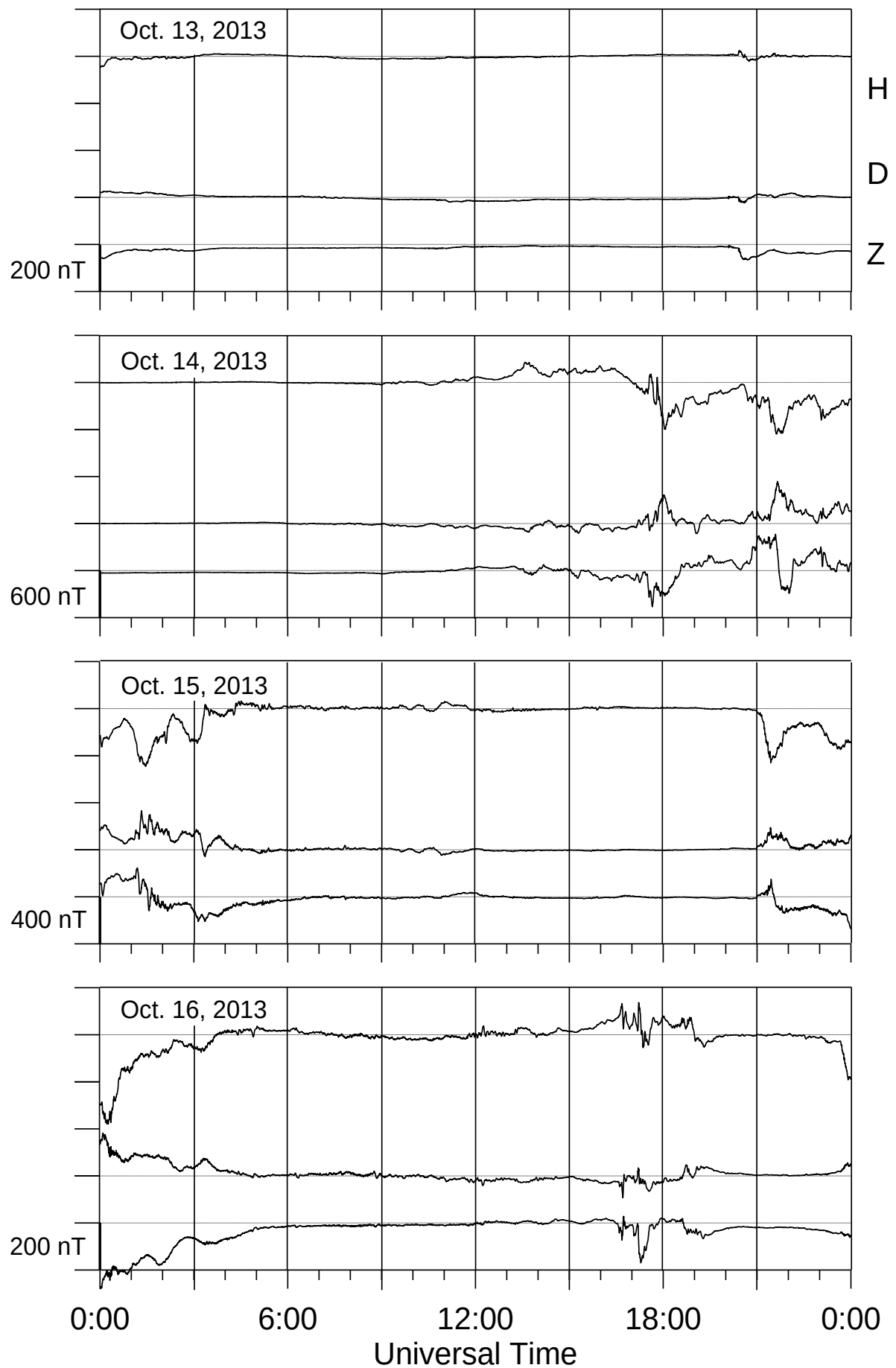
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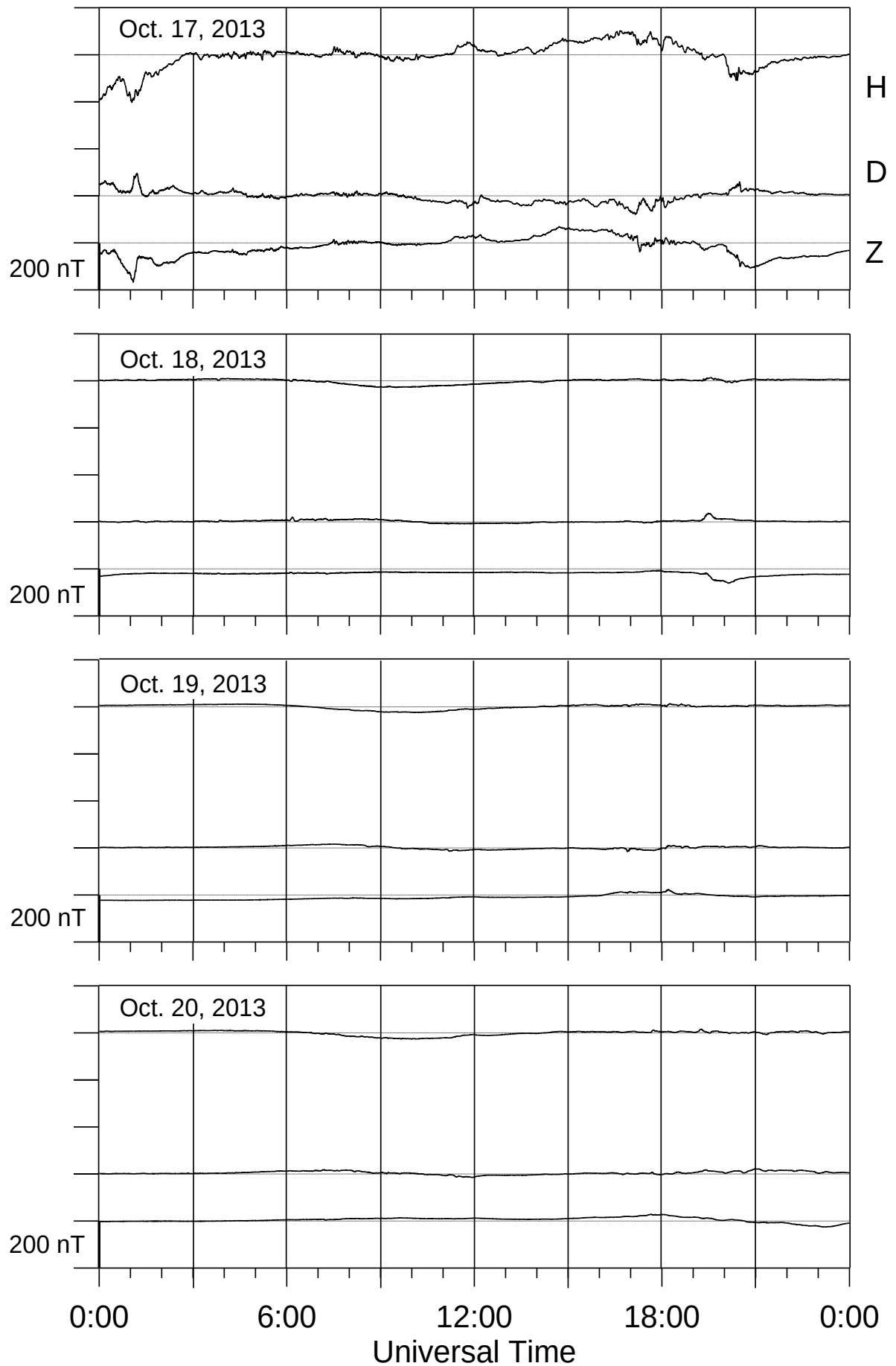
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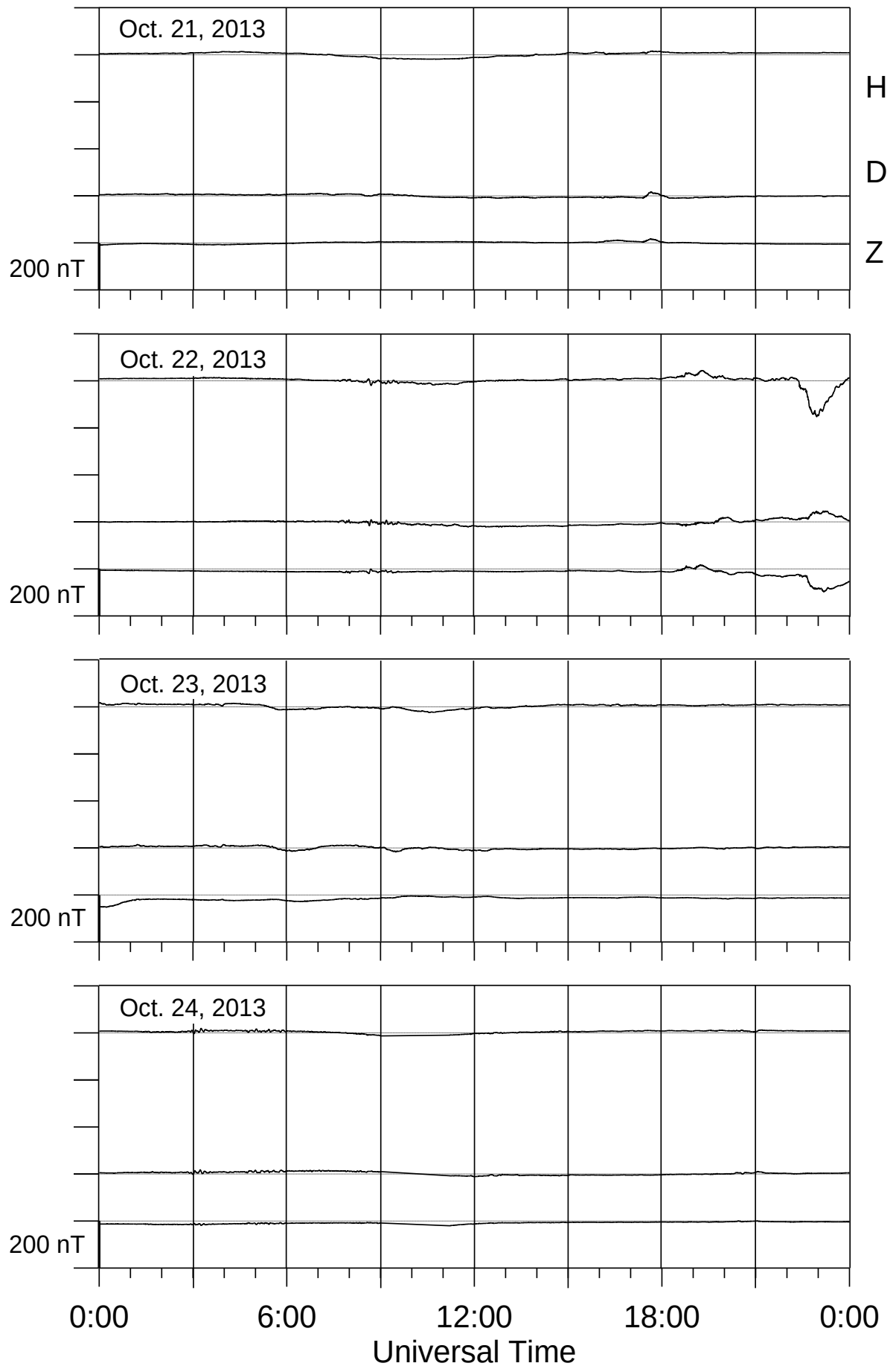
