BRITISH GEOLOGICAL SURVEY

Sable Island Observatory *Monthly Magnetic Bulletin*

January 2006

06/01/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 8th 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
Murchison House, West Mains Road
Edinburgh EH9 3LA
Scotland, UK

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Fax:	+44 (0) 131 668 4368
E-mail:	o.baillie@bgs.ac.uk
Internet:	*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° 55.9′N*	*299°0.4′E*
Geomagnetic*:*	*53° 02.4′N*	*13°07.7′E*
Height above mean sea level:	*5m (approx)*	

The geomagnetic co-ordinates are calculated using the 10th 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 13th 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.

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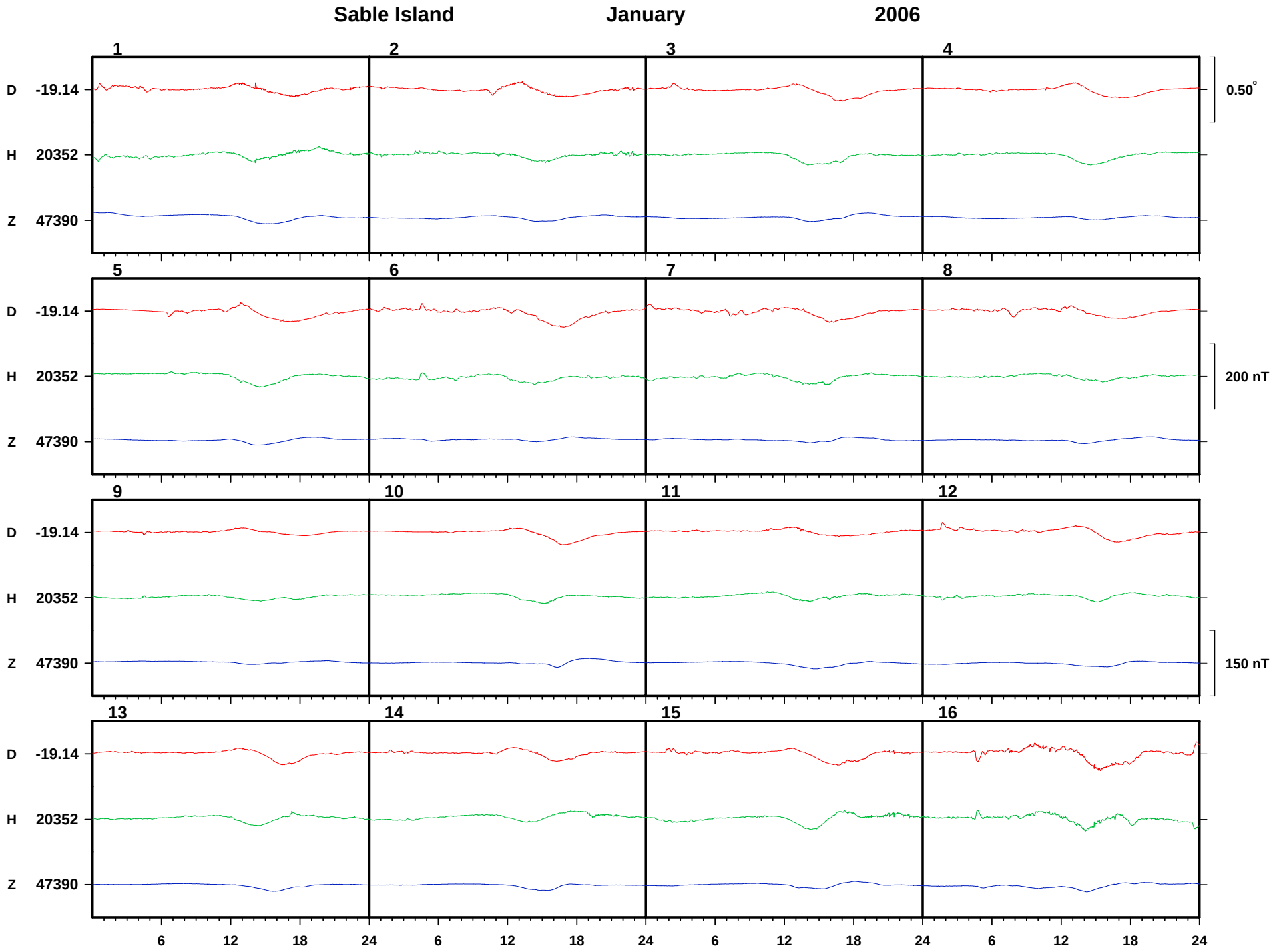
Sable Island
January
2006
1
2
3
4
D -19.14
H 20352
Z 47390
0.50°
5
6
7
8
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150 nT
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16
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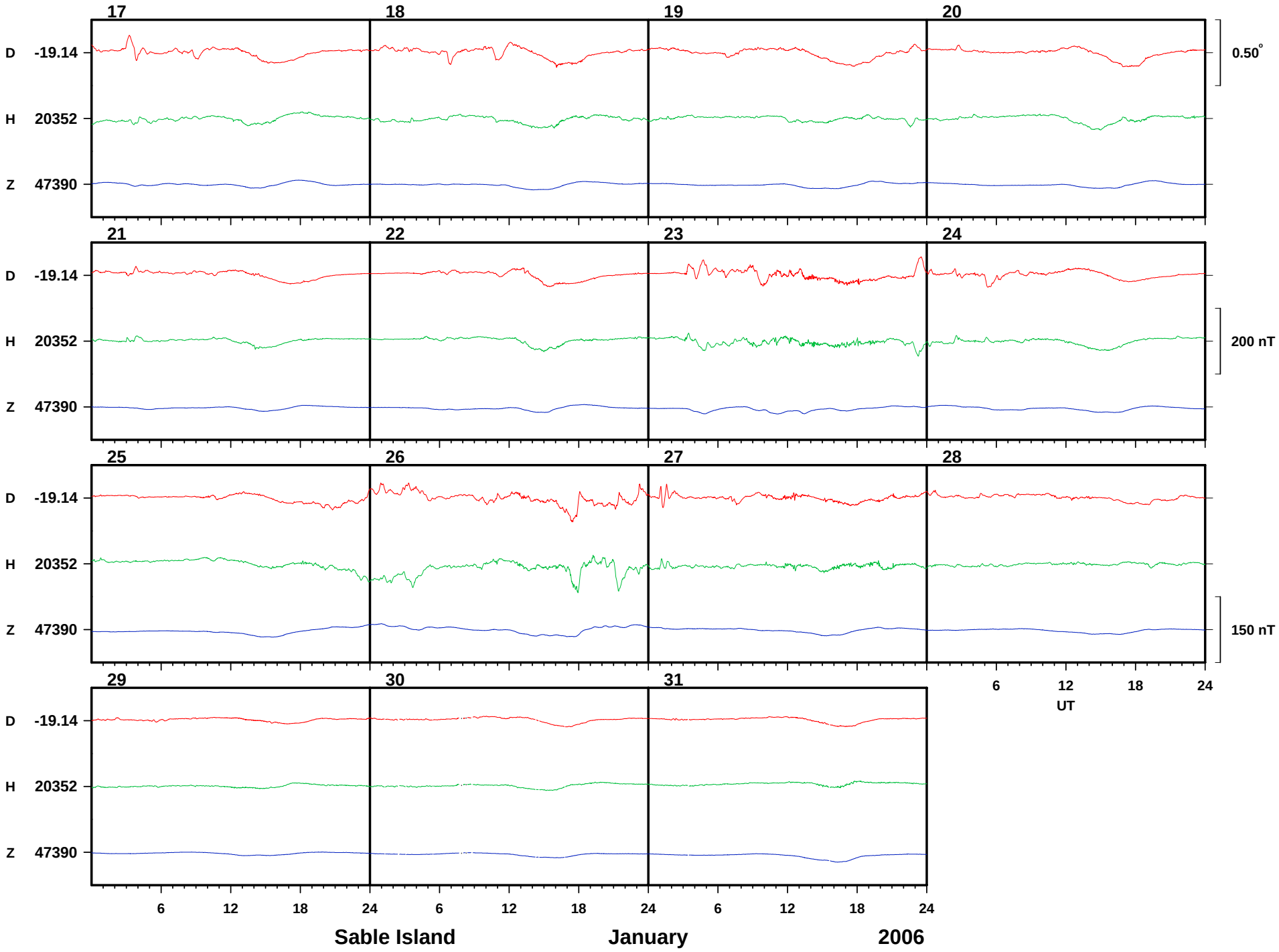
18
24


