

Title	How is the IUGONET project using TDAS?
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Citation	(2011)
Issue Date	2011-12-04
URL	<a href="http://hdl.handle.net/2433/152435">http://hdl.handle.net/2433/152435</a>
Right	
Type	Presentation
Textversion	author



# IUGONET

Metadata DB for Upper Atmosphere

超高層大気長期変動の全球地上ネットワーク観測・研究  
Inter-university Upper atmosphere Global Observation NETwork

*GEM Mini-Workshop, San Francisco, 4 Dec. 2011  
- Themis Data Analysis Software tutorial -*

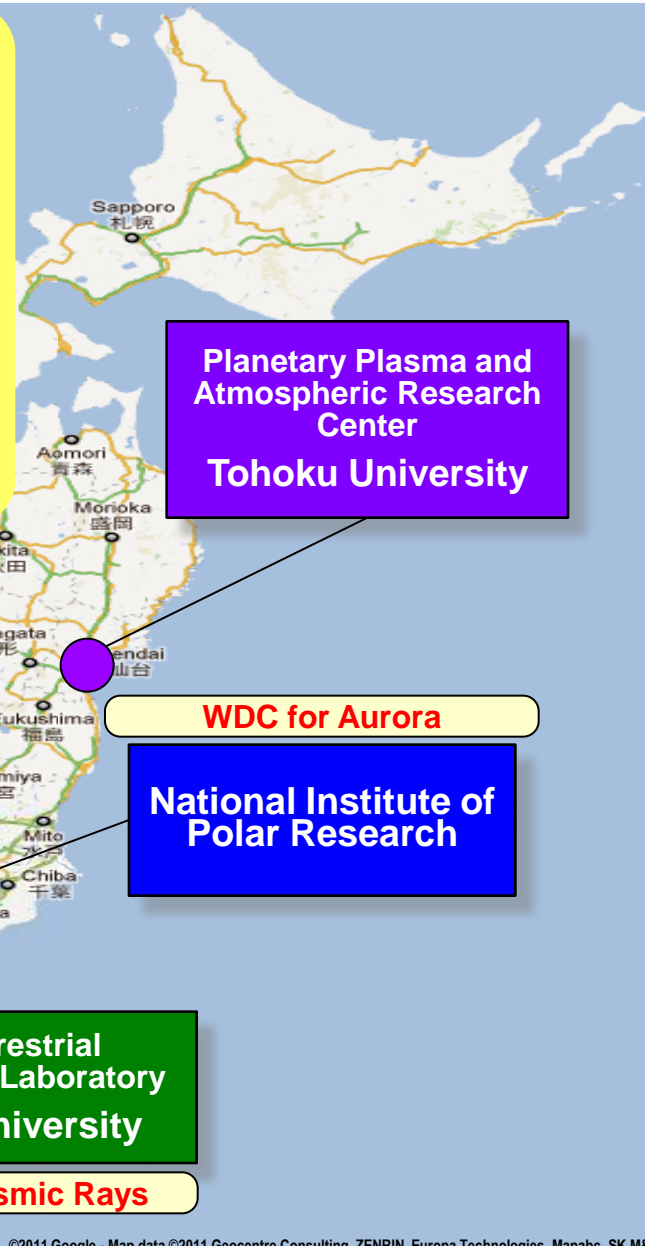
# How is the IUGONET project using TDAS?

**(IUGONET : Inter-university Upper atmosphere  
Global Observation NETwork)**

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and IUGONET project team**

The IUGONET project aims at building “e-infrastructure” for researchers to effectively find, get, and analyze various kinds of upper atmospheric data spread over universities and institutes.