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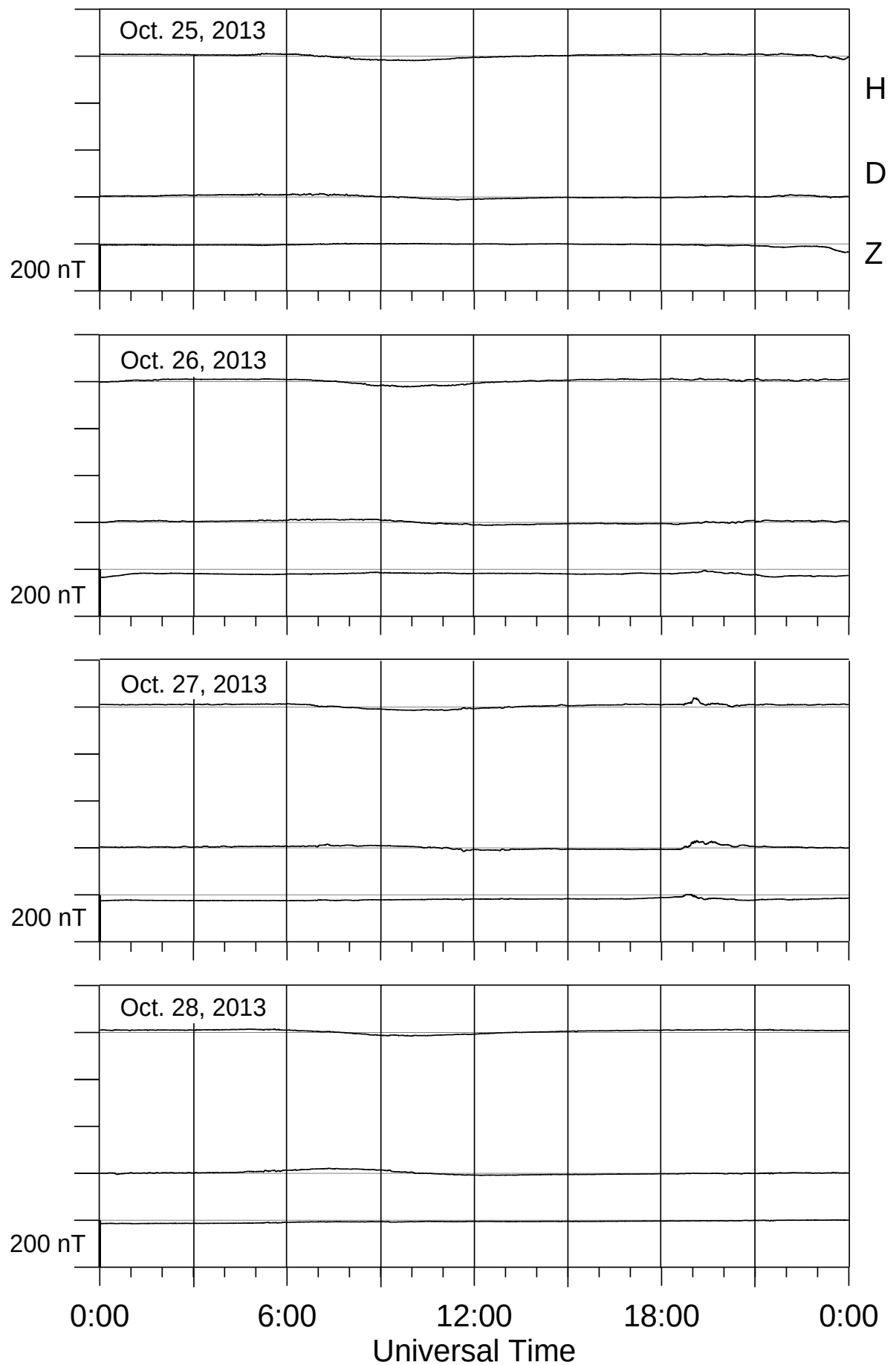
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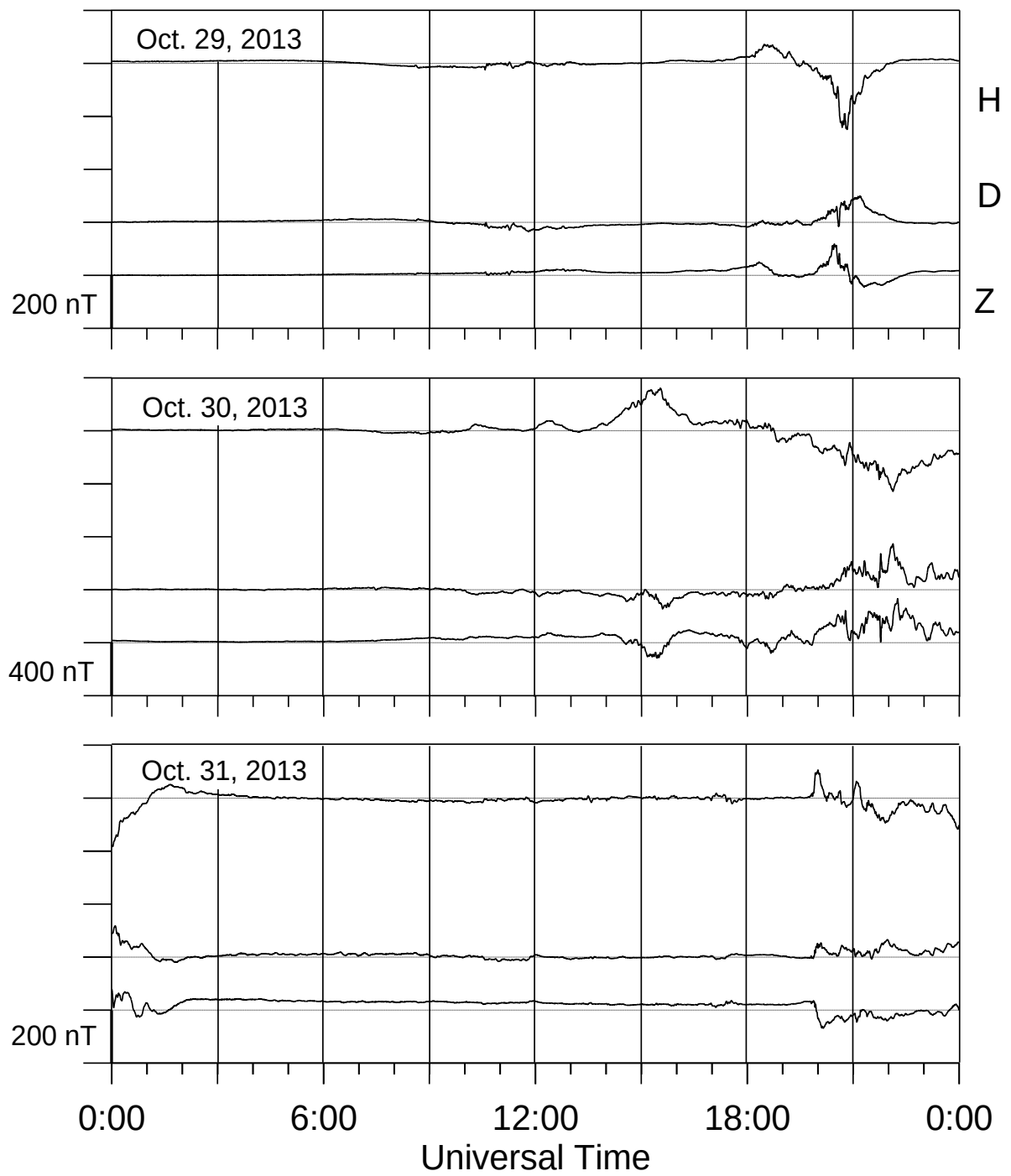
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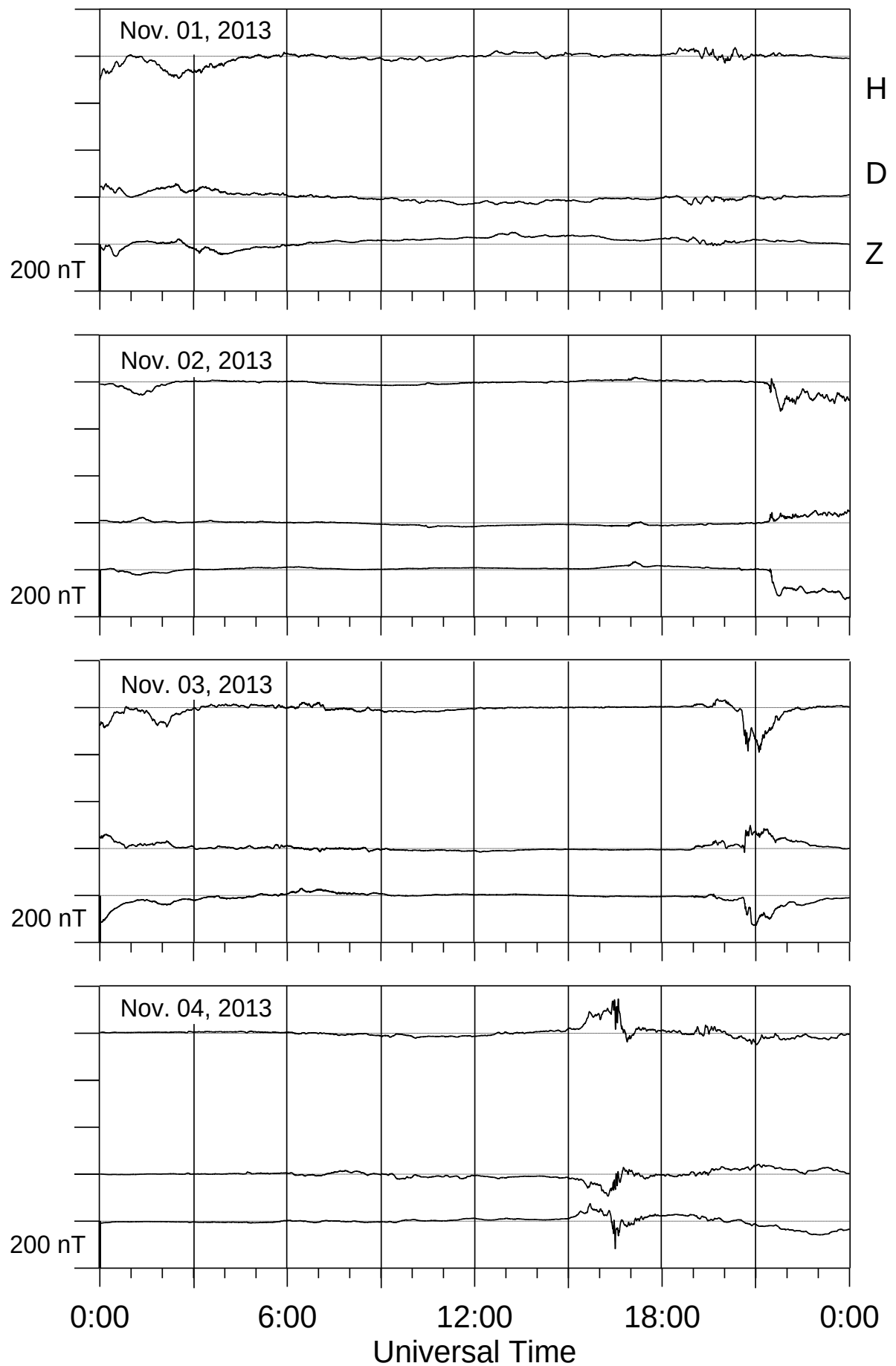
