

**BRITISH GEOLOGICAL SURVEY**

**Sable Island  
Observatory  
Monthly  
Magnetic  
Bulletin**

**October 2006**

**06/10/SB**



**British  
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

# SABLE ISLAND OBSERVATORY MAGNETIC DATA

## 1.1 Introduction

Sable Island is the third overseas geomagnetic observatory to be established by BGS. The installation, funded by a joint venture between BGS, Sperry Drilling Services and Sable Offshore Energy, was completed in May 1999 and the observatory became operational from 8<sup>th</sup> May 1999.

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:

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British Geological Survey  
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Edinburgh EH9 3LA  
Scotland, UK

Tel: +44 (0) 131 667 1000  
Fax: +44 (0) 131 668 4368  
E-mail: orba@bgs.ac.uk  
Internet: [www.geomag.bgs.ac.uk](http://www.geomag.bgs.ac.uk)

## 1.2 Position

The Island is a sandbank formed by the meeting of currents from the St. Lawrence Delta and the Gulf Stream and is located approximately 290km southeast of Halifax, Nova Scotia.

The observatory co-ordinates are:-

Geographic:  $43^{\circ} 55.9'N$   $299^{\circ}0.4'E$   
Geomagnetic:  $53^{\circ} 02.4'N$   $13^{\circ}07.7'E$   
Height above mean sea level:  $5m$  (approx)

The geomagnetic co-ordinates are calculated using the 10<sup>th</sup> generation International Geomagnetic Reference Field (IGRF) at epoch 2006.5

## 1.3 The Observatory Operation

### 1.3.1 GDAS

The observatory operates under the control of the Geomagnetic Data Acquisition System (GDAS), which was developed by BGS staff, installed in April 2004 and became fully operational from 13<sup>th</sup> May 2004. 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.

## 1.4 Data Presentation

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

### 1.4.1 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.

### 1.4.2 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.

### 1.4.3 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.

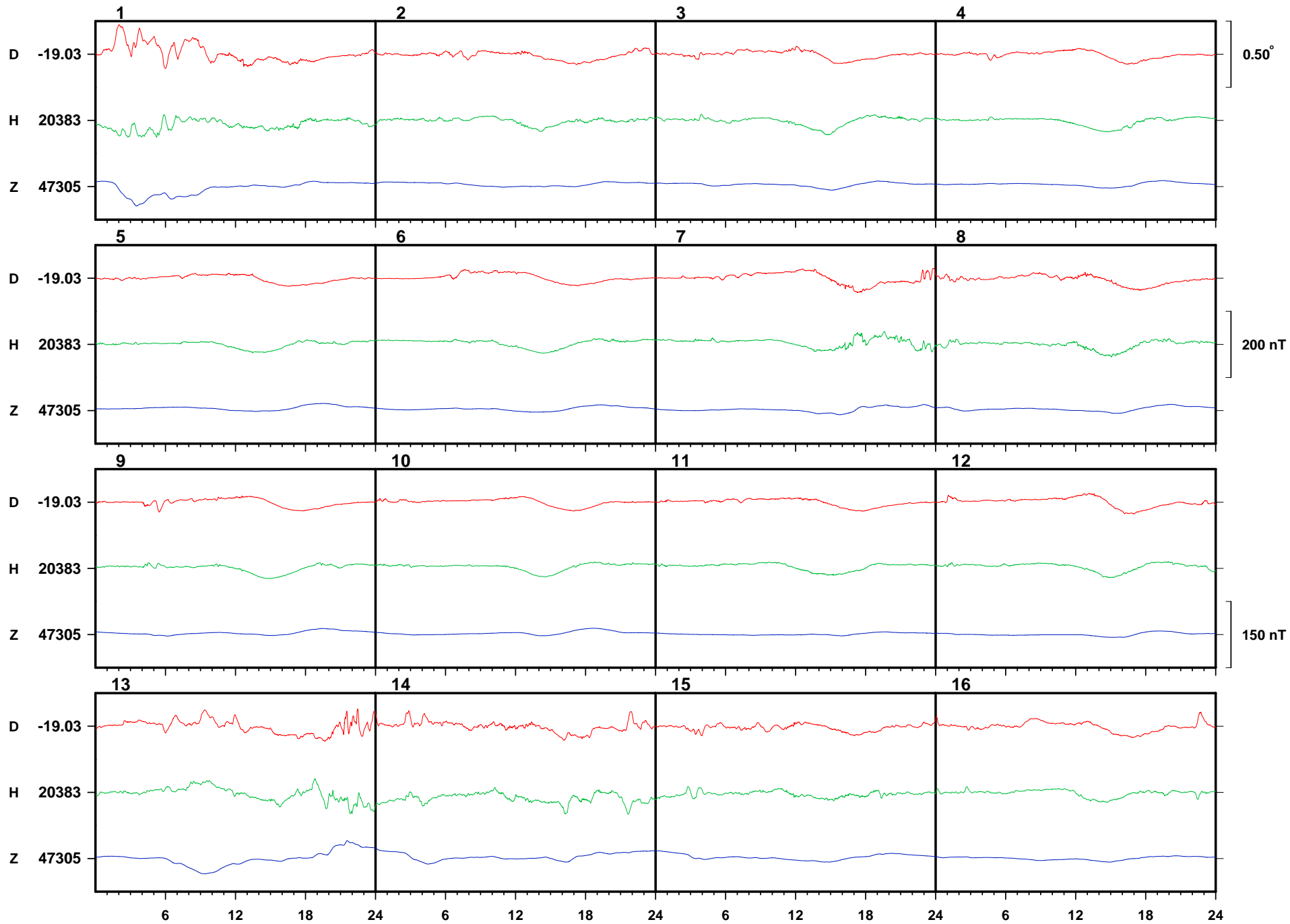
### 1.4.4 Daily and Monthly Mean Values

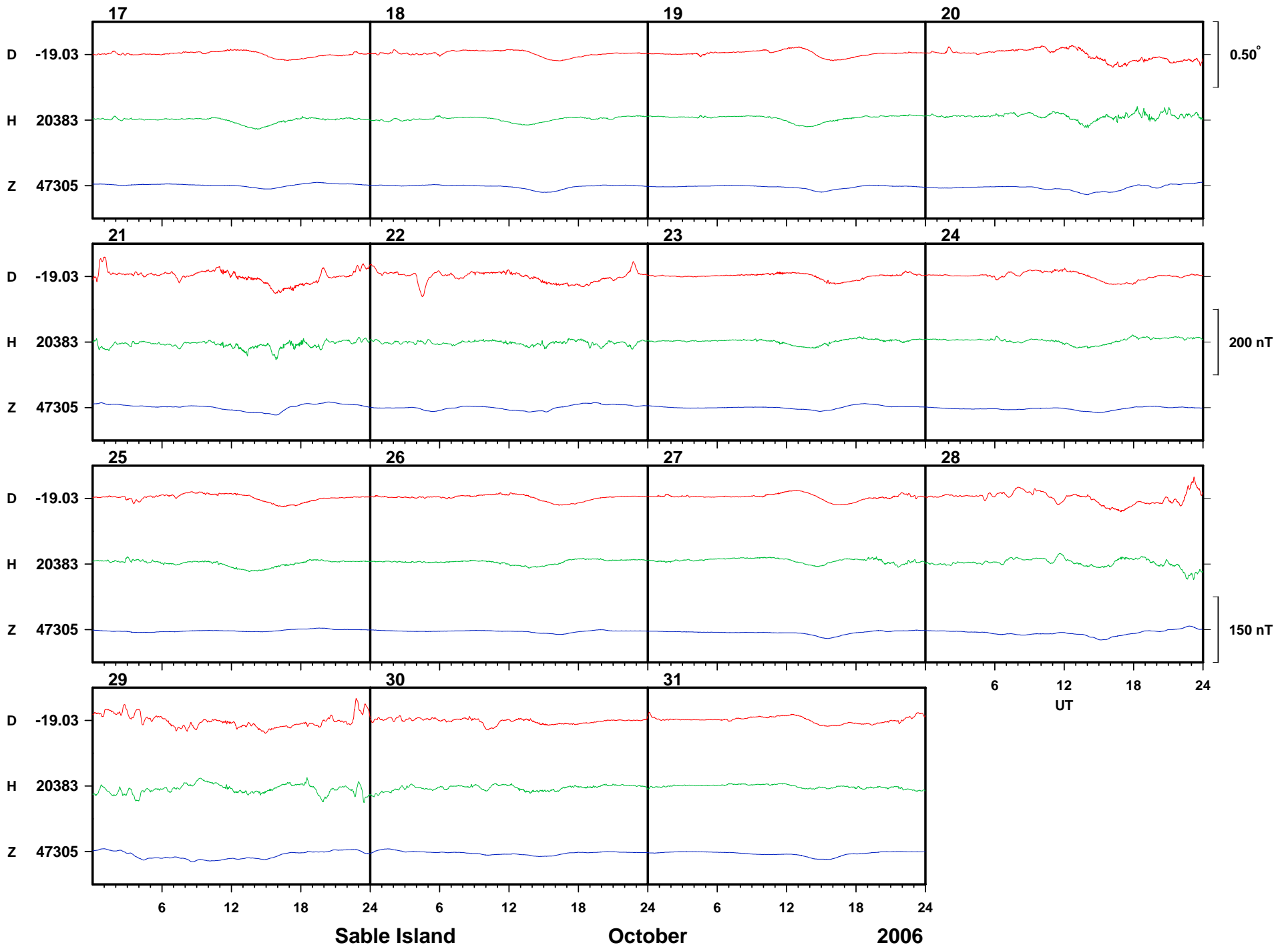
Daily mean values of  $D$ ,  $H$ ,  $Z$  and  $F$  are plotted throughout the year. In addition, a table of monthly mean values of all the geomagnetic elements is provided. These values depend on accurate specification of the fluxgate sensor baselines. It is anticipated that provisional values will not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

