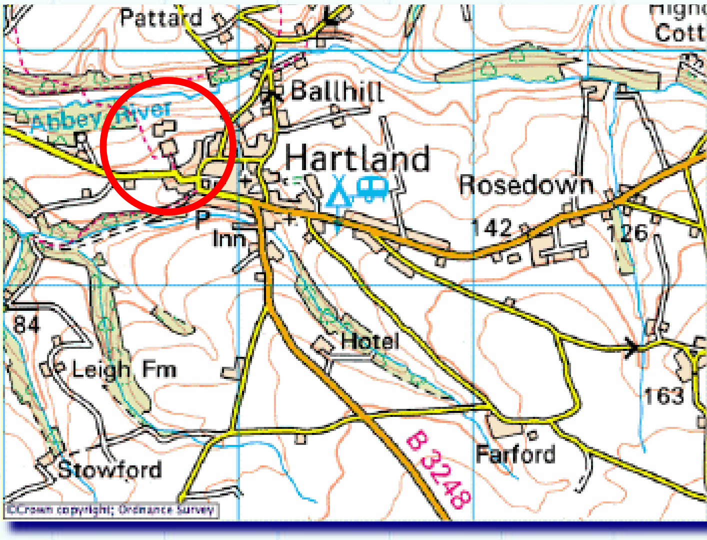
BRITISH GEOLOGICAL SURVEY

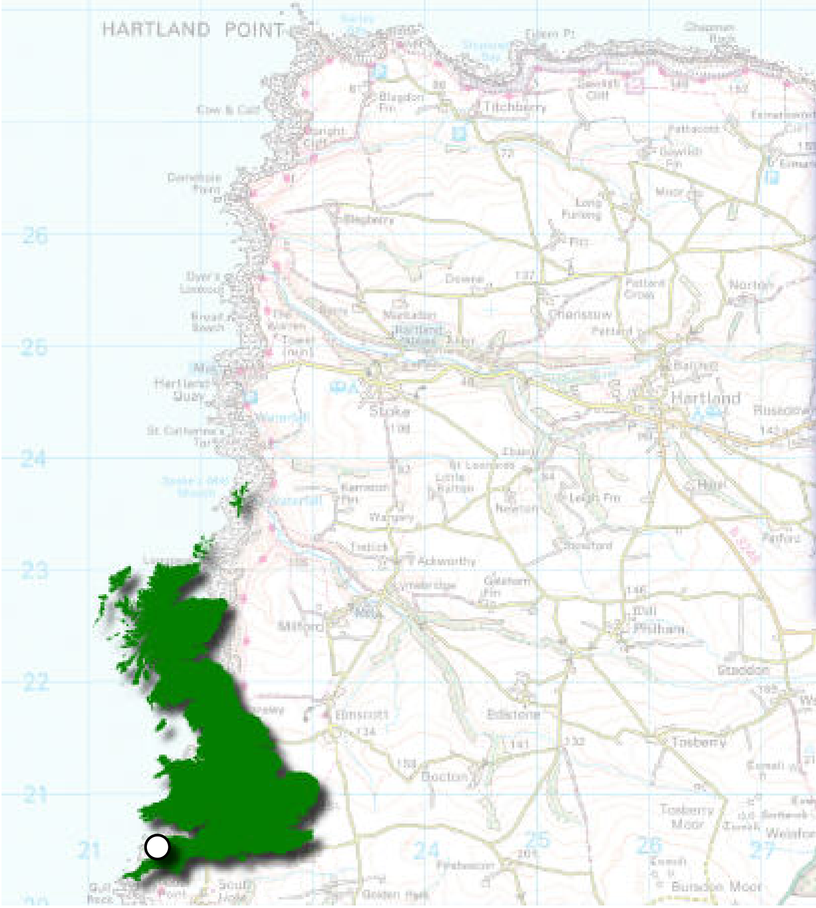
Hartland Observatory

Monthly Magnetic Bulletin

October 2015



15/10/HA



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

HARTLAND OBSERVATORY MAGNETIC DATA

1. Introduction

Hartland observatory is one of three geomagnetic observatories in the UK operated and maintained by the British Geological Survey (BGS).

This bulletin is published to provide rapid access to the provisional geomagnetic observatory results. The information is freely available for personal, academic, educational and non-commercial research or use. Magnetic observatory data are presented as a series of plots of one-minute, hourly and daily values, followed by tabulations of monthly values, reports of rapid variations and geomagnetic activity indices. The operation of the observatory and presentation of data are described in the rest of this section.

Enquiries about the data should be addressed to:

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Fax: +44 (0) 131 668 2683
E-mail: enquiries@bgs.ac.uk
Internet: www.geomag.bgs.ac.uk

2. Position

The observatory is situated on the NW boundary of the village of Hartland in North Devon. The observatory co-ordinates are:

Geographic: 50° 59' 42.5"N 355° 30' 56.0"E
Geomagnetic: 53° 38' 24"N 080°16' 59"E
Height above mean sea level: 95 m

The geographical coordinates are measured by a handheld GPS device, which uses WGS84 as the reference coordinate system. The height above MSL is determined from the best available contour maps. The geomagnetic co-ordinates are approximations, calculated using the 12th generation International Geomagnetic Reference Field (IGRF) at epoch 2015.5. On-line access to models (including IGRF), charts and navigational data are available at
http://www.geomag.bgs.ac.uk/data_service/models_compass/home

3. The Observatory Operation

3.1 GDAS

The observatory operates under the control of the Geomagnetic Data Acquisition System (GDAS), which was developed by BGS staff, installed in 2002, and became fully operational in January 2003. The data acquisition software, running on QNX operated computers, controls the data logging and the communications.

There are two sets of sensors used for making magnetic measurements. A tri-axial linear-core fluxgate magnetometer, manufactured by the Danish Meteorological Institute, is used to measure the variations in the horizontal (*H*) and vertical (*Z*) components of the field. The third sensor is oriented perpendicular to these, and measures variations, which are proportional to the changes in declination (*D*). Measurements are made at a rate of 1 Hz.

In addition to the fluxgate sensors there is a proton precession magnetometer (PPM) making measurements of the absolute total field intensity (*F*) at a rate of 0.1Hz.

The raw unfiltered data are retrieved automatically via Internet connections to the BGS office in Edinburgh in near real-time. The fluxgate data are filtered to produce one-minute values using a 61-point cosine filter and the total field intensity samples are filtered using a 7-point cosine filter. The one-minute values provide input for various data products, available on-line at
www.geomag.bgs.ac.uk/data_service/home

3.2 Back-up Systems

There are two other fully independent identical systems, GDAS 2 and GDAS 3, operating at the observatory. The data from these are also processed in near real-time and used for quality control purposes. They are also used to fill any gaps or replace any corrupt values in the primary system, GDAS 1.

3.3 Absolute Observations

The GDAS fluxgate magnetometers accurately measure variations in the components of the geomagnetic field, but not the absolute magnitudes. Two sets of absolute measurements of the field are made manually once per week. A fluxgate sensor mounted on a theodolite is used to determine *D* and inclination (*I*); the GDAS PPM measurements, with a site difference correction applied, are used for *F*. The absolute observations are used in conjunction with the GDAS variometer measurements to produce a continuous record of the absolute values of the geomagnetic field elements as if they had been measured at the observatory reference pillar.

4. Observatory Results

The data presented in the bulletin are in the form of plots and tabulations described in the following sections.

4.1 Absolute Observations

The absolute observation measurements made during the month are tabulated. Also included are the corresponding baseline values, which are the differences between the absolute measurements and the variometer measurements of *D*, *H* and *Z* (in the sense absolute–variometer). These are also plotted (markers) along with the derived preliminary daily baseline values (line) throughout the year. Daily mean differences between the measured absolute *F* and the *F* computed from the baseline corrected *H* and *Z* values are plotted in the fourth panel (in the sense measured–derived). The bottom panel shows the daily mean temperature in the fluxgate chamber.

4.2 Summary magnetograms

Small-scale magnetograms are plotted which allow the month's data to be viewed at a glance. They are plotted 16 days to a page and show the one-minute variations in *D*, *H* and Z. The scales are shown on the right-hand side of the page. On disturbed days the scales are multiplied by a factor, which is indicated above the panel for that day. The variations are centred on the monthly mean value, shown on the left side of the page.

4.3 Magnetograms

The daily magnetograms are plotted using one-minute values of *D*, *H* and *Z* from the fluxgate sensors, with any gaps filled using back-up data. The magnetograms are plotted to a variable scale; scale bars are shown to the right of each plot. The absolute level (the monthly mean value) is indicated on the left side of the plots.

4.4 Hourly Mean Value Plots

Hourly mean values of *D*, *H* and *Z* for the past 12 months are plotted in 27-day segments corresponding to the Bartels solar rotation number. Magnetic disturbances associated with active regions and/or coronal holes on the Sun may recur after 27 days: the same is true for geomagnetically quiet intervals. Plotting the data in this way highlights this recurrence. Diurnal variations are also clear in these plots and the amplitude changes throughout the year highlight the seasonal changes. Longer term secular variation is also illustrated.

Full lists of the UK observatory hourly mean values from 1983 to the present day are available at www.geomag.bgs.ac.uk/data_service/data/obs_data/hourly_means

4.5 Daily and Monthly Mean Values

Daily mean values of *D*, *H*, *Z* and *F* are plotted throughout the year. In addition, a table of monthly mean values of all the geomagnetic elements is provided. These values depend on accurate specification of the fluxgate sensor baselines. It is anticipated that these provisional values will not be altered by more than a few nT or tenths of arcminutes before being made definitive at the end of the year.

4.6 Rapid Variations

Charged particles stream from the Sun in the solar wind. The solar wind interacts with the geomagnetic field to create a cavity, the magnetosphere, in which the field is confined. When a region of enhanced velocity and/or density in the solar wind arrives at the dayside boundary of the magnetosphere (at about 10 earth radii) the boundary is pushed towards the Earth. Currents set up on the boundary of the magnetosphere can cause an abrupt change in the geomagnetic field measured on the ground and this is recorded on observatory magnetograms as a sudden impulse (*si*). If, following an *si*, there is a change in the rhythm of activity, the *si* is termed a storm sudden commencement (*ssc*). A classical magnetic storm exhibiting initial, main and recovery phases (shown by, for instance, the *Dst* ring current index) can often occur after a *ssc*, in which case the start of the storm is taken as the time of the *ssc*.

Solar flares, seen at optical wavelengths as a sudden brightening of a small region of the Sun's surface, are also responsible for increased X-ray emissions. These X-rays cause increased ionisation in the ionosphere, which leads to absorption of short-wave radio signals. A solar flare effect (*sfe*), or "crochet", may be observed on a magnetogram during geomagnetically quiet times. It is a relatively short-term change (tens of minutes) to the normal diurnal variation and can vary in size (tens of nT) depending on local time (LT), geomagnetic latitude and solar zenith angle.

4.7 Local geomagnetic activity indices

The Observatory K index. This summarises geomagnetic activity at an observatory by assigning a code, an integer in the range 0 to 9, to each 3-hour Universal Time (UT) interval. The index for each 3-hour UT interval is determined from the maximum range in *H* or *D* (scaled in nT), with allowance made for the regular (undisturbed) diurnal variation. The conversion from range to an index value is made using a quasi-logarithmic scale, with the scale values dependent on the geomagnetic latitude of the observatory. The lower bounds (in nT) for the classification of each period at Hartland are:

0	1	2	3	4	5	6	7	8	9
0	5	10	20	40	70	120	200	330	500

The *K* index retains the LT and seasonal dependence of activity associated with the position of the observatory. The 3-hourly *K* indices for the month are tabulated and also plotted as a histogram. All UK observatory *K* indices are available at www.geomag.bgs.ac.uk/data_service/data/magnetic_indices/k_indices

4.8 Global geomagnetic activity indices

The aa index. A number of 3-hour geomagnetic indices are computed by combining *K* indices from networks of observatories to characterise global activity levels and to eliminate LT and seasonal effects. The simplest of these is the *aa* index, computed using the *K* indices from two approximately antipodal observatories: Hartland in the UK and Canberra in Australia. The *aa* index is calculated from linearisations of the Hartland and Canberra *K* indices, and has units of nT. The 3-hourly *aa* indices are tabulated along with the daily mean value of *aa* (denoted *Aa*), the mean values of *aa* for the intervals 00-12UT (Aa_{am}) and 12-24UT (Aa_{pm}) and the monthly mean value. The 3-hourly *aa* indices for the month are also plotted as a histogram.

Although the *aa* index is based on data from only two observatories, provided averages over 12 hours or longer are used, the index is strongly correlated with the *ap* and *am* indices, which are derived using data from more extensive observatory networks.

The *aa* indices listed in this bulletin are available at www.geomag.bgs.ac.uk/data_service/data/magnetic_indices/aaindex as well as the full data set from 1868.

Definitive *aa* are published by the International Service for Geomagnetic Indices, LATMOS, 4 Avenue de Neptune, F-94107 Saint Maur Cedex, France.

5. Conditions of Use

The data presented in this bulletin are provided for personal, academic, educational, non-commercial research or other non-commercial use and are not for sale or distribution to third parties without written permission from BGS.

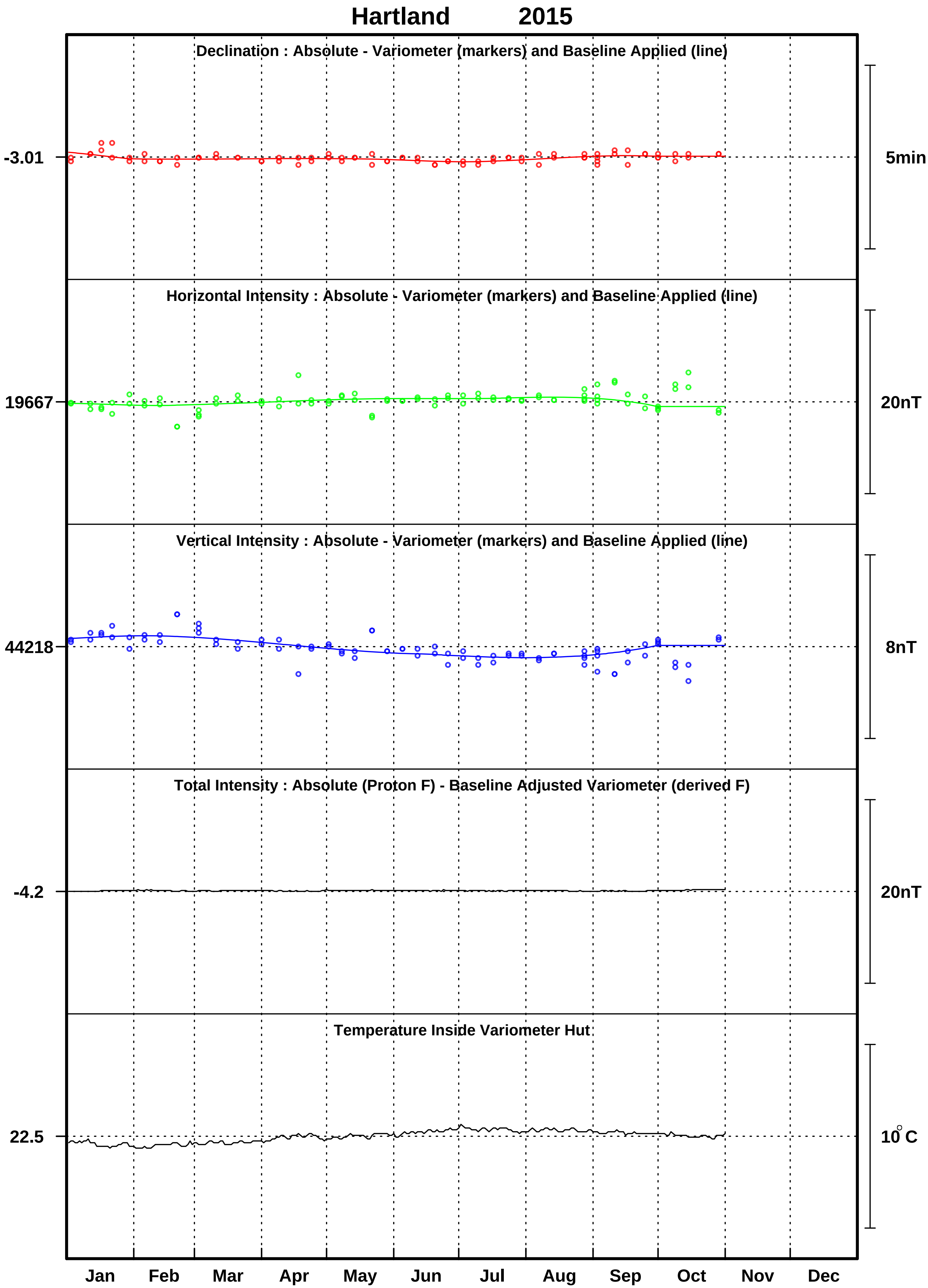
Reproduction of any part of this bulletin should be accompanied by the statement: 'Reproduced with the permission of the British Geological Survey ©NERC. All rights Reserved'. Publications making use of the data should include an acknowledgment statement of the form: 'The results presented in this paper rely on the data collected at Hartland magnetic observatory, operated by the British Geological Survey.'

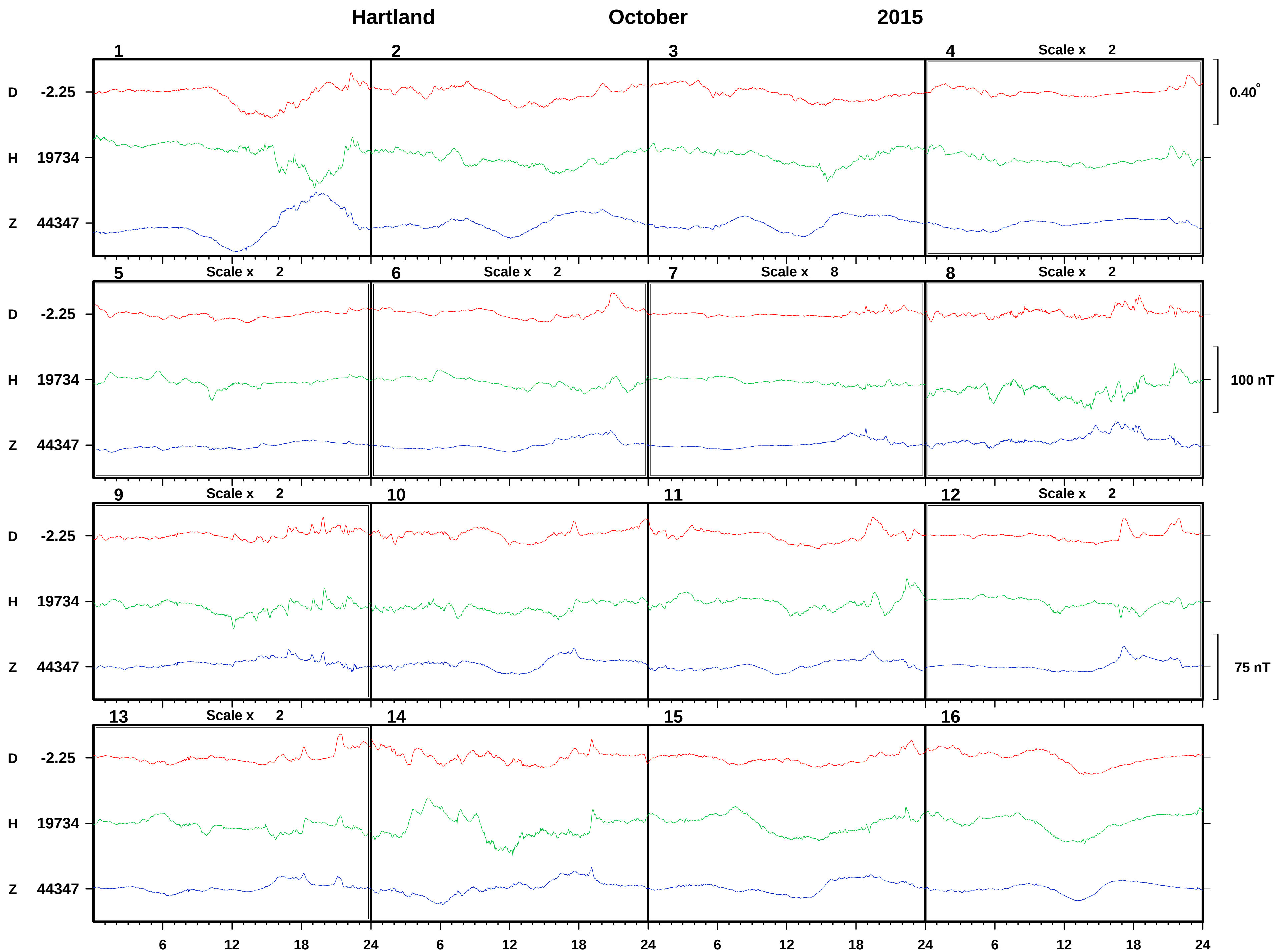
Commercial users can contact the geomagnetism team for information on the range of applications and services offered. Full contact details are available at www.geomag.bgs.ac.uk/contactus/staff

