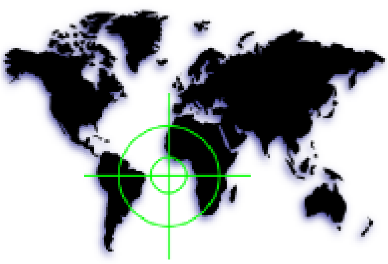
BRITISH GEOLOGICAL SURVEY

Ascension Island Observatory

Monthly Magnetic Bulletin

July 2008

08/07/AS



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

ASCENSION ISLAND OBSERVATORY MAGNETIC DATA

1. Introduction

Ascension Island Observatory was installed by the British Geological Survey (BGS) with financial support from a consortium of oil companies and became operational in September 1992.

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.

Enquiries about the data should be addressed to:

National Geomagnetic Service
British Geological Survey
Murchison House, West Mains Road
Edinburgh EH9 3LA
Scotland, UK

Tel: +44 (0) 131 667 1000
Fax: +4 (0) 131 650 0265
E-mail: orba@bgs.ac.uk
Internet: *www.geomag.bgs.ac.uk*

2. Position

Ascension Island Observatory, one of the geomagnetic observatories maintained and operated by BGS, is situated on a site adjacent to the Cable and Wireless Earth Station on Donkey Plain, Ascension Island.
The observatory co-ordinates are:

Geographic:	*7°57.0′S*	*345°37.4′E*
Geomagnetic:	*2°20.7′S*	*56°34.8′E*
Height above mean sea level:	*177 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 month. 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.

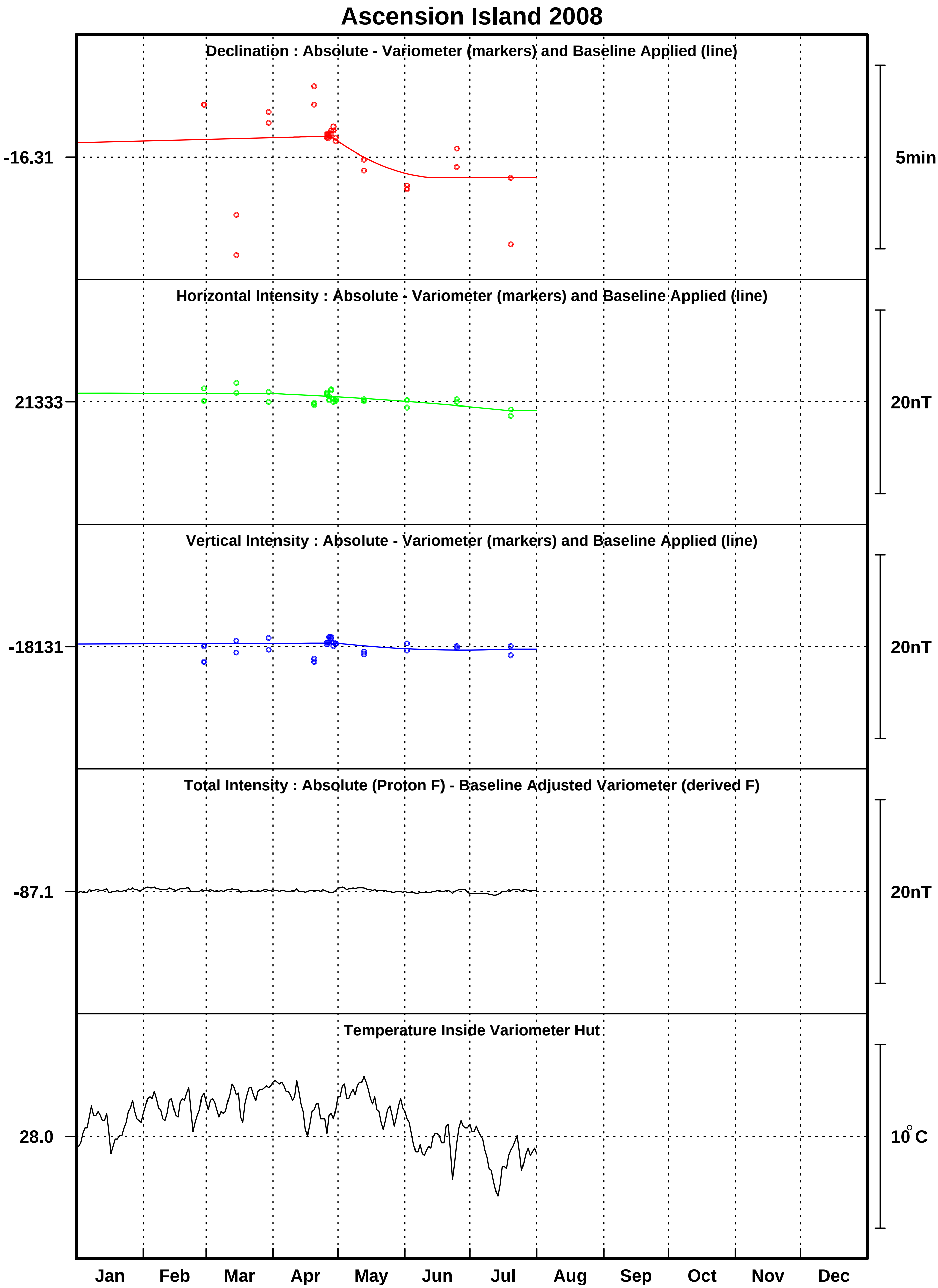
4.5 Daily and Monthly Mean Values

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.

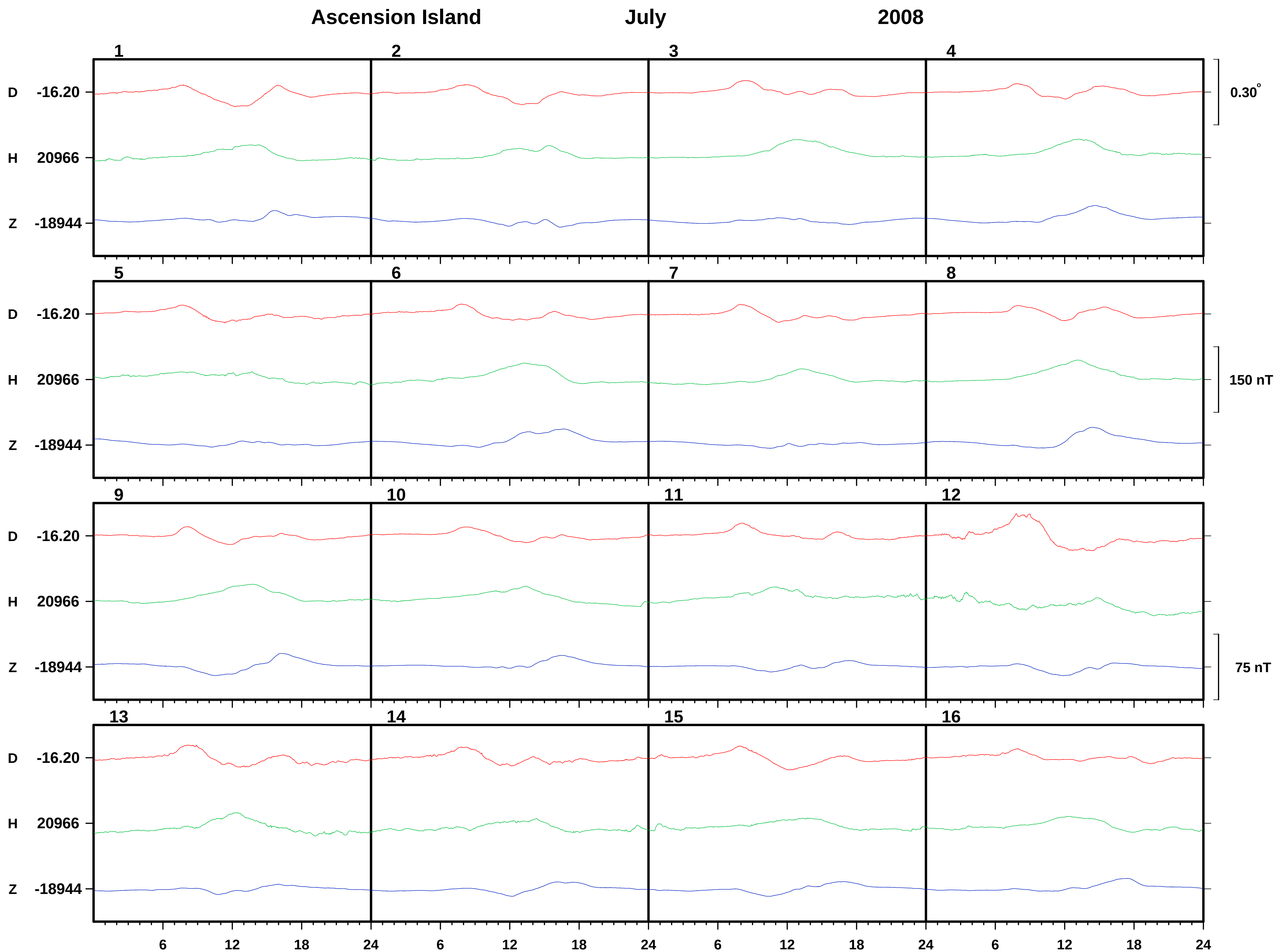
ASCENSION ISLAND OBSERVATORY

ABSOLUTE OBSERVATIONS

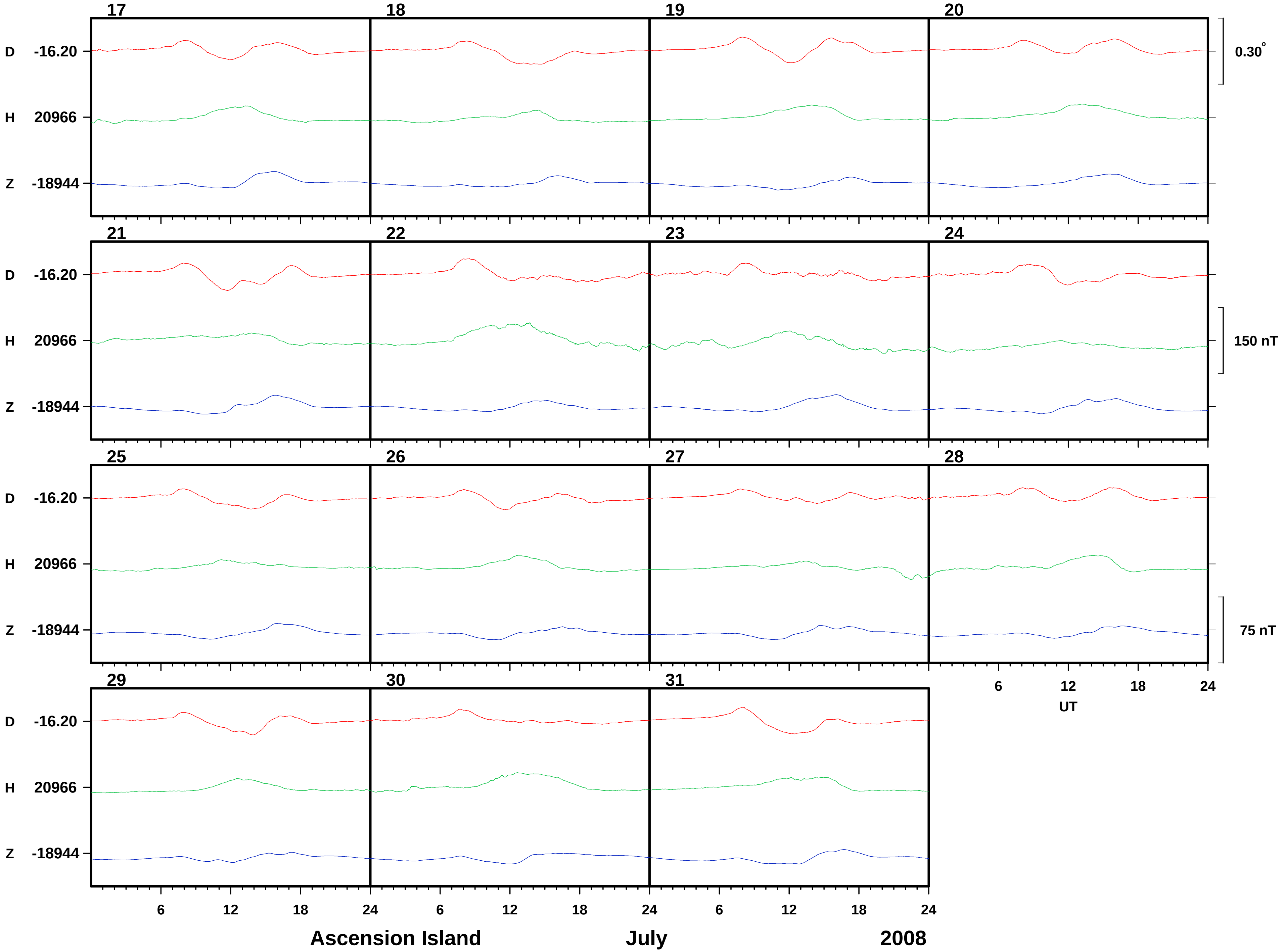
		DECLINATION			INCLINATION							
Date	**Day Number**	**Time (UT)**	**Absolute (º)**	**Baseline (º)**	**Time (UT)**	**Inclination (º)**	**Total Field Intensity (nT)**	**H Absolute (nT)**	**H Baseline (nT)**	**Z Absolute (nT)**	**Z Baseline (nT)**	**Observer**
19-Jul-08	201	10:39	-16.2437	-16.3467	11:02	-42.0881	28273.9	20982.5	21331.9	-18951.2	-18130.5	GA
19-Jul-08	201	11:27	-16.2431	-16.3167	11:41	-42.0886	28273.8	20982.3	21331.2	-18951.4	-18131.5	GA



Ascension Island 2008
Declination : Absolute - Variometer (markers) and Baseline Applied (line)
-16.31
5min
Horizontal Intensity : Absolute - Variometer (markers) and Baseline Applied (line)
21333
20nT
Vertical Intensity : Absolute - Variometer (markers) and Baseline Applied (line)
-18131
20nT
Total Intensity : Absolute (Proton F) - Baseline Adjusted Variometer (derived F)
-87.1
20nT
Temperature Inside Variometer Hut
28.0
10 °C
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

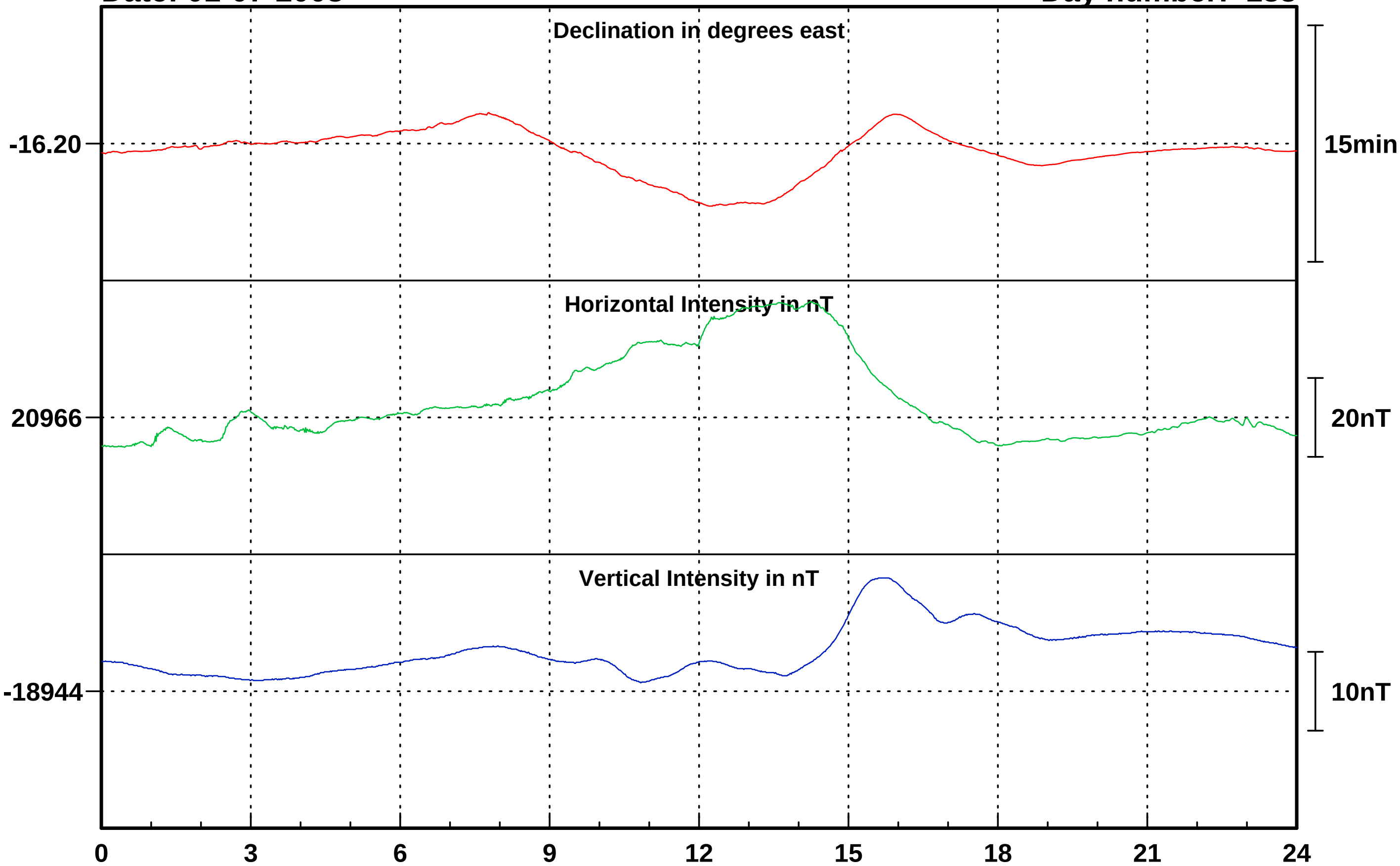


Ascension Island
July
2008
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
D -16.20
H 20966
Z -18944
0.30°
150 nT
75 nT
6
12
18
24