Sable Island

October

2006





Sable Island

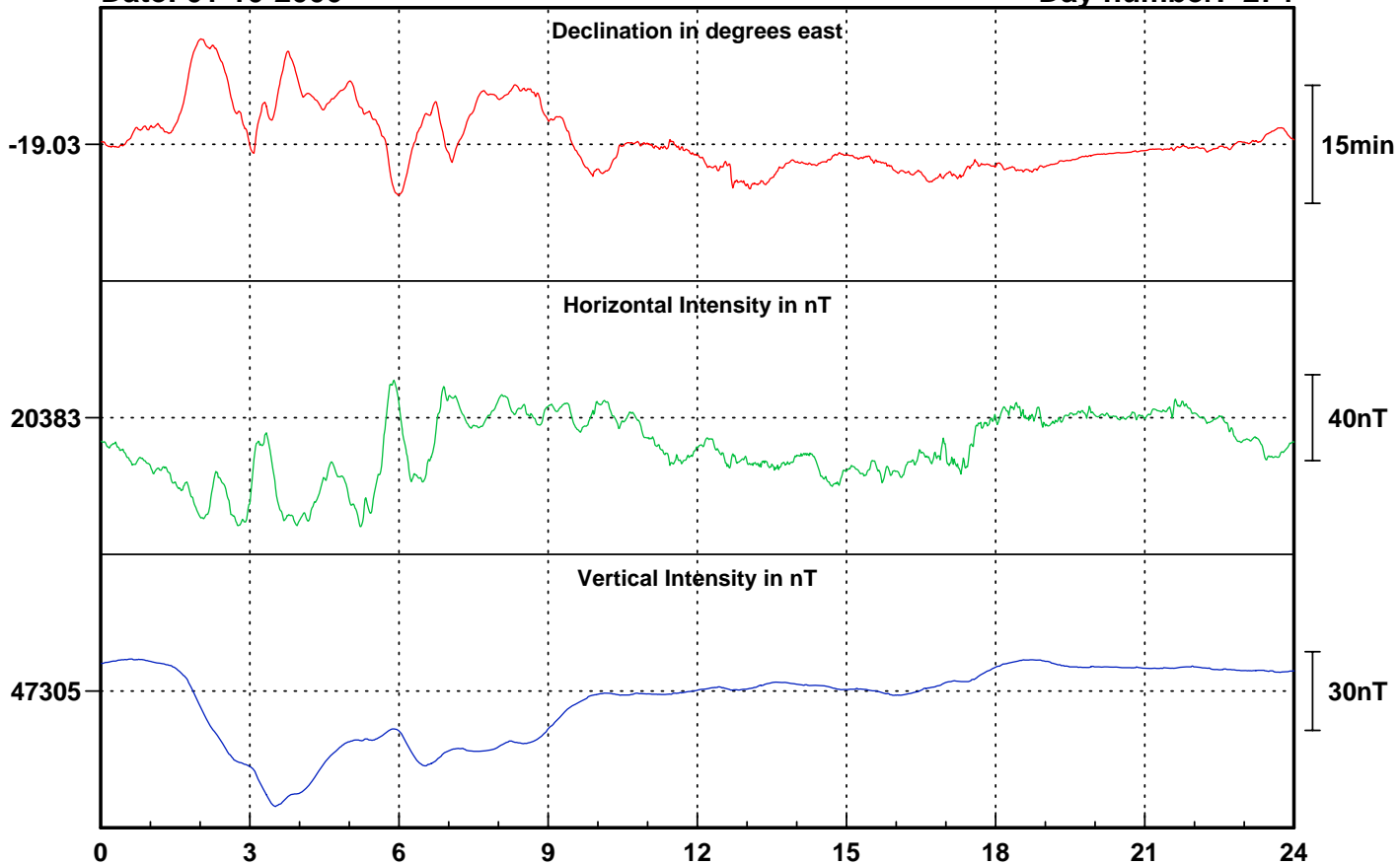
October

2006

Date: 01-10-2006

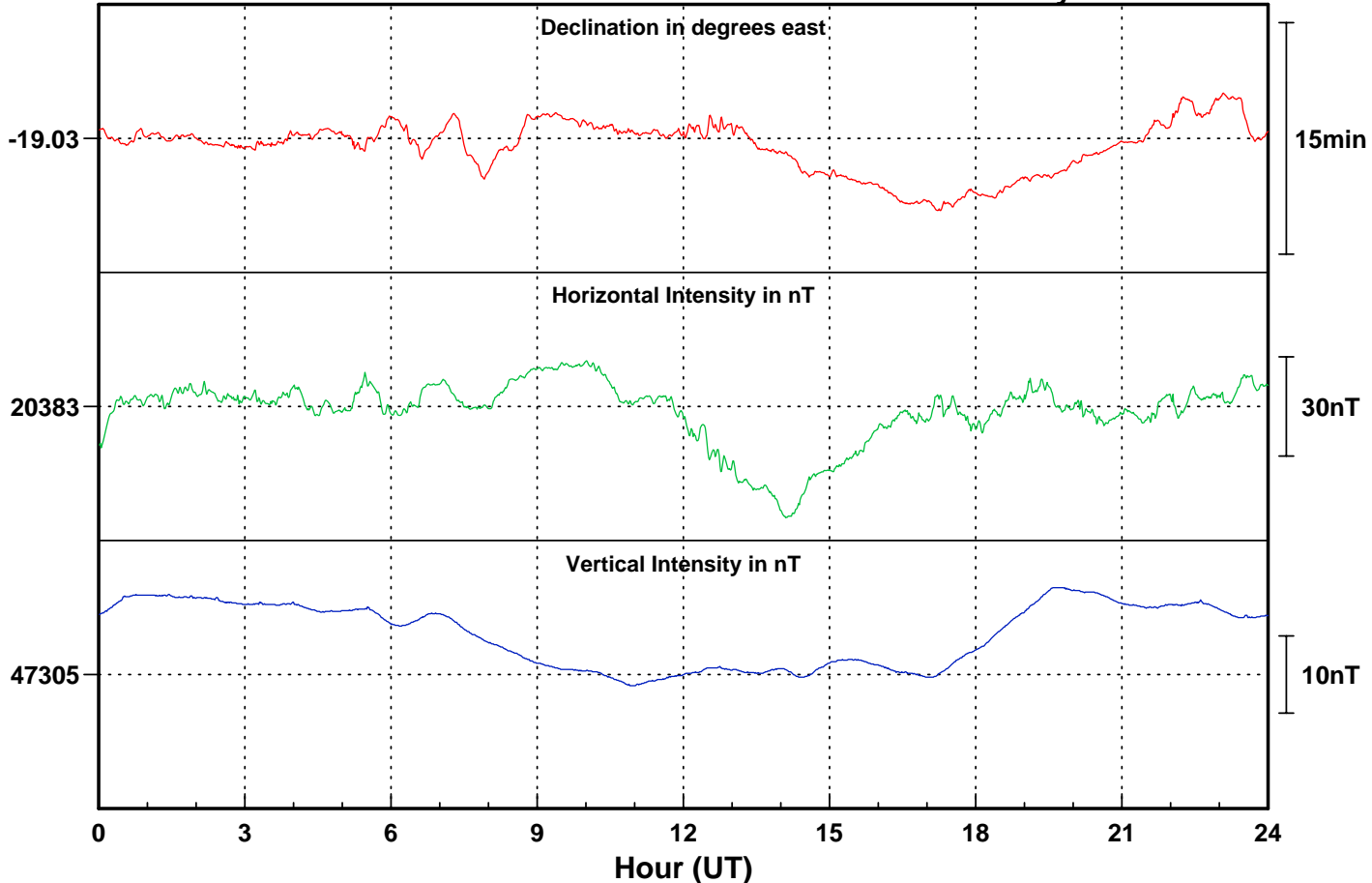
# Sable Island

Day number: 274



Date: 02-10-2006

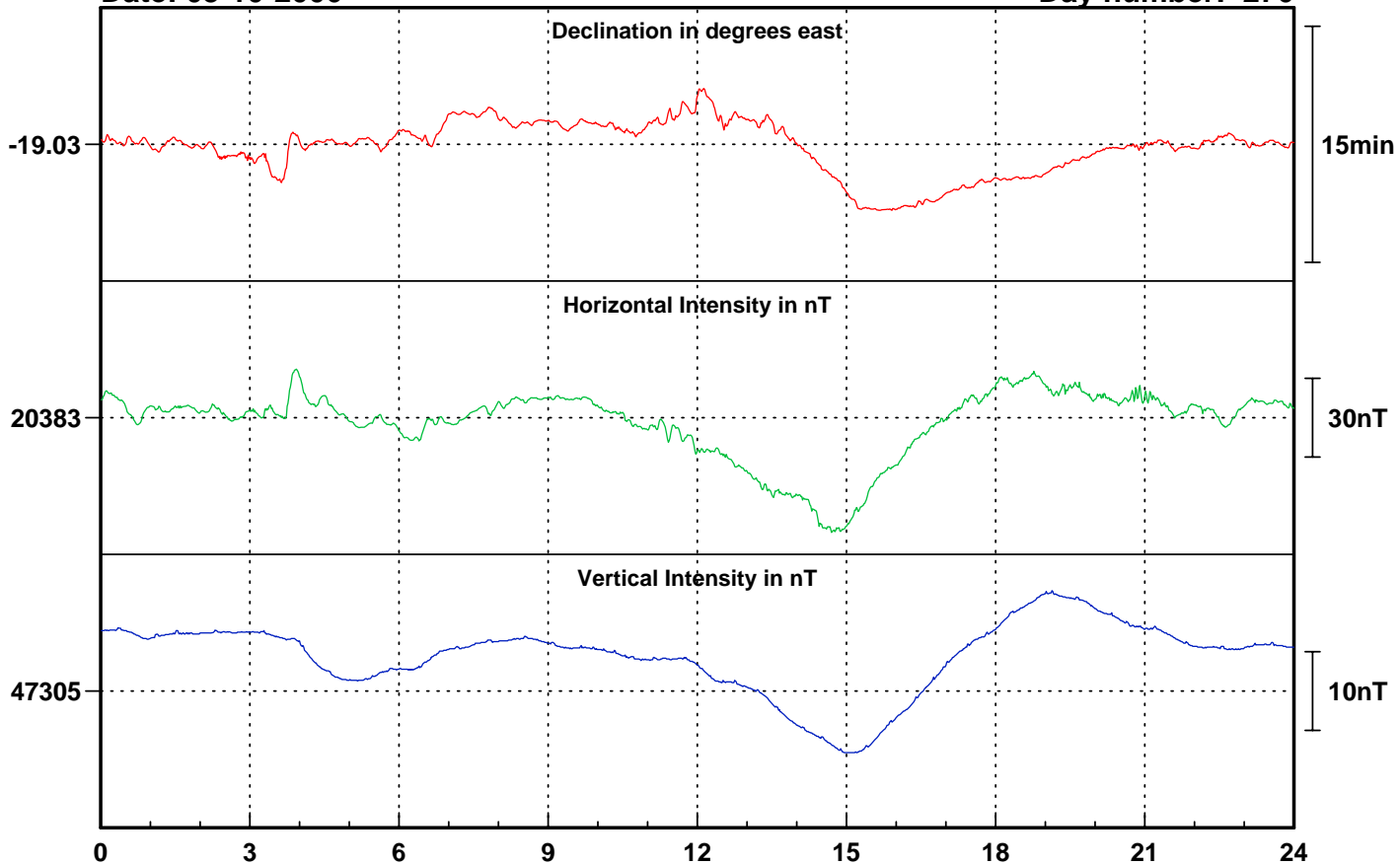
Day number: 275



Date: 03-10-2006

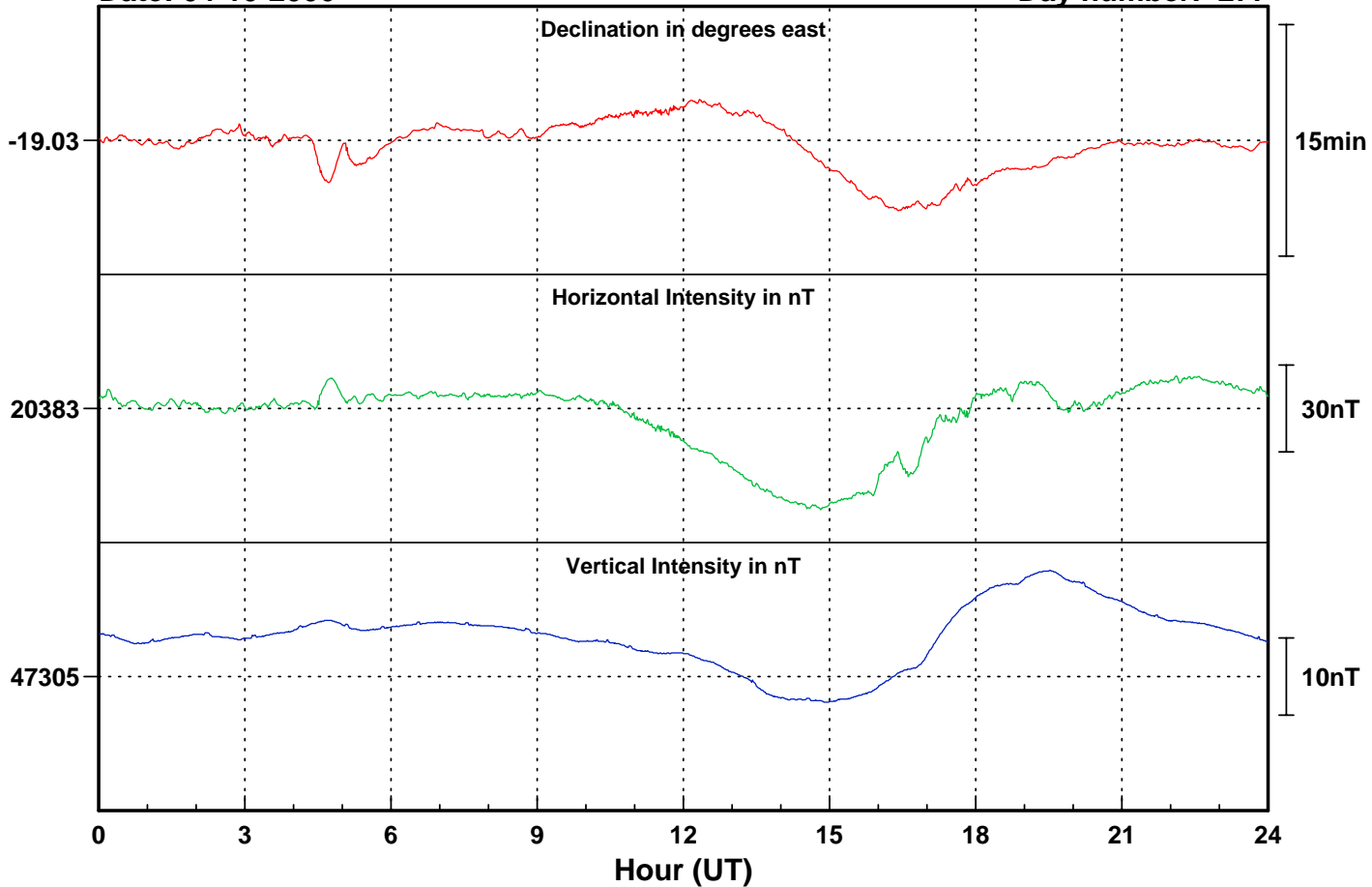
# Sable Island

Day number: 276



Date: 04-10-2006

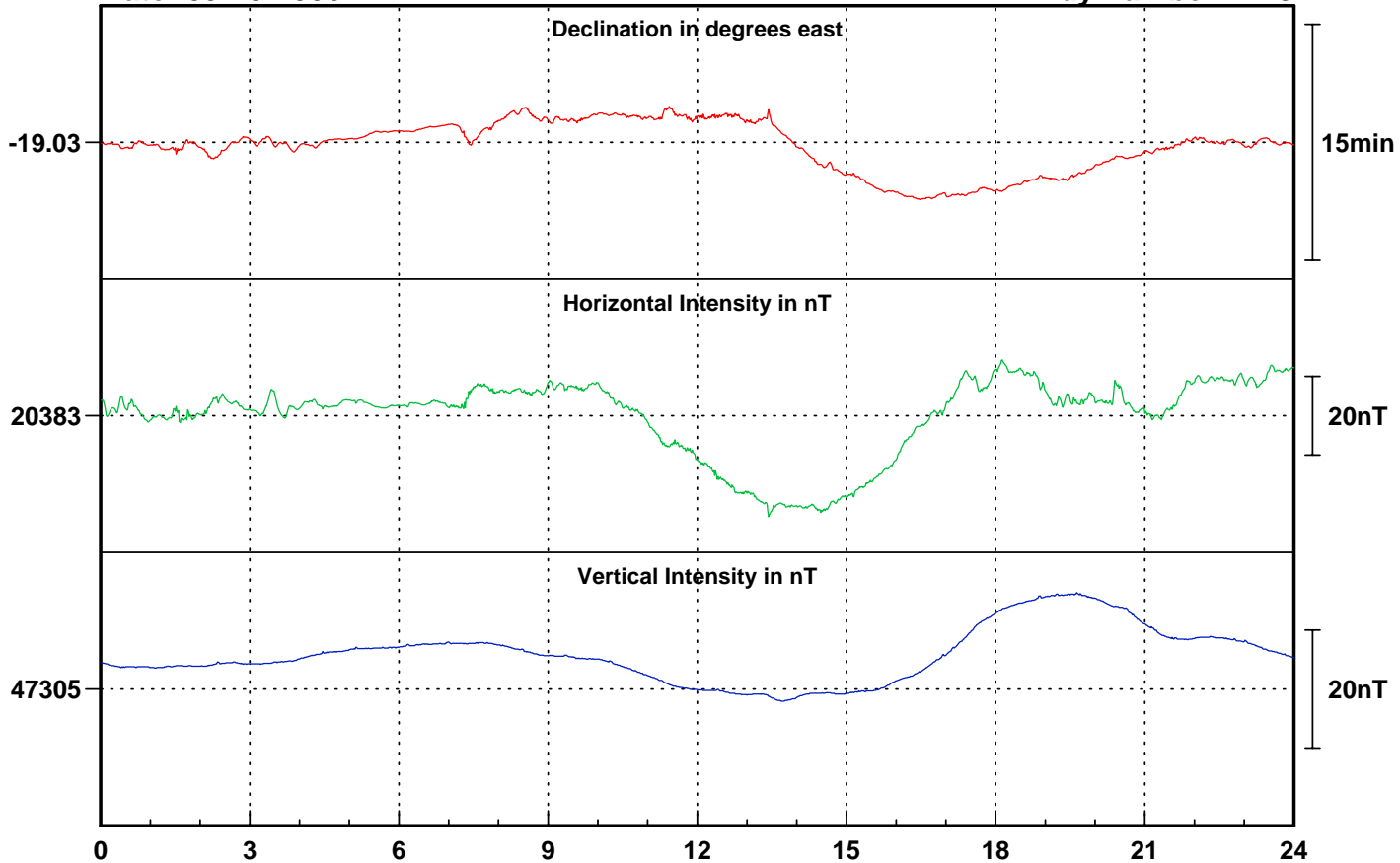
