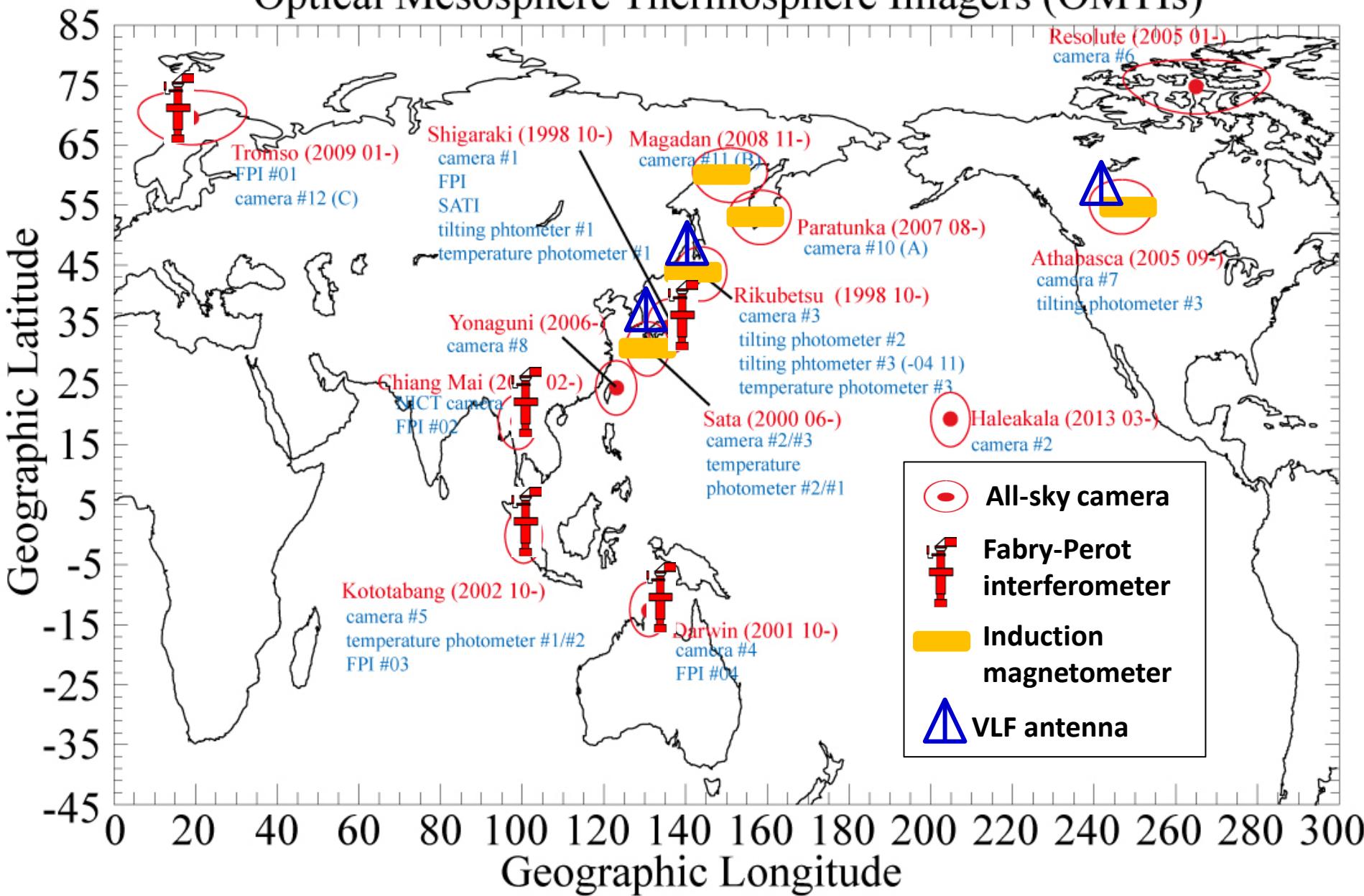


# **Ground-based optical and magnetic field measurements of the upper atmosphere by STEL, Nagoya University**

**Kazuo Shiokawa**

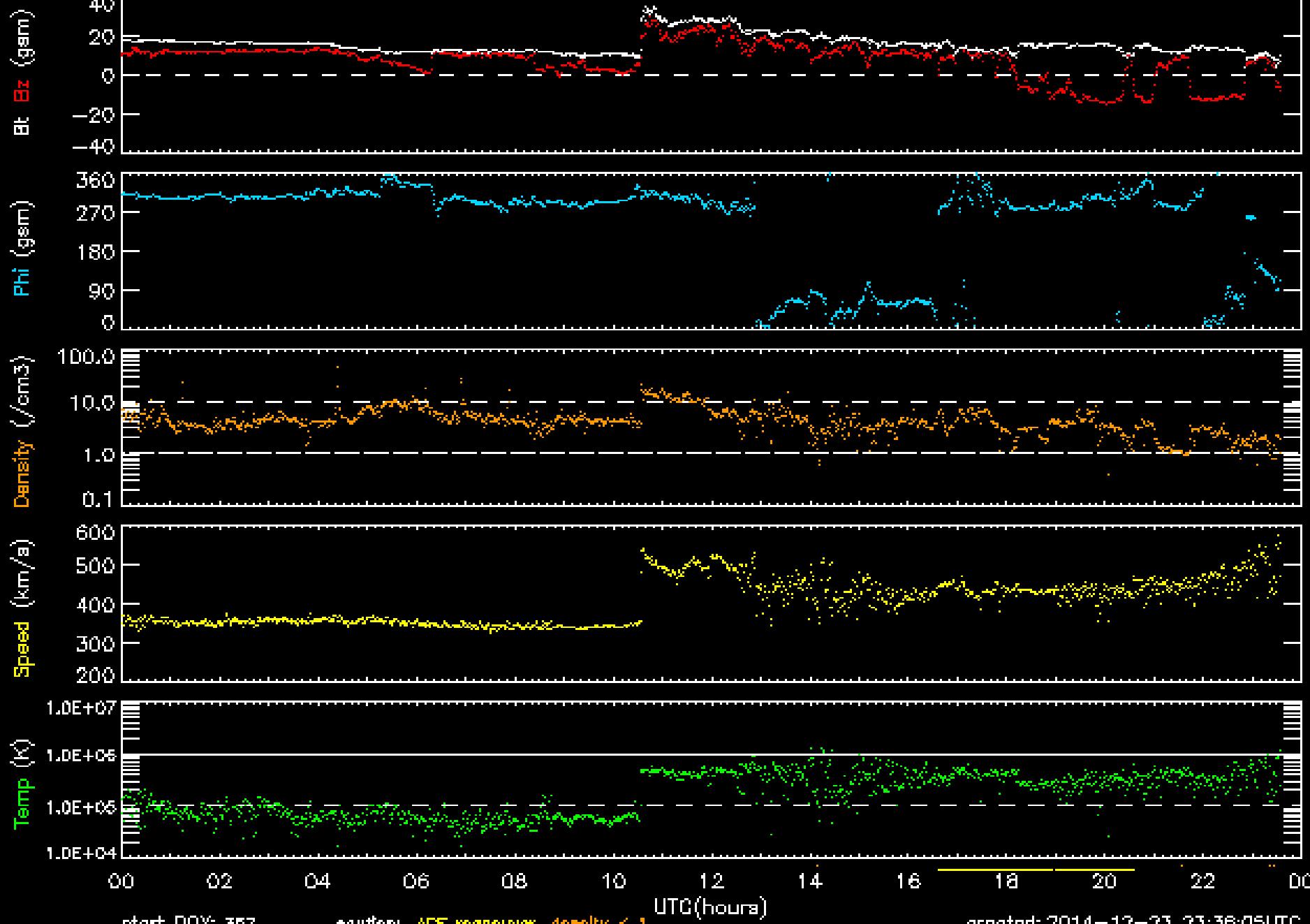
**Solar-Terrestrial Environment Laboratory  
Nagoya University, Japan**

## Optical Mesosphere Thermosphere Imagers (OMTIs)



## ACE RTSW (Estimated) MAG &amp; SWEPAM

Begin: 2014-12-23 00:00:00UTC

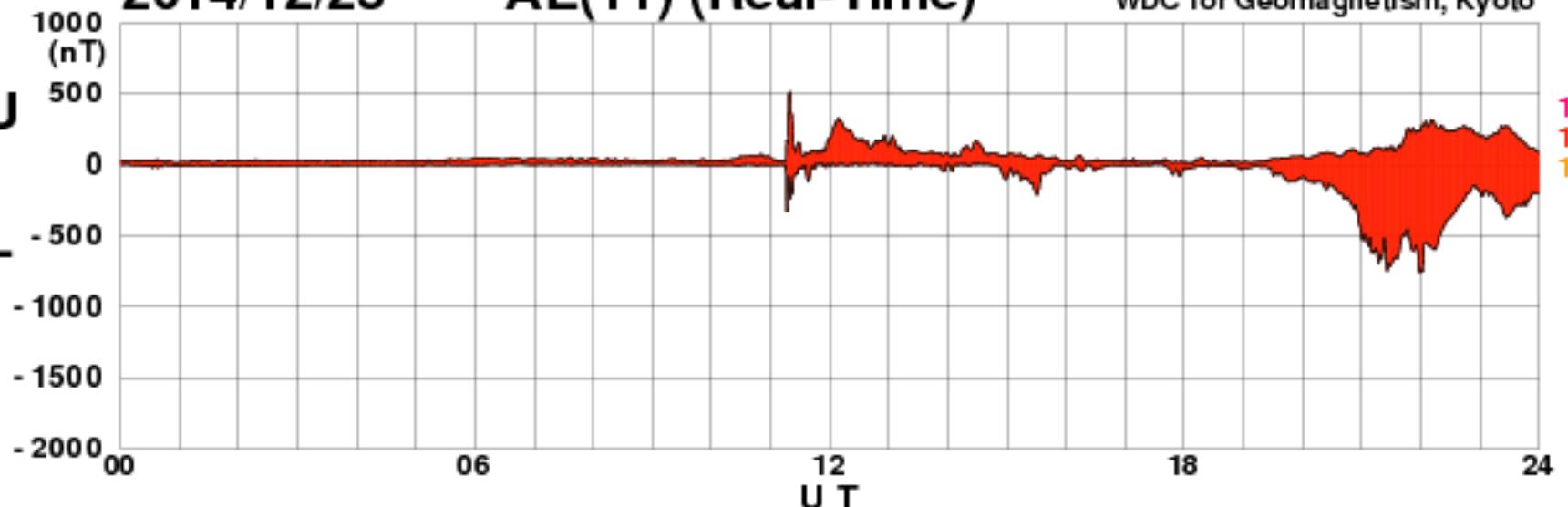


2014/12/23

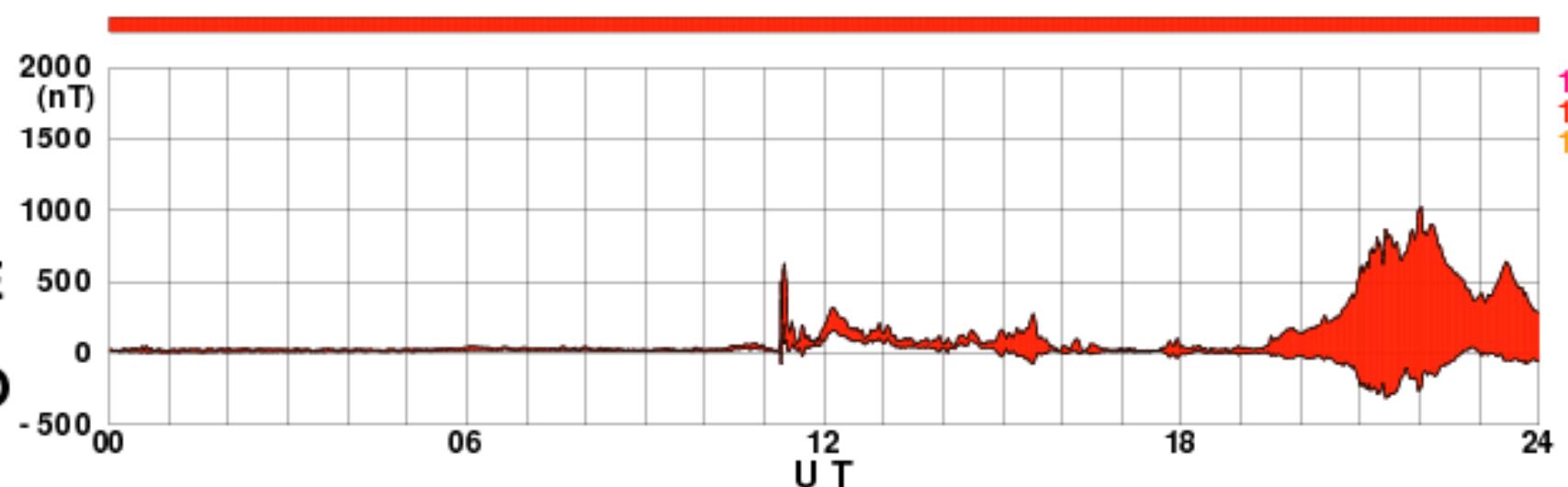
# AE(11) (Real-Time)

WDC for Geomagnetism, Kyoto

AU



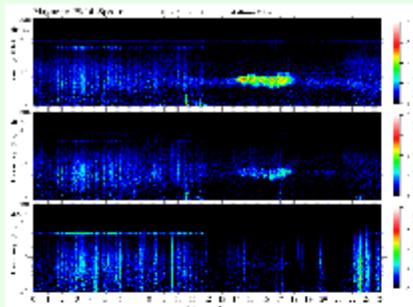
AL



AE

AO

[Created at 2015-03-02 15:13UT]



## STEL Magnetometer Data

This homepage is to show quick-look plots of the magnetometer data obtained by the Division II of the Solar-Terrestrial Environment Laboratory, Nagoya University.