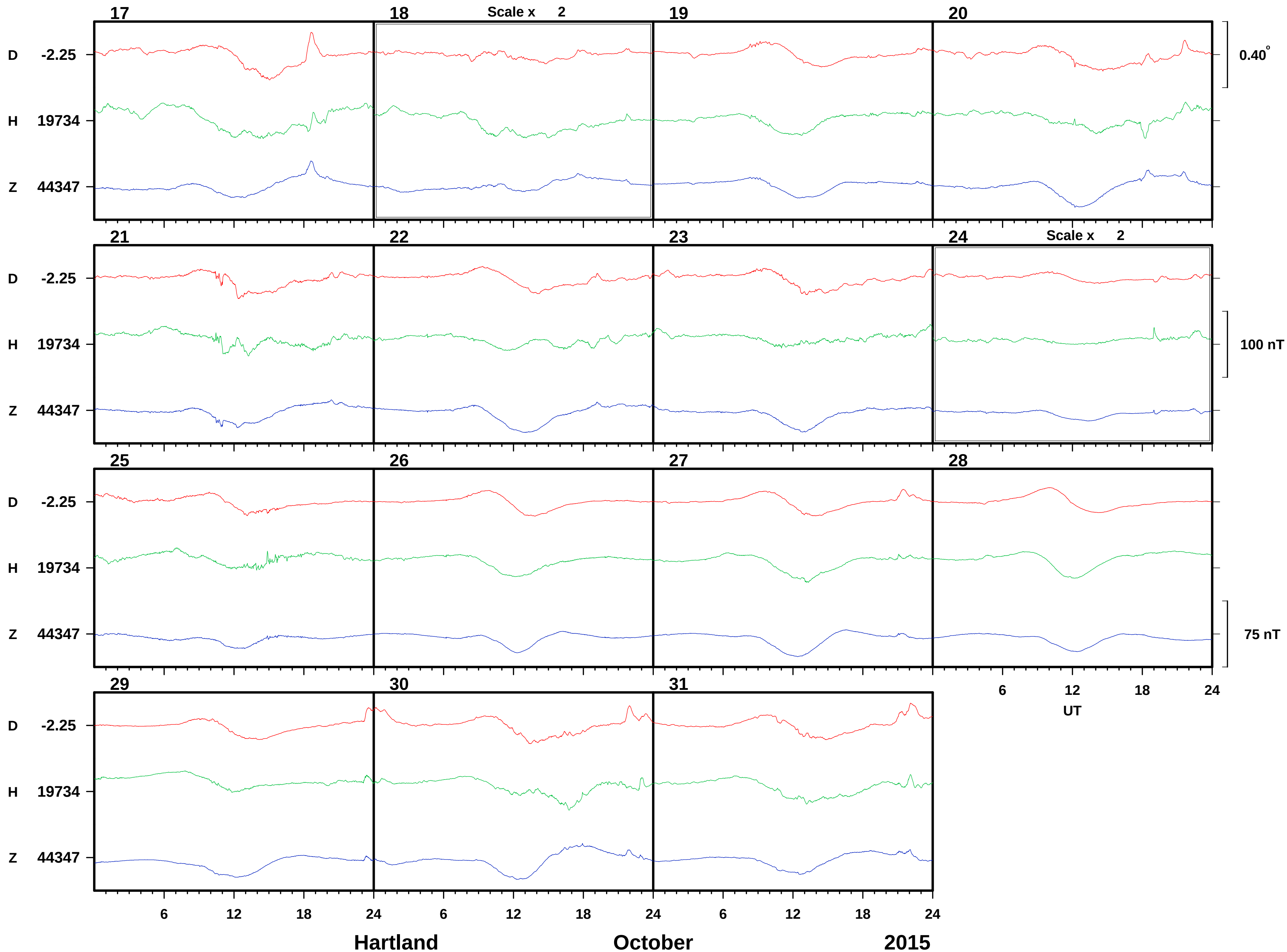
HARTLAND OBSERVATORY

ABSOLUTE OBSERVATIONS

		Declination			Inclination		Total Field		Horizontal Intensity		Vertical Intensity		
Date	**Day Number**	**Time (UT)**	**Absolute (º)**	**Baseline (º)**	**Time (UT)**	**Absolute (º)**	**Site difference (nT)**	**Absolute corrected (nT)**	**Absolute (nT)**	**Baseline (nT)**	**Absolute (nT)**	**Baseline (nT)**	**Observer**
08-Oct-15	281	09:22	-2.1895	-3.0083	09:33	66.0364	4.1	48538.9	19714.4	19669.3	44355.0	44216.8	ST
08-Oct-15	281	09:41	-2.1931	-3.0050	09:50	66.0413	4.1	48535.2	19709.1	19668.8	44353.3	44217.0	ST
14-Oct-15	287	09:26	-2.2387	-3.0067	09:35	66.0169	4.1	48532.9	19727.0	19669.0	44342.9	44216.9	ST
14-Oct-15	287	09:44	-2.2335	-3.0050	09:52	66.0292	4.1	48528.7	19715.8	19670.6	44343.2	44216.2	ST
28-Oct-15	301	08:42	-2.1849	-3.0050	08:53	65.9875	4.1	48545.4	19754.9	19666.2	44344.1	44218.1	ST
28-Oct-15	301	08:59	-2.1758	-3.0050	09:10	65.9895	4.1	48544.1	19752.8	19666.5	44343.6	44218.0	ST

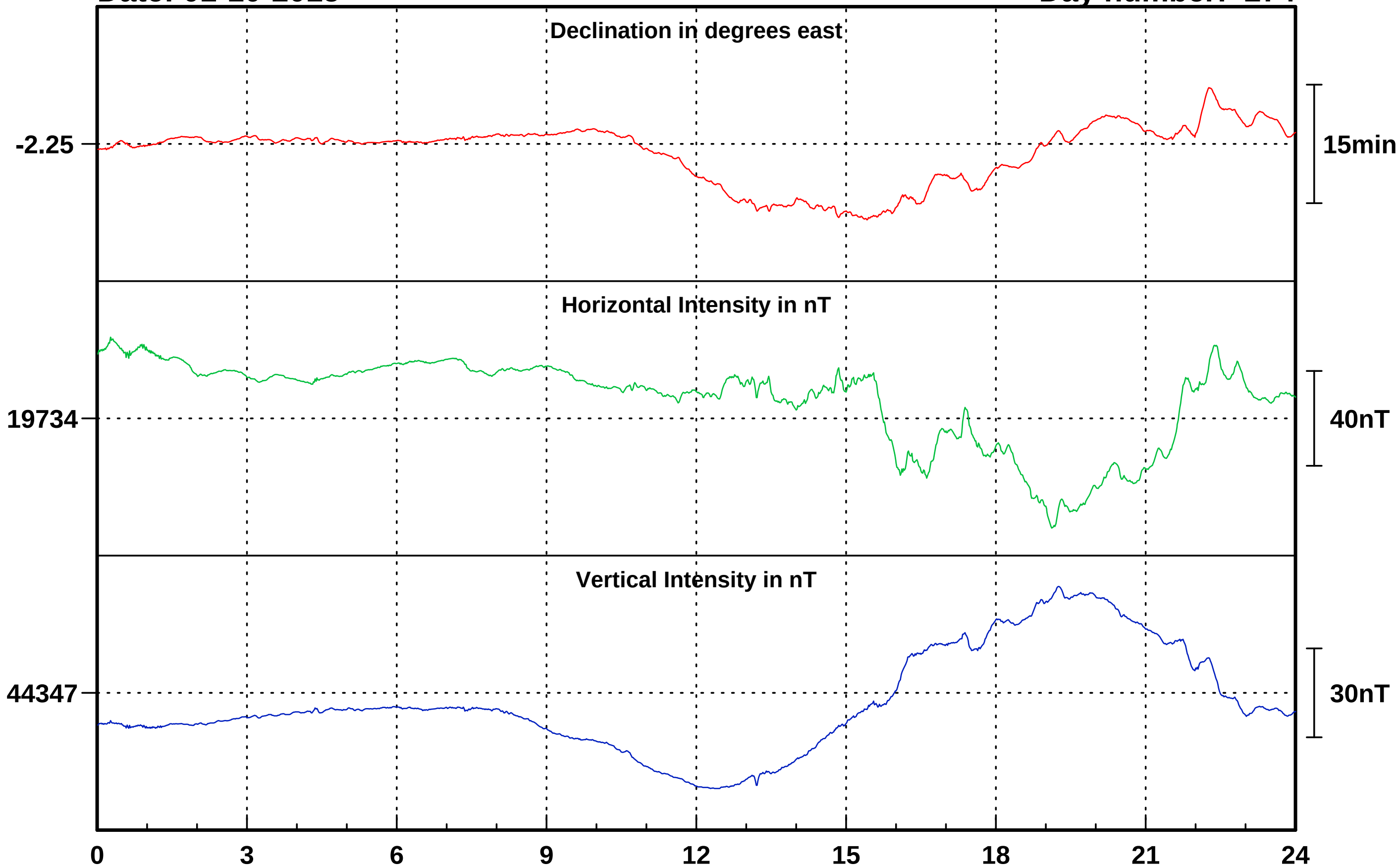

Hartland 2015
Declination : Absolute - Variometer (markers) and Baseline Applied (line)
-3.01
5min
Horizontal Intensity : Absolute - Variometer (markers) and Baseline Applied (line)
19667
20nT
Vertical Intensity : Absolute - Variometer (markers) and Baseline Applied (line)
44218
8nT
Total Intensity : Absolute (Proton F) - Baseline Adjusted Variometer (derived F)
-4.2
20nT
Temperature Inside Variometer Hut
22.5
10 °C
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Hartland
October
2015
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Scale x 2
Scale x 8
D -2.25
H 19734
Z 44347
0.40°
100 nT
75 nT
6
12
18
24


17
18
Scale x 2
19
20
21
22
23
24
Scale x 2
25
26
27
28
29
30
31
D -2.25
H 19734
Z 44347
0.40°
100 nT
75 nT
6
12
18
24
UT
Hartland
October
2015

Hartland

Date: 01-10-2015 Day number: 274



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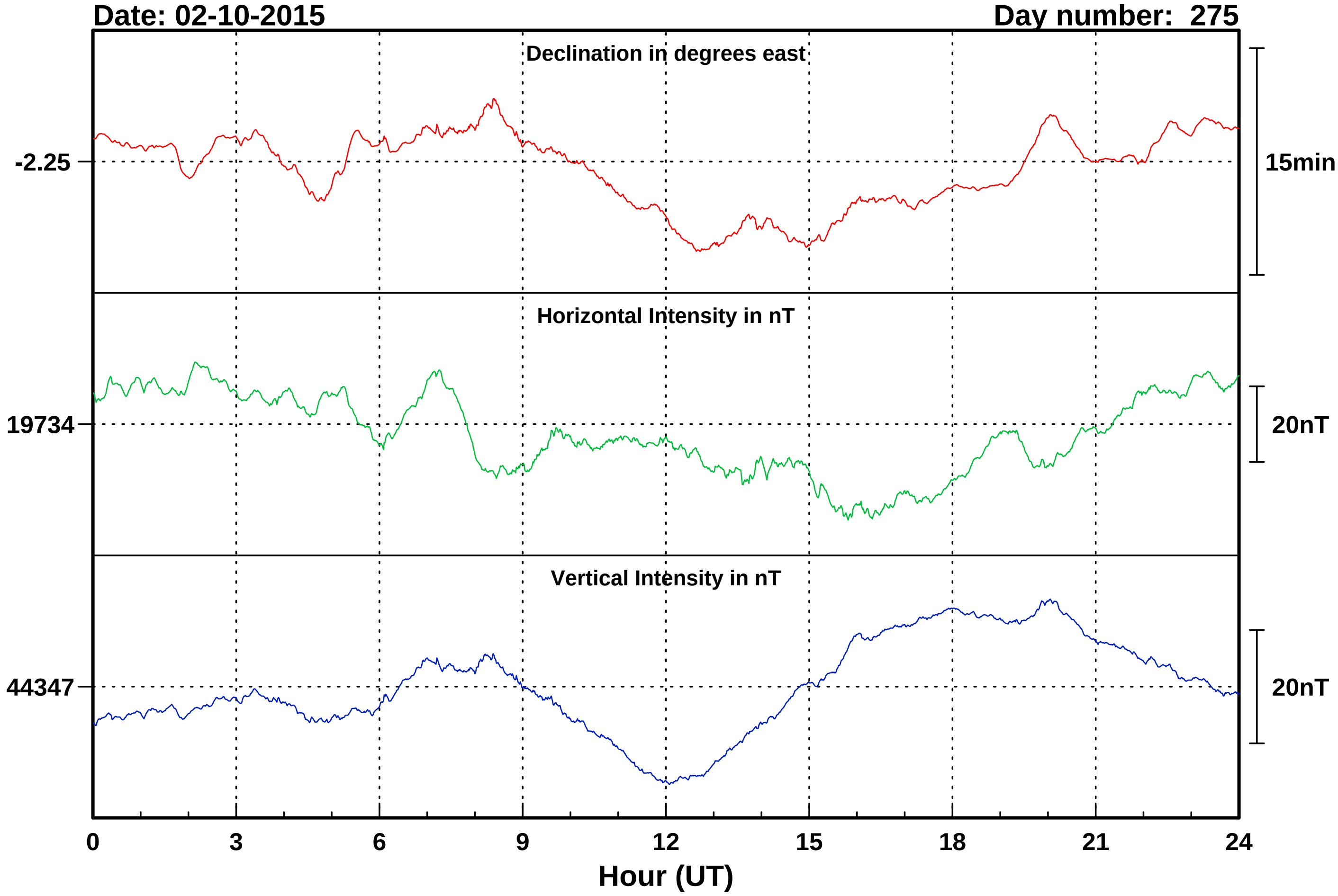
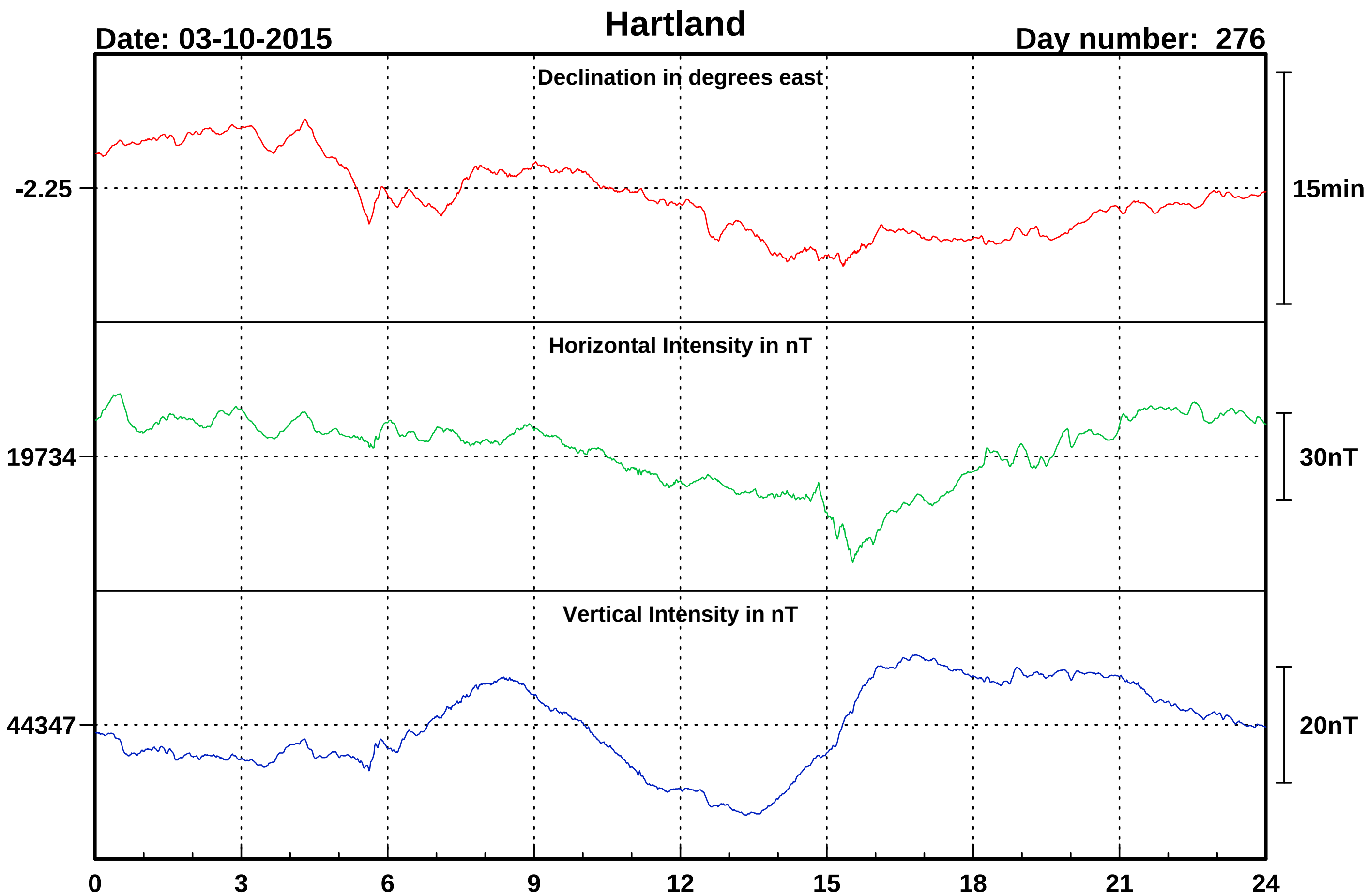
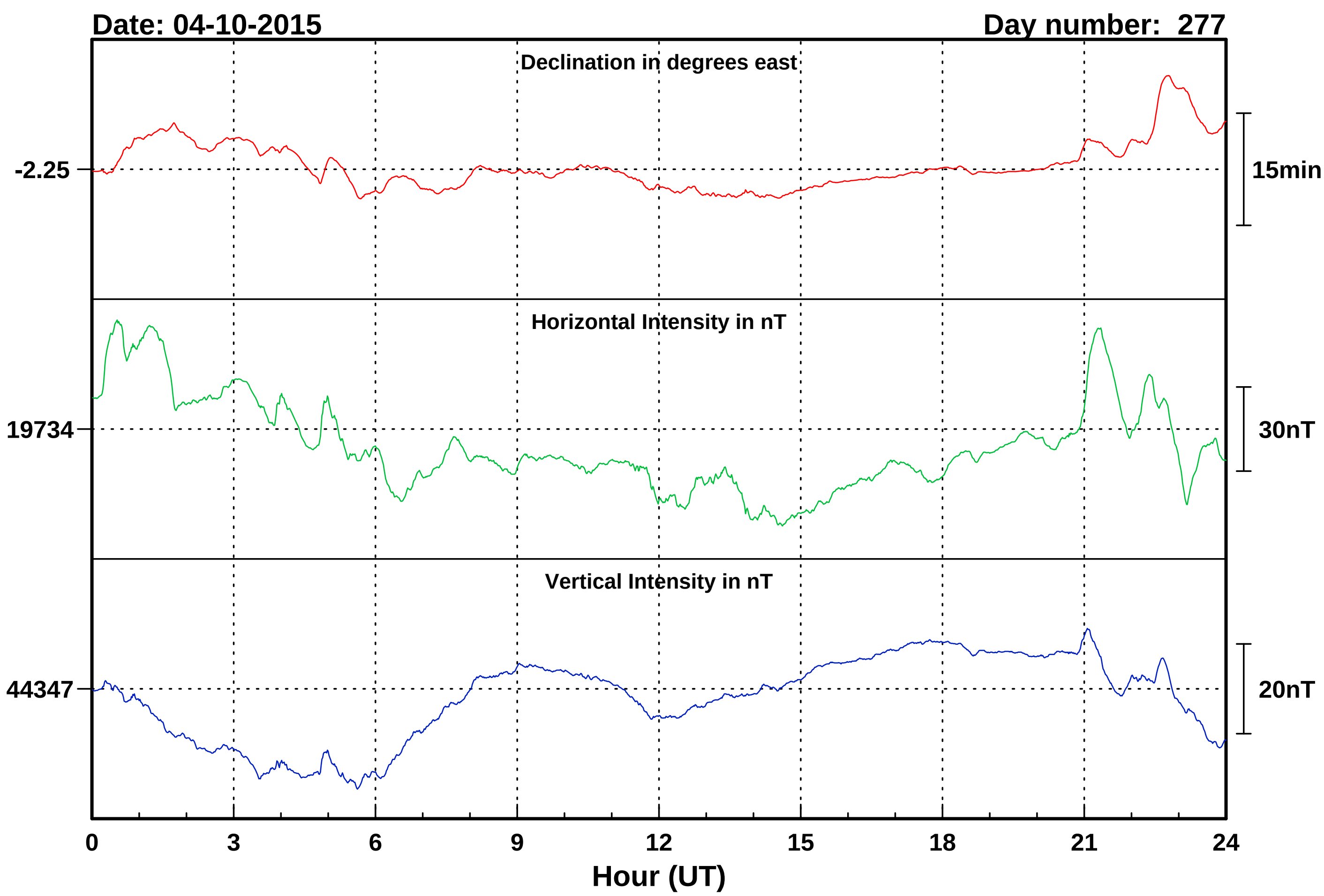
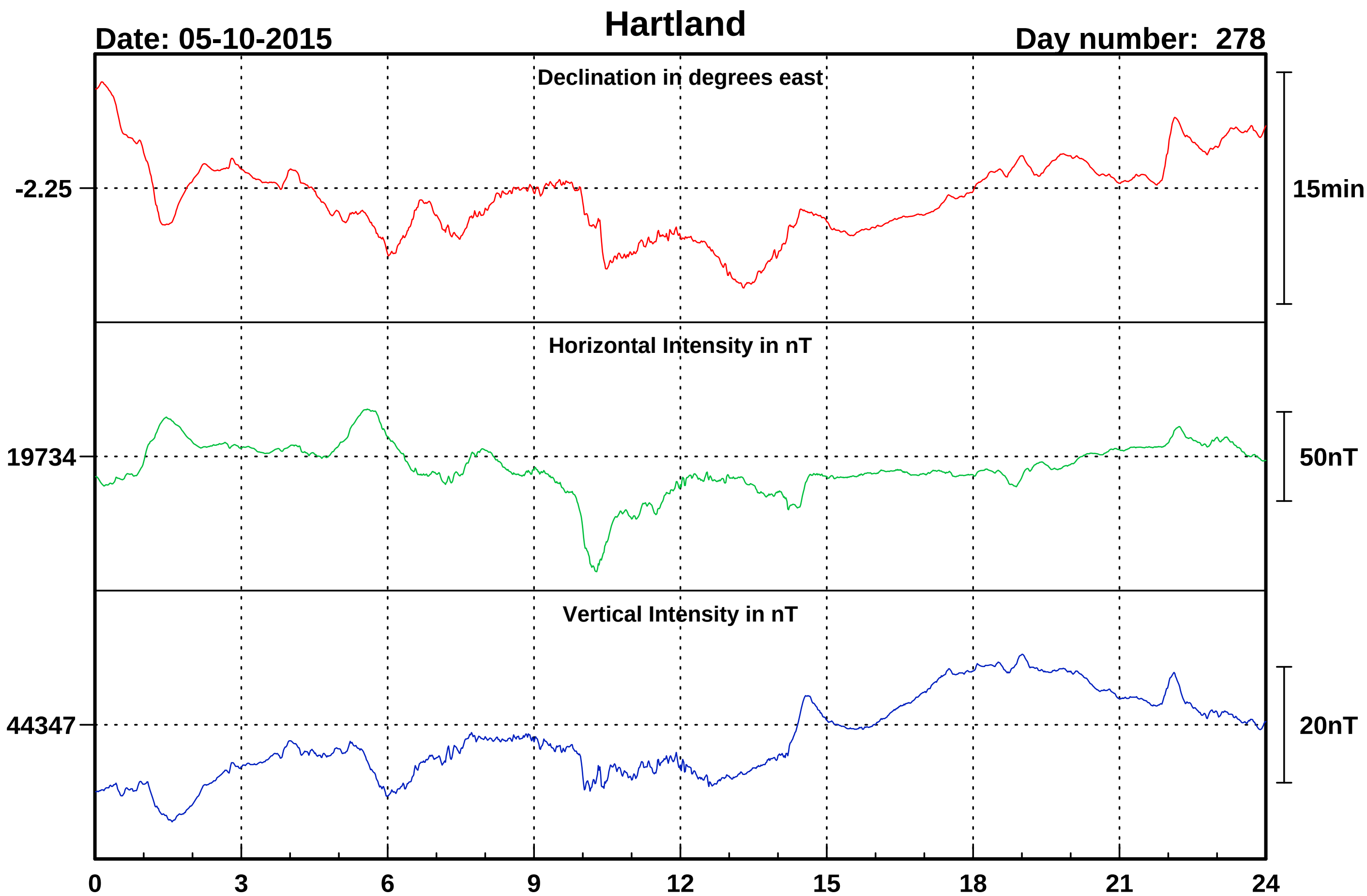
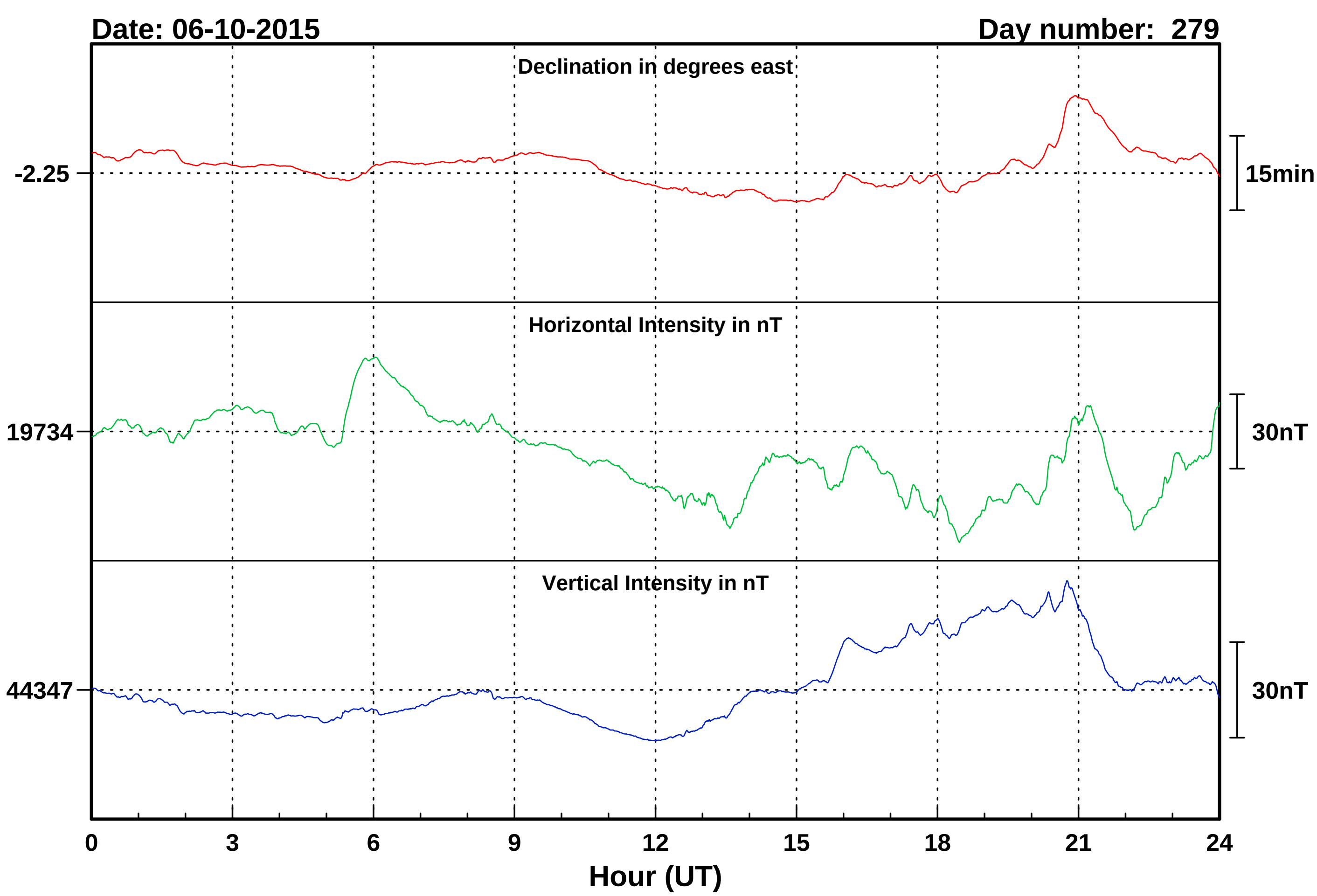