Day number: 277



Date: 05-10-2006

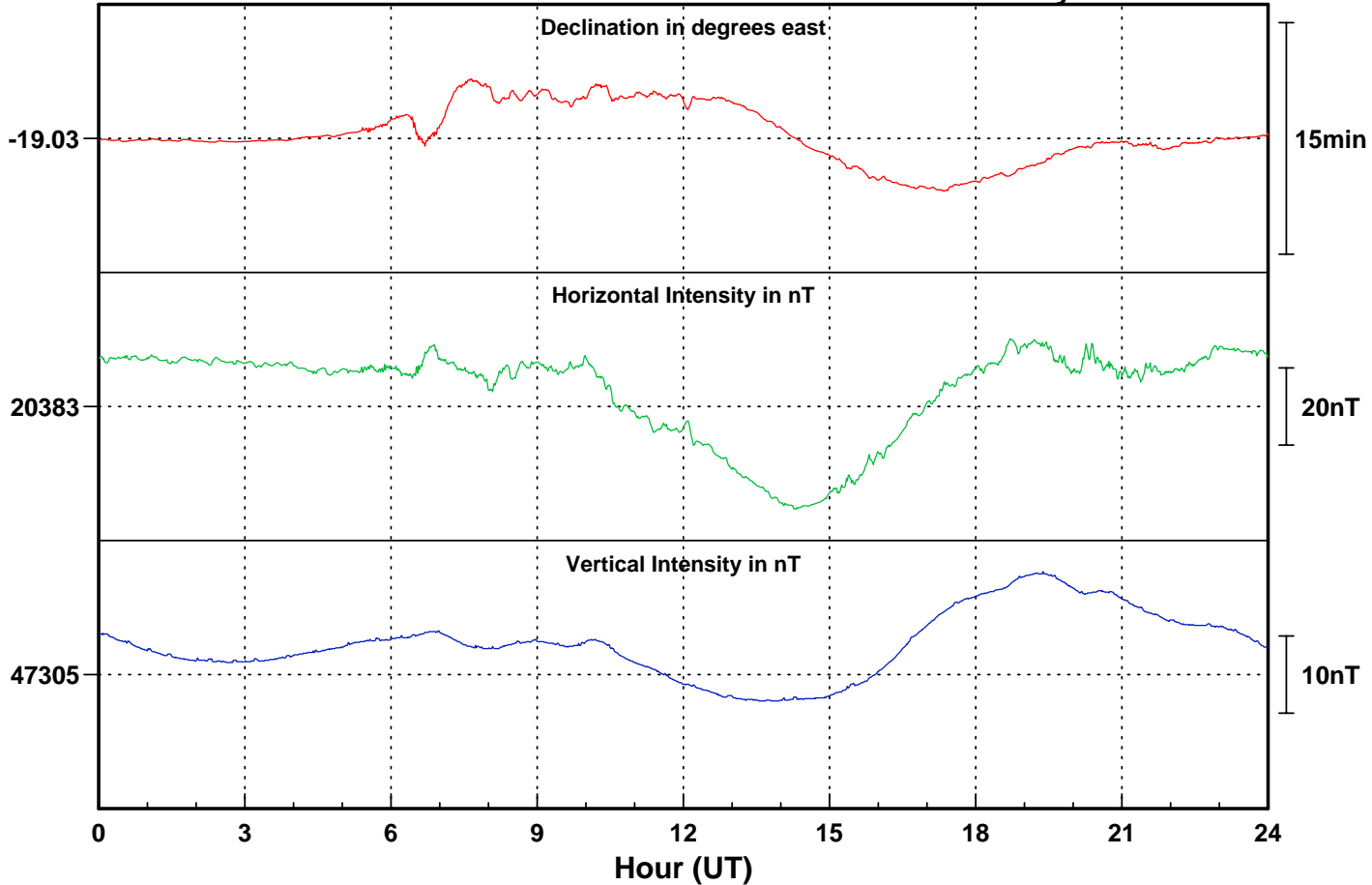
# Sable Island

Day number: 278



Date: 06-10-2006

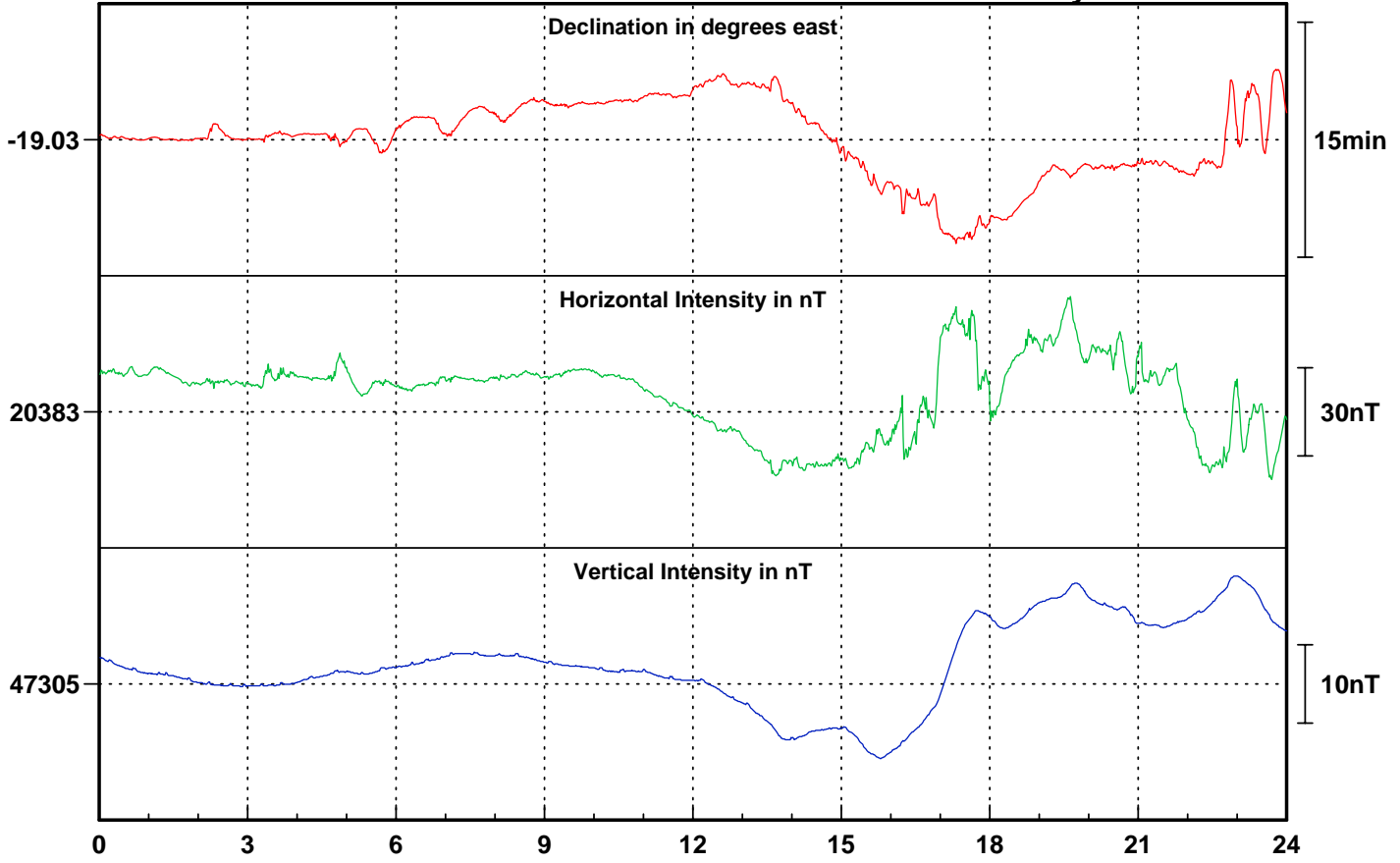
Day number: 279



Date: 07-10-2006

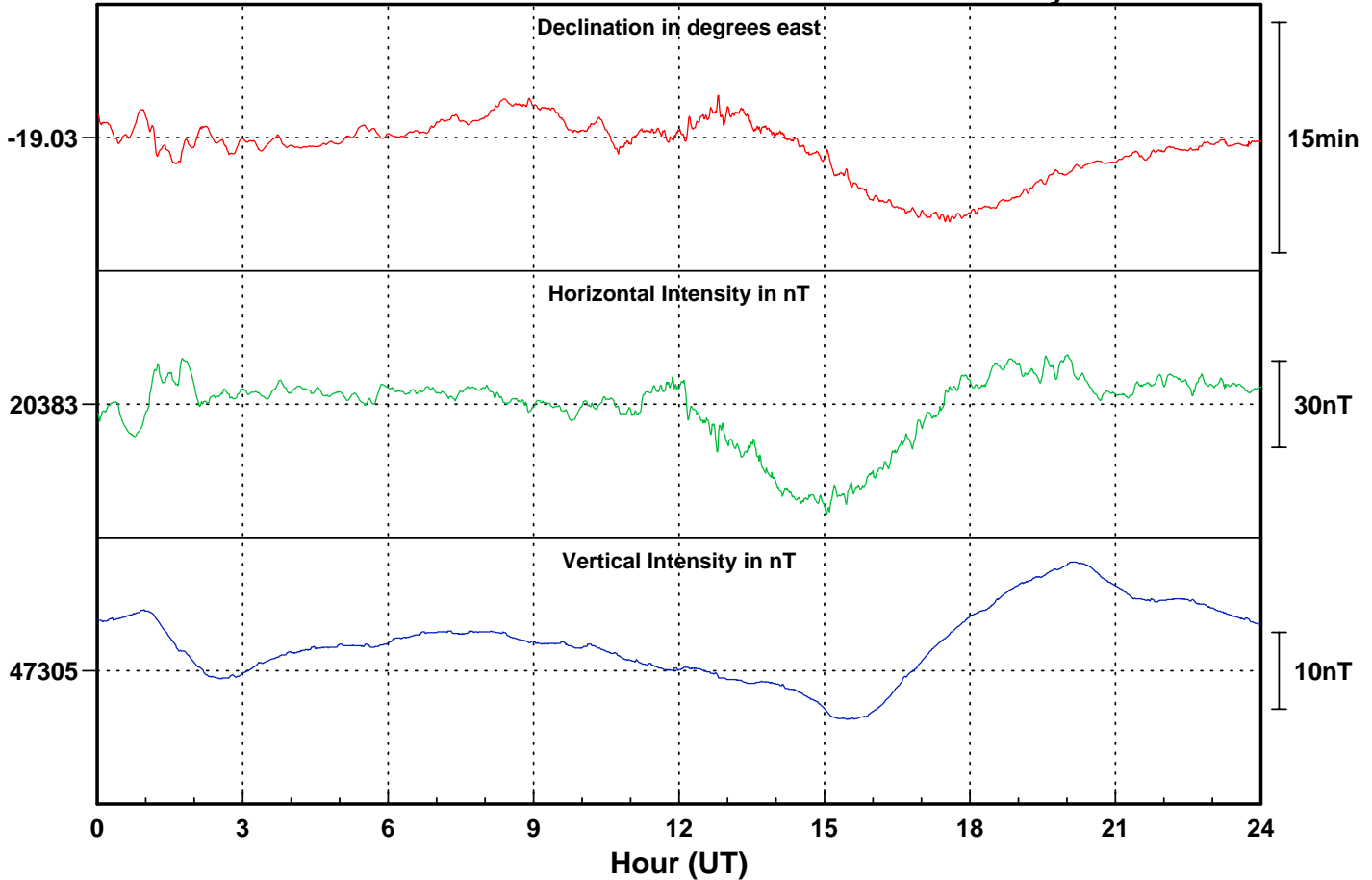
# Sable Island

Day number: 280



Date: 08-10-2006

Day number: 281

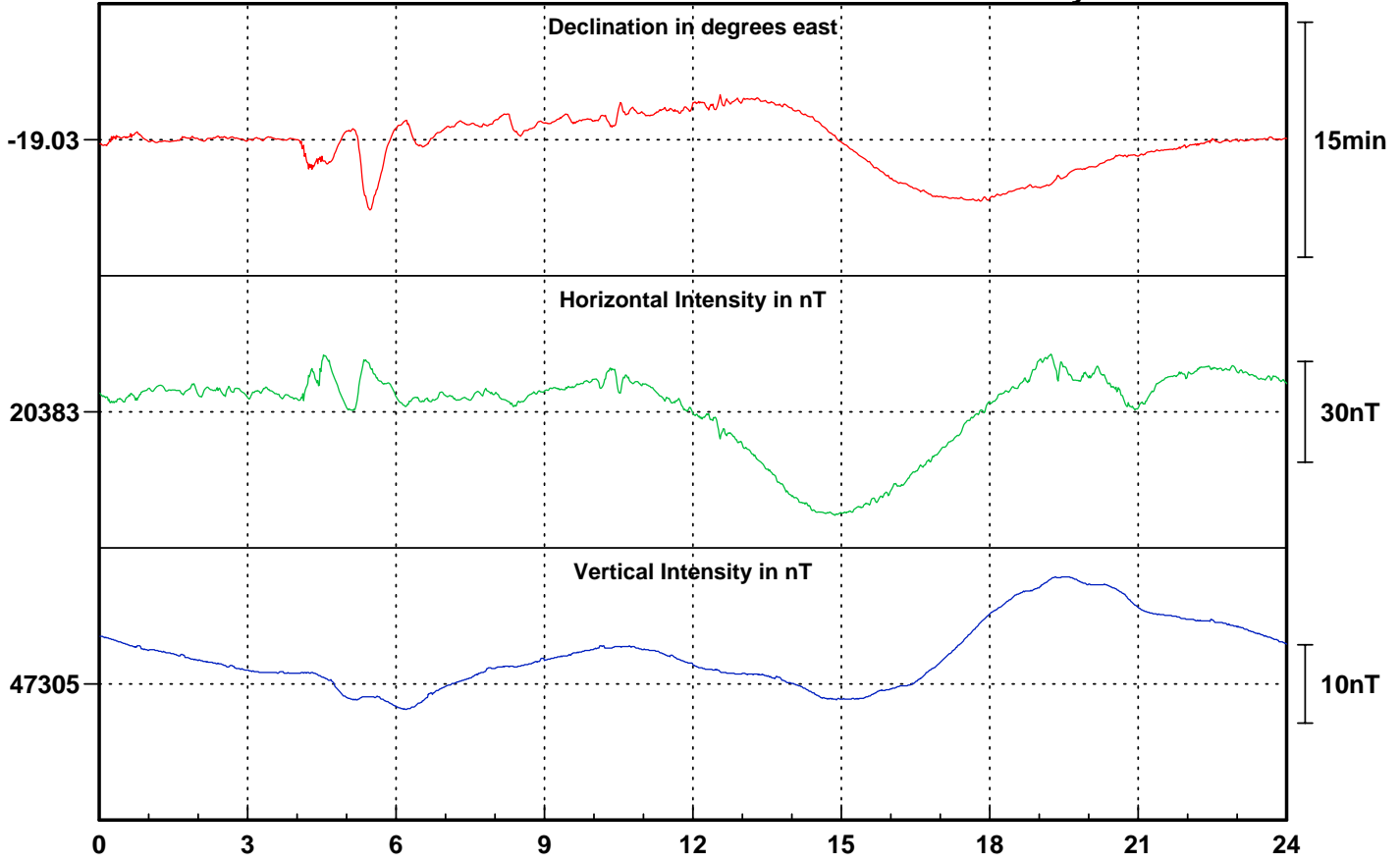




Date: 09-10-2006

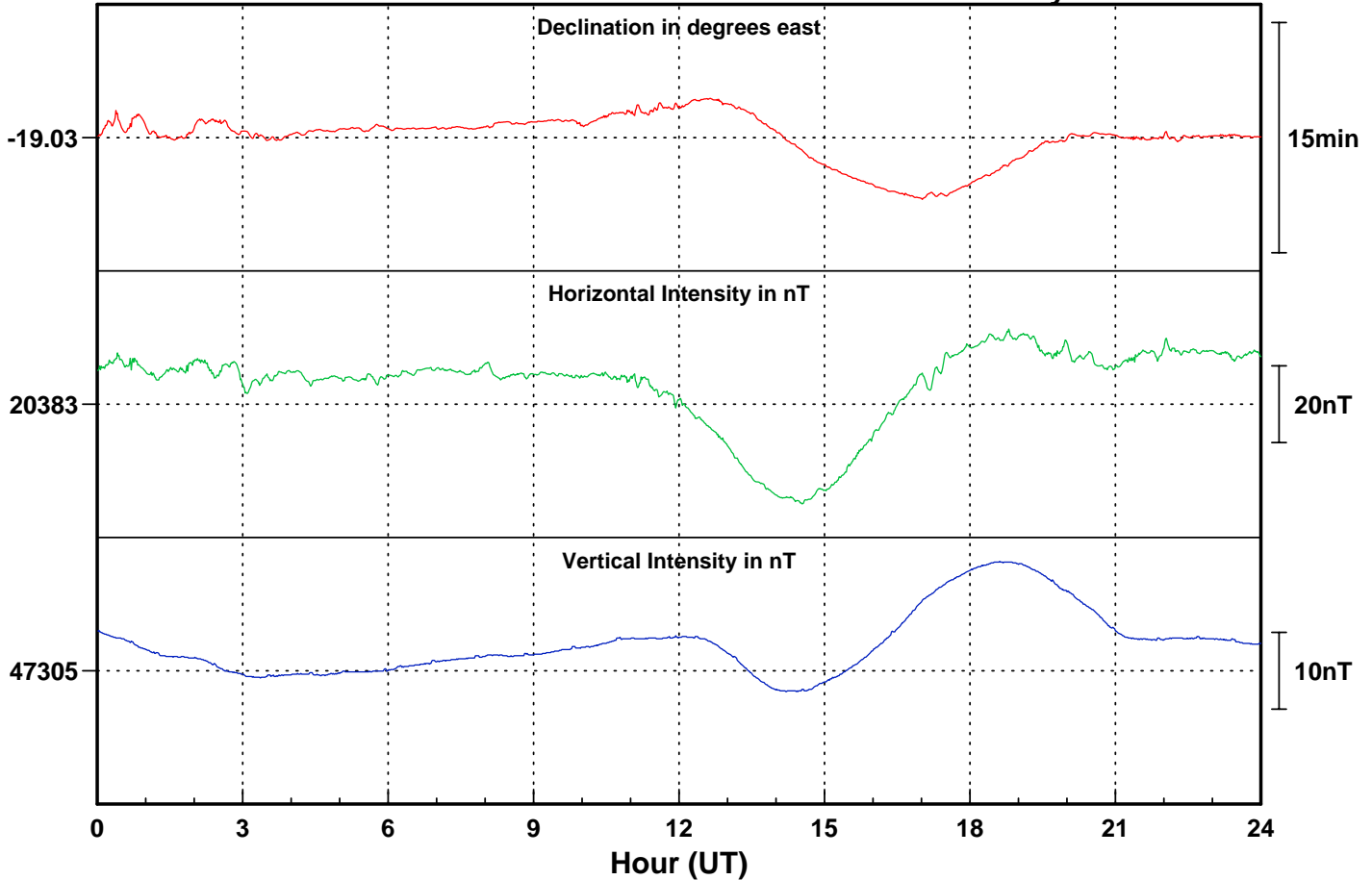
# Sable Island

Day number: 282