17
18
19
20
D -19.14
H 20352
Z 47390
0.50°
21
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24
200 nT
25
26
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28
150 nT
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31
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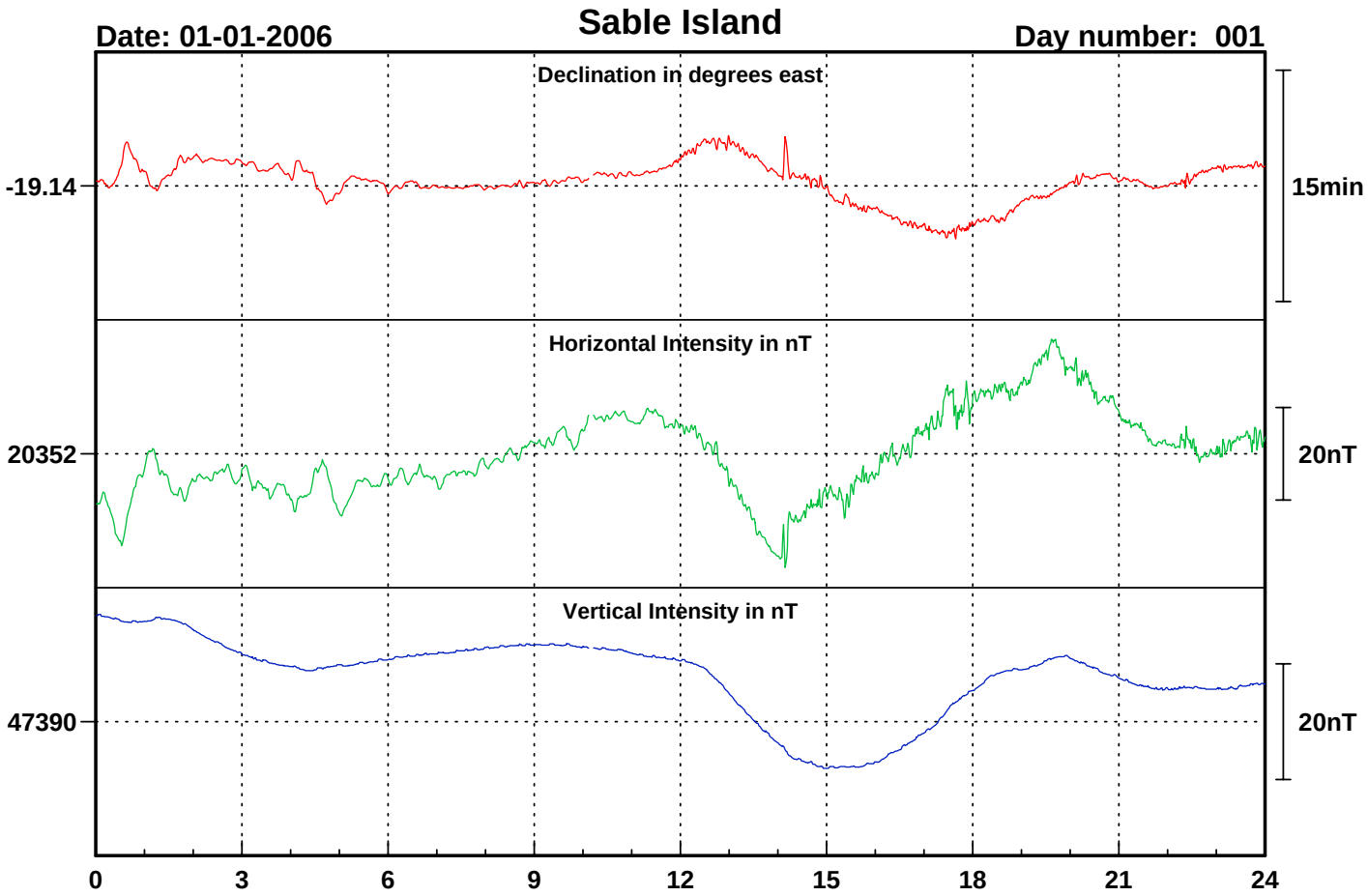
18
24
UT
Sable Island
January
2006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15min
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20nT
Vertical Intensity in nT
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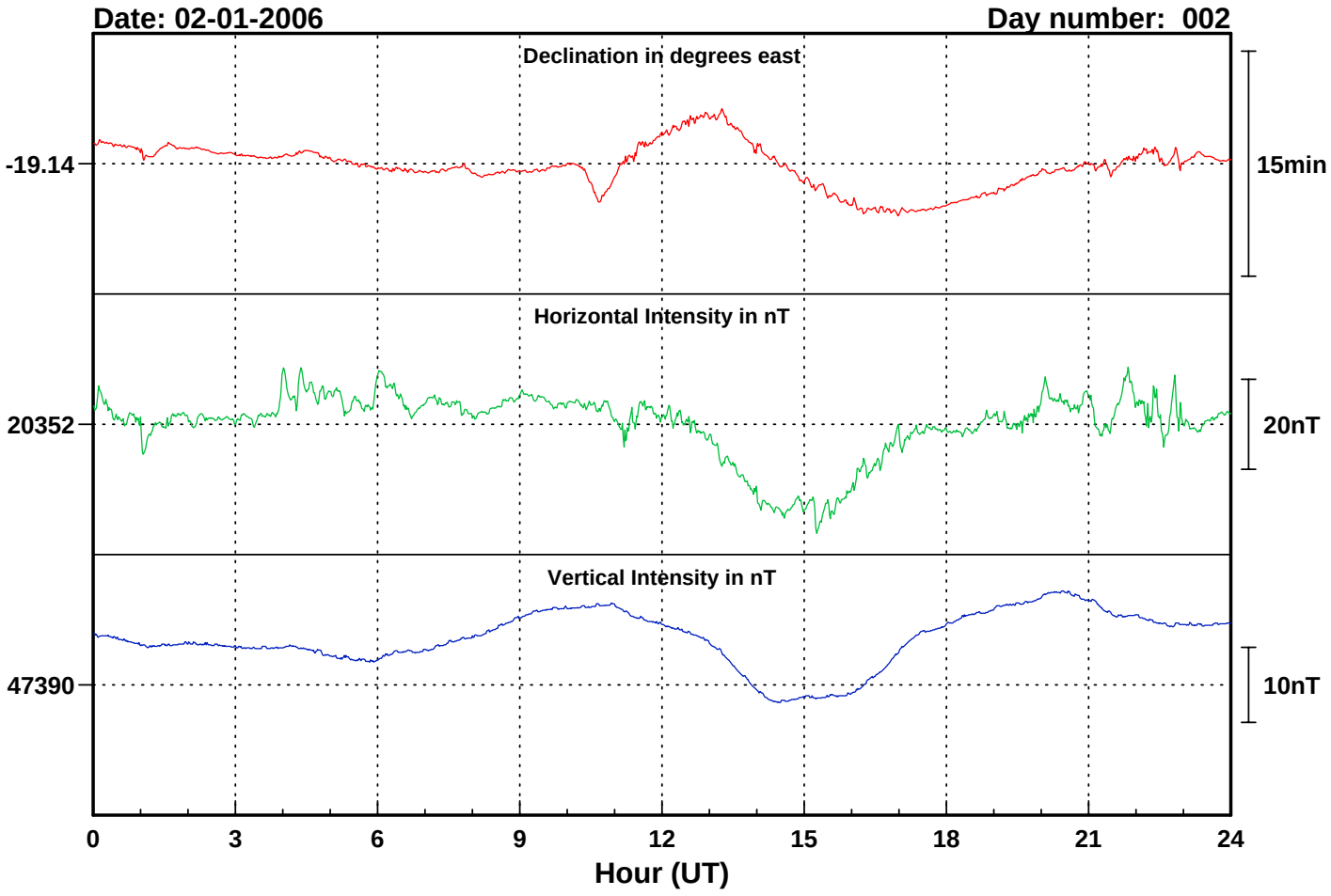
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15min
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20nT
Vertical Intensity in nT
