

RUSSIAN ACADEMY OF SCIENCES
KOLA SCIENCE CENTRE



PGI
GEOPHYSICAL DATA

2015

OCTOBER

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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 2015. 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 390 459

November 392 319

December 391 856

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

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

All-sky camera observations

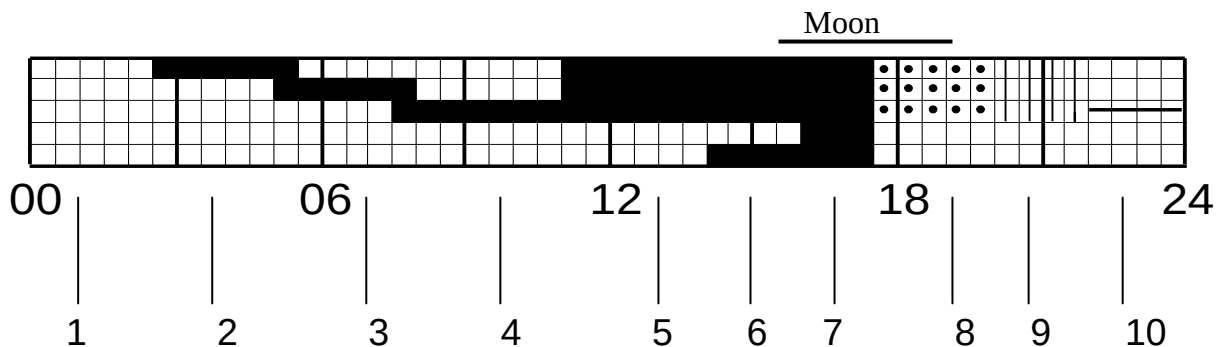
Calendar

Calendar shows the intervals of digital all-sky camera observations in Apatity and Lovozero, 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 and Lovozero in night-time interval from 17:00 UT to 01:00 UT. Zenith angles are given along the vertical axis. Magnetic north is at the top of the figure.

Coordinates of stations

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

Please visit [***http://pgia.ru/lang/en/data/***](http://pgia.ru/lang/en/data/)

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GEOMAGNETIC K-INDICES, LOVOZERO

October, 2015

Lower limit of K=9 is 1500 nT

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

GEOMAGNETIC K-INDICES, LOVOZERO

November, 2015

Lower limit of K=9 is 1500 nT

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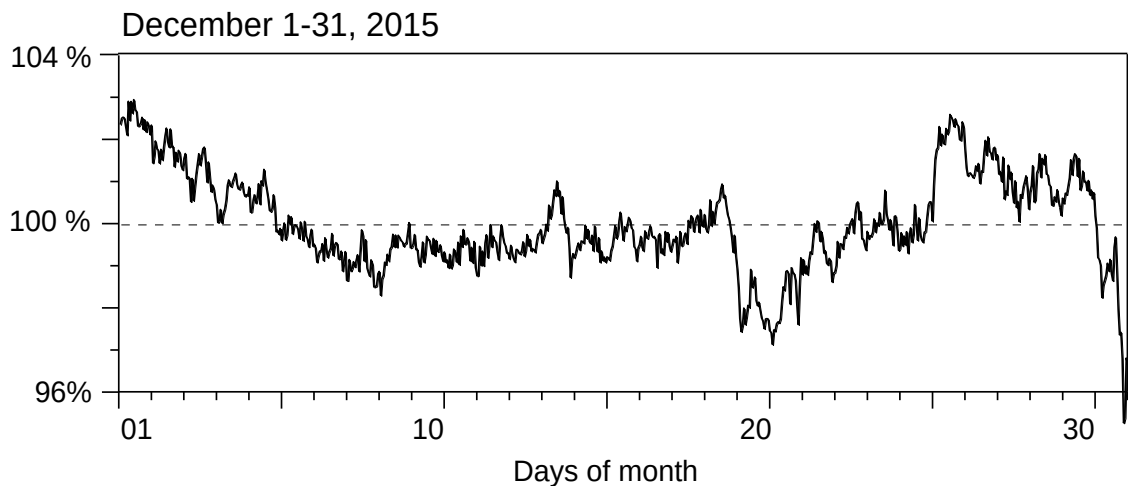
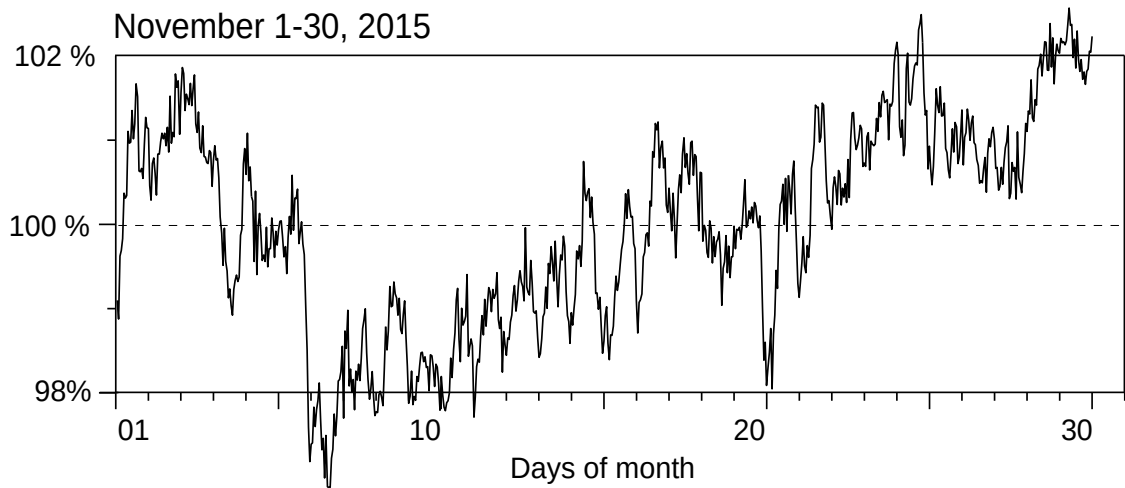
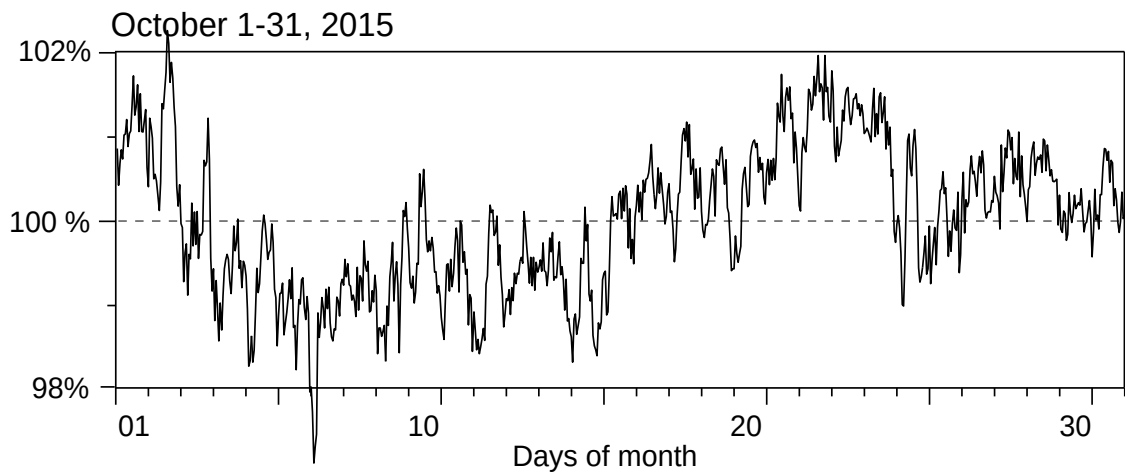
GEOMAGNETIC K-INDICES, LOVOZERO

December, 2015

Lower limit of K=9 is 1500 nT

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

Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

October - December 2015

CALENDAR OF APATITY TV OBSERVATIONS

October 12 - 13

[illegible]

October 13 - 14

[illegible]

October 14 - 15

[illegible]

October 15 - 16

[illegible]

October 16 - 17

[illegible]

October 17 - 18

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

October 18 - 19

[illegible]

October 19 - 20

[illegible]

October 20 - 21

[illegible]

October 21 - 22

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

October 22 - 23

[illegible]

CALENDAR OF APATITY TV OBSERVATIONS

November 14 - 15

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

November 15 - 16

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

November 16 - 17

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

November 17 - 18

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

November 18 - 19

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

November 19 - 20

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

November 20 - 21

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

November 21 - 22

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

November 22 -23

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

November 23 - 24

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

November 24 - 25

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

CALENDAR OF LOVOZERO TV OBSERVATIONS

December 04 - 05

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

December 05 - 06

[illegible]

December 06 - 07

[illegible]

December 07 - 08

[illegible]

December 08 - 09

[illegible]

December 09 - 10

[illegible]

December 10 - 11

[illegible]

December 11 - 12

[illegible]

December 12 - 13

[illegible]

December 13 - 14

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

December 14 - 15

[illegible]

CALENDAR OF LOVOZERO TV OBSERVATIONS

December 26 - 27

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

December 27 - 28

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

December 28 - 29

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

December 29 - 30

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

December 30 - 31

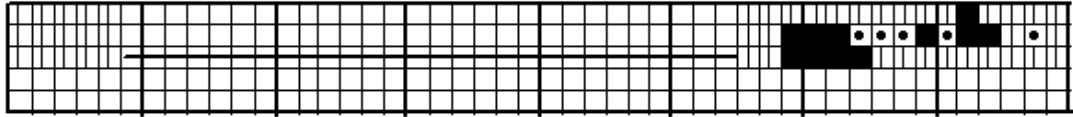
UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

December 31

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

Apatity ascaplots

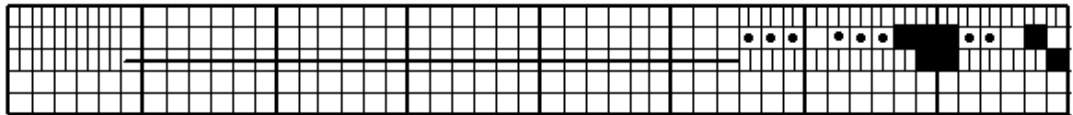
Oct. 01, 2015



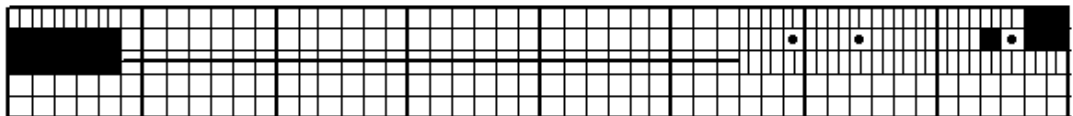
Oct. 02, 2015



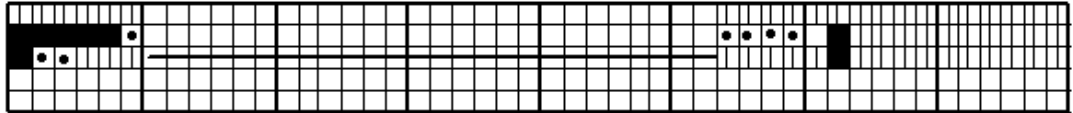
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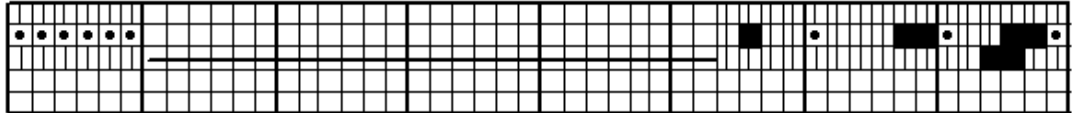
Oct. 04, 2015



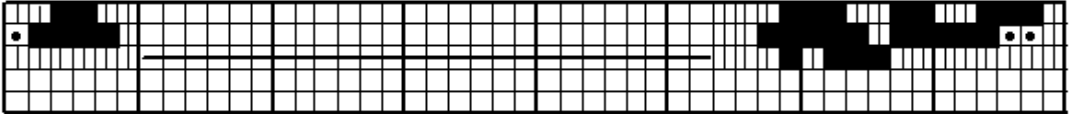
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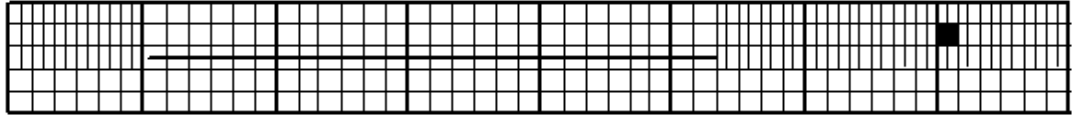
Oct. 06, 2015



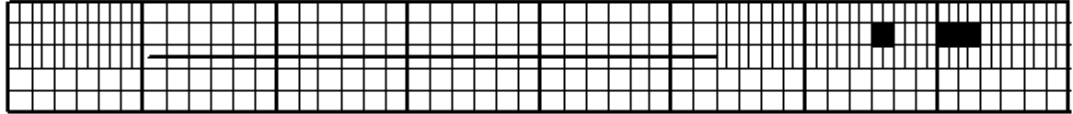
Oct. 07, 2015



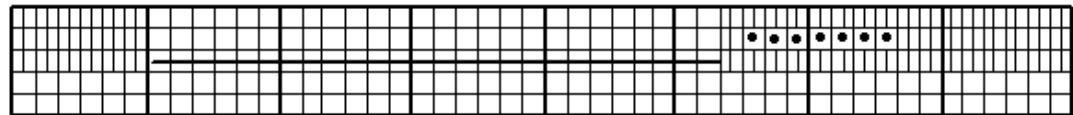
Oct. 08, 2015



Oct. 09, 2015



Oct. 10, 2015

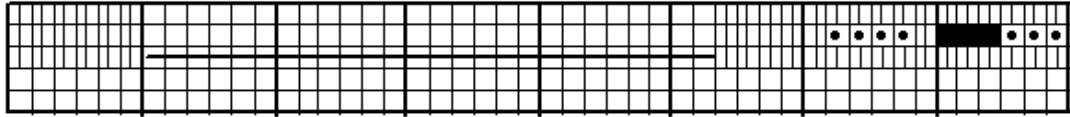


00 06 12 18 24

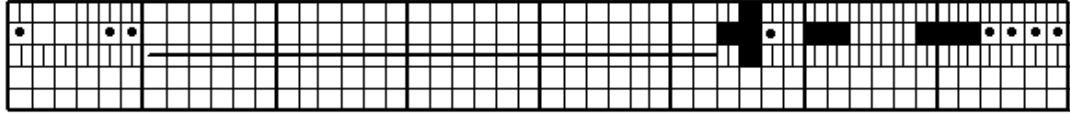
Universal Time

Apatity ascaplots

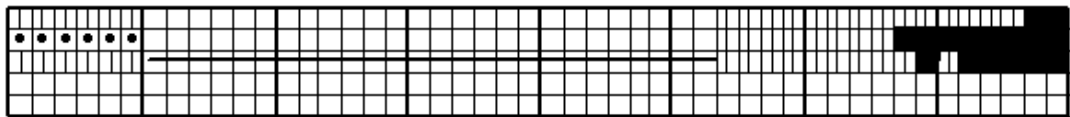
Oct. 11, 2015



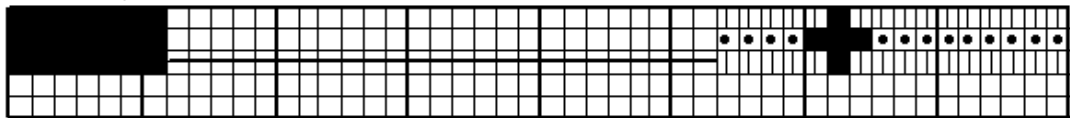
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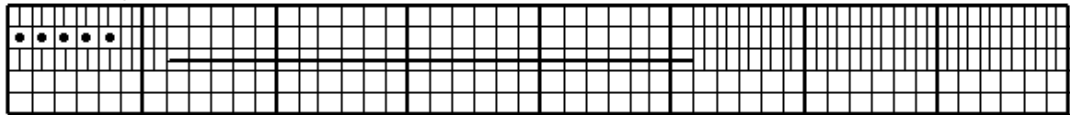
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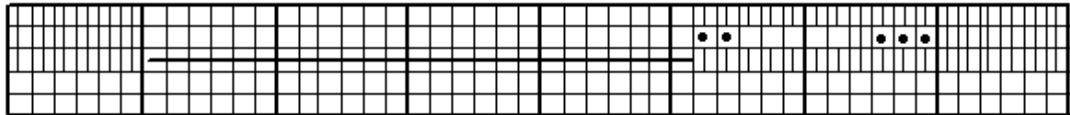
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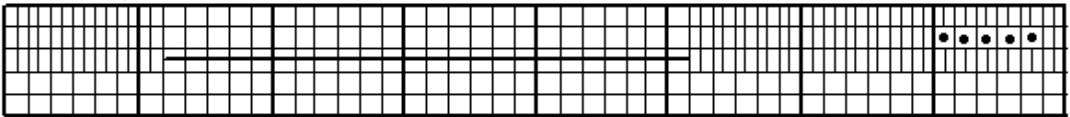
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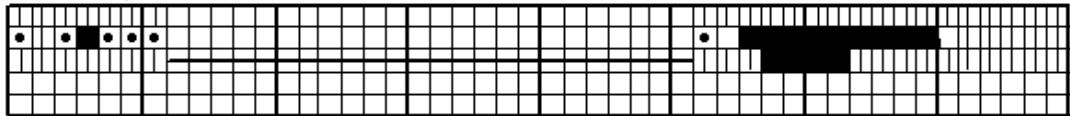
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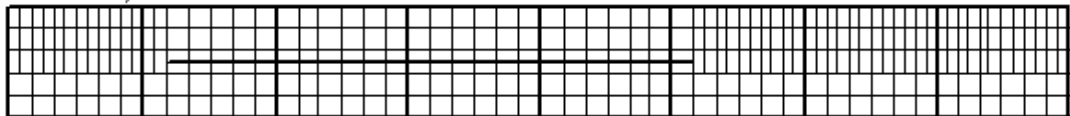
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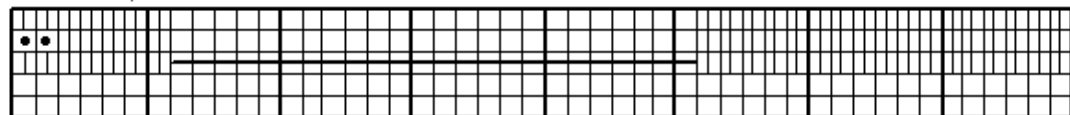
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Oct. 19, 2015



Oct. 20, 2015

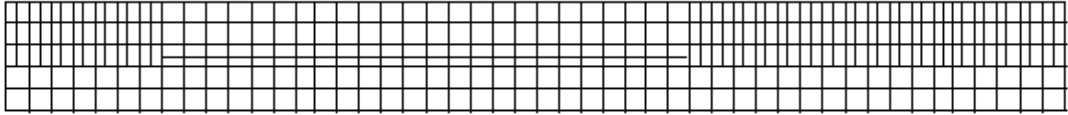


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Universal Time

Apatity ascaplots

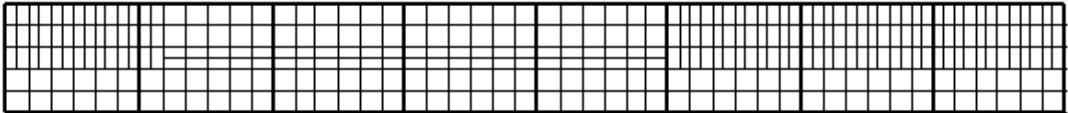
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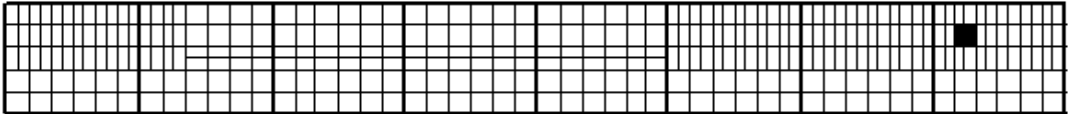
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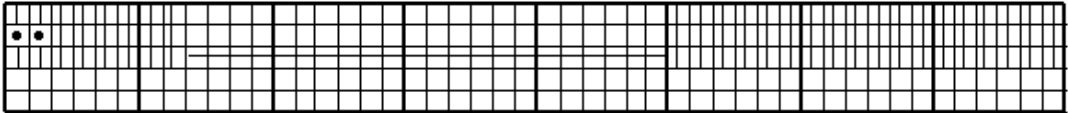
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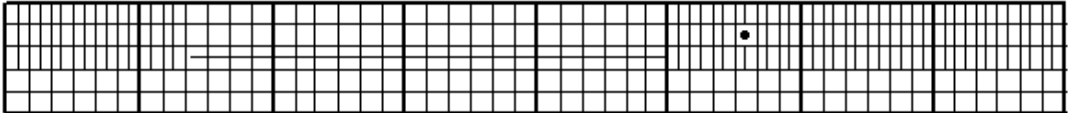
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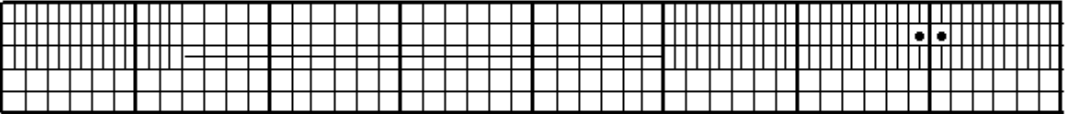
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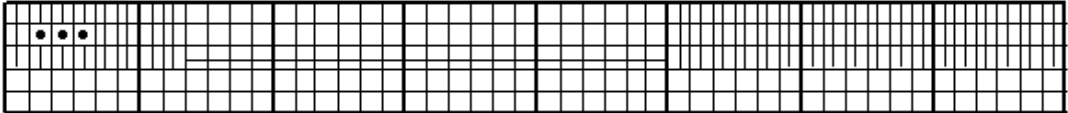
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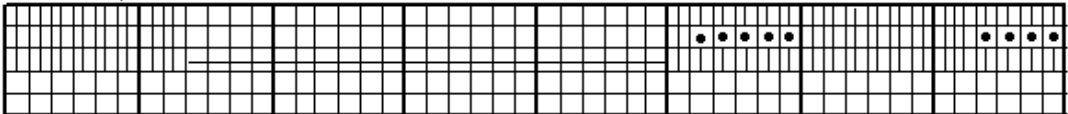
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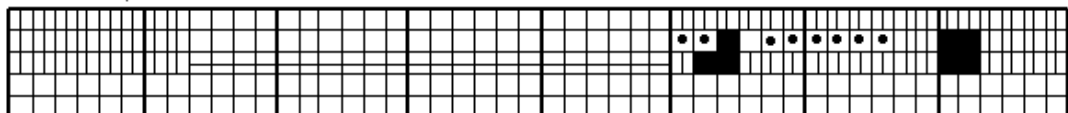
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Oct. 29, 2015



Oct. 30, 2015



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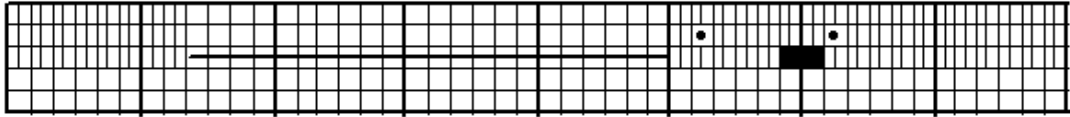
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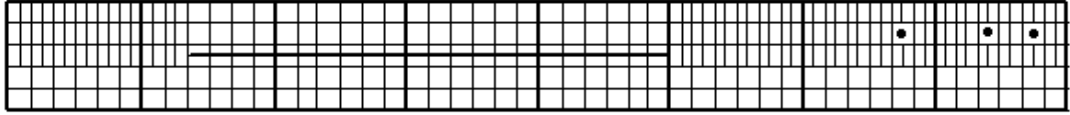
Universal Time

Apatity ascaplots

Oct. 31, 2015



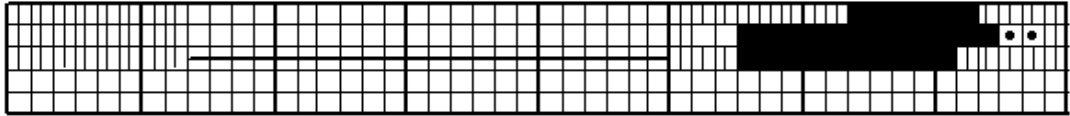
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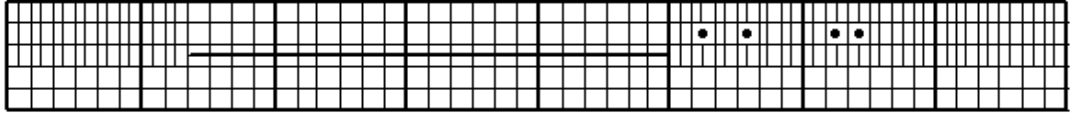
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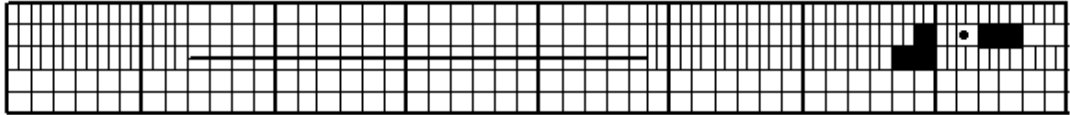
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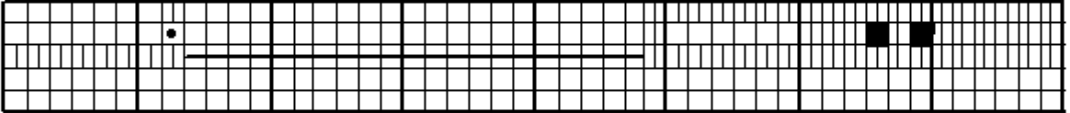
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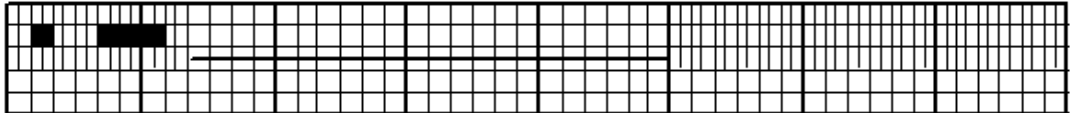
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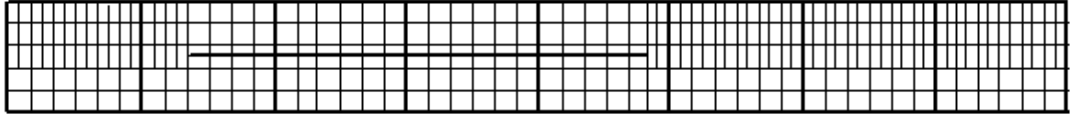
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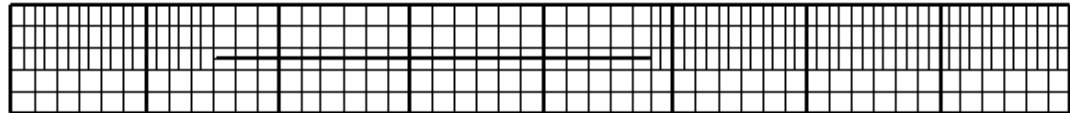
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Nov. 08, 2015



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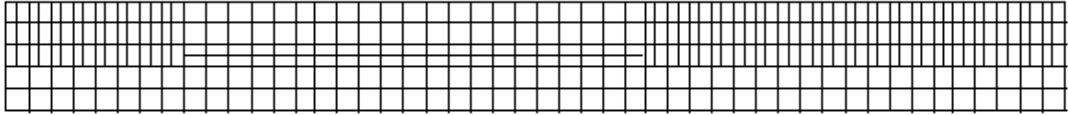


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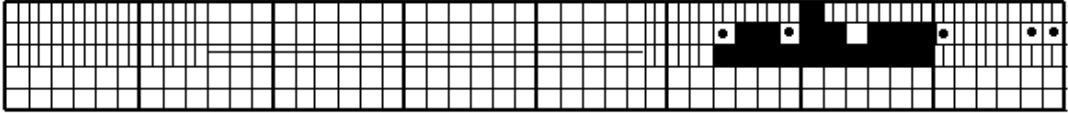
Universal Time