Date: 10-10-2006

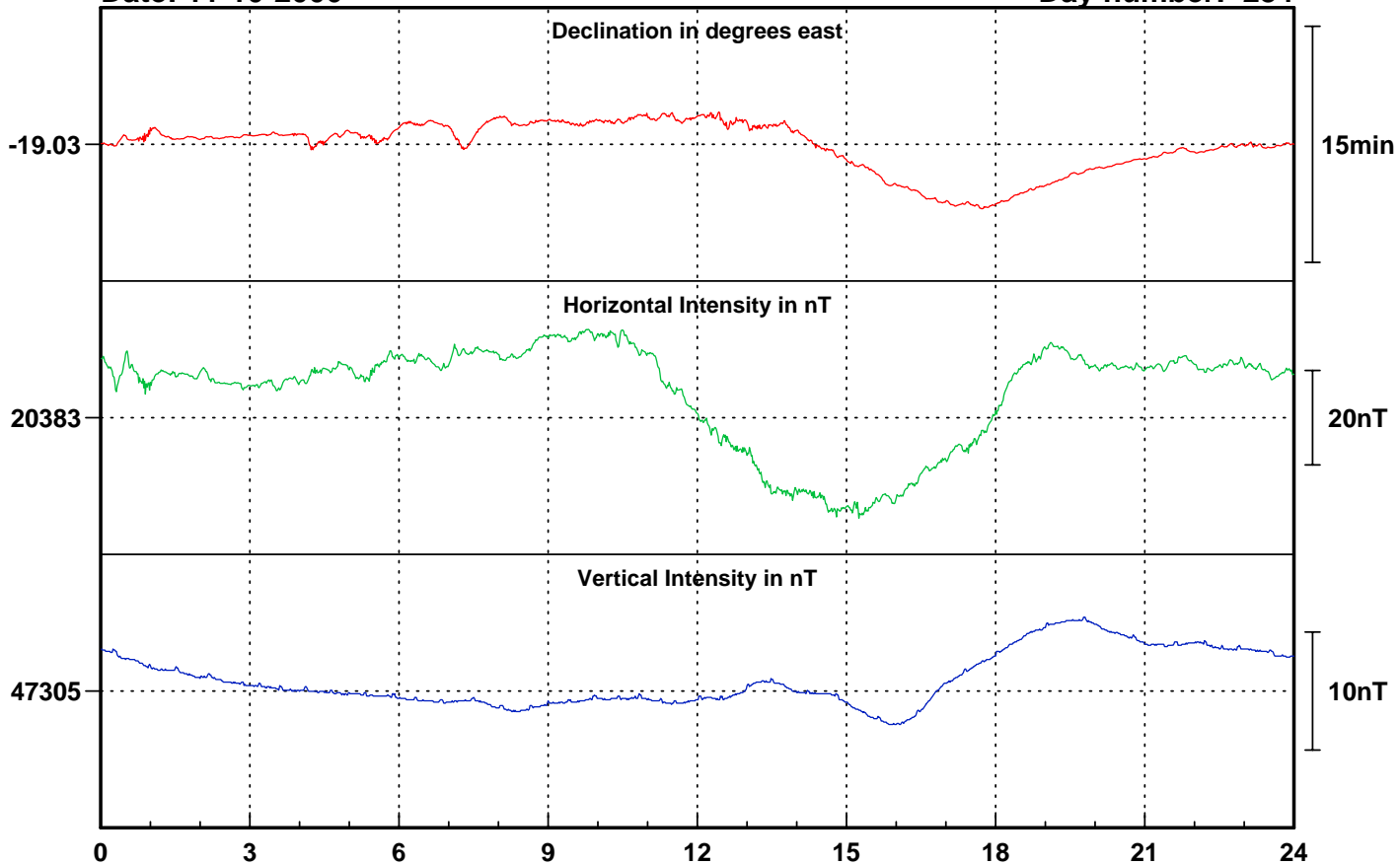
Day number: 283



Date: 11-10-2006

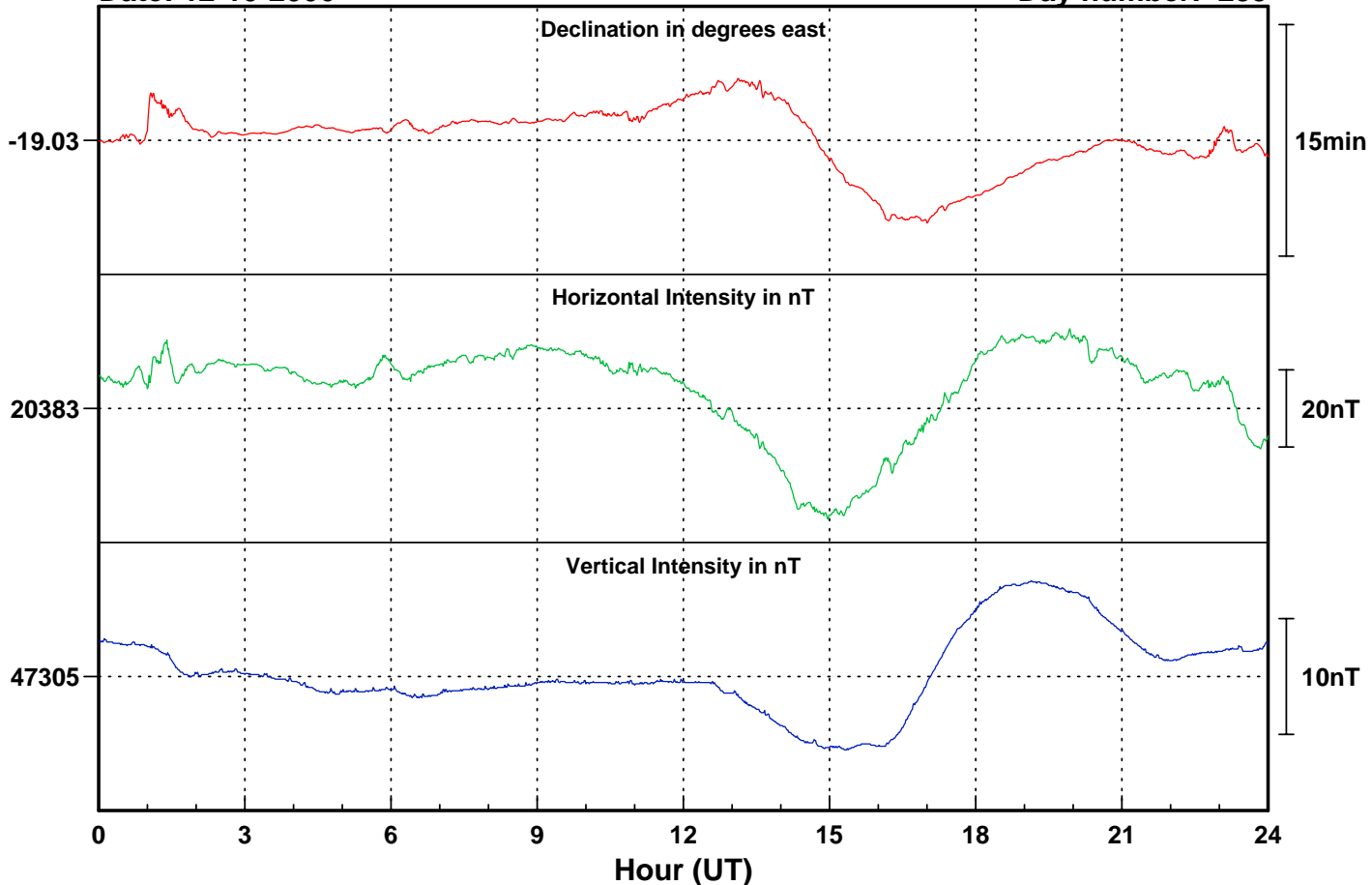
# Sable Island

Day number: 284



Date: 12-10-2006

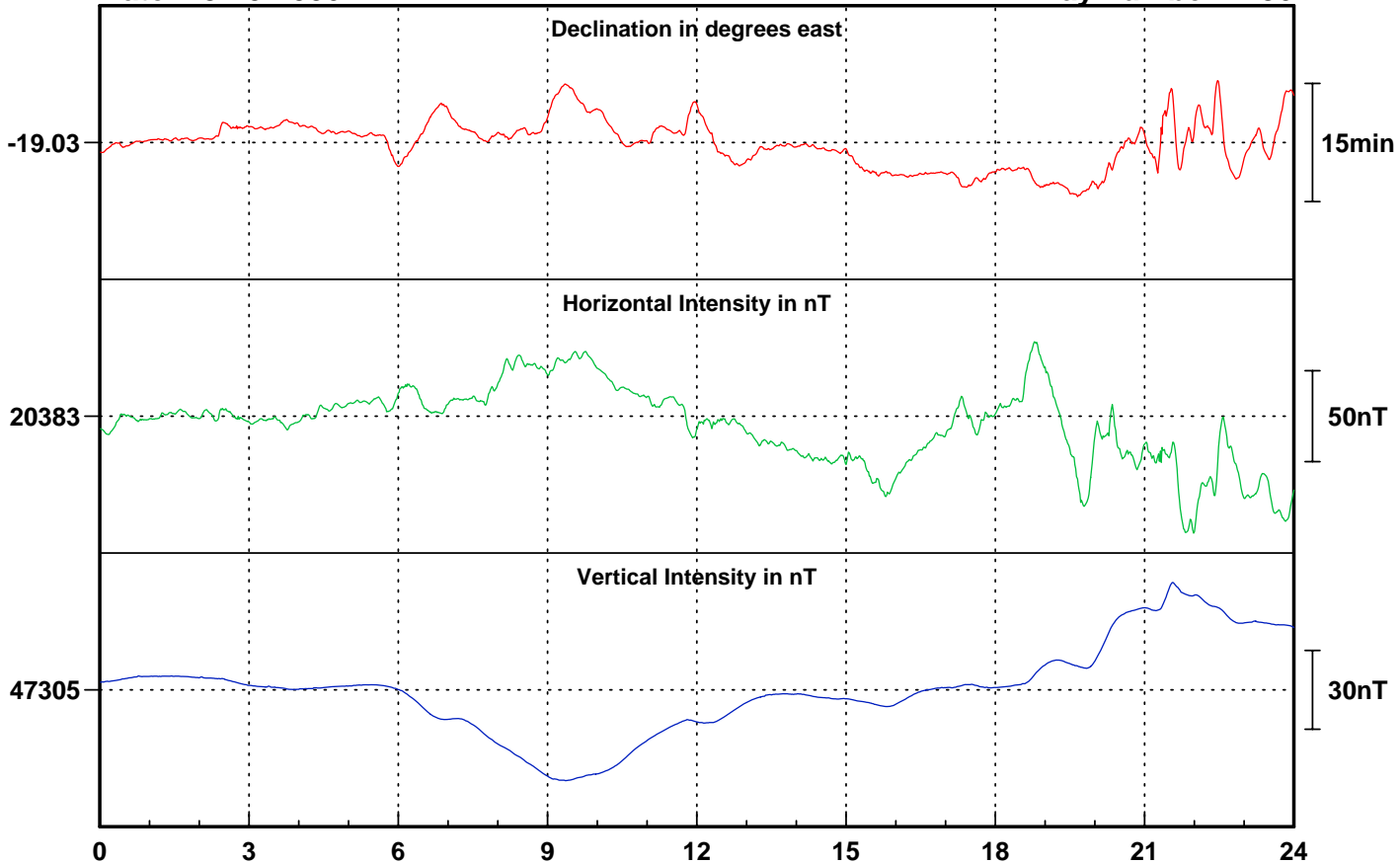
Day number: 285



Date: 13-10-2006

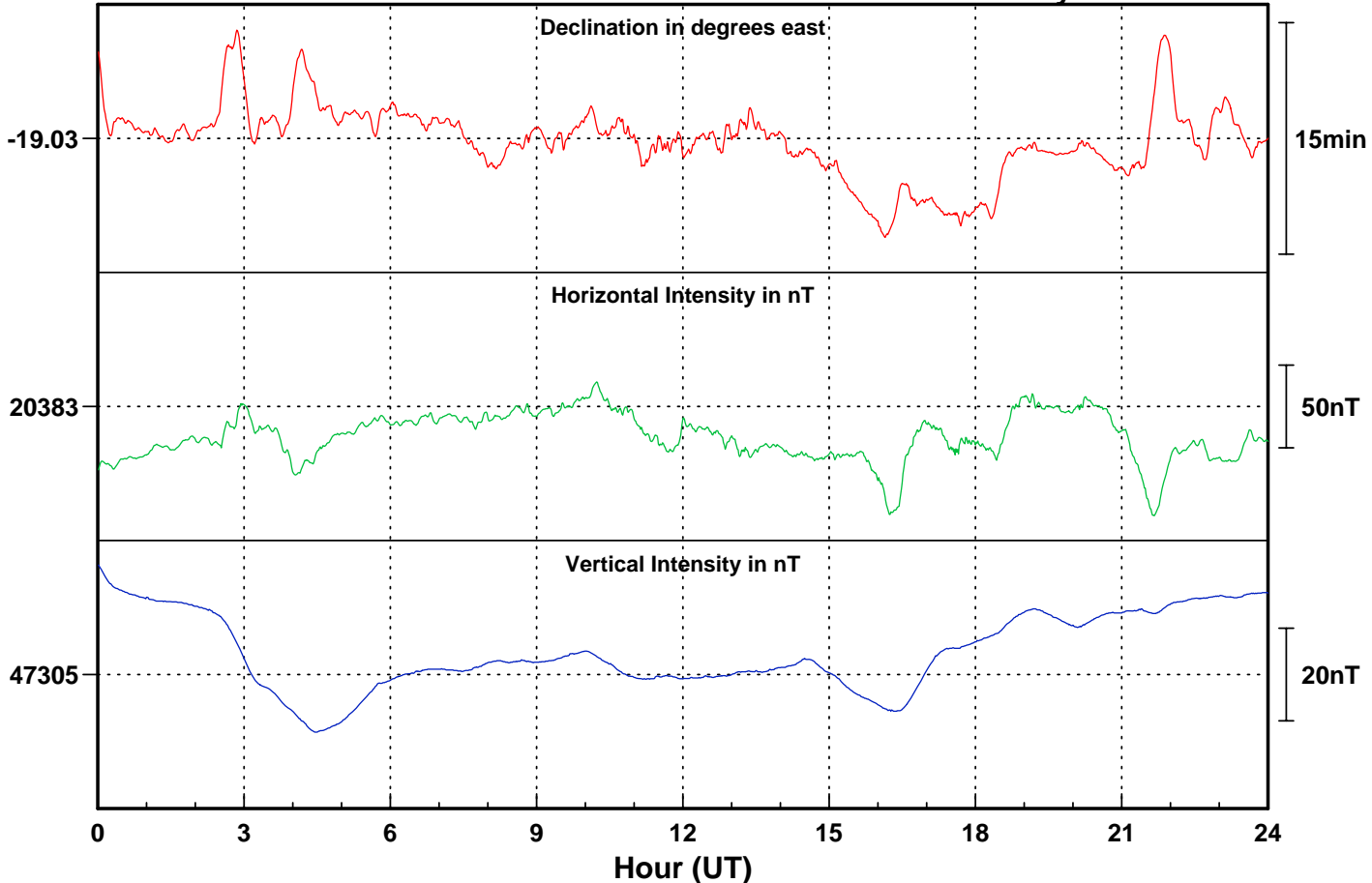
# Sable Island

Day number: 286



Date: 14-10-2006

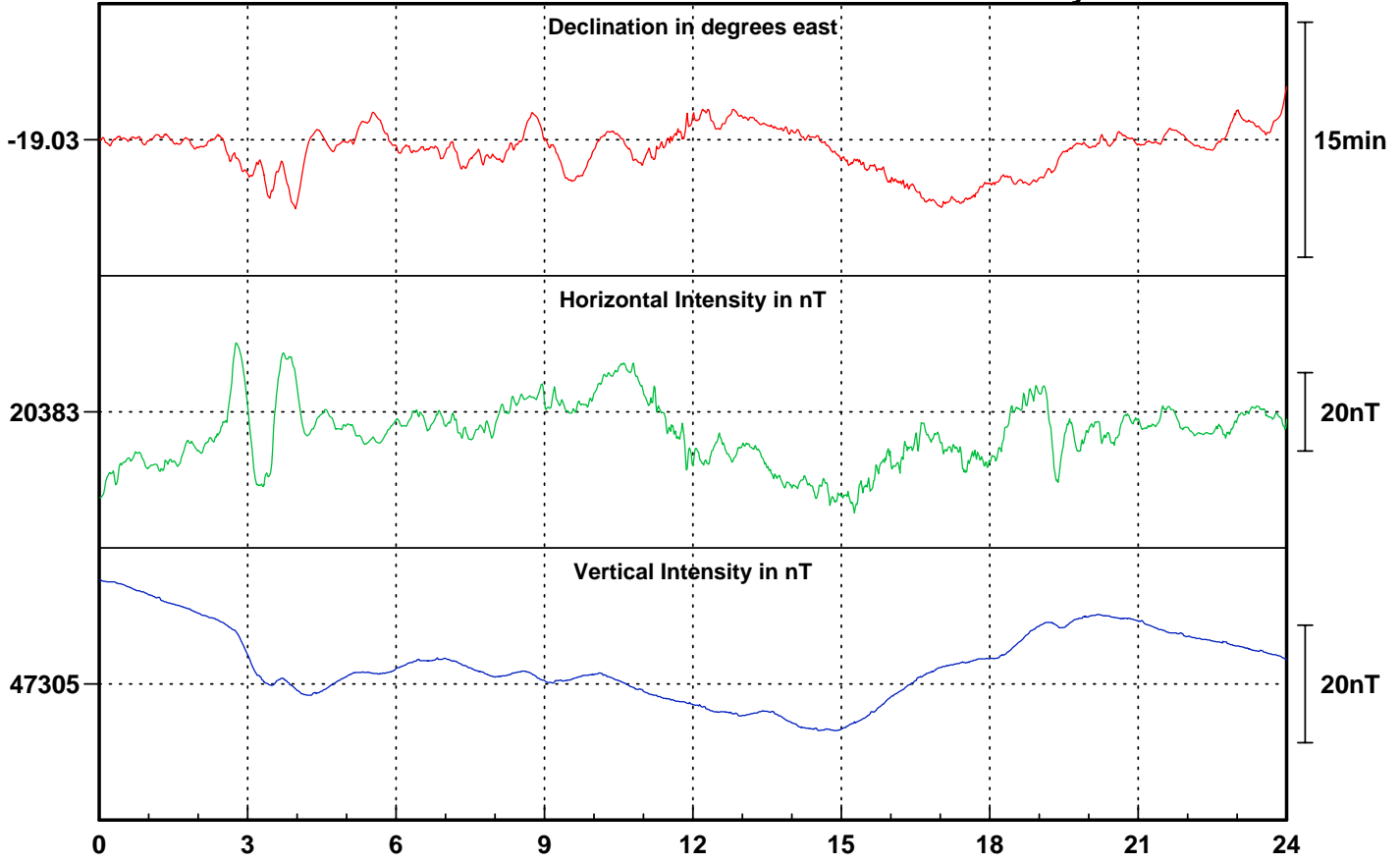
Day number: 287