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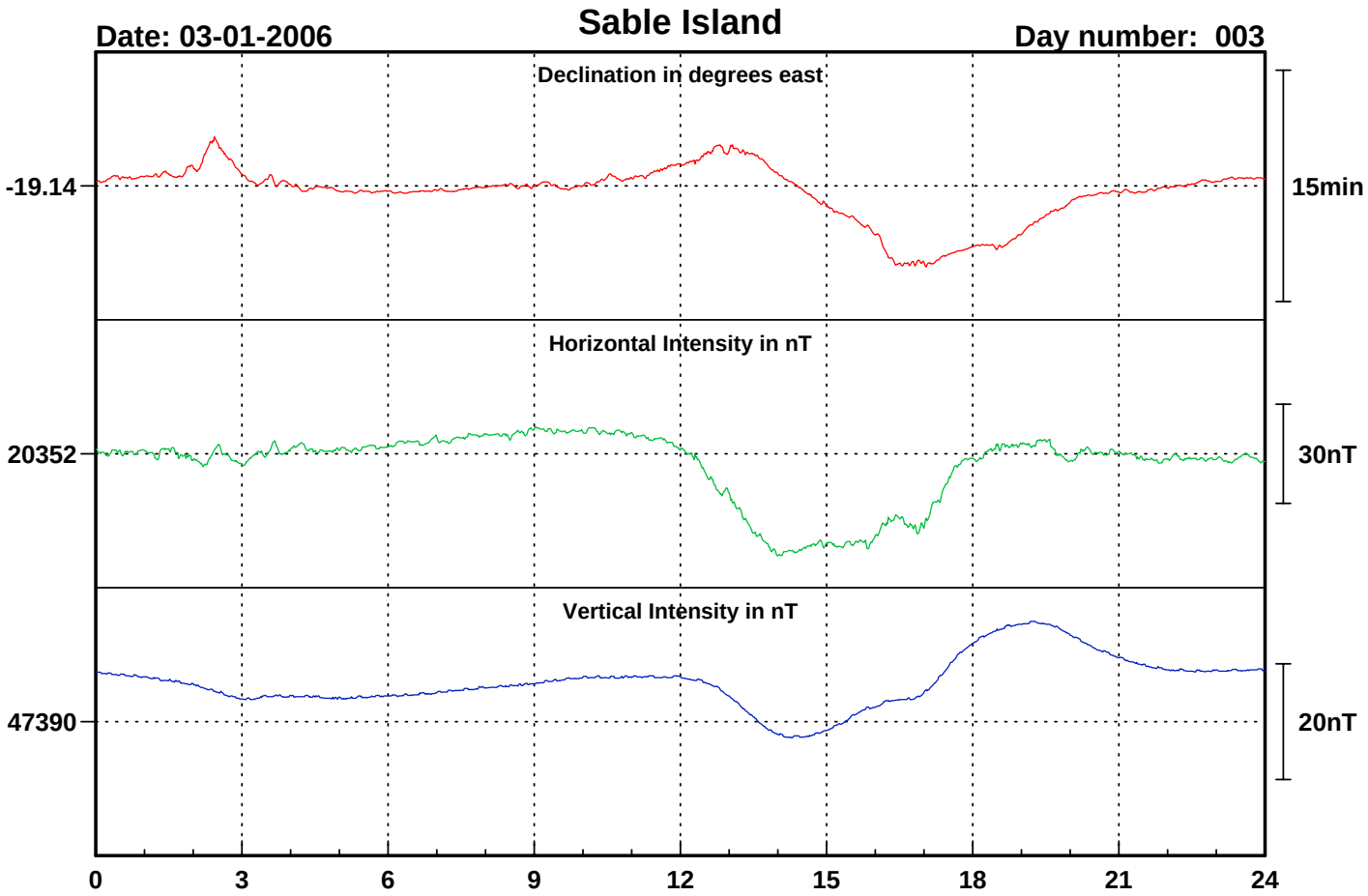
Hour (UT)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Vertical Intensity in nT
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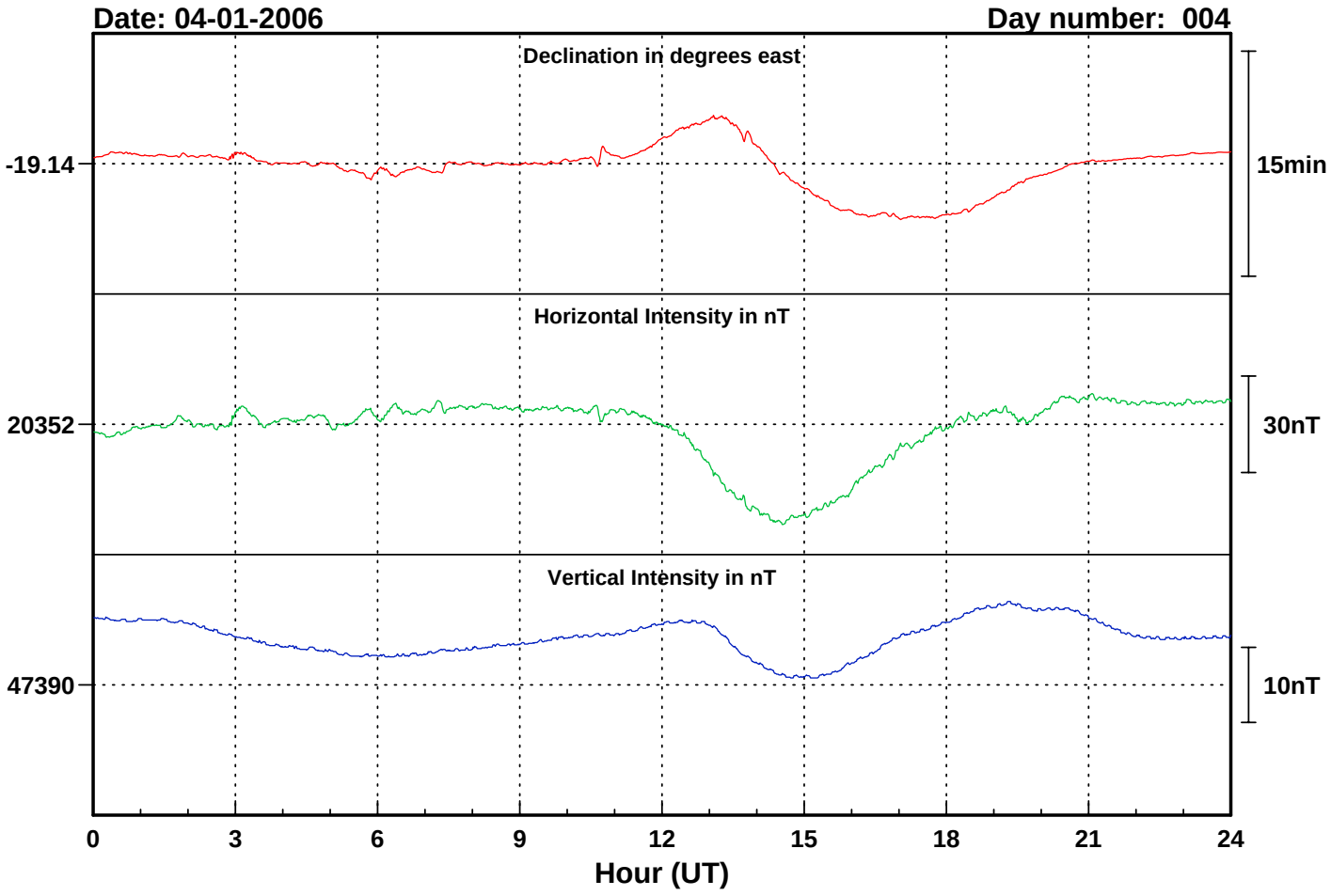
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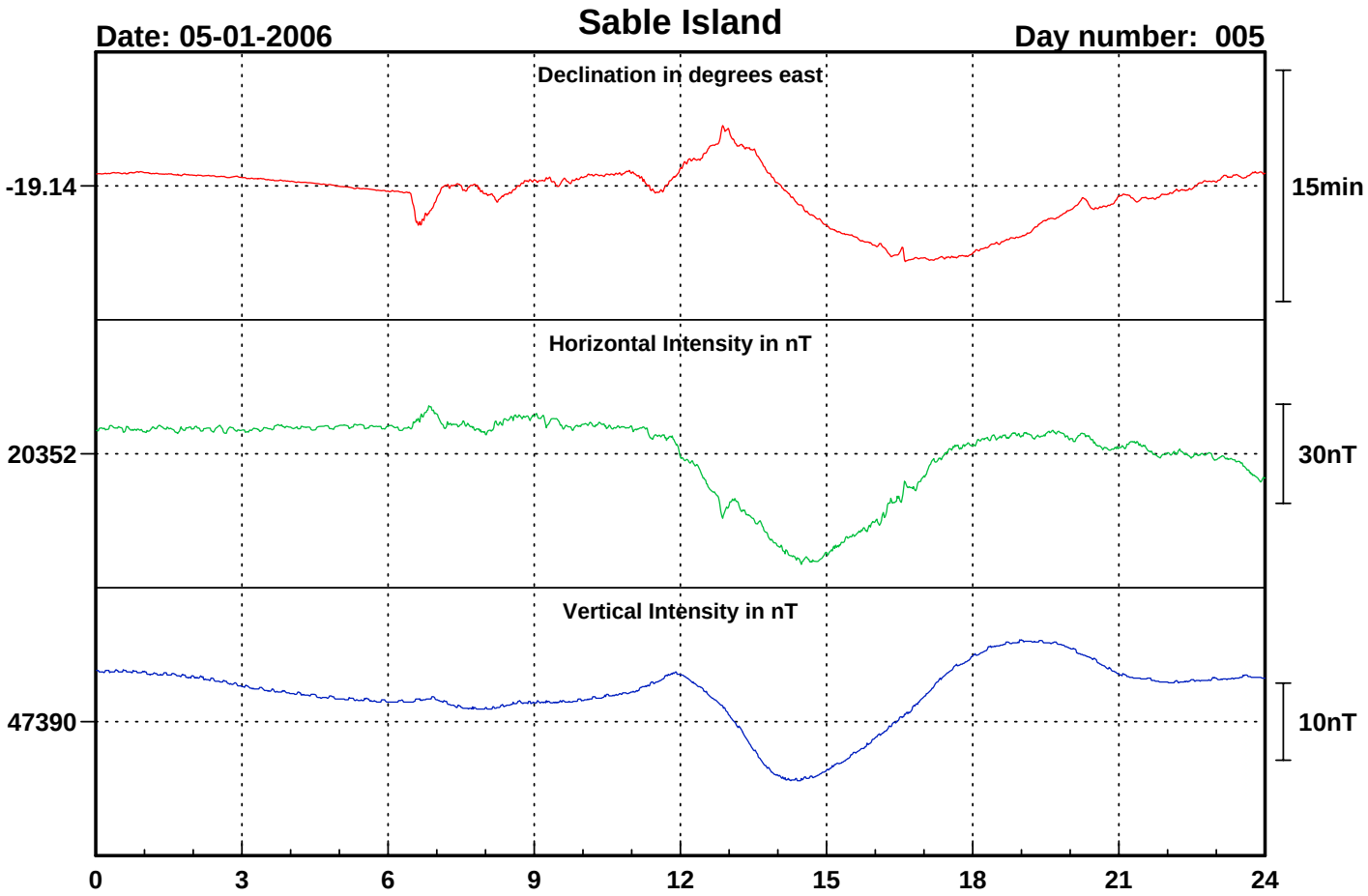
Hour (UT)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15min
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Vertical Intensity in nT
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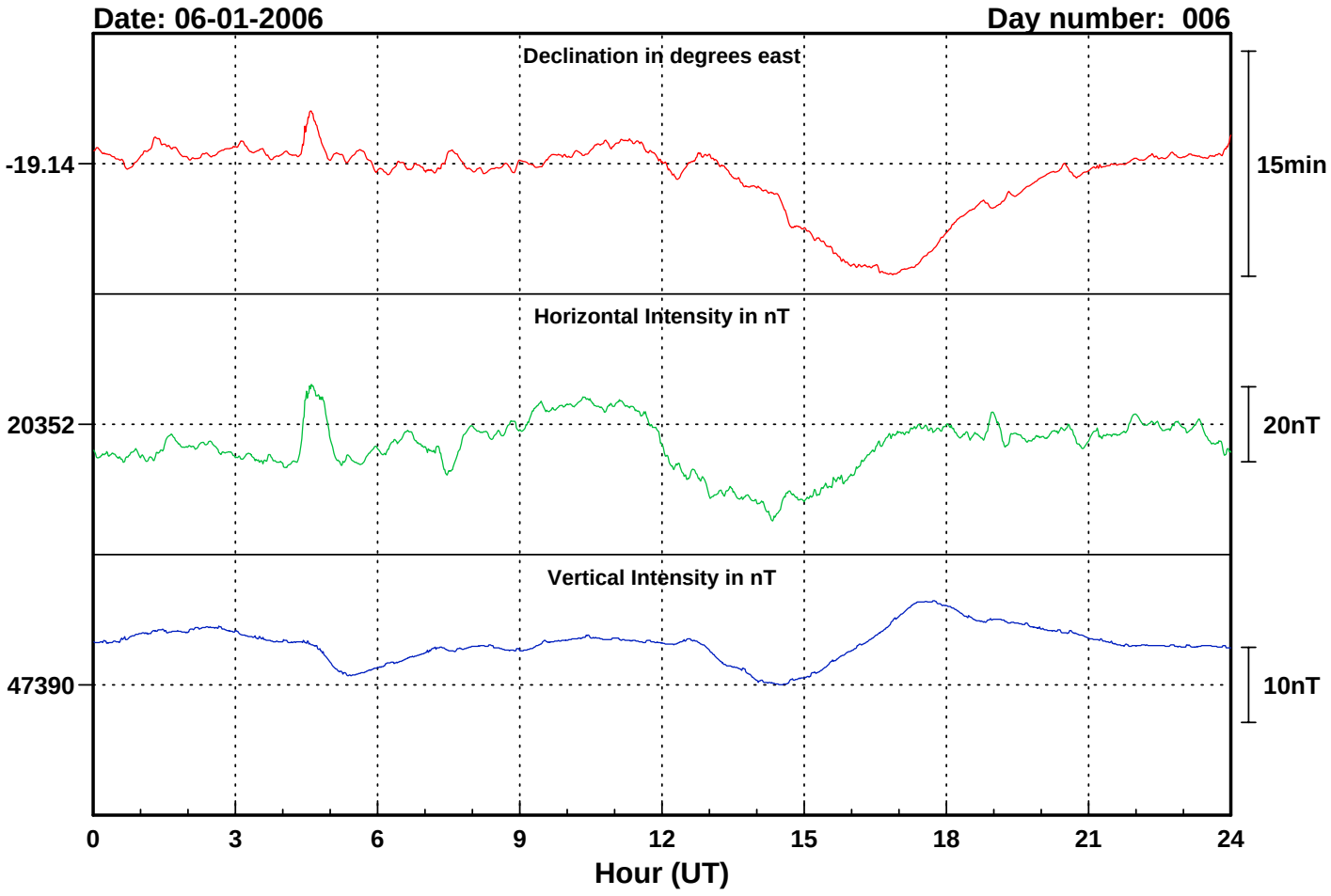
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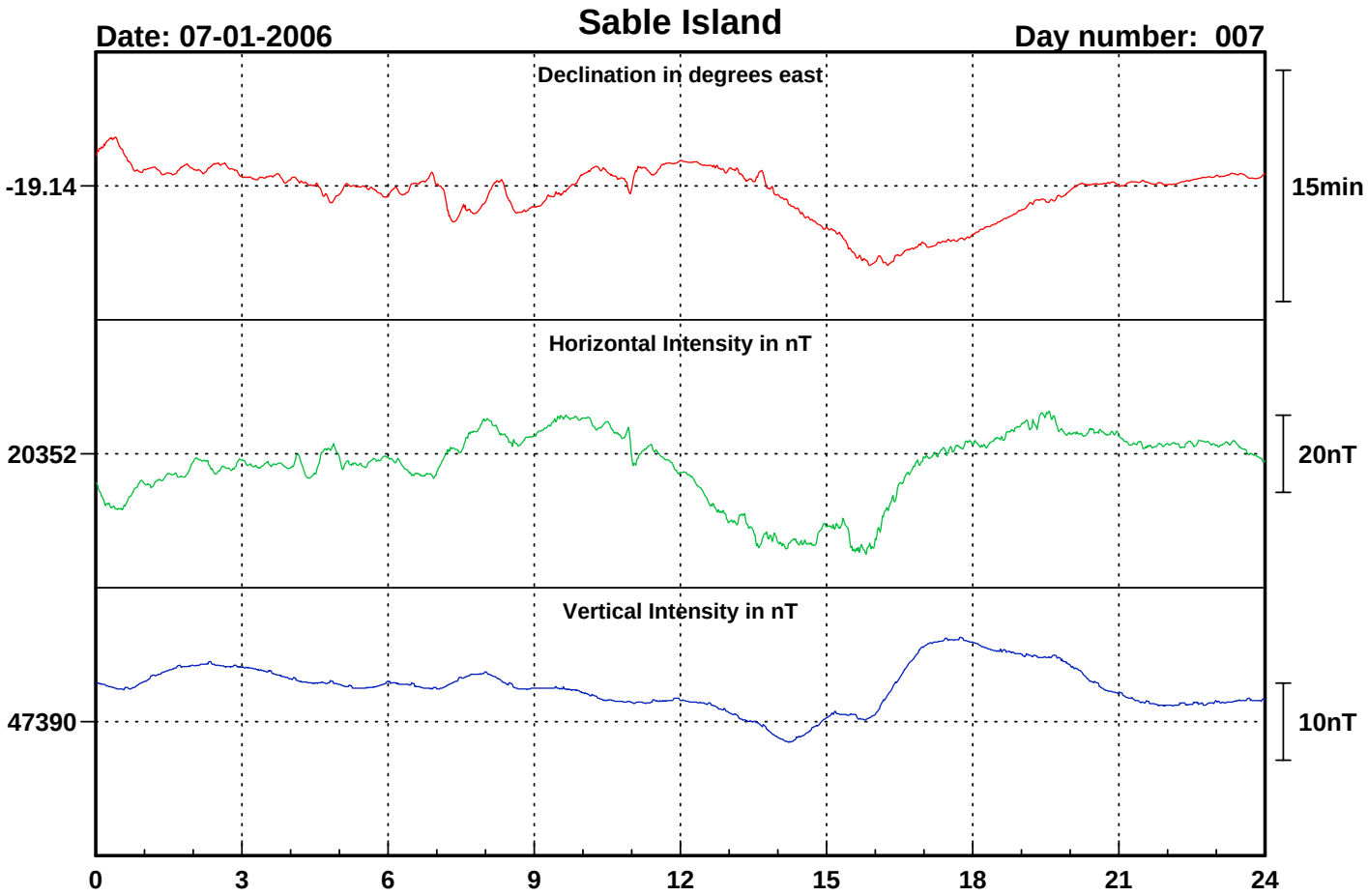
Hour (UT)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15min