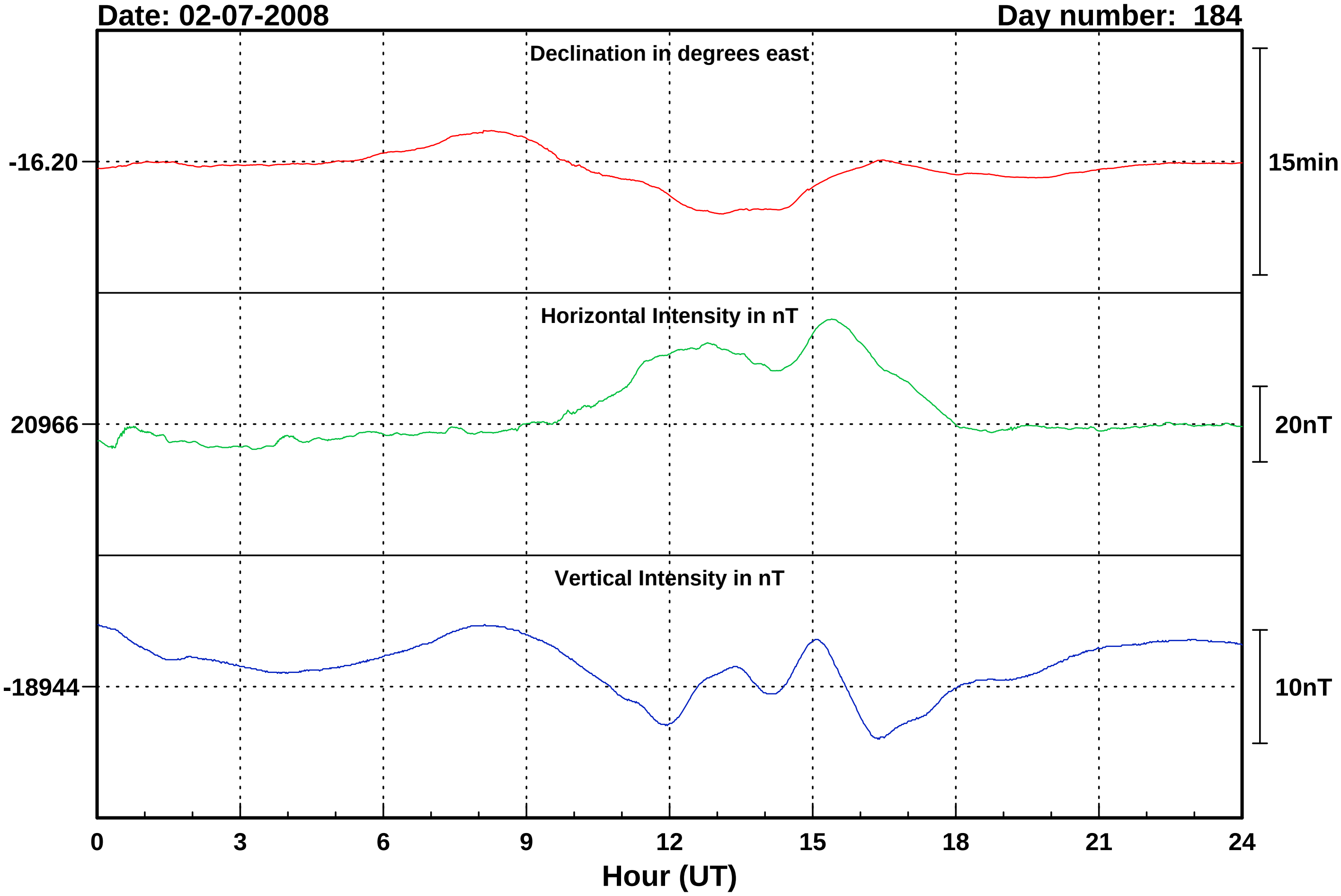

17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
D -16.20
H 20966
Z -18944
0.30°
150 nT
75 nT
6
12
18
24
UT
Ascension Island
July
2008