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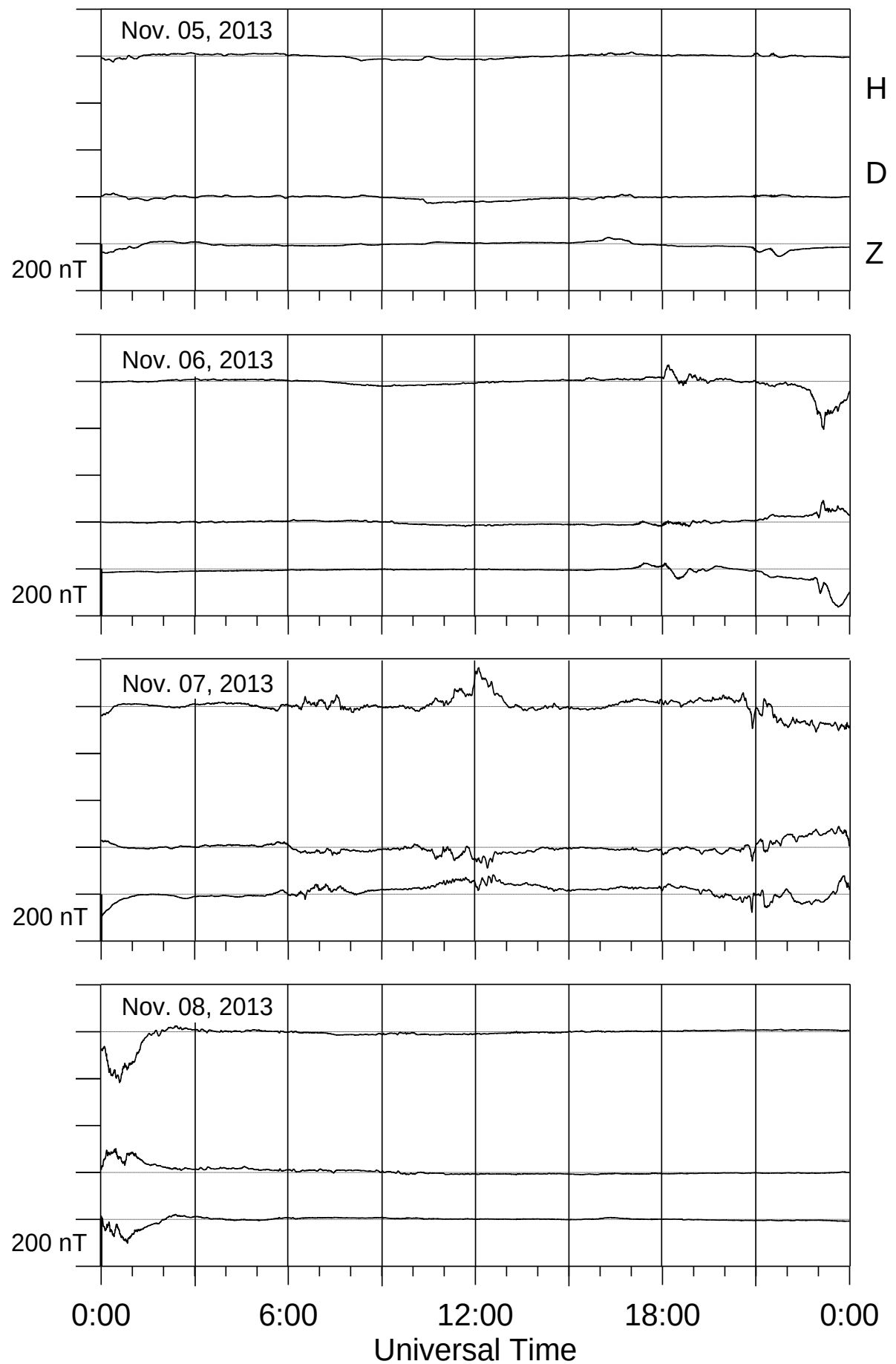
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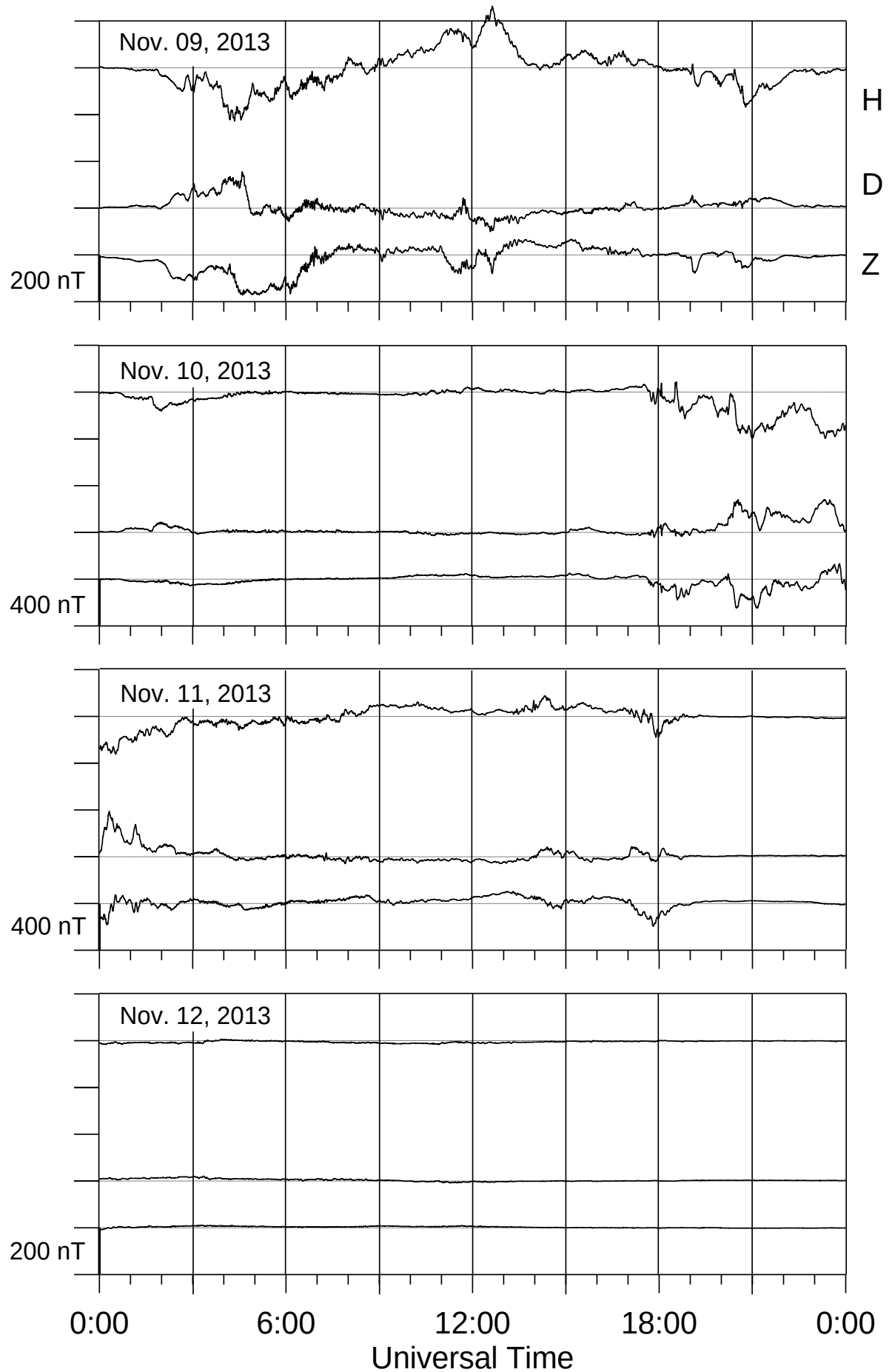