- To distribute ground-based observational data accumulated over 50 years since IGY (both digital and analogue data)
- To promote analyses of multi-disciplinary data, which will lead to comprehensive studies of mechanisms of long-term variations in the upper atmosphere



Planetary Plasma and Atmospheric Research Center  
Tohoku University

Kwasan and Hida Observatories  
Kyoto University

WDC for Geomagnetism  
Data Analysis Center for Geomagnetism and Space Magnetism  
Kyoto University

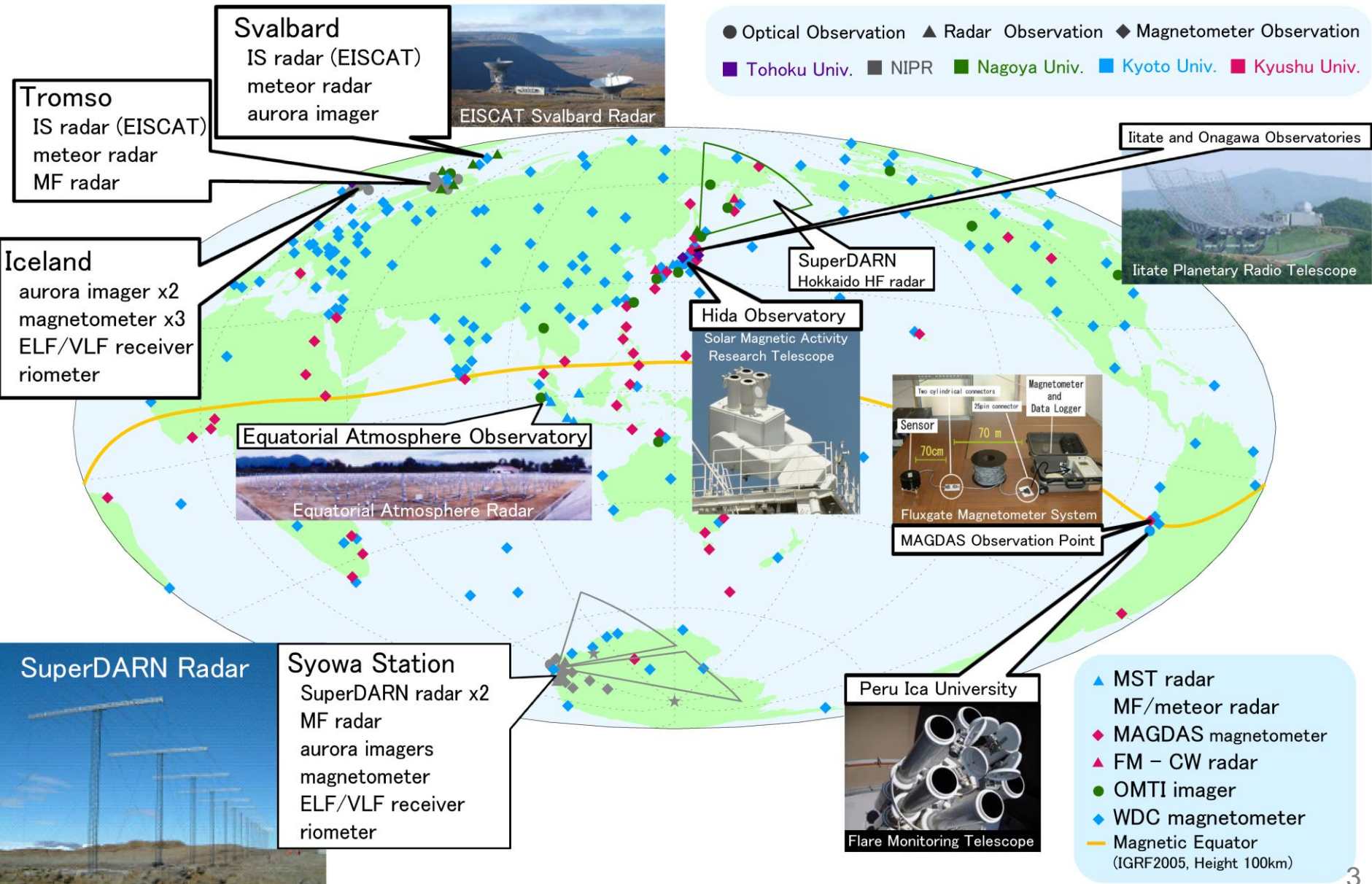
WDC for Aurora  
National Institute of Polar Research

Space Environment Research Center  
Kyushu University

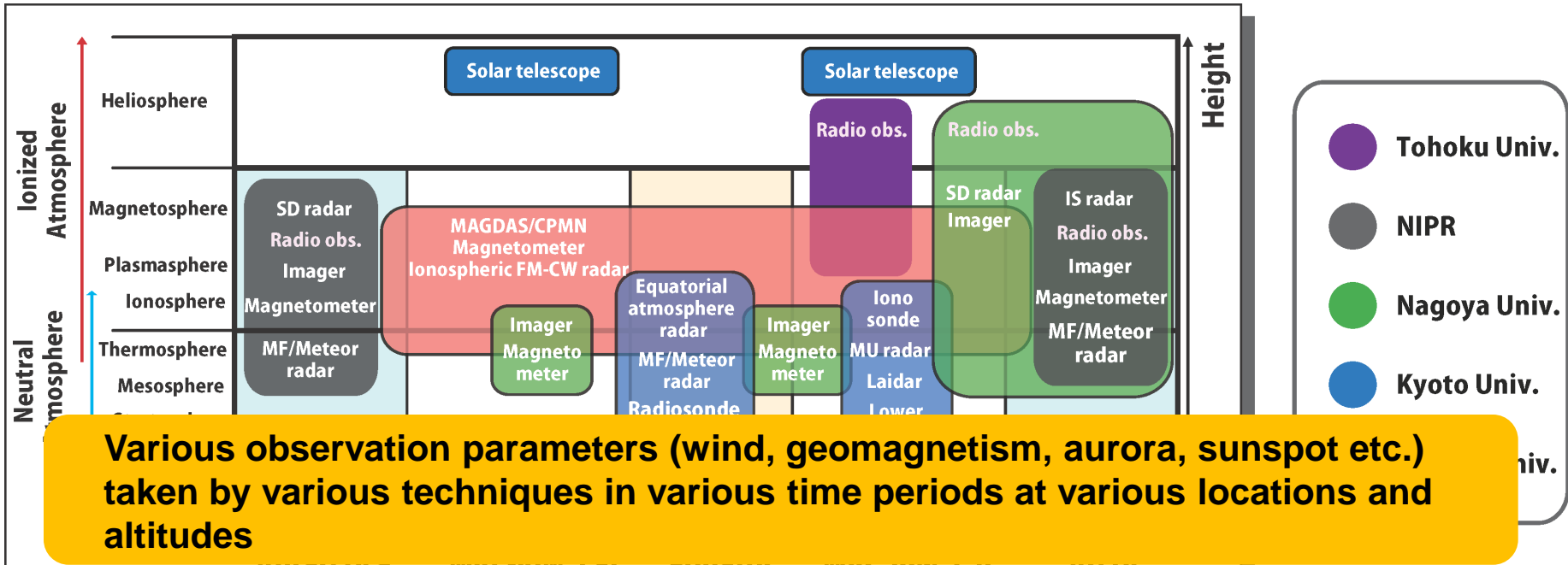
Solar Terrestrial Environment Laboratory  
Nagoya University

Research Institute for Sustainable Humanosphere  
Kyoto University

WDC for Cosmic Rays







Various observation parameters (wind, geomagnetism, aurora, sunspot etc.) taken by various techniques in various time periods at various locations and altitudes

Such observational data not necessarily well used in scientific researches so far  
 → **PROBLEMS: databases dispersed, too little info, various data format, etc.**

**SOLUTIONS**

1. Metadata database : to share info of data online and realize cross-search
2. Data analysis software : to help users quickly visualize and analyze data

## 1. Metadata database

<http://search.iugonet.org/iugonet>

Result of Search

Relative Stop Date: 14 days ago (-P14D)  
<http://gemsissc.stelab.nagoya-u.ac.jp/erg/>  
 Repository: <spase://IUGONET/Repository/STEL/ERG-SC>  
 Instrument: <spase://IUGONET/Instrument/STEL/SuperDARN/HOK/HFRadar>

[The common time fitacf CDF data of SuperDARN King Salmon HF radar distributed by ERG-SC](#)

*NumericalData*  
 Common mode data obtained by SuperDARN King Salmon HF radar. Data files are distributed in the CDF format through the ERG-SC repository  
 Start Date: 2006-12-02T00:00:00  
 Relative Stop Date: 180 days ago (-P180D)  
<http://gemsissc.stelab.nagoya-u.ac.jp/erg/>  
 Repository: <spase://IUGONET/Repository/STEL/ERG-SC>  
 Instrument: <spase://IUGONET/Instrument/STEL/SuperDARN/KSR/HFRadar>

[Standard observation data of the troposphere and lower stratosphere taken by the MU radar \(NetCDF format\)](#)

*NumericalData*  
 The 10-minute average (NetCDF format) data taken by the MU radar at Shigaraki in the Shiga prefecture, Japan (34.85N, 136.10E, 385m MSL), which has been operated in the standard observation mode of the troposphere and stratosphere. The observation data are stored in the NetCDF files of each day. The file name is (year)(month)(day).nc. The NetCDF data include range, height, time, three components of wind velocity, radial Doppler velocity, echo power, spectral width and noise level for each beam number and so on. The azimuth and zenith angles of beam 1, 2, 3, 4 and 5 are (0, 0), (0, 10), (90, 10), (180, 10) and (270, 10), respectively, in unit of degree. The value of 1.0e+10 means missing data.  
 Start Date: 1986-03-16T15:05:00  
 Relative Stop Date: 14 days ago (-P14D)  
<http://www.rish.kyoto-u.ac.jp/radar-group/mu/data/>

Repository: <spase://IUGONET/Repository/STEL/ERG-SC>  
 Instrument: <spase://IUGONET/Instrument/STEL/SuperDARN/KSR/HFRadar>

[Field-aligned irregularity \(FAI\) observation data of the ionosphere taken by the EAR \(NetCDF format\)](#)

*NumericalData*  
 The field-aligned irregularity (FAI) observation data in the NetCDF (Network Common Data Form) format taken by the equatorial atmosphere radar (EAR) at Kototabang, Indonesia (0.20S, 100.32E, 865m MSL). This FAI observation mode covers a wide altitude range from 80 to 600 km in the ionosphere (D-region (below 90 km), E-region (90-150 km), and F-region (above 150 km)). The observation data are stored in the NetCDF files of each day and observation parameter. The file name is (year)(month)(day).(observation parameter).nc. The NetCDF data include range, height, time, radial Doppler velocity, echo power, spectral width and noise level for each beam number and so on. Details of the observation parameter are described in the EAR-FAI homepage (<http://www.rish.kyoto-u.ac.jp/ear/data-fai/index.html>). The value of 1.0e+10 means missing data.

Go to metadata details →

Jump to database web →

## 2. Data analysis software

<http://www.iugonet.org/en/software.html>

UDAS (IUGONET Data Analysis Software)

● 日本語版 Japanese Version

**Topics**


- UDAS v1.00.b1 was released on May 13, 2011. → [Download UDAS](#)

**What is UDAS?**

We provide users with IUGONET Data Analysis Software (UDAS) to read and analyze ground-based observational data opened individually by [each institution in the IUGONET project](#).

- UDAS is a plug-in software of [THEMIS Data Analysis Software suite \(TDAS\)](#), which has many useful routines to visualize and analyze time series data.
- It accesses the IUGONET data through the internet, and then the data are automatically downloaded onto the user's computer. Users can get and analyze the data without any concerns about data locations.
- The loaded data and/or plots can be exported to a variety of data format (ASCII, PNG, JPEG, PS, EPS, etc.).
- GUI (Graphical User Interface) as well as the CUI (Character User Interface) is supplied for beginners.
- Even users who do not have the IDL commercial license will be able to use the GUI-based UDAS on the IDL Virtual Machine\* (Under development)

\* The IDL Virtual Machine is a freely distributed, cross-platform utility for running compiled IDL codes. The IUGONET project will distribute compiled IDL codes of the data analysis software.



The 1st ICSU  
WDS Conference  
Global Data for Global Science  
Kyoto/Japan  
3 - 6 September 2011


**Getting started**

[View screenshots](#)

[List of load procedures and corresponding IUGONET observations](#)

**Download UDAS**

iUgonet  
Data  
Analysis  
Software



**Data Policy**

When you use the IUGONET data, please check the data policy for each data set. The data policy will be displayed in the console, when you run the load procedures on IDL. It is also possible to search the data policy at [the IUGONET Metadata Database](#).

**Collaborations**

We have already released the IUGONET metadata database and the data analysis software for beta-testing!