Hartland
Date: 03-10-2015
Day number: 276
Declination in degrees east
Horizontal Intensity in nT
Vertical Intensity in nT
-2.25
19734
44347
15min
30nT
20nT
0
3
6
9
12
15
18
21
24


Date: 04-10-2015
Day number: 277
Declination in degrees east
Horizontal Intensity in nT
Vertical Intensity in nT
-2.25
19734
44347
15min
30nT
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Hartland
Date: 05-10-2015
Day number: 278
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
50nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24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Declination in degrees east
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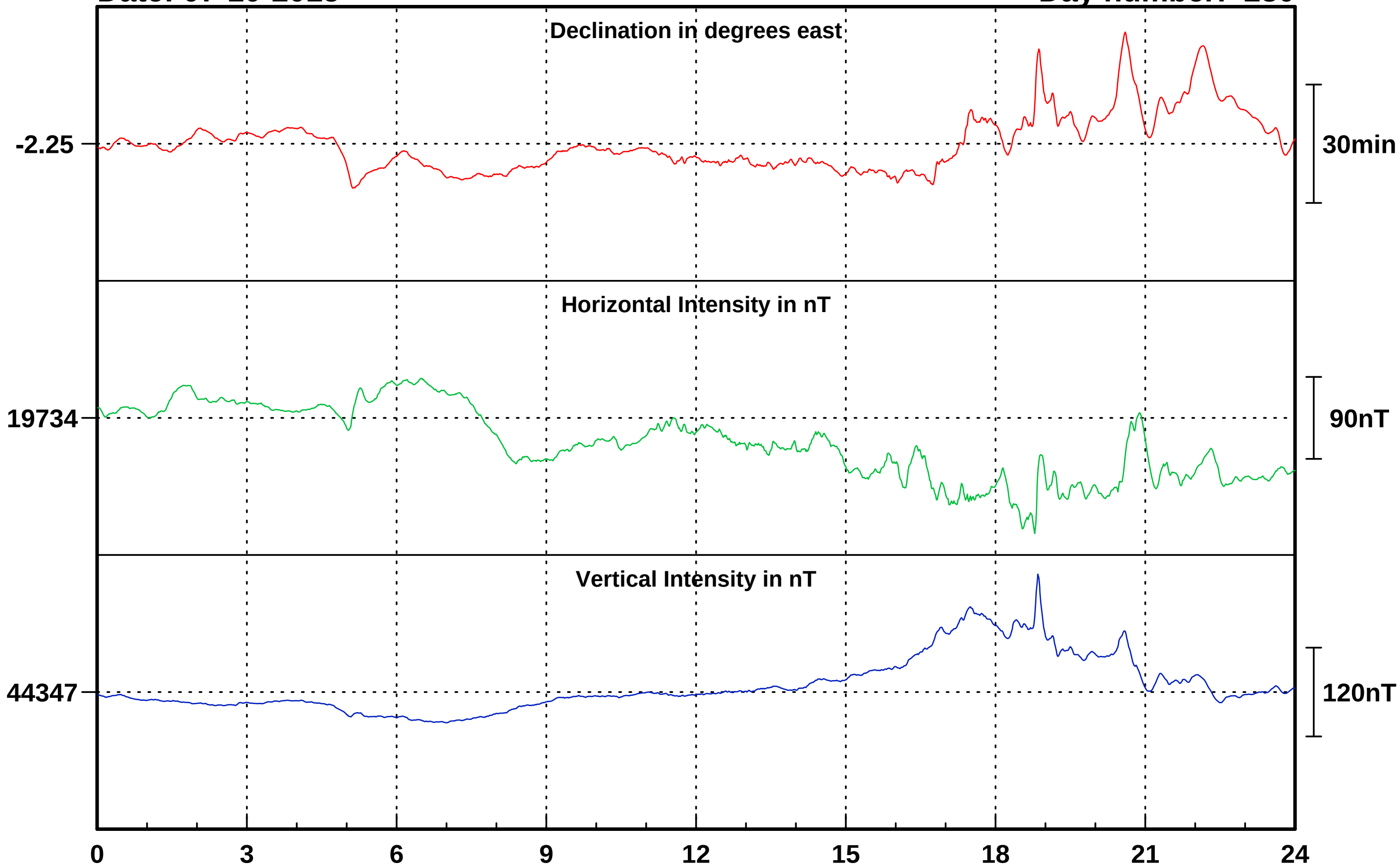
15min
Horizontal Intensity in nT
19734
30nT
Vertical Intensity in nT
44347
30nT
0
3
6
9
12
15
18
21
24
Hour (UT)

Hartland

Date: 07-10-2015 Day number: 280



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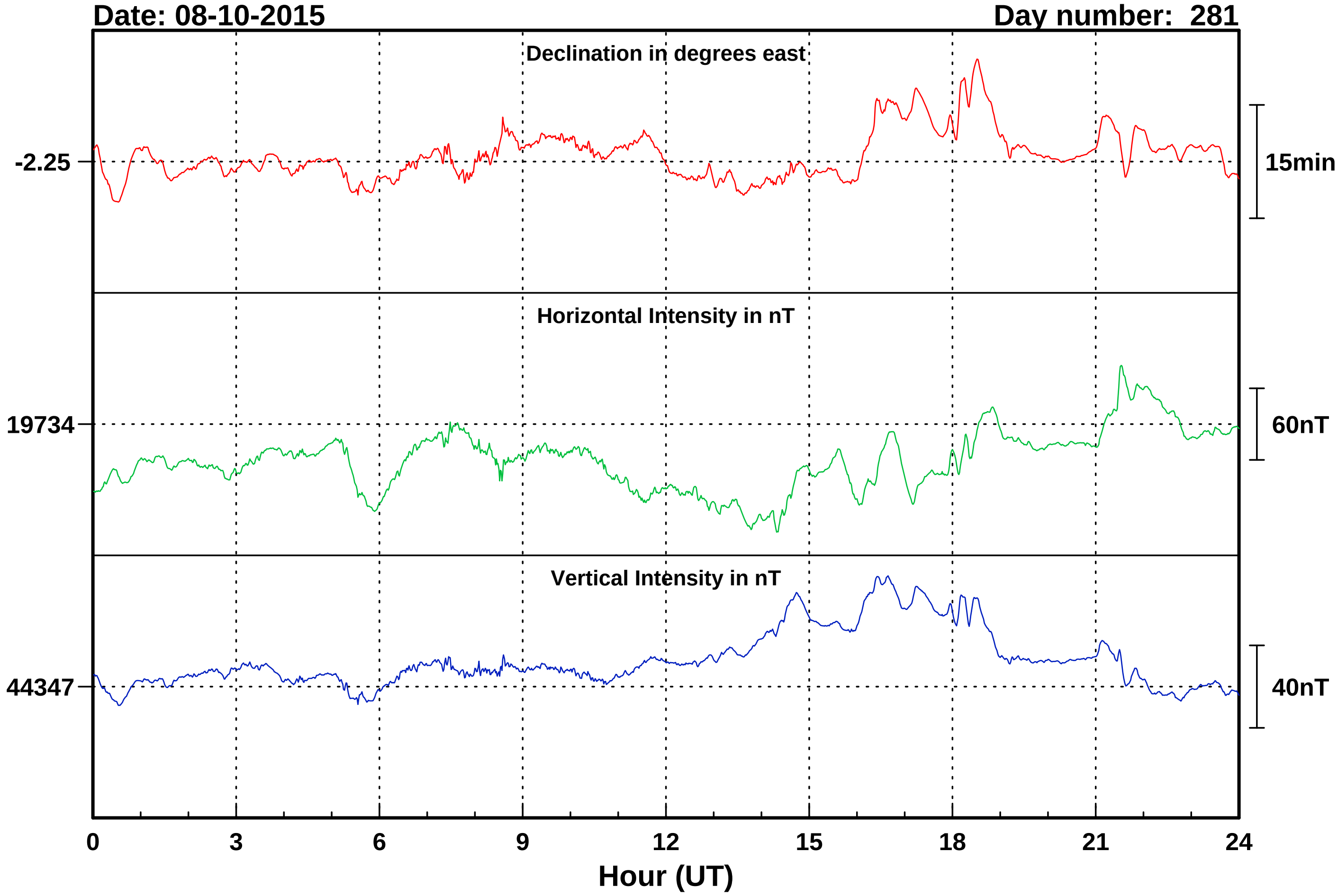
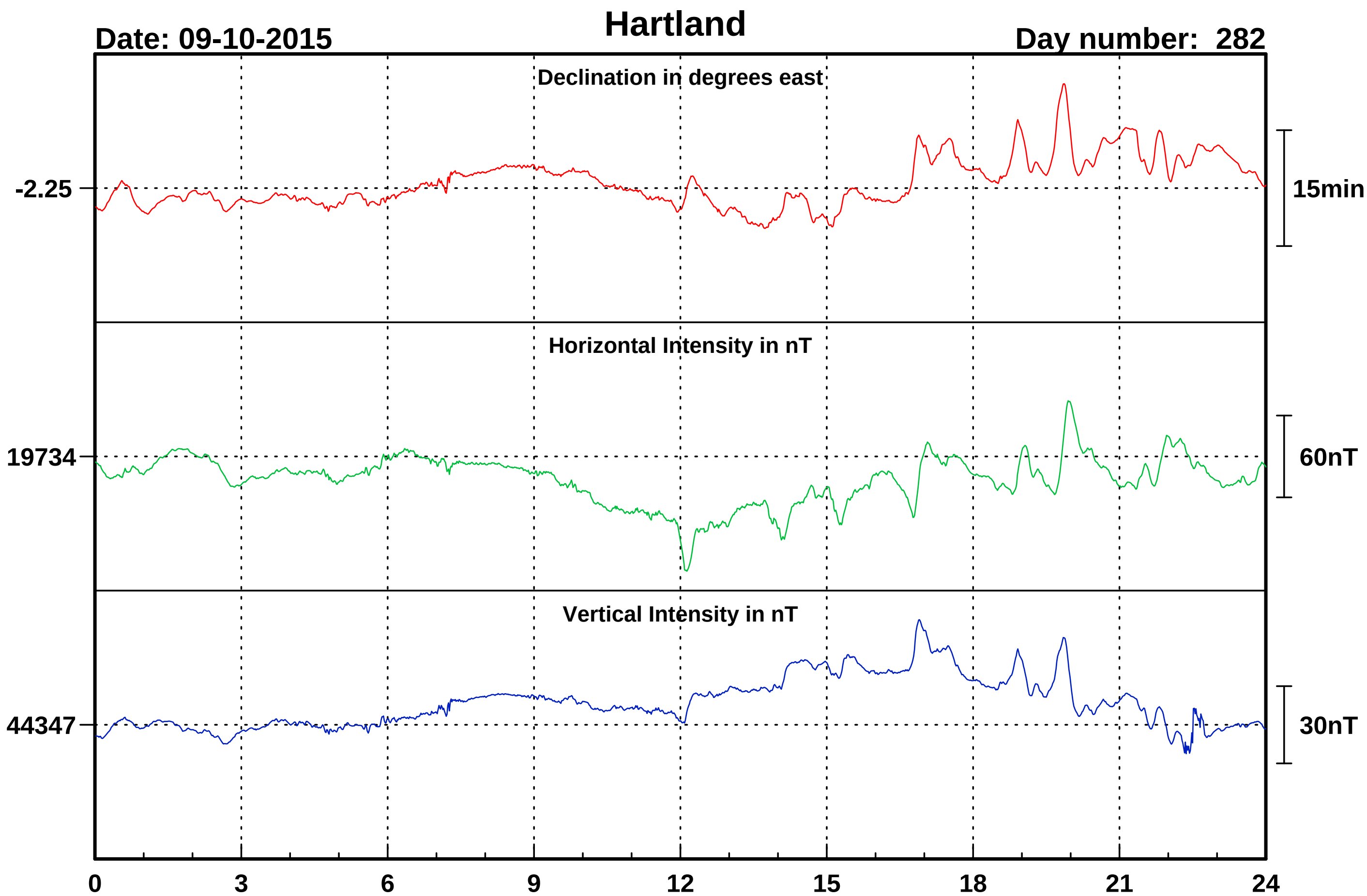
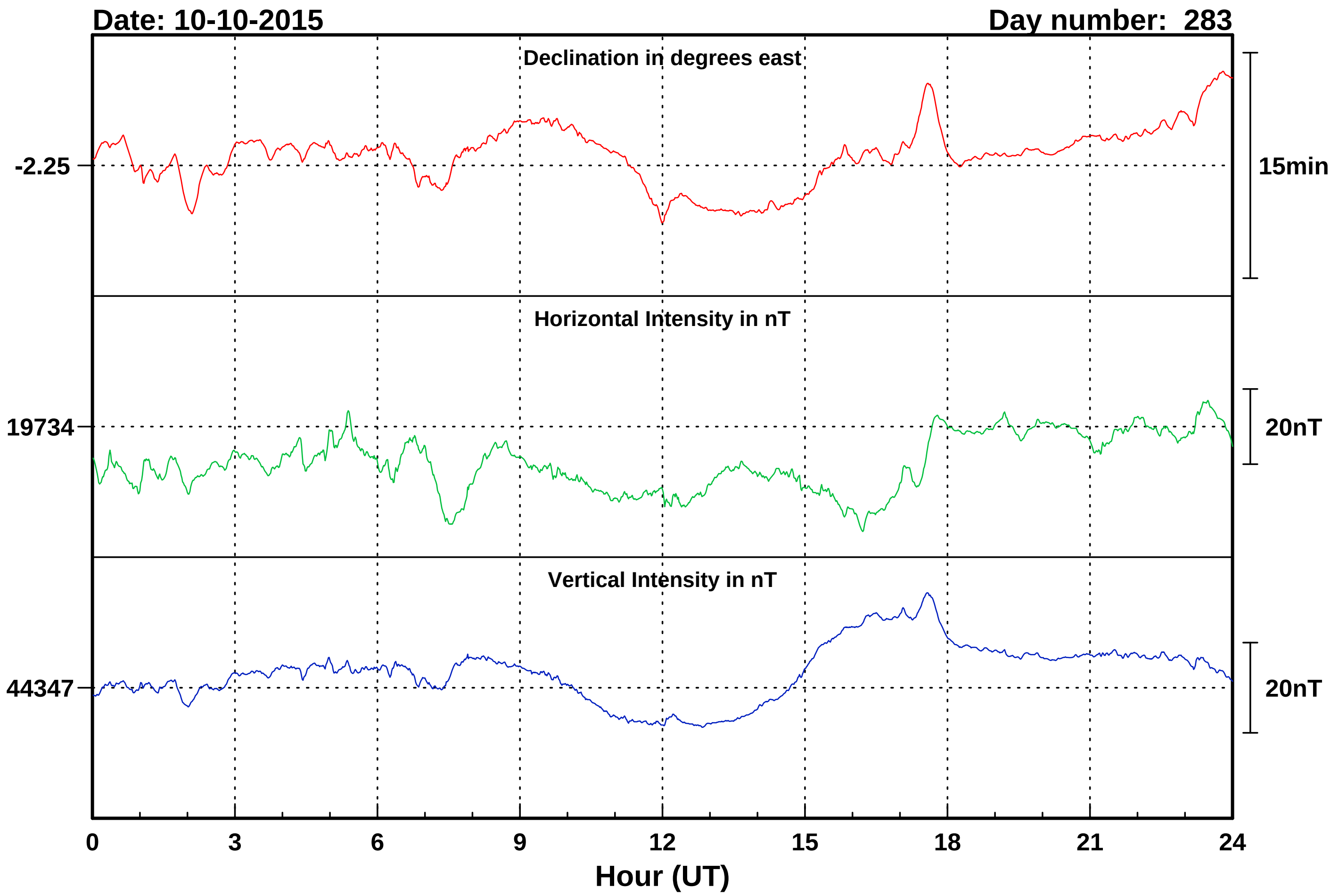
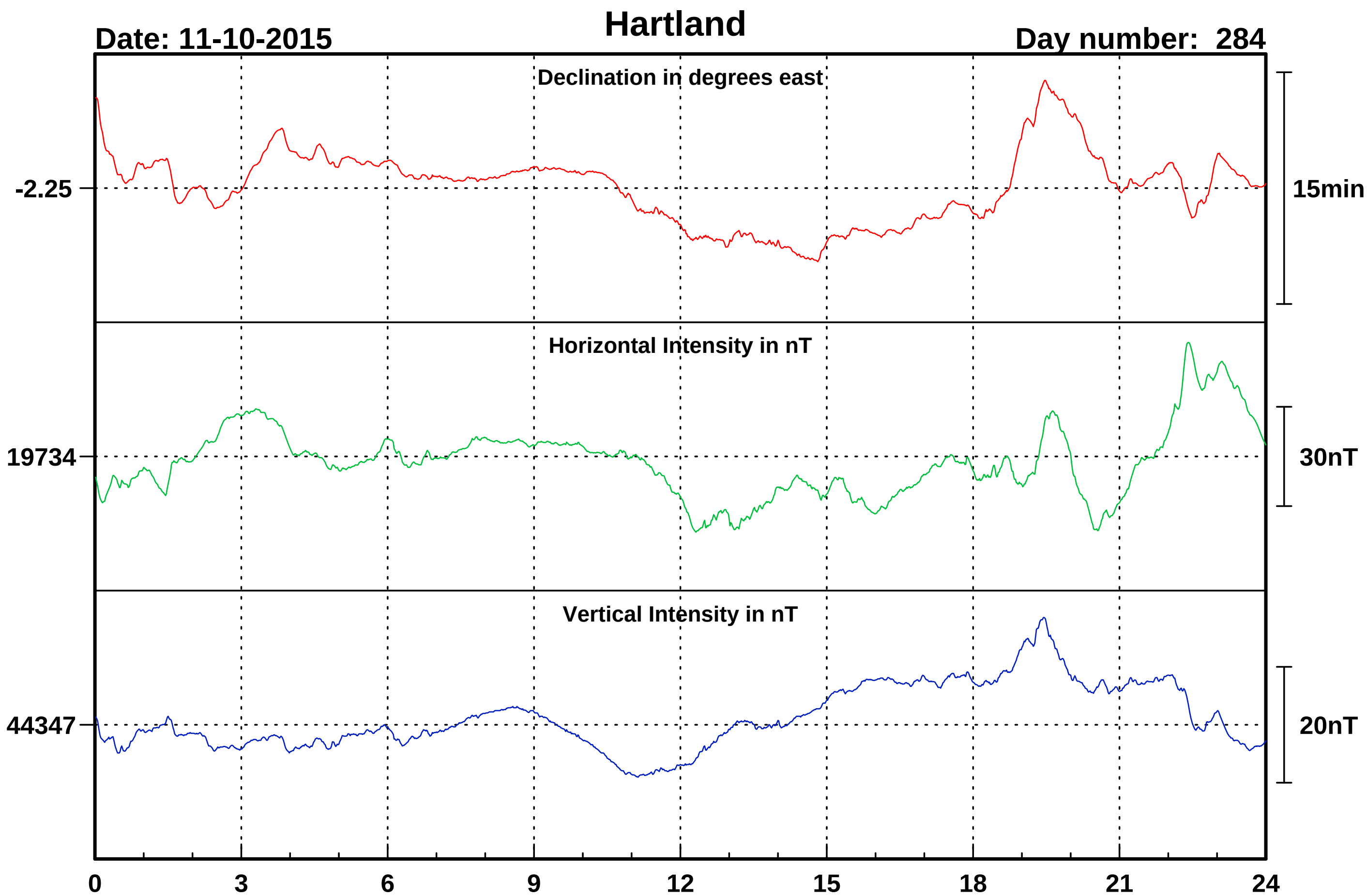
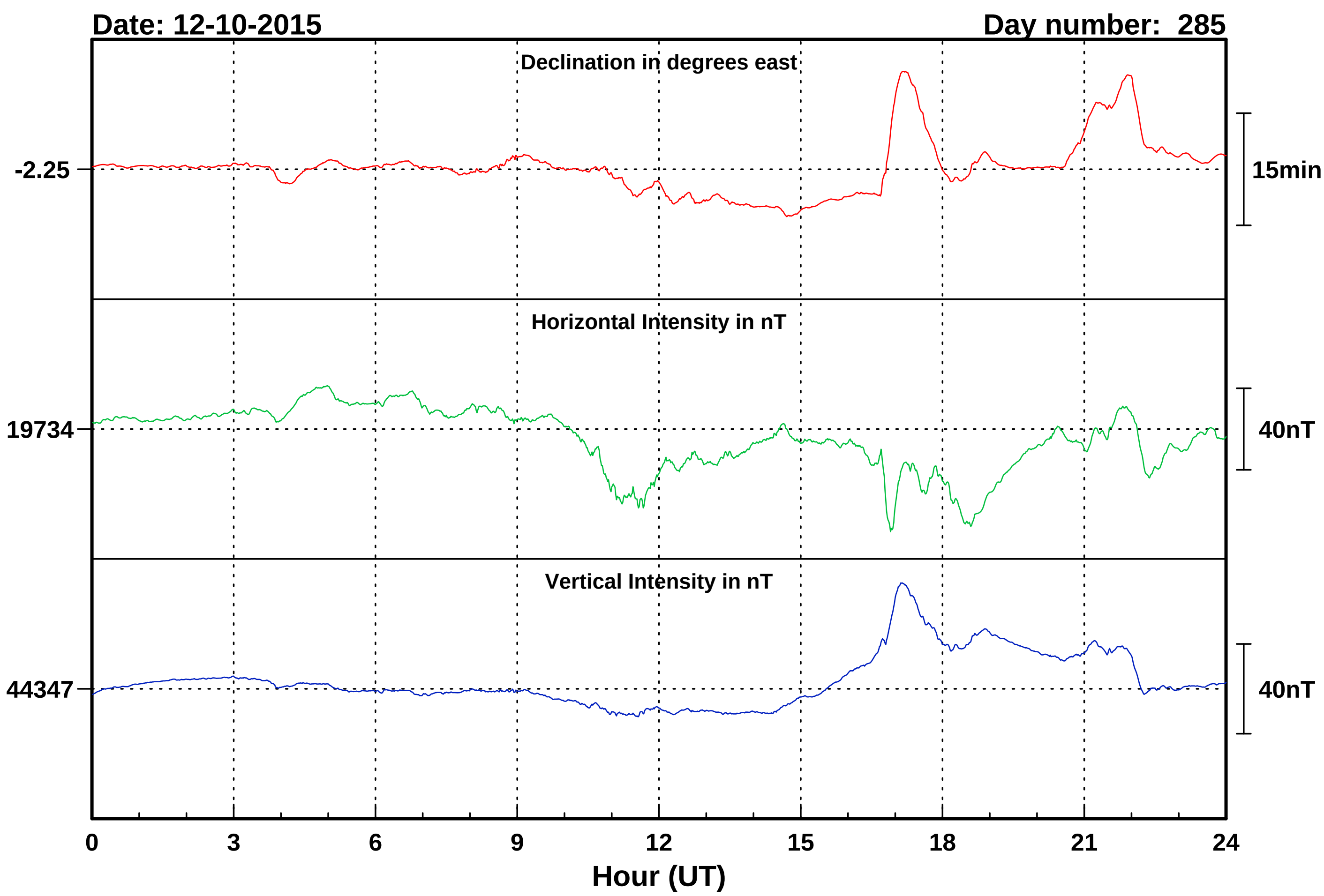