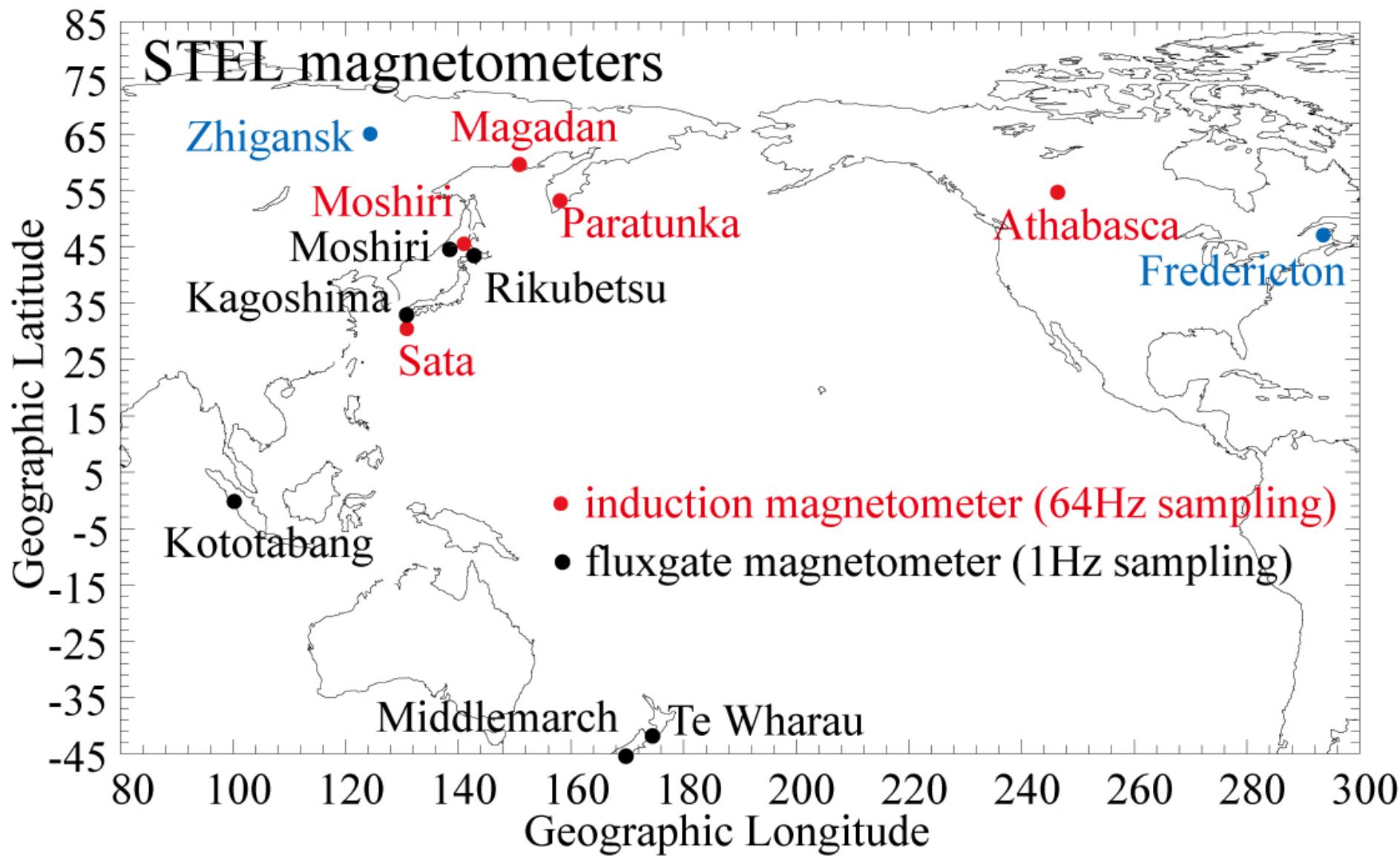
PLEASE CONTACT [K. Shiokawa](#) before using these data for any publications and/or presentations. Please note that the data are just for browsing purpose.

- 
- [Stations, Instruments, and Acknowledgements](#)
  - [Some Notes and Data Error Histories](#)
  - [Map of Stations](#)
  - [Induction Magnetometer Plots \(Dynamic Spectra and Rapid-Run Magnetograms\)](#)
  - [Fluxgate Magnetometer Plots \(Ordinary and Rapid Run\)](#)
  - [Fluxgate Magnetometer Plots \(P12/Pc3 pulsation plots\)](#)
  - [Conjunction Event Finder \(CEF\) NEW](#)



This data has been registered in [IUGONET](#) (Inter-university Upper atmosphere Global Observation NETwork) metadata database. The IUGONET metadata database will be of great help to researchers