Ascension Island

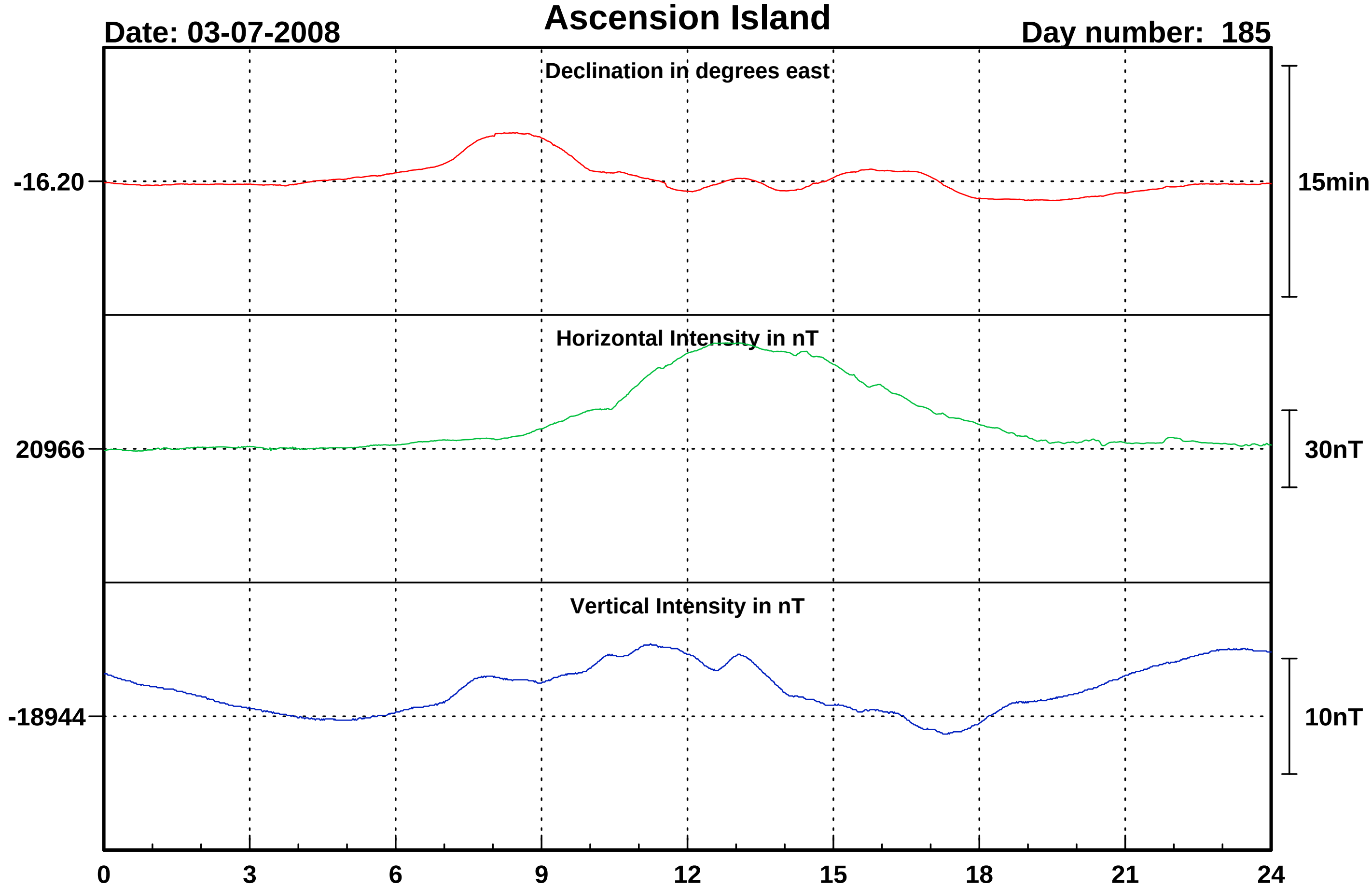
Date: 01-07-2008 Day number: 183

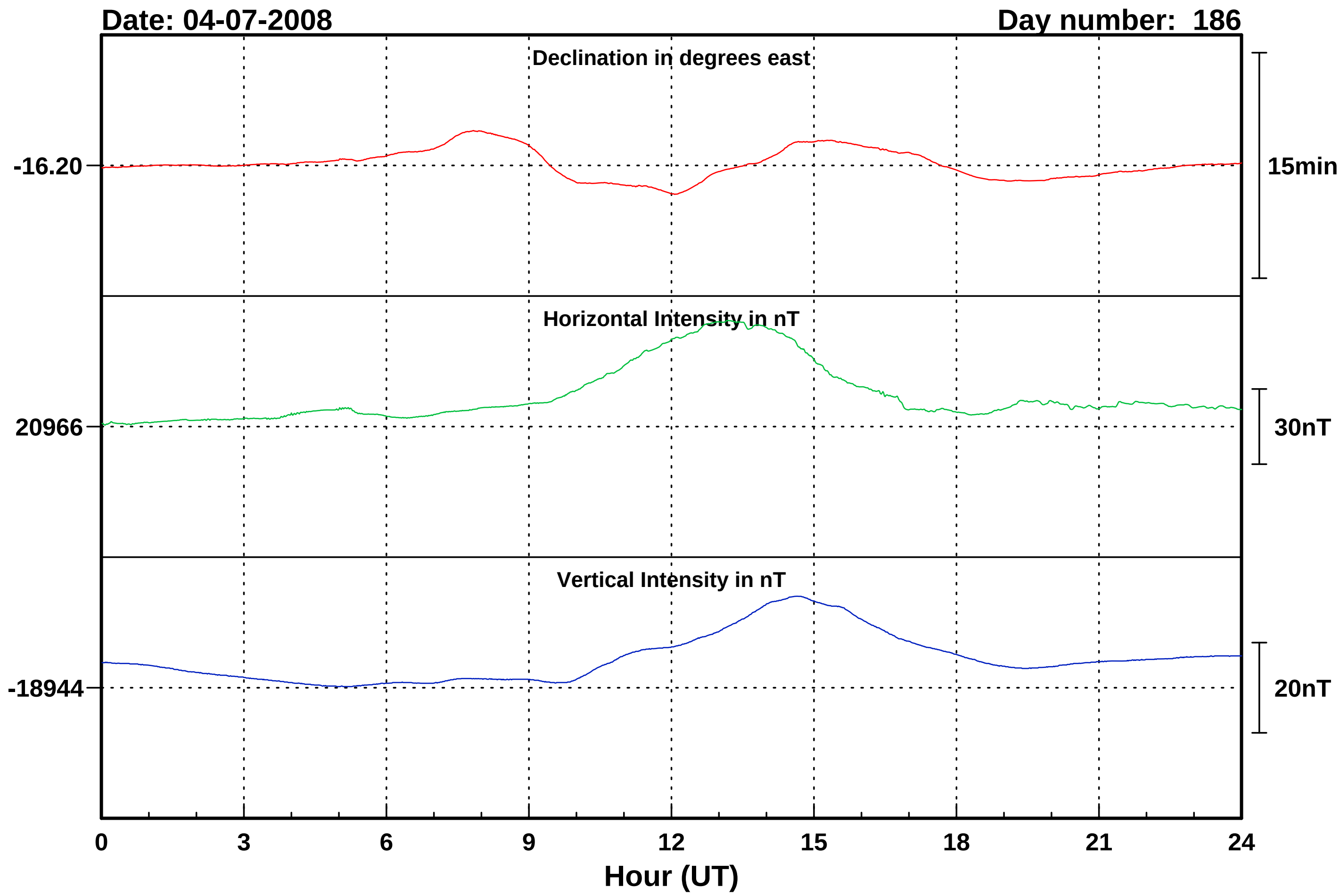


Date: 02-07-2008 Day number: 184



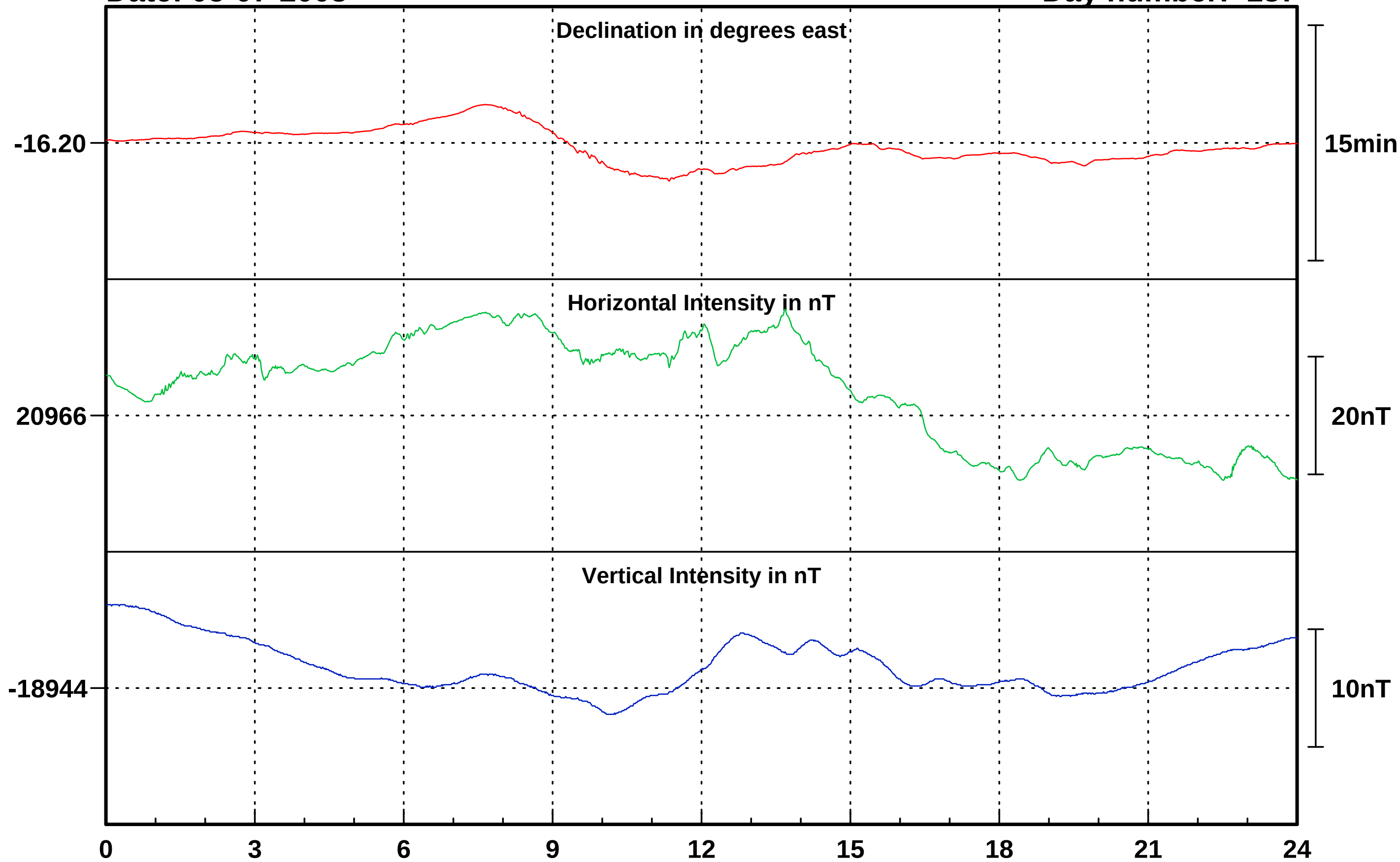
Ascension Island



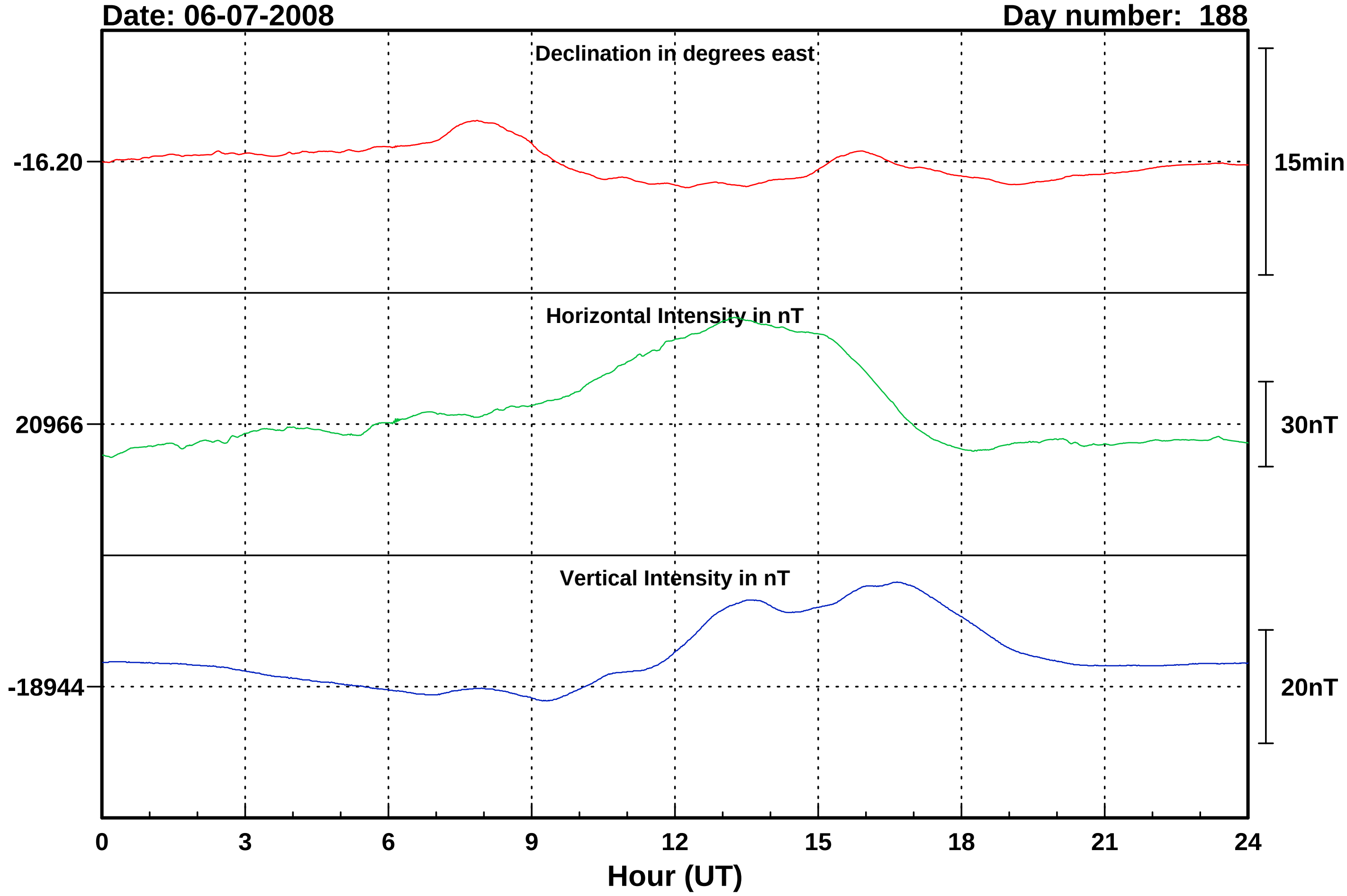


Ascension Island

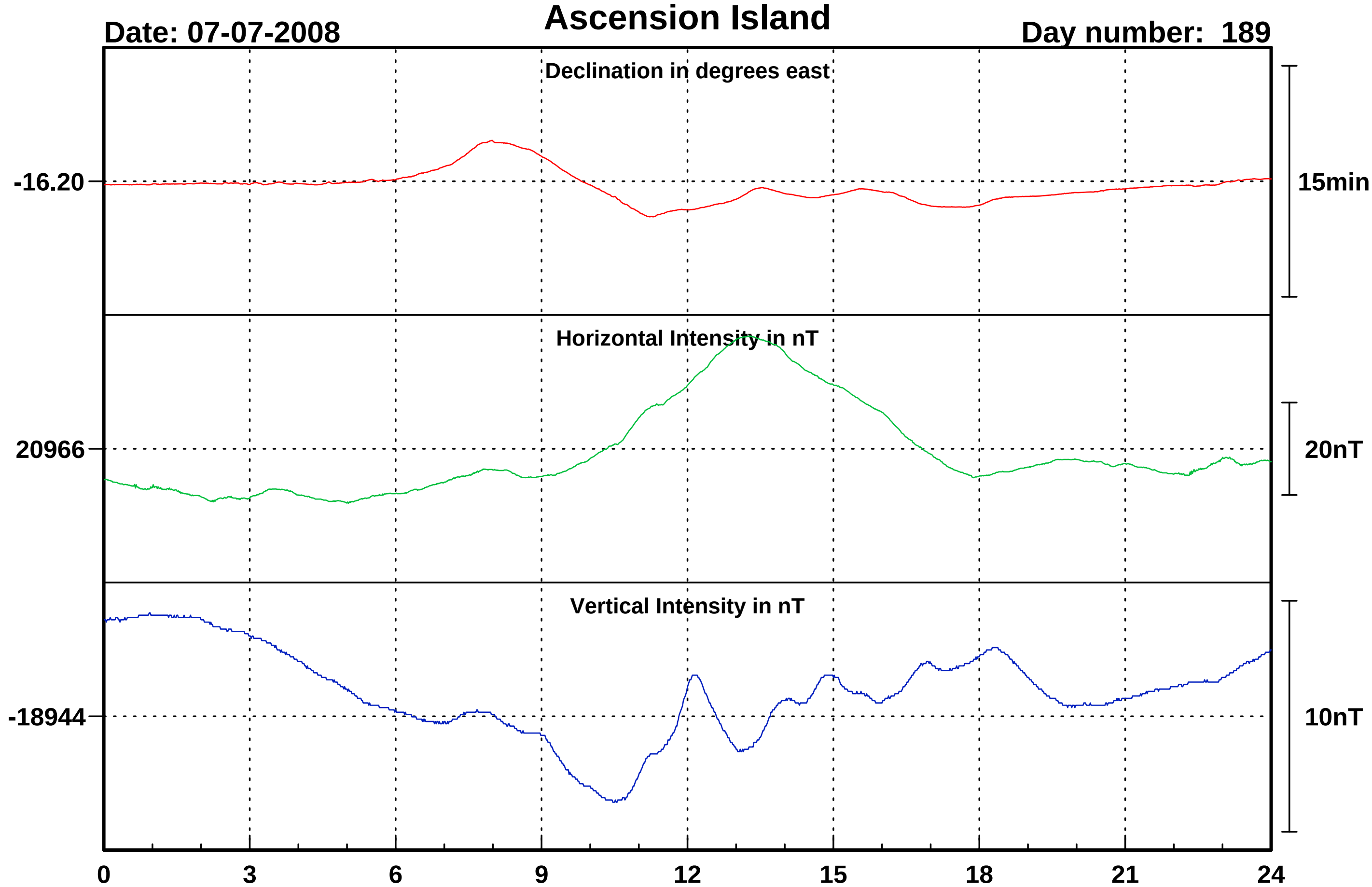
