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KOLA SCIENCE CENTRE

PGI
GEOPHYSICAL DATA

2013
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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 first quarter of 2013. All-sky camera observations are published only for the quarters when observations were carried out. All data are available by request.

CONTENTS:

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:

January	451 546
February	453 807
March	450 033

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

Please visit **http://pgia.ru**

All-sky camera observations

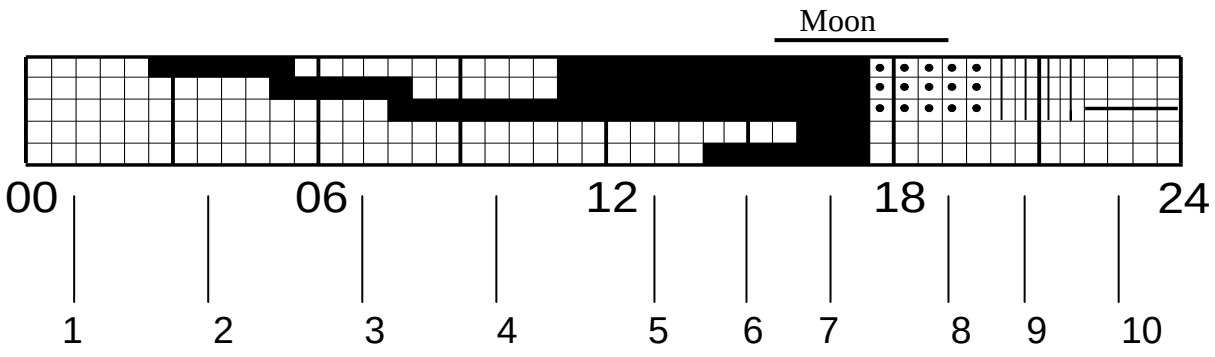
Calendar

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.

Coordinates of stations

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

Please visit also http://pgia.ru

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GEOMAGNETIC K-INDICES, LOVOZERO

Janyary, 2013

Lower limit of K=9 is 1500 nT

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

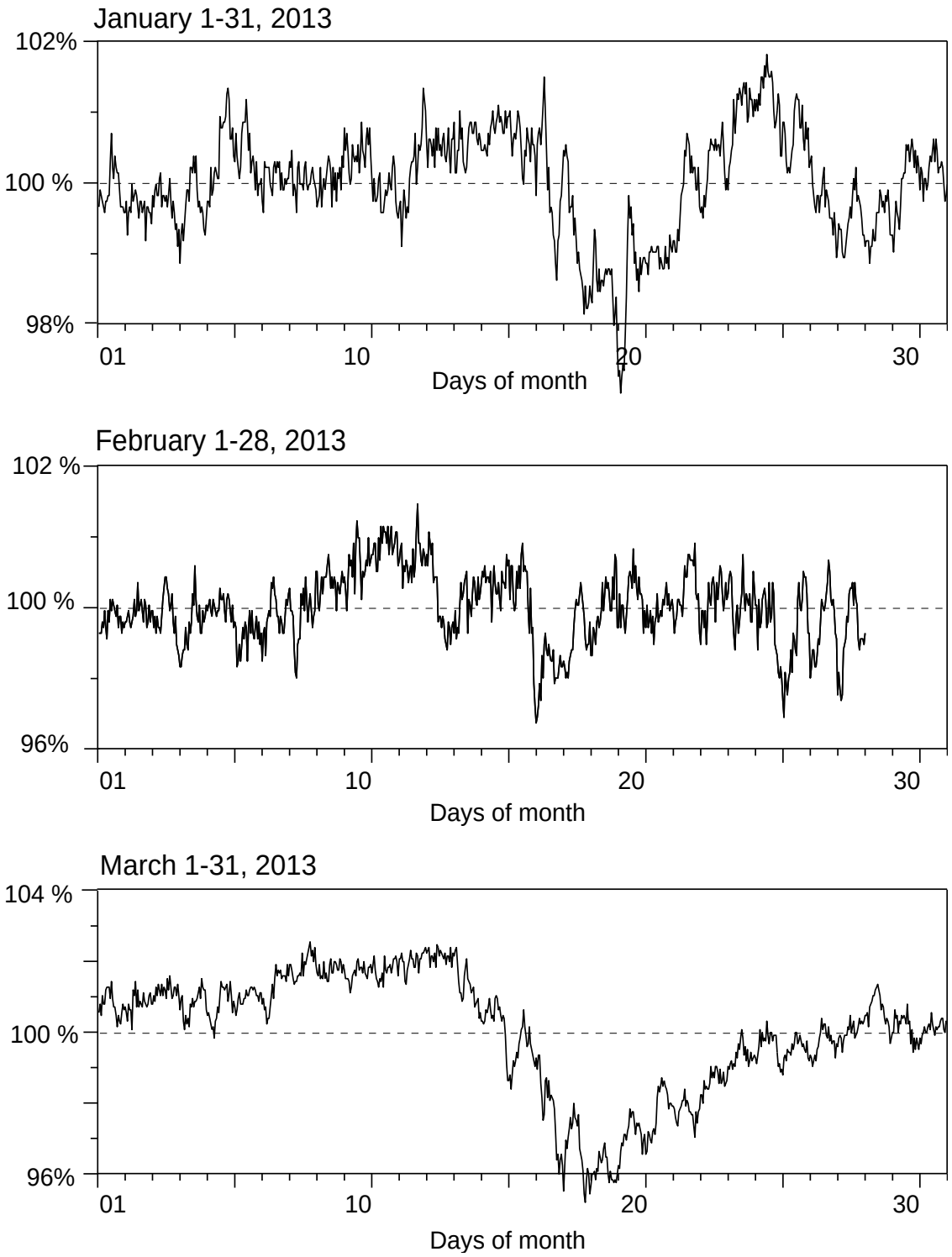
GEOMAGNETIC K-INDICES, LOVOZERO
February, 2013
Lower limit of K=9 is 1500 nT

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

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

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

Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

January - March 2013

CALENDAR OF **TV** OBSERVATIONS

January 01 - 02

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

January 02 - 03

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

January 03 - 04

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

January 04 - 05

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

January 05 - 06

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

January 06 - 07

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

January 07 - 08

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

January 08 - 09

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

January 09 - 10

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

January 10 - 11

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

January 11 - 12

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

CALENDAR OF **TV** OBSERVATIONS

January 12 - 13

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

January 13 - 14

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

January 14 - 15

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

January 15 - 16

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

January 16 - 17

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

January 17 - 18

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

January 18 - 19

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

January 19 - 20

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

January 20 - 21

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

January 21 - 22

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

January 22 - 23

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

CALENDAR OF **TV** OBSERVATIONS

January 23 - 24

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

January 24 - 25

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

January 25 - 26

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

January 26 - 27

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

January 27 - 28

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

January 28 - 29

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

January 29 - 30

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

January 30 - 31

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

January 31 – February 01

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

February 01 - 02

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

February 02 - 03

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

CALENDAR OF **TV** OBSERVATIONS

February 03 - 04

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

February 04 - 05

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

February 05 - 06

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

February 06 - 07

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

February 07 - 08

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

February 08 - 09

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

February 09 - 10

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

February 10 - 11

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

February 11 - 12

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

February 12 - 13

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

February 13 - 14

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

CALENDAR OF **TV** OBSERVATIONS

February 14 - 15

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

February 15 - 16

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

February 16 - 17

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

February 17 - 18

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

February 18 - 19

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

February 19 - 20

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

February 20 - 21

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

February 21 - 22

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

February 22 - 23

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

February 23 - 24

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

February 24 - 25

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

CALENDAR OF **TV** OBSERVATIONS

February 25 - 26

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

February 26 - 27

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

February 27 - 28

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

February 28 – March 01

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

March 01 - 02

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

March 02 - 03

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

March 03 - 04

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

March 04 - 05

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

March 05 - 06

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

March 06 - 07

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

March 07 - 08

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

CALENDAR OF **TV** OBSERVATIONS

March 08 - 09

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

March 09 - 10

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

March 10 - 11

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

March 11 - 12

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

March 12 - 13

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

March 13 - 14

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

March 14 - 15

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

March 15 - 16

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

March 16 - 17

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

March 17 - 18

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

March 18 - 19

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

CALENDAR OF **TV** OBSERVATIONS

March 19 - 20

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

March 20 - 21

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

March 21 - 22

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

March 22 - 23

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

March 23 - 24

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

March 24 - 25

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

March 25 - 26

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

March 26 - 27

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

March 27 - 28

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

March 28 - 29

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

March 29 - 30

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

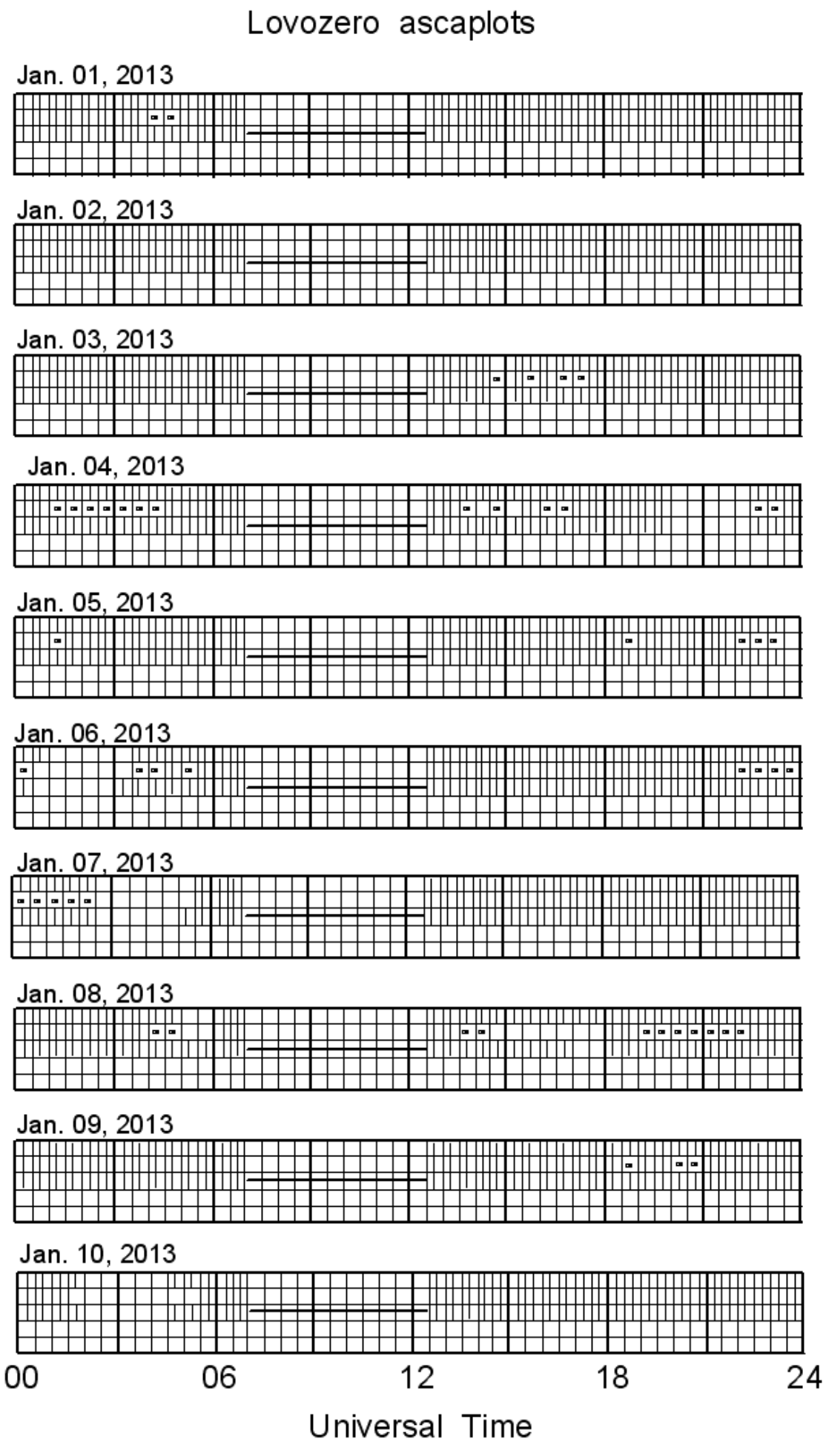
CALENDAR OF **TV** OBSERVATIONS

March 30 - 31

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

March 31

UT	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05
LOZ																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Jan. 03, 2013
Jan. 04, 2013
Jan. 05, 2013
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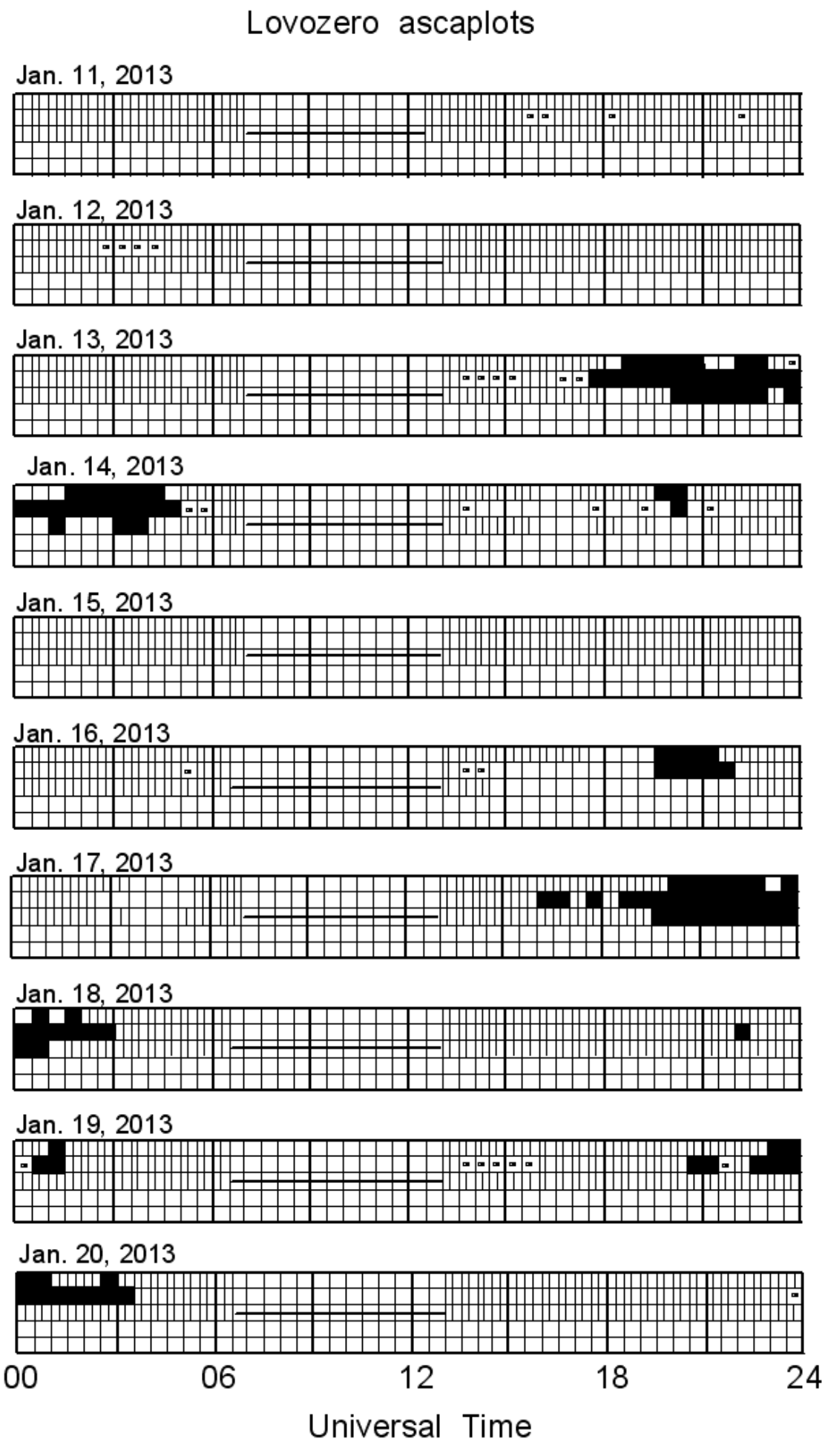
Jan. 07, 2013
Jan. 08, 2013
Jan. 09, 2013
Jan. 10, 2013
00
06
12
18
24
Universal Time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Jan. 13, 2013
Jan. 14, 2013
Jan. 15, 2013
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Jan. 17, 2013
Jan. 18, 2013
Jan. 19, 2013
Jan. 20, 2013
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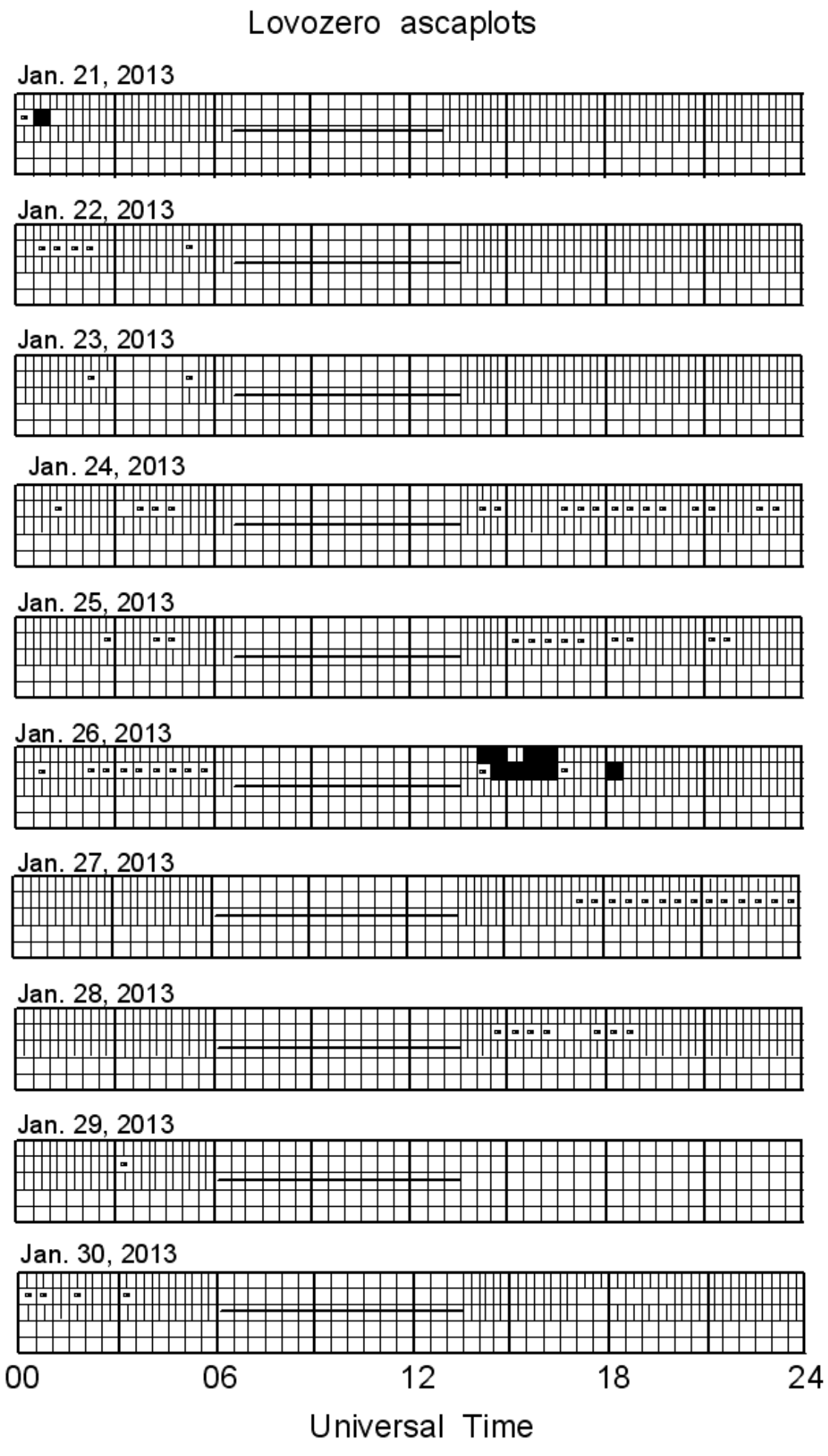
06
12
18
24
Universal Time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Jan. 21, 2013
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Jan. 27, 2013
Jan. 28, 2013
Jan. 29, 2013
Jan. 30, 2013
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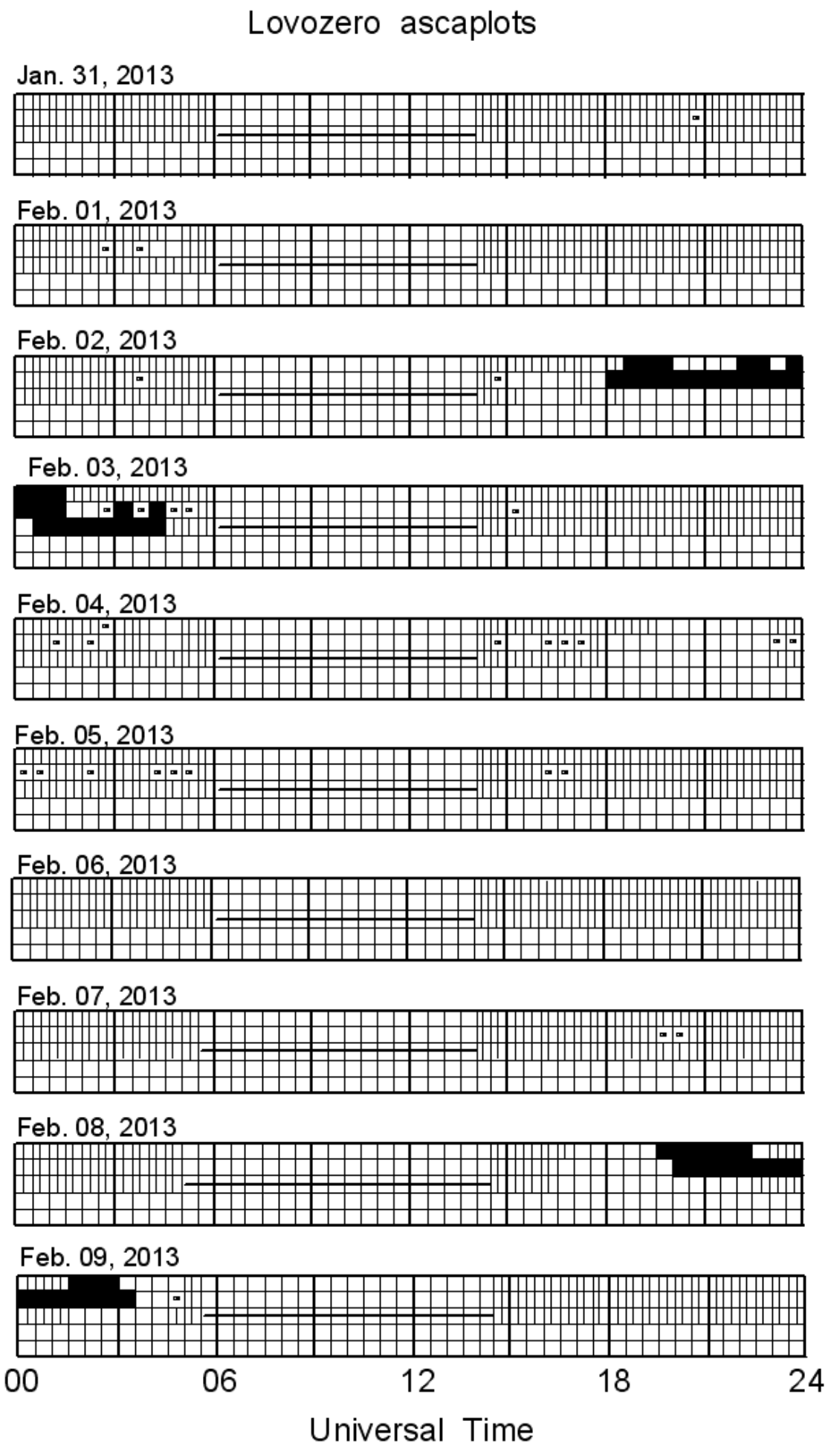
12
18
24
Universal Time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Feb. 09, 2013
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12
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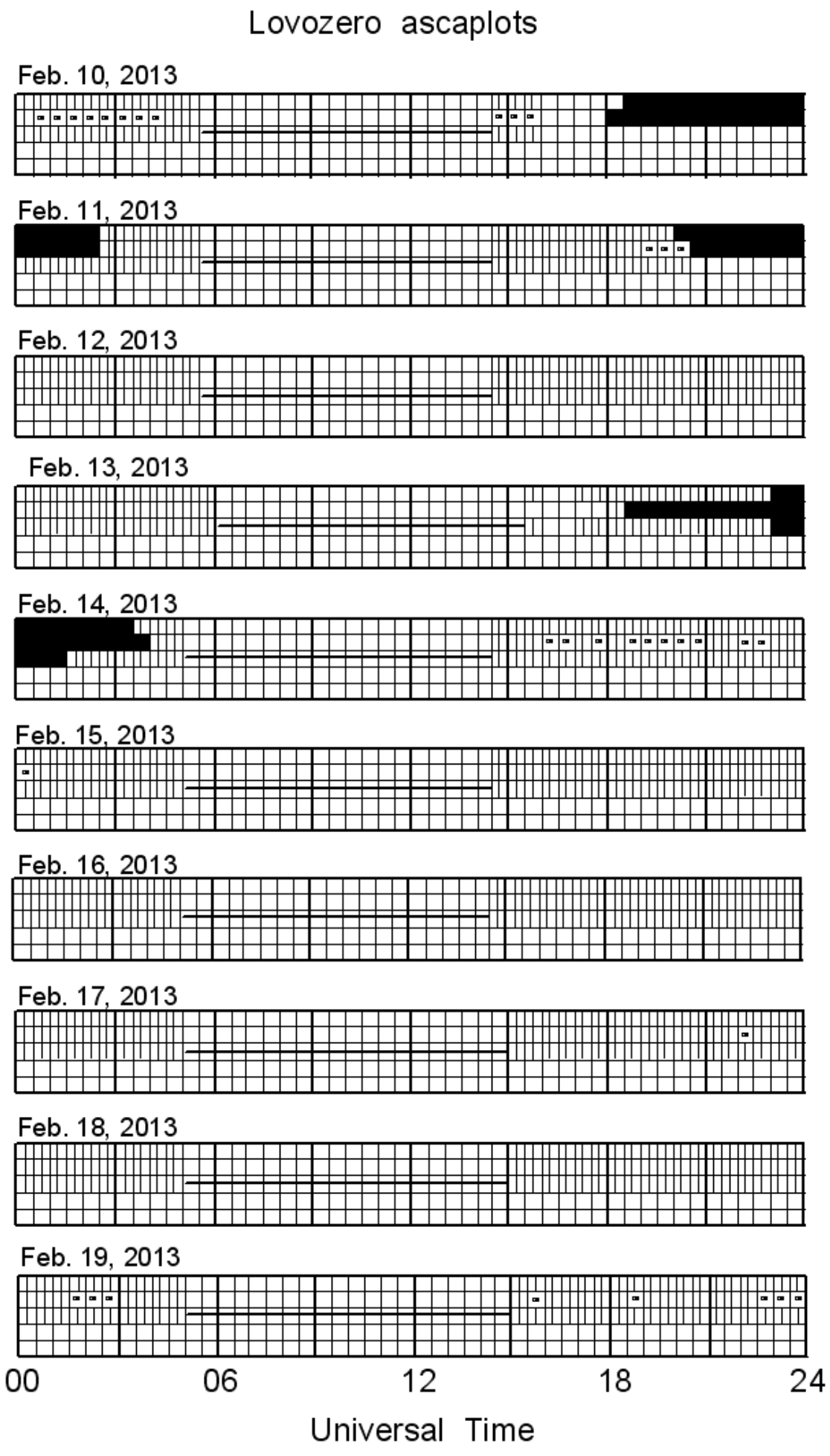
24
Universal Time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Feb. 18, 2013
Feb. 19, 2013
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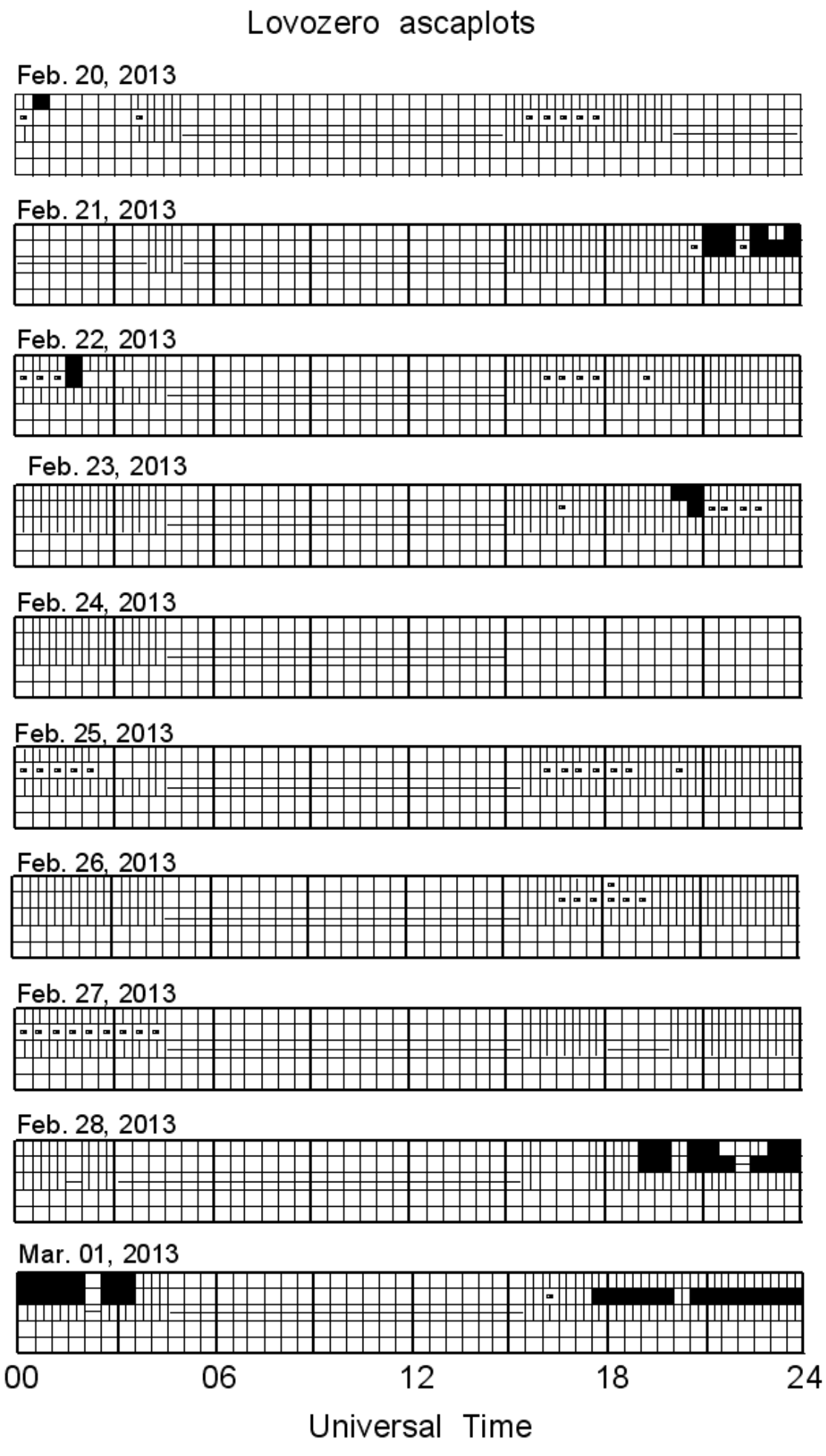
12
18
24
Universal Time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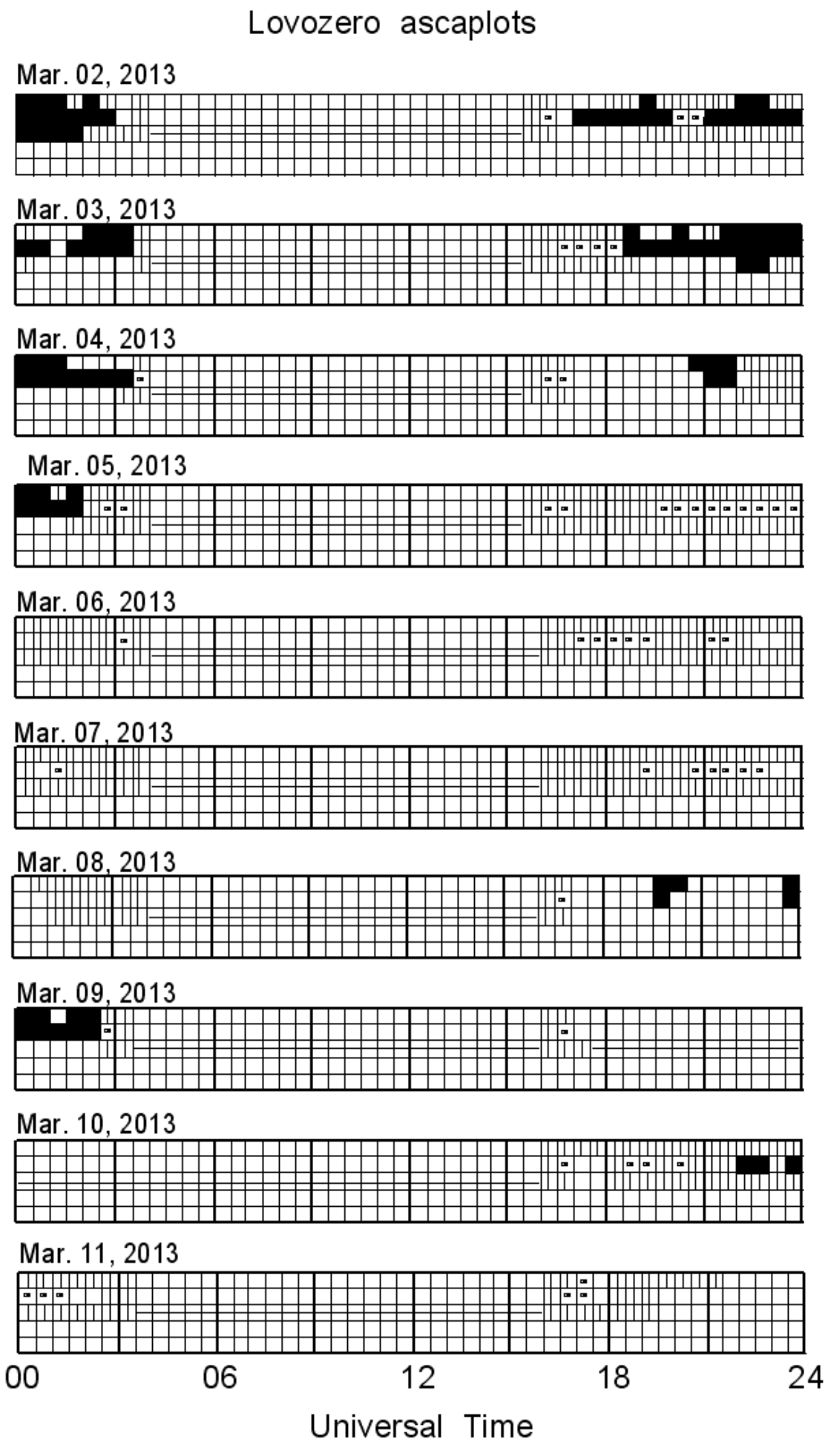
Feb. 26, 2013
Feb. 27, 2013
Feb. 28, 2013
Mar. 01, 2013
00
06
12
18
24
Universal Time