<http://stdb2.stelab.nagoya-u.ac.jp/magne/>

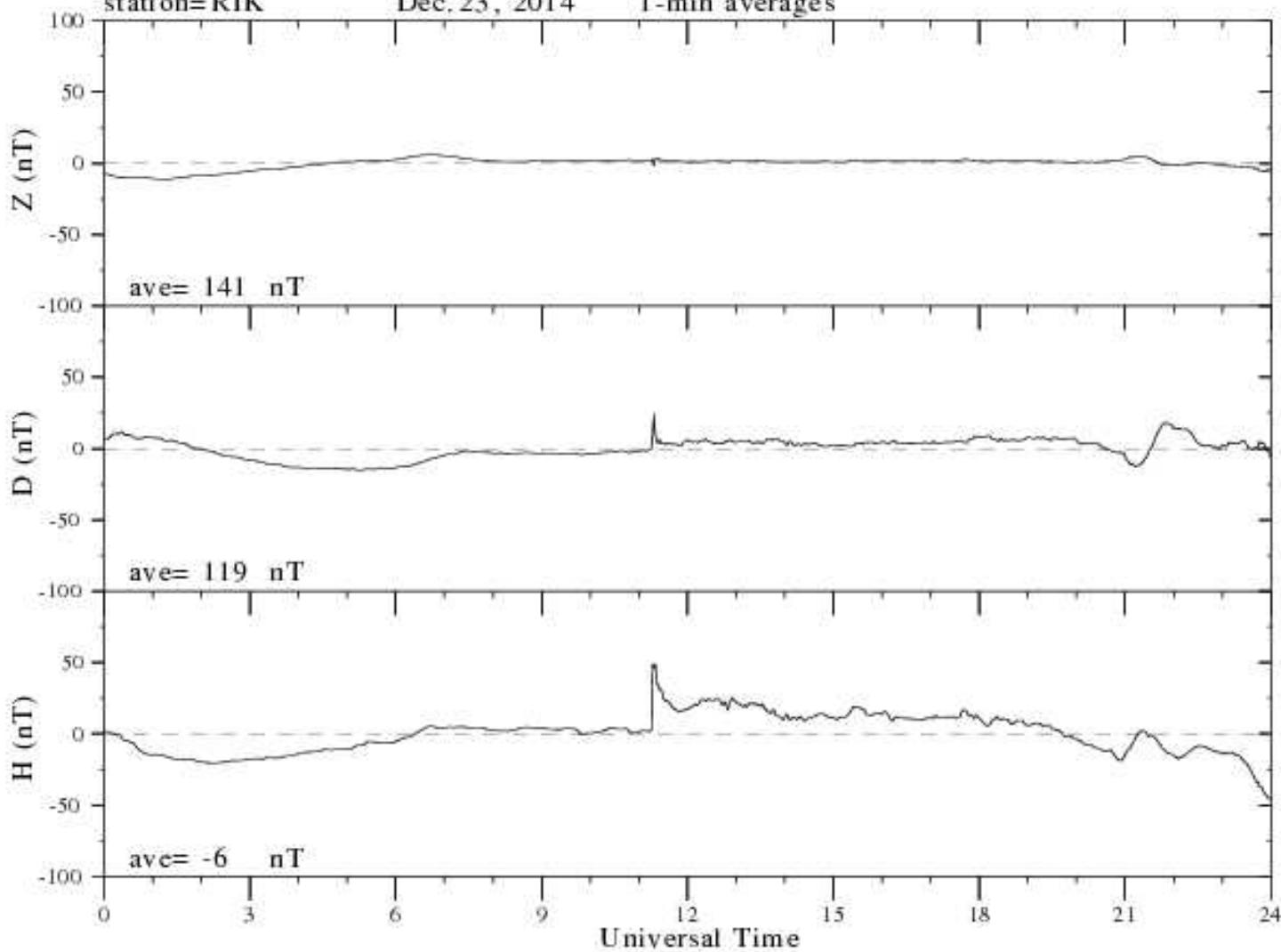


# Magnetic Field Variation (H,D,Z)

station= RIK

Dec. 23, 2014

1-min averages

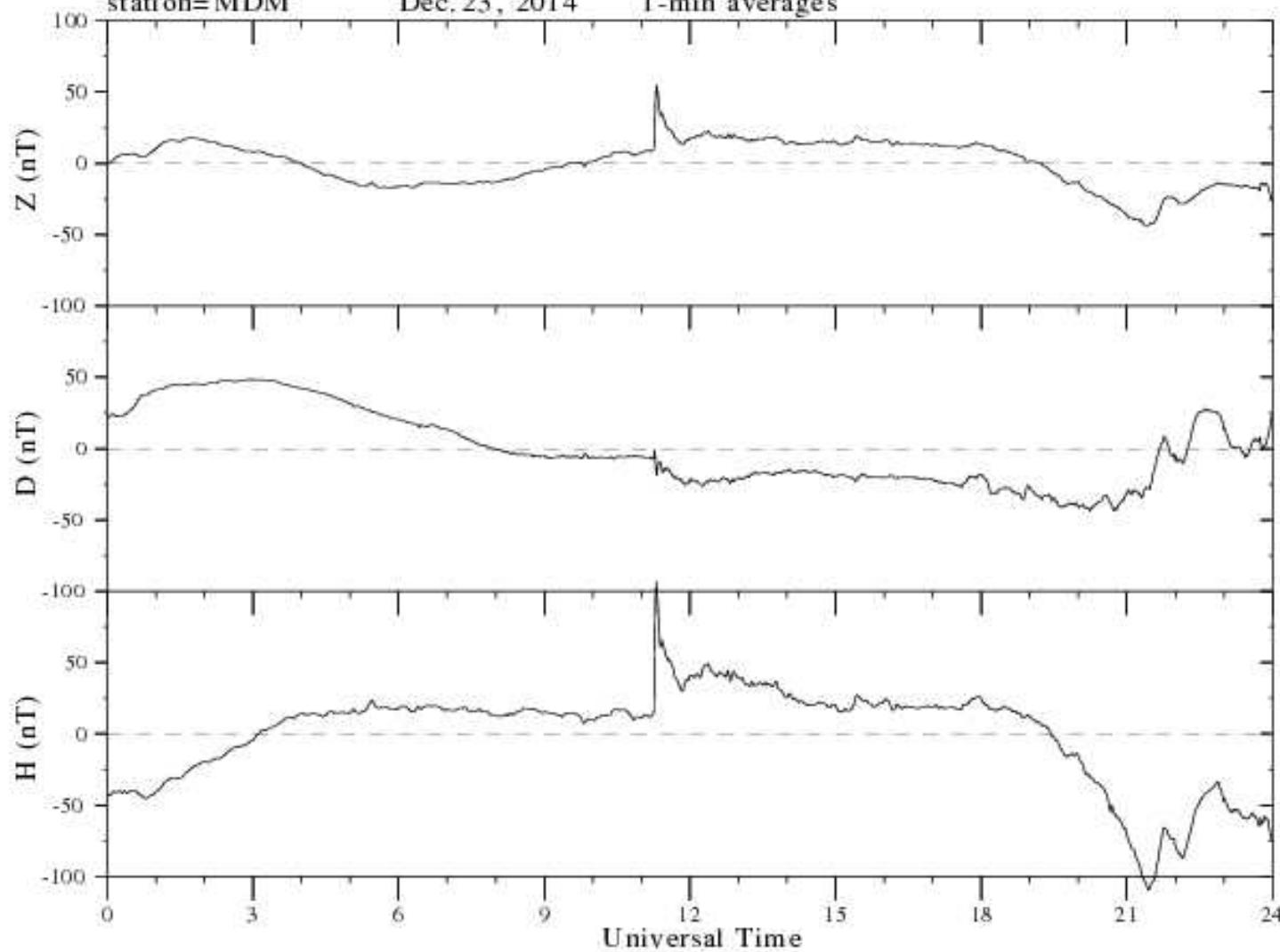


### Magnetic Field Variation (H,D,Z)

station=MDM

Dec. 23, 2014

1-min averages



# Magnetic Field Variation ( $dH/dt, dD/dt, dZ/dt$ )

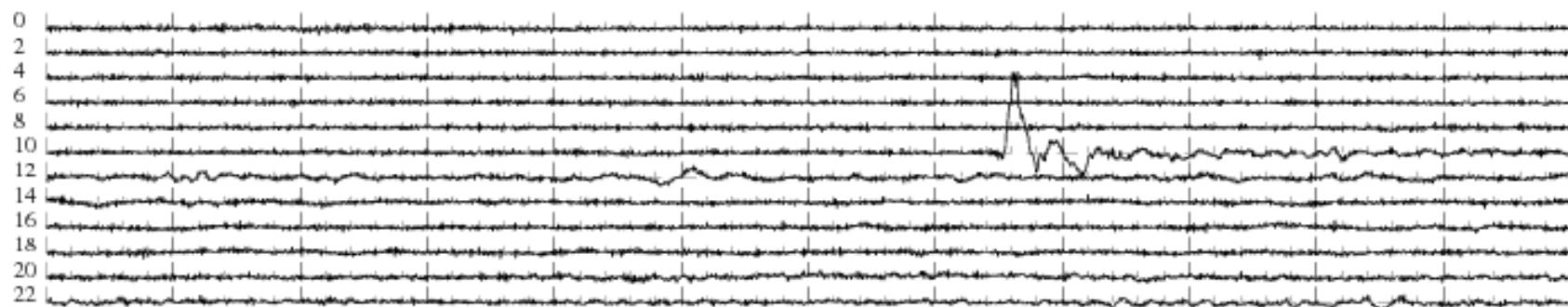
Dec. 23, 2014

station=RIK

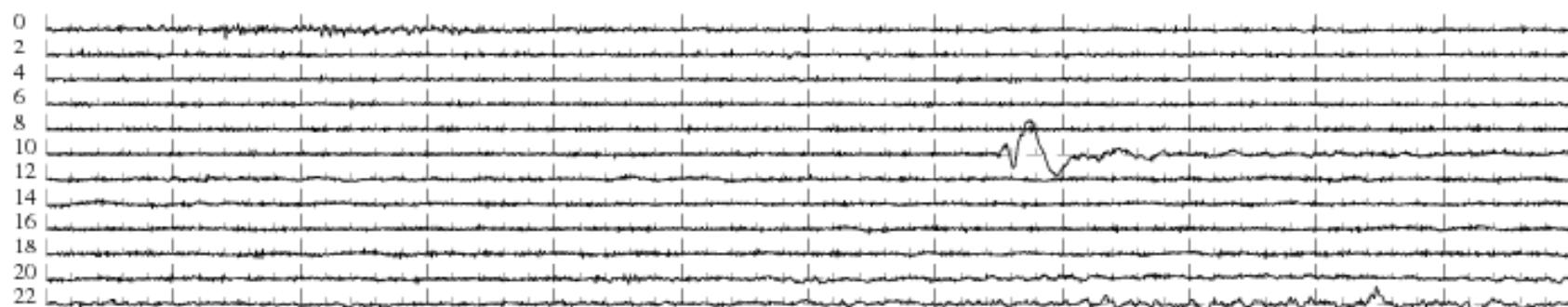
4 sec averages

0.1 nT/s

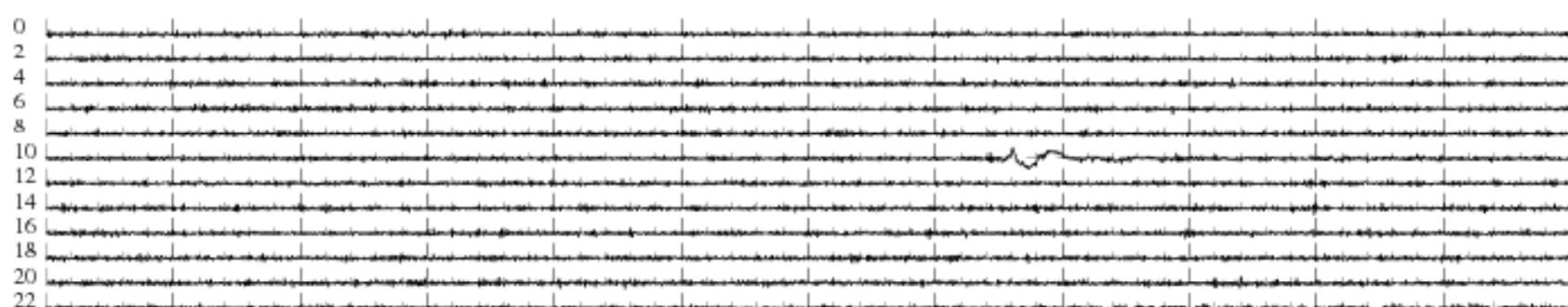
$dH/dt$



$dD/dt$



$dZ/dt$



# Magnetic Field Variation ( $dH/dt, dD/dt, dZ/dt$ )

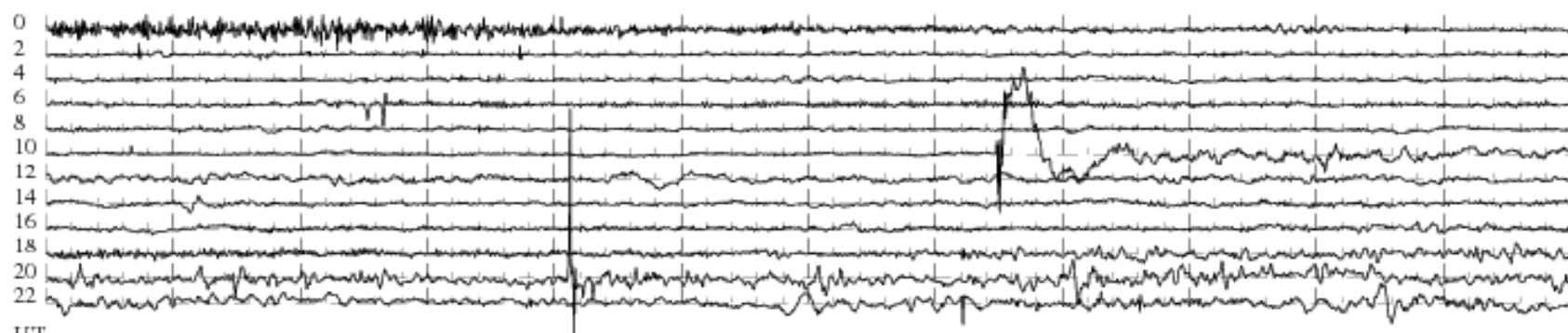
Dec. 23, 2014

station=MDM