Apatity ascaplots

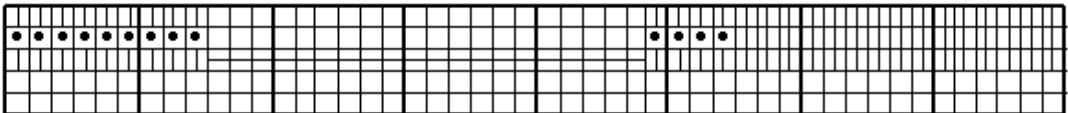
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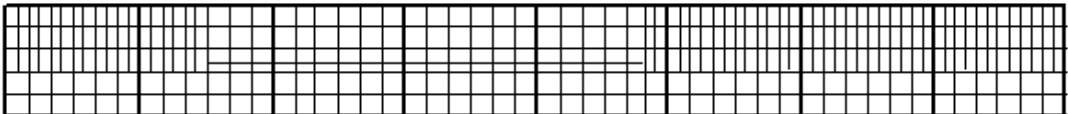
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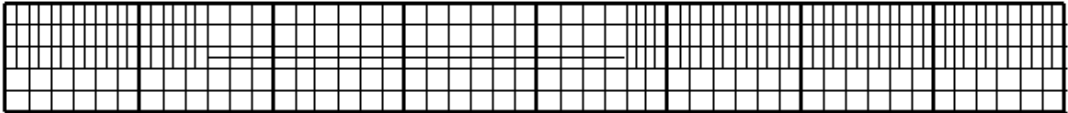
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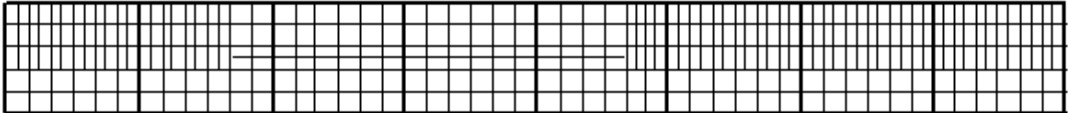
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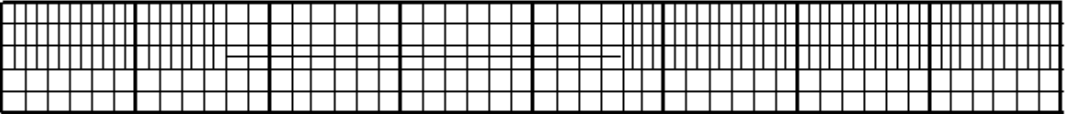
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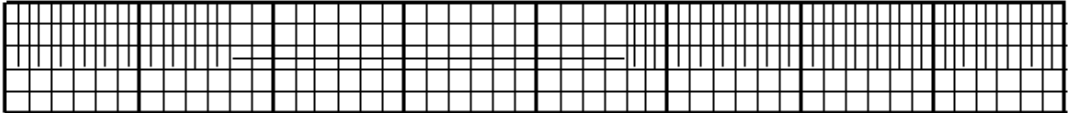
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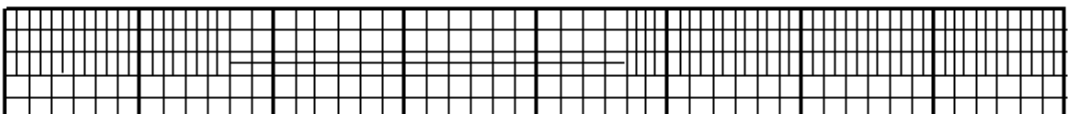
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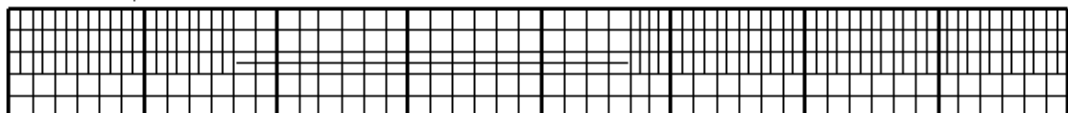
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Nov. 18, 2015



Nov. 19, 2015

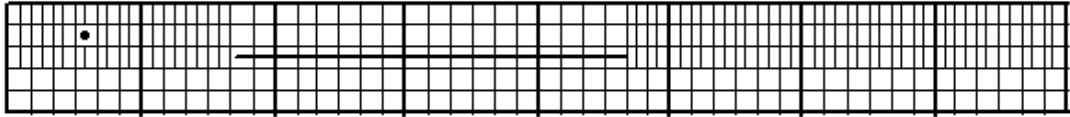


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Universal Time

Apatity ascaplots

Nov. 20, 2015



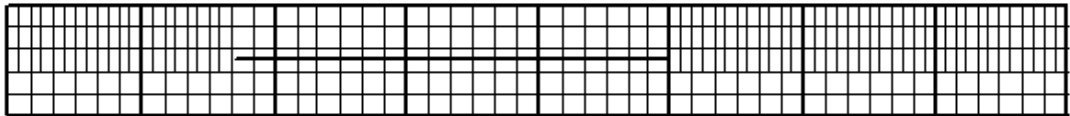
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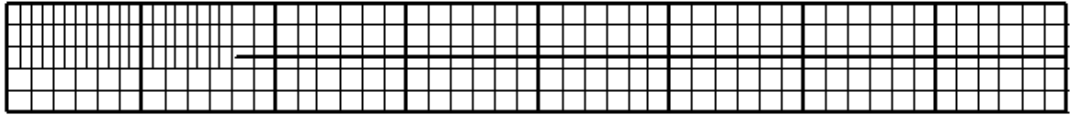
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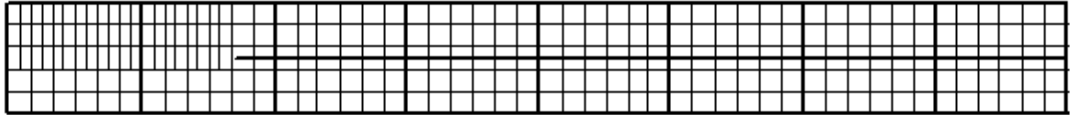
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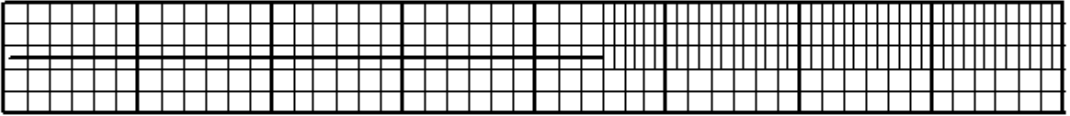
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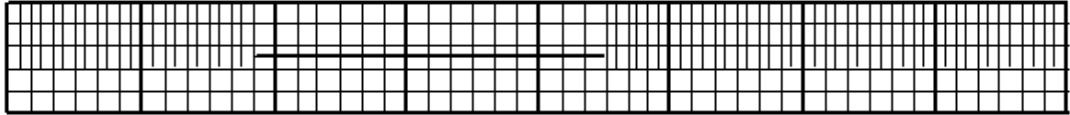
Nov. 25, 2015



Dec. 05, 2015



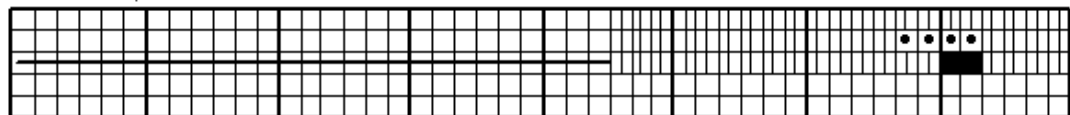
Dec. 06, 2015



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Dec. 08, 2015

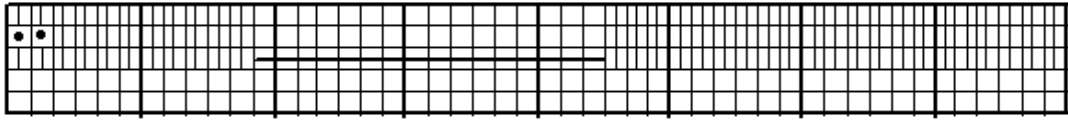


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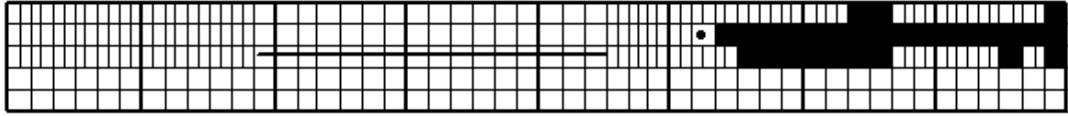
Universal Time

Apatity ascaplots

Dec. 09, 2015



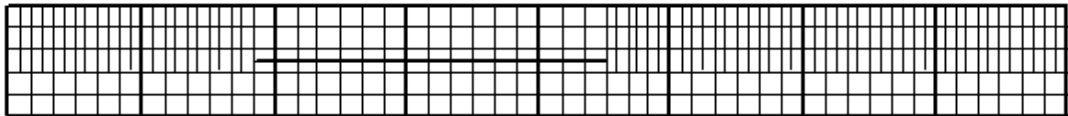
Dec. 10, 2015



Dec. 11, 2015



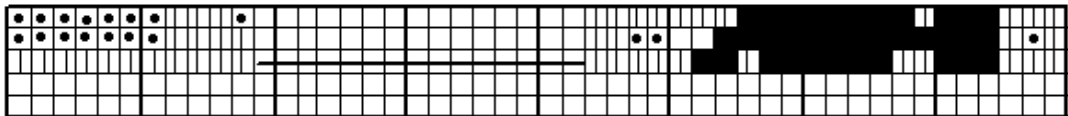
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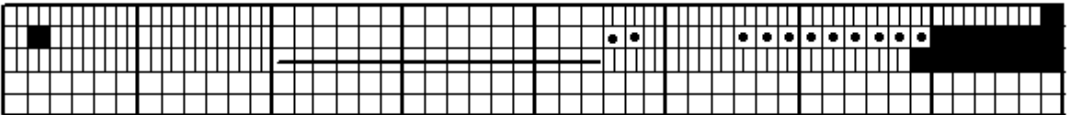
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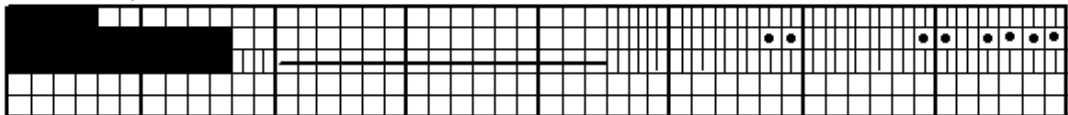
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Dec. 15, 2015



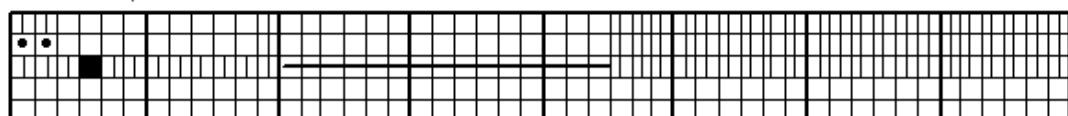
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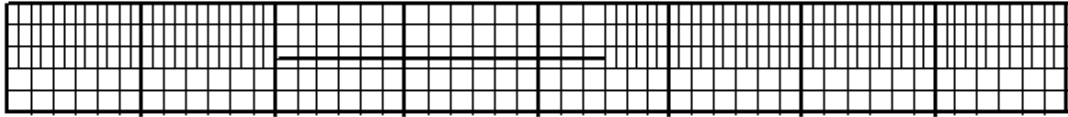


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Universal Time

Apatity ascaplots

Dec. 19, 2015



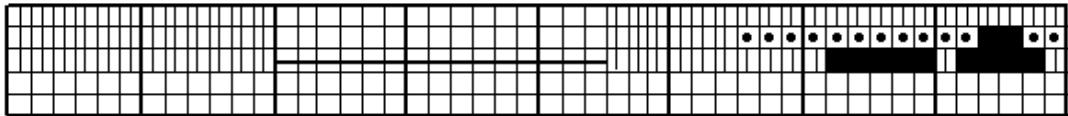
Dec. 20, 2015



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Dec. 22, 2015



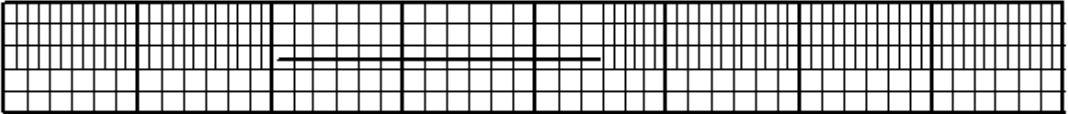
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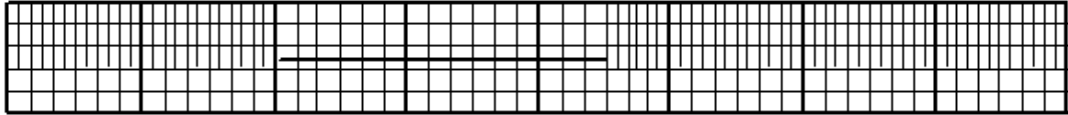
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Dec. 25, 2015



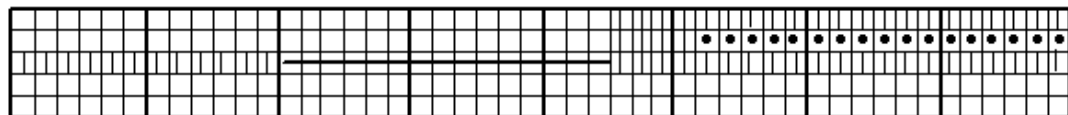
Dec. 26, 2015



Dec. 27, 2015



Dec. 28, 2015

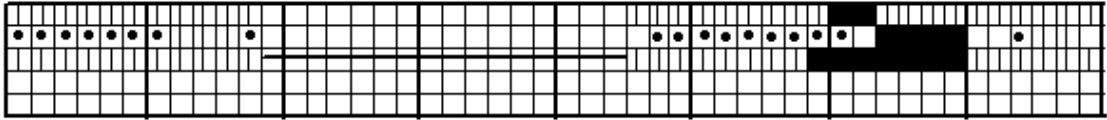


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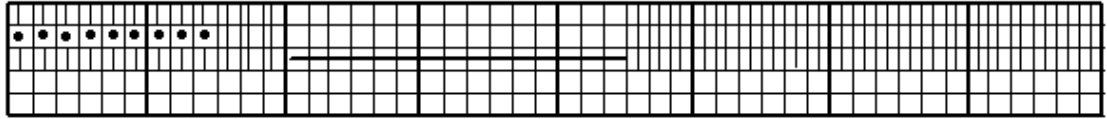
Universal Time

Apatity ascaplots

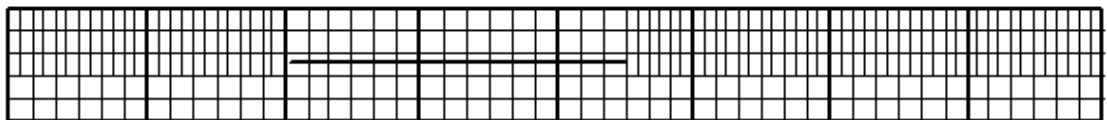
Dec. 29, 2015



Dec. 30, 2015



Dec. 31, 2015



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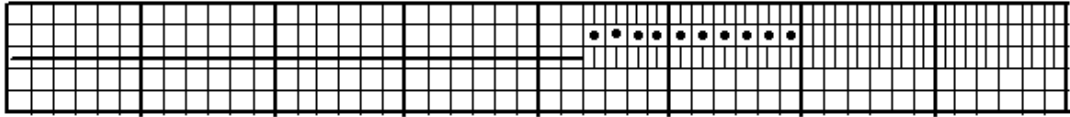
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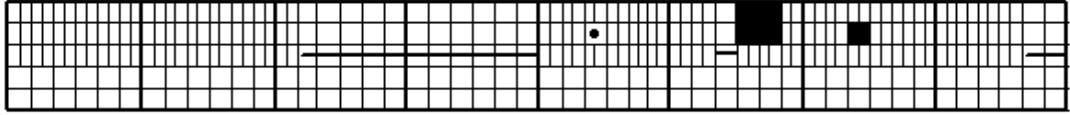
Universal Time

Lovozero ascaplots

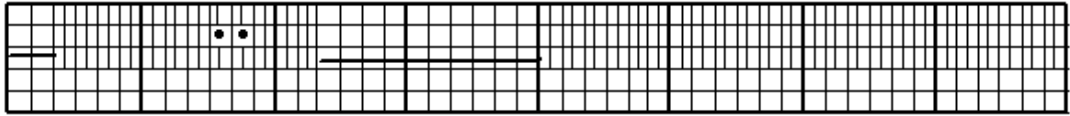
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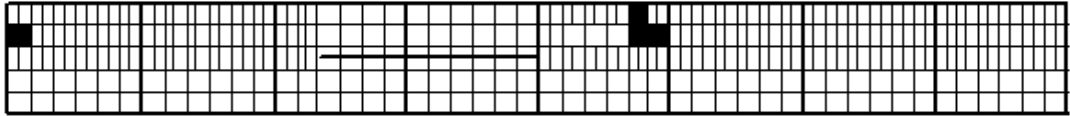
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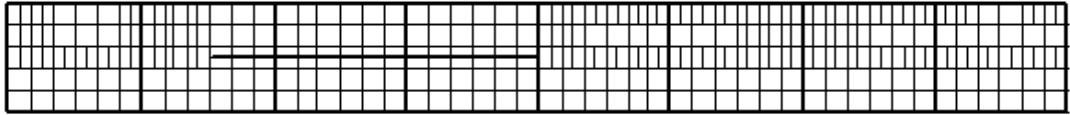
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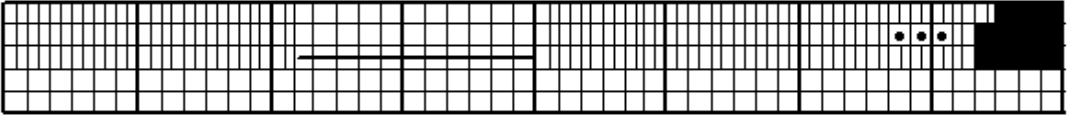
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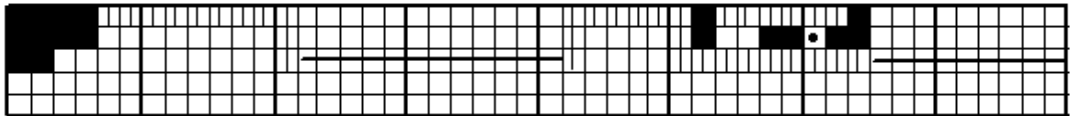
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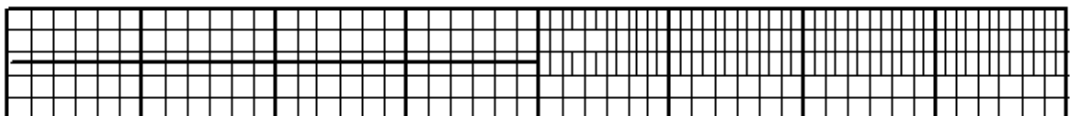
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Dec. 11, 2015



Dec. 12, 2015



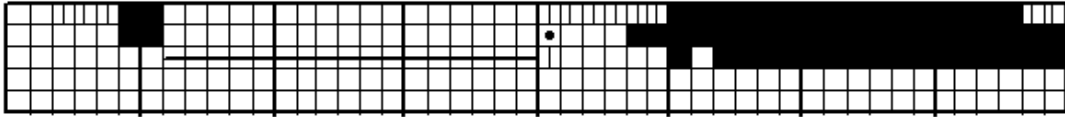
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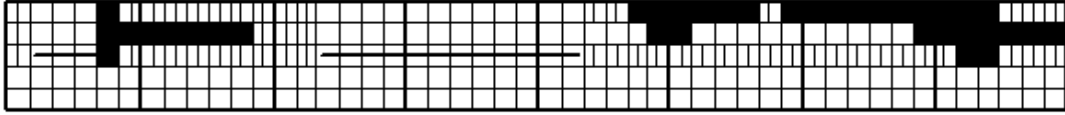
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Universal Time

Lovozero ascaplots

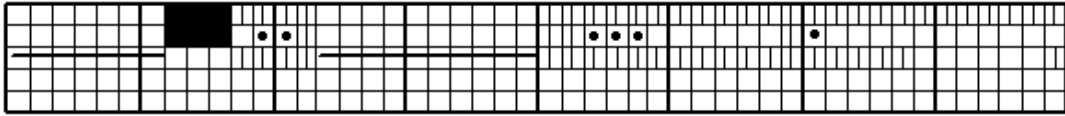
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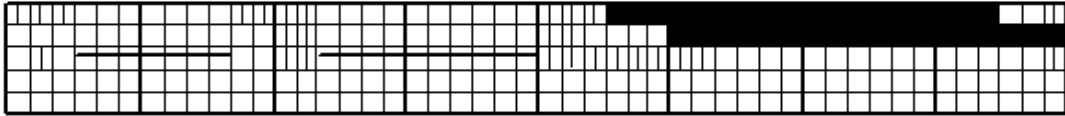
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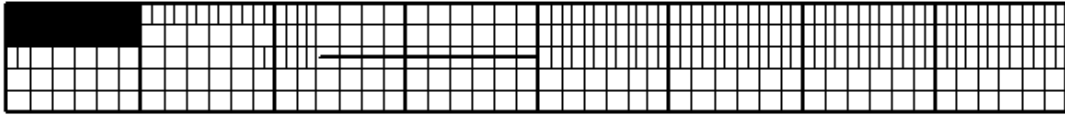
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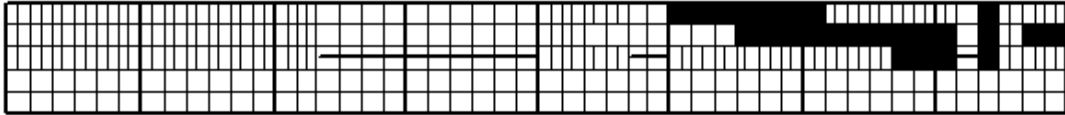
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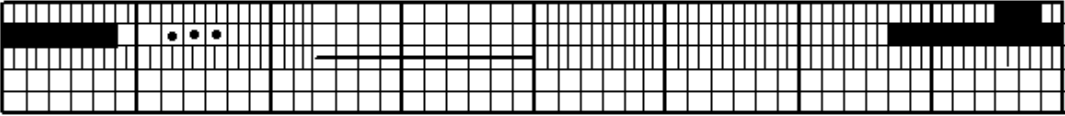
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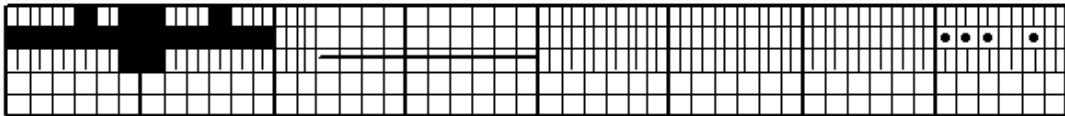
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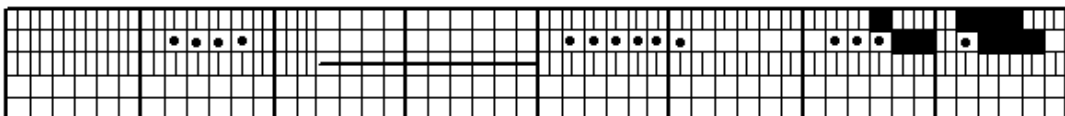
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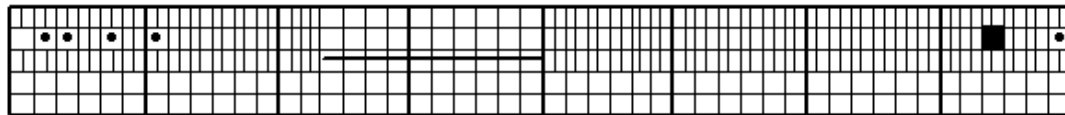
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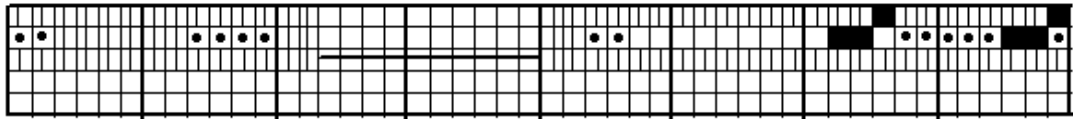


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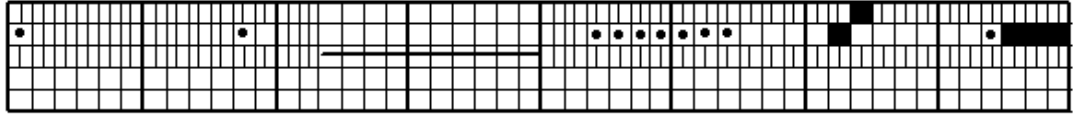
Universal Time

Lovozero ascaplots

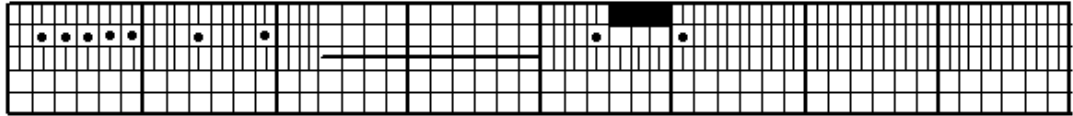
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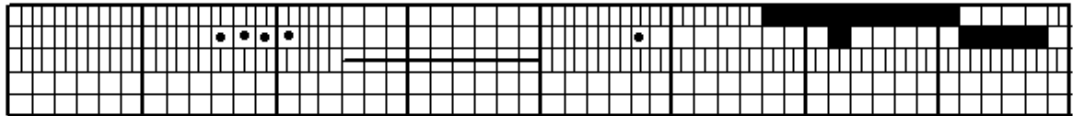
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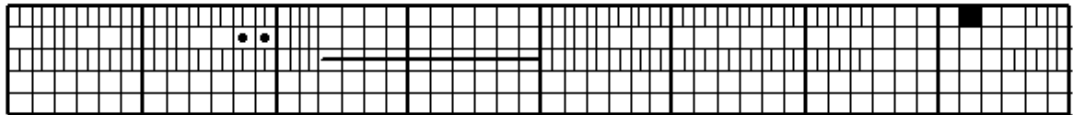
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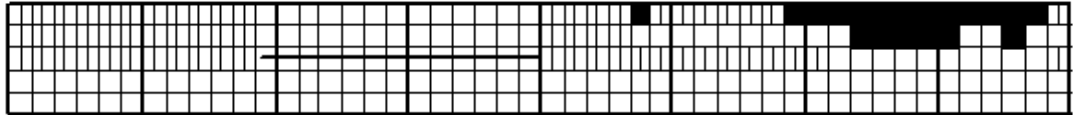
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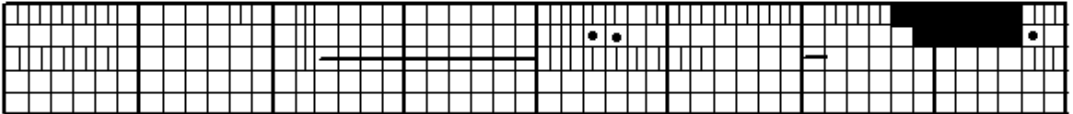
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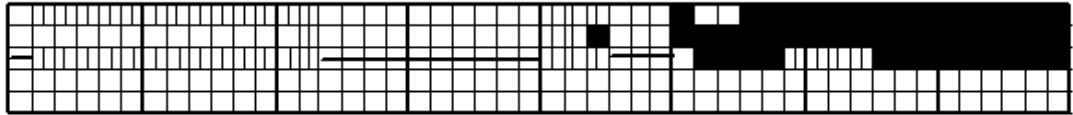
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Dec. 30, 2015



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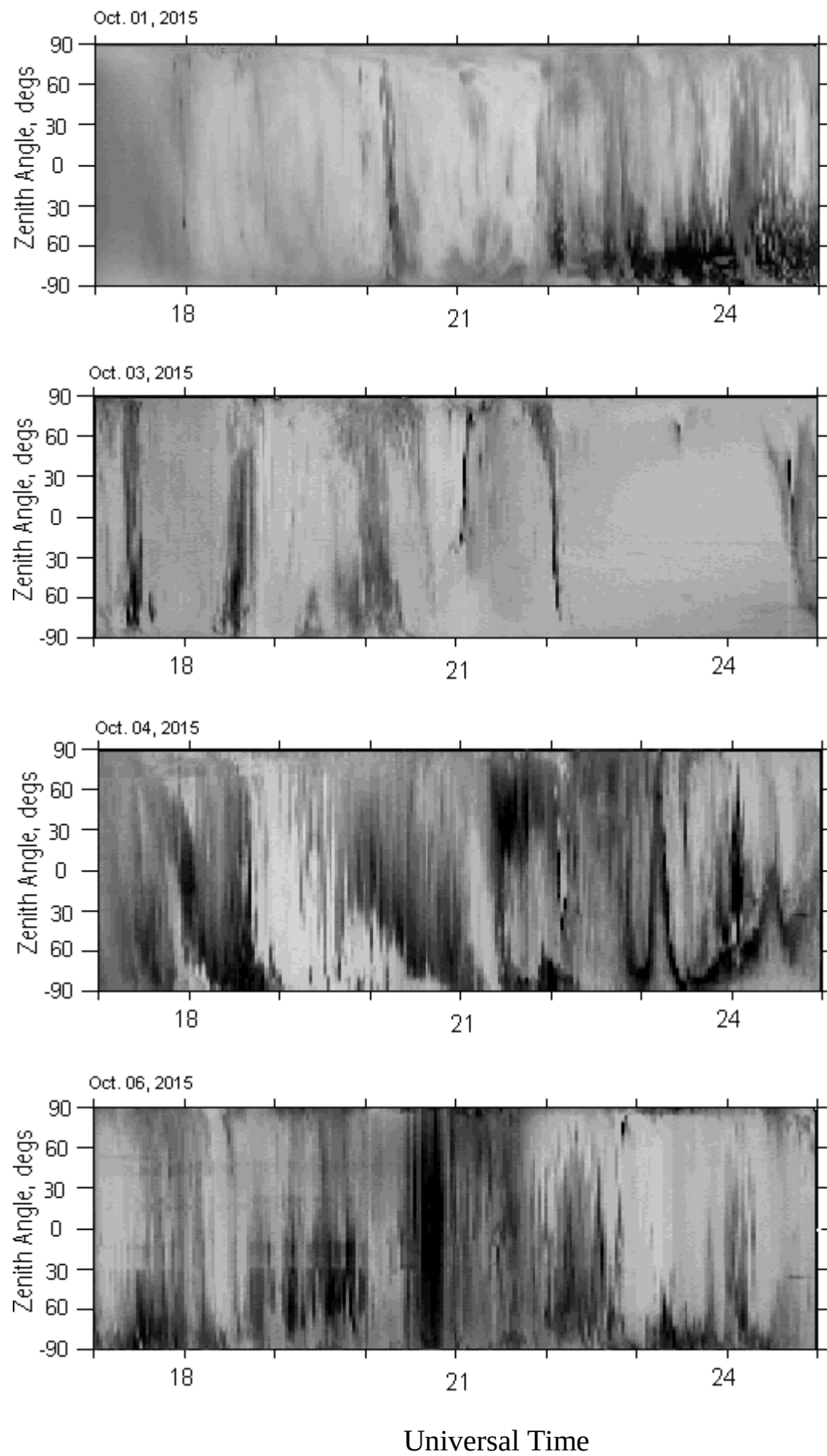
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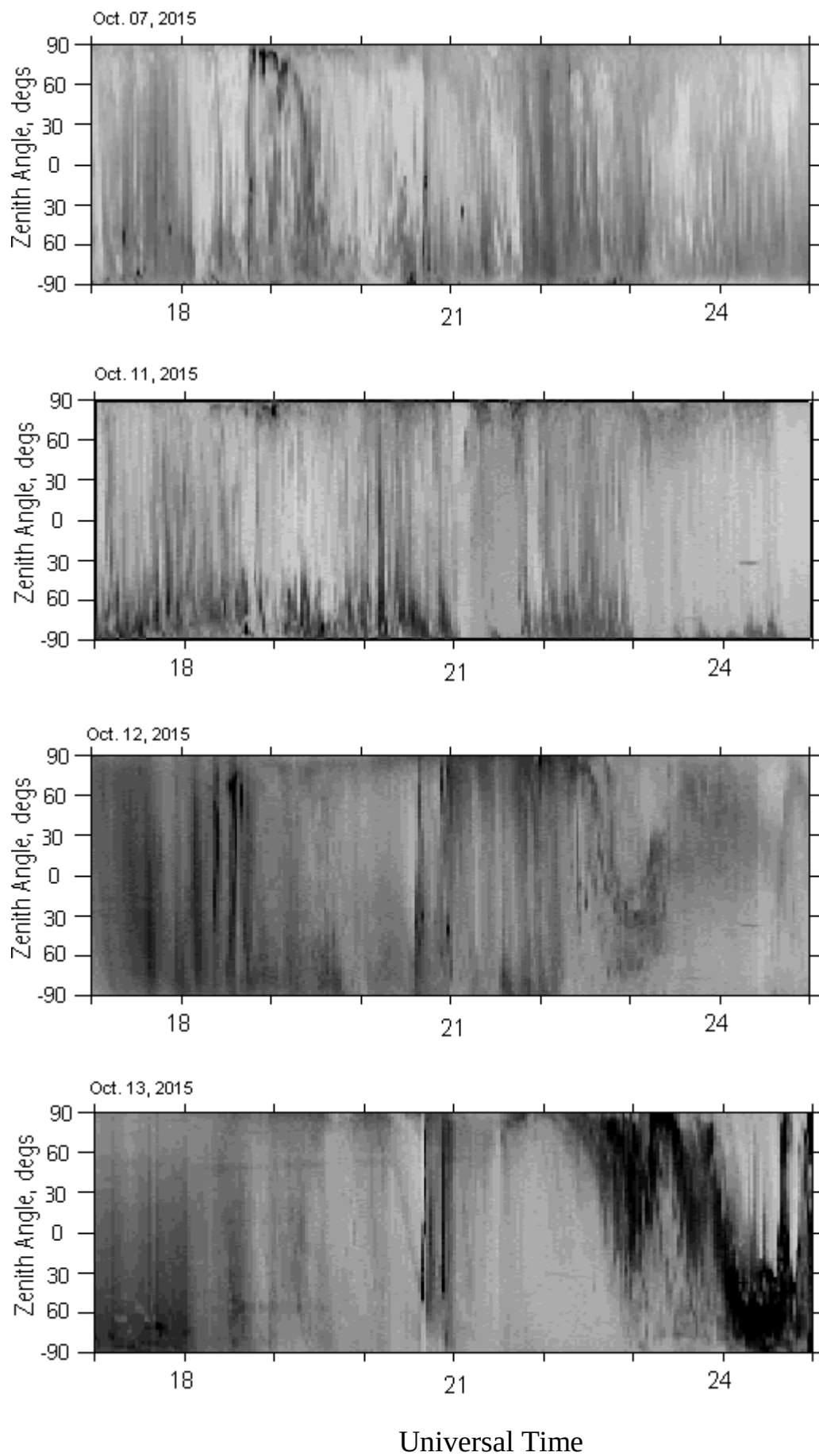
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Universal Time

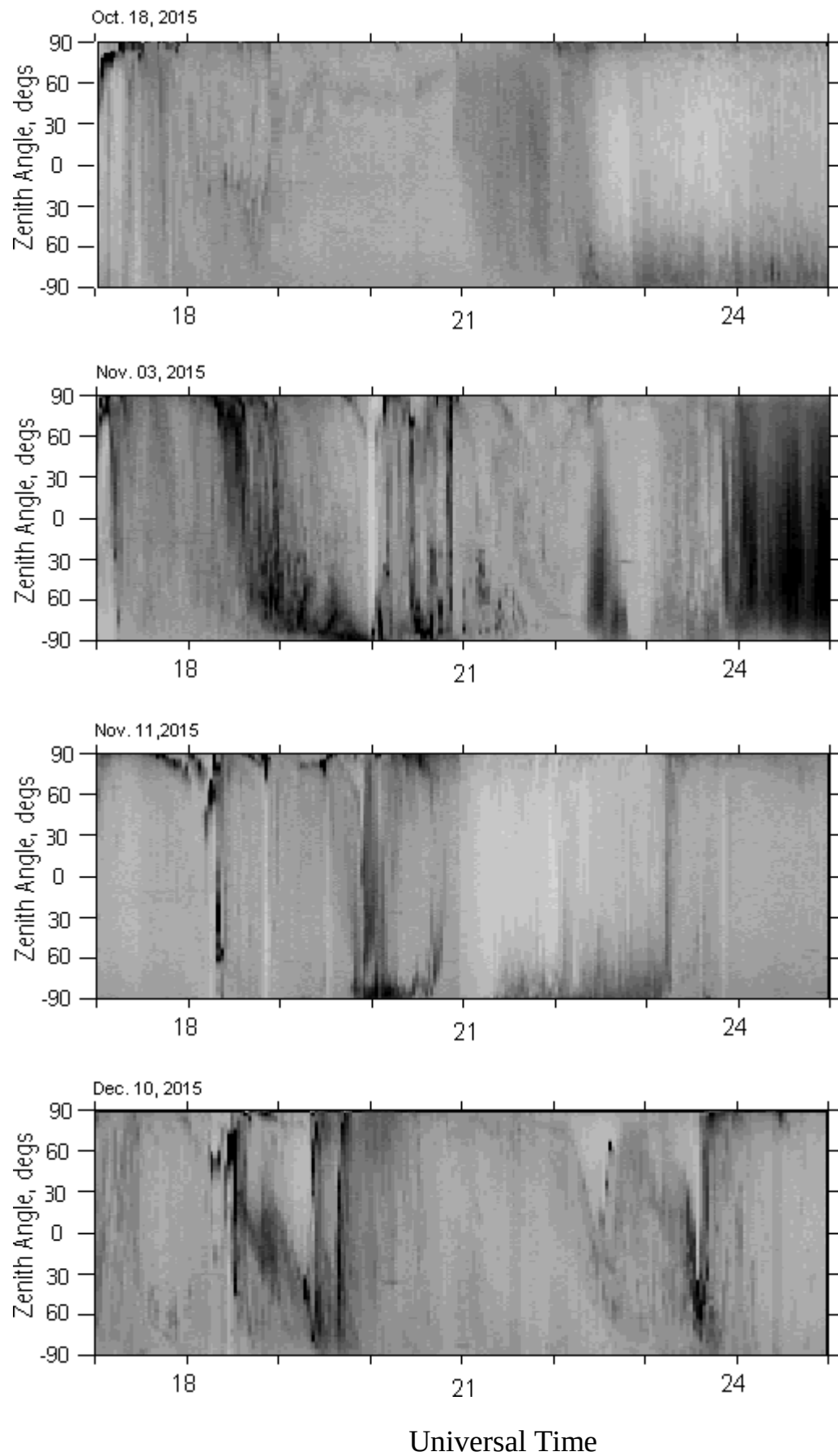
Apatity TV keograms



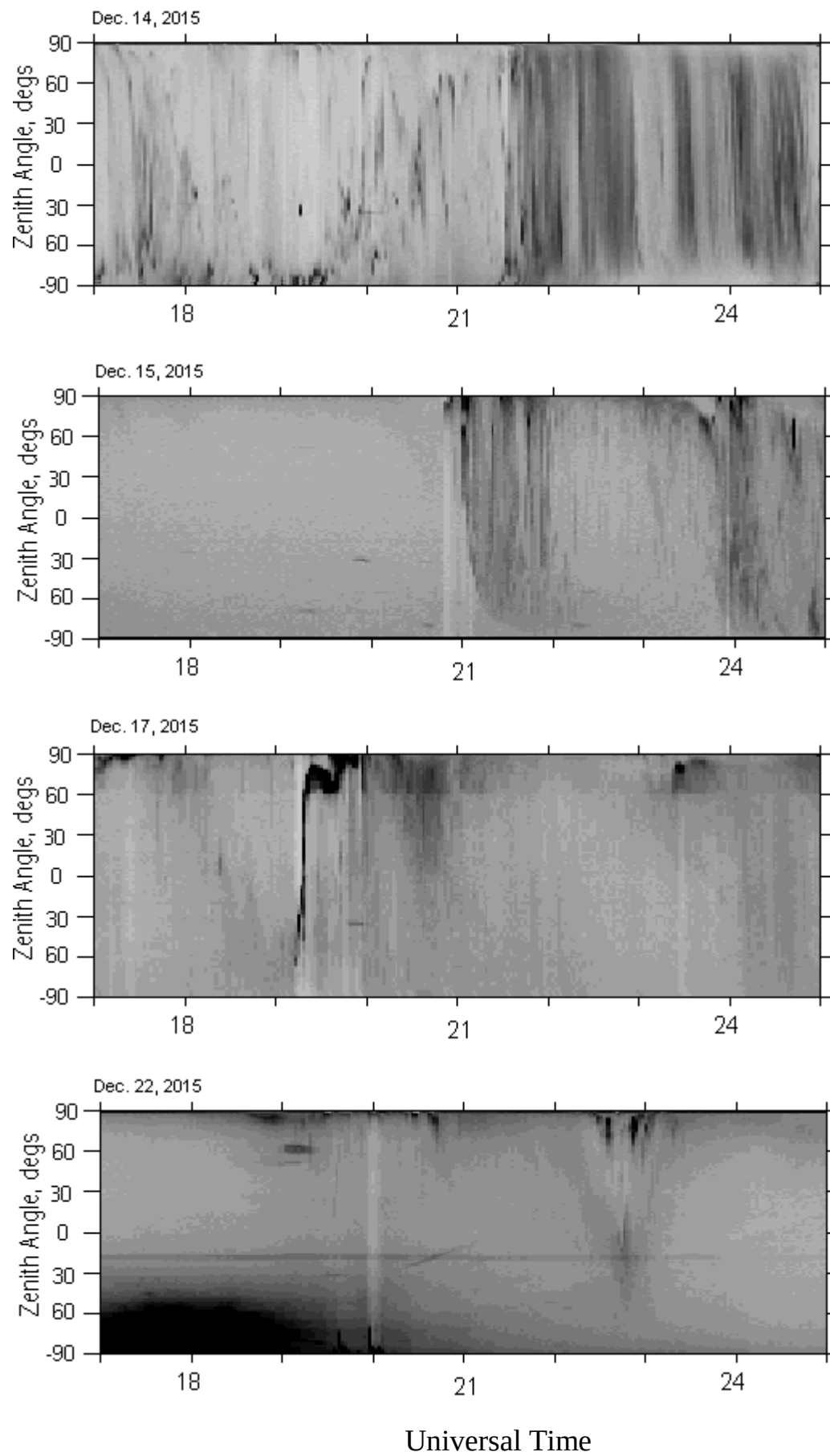
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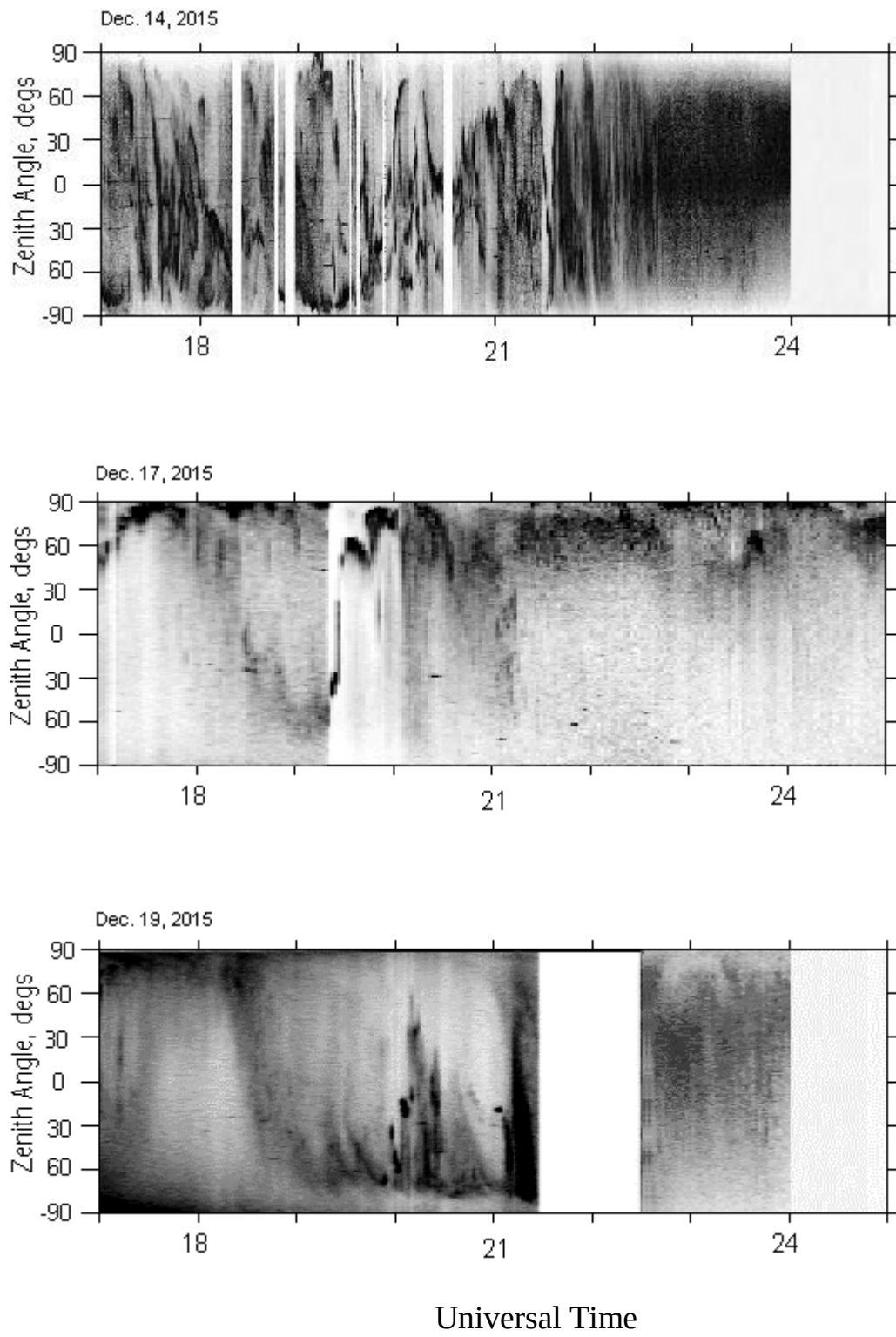
Apatity TV keograms



Apatity TV keograms



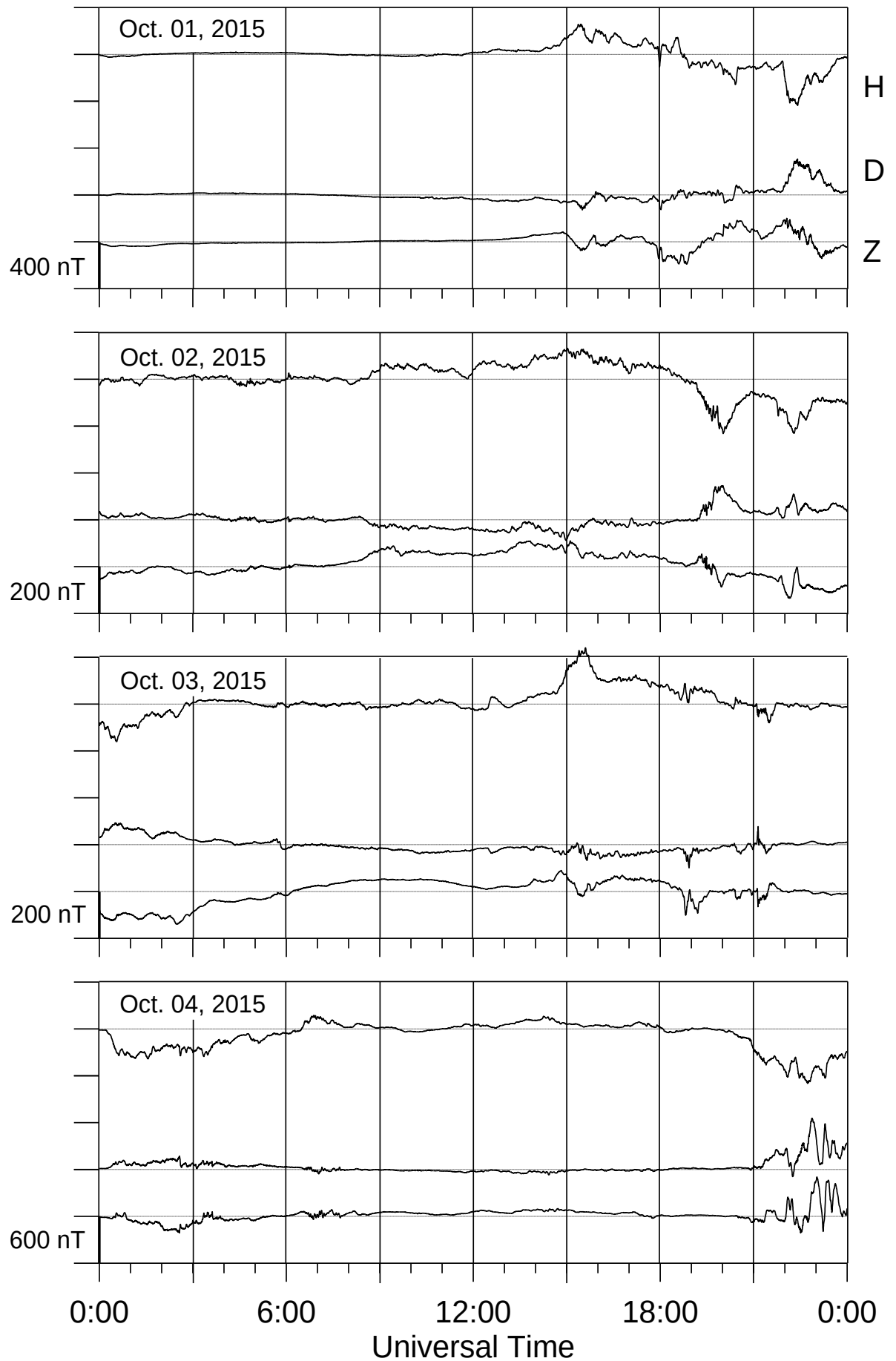
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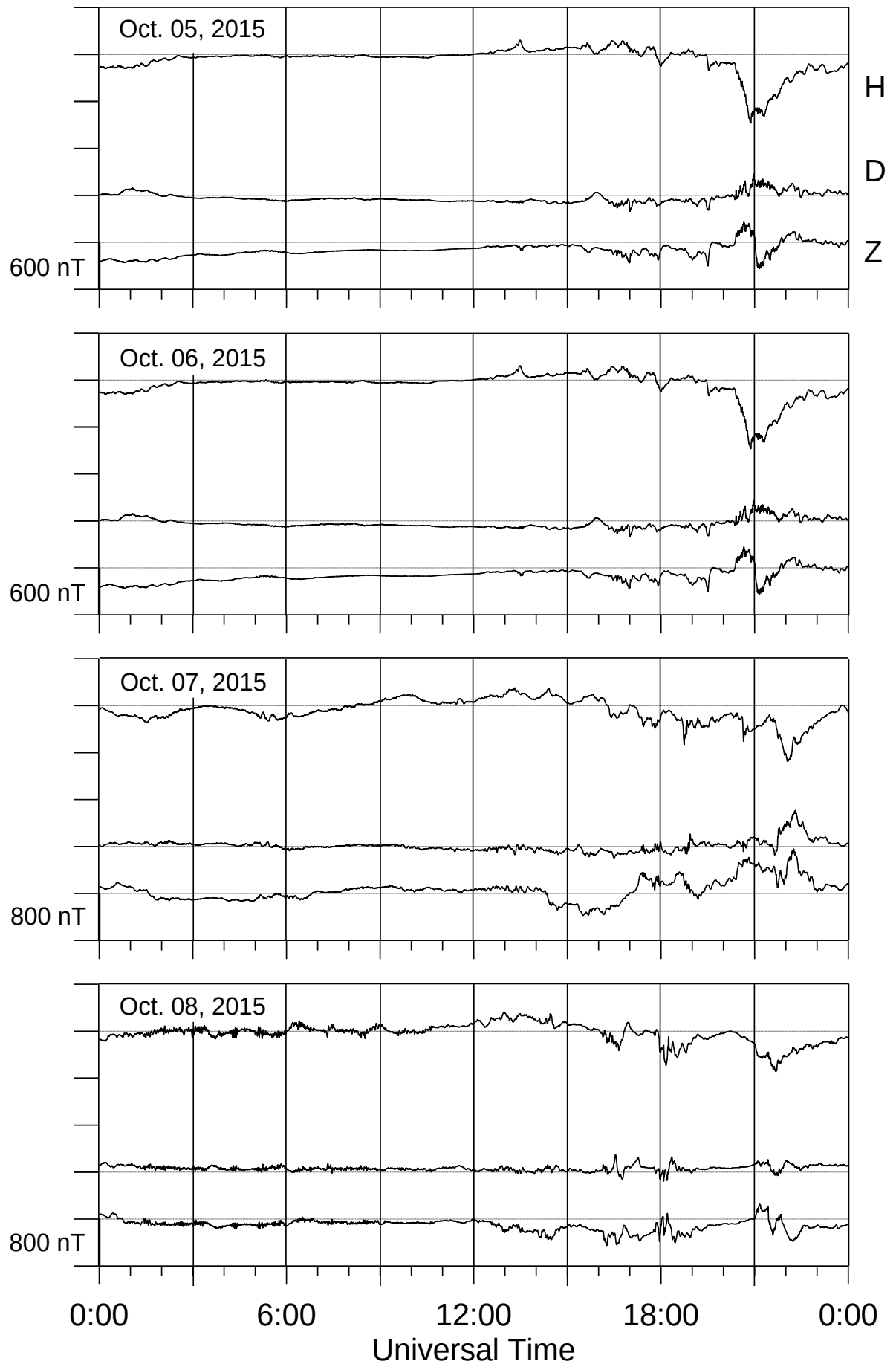
LOVOZERO MAGNETOGRAMS

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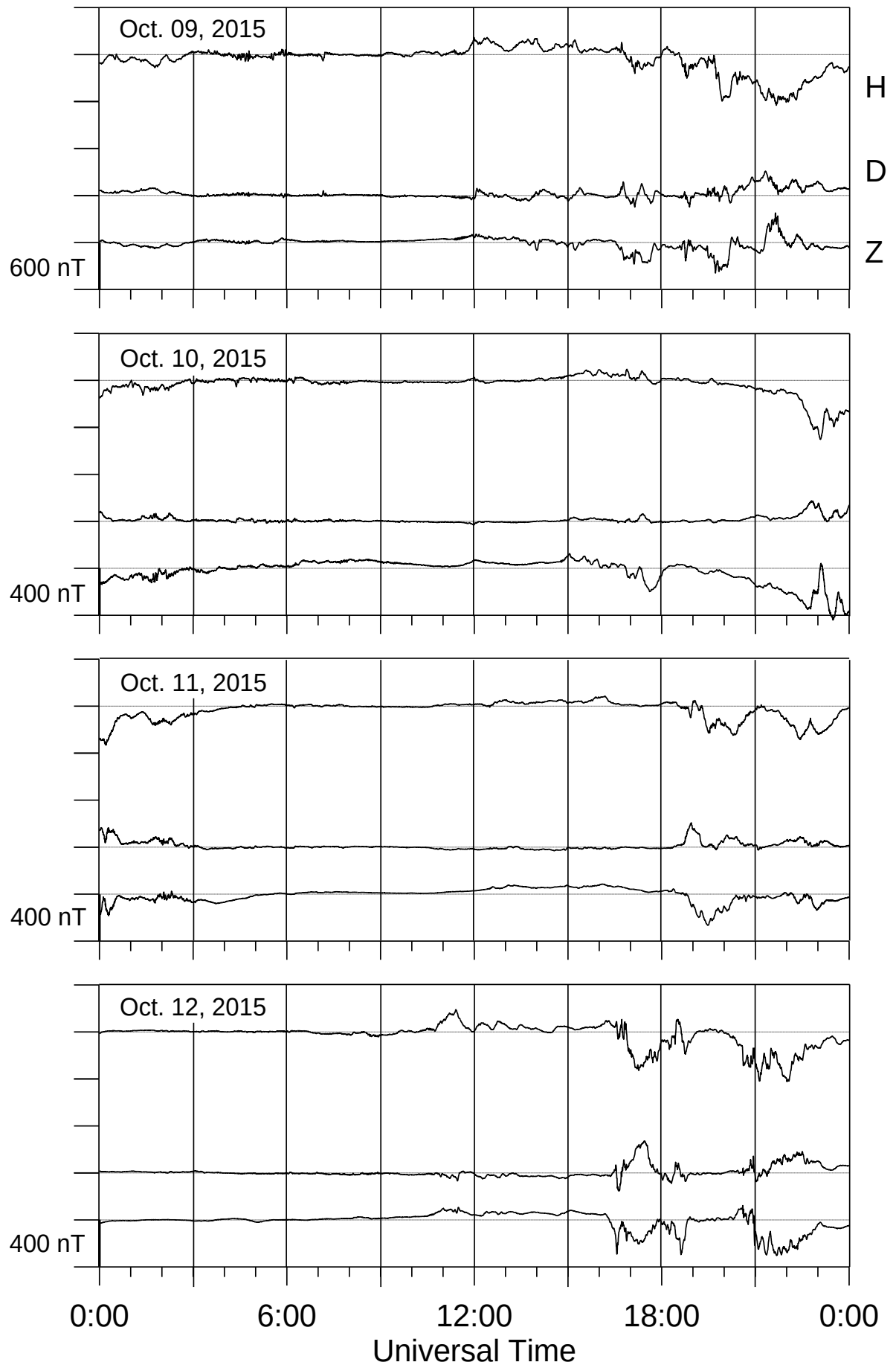
Lovozero magnetometer



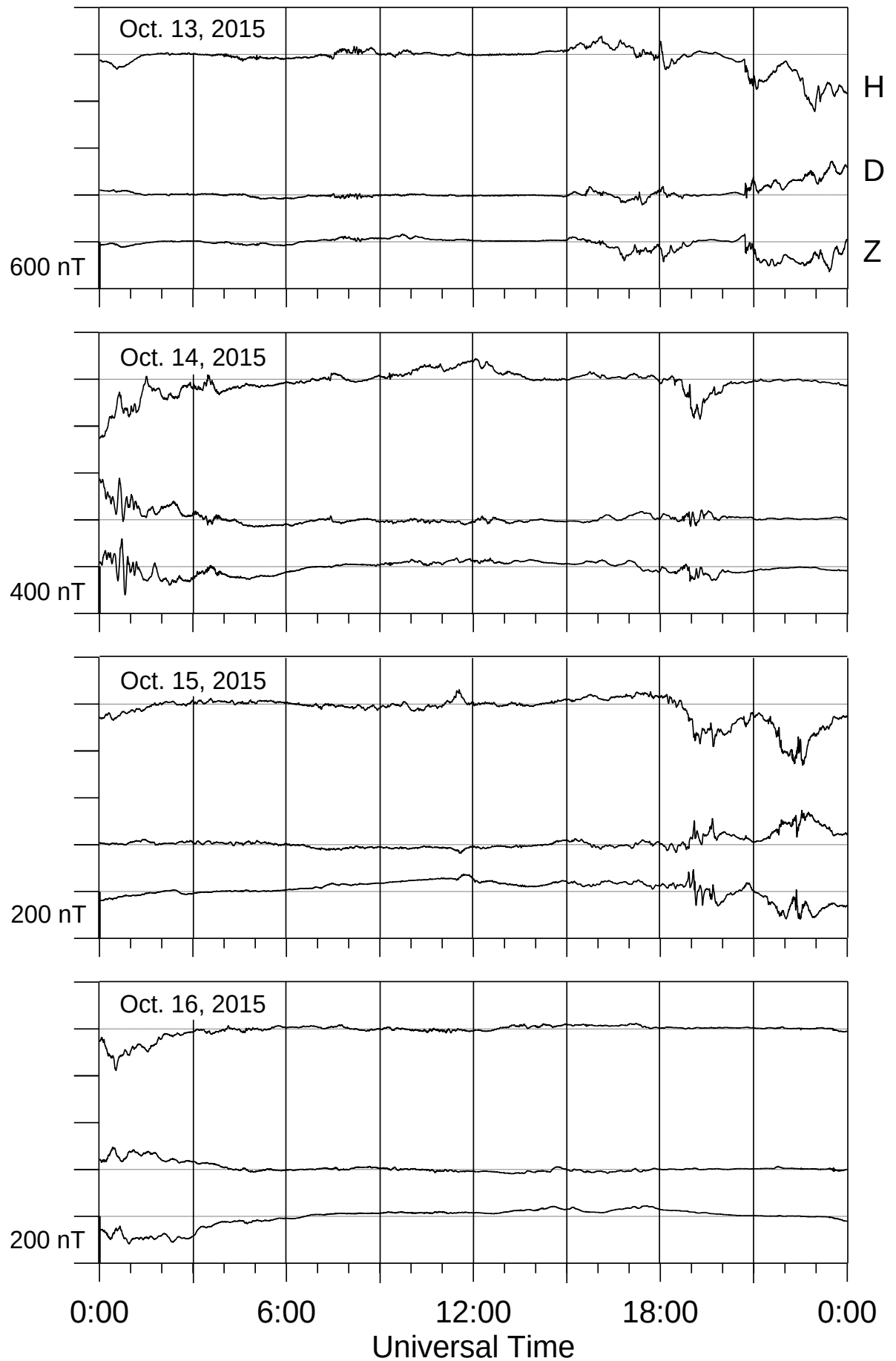
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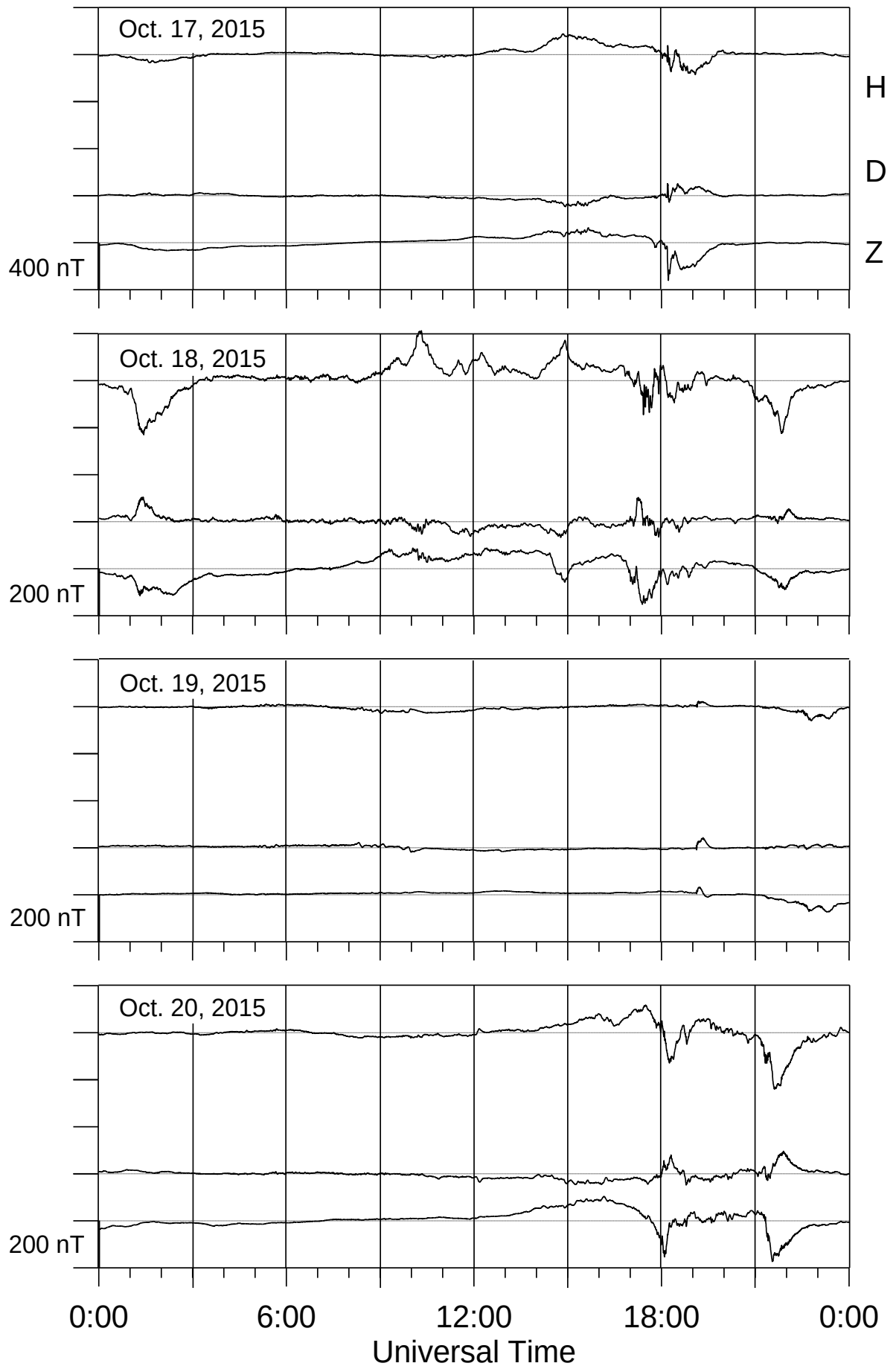
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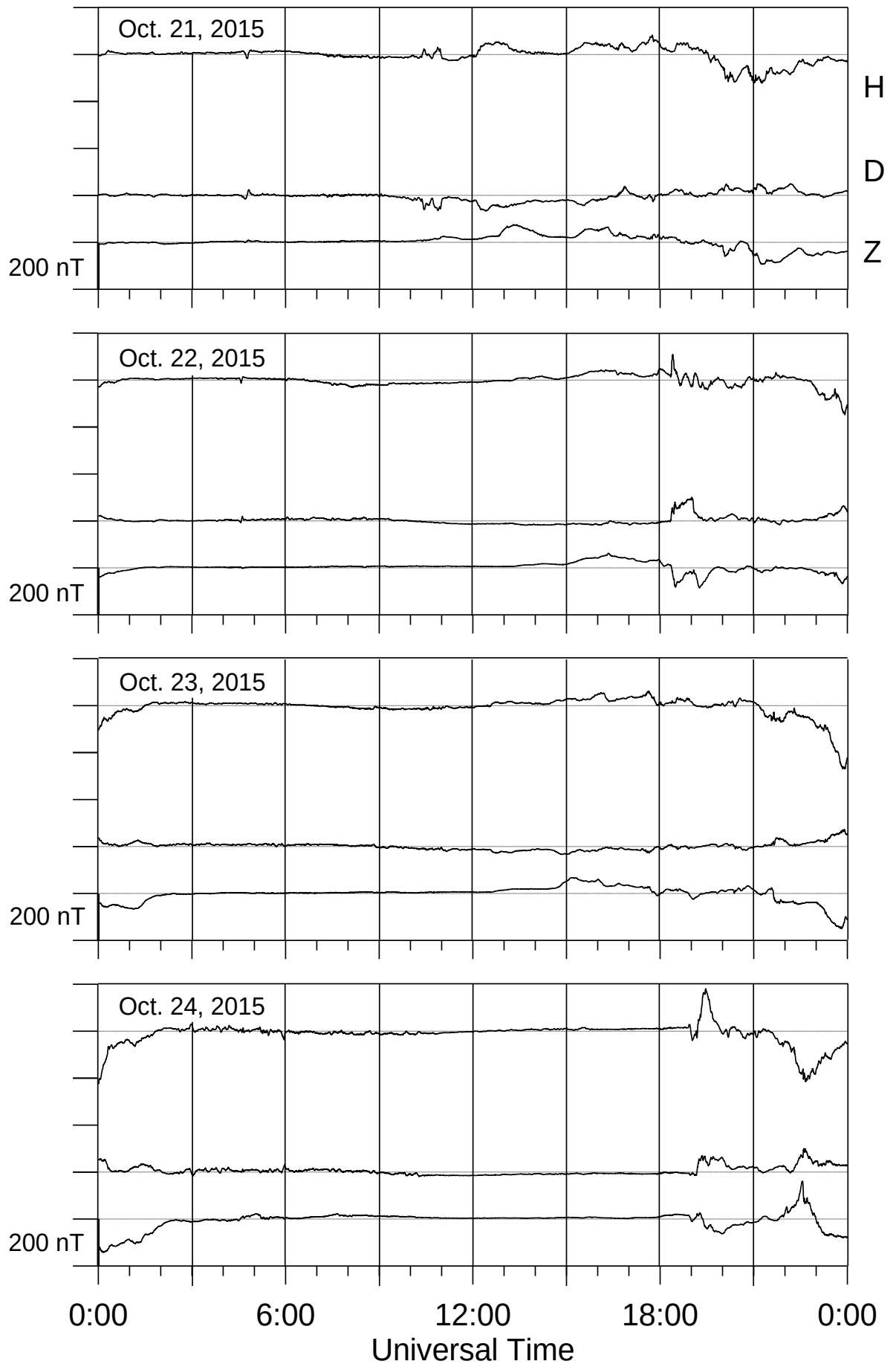
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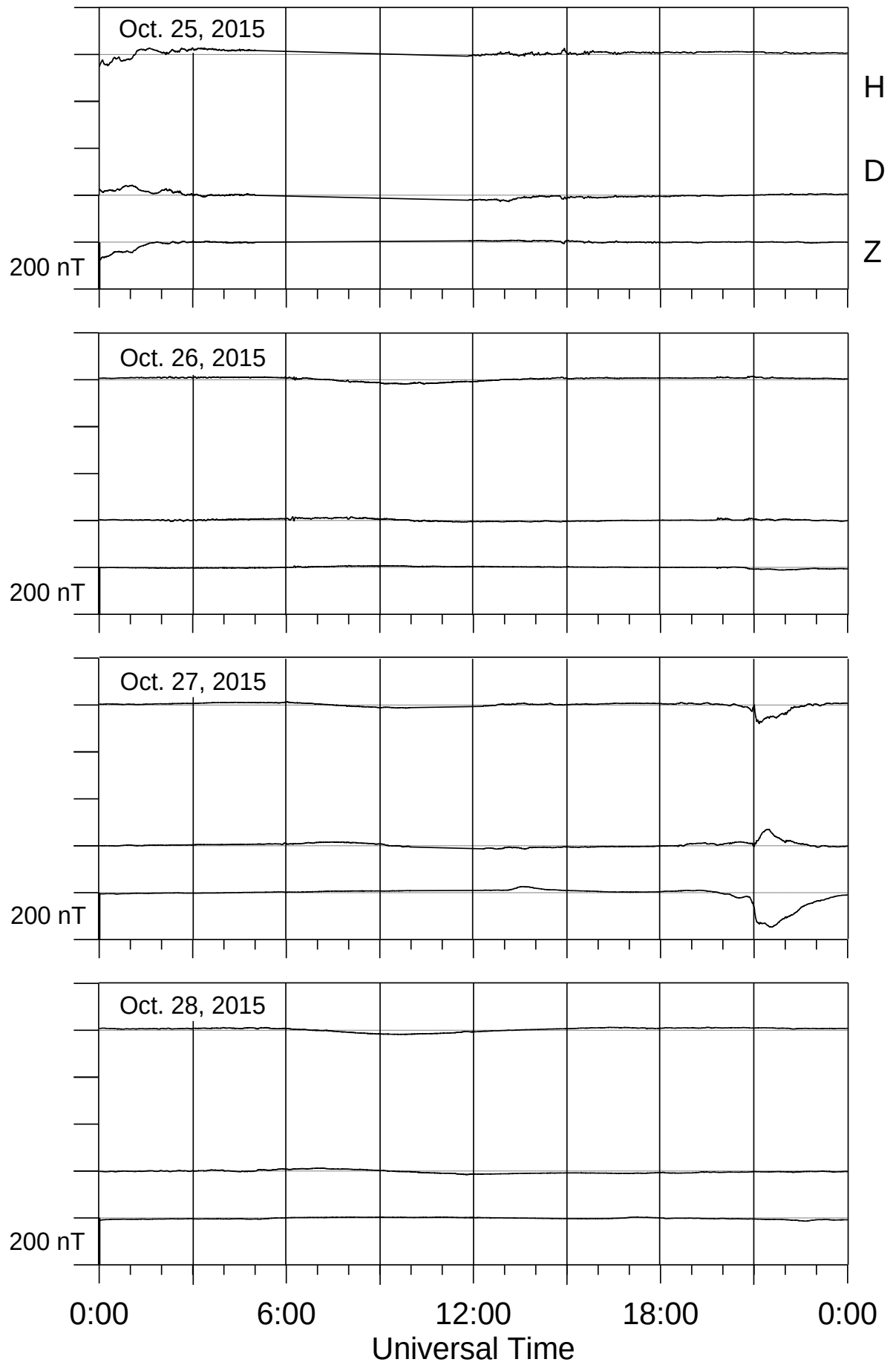
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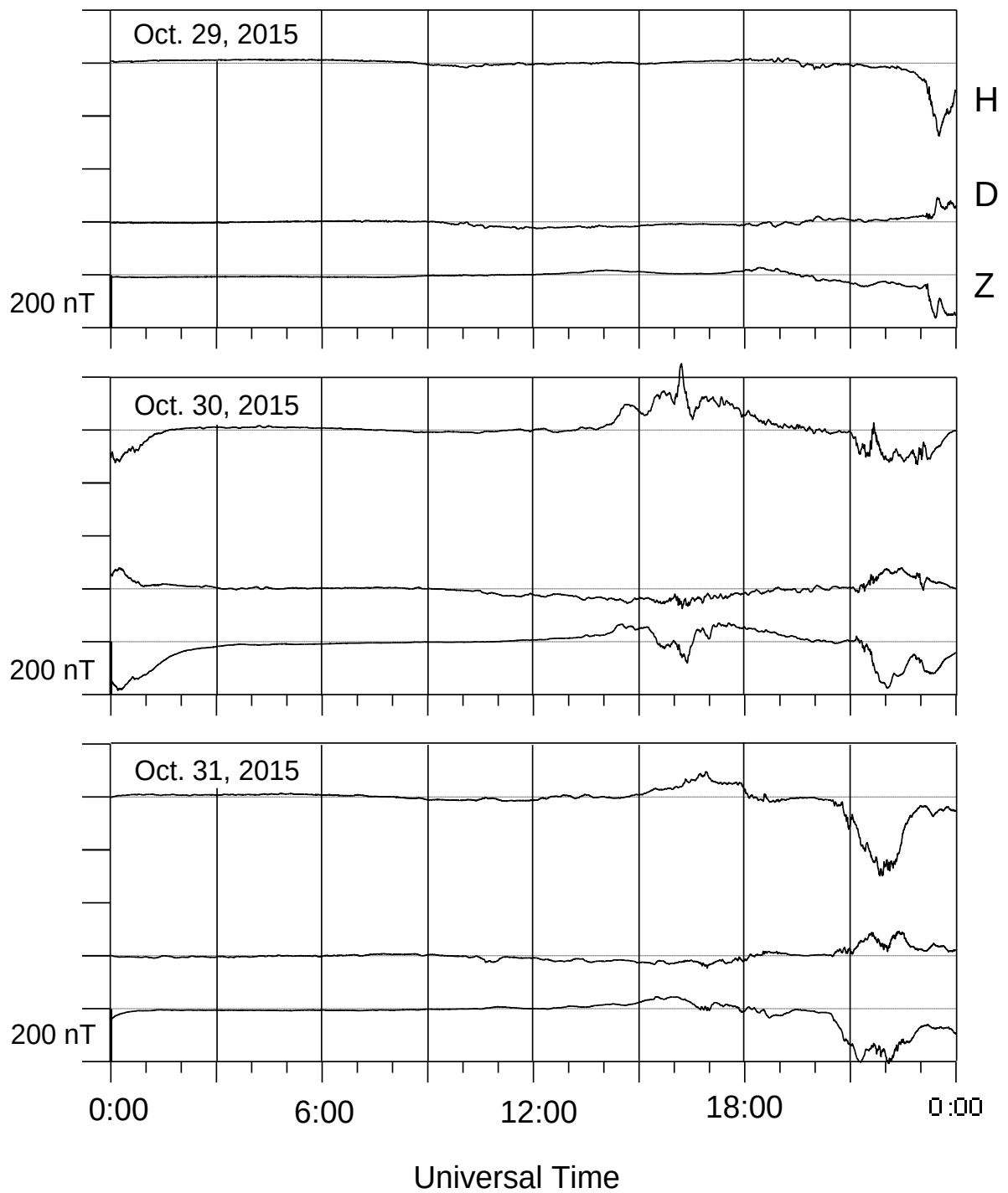
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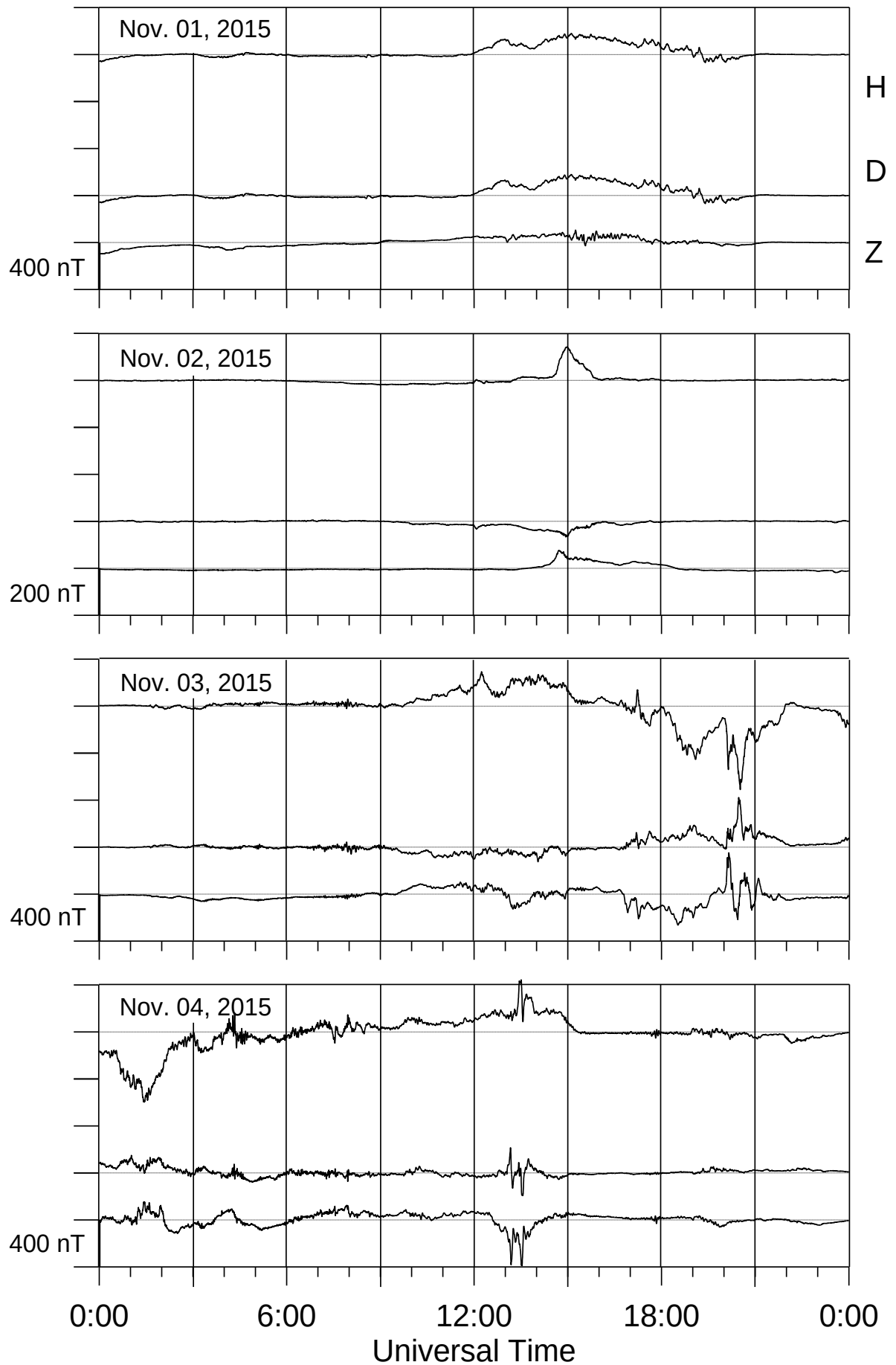
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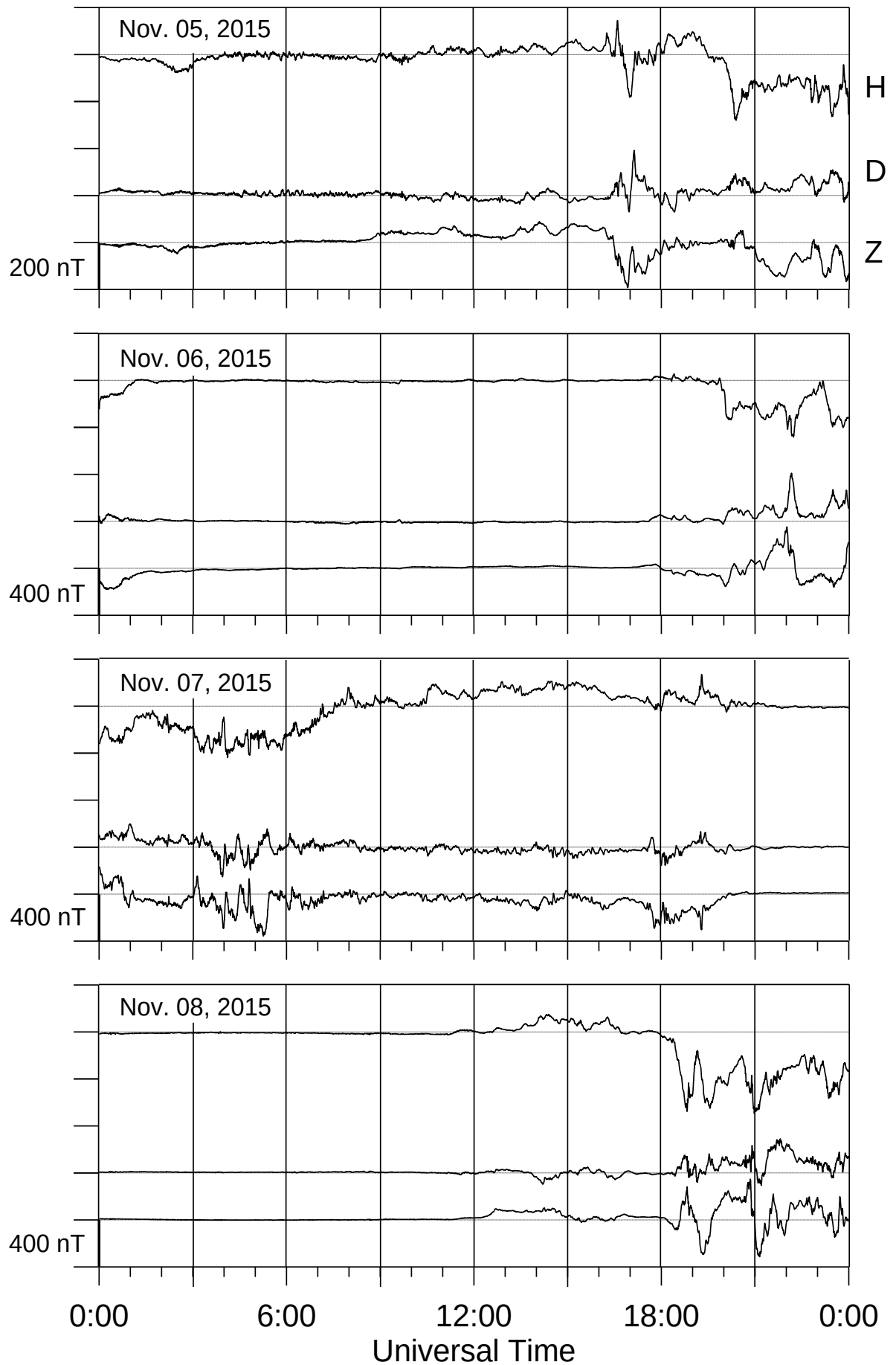
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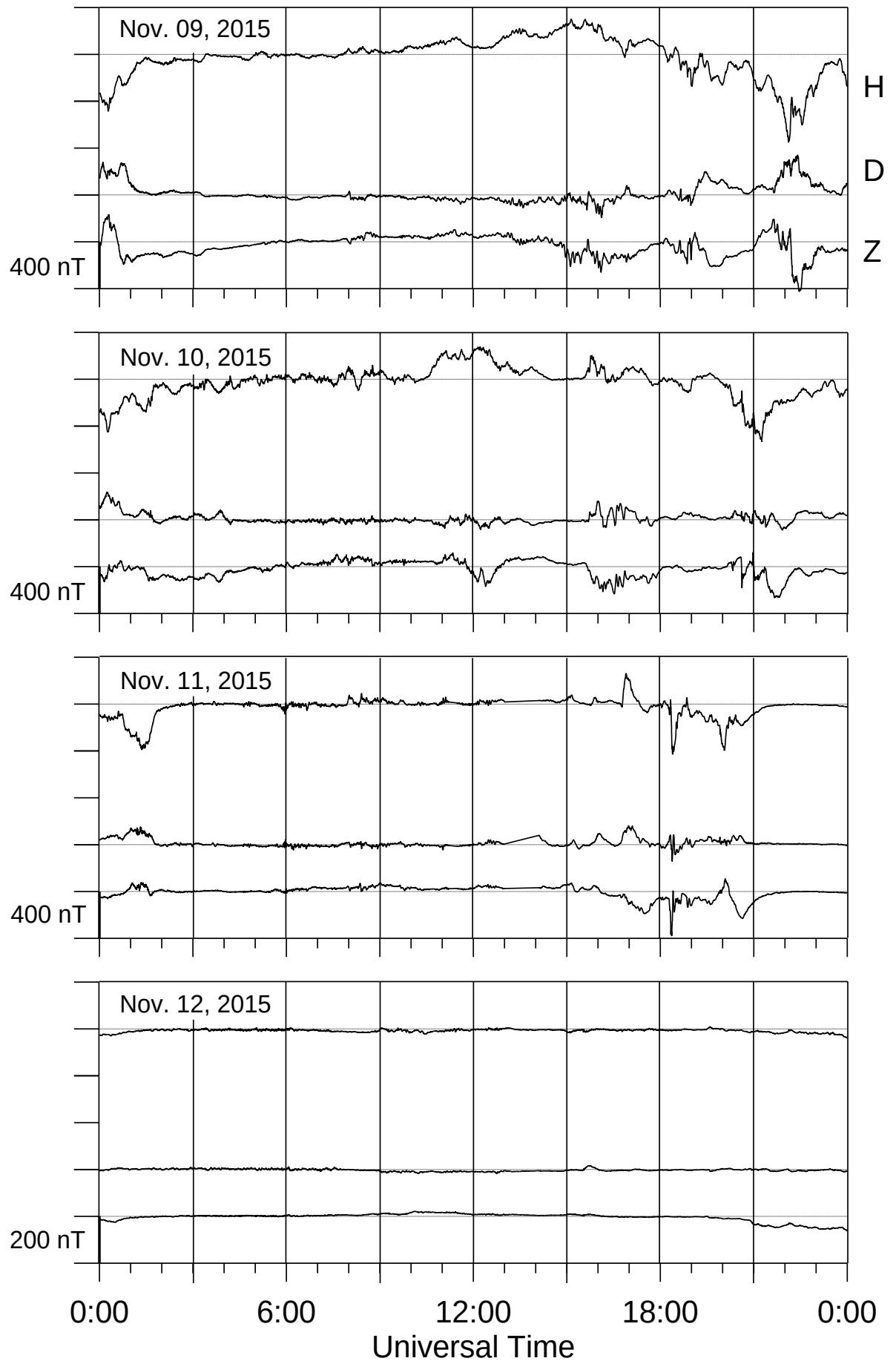
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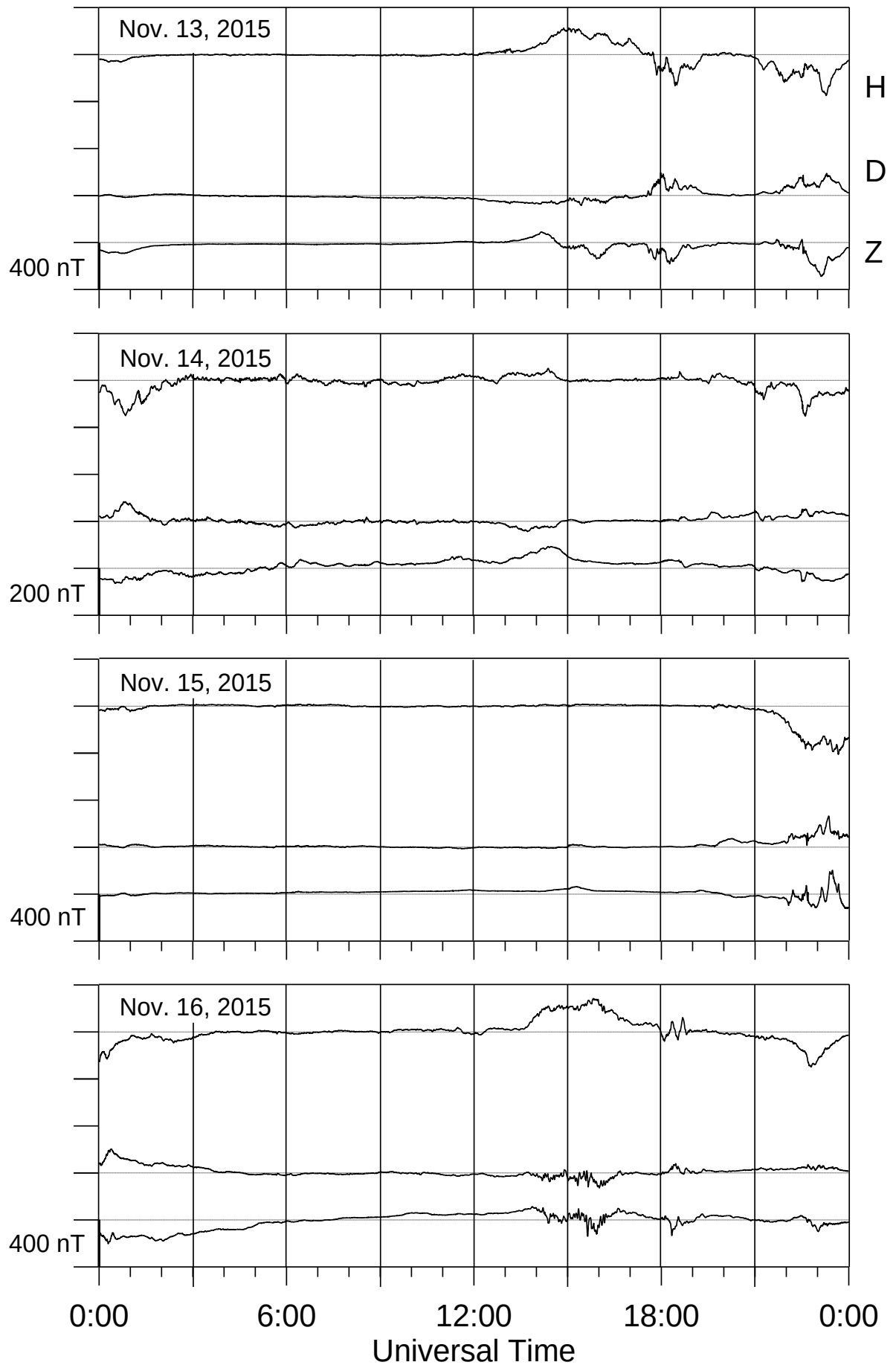
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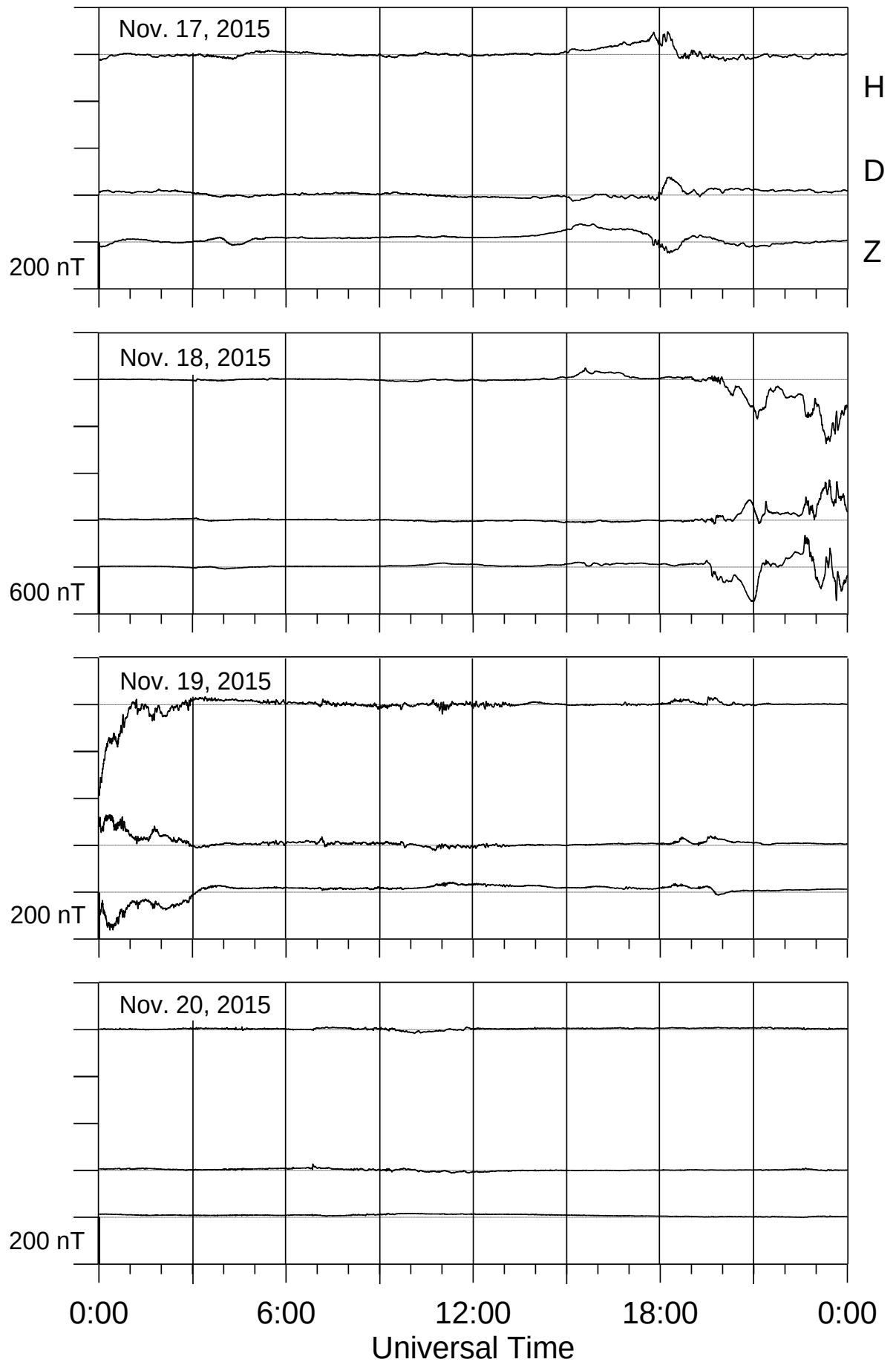
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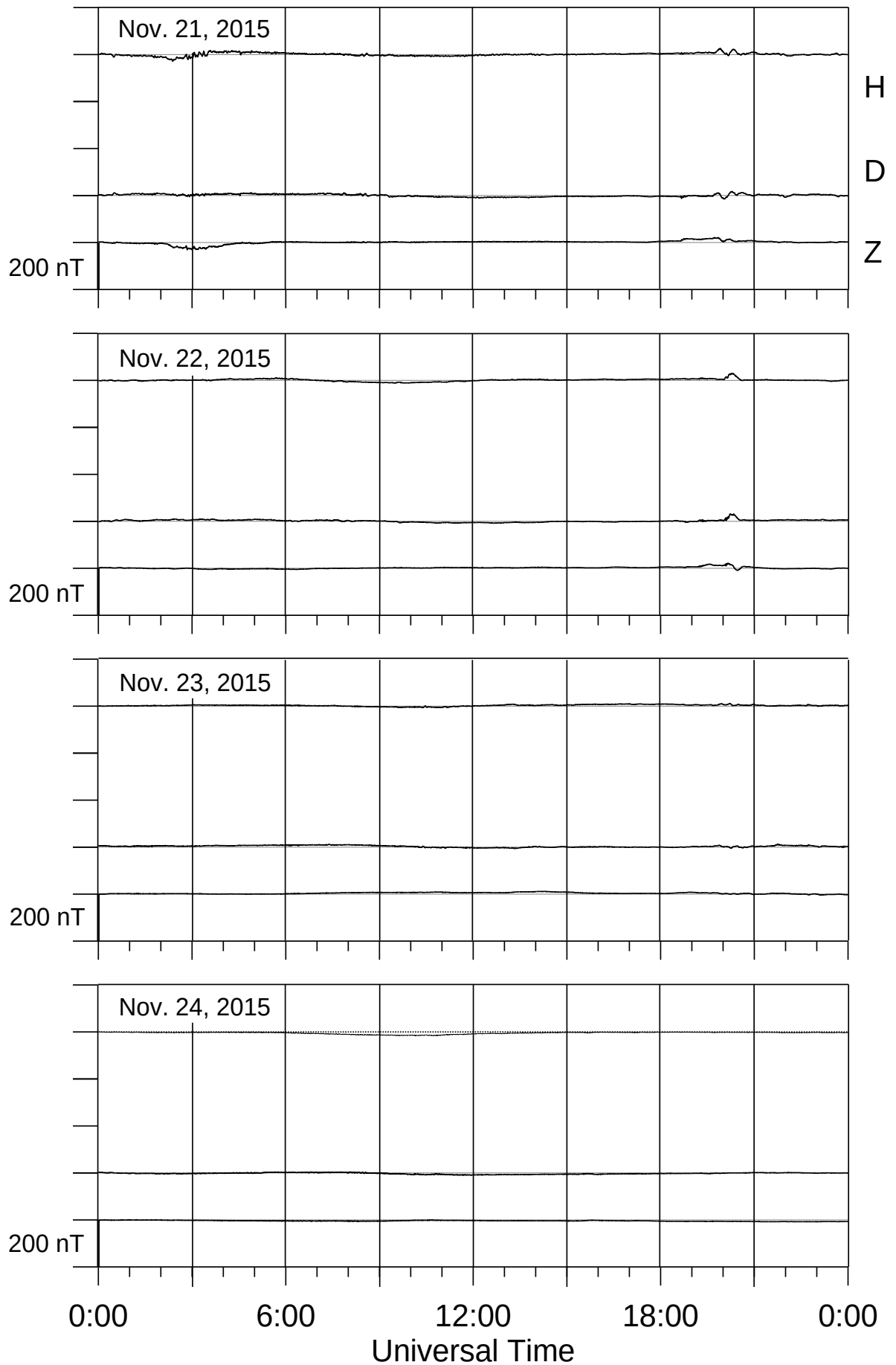
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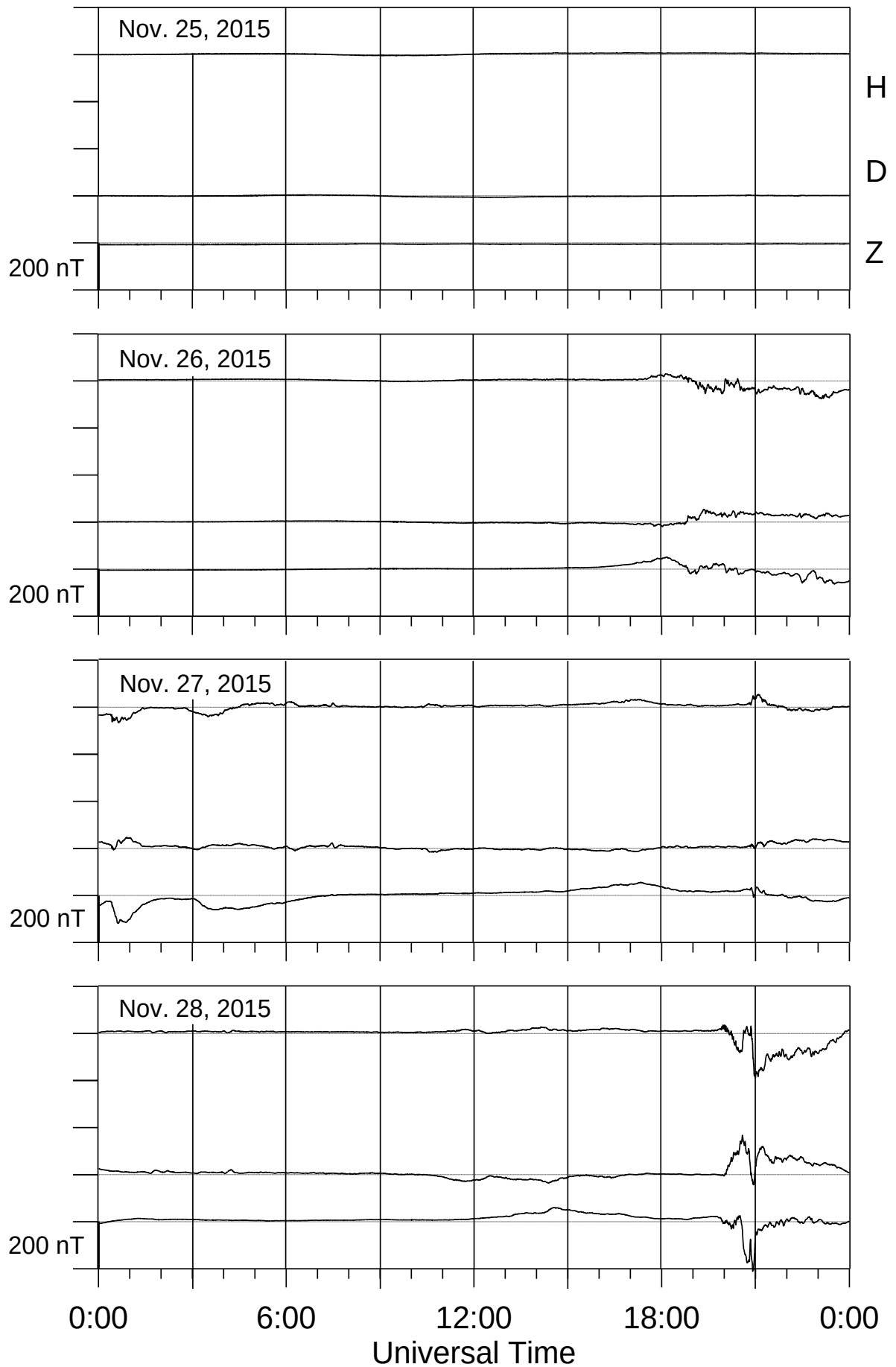
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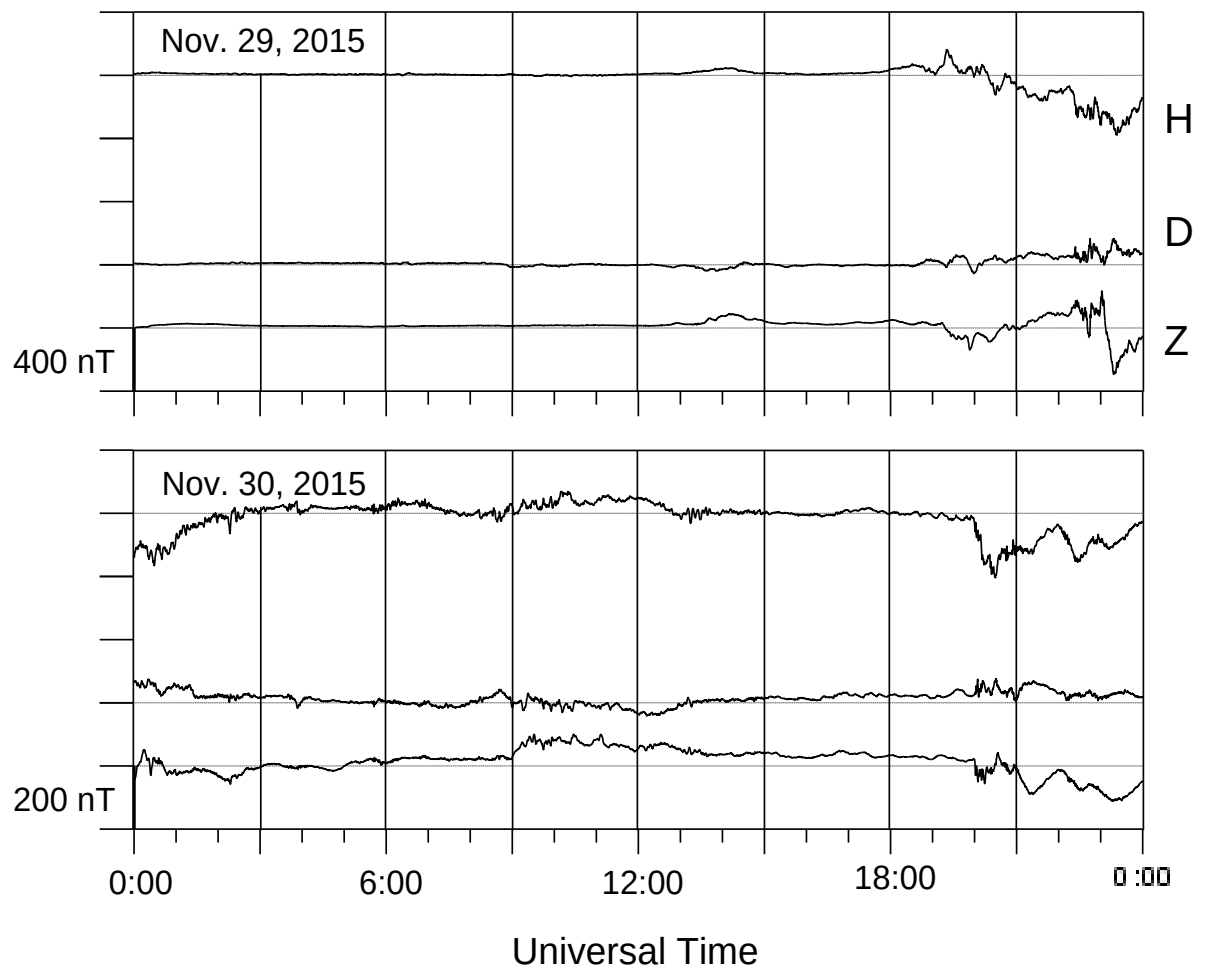
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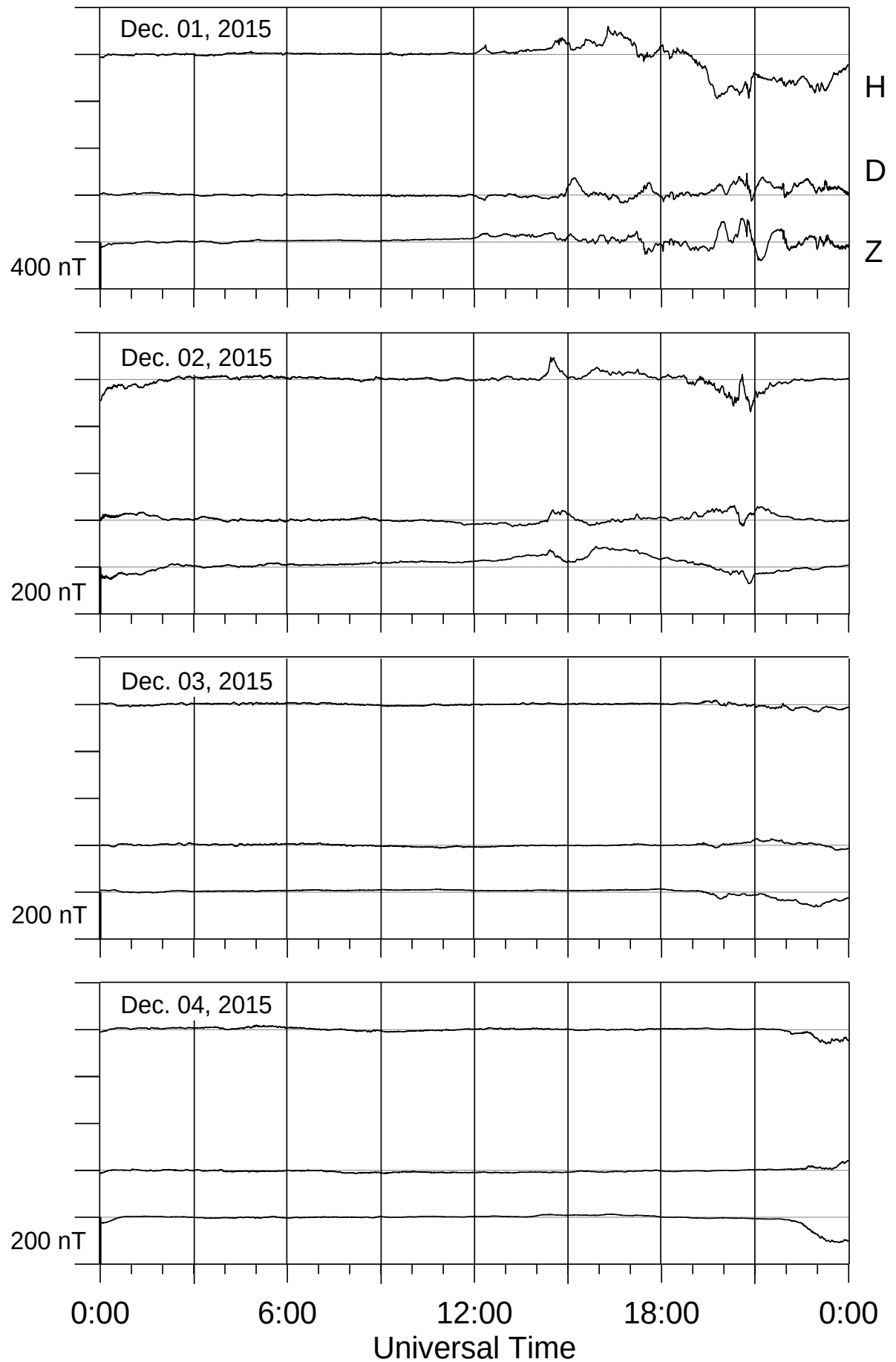
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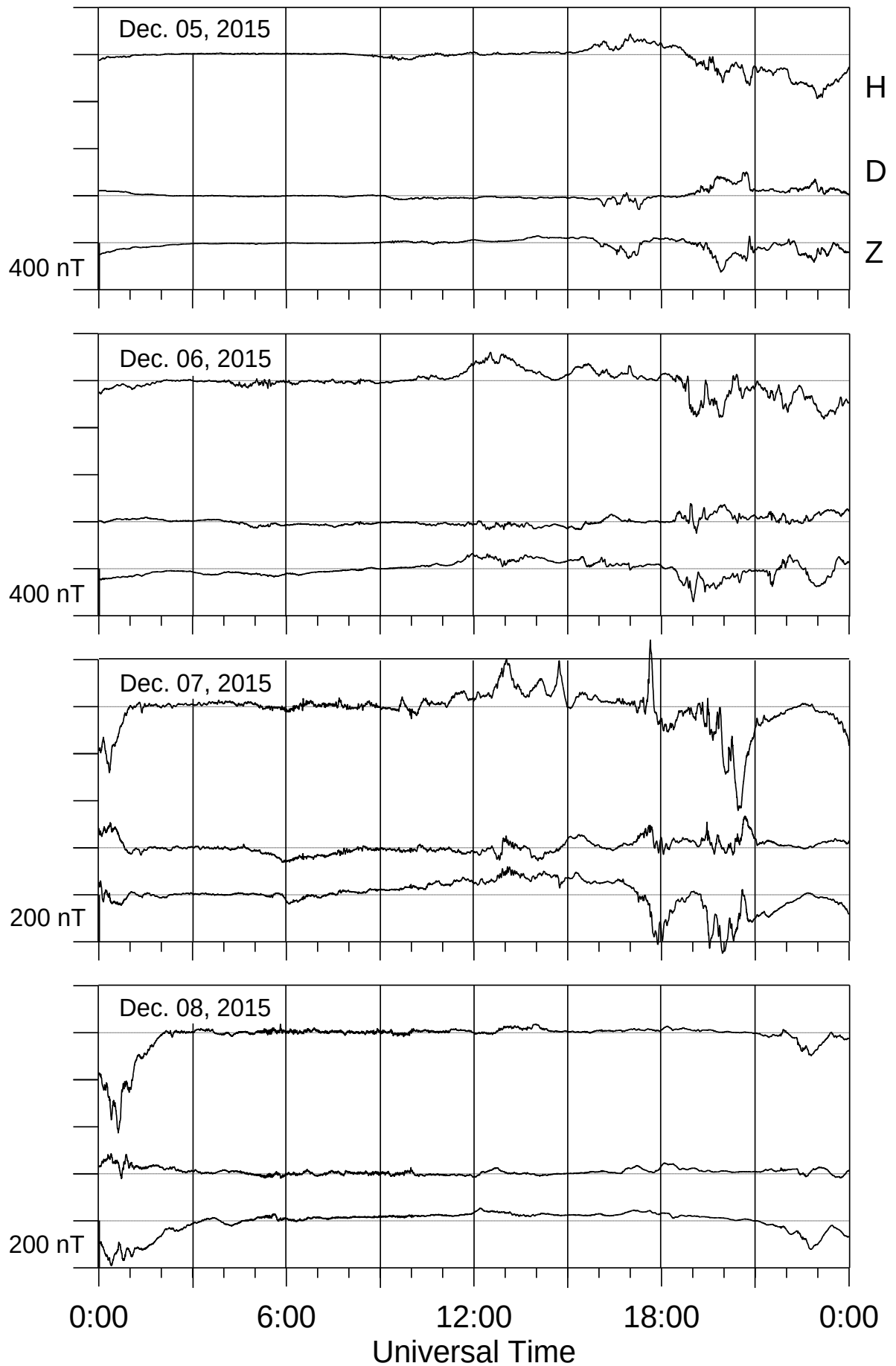
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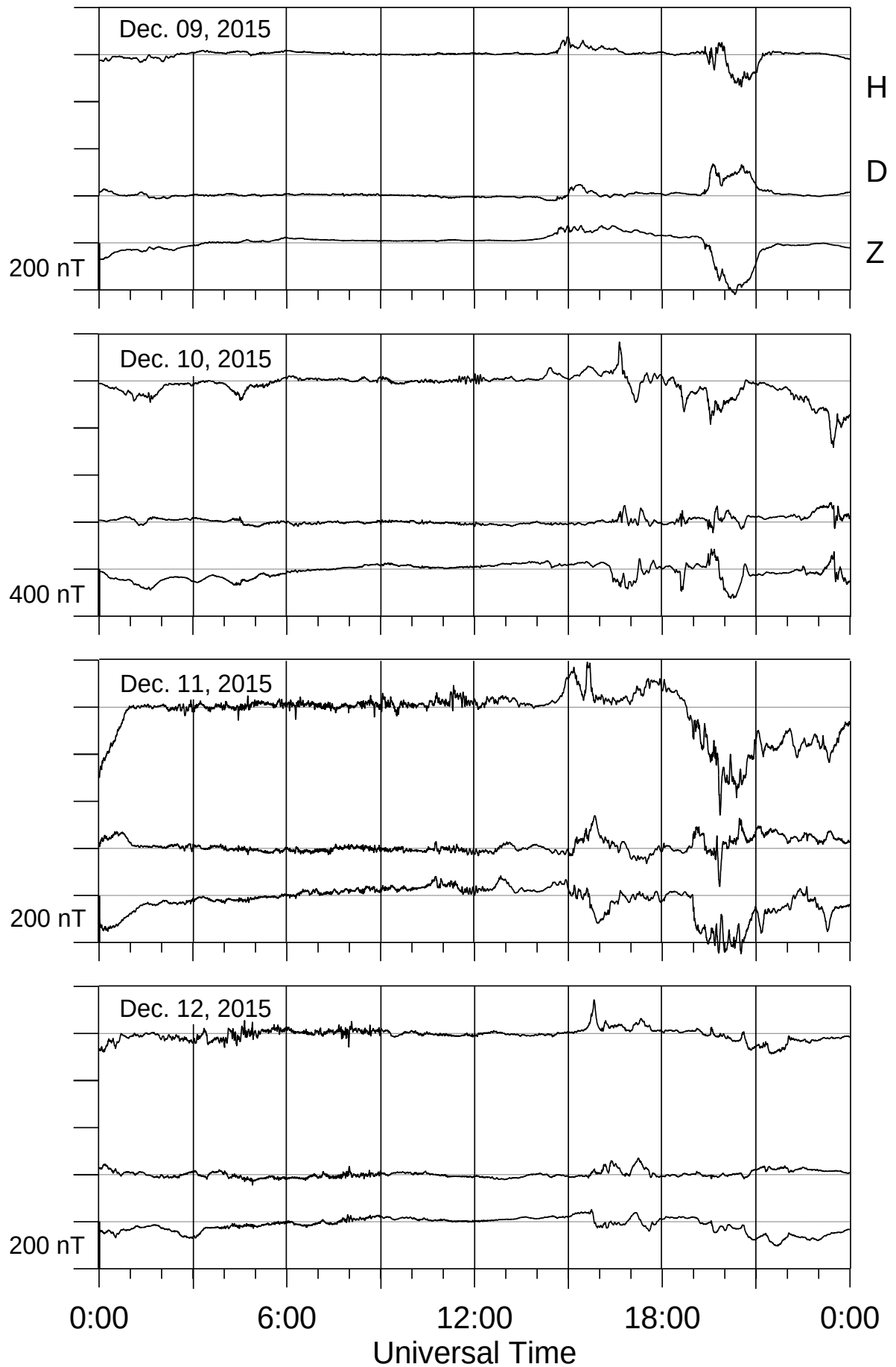
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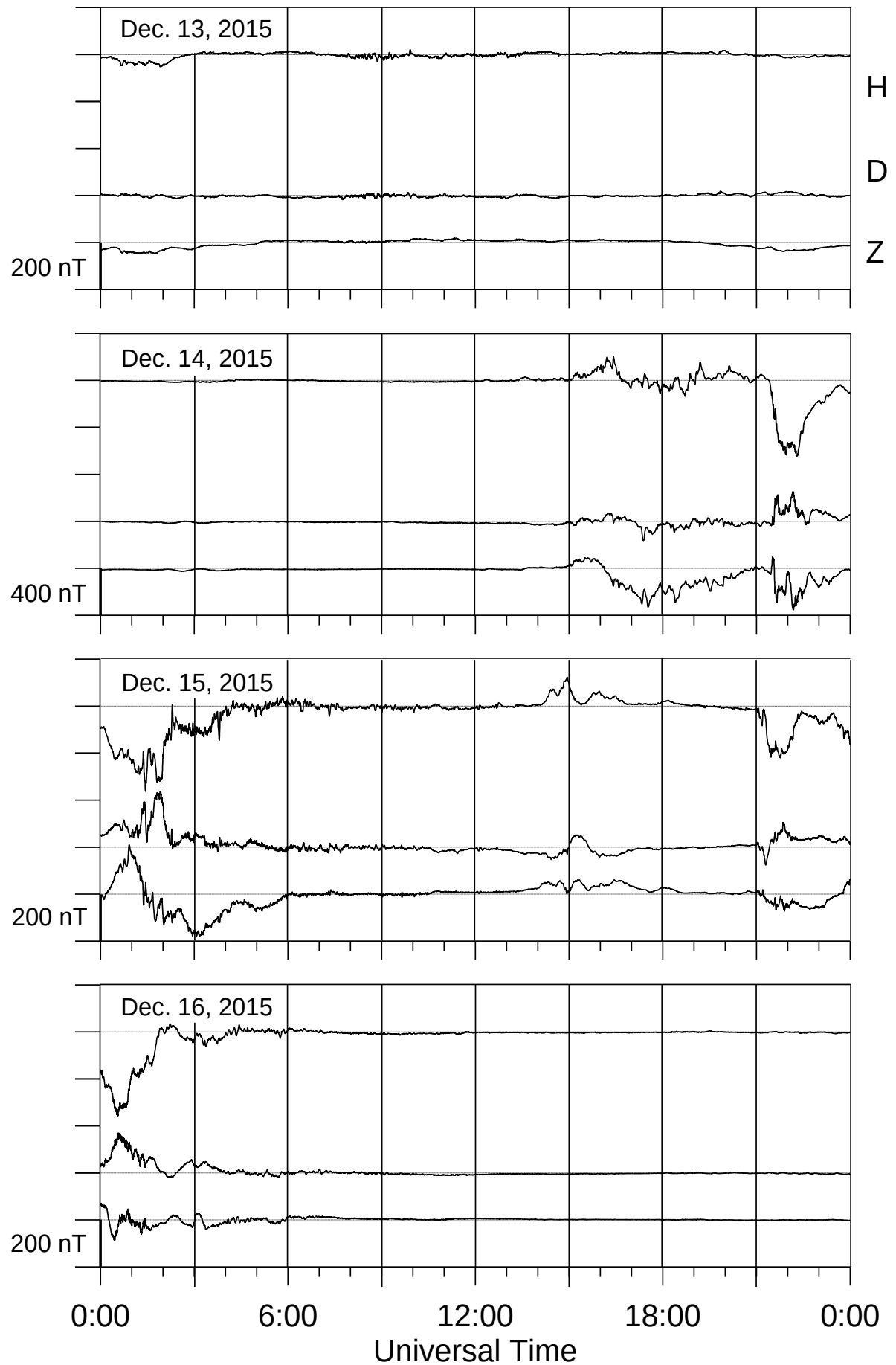
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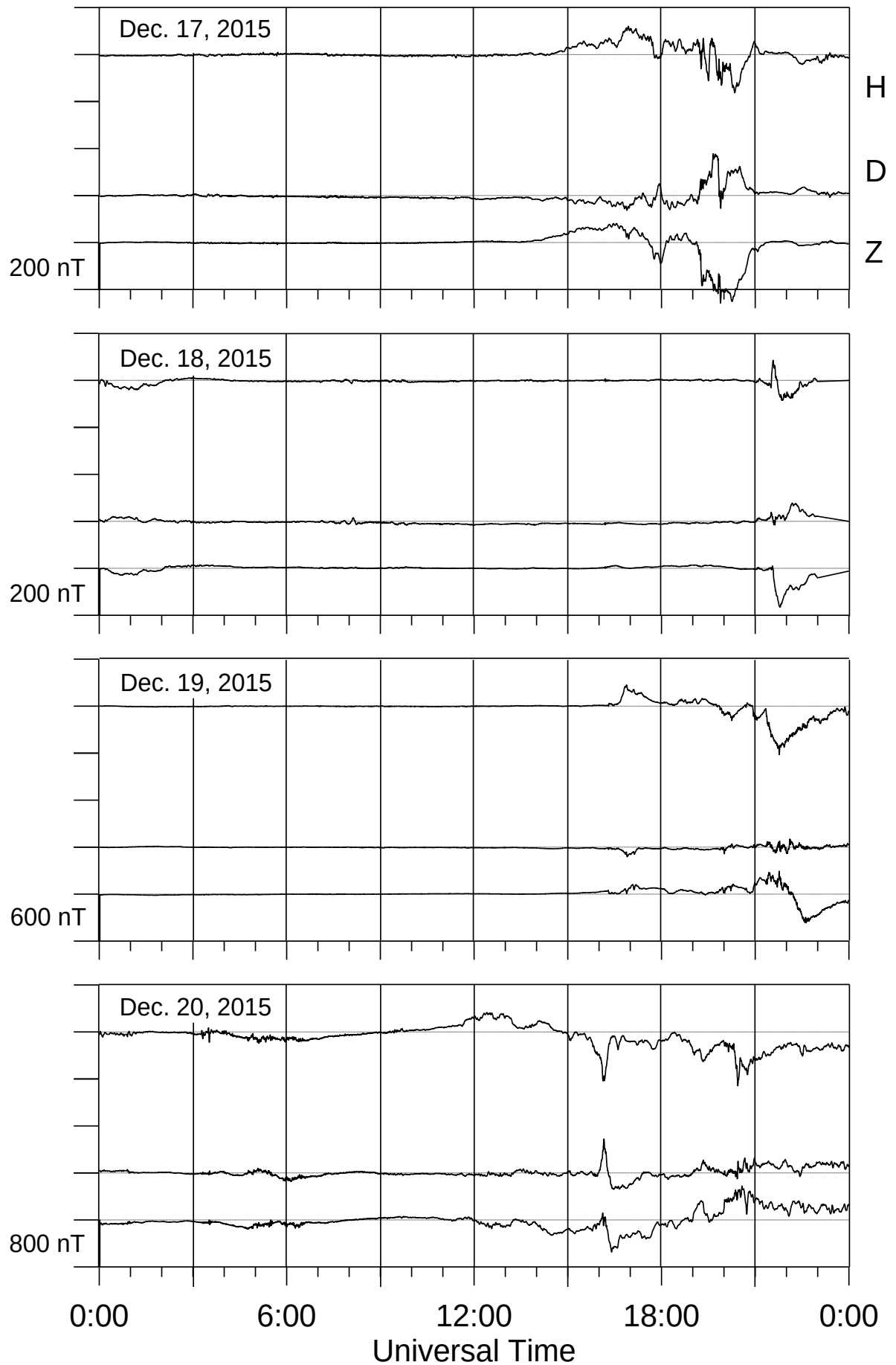
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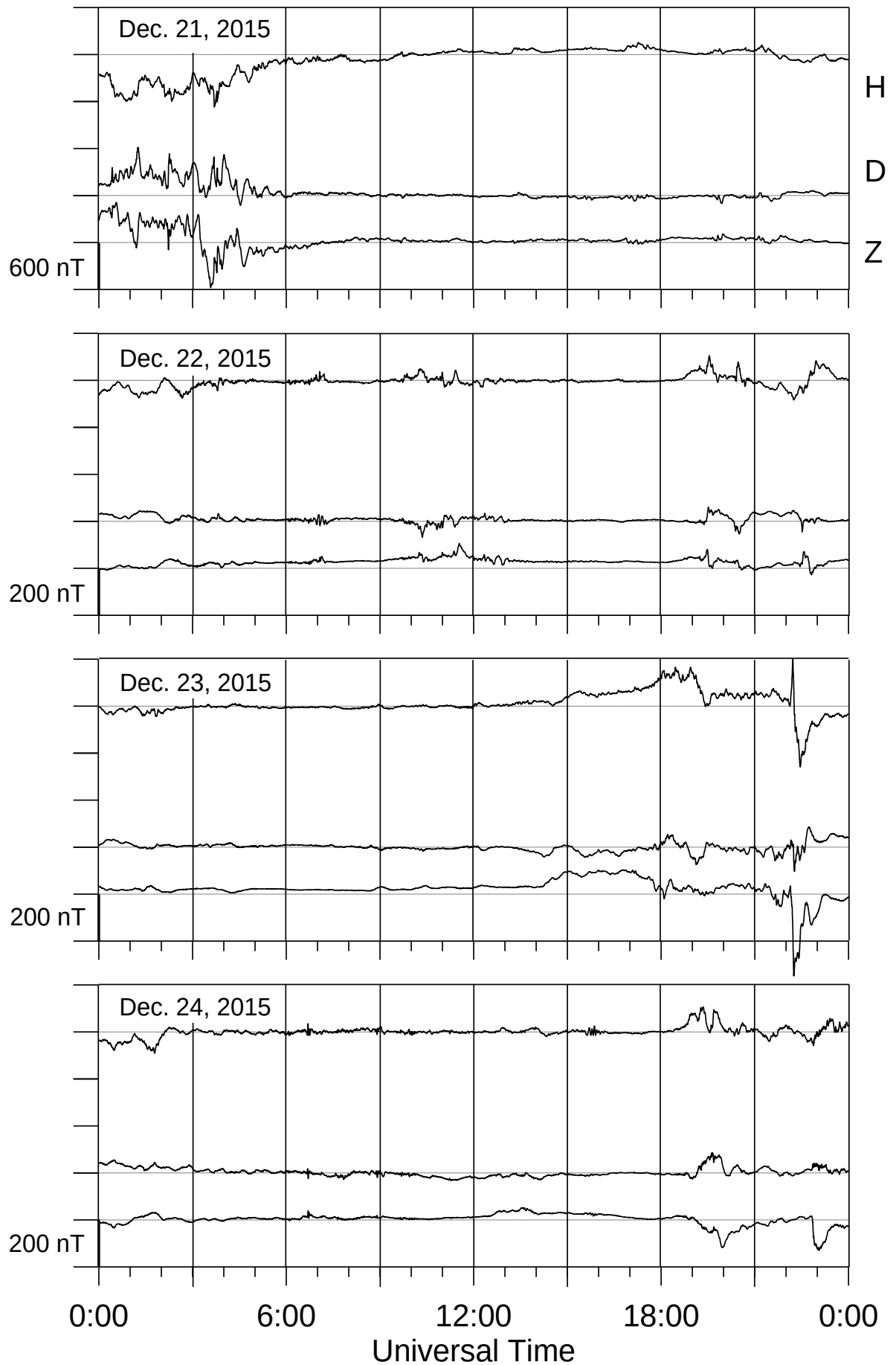
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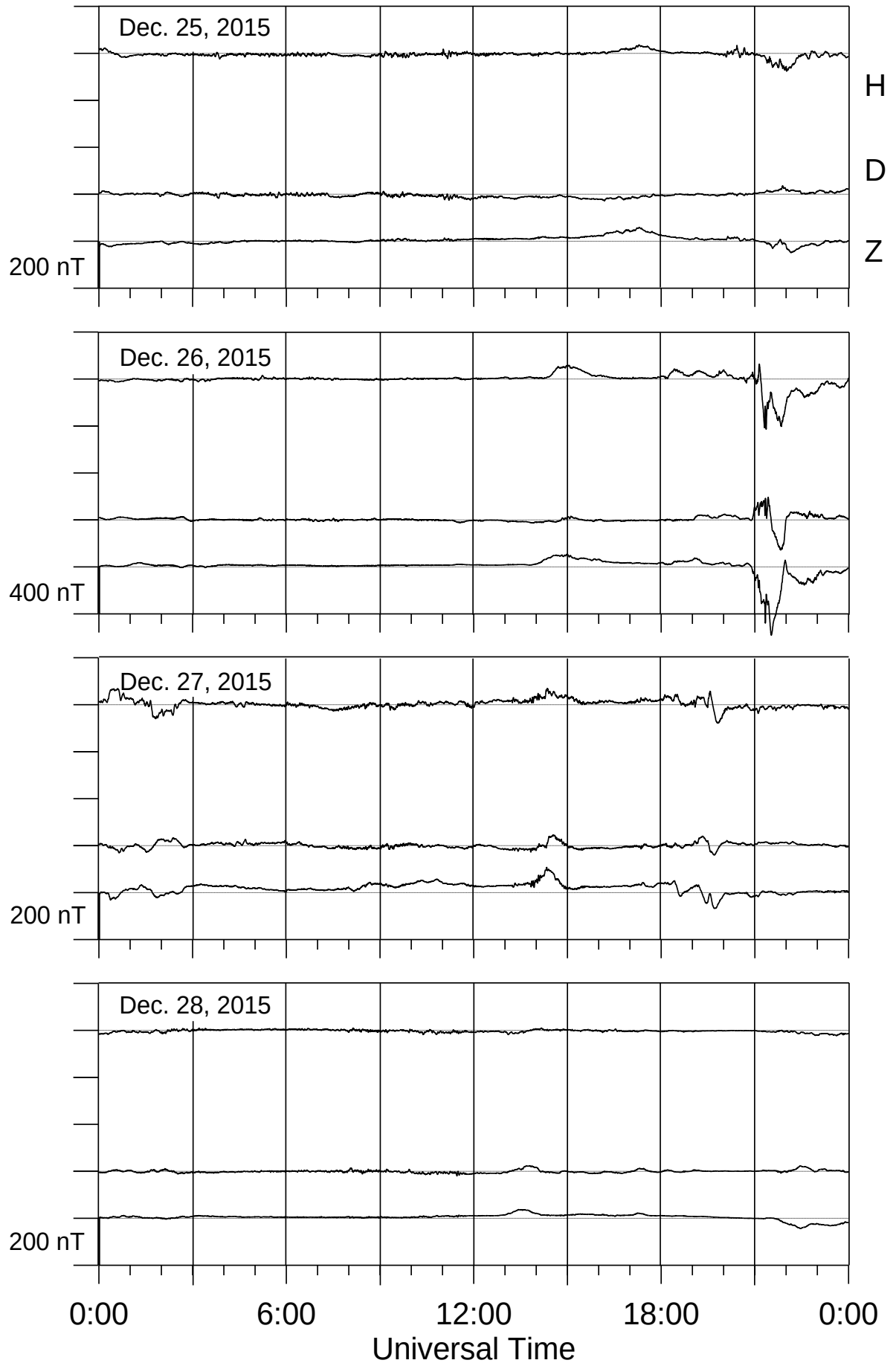
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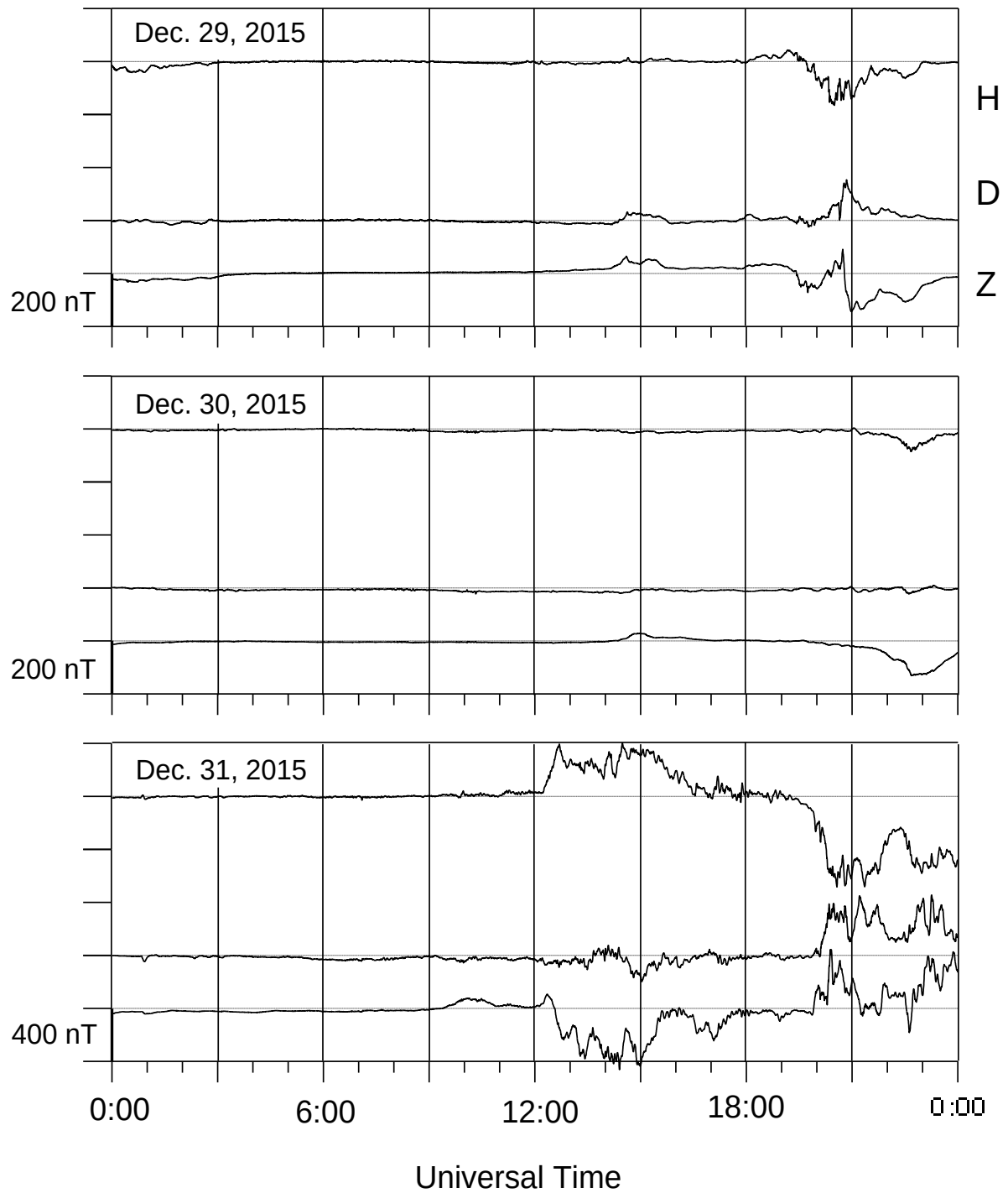
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Lovozero magnetometer



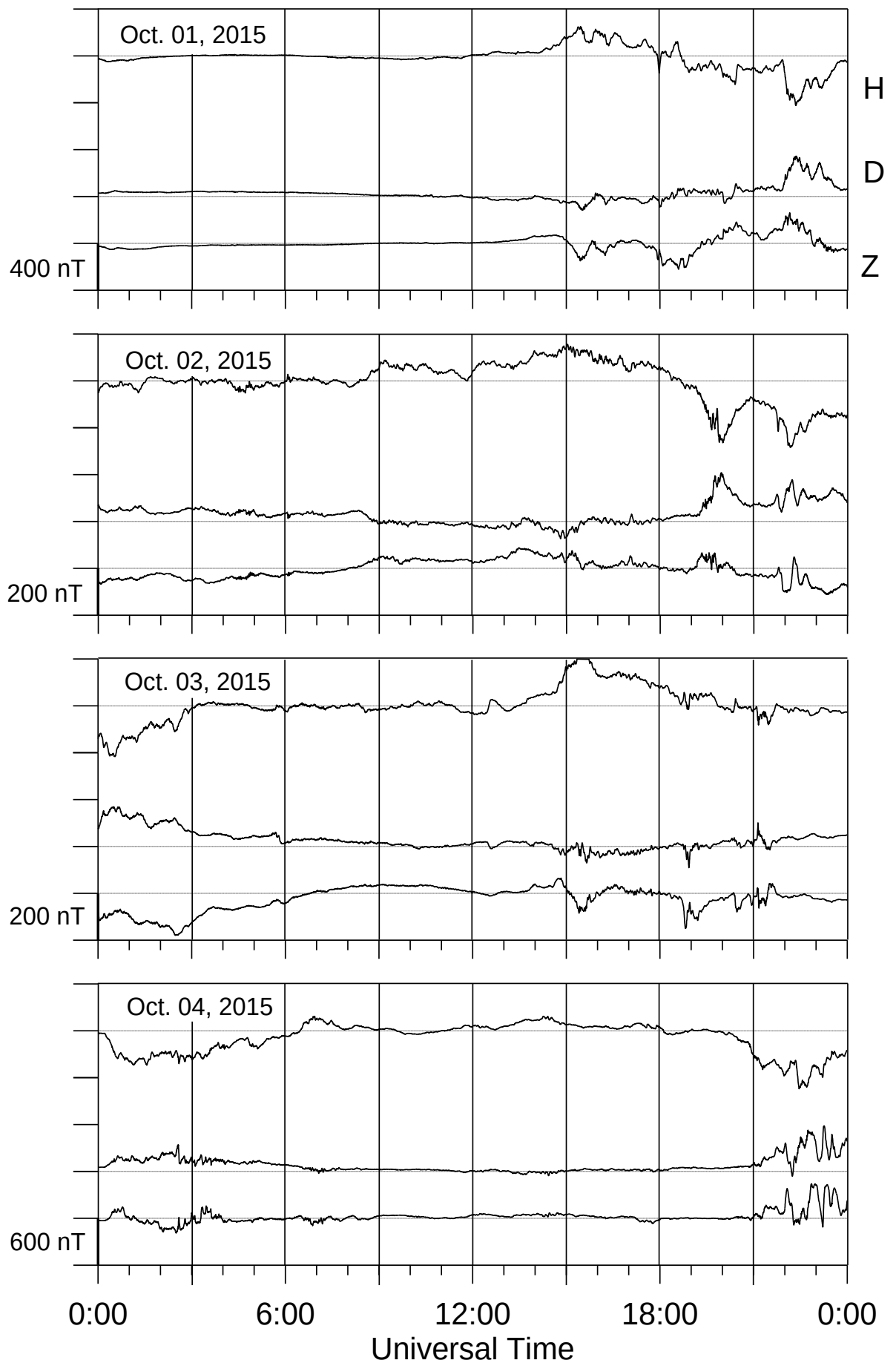
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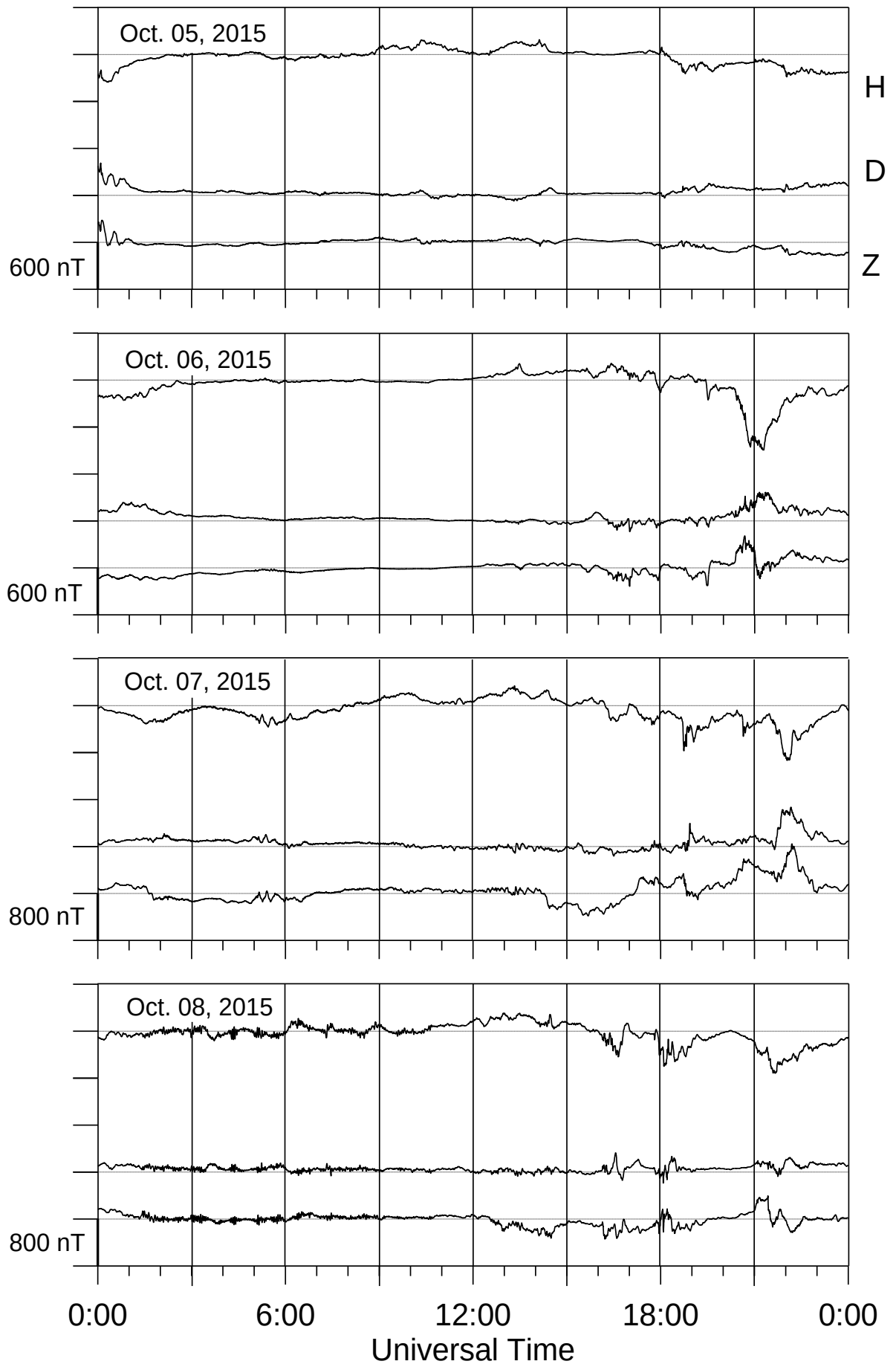
LOPARSKAYA MAGNETOGRAMS

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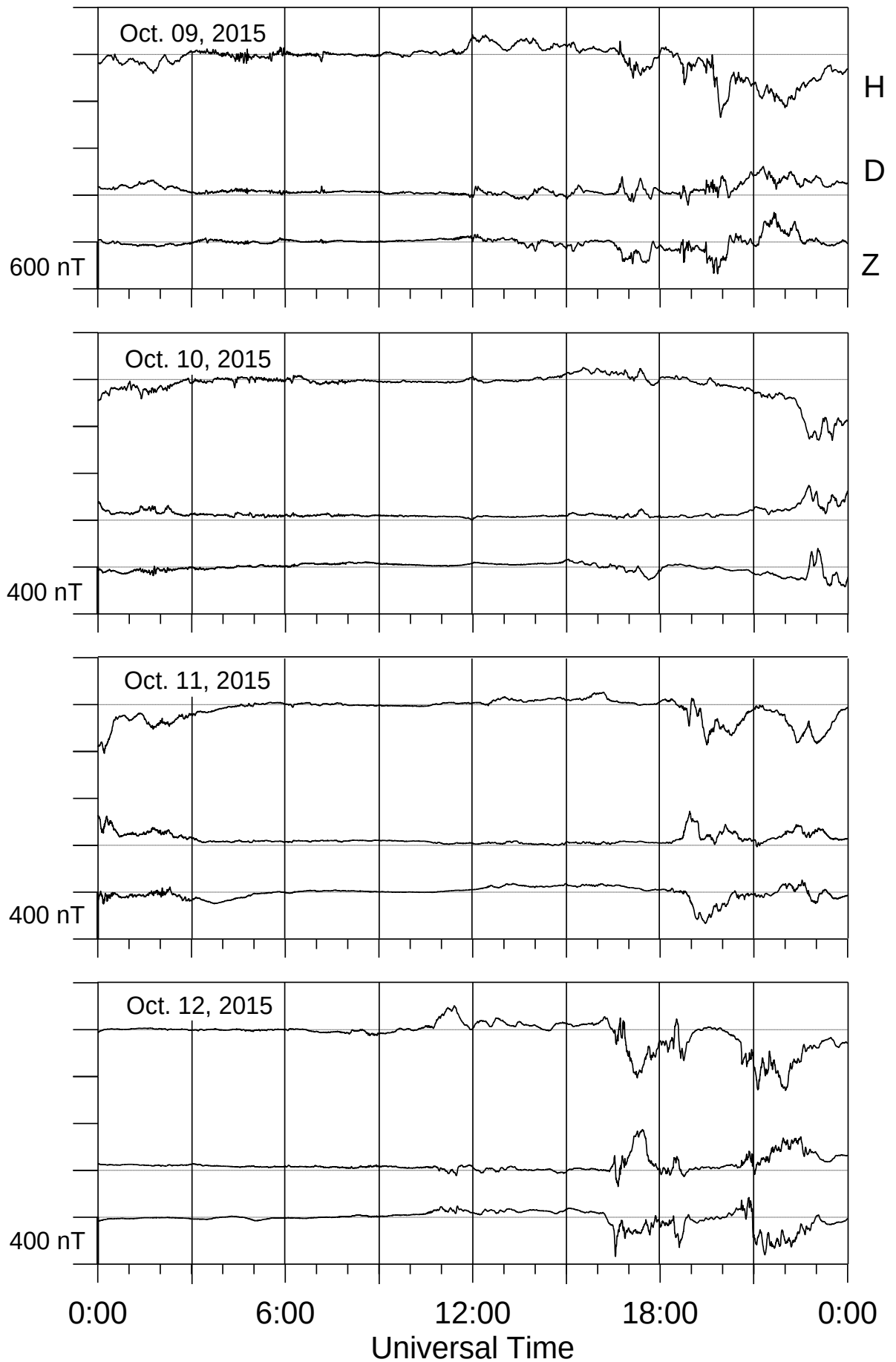
Loparskaya magnetometer



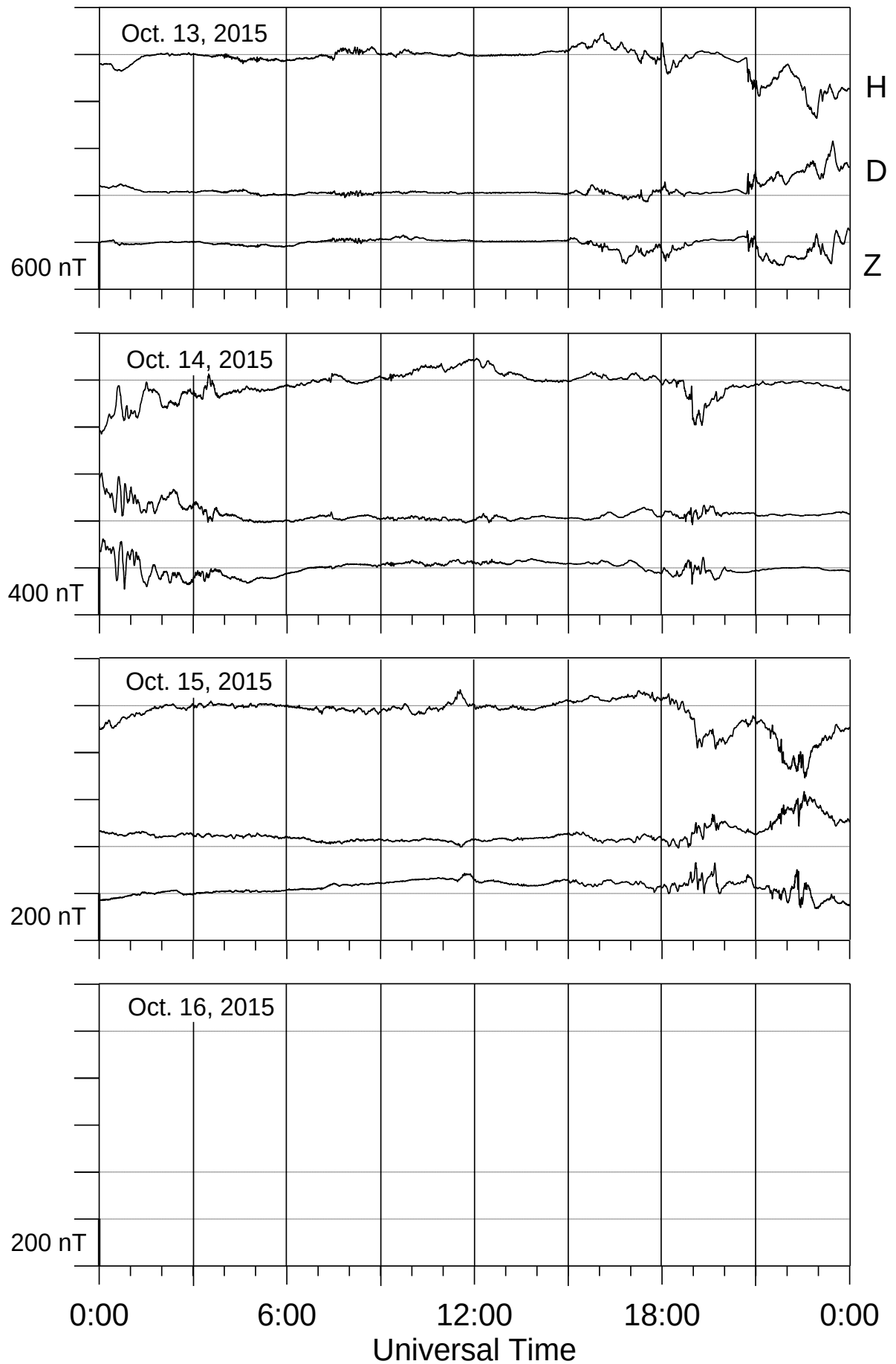
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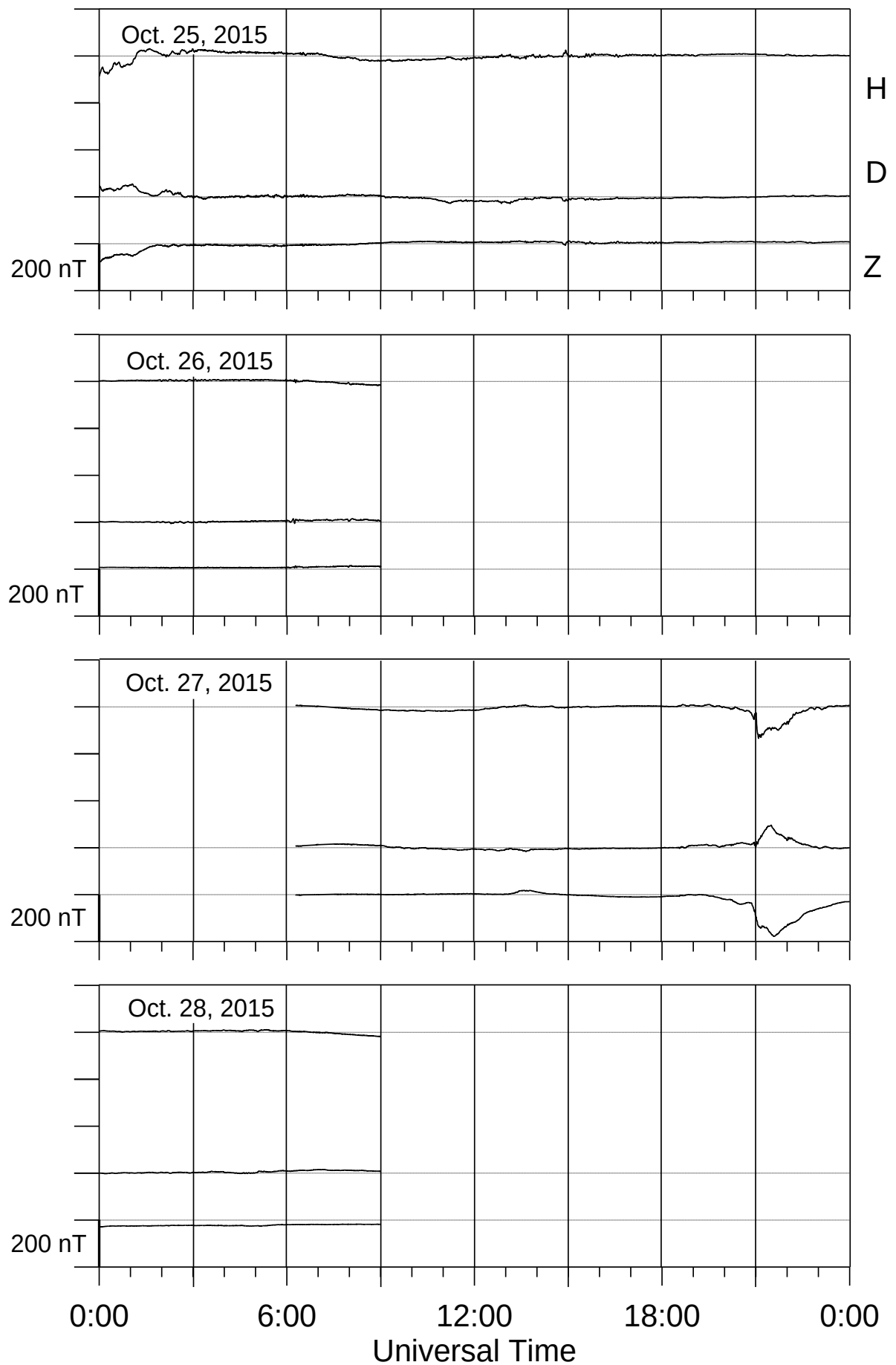
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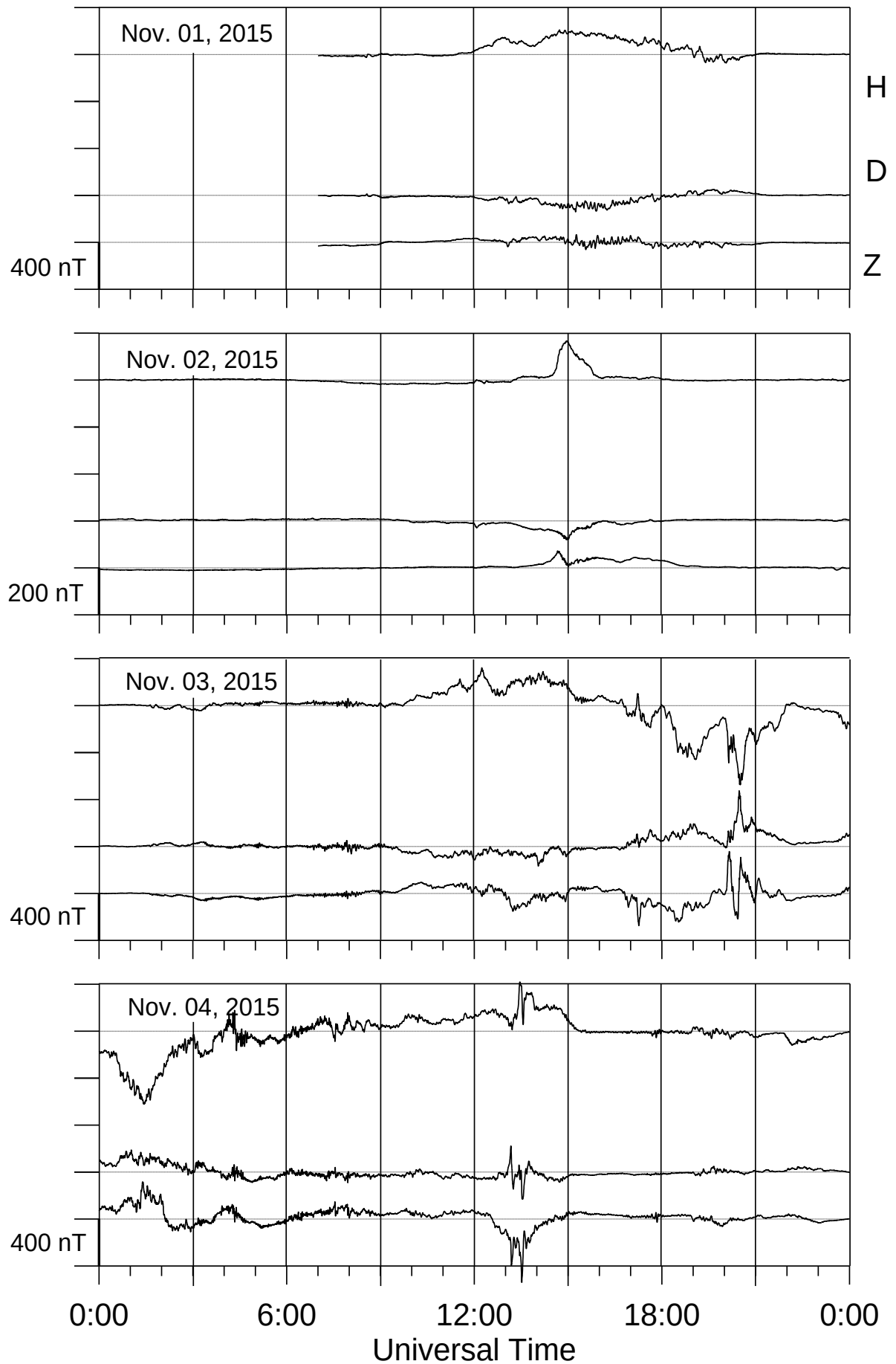
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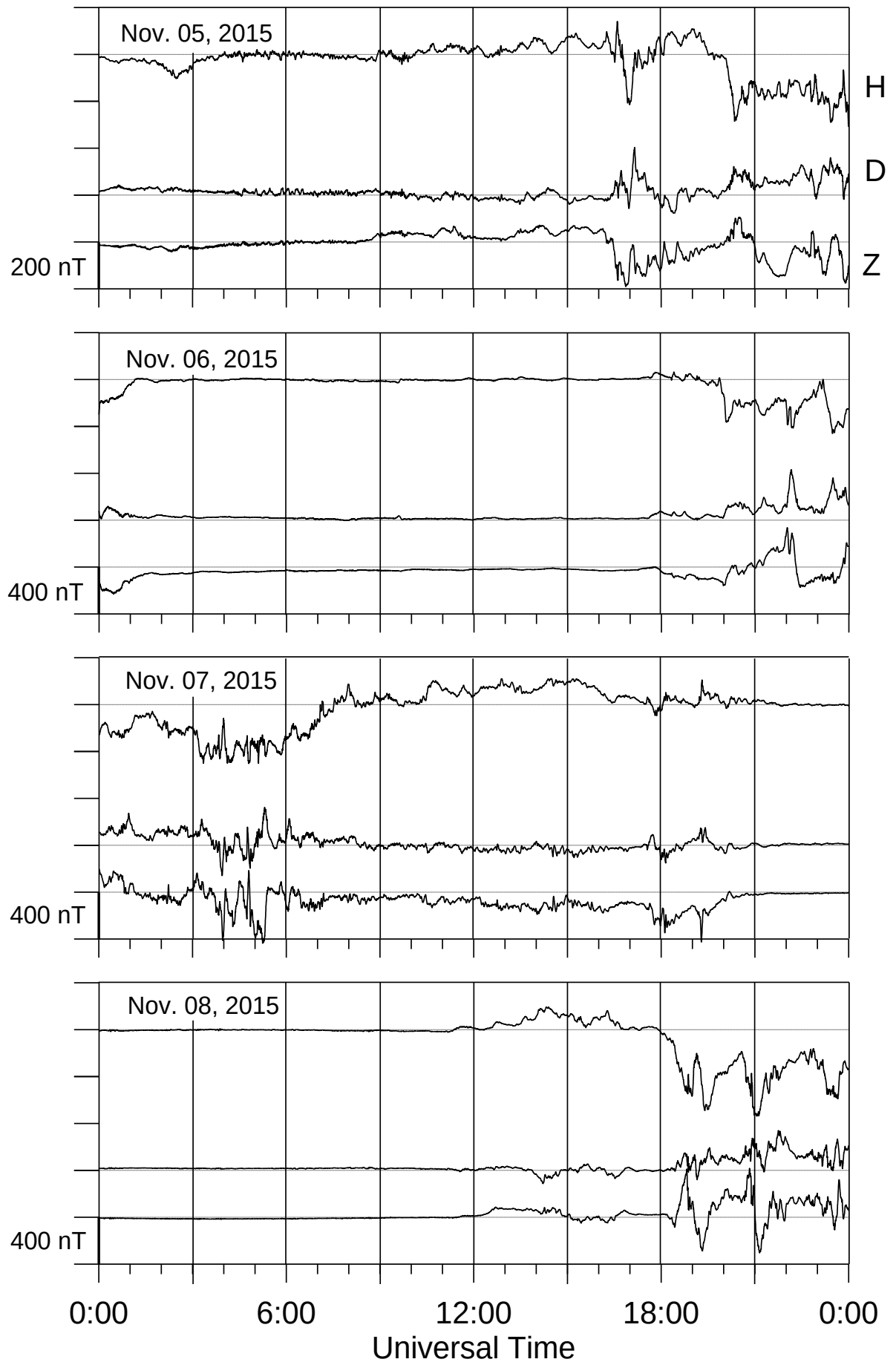
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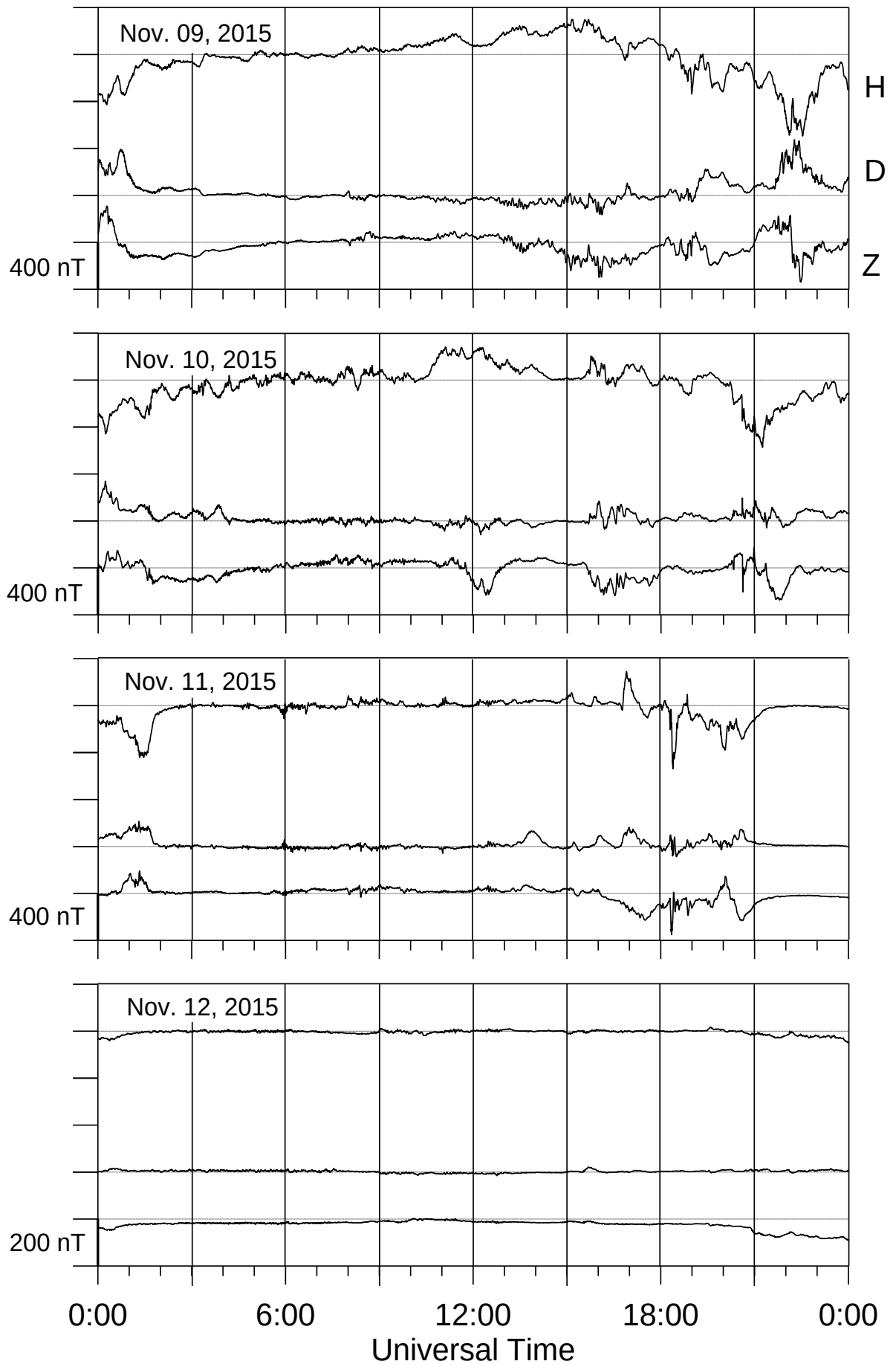
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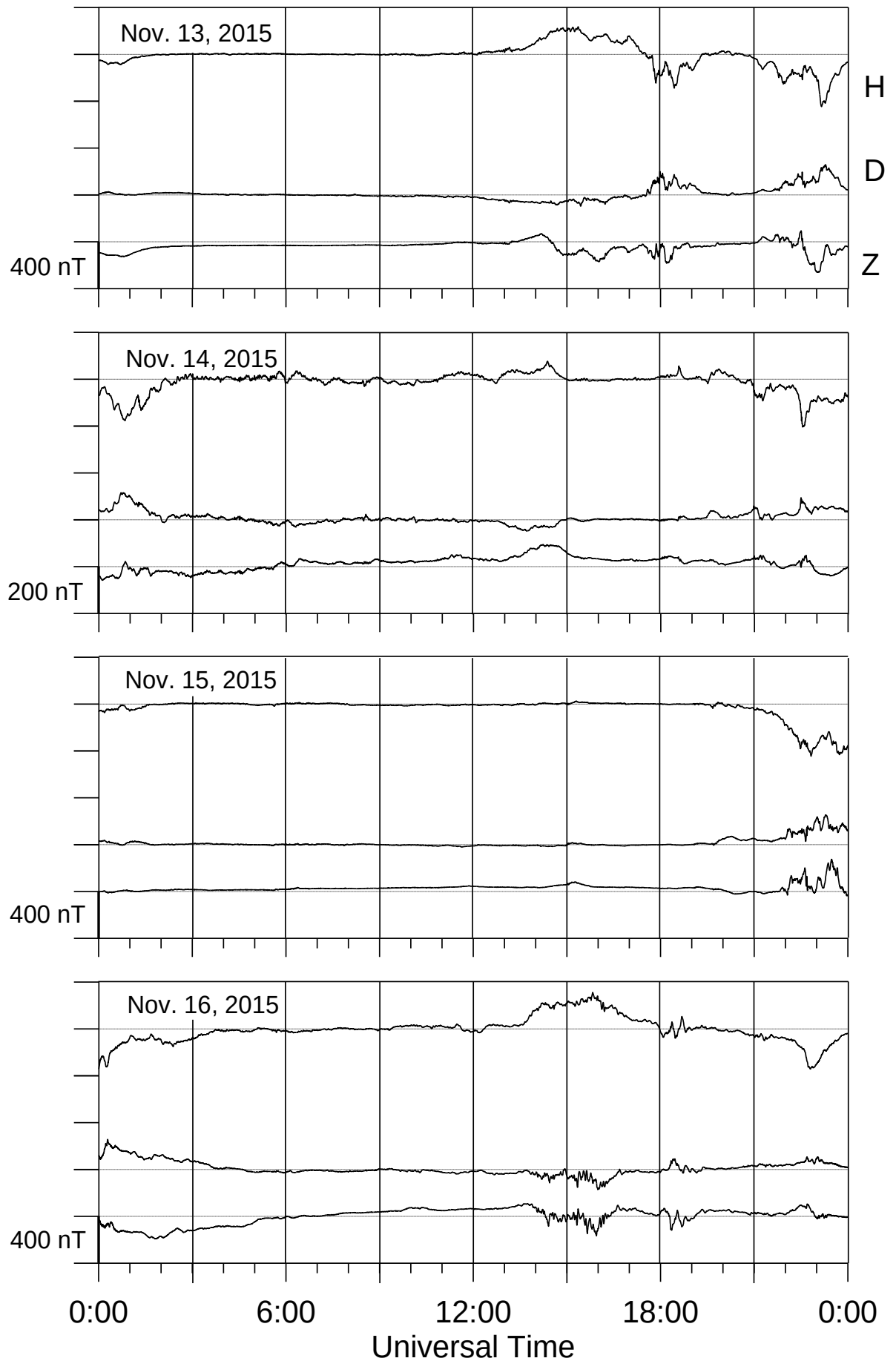
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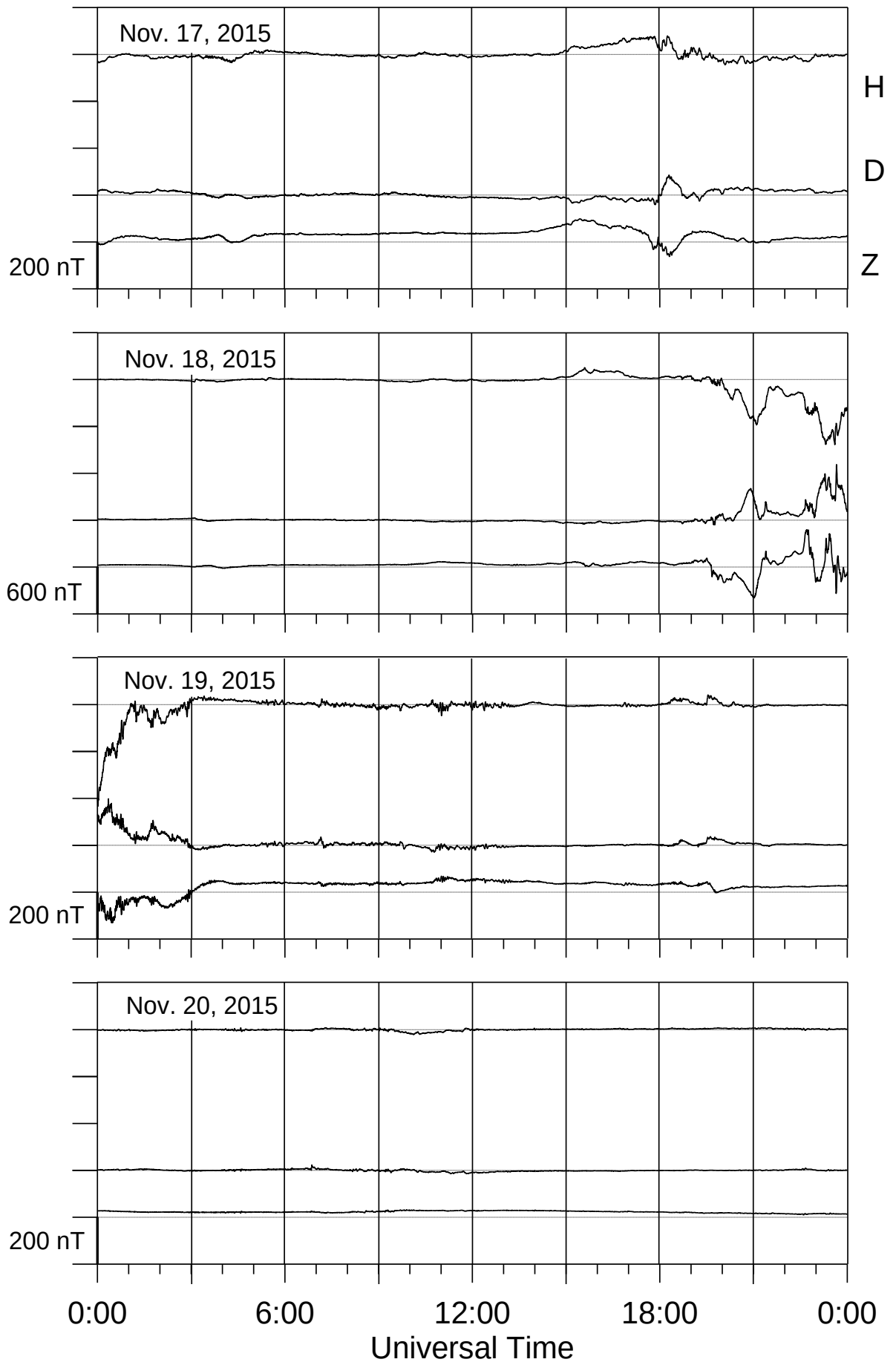
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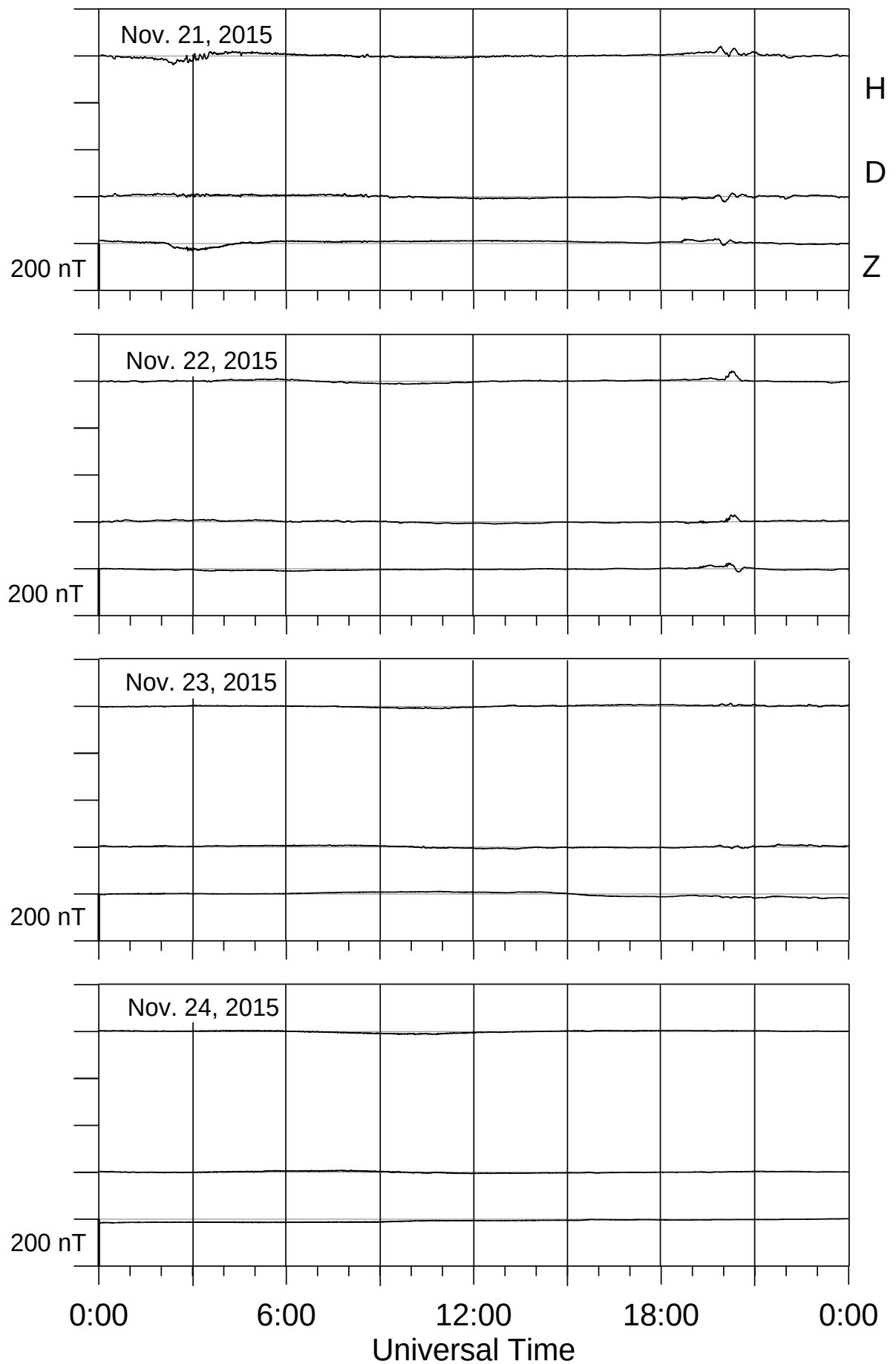
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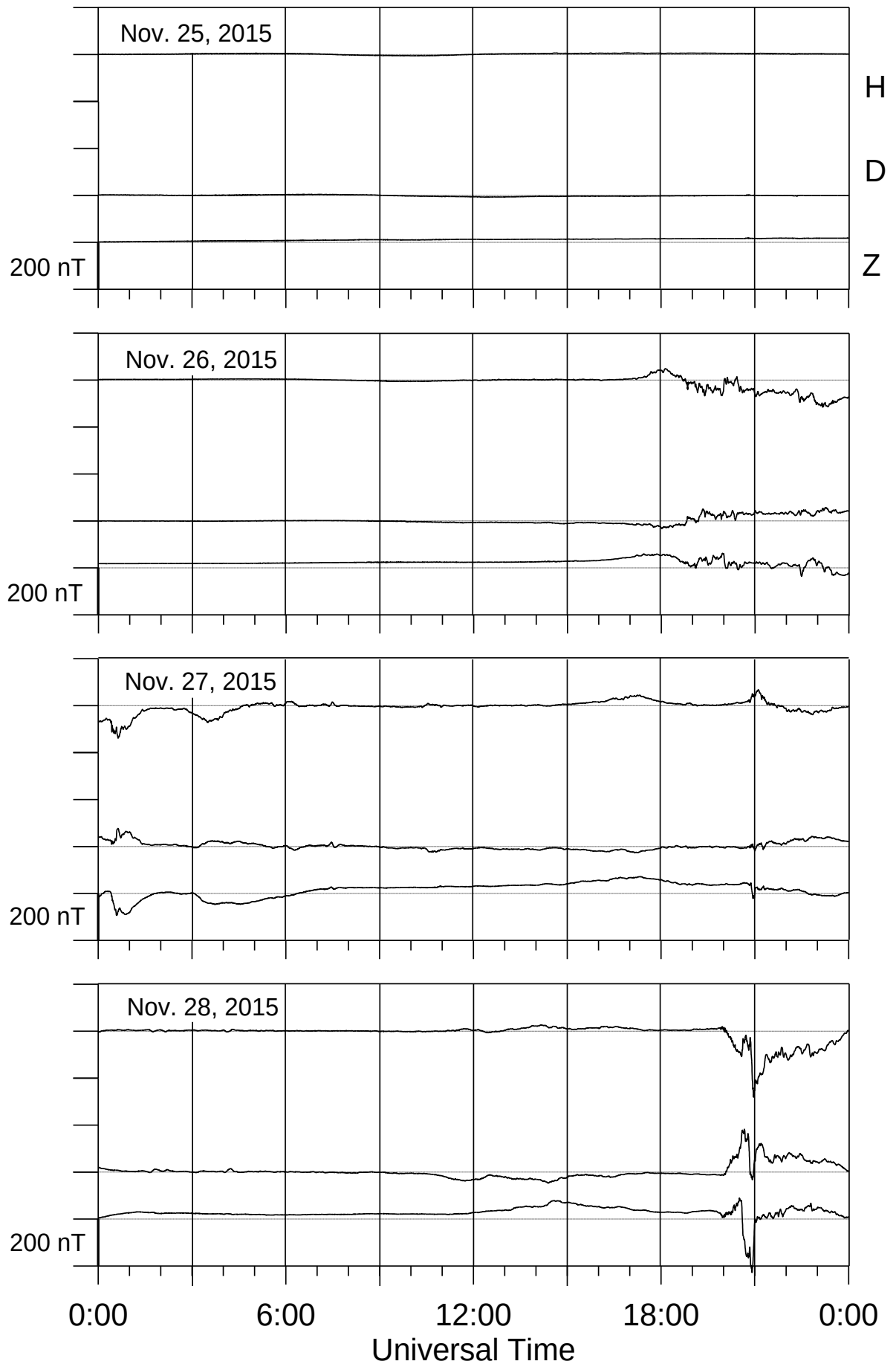
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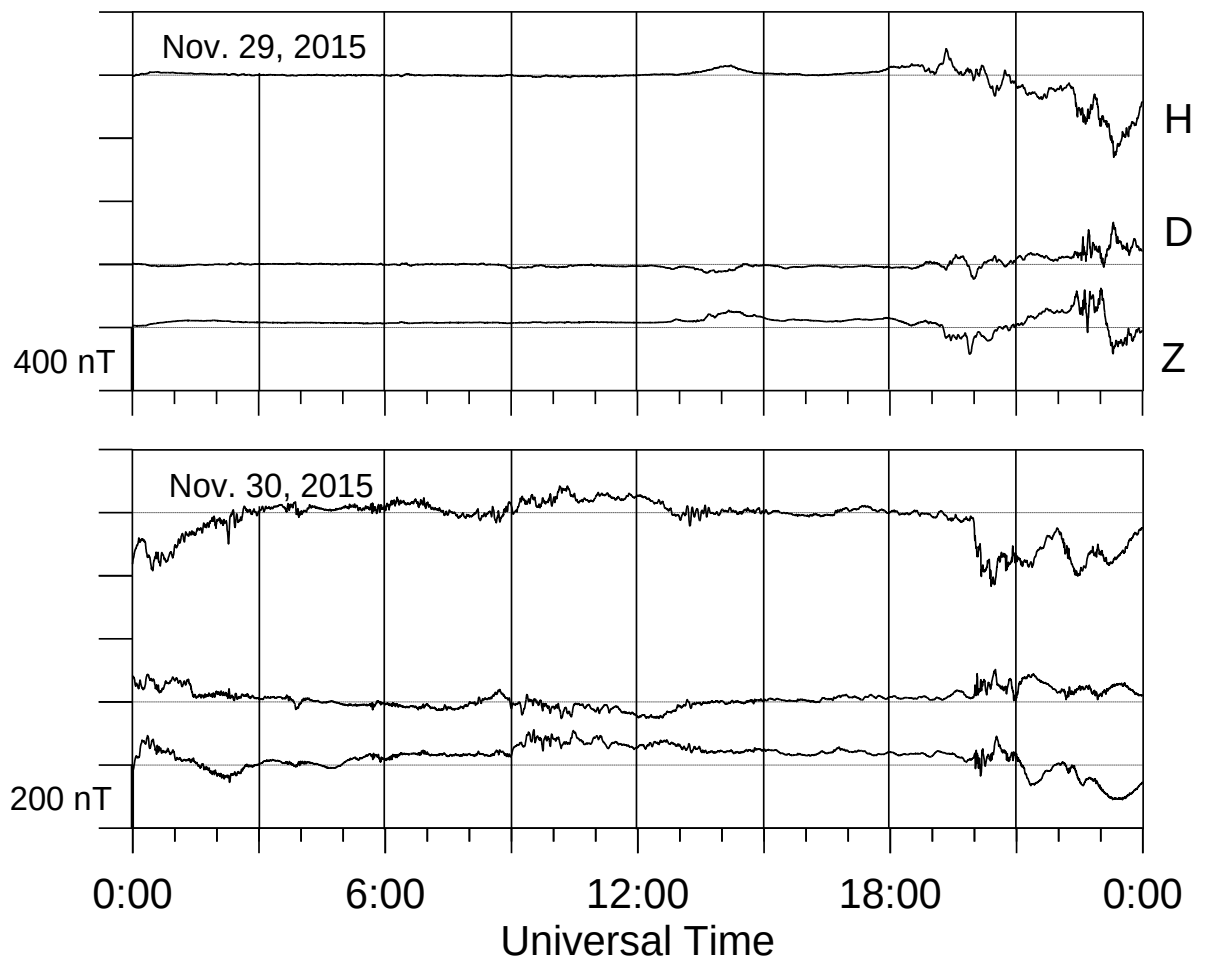
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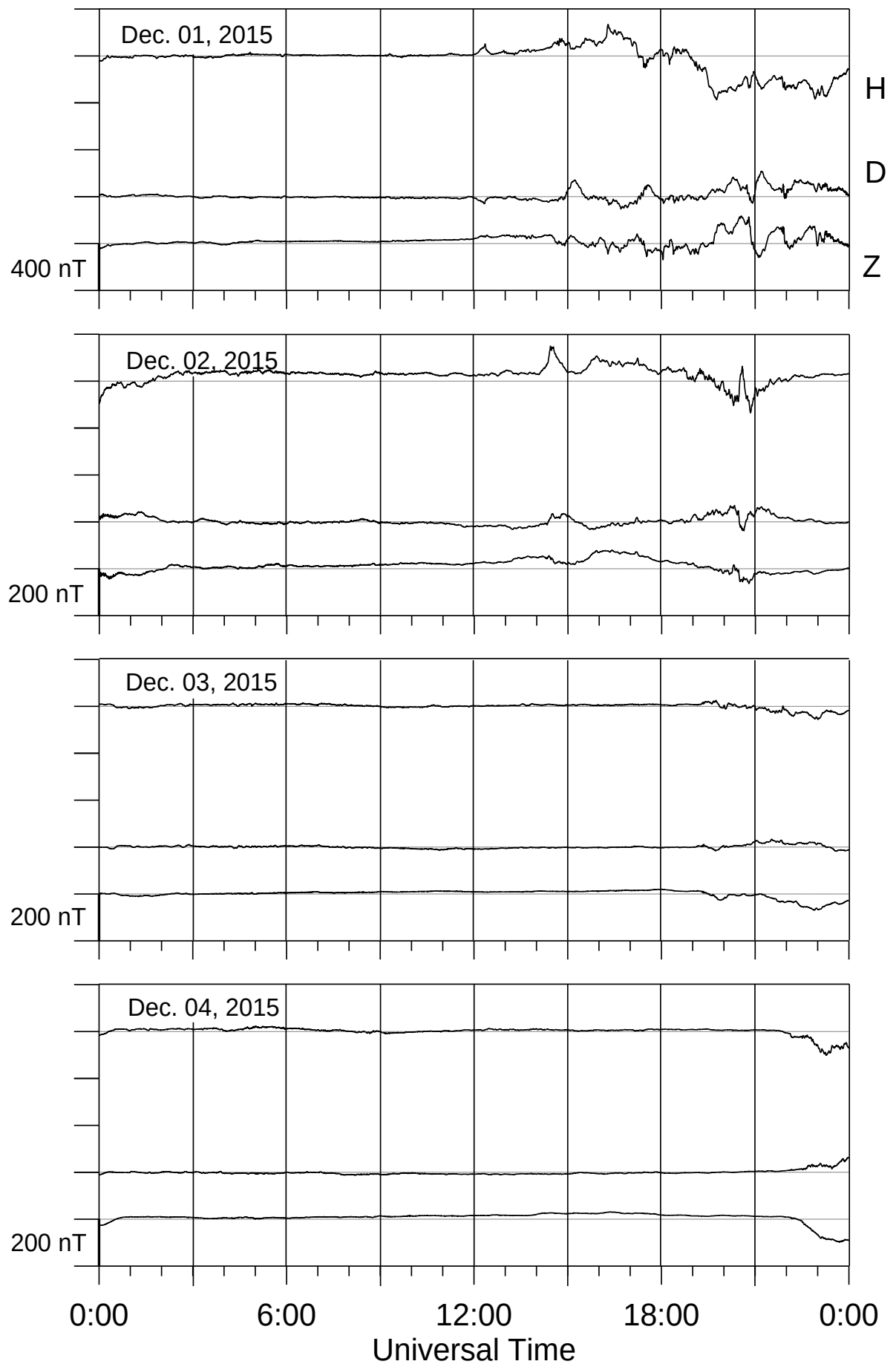
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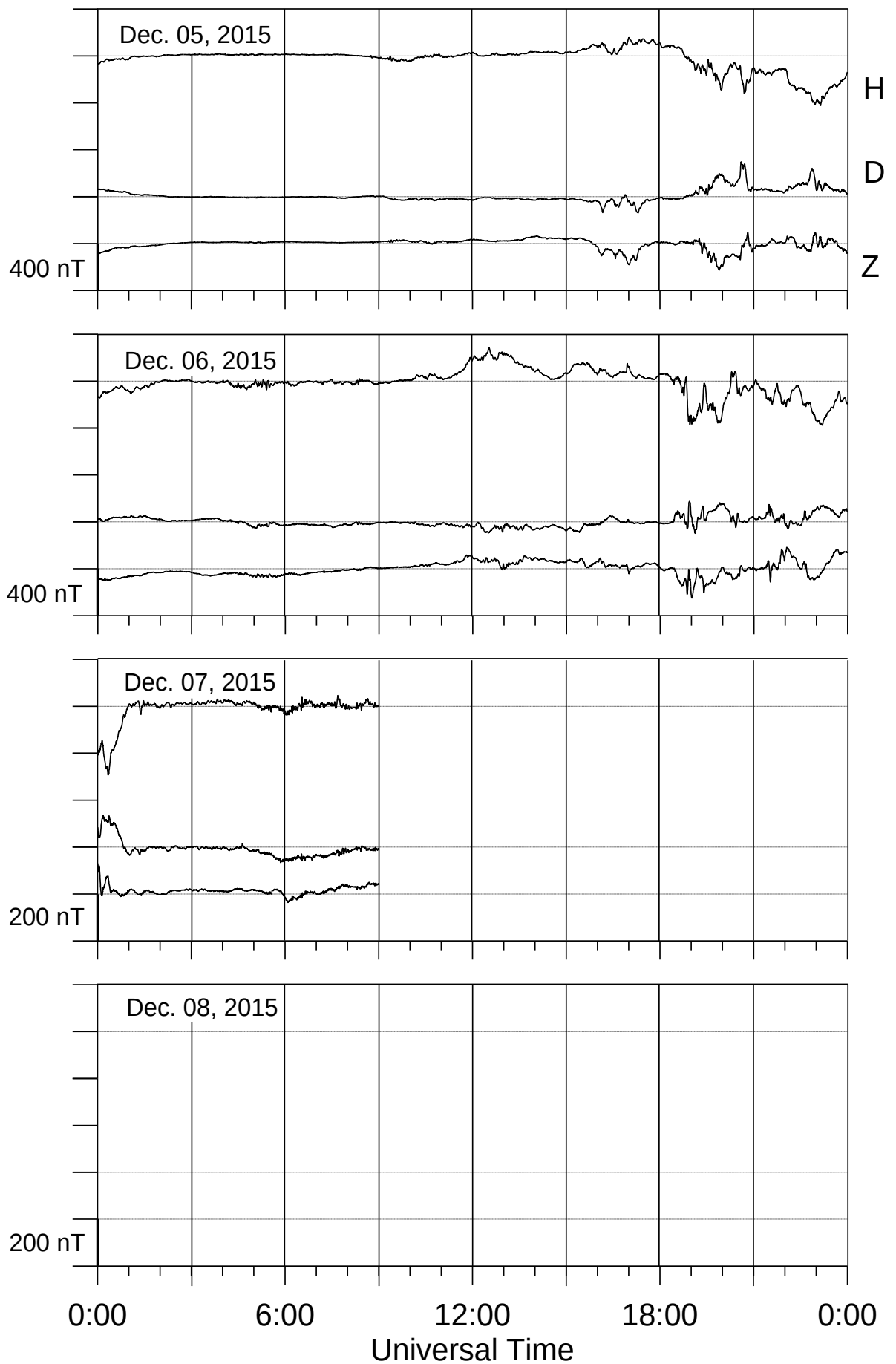
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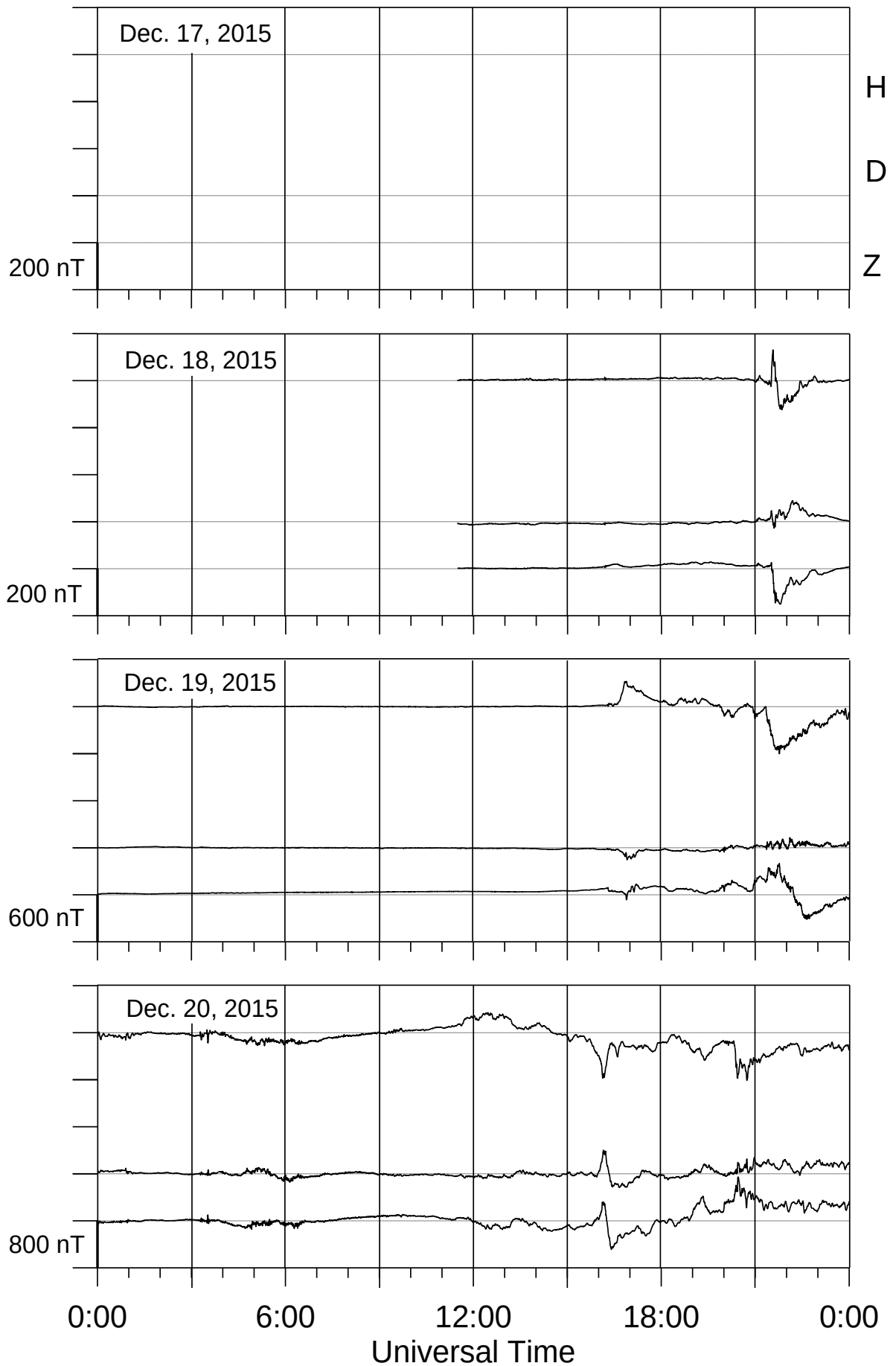
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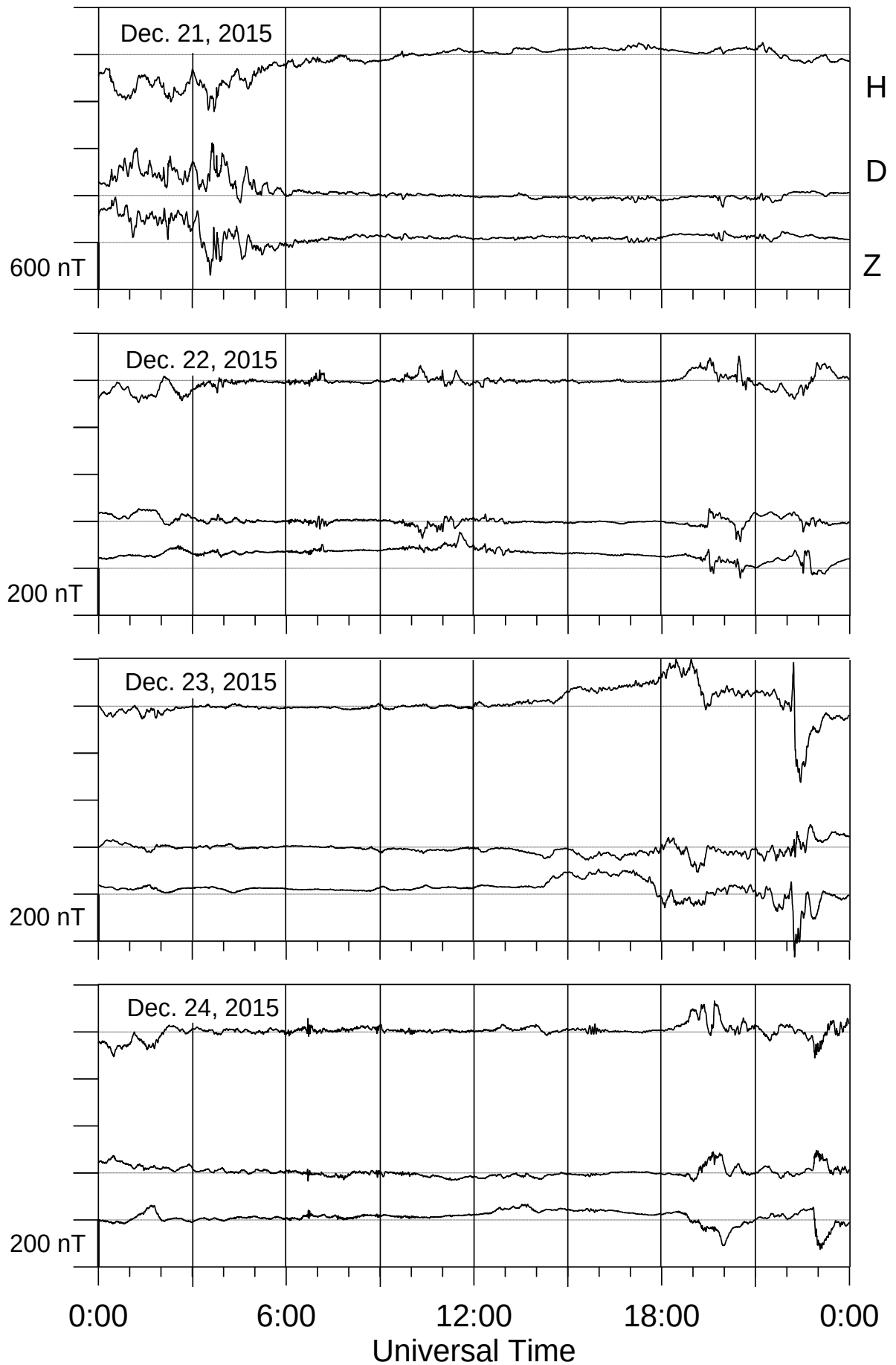
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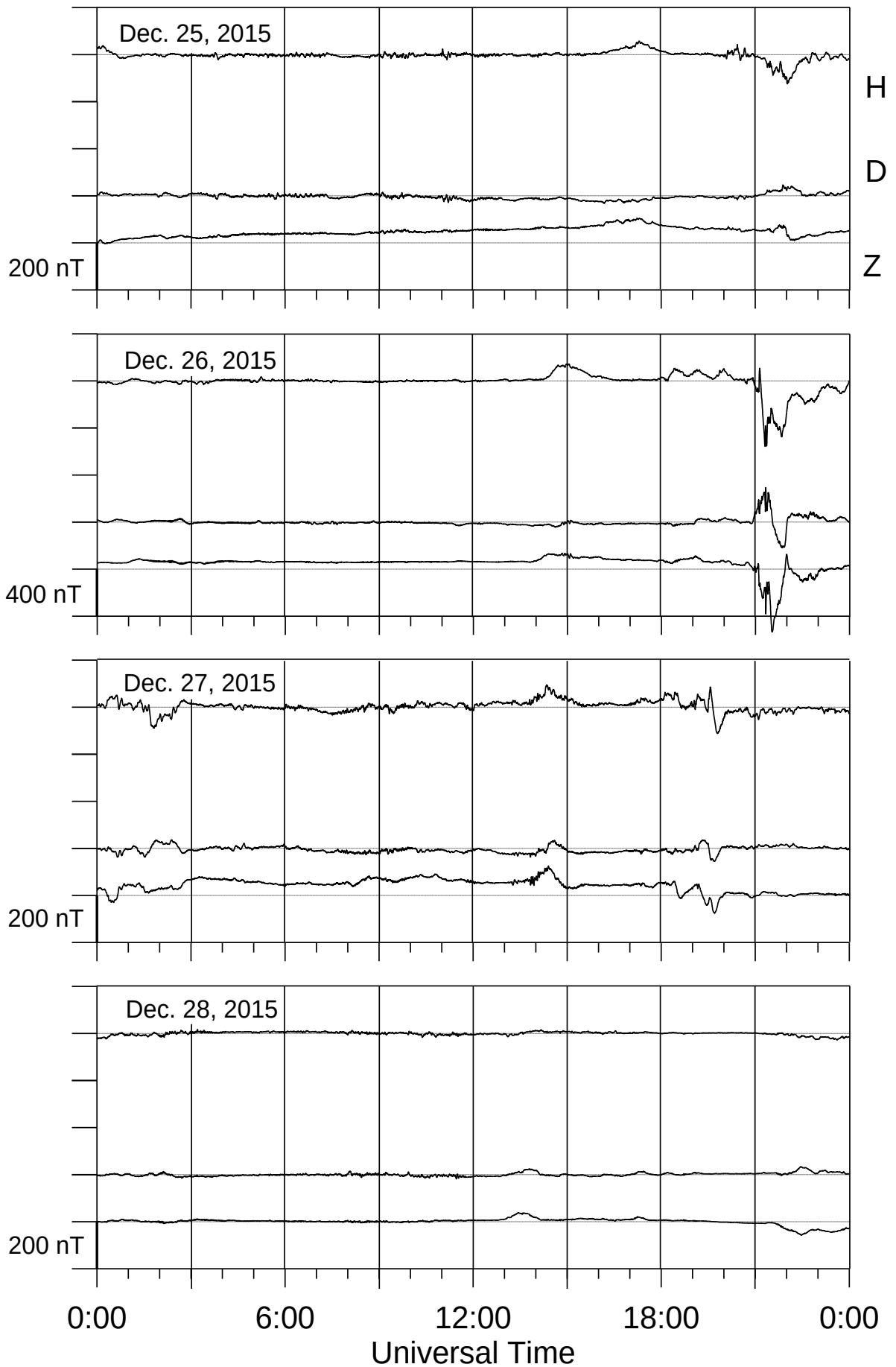
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Loparskaya magnetometer



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