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Vertical Intensity in nT
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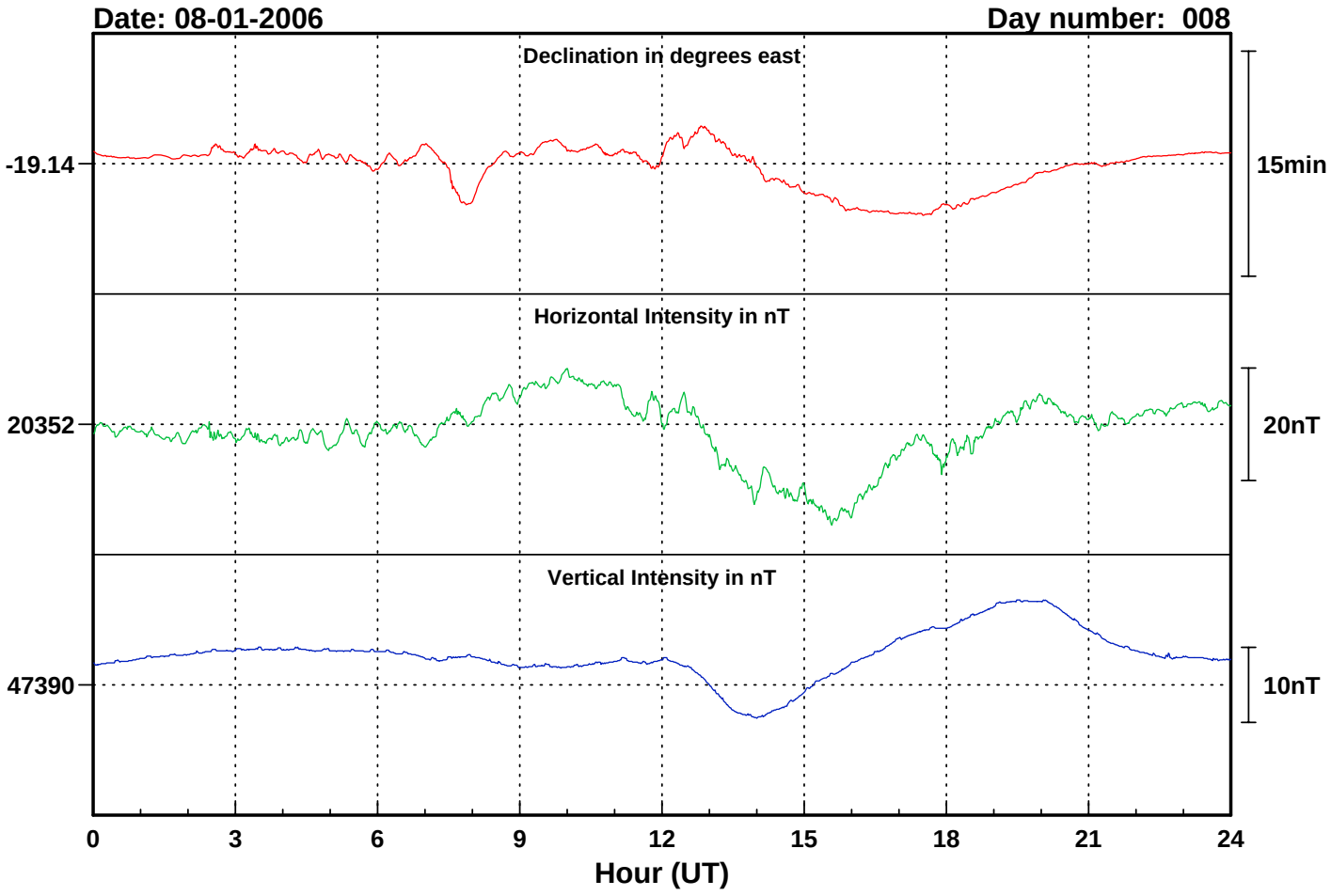
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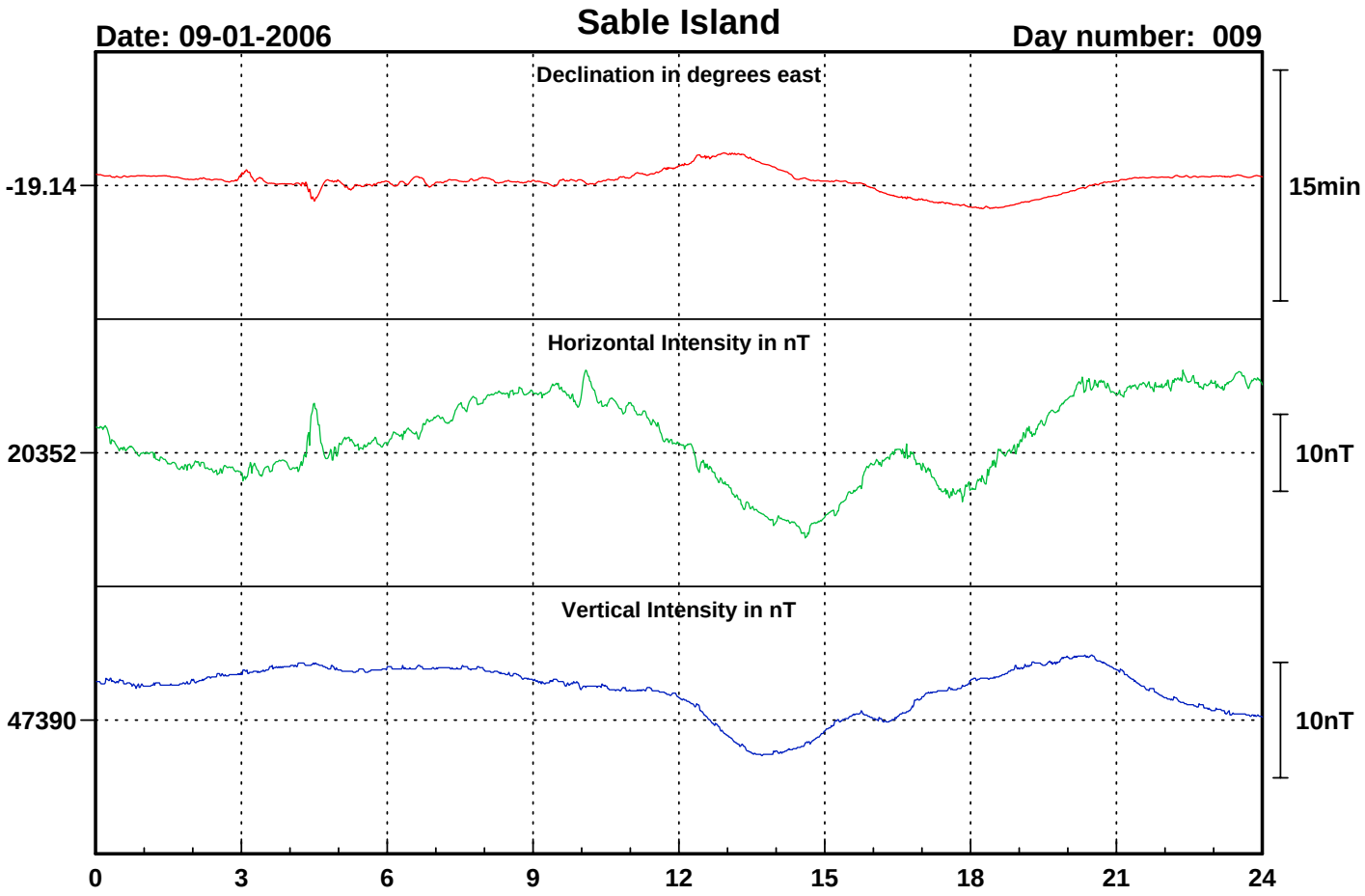
Hour (UT)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15min
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Vertical Intensity in nT
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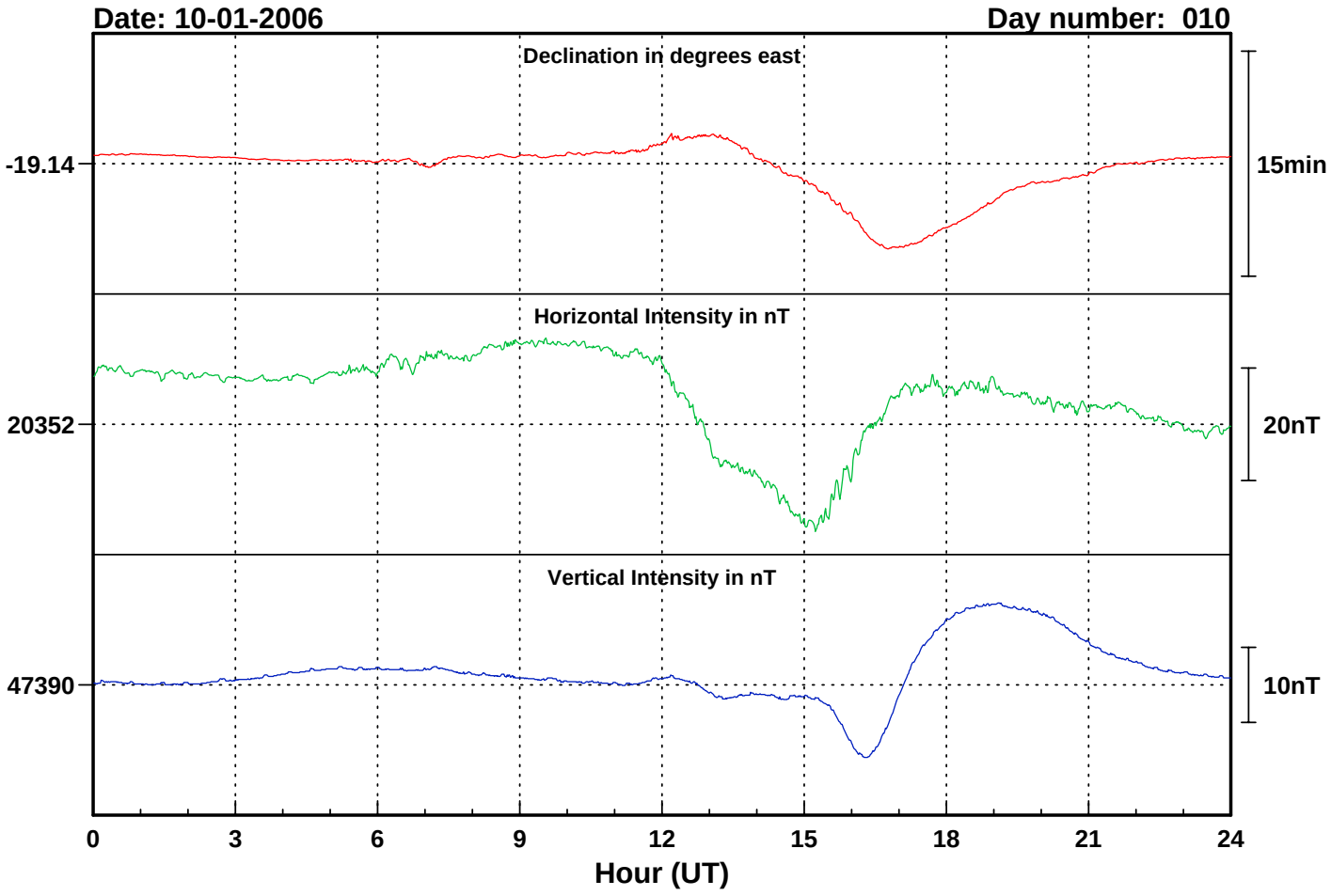
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Horizontal Intensity in nT
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Vertical Intensity in nT
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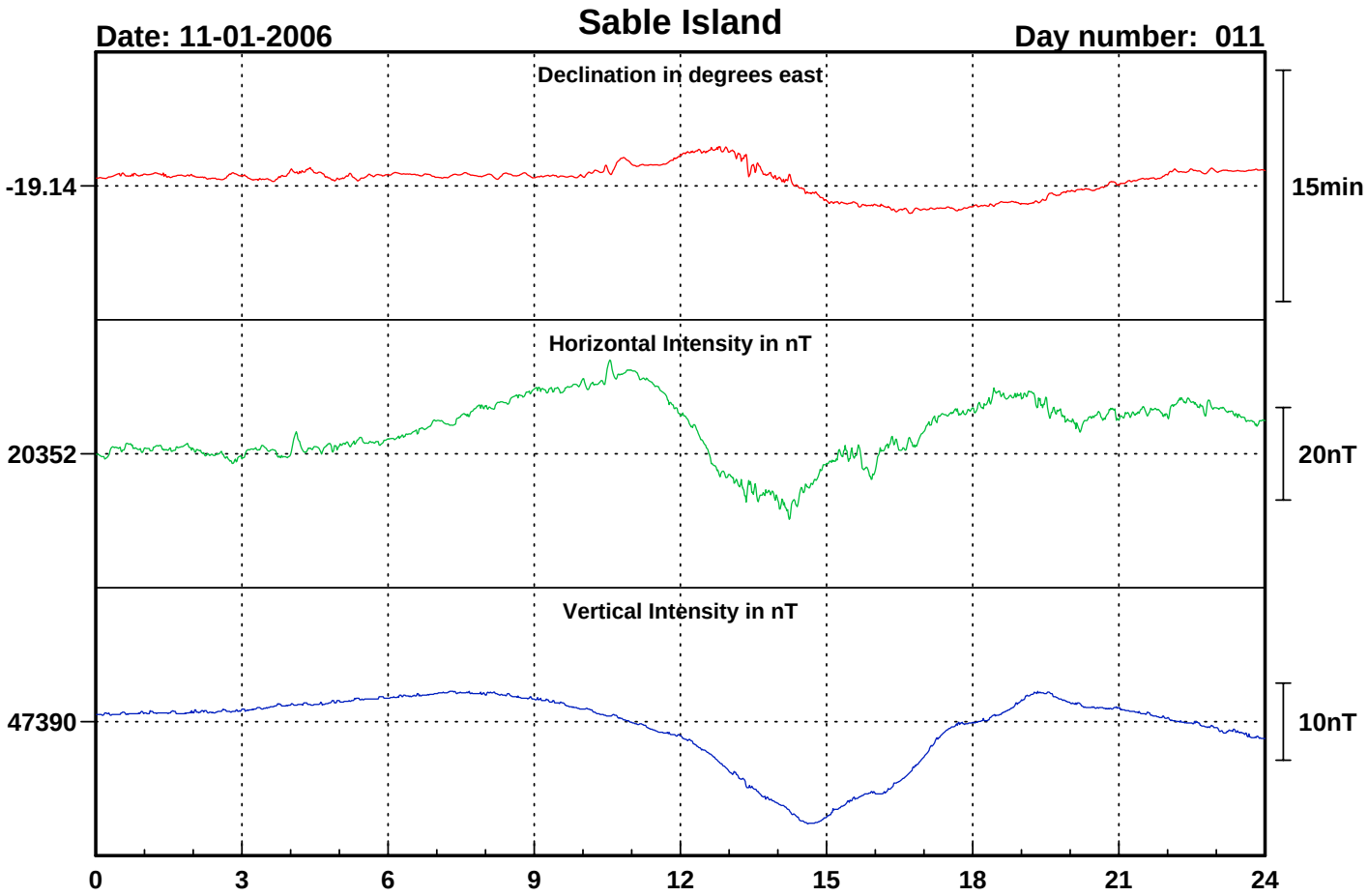