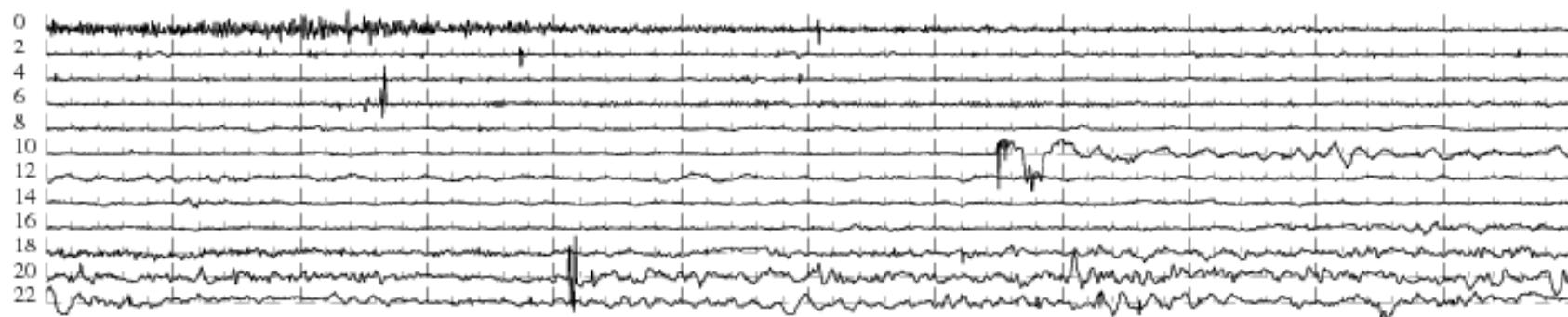
4 sec averages

0.1 nT/s

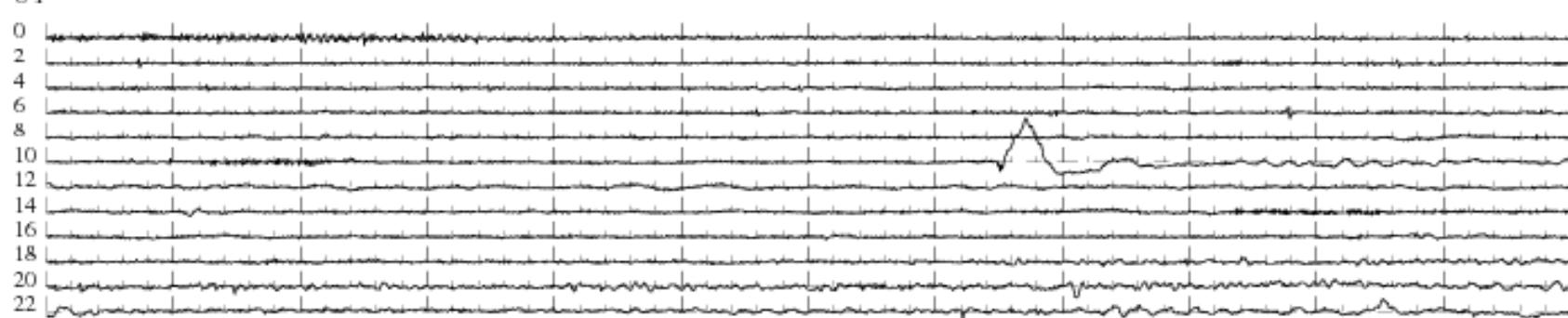
$dH/dt$



$dD/dt$



$dZ/dt$



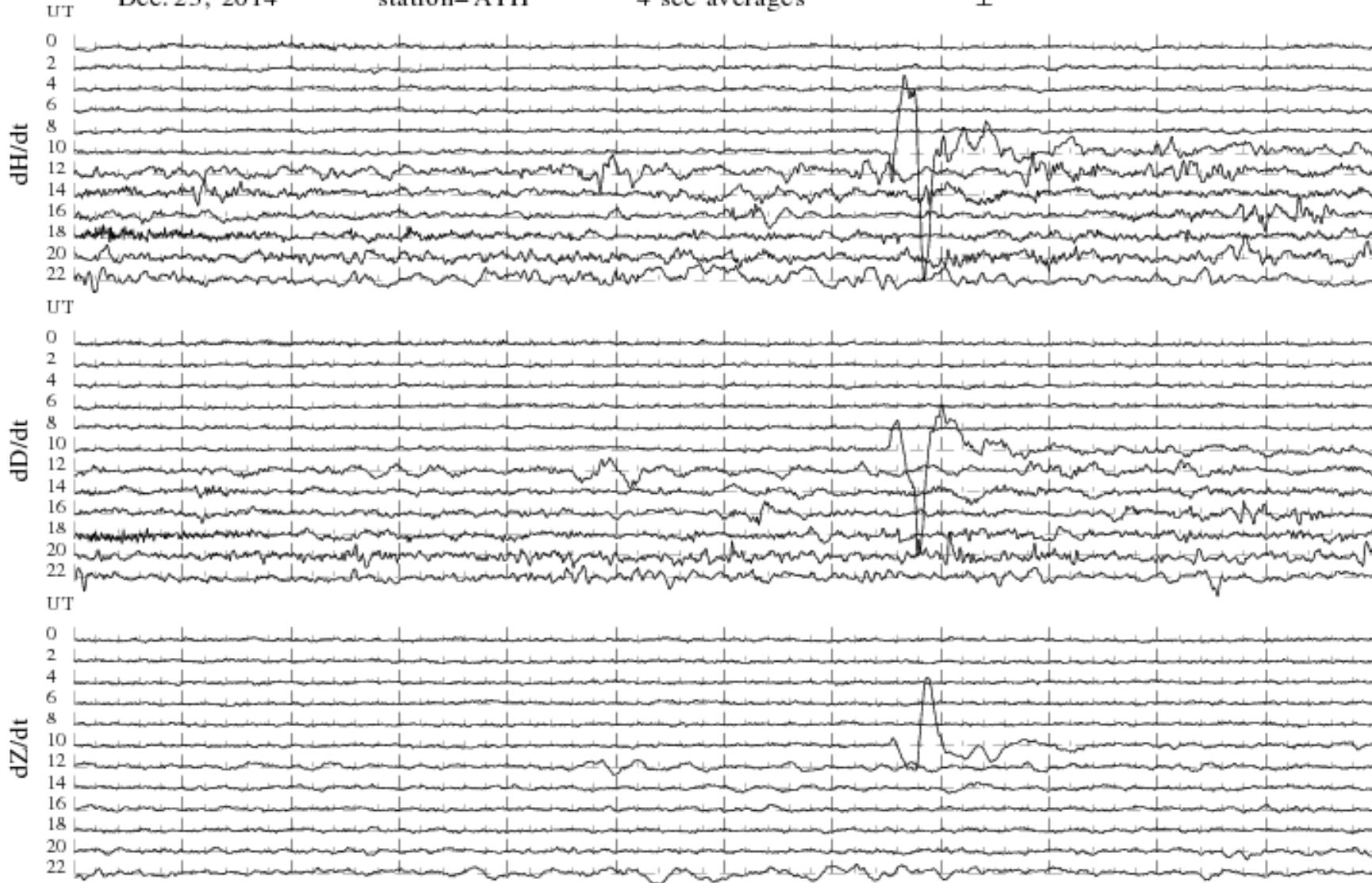
# Magnetic Field Variation ( $dH/dt, dD/dt, dZ/dt$ )

Dec. 23, 2014

station=ATH

4 sec averages

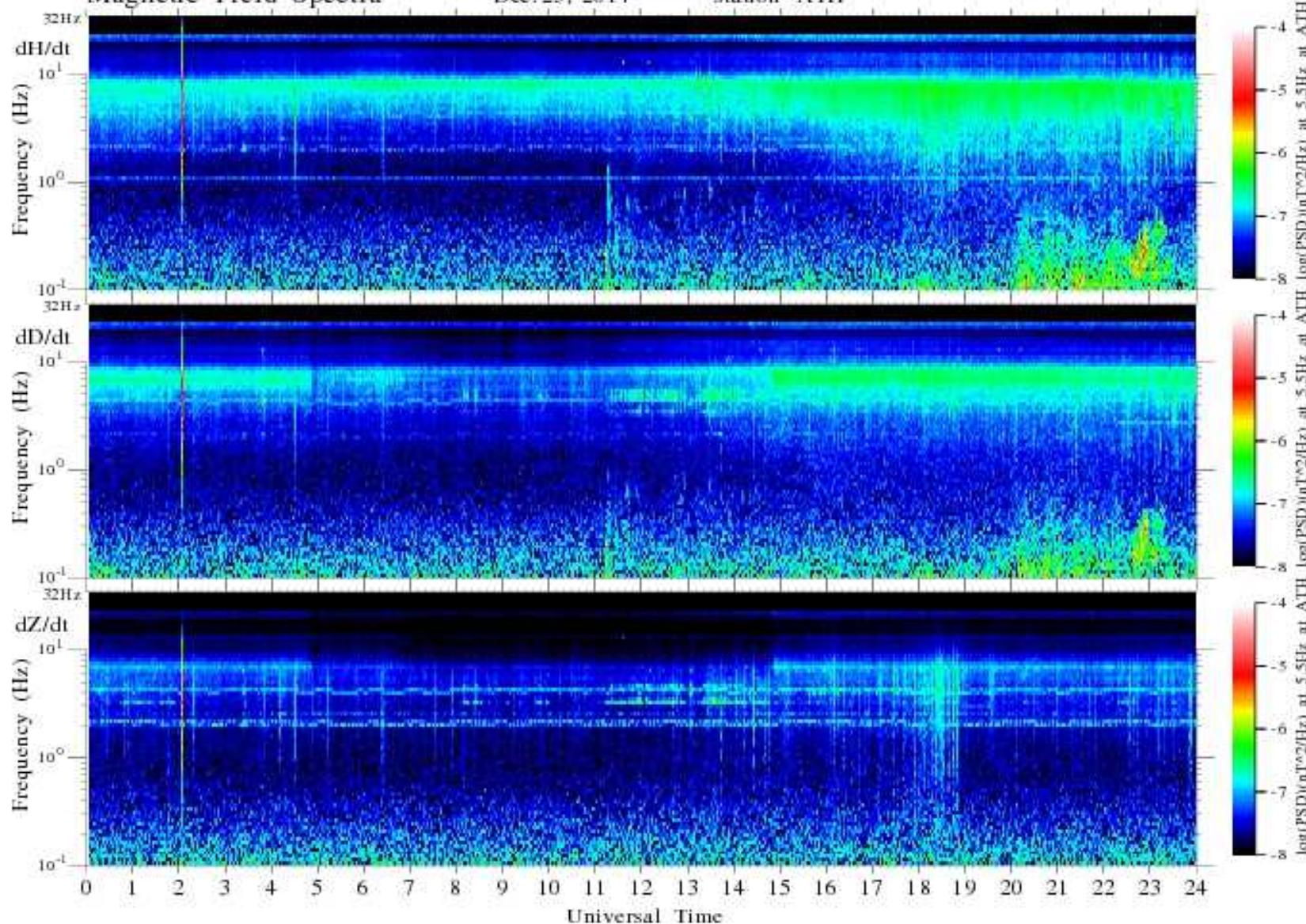
0.010V (0.00810 V/nT at 0.1 Hz at ATH)

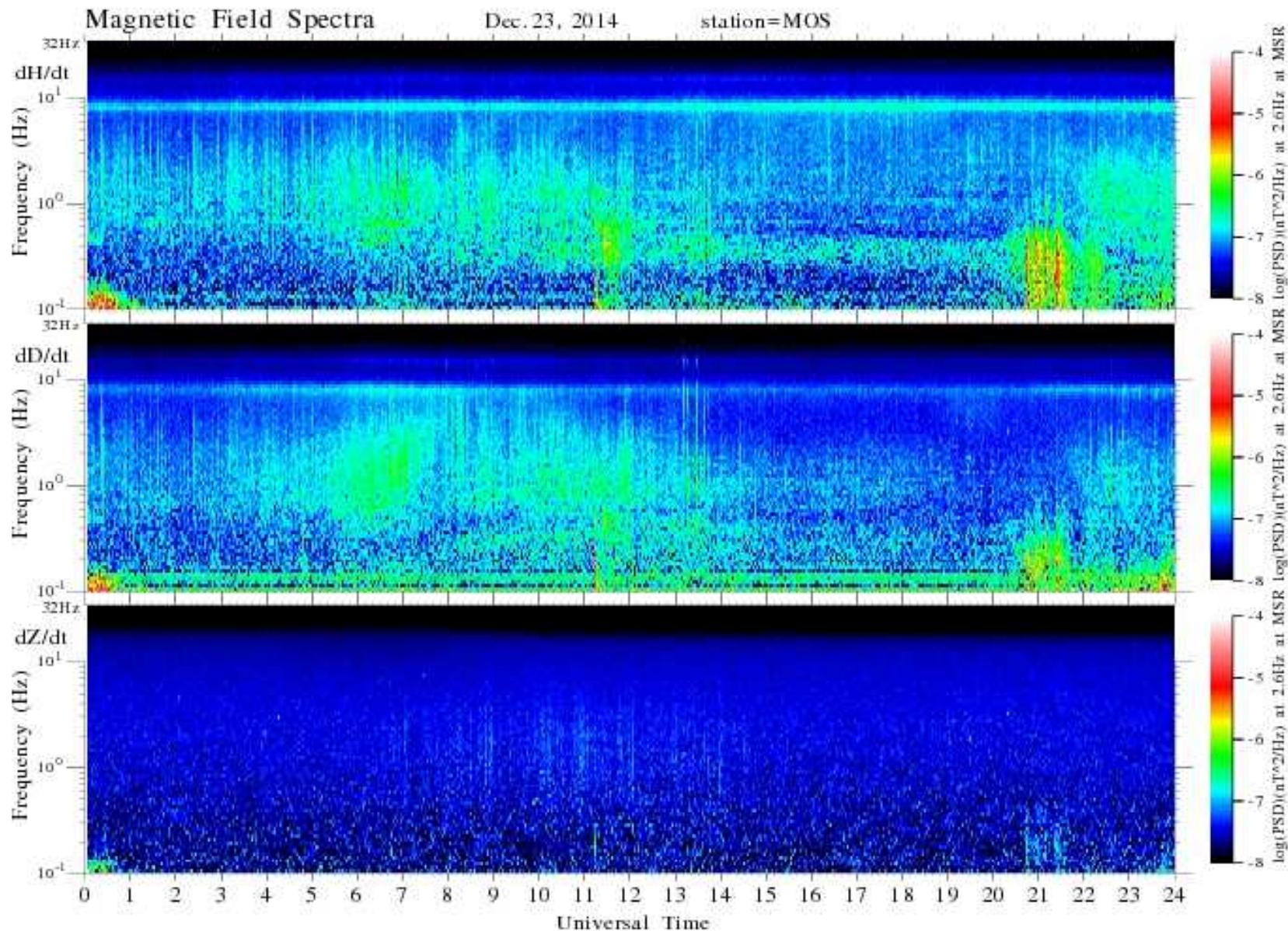


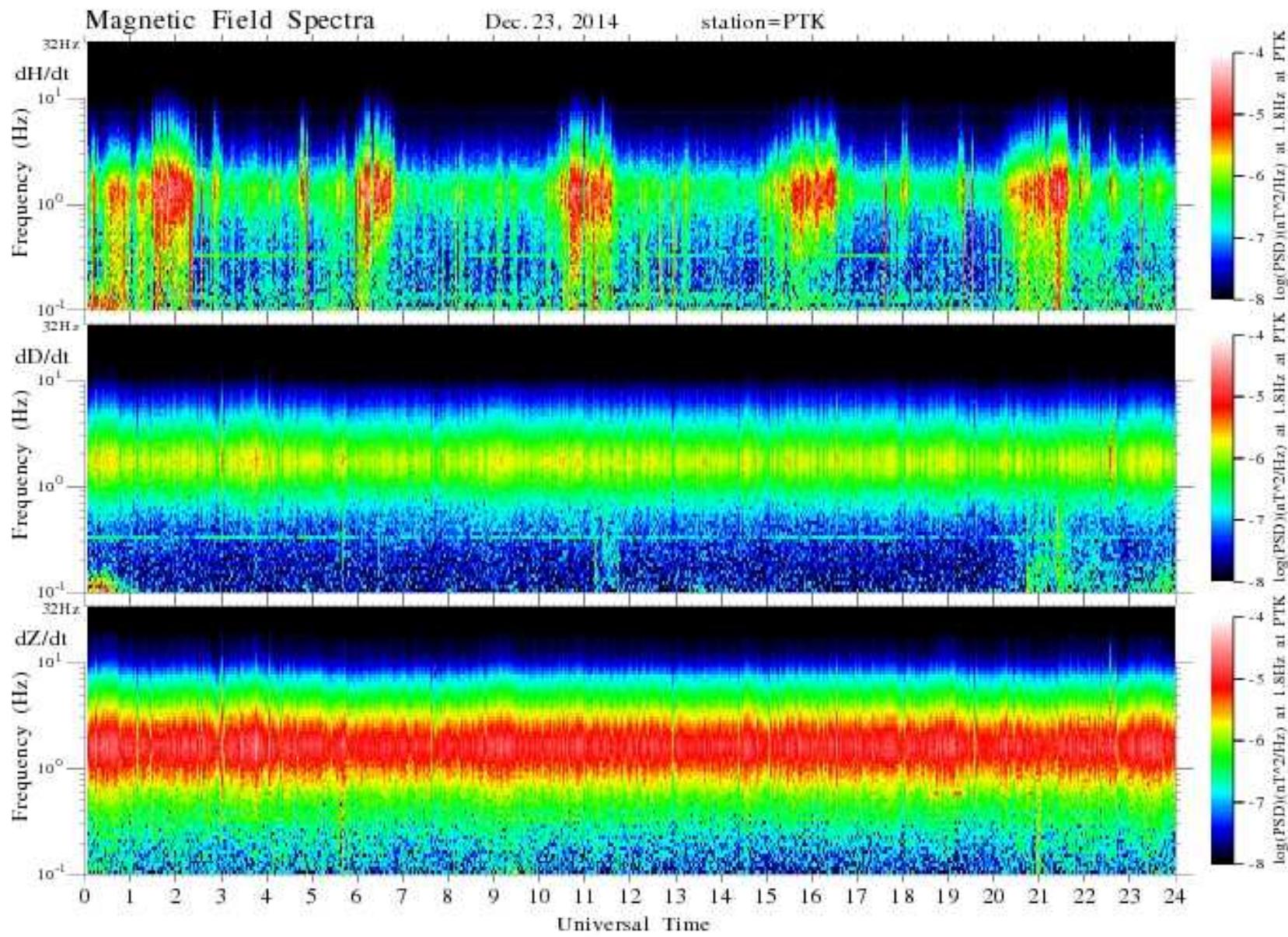
Magnetic Field Spectra

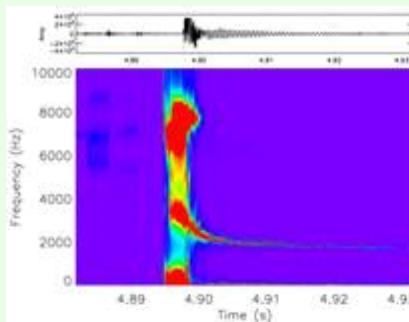
Dec. 23, 2014

station=ATH









## STEL VLF/ELF Data

This homepage is to show quick-look plots and data list of VLF/ELF tapes obtained by the Solar-Terrestrial Environment Laboratory, Nagoya University.