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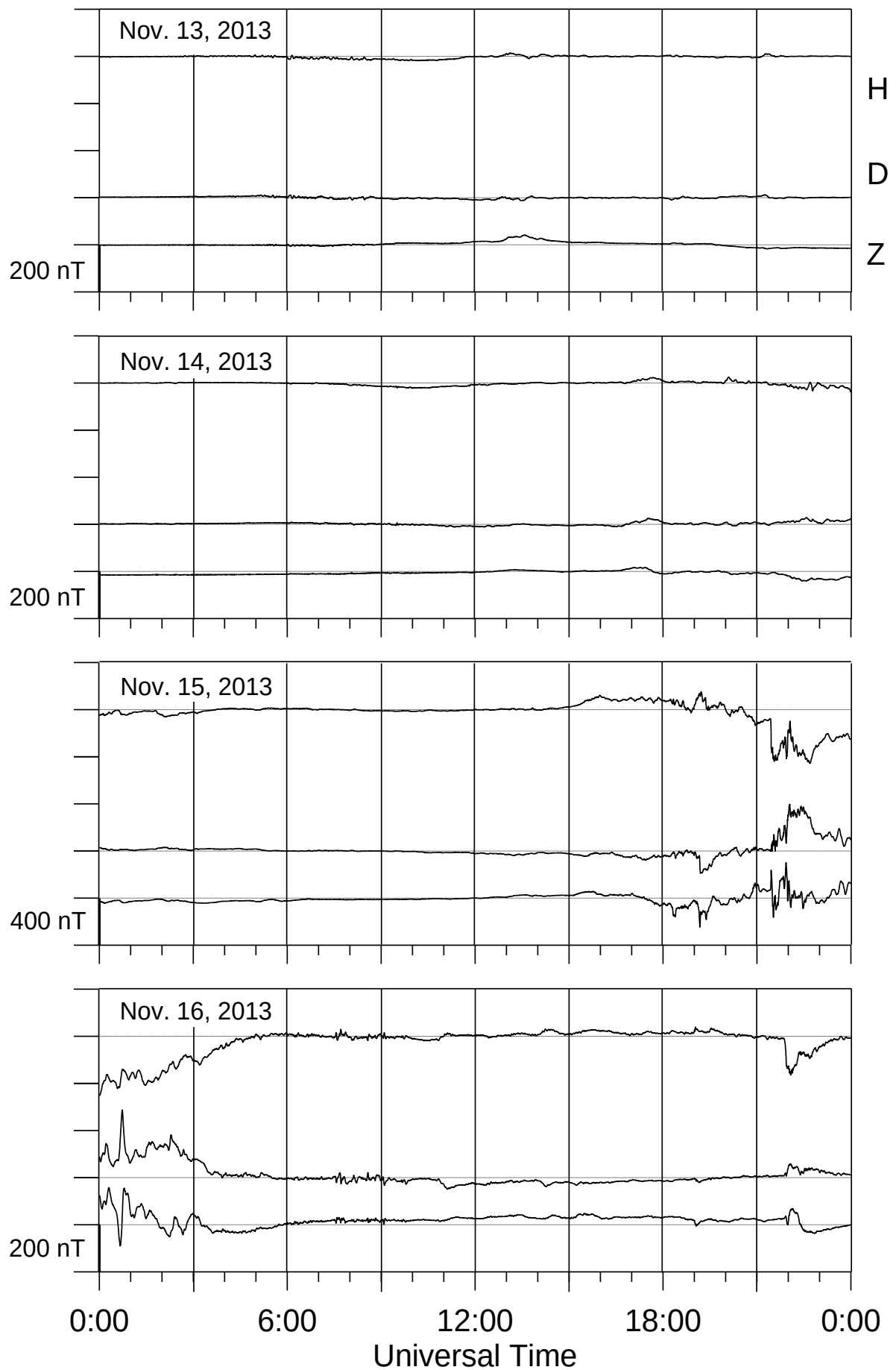
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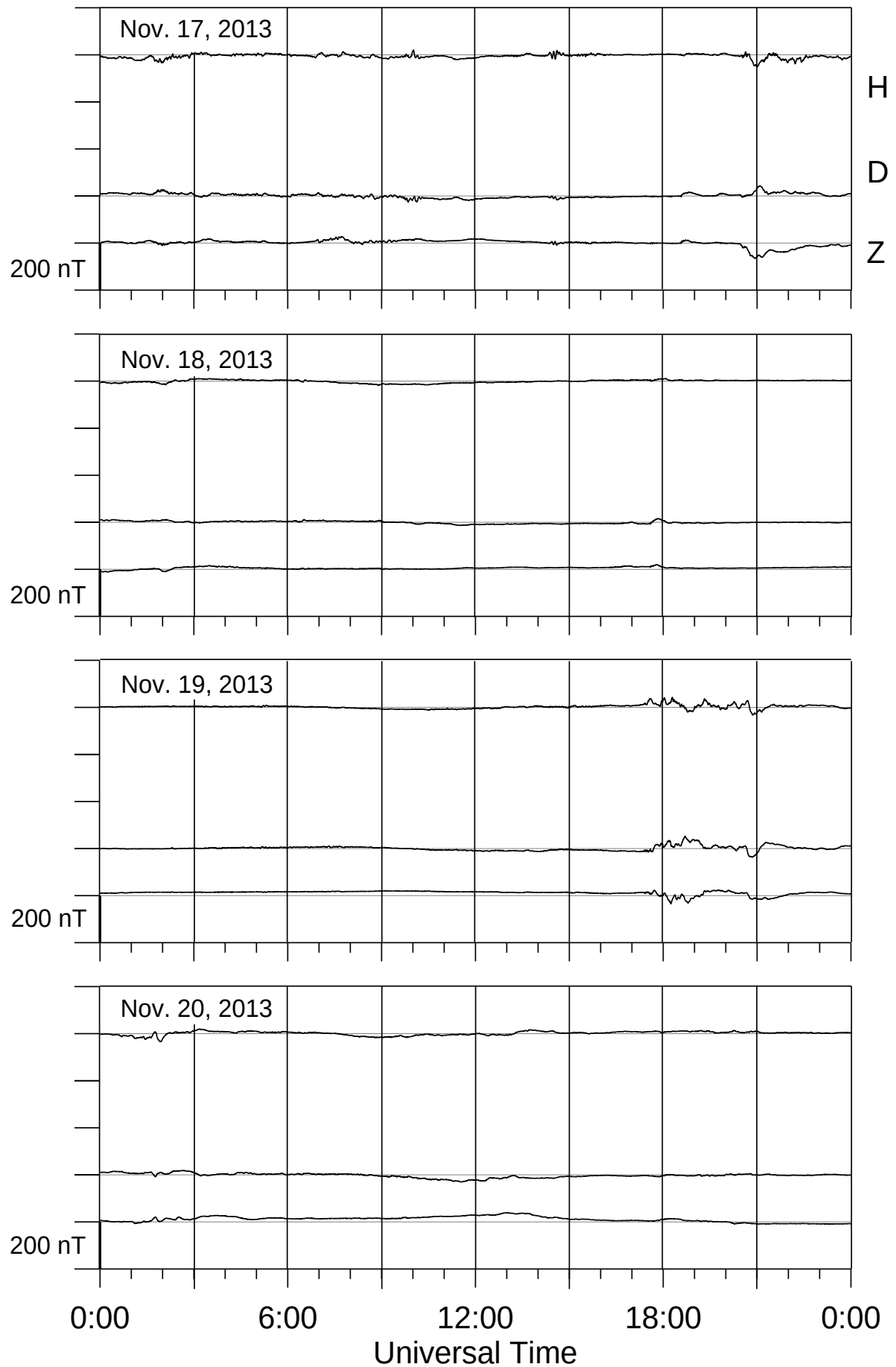
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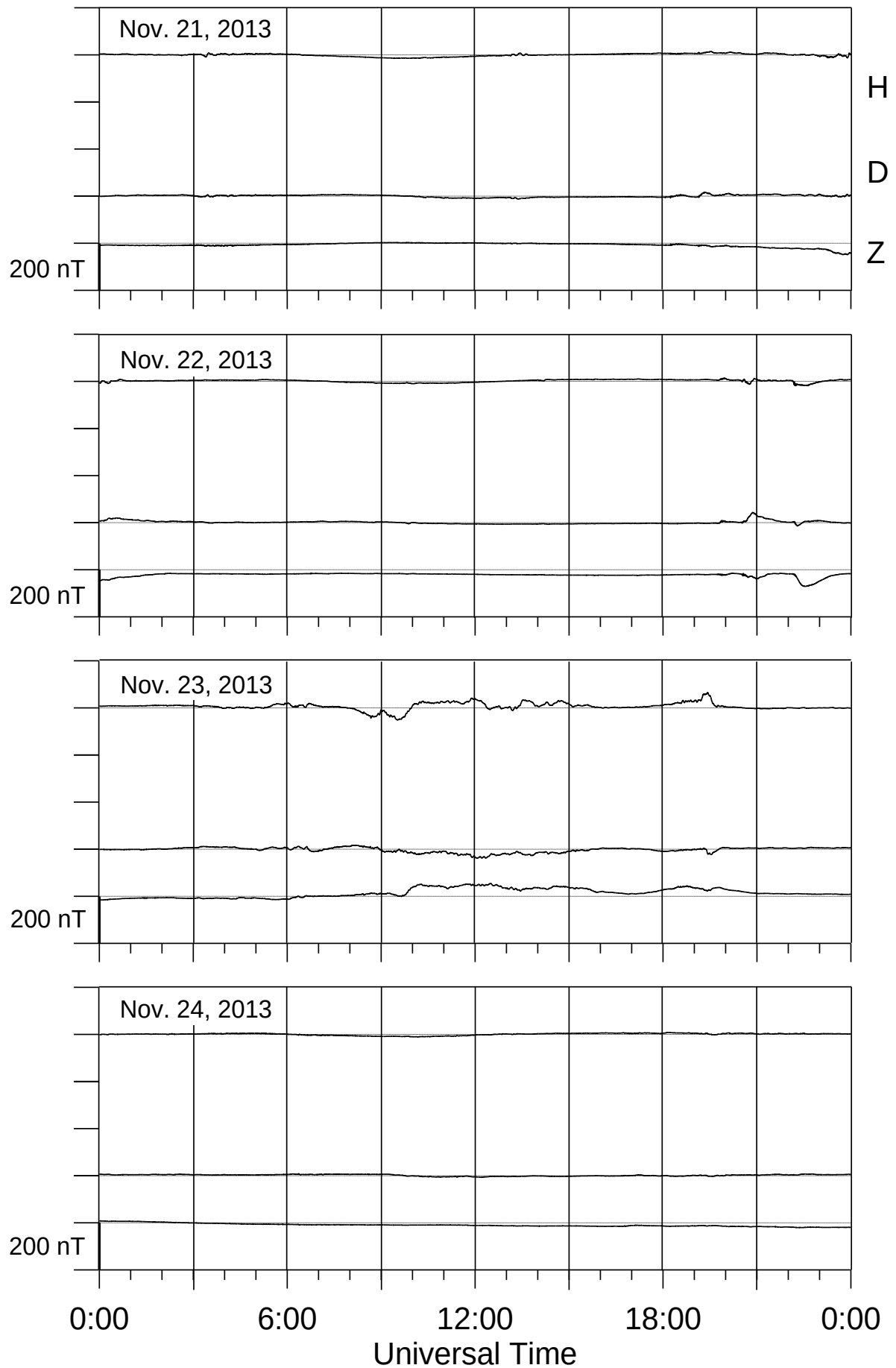
