

POLAR GEOPHYSICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES



PGI
GEOPHYSICAL DATA

2024

OCTOBER

NOVEMBER

DECEMBER

MURMANSK, APATITY, RUSSIA
February, 2025

PGI GEOPHYSICAL DATA

V. VOROBJEV, editor

V. Burnaeva and N. Kudriashova make-up editors

This bulletin presents the preliminary ground-based optical, geomagnetic and cosmic ray data obtained by Polar Geophysical Institute in the fourth quarter of 2024. All-sky camera observations are published only for the quarters when observations were carried out. All data are available by request.

Reviewer Orlov K.G.

Published since 1996

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DATA DESCRIPTION

Magnetic data

The magnetograms (H, D, and Z) are plotted as magnetic variations recorded in Loparskaya and Lovozero stations by the three component Bobrov type magnetometer with a sampling frequency of 10 samples per seconds. The instrument has a range ± 2620 nT and a resolution of 5 pT. Magnetic observations are gathered every second and registered in the digital form as the 10-sec averaged data. Digits in the plots at the left-hand side denote the scale of the records in nT/div. Timing is provided by the GPS.

Magnetic quiet values for H, D and Z components are shown by dotted line as a daily averaged magnetic activity level for three magnetically quiet days of each month. Quiet days are brand by the symbol Q in tables of geomagnetic K-indices.

Geomagnetic K-indices

The hourly K-indices indicate the level of geomagnetic field disturbance. The maximum deflection of two components H and D from the magnetic quiet value during one hour interval have been recalculated to the value of the local hourly K-index. The following scale has been used:

K-indices	Deflection in nT
0	0-15
1	15-30
2	30-60
3	60-120
4	120-210
5	210-360
6	360-600
7	600-990
8	990-1500
9	1500 and more

Cosmic ray data

The 18-NM-64-neutron monitor has been operating in Apatity since 1969. A plot of pressure corrected hourly data (count accumulated during one hour interval) is presented in units of percent with respect to the monthly mean intensity. Mean values are:

October 5482.9

November 5496.3

December 5495.3

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

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

All-sky camera observations

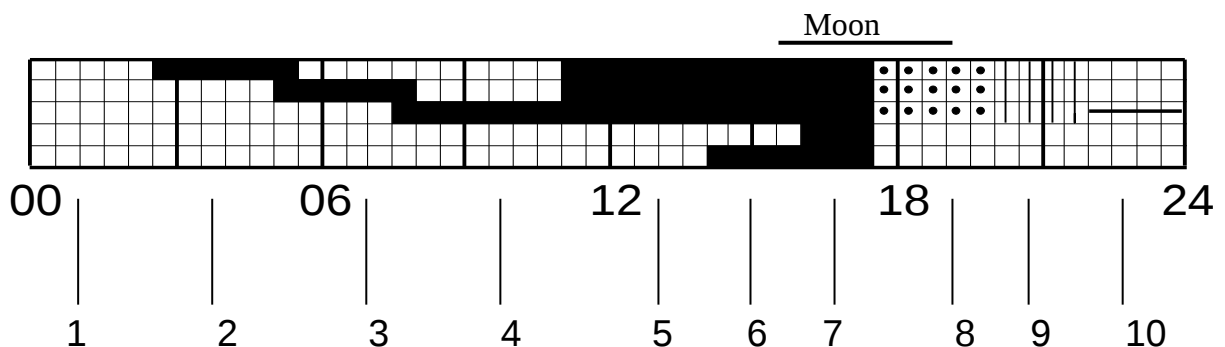
Calendar

Calendar shows the intervals of digital all-sky camera observations in Lovozero, Verhnetulomsky and Tumanny 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- aurorae present in north range
- 3- weak aurorae present in zenith range
- 4- aurorae 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, Verhnetulomsky and Tumanny 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.

PLEASE NOTE:

All-sky camera in Tumanny was not in operation from November 23 to the end of 2024 because of some technical problems. Magnetometer in Lovozero was not in operation during the entire fourth quarter.

Coordinates of stations

Stations	Code	Geographic		Corr. Geomagnetic	
		Lat	Long	Lat	Long
<i>Tumanny</i>	TUM	69.14° N	35.82° E	65.24° N	116.7° E
<i>Loparskaya</i>	LOP	68.63° N	33.25° E	64.94° N	113.6° E
<i>Verhnetulomsky</i>	VTL	68.59° N	31.75° E	64.92° N	113.0° E
<i>Lovozero</i>	LOZ	67.97° N	35.02° E	64.17° N	115.3° E

Please visit

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

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184209, RUSSIA

GEOMAGNETIC K-INDICES, LOPARSKAYA
October, 2024
Lower limit of K=9 is 1500 nT

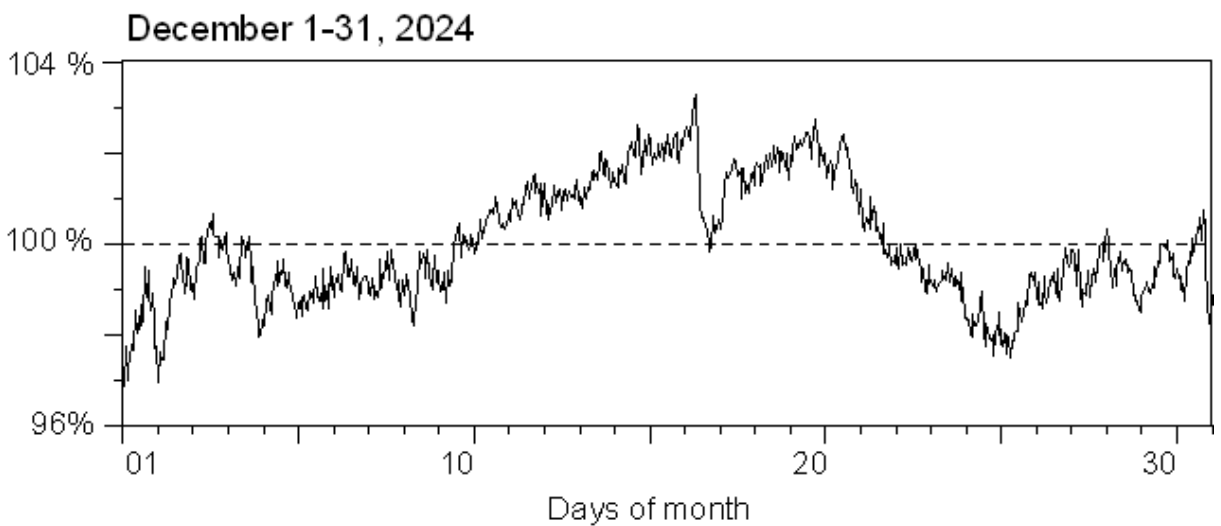
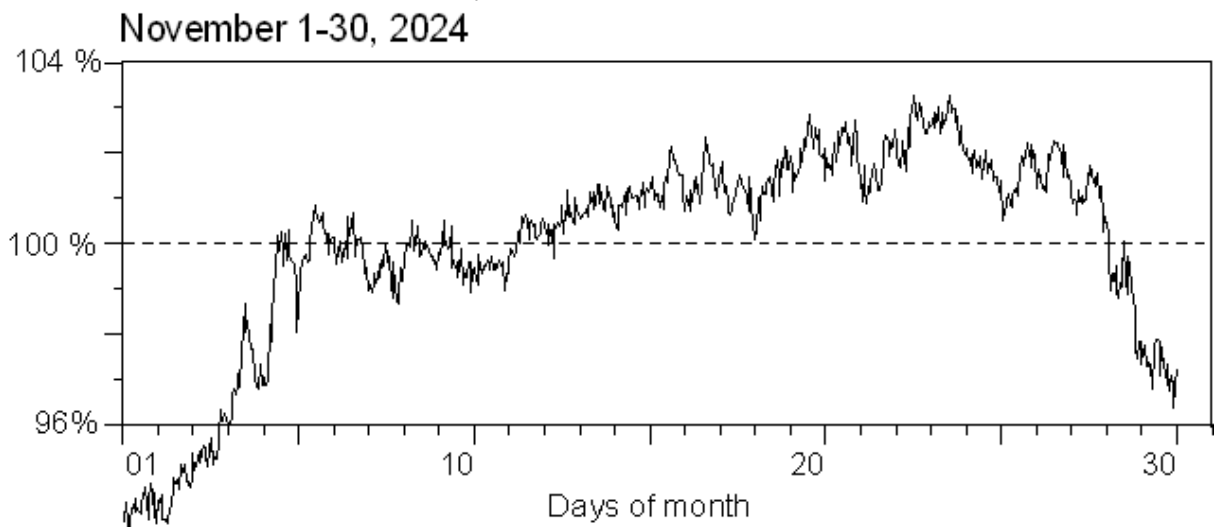
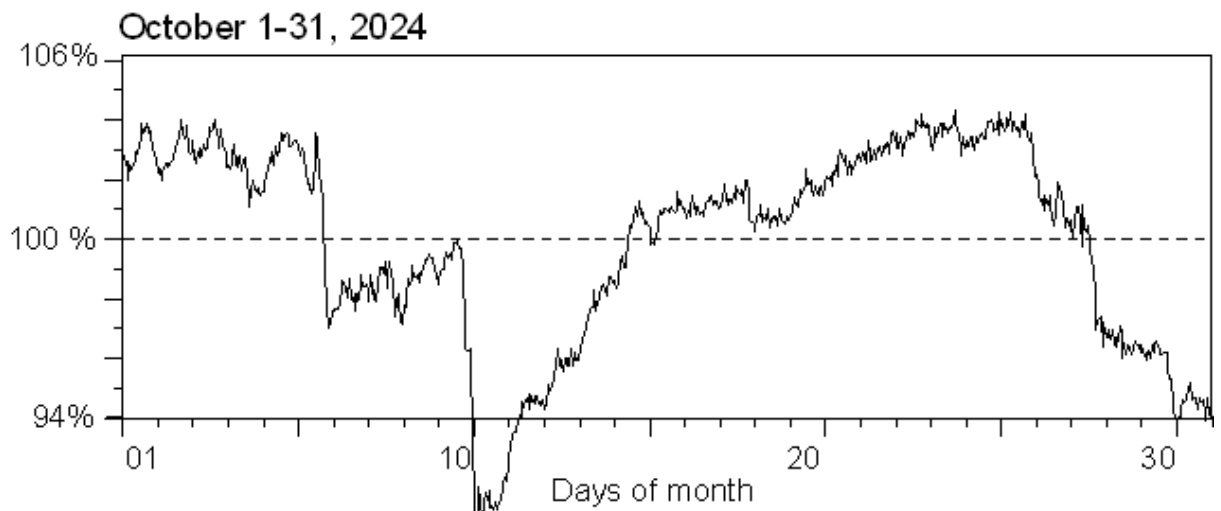
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9	6 6 4	5 6 5	3 2 2	3 3 4	5 5 5	5 3 3	3 2 4	5 5 5	
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GEOMAGNETIC K-INDICES, LOPARSKAYA
December, 2024
Lower limit of K=9 is 1500 nT

Day	Time, UT								
	03	06	09	12	15	18	21	24	
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Apatity neutron monitor



ALL – SKY CAMERA OBSERVATIONS

October - December 2024

CALENDAR OF TV OBSERVATIONS

November 29 - 30

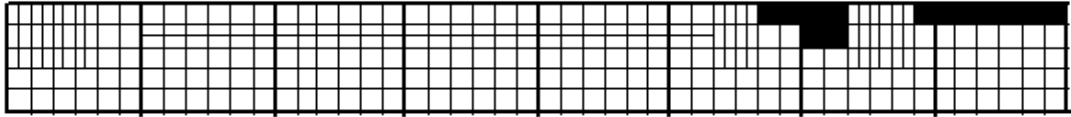
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November 30

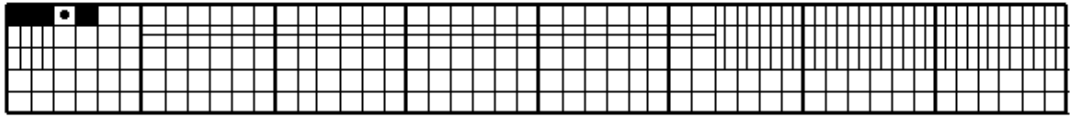
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Lovozero ascaplots

Oct. 01, 2024



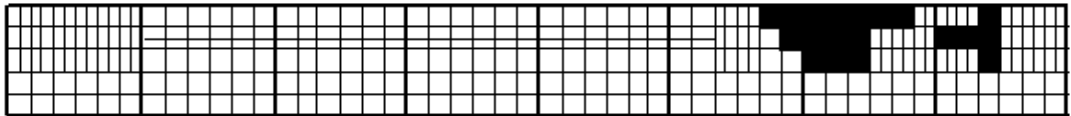
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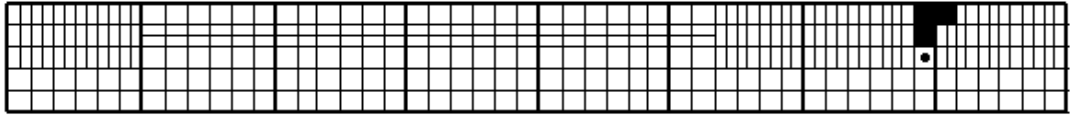
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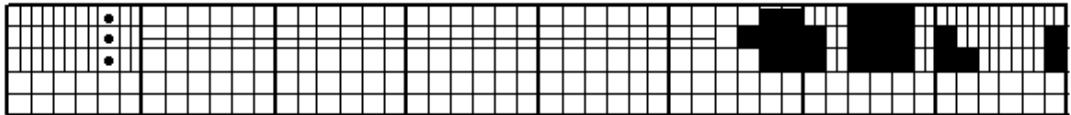
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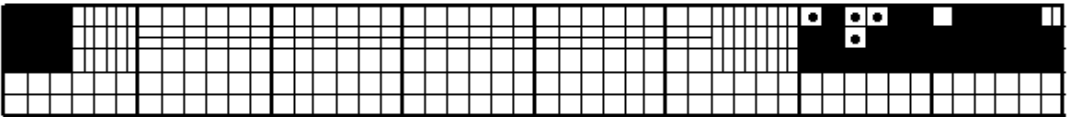
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Oct. 06, 2024



Oct. 07, 2024



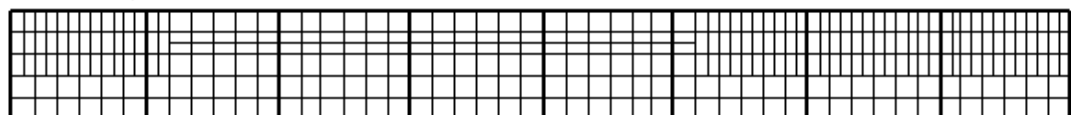
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Oct. 09, 2024



Oct. 10, 2024

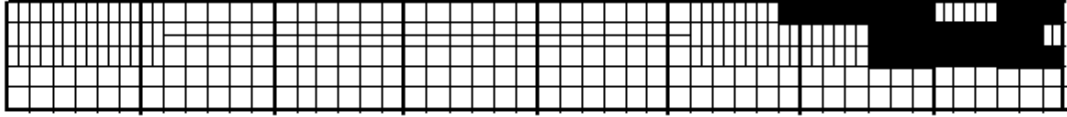


00 06 12 18 24

Universal Time

Lovozero ascaplots

Oct. 11, 2024



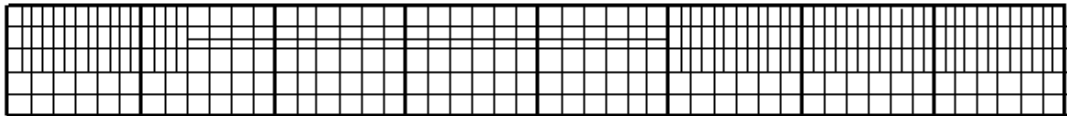
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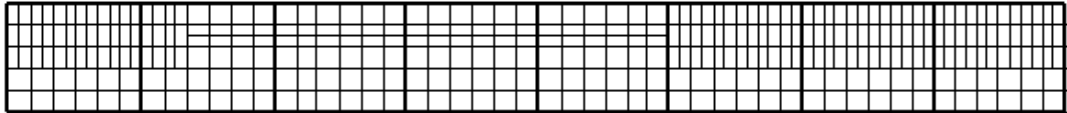
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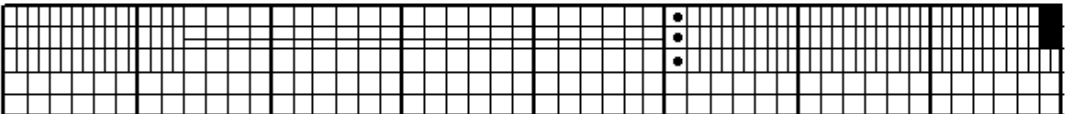
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Oct. 17, 2024



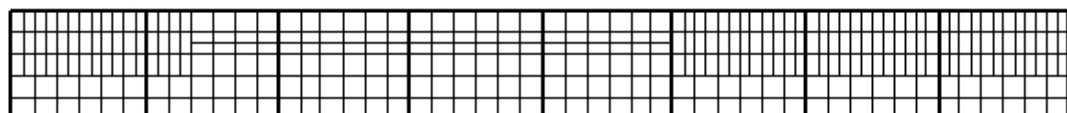
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Oct. 19, 2024



Oct. 20, 2024

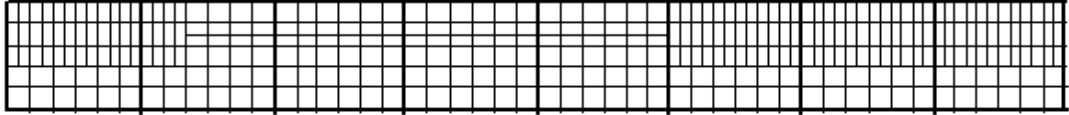


00 06 12 18 24

Universal Time

Lovozero ascaplots

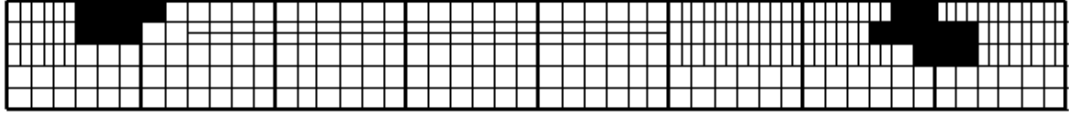
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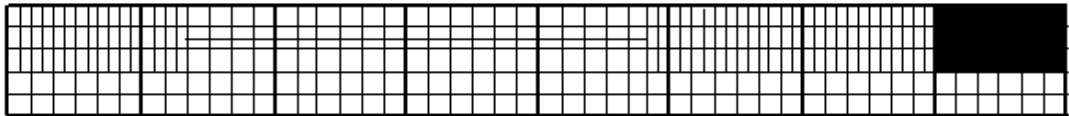
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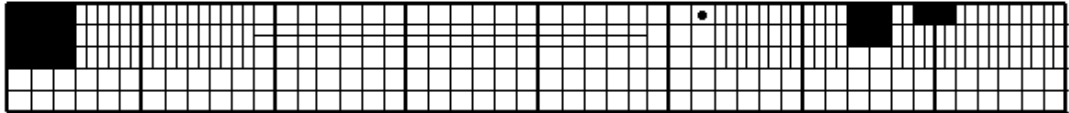
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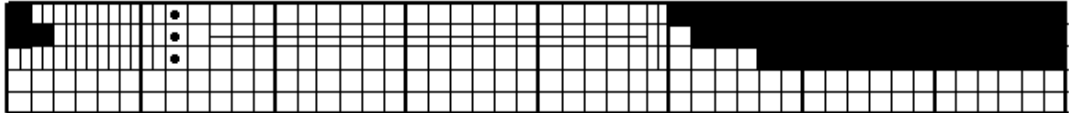
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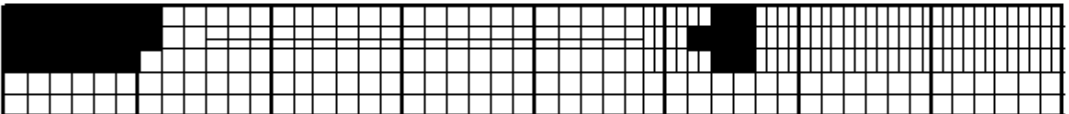
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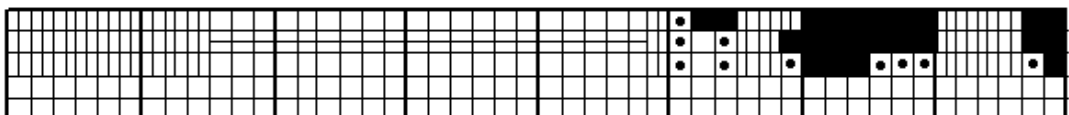
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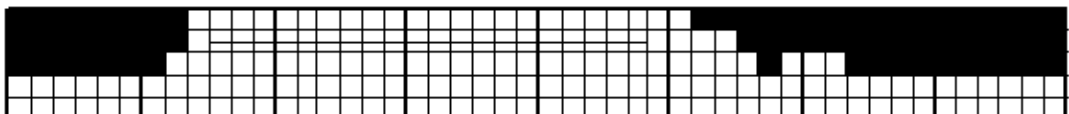
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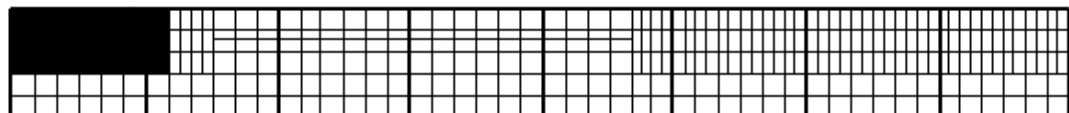
Oct. 28, 2024



Oct. 29, 2024



Oct. 30, 2024



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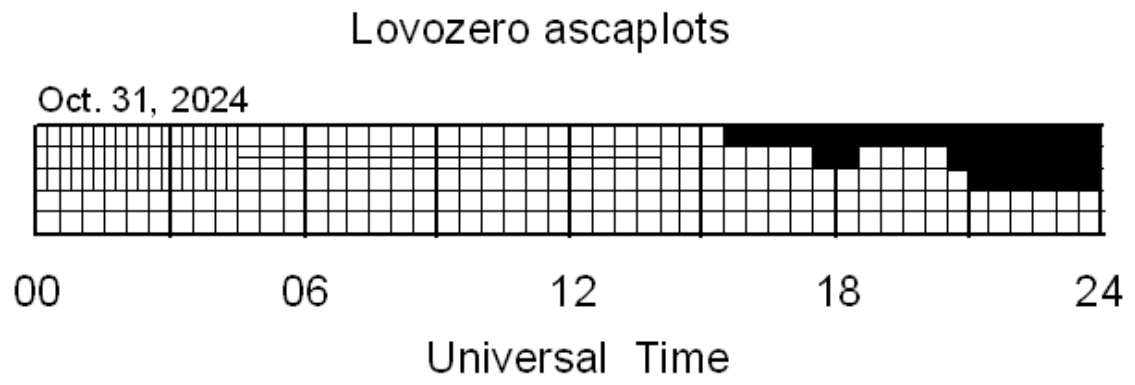
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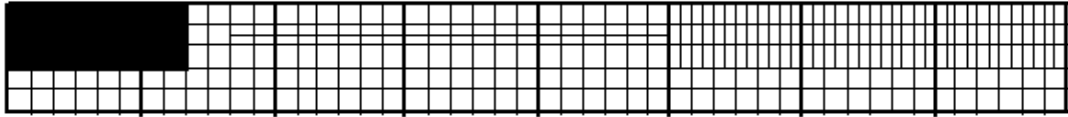
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Universal Time

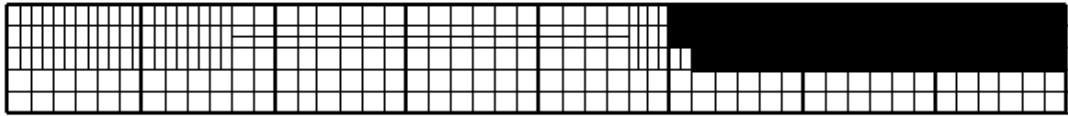


Lovozero ascaplots

Nov. 01, 2024



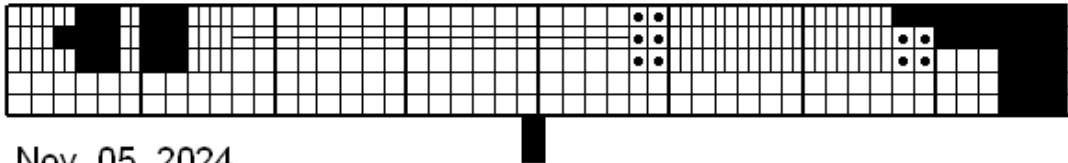
Nov. 02, 2024



Nov. 03, 2024



Nov. 04, 2024



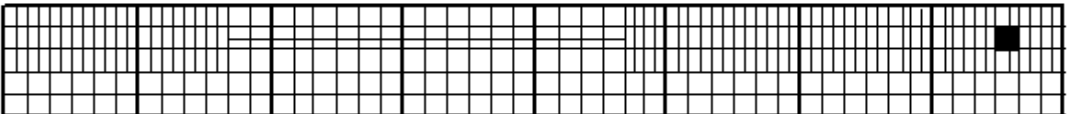
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Nov. 06, 2024



Nov. 07, 2024



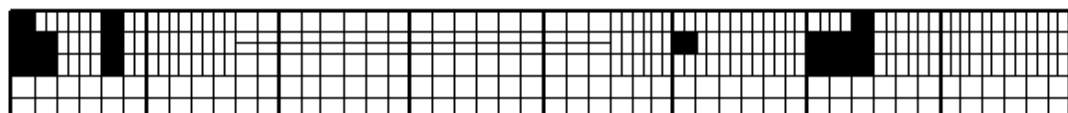
Nov. 08, 2024



Nov. 09, 2024



Nov. 10, 2024

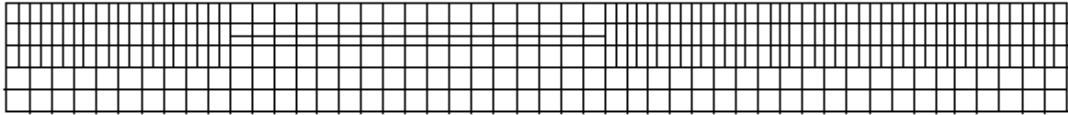


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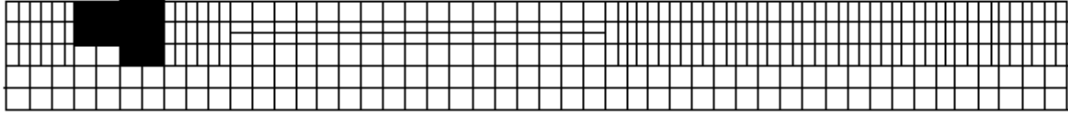
Universal Time

Lovozero ascaplots

Nov. 11, 2024



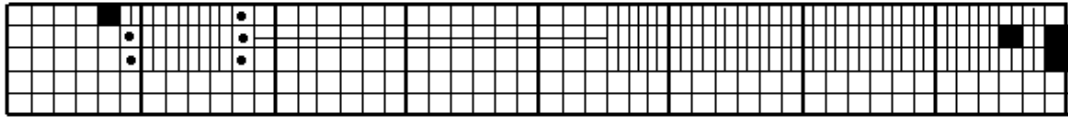
Nov. 12, 2024



Nov. 13, 2024



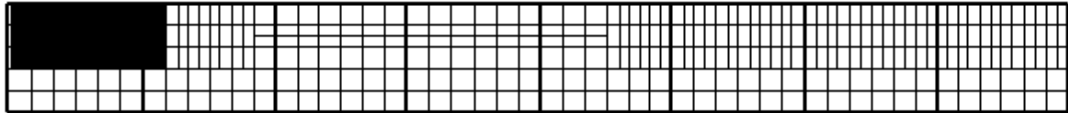
Nov. 14, 2024



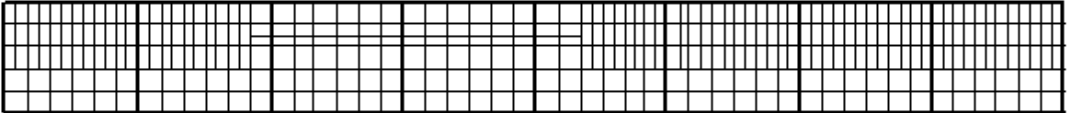
Nov. 15, 2024



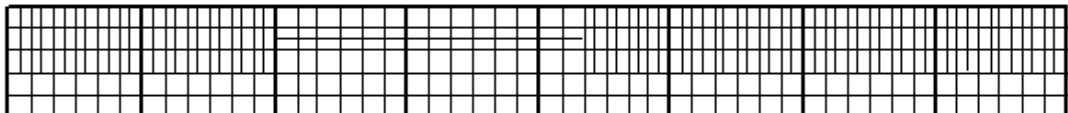
Nov. 16, 2024



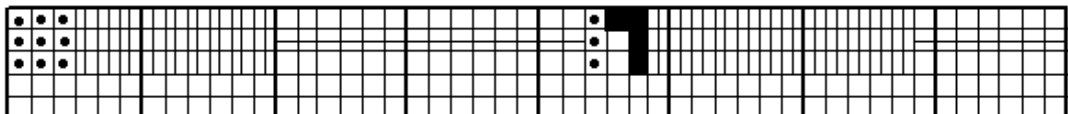
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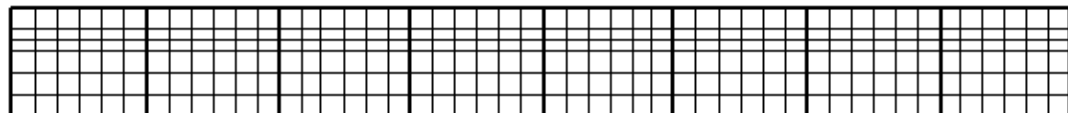
Nov. 18, 2024



Nov. 19, 2024



Nov. 20, 2024



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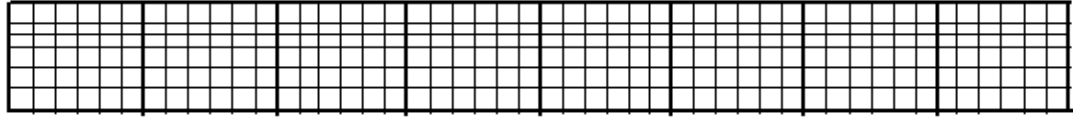
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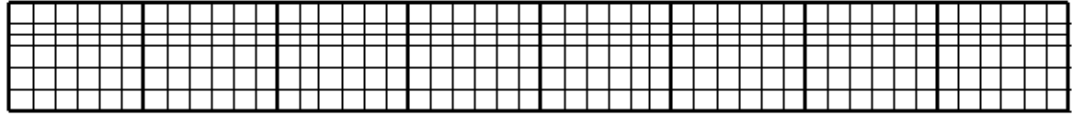
Universal Time

Lovozero ascaplots

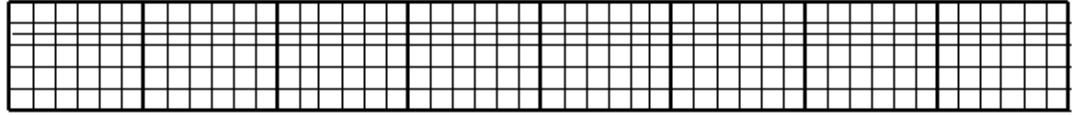
Nov. 21, 2024



Nov. 22, 2024



Nov. 23, 2024



Nov. 24, 2024



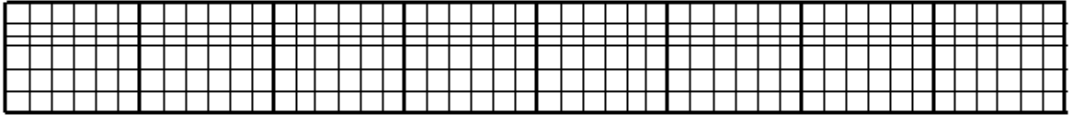
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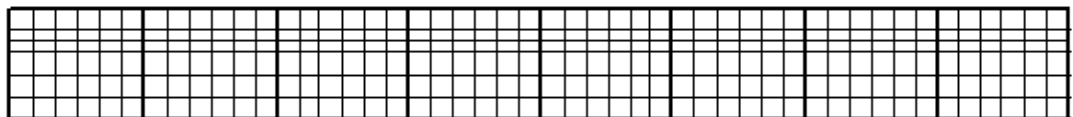
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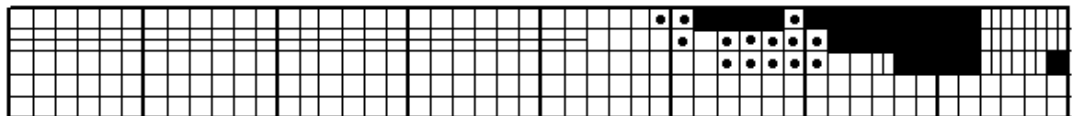
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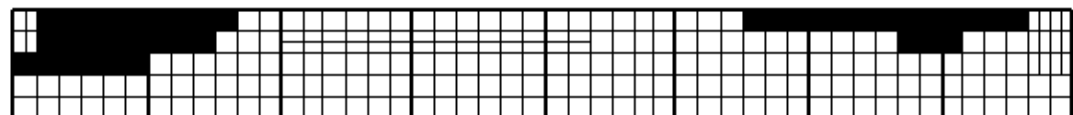
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Nov. 30, 2024

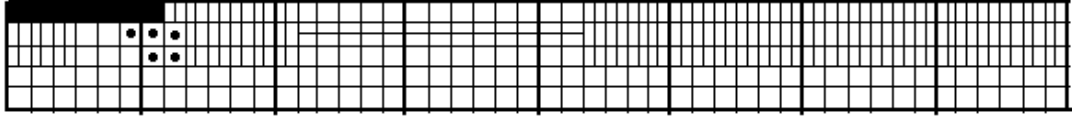


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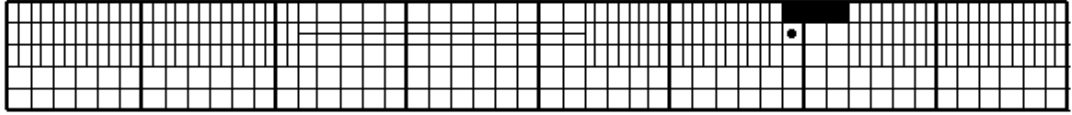
Universal Time

Lovozero ascaplots

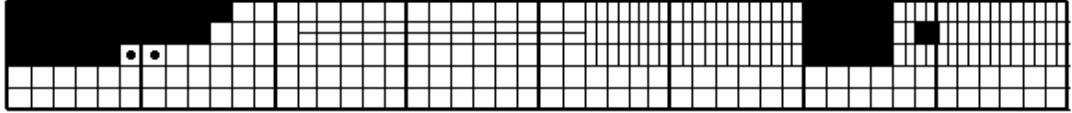
Dec. 01, 2024



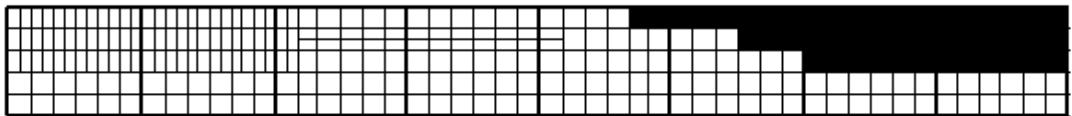
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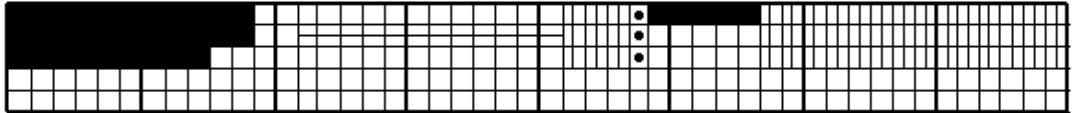
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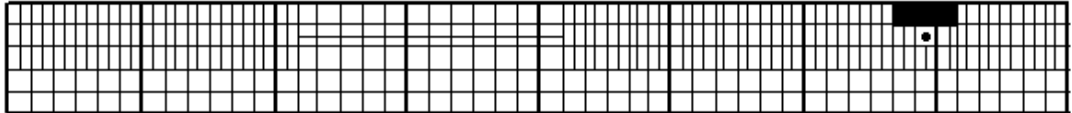
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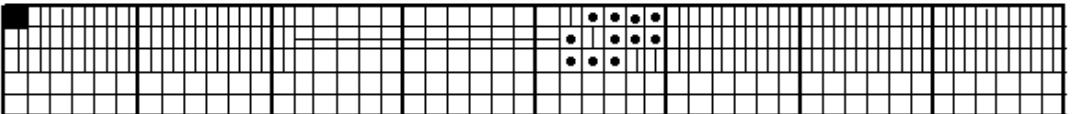
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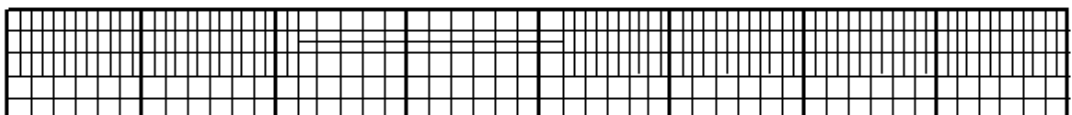
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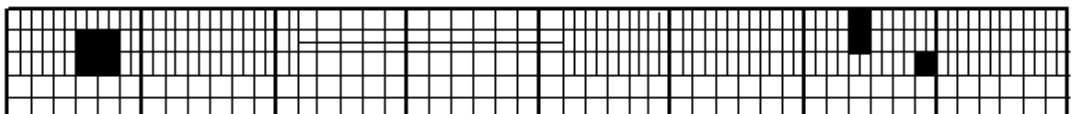
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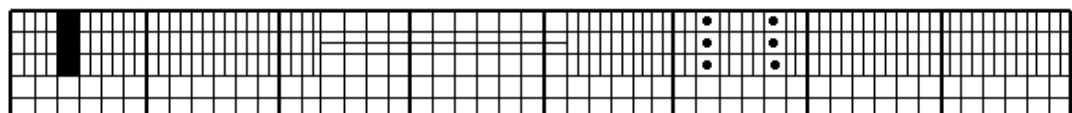
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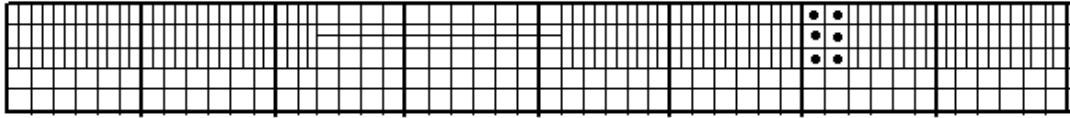
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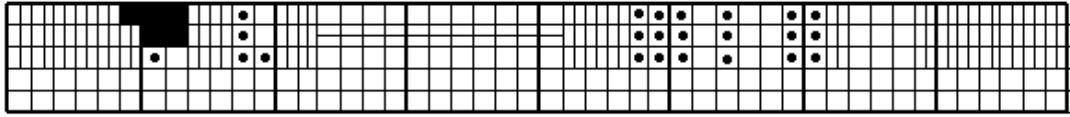
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Universal Time

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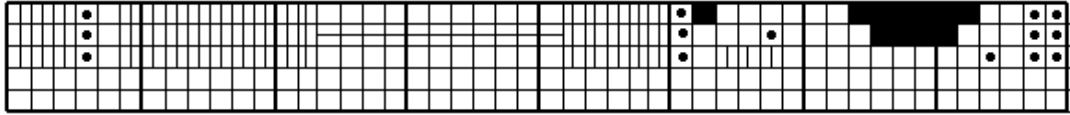
Dec. 11, 2024



Dec. 12, 2024



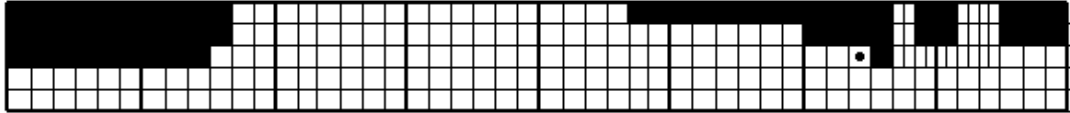
Dec. 13, 2024



Dec. 14, 2024



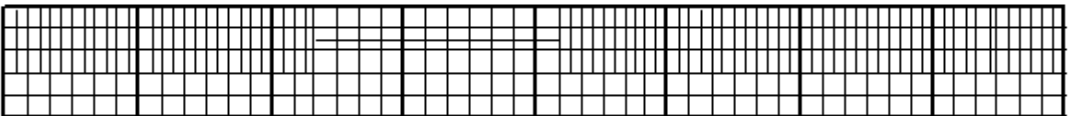
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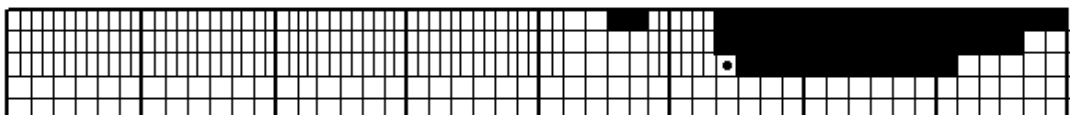
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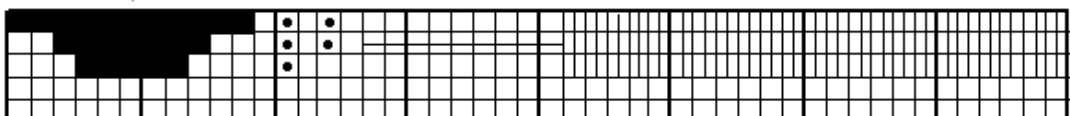
Dec. 17, 2024



Dec. 18, 2024



Dec. 19, 2024



Dec. 20, 2024

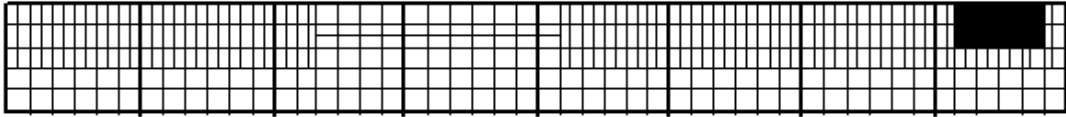


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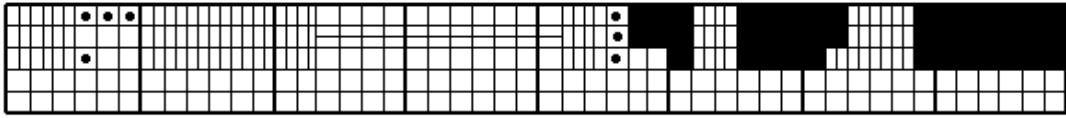
Universal Time

Lovozero ascaplots

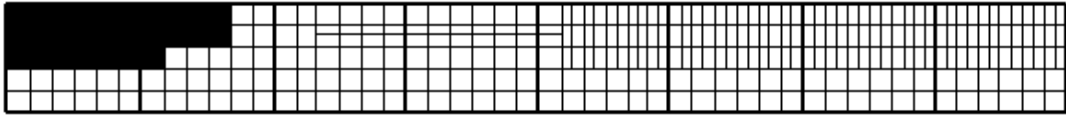
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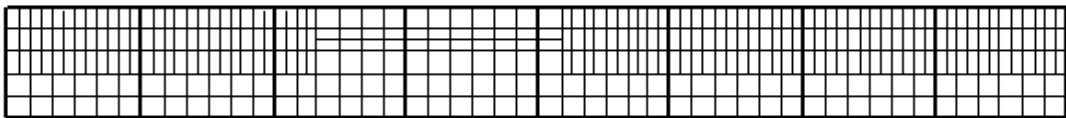
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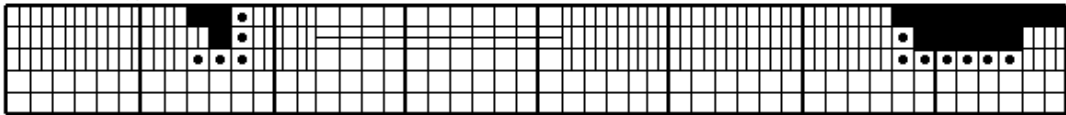
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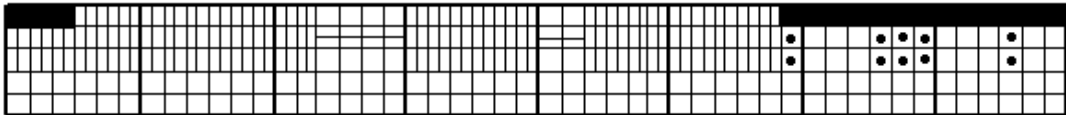
Dec. 24, 2024



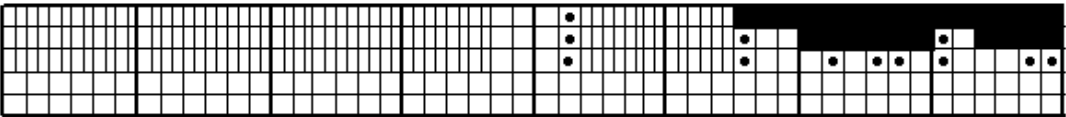
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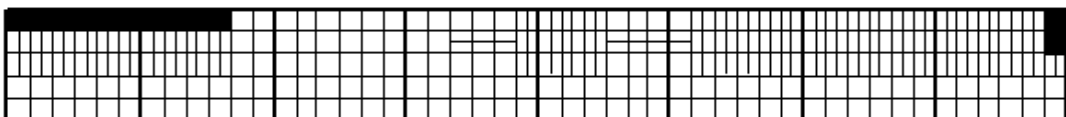
Dec. 26, 2024



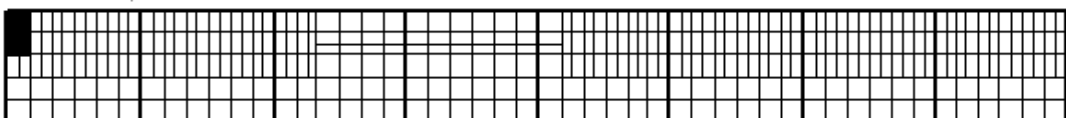
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Dec. 28, 2024



Dec. 29, 2024



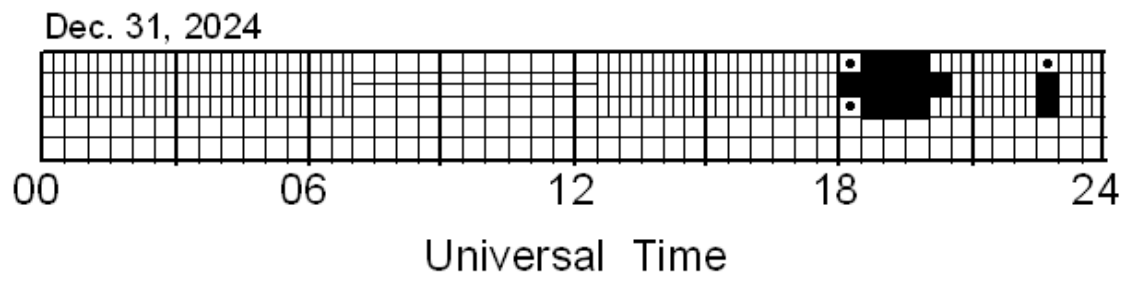
Dec. 30, 2024



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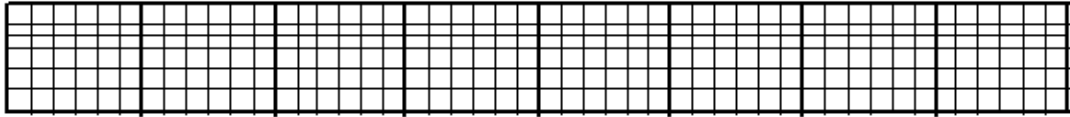
Universal Time

Lovozero ascaplots



Tumanny ascaplots

Oct. 01, 2024



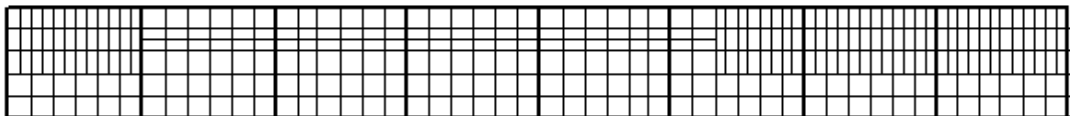
Oct. 02, 2024



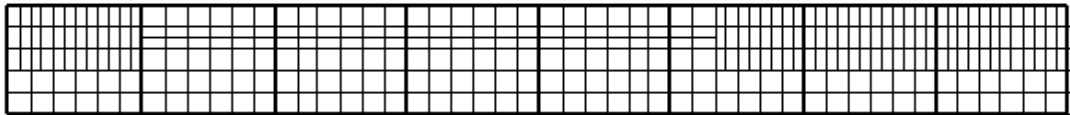
Oct. 03, 2024



Oct. 04, 2024



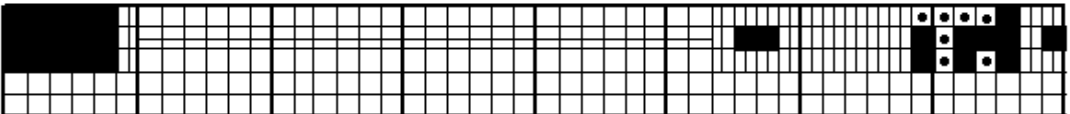
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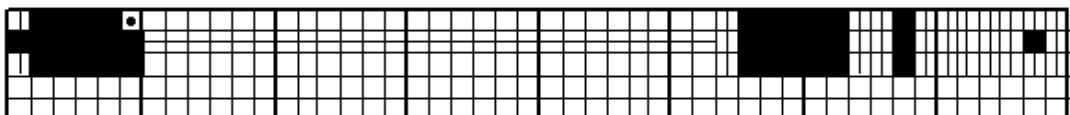
Oct. 06, 2024



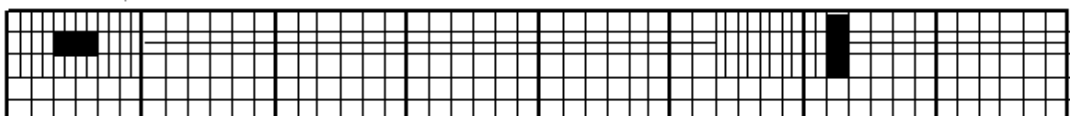
Oct. 07, 2024



Oct. 08, 2024



Oct. 09, 2024



Oct. 10, 2024



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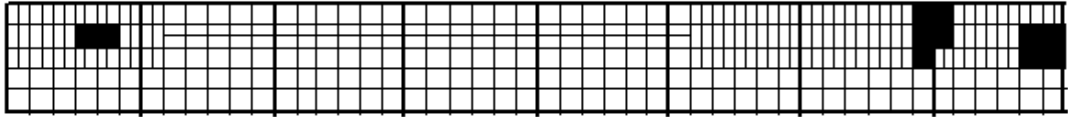
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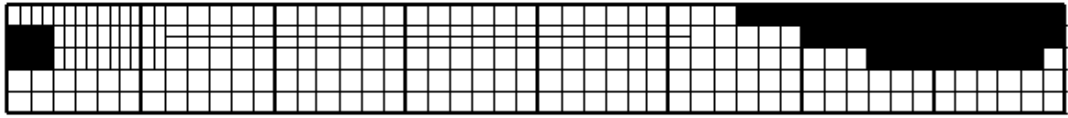
Universal Time

Tumanny ascaplots

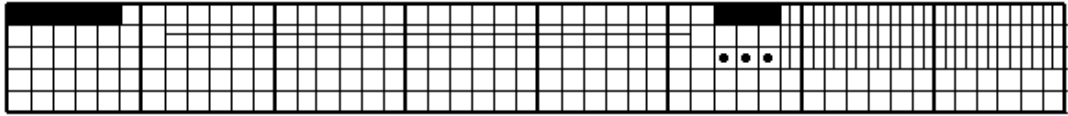
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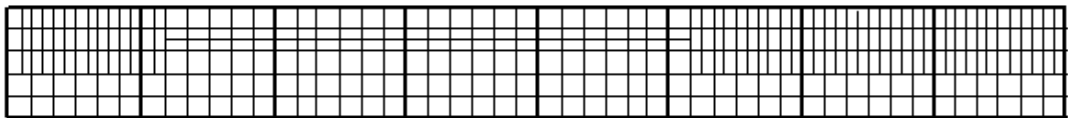
Oct. 12, 2024



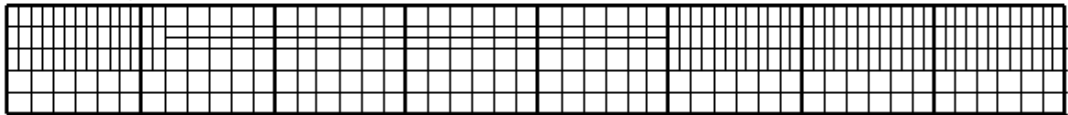
Oct. 13, 2024



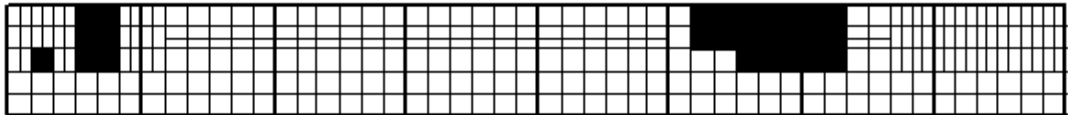
Oct. 14, 2024



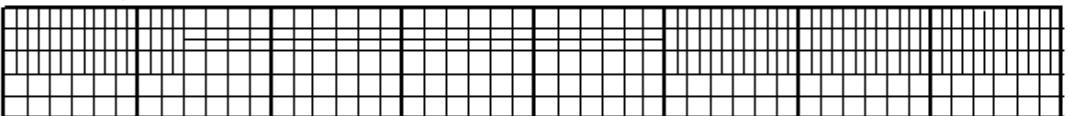
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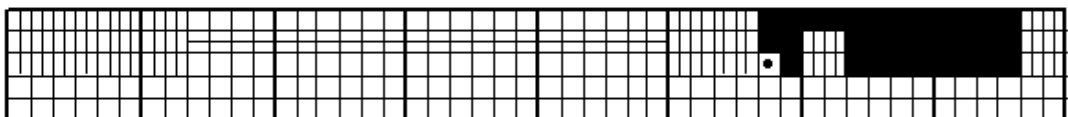
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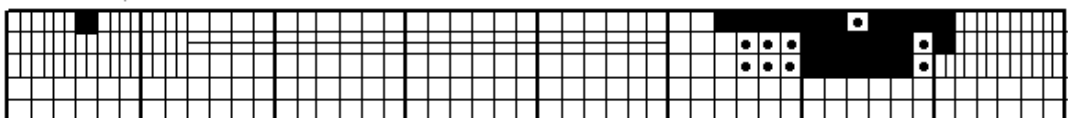
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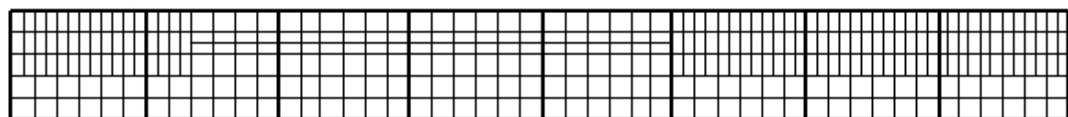
Oct. 18, 2024



Oct. 19, 2024



Oct. 20, 2024

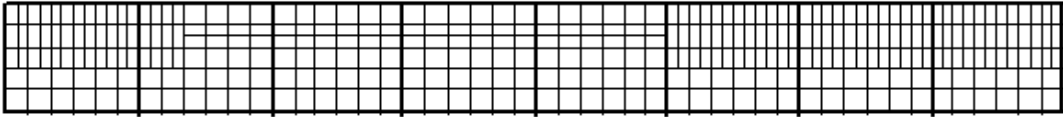


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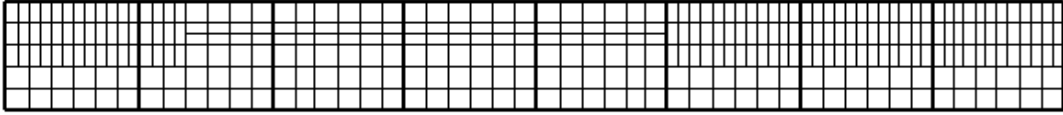
Universal Time

Tumanny ascaplots

Oct. 21, 2024



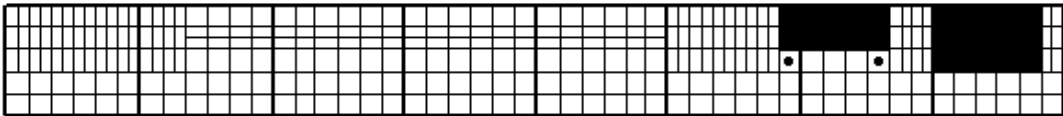
Oct. 22, 2024



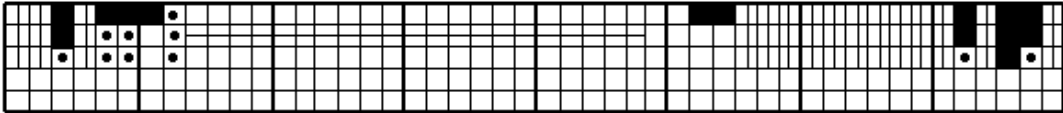
Oct. 23, 2024



Oct. 24, 2024



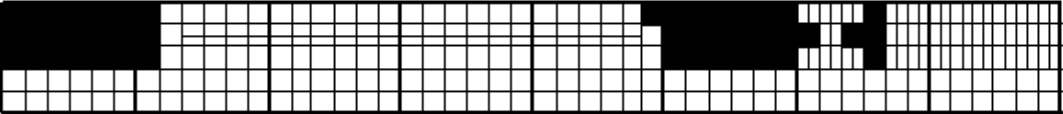
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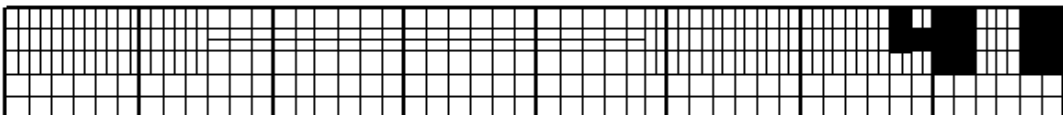
Oct. 26, 2024



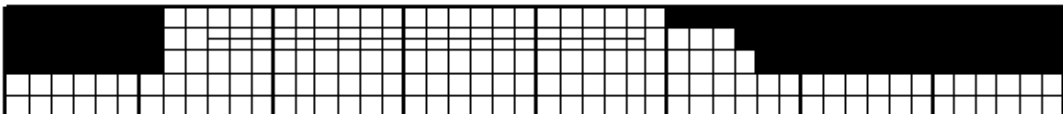
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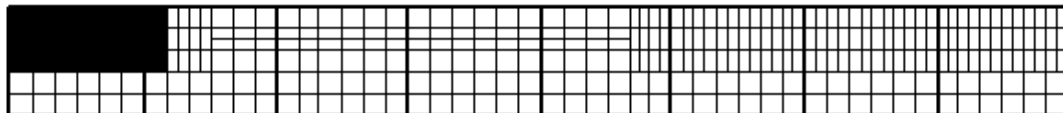
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Oct. 29, 2024

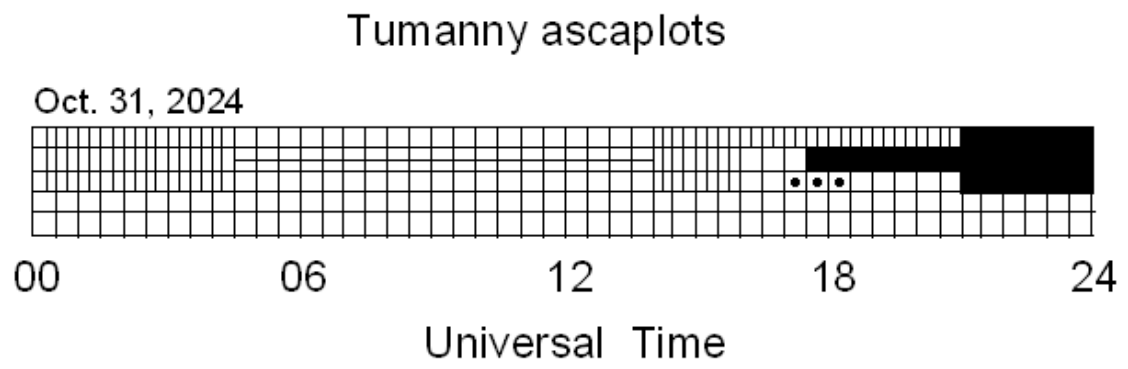


Oct. 30, 2024



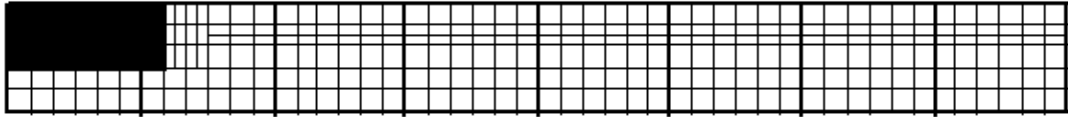
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Universal Time

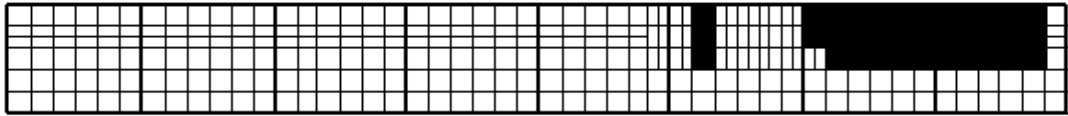


Tumanny ascaplots

Nov. 01, 2024



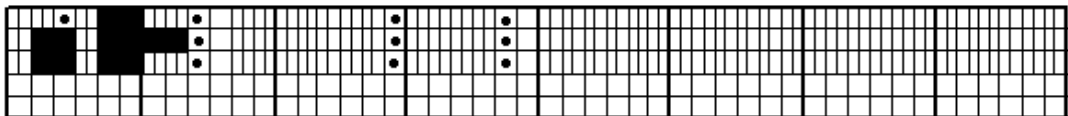
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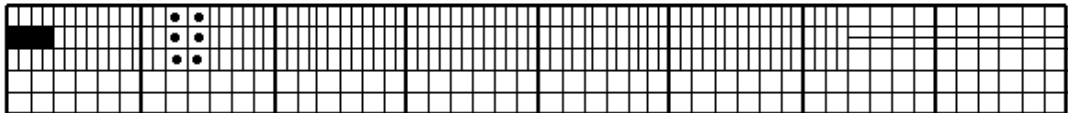
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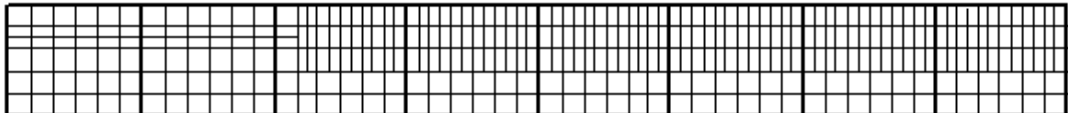
Nov. 04, 2024



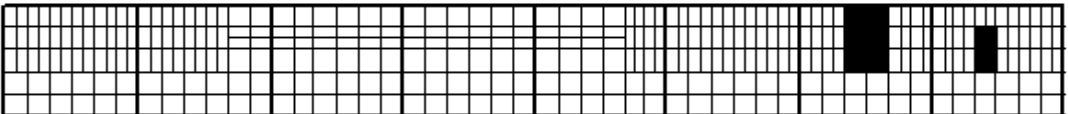
Nov. 05, 2024



Nov. 06, 2024



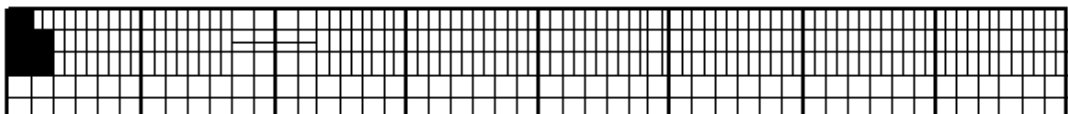
Nov. 07, 2024



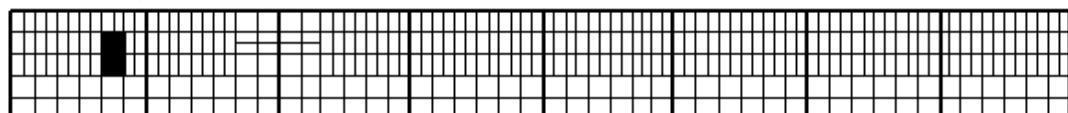
Nov. 08, 2024



Nov. 09, 2024



Nov. 10, 2024

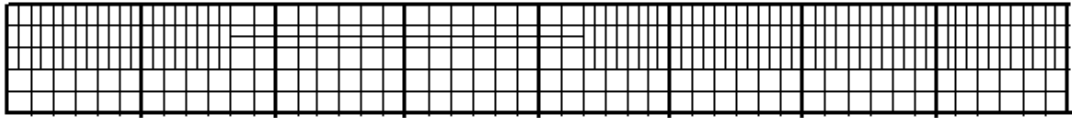


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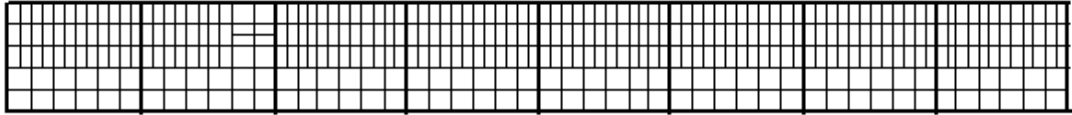
Universal Time

Tumanny ascaplots

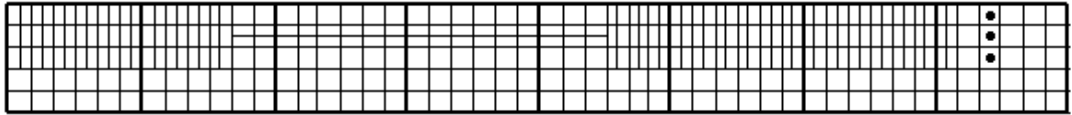
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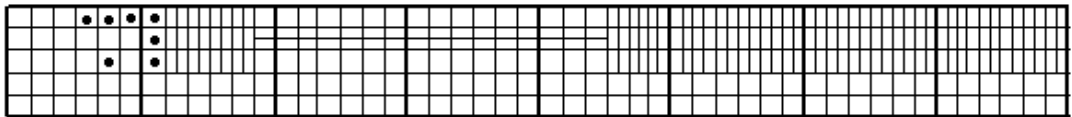
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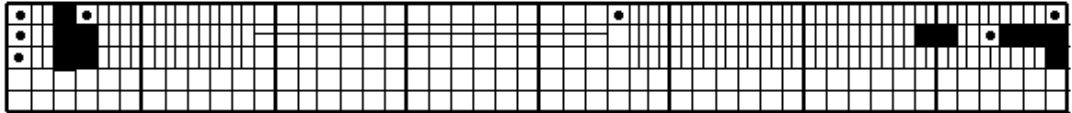
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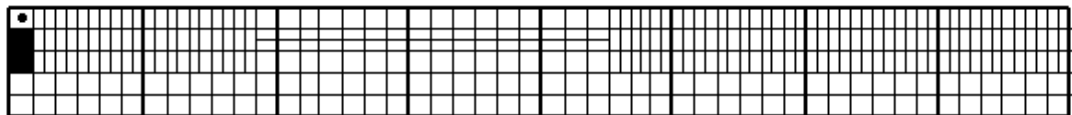
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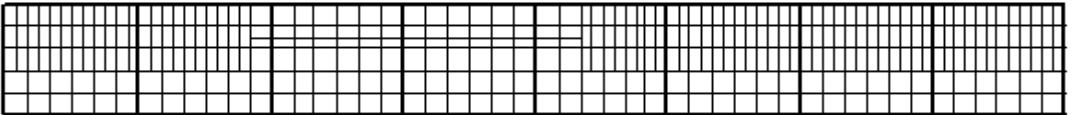
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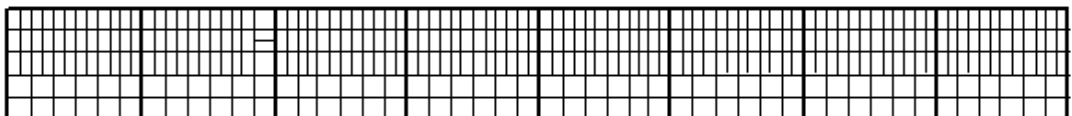
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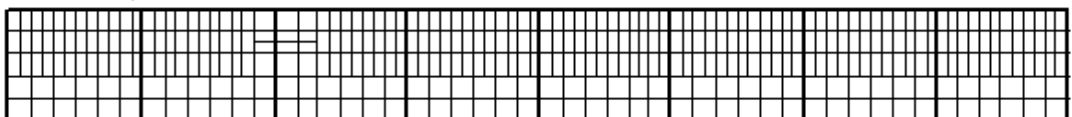
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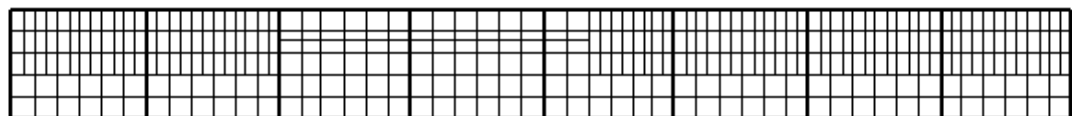
Nov. 18, 2024



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Nov. 20, 2024



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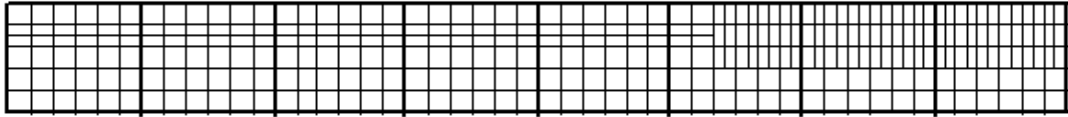
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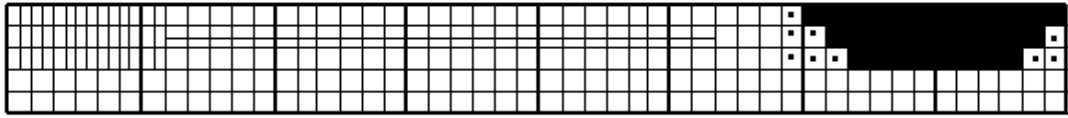
Universal Time

Verhnetulomsky ascaplots

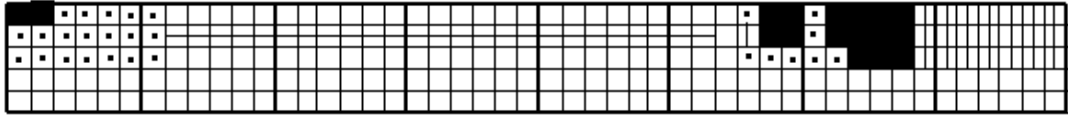
Oct. 04, 2024



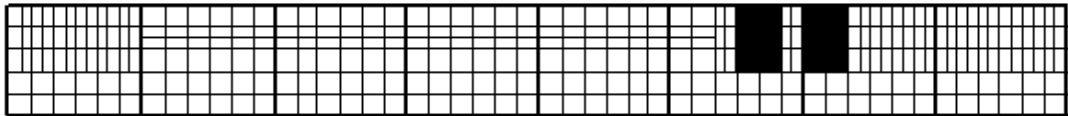
Oct. 05, 2024



Oct. 06, 2024



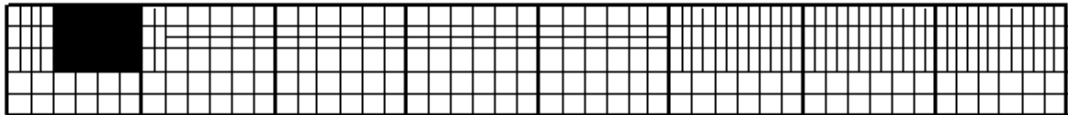
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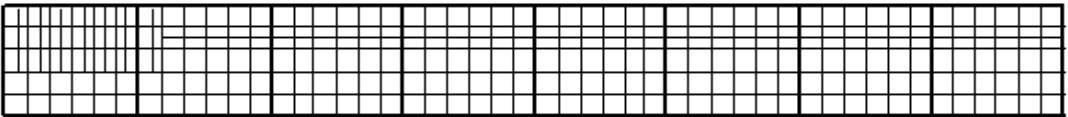
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Oct. 09, 2024



Oct. 10, 2024



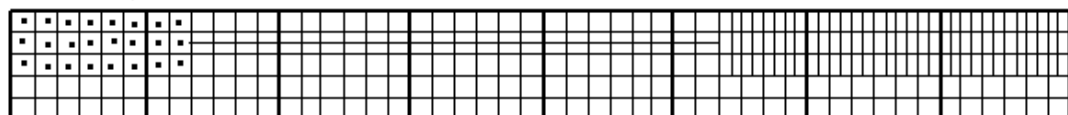
Oct. 11, 2024



Oct. 12, 2024



Oct. 13, 2024

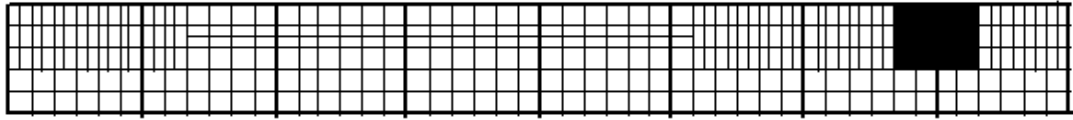


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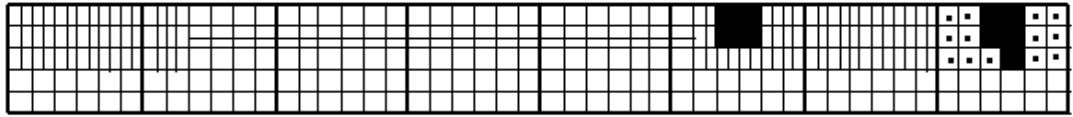
Universal Time

Verhnetulomsky ascaplots

Oct. 14, 2024



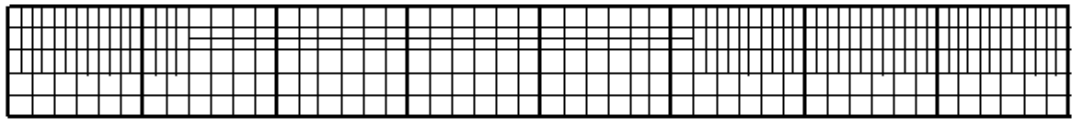
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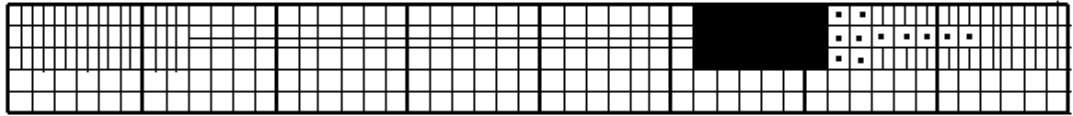
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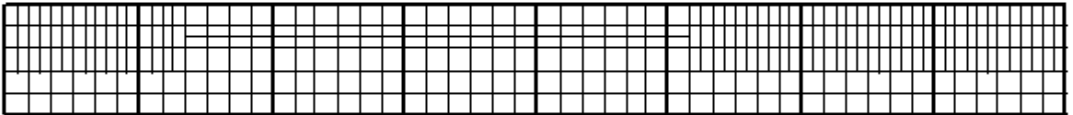
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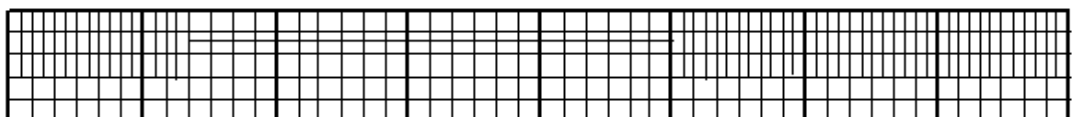
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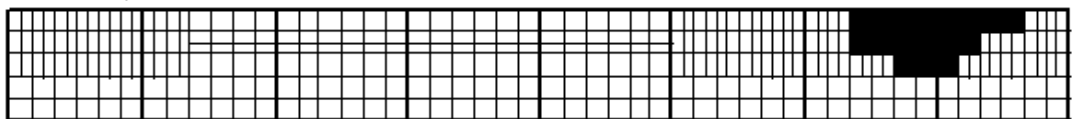
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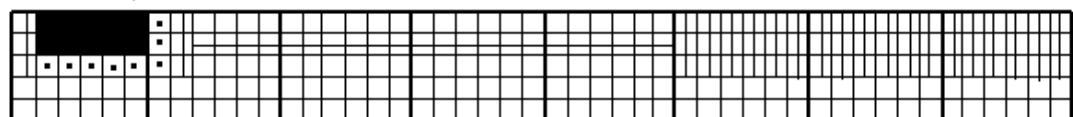
Oct. 21, 2024



Oct. 22, 2024



Oct. 23, 2024



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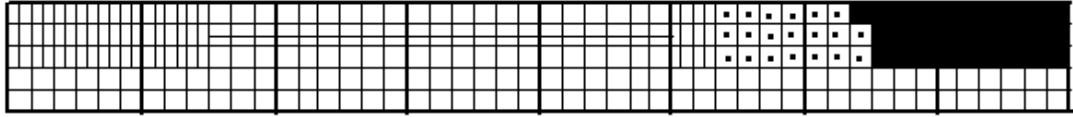
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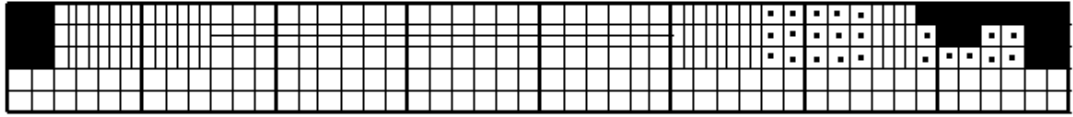
Universal Time

Verhnetulomsky ascaplots

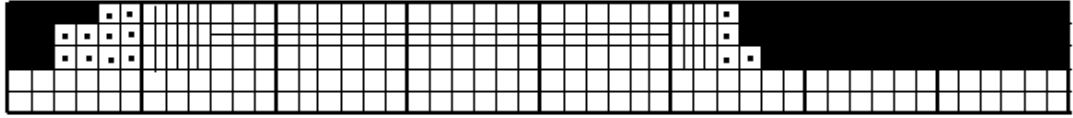
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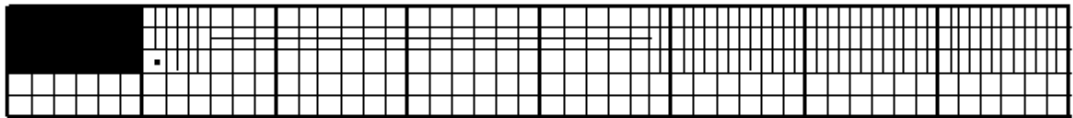
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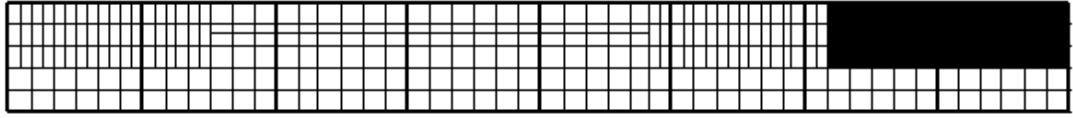
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Oct. 27, 2024



Oct. 28, 2024



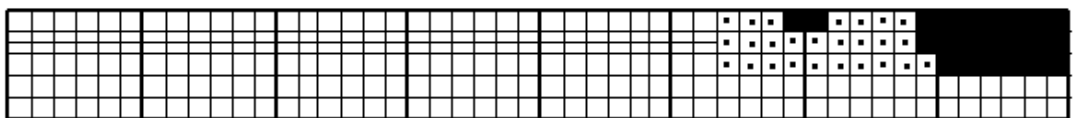
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Oct. 30, 2024



Oct. 31, 2024

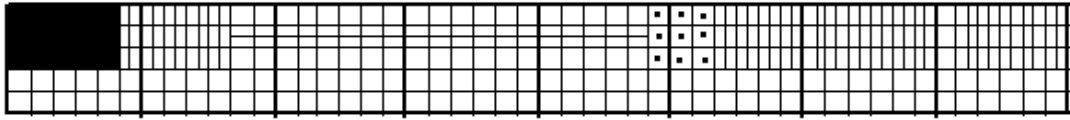


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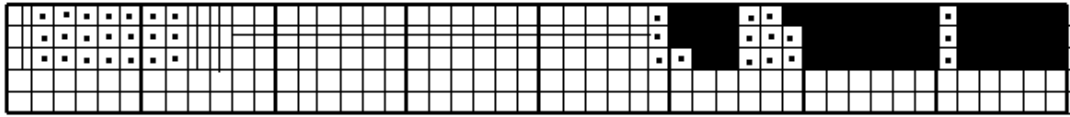
Universal Time

Verhnetulomsky ascaplots

Nov. 01, 2024



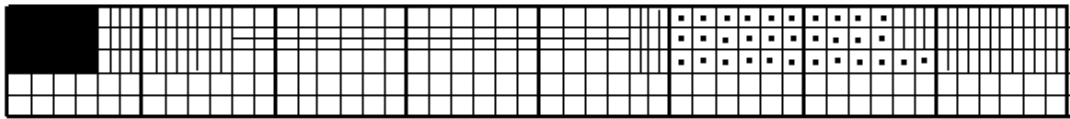
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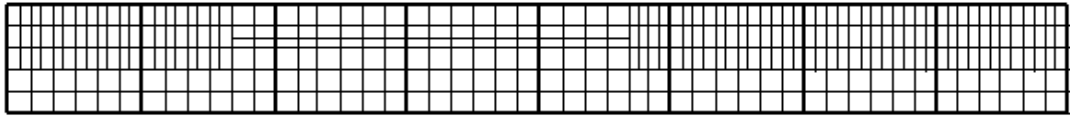
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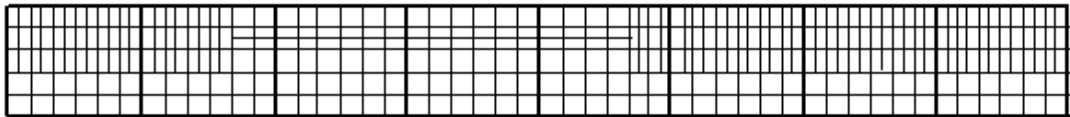
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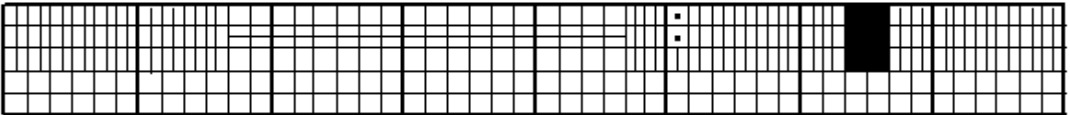
Nov. 05, 2024



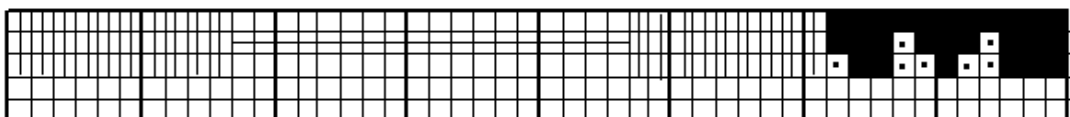
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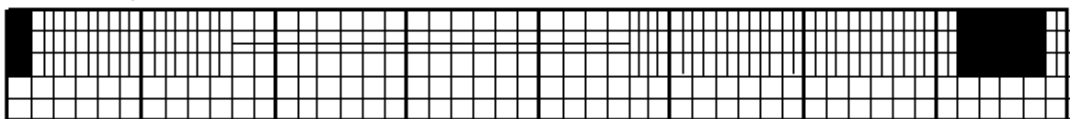
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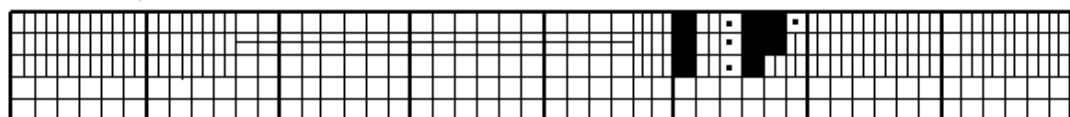
Nov. 08, 2024



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Nov. 10, 2024



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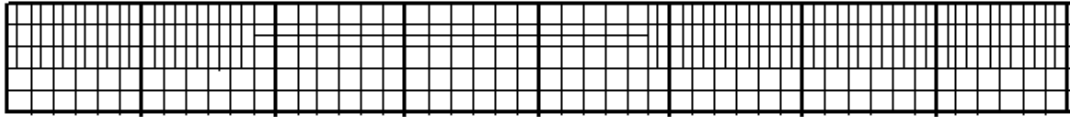
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Universal Time

Verhnetulomsky ascaplots

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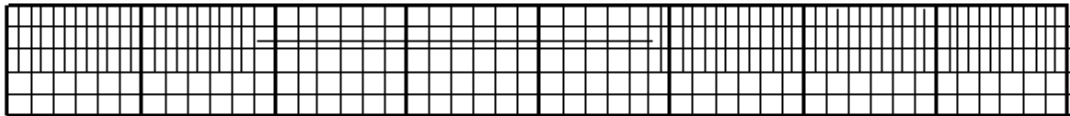
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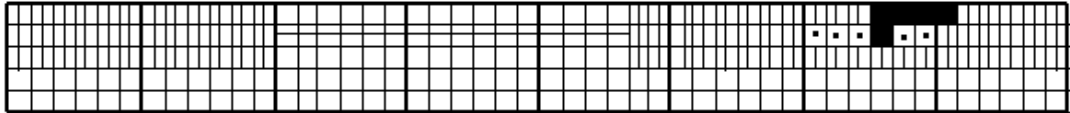
Nov. 13, 2024



Nov. 14, 2024



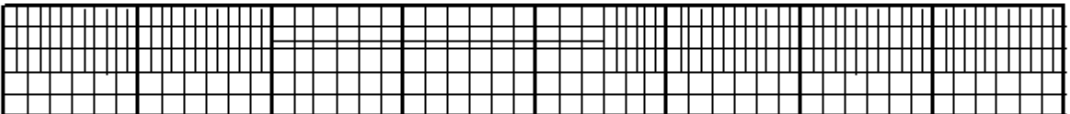
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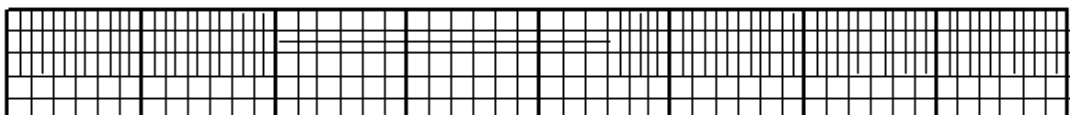
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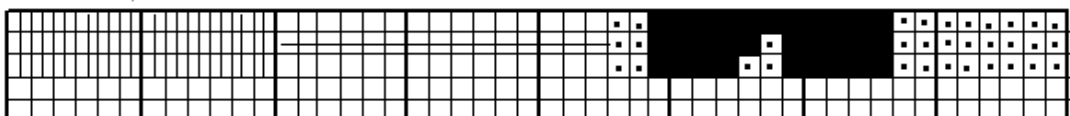
Nov. 17, 2024



Nov. 18, 2024



Nov. 19, 2024



Nov. 20, 2024

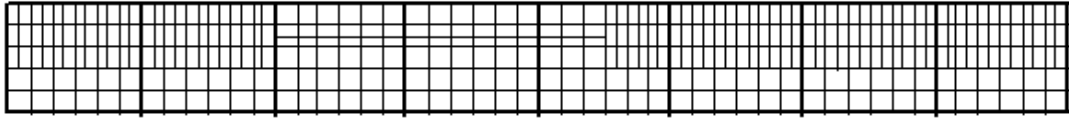


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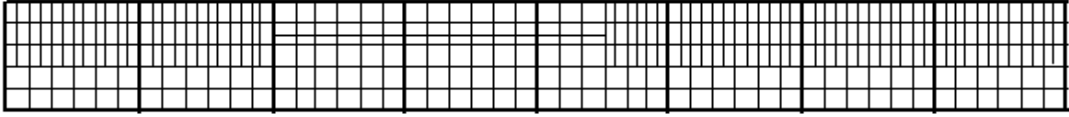
Universal Time

Verhnetulomsky ascaplots

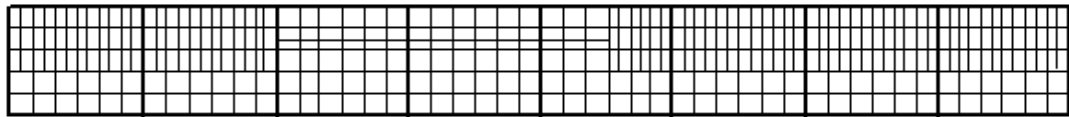
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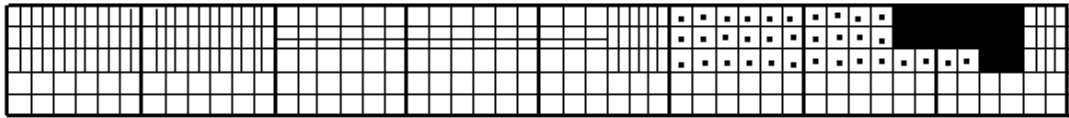
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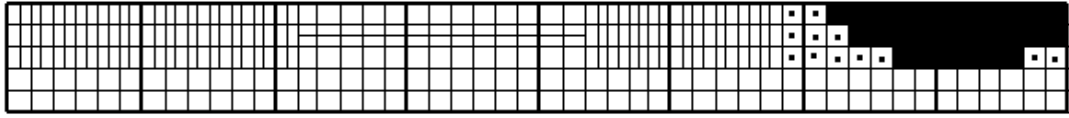
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Nov. 24, 2024



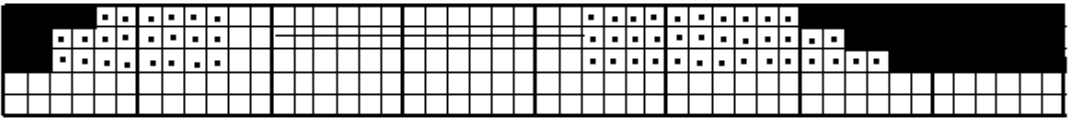
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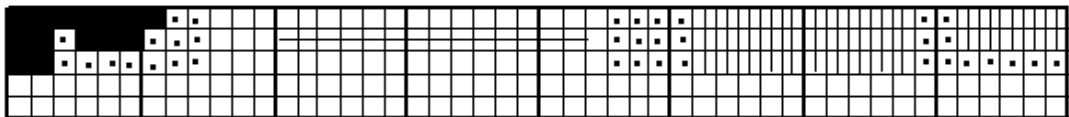
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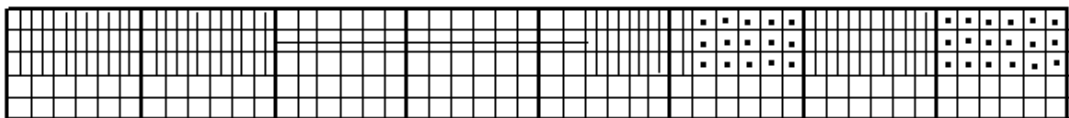
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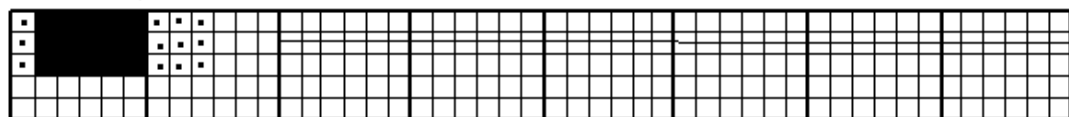
Nov. 28, 2024



Nov. 29, 2024



Nov. 30, 2024



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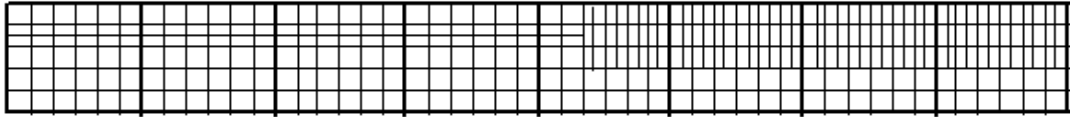
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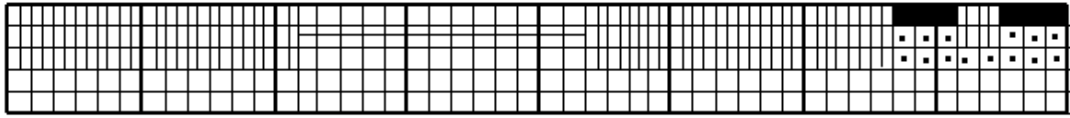
Universal Time

Verhnetulomsky ascaplots

Dec. 01, 2024



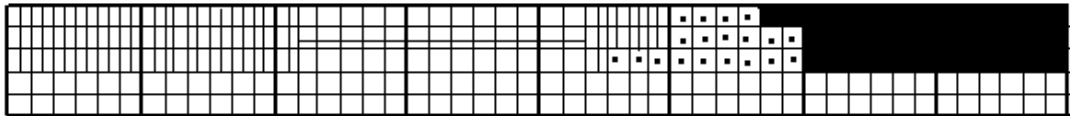
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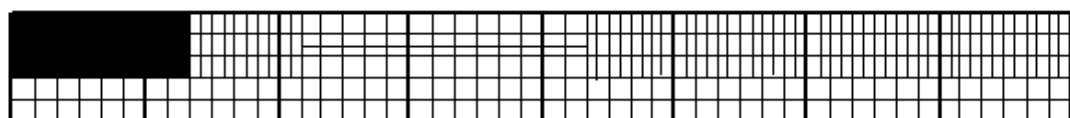
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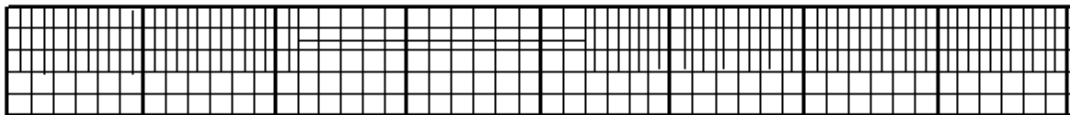
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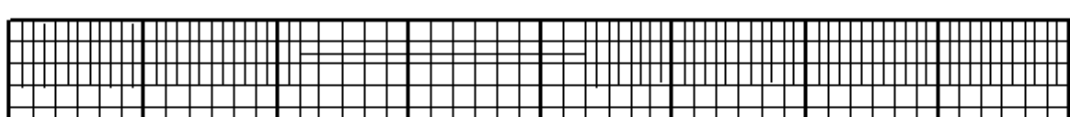
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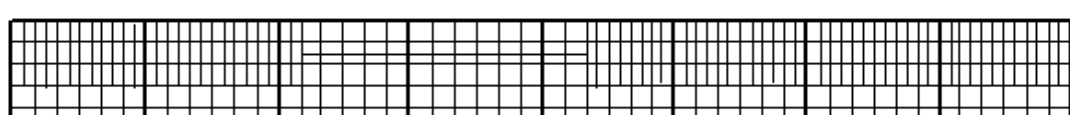
Dec. 06, 2024



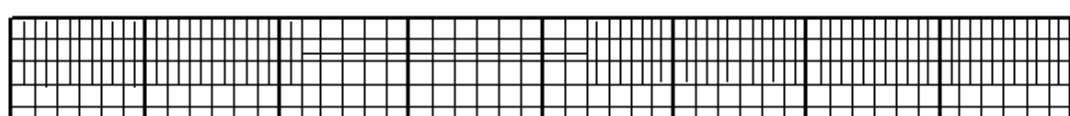
Dec. 07, 2024



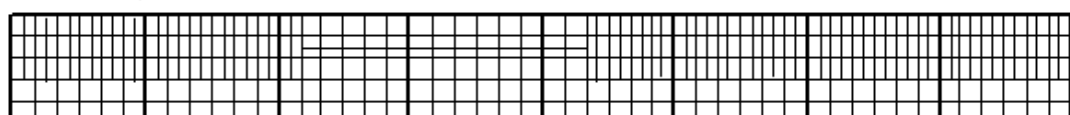
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Dec. 09, 2024



Dec. 10, 2024

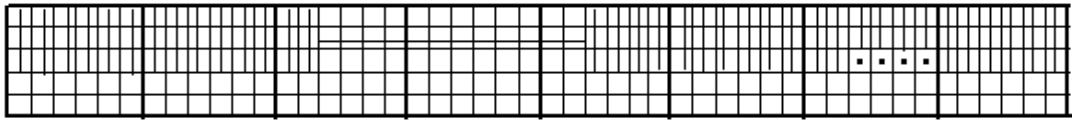


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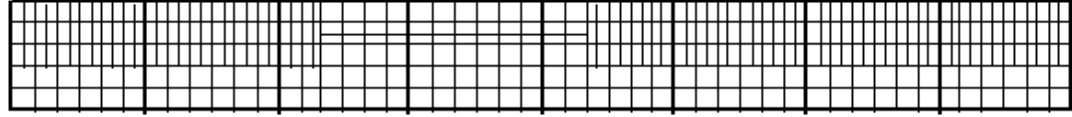
Universal Time

Verhnetulomsky ascaplots

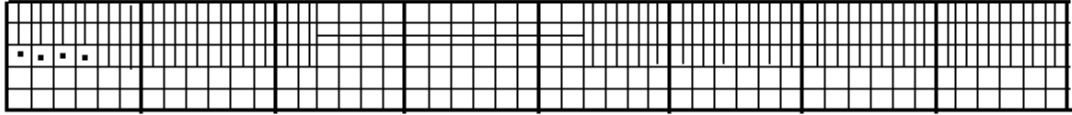
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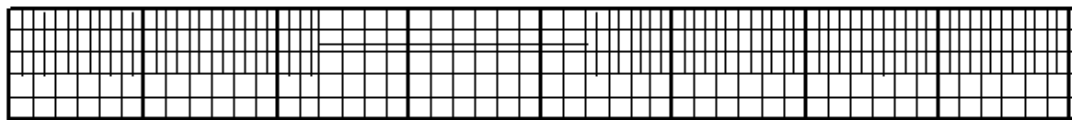
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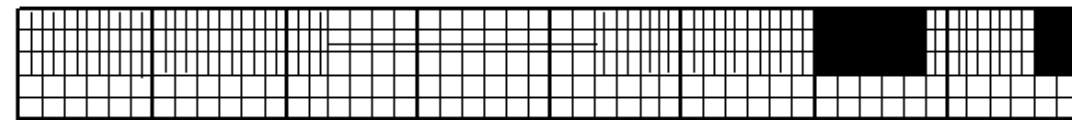
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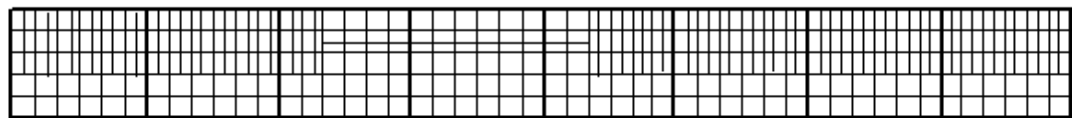
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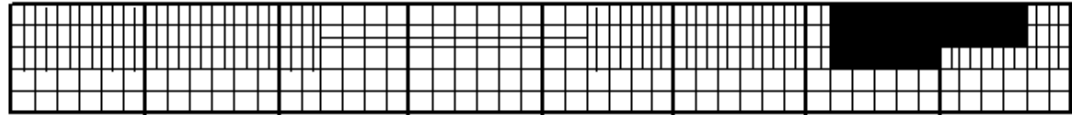
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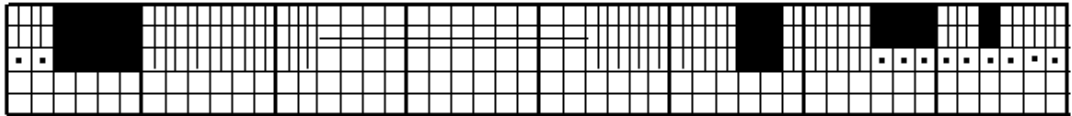
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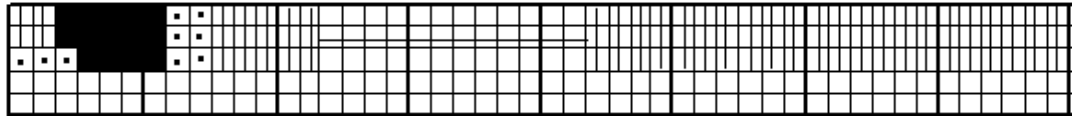
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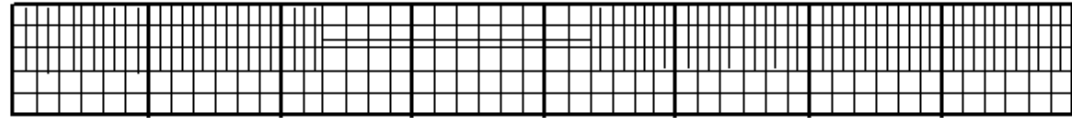
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Dec. 19, 2024



Dec. 20, 2024

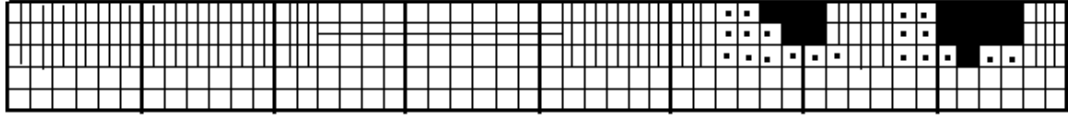


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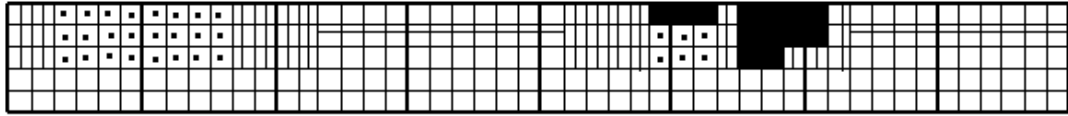
Universal Time

Verhnetulomsky ascaplots

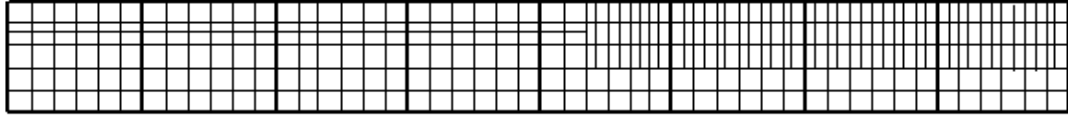
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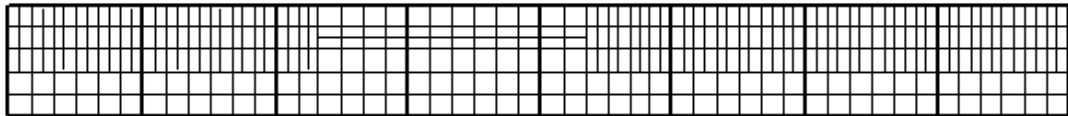
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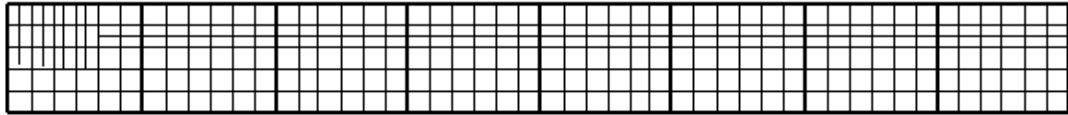
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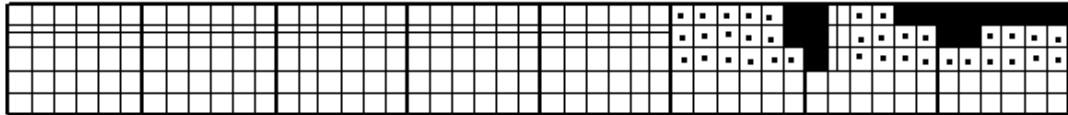
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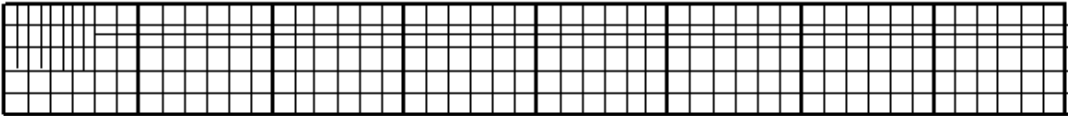
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Dec. 26, 2024



Dec. 27, 2024



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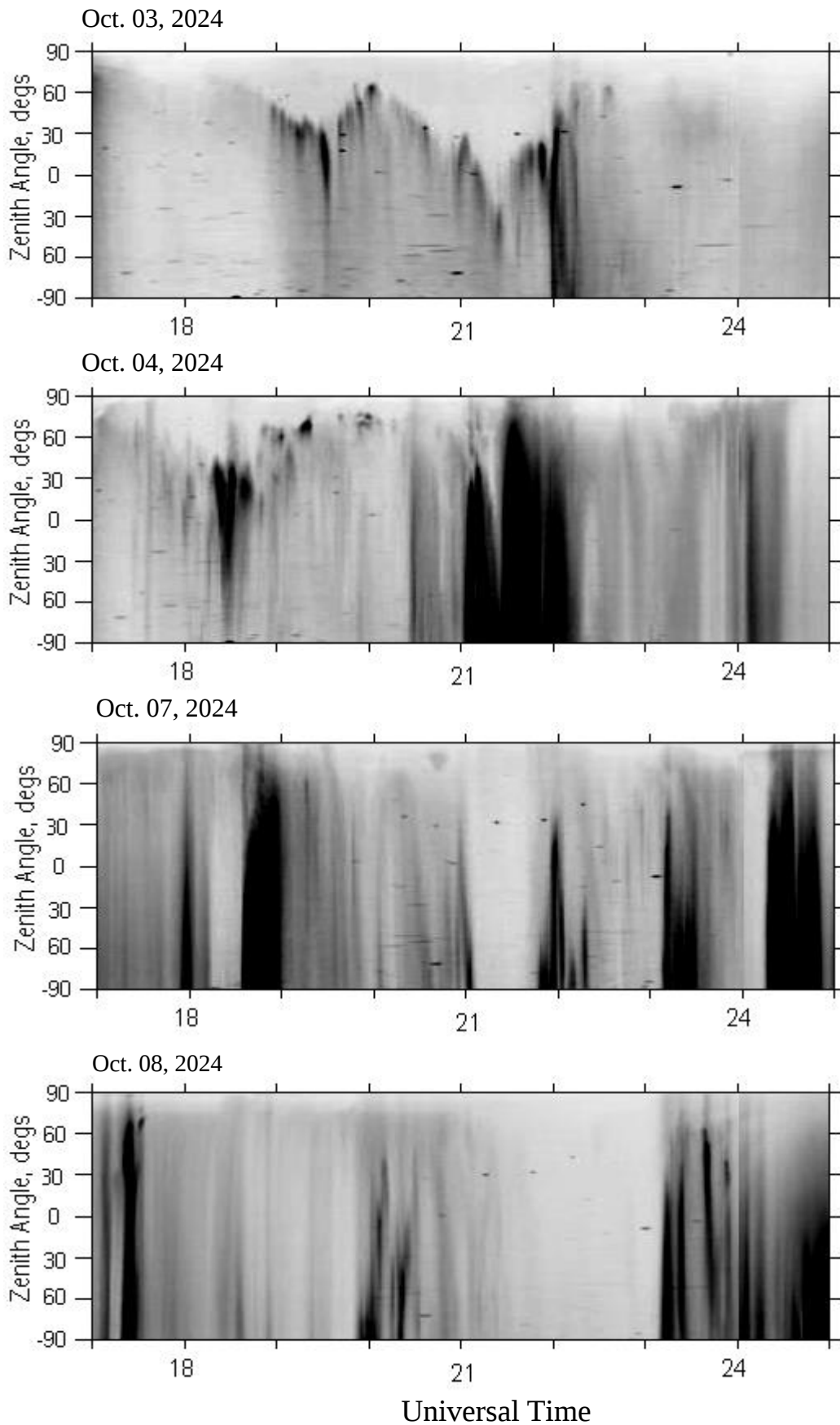
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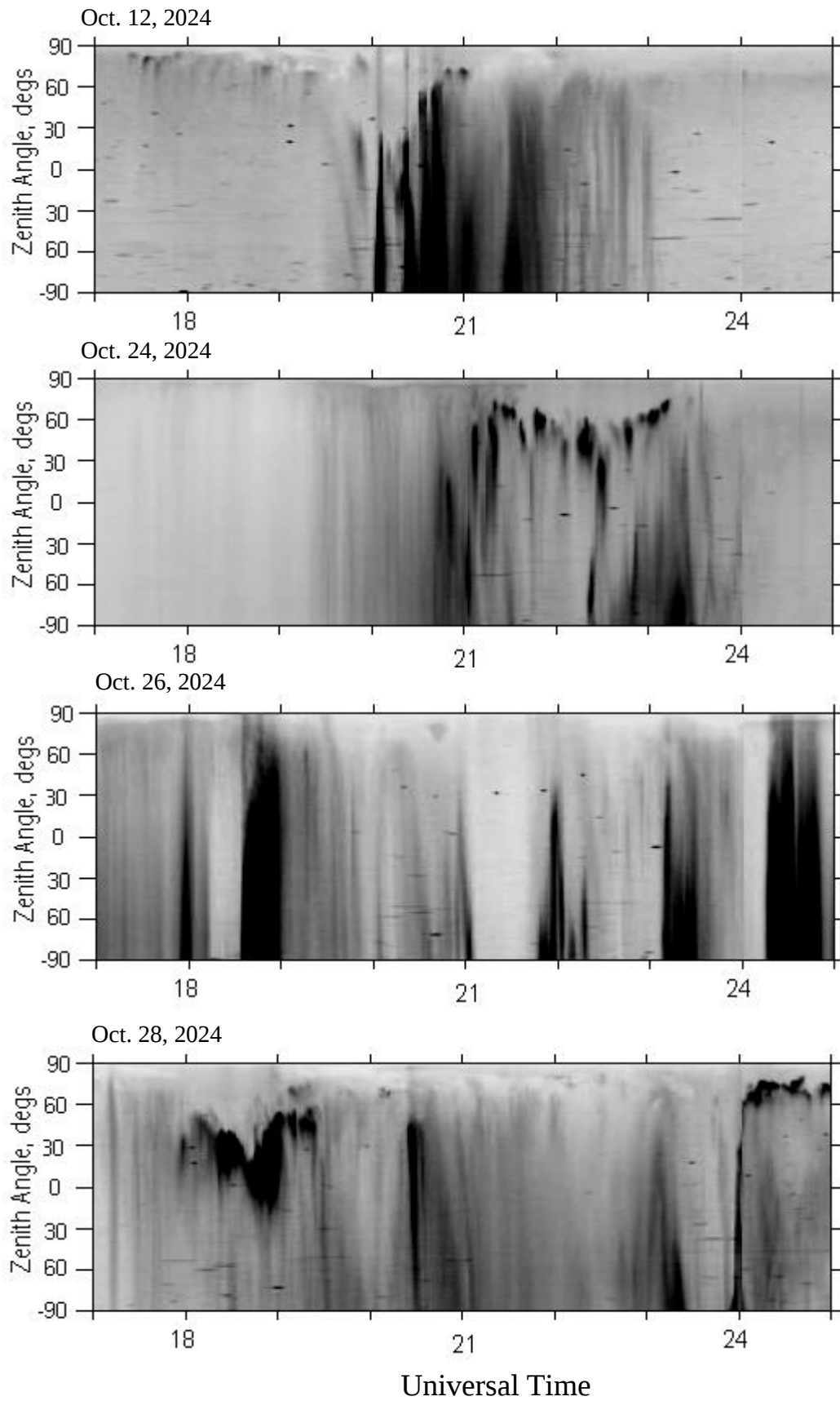
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Universal Time

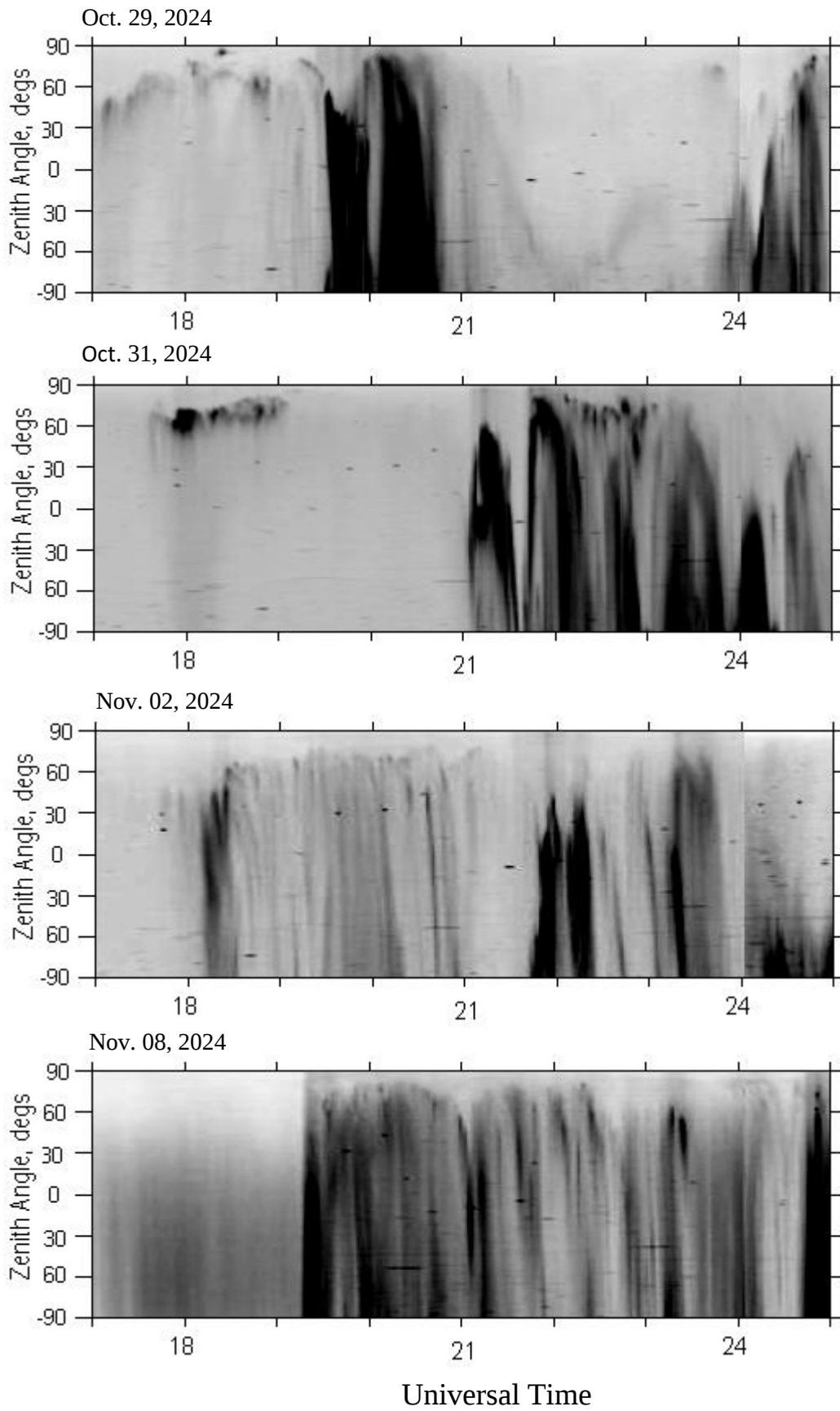
Lovozero TV keograms



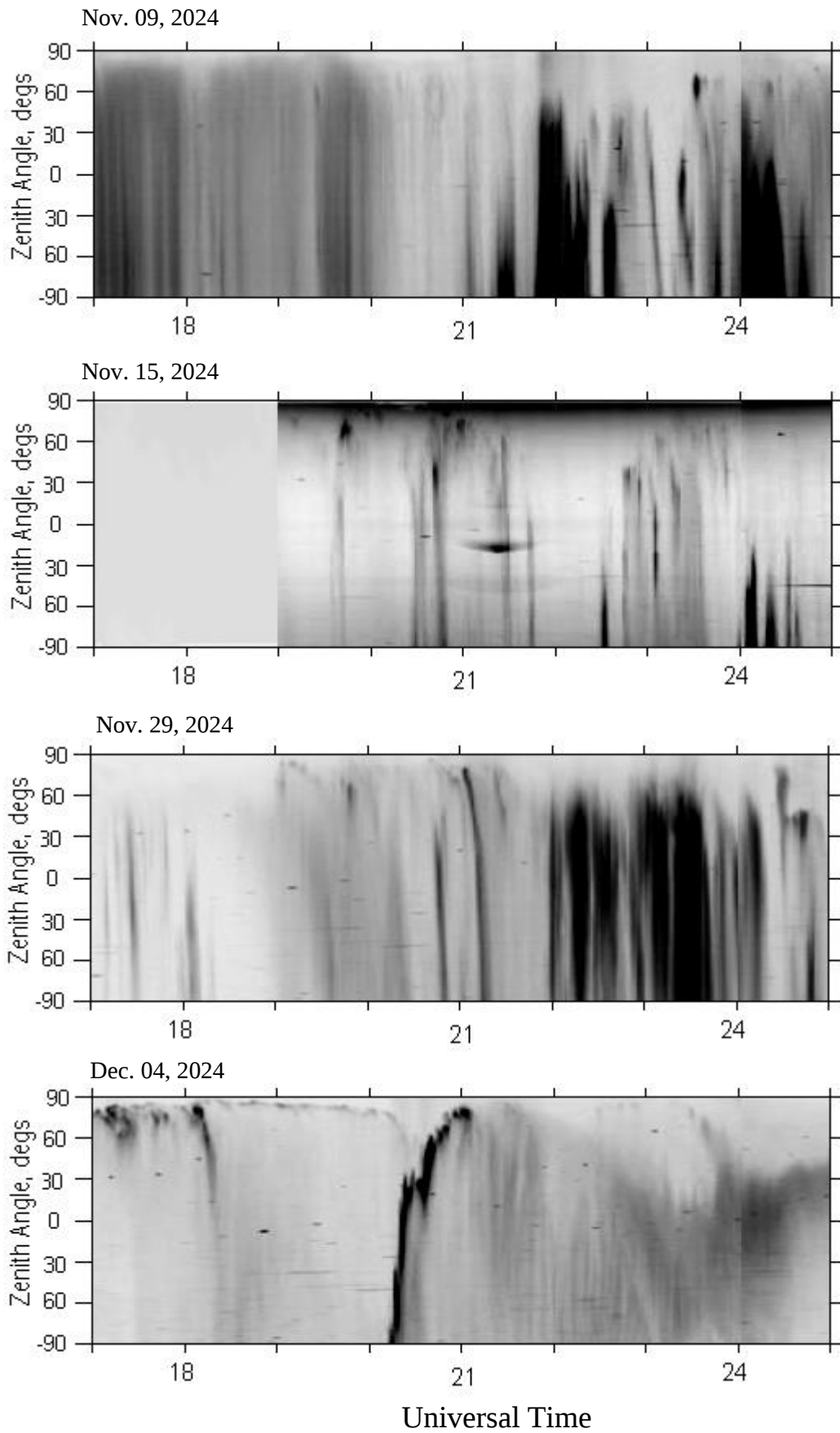
Lovozero TV keograms



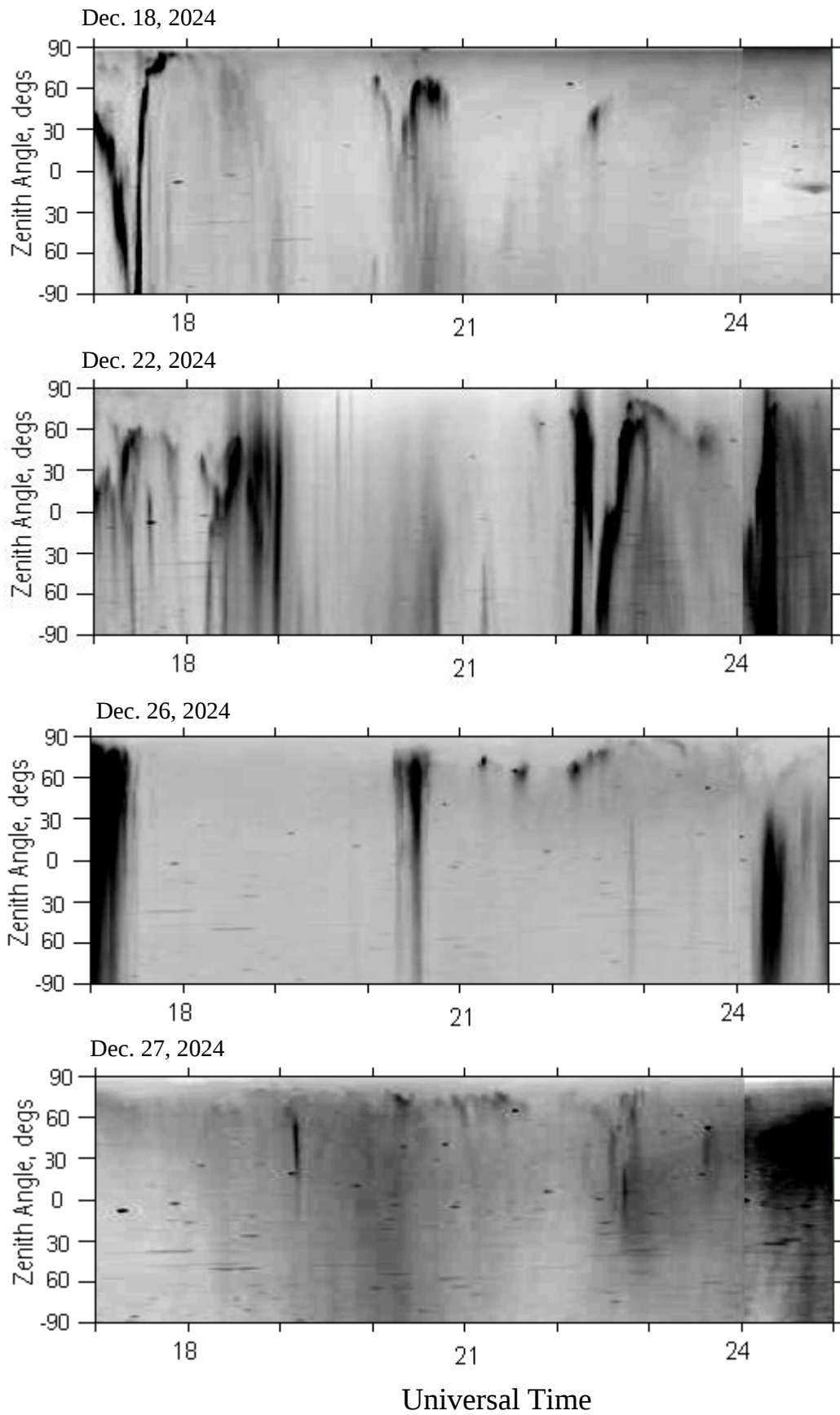
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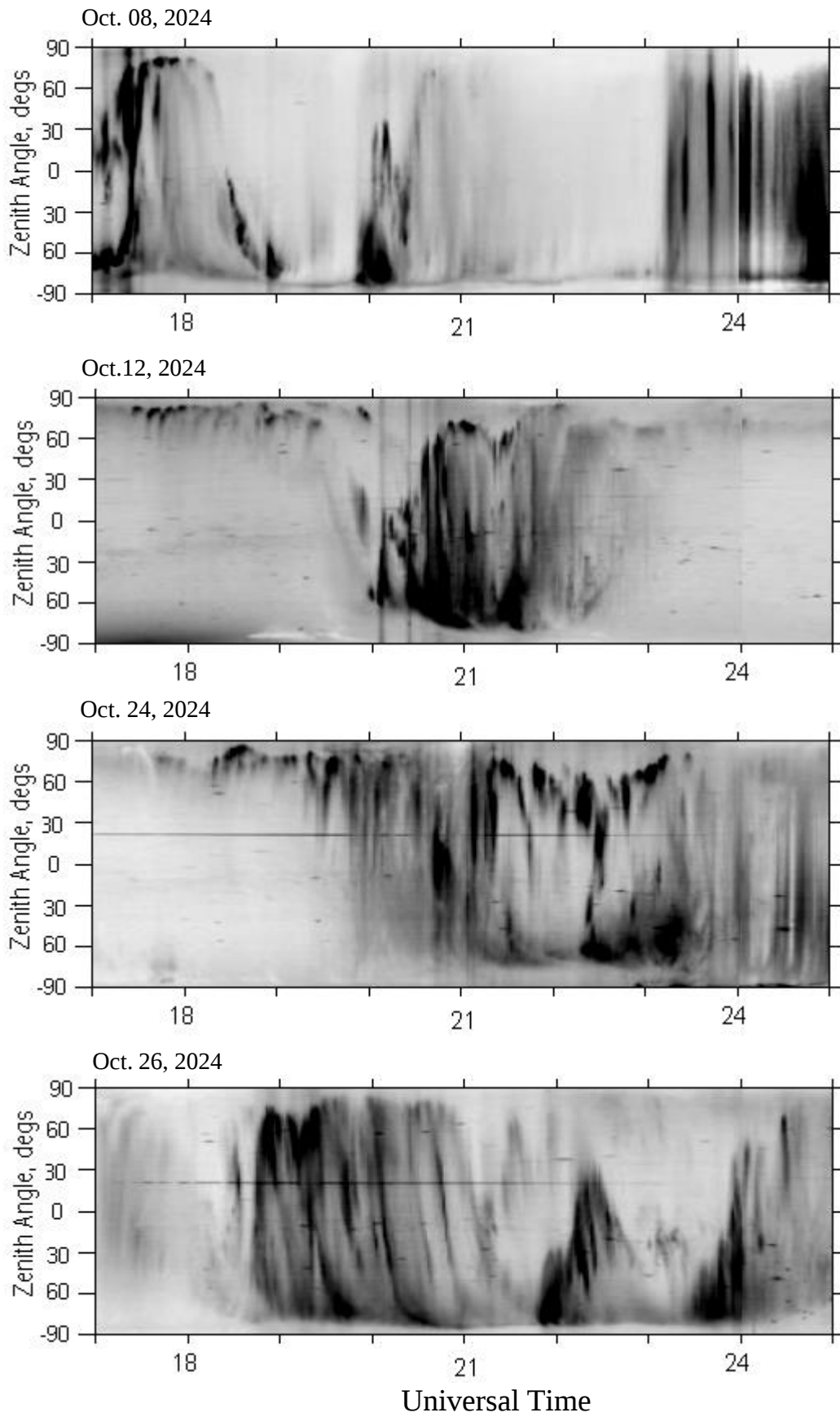
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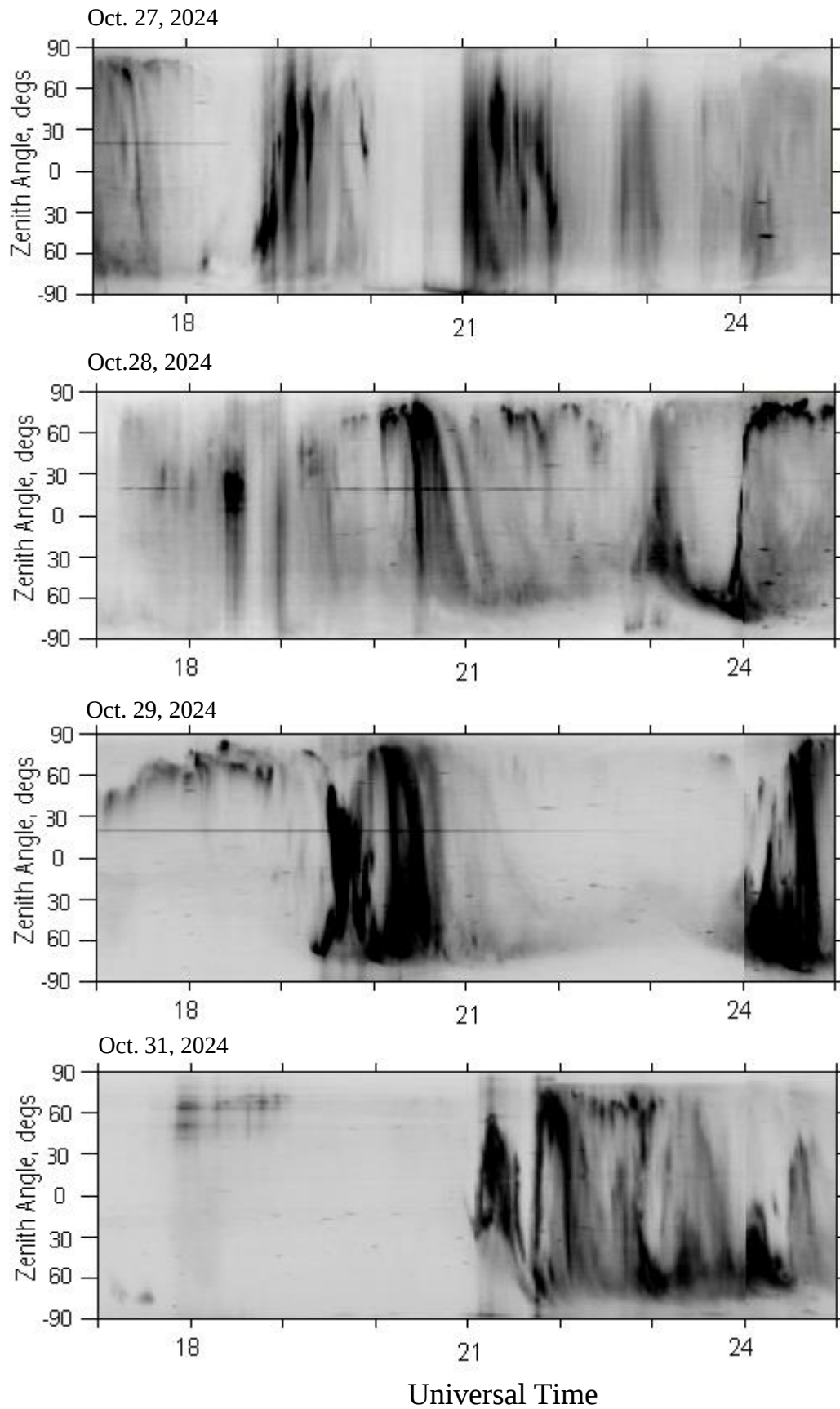
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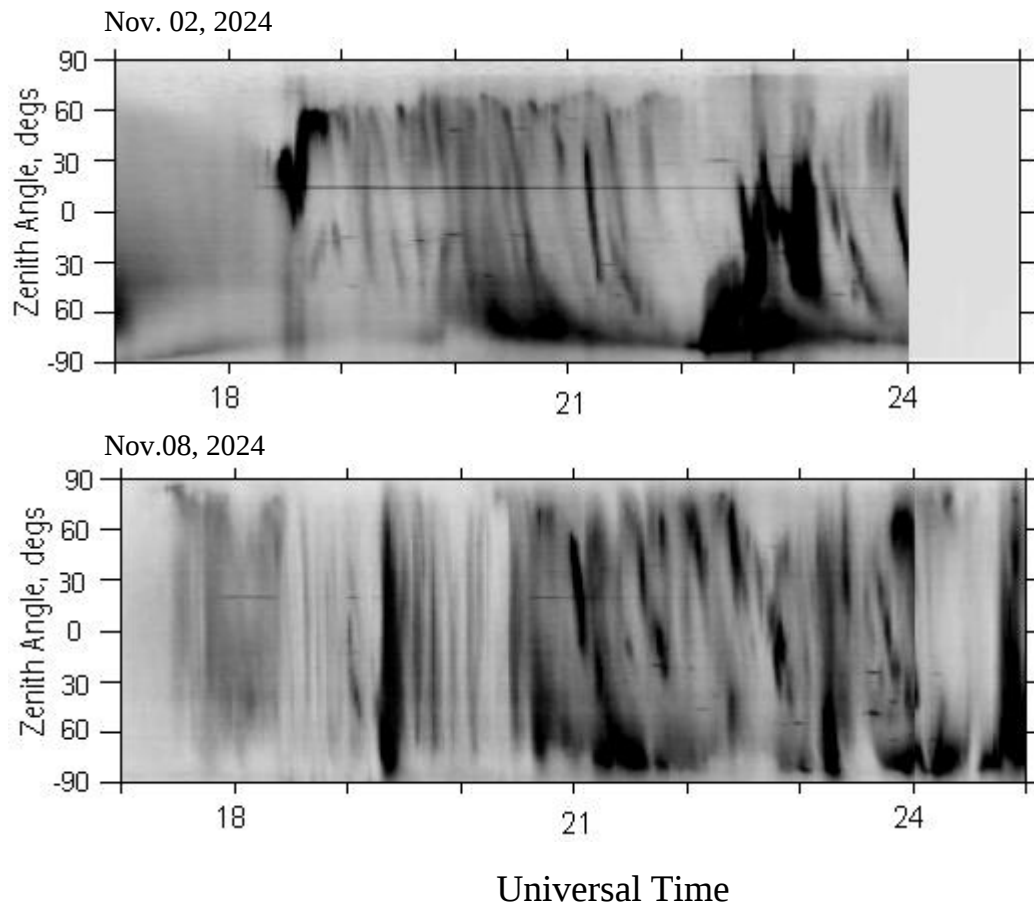
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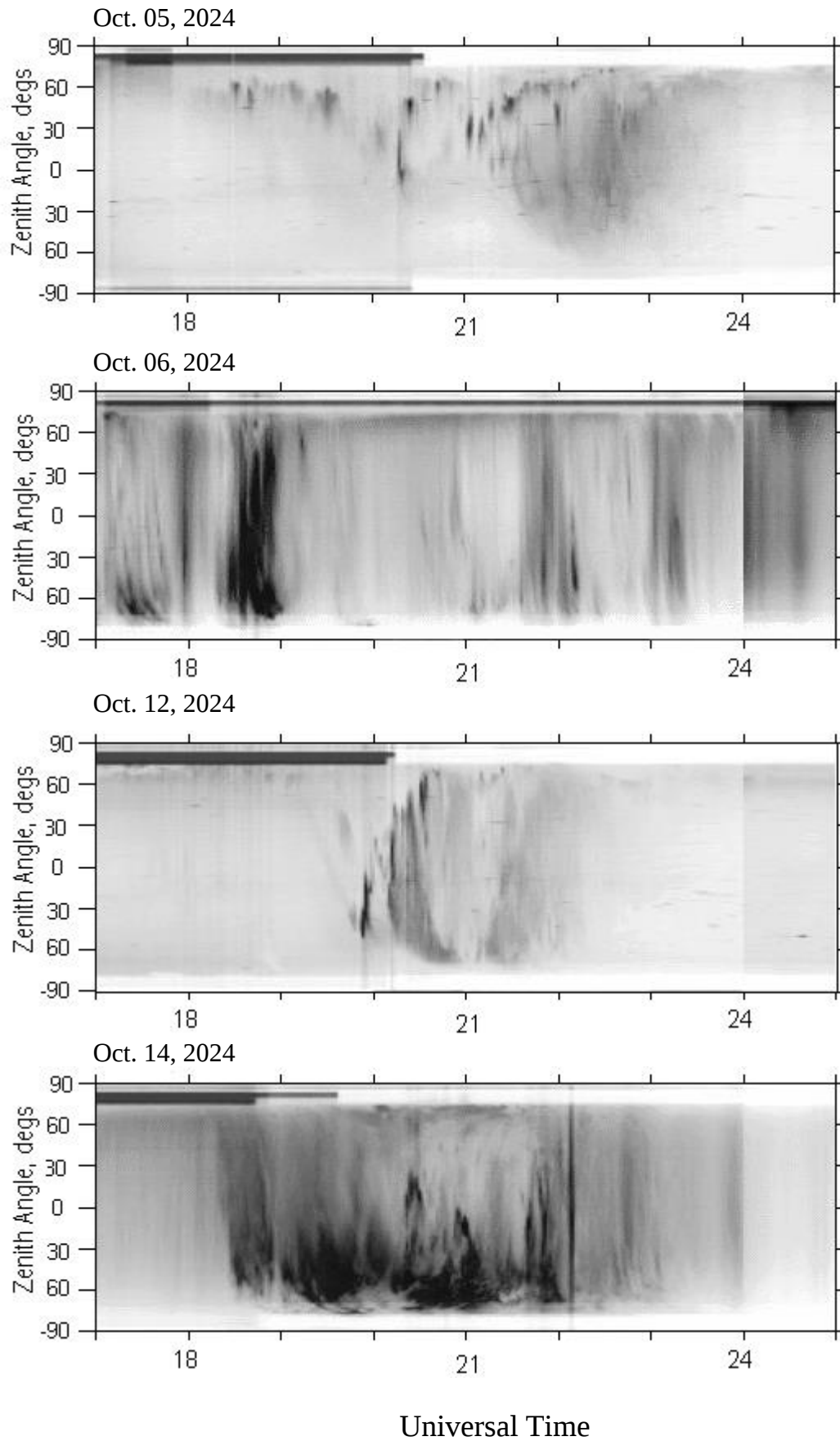
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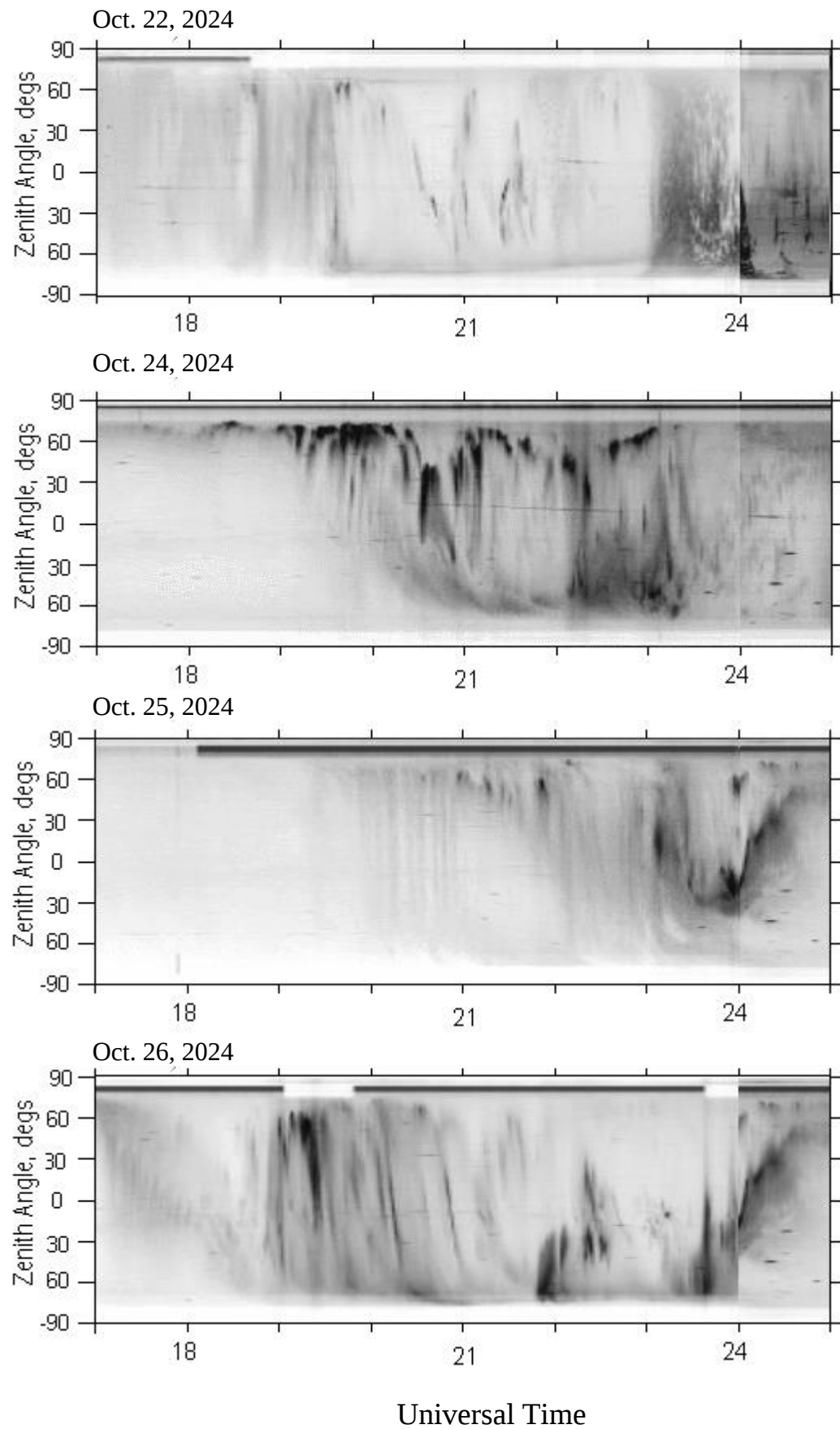
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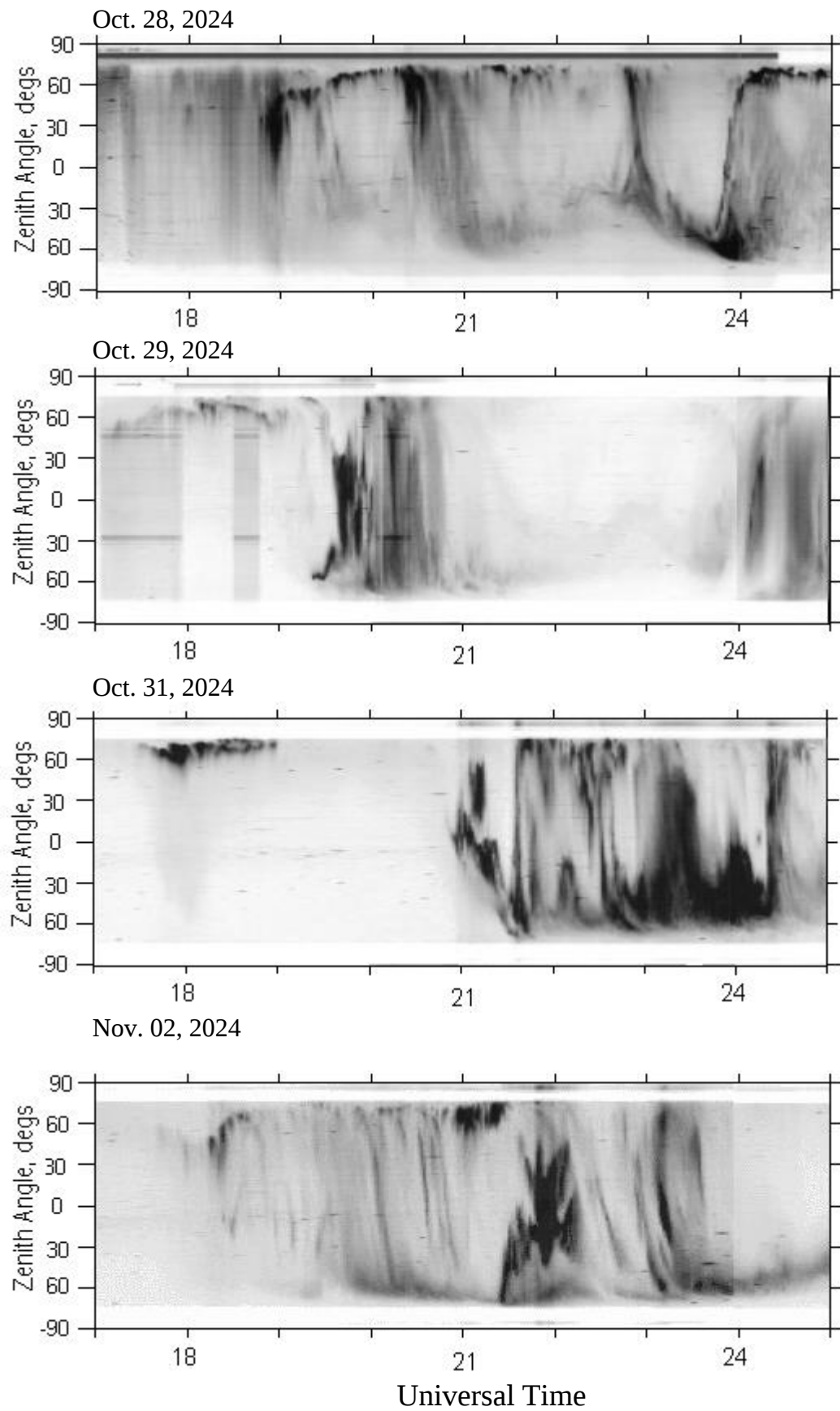
Verhnetulomsky TV keograms



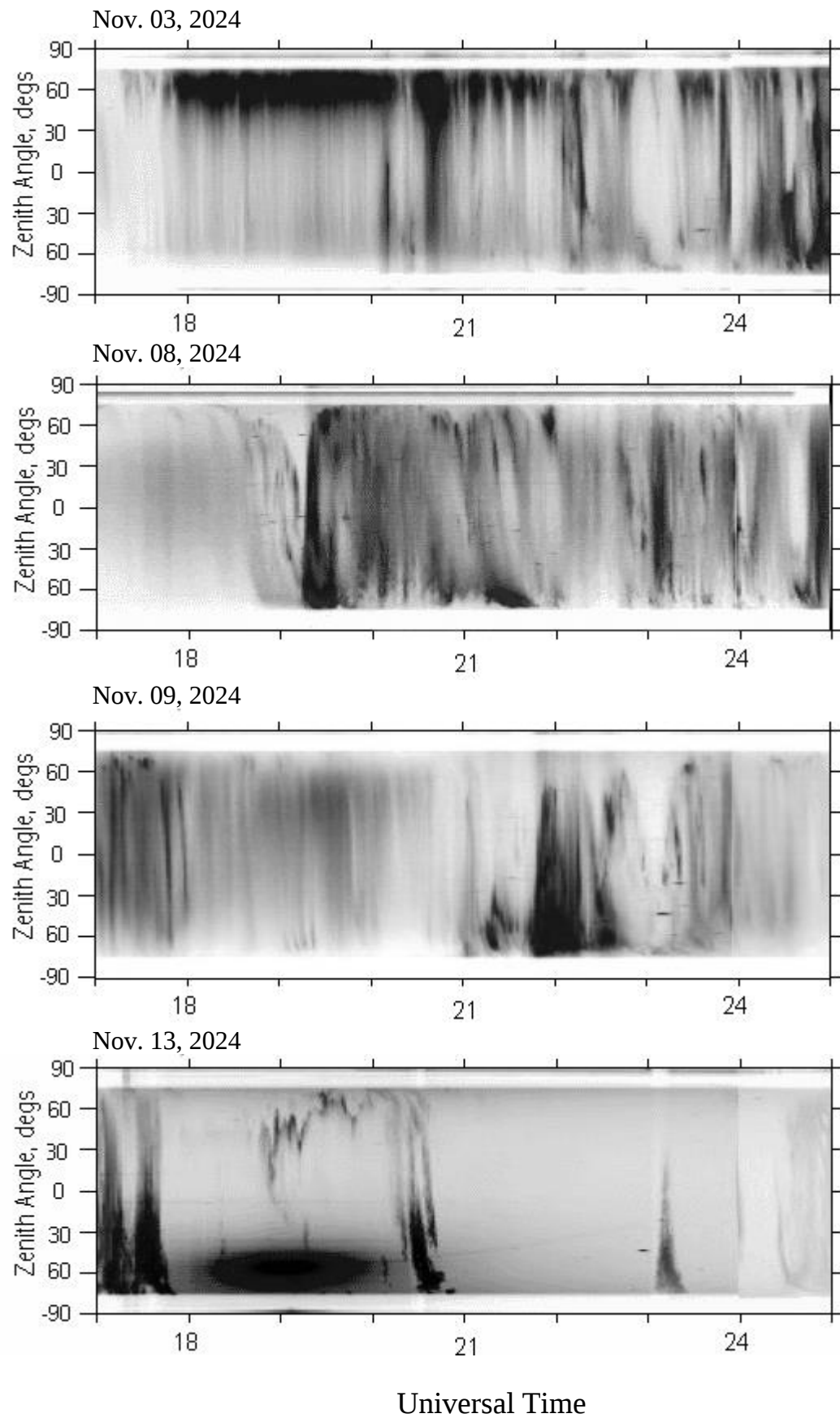
Verhnetulomsky TV keograms



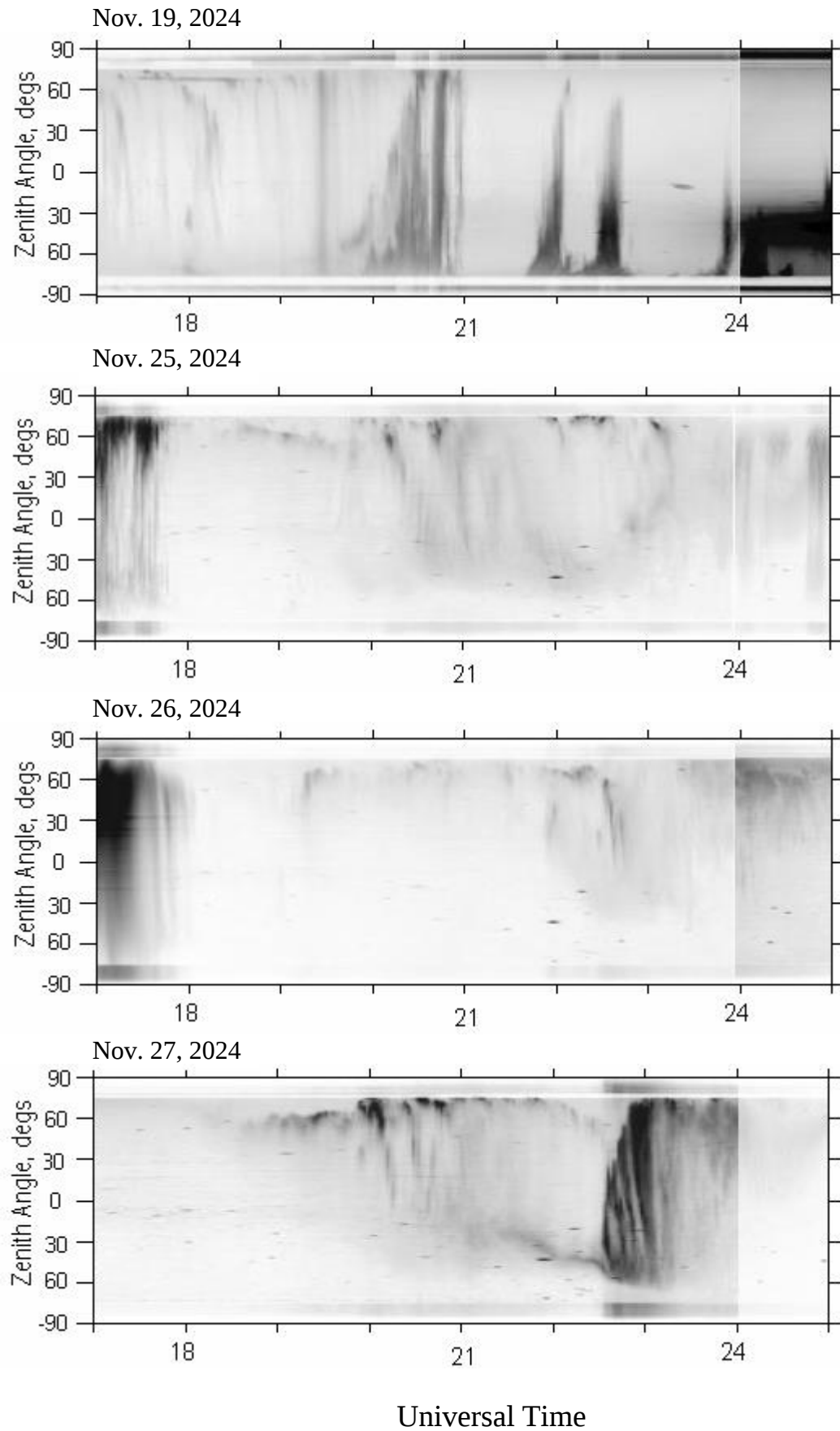
Verhnetulomsky TV keograms



Verhnetulomsky TV keograms

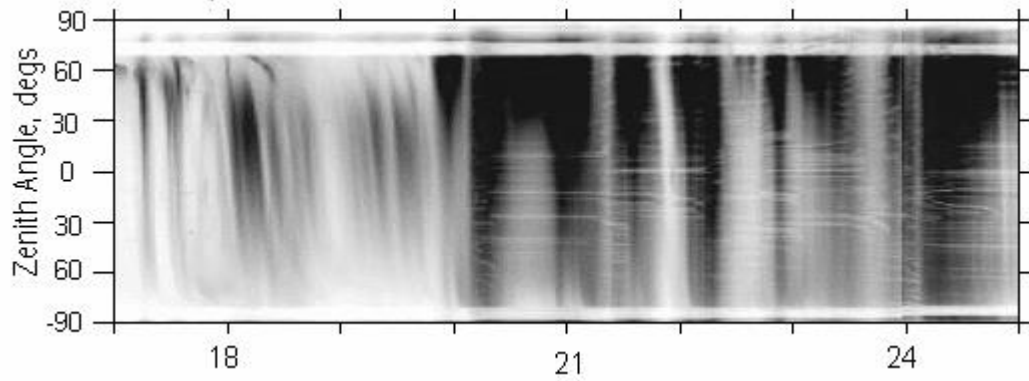


Verhnetulomsky TV keograms

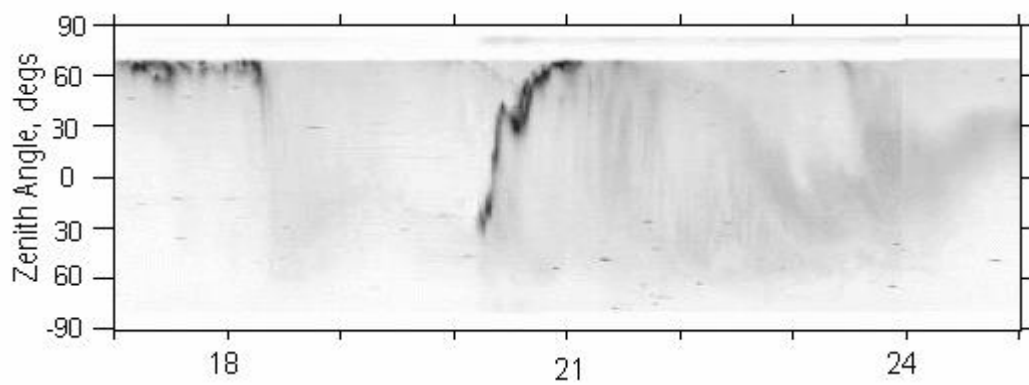


Verhnetulomsky TV keograms

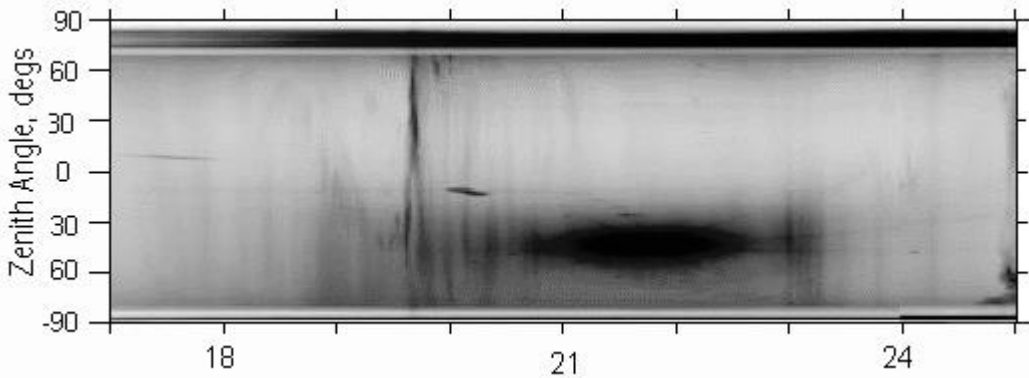
Dec. 03, 2024



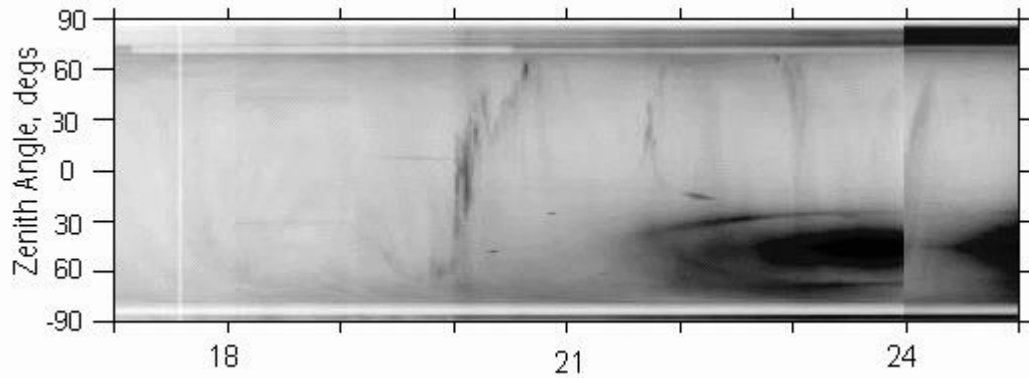
Dec. 04, 2024



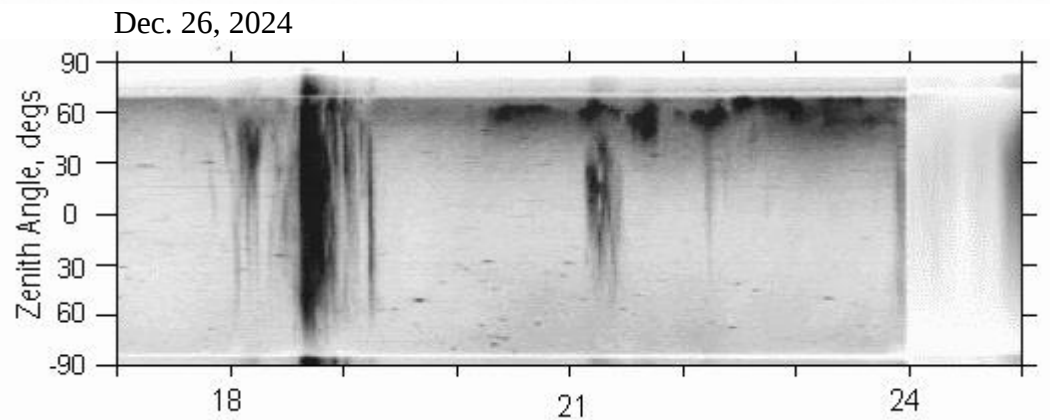
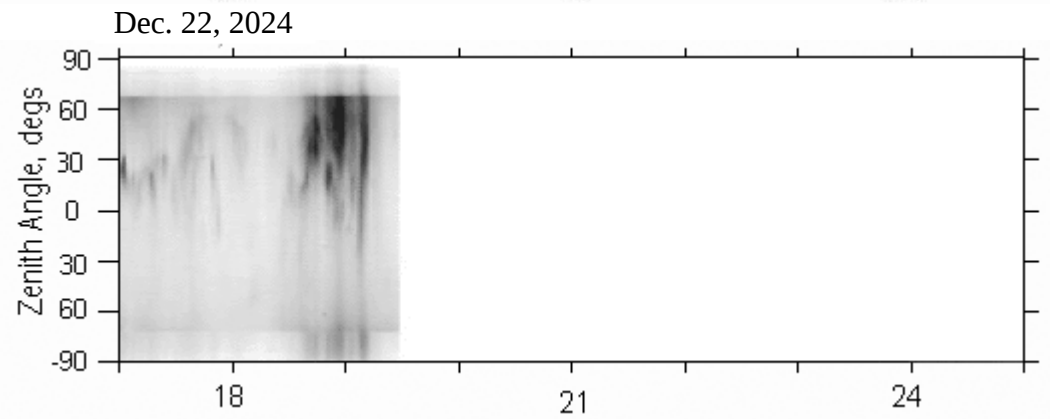
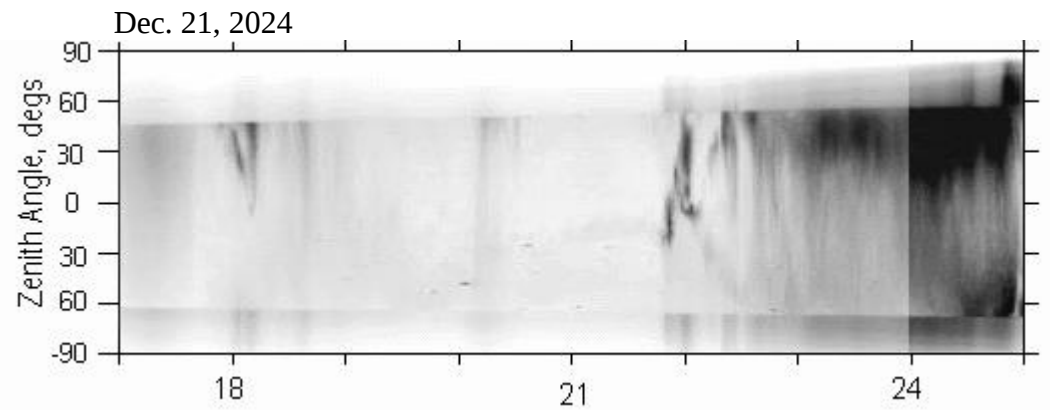
Dec. 15, 2024



Dec. 17, 2024



Universal Time
Verhnetulomsky TV keograms

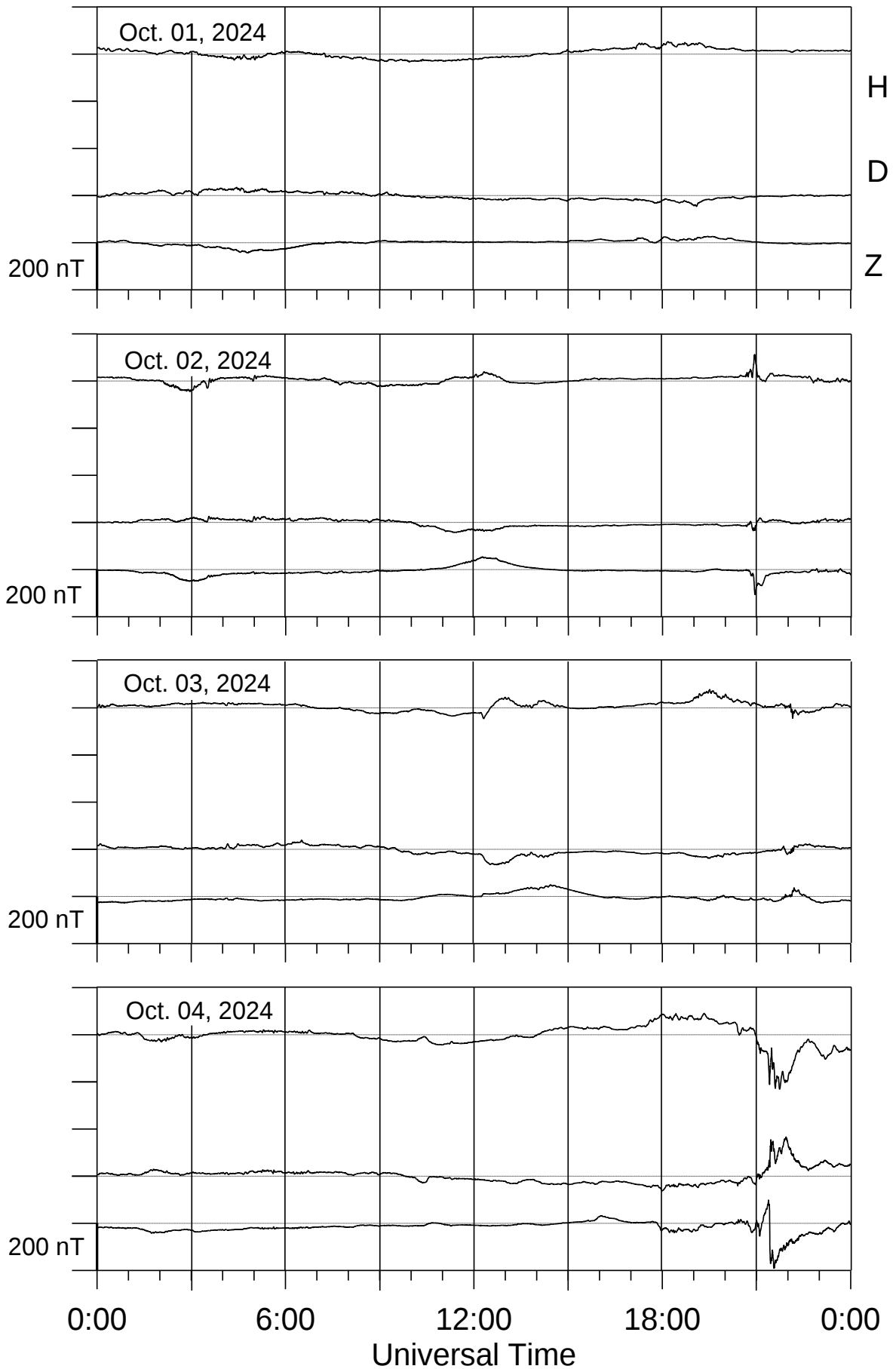


Universal Time

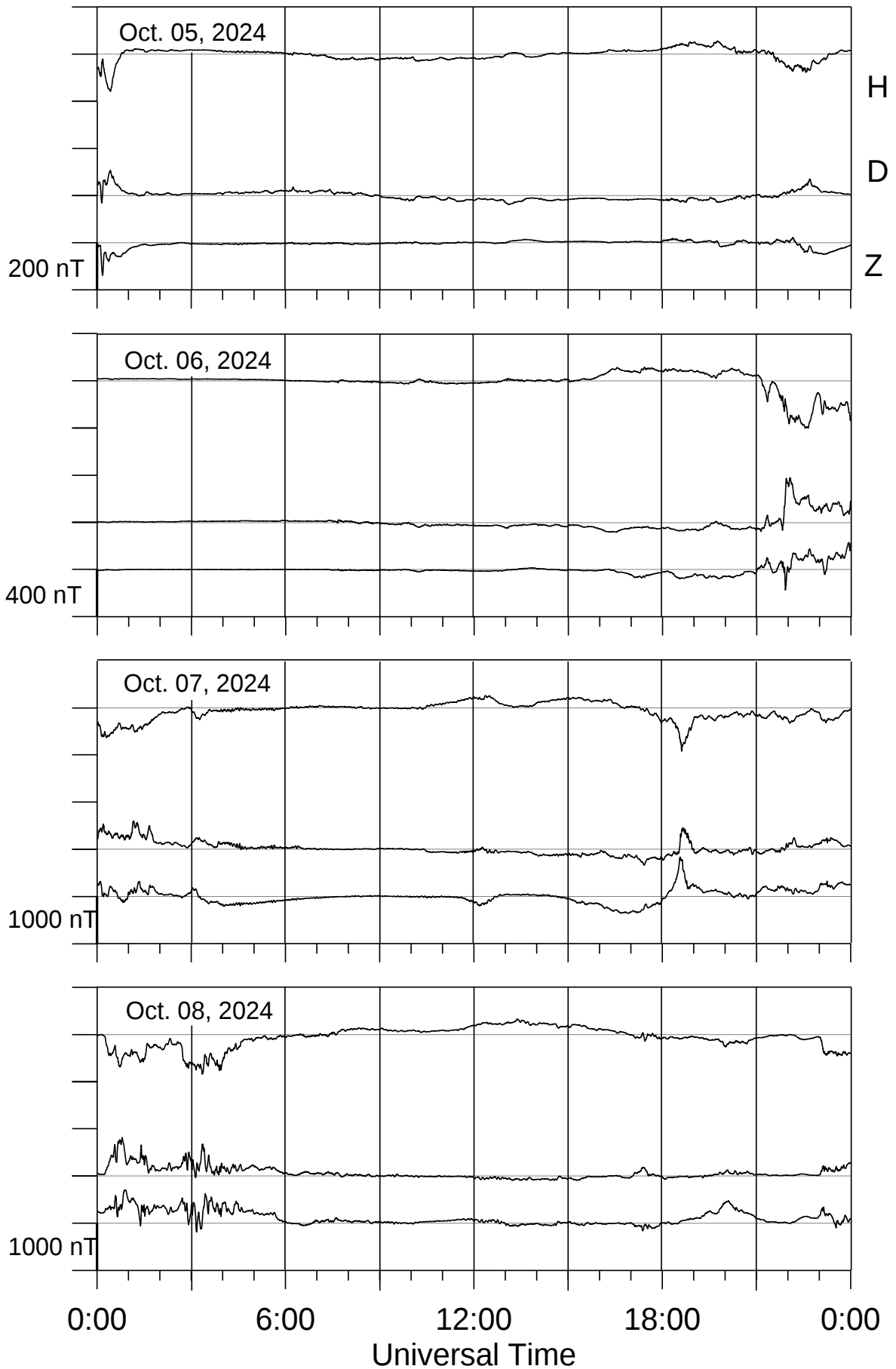
LOPARSKAYA MAGNETOGRAMS

October - December 2024

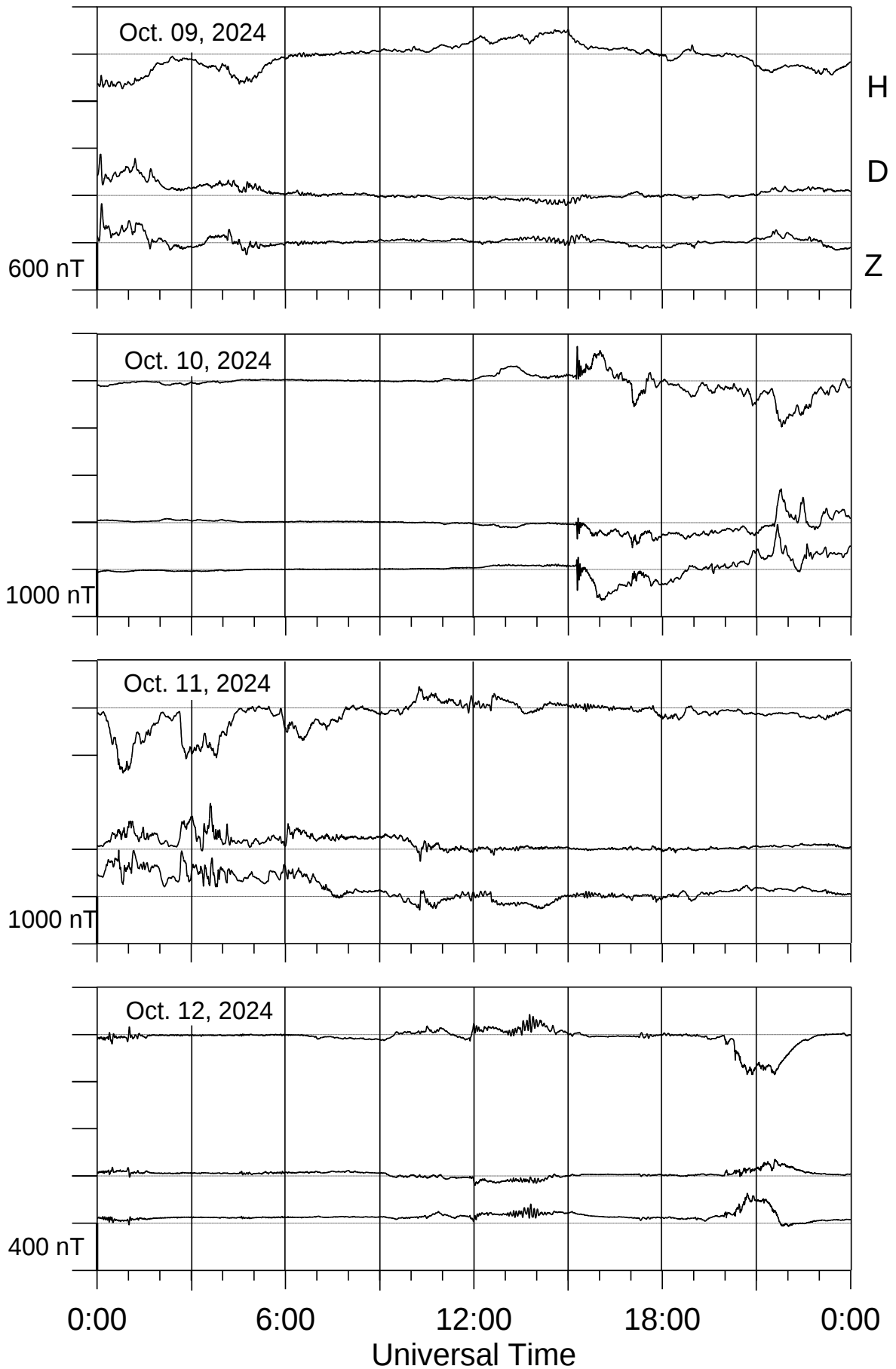
Loparskaya magnetometer



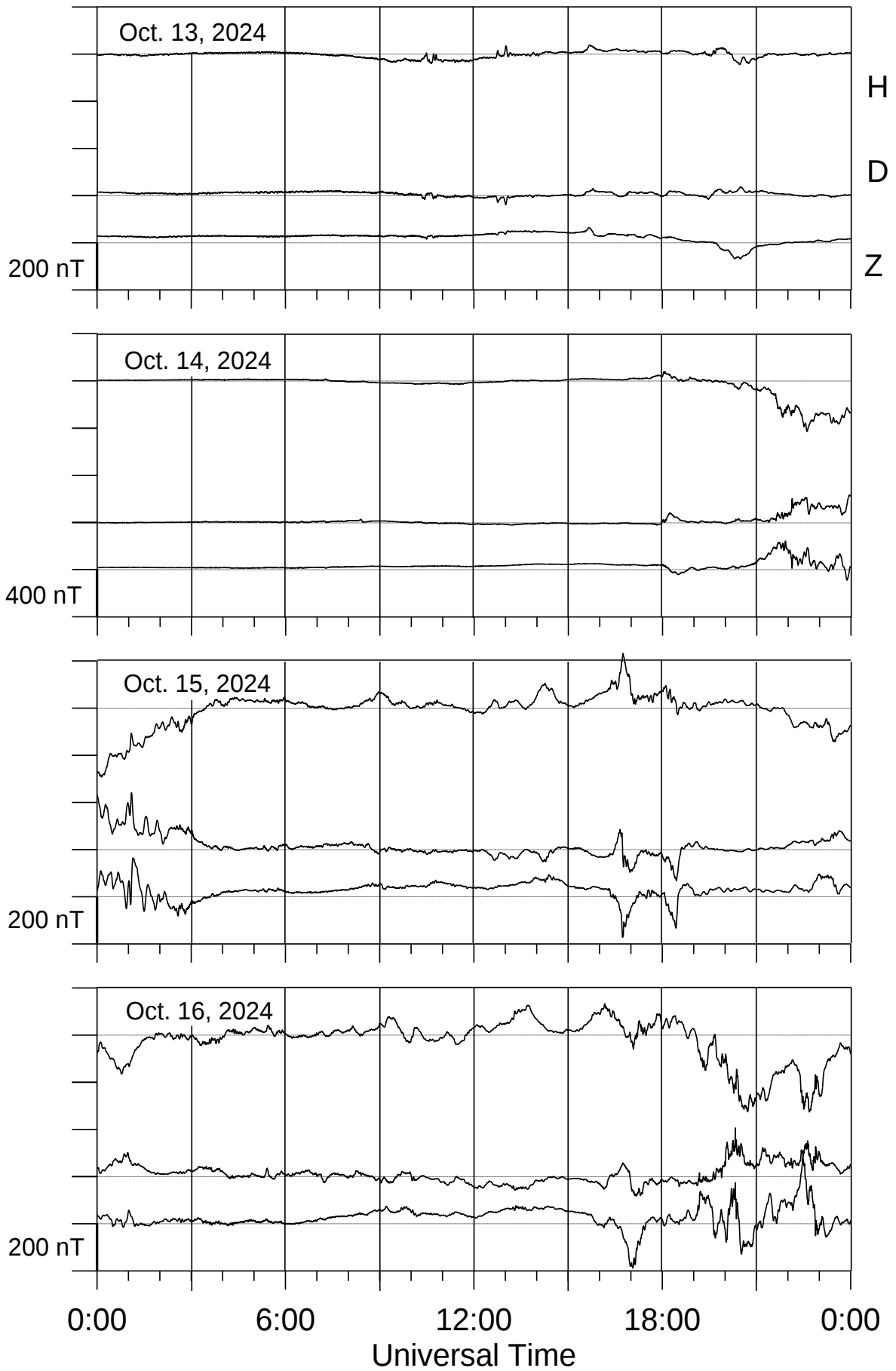
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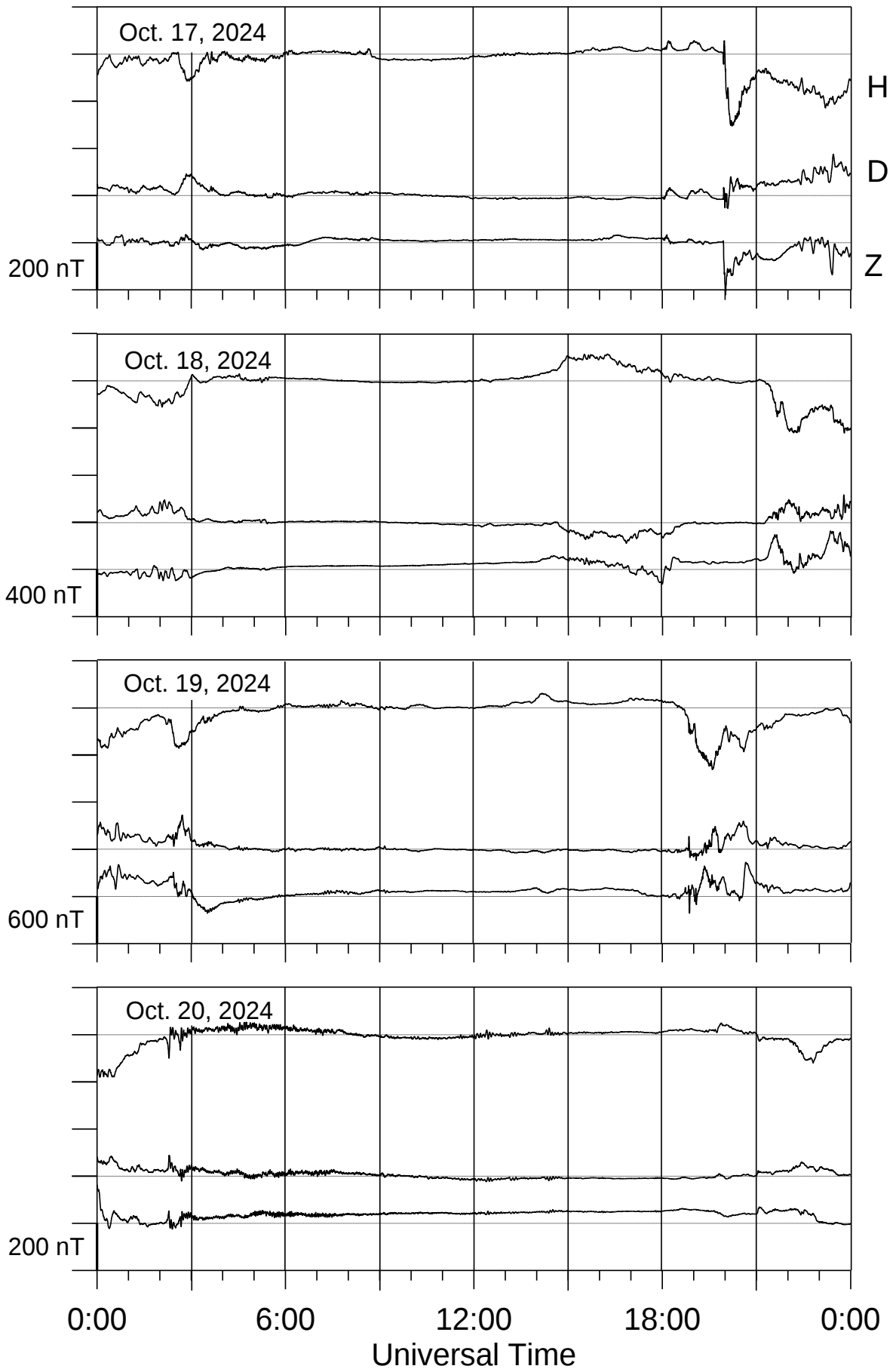
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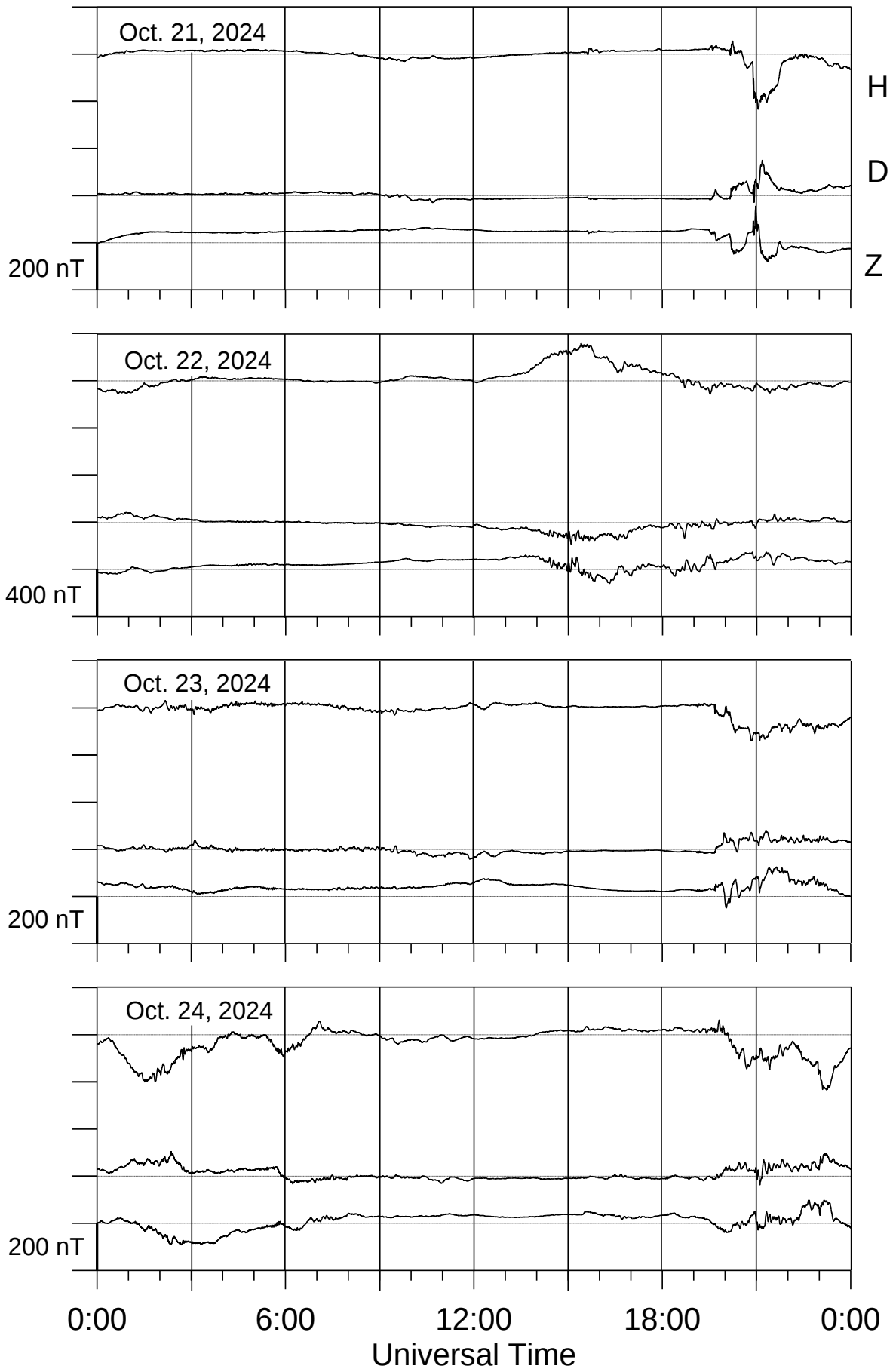
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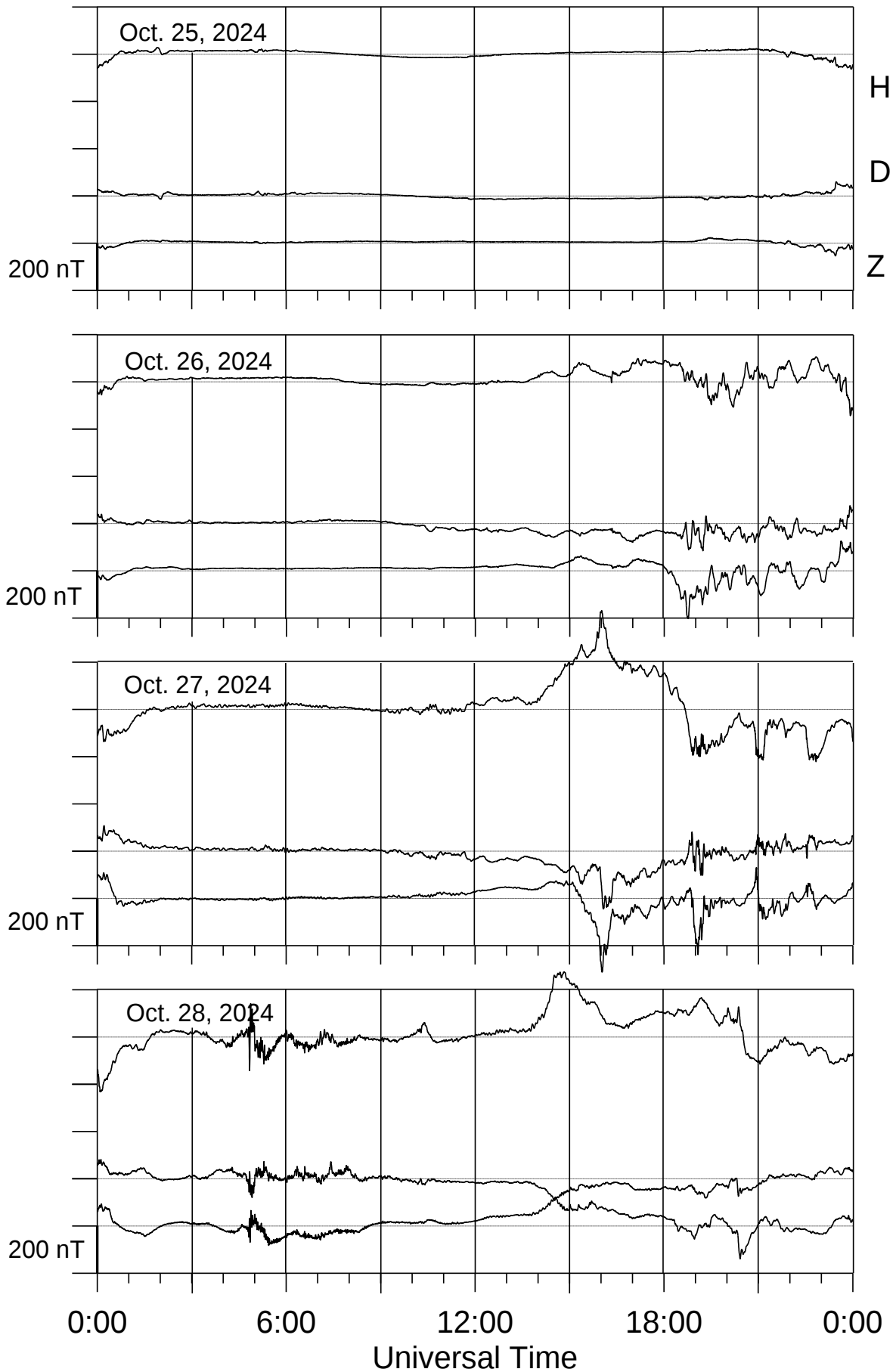
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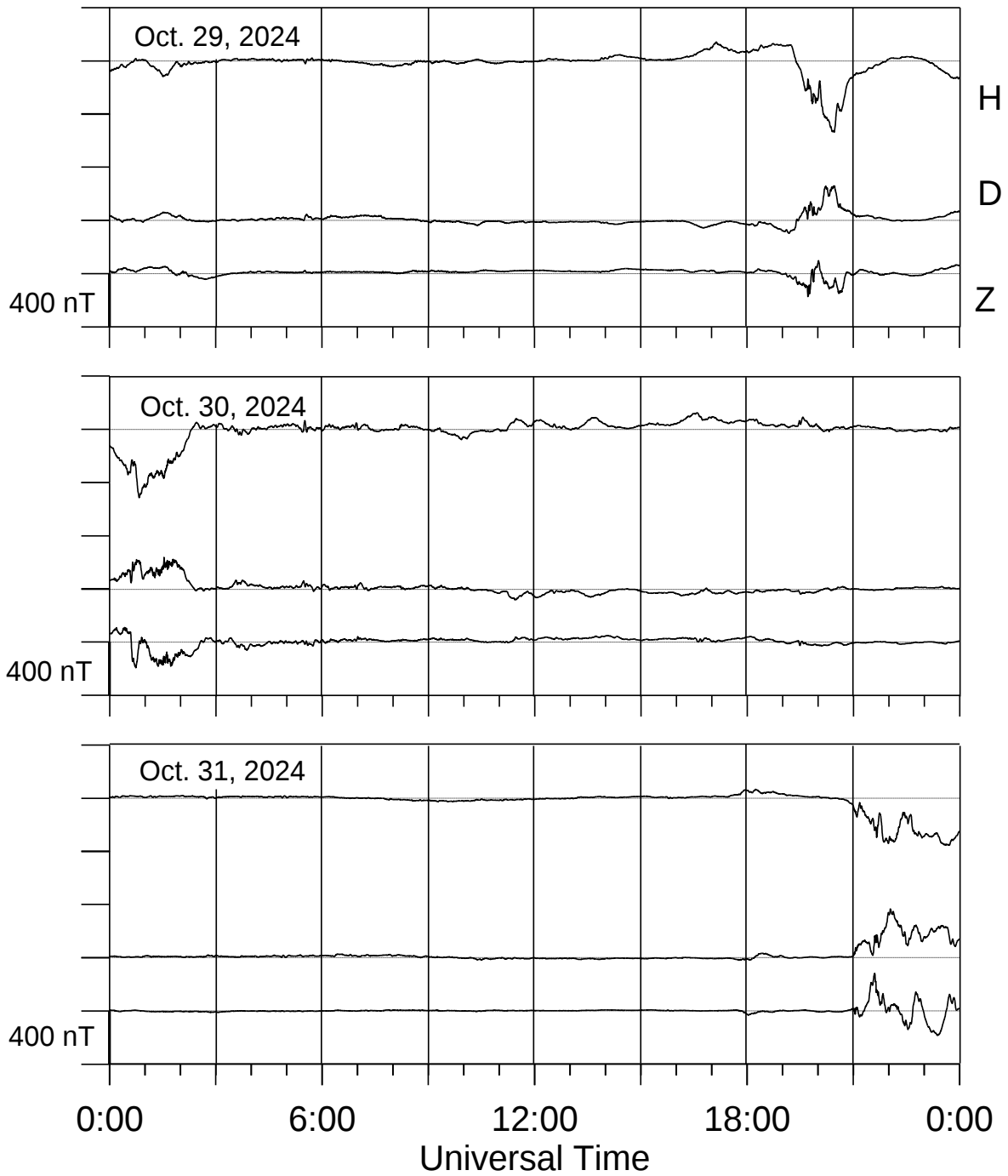
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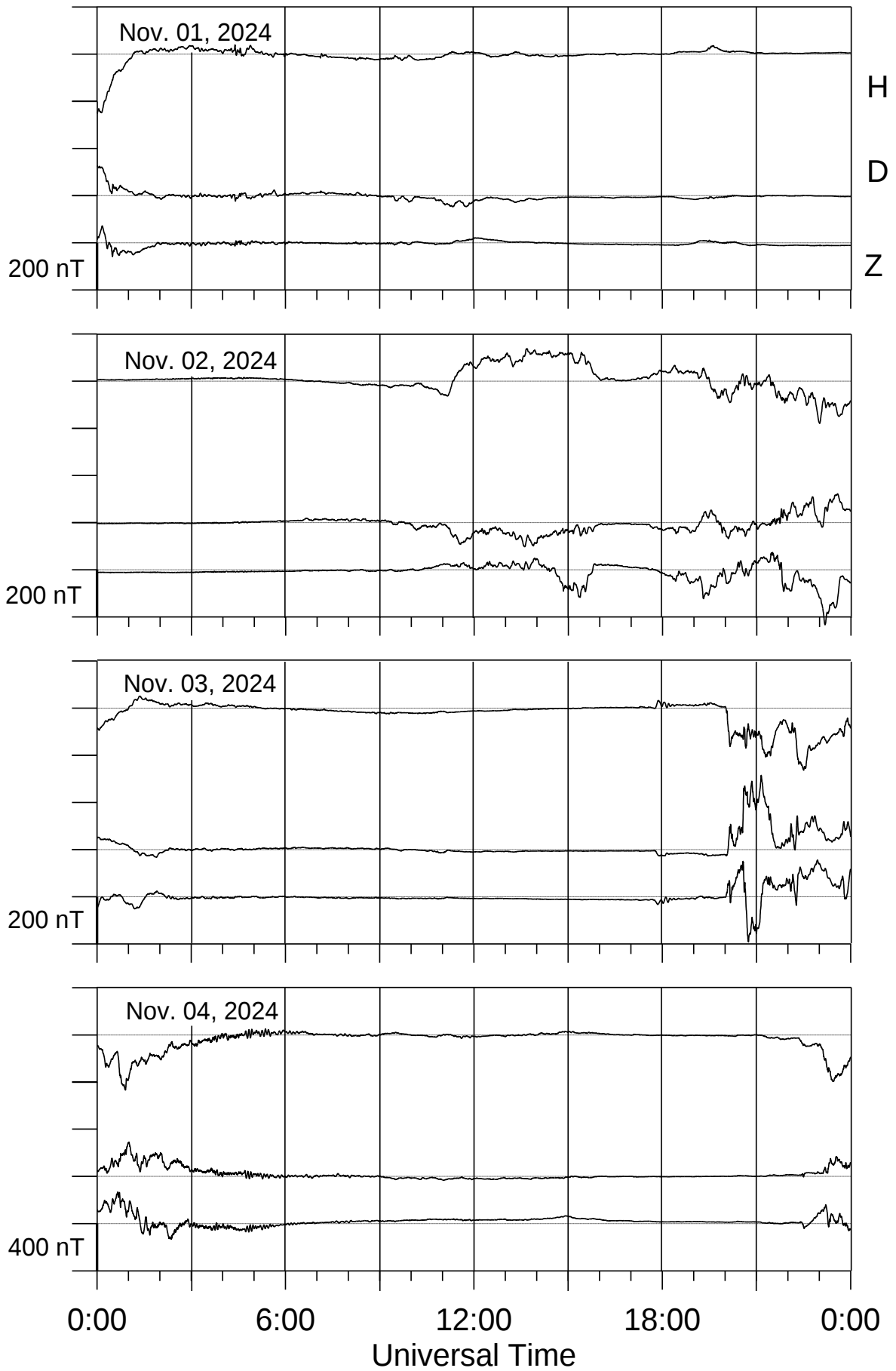
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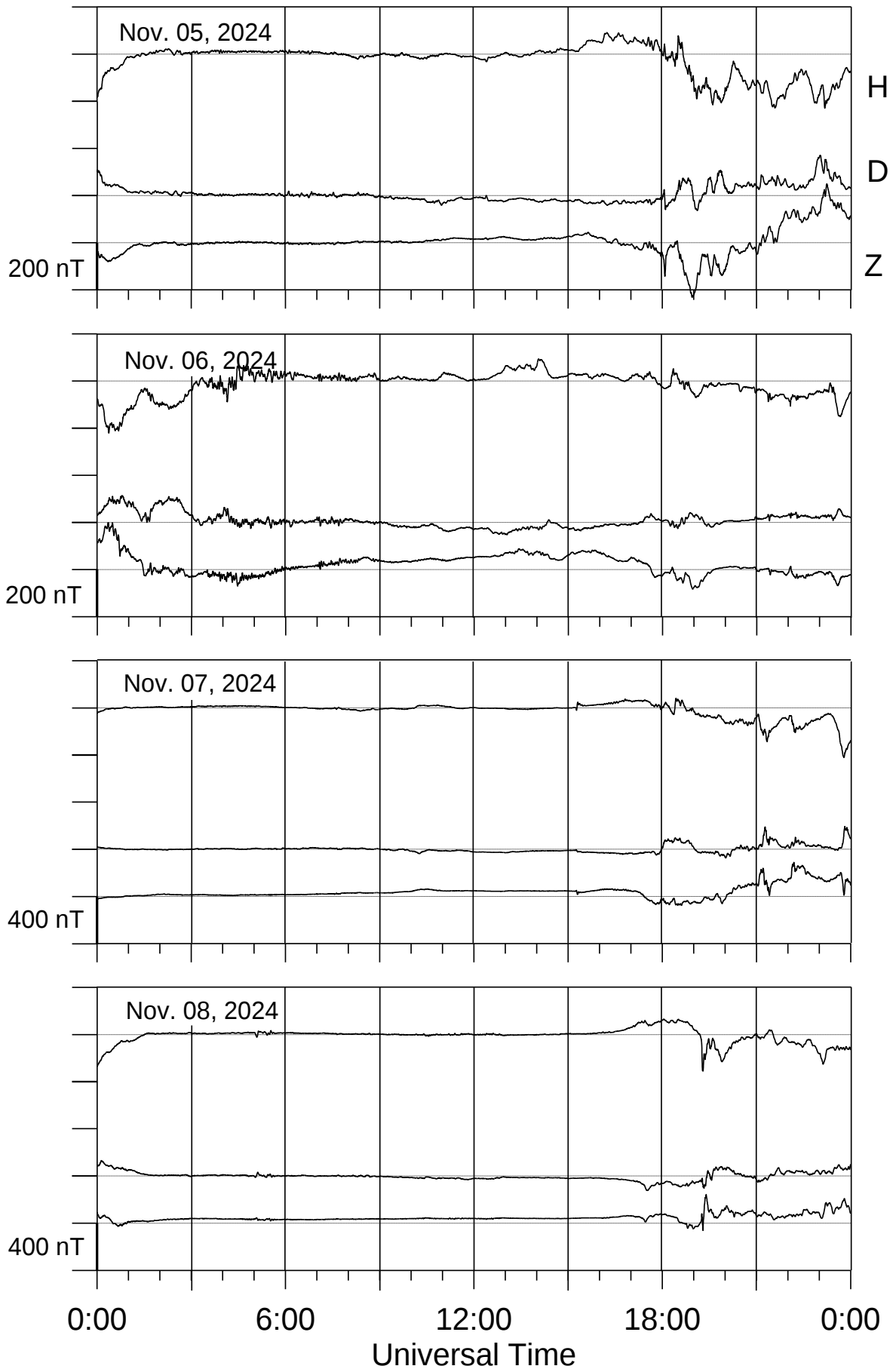
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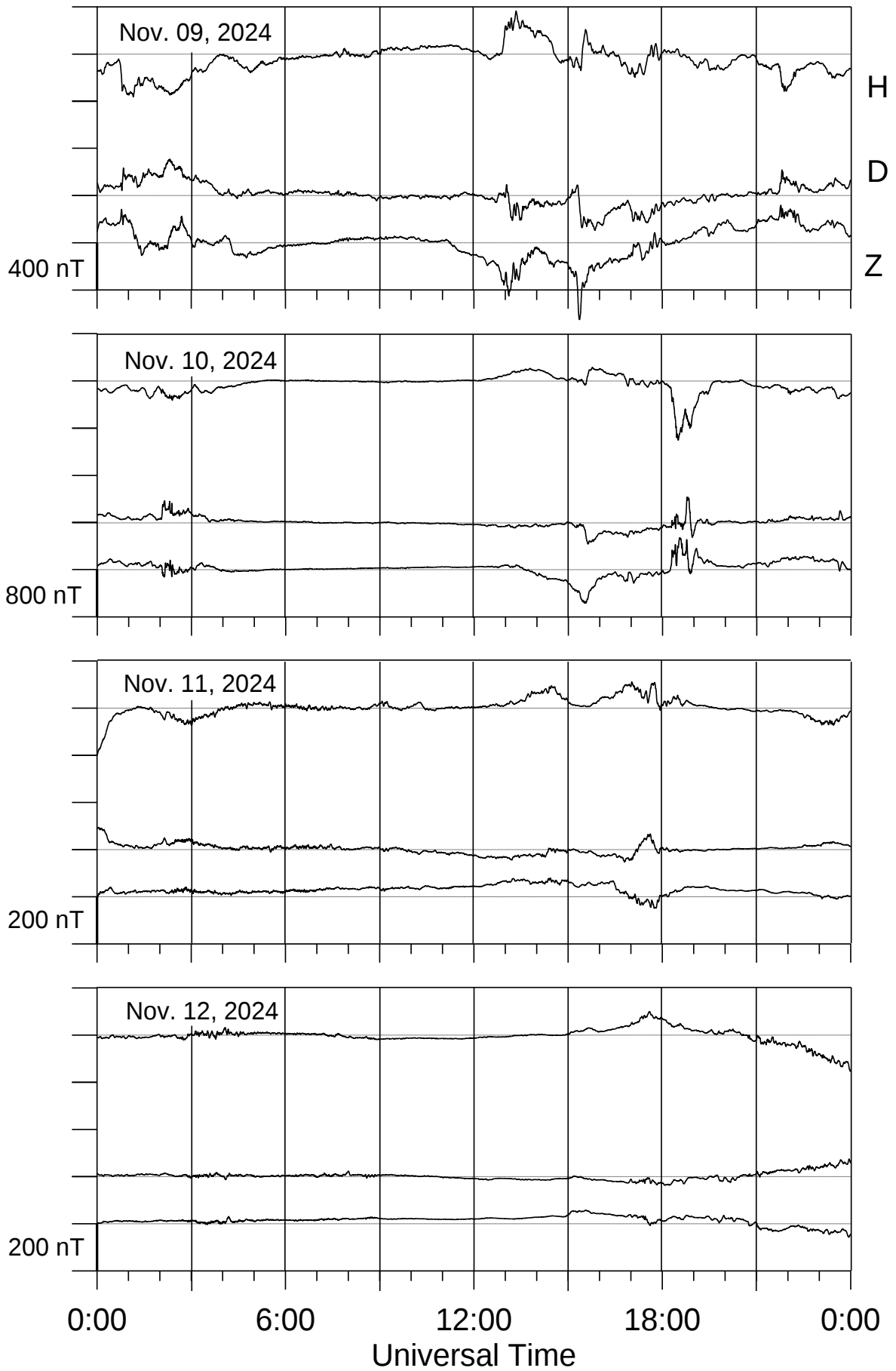
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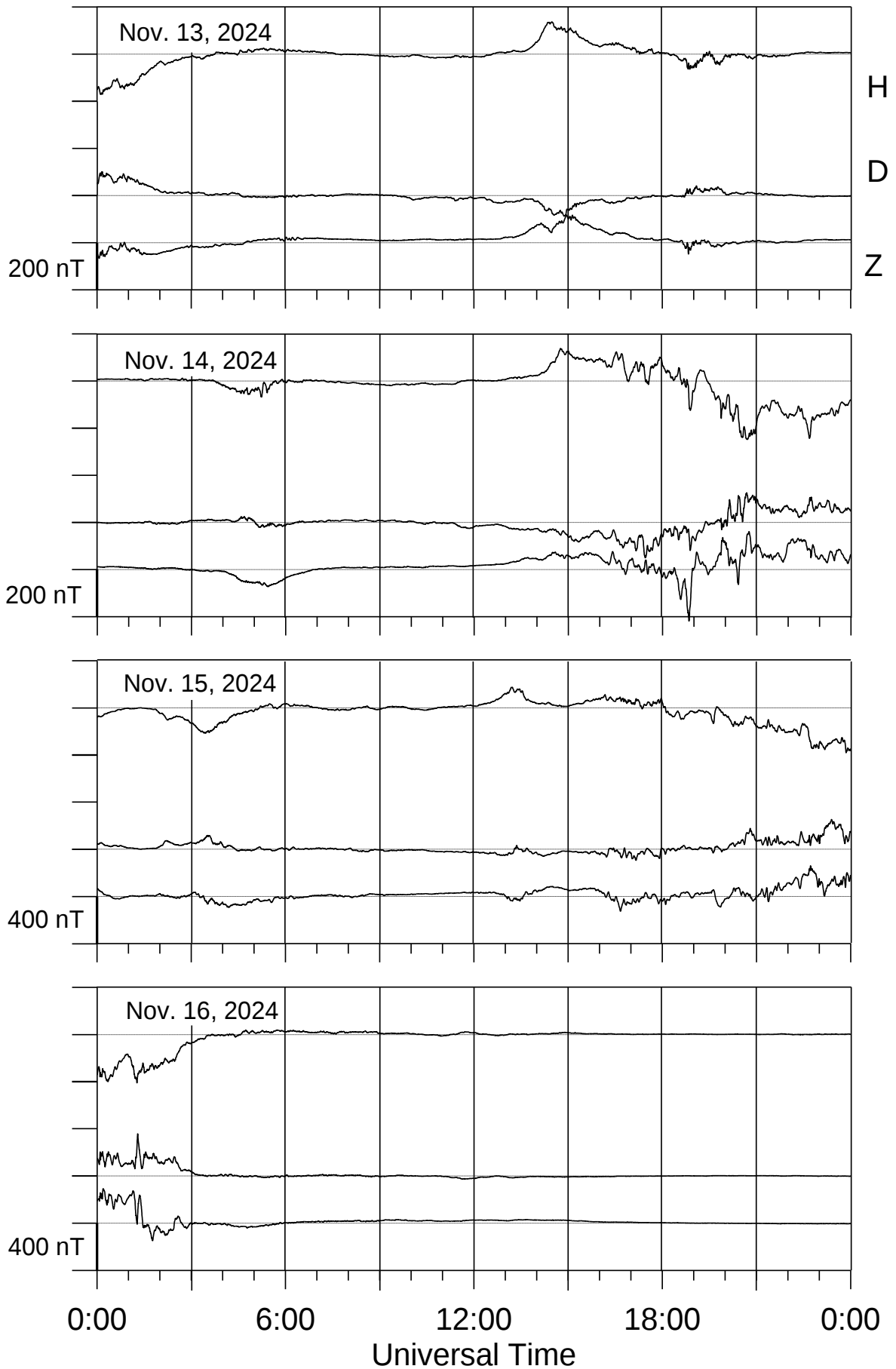
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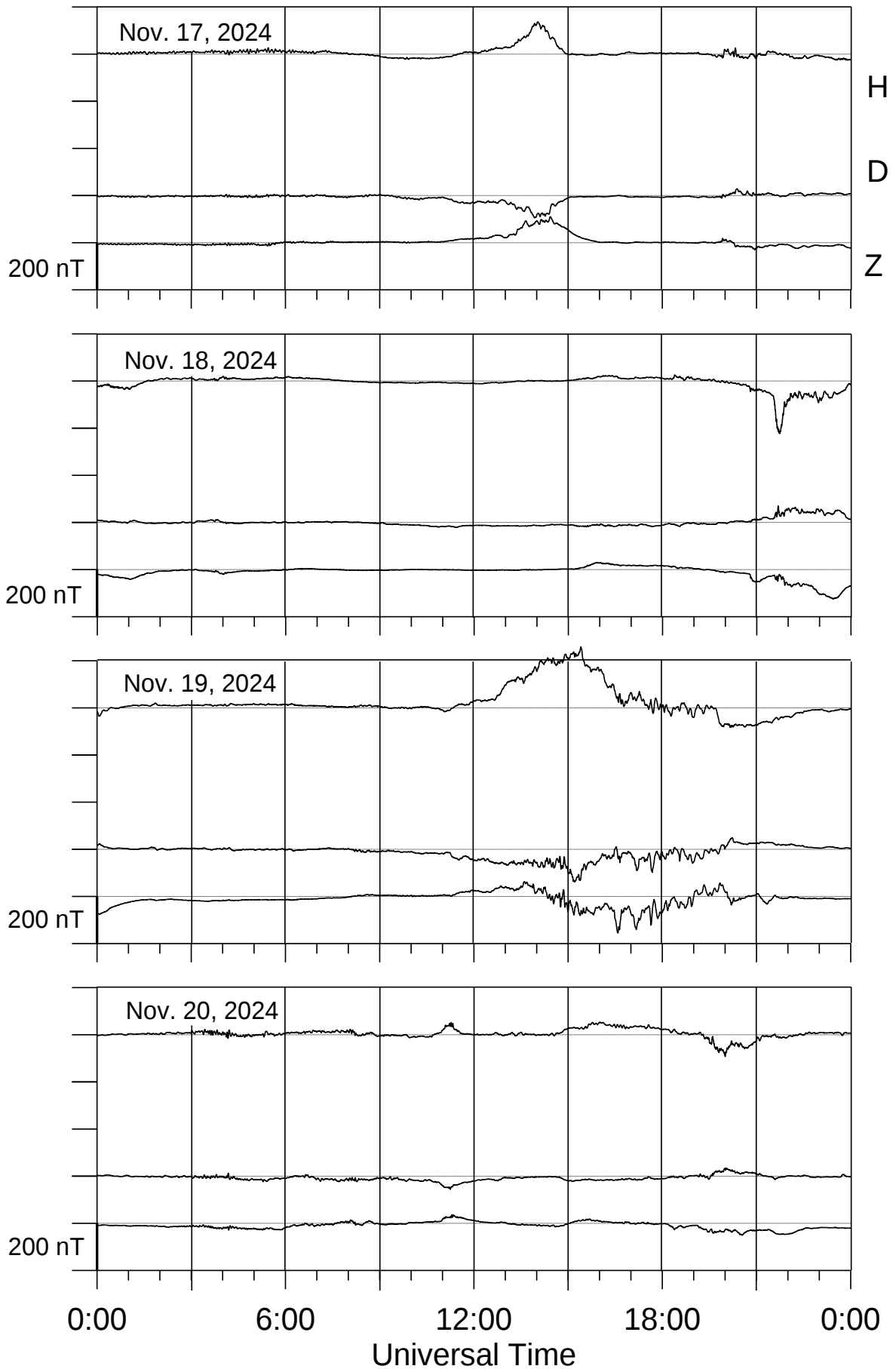
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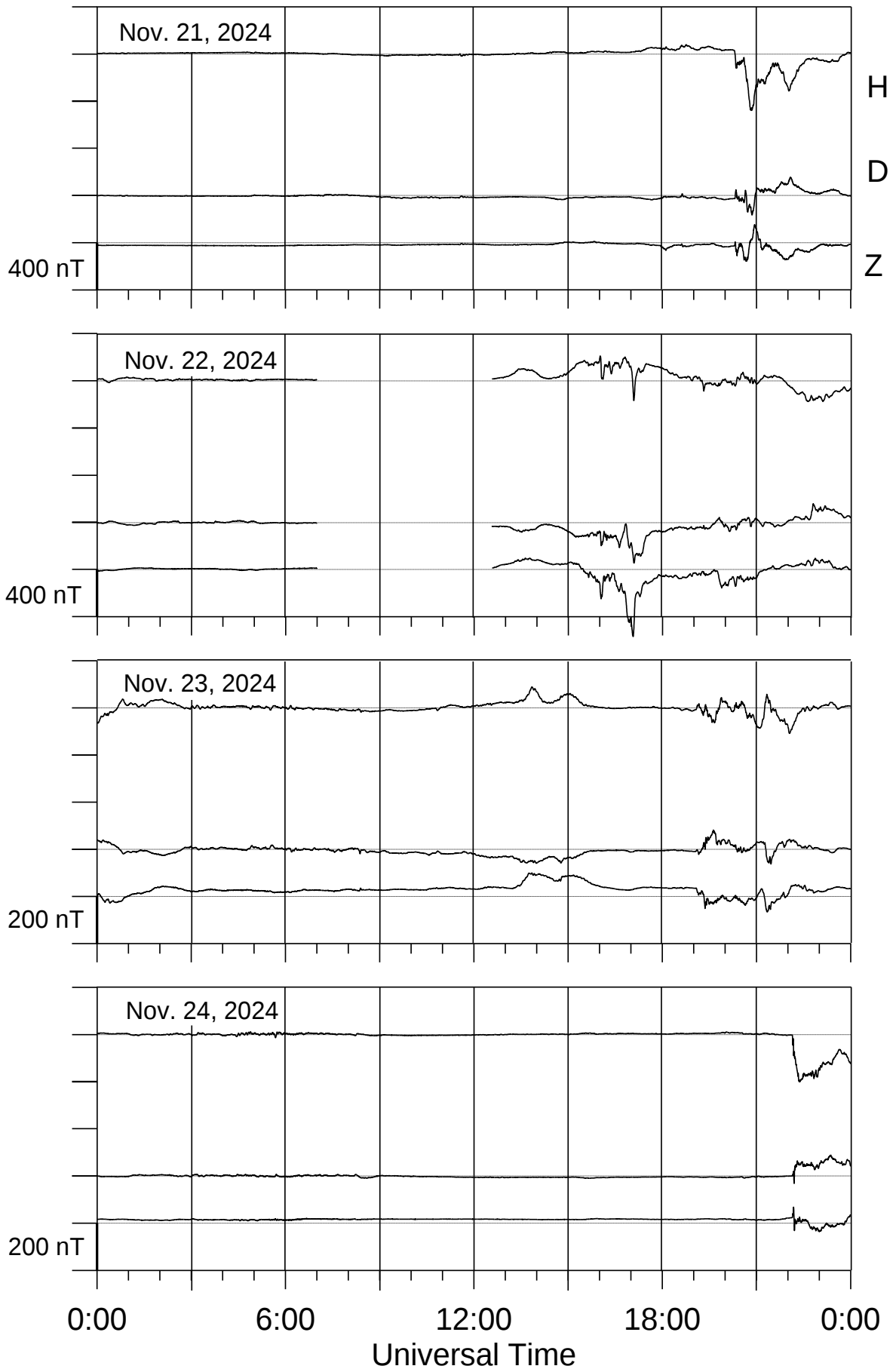
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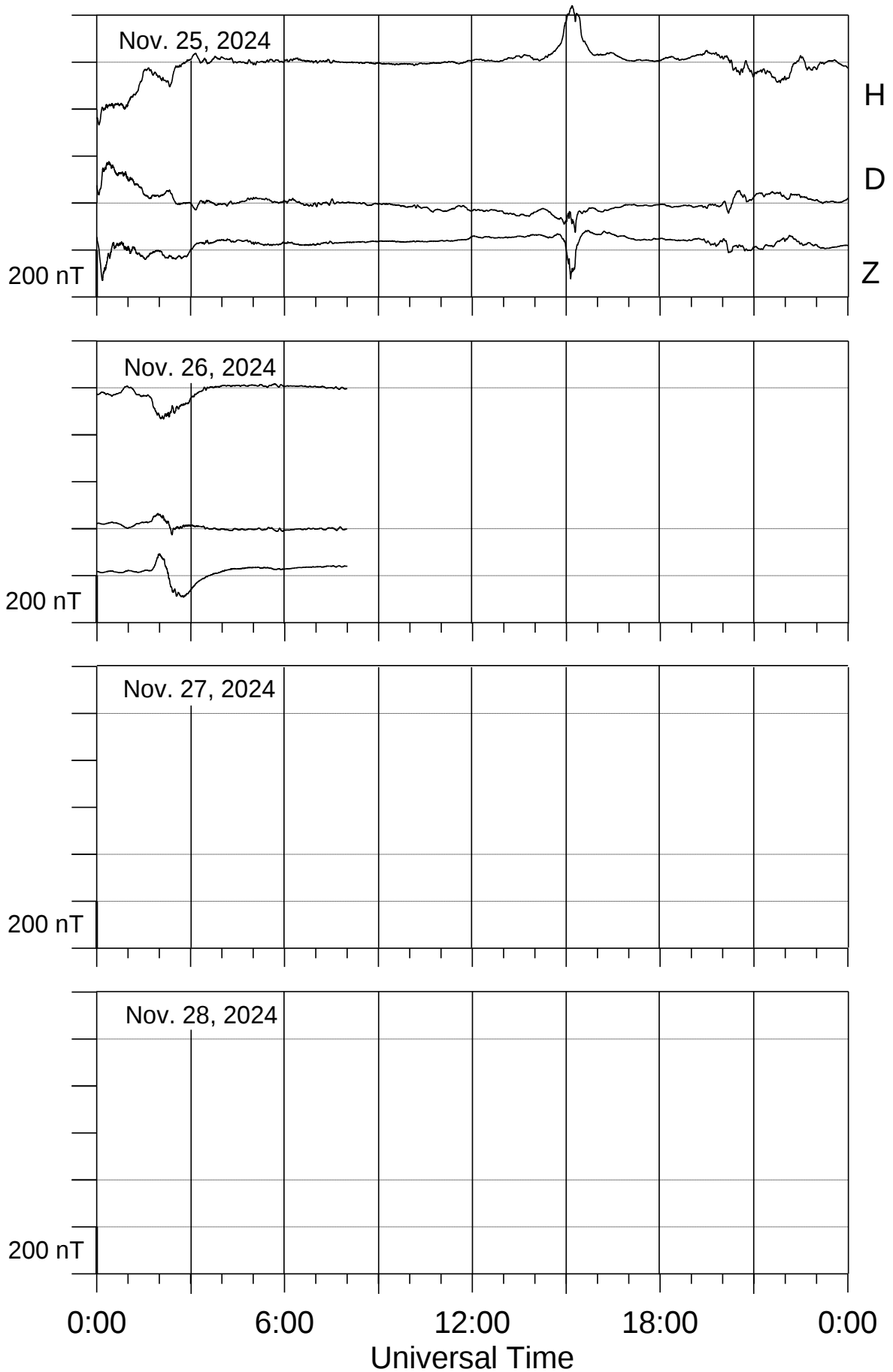
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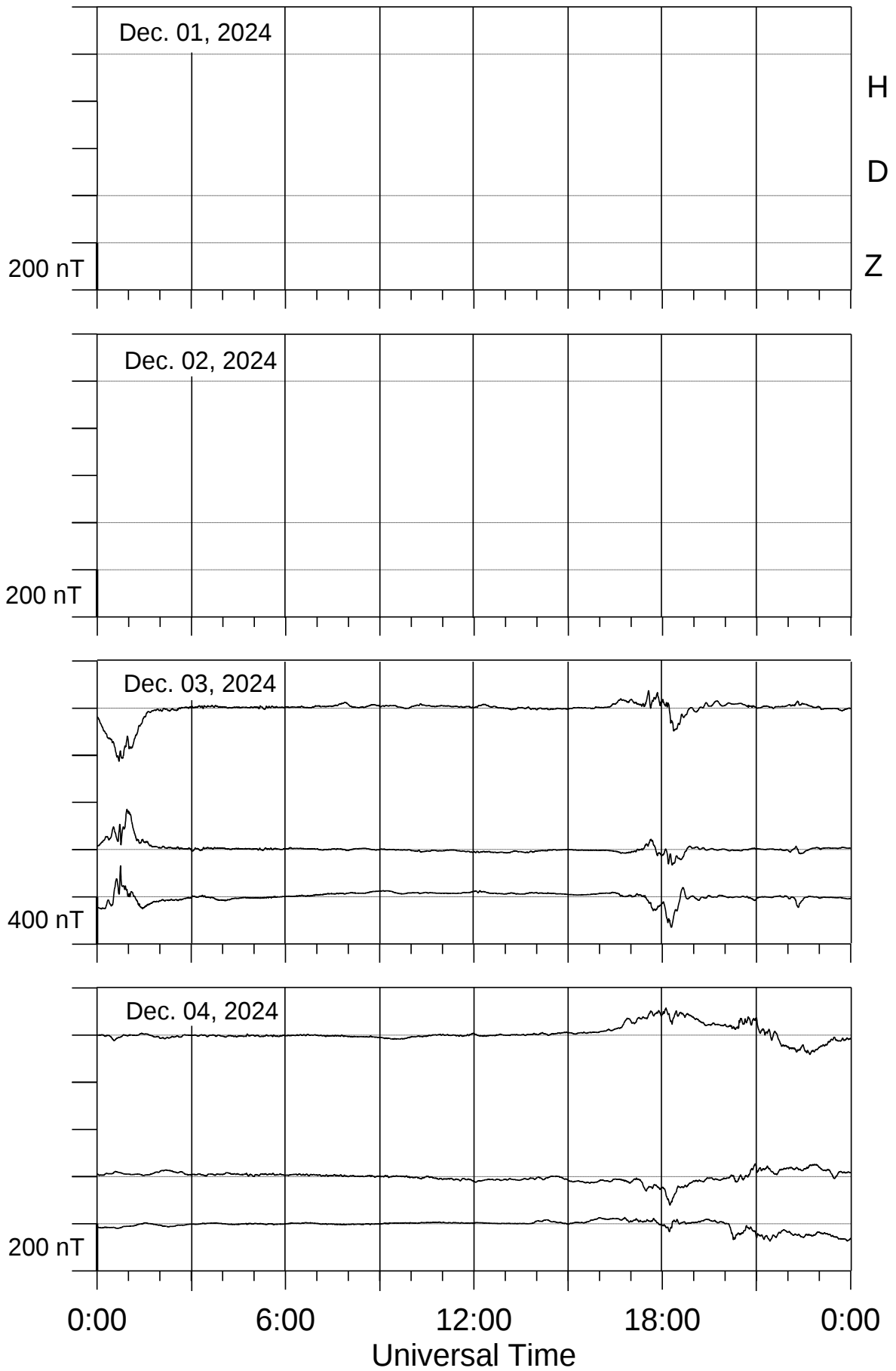
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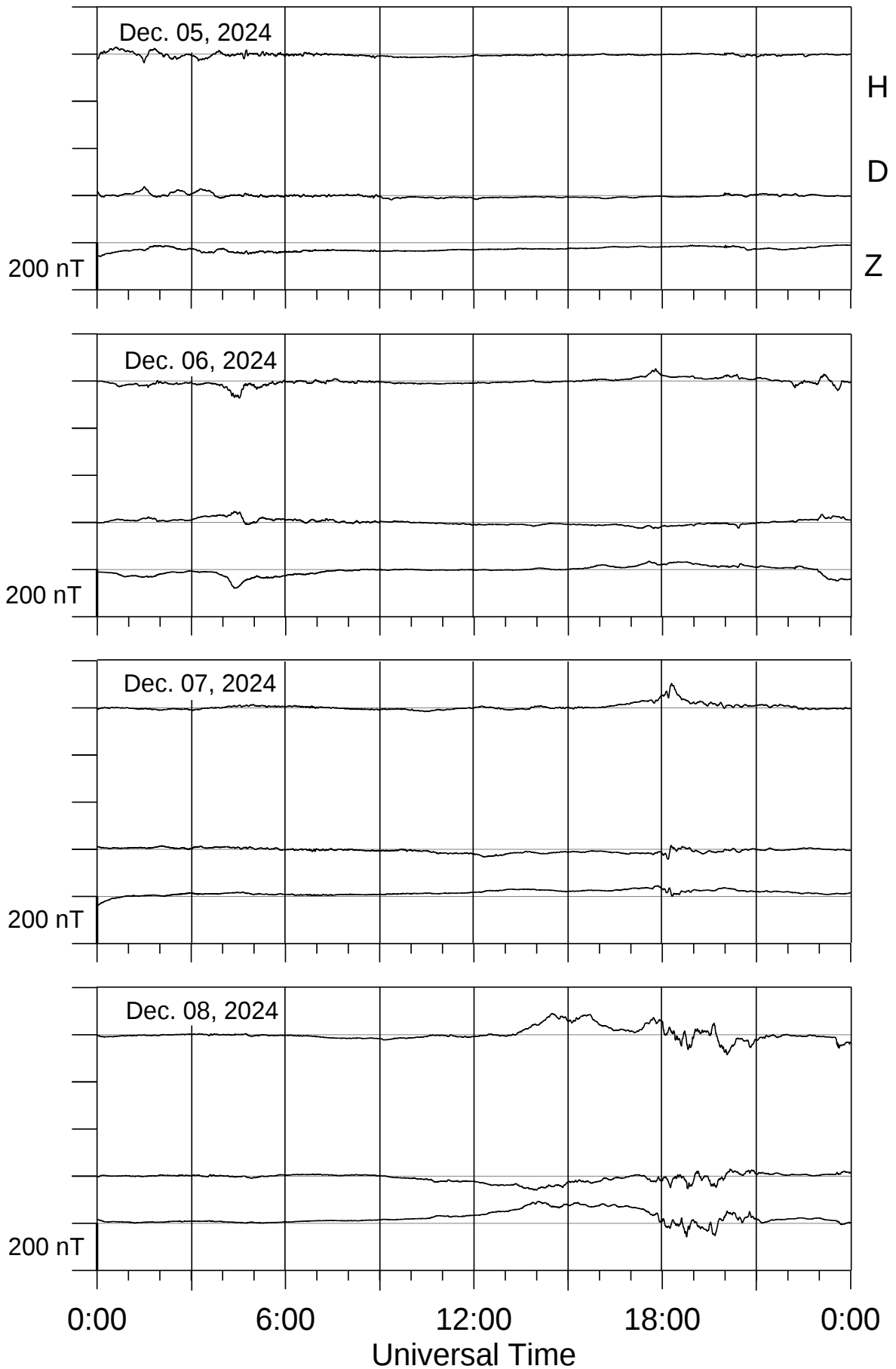
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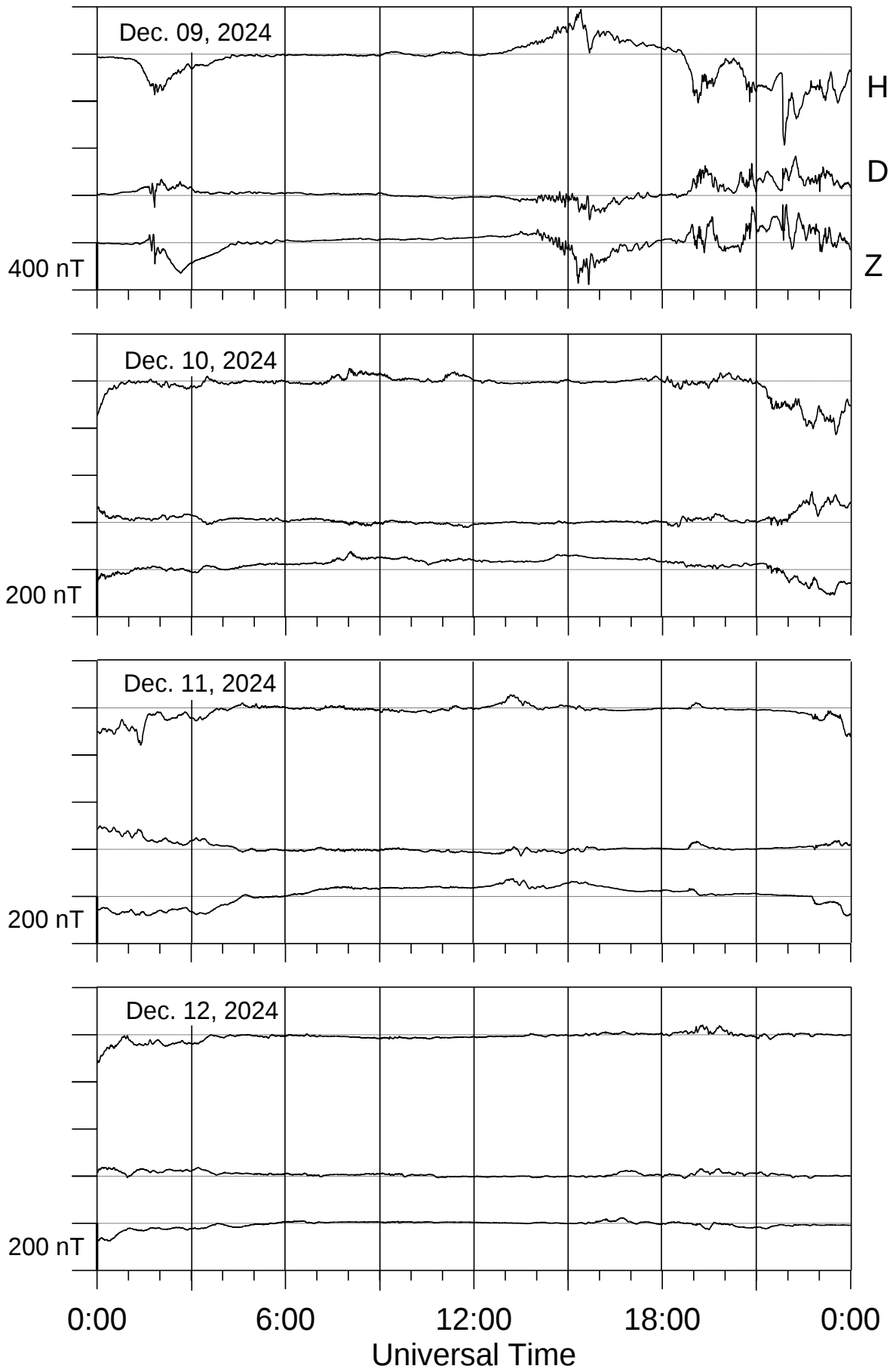
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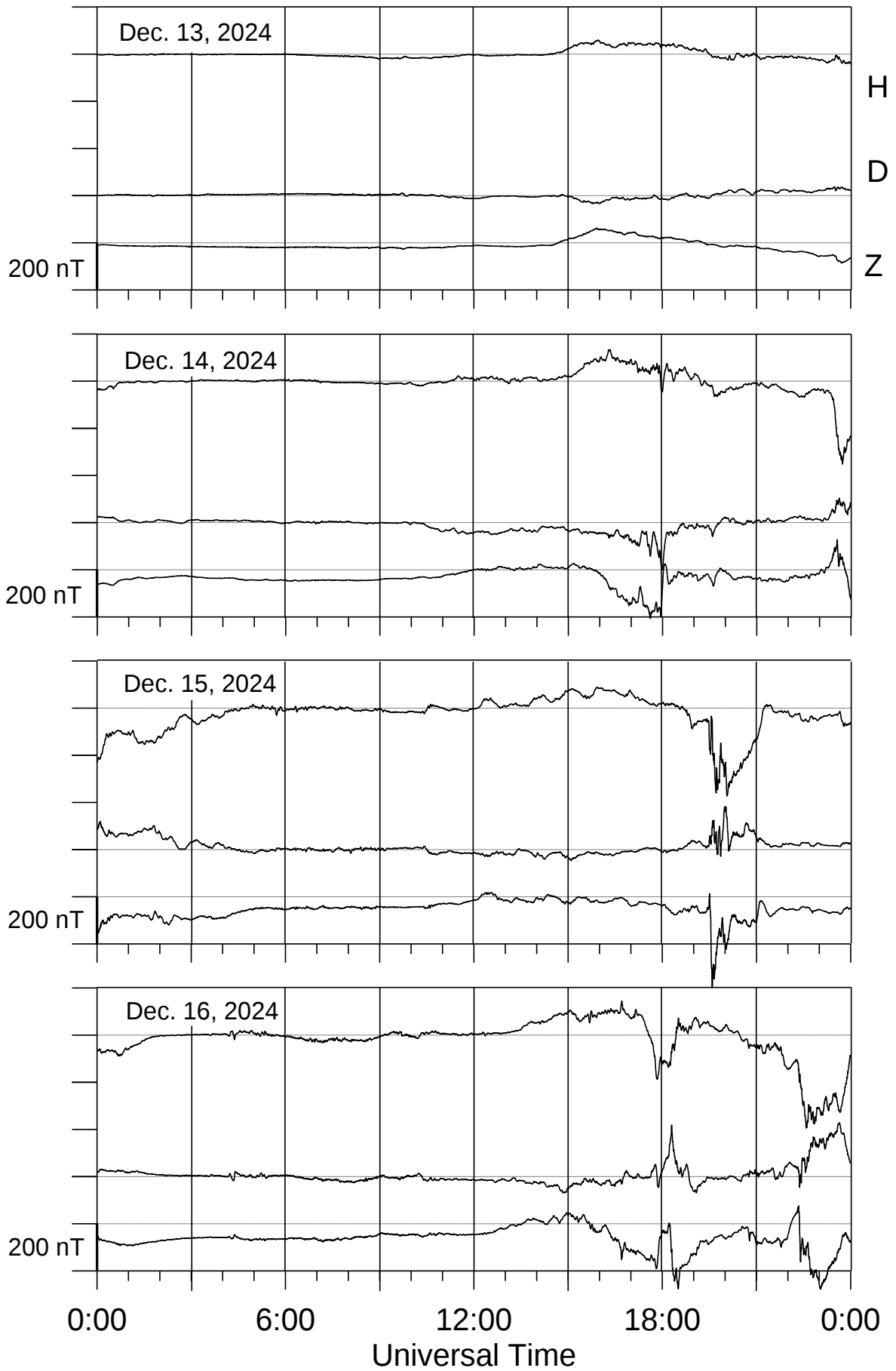
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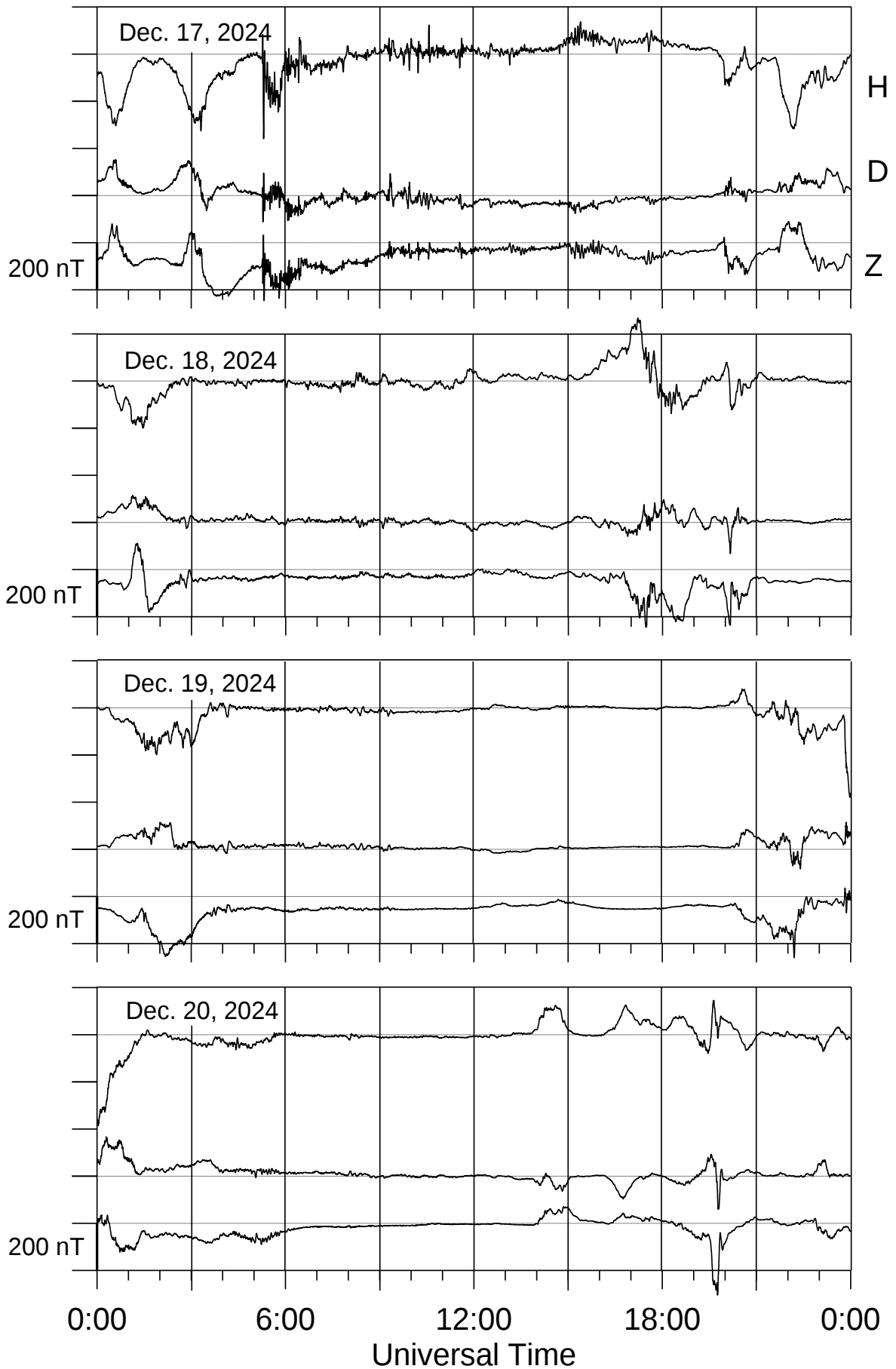
Loparskaya magnetometer



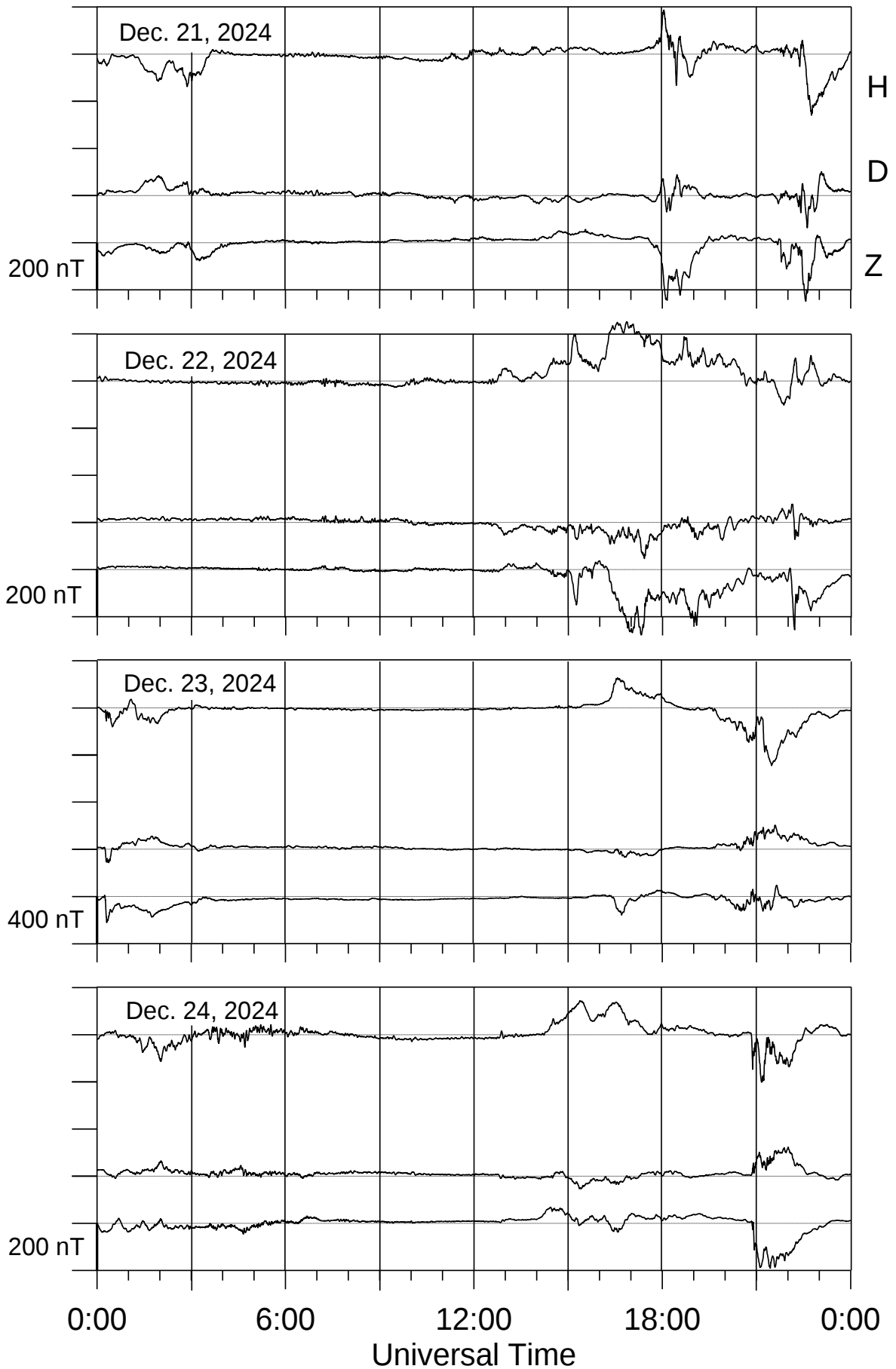
Loparskaya magnetometer



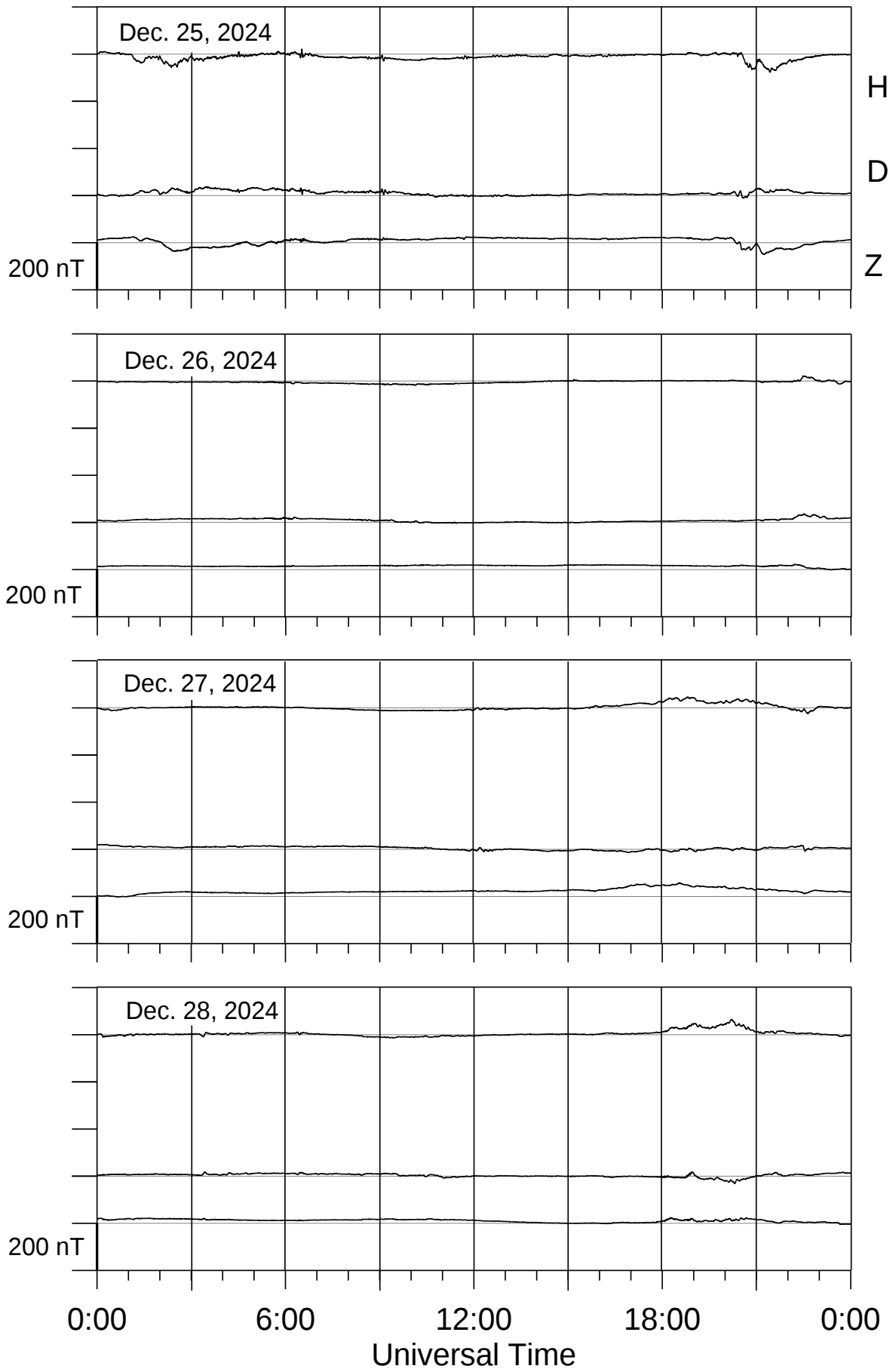
Loparskaya magnetometer



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