[Stations, Instruments, and Acknowledgements](#)



[Tape data obtained by the Kagoshima Observatory since 1976](#)



[Some notes and errors](#)

## DATA PLOTS VLF sound player

Contact Address

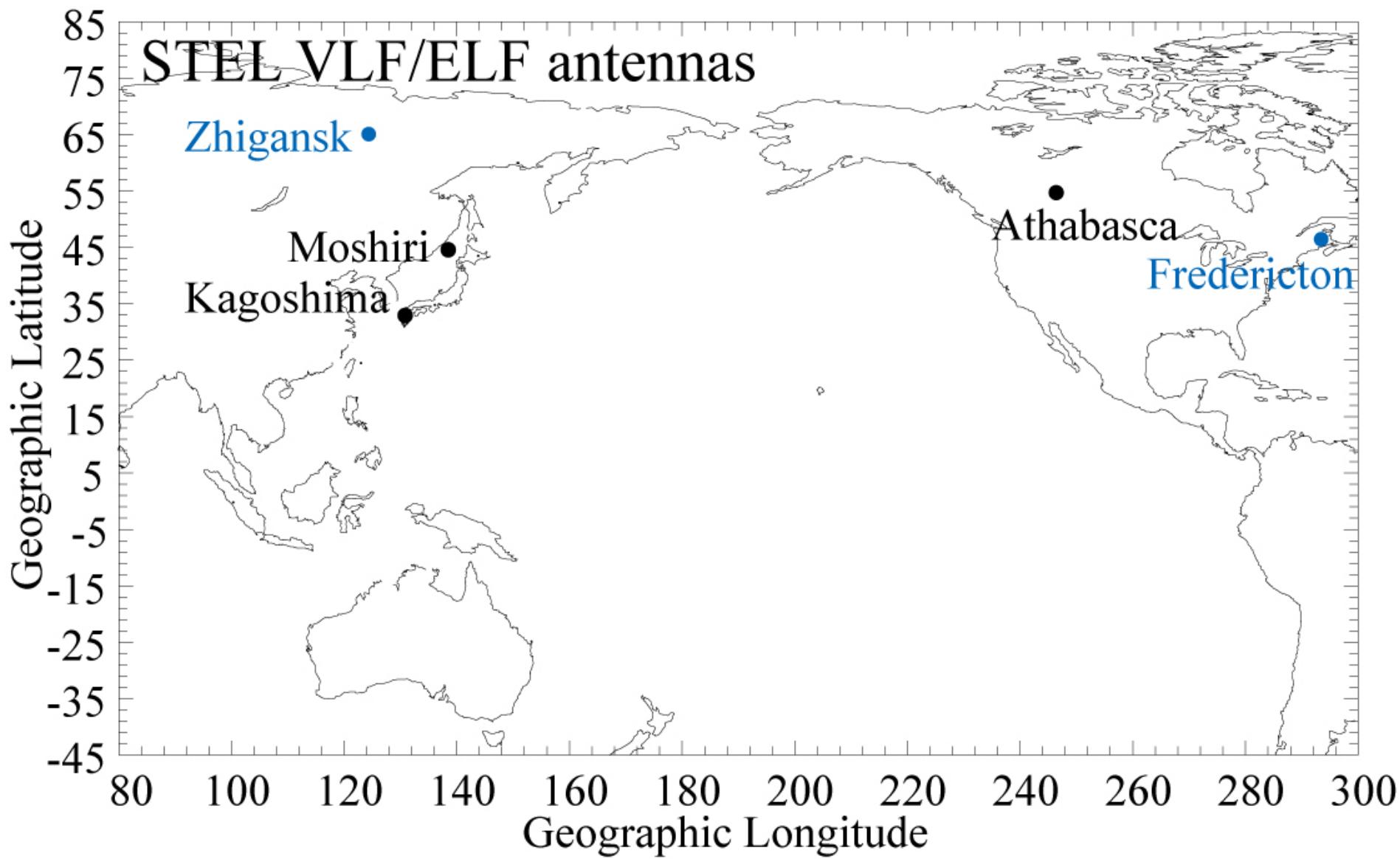
[Kazuo Shiokawa,](#)

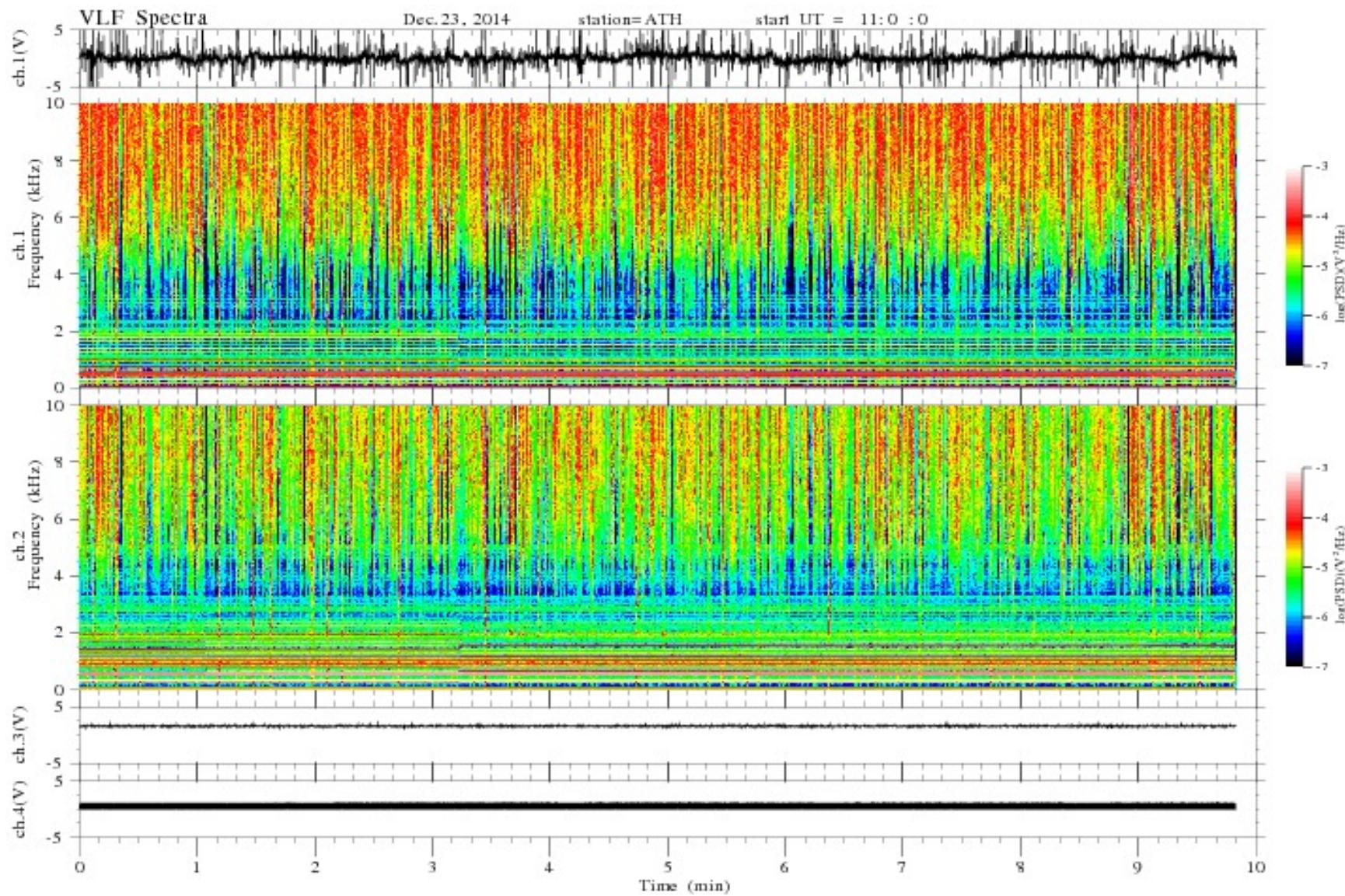
Solar-Terrestrial Environment Laboratory, Nagoya University

Furo-cho, Chikusa-ku, Nagoya, Aichi 464-8601, Japan

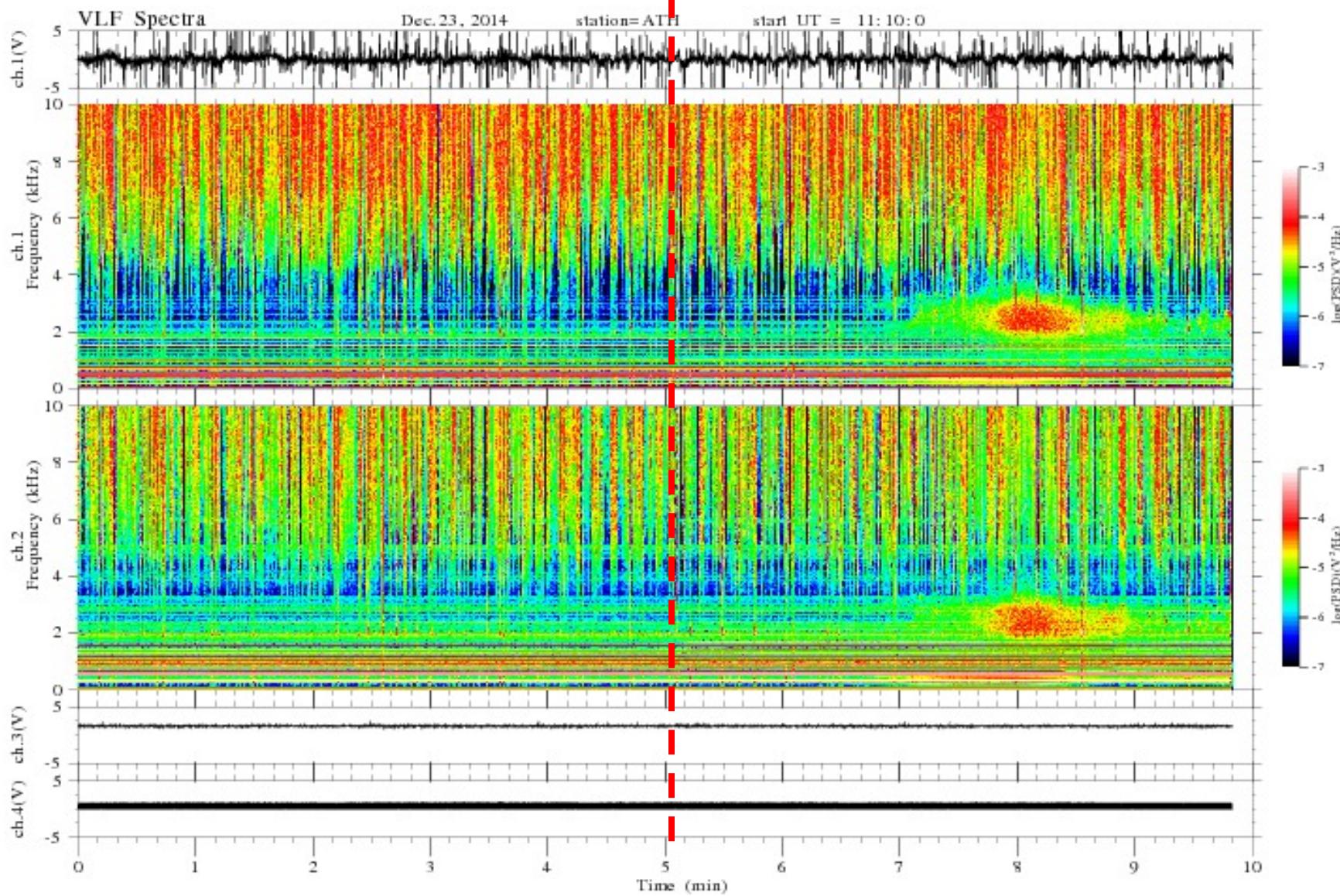
tel: +81-52-747-6419 fax: +81-52-747-6323