Lovozero magnetometer



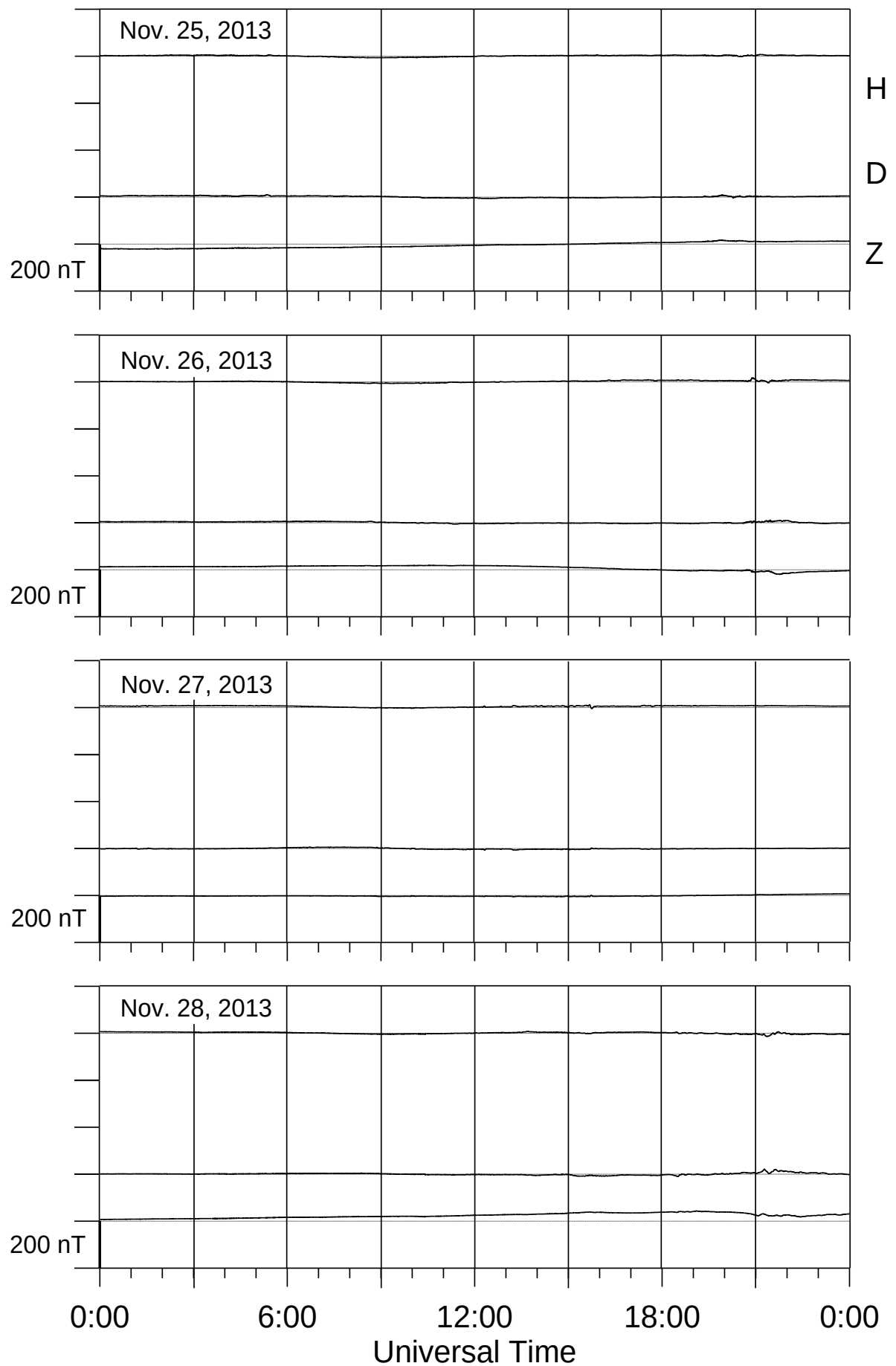
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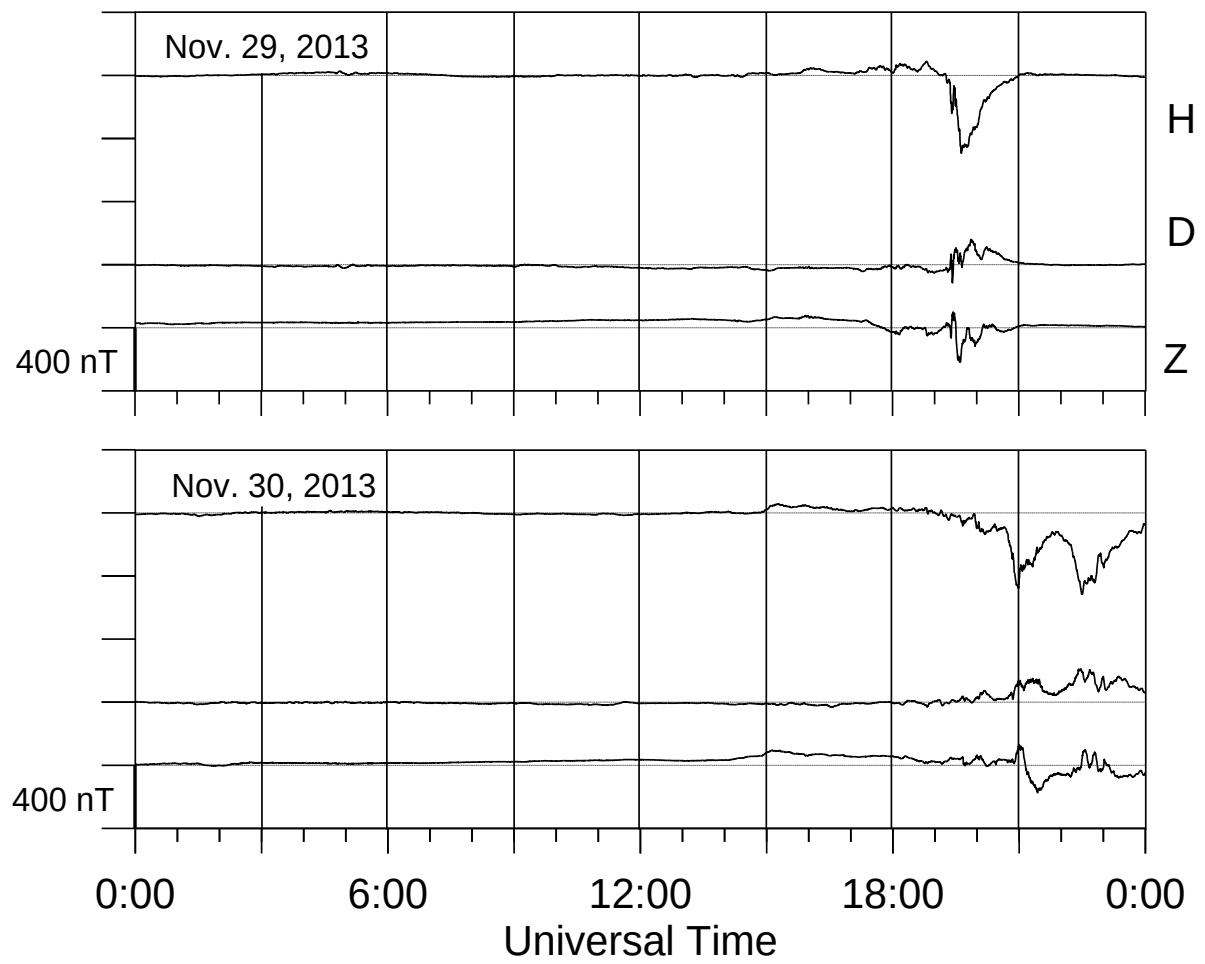
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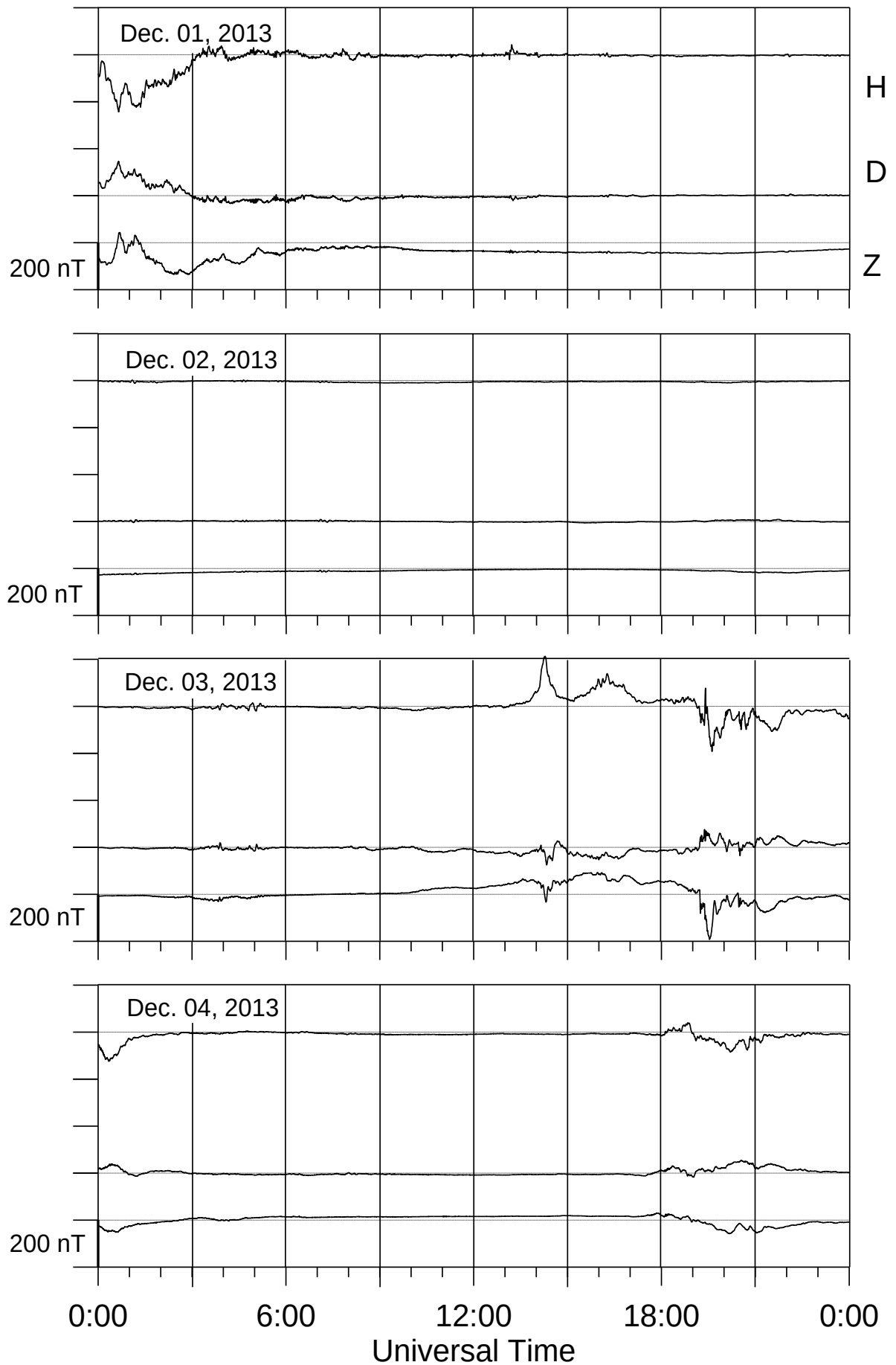