Date: 05-07-2008 Day number: 187

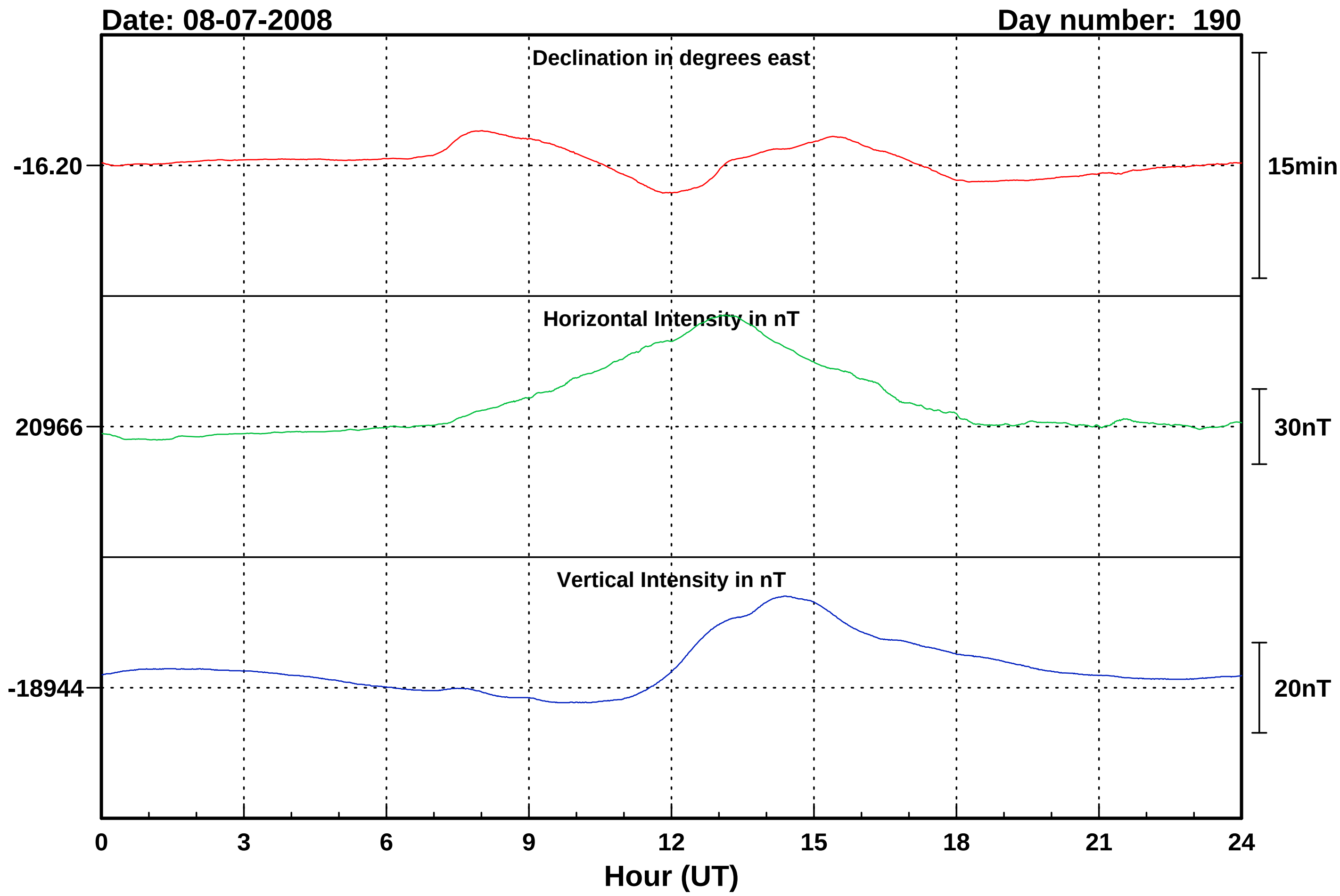


Date: 06-07-2008 Day number: 188



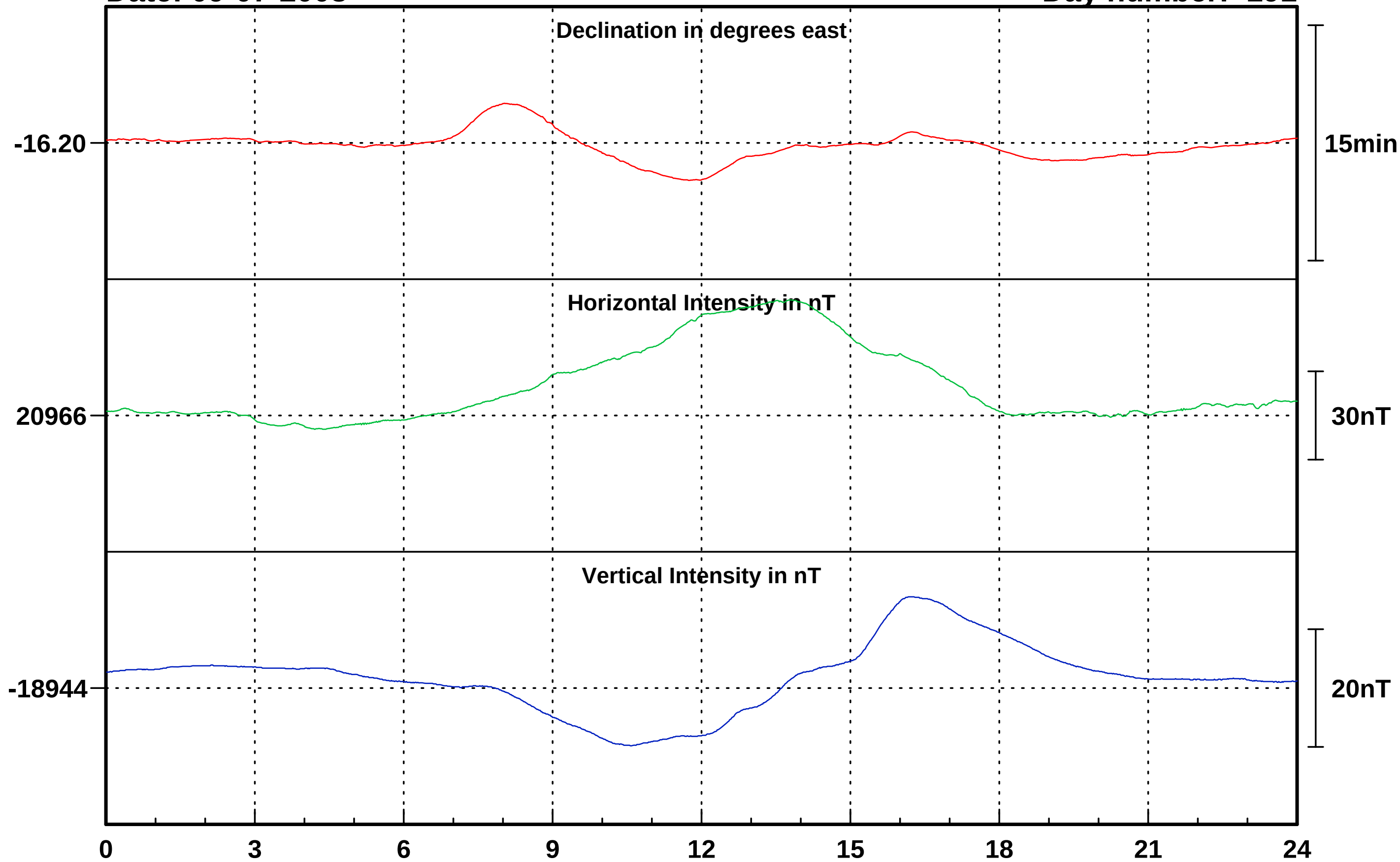
Ascension Island



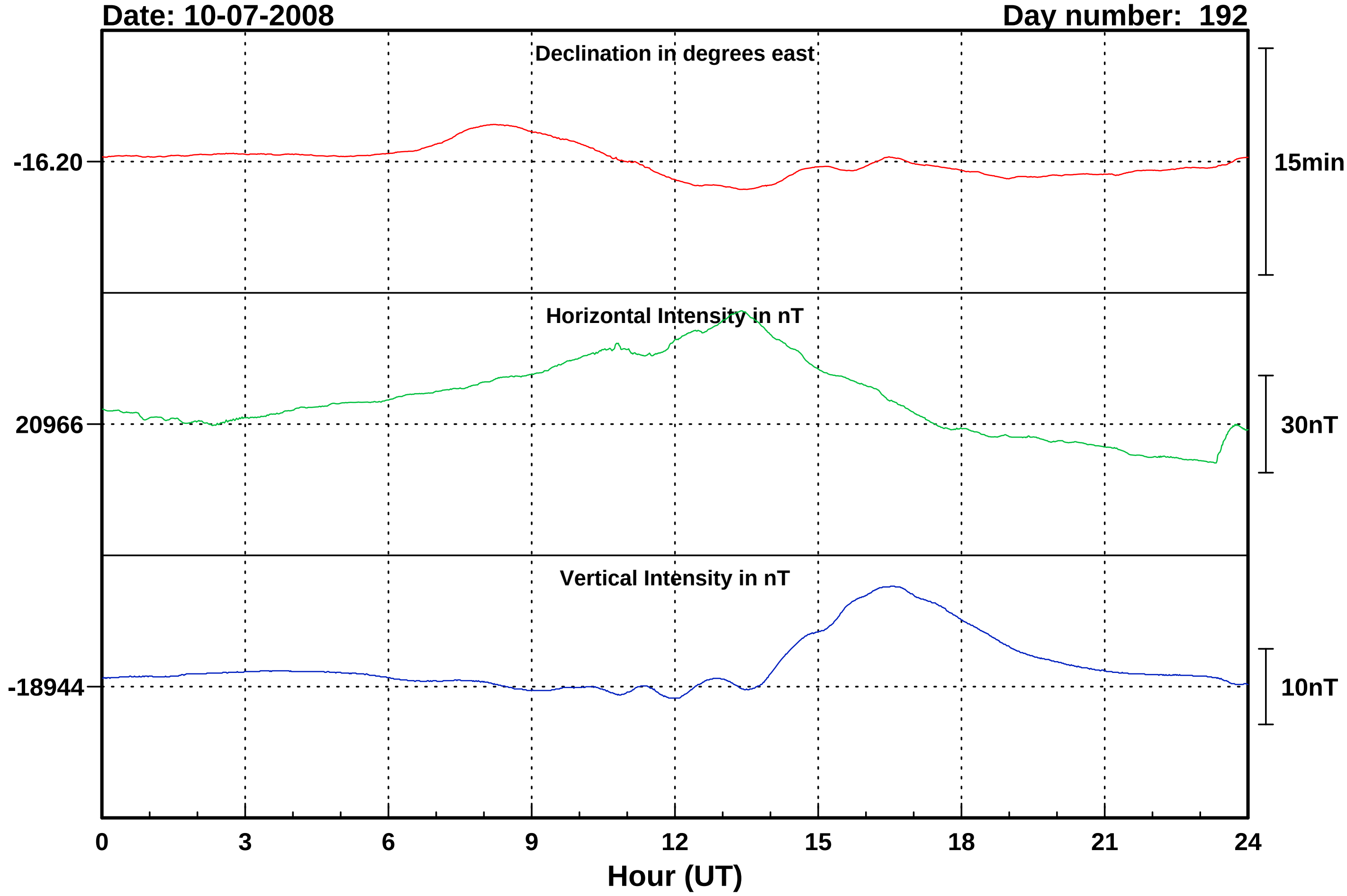


Ascension Island

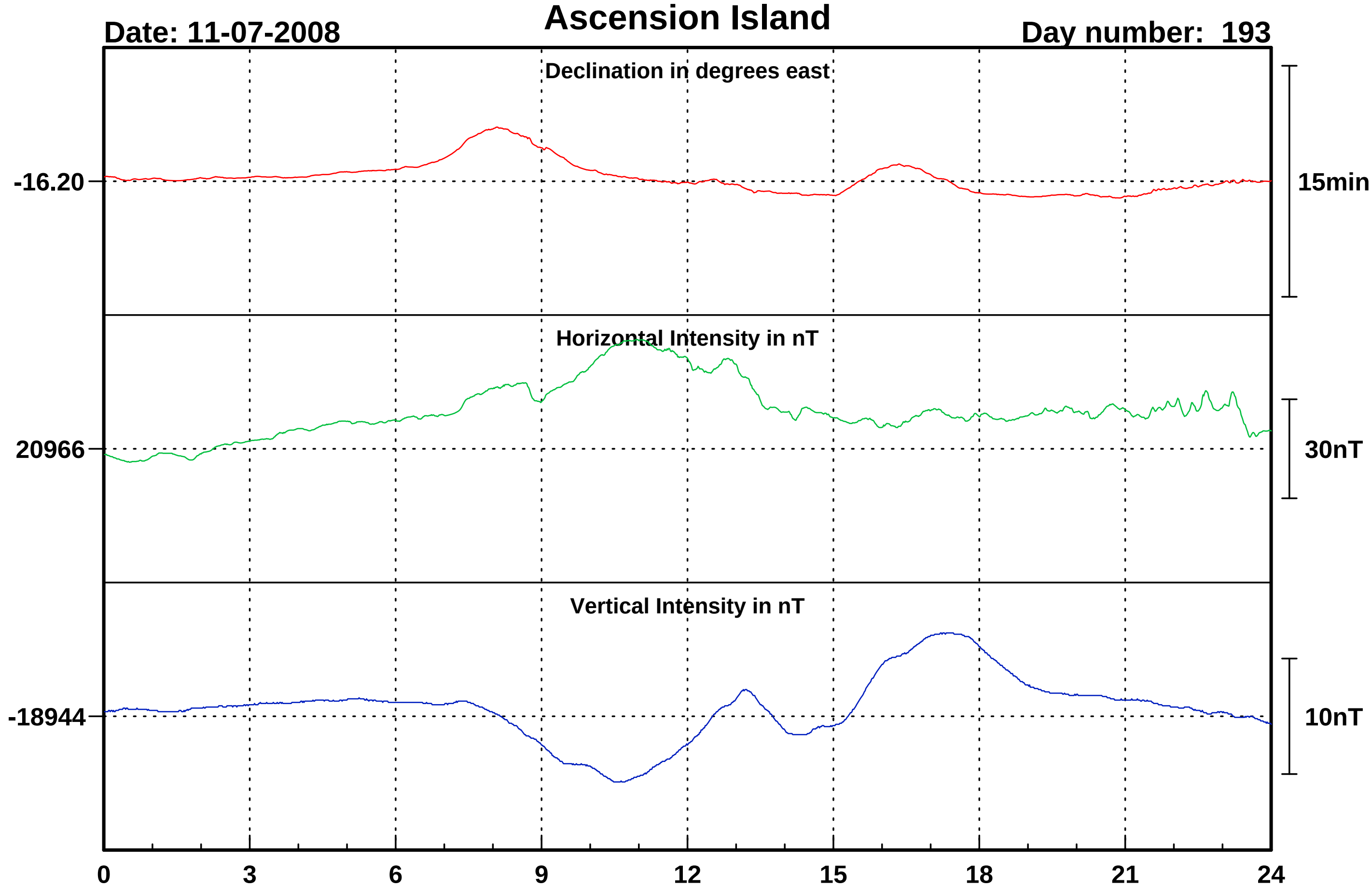
Date: 09-07-2008 Day number: 191

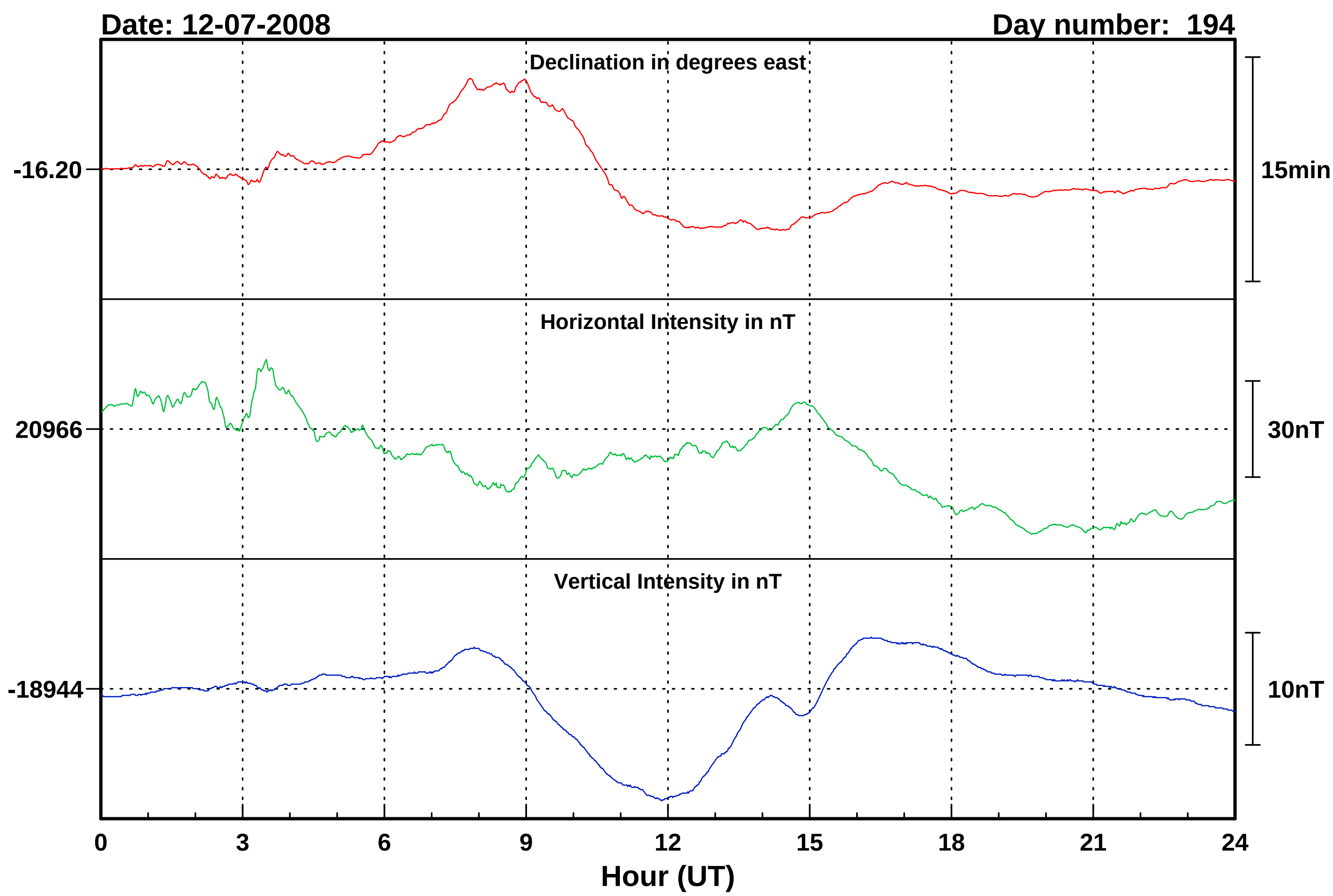