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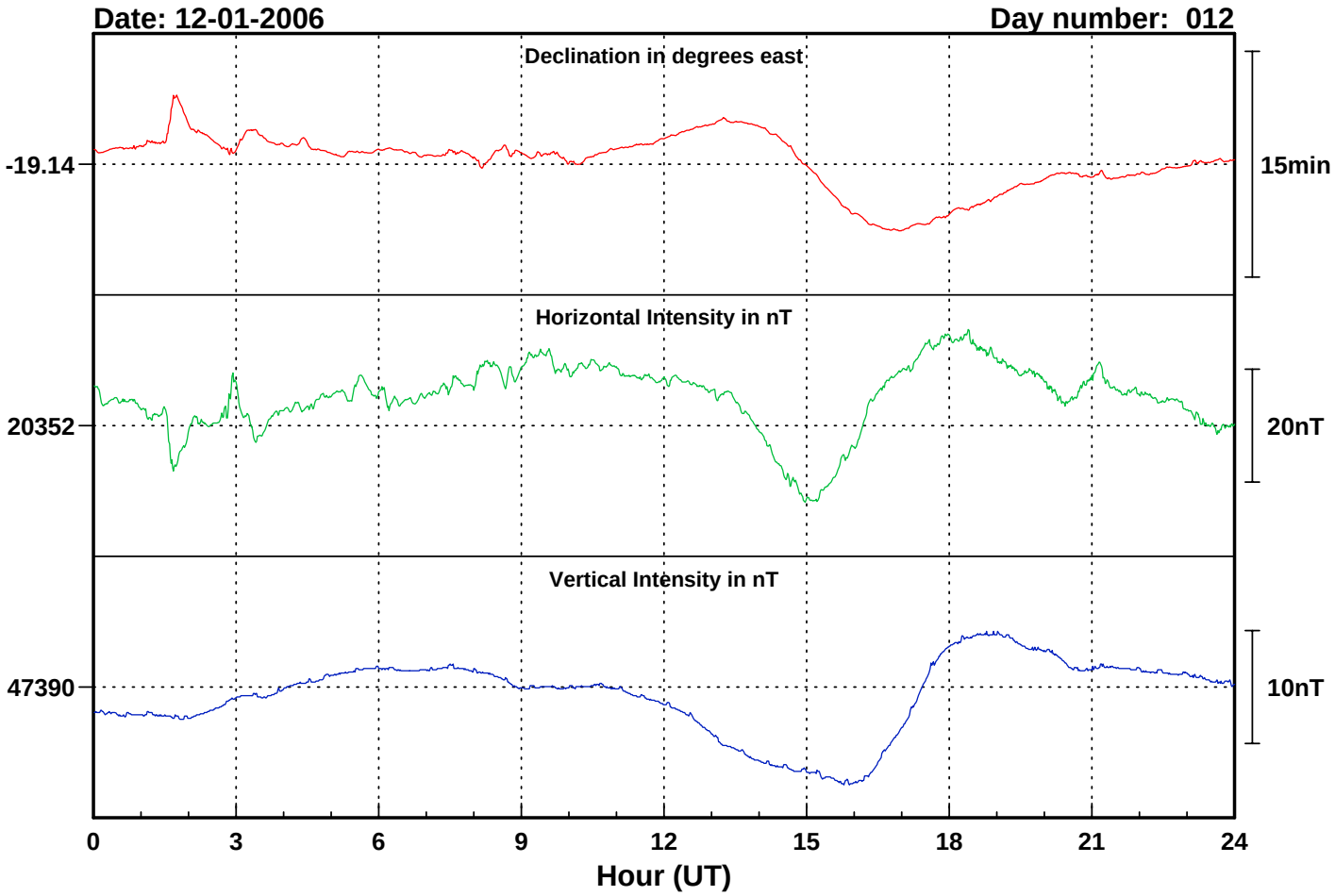
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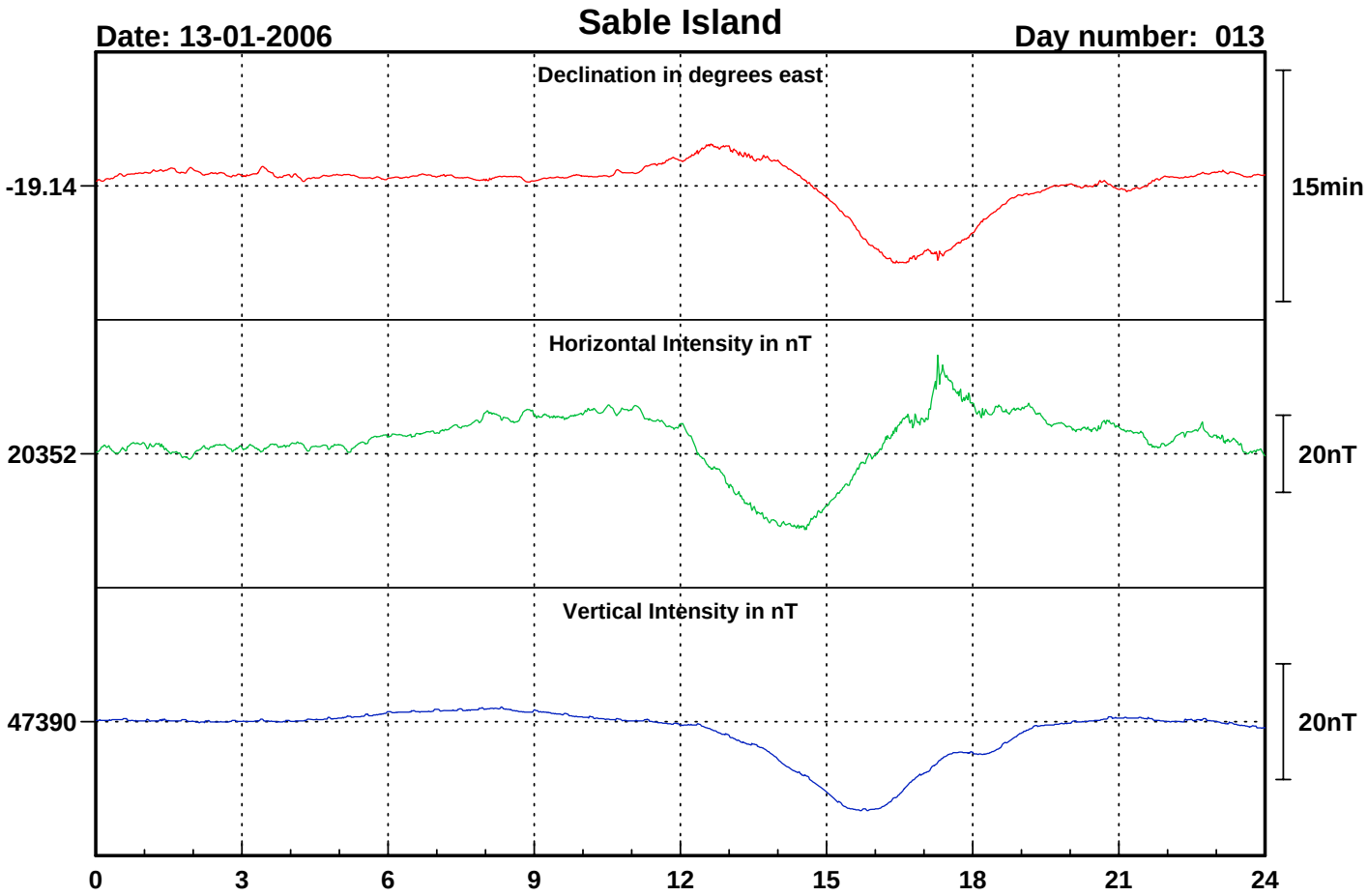
Hour (UT)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Vertical Intensity in nT
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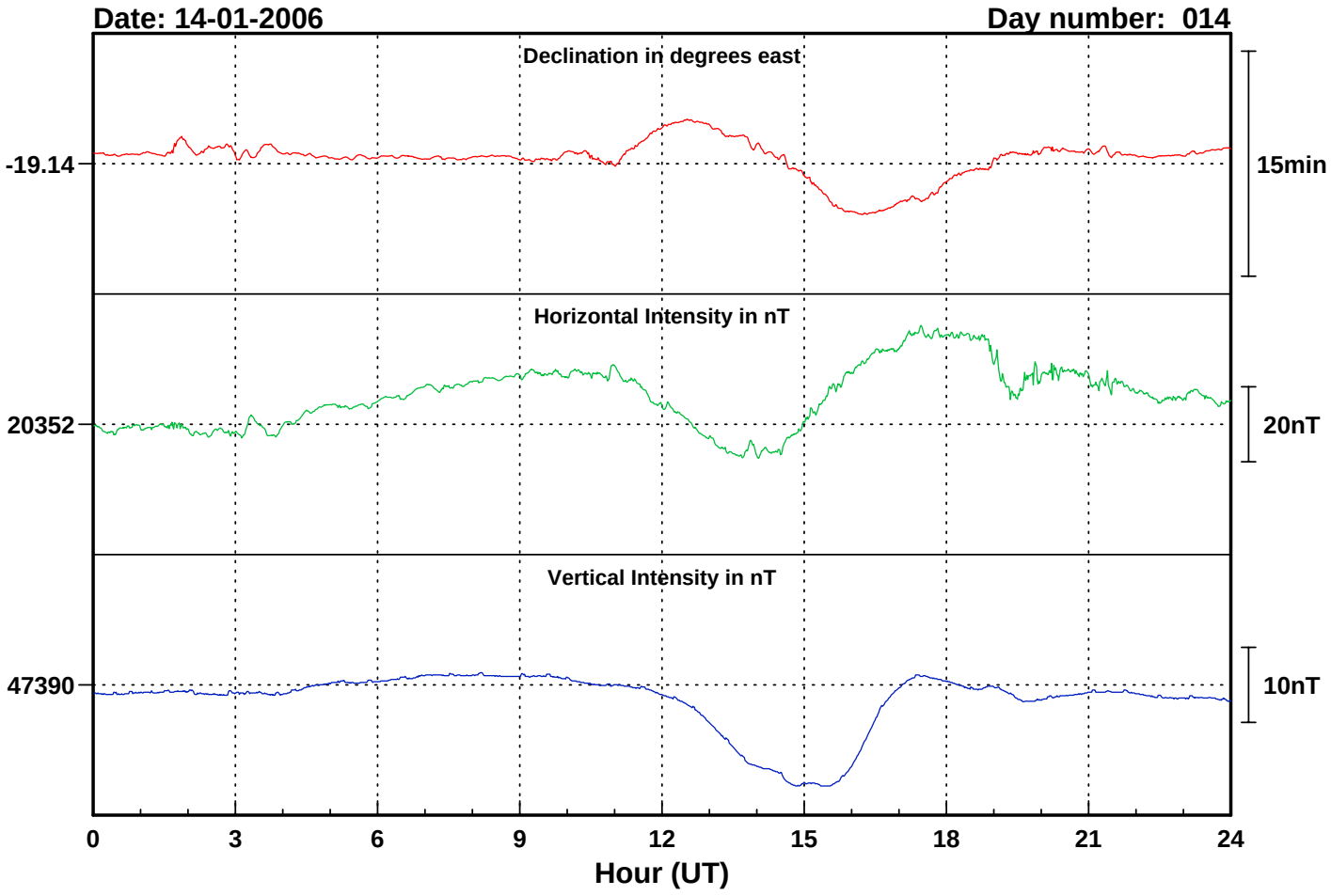
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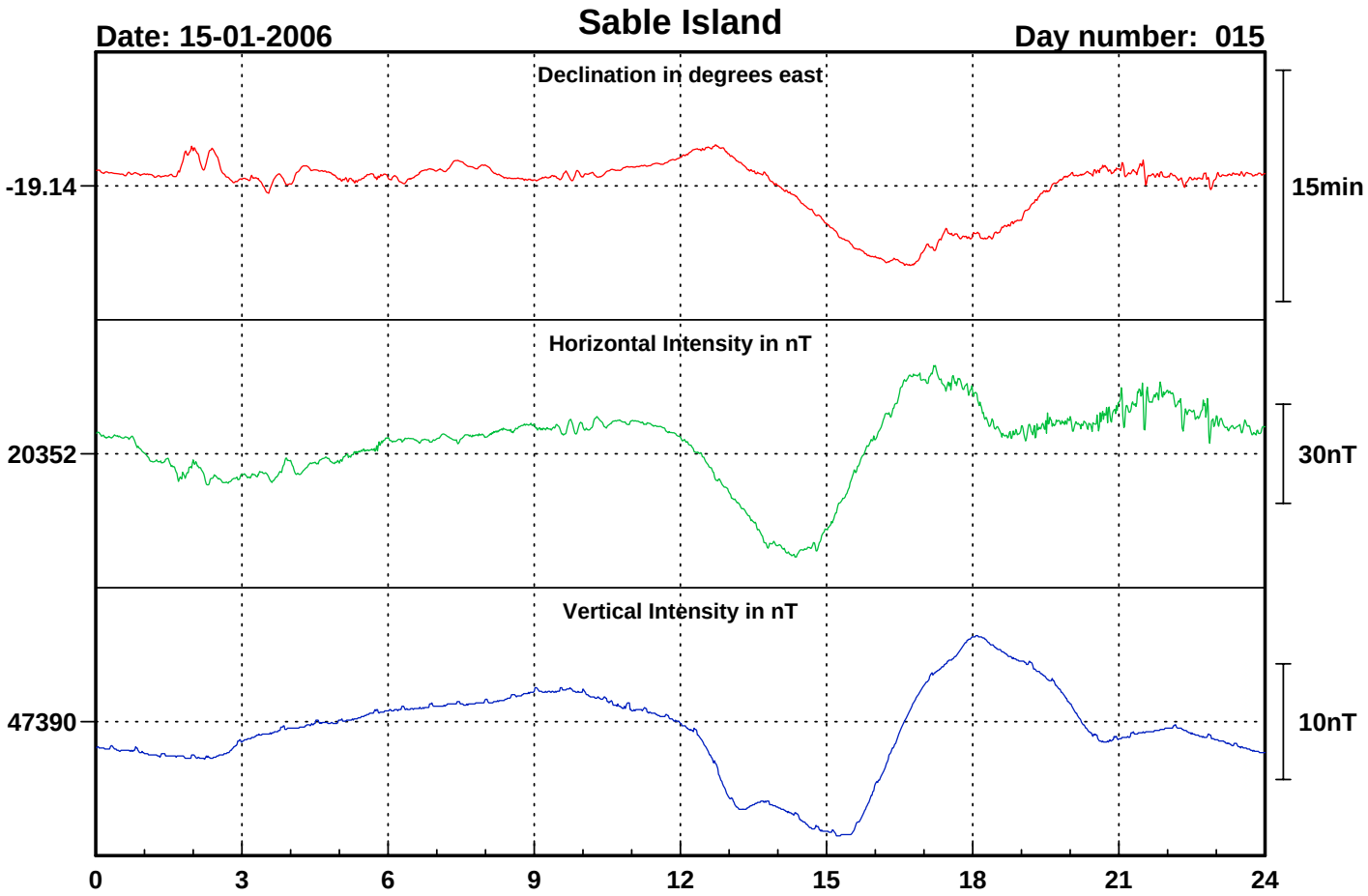
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Vertical Intensity in nT
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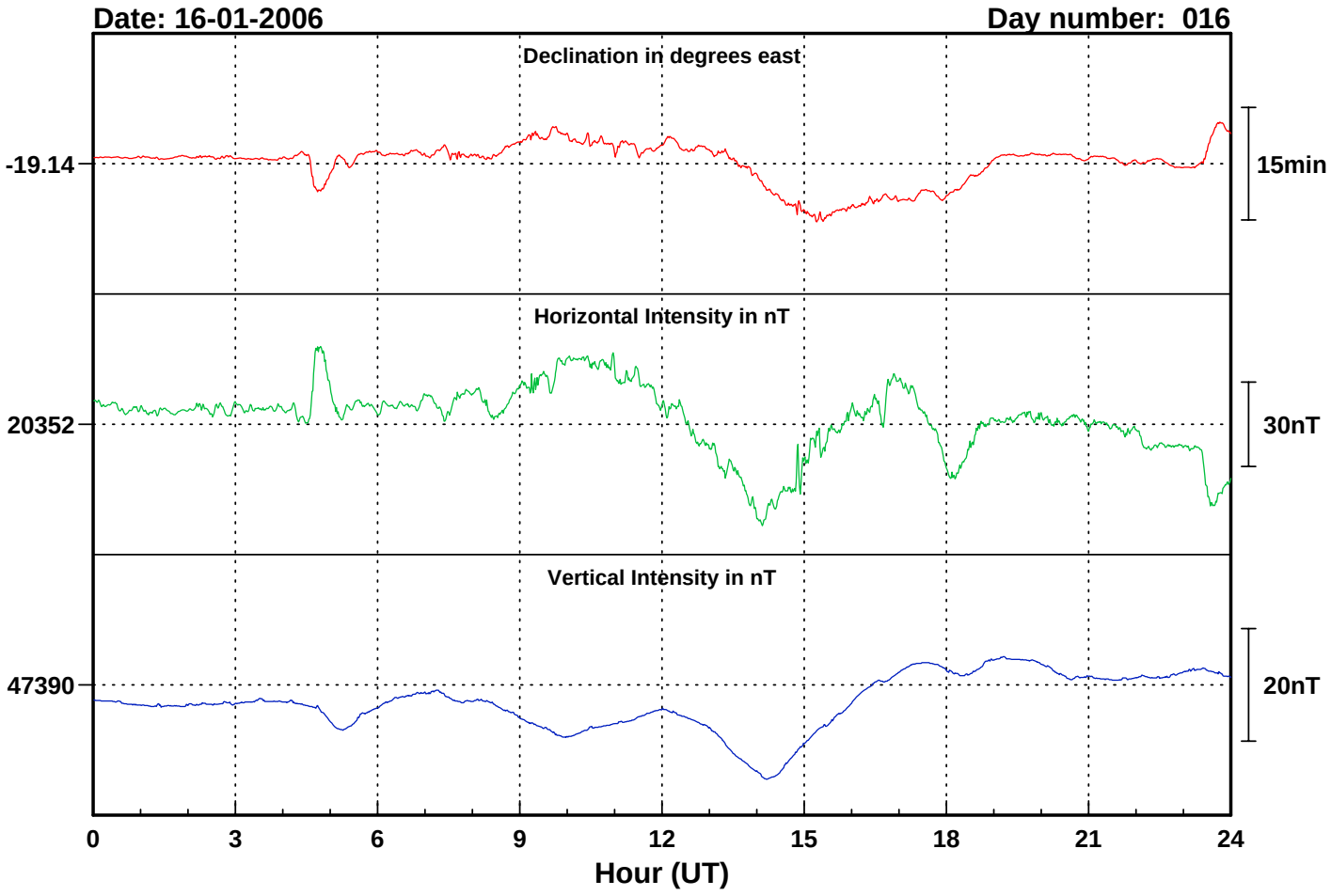
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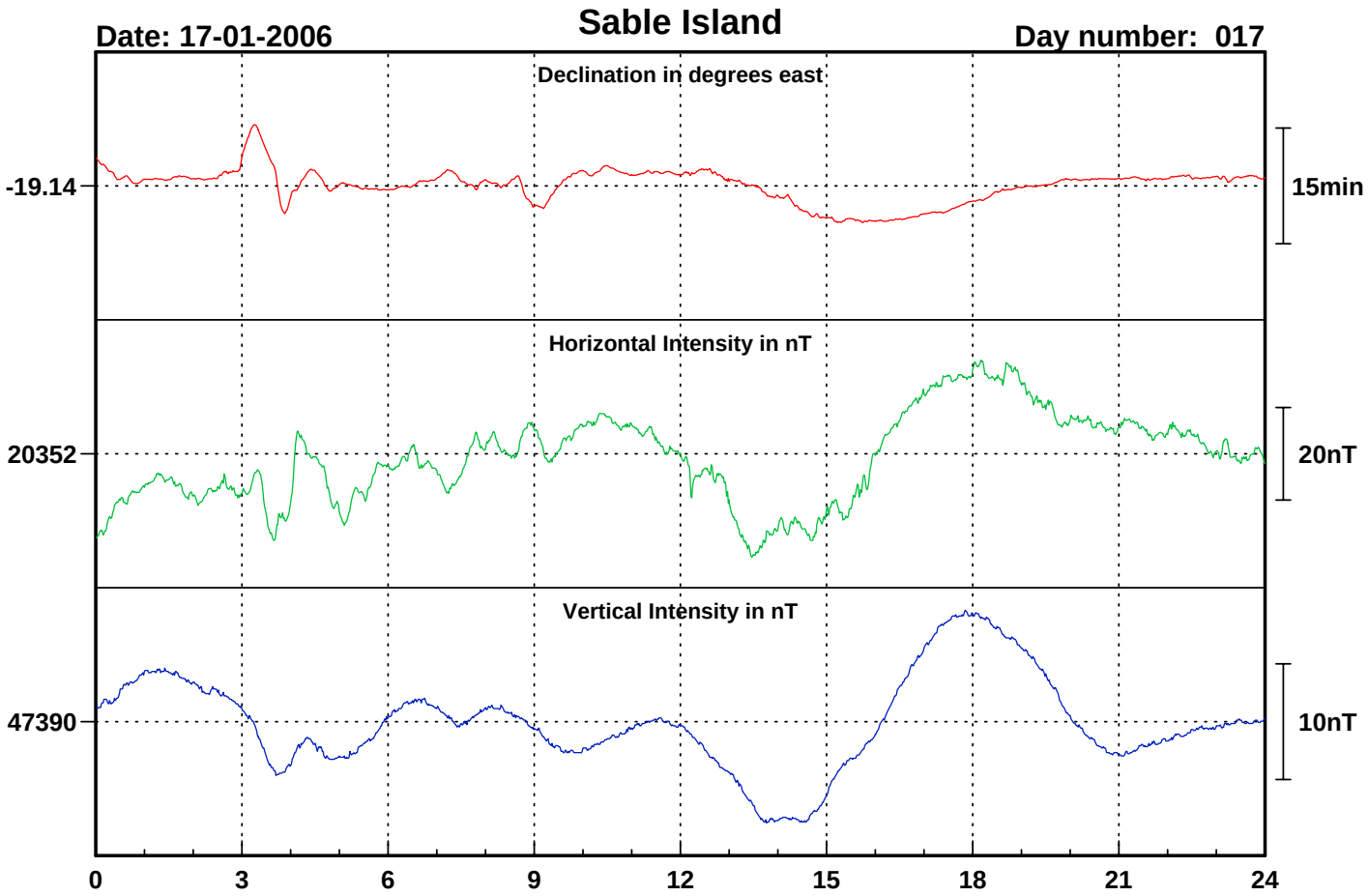