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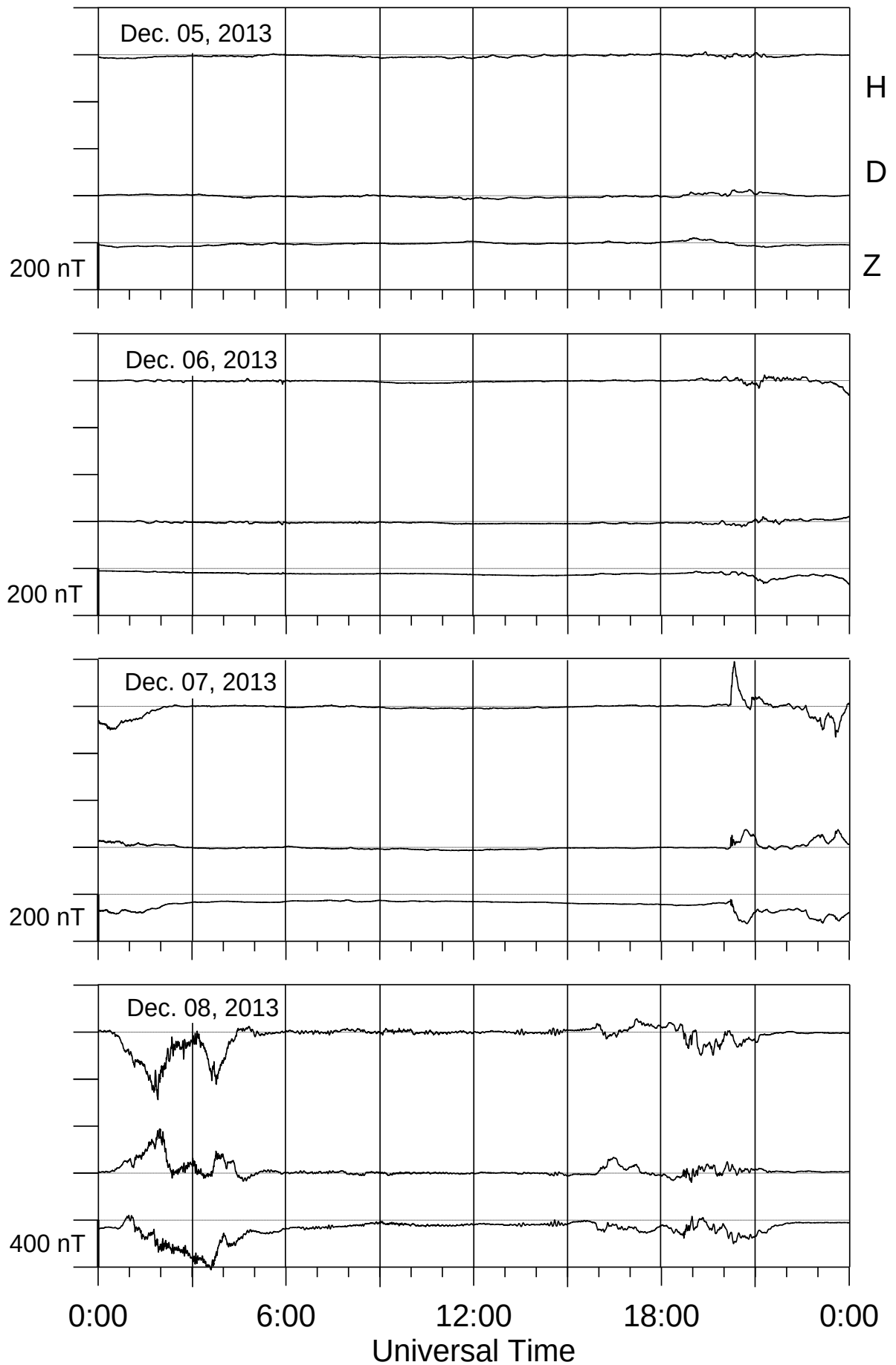
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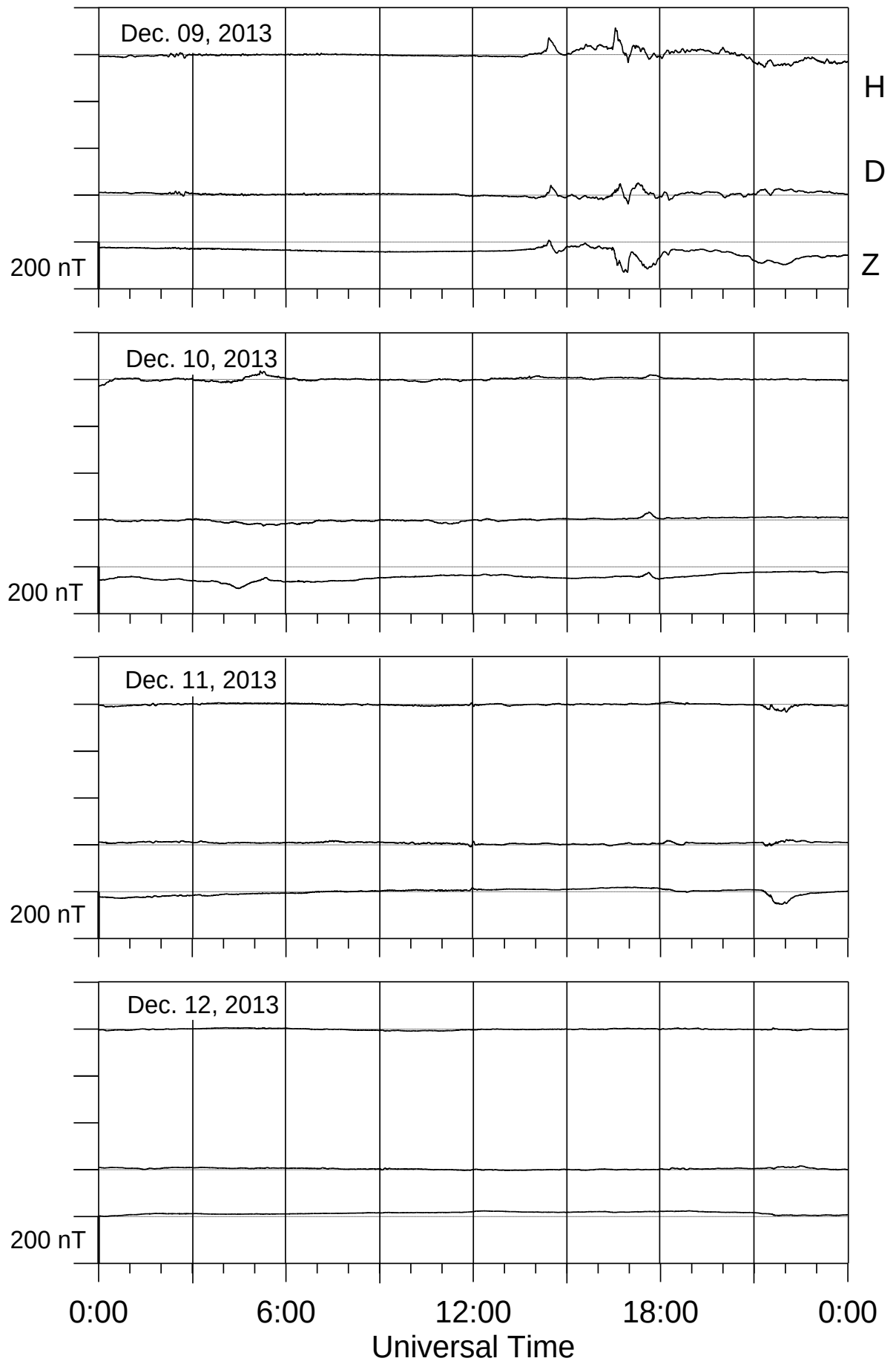