Date: 10-07-2008 Day number: 192



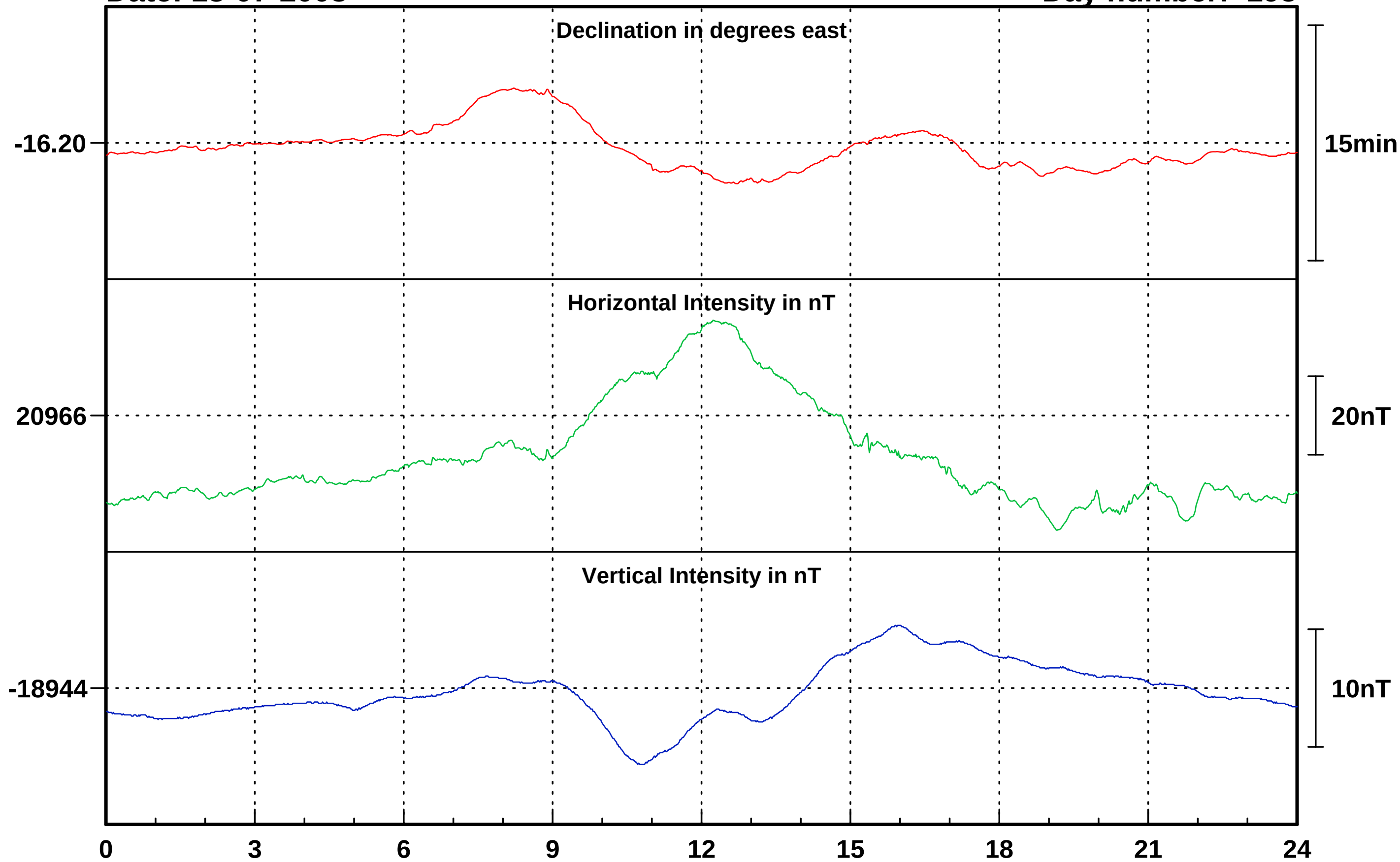
Ascension Island



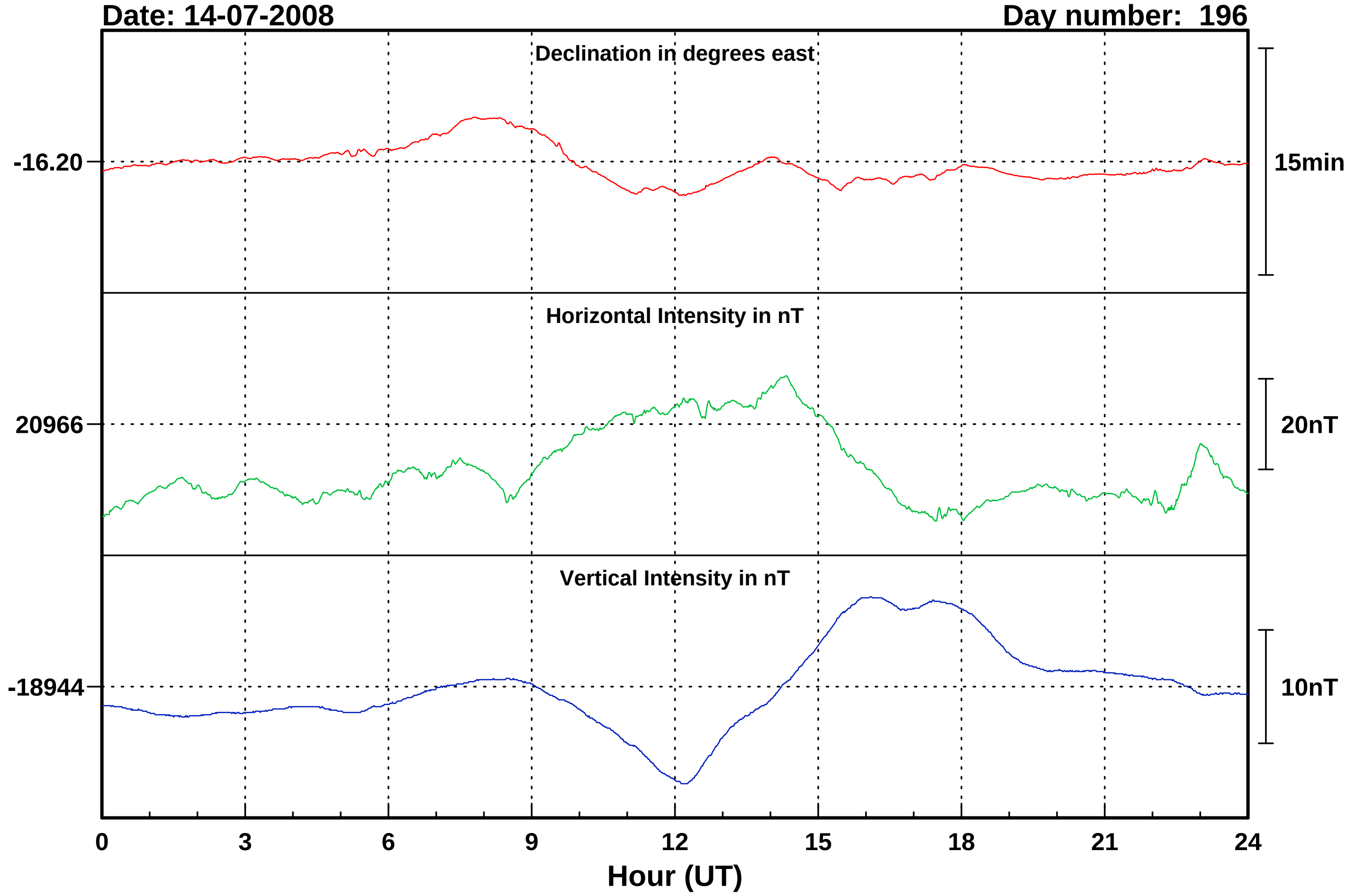


Ascension Island

Date: 13-07-2008 Day number: 195

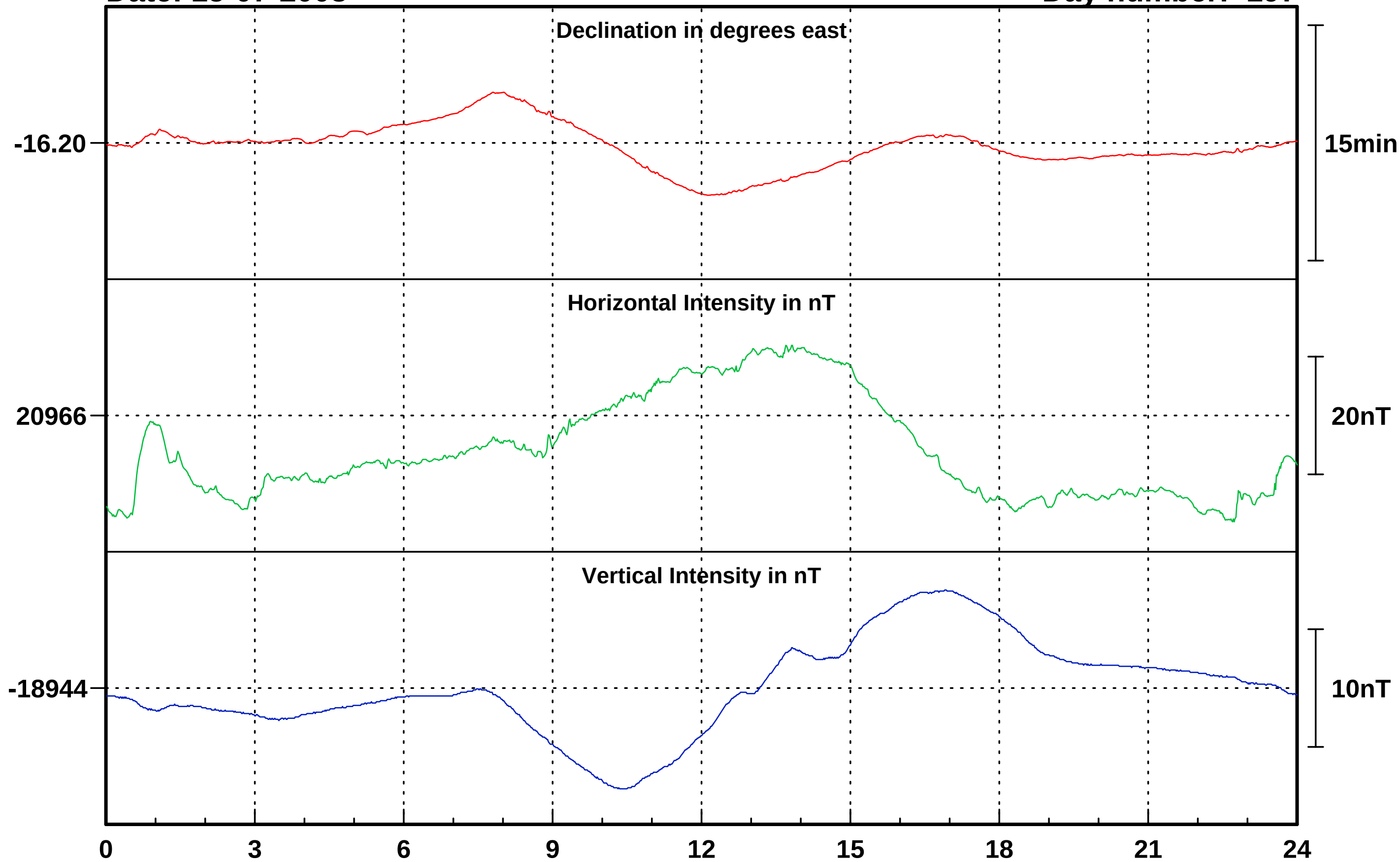


Date: 14-07-2008 Day number: 196

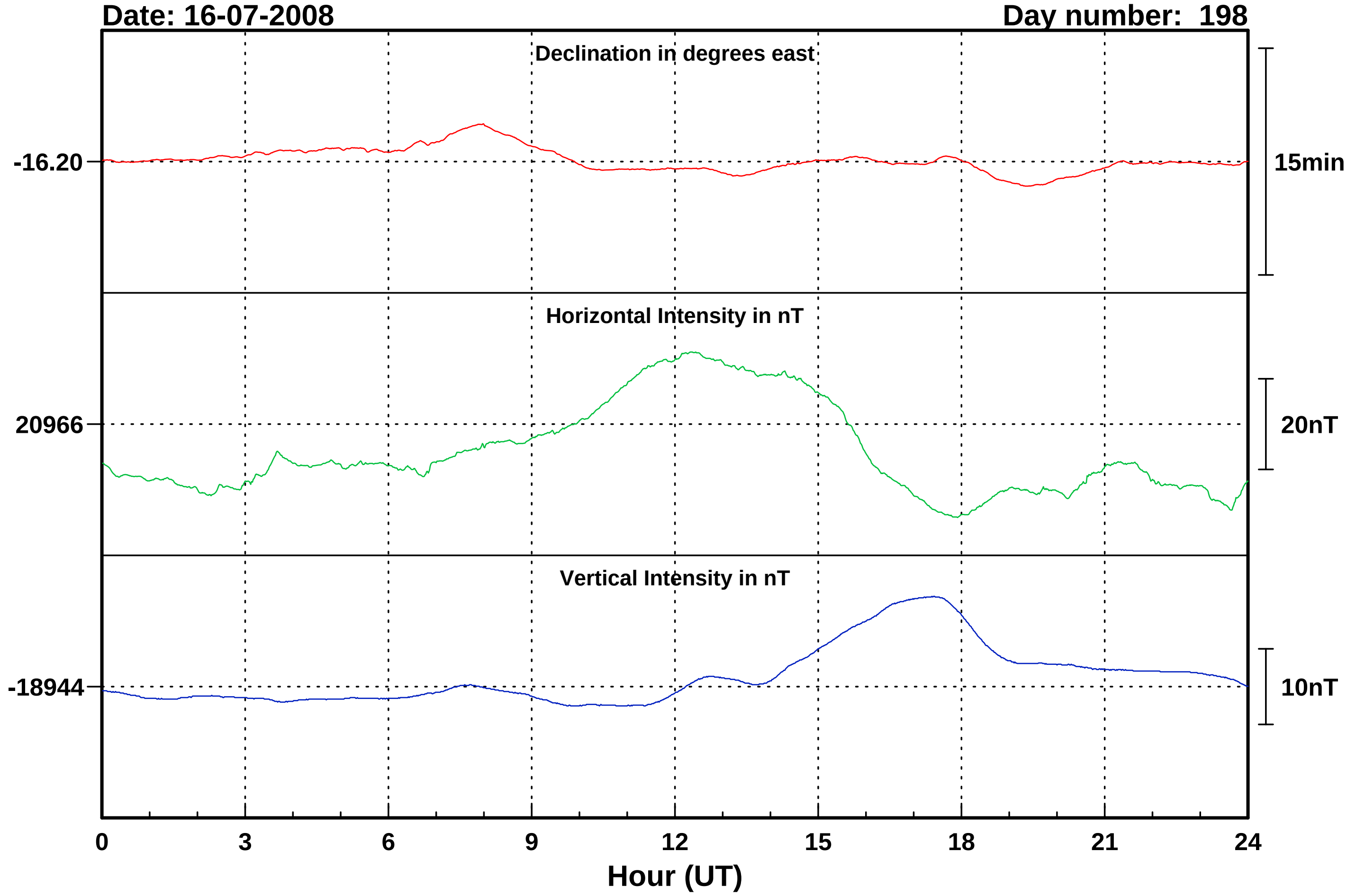


Ascension Island

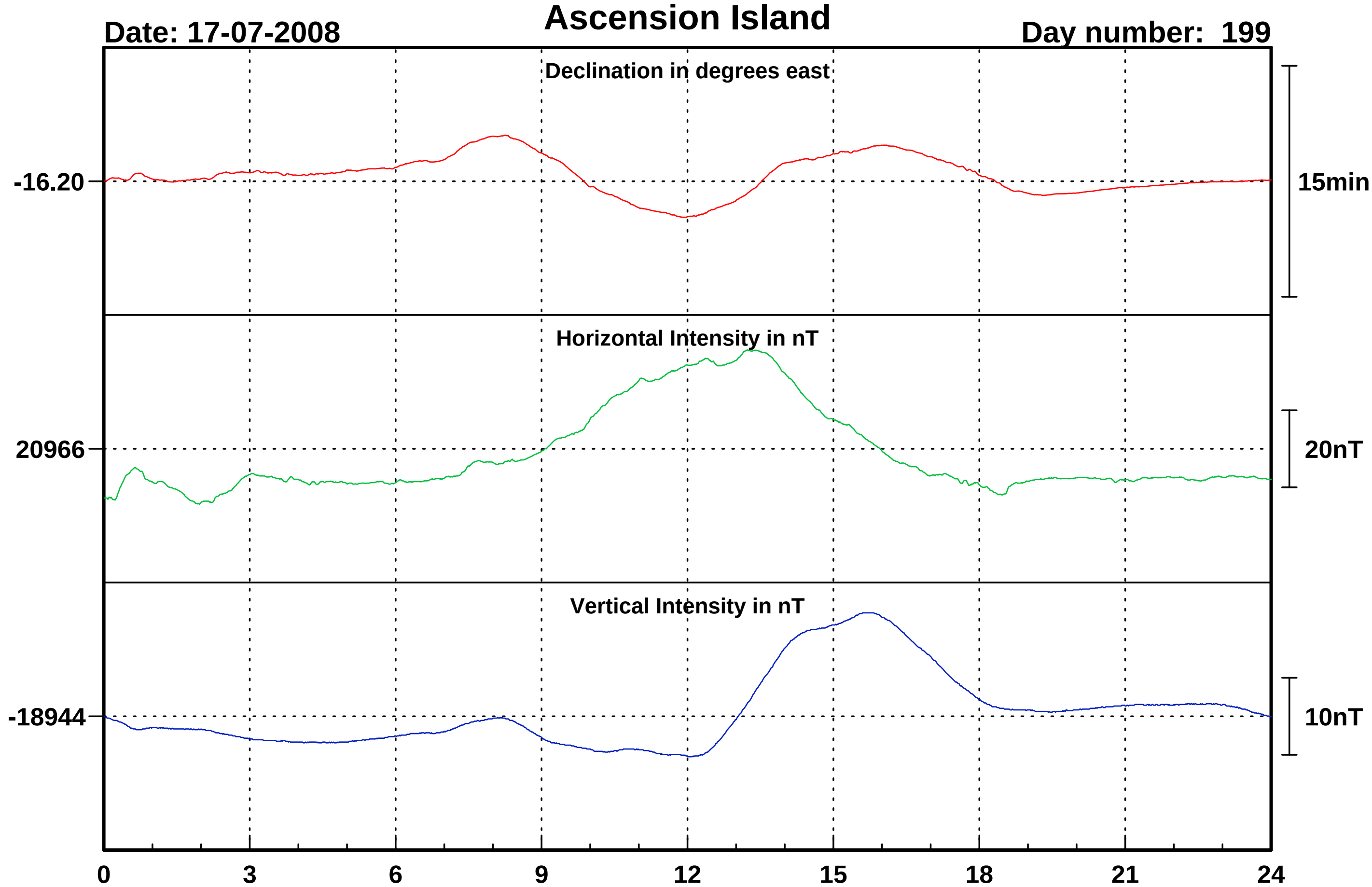