Date: 15-10-2006

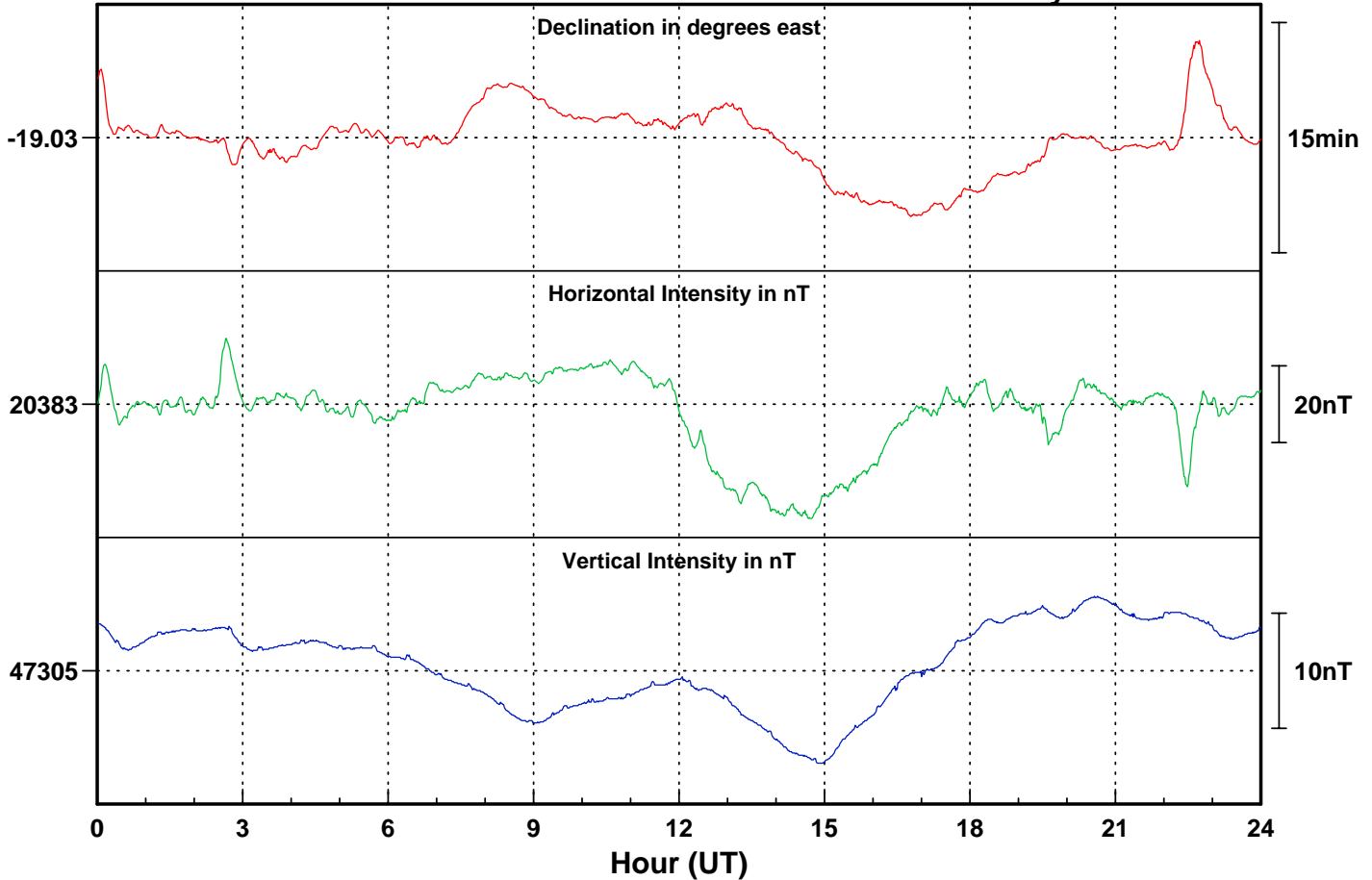
# Sable Island

Day number: 288



Date: 16-10-2006

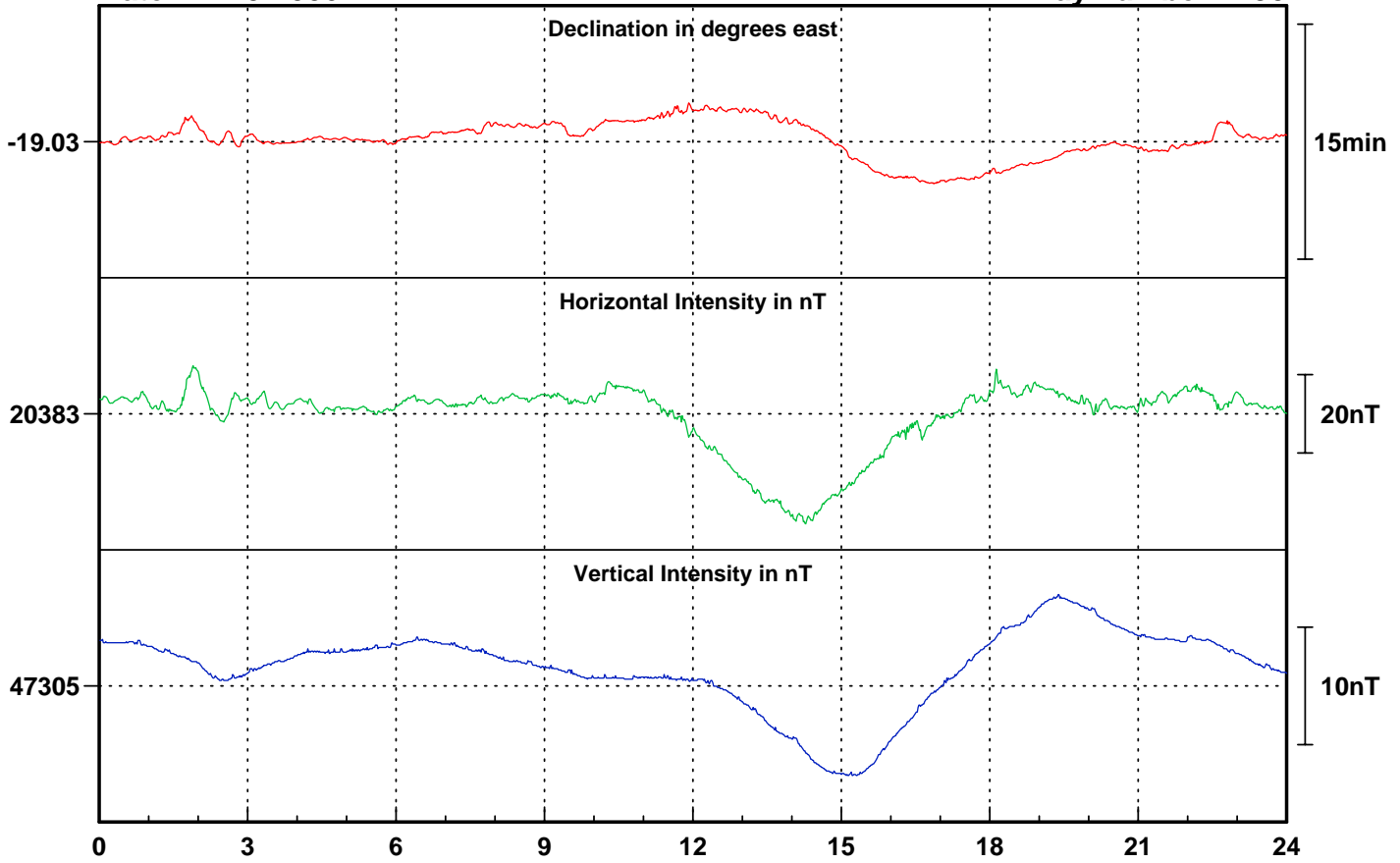
Day number: 289



Date: 17-10-2006

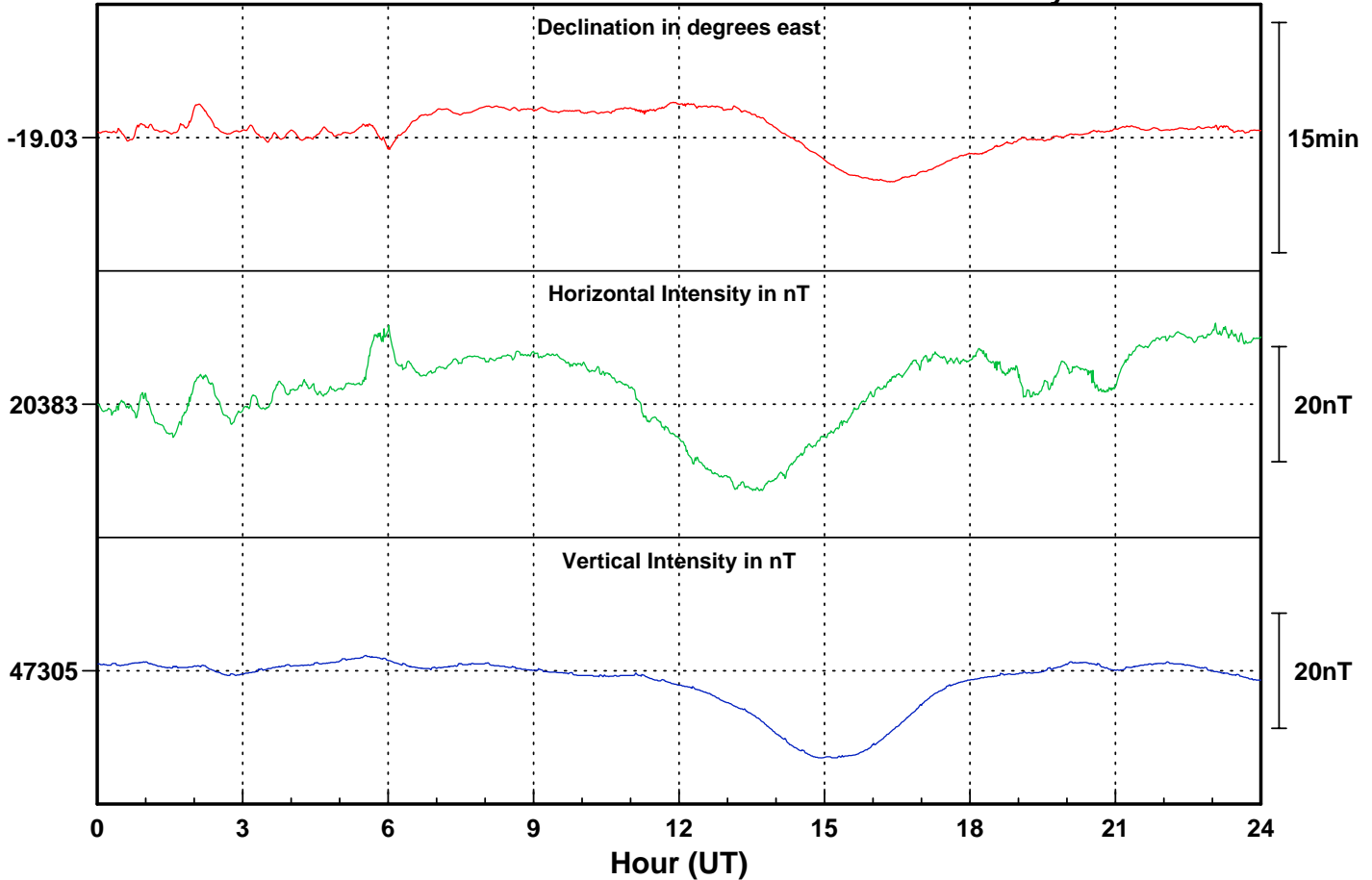
# Sable Island

Day number: 290



Date: 18-10-2006

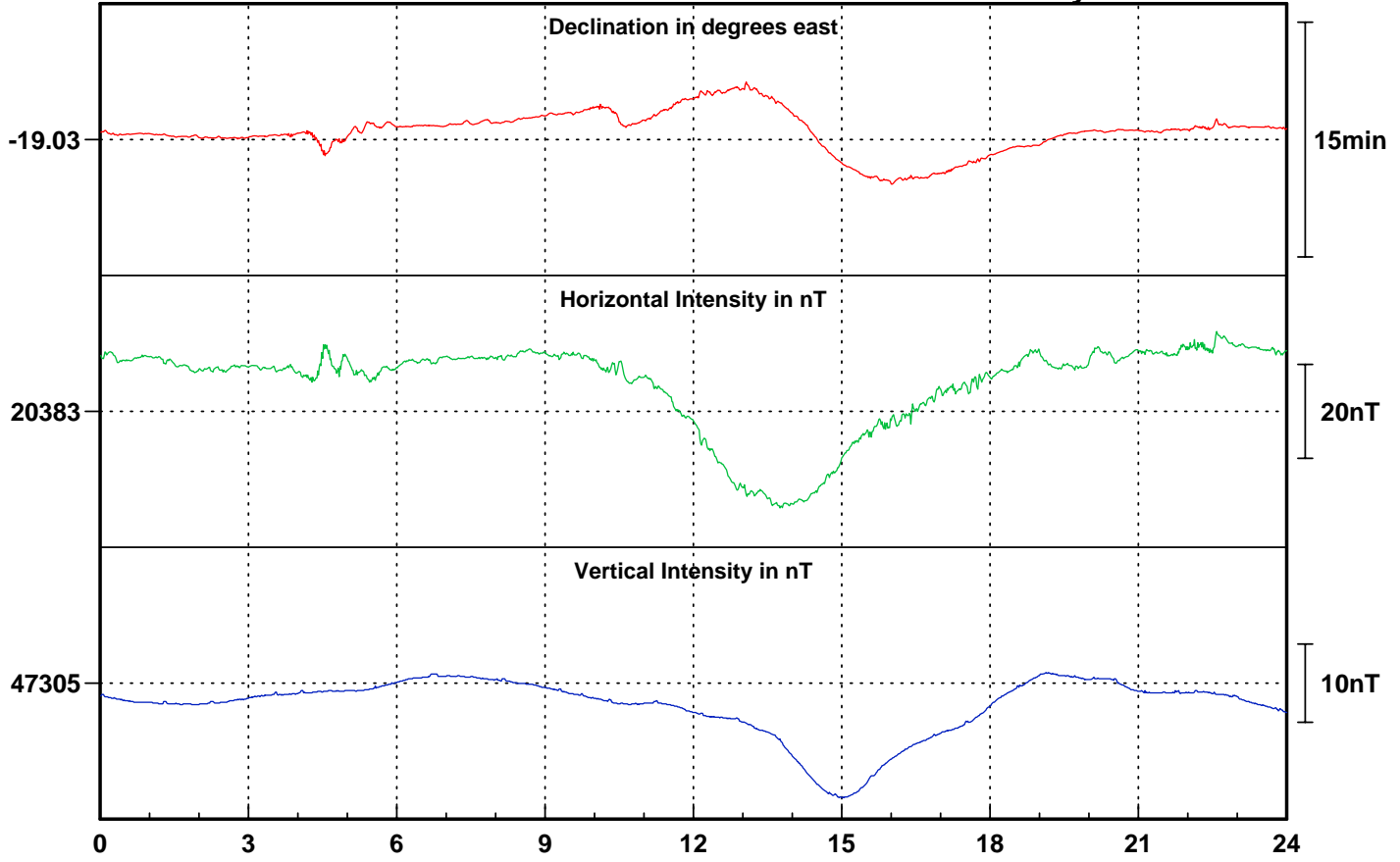
Day number: 291



Date: 19-10-2006

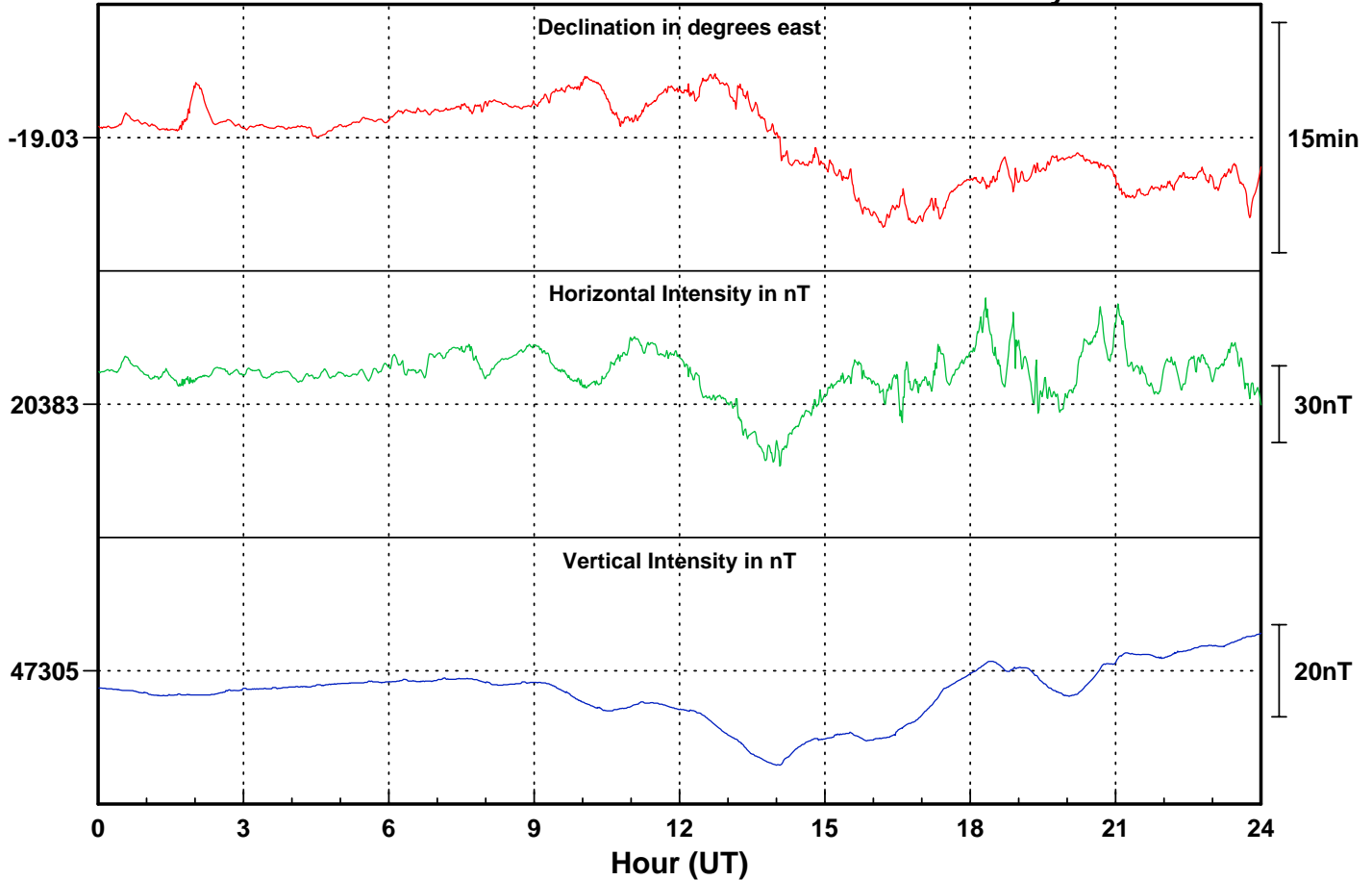
# Sable Island

Day number: 292