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Vertical Intensity in nT
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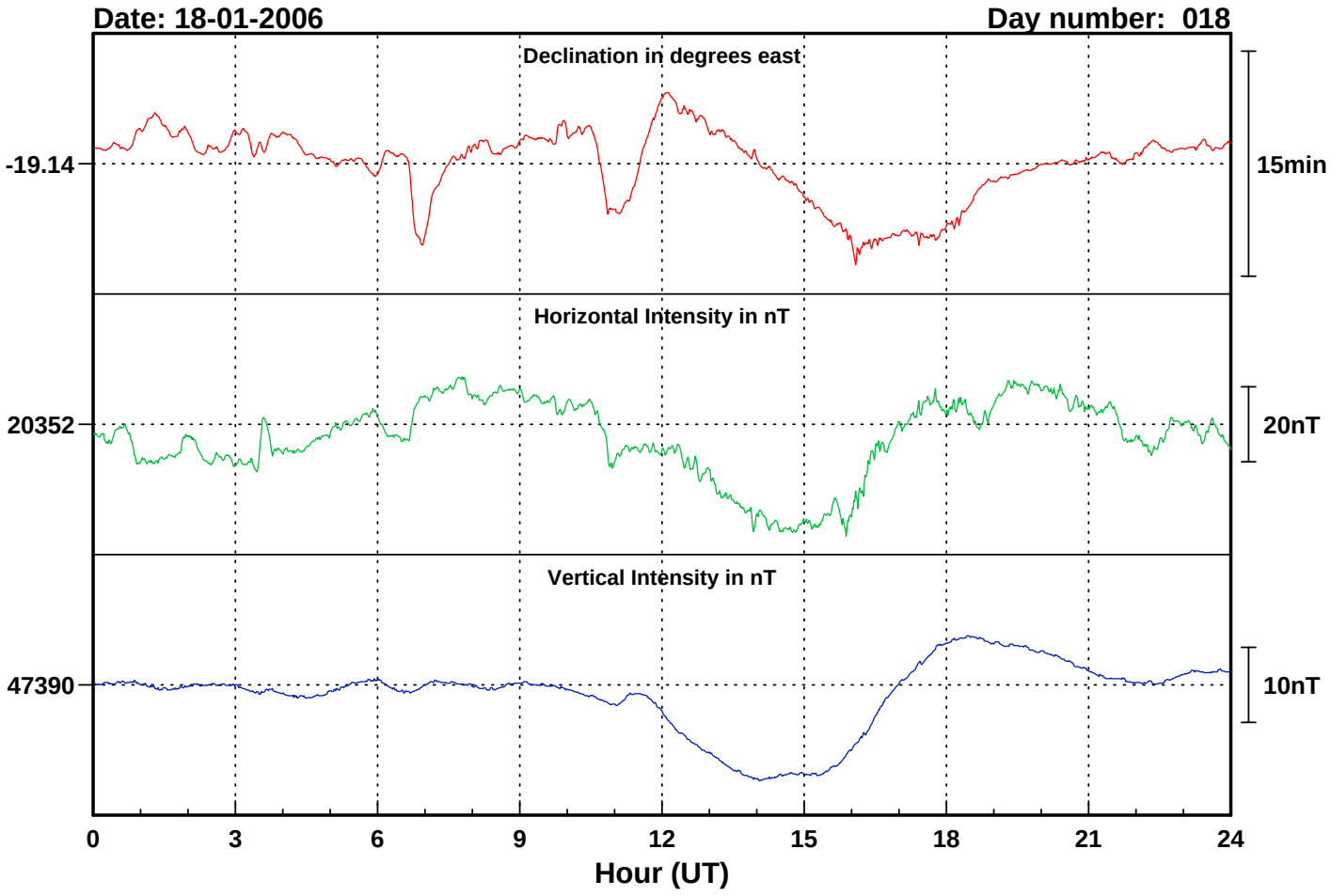
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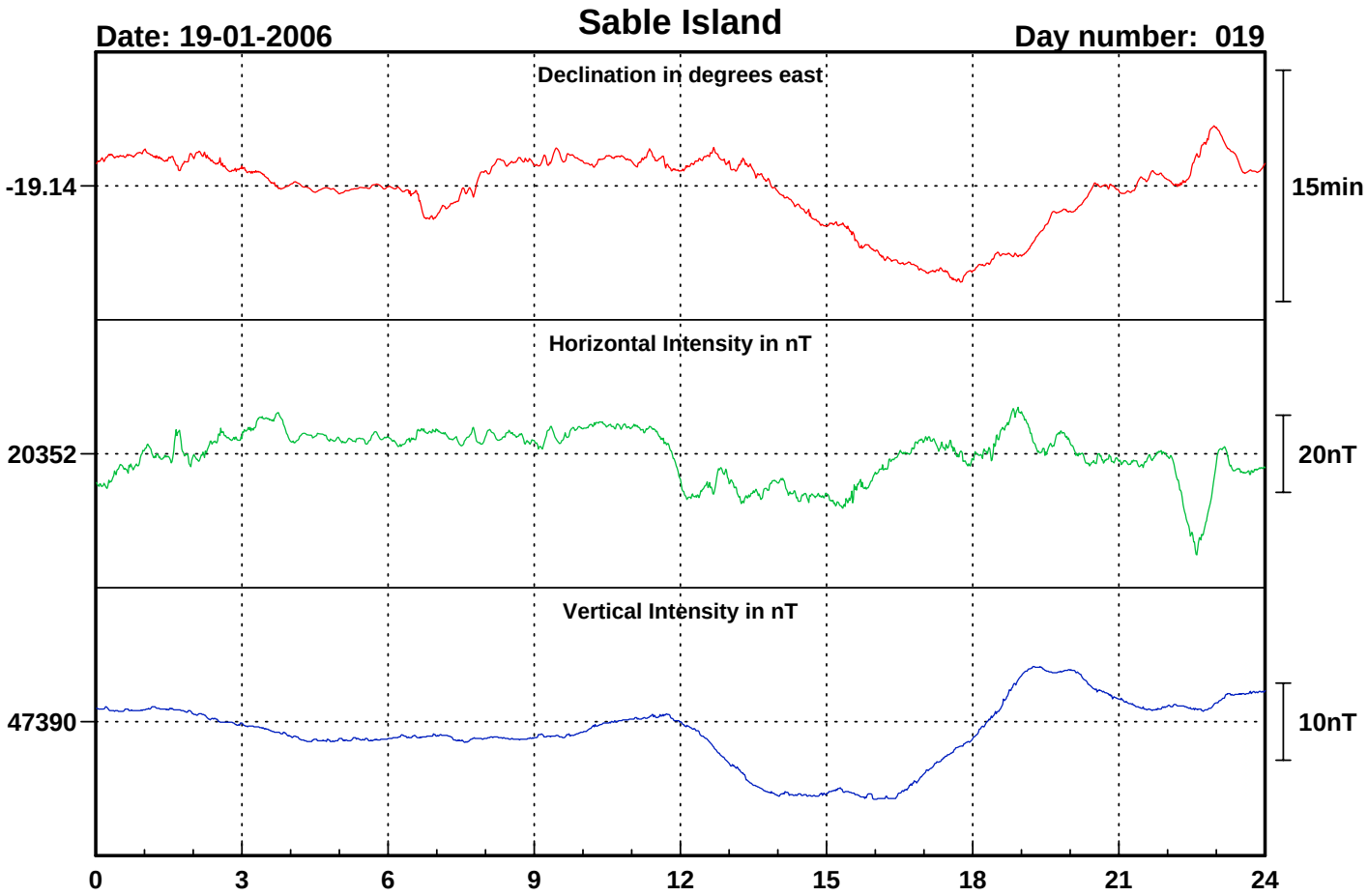
Hour (UT)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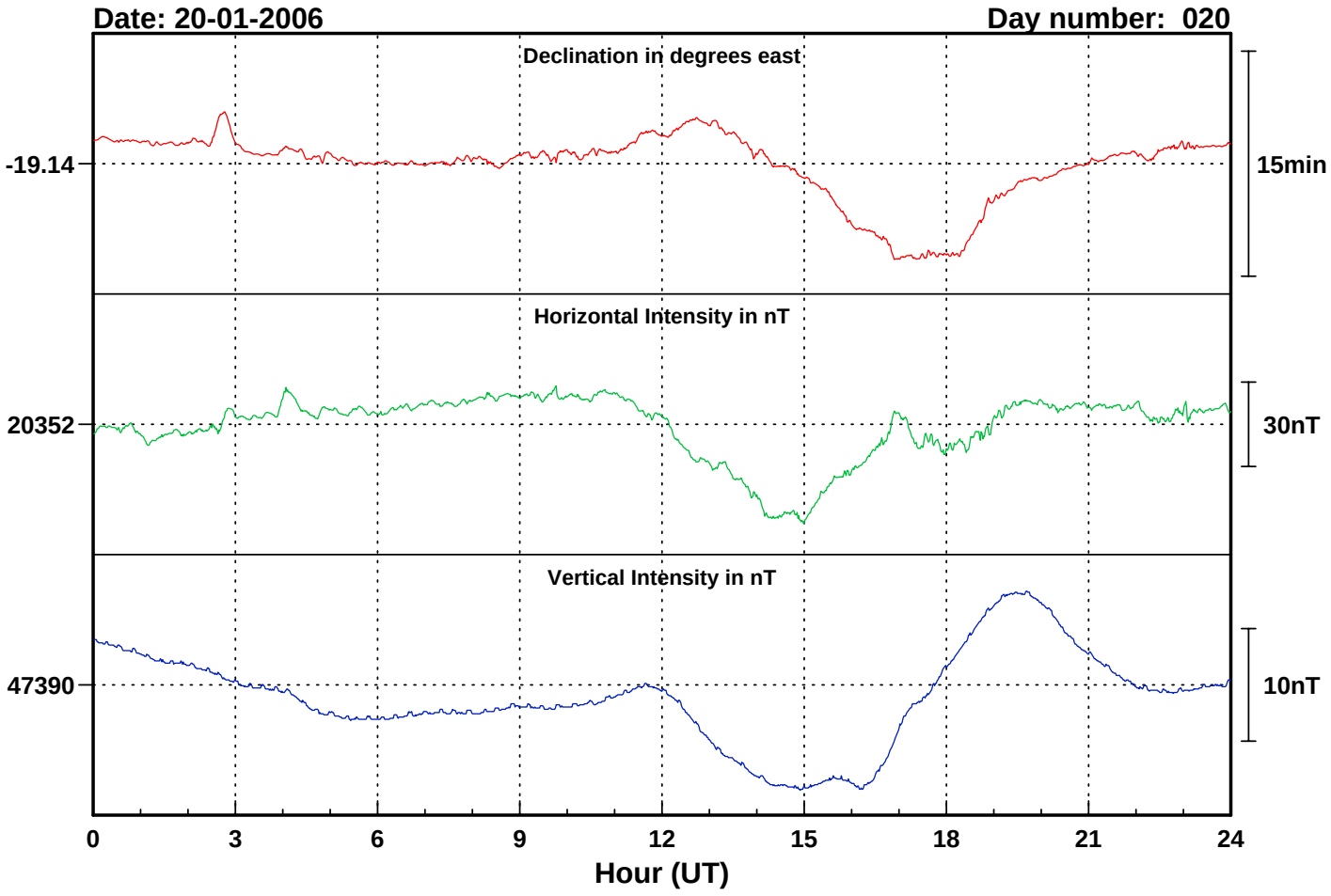
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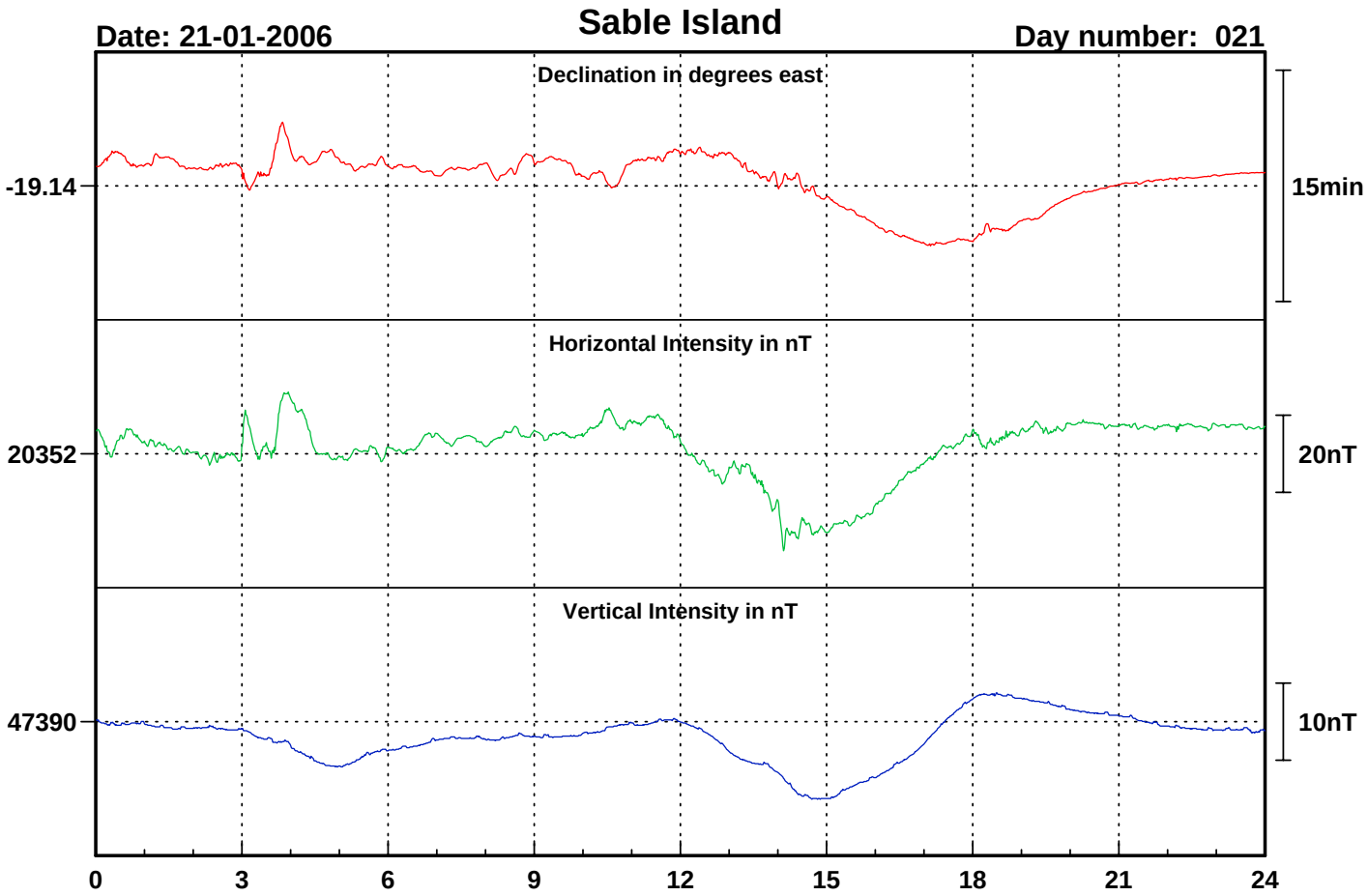
Hour (UT)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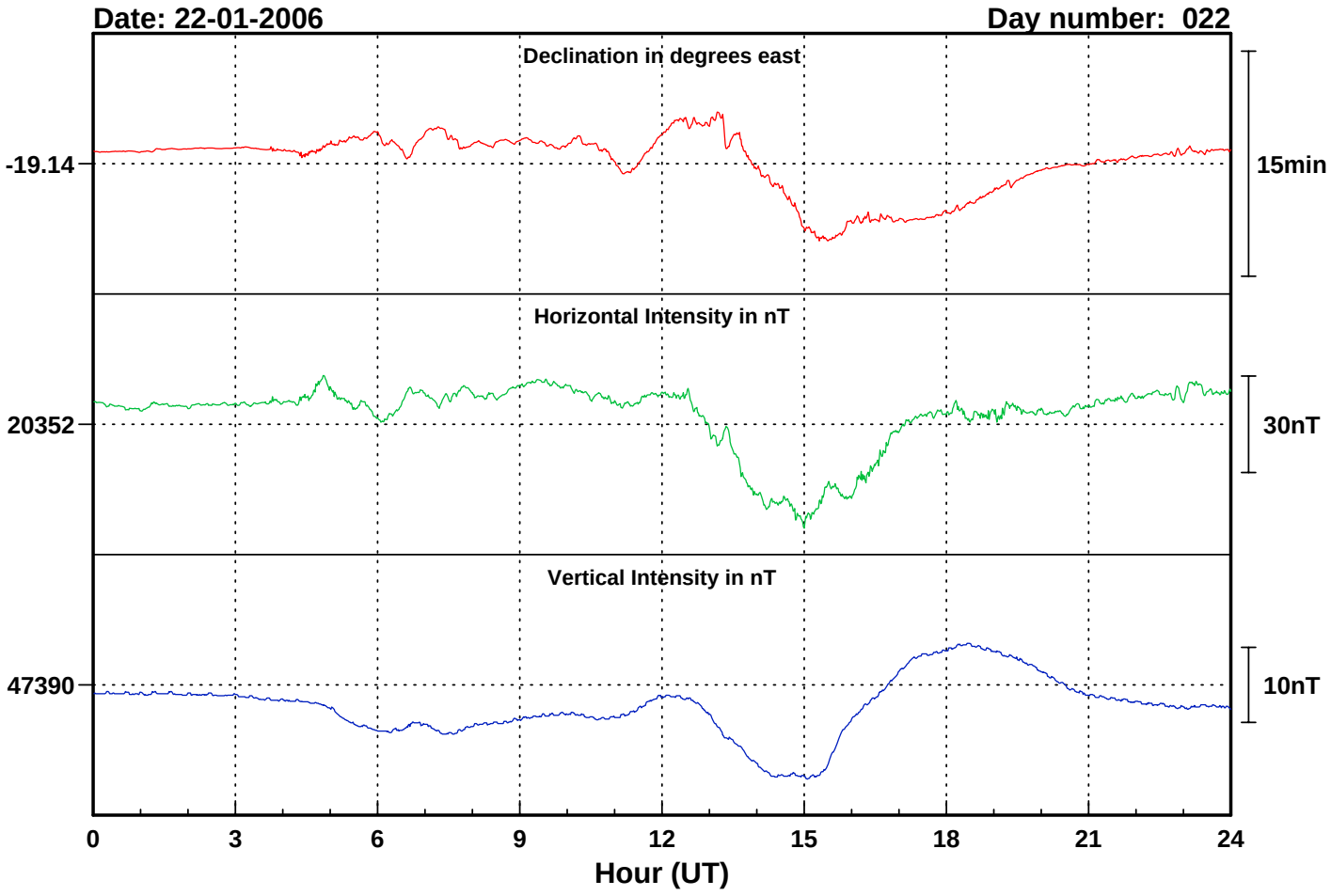
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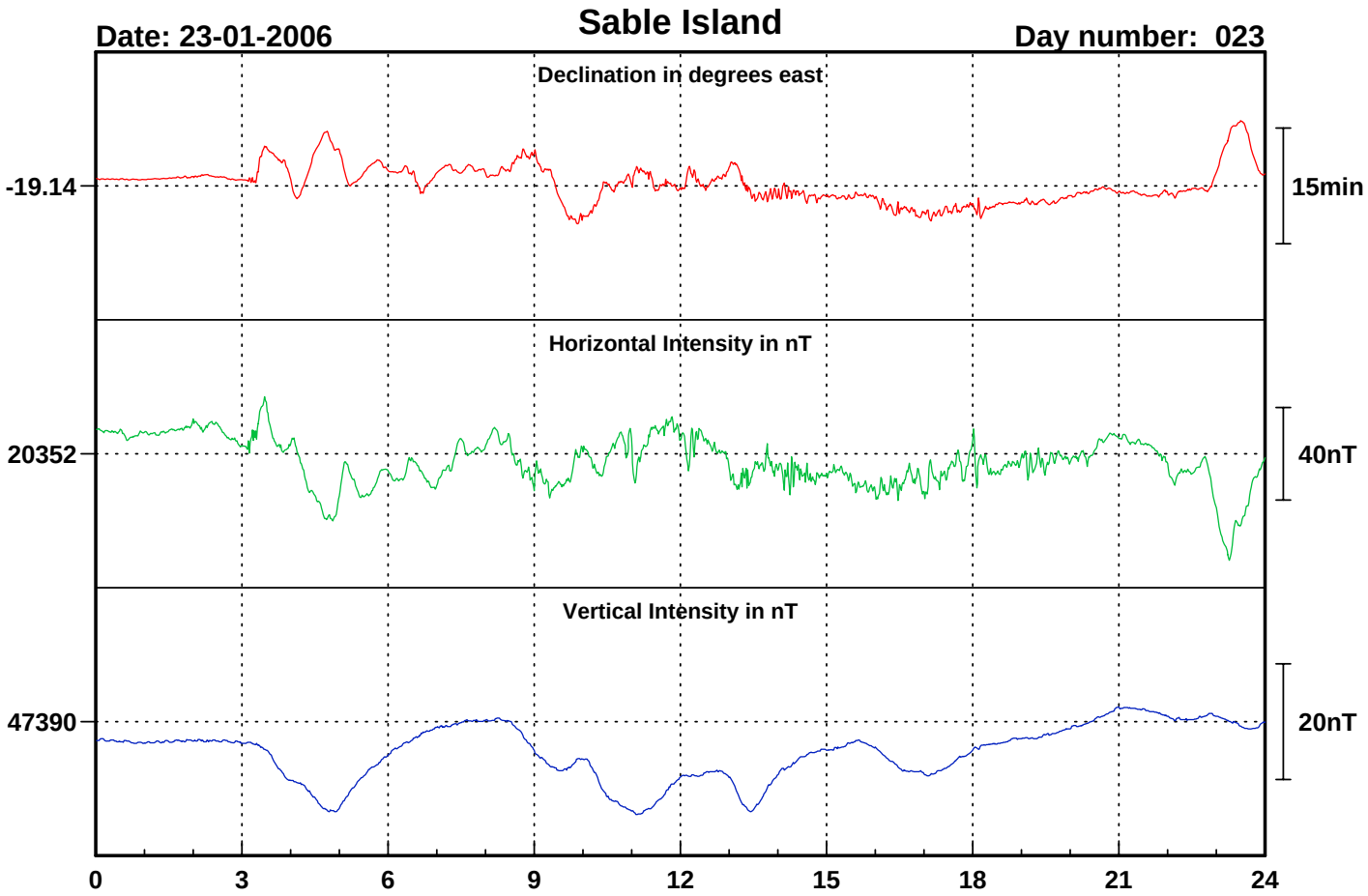
Hour (UT)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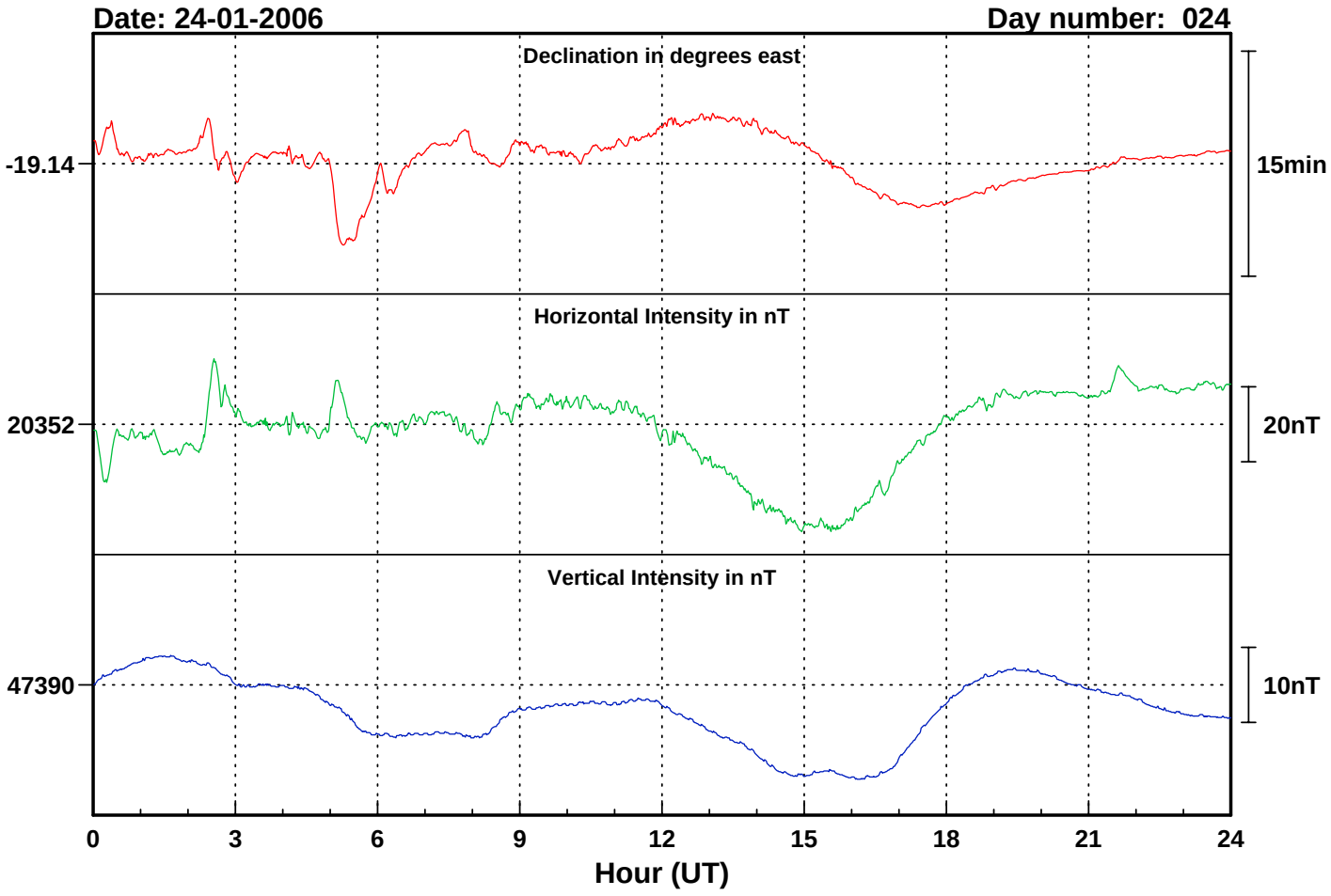