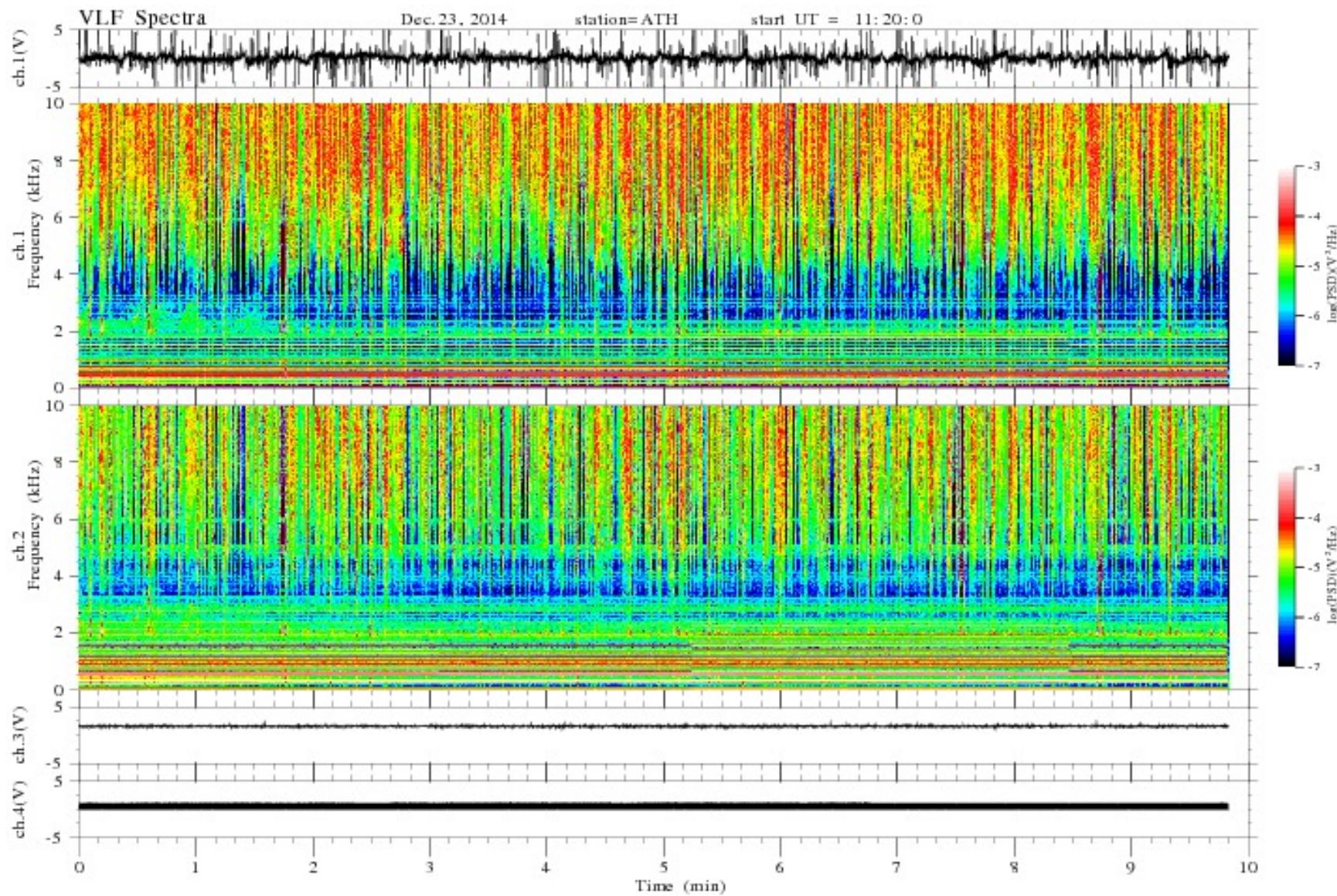
<http://stdb2.stelab.nagoya-u.ac.jp/vlf/>





# Si





# VLF sound player

## Kagoshima(Japan) VLF sounds

[2007](#) [2008](#) [2009](#) [2010](#) [2011](#) [2012](#) [2013](#) [2014](#) [2015](#)

## Athabasca(Canada) VLF sounds

[2012](#) [2013](#) [2014](#) [2015](#)

\*\*\*\*\*

These data can be used only for non-commercial scientific purposes.

When you use these data at any presentation and/or publication, please contact the Principal Investigator (PI) of the project, [Kazuo Shiokawa](#) (shiokawa at stelab.nagoya-u.ac.jp) for authorship/acknowledgements.

This VLF sound player is prepared by [Yoshiyuki Hamaguchi](#) of STEL, Nagoya University.

\*\*\*\*\*

#Notice : This sound file may be too big for downloading  
(e.g., KAG: 4.8MB/file, ATH: 470MB/file). Please also be careful not to turn up the sound volume too high when you listen the sound.  
#As for the browser and plug in, Firefox and QuickTime are recommended.

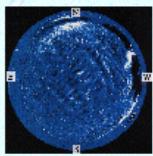
# File format :

The file format of these sounds is based on the wav format.

The first 44 bytes are wav headers followed by the sound data.

VLF sound of Kagoshima is stored at 2 bytes /sample, one channel, 20kHz and corresponds to the magnetic field variation in the E-W direction.

VLF sound of Athabasca is stored at 2 bytes /sample, 4 channels, 100kHz. Channel 1 of Athabasca is the magnetic field variation in the N-S direction, and channel 2 for the E-W direction.



## Optical Mesosphere Thermosphere Imagers (OMTIs)

*Solar-Terrestrial Environment Laboratory, Nagoya University*

You are 019762 th visitor since Jan.25, 2002.

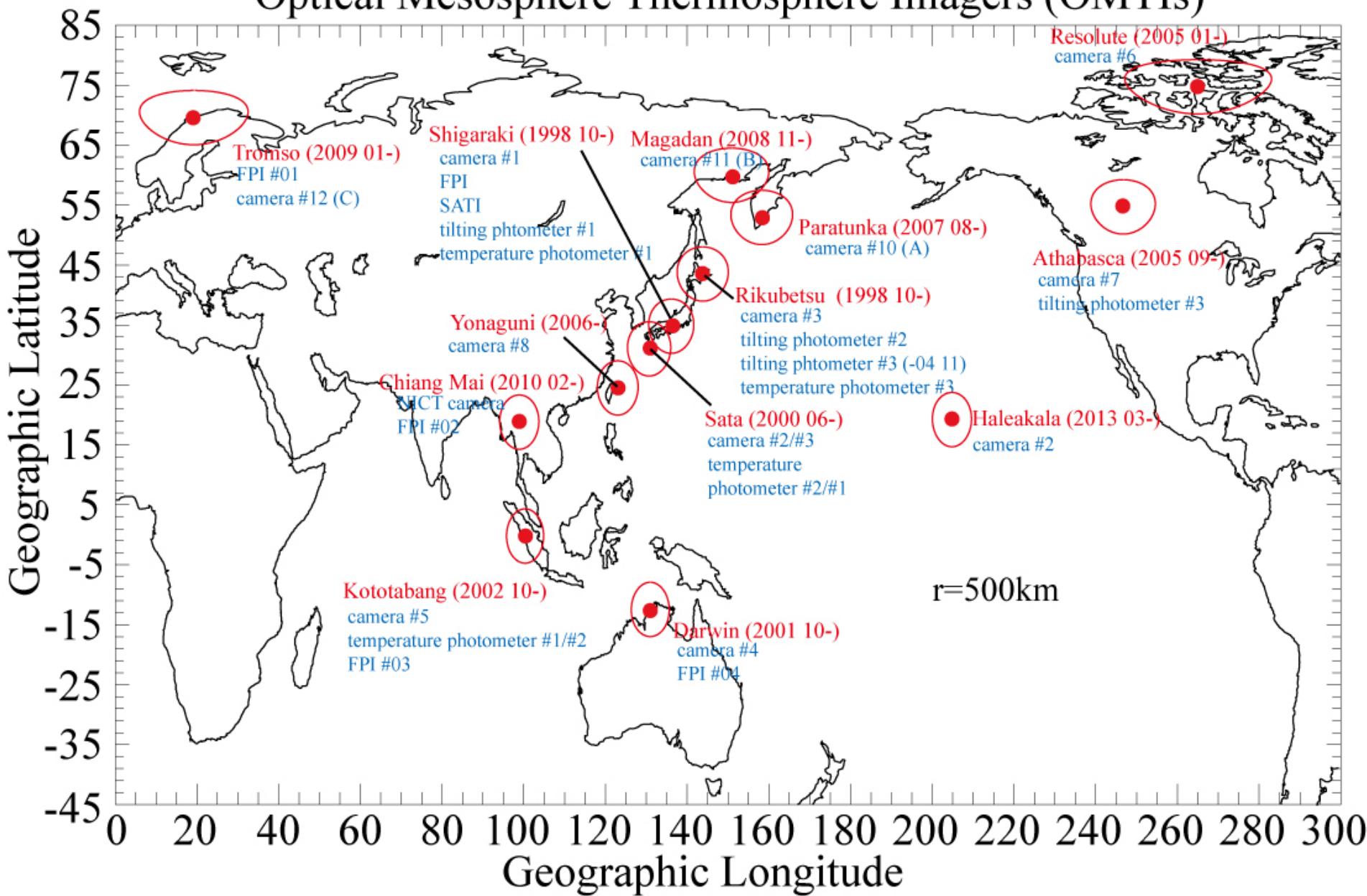
The Optical Mesosphere Thermosphere Imagers (OMTI) were developed at the Solar-Terrestrial Environment Laboratory, Nagoya University, in order to investigate the dynamics of the upper atmosphere through nocturnal airglow emissions. In this homepage, plots of intensity, two-dimensional images, rotational temperatures, and Doppler wind velocities of nocturnal airglow obtained at several ground stations are available.

