BRITISH GEOLOGICAL SURVEY

Port Stanley Observatory Monthly Magnetic Bulletin

October 2008

08/10/PS

Falkland Islands

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British Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

PORT STANLEY OBSERVATORY MAGNETIC DATA

1. Introduction

Port Stanley Observatory was installed by BGS with financial support from a consortium of oil companies and became operational in February 1994.

This bulletin is published to meet the needs of users of geomagnetic data. Magnetic observatory data is presented as a series of plots of one-minute, hourly and daily values, followed by a tabulation of monthly values. The operation of the observatory and presentation of data are described in the rest of this section.

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Scotland, UK

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Internet: *www.geomag.bgs.ac.uk*

2. Position

Port Stanley Observatory, one of the geomagnetic observatories maintained and operated by the British Geological Survey (BGS), is situated on a site at Sapper Hill near Port Stanley in the Falkland Islands. The observatory co-ordinates are:

Geographic:	*51°42.2′S*	*302°06.6′E*
Geomagnetic:	*41°41.1′S*	*11°27.2′E*
Height above mean sea level:		*135 m*

The geomagnetic co-ordinates are calculated using the 10th generation International Geomagnetic Reference Field at epoch 2008.5.

3. The Observatory Operation

3.1 GDAS
The observatory operates under the control of the Geomagnetic Data Acquisition System (GDAS), developed by BGS, which was installed in August 2002. The system operates under the control of data acquisition software running on QNX computers, which control the data logging and communications.

There are two sets of sensors used for making magnetic measurements. A triaxial 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 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 whilst the total field intensity samples are filtered using a 7-point cosine filter.

3.2 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. Data Presentation
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 a page and show the 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 on the surface of the Sun may recur after 27 days: the same is true for geomagnetically quiet intervals. Plotting the data in this way highlights this recurrence, and also illustrates seasonal and diurnal variations throughout the year.

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. This data is provisional. It is anticipated that provisional values will not be altered by more than a few nT or tenths of arcminutes before being made definitive.

PORT STANLEY OBSERVATORY

ABSOLUTE OBSERVATIONS

| Date | Day Number | DECLINATION | | | INCLINATION | | | | | | | Observer |
		Time (UT)	Absolute (º)	Baseline (º)	Time (UT)	Inclination (º)	Total Field Intensity (nT)	H Absolute (nT)	H Baseline (nT)	Z Absolute (nT)	Z Baseline (nT)	
19-Oct-08	293	21:02	3.5139	3.6500	21:11	-49.2669	28836.5	18816.8	18848.1	-21851.0	-21941.6	NB
19-Oct-08	293	21:20	3.5032	3.6450	21:29	-49.2686	28836.8	18816.4	18847.3	-21851.8	-21942.2	NB
27-Oct-08	301	16:50	3.5863	3.6550	16:59	-49.2720	28835.4	18814.2	18849.0	-21851.9	-21940.5	NB
27-Oct-08	301	17:05	3.5915	3.6550	17:12	-49.2720	28836.2	18814.8	18848.5	-21852.5	-21940.9	NB

Falkland Island 2008

Declination : Absolute - Variometer (markers) and Baseline Applied (line)

214.6

5min

Horizontal Intensity : Absolute - Variometer (markers) and Baseline Applied (line)

18866

20nT

Vertical Intensity : Absolute - Variometer (markers) and Baseline Applied (line)

-21792

20nT

Total Intensity : Absolute (Proton F) - Baseline Adjusted Variometer (derived F)

23.0

20nT

Temperature Inside Variometer Hut

22.6

20° C

Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec

Falkland Islands   October   2008

Falkland Islands   October   **2008**

Falkland Islands

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Date: 02-10-2008

Day number: 276

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

30nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

20nT

0   3   6   9   12   15   18   21   24
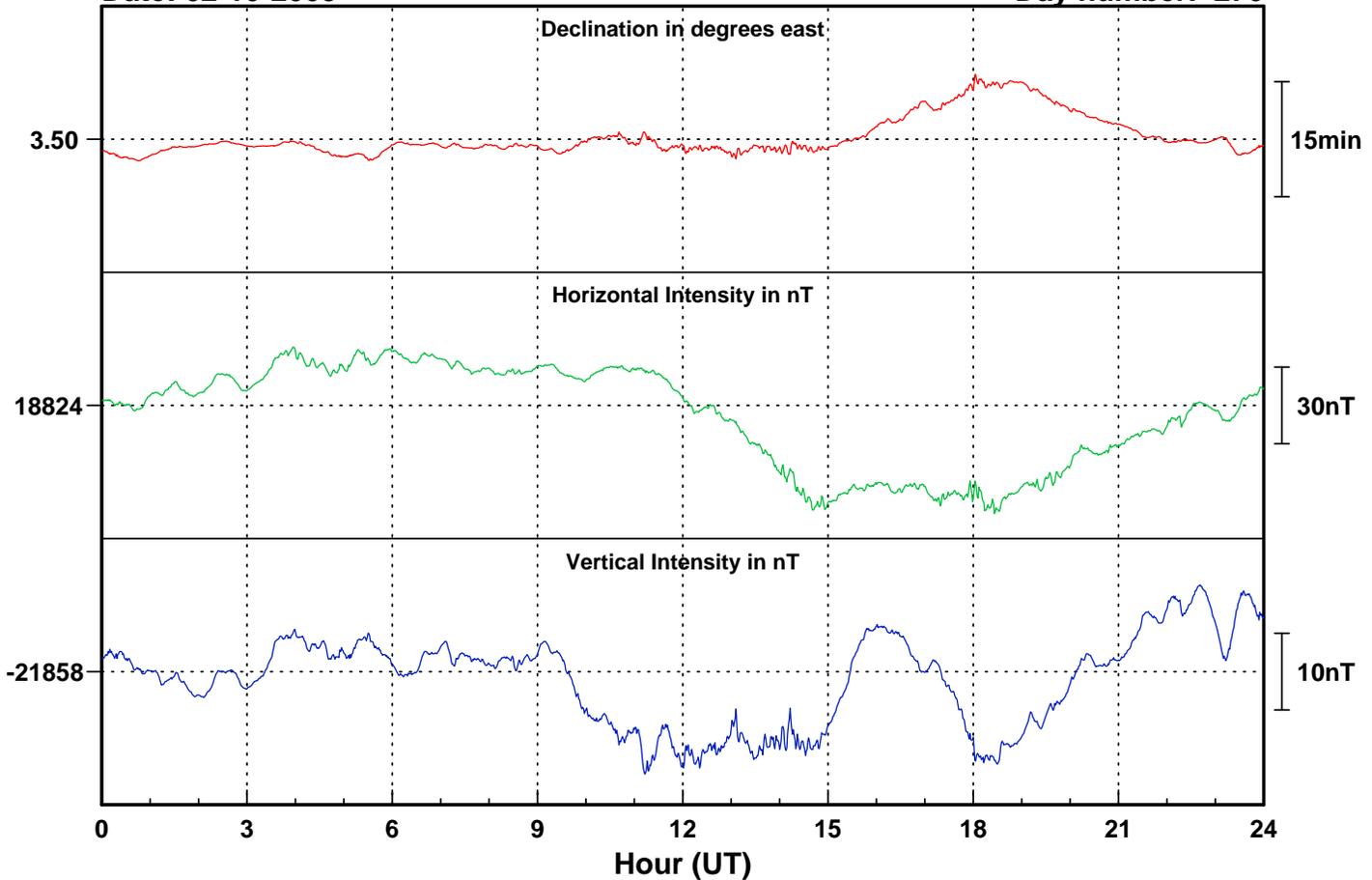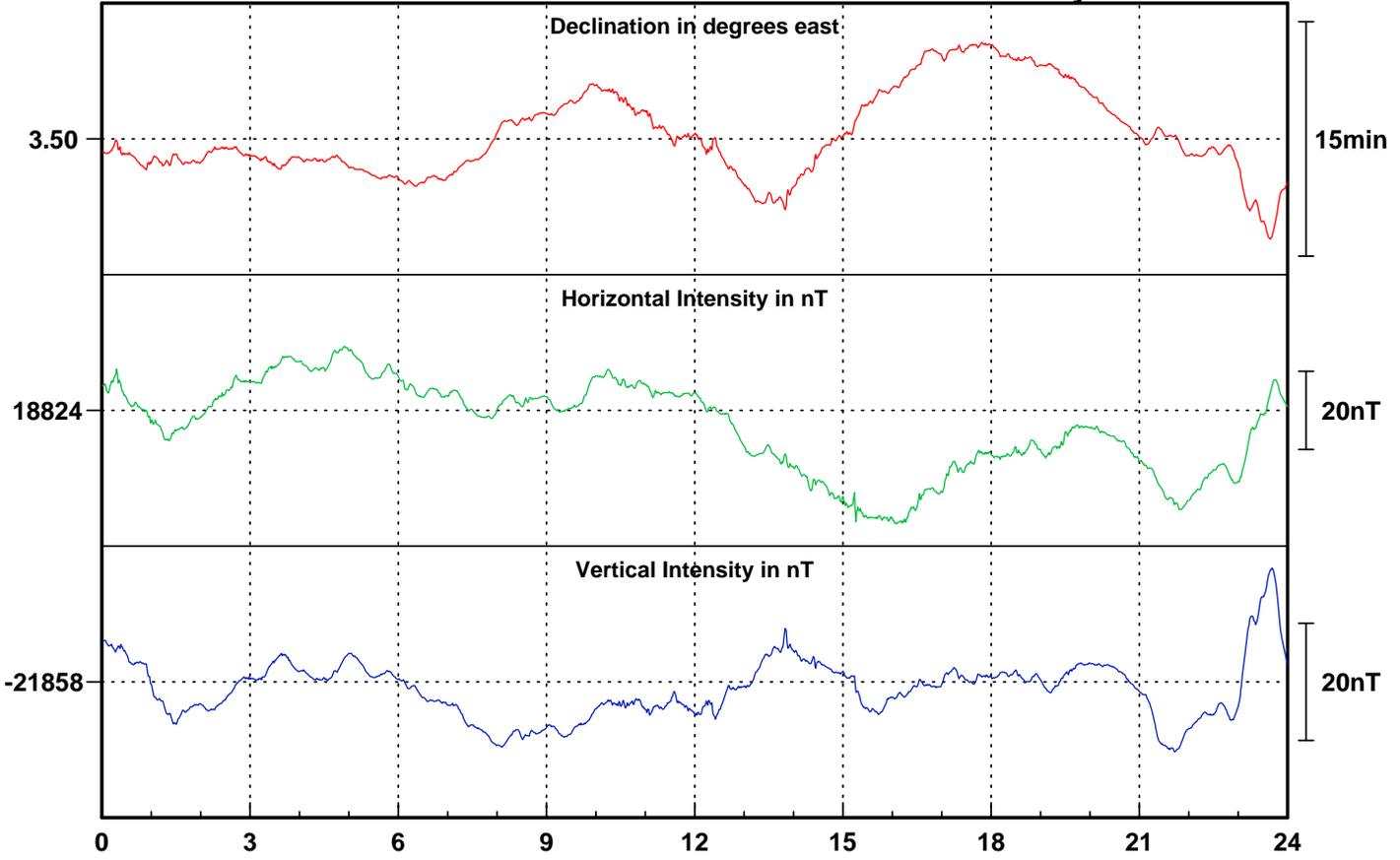
Date: 04-10-2008