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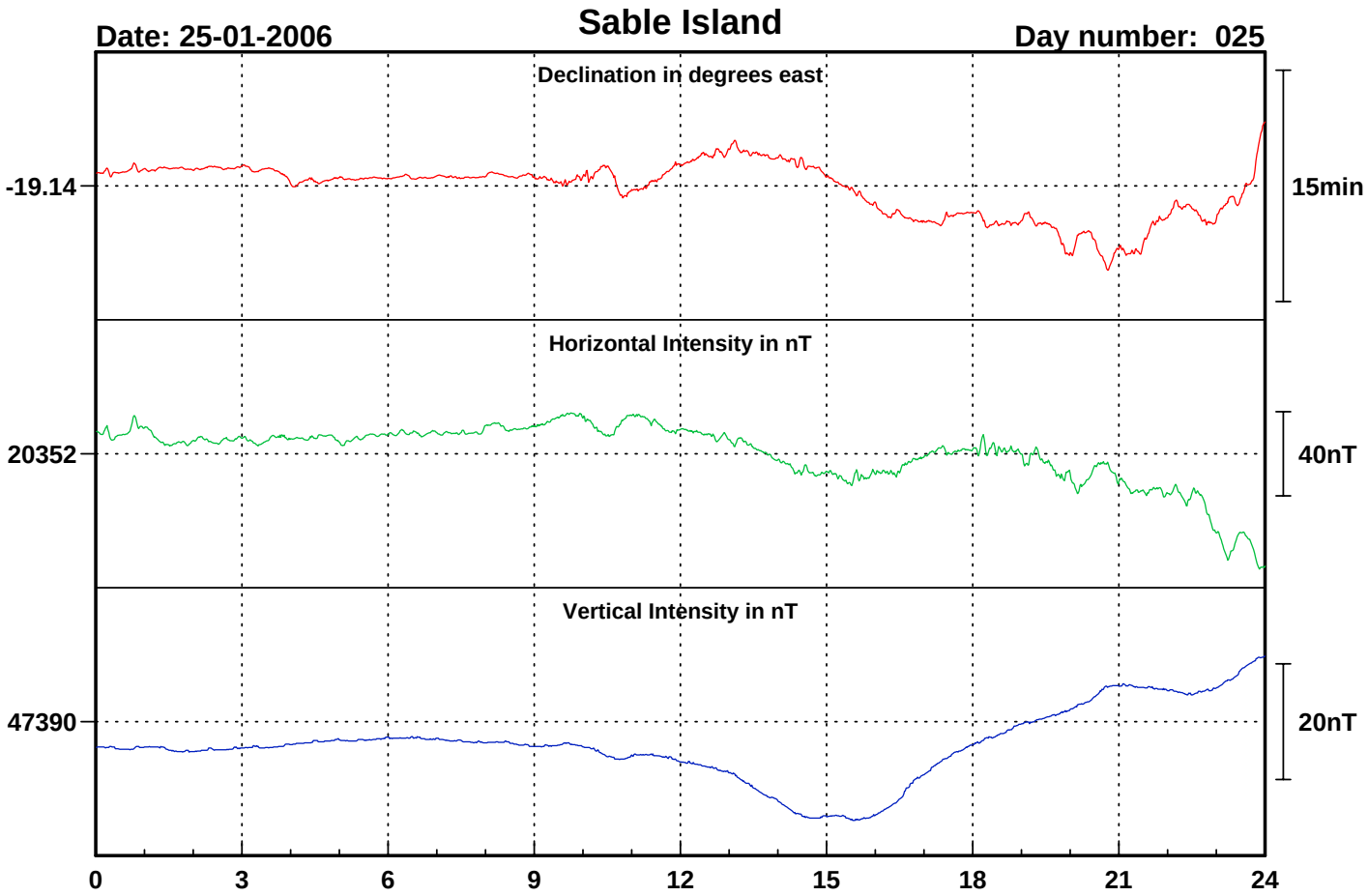
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Vertical Intensity in nT
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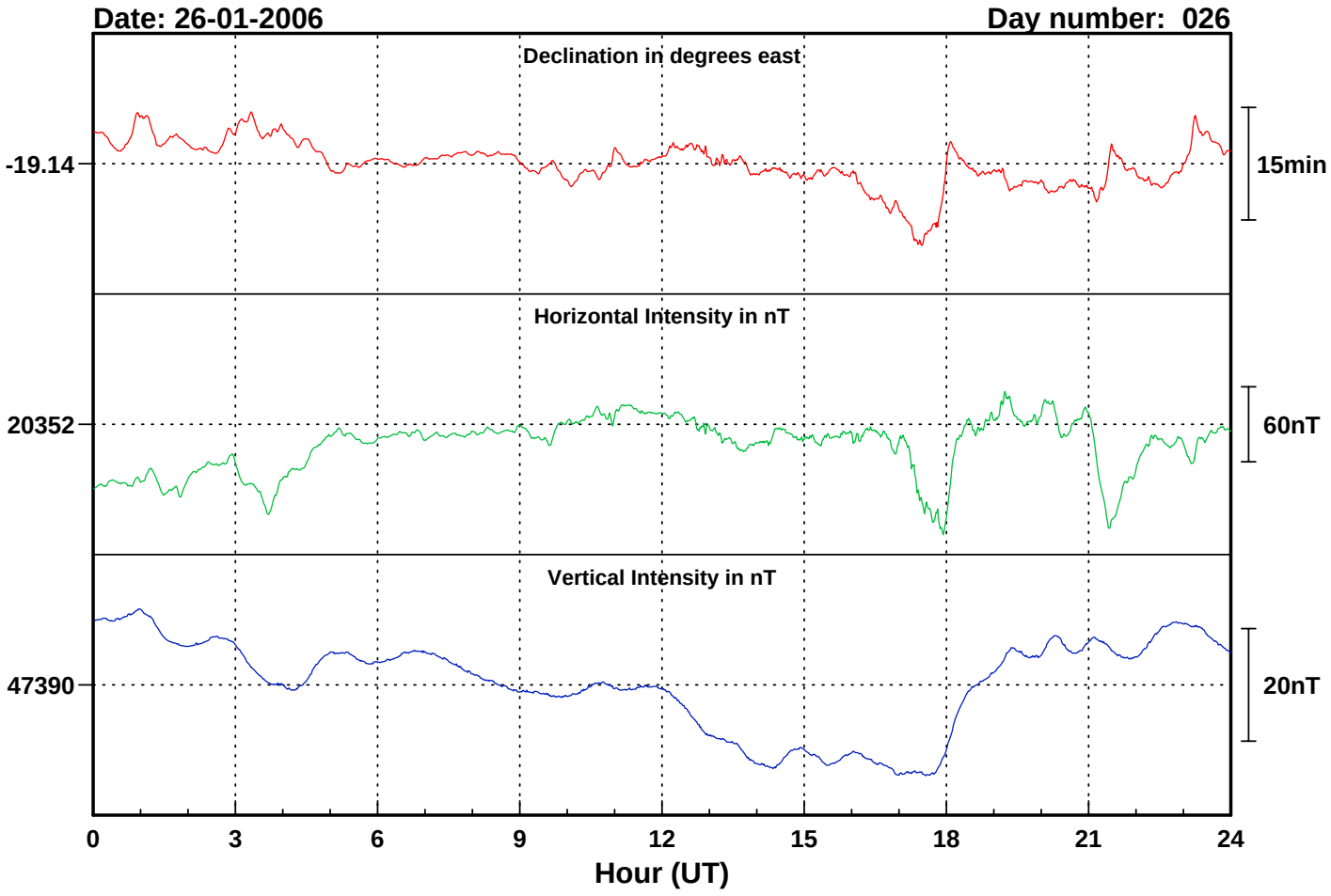
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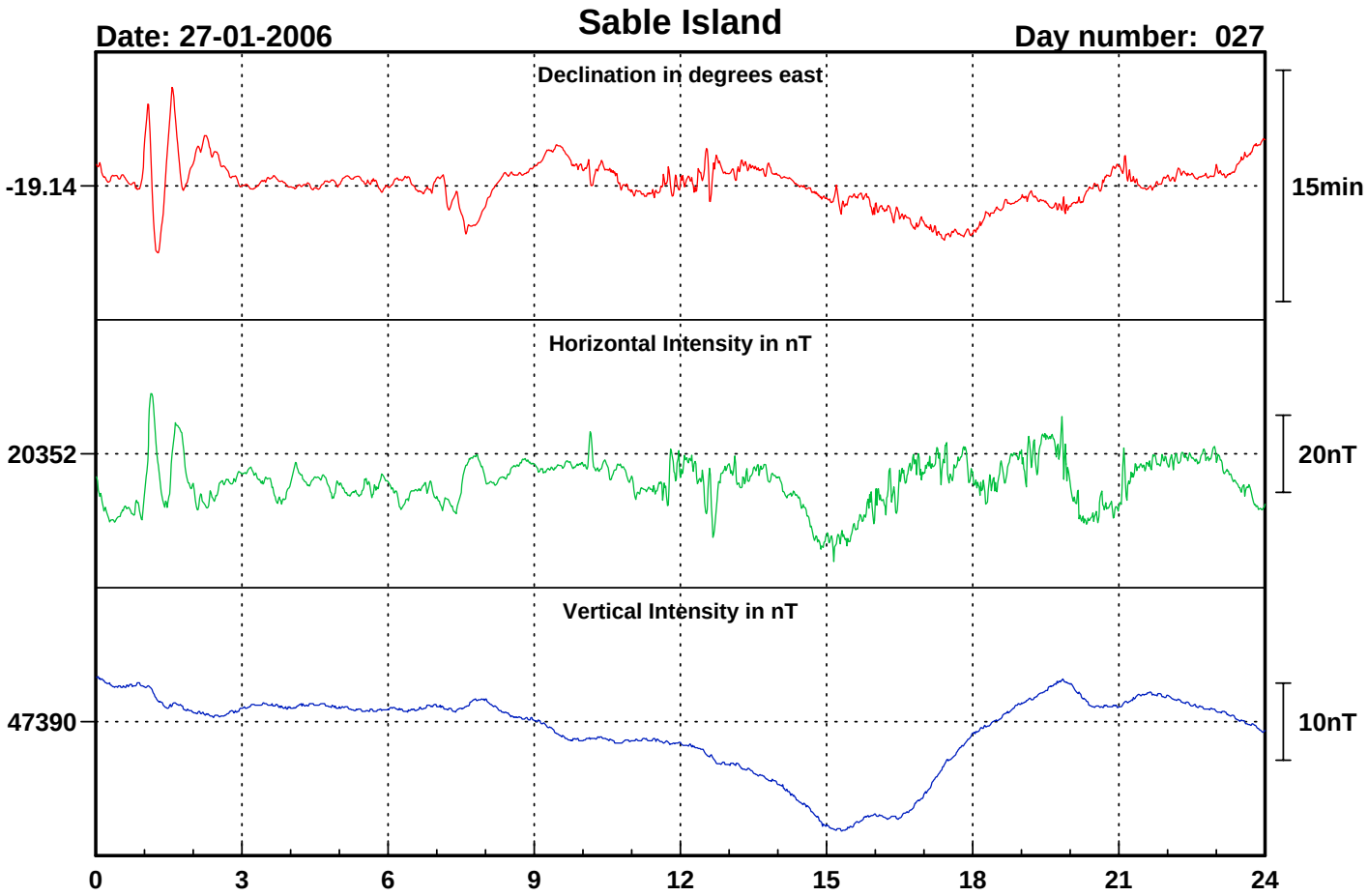
Hour (UT)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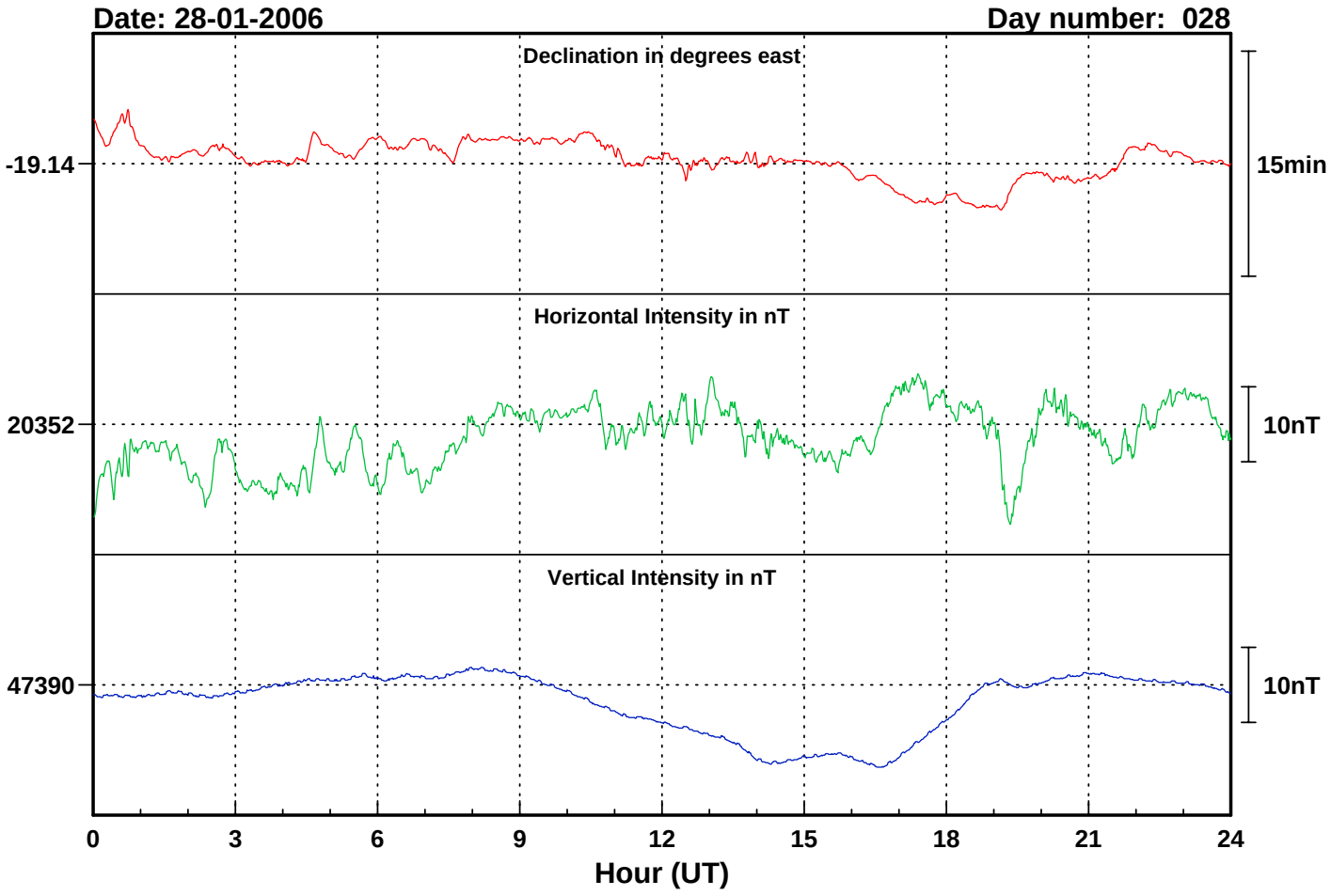
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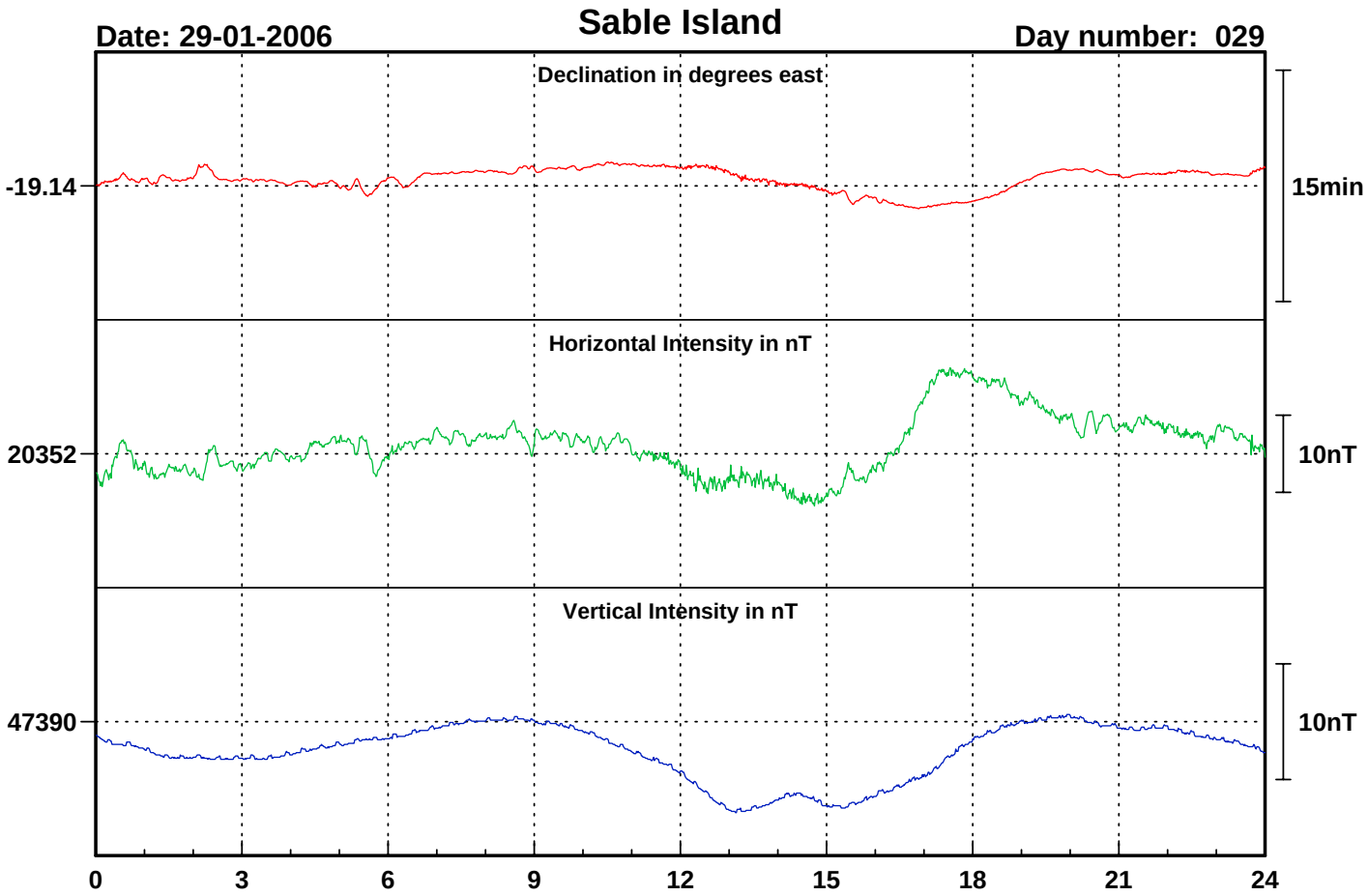
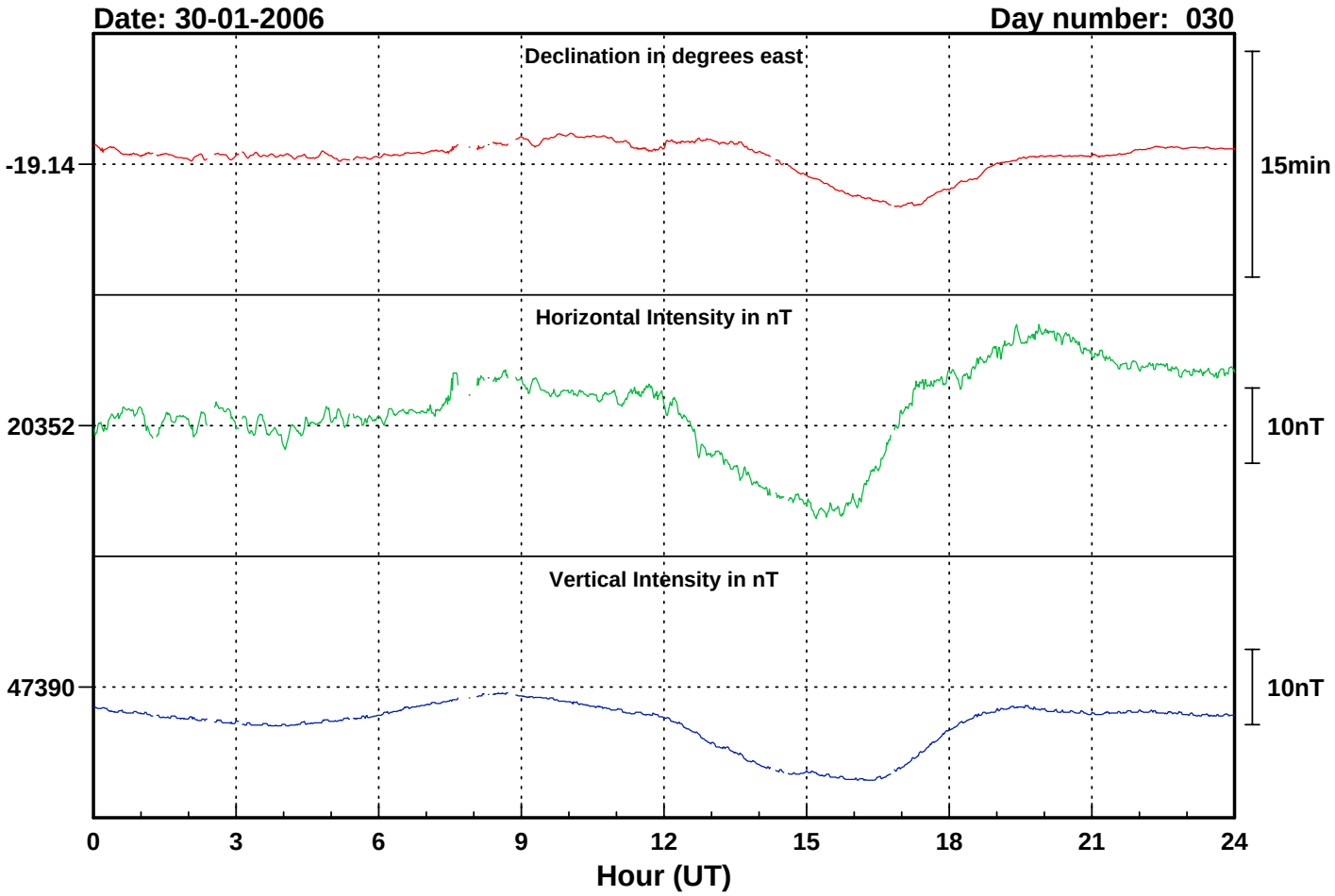
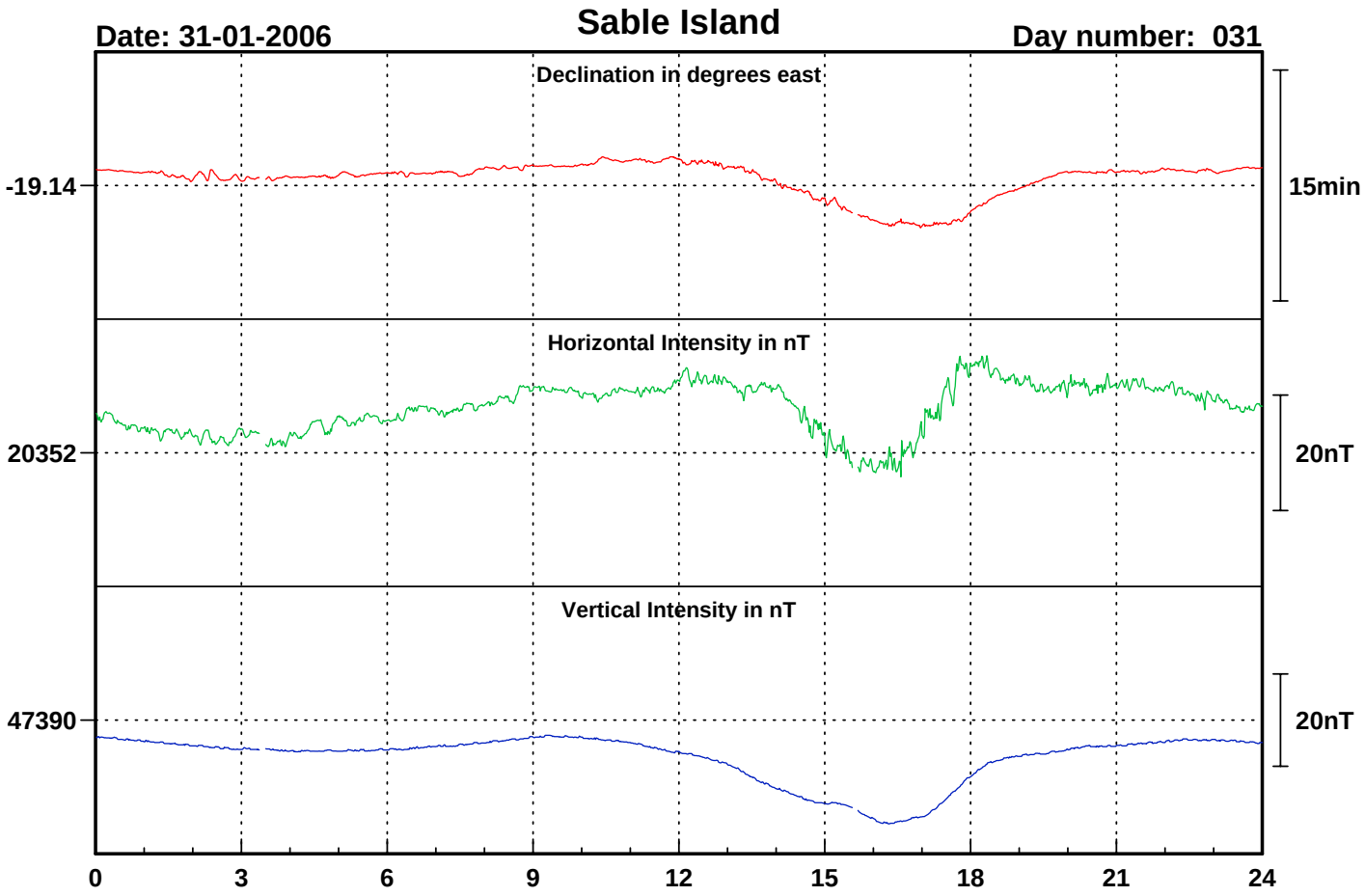
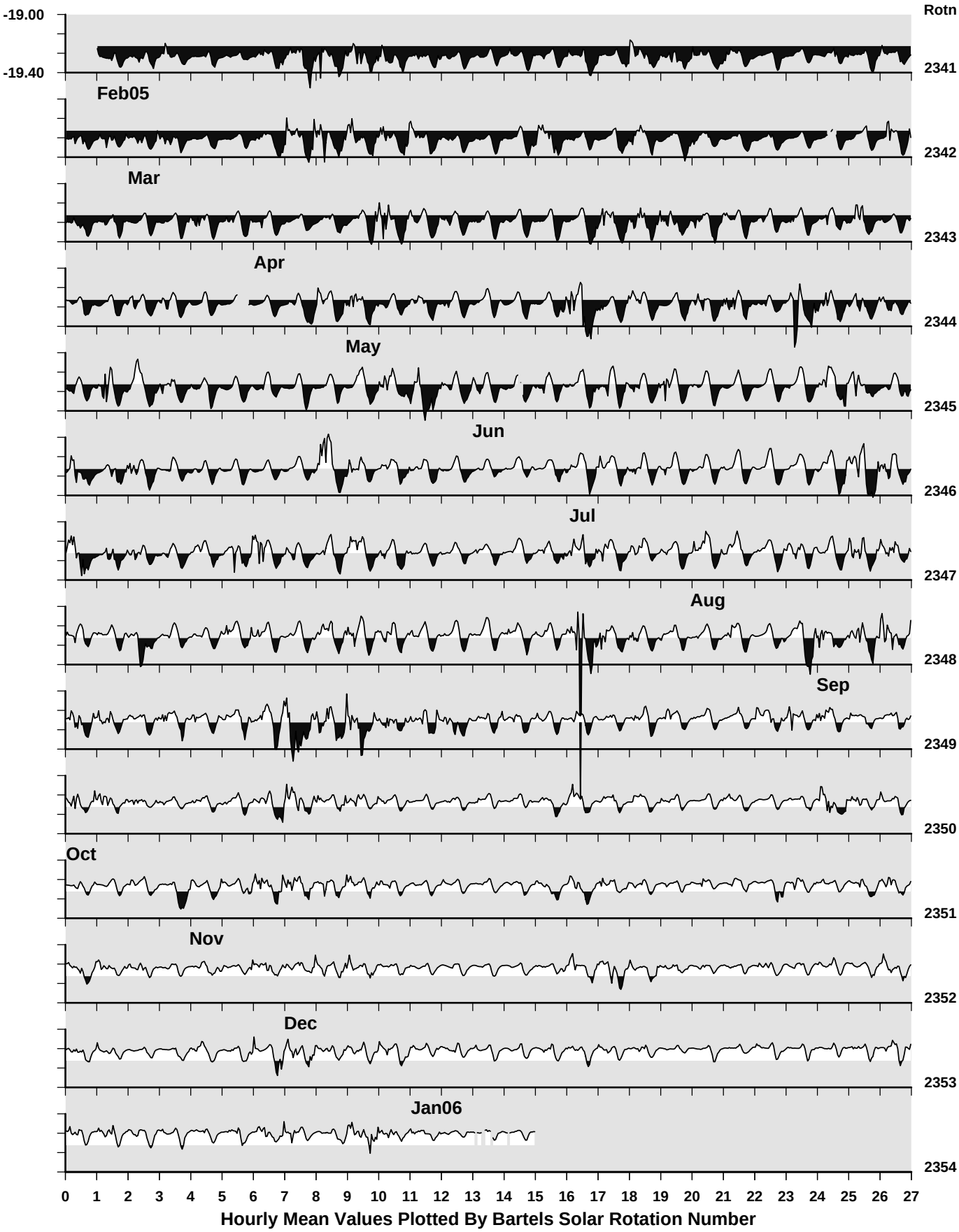
Hour (UT)