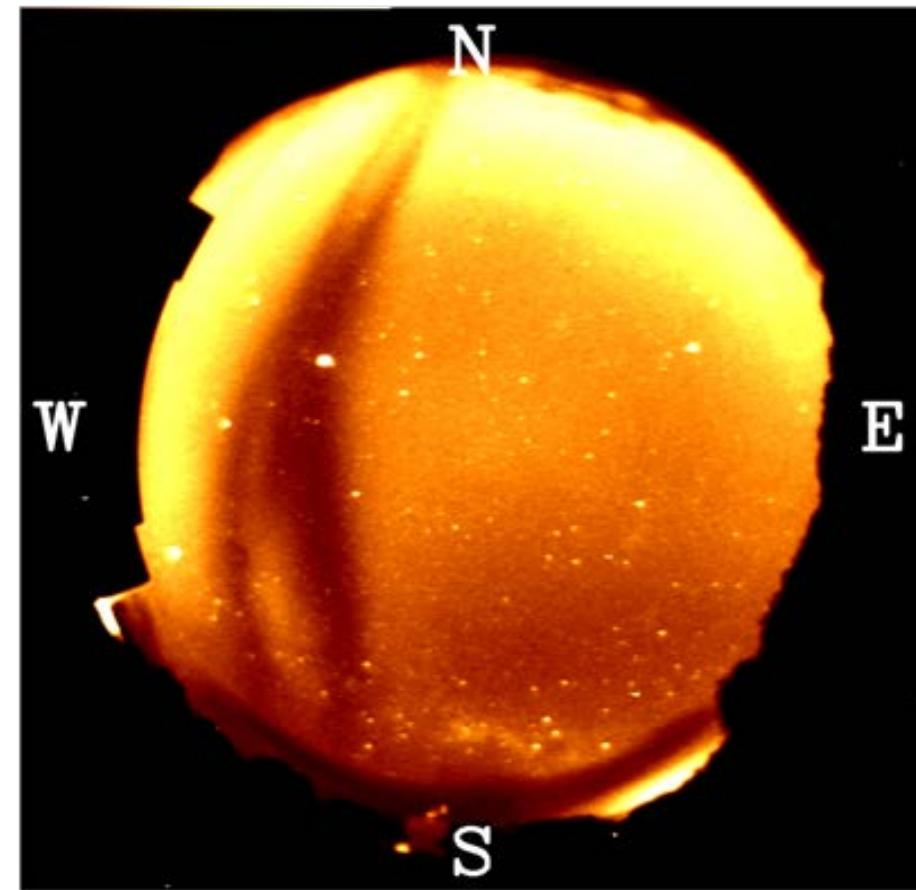
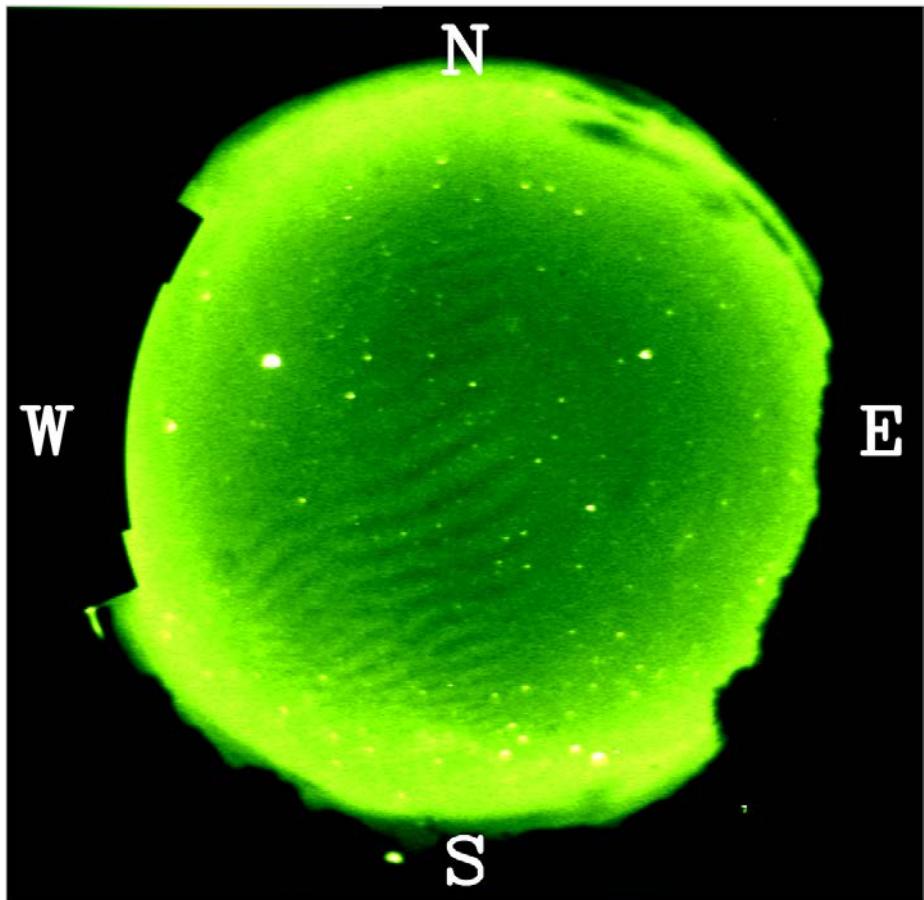
PLEASE CONTACT the Principal Investigators, [K. Shiokawa](#) before using these data for any publications and/or presentations.

Please note that the data are just for browsing purpose and are not fully calibrated.

1. [Important Notes](#)
2. [Station Locations, Observed Airglow Lines, and Time Resolutions](#)
3. [Figure Captions](#)
4. [Instrumental Papers](#)
5. [Publication List](#)
6. [Picture of the Instruments](#)
7. [Sky Condition \(1-hour value\)](#)
8. [Sky Condition \(1-hour value, Canadian stations\)](#)
9. [Sky Condition \(1-hour value, Ithaca \(USA\) station\)](#)

## Optical Mesosphere Thermosphere Imagers (OMTIs)





**Mesospheric gravity waves**

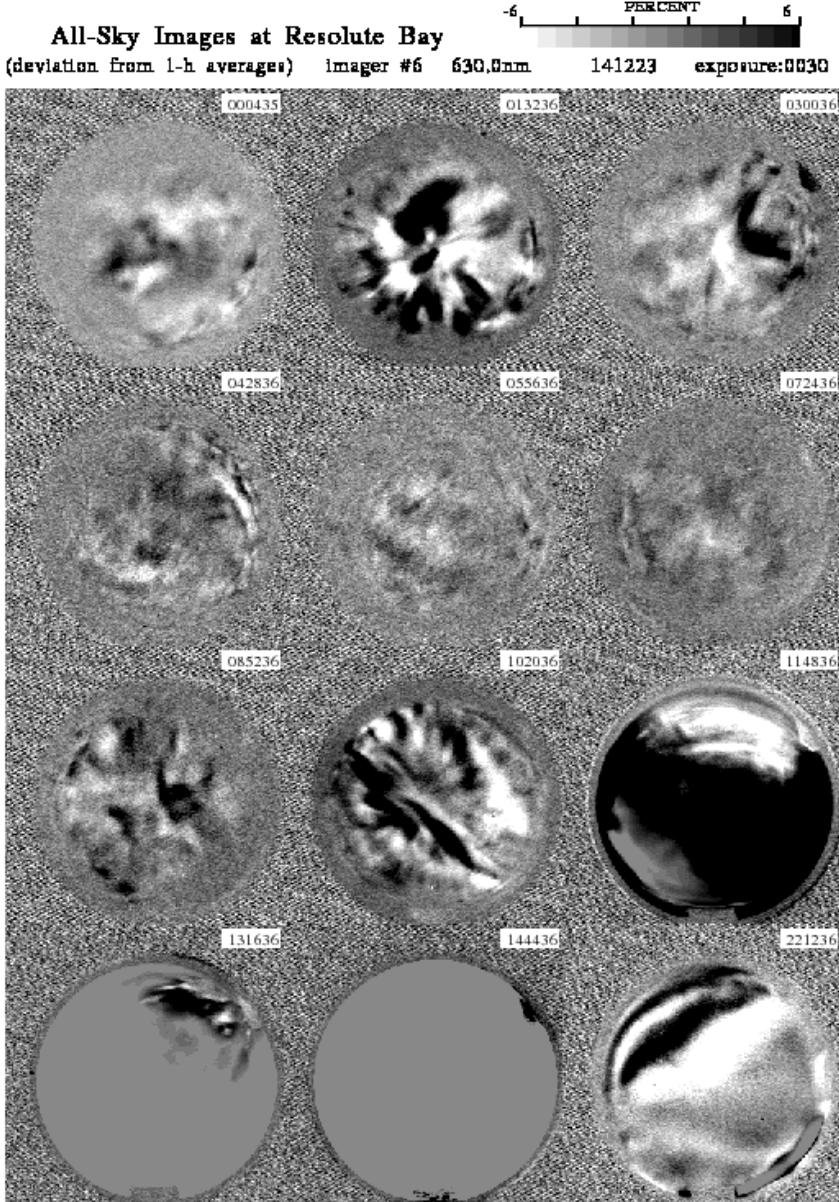
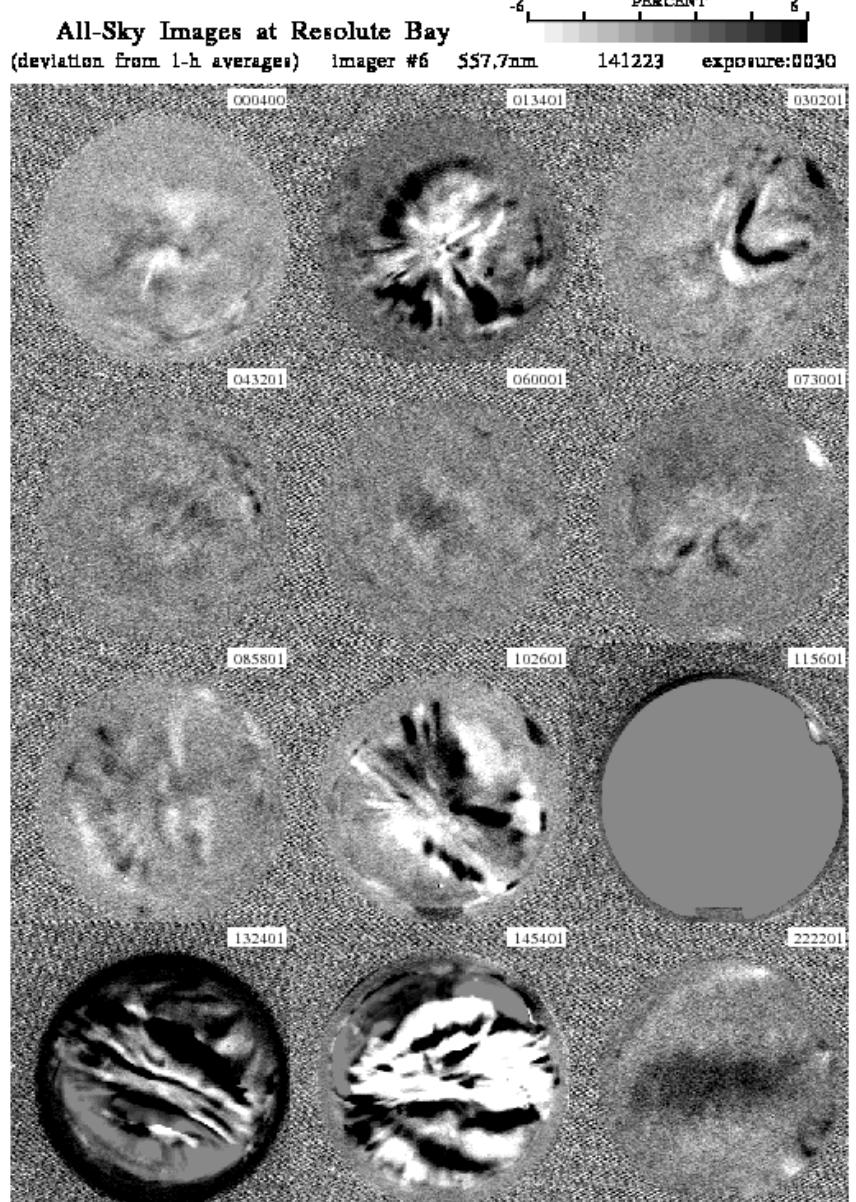
Airglow image at a wavelength of 557.7nm