Day number: 278

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24
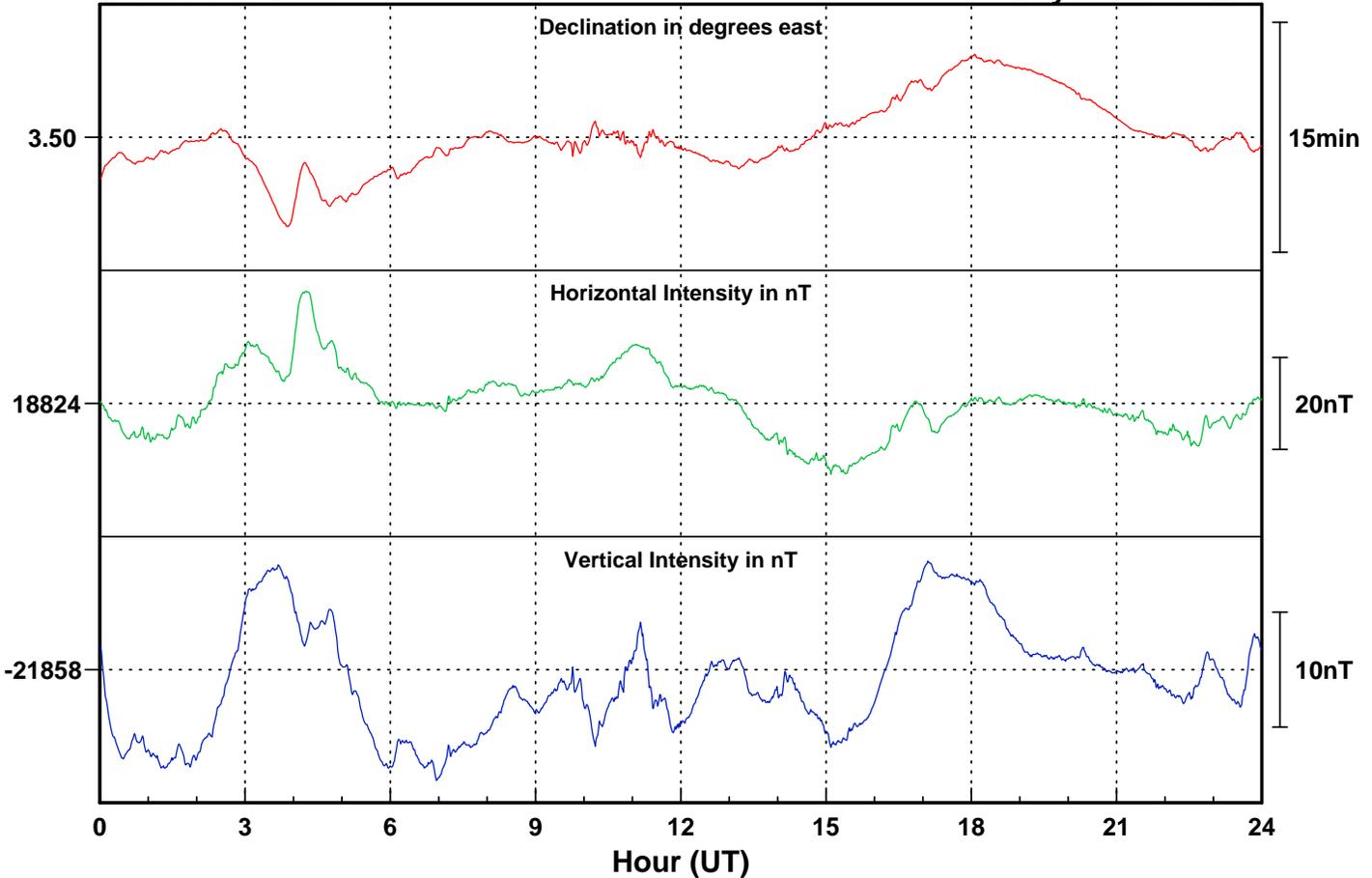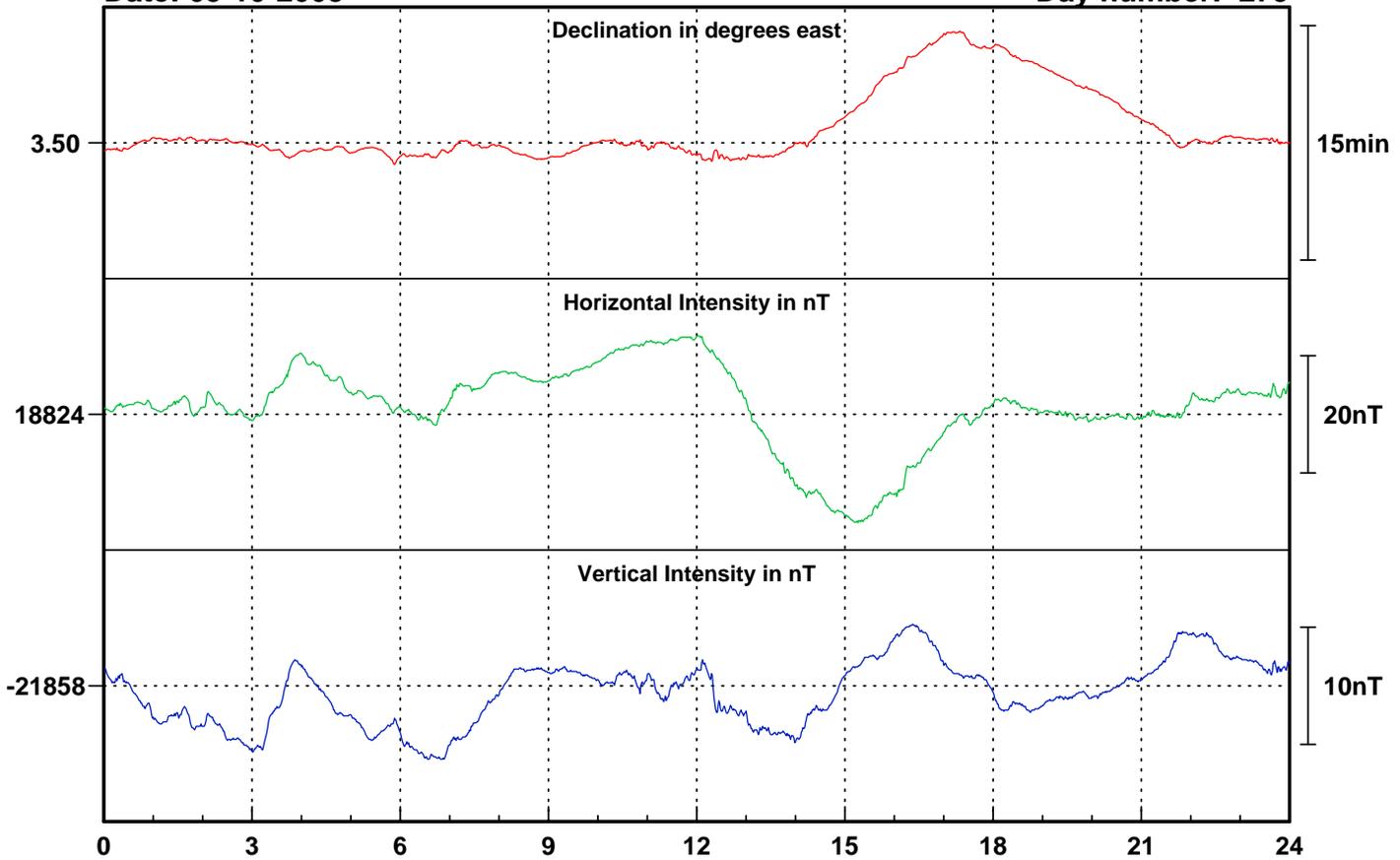
Date: 06-10-2008

Day number: 280

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Date: 07-10-2008   Day number: 281

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24
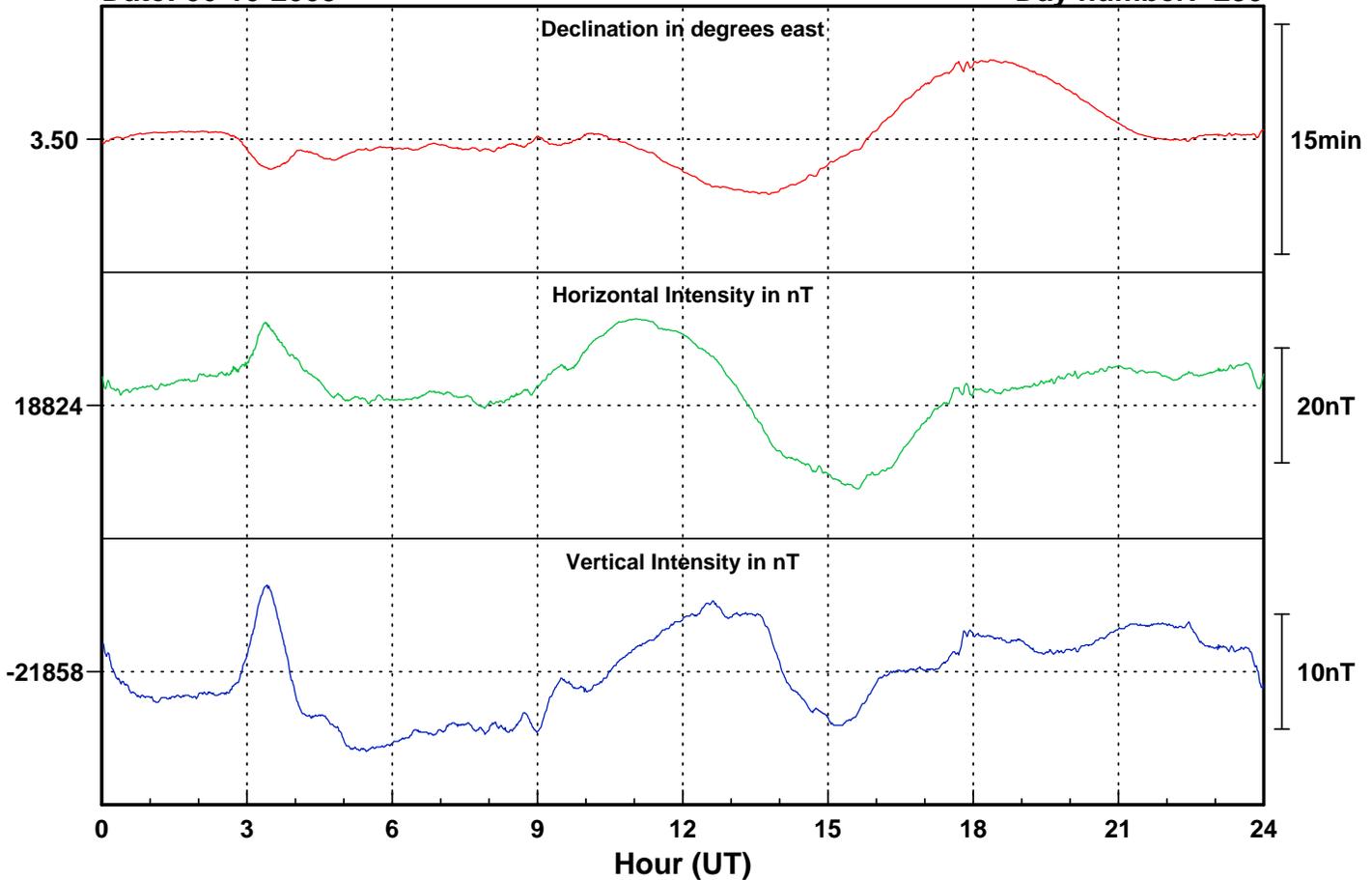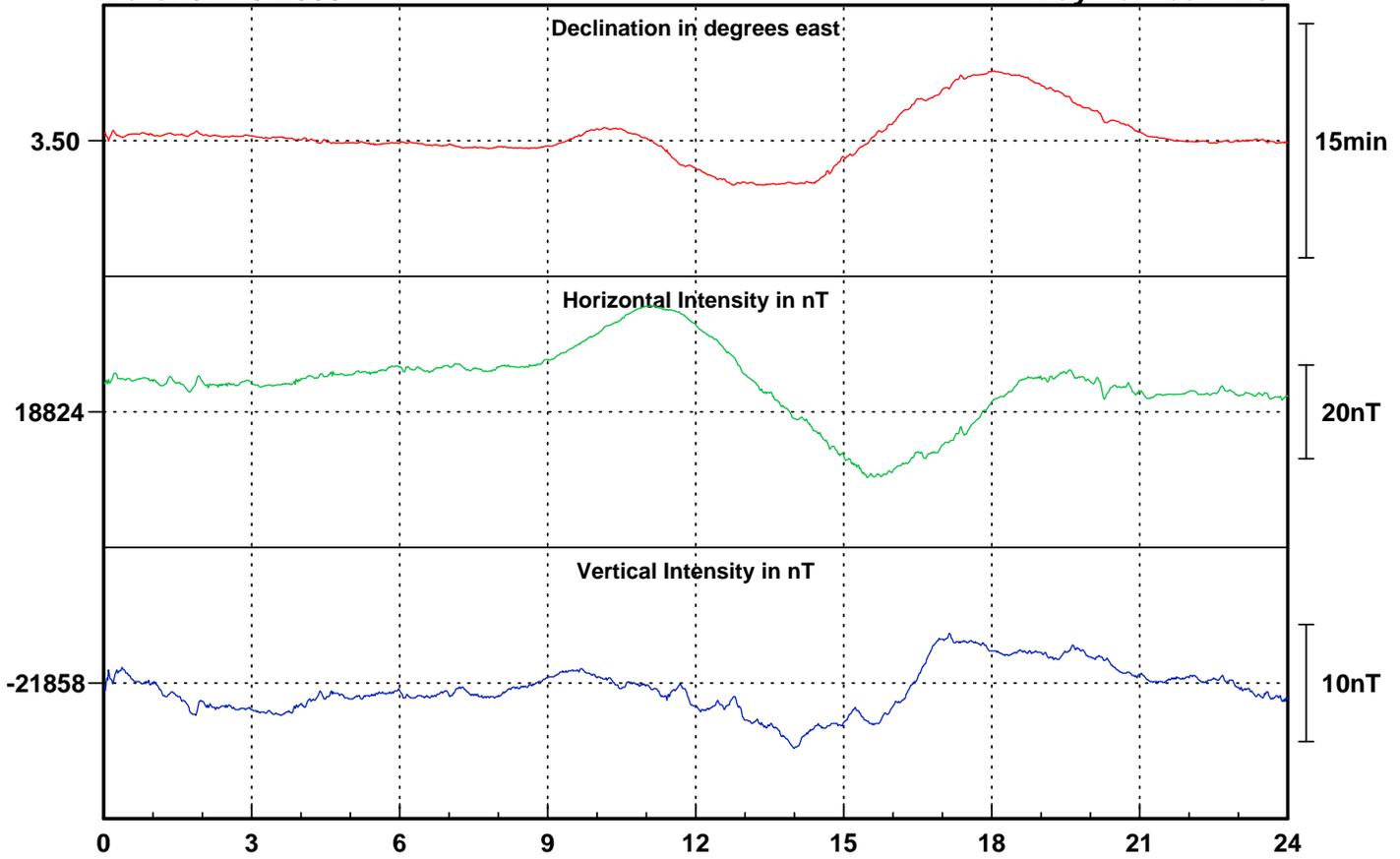
Date: 08-10-2008   Day number: 282

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Date: 09-10-2008

Day number: 283

Declination in degrees east

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

3.50

0   3   6   9   12   15   18   21   24

Date: 10-10-2008

Day number: 284

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

50nT

Vertical Intensity in nT

-21858

30nT

0   3   6   9   12   15   18   21   24

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

30nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Date: 13-10-2008   Day number: 287

Declination in degrees east   15min

Horizontal Intensity in nT   20nT

Vertical Intensity in nT   10nT
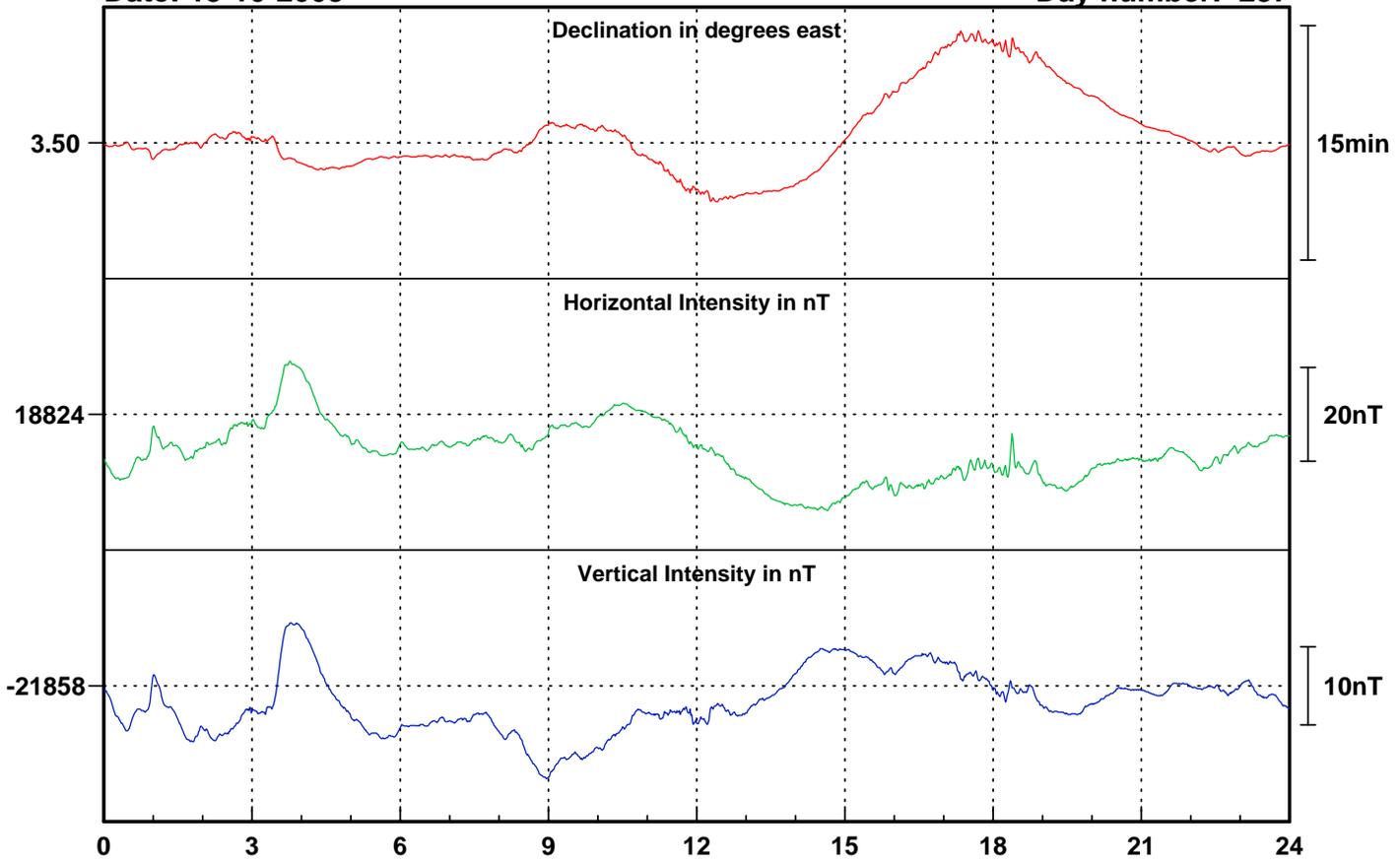
Date: 14-10-2008   Day number: 288

Declination in degrees east   15min

Horizontal Intensity in nT   30nT

Vertical Intensity in nT   10nT

Hour (UT)
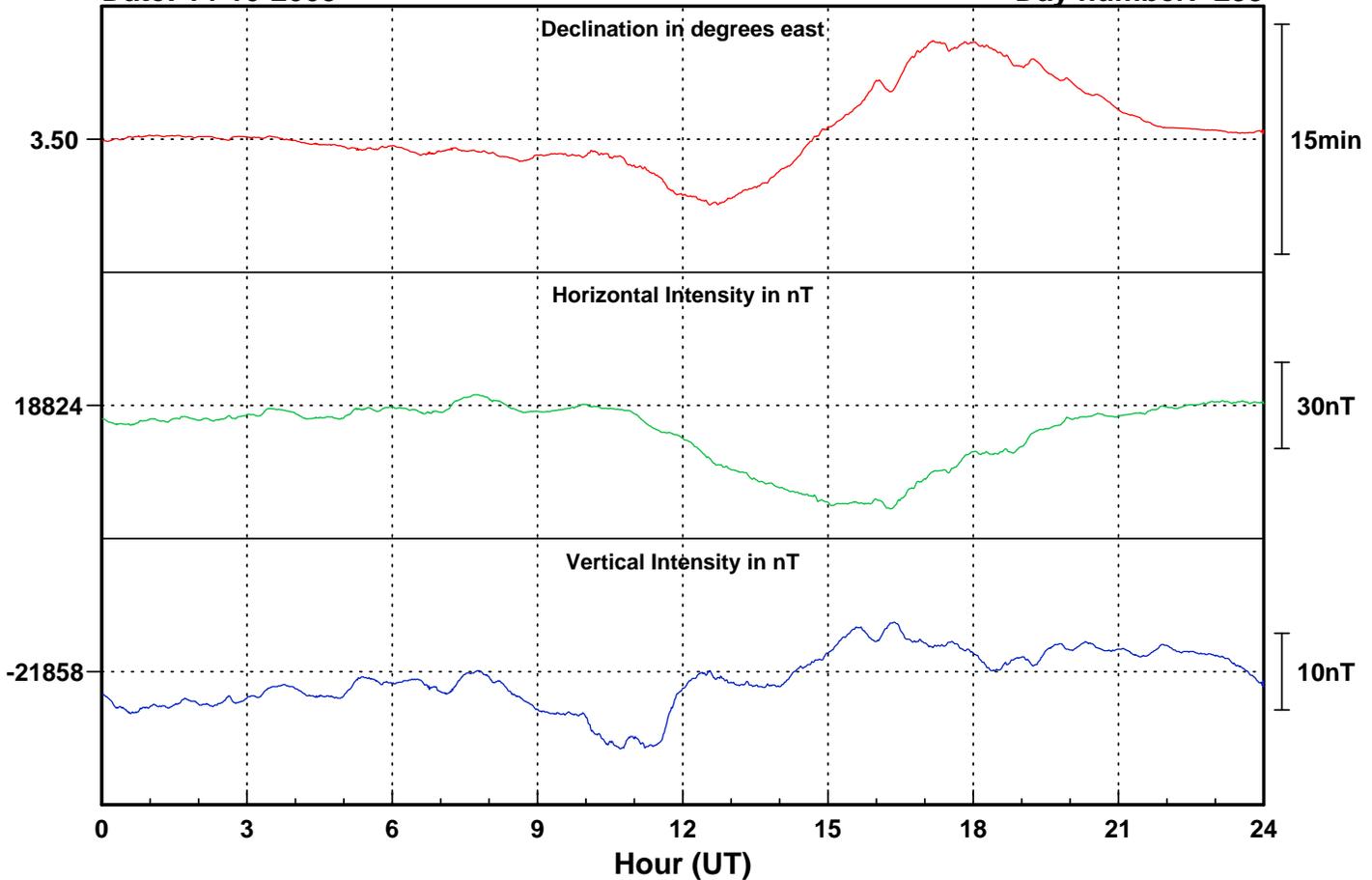
Falkland Islands

Date: 15-10-2008   Day number: 289

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

Hour (UT): 0 3 6 9 12 15 18 21 24
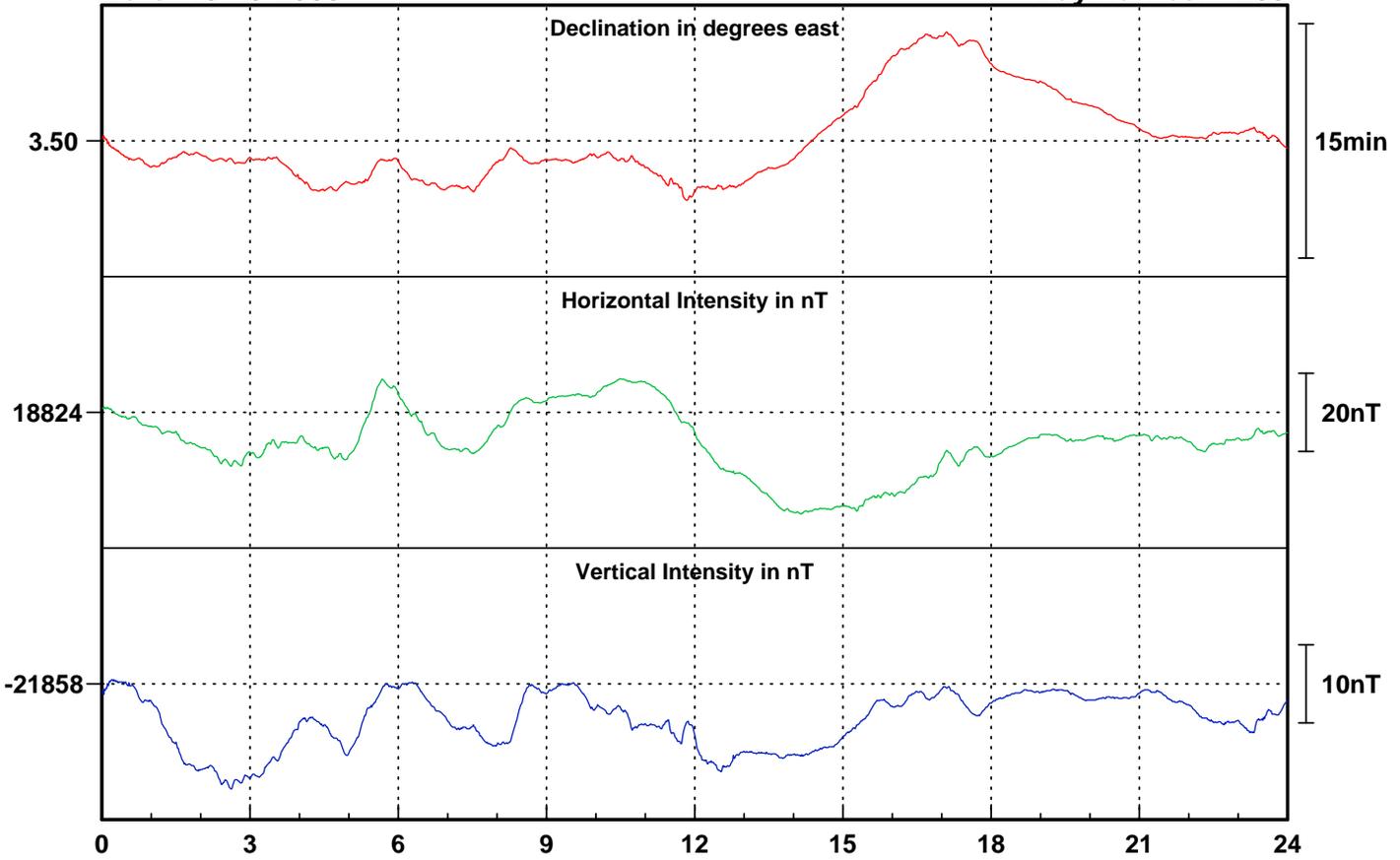
Date: 16-10-2008   Day number: 290

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

30nT

Vertical Intensity in nT

-21858

10nT

Hour (UT): 0 3 6 9 12 15 18 21 24

Falkland Islands

Date: 17-10-2008   Day number: 291

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24
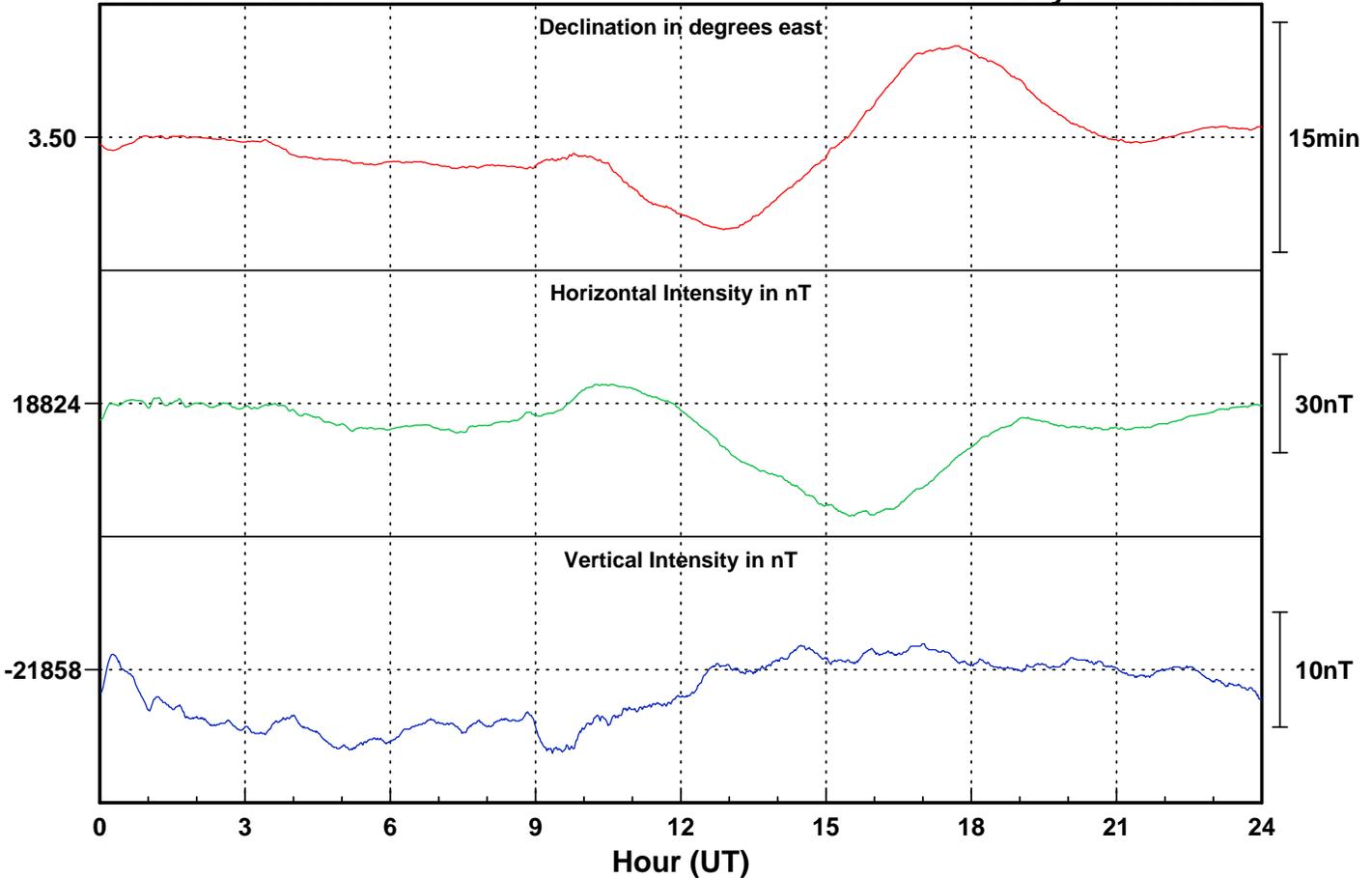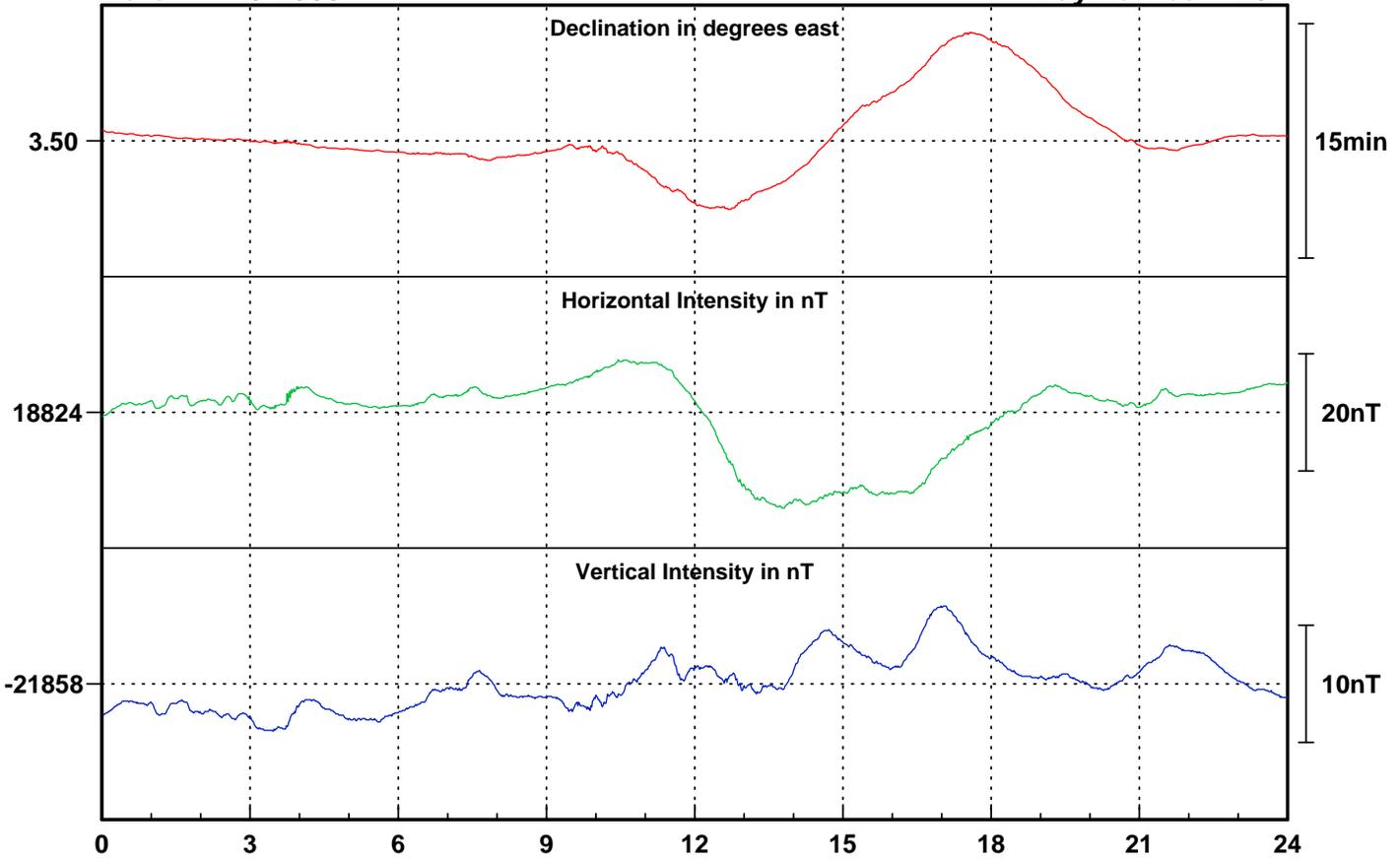
Date: 18-10-2008   Day number: 292

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Date: 19-10-2008   Day number: 293

Declination in degrees east

3.50 —   15min

Horizontal Intensity in nT

18824 —   20nT

Vertical Intensity in nT

-21858 —   10nT

0   3   6   9   12   15   18   21   24
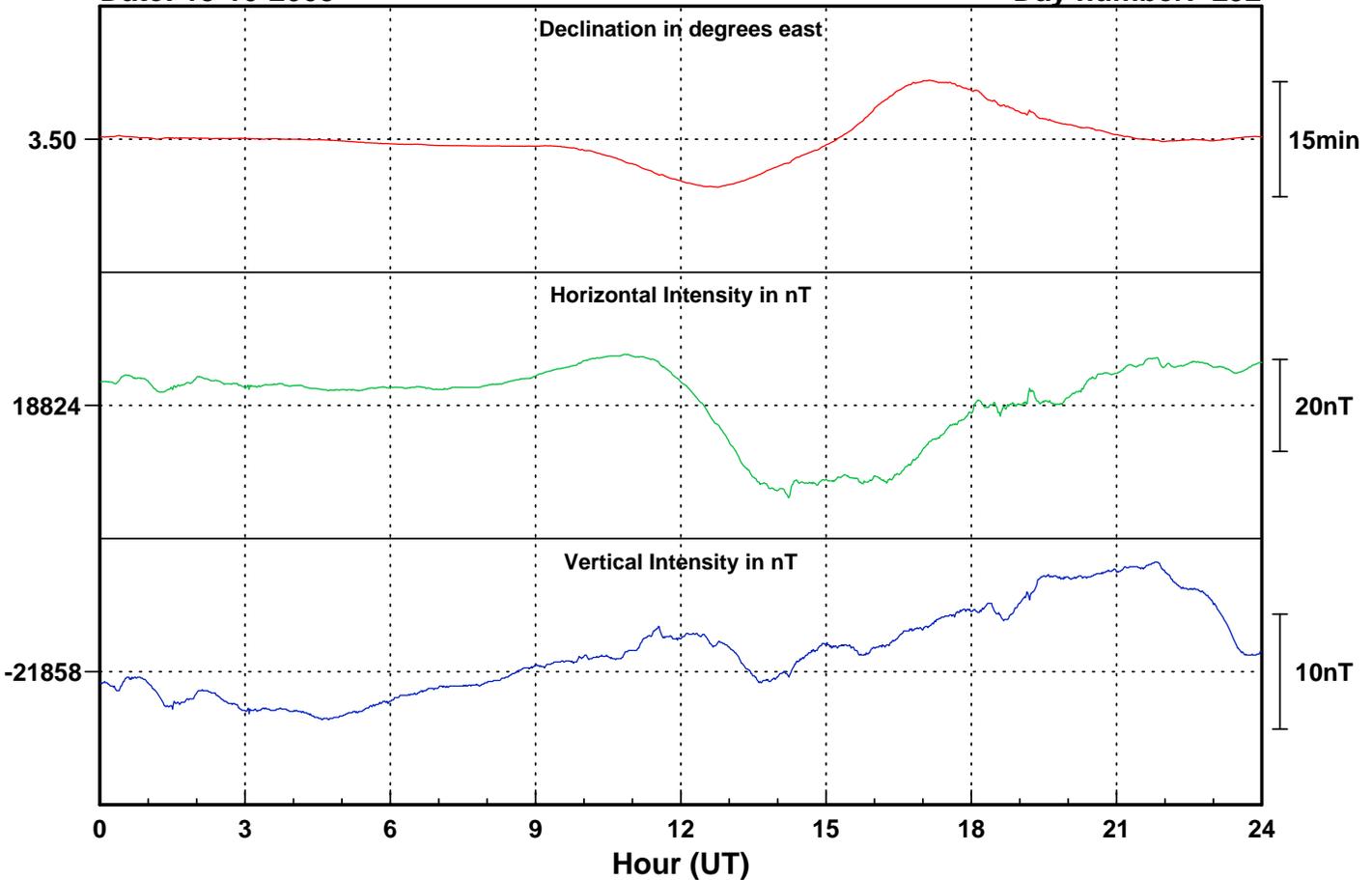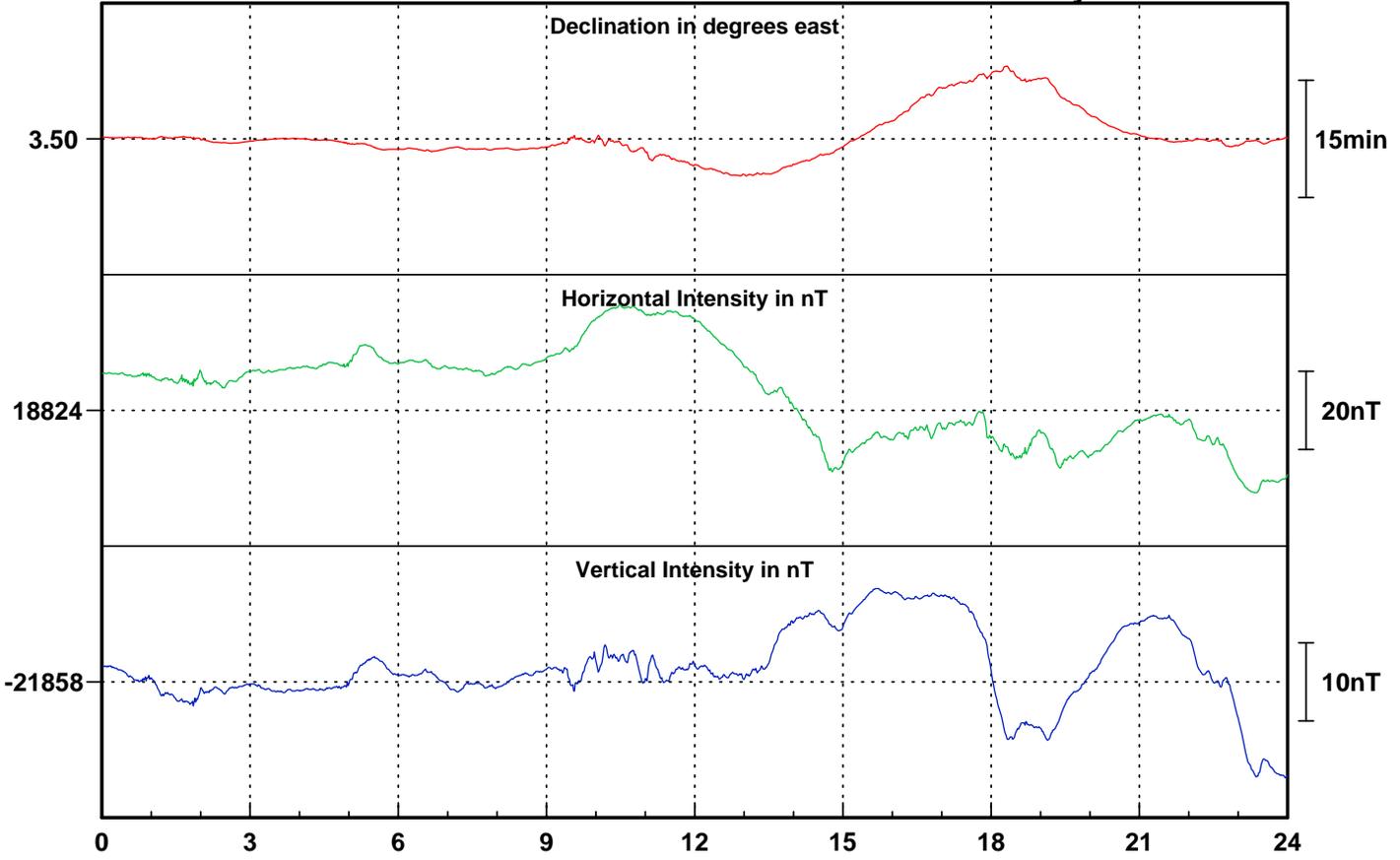
Date: 20-10-2008   Day number: 294
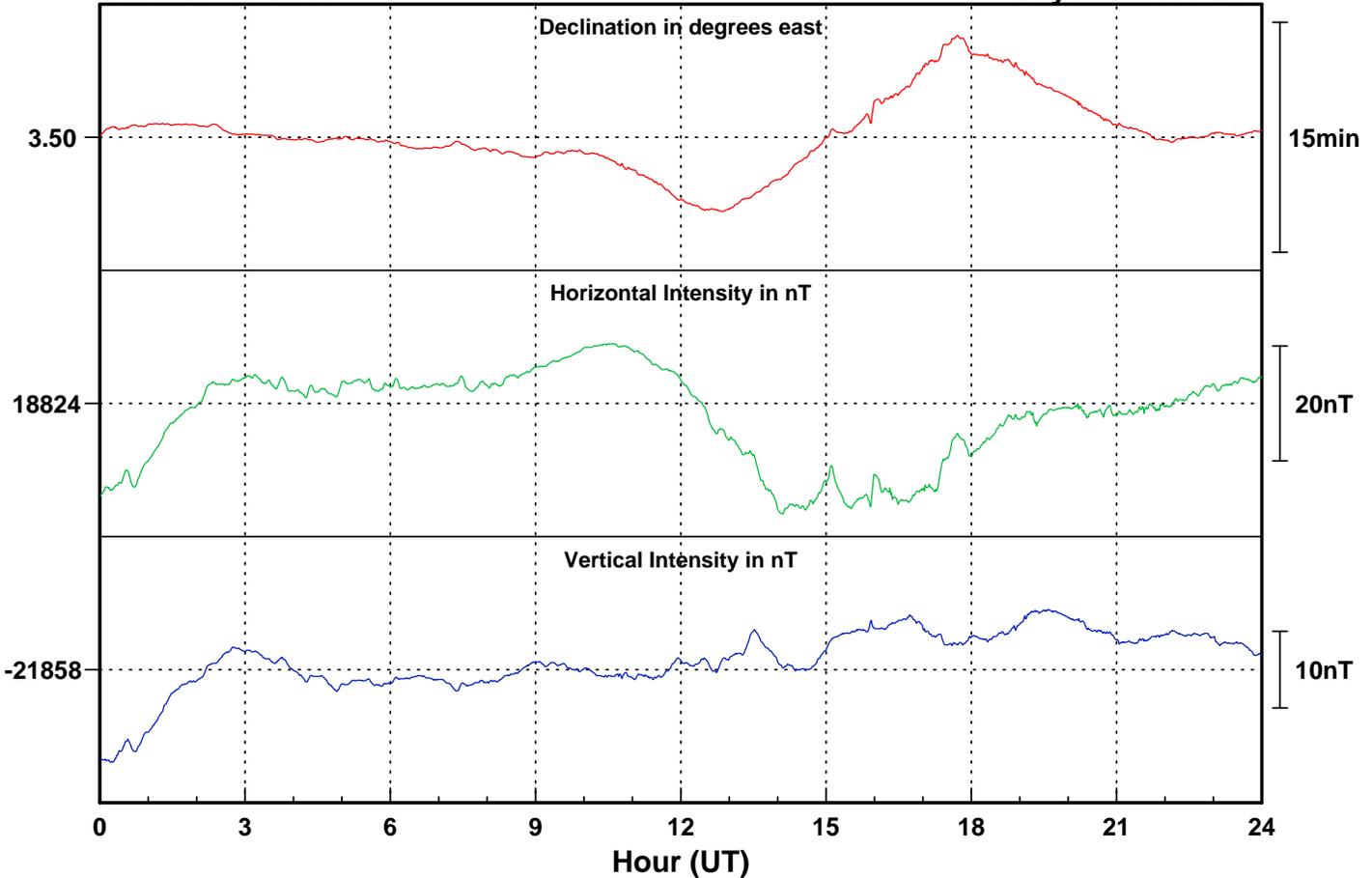
Declination in degrees east
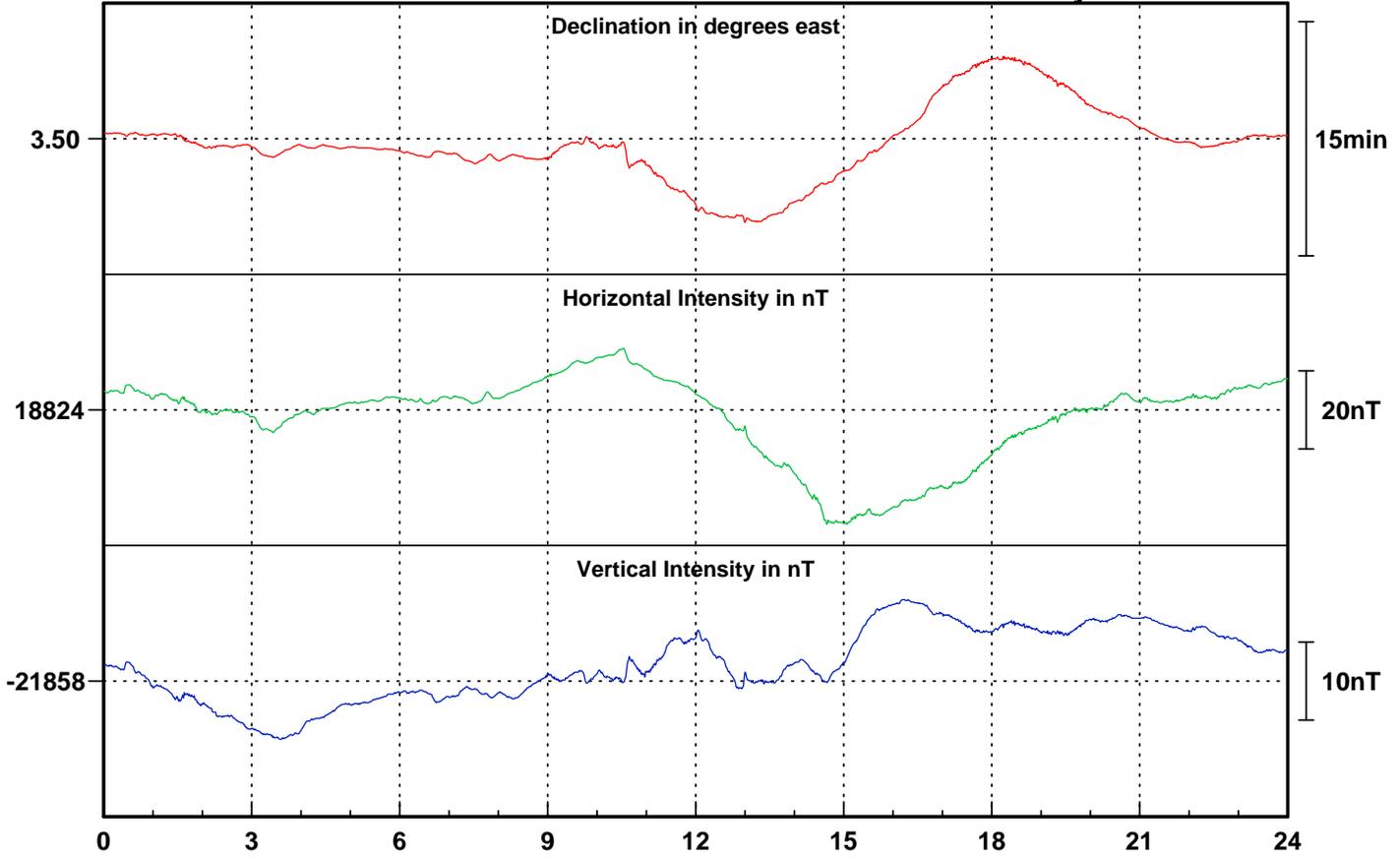
3.50 —   15min

Horizontal Intensity in nT

18824 —   20nT

Vertical Intensity in nT

-21858 —   10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Falkland Islands

Date: 23-10-2008   Day number: 297

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

20nT

0   3   6   9   12   15   18   21   24
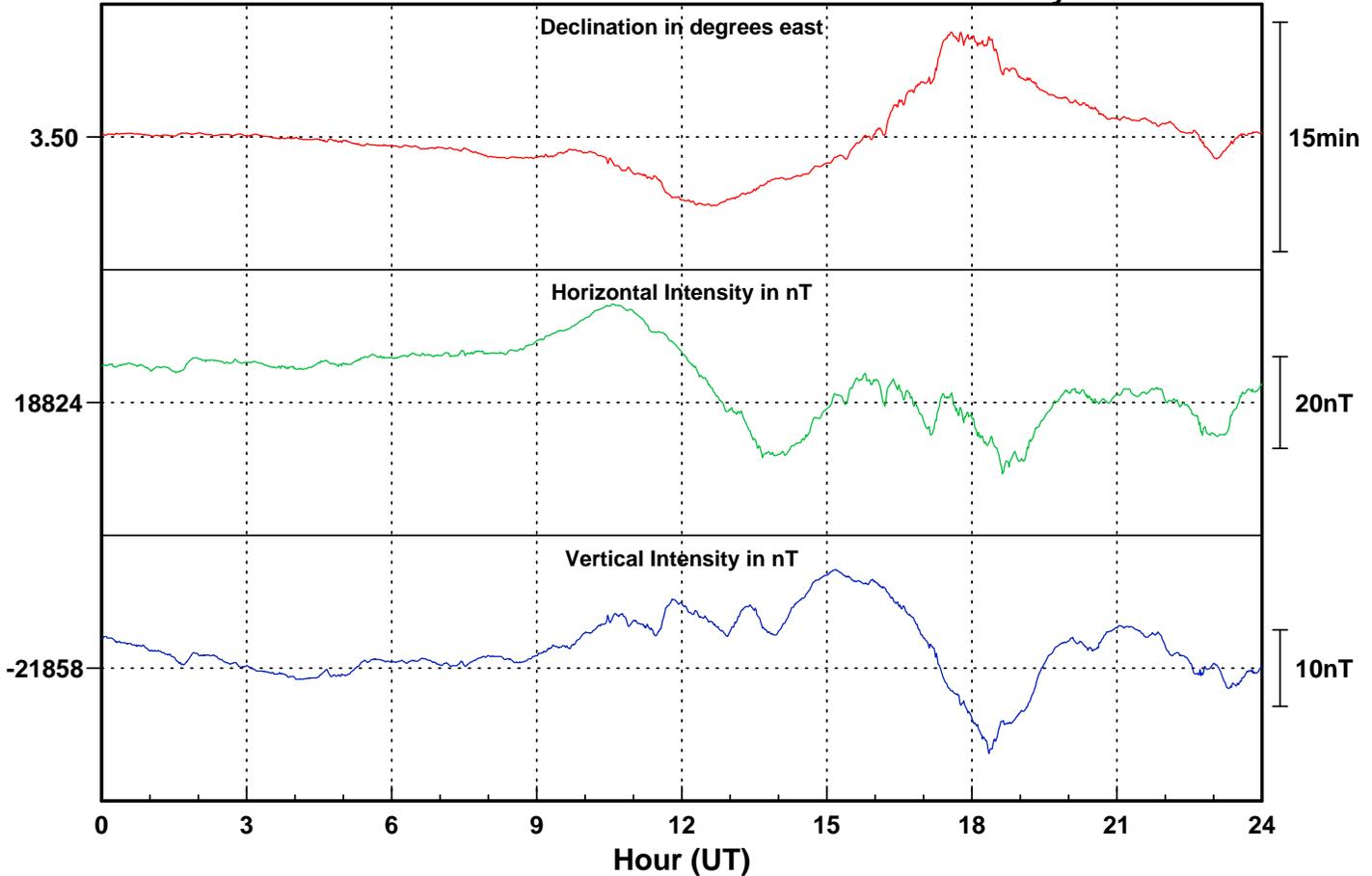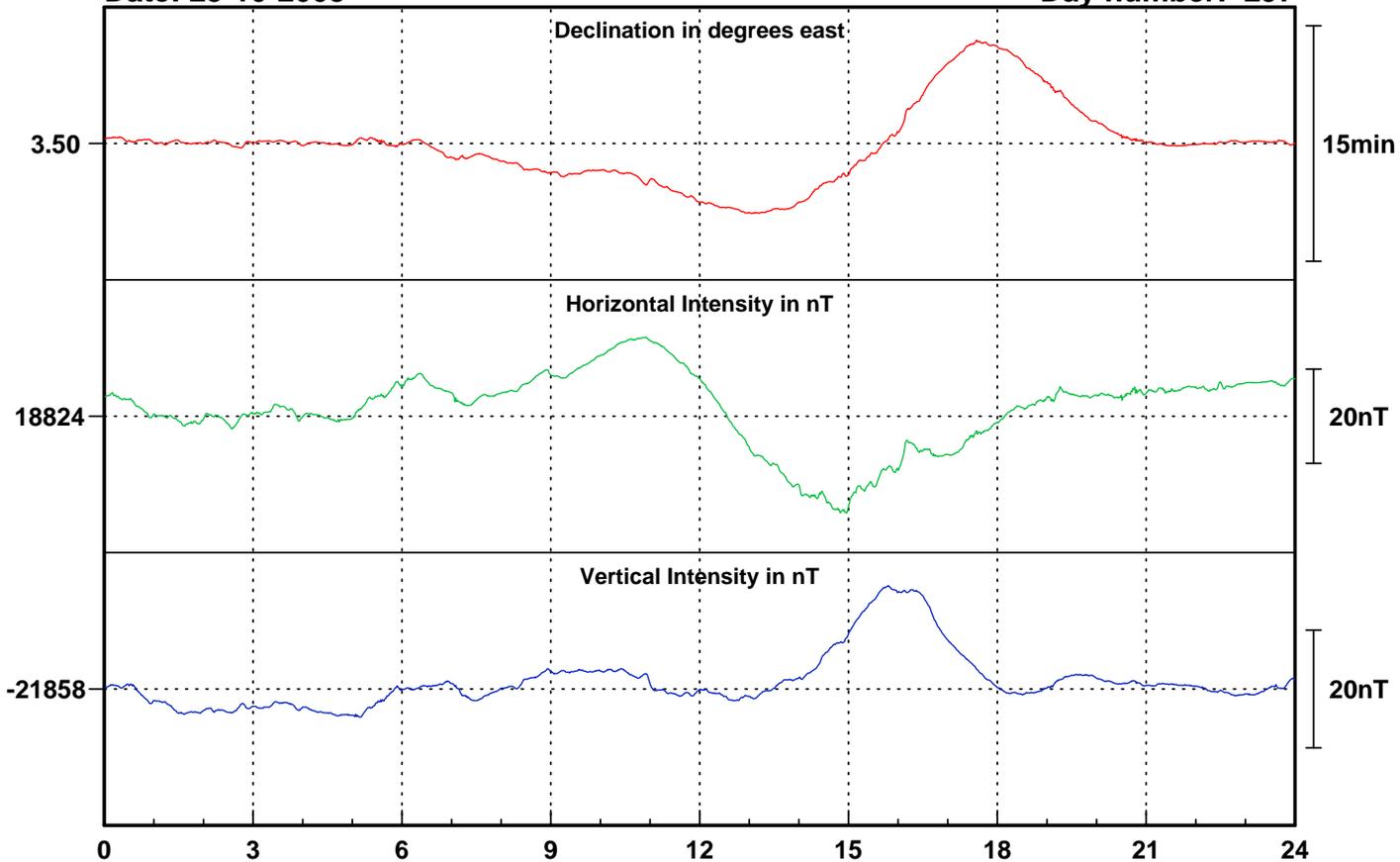
Date: 24-10-2008   Day number: 298

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24
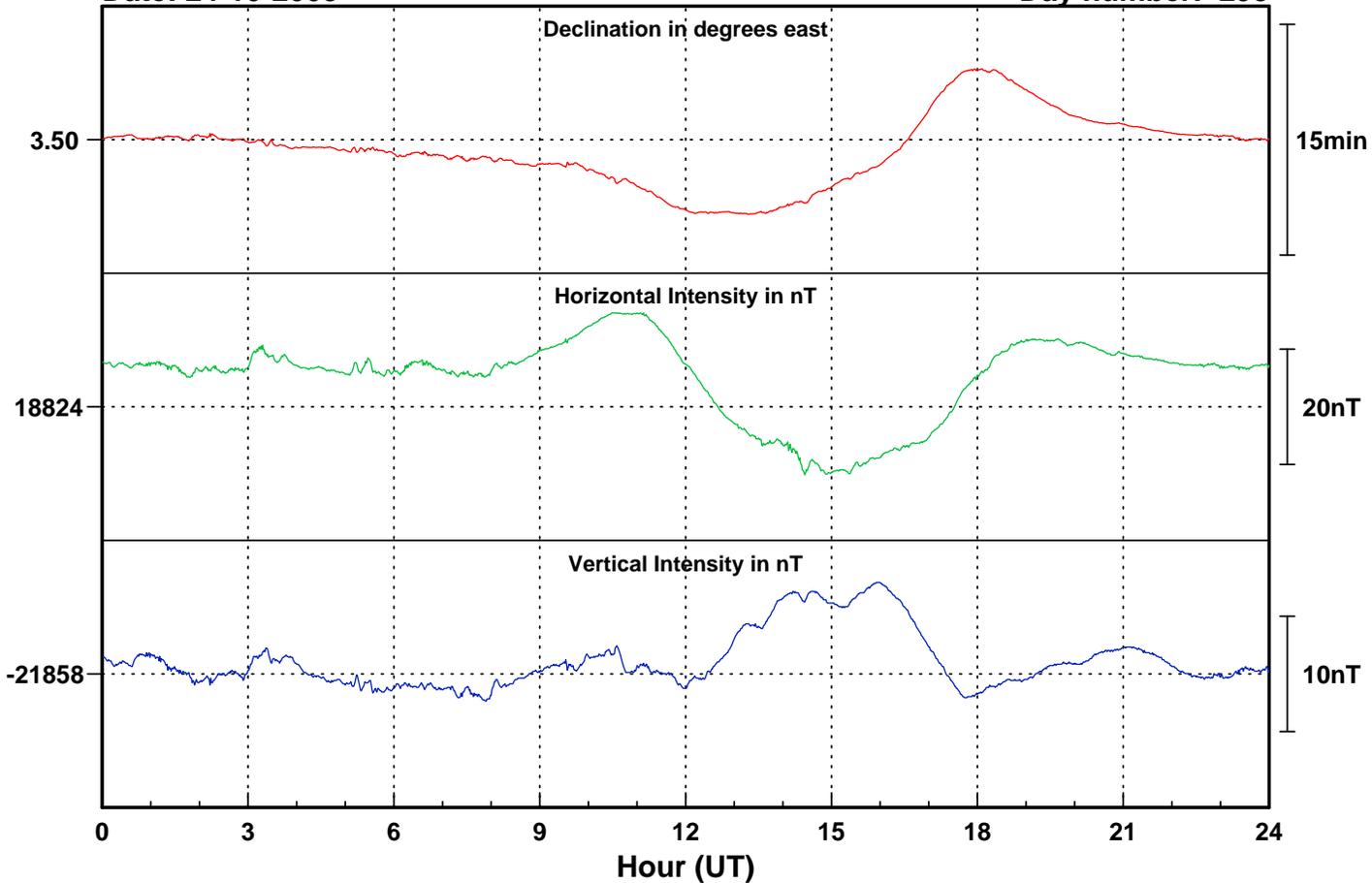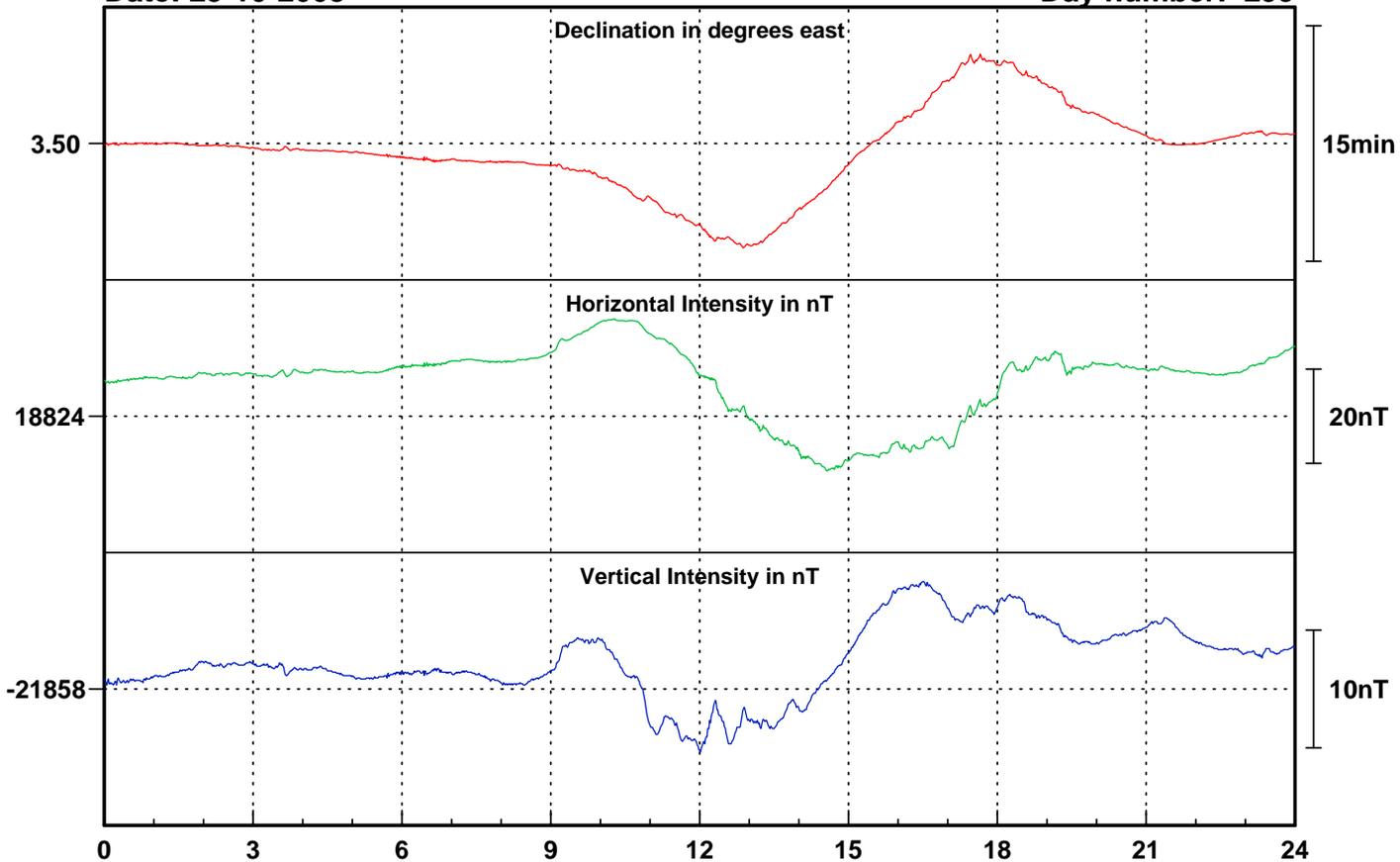
Date: 26-10-2008

Day number: 300

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24
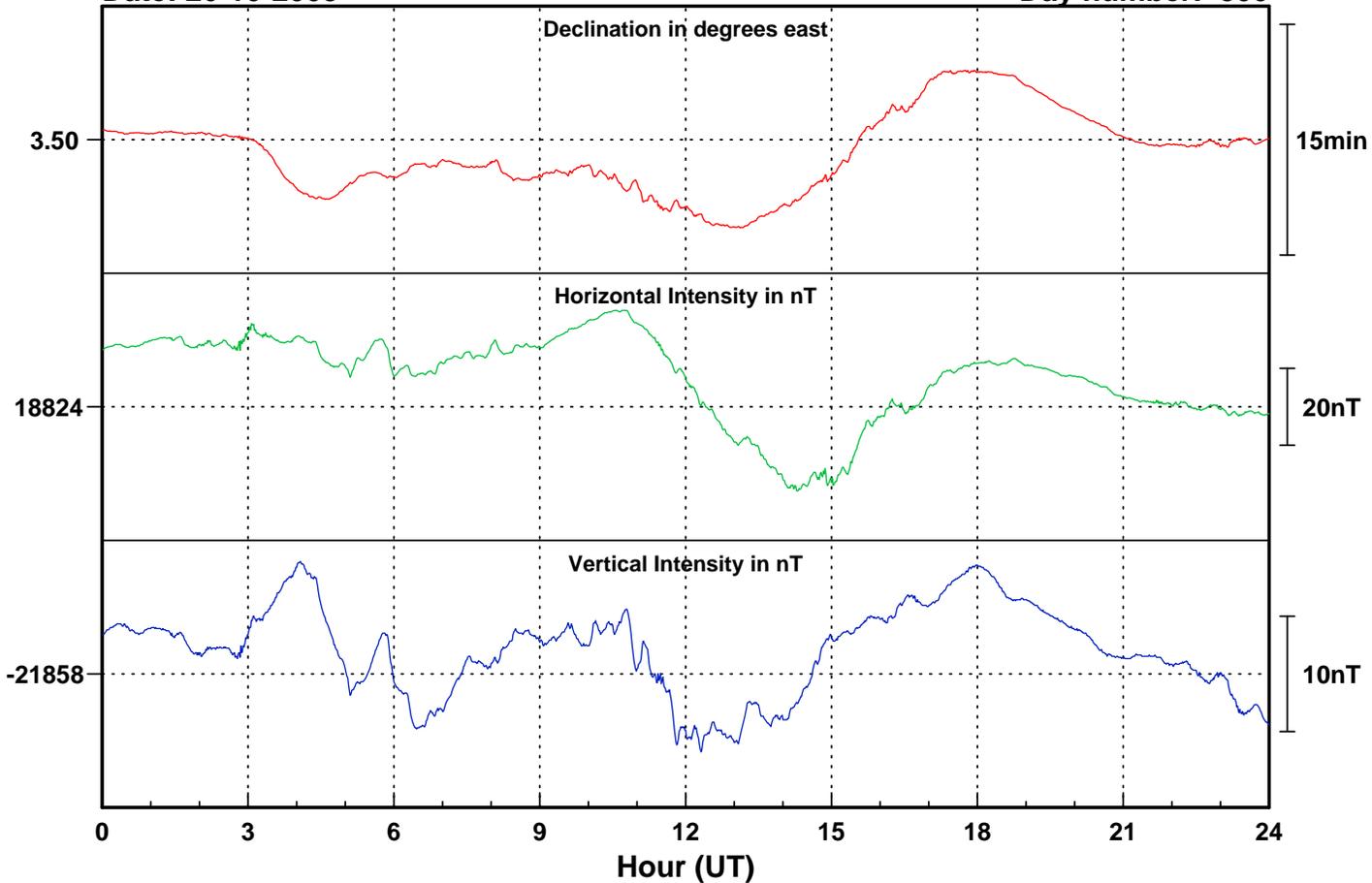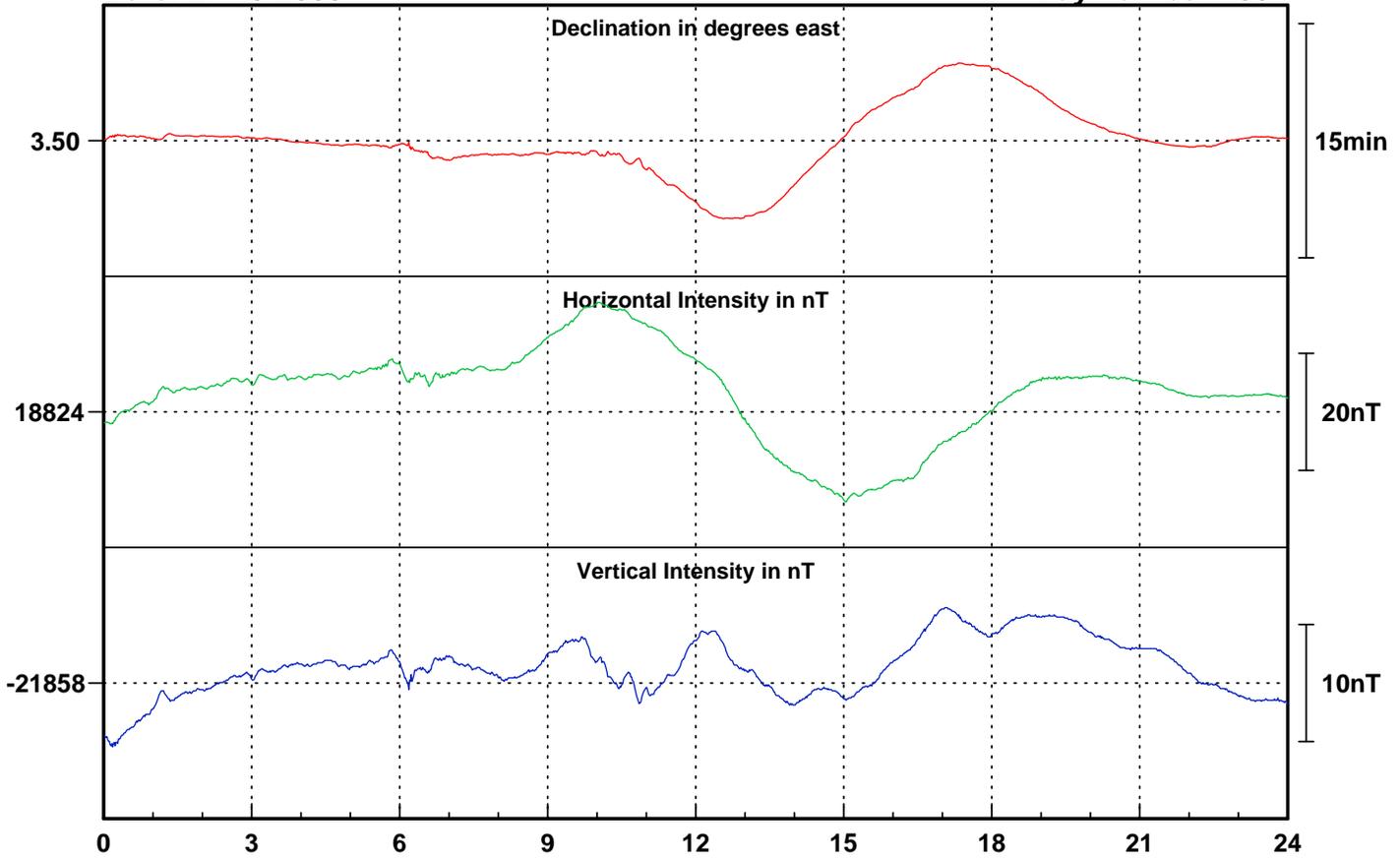
Date: 28-10-2008

Day number: 302

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

30nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Date: 29-10-2008   Day number: 303

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

30nT

Vertical Intensity in nT

-21858

20nT

0   3   6   9   12   15   18   21   24
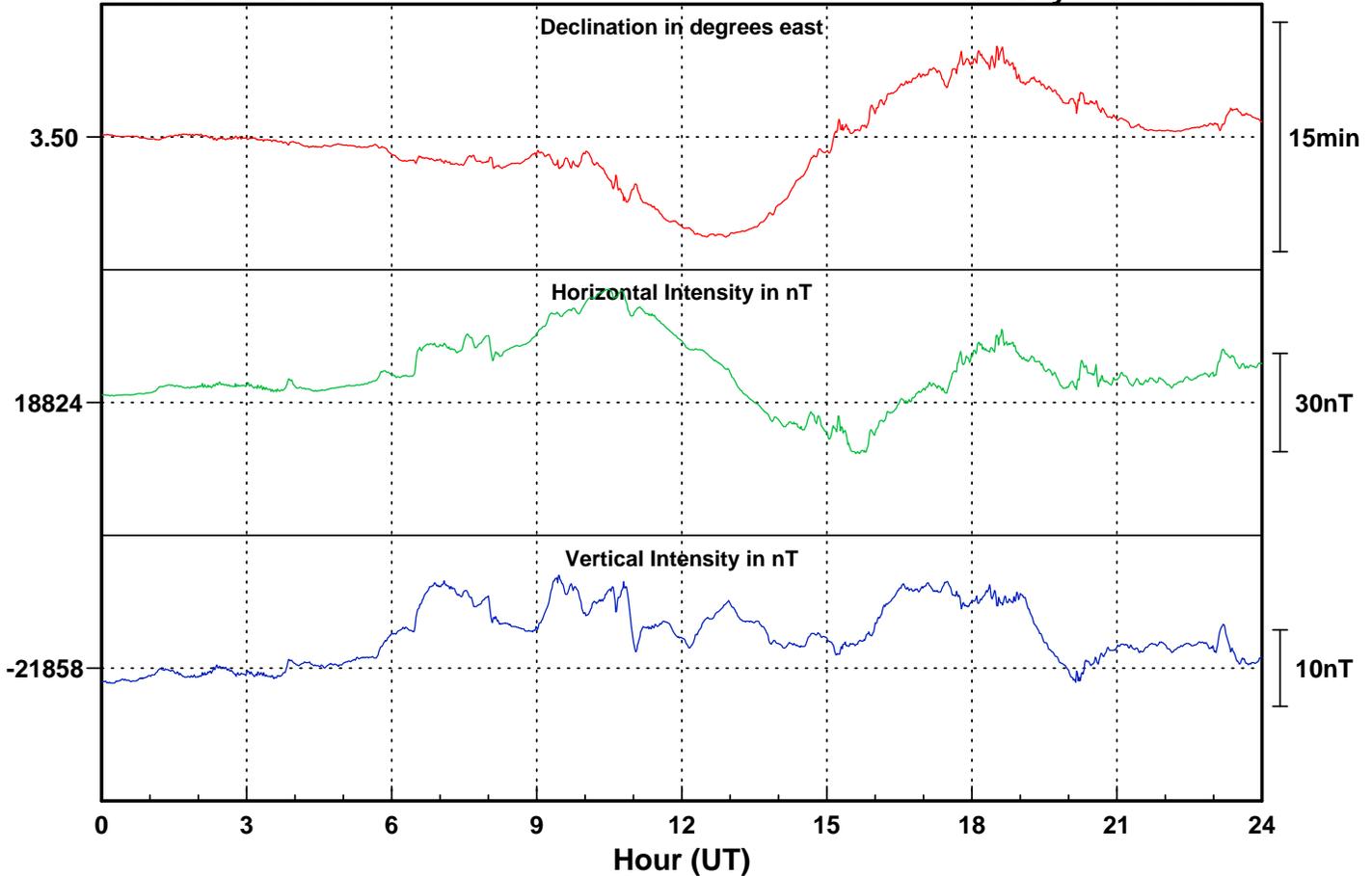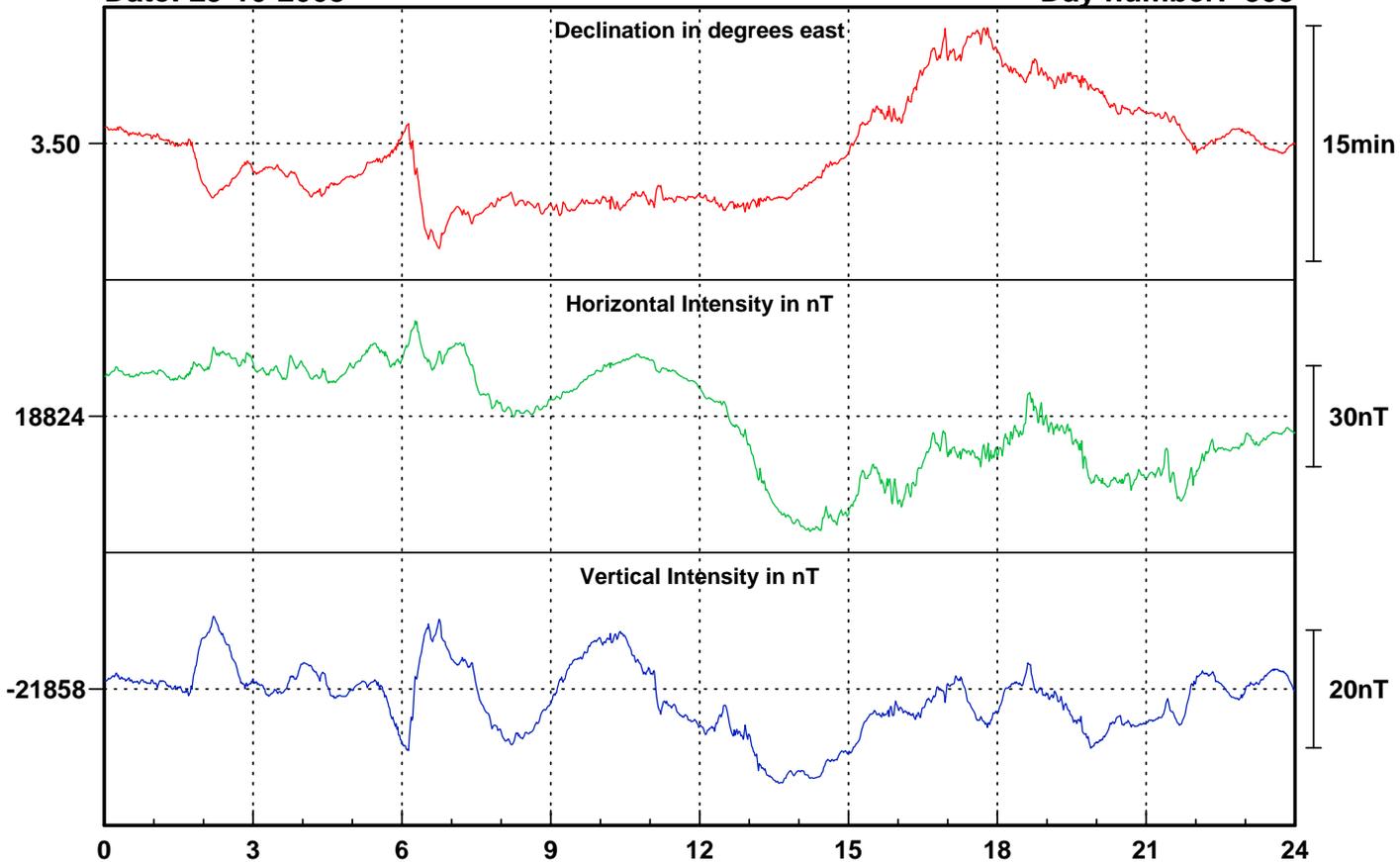
Date: 30-10-2008   Day number: 304

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

30nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24

Hour (UT)

Falkland Islands

Date: 31-10-2008

Day number: 305

Declination in degrees east

3.50

15min

Horizontal Intensity in nT

18824

20nT

Vertical Intensity in nT

-21858

10nT

0   3   6   9   12   15   18   21   24
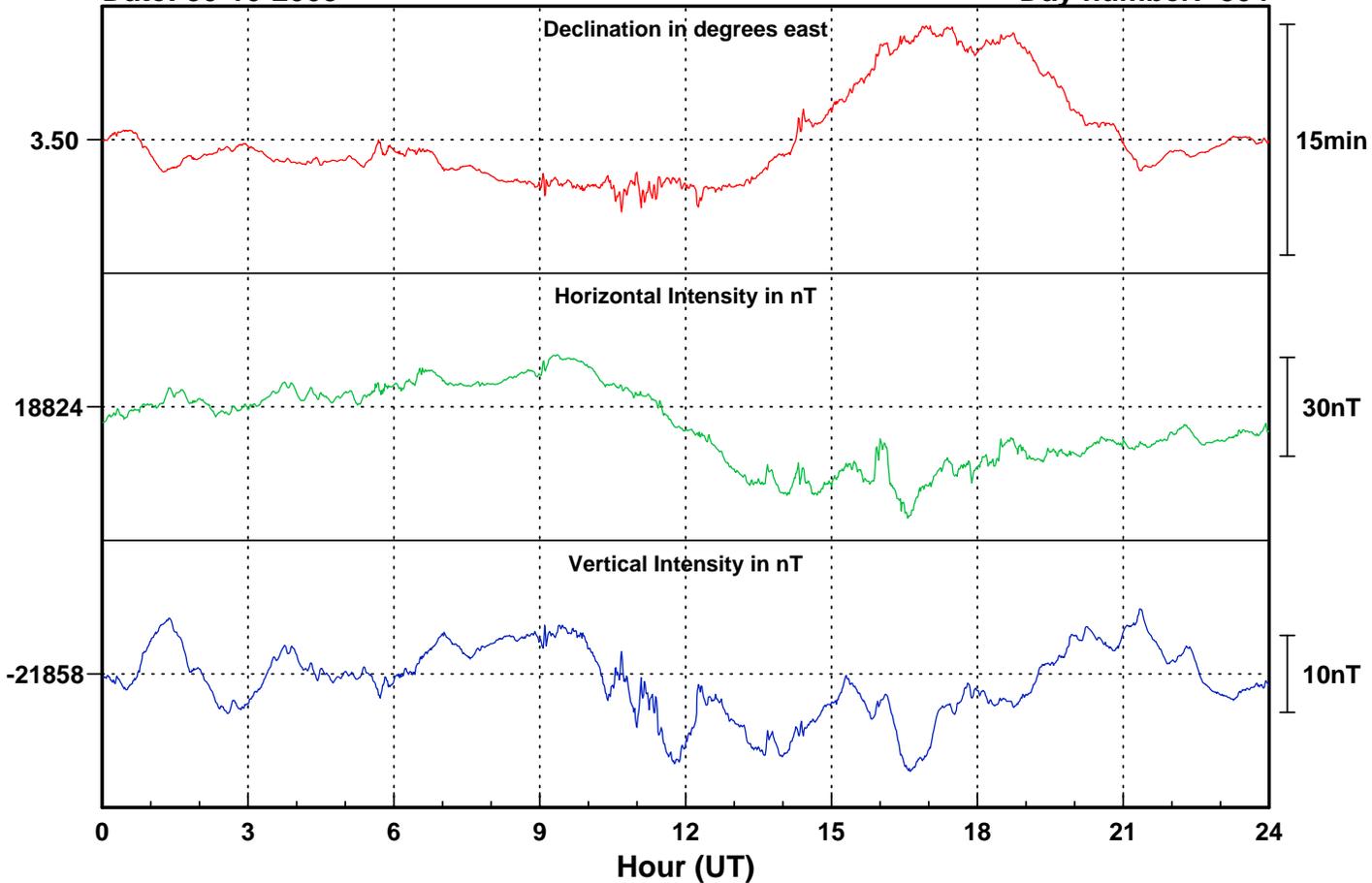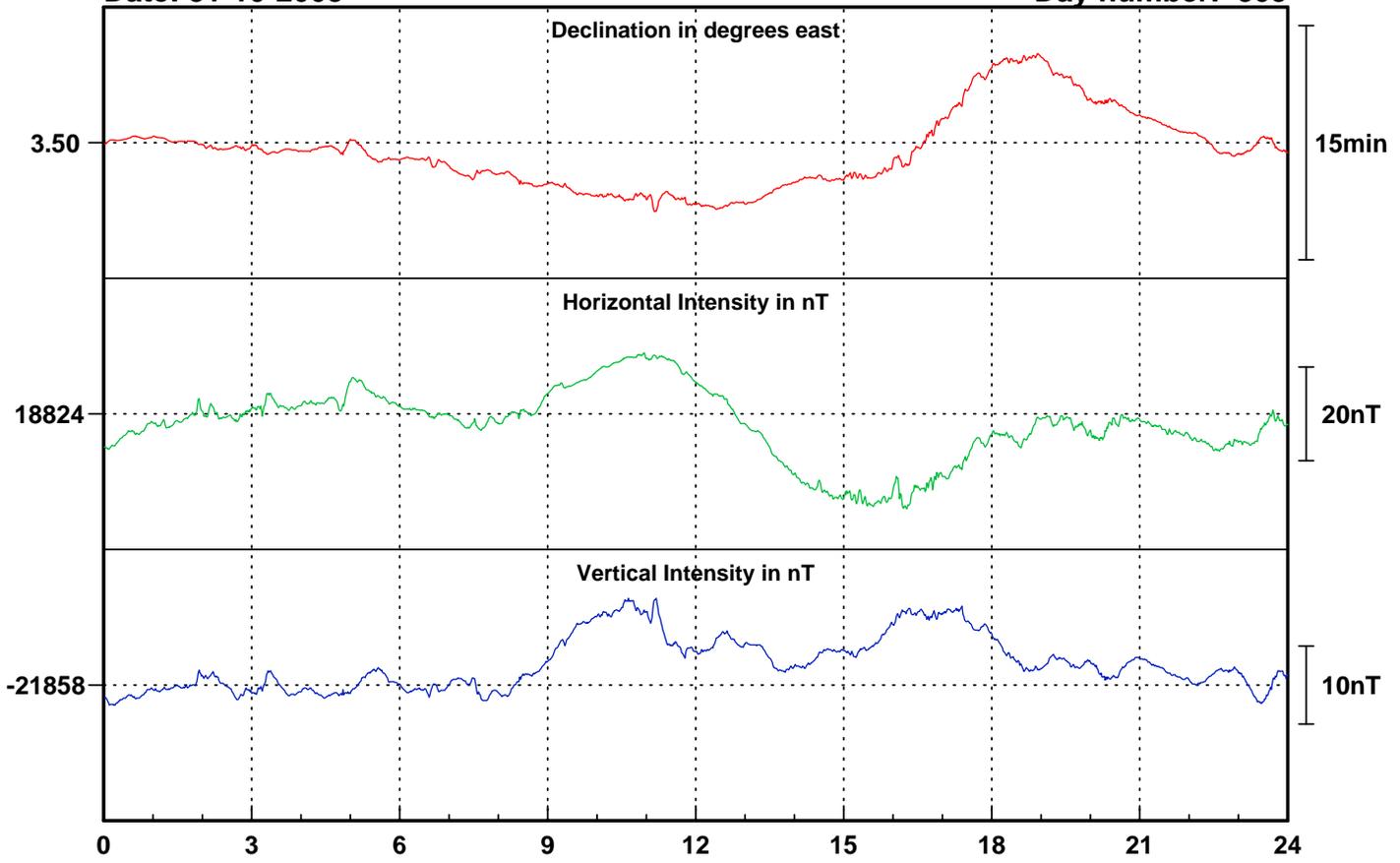
Falkland Islands Observatory: Declination (degrees)
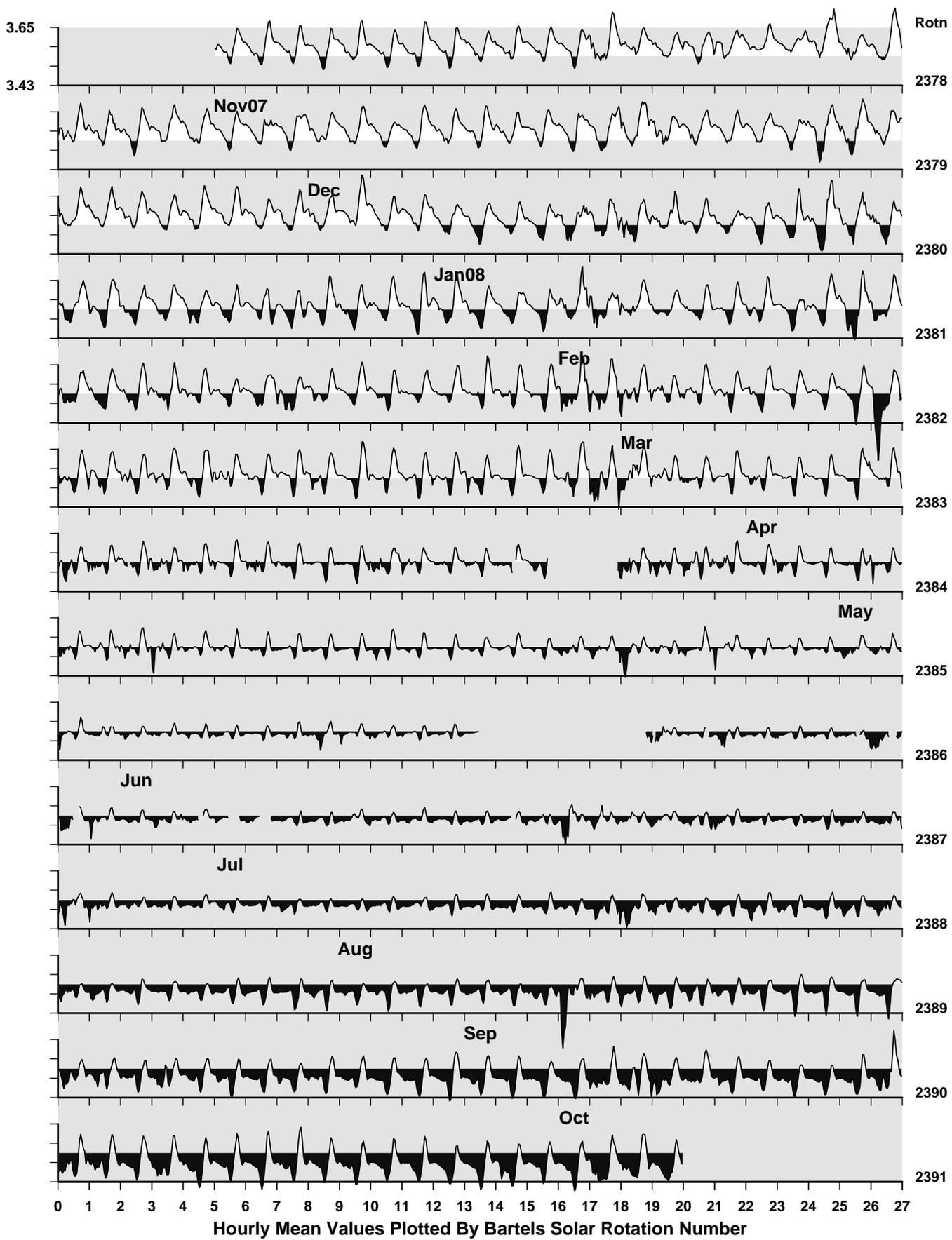
Hourly Mean Values Plotted By Bartels Solar Rotation Number

Falkland Islands Observatory: Horizontal Intensity (nT)

Hourly Mean Values Plotted By Bartels Solar Rotation Number
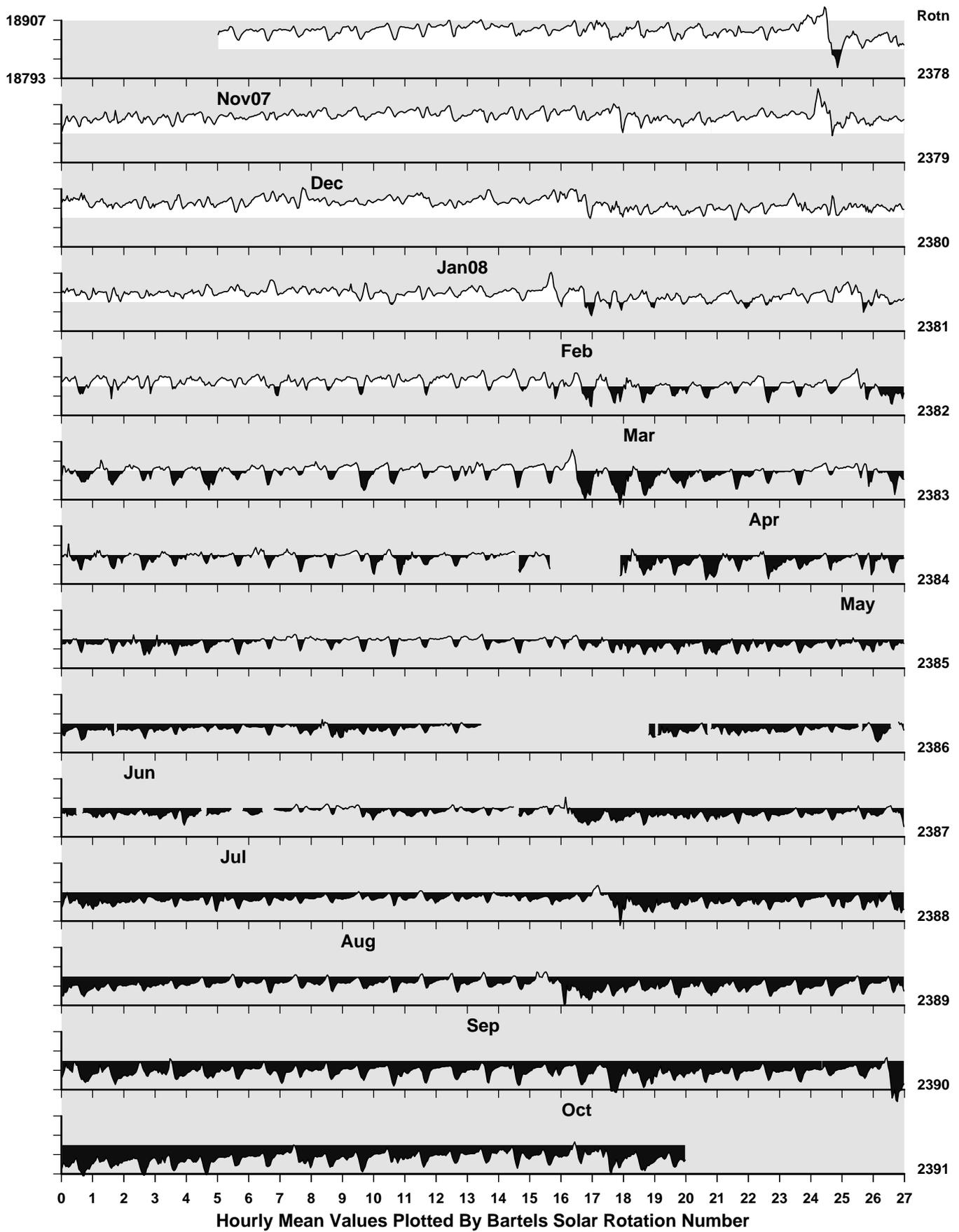
Falkland Islands Observatory: Vertical Intensity (nT)

Hourly Mean Values Plotted By Bartels Solar Rotation Number
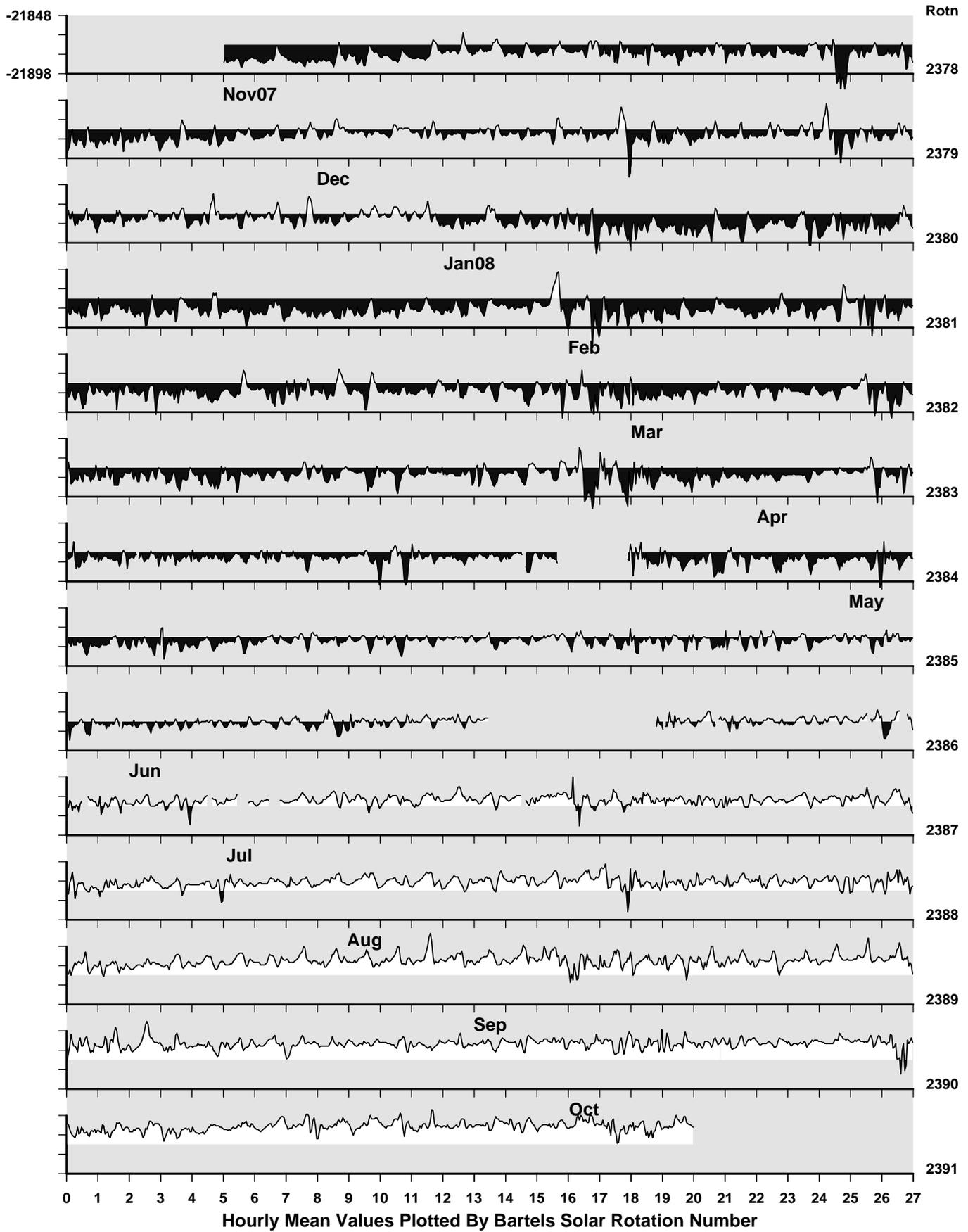
Falklands Is Observatory 2008

Daily Mean Declination (deg)

Daily Mean Horizontal Intensity (nT)

Daily Mean Vertical Intensity (nT)

Daily Mean Total Intensity (nT)
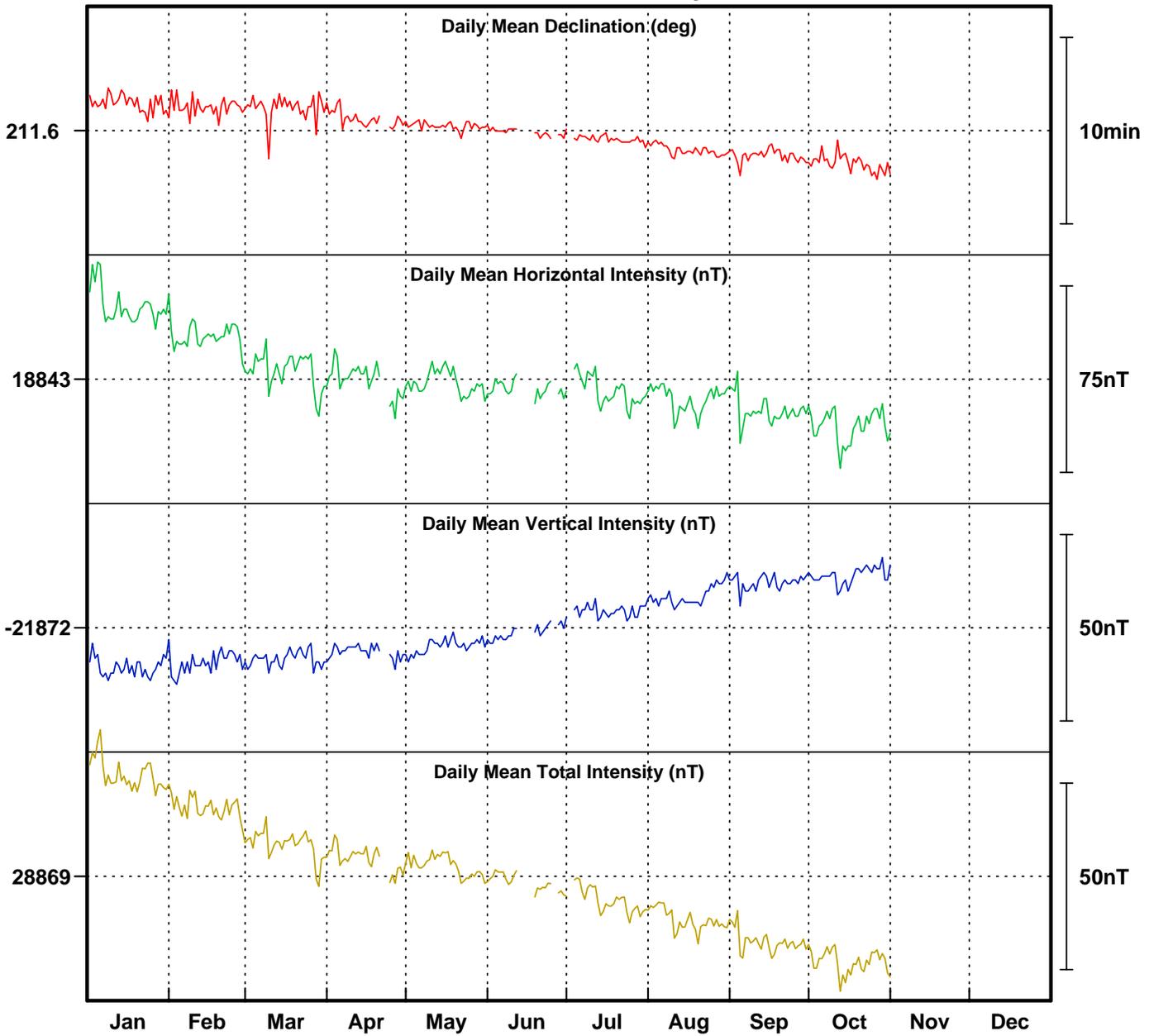
Monthly Mean Values for Port Stanley Observatory 2008

Month	D	H	I	X	Y	Z	F
January	3° 34.6´	18875 nT	-49° 12.7´	18838 nT	1178 nT	-21876 nT	28893 nT
February	3° 34.3´	18861 nT	-49° 13.9´	18824 nT	1175 nT	-21875 nT	28884 nT
March	3° 33.9´	18845 nT	-49° 15.1´	18809 nT	1172 nT	-21873 nT	28871 nT
April	3° 33.6´	18845 nT	-49° 15.3´	18808 nT	1170 nT	-21874 nT	28872 nT
May	3° 33.2´	18843 nT	-49° 15.2´	18807 nT	1168 nT	-21870 nT	28868 nT
June	3° 32.6´	18840 nT	-49° 15.2´	18804 nT	1165 nT	-21867 nT	28864 nT
July	3° 32.3´	18835 nT	-49° 15.3´	18799 nT	1163 nT	-21864 nT	28858 nT
August	3° 30.5´	18835 nT	-49° 15.3´	18800 nT	1153 nT	-21863 nT	28857 nT
September	3° 30.3´	18830 nT	-49° 15.5´	18795 nT	1151 nT	-21860 nT	28851 nT
October	3° 29.8´	18824 nT	-49° 15.9´	18789 nT	1148 nT	-21858 nT	28846 nT

Note
i.   The values shown here are provisional.