Date: 20-10-2006

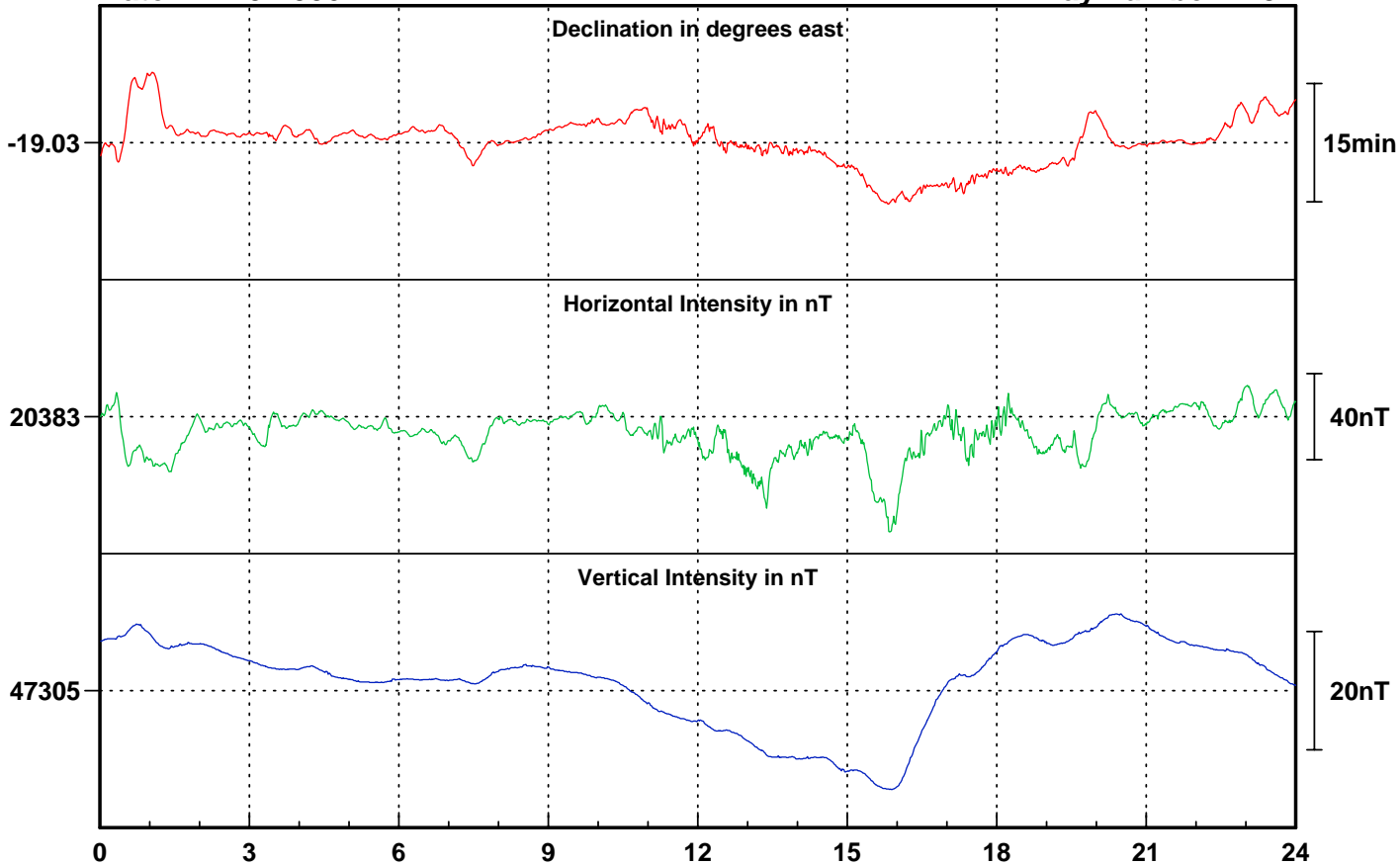
Day number: 293



Date: 21-10-2006

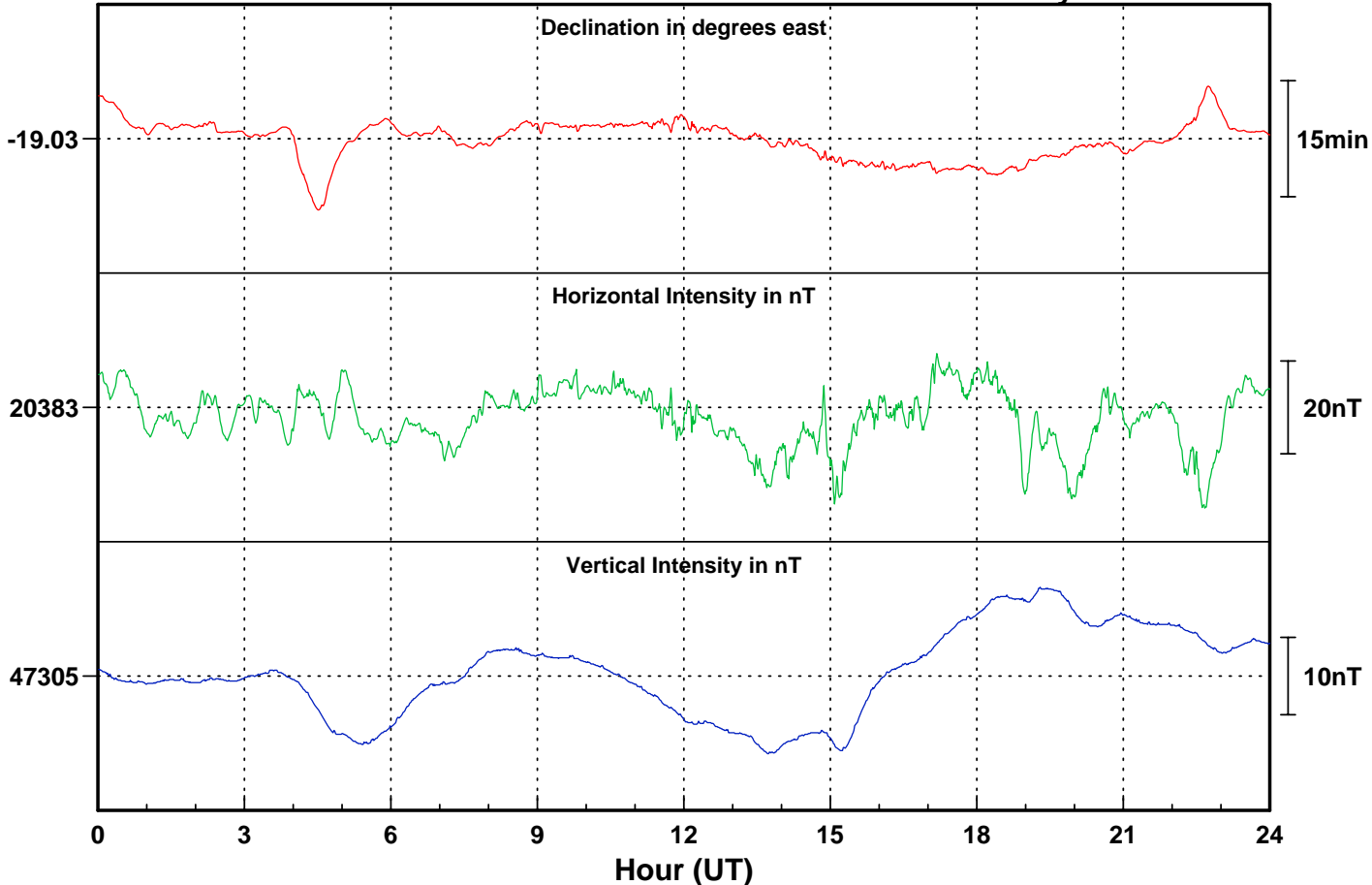
# Sable Island

Day number: 294



Date: 22-10-2006

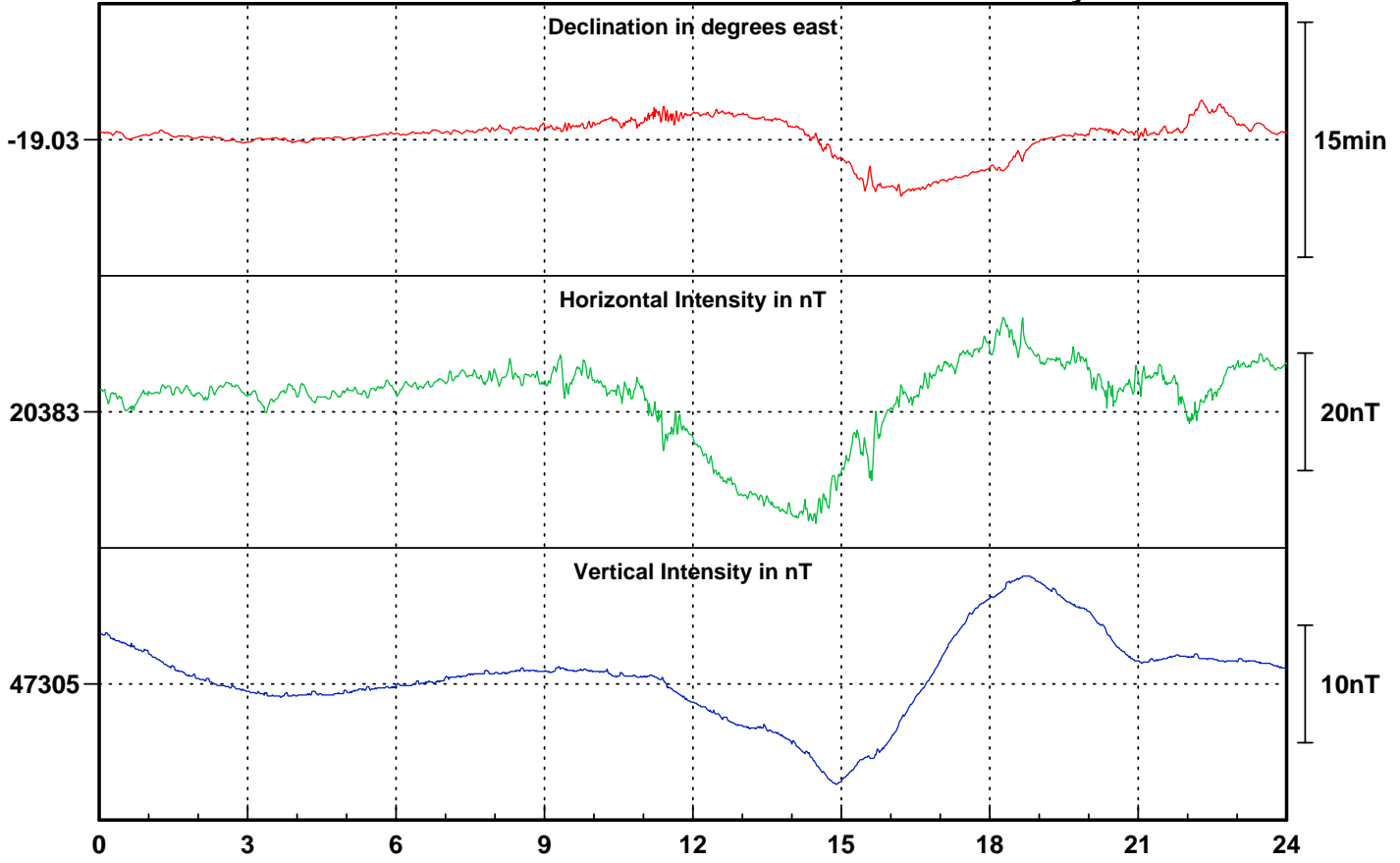
Day number: 295



Date: 23-10-2006

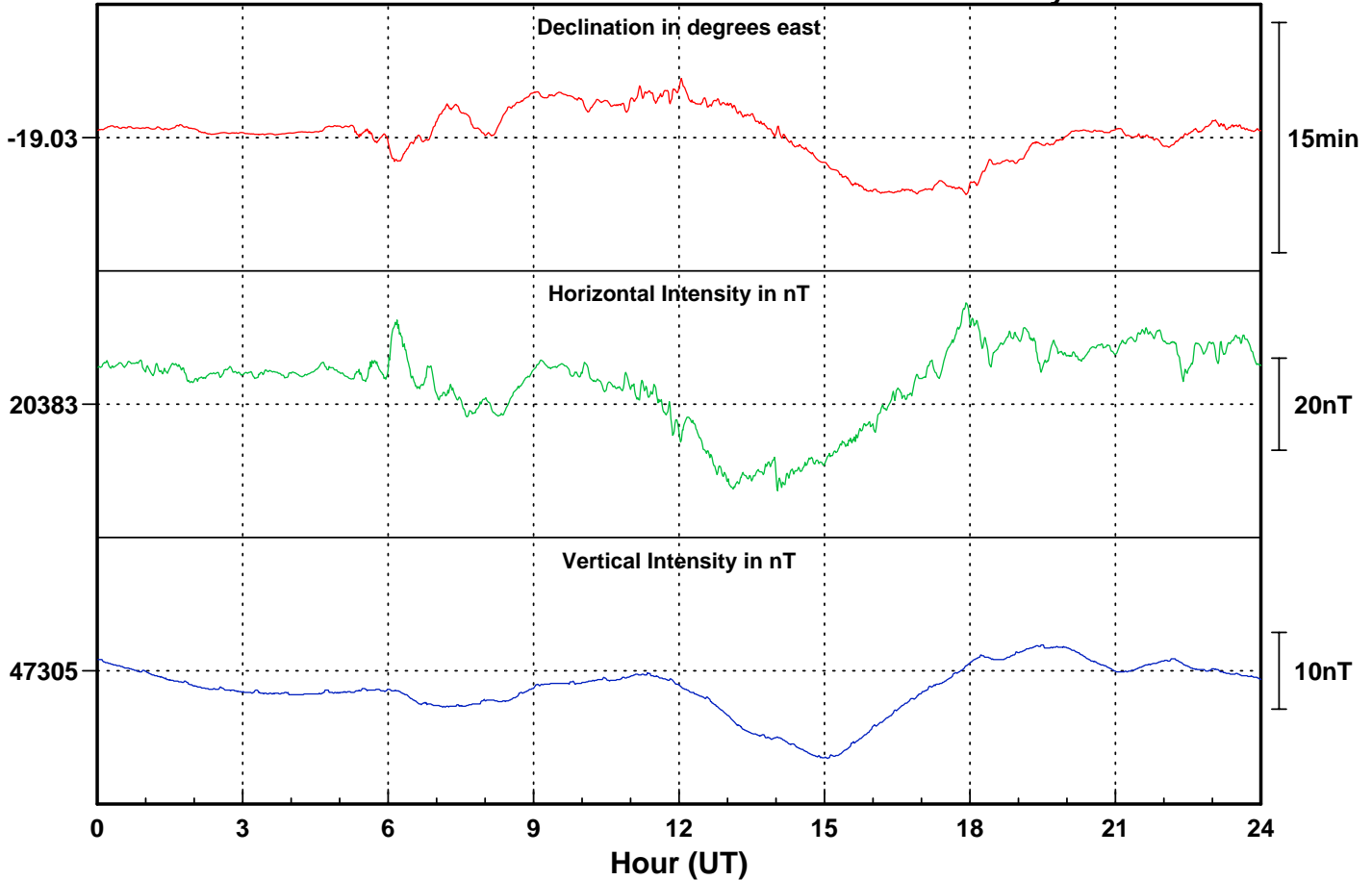
# Sable Island

Day number: 296



Date: 24-10-2006

Day number: 297

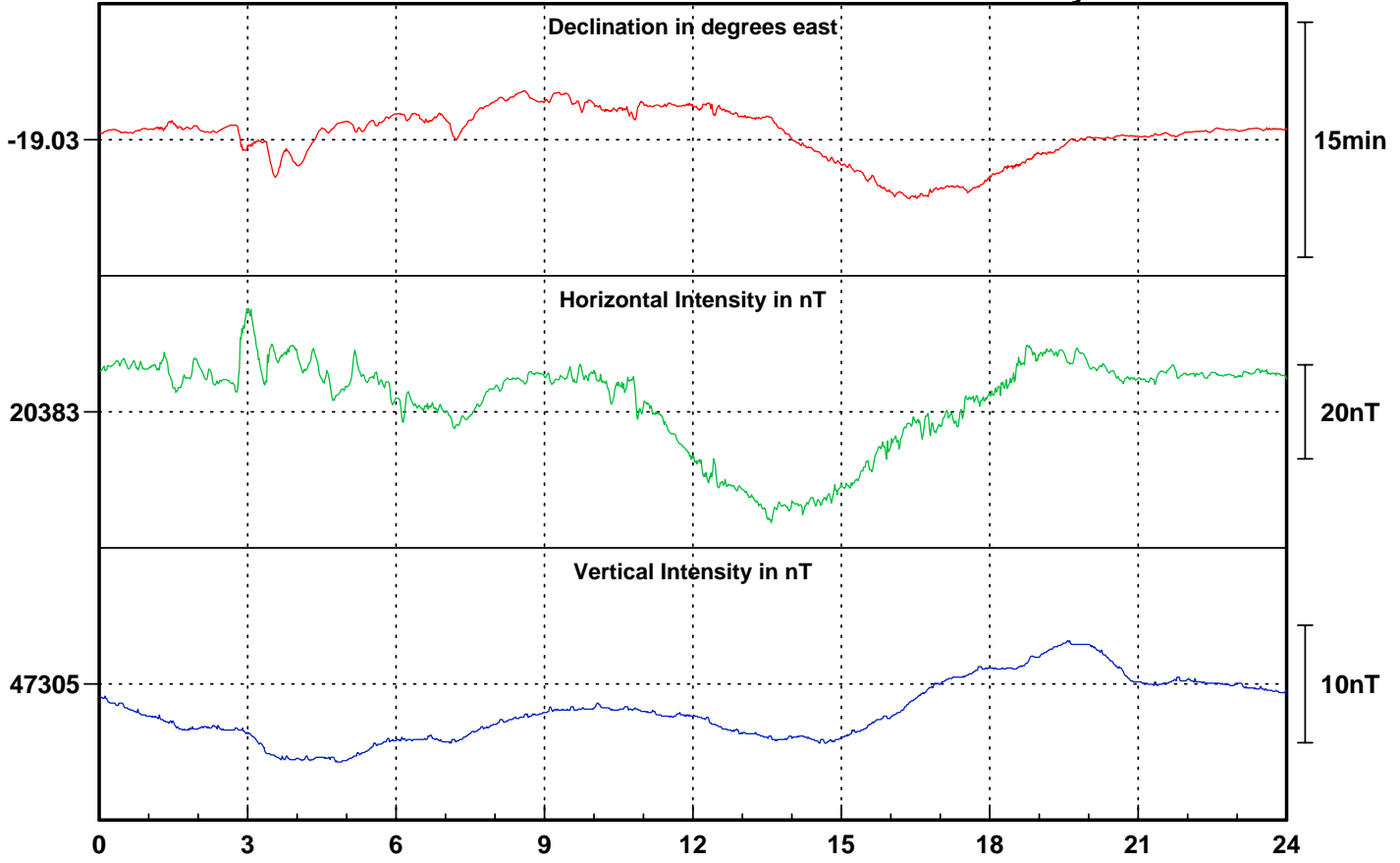




Date: 25-10-2006