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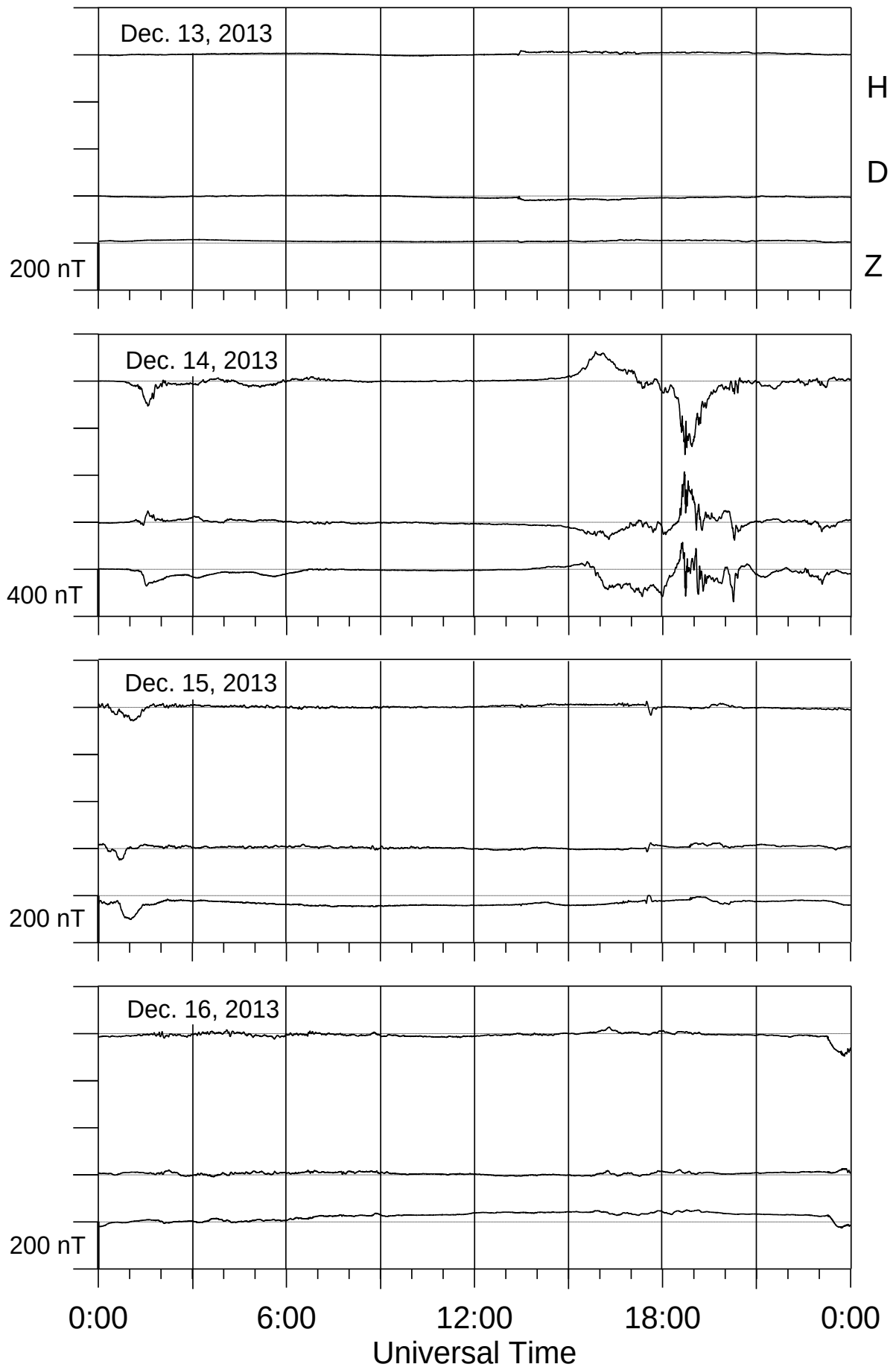
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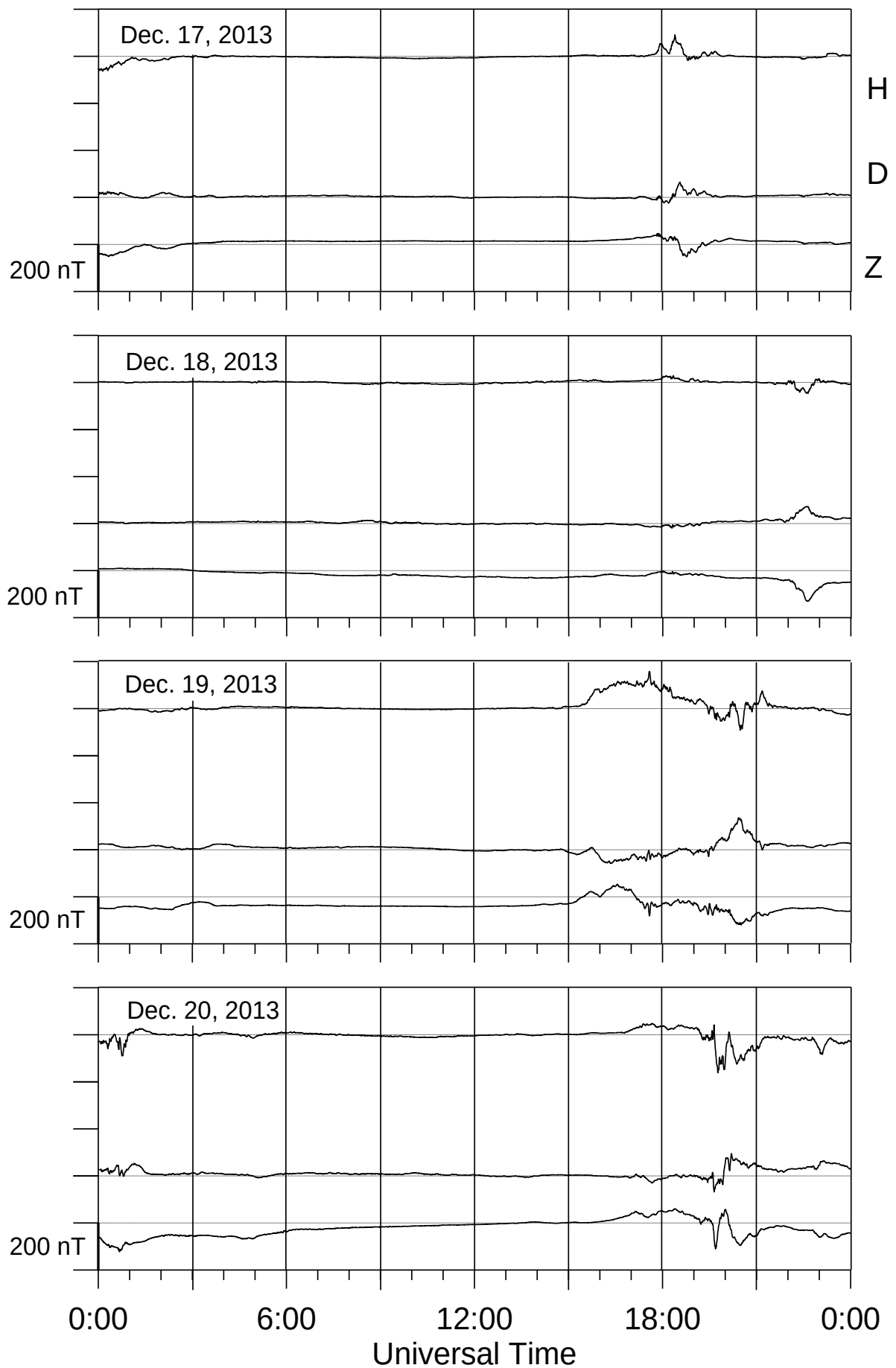
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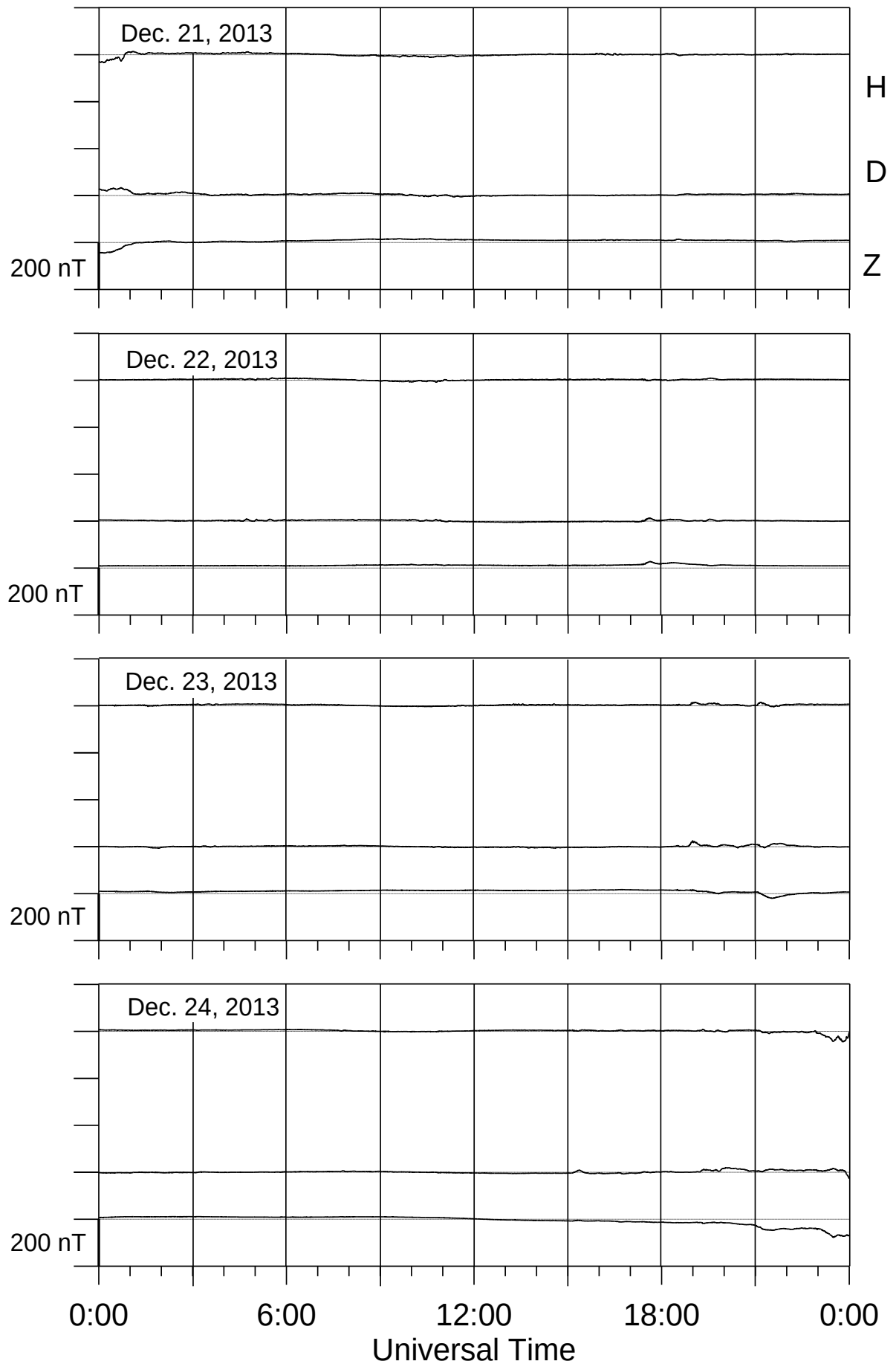