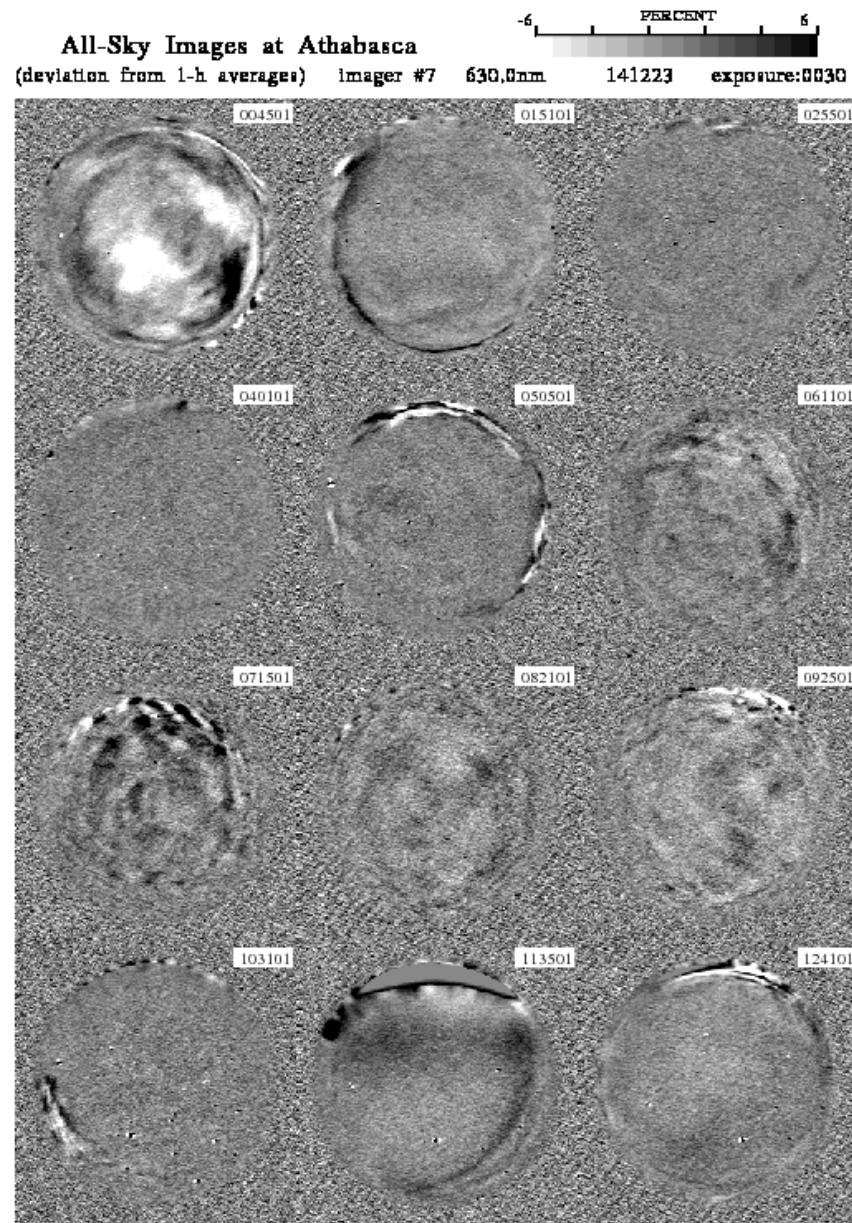
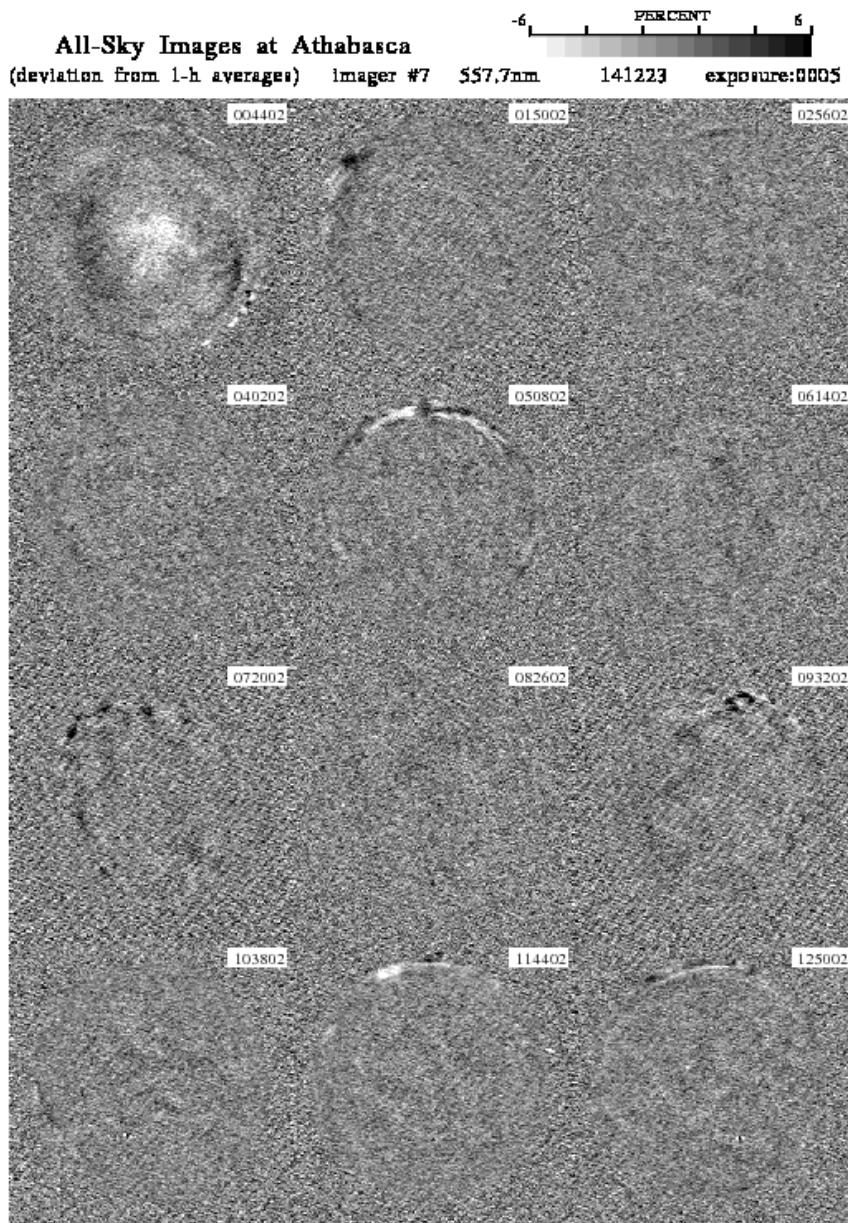
Kototabang, Indonesia, March 6, 2003

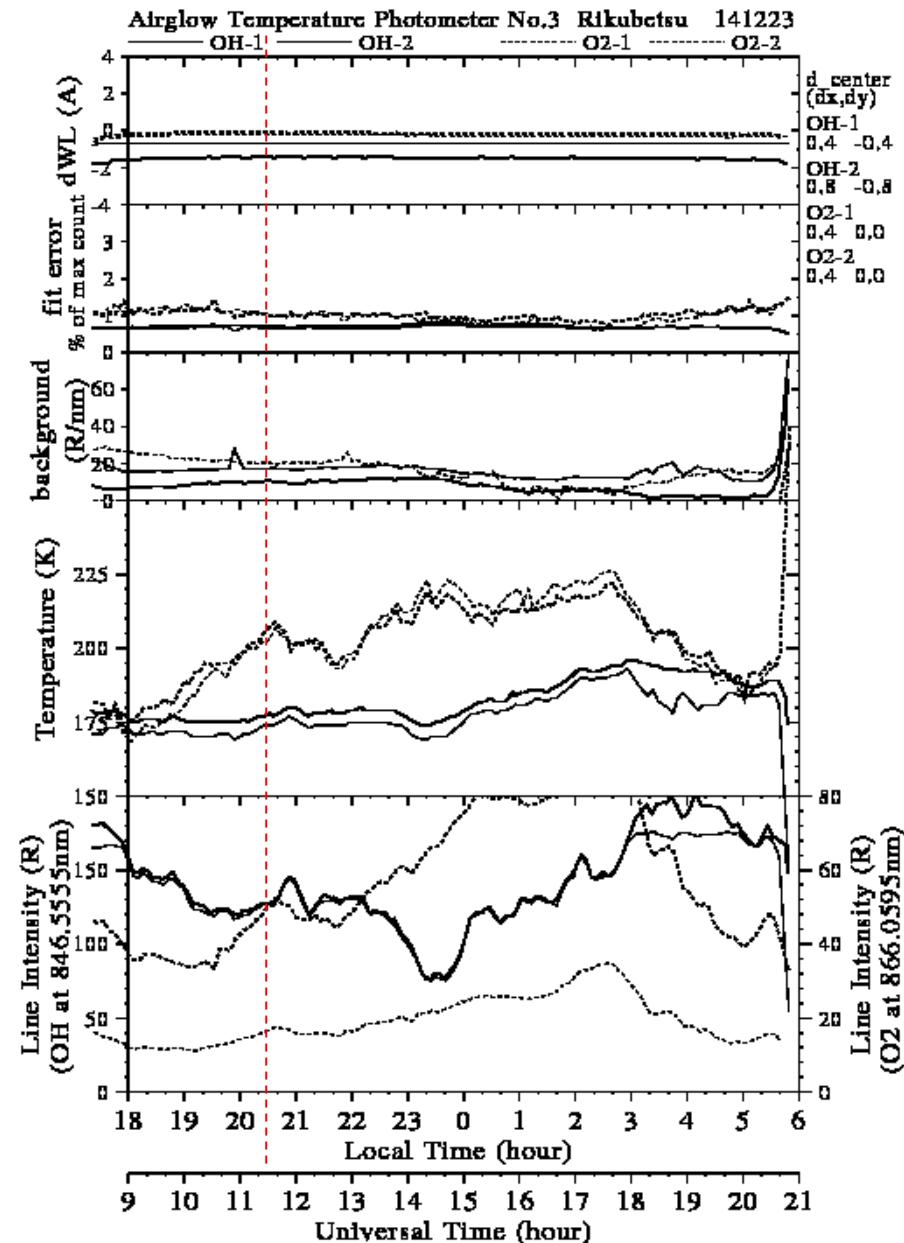
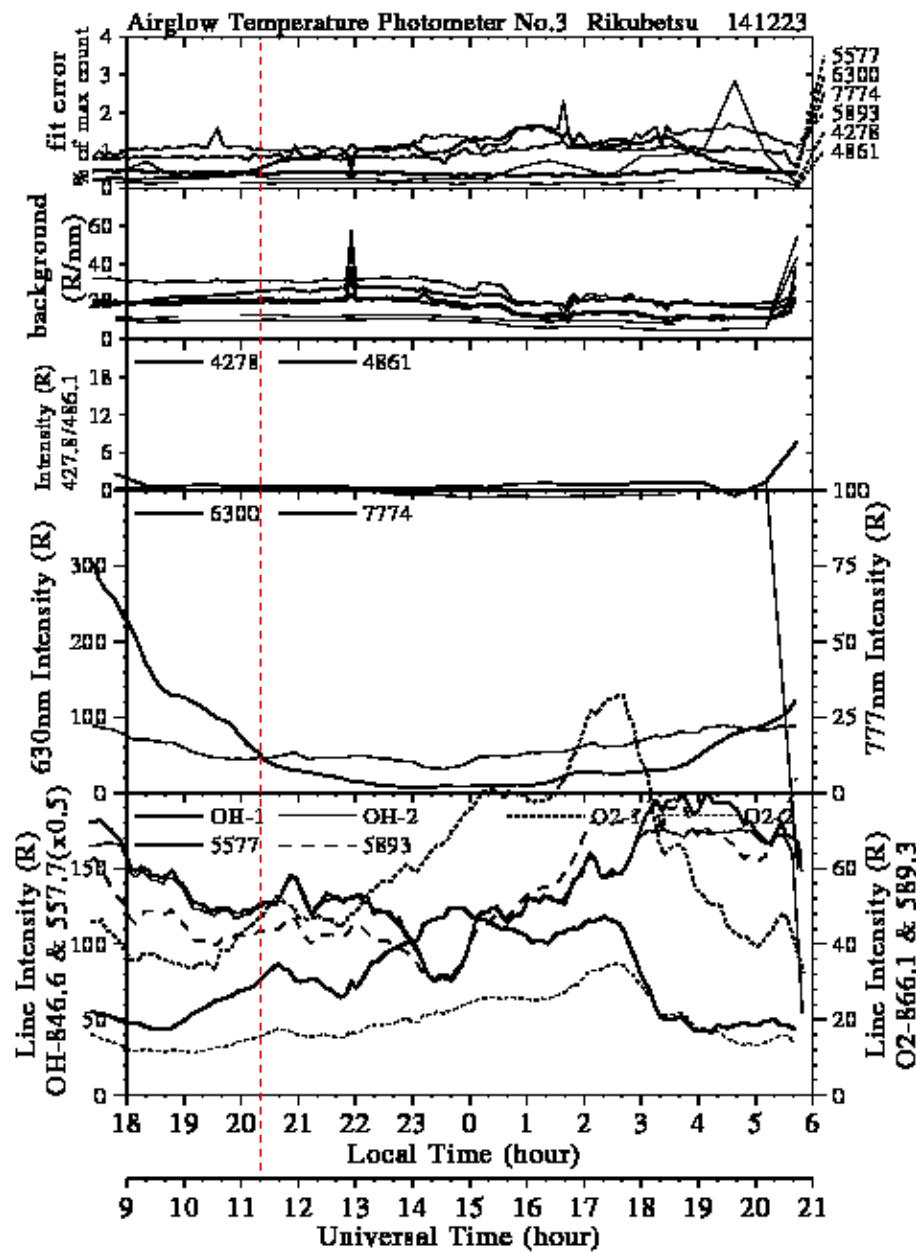
**Ionospheric plasma bubble**

Airglow image at a wavelength of 630.0nm

Kototabang, Indonesia, March 6, 2003







## Summary

Sudden jump in solar wind dynamic pressure with northward IMF at 10:30UT on December 23, 2014.

- (1) An intense sudden impulse (Si) with amplitudes of ~50 nT was observed at 11:15UT in Japan and New Zealand.
- (2) A Pc1 burst is induced. Short (<10min) burst in the postmidnight sector (ATH) and longer (~1h) burst in the premidnight sector (MSR, PTK)
- (3) Intense VLF/ELF chorus emission at ATH ( $L=4.3$ ) at ~2-3 min after the ssc.
- (4) 630-nm aurora enhancement at north of ATH ( $L=4.3$ ).  
Intense 557.7nm and 630nm emission in the polar cap (RSB)
- (5) No signatures in airglow intensity, rotational temperature, and thermospheric wind at middle latitudes.