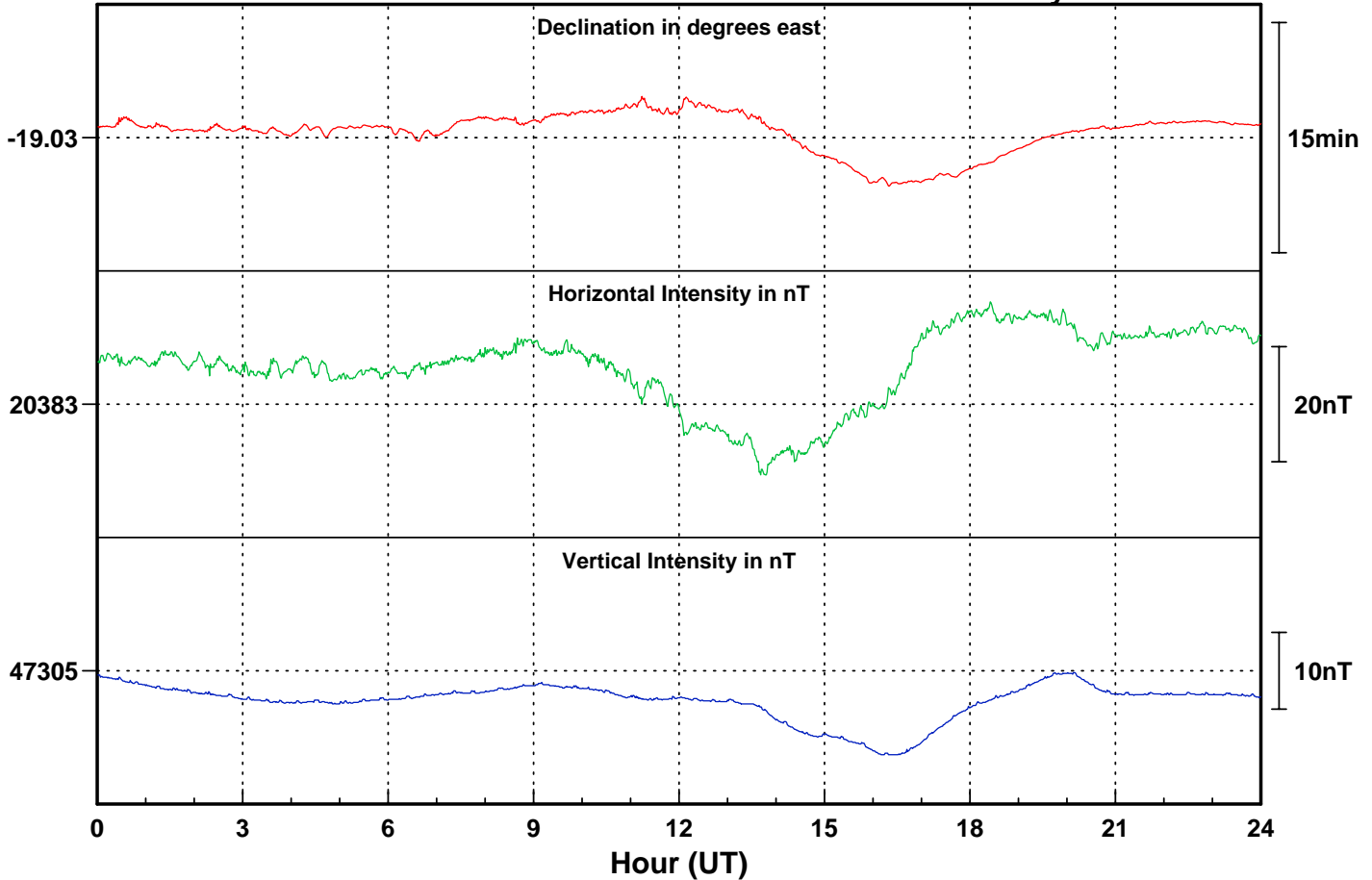
# Sable Island

Day number: 298



Date: 26-10-2006

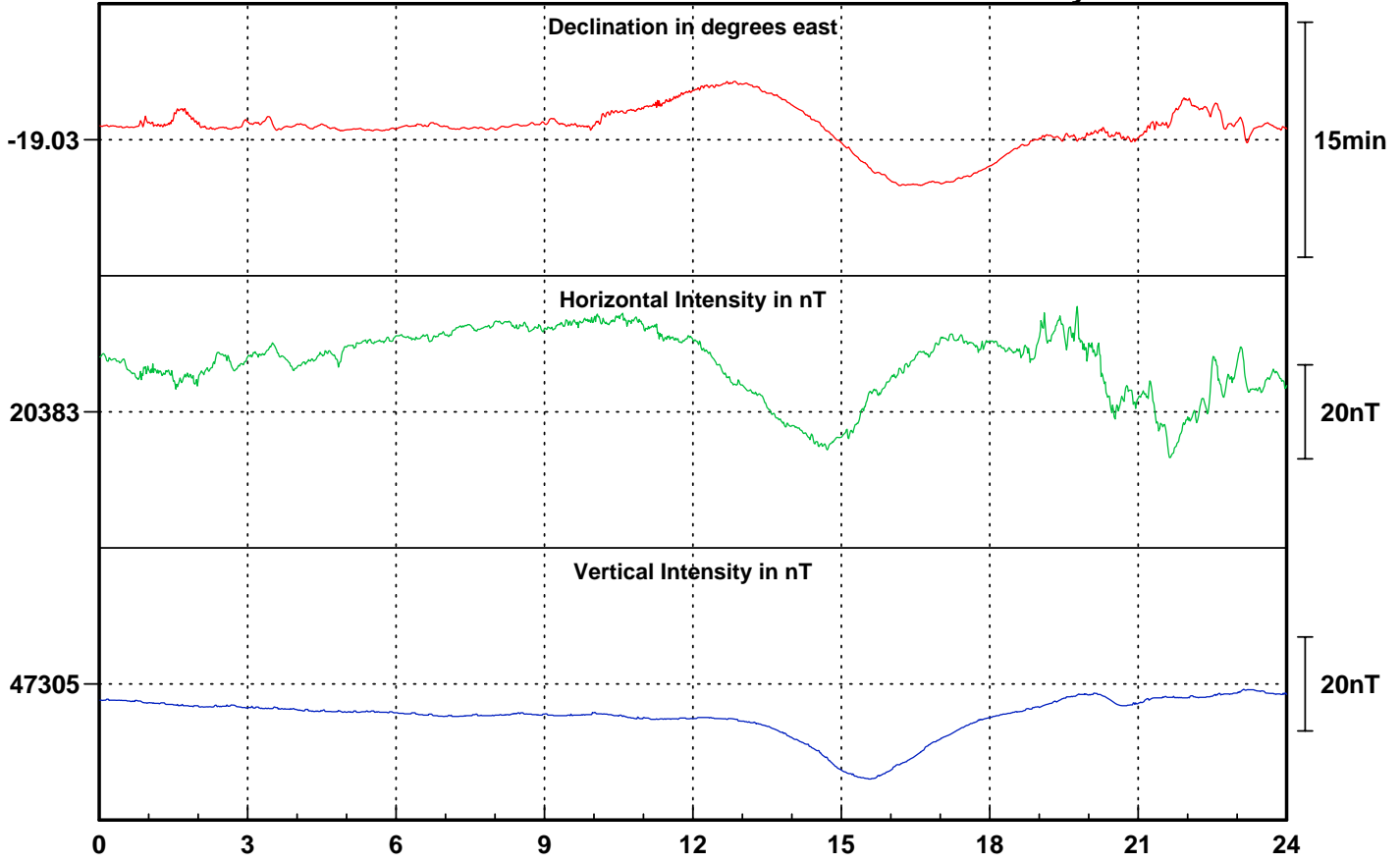
Day number: 299



Date: 27-10-2006

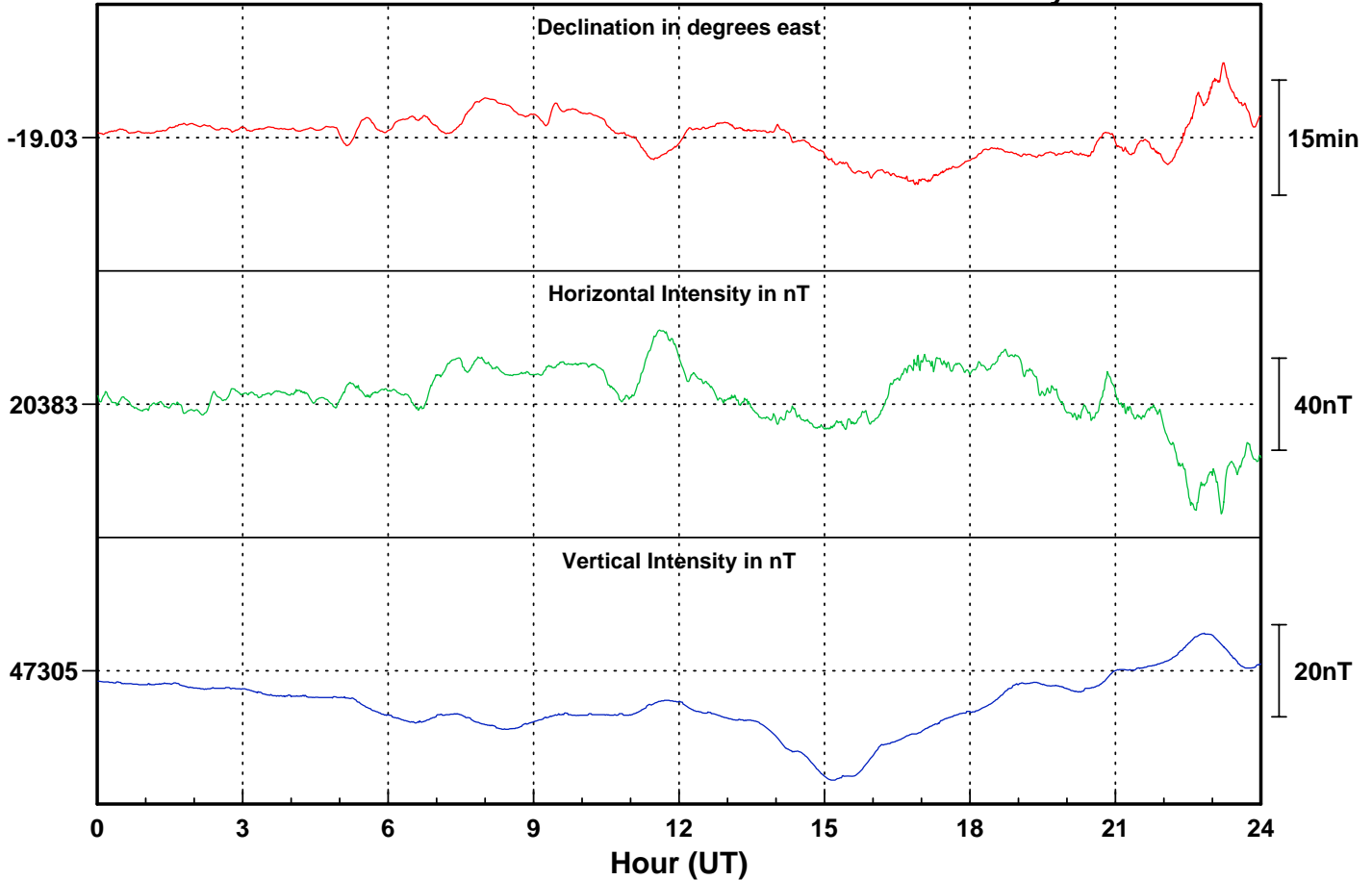
# Sable Island

Day number: 300



Date: 28-10-2006

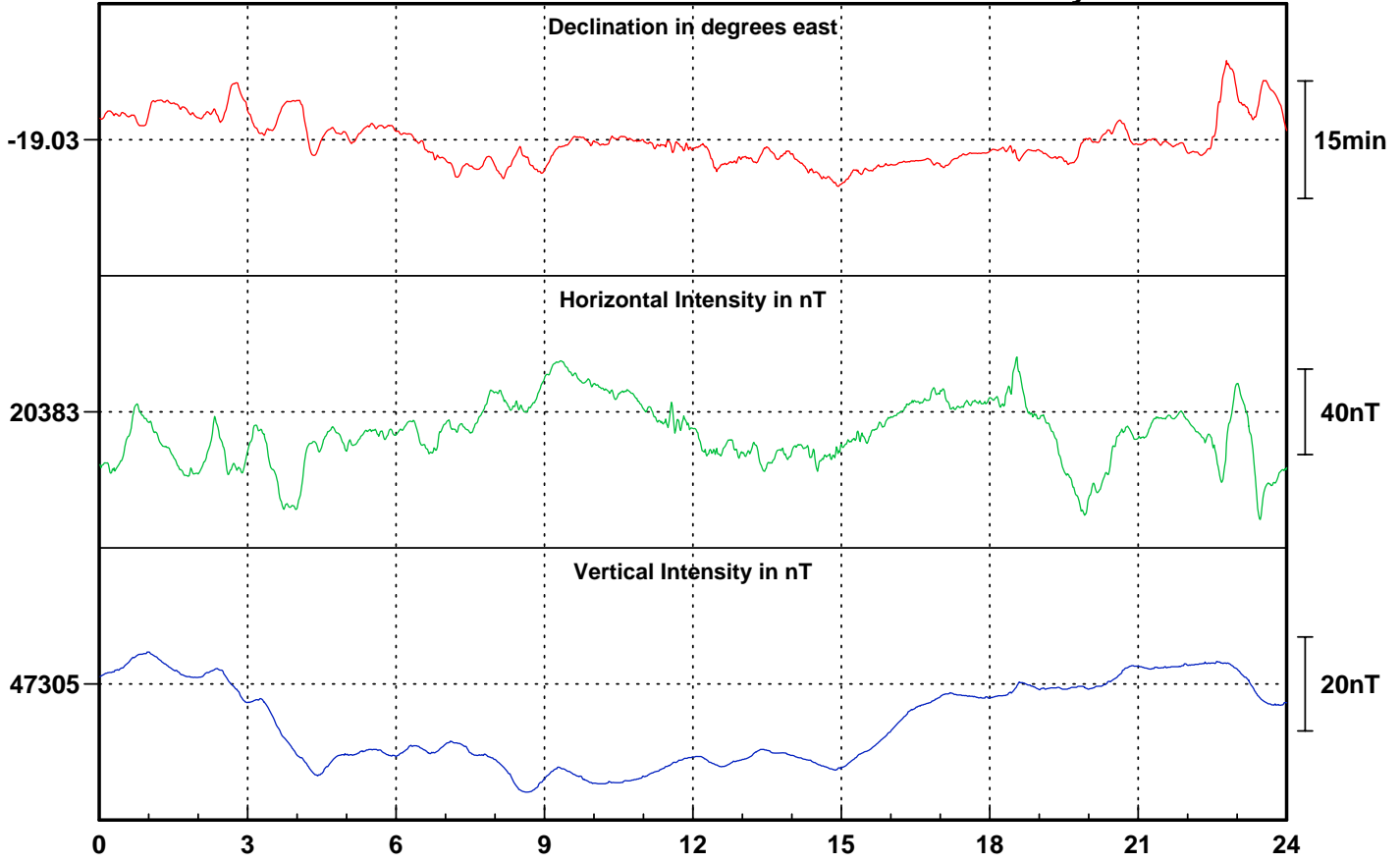
Day number: 301



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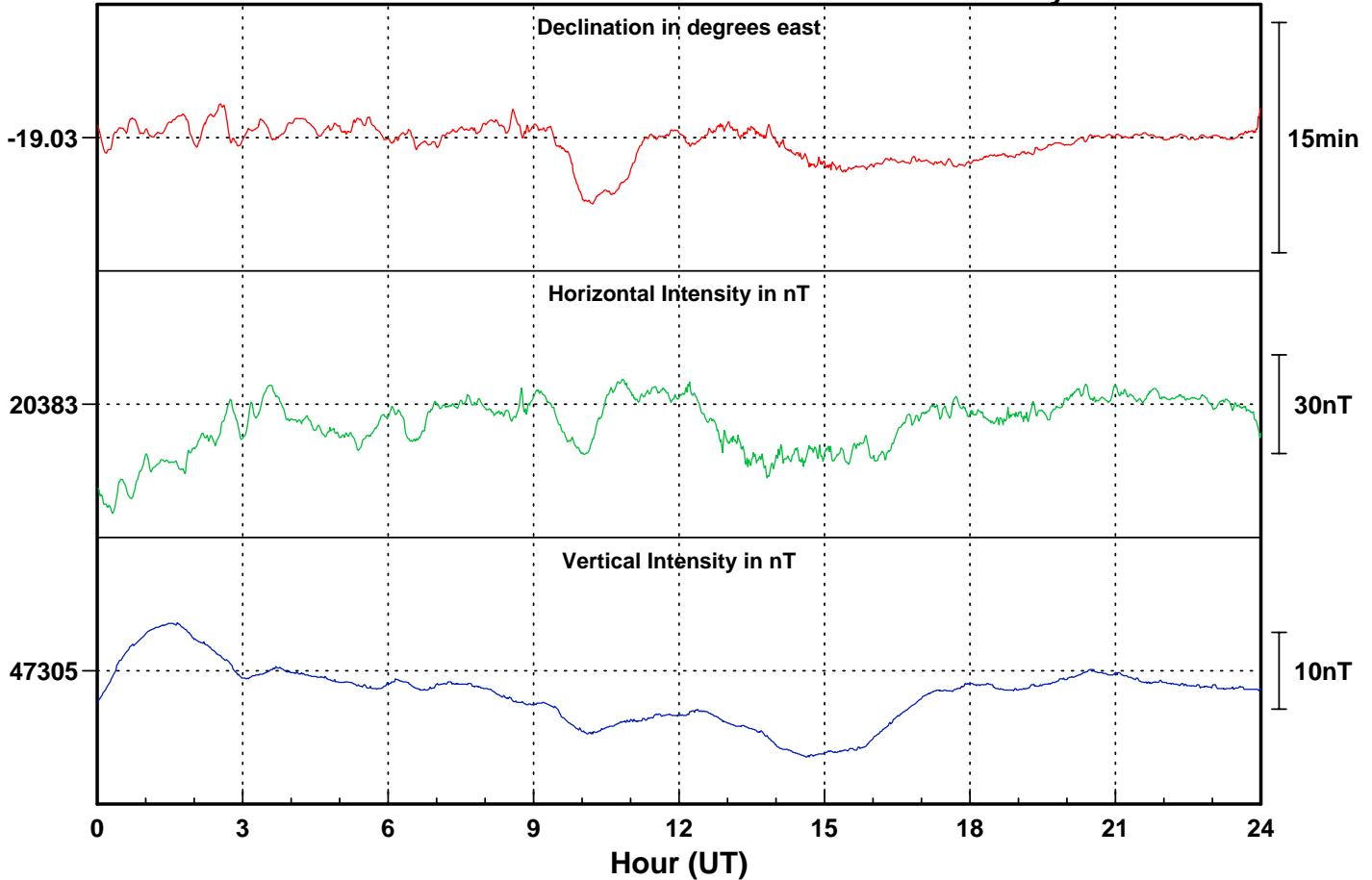
# Sable Island