Sable Island
Date: 29-01-2006
Day number: 029
Declination in degrees east
-19.14
15min
Horizontal Intensity in nT
20352
10nT
Vertical Intensity in nT
47390
10nT
0
3
6
9
12
15
18
21
24


Date: 30-01-2006
Day number: 030
Declination in degrees east
-19.14
15min
Horizontal Intensity in nT
20352
10nT
Vertical Intensity in nT
47390
10nT
0
3
6
9
12
15
18
21
24
Hour (UT)

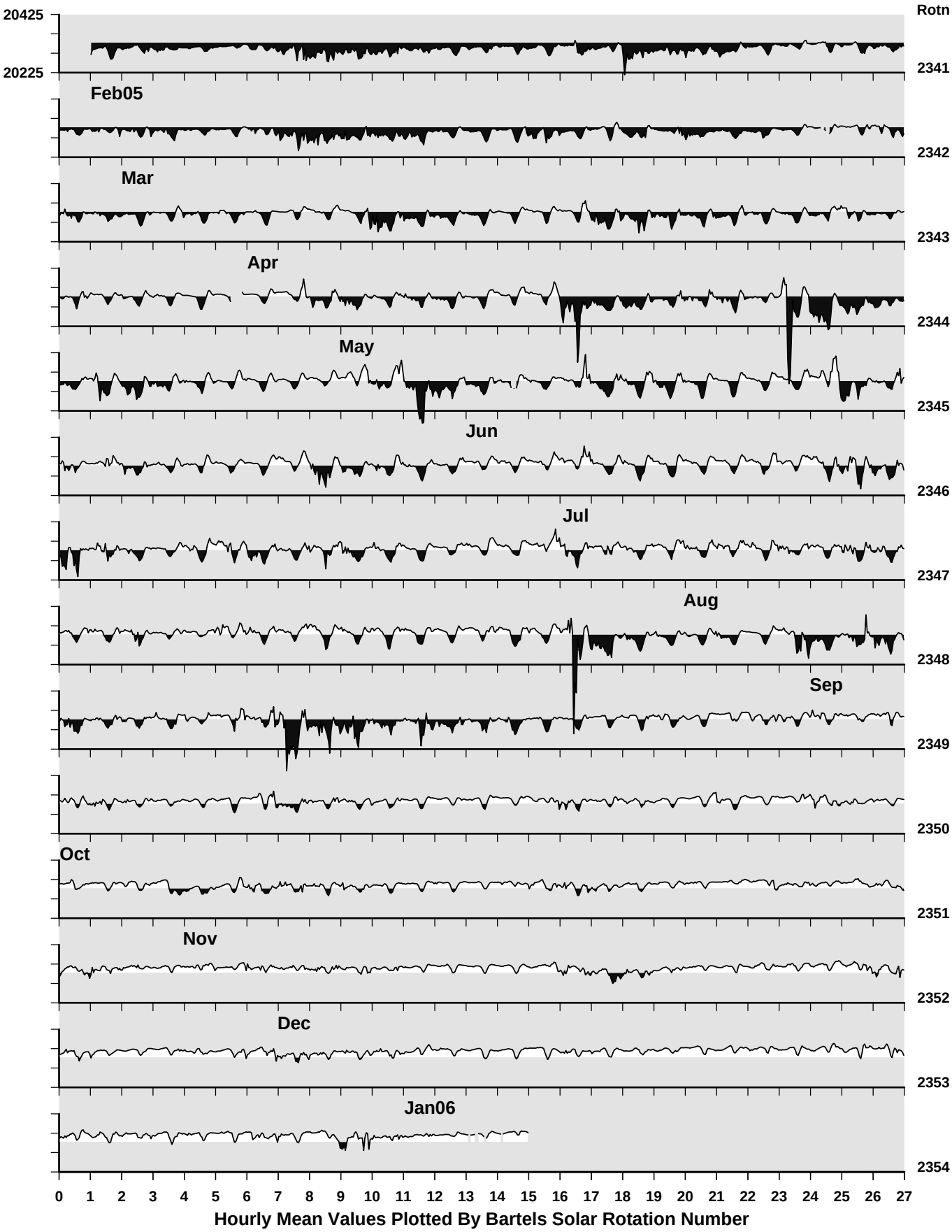

Sable Island
Date: 31-01-2006
Day number: 031
Declination in degrees east
-19.14
15min
Horizontal Intensity in nT
20352
20nT
Vertical Intensity in nT
47390
20nT
0
3
6
9
12
15
18
21
24

Sable Island Observatory: Declination (degrees)

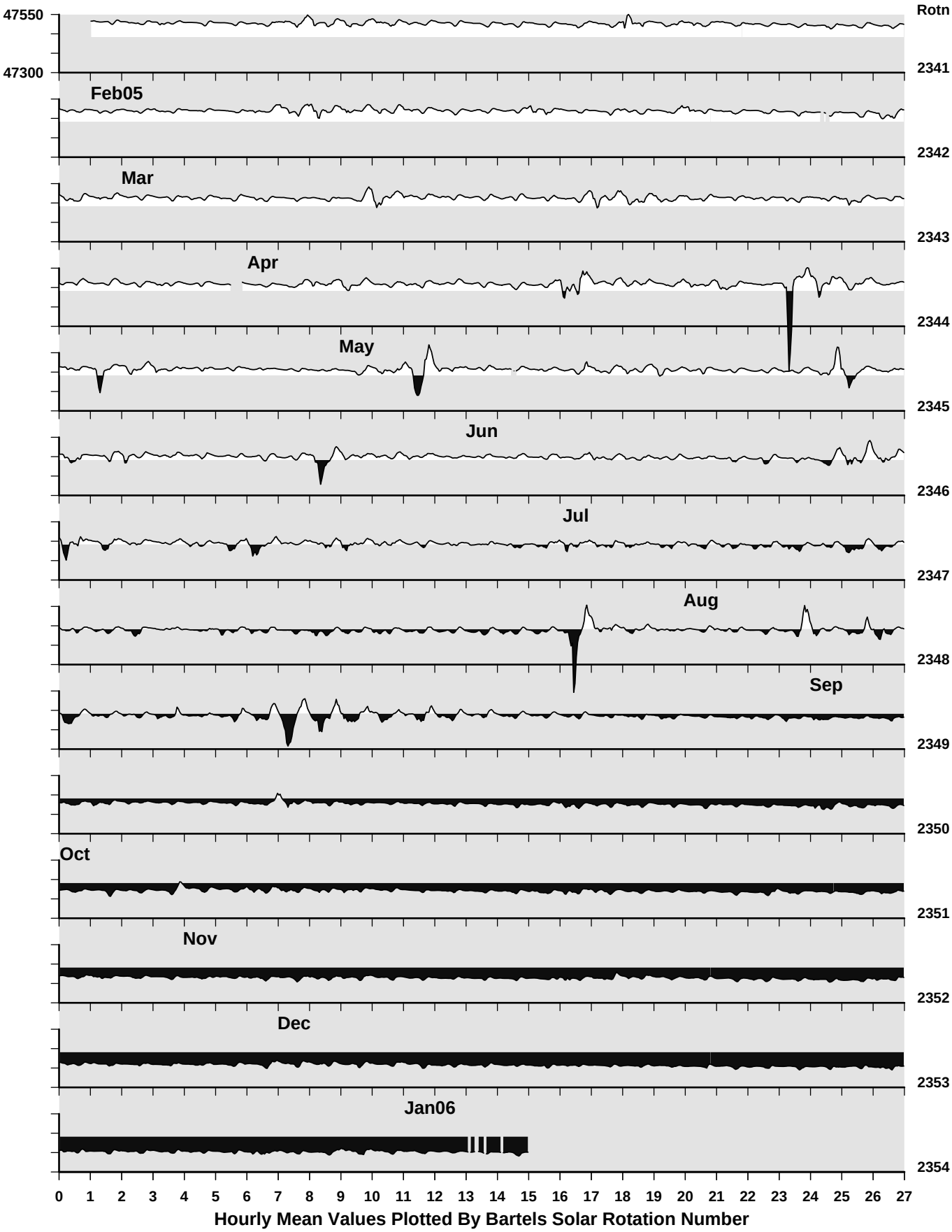


Hourly Mean Values Plotted By Bartels Solar Rotation Number

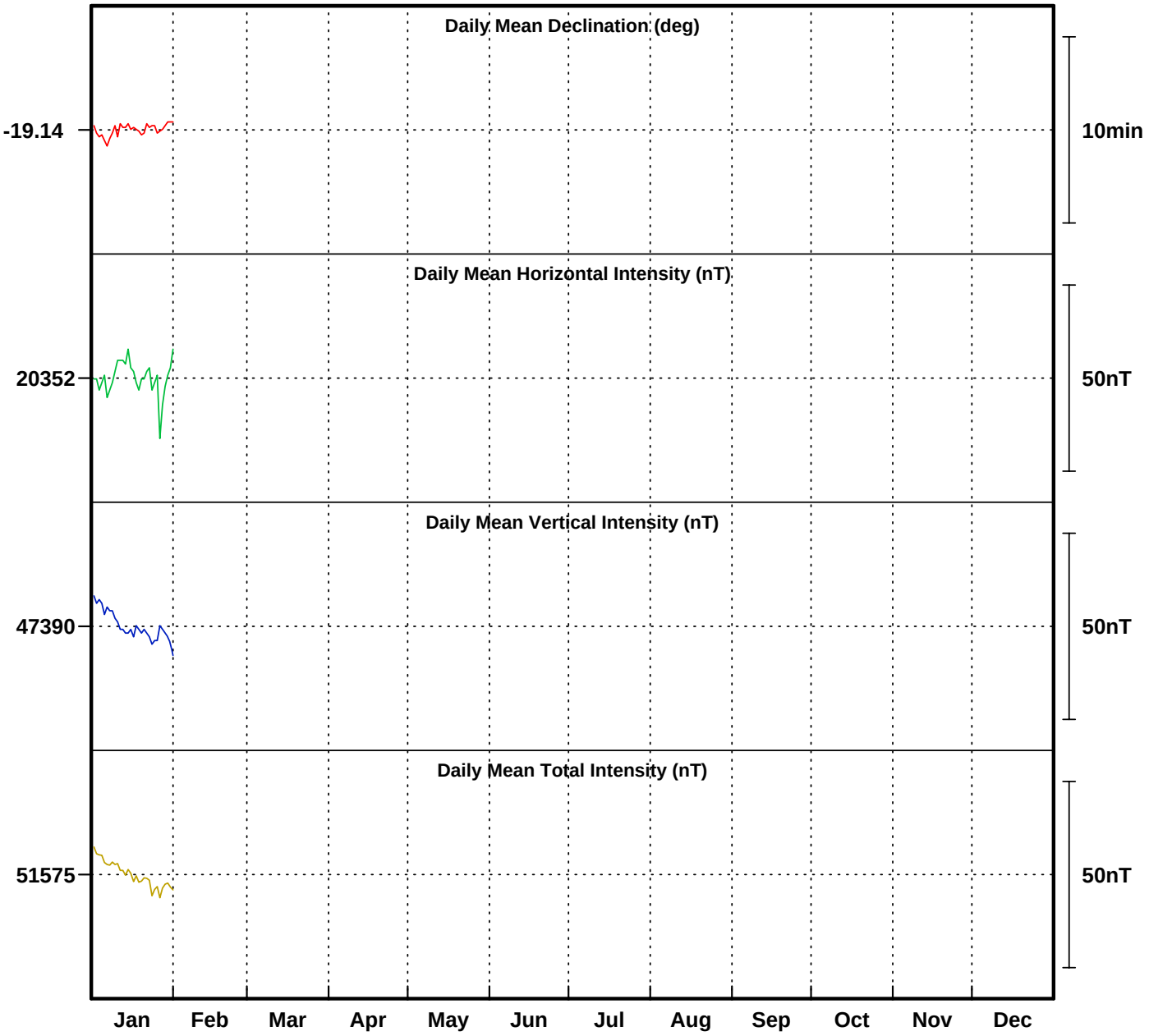
Sable Island Observatory: Horizontal Intensity (nT)



Sable Island Observatory: Vertical Intensity (nT)



Sable Island Observatory 2006



Monthly Mean Values for Sable Island Observatory 2006

Month	*D*	*H*	*I*	*X*	*Y*	*Z*	*F*
January	-19° 8.4´	20352 nT	66° 45.5´	19227 nT	-6673 nT	47390 nT	51575 nT

Note

i. The values shown here are provisional.