Date: 15-07-2008 Day number: 197

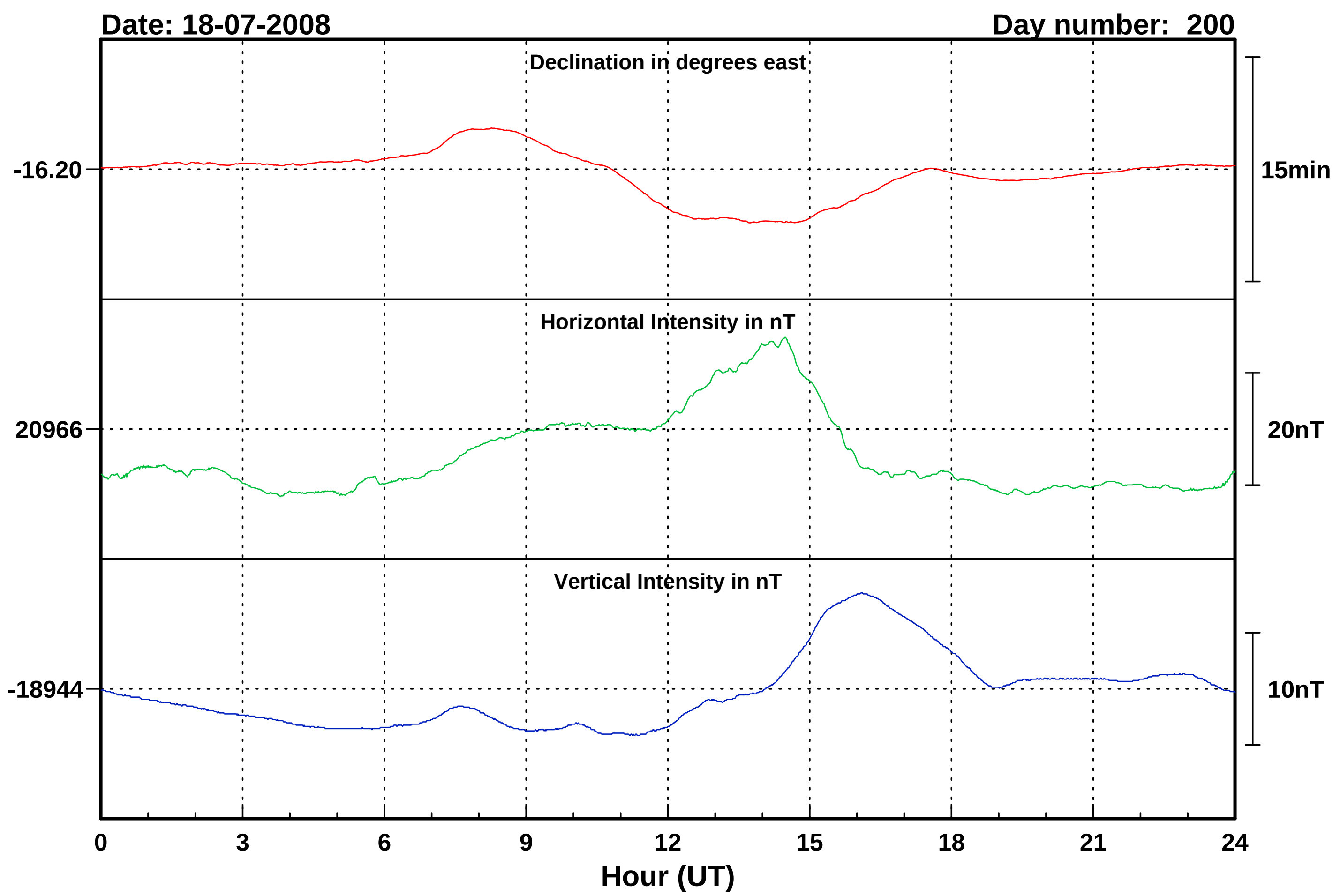


Date: 16-07-2008 Day number: 198

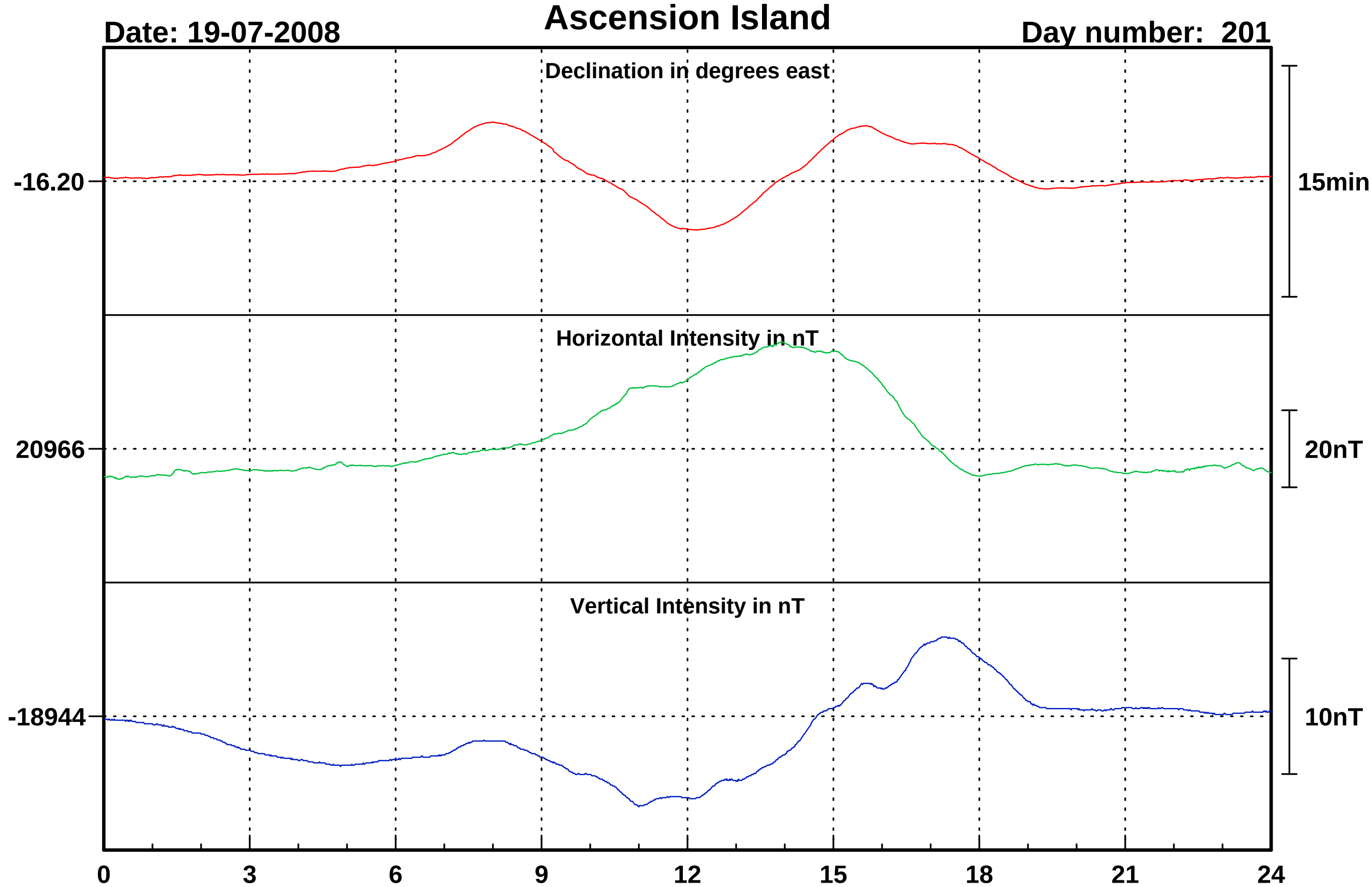


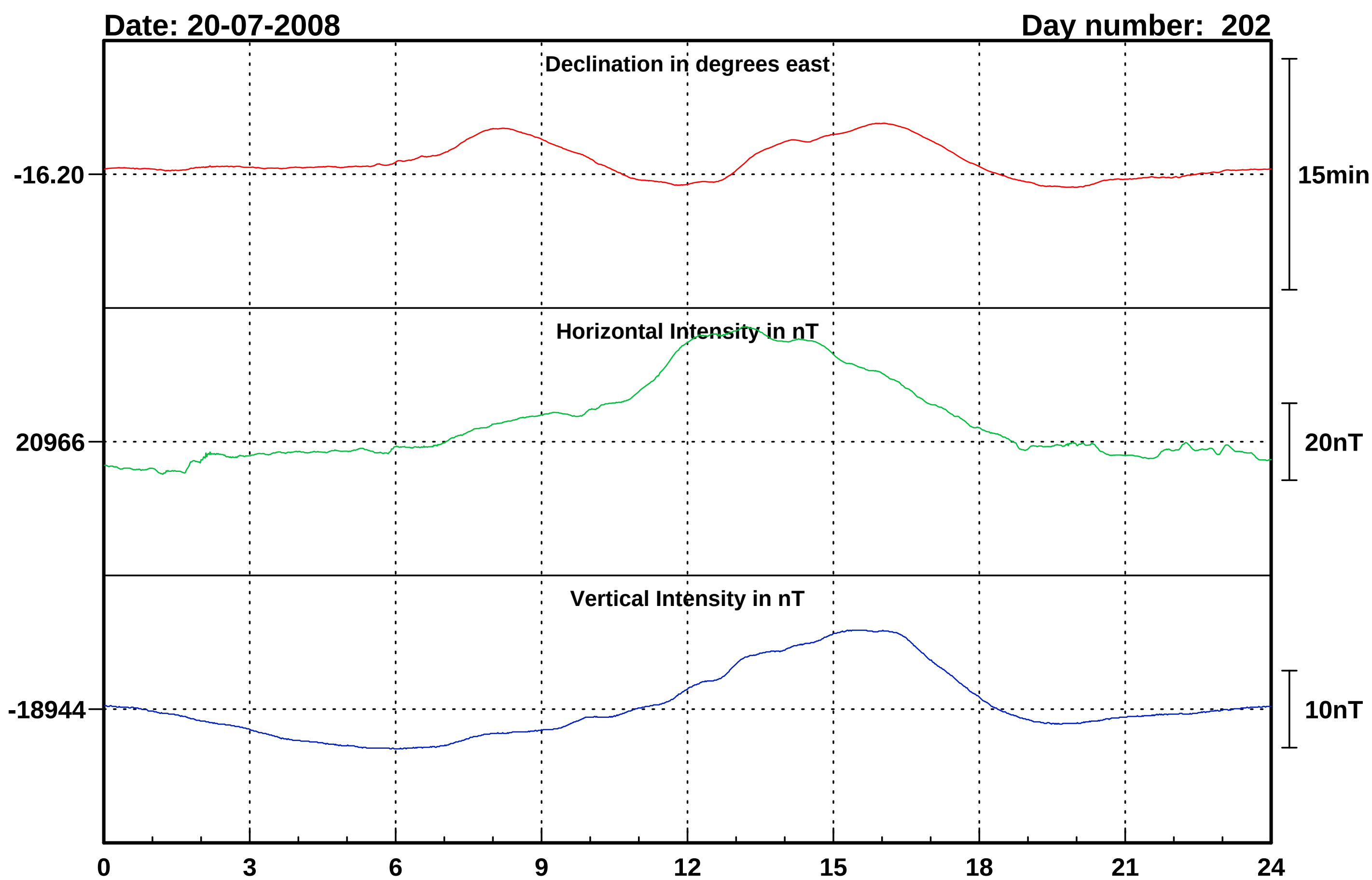
Ascension Island





Ascension Island

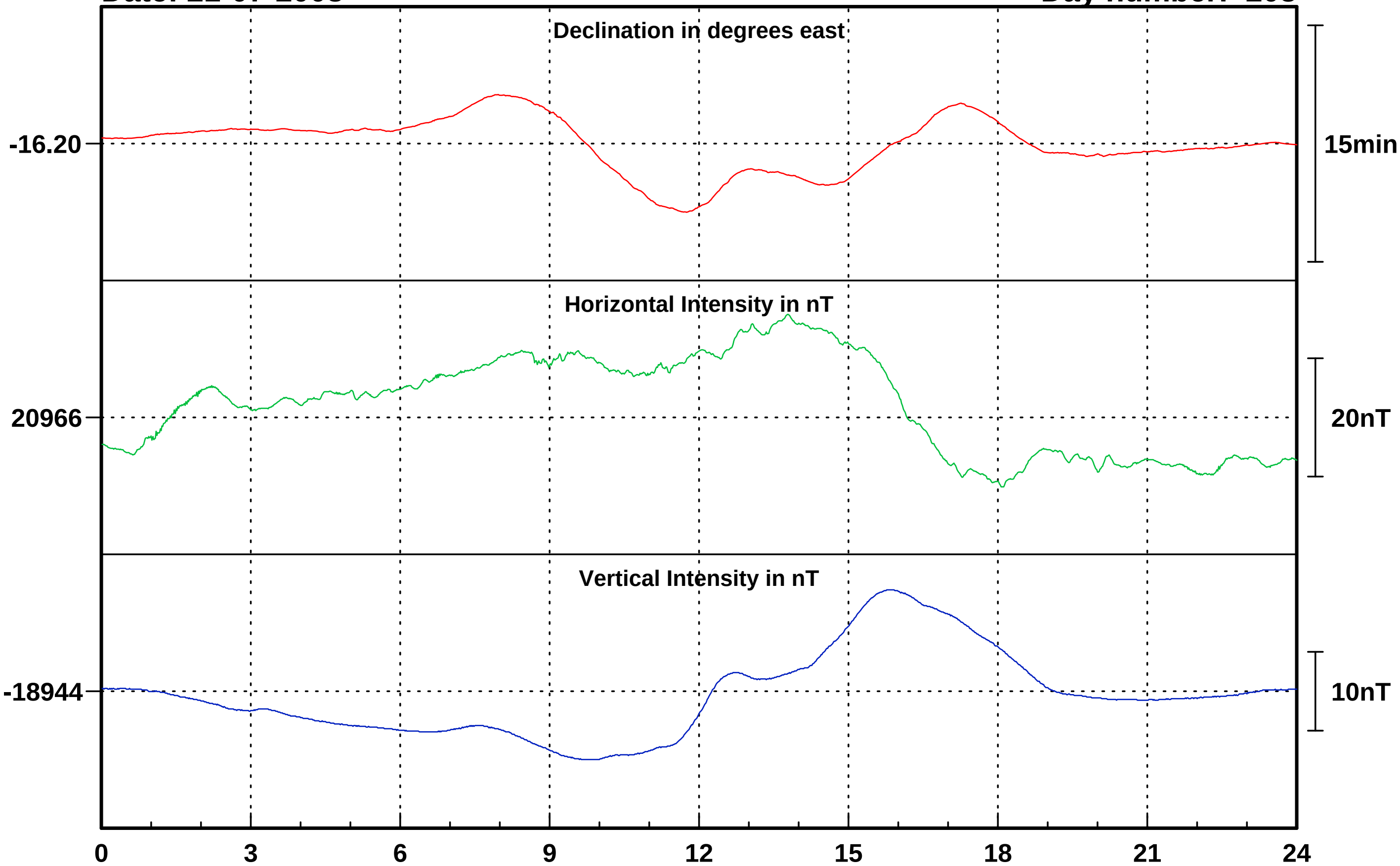




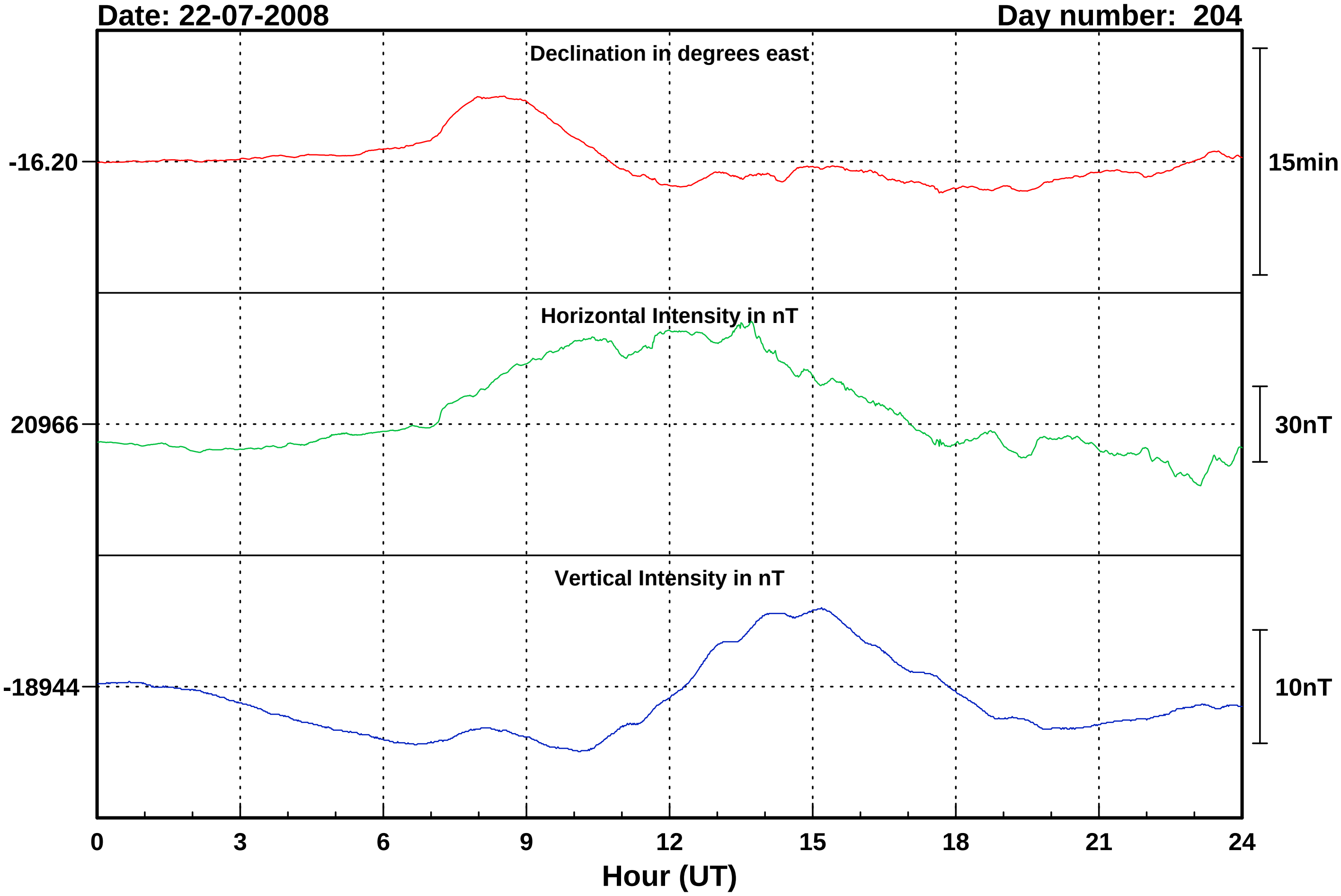
Hour (UT)