Day number: 302



Date: 30-10-2006

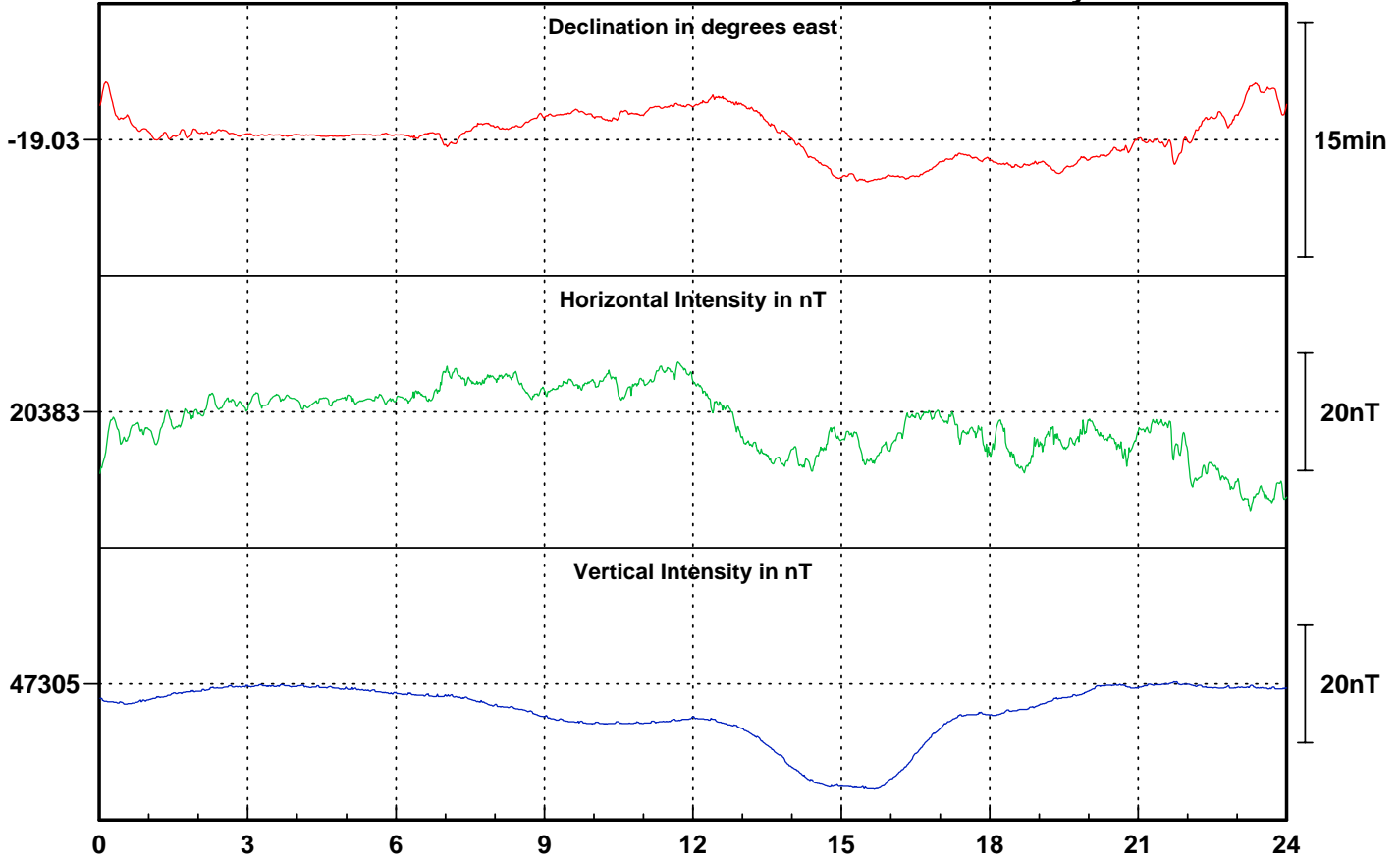
Day number: 303



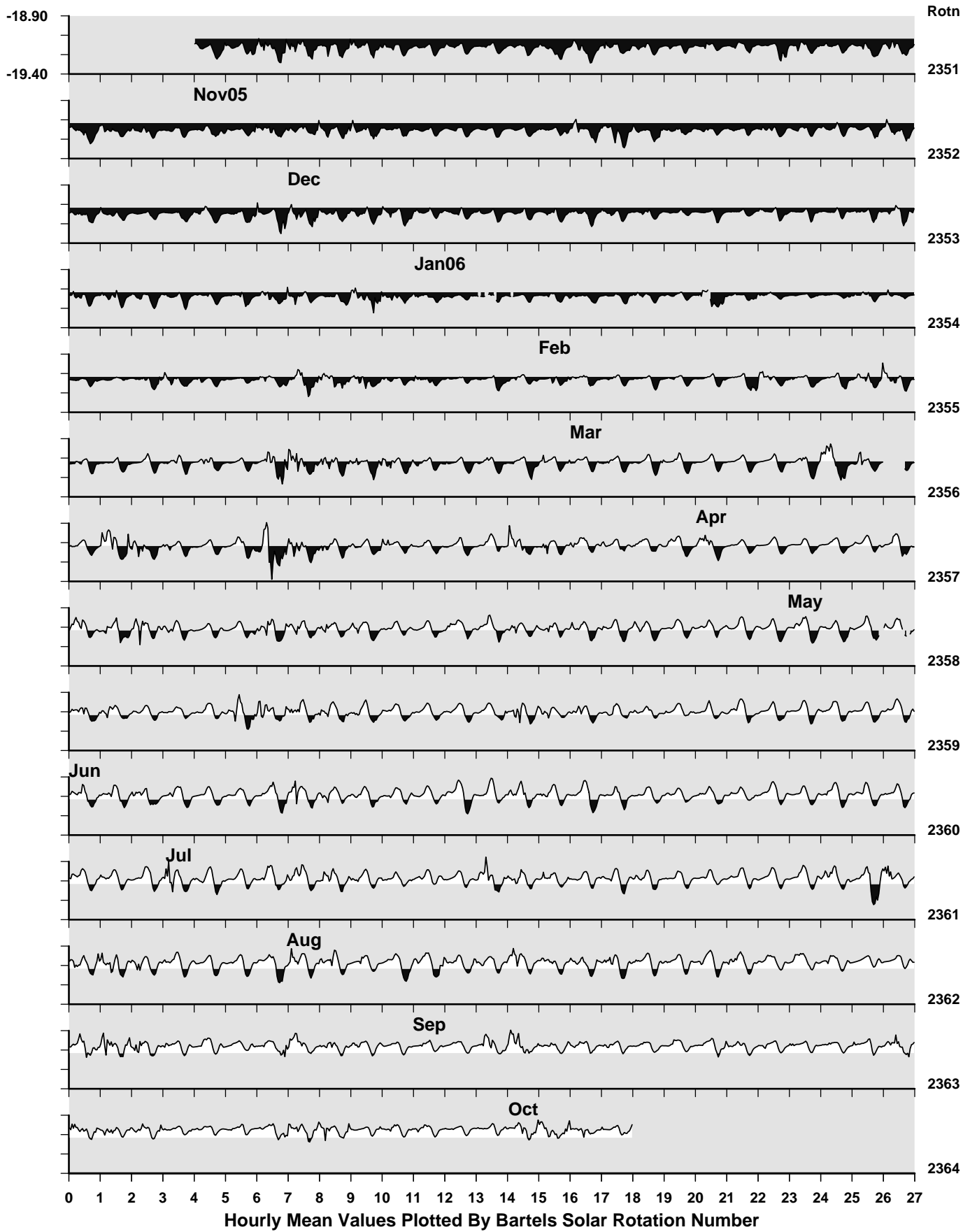
Date: 31-10-2006

# Sable Island

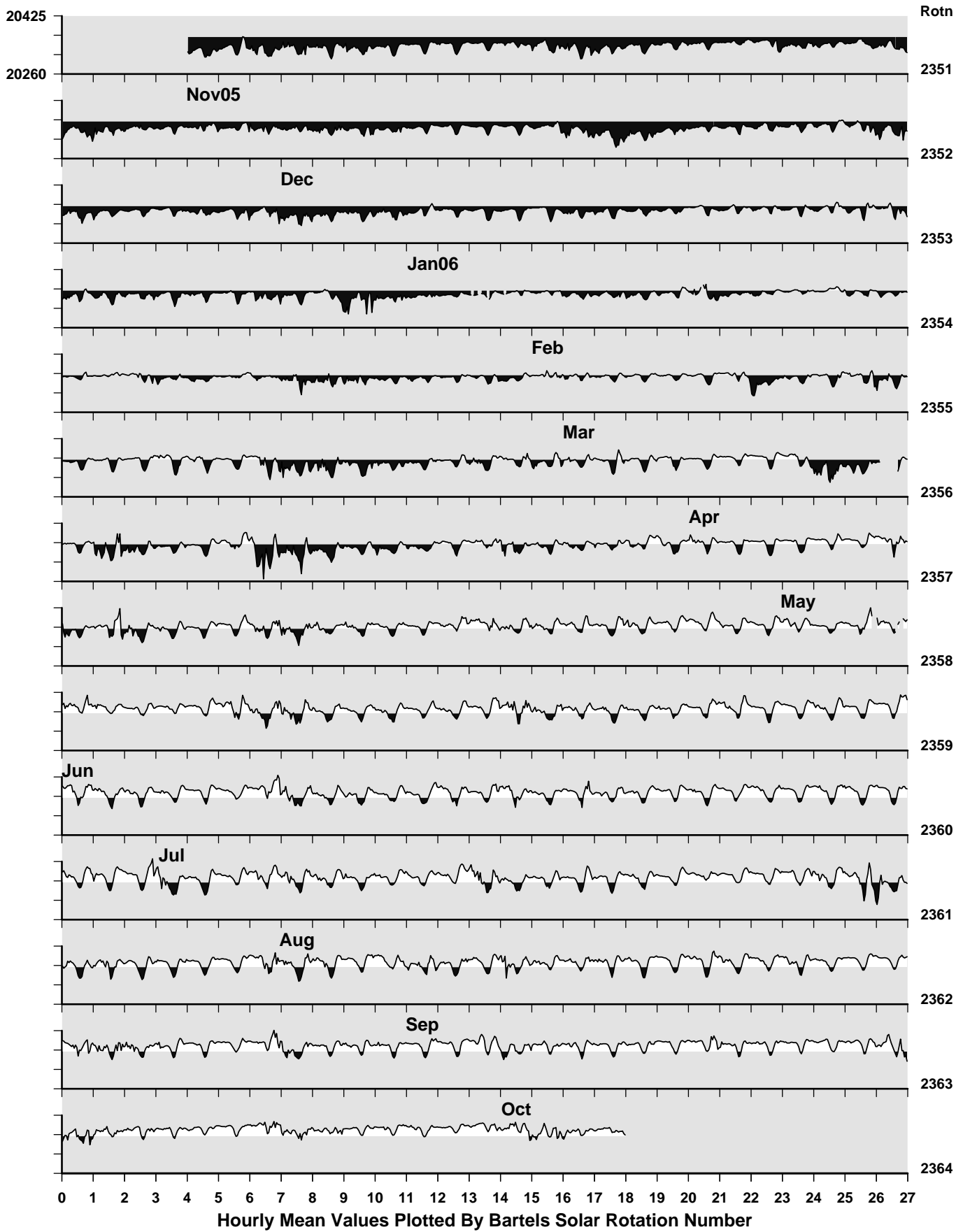
Day number: 304



# Sable Island Observatory: Declination (degrees)

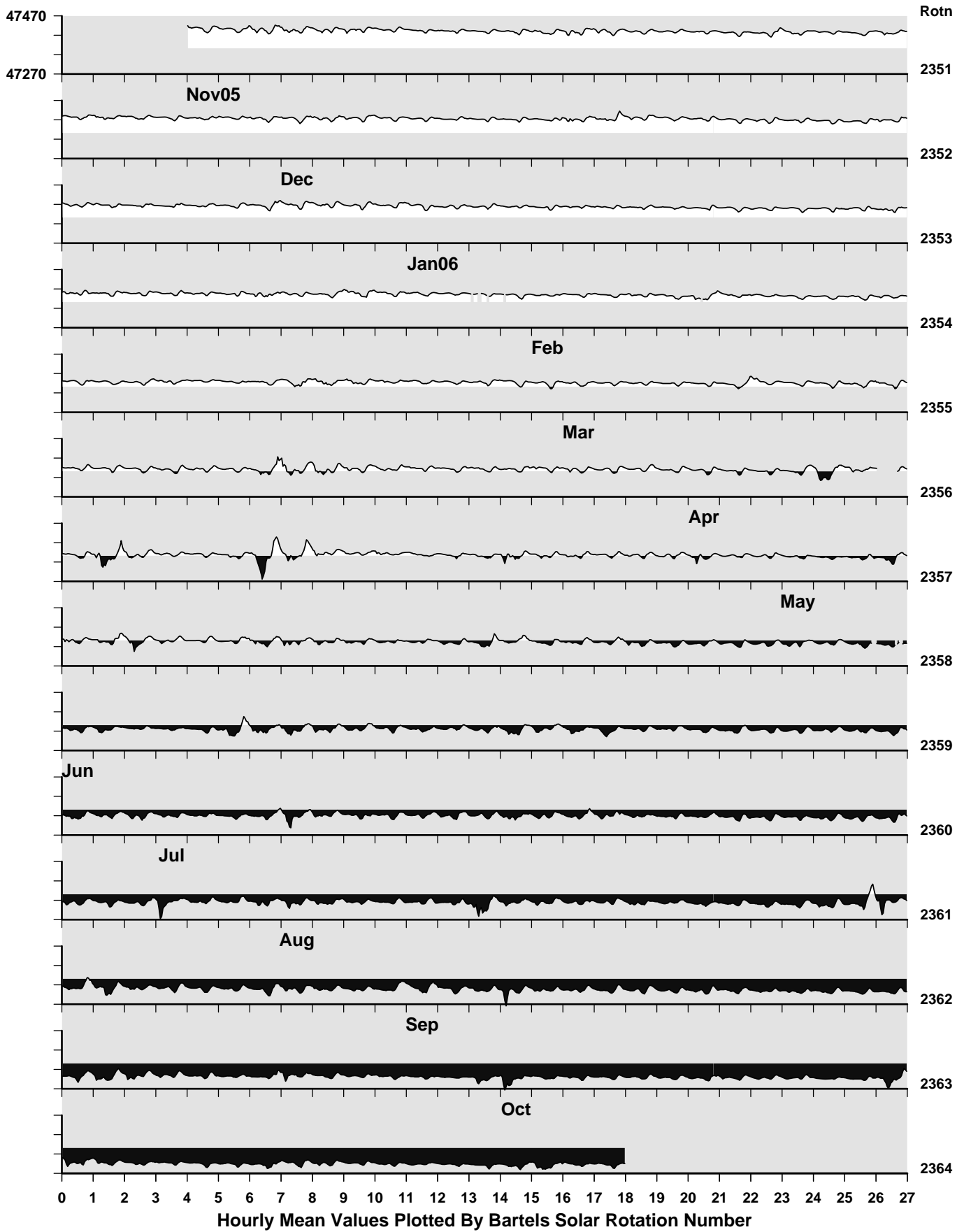


# Sable Island Observatory: Horizontal Intensity (nT)



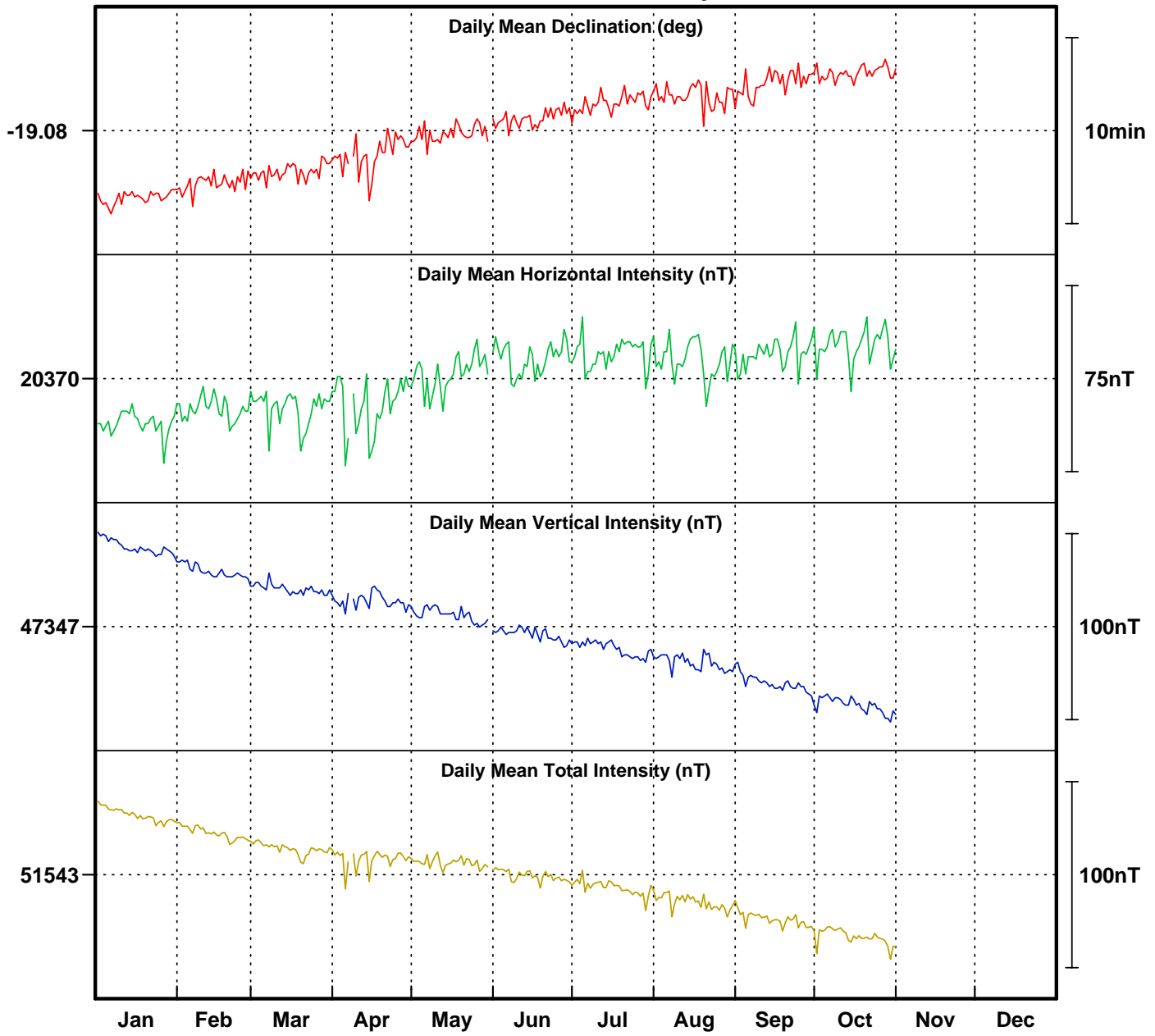
Hourly Mean Values Plotted By Bartels Solar Rotation Number

# Sable Island Observatory: Vertical Intensity (nT)



Hourly Mean Values Plotted By Bartels Solar Rotation Number

# Sable Island Observatory 2006





### Monthly Mean Values for Sable Island Observatory 2006

Month	<i>D</i>	<i>H</i>	<i>I</i>	<i>X</i>	<i>Y</i>	<i>Z</i>	<i>F</i>
January	-19° 8.4′	20352 nT	66° 45.5′	19227 nT	-6673 nT	47390 nT	51575 nT
February	-19° 7.6′	20358 nT	66° 44.8′	19234 nT	-6671 nT	47377 nT	51565 nT
March	-19° 7.0′	20358 nT	66° 44.5′	19236 nT	-6667 nT	47367 nT	51557 nT
April	-19° 6.1′	20359 nT	66° 44.3′	19238 nT	-6662 nT	47361 nT	51551 nT
May	-19° 5.0′	20372 nT	66° 43.3′	19253 nT	-6660 nT	47353 nT	51550 nT
June	-19° 4.2′	20378 nT	66° 42.7′	19260 nT	-6658 nT	47343 nT	51542 nT
July	-19° 3.3′	20380 nT	66° 42.3′	19264 nT	-6654 nT	47335 nT	51536 nT
August	-19° 3.0′	20378 nT	66° 42.3′	19262 nT	-6651 nT	47328 nT	51528 nT
September	-19° 2.2′	20380 nT	66° 41.8′	19266 nT	-6648 nT	47316 nT	51519 nT
October	-19° 1.7′	20383 nT	66° 41.3′	19270 nT	-6646 nT	47305 nT	51510 nT

#### Note

i. The values shown here are provisional.