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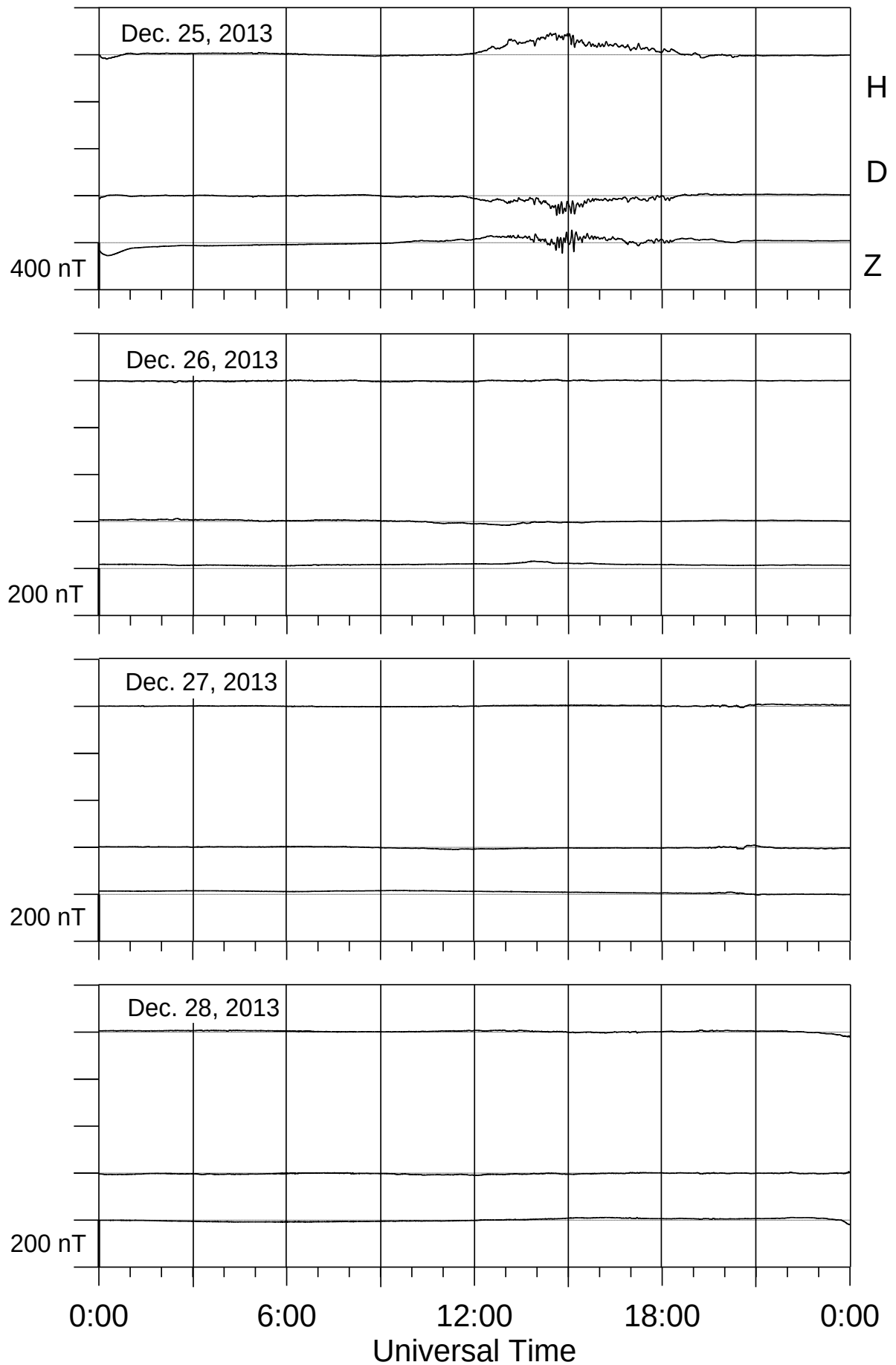
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Loparskaya magnetometer



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