Ascension Island

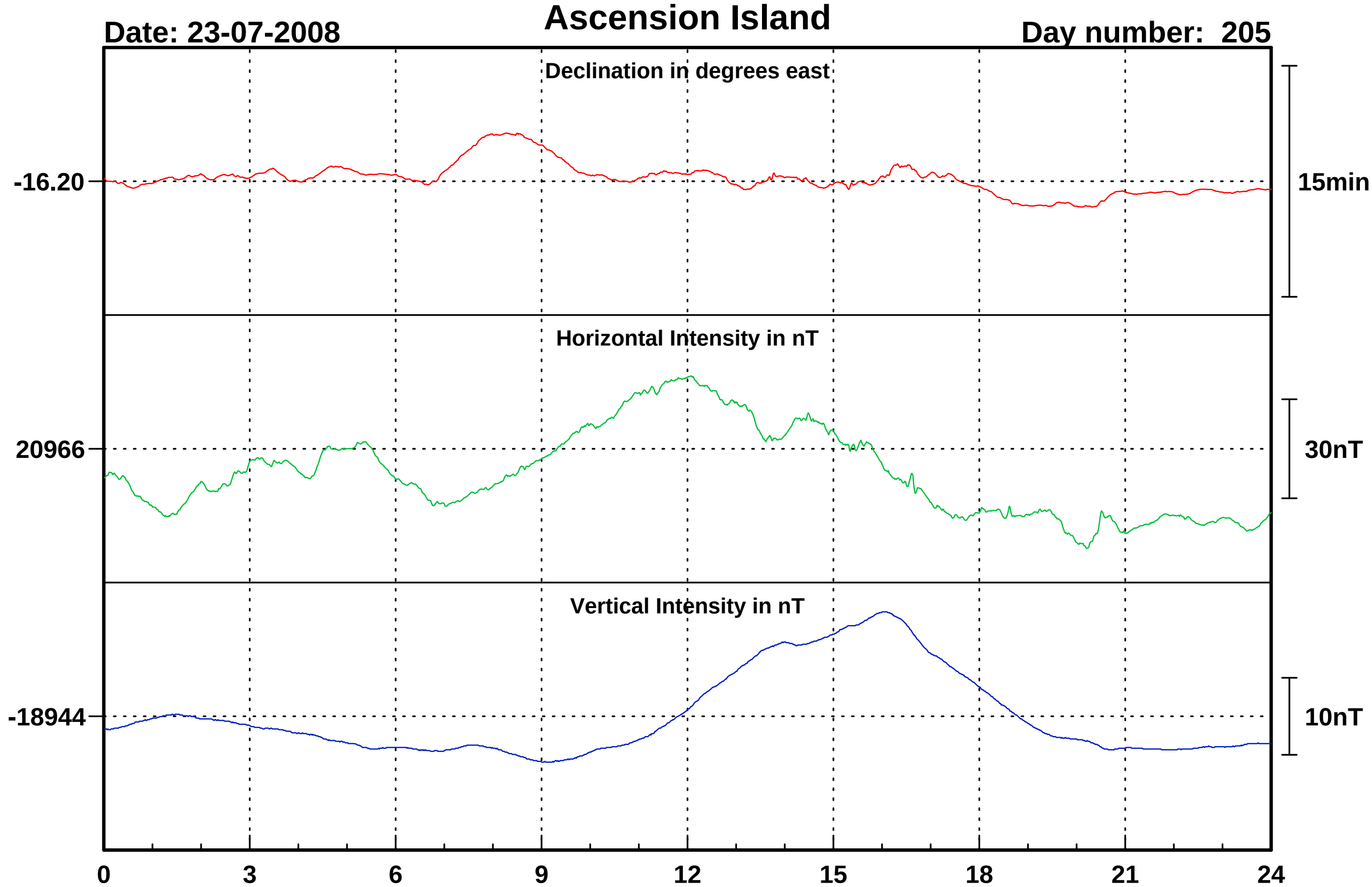
Date: 21-07-2008 Day number: 203

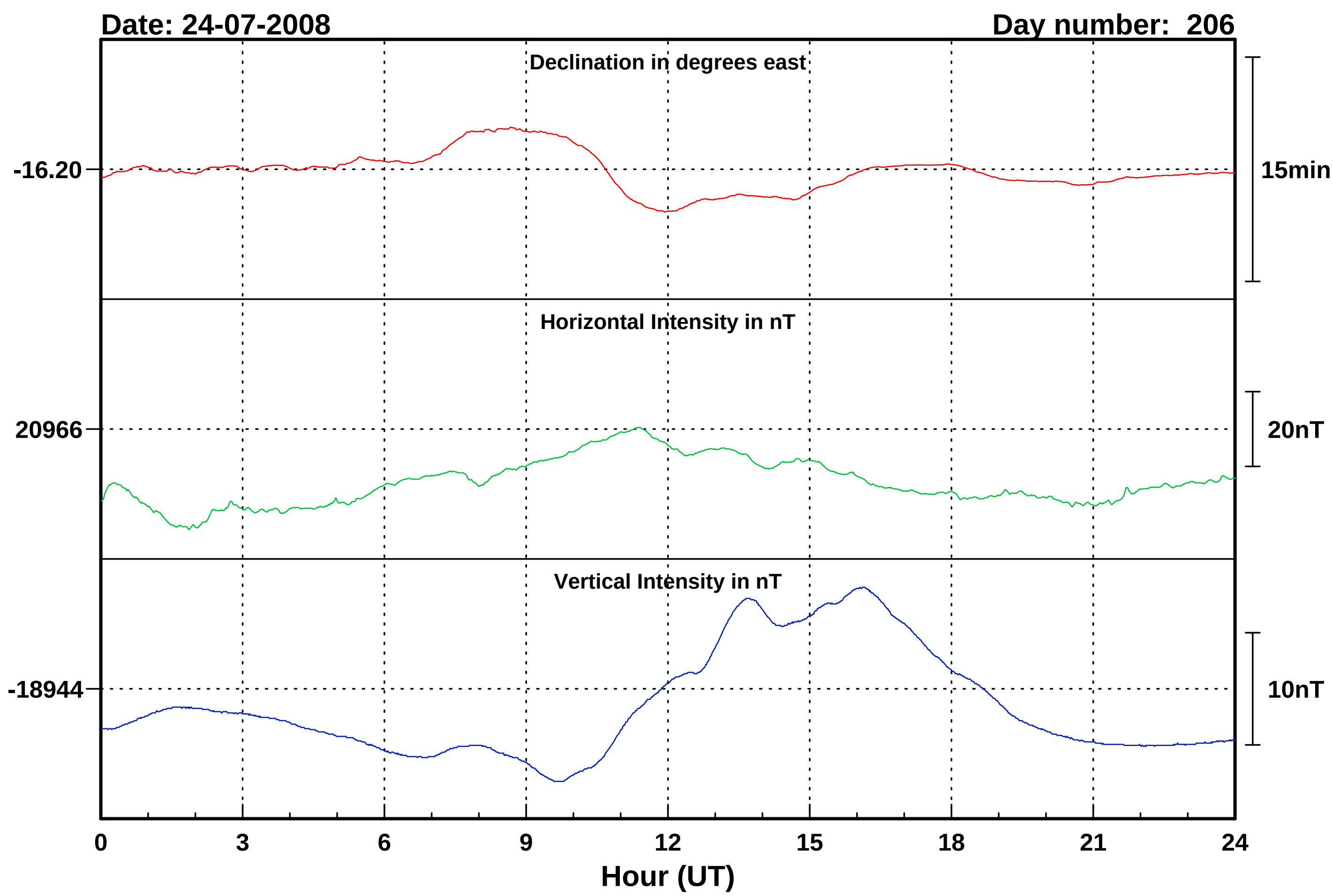


Date: 22-07-2008 Day number: 204

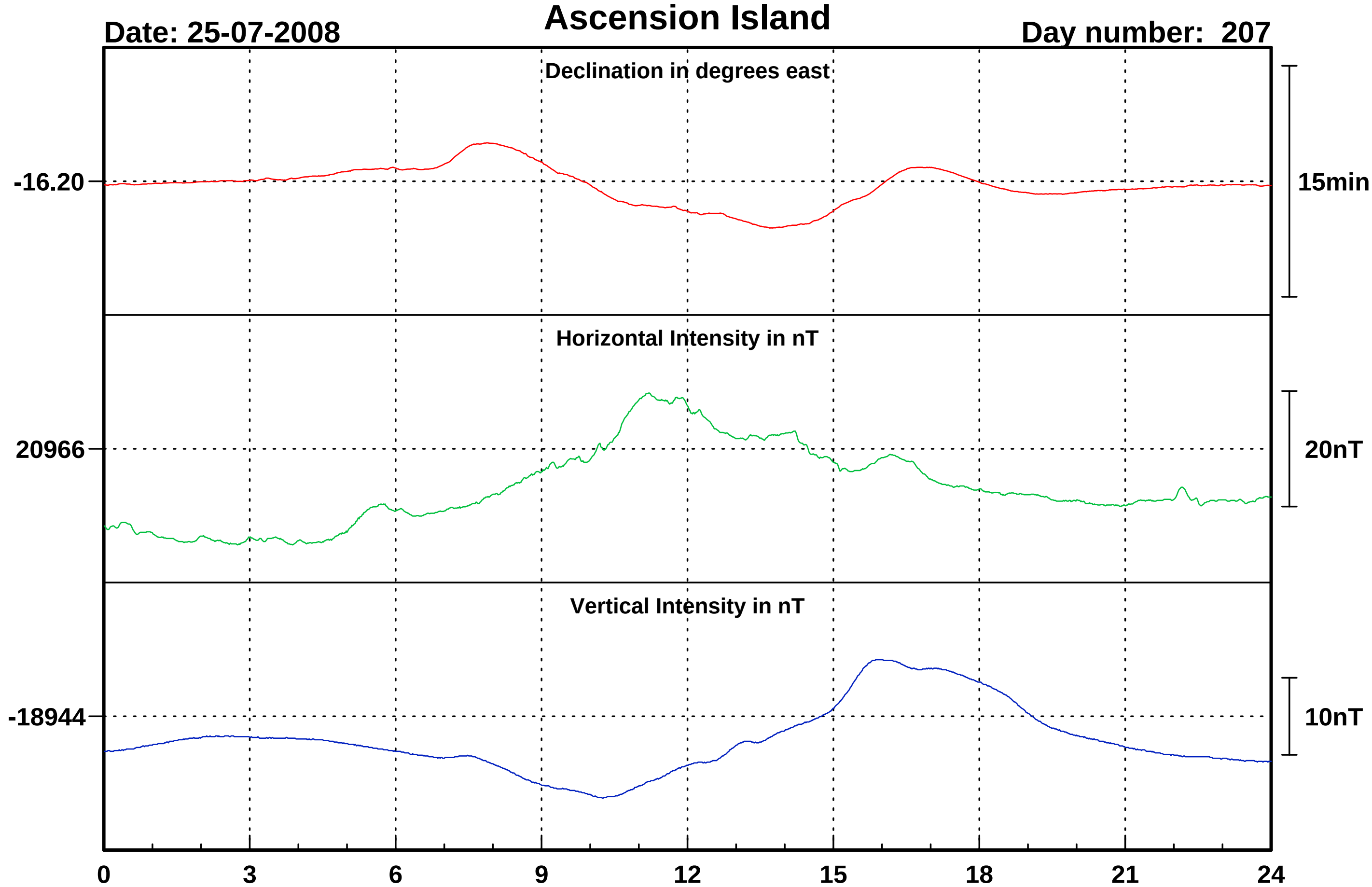


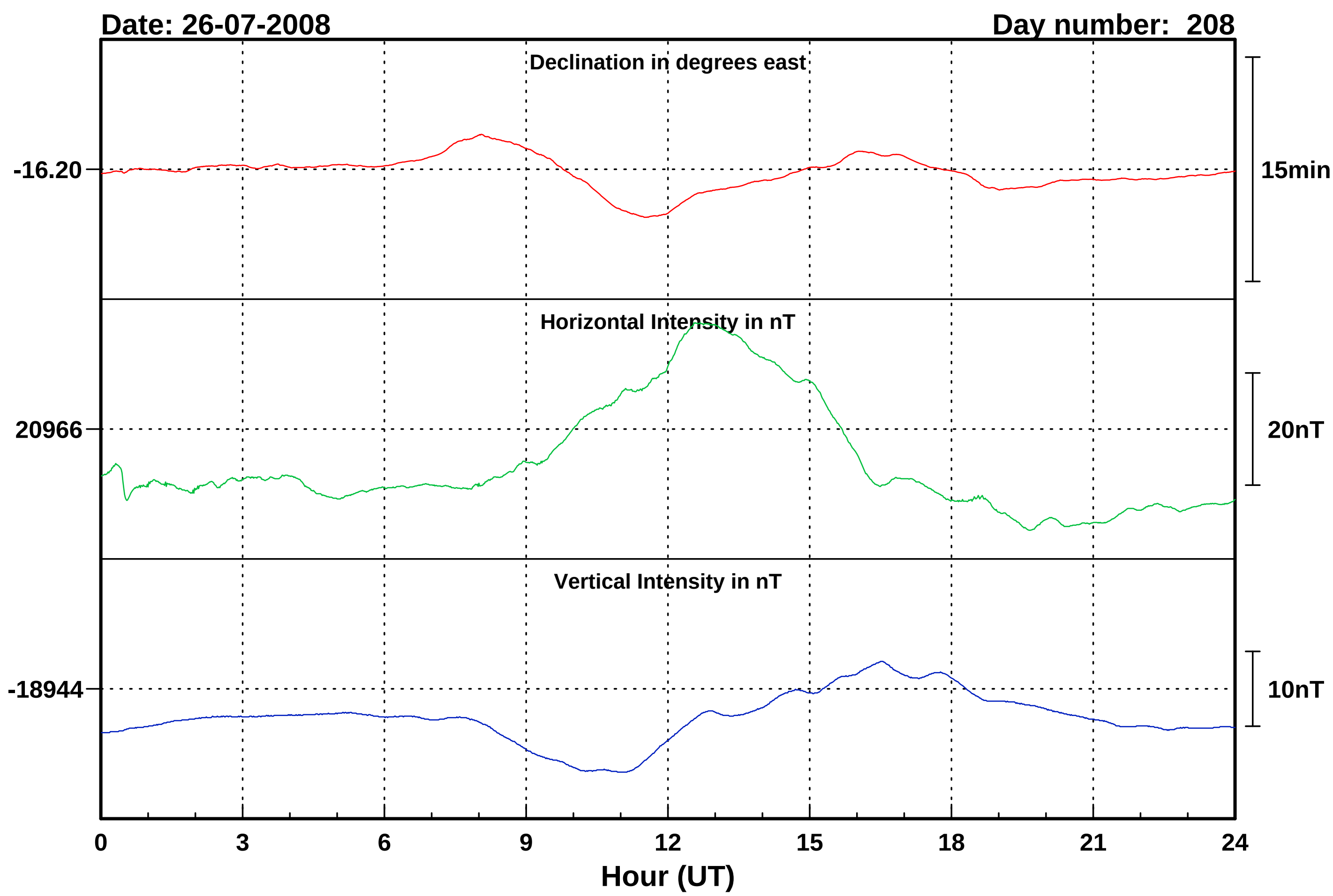
Ascension Island



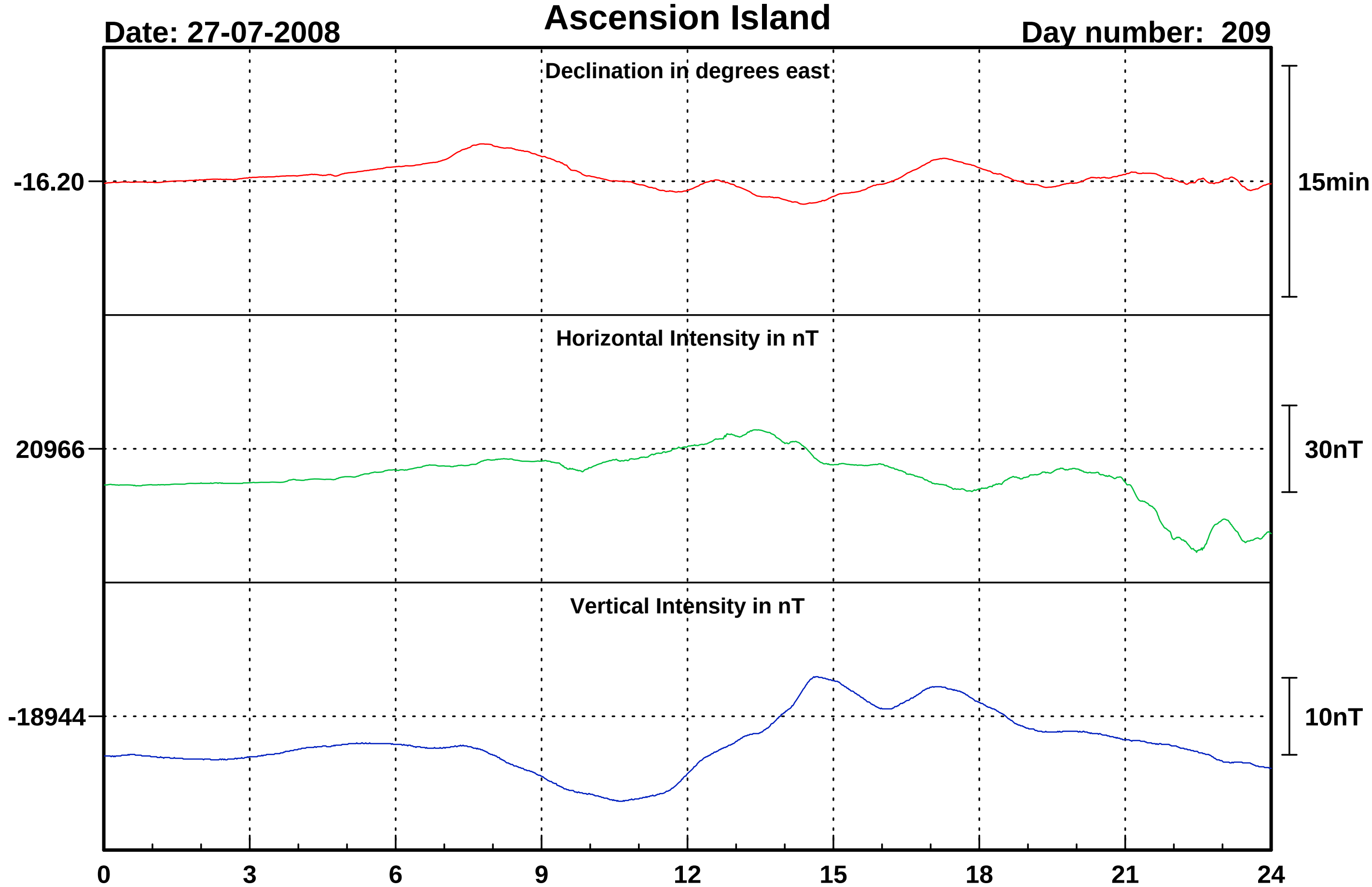


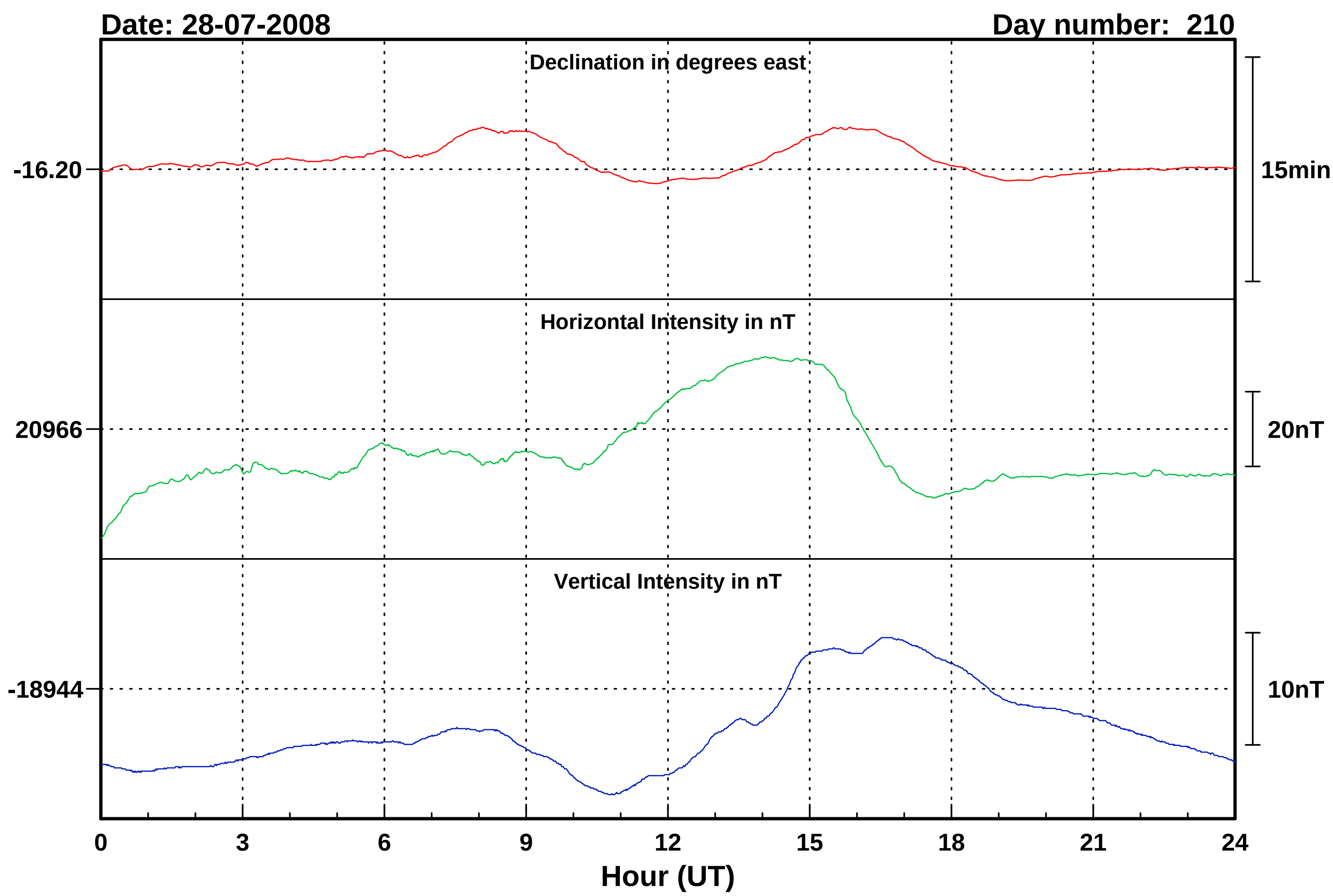
Ascension Island





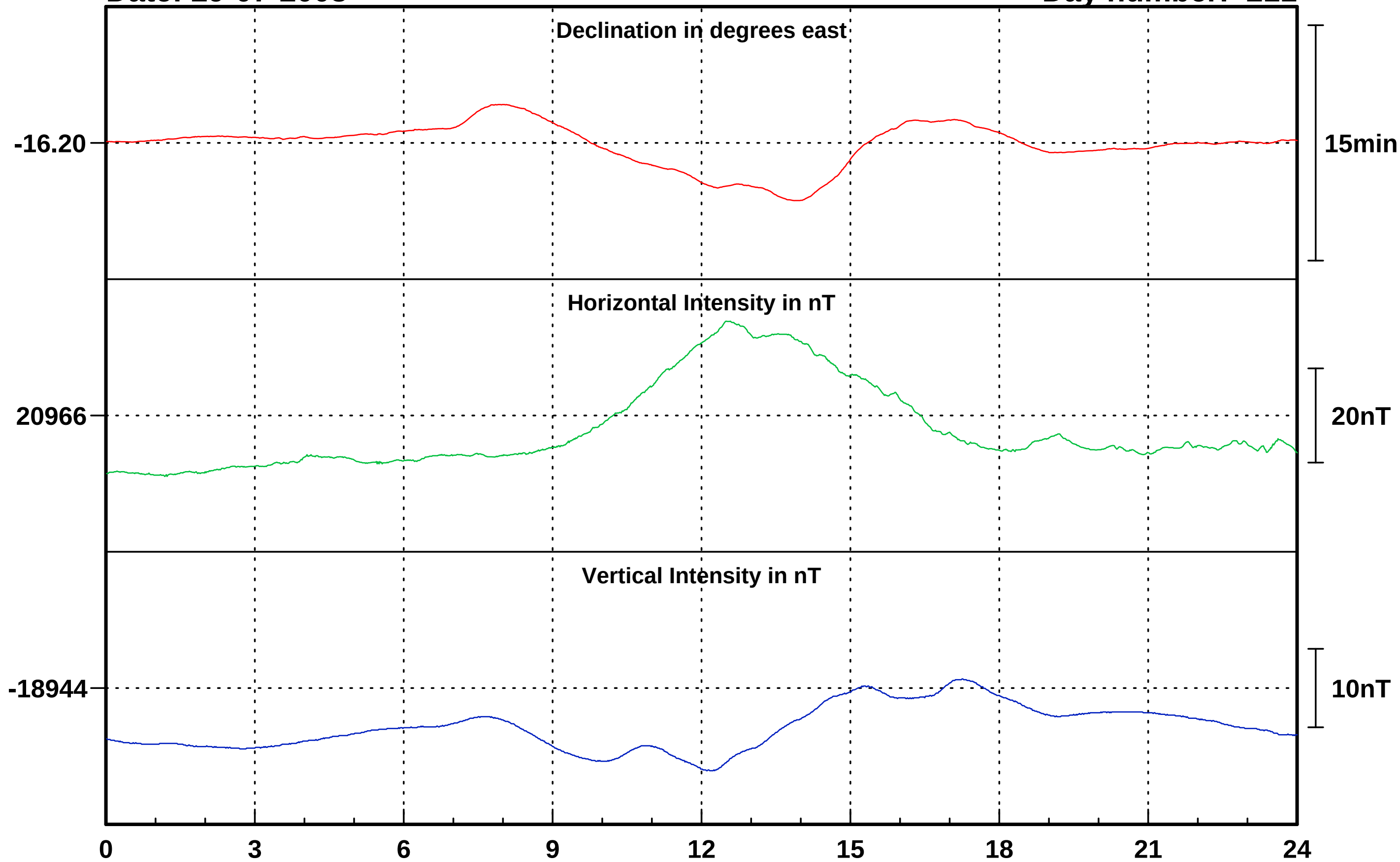
Ascension Island



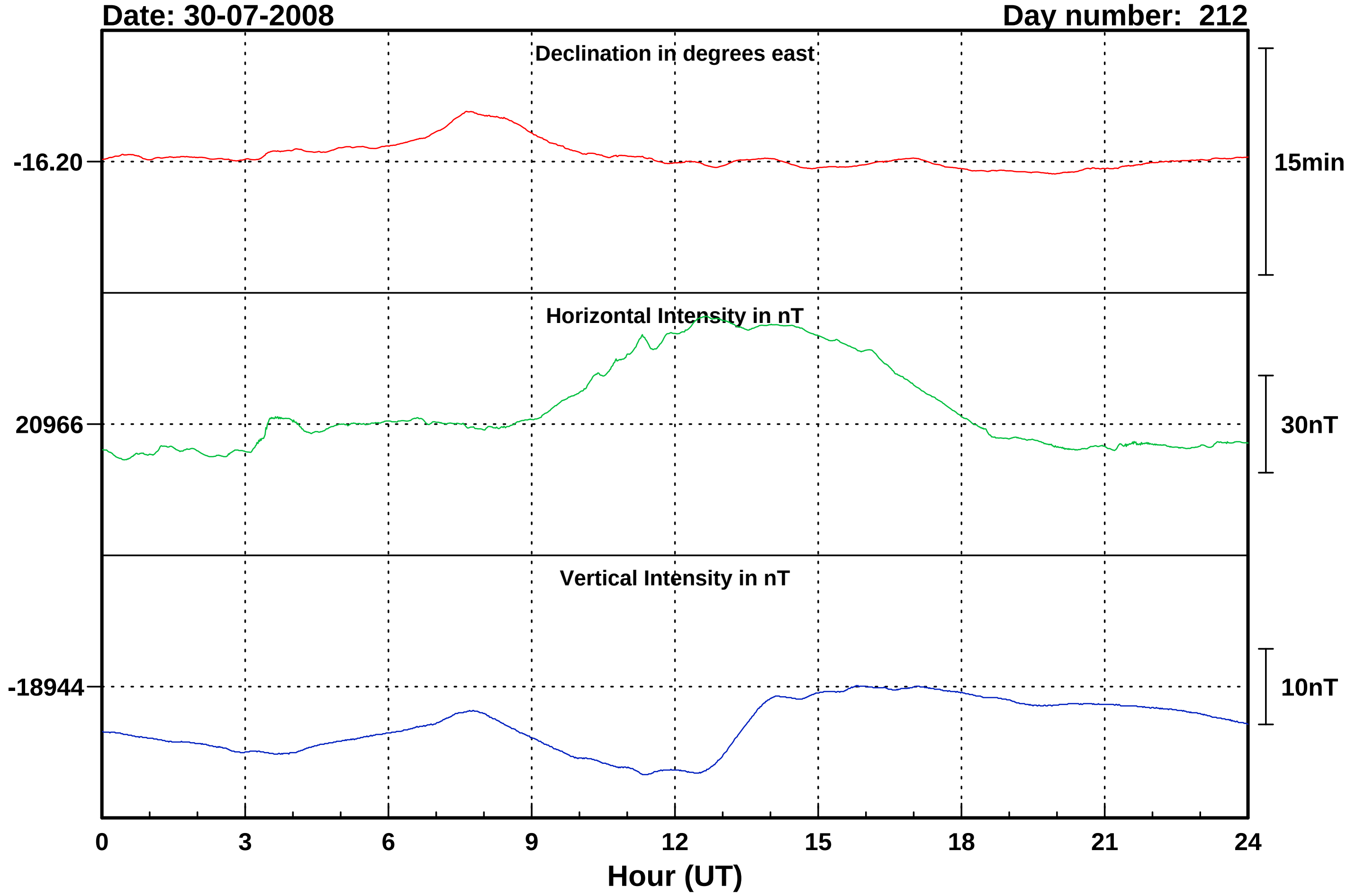


Ascension Island

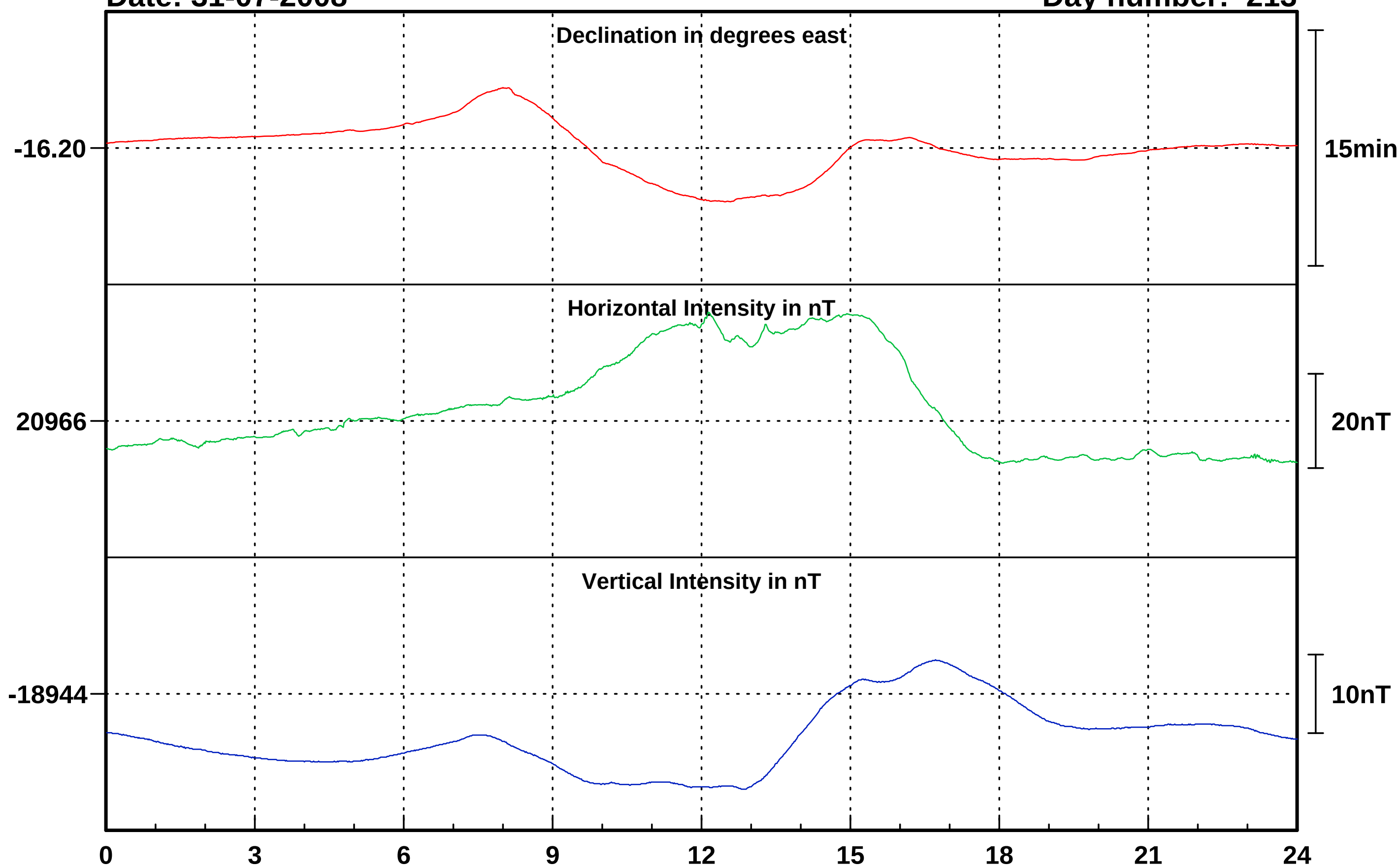
Date: 29-07-2008 Day number: 211



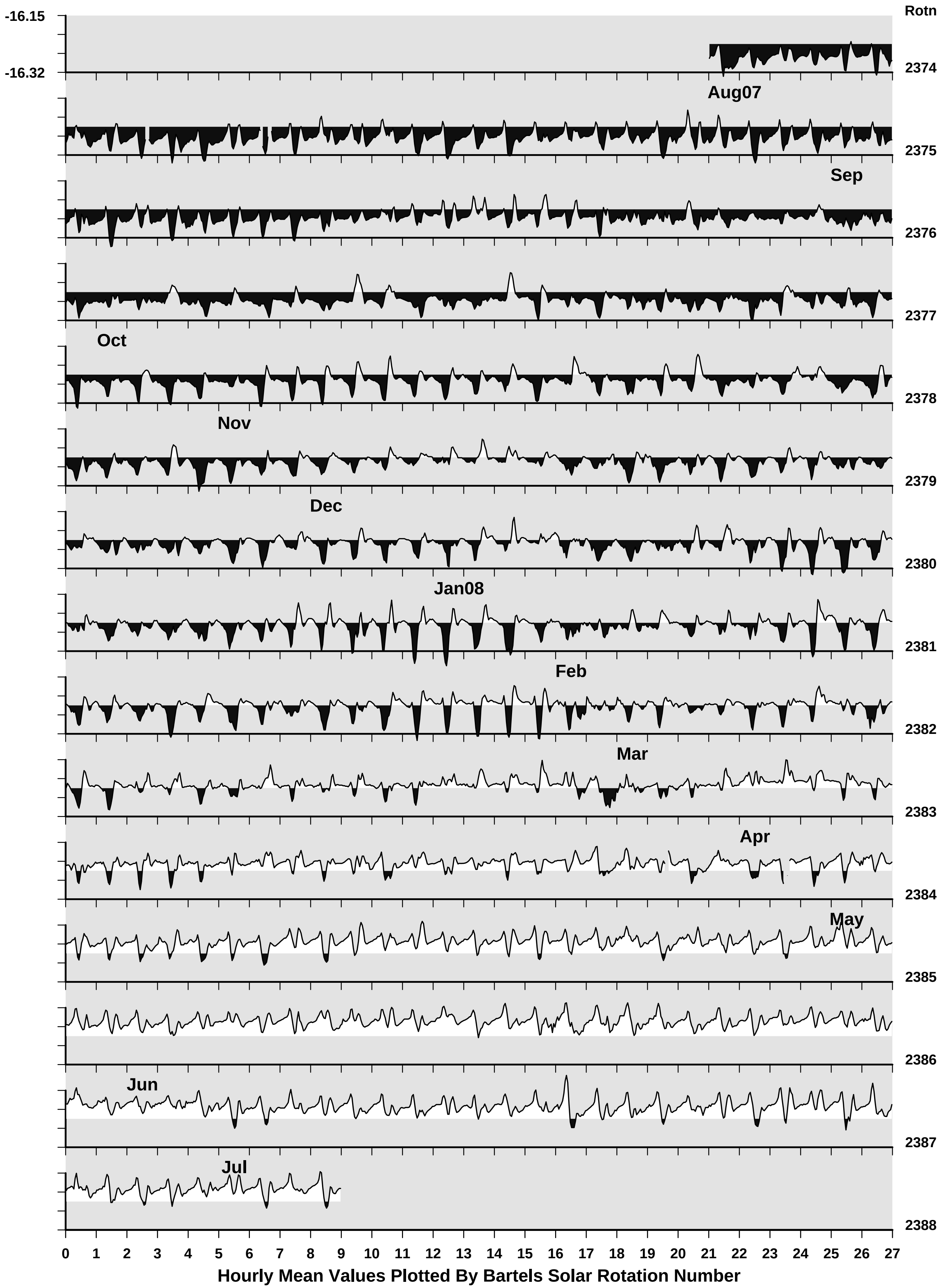
Date: 30-07-2008 Day number: 212



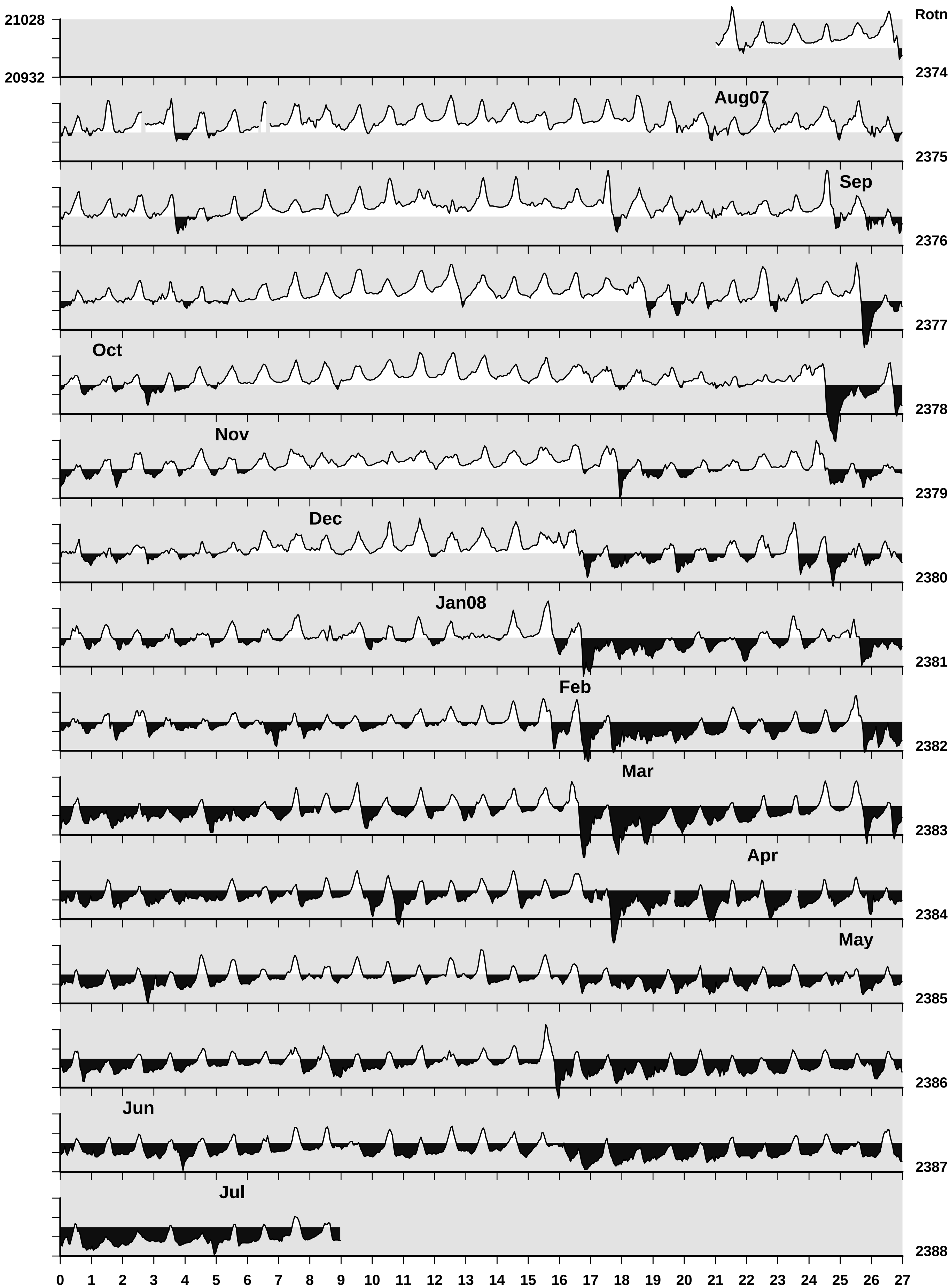
Date: 31-07-2008 **Ascension Island** Day number: 213



Ascension Island Observatory: Declination (degrees)

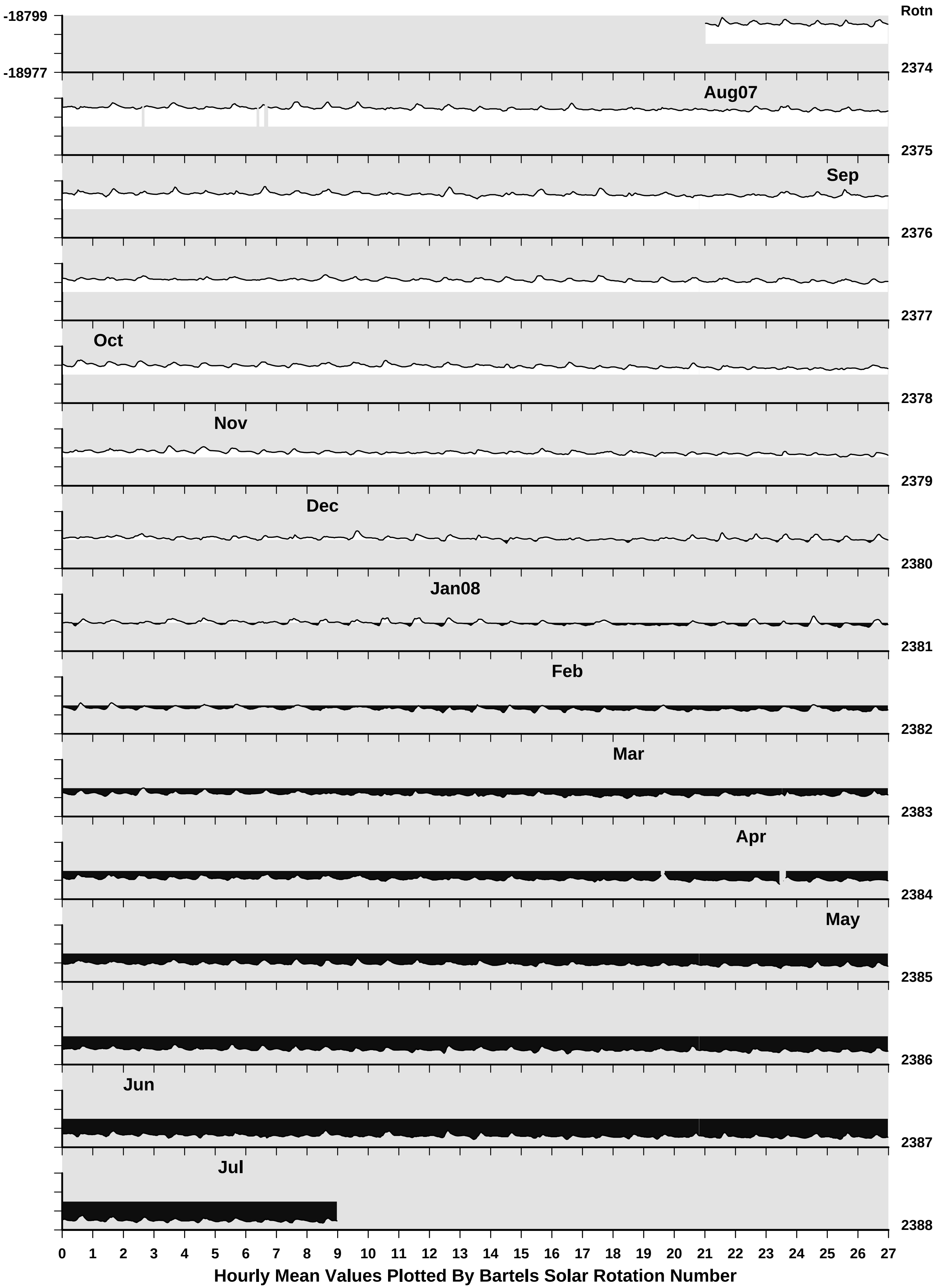