Hartland
Date: 09-10-2015
Day number: 282
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
60nT
Vertical Intensity in nT
44347
30nT
0
3
6
9
12
15
18
21
24


Date: 10-10-2015
Day number: 283
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
20nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Hartland
Date: 11-10-2015
Day number: 284
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
30nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24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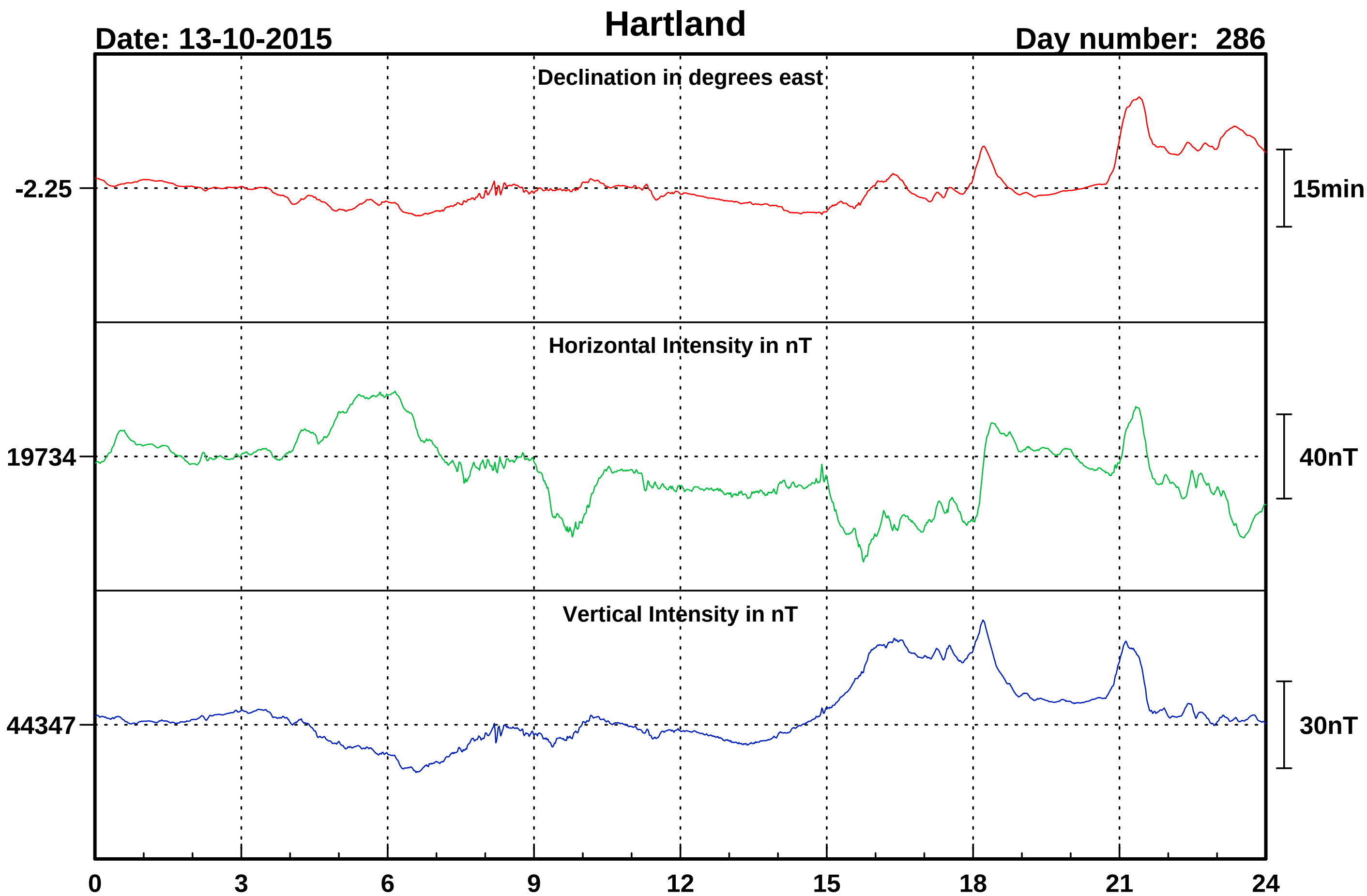
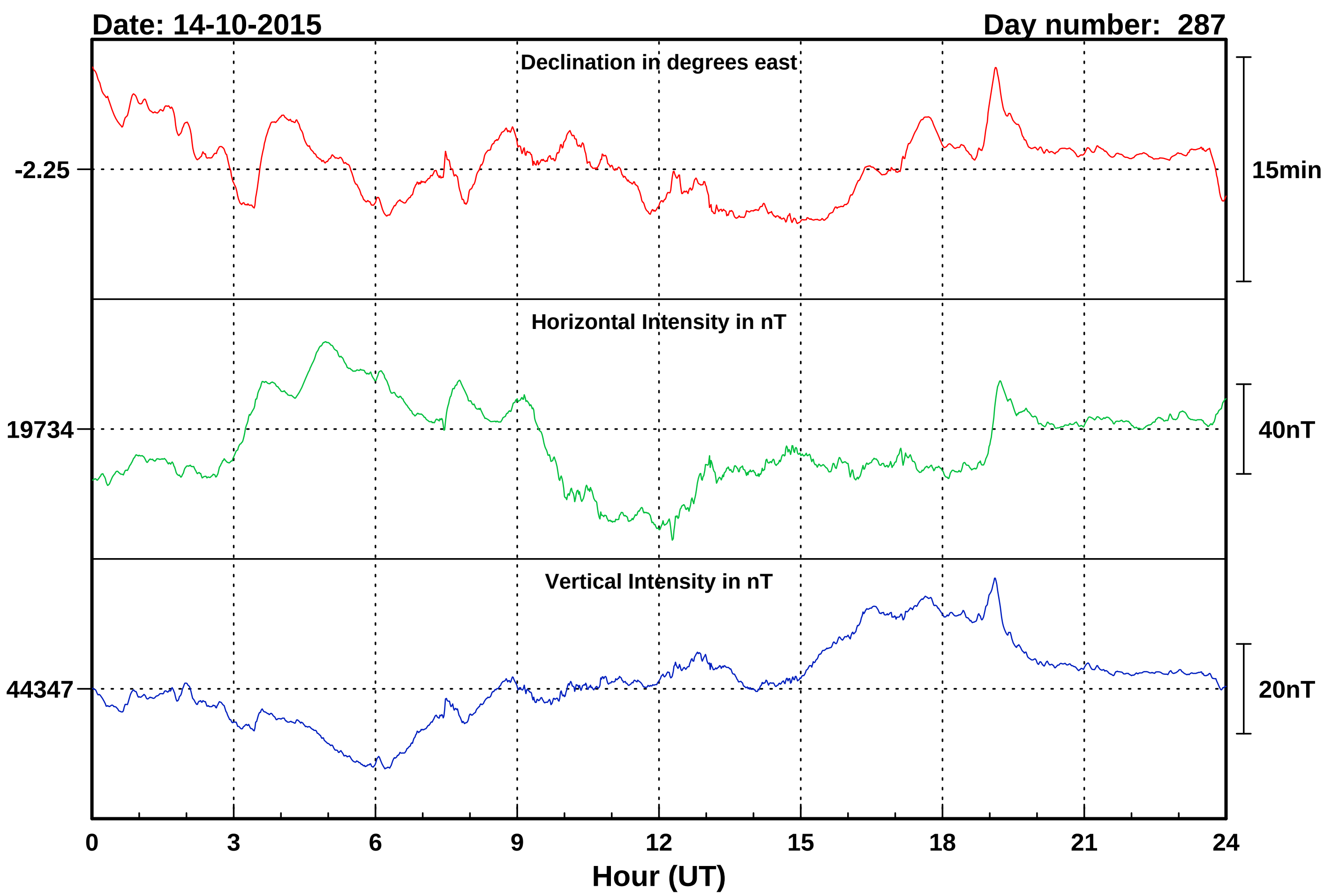
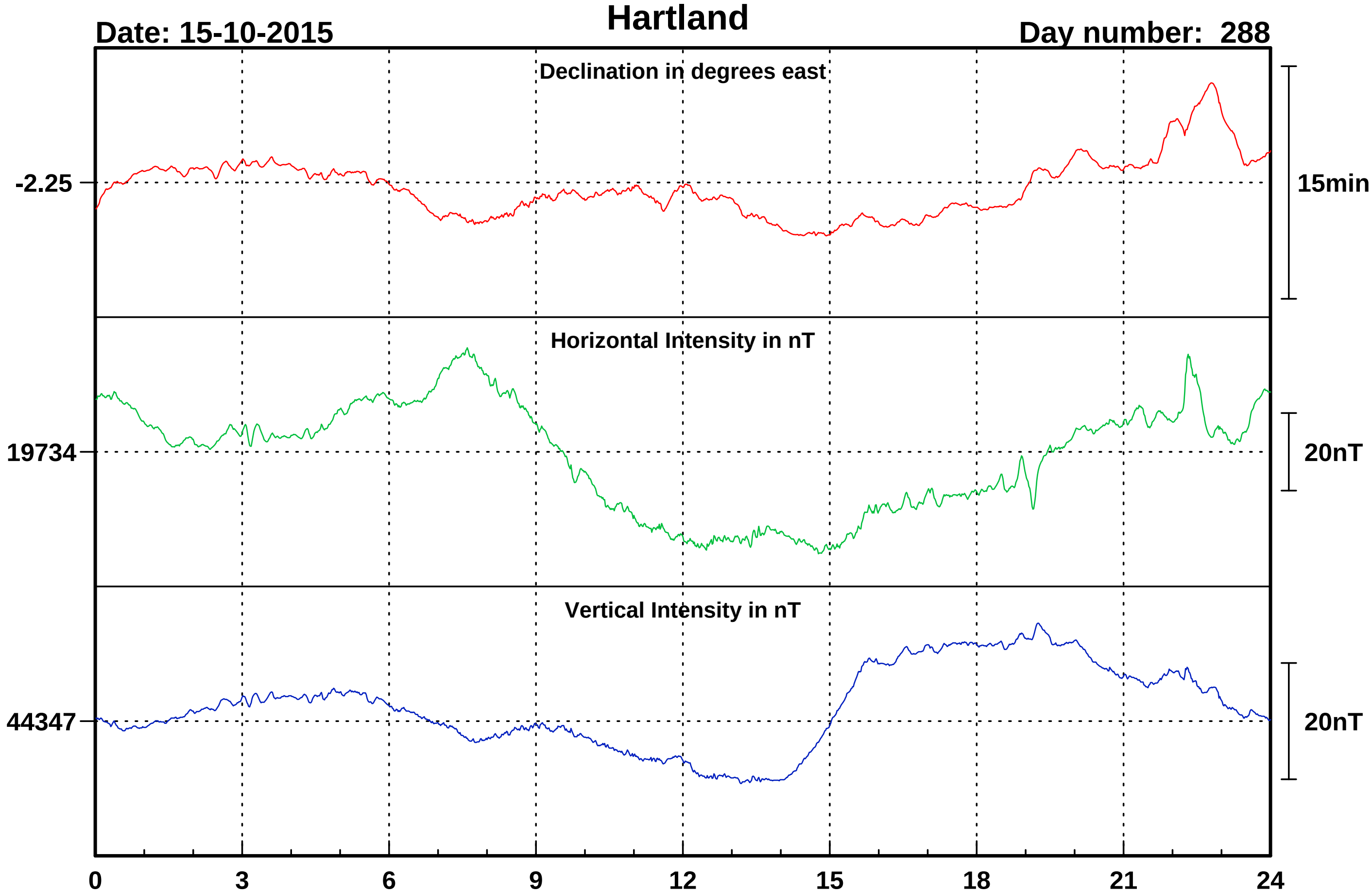
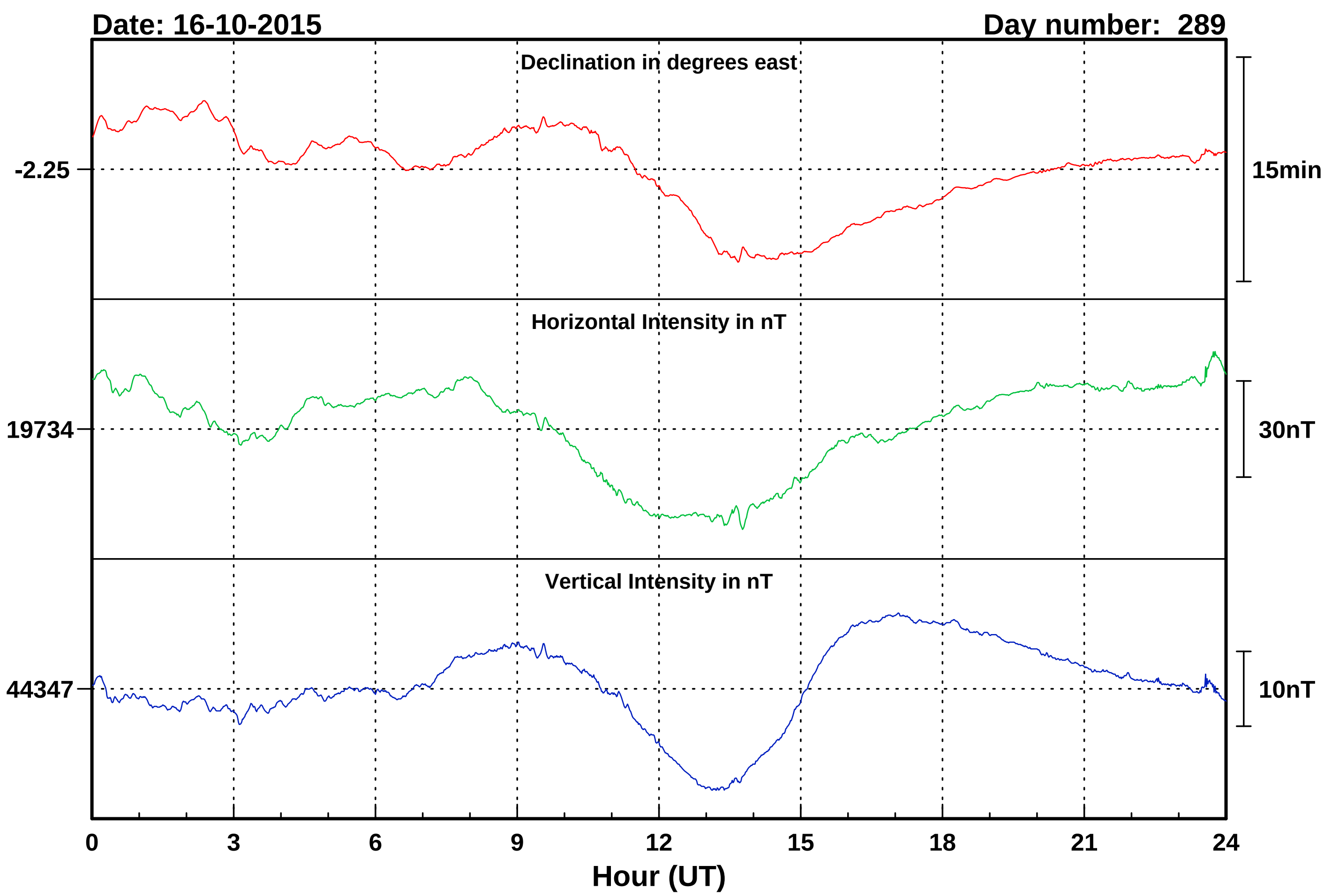
Day number: 285
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
40nT
Vertical Intensity in nT
44347
40nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Hartland
Date: 13-10-2015
Day number: 286
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
40nT
Vertical Intensity in nT
44347
30nT
0
3
6
9
12
15
18
21
24


Date: 14-10-2015
Day number: 287
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
40nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)

Hartland


Date: 15-10-2015
Day number: 288
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
20nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24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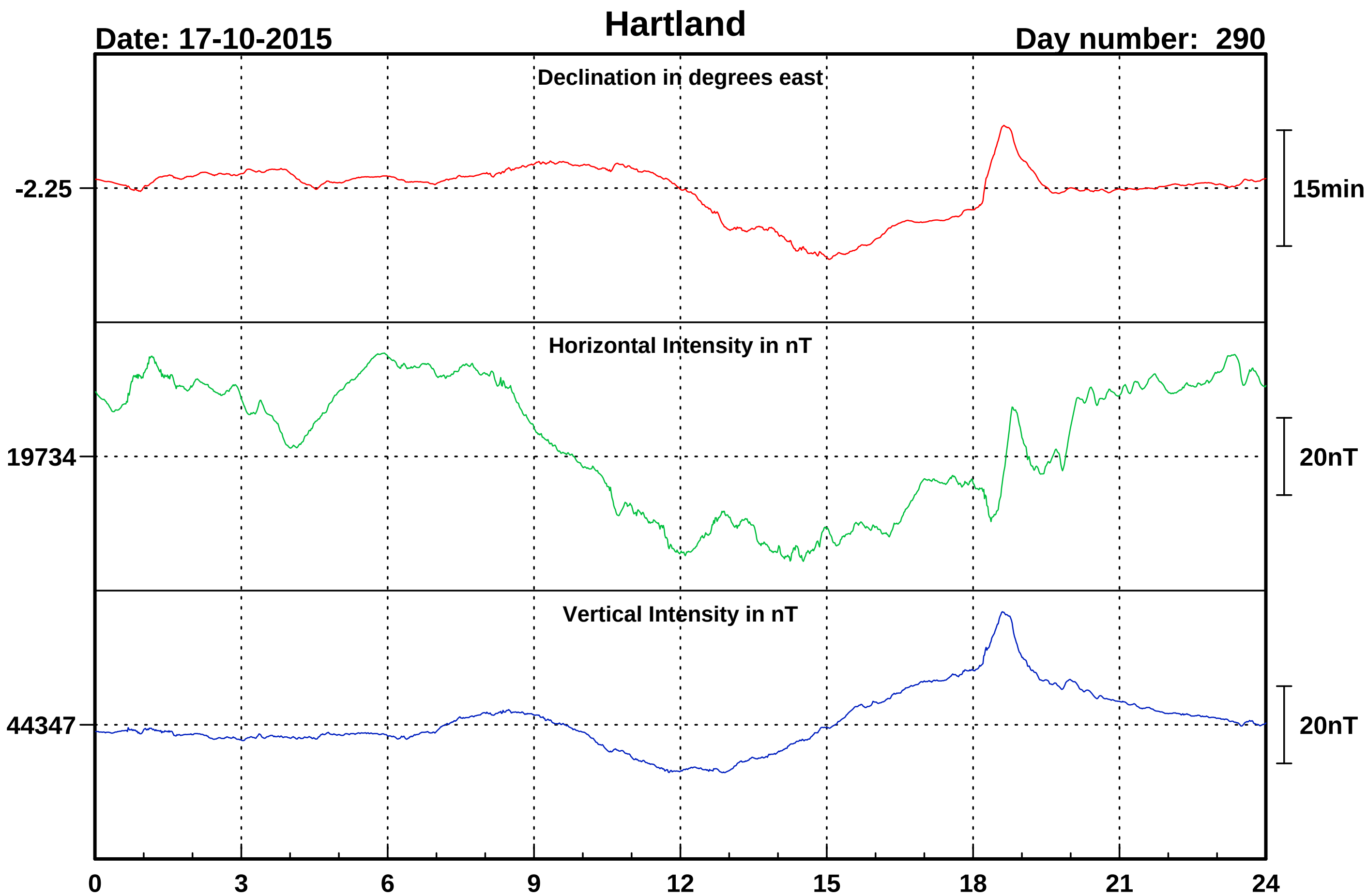
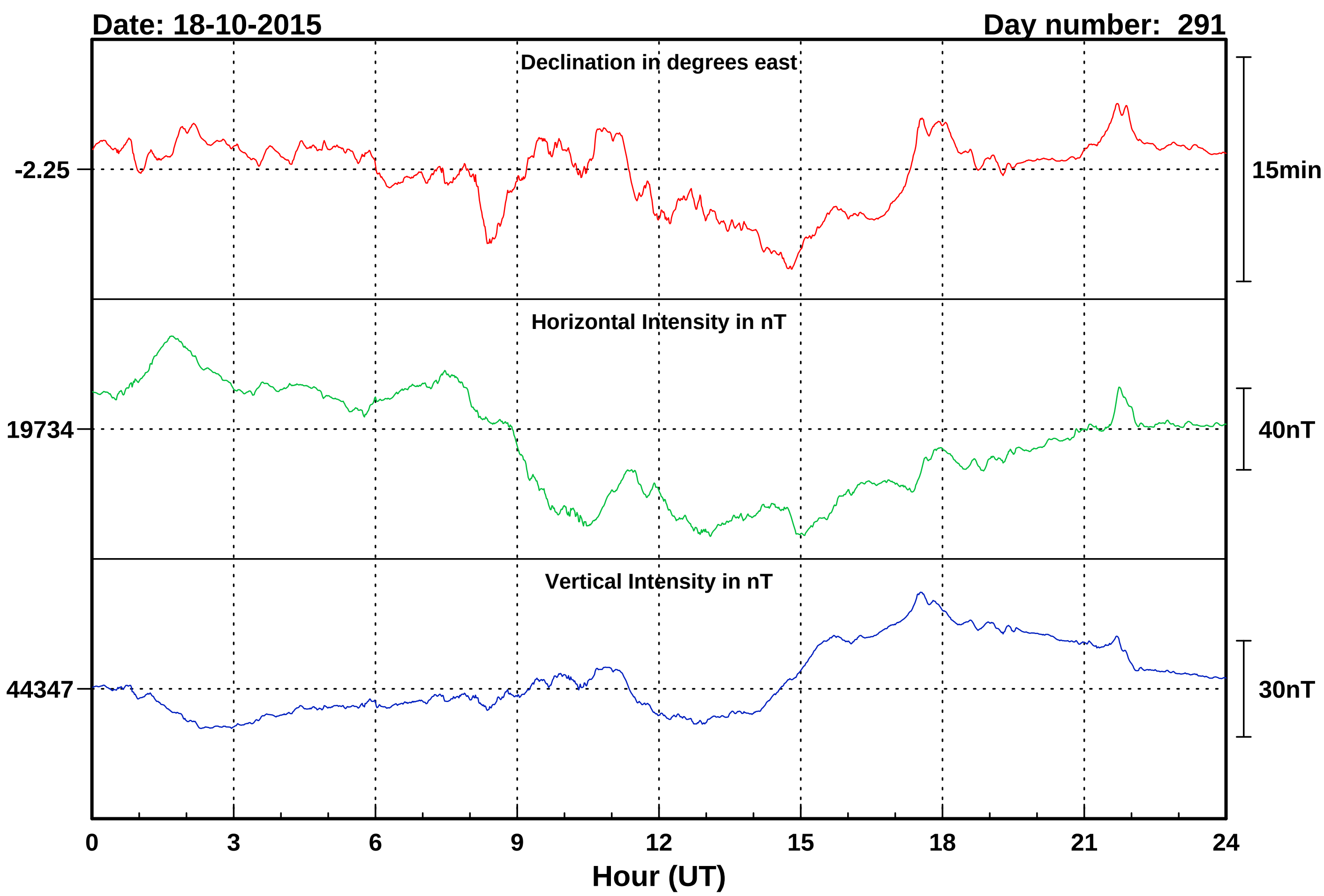
Day number: 289
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
30nT
Vertical Intensity in nT
44347
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)


Hartland
Date: 17-10-2015
Day number: 290
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
20nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24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Day number: 291
Declination in degrees east
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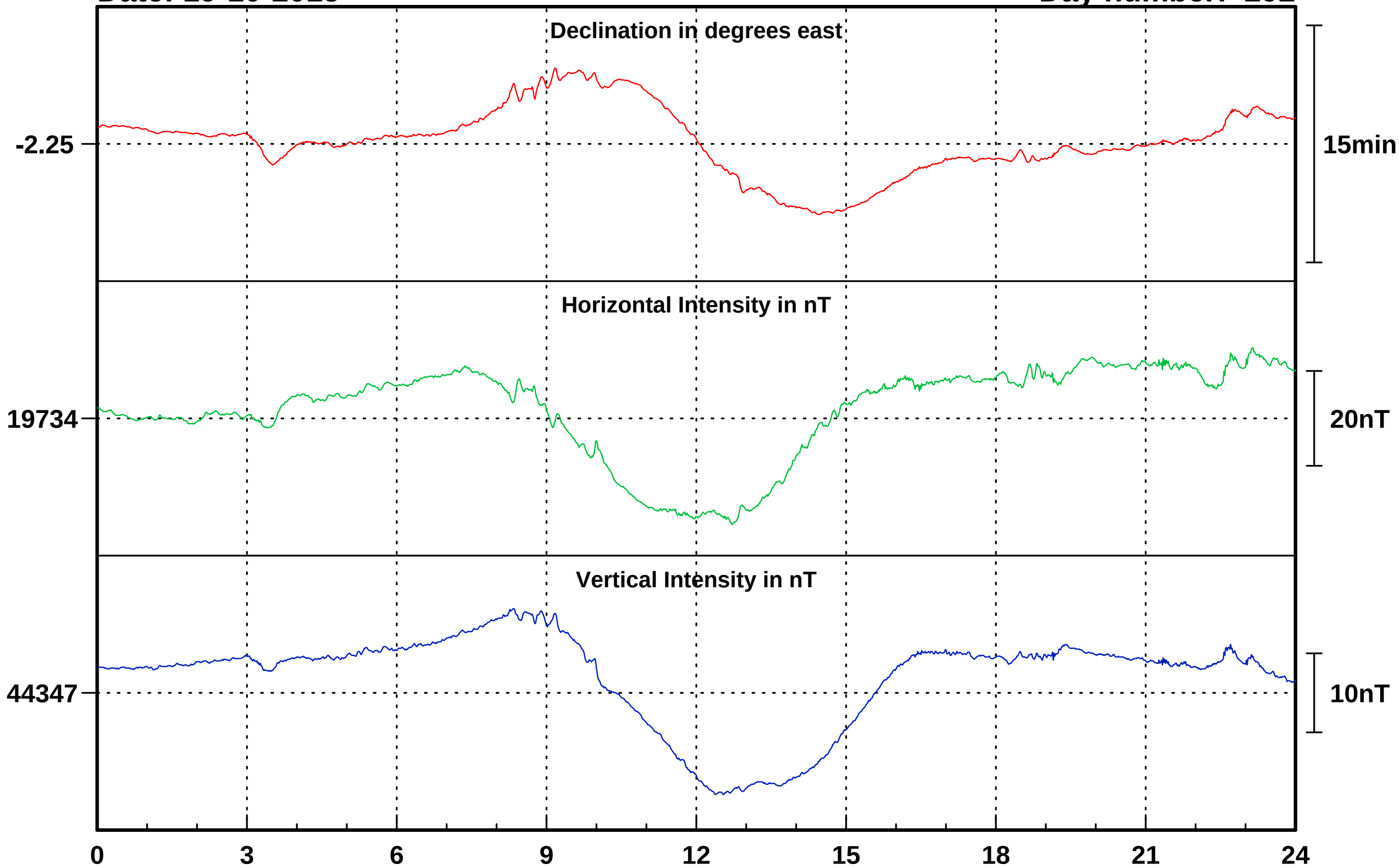
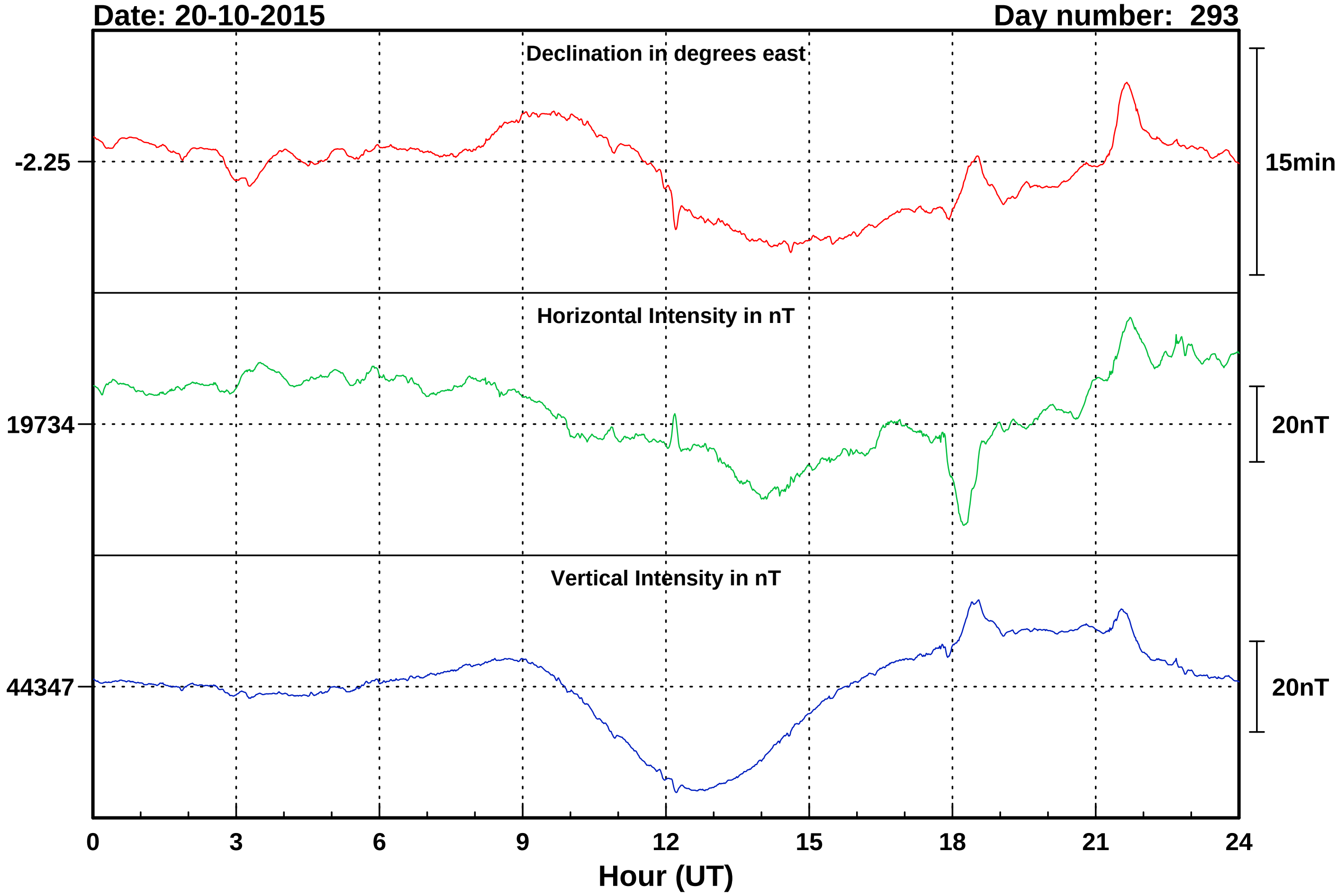
15min
Horizontal Intensity in nT
19734
40nT
Vertical Intensity in nT
44347
30nT
0
3
6
9
12
15
18
21
24
Hour (UT)

Hartland

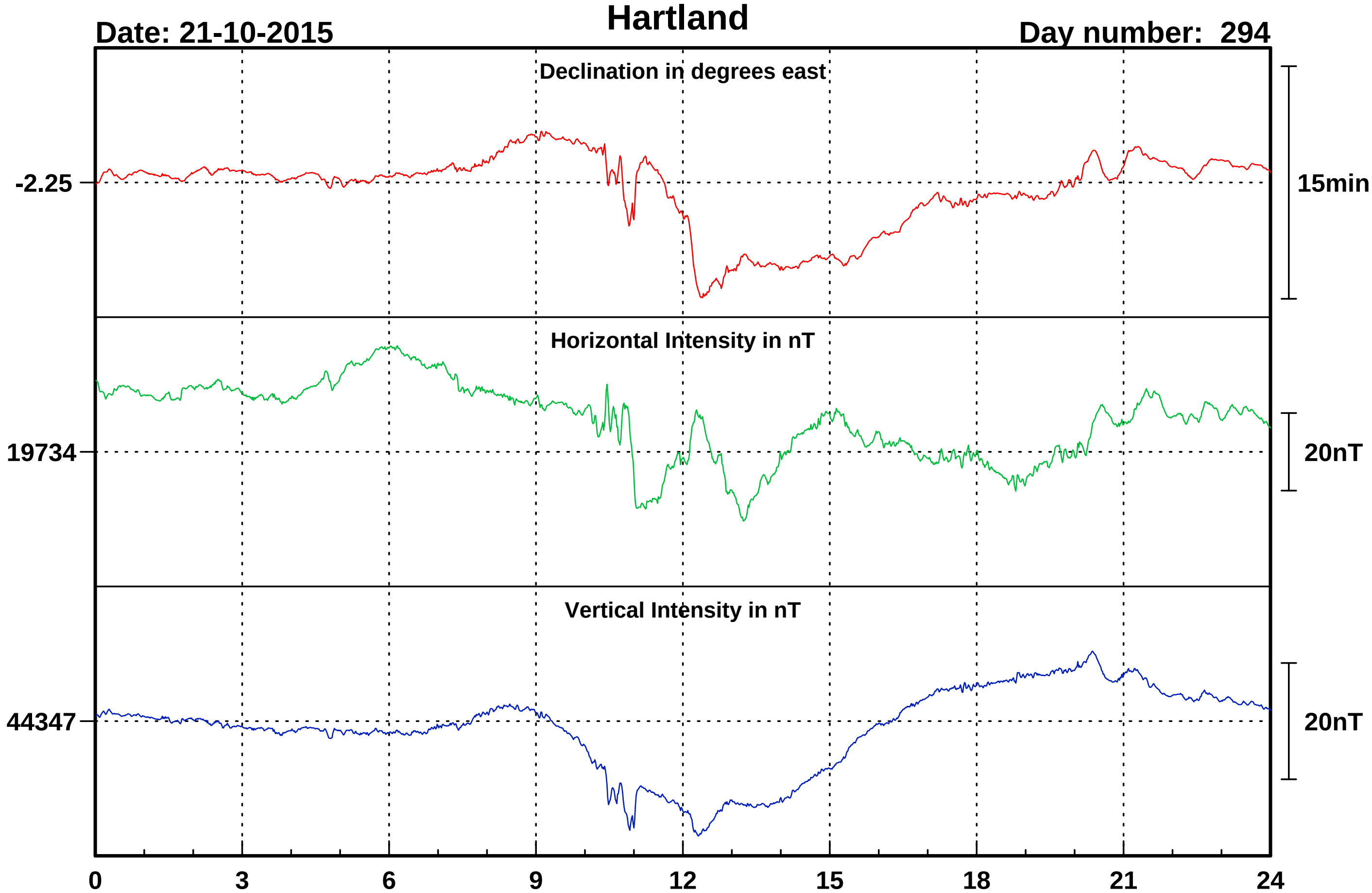
Date: 19-10-2015 Day number: 292

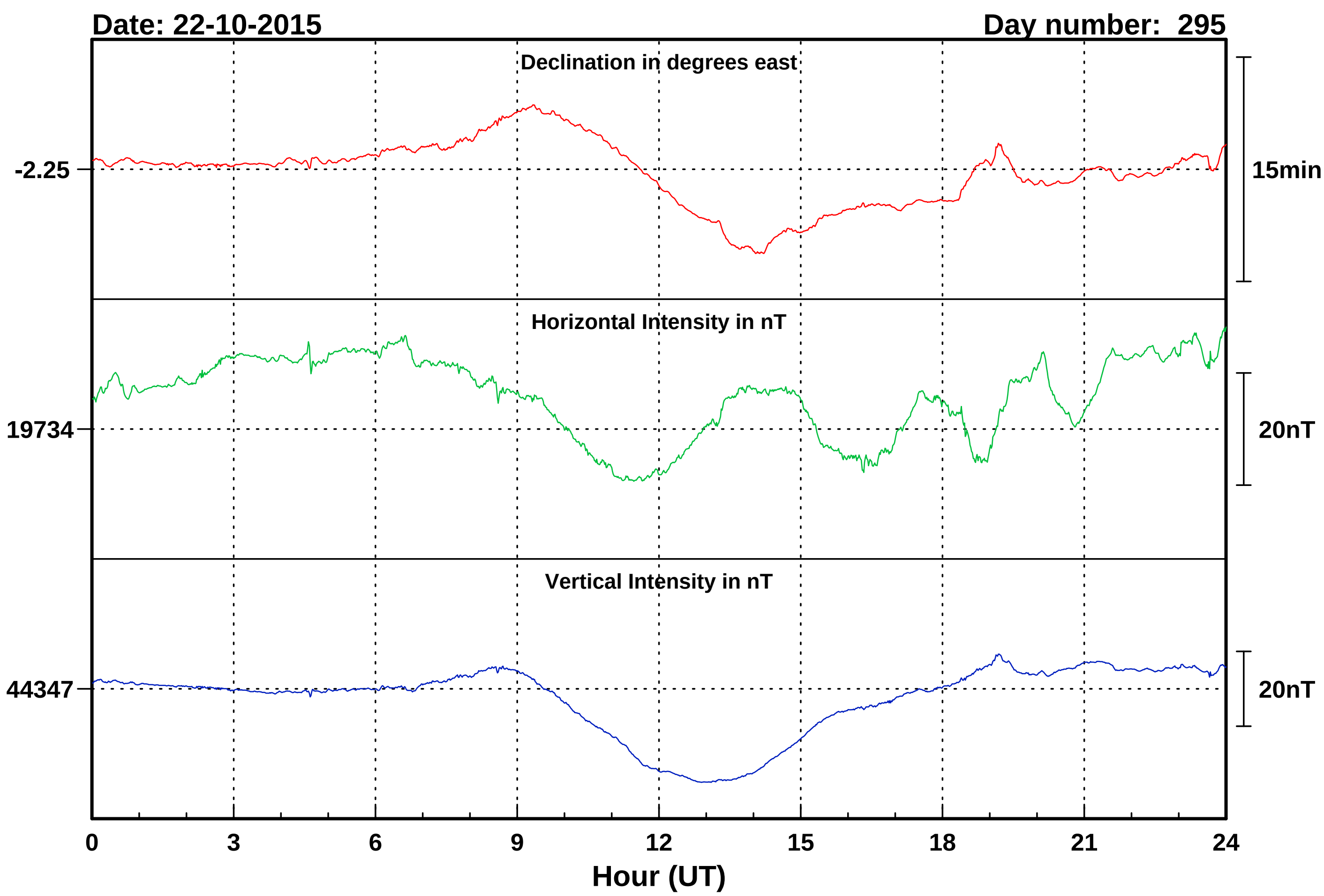


Date: 20-10-2015 Day number: 293



Hartland


Date: 21-10-2015
Day number: 294
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
20nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24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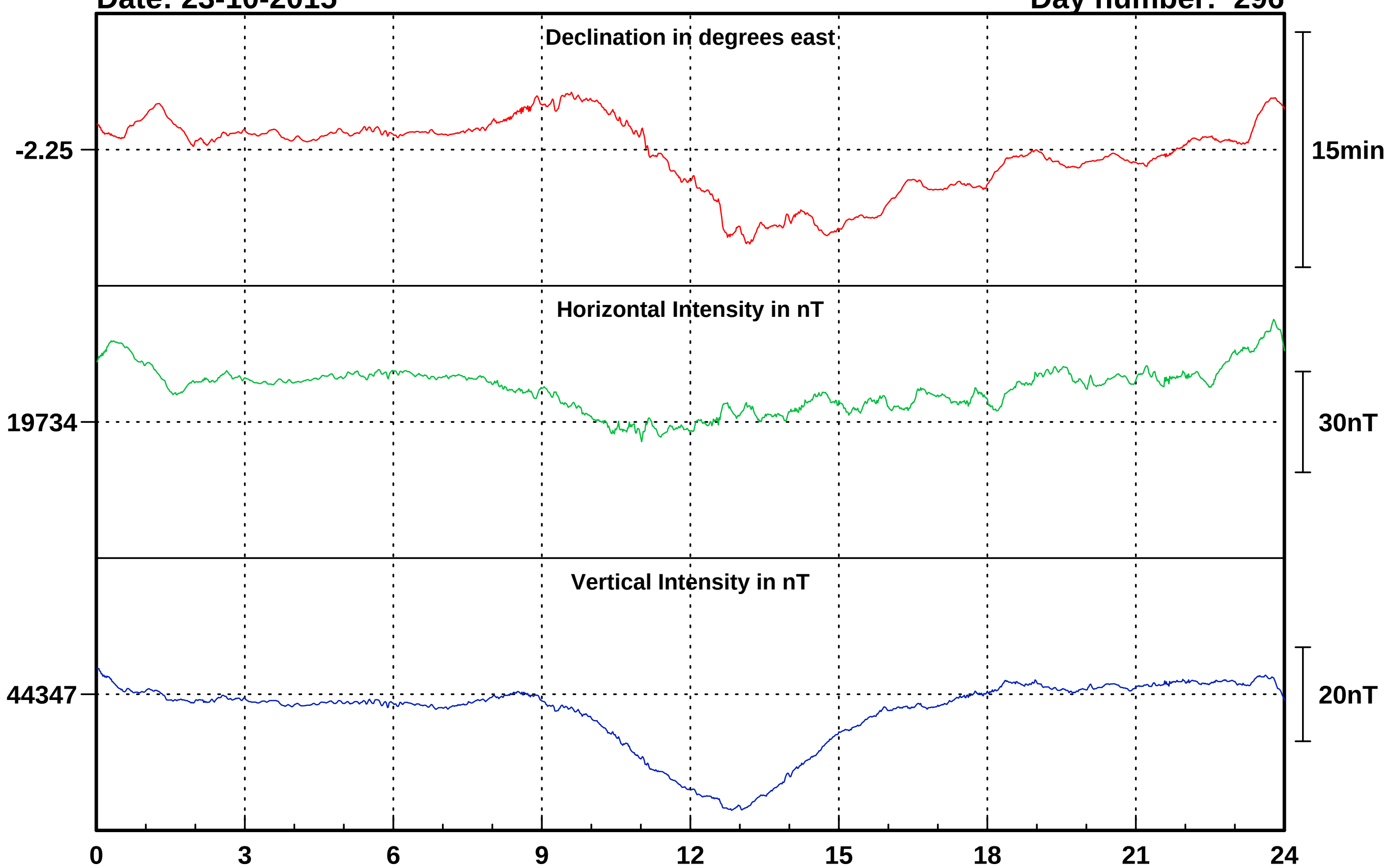
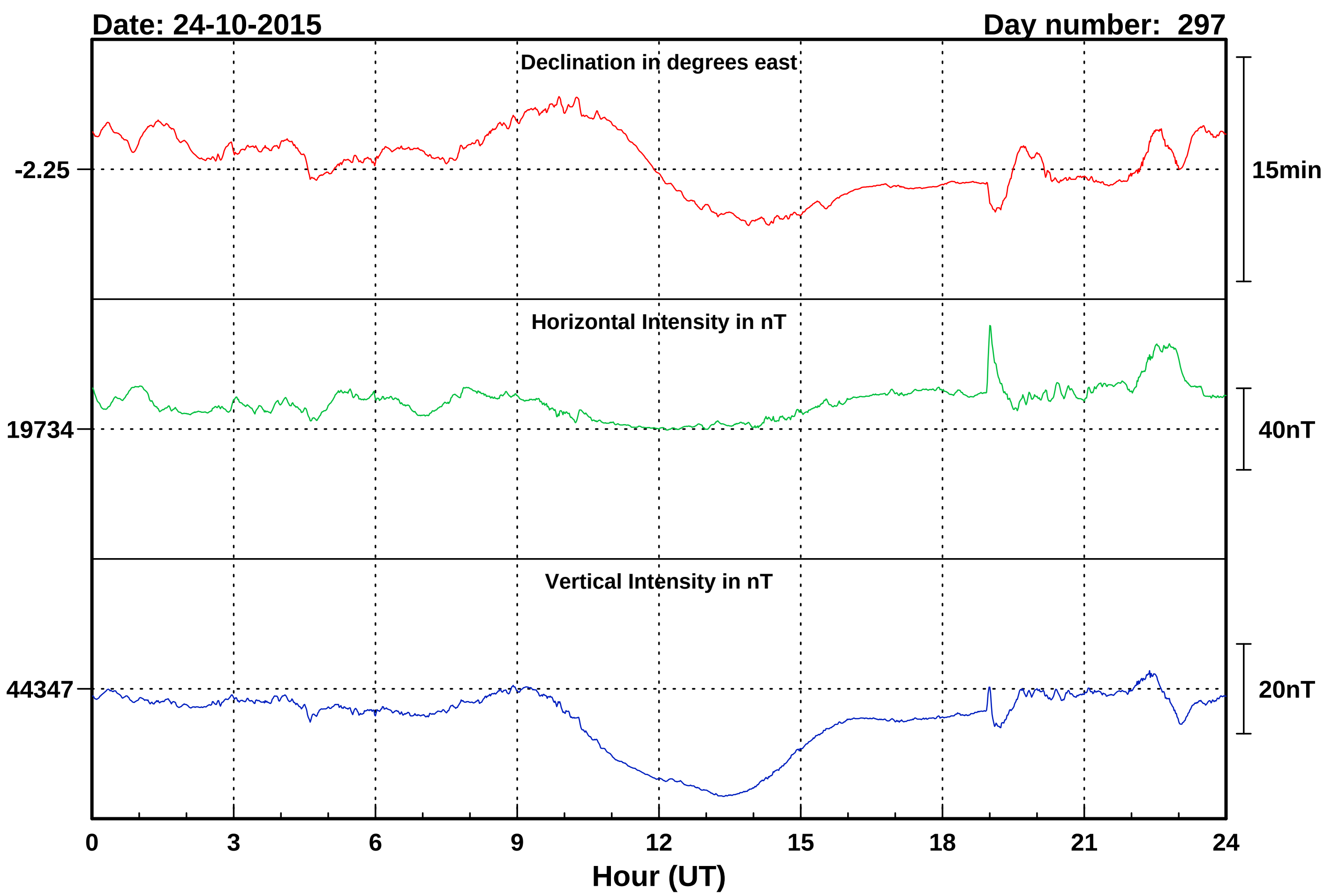
Day number: 295
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
20nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)

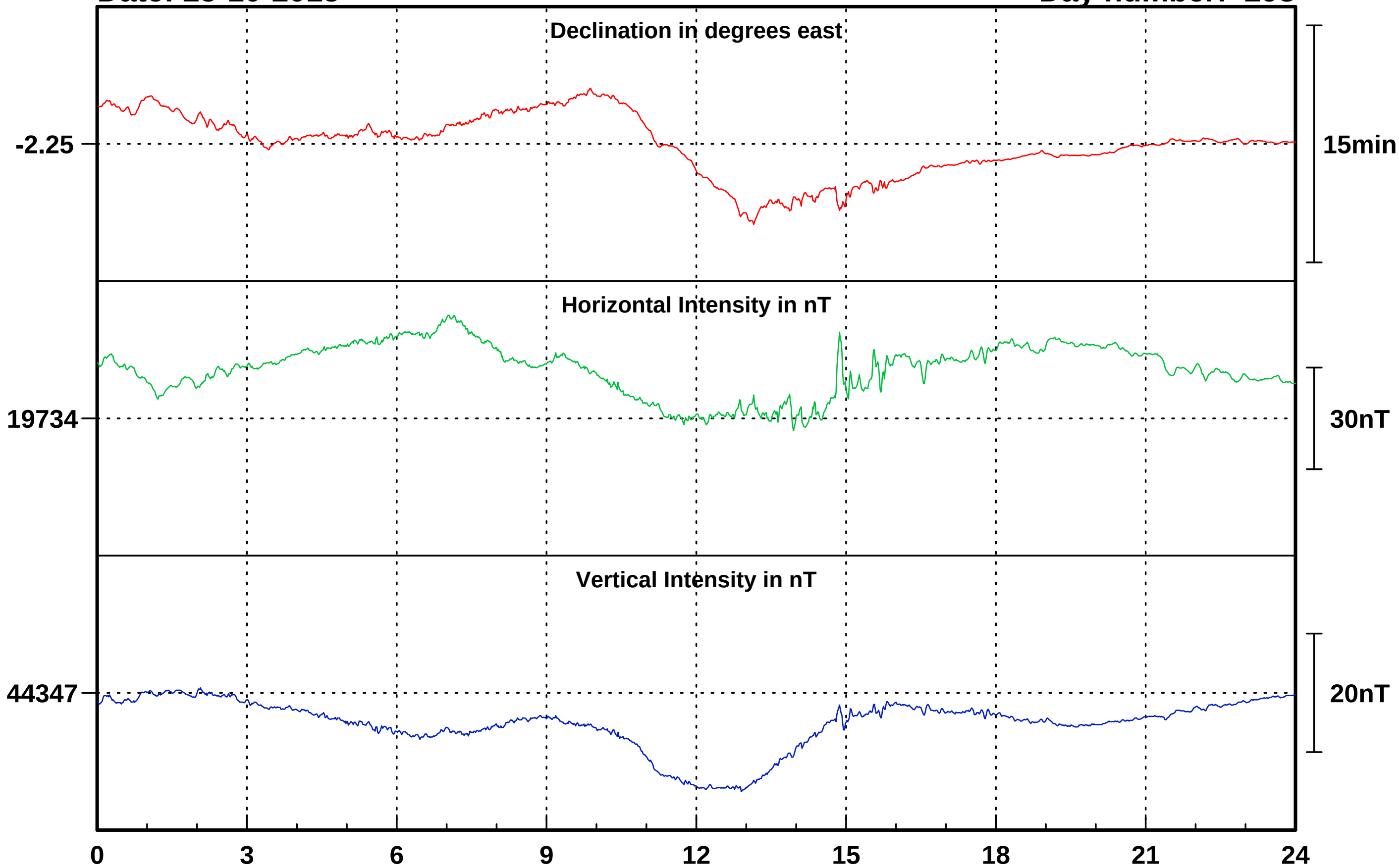
Hartland


Date: 23-10-2015
Day number: 296
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
30nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24

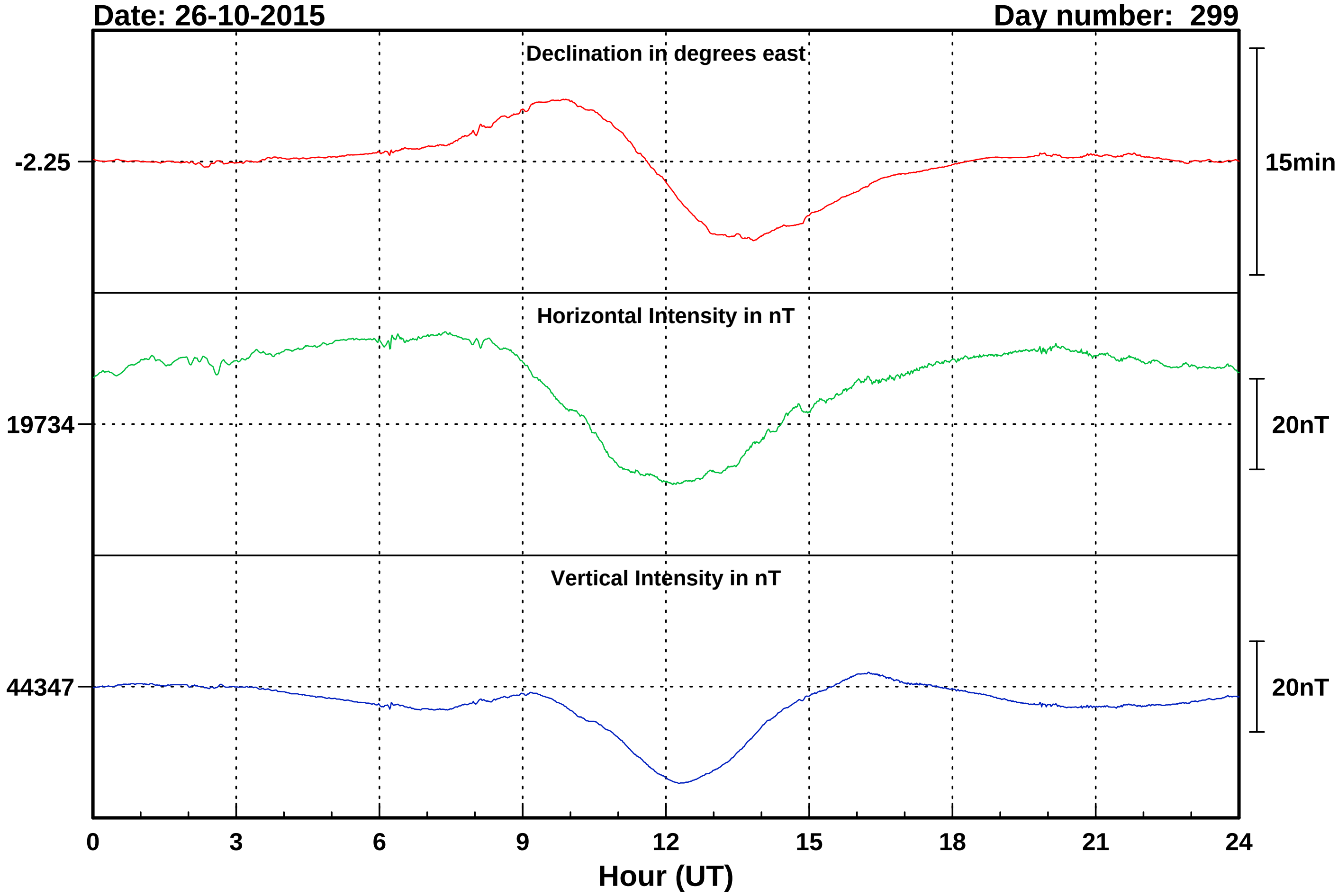

Date: 24-10-2015
Day number: 297
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
40nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24
Hour (UT)

Hartland

Date: 25-10-2015 Day number: 298

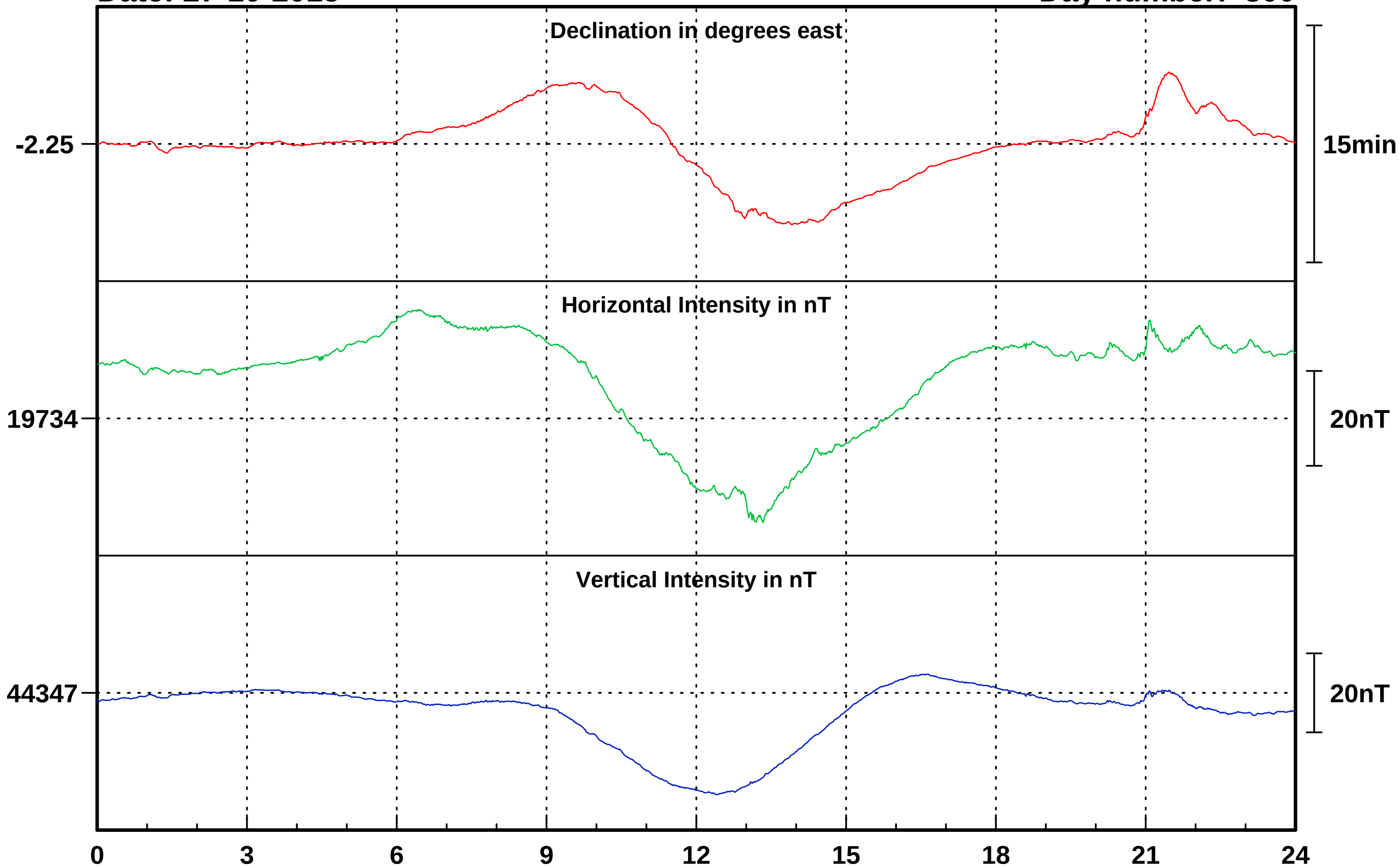


Date: 26-10-2015 Day number: 299

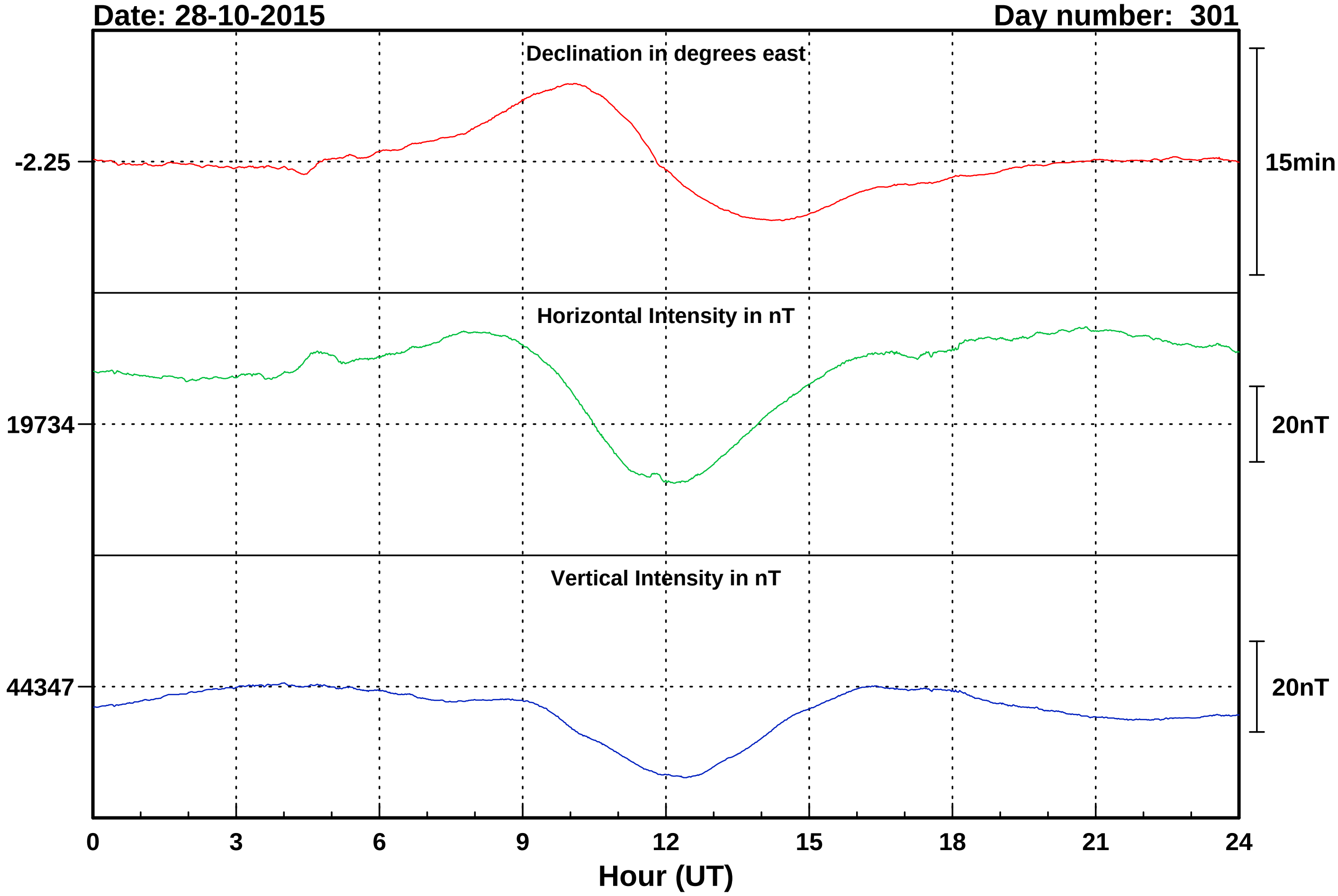


Hartland

Date: 27-10-2015 Day number: 300

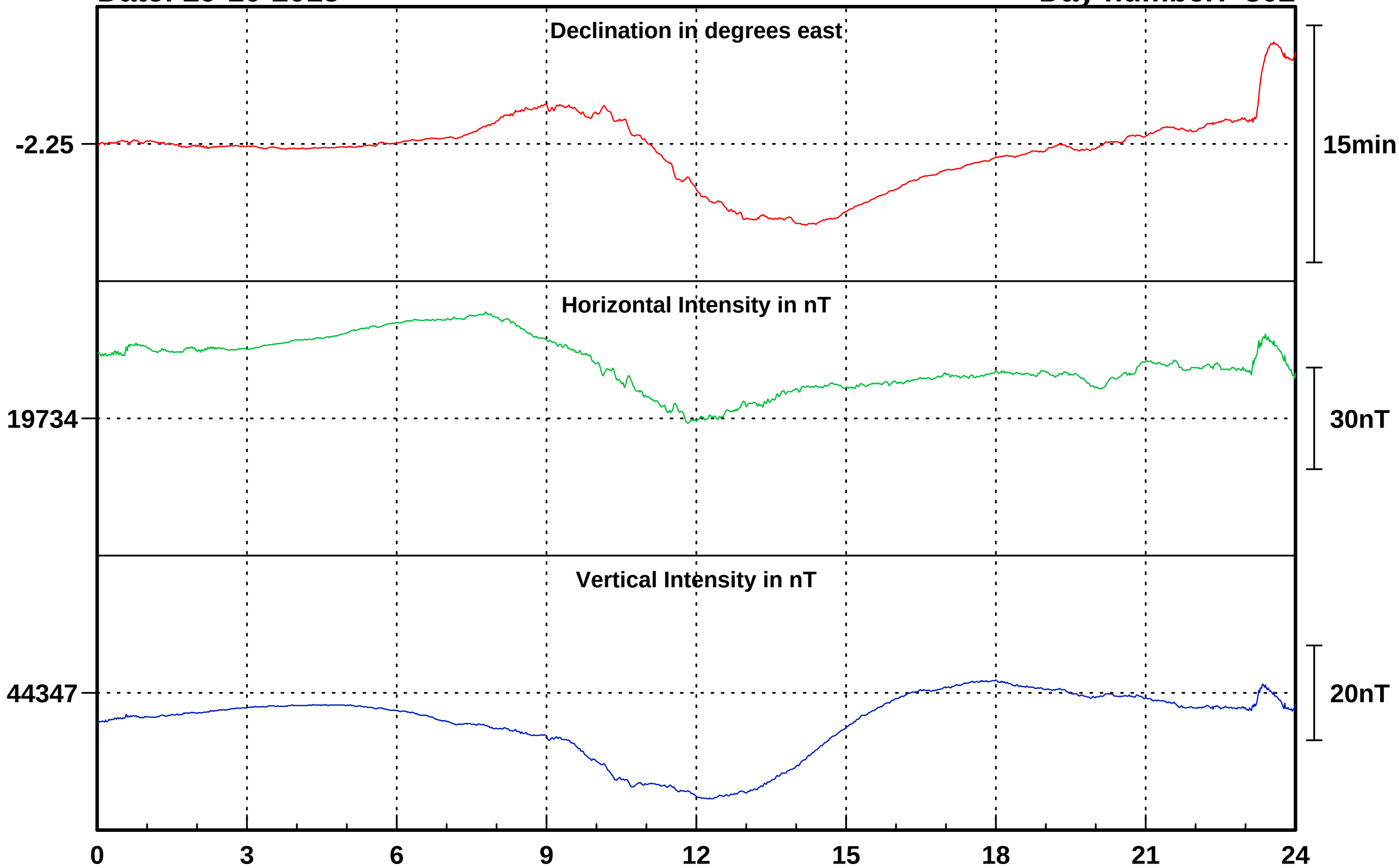


Date: 28-10-2015 Day number: 301

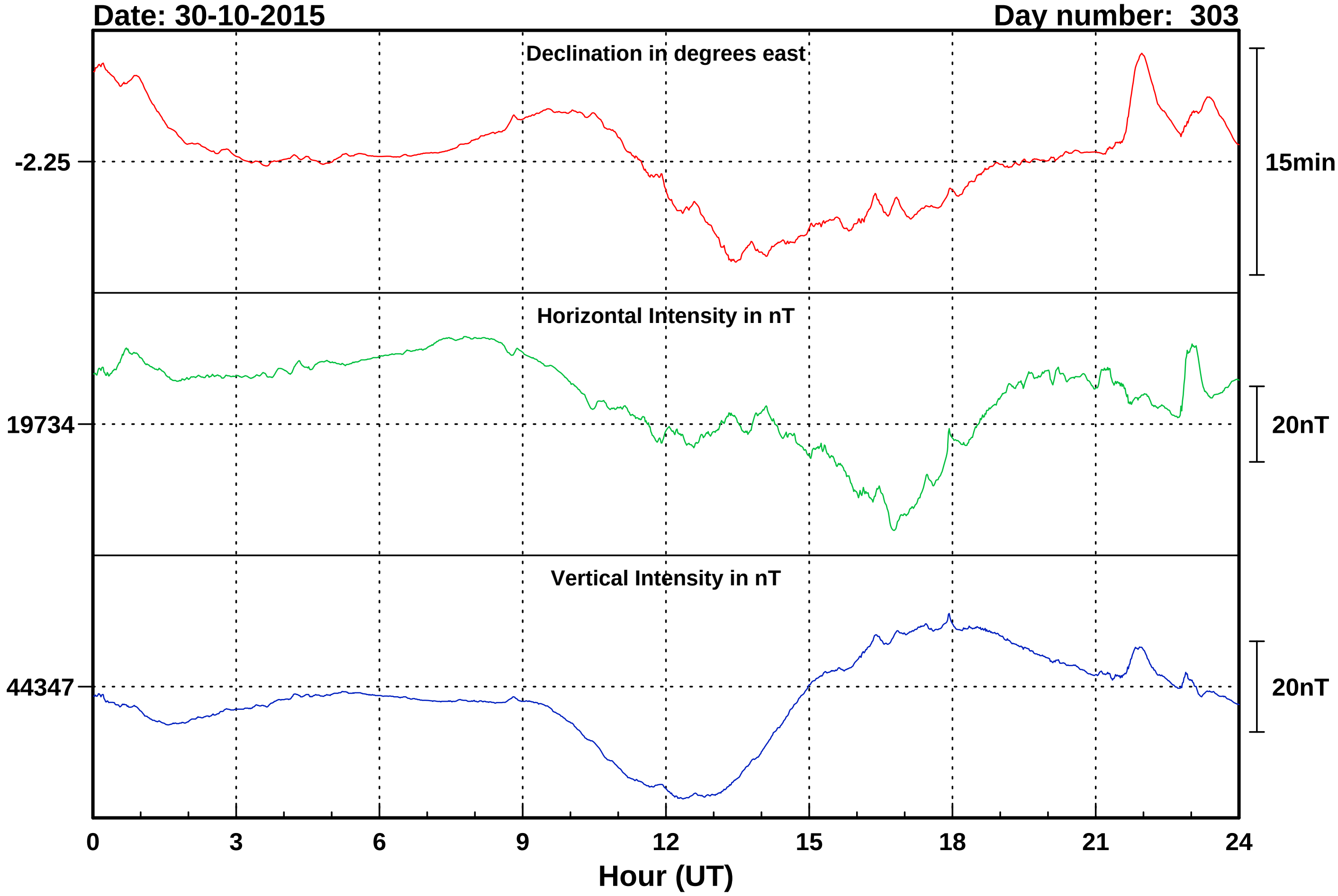


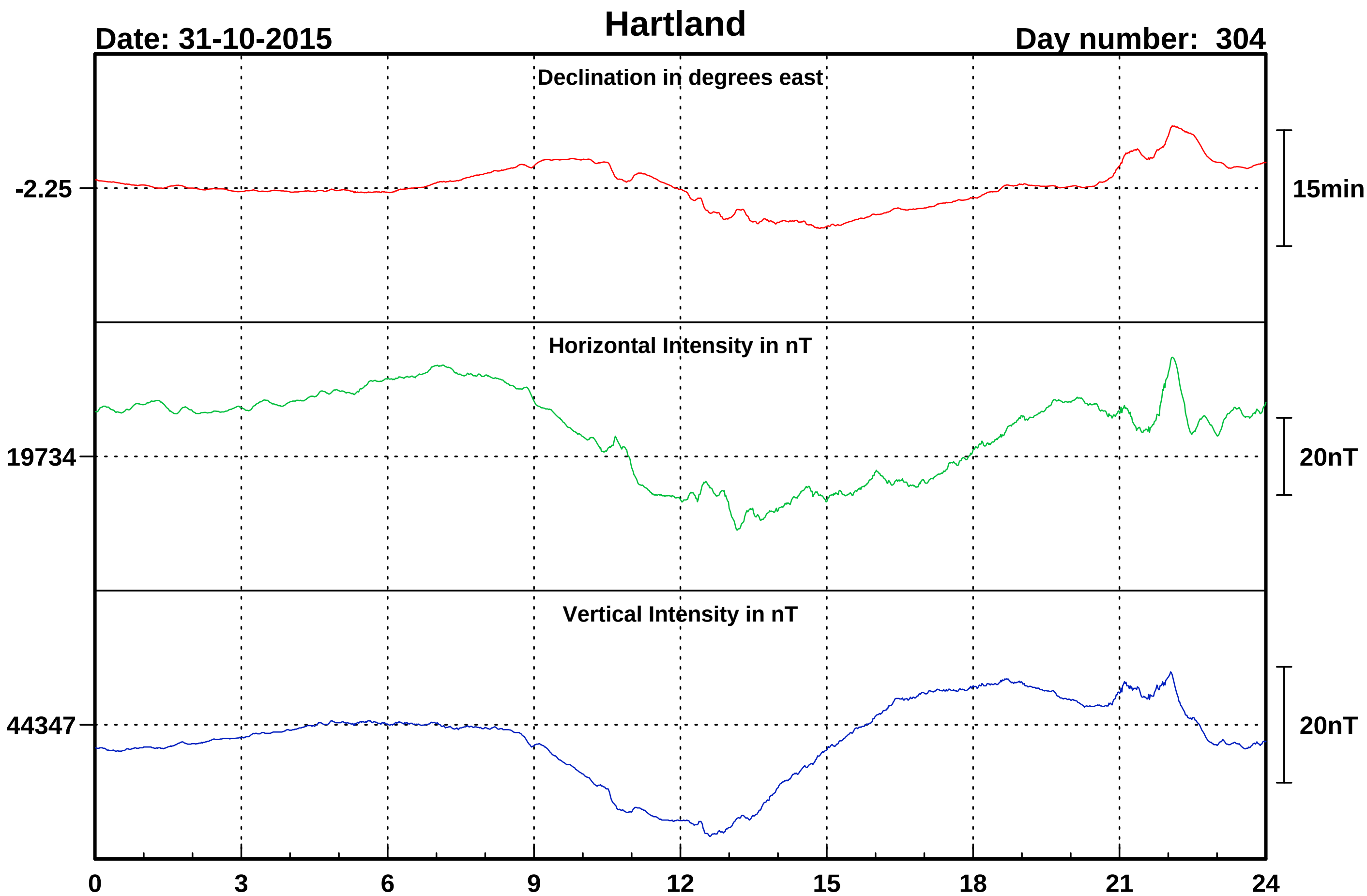
Hartland

Date: 29-10-2015 Day number: 302



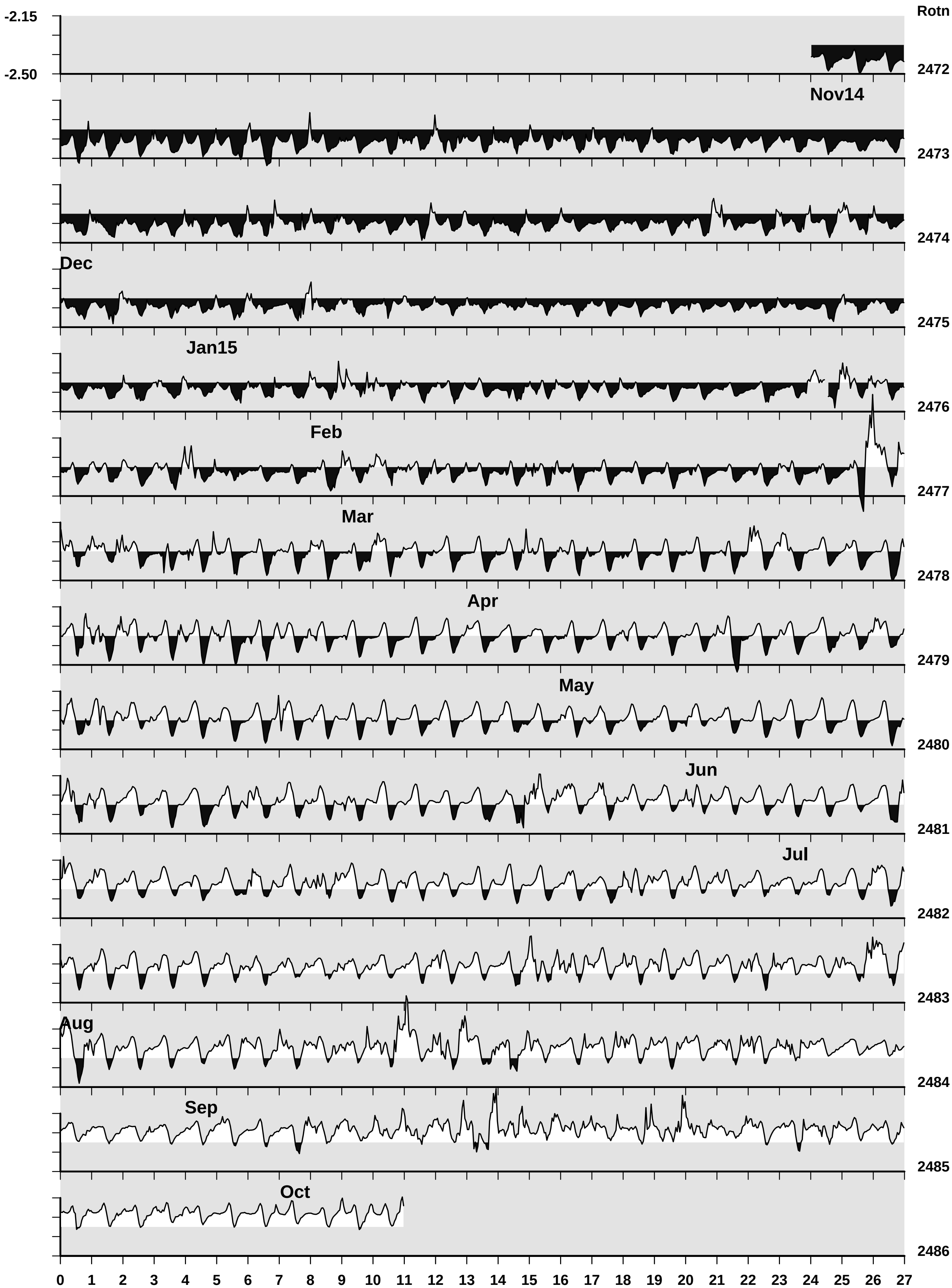
Date: 30-10-2015 Day number: 303





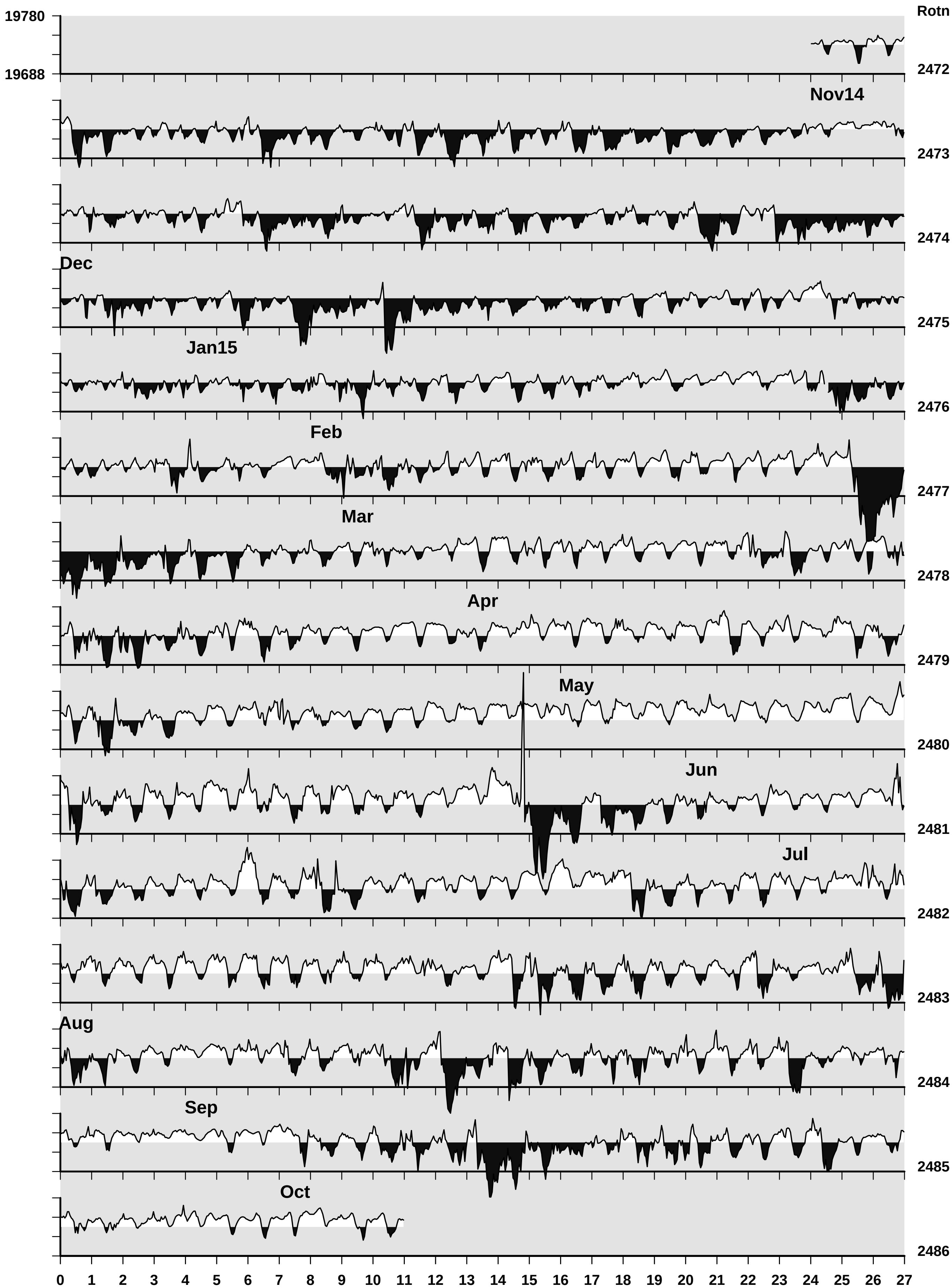
Hartland
Date: 31-10-2015
Day number: 304
Declination in degrees east
-2.25
15min
Horizontal Intensity in nT
19734
20nT
Vertical Intensity in nT
44347
20nT
0
3
6
9
12
15
18
21
24

Hartland Observatory: Declination (degrees)



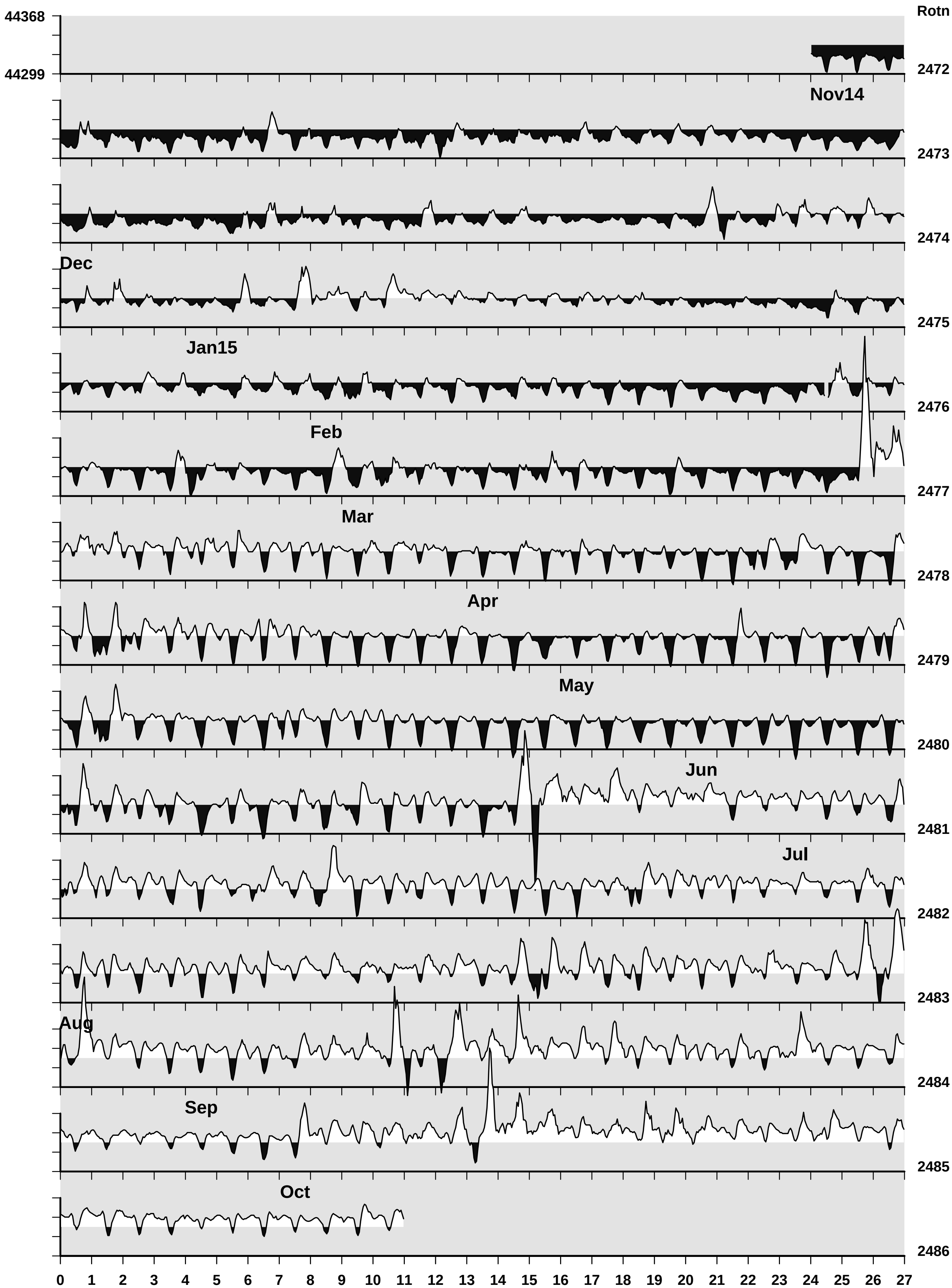
Hourly Mean Values Plotted By Bartels Solar Rotation Number

Hartland Observatory: Horizontal Intensity (nT)



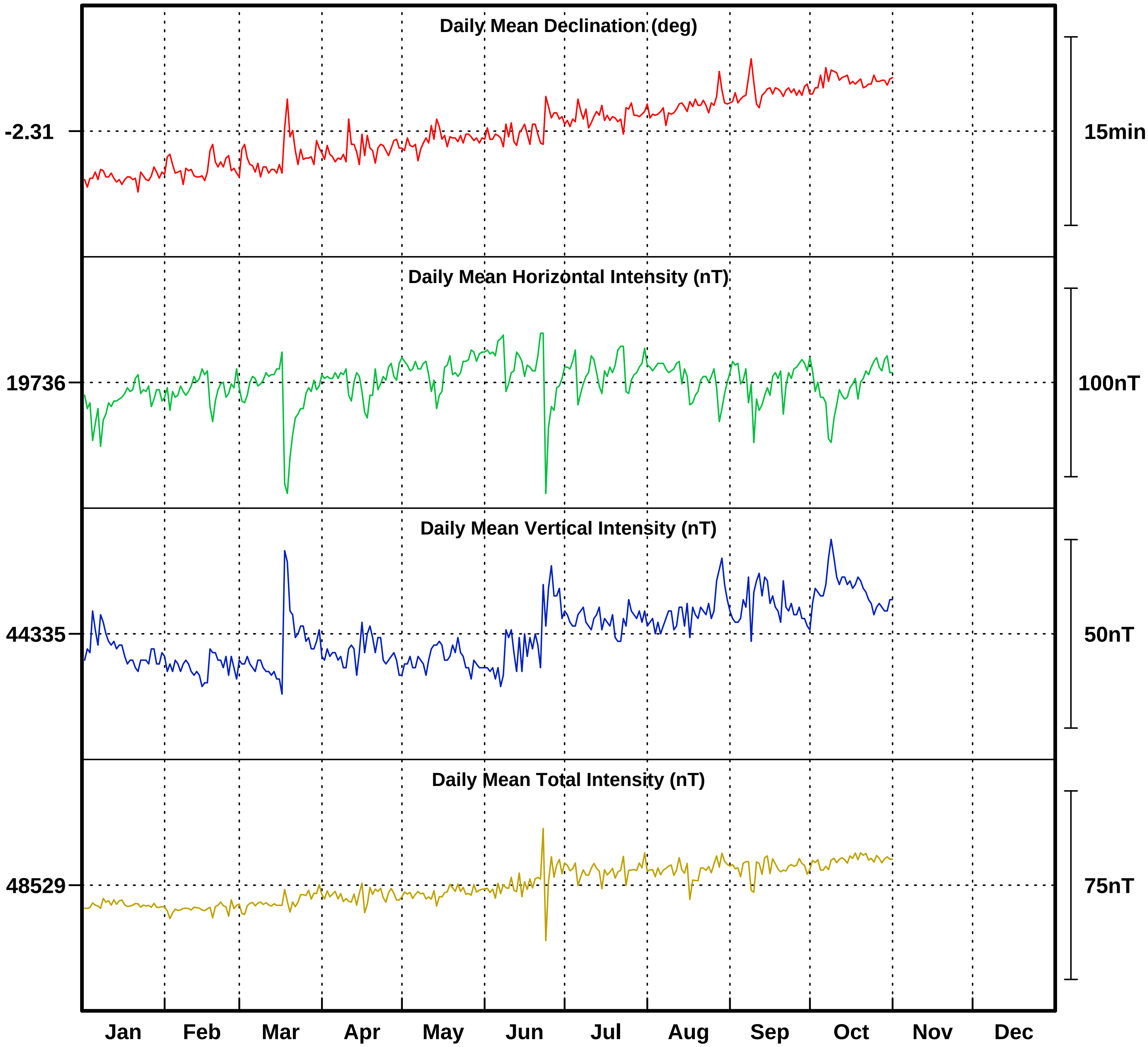
Hourly Mean Values Plotted By Bartels Solar Rotation Number

Hartland Observatory: Vertical Intensity (nT)



Hourly Mean Values Plotted By Bartels Solar Rotation Number

Hartland Observatory 2015



Monthly Mean Values for Hartland Observatory 2015

Month	*D*	*H*	*I*	*X*	*Y*	*Z*	*F*
January	-2° 22.4´	19726 nT	66° 00.7´	19709 nT	-817 nT	44331 nT	48521 nT
February	-2° 21.7´	19733 nT	66° 00.2´	19716 nT	-813 nT	44326 nT	48520 nT
March	-2° 20.8´	19728 nT	66° 00.6´	19712 nT	-808 nT	44331 nT	48523 nT
April	-2° 20.2´	19737 nT	66° 00.0´	19720 nT	-805 nT	44330 nT	48525 nT
May	-2° 19.4´	19743 nT	65° 59.5´	19727 nT	-800 nT	44328 nT	48526 nT
June	-2° 18.6´	19742 nT	65° 59.8´	19726 nT	-796 nT	44334 nT	48531 nT
July	-2° 17.5´	19742 nT	65° 59.9´	19726 nT	-790 nT	44339 nT	48535 nT
August	-2° 16.8´	19738 nT	66° 0.3´	19722 nT	-785 nT	44341 nT	48535 nT
September	-2° 15.6´	19736 nT	66° 0.4´	19721 nT	-778 nT	44342 nT	48536 nT
October	-2° 14.7´	19734 nT	66° 0.7´	19719 nT	-773 nT	44347 nT	48539 nT

Note

i. The values shown here are provisional.

HARTLAND RAPID VARIATIONS

SIs and SSCs

Date	Time (UT)	Type	Quality	H (nT)	D (min)	Z (nT)
24-10-15	18 55	SSC	B	32.9	-1.38	5.1

Notes:
An asterisk (*) indicates that the principal impulse was preceded by a smaller reversed impulse.
The quality of the event is classified as follows:

A = very distinct
B = fair, ordinary, but unmistakable
C = doubtful

The amplitudes given are for the first chief movement of the event.

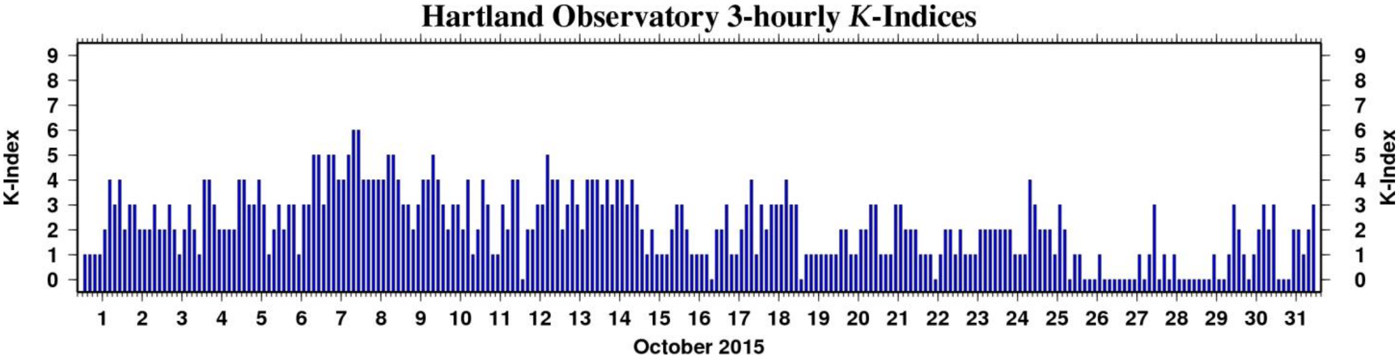
SFEs

Date	Universal Time			H (nT)	D (min)	Z (nT)
	Start	Maximum	End			
None						

Note:
The amplitudes given are for the first chief movement of the event.

INDICES OF GEOMAGNETIC ACTIVITY

Day	K - INDICES FOR THREE-HOUR INTERVAL							
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24
1	1	1	1	1	2	4	3	4
2	2	3	3	2	2	2	3	2
3	2	3	2	1	2	3	2	1
4	4	4	3	2	2	2	2	4
5	4	3	3	4	3	1	2	3
6	2	3	3	1	3	3	5	5
7	3	5	5	4	4	5	6	6
8	4	4	4	4	4	5	5	4
9	3	3	2	3	4	4	5	4
10	3	2	3	3	2	4	1	2
11	4	3	1	1	3	2	4	4
12	0	2	2	3	3	5	4	4
13	2	3	4	3	2	4	4	4
14	3	4	3	4	4	3	4	3
15	2	1	2	1	1	1	2	3
16	3	2	1	1	1	1	0	2
17	2	3	1	1	2	3	4	1
18	3	2	3	3	3	4	3	3
19	0	1	1	1	1	1	1	1
20	2	2	1	1	2	2	3	3
21	1	1	1	3	3	2	2	2
22	1	1	1	0	1	2	2	1
23	2	1	1	1	2	2	2	2
24	2	2	2	1	1	1	4	3
25	2	2	2	1	3	2	0	1
26	1	0	0	0	1	0	0	0
27	0	0	0	0	1	0	1	3
28	0	1	0	1	0	0	0	0
29	0	0	0	1	0	0	1	3
30	2	1	0	1	2	3	2	3
31	0	0	0	2	2	1	2	3



The *aa* Index

Date	Day	3-hourly *aa*-indices								Aa_{am}	Aa_{pm}	*Aa*
01-10-15	274	8	12	8	8	24	45	24	45	8.9	34.7	21.8
02-10-15	275	12	24	32	24	24	24	24	16	23.1	22.1	22.6
03-10-15	276	12	32	16	12	24	32	16	12	18.0	21.1	19.6
04-10-15	277	37	45	46	24	24	16	12	45	38.1	24.4	31.3
05-10-15	278	37	32	46	81	32	12	12	20	48.9	19.0	33.9
06-10-15	279	12	20	20	12	32	46	58	67	15.9	50.7	33.3
07-10-15	280	24	80	80	116	81	102	171	101	75.0	113.7	94.4
08-10-15	281	45	81	59	59	81	80	67	45	61.0	68.2	64.6
09-10-15	282	32	32	16	46	59	59	58	37	31.5	53.4	42.5
10-10-15	283	24	16	32	17	16	37	8	12	22.3	18.3	20.3
11-10-15	284	37	20	8	12	32	16	37	33	19.2	29.6	24.4
12-10-15	285	5	16	24	67	32	67	45	37	28.2	45.3	36.8
13-10-15	286	12	24	45	46	16	81	45	45	31.7	46.9	39.3
14-10-15	287	32	37	32	81	45	24	37	20	45.5	31.6	38.6
15-10-15	288	12	8	16	20	8	12	12	24	14.0	13.9	14.0
16-10-15	289	20	16	12	8	20	12	2	12	13.9	11.6	12.8
17-10-15	290	16	20	8	20	24	24	45	12	16.0	26.4	21.2
18-10-15	291	24	24	46	103	46	45	24	24	49.1	34.8	42.0
19-10-15	292	2	8	12	8	8	5	5	8	7.5	6.5	7.0
20-10-15	293	12	12	8	20	24	16	32	20	12.9	23.1	18.0
21-10-15	294	8	12	12	46	46	24	12	12	19.4	23.4	21.4
22-10-15	295	8	5	12	5	8	12	16	12	7.5	11.9	9.7
23-10-15	296	16	8	5	8	16	16	16	16	9.2	16.1	12.6
24-10-15	297	16	16	24	5	8	8	45	24	15.4	21.3	18.3
25-10-15	298	16	12	16	8	32	16	5	8	13.0	15.3	14.1
26-10-15	299	8	2	5	5	5	2	5	2	5.2	3.8	4.5
27-10-15	300	2	5	5	5	12	2	8	20	4.5	10.5	7.5
28-10-15	301	2	5	2	5	2	2	2	2	3.8	2.5	3.1
29-10-15	302	2	2	5	8	9	2	8	20	4.5	9.9	7.2
30-10-15	303	12	8	2	12	38	32	12	32	8.5	28.5	18.5
31-10-15	304	5	2	5	16	16	12	12	32	7.2	18.0	12.6
											Monthly Mean Value	24.8

Notes
i. The units of the *aa* index are nT.
ii. The 3-hour *aa* values are rounded to the nearest integer. Where *aa* = *.5, *aa* is rounded down.
iii. Daily values (Aa_{am}, Aa_{pm} and *Aa*) are computed from *aa* values of original resolution.
iv. The monthly mean value is computed from the daily mean values, *Aa*.
v. Definitive *aa* indices are derived and published by the International Service for Geomagnetic Indices.

3-hourly *aa*-indices