Lovozero ascaplots
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Mar. 06, 2013
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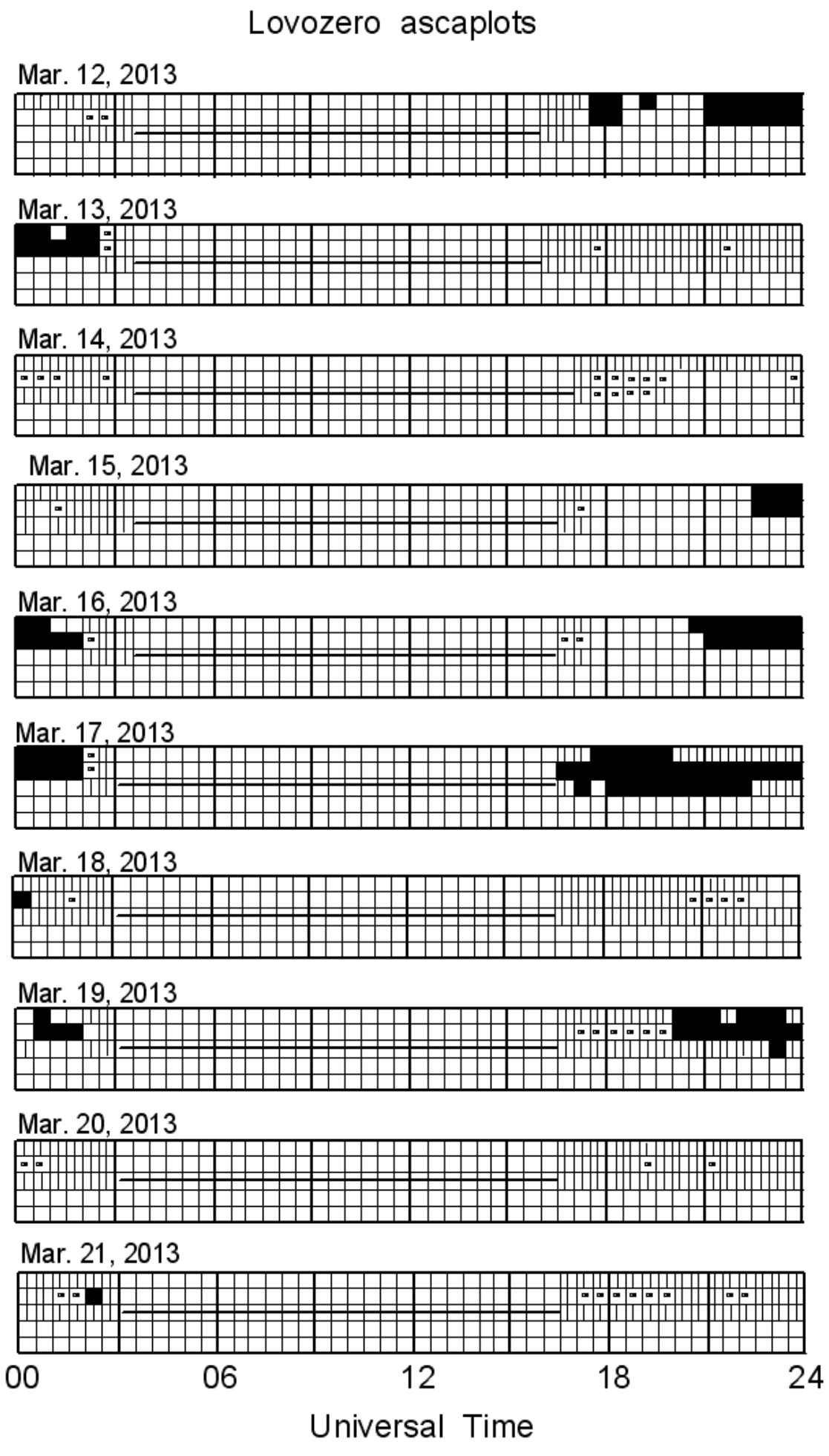
Mar. 11, 2013
00
06
12
18
24
Universal Time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Mar. 18, 2013
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Mar. 21, 2013
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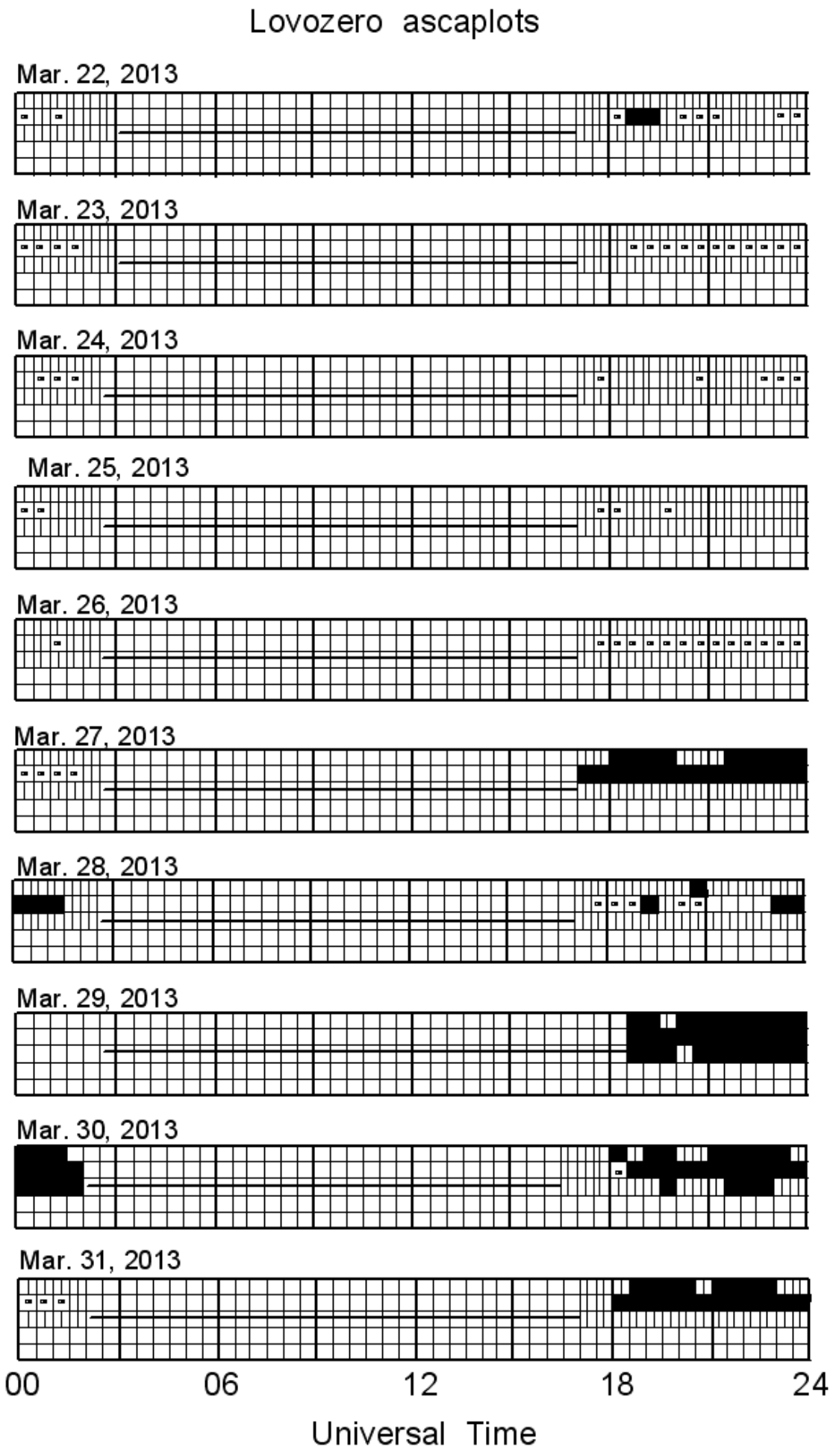
06
12
18
24
Universal Time


Lovozero ascaplots
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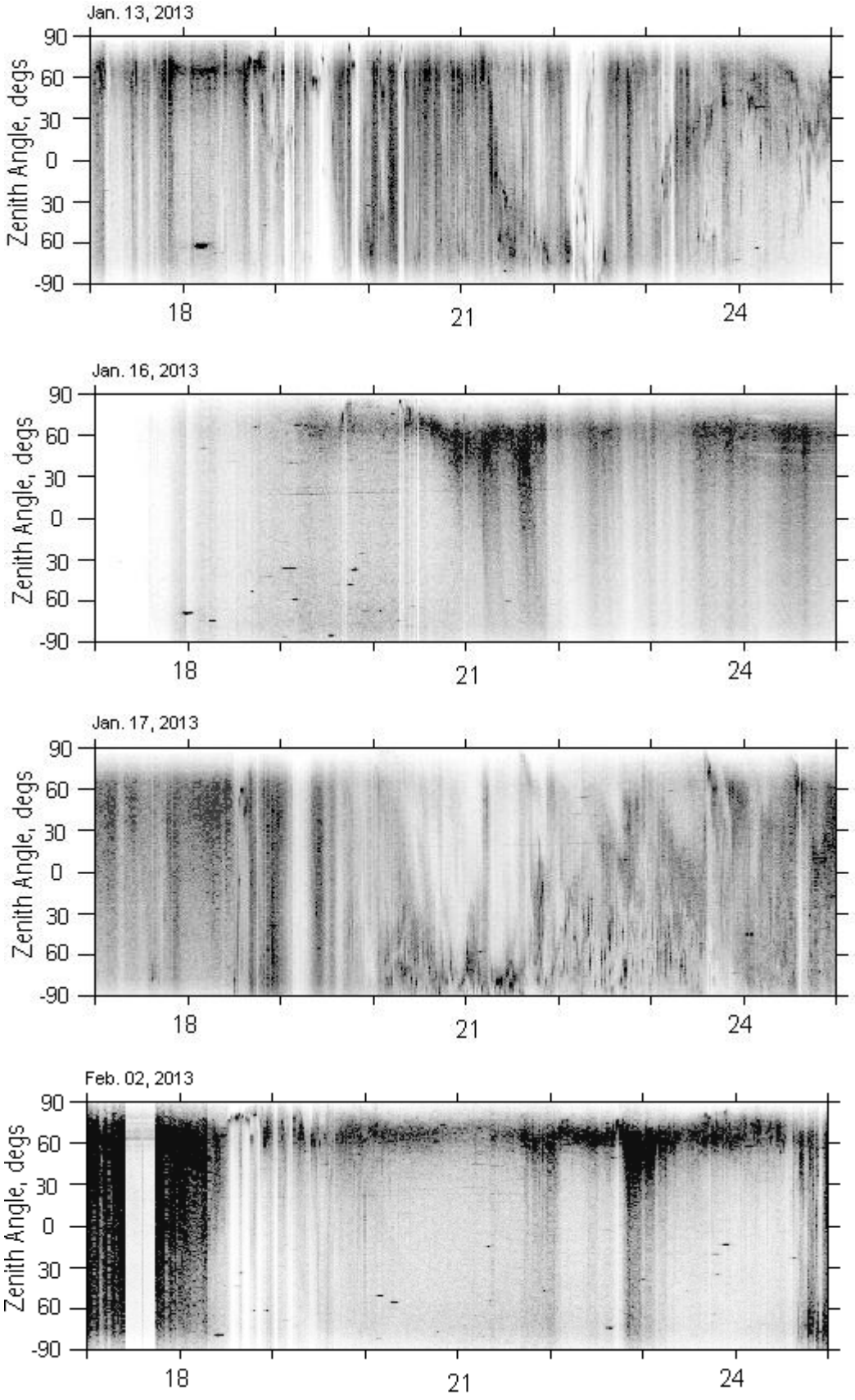
Mar. 24, 2013
Mar. 25, 2013
Mar. 26, 2013
Mar. 27, 2013
Mar. 28, 2013
Mar. 29, 2013
Mar. 30, 2013
Mar. 31, 2013
00
06
12
18
24
Universal Time

Lovozero TV keograms



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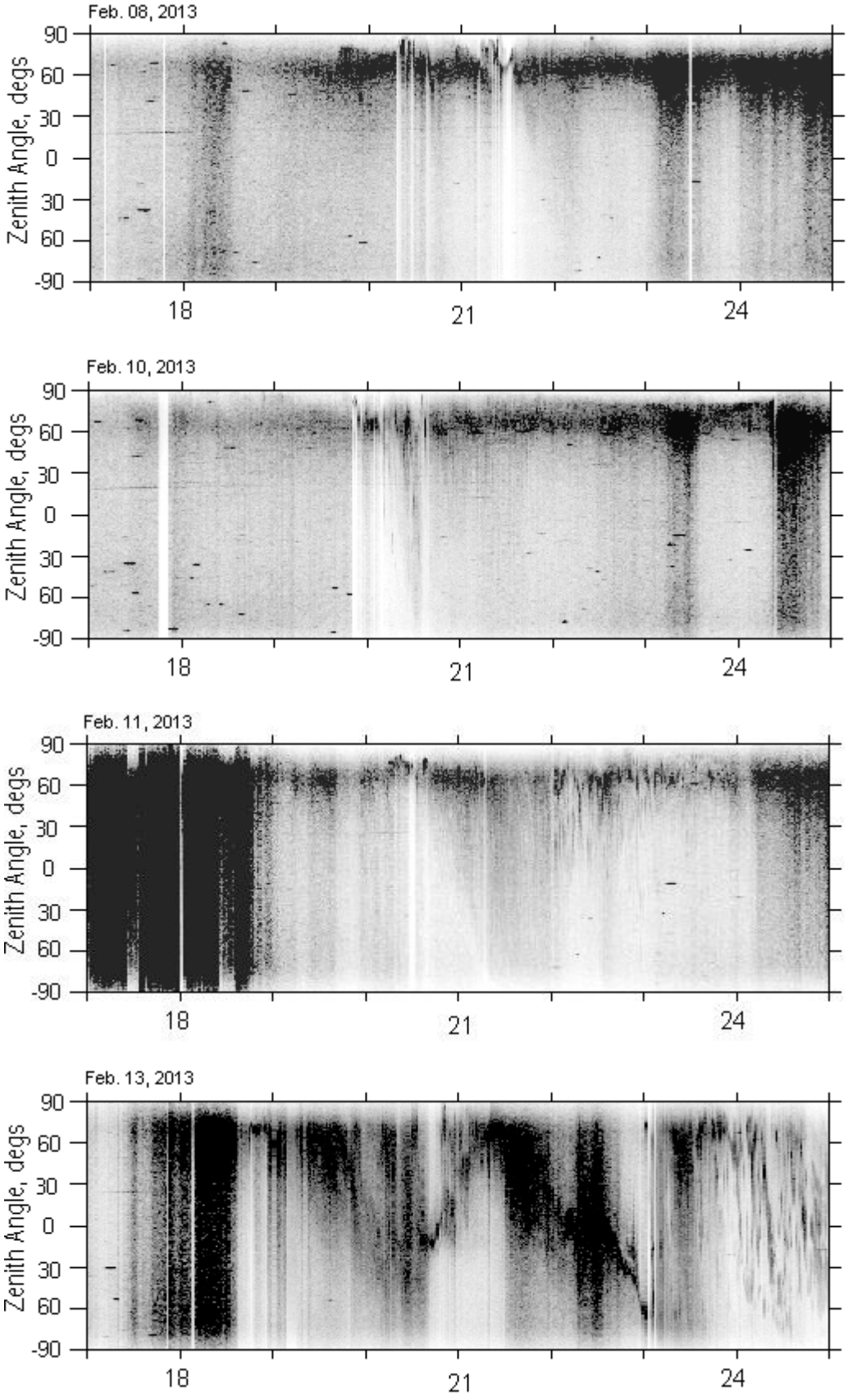

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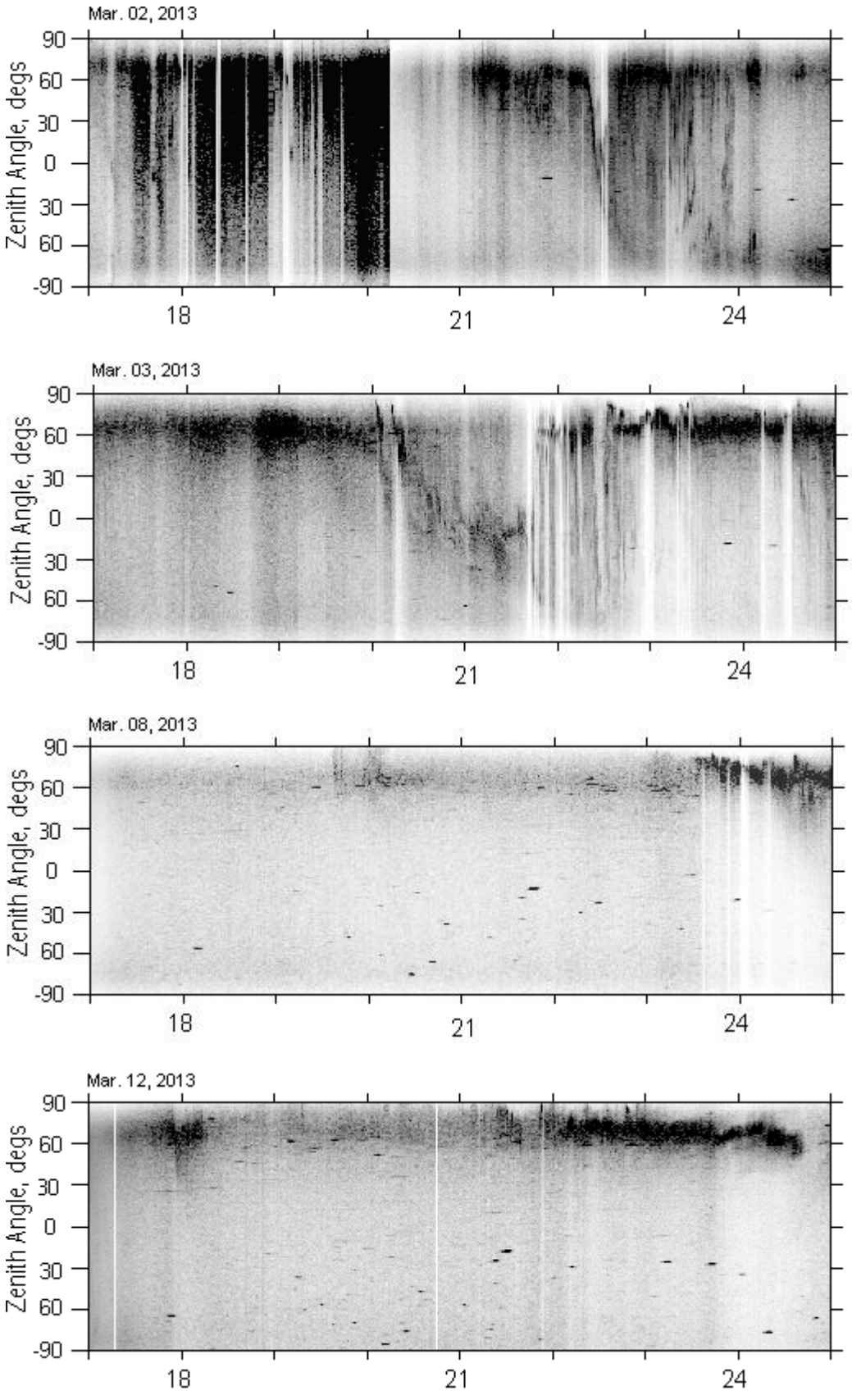

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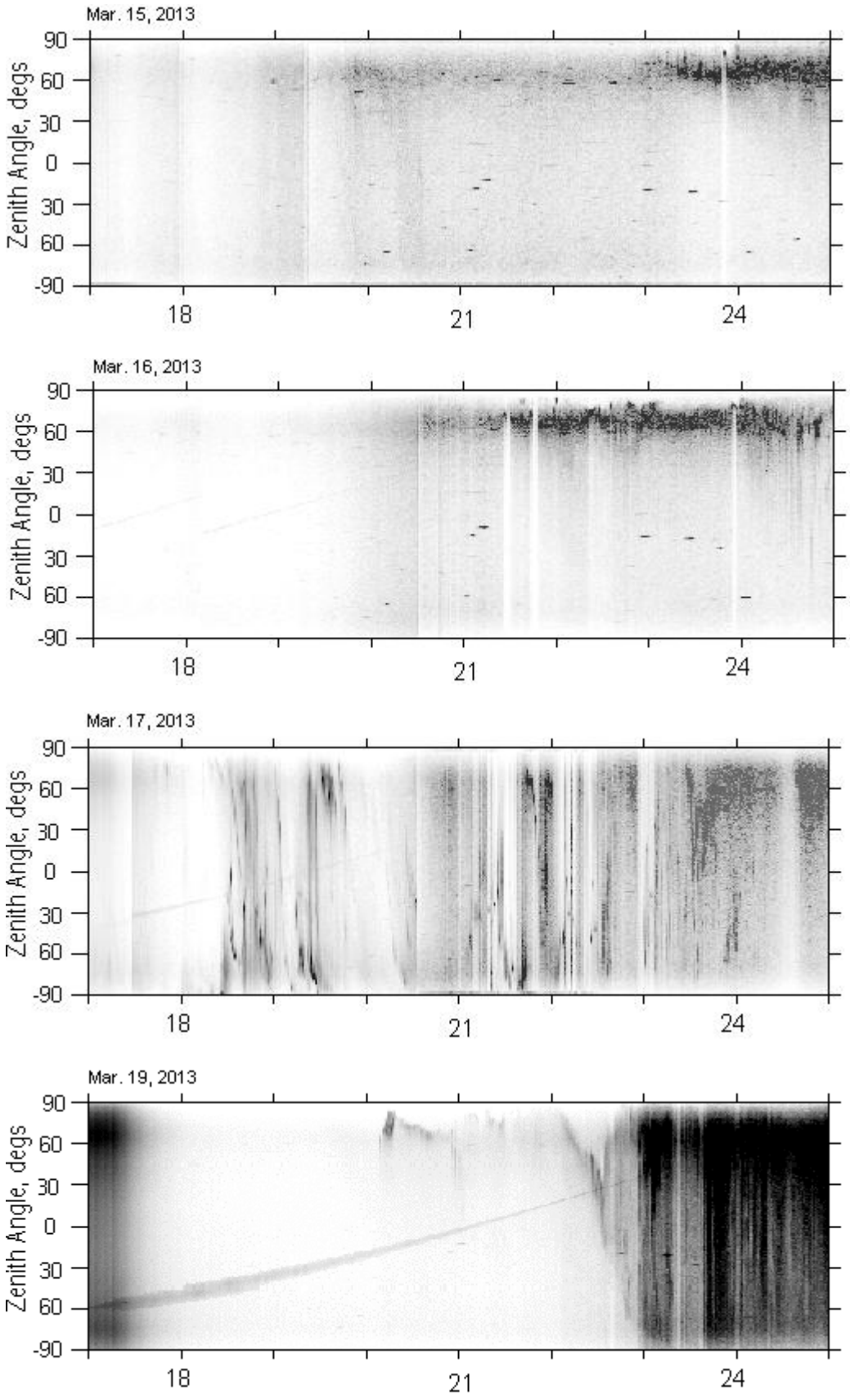

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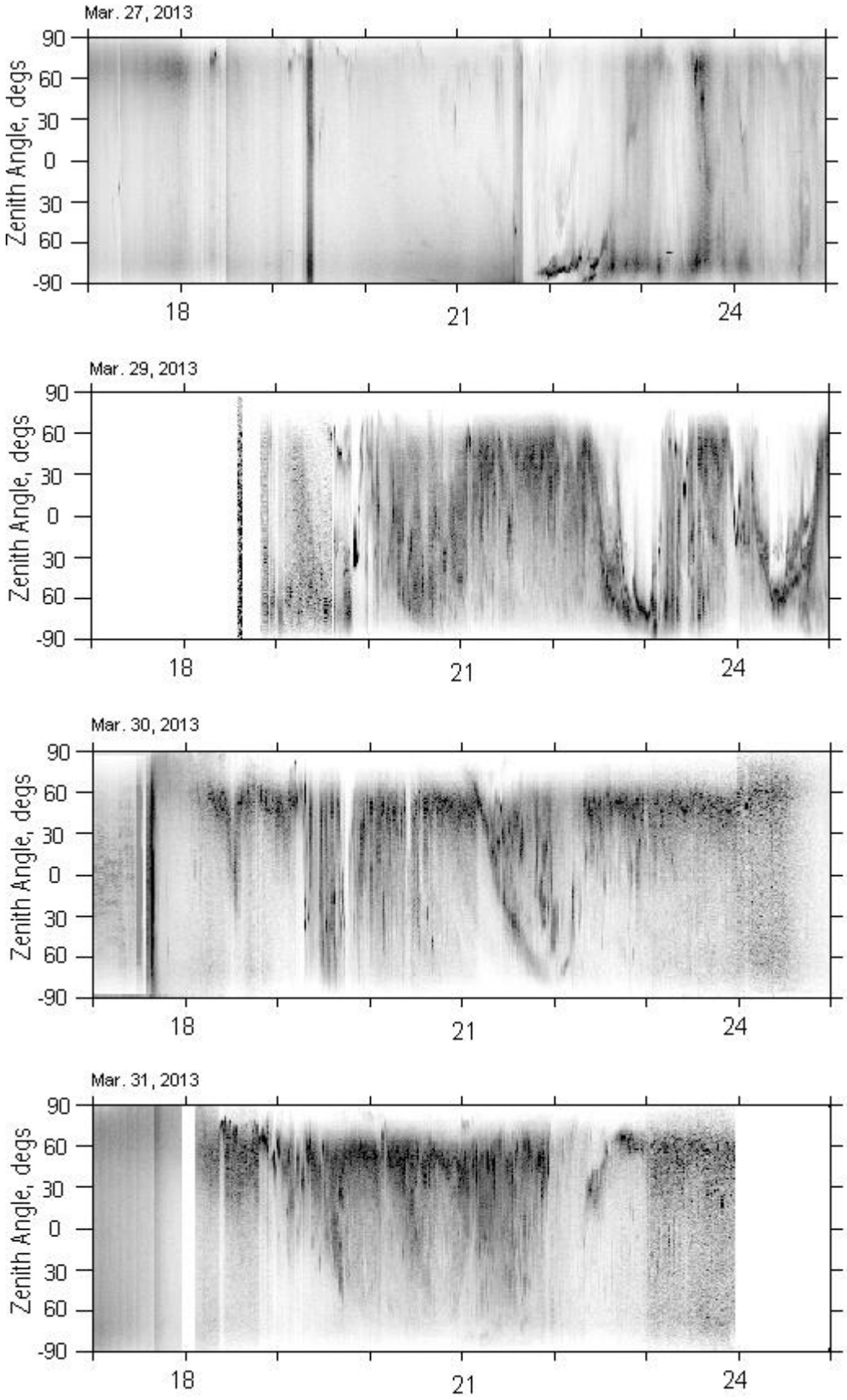
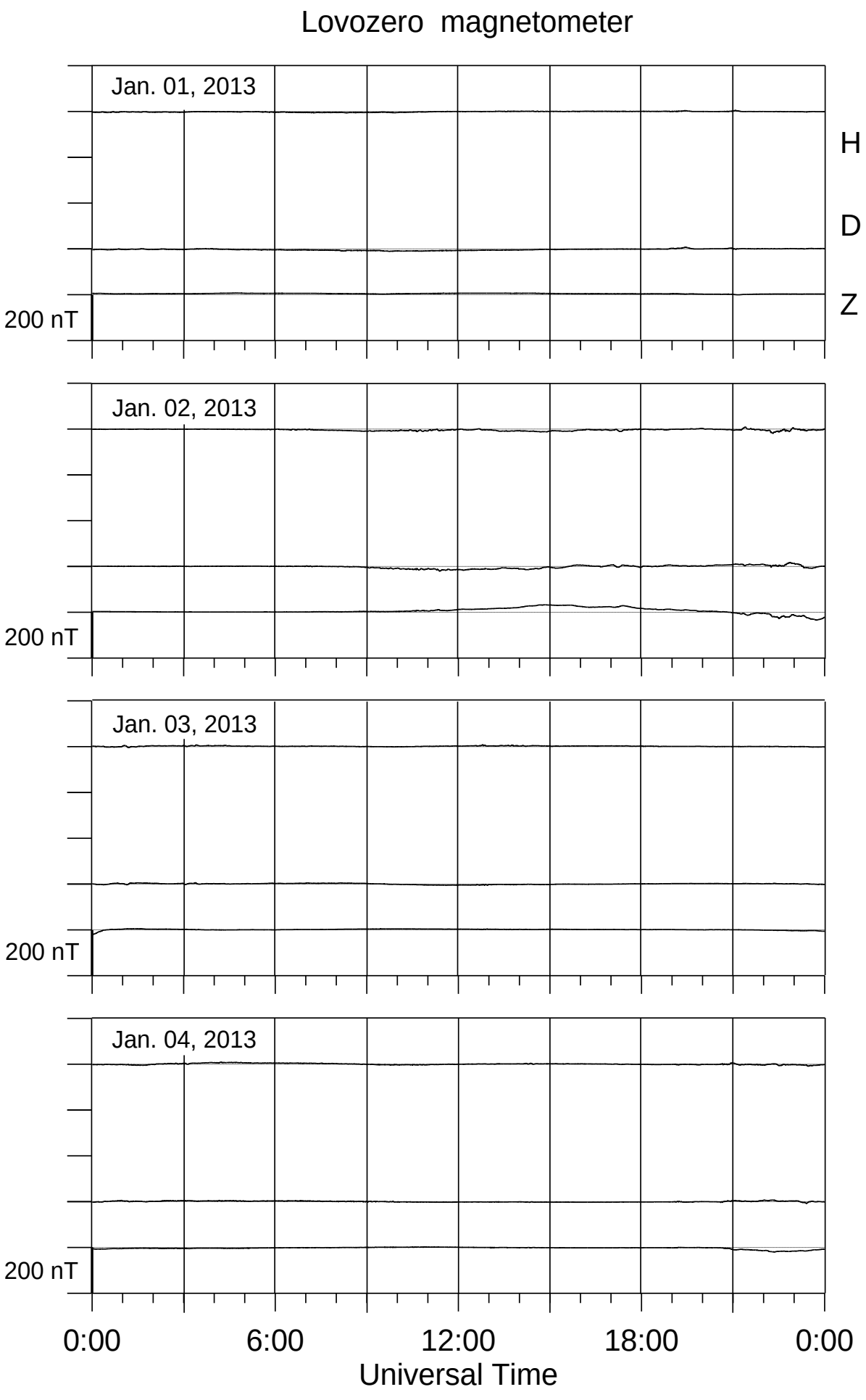
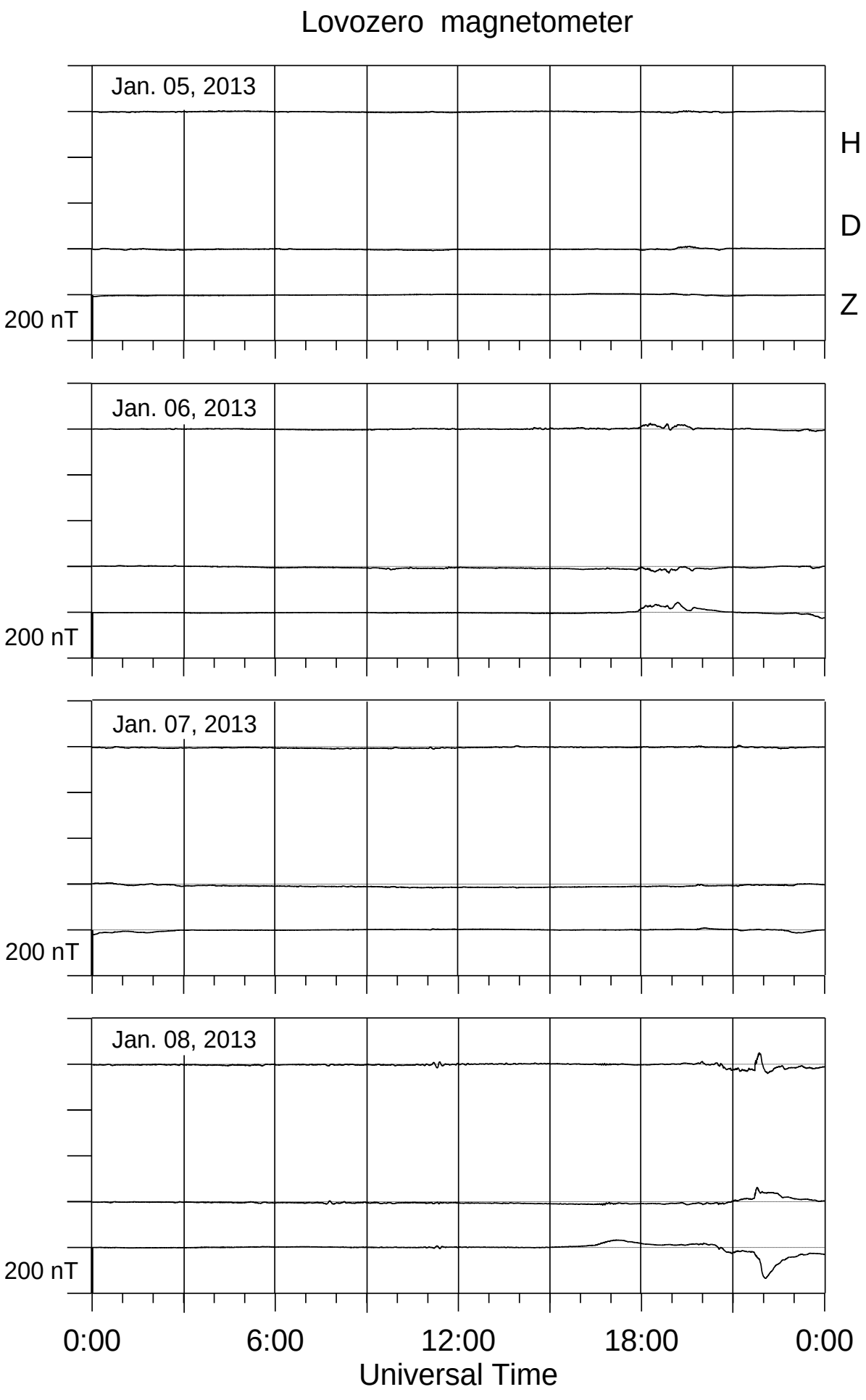
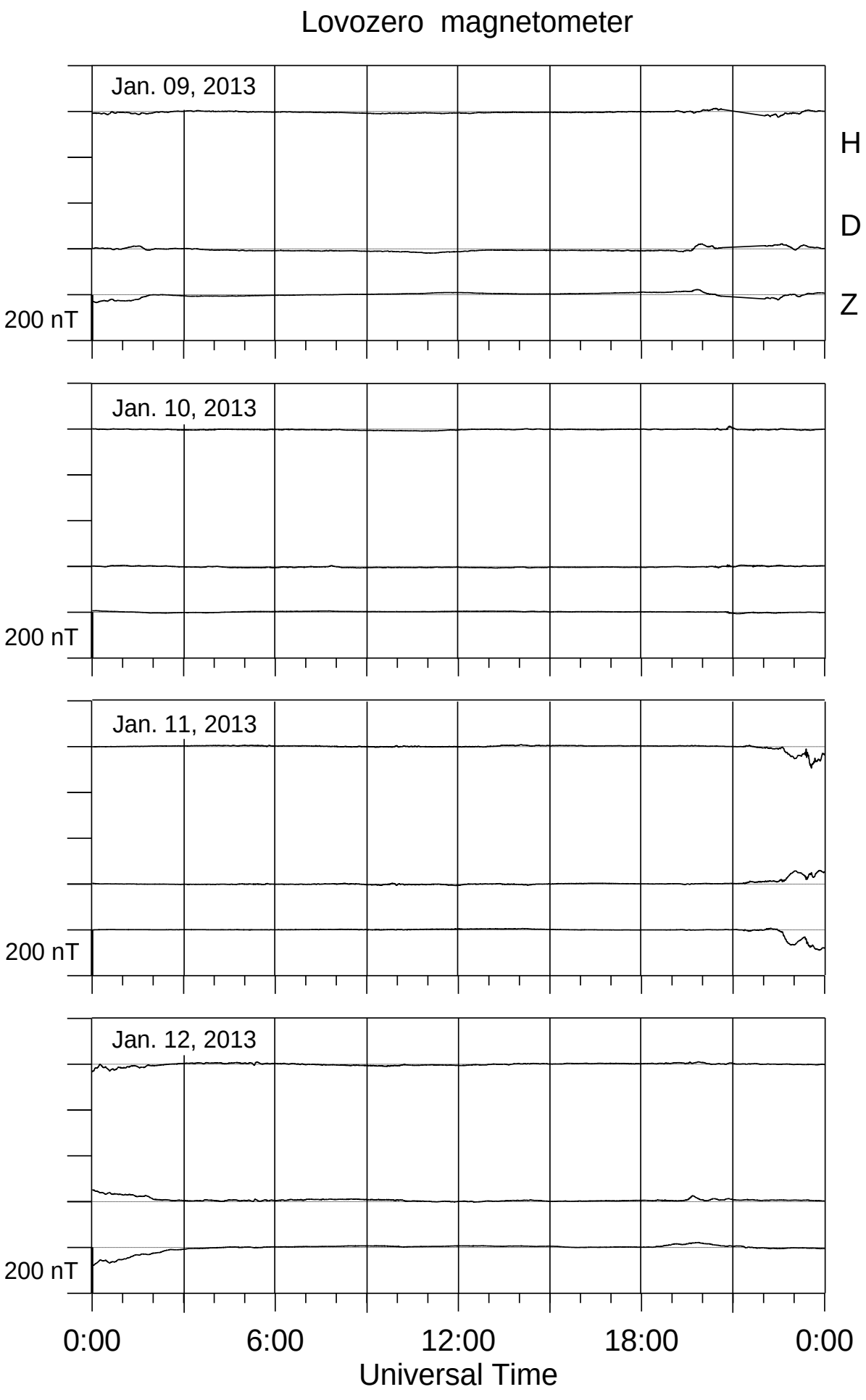


LOVOZERO MAGNETOGRAMS

January - March 2013


Lovozero magnetometer
Jan. 01, 2013
H
D
Z
200 nT
Jan. 02, 2013
200 nT
Jan. 03, 2013
200 nT
Jan. 04, 2013
200 nT
0:00
6:00
12:00
18:00
0:00
Universal Time


Lovozero magnetometer
Jan. 05, 2013
H
D
Z
200 nT
Jan. 06, 2013
200 nT
Jan. 07, 2013
200 nT
Jan. 08, 2013
200 nT
0:00
6:00
12:00
18:00
0:00
Universal Time


Lovozero magnetometer
Jan. 09, 2013
H
D
Z
200 nT
Jan. 10, 2013
200 nT
Jan. 11, 2013
200 nT
Jan. 12, 2013
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0:00
6:00
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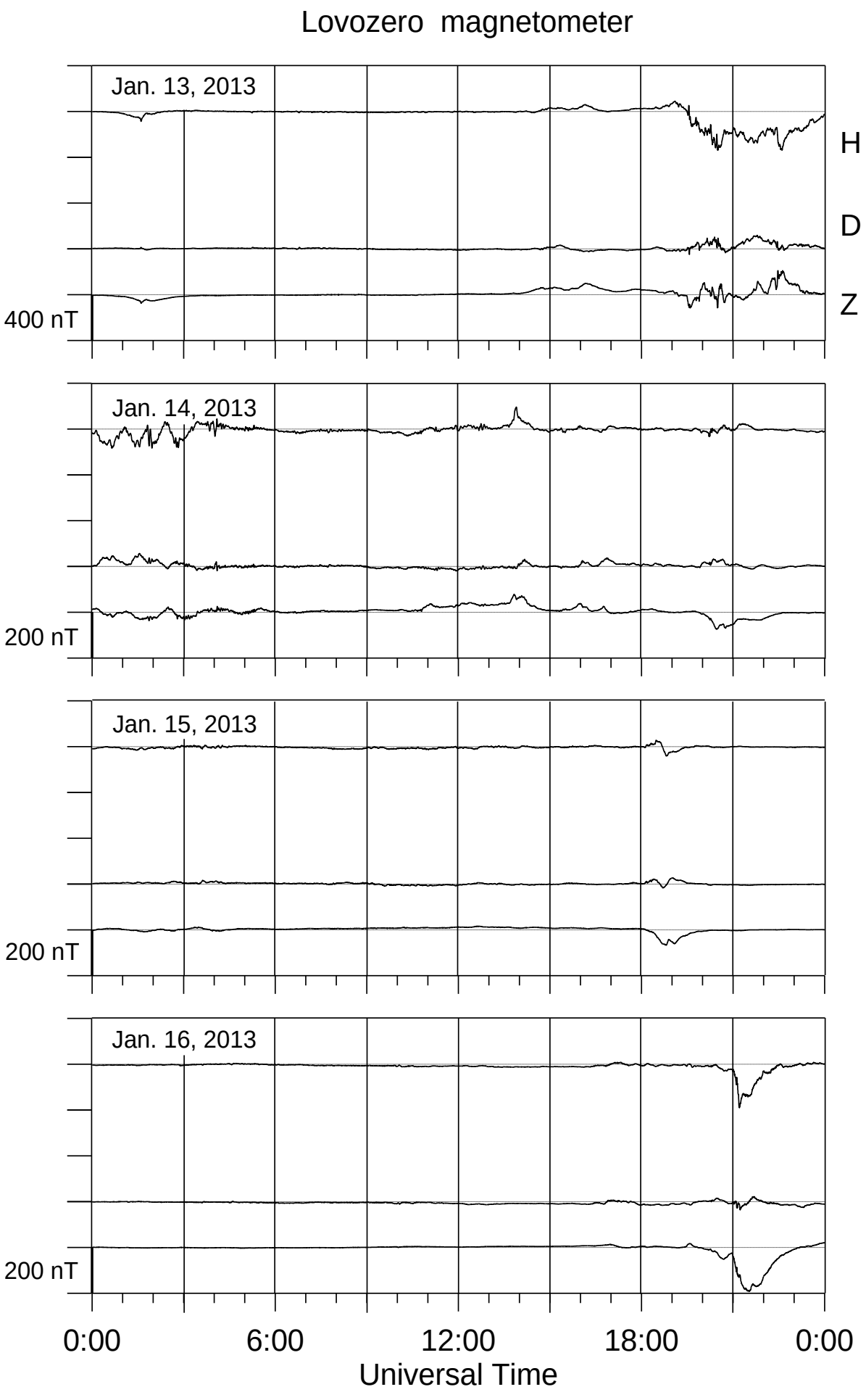
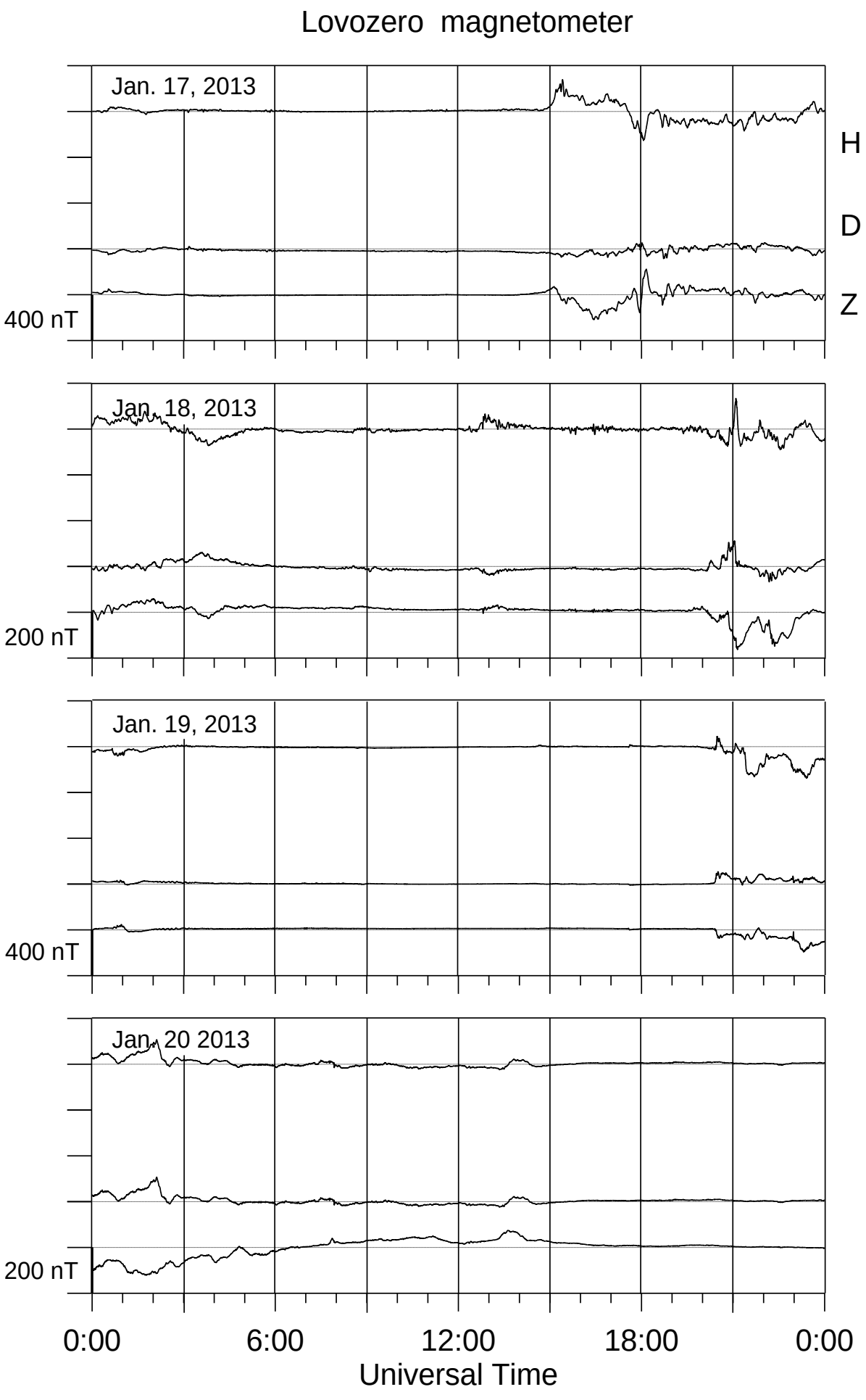
18:00
0:00
Universal Time


Lovozero magnetometer
Jan. 13, 2013
H
D
Z
400 nT
Jan. 14, 2013
200 nT
Jan. 15, 2013
200 nT
Jan. 16, 2013
200 nT
0:00
6:00
12:00
18:00
0:00
Universal Time


Lovozero magnetometer
Jan. 17, 2013
H
D
Z
400 nT
Jan. 18, 2013
200 nT
Jan. 19, 2013
400 nT
Jan. 20 2013
200 nT
0:00
6:00
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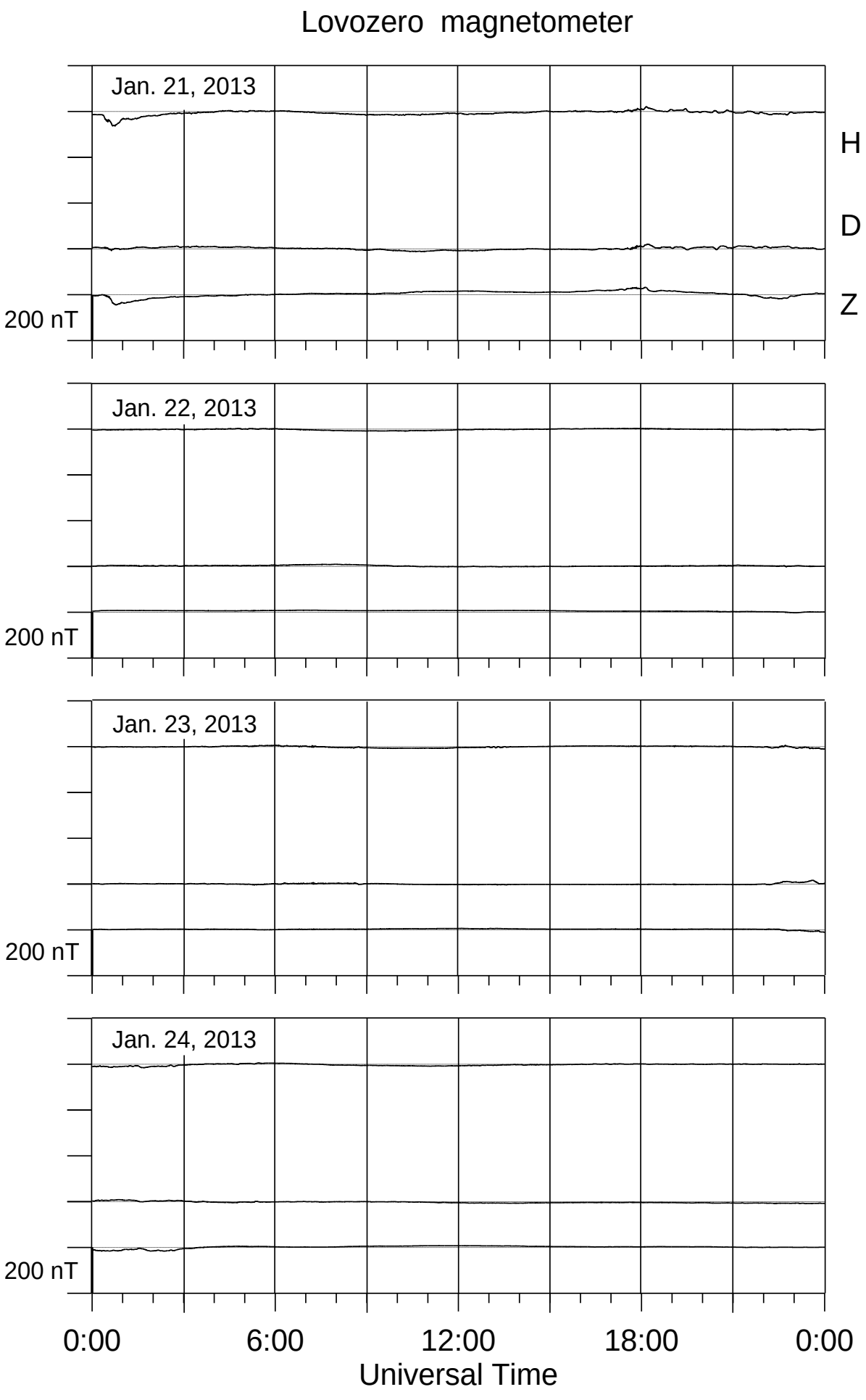
Universal Time


Lovozero magnetometer
Jan. 21, 2013
H
D
Z
200 nT
Jan. 22, 2013
200 nT
Jan. 23, 2013
200 nT
Jan. 24, 2013
200 nT
0:00
6:00
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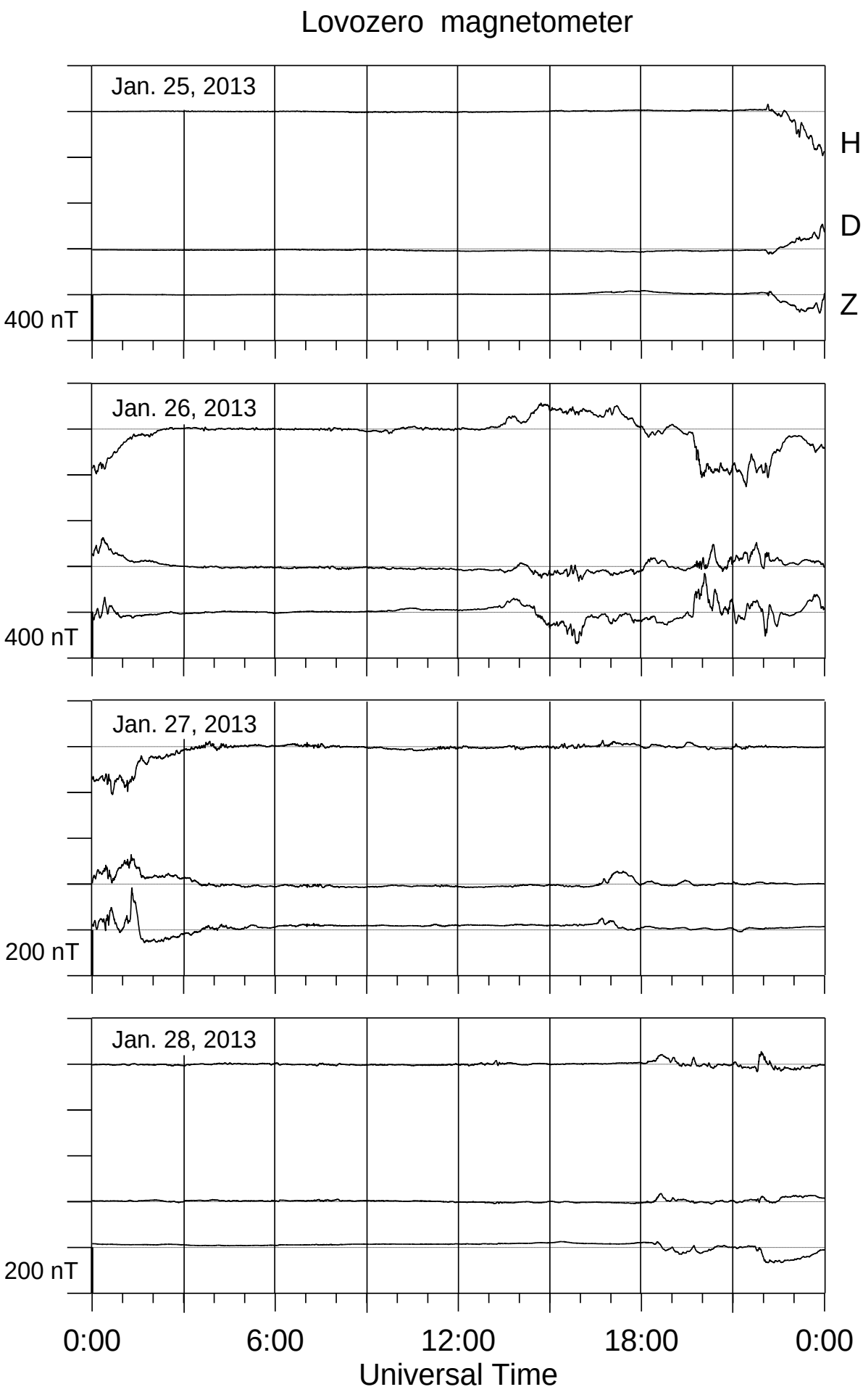
18:00
0:00
Universal Time


Lovozero magnetometer
Jan. 25, 2013
H
D
Z
400 nT
Jan. 26, 2013
400 nT
Jan. 27, 2013
200 nT
Jan. 28, 2013
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6:00
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18:00
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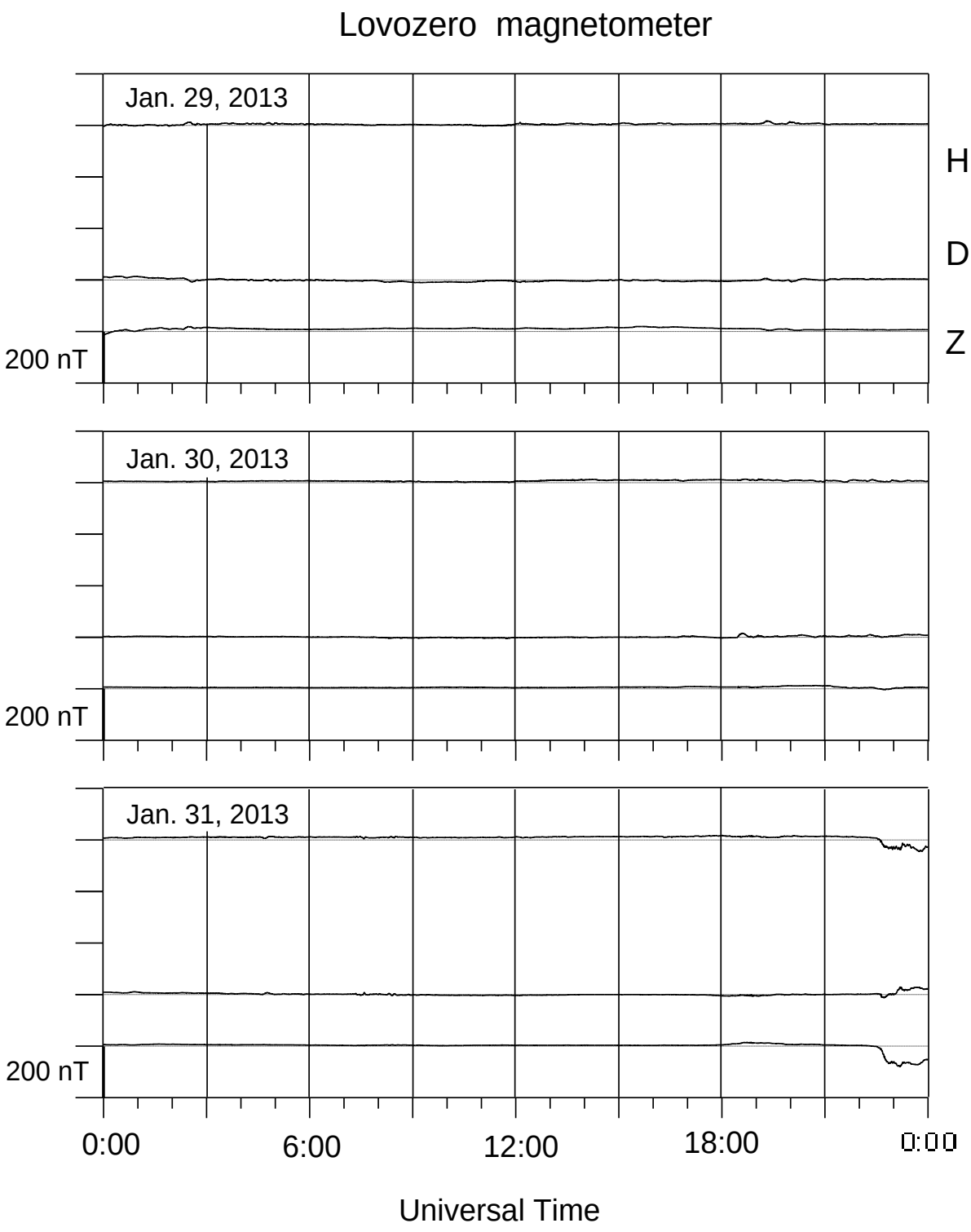
Universal Time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Jan. 29, 2013
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D
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Jan. 30, 2013
200 nT
Jan. 31, 2013
200 nT
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6:00
12:00
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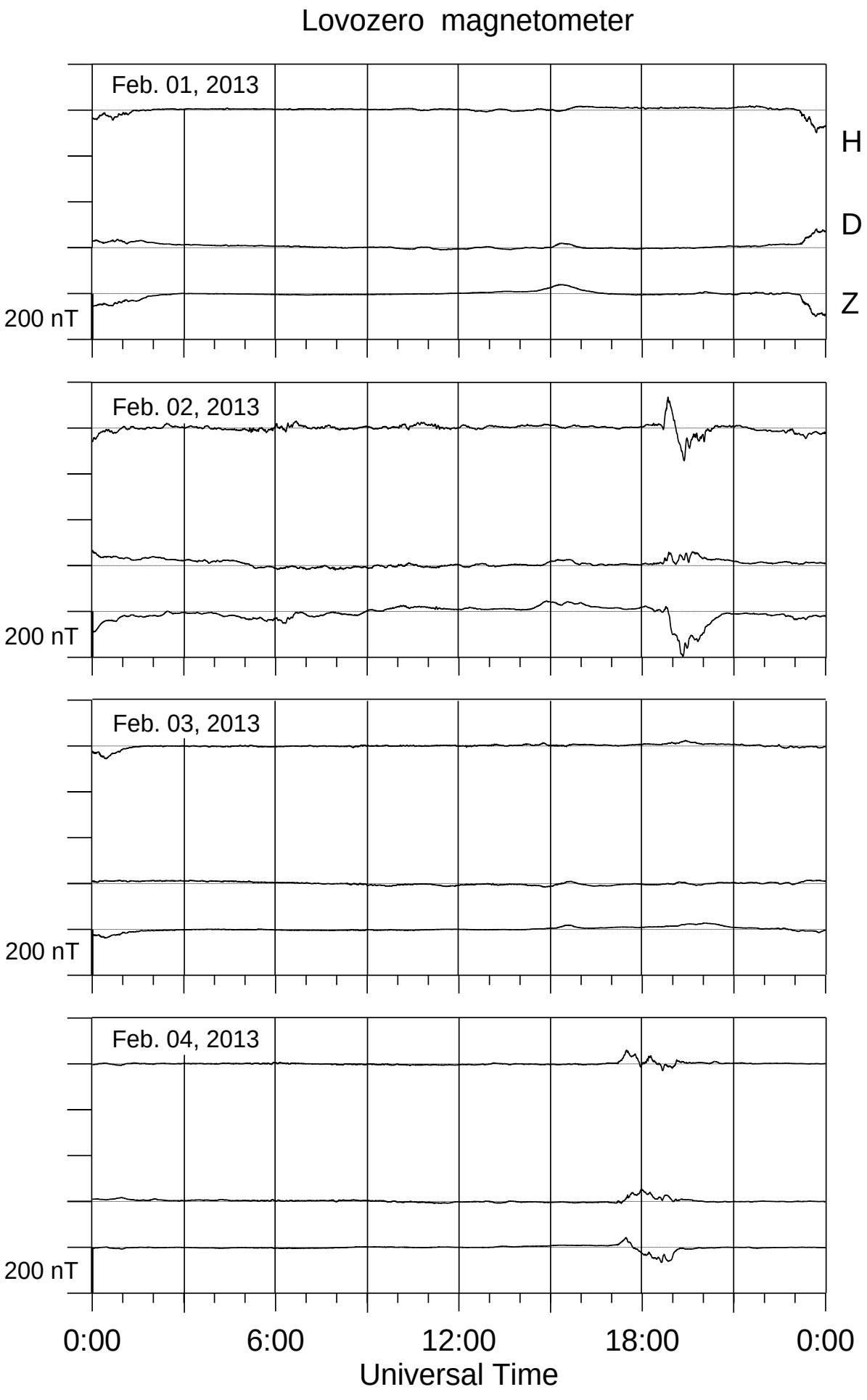
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Feb. 01, 2013
H
D
Z
200 nT
Feb. 02, 2013
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Feb. 03, 2013
200 nT
Feb. 04, 2013
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6:00
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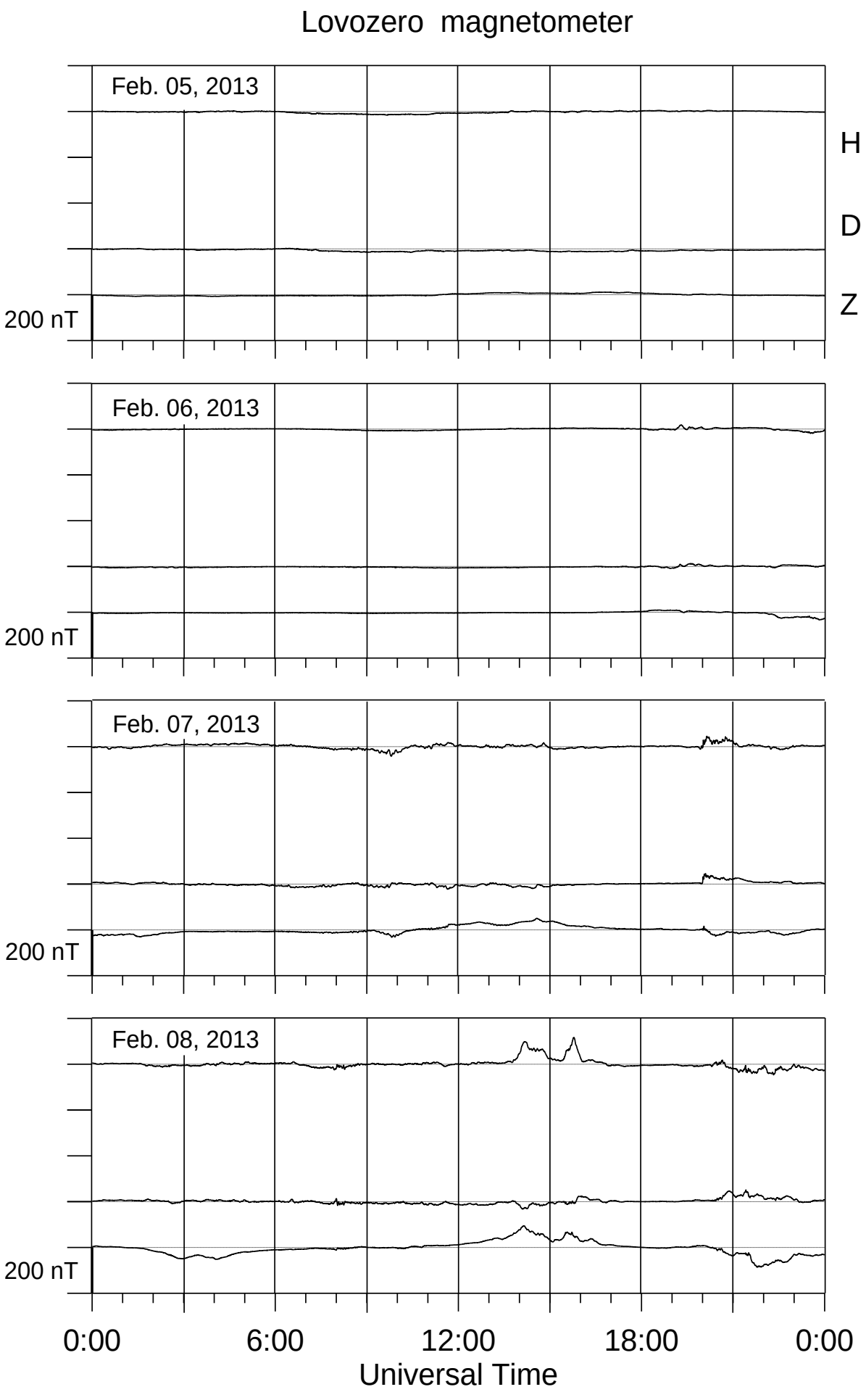
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Feb. 05, 2013
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D
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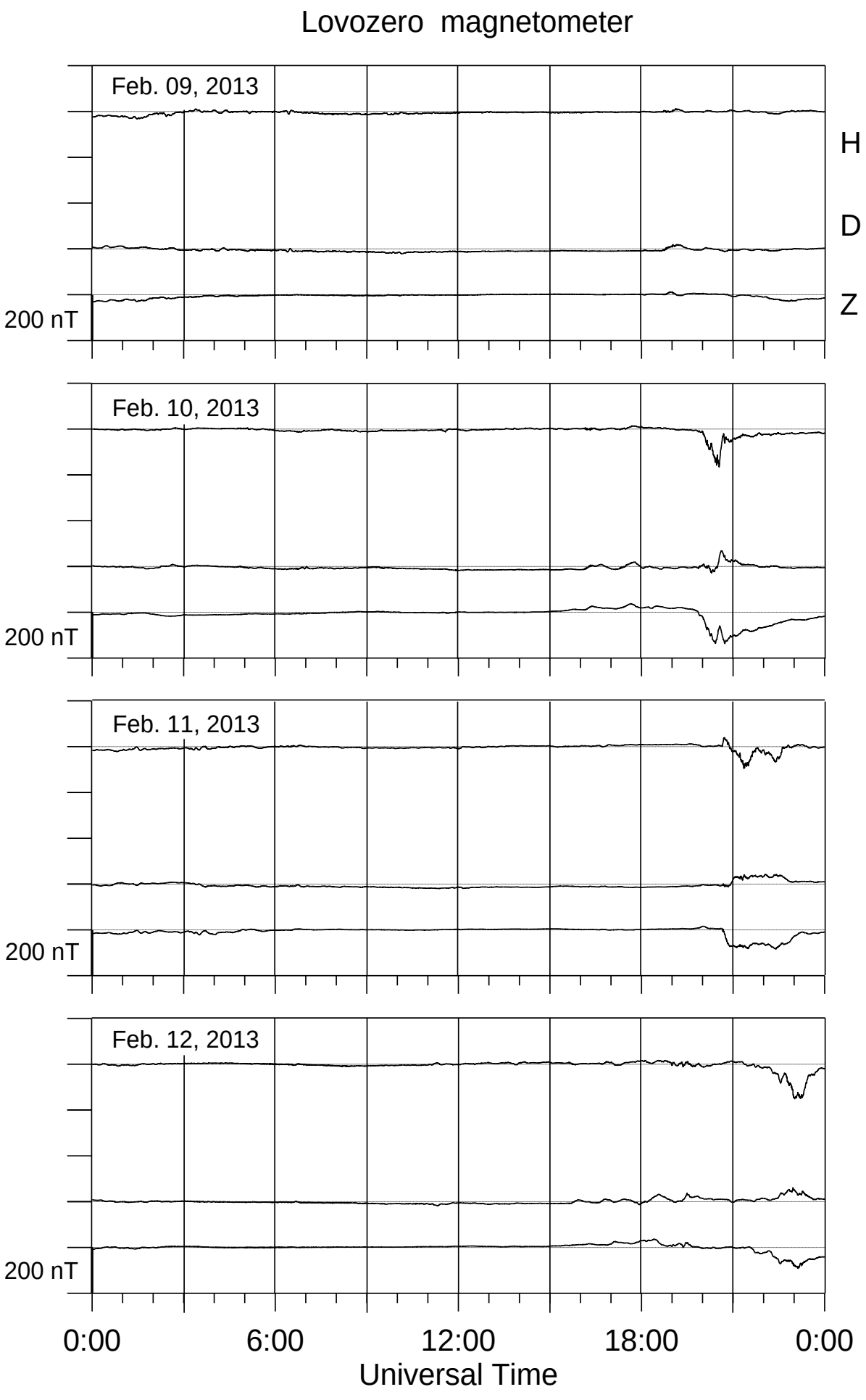
Lovozero magnetometer
Feb. 09, 2013
H
D
Z
200 nT
Feb. 10, 2013
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Feb. 11, 2013
200 nT
Feb. 12, 2013
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6:00
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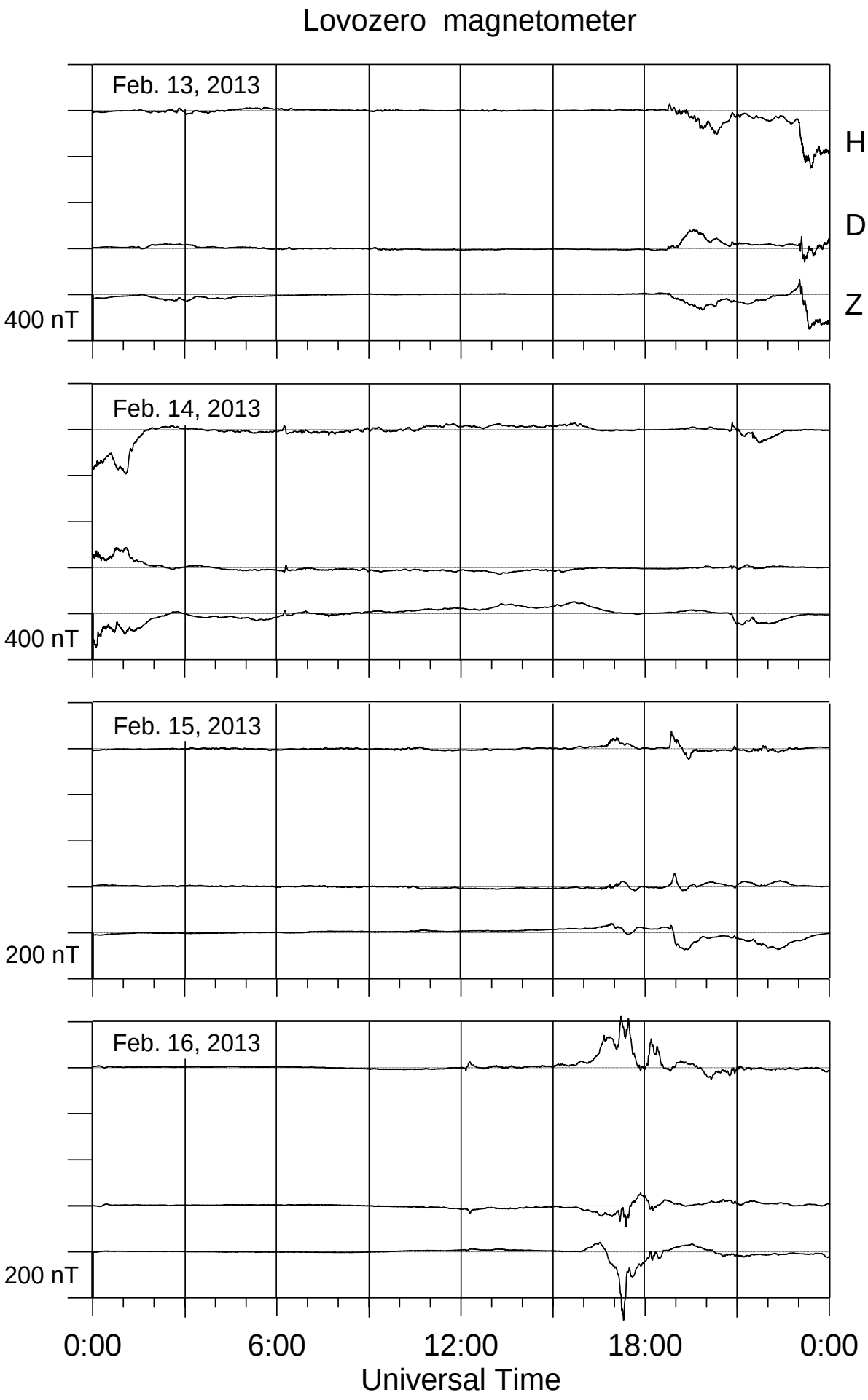
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Feb. 13, 2013
H
D
Z
400 nT
Feb. 14, 2013
400 nT
Feb. 15, 2013
200 nT
Feb. 16, 2013
200 nT
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6:00
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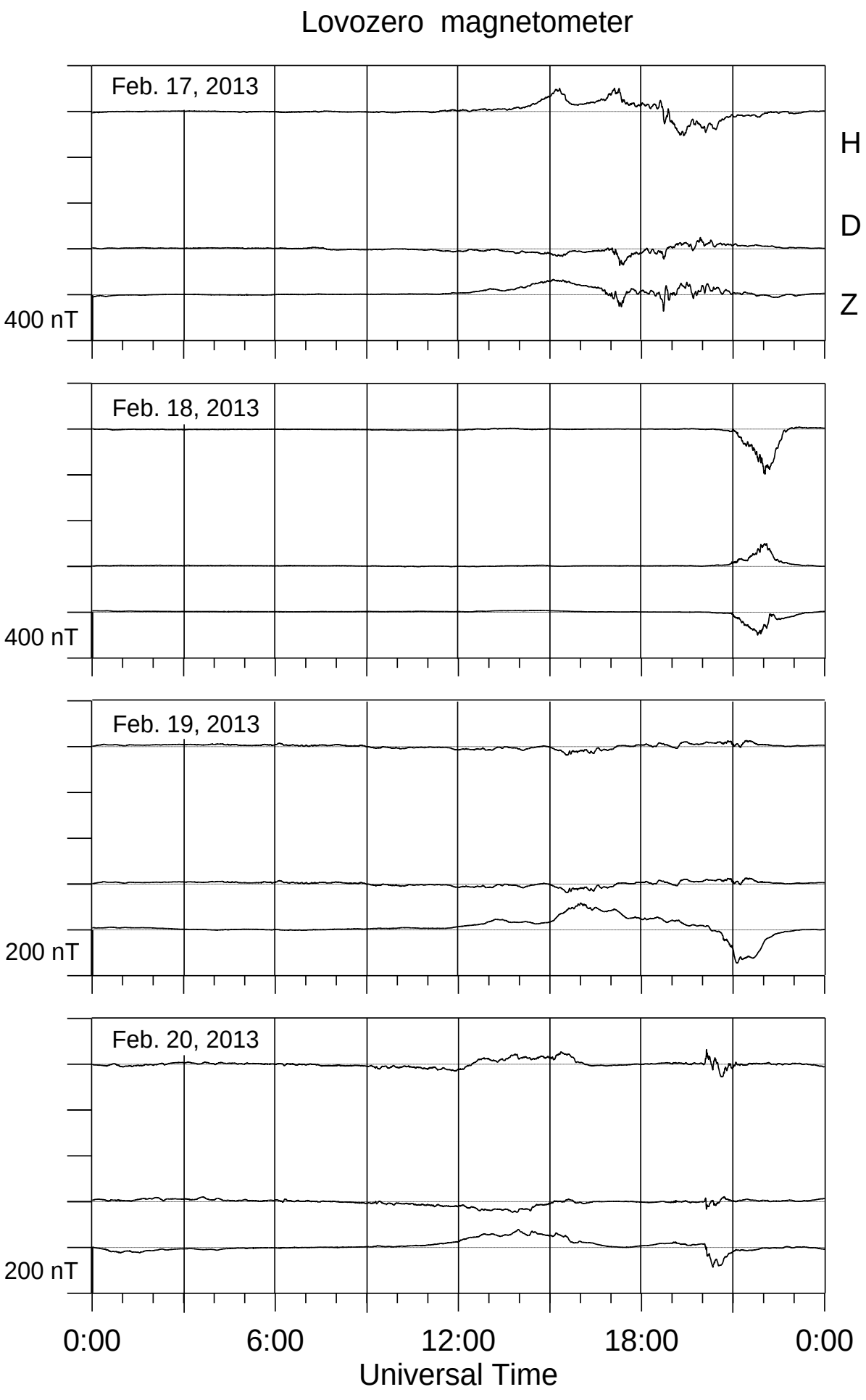
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Feb. 20, 2013
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6:00
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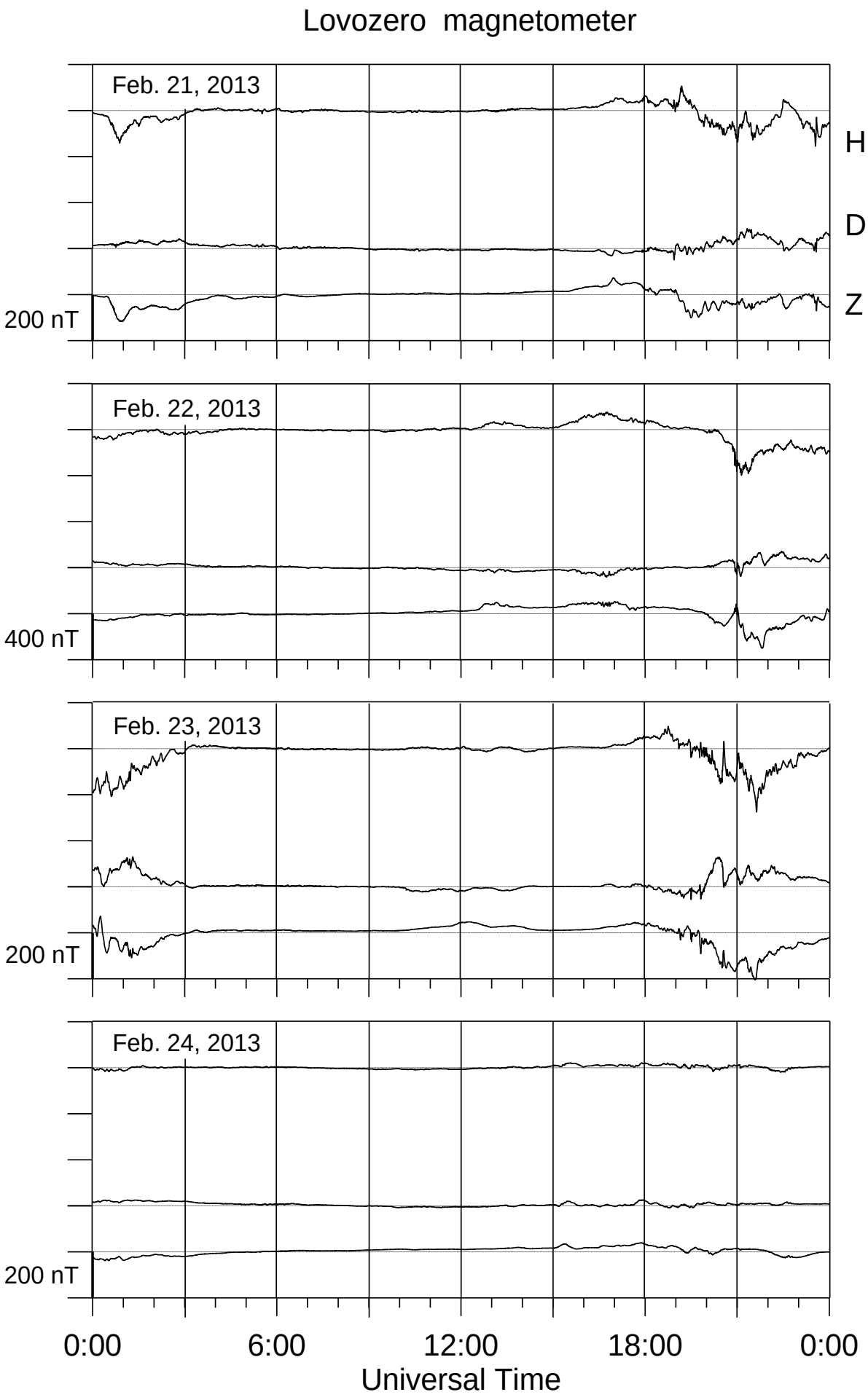
Lovozero magnetometer
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D
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Feb. 23, 2013
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Feb. 24, 2013
200 nT
0:00
6:00
12:00
18:00
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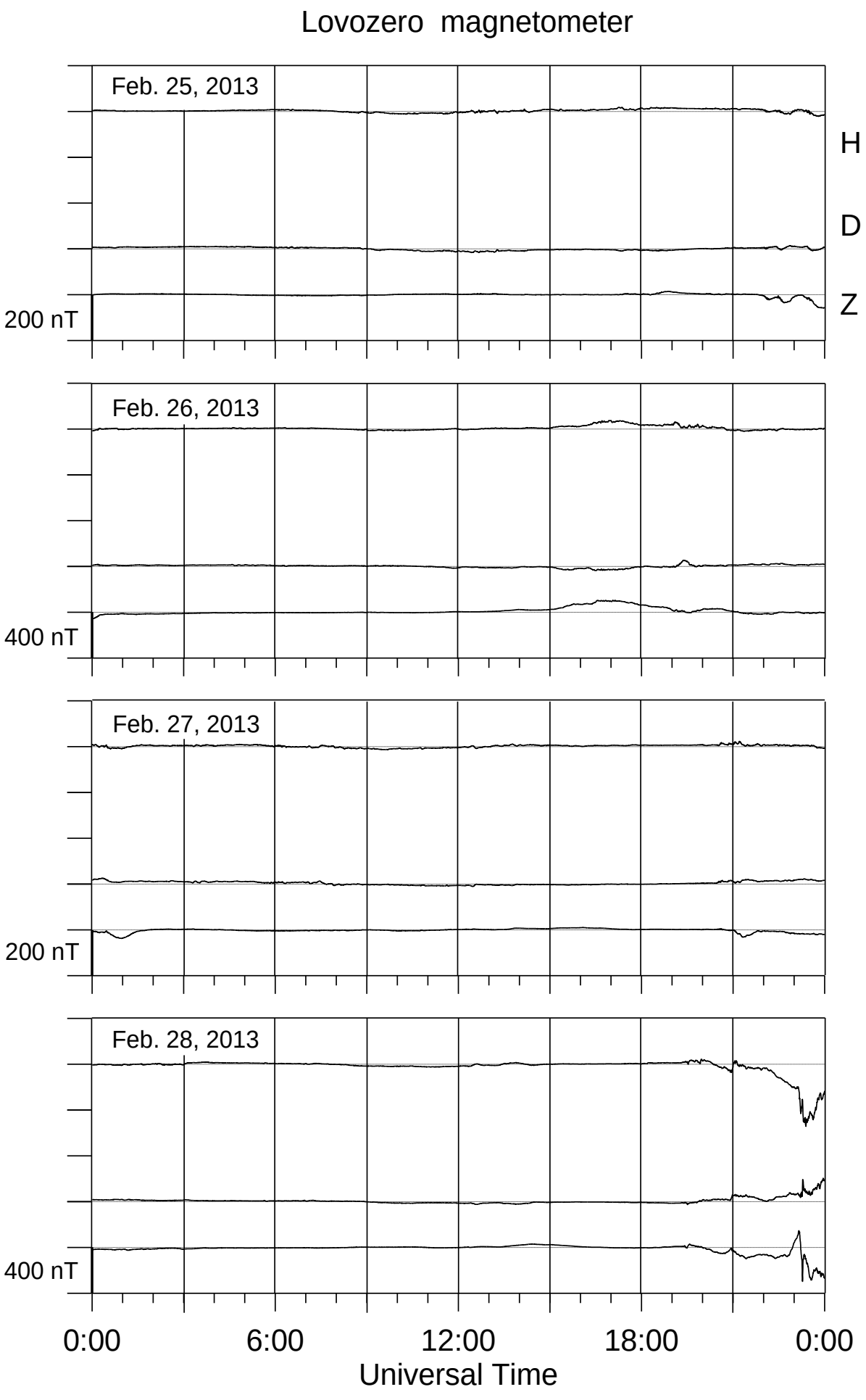
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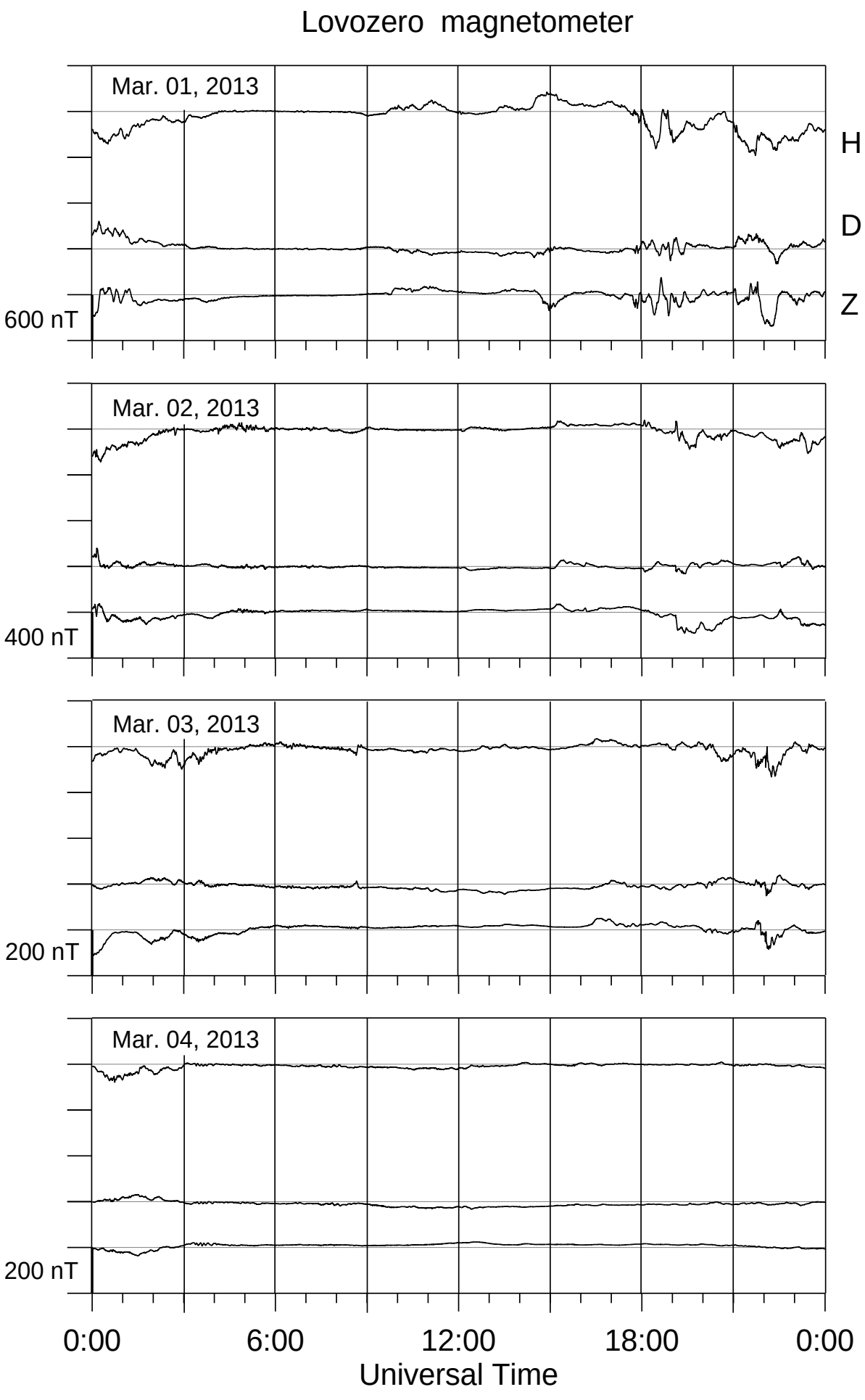
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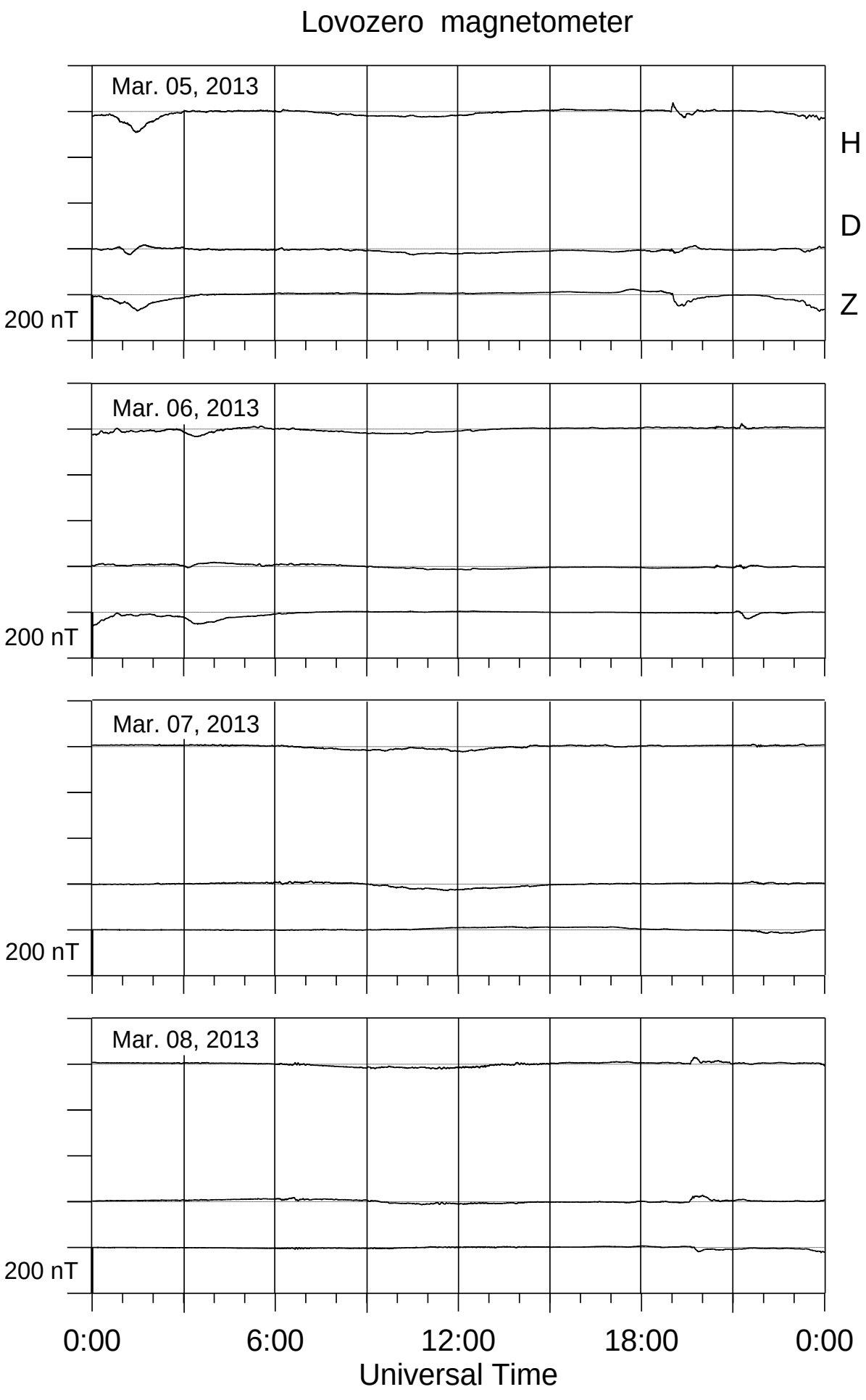
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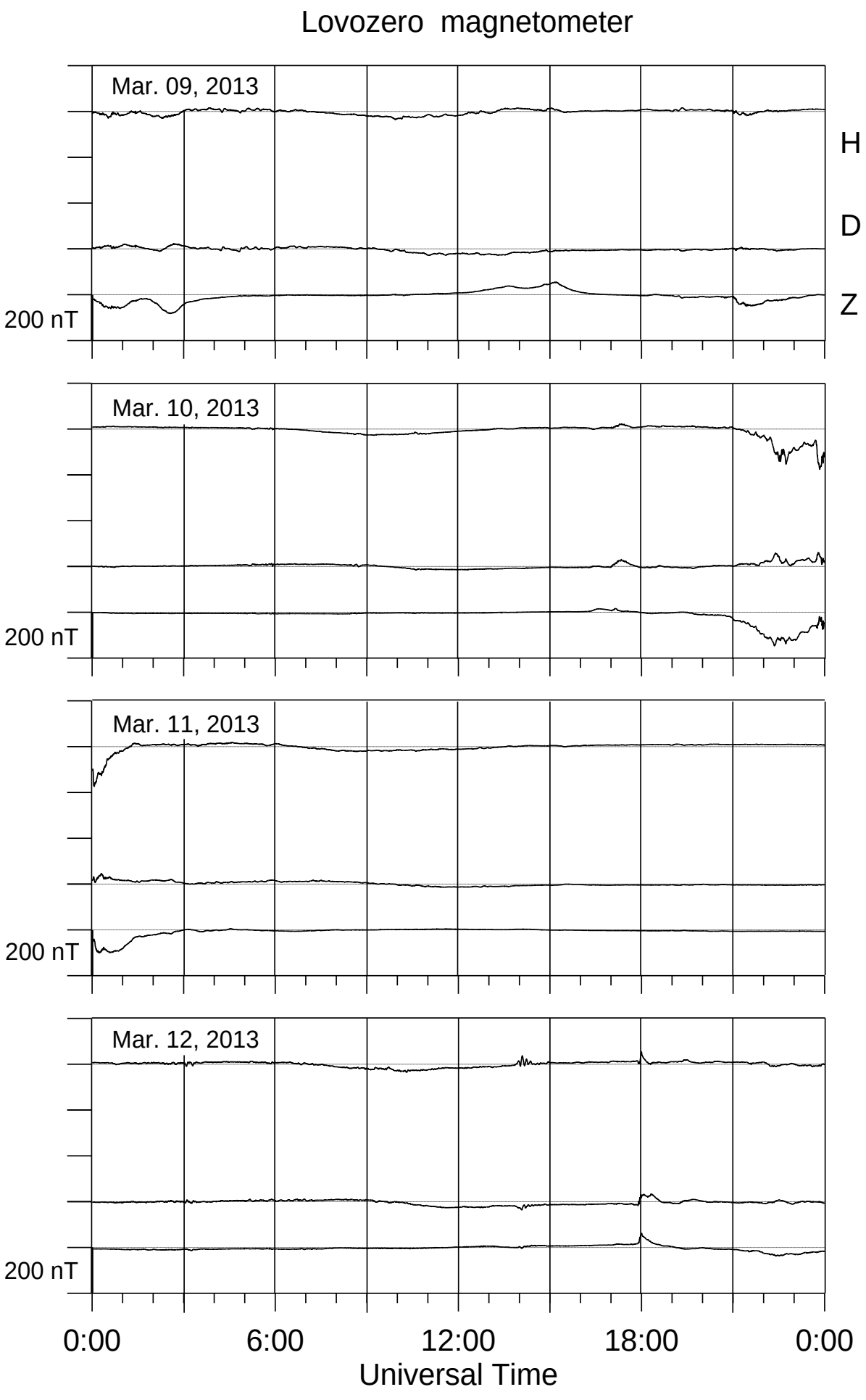
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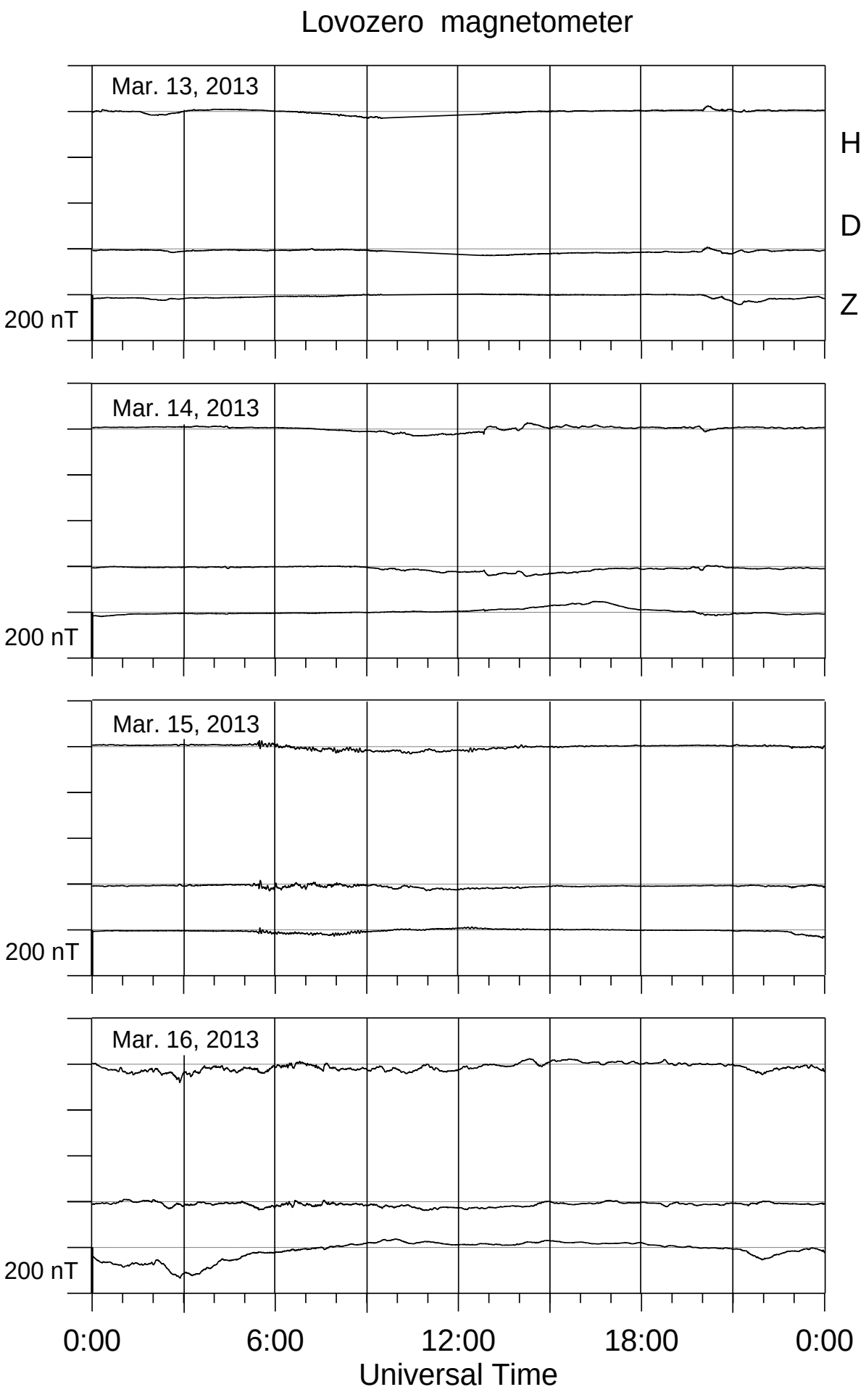
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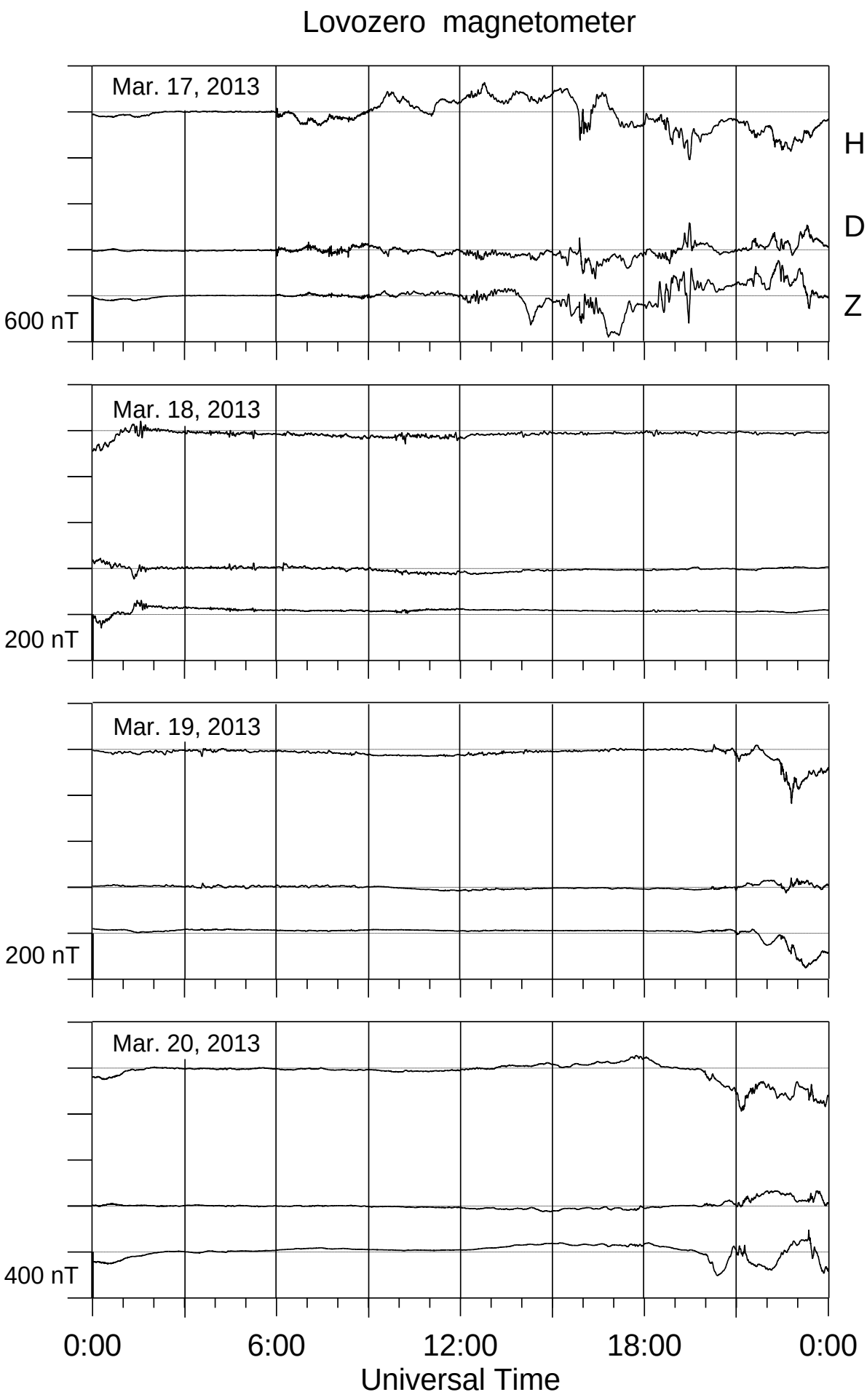
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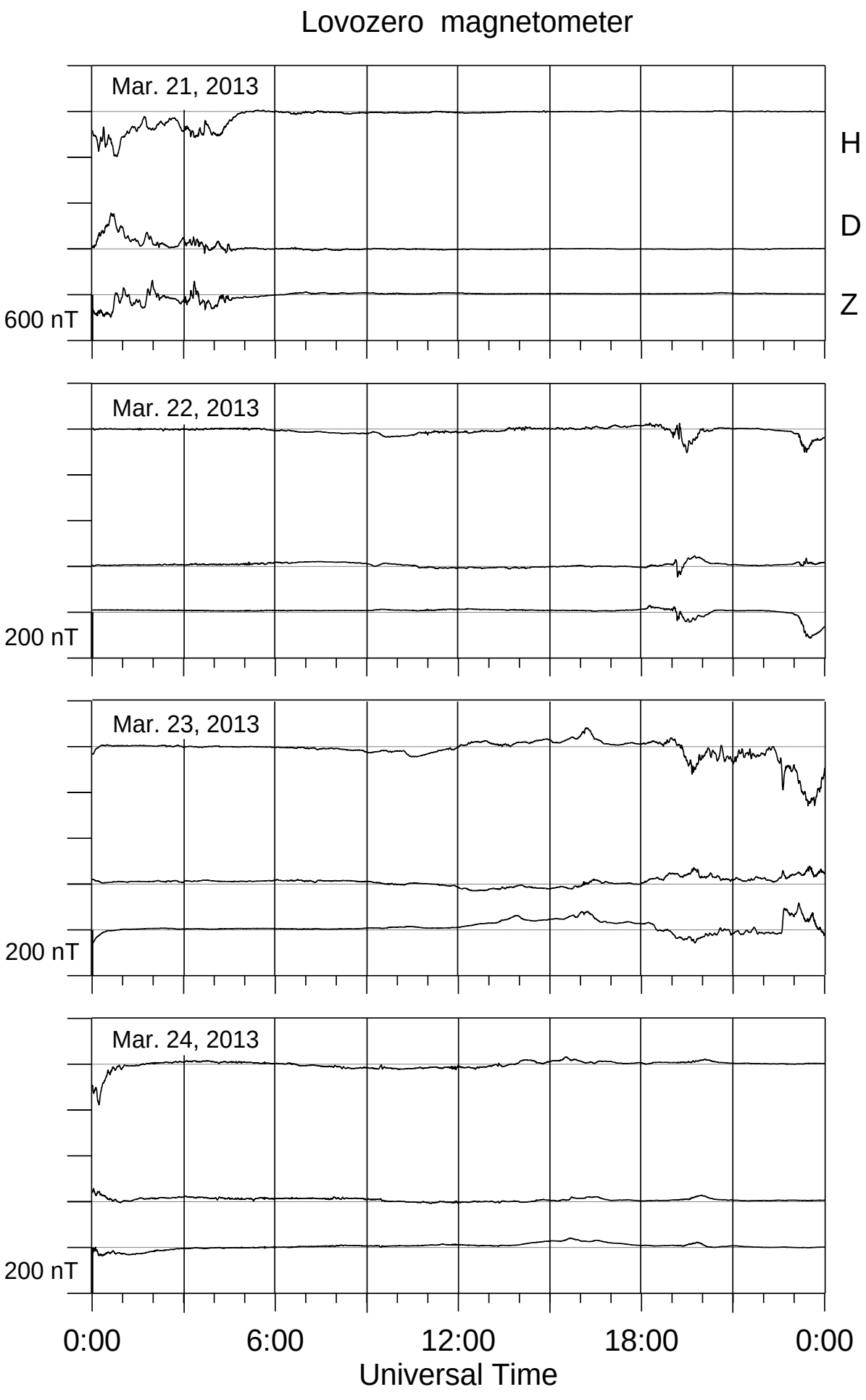
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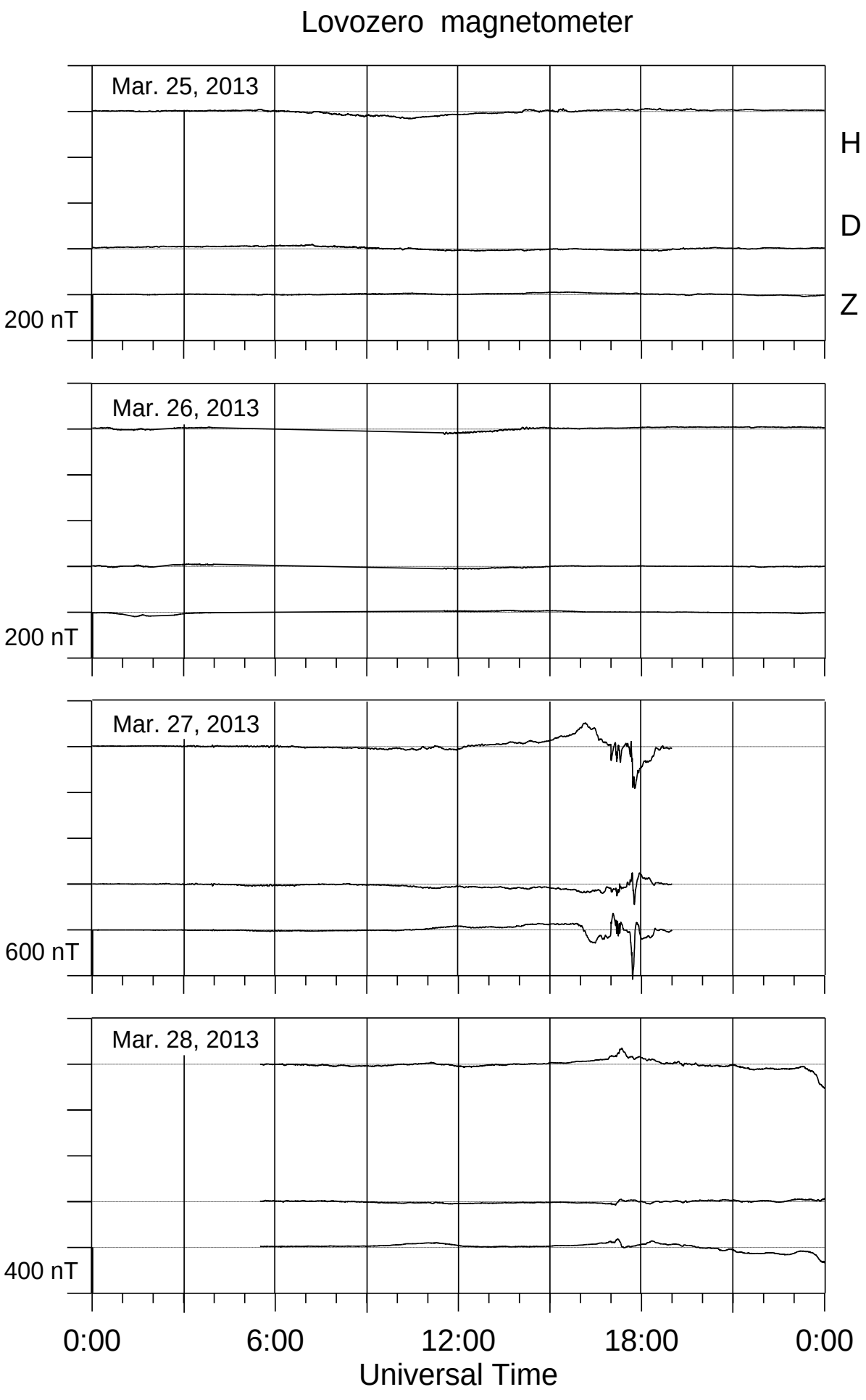
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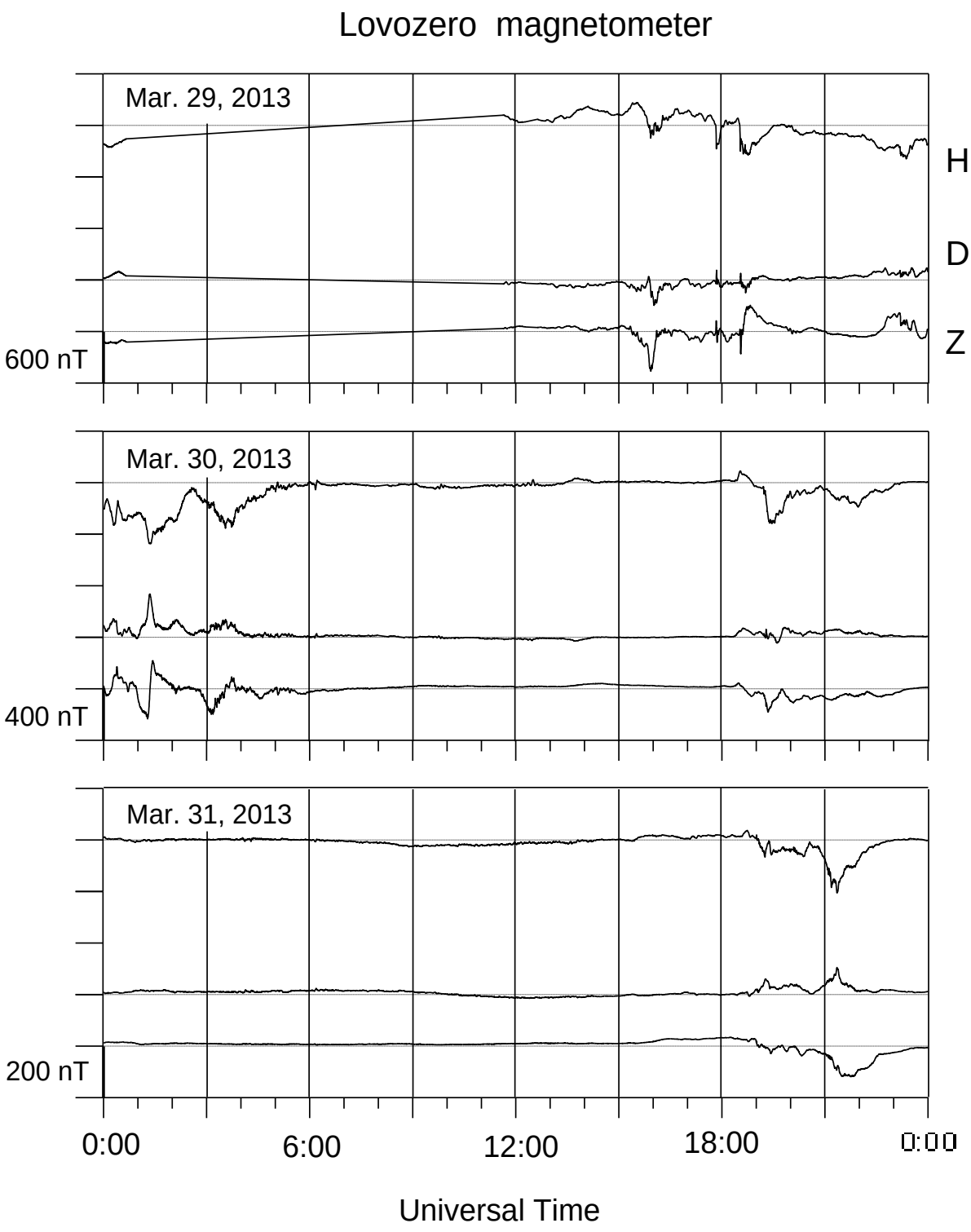
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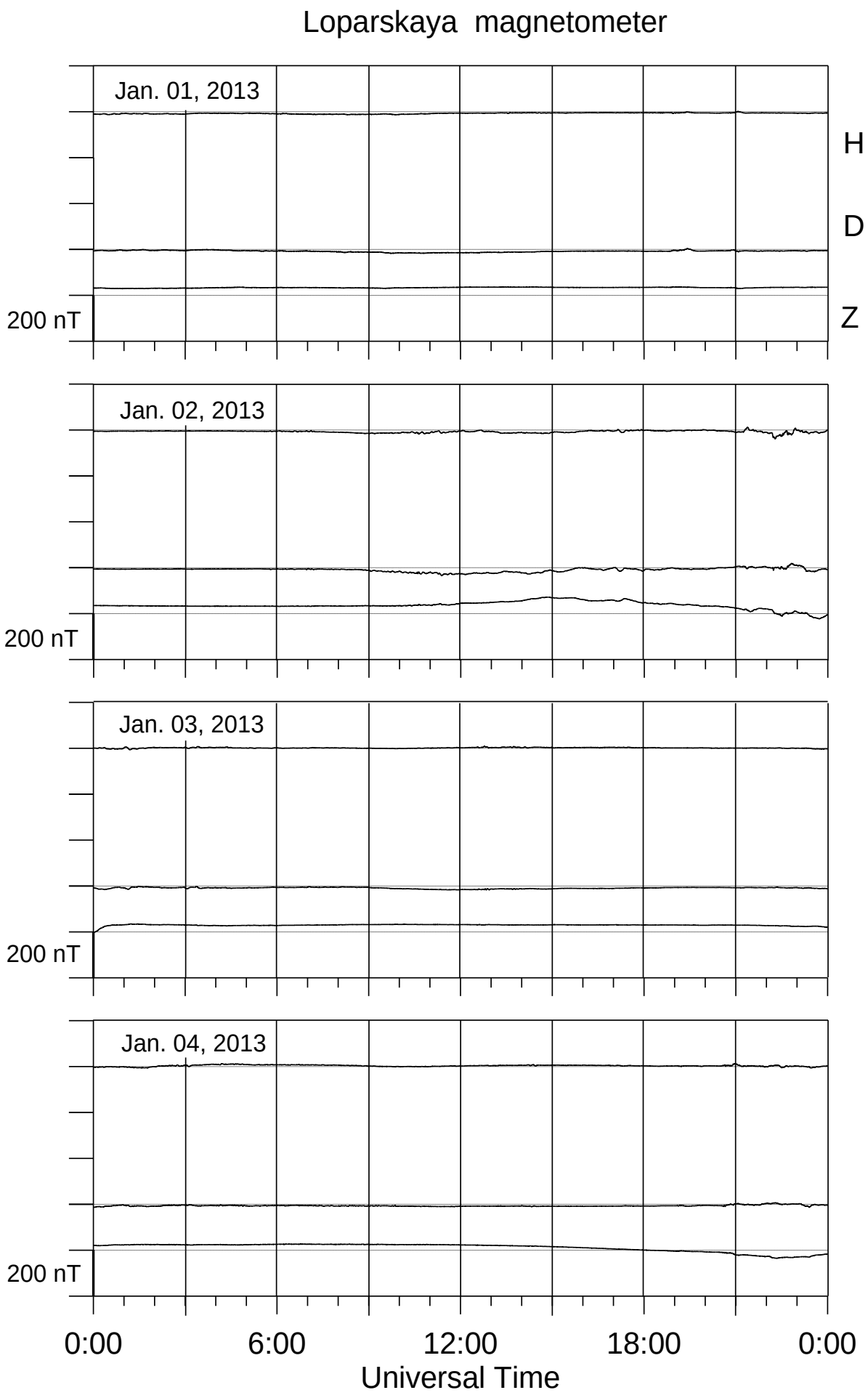
LOPARSKAYA MAGNETOGRAMS

January - March 2013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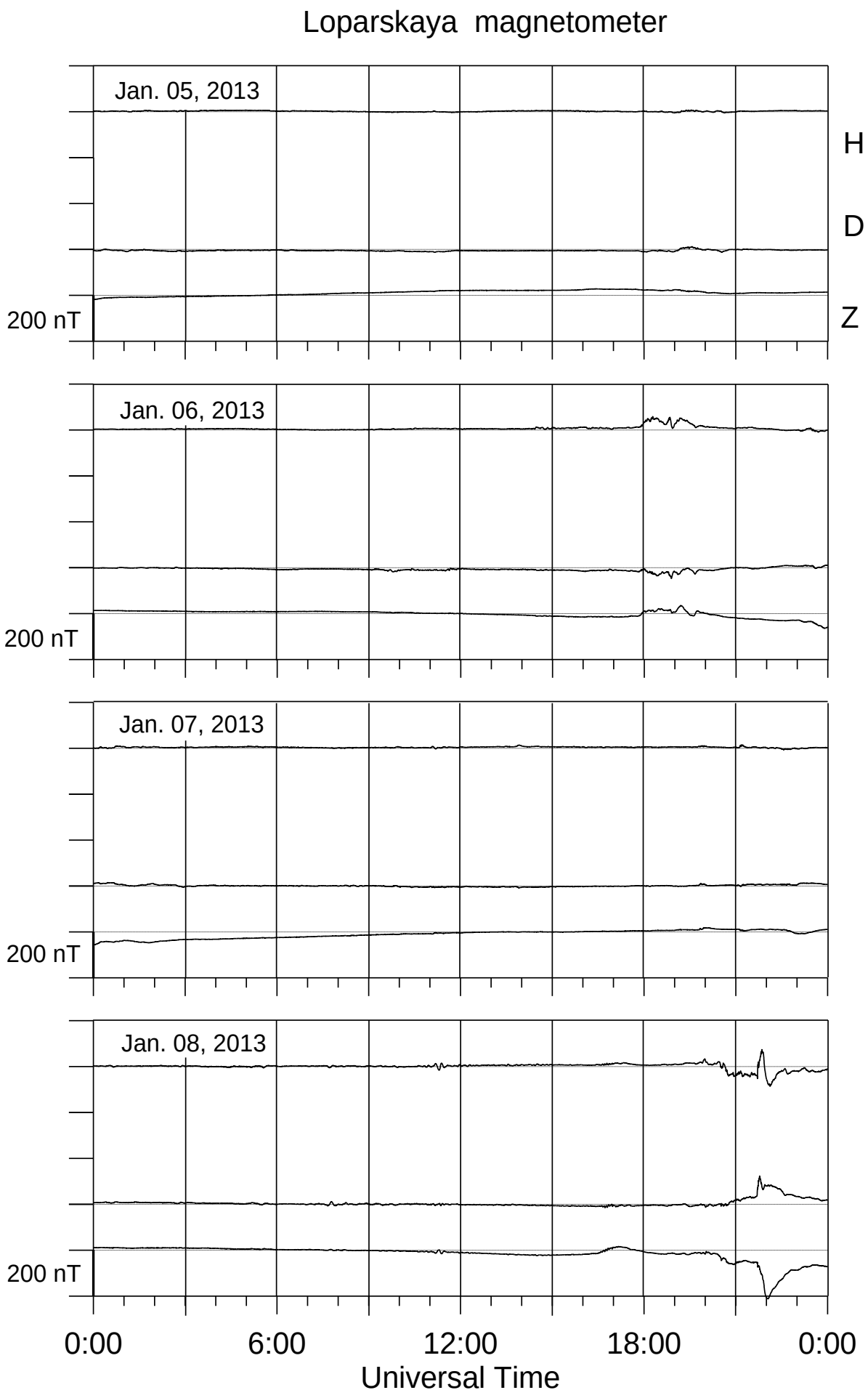
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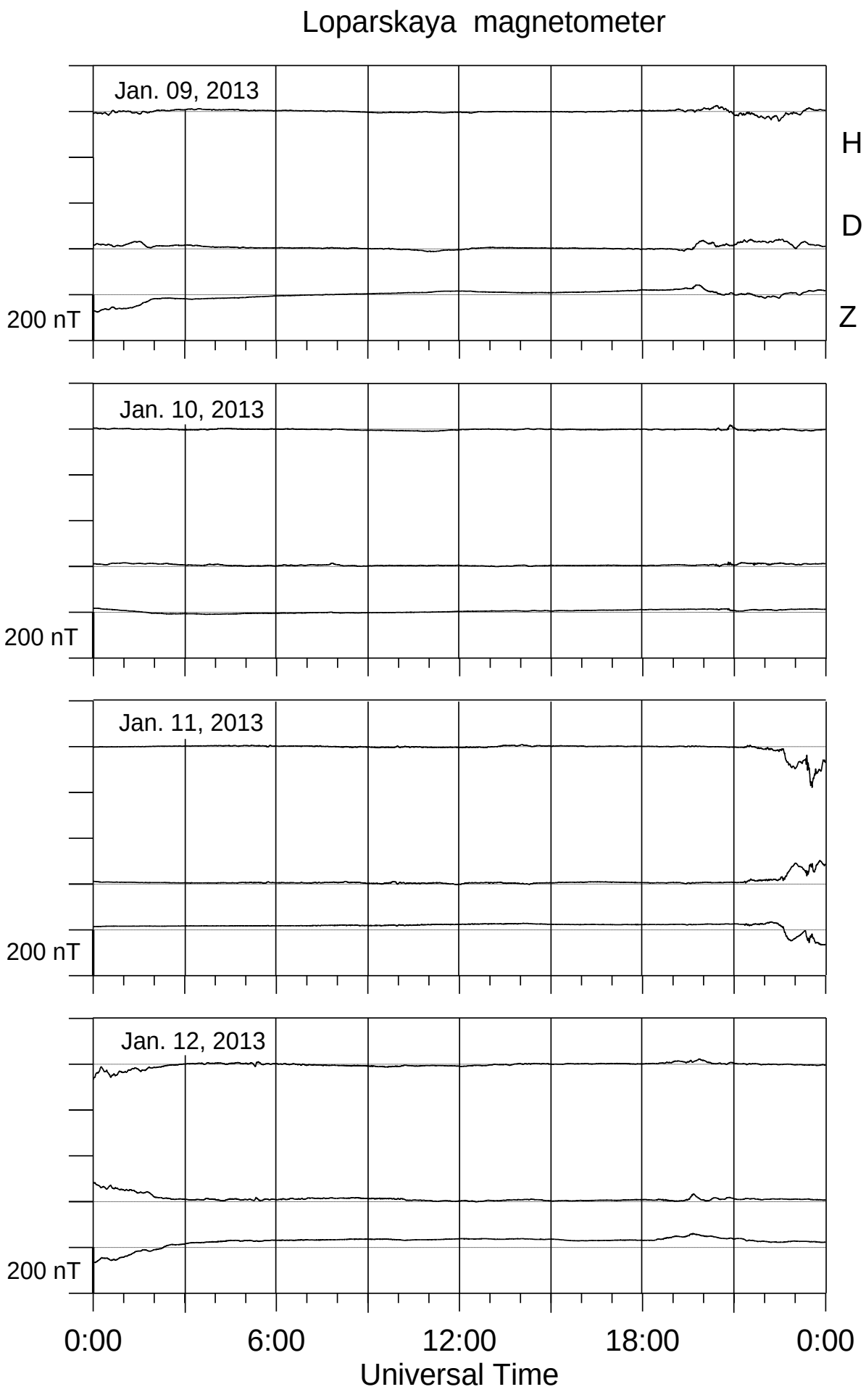
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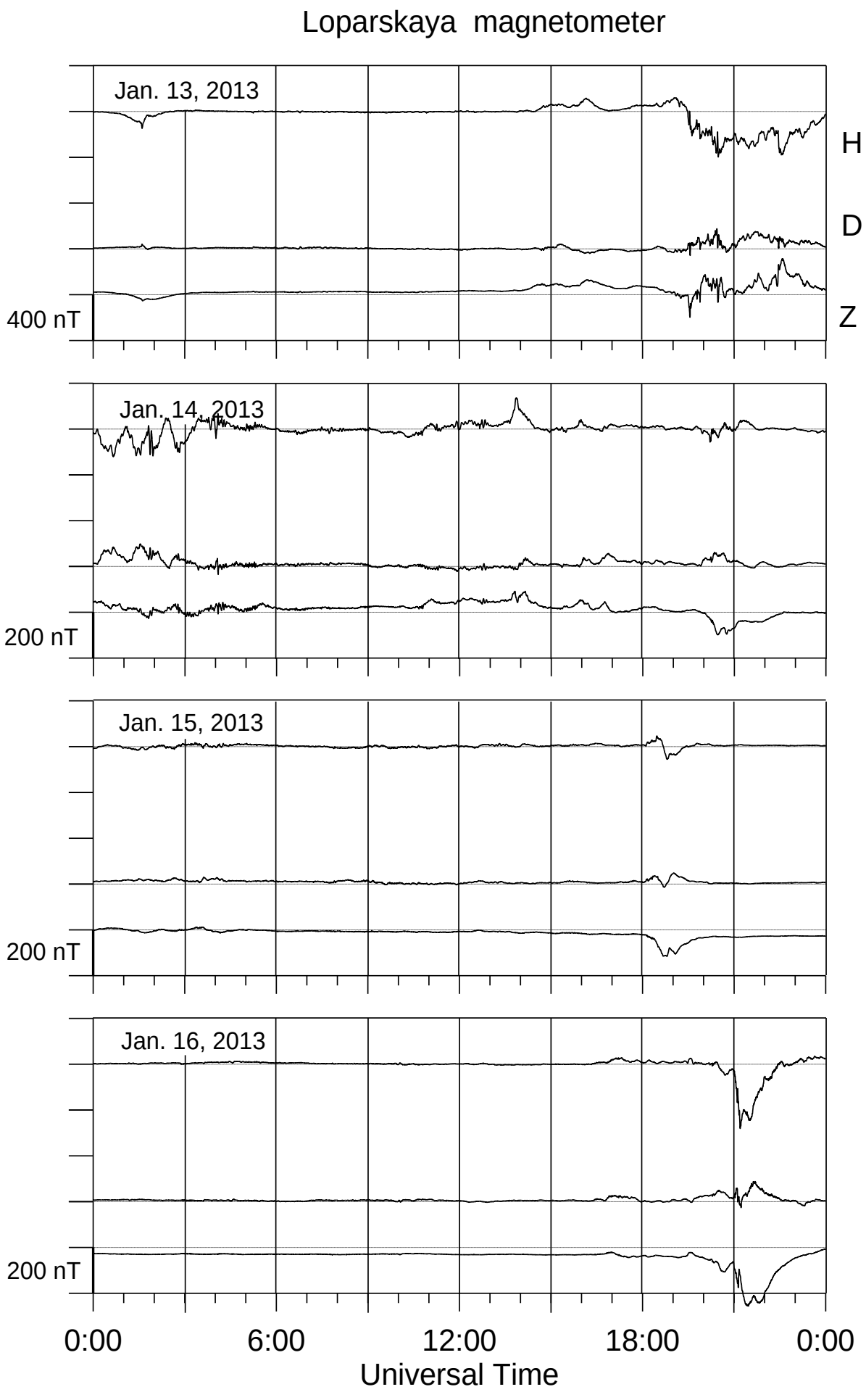
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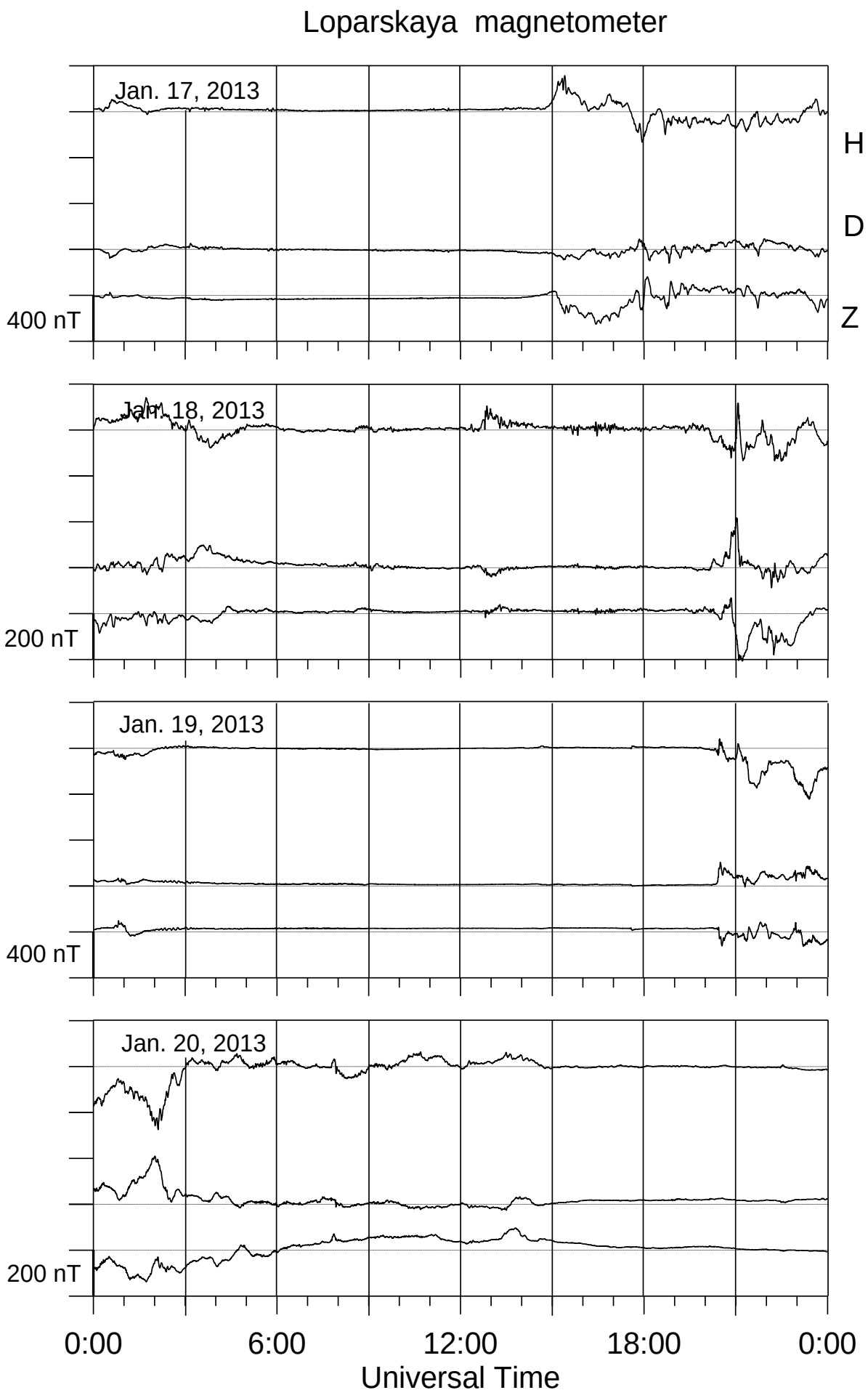
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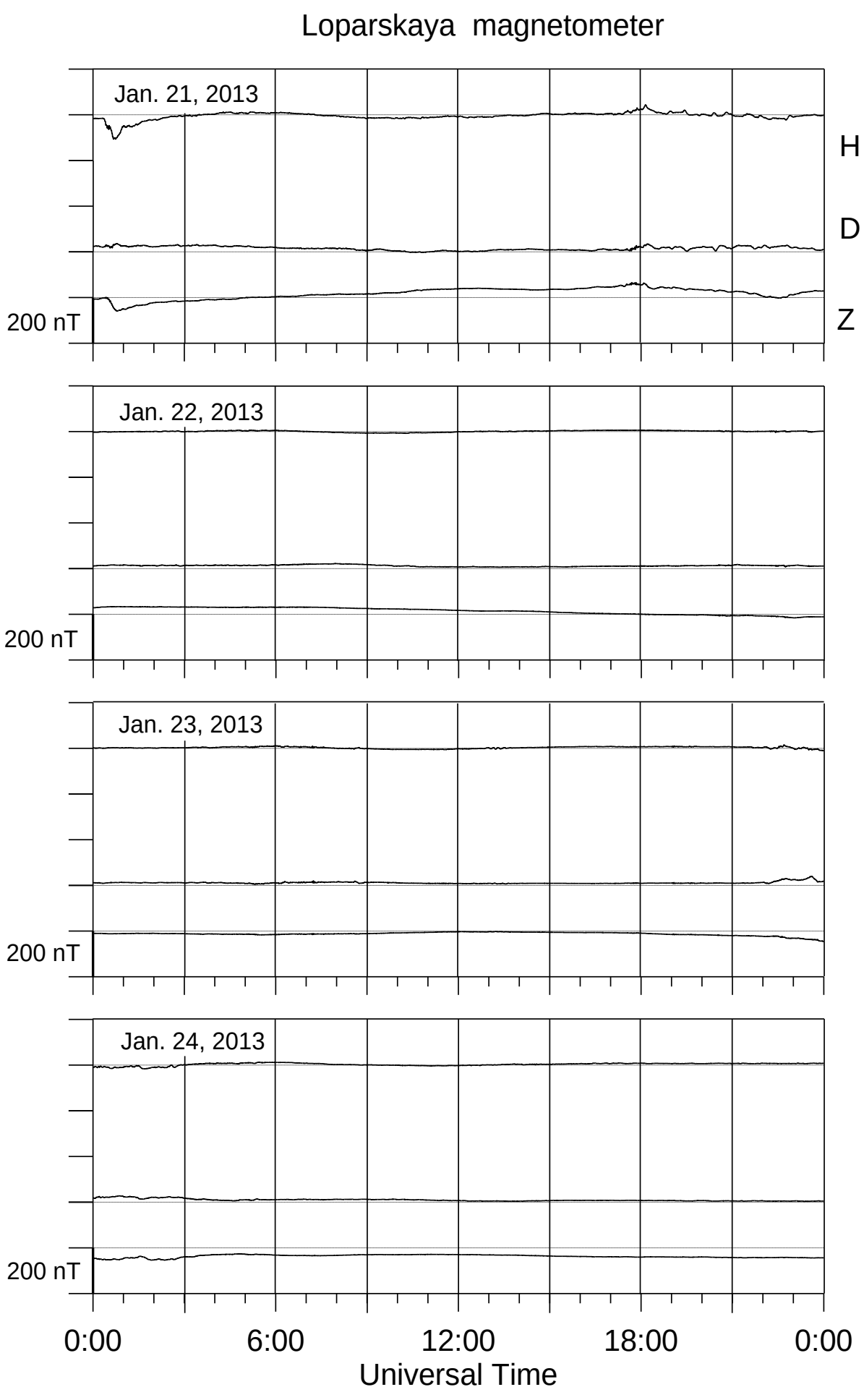
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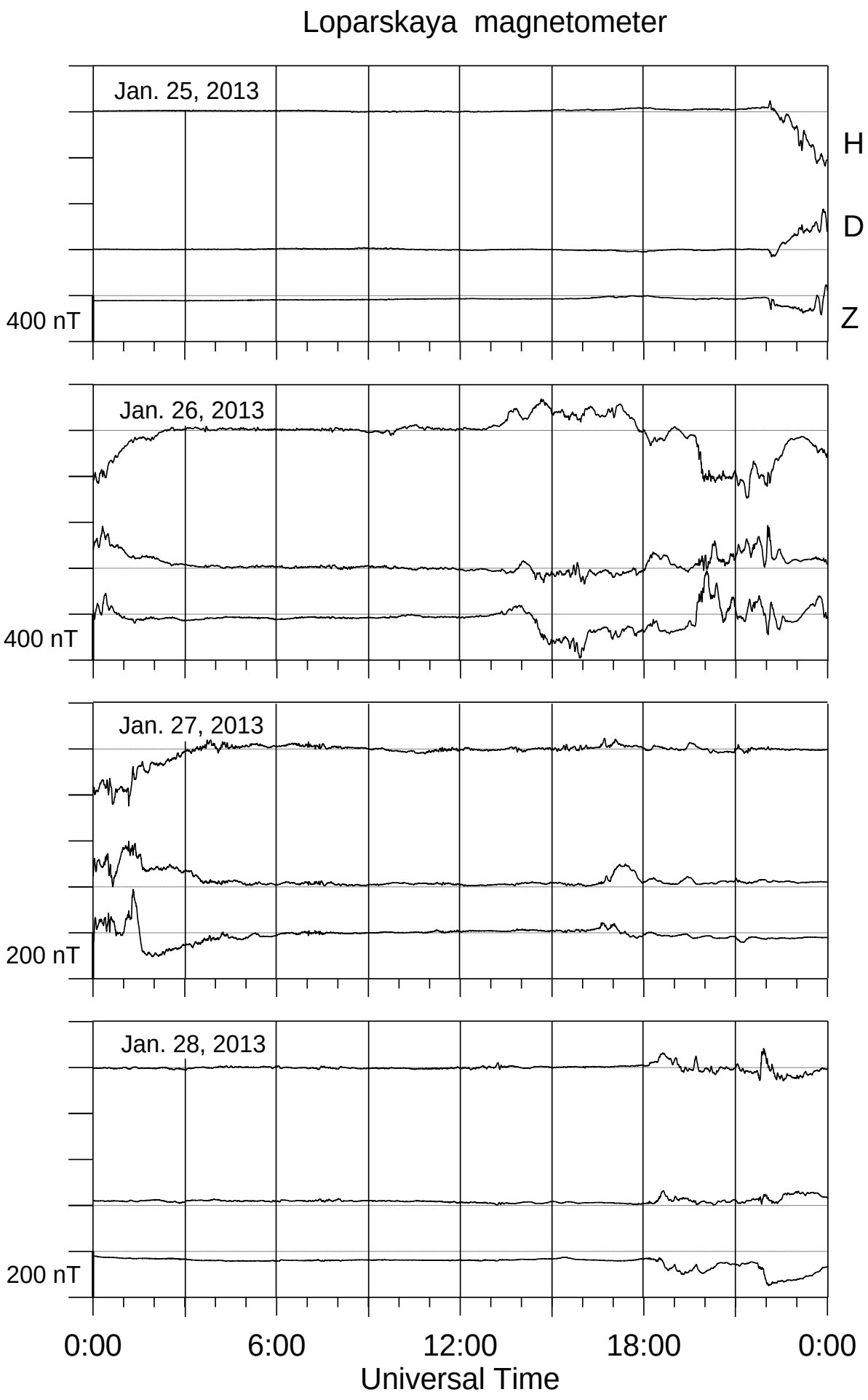
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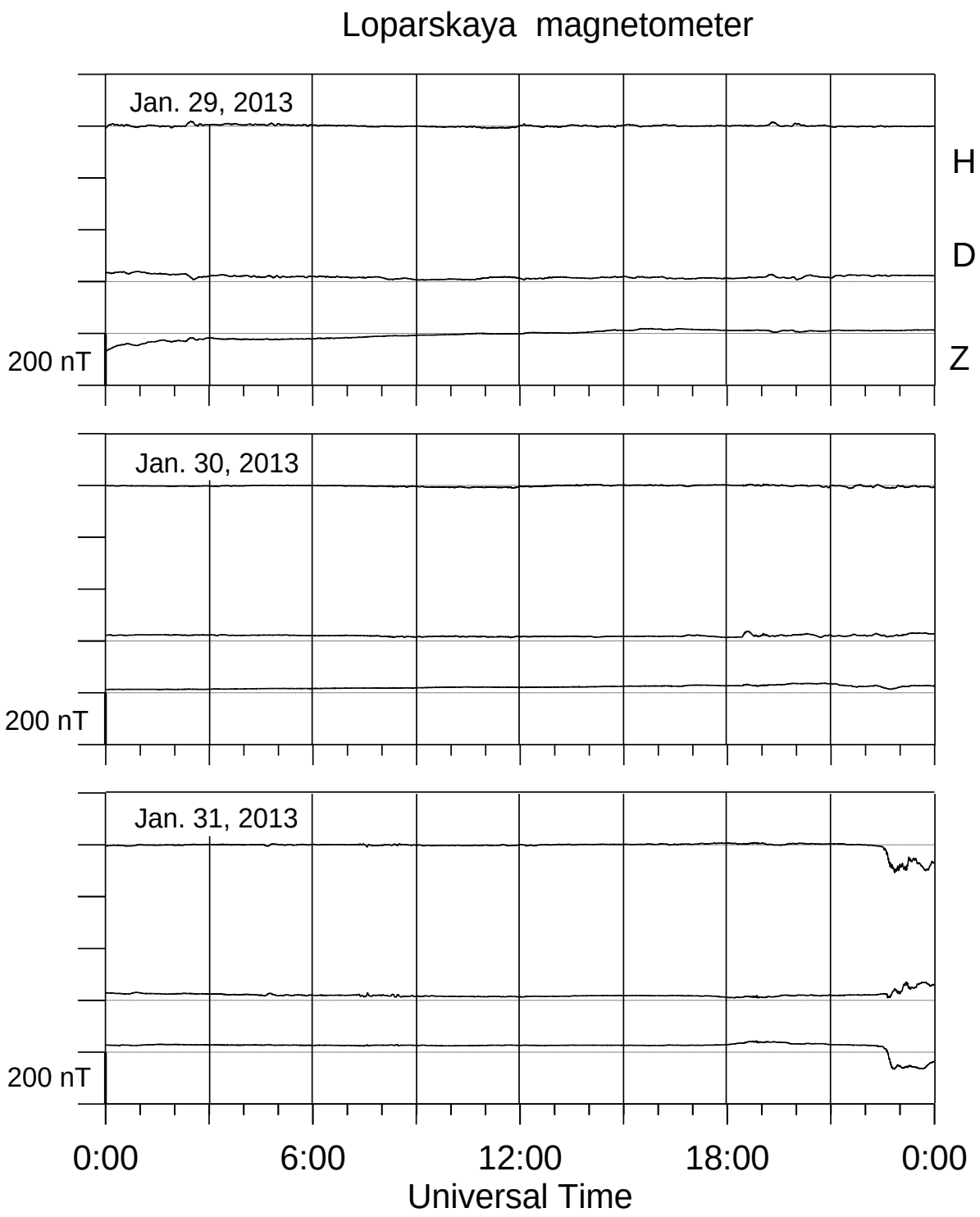
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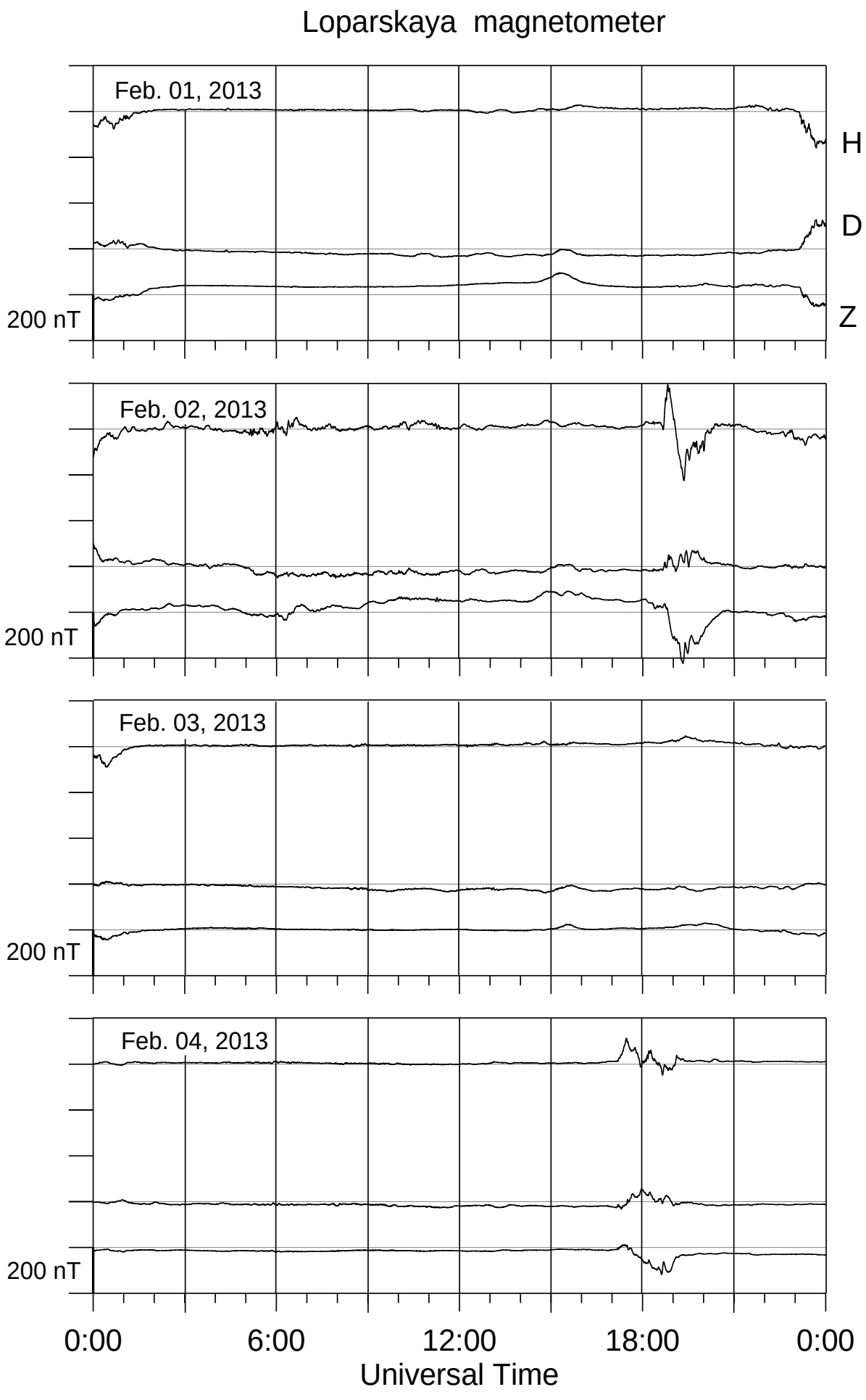
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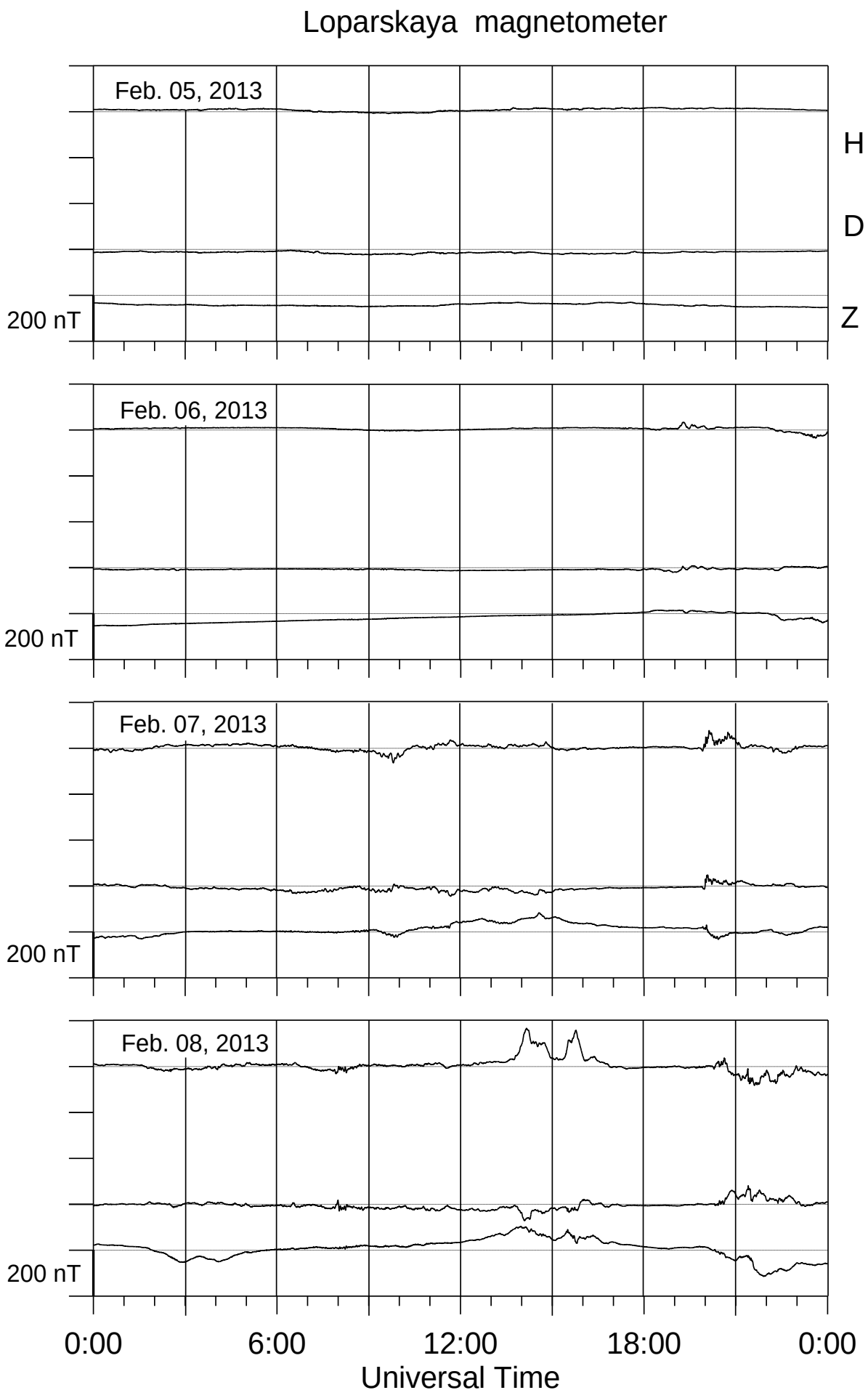
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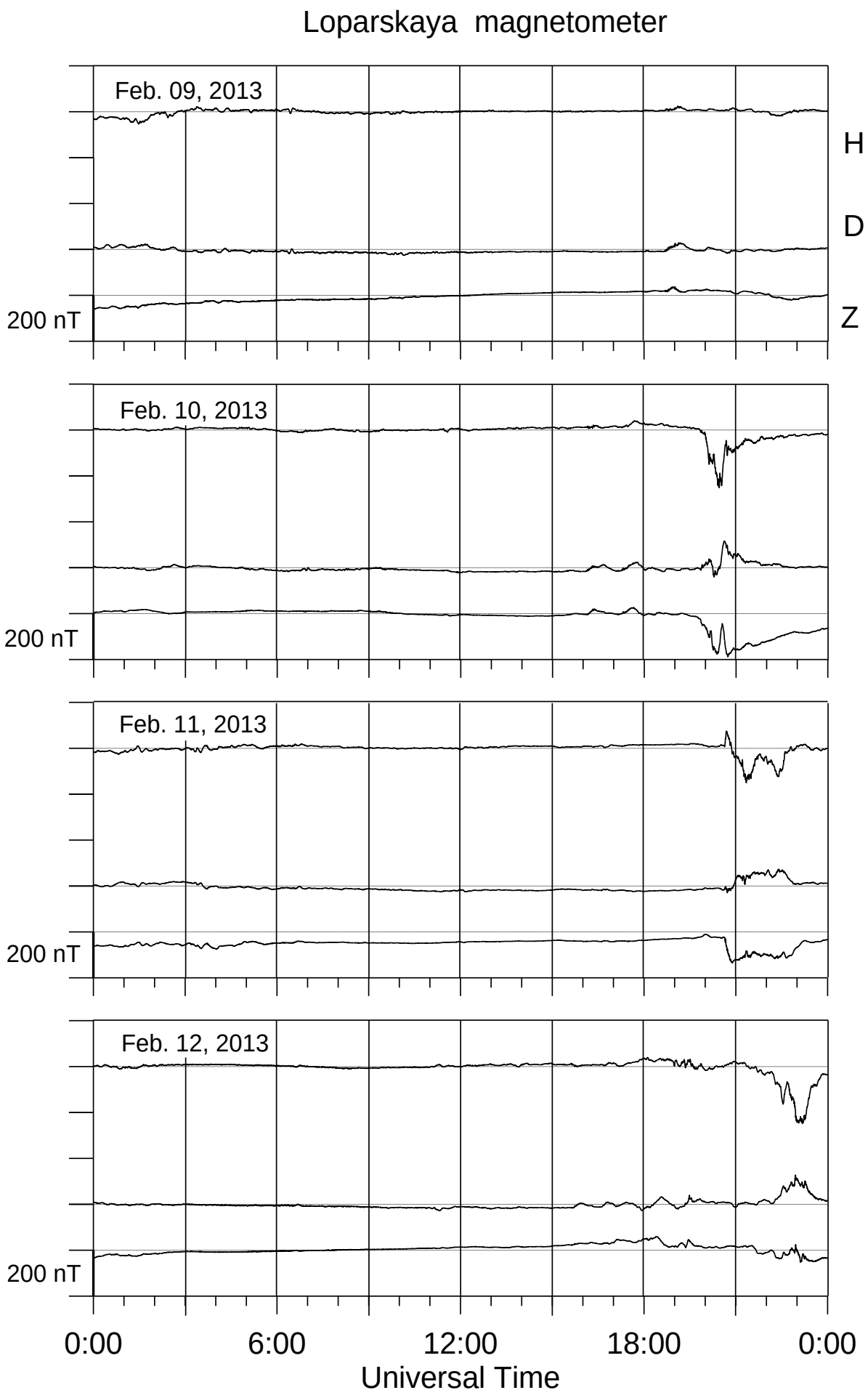
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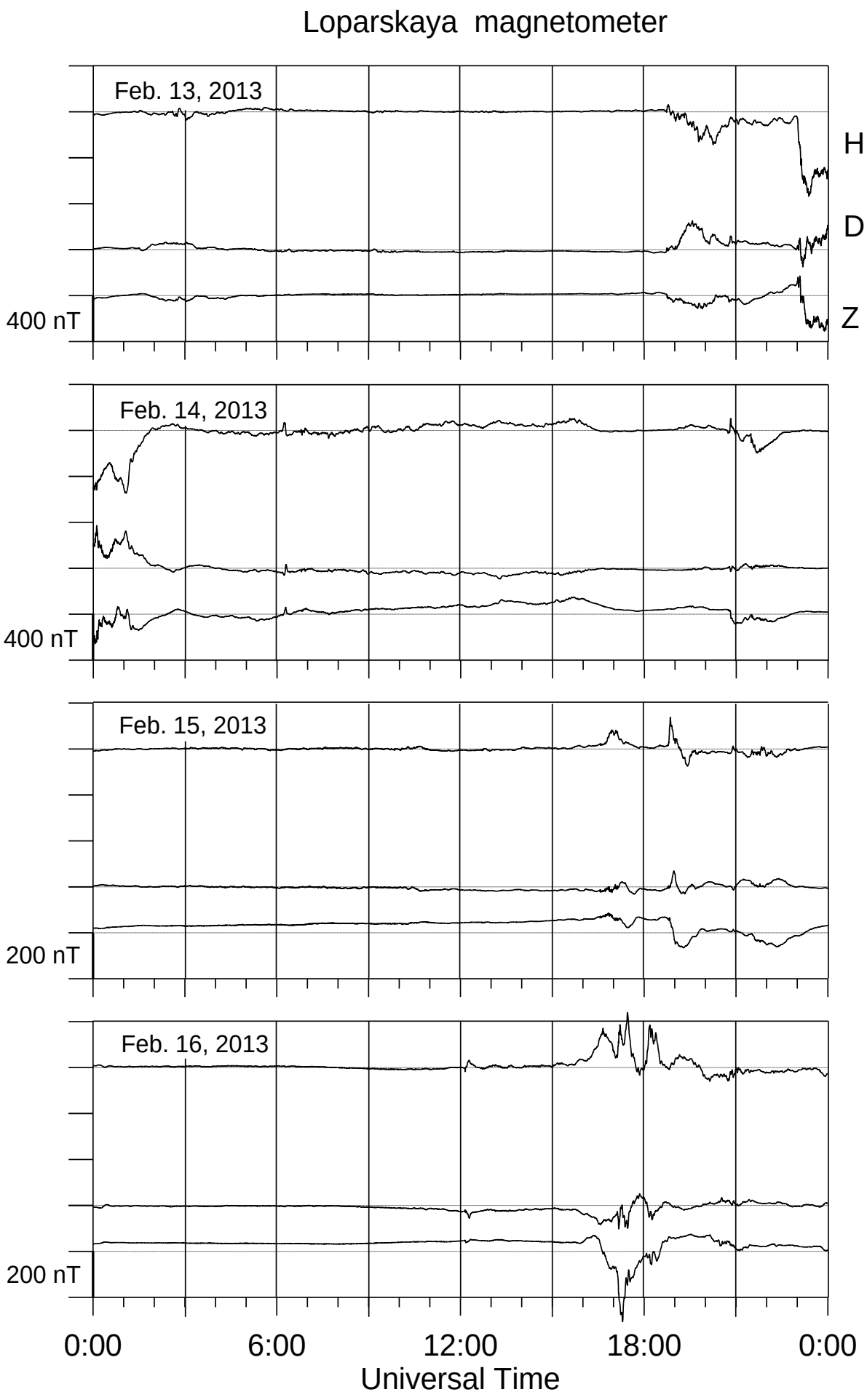
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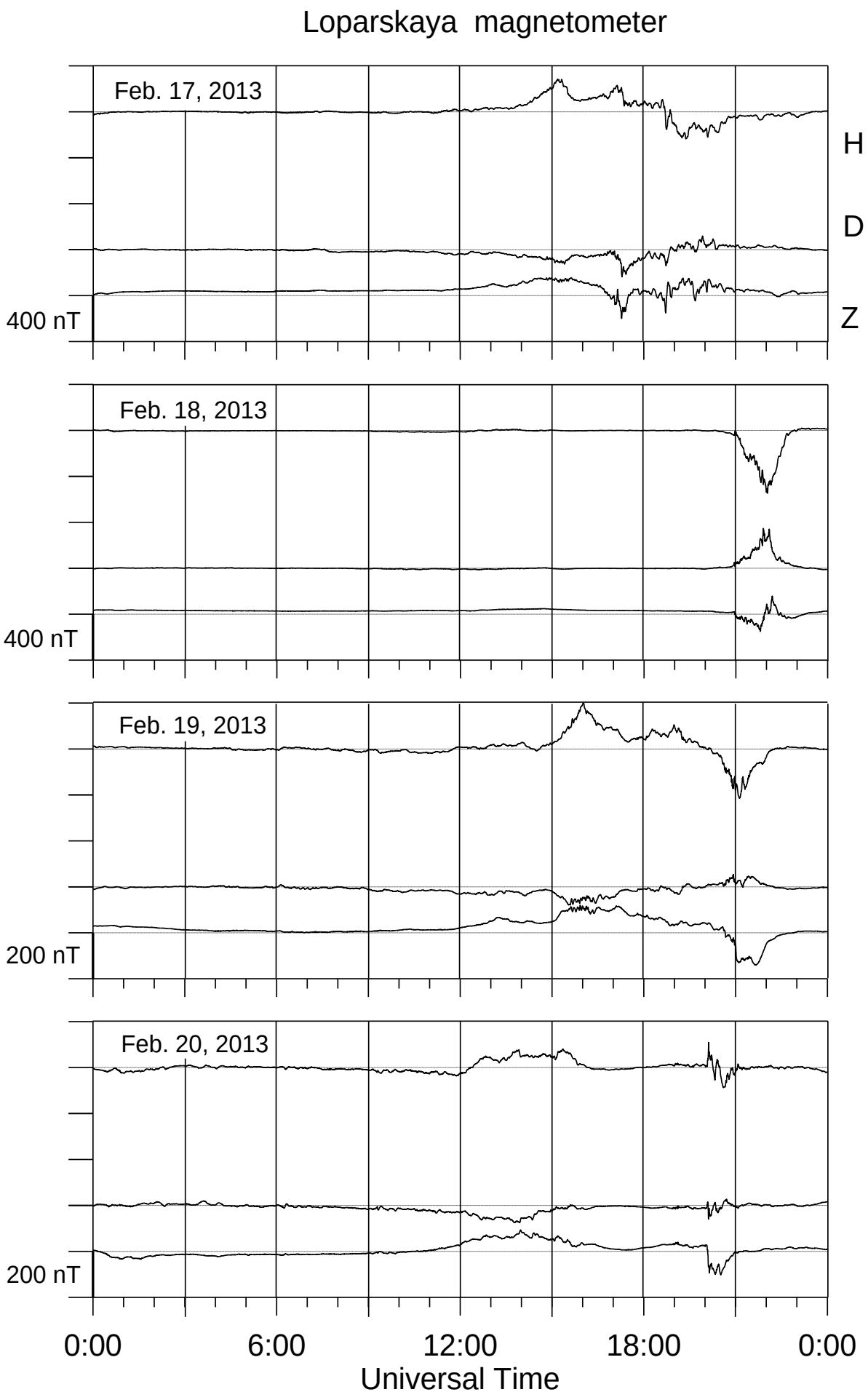
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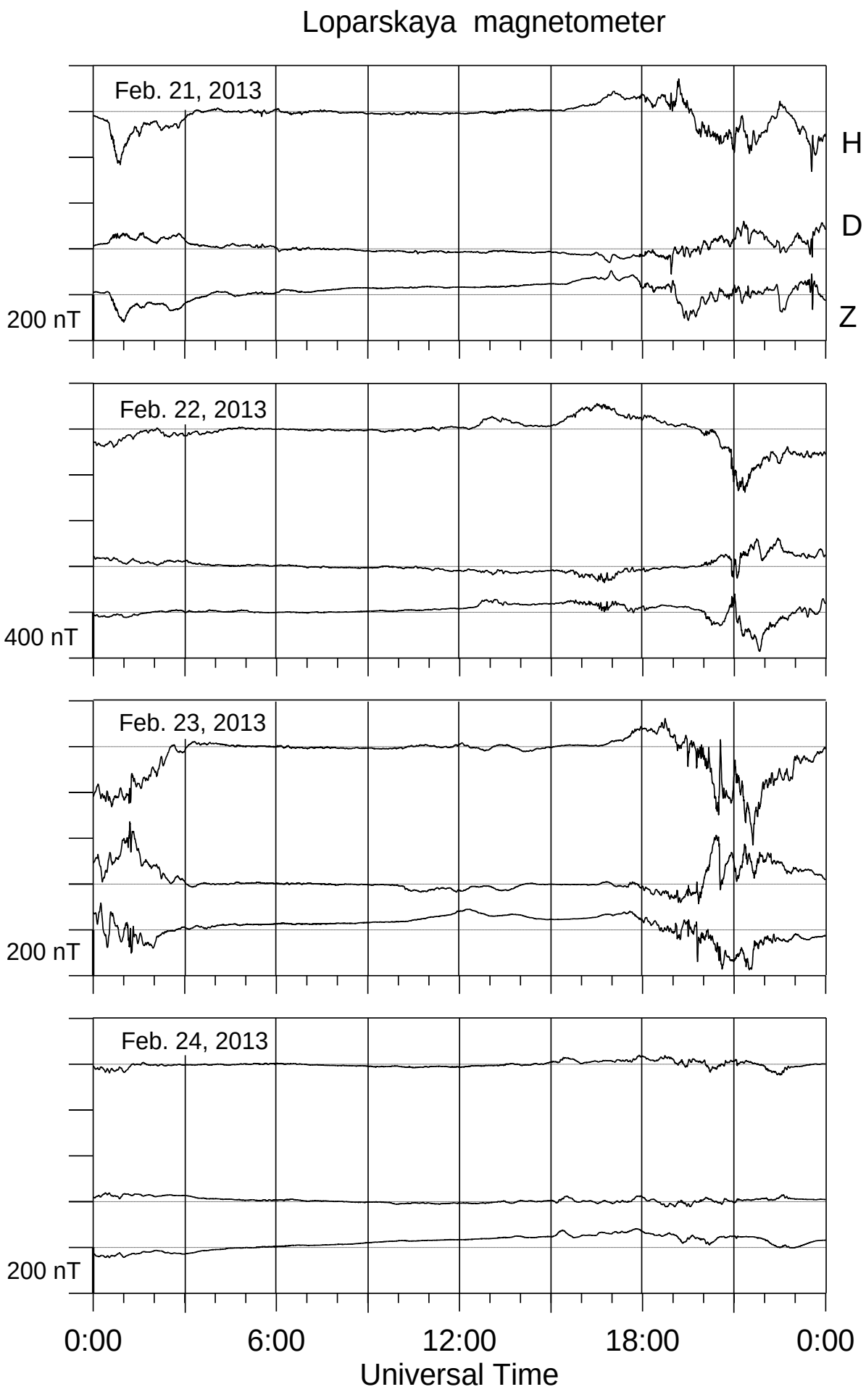
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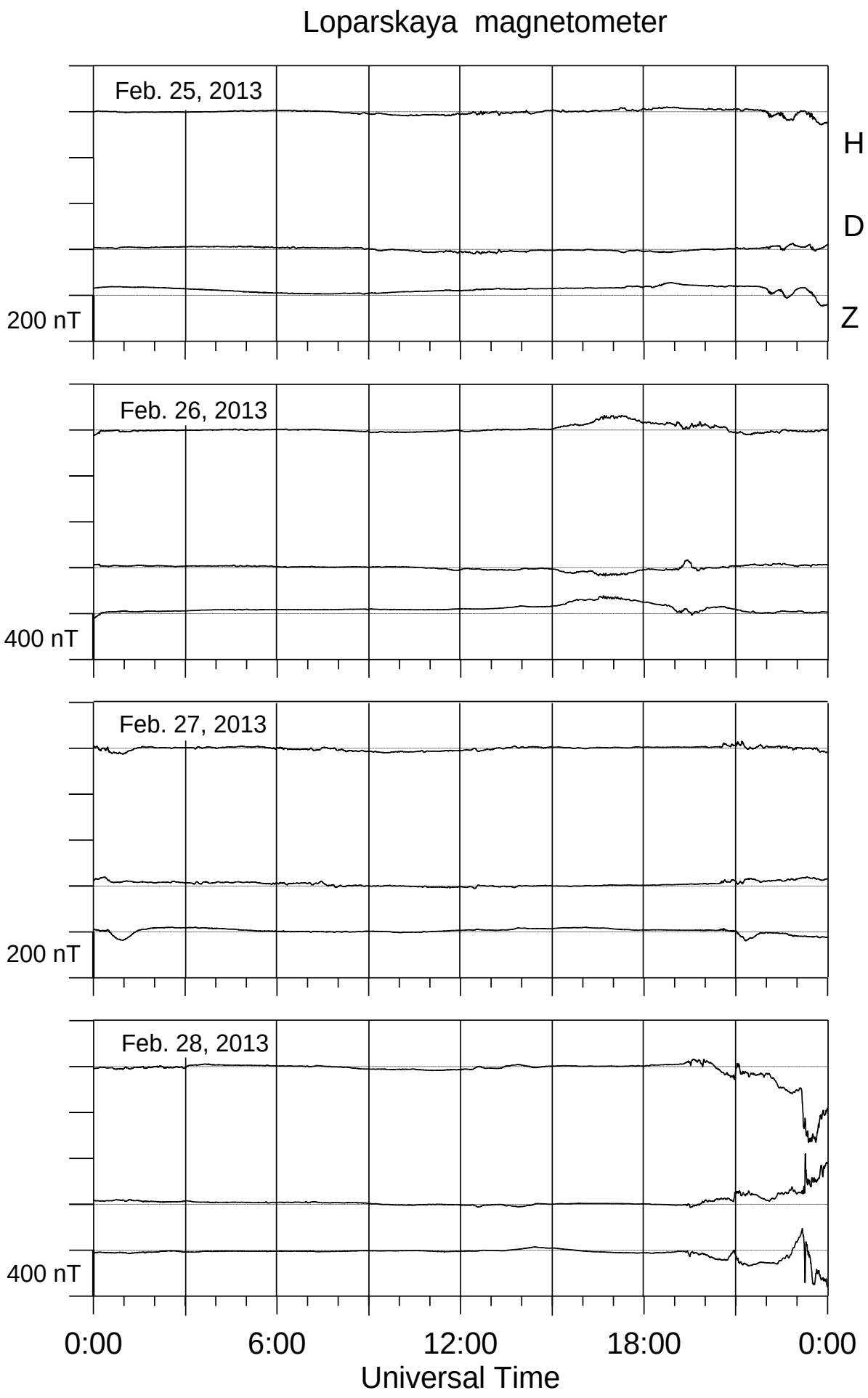
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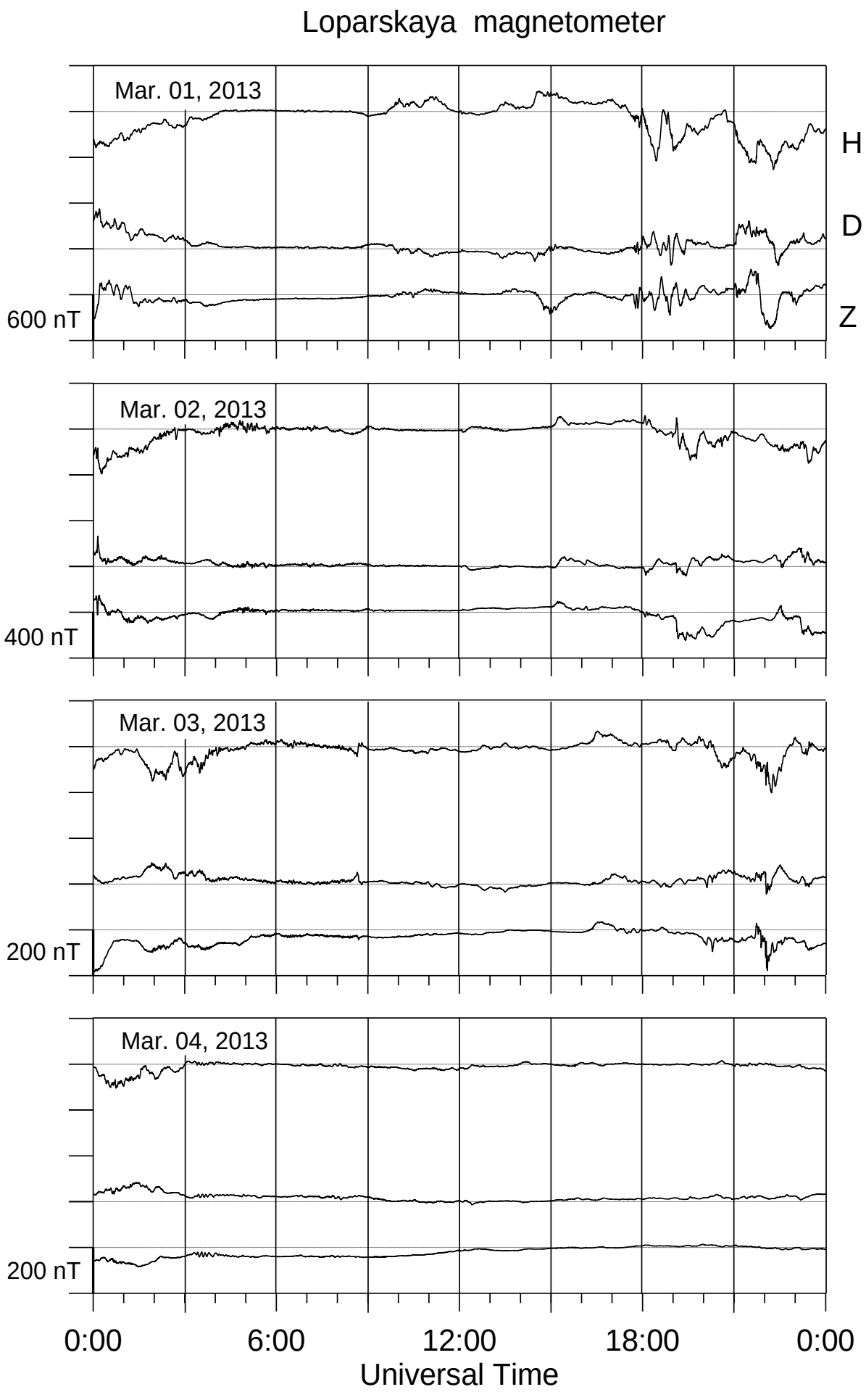
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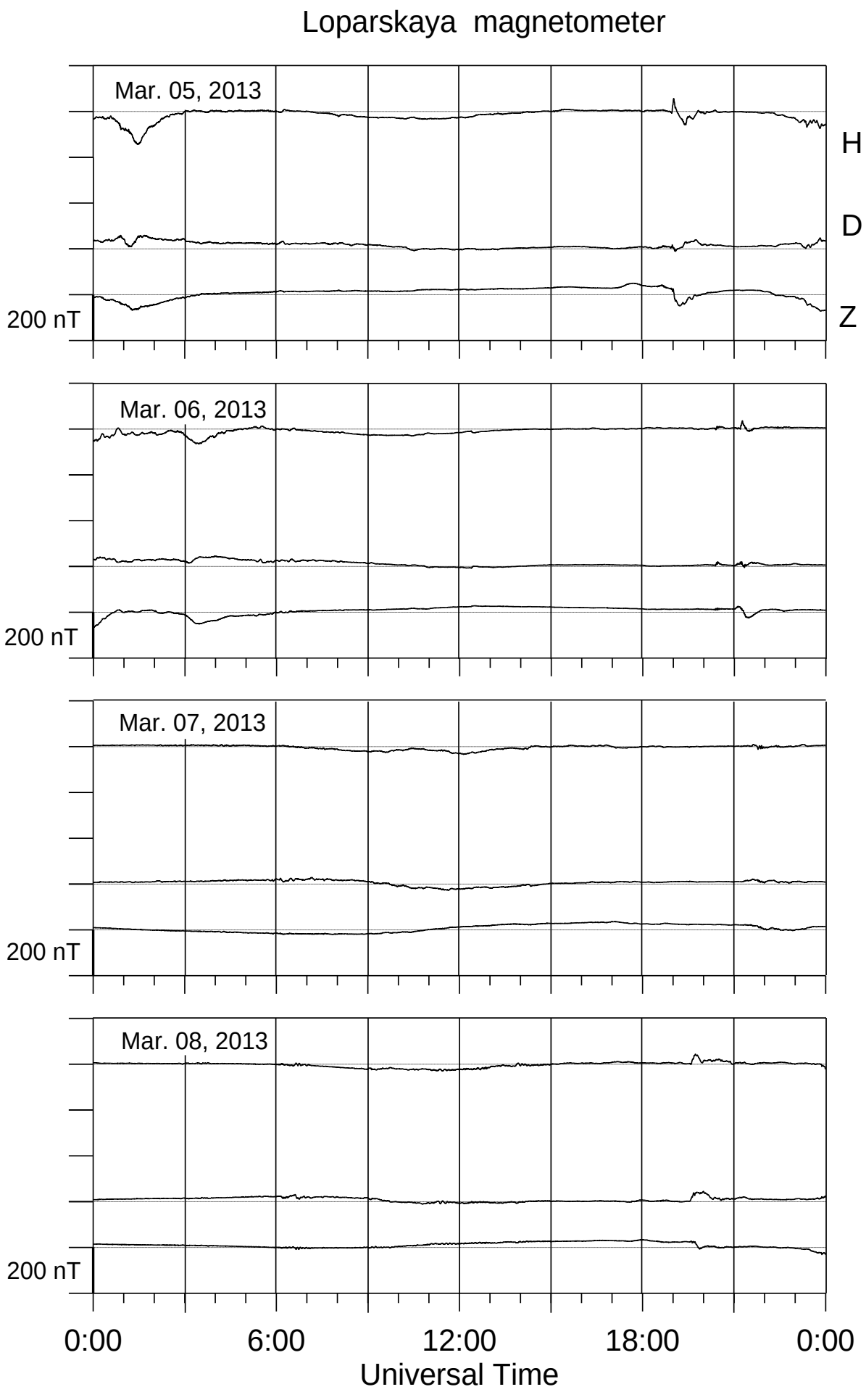
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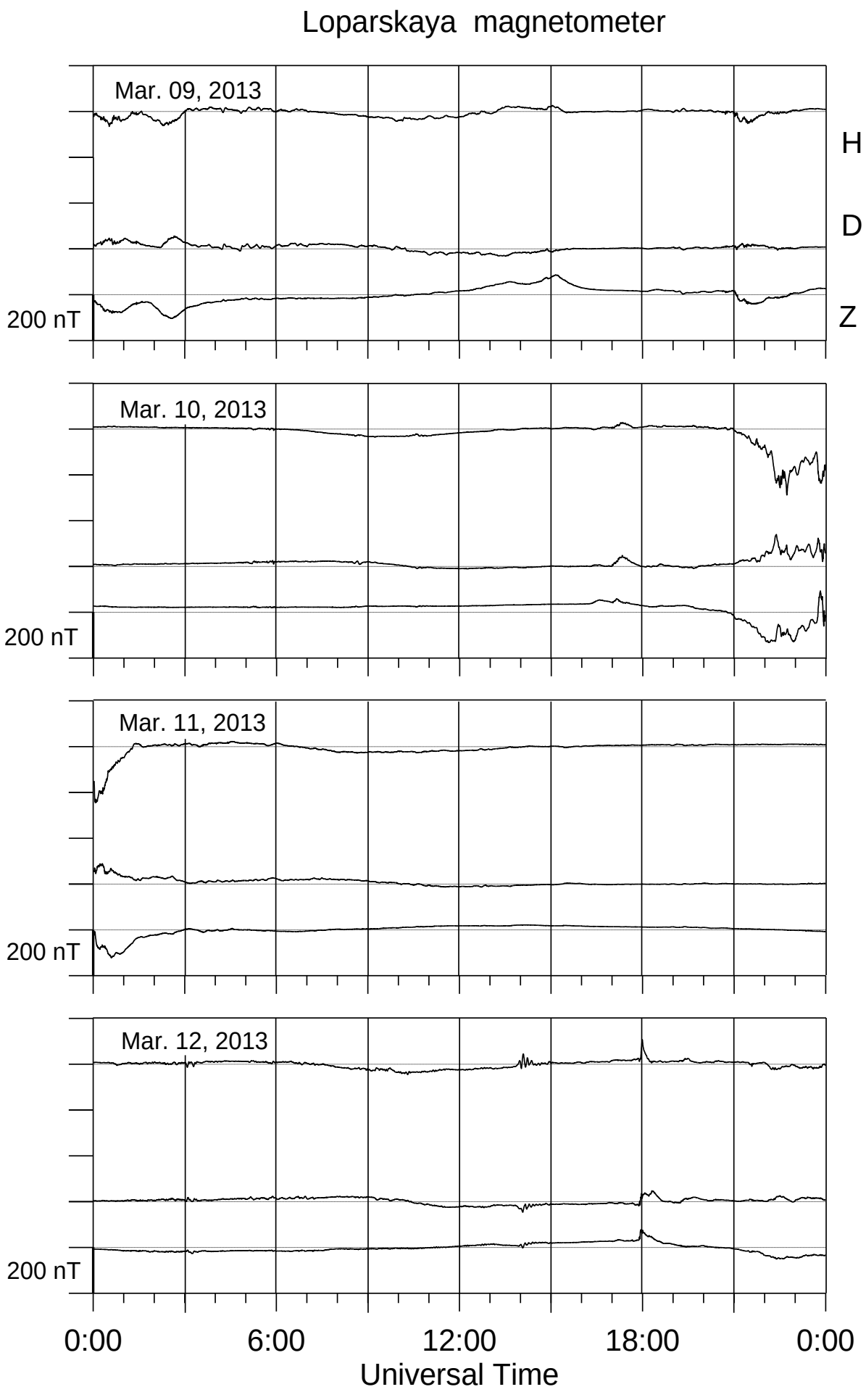
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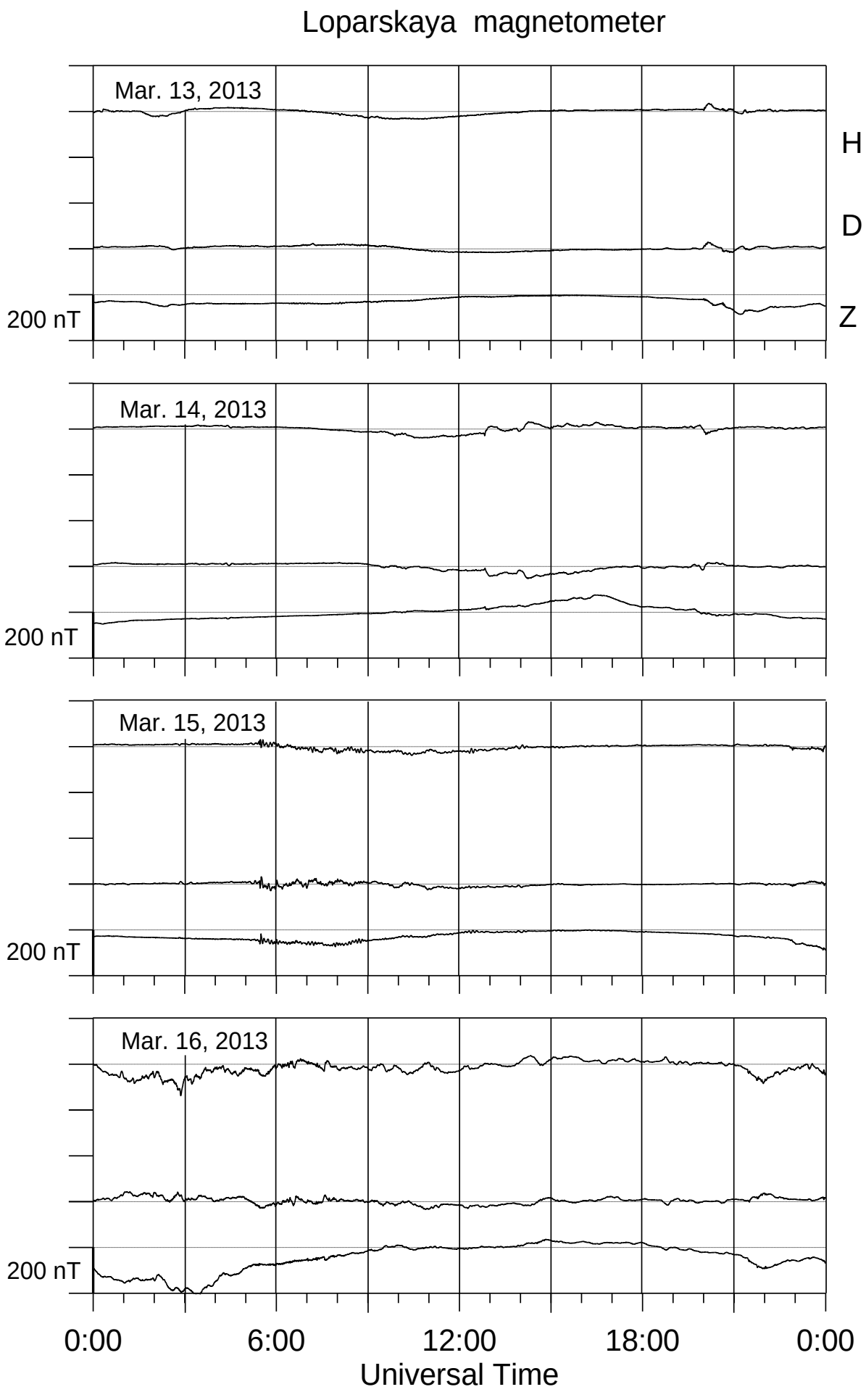
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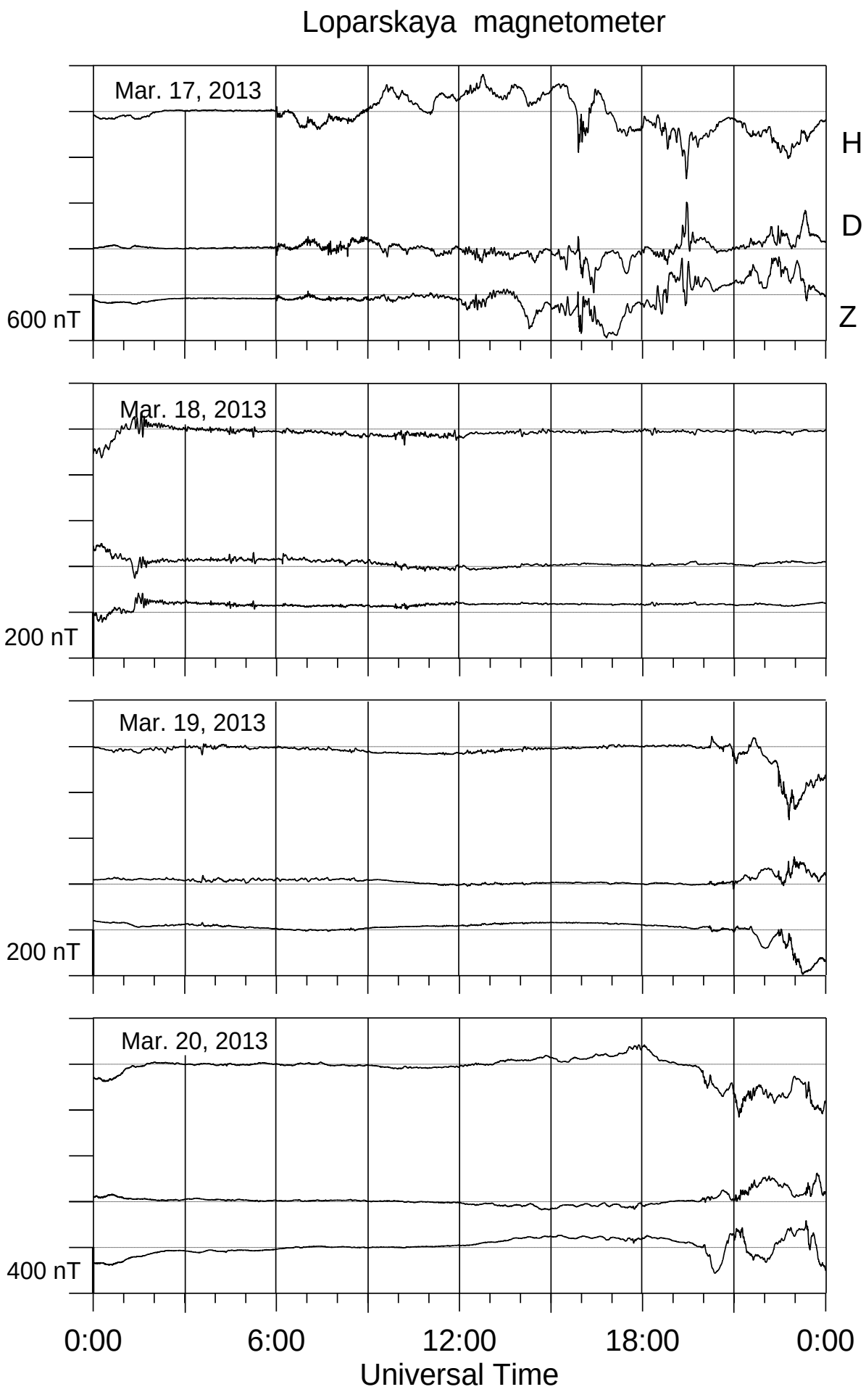
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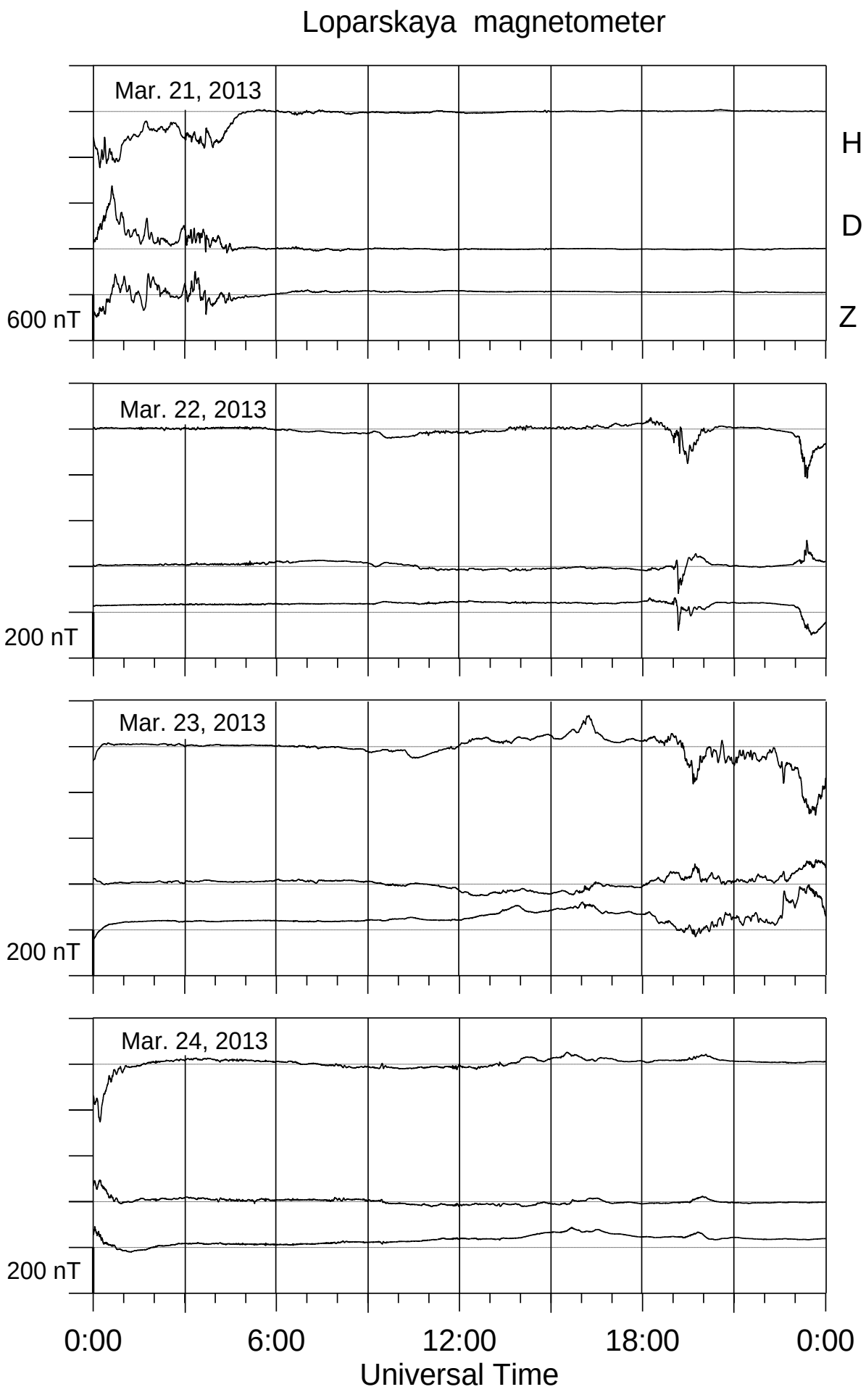
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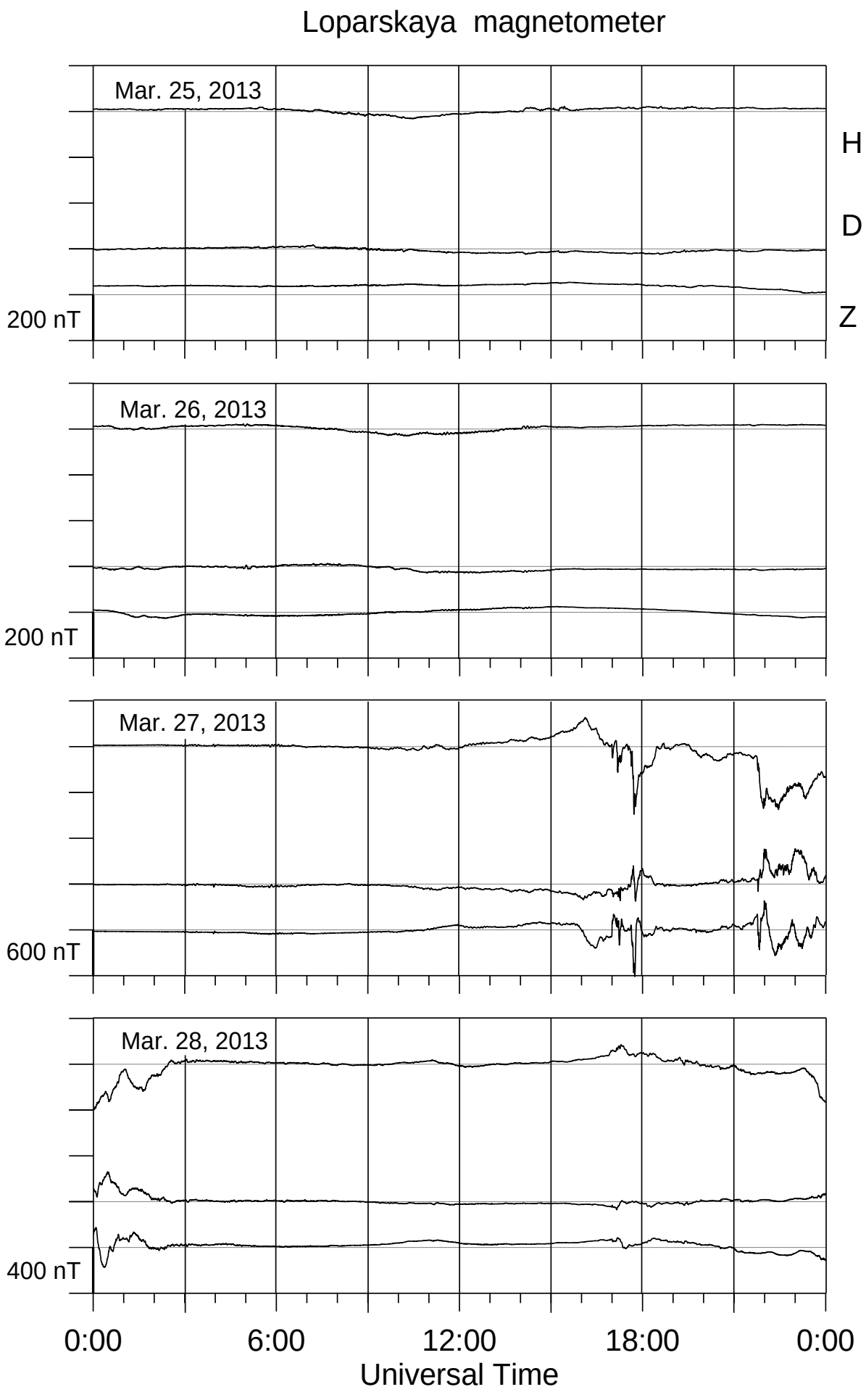
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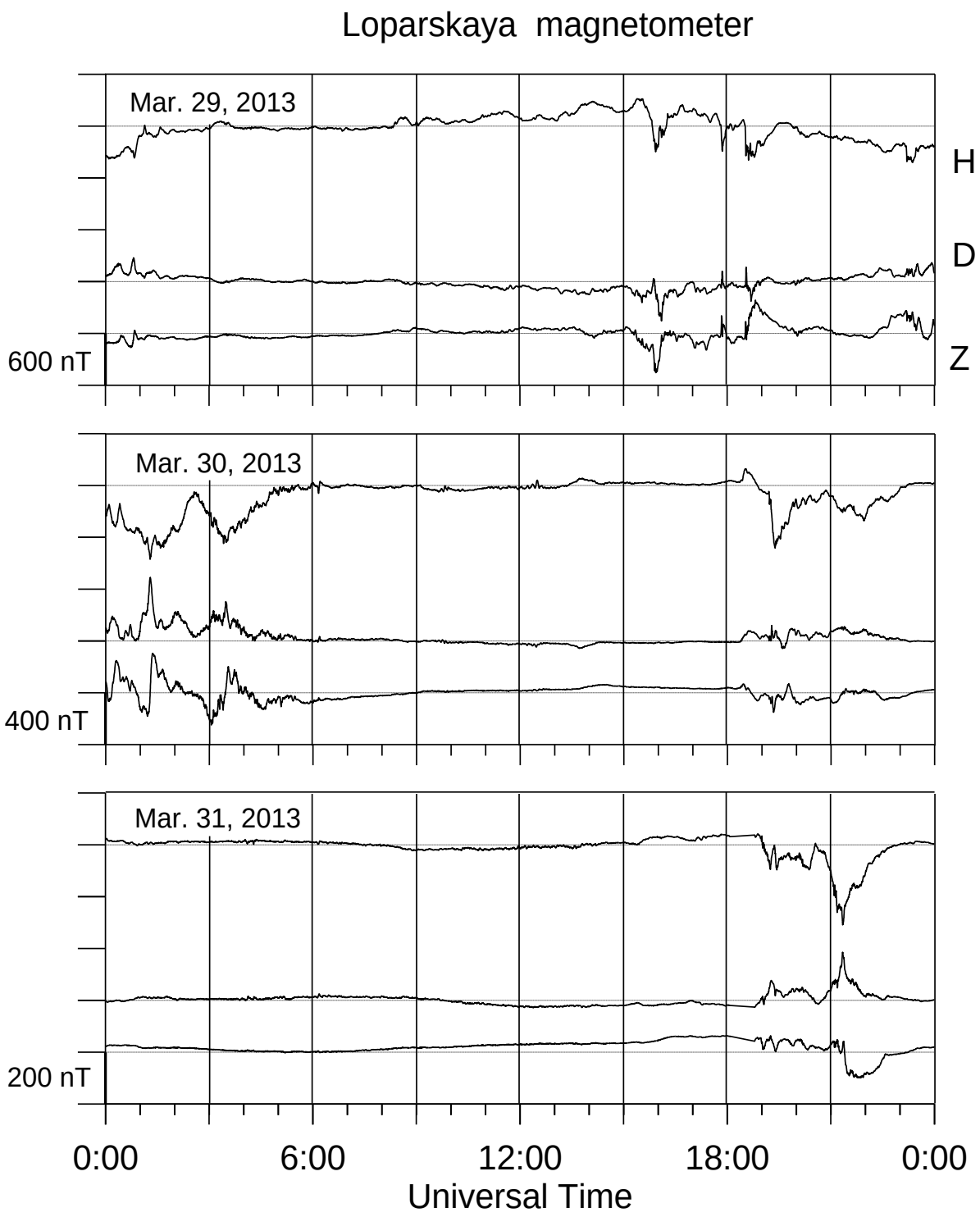
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