Ascension Island Observatory: Horizontal Intensity (nT)

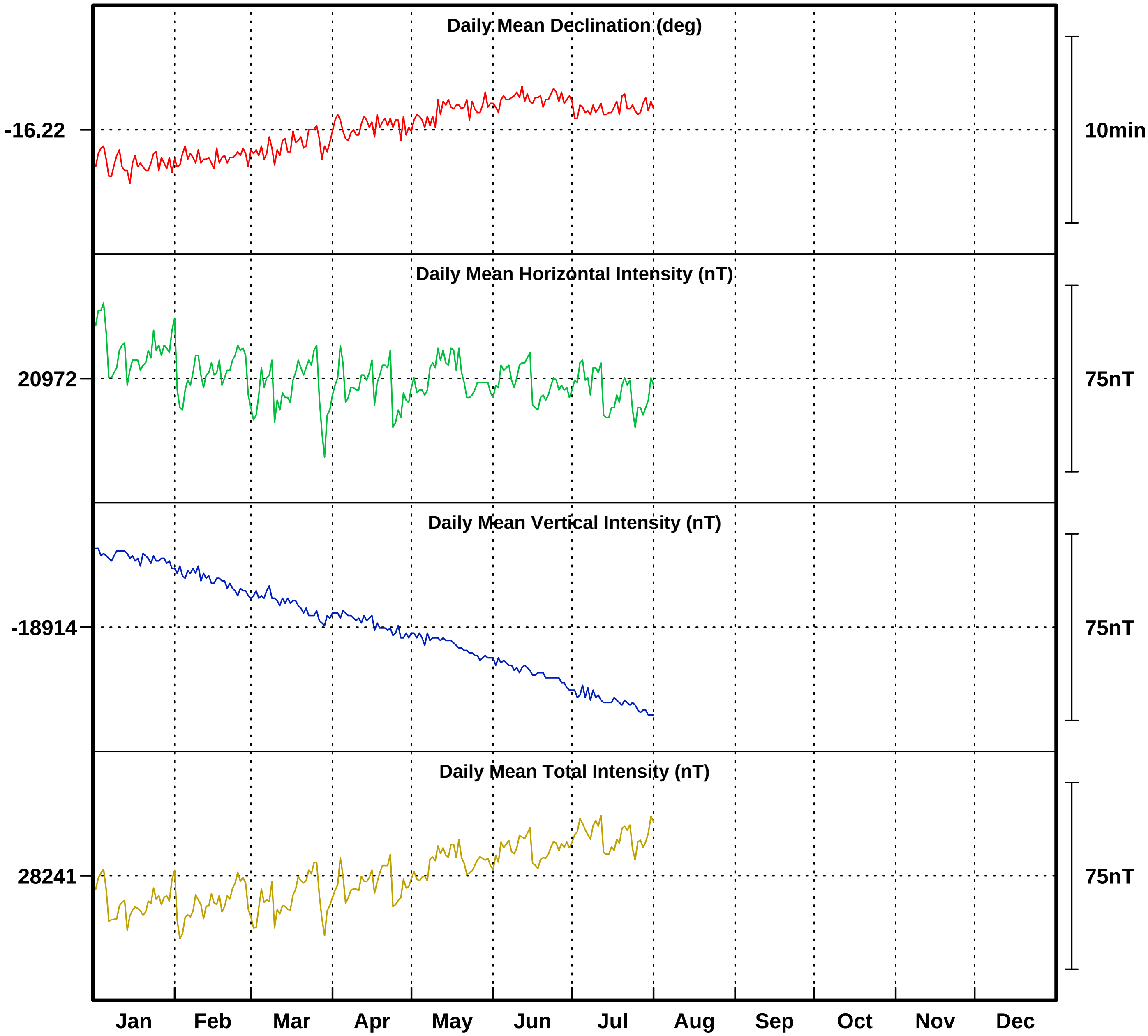


Hourly Mean Values Plotted By Bartels Solar Rotation Number

Ascension Island Observatory: Vertical Intensity (nT)



Ascension Is Observatory 2008



Monthly Mean Values for Ascension Island Observatory 2008

Month	*D*	*H*	*I*	*X*	*Y*	*Z*	*F*
January	-16° 15.1´	20983 nT	-41° 59.3´	20145 nT	-5872 nT	-18886 nT	28231 nT
February	-16° 14.8´	20973 nT	-42° 0.9´	20136 nT	-5868 nT	-18895 nT	28230 nT
March	-16° 14.1´	20967 nT	-42° 2.3´	20131 nT	-5862 nT	-18905 nT	28232 nT
April	-16° 13.1´	20969 nT	-42° 2.9´	20134 nT	-5857 nT	-18912 nT	28238 nT
May	-16° 12.3´	20972 nT	-42° 3.4´	20139 nT	-5853 nT	-18921 nT	28246 nT
June	-16° 11.6´	20970 nT	-42° 4.6´	20138 nT	-5848 nT	-18932 nT	28252 nT
July	-16° 12.2´	20966 nT	-42° 5.9´	20134 nT	-5850 nT	-18944 nT	28257 nT

Note

i. The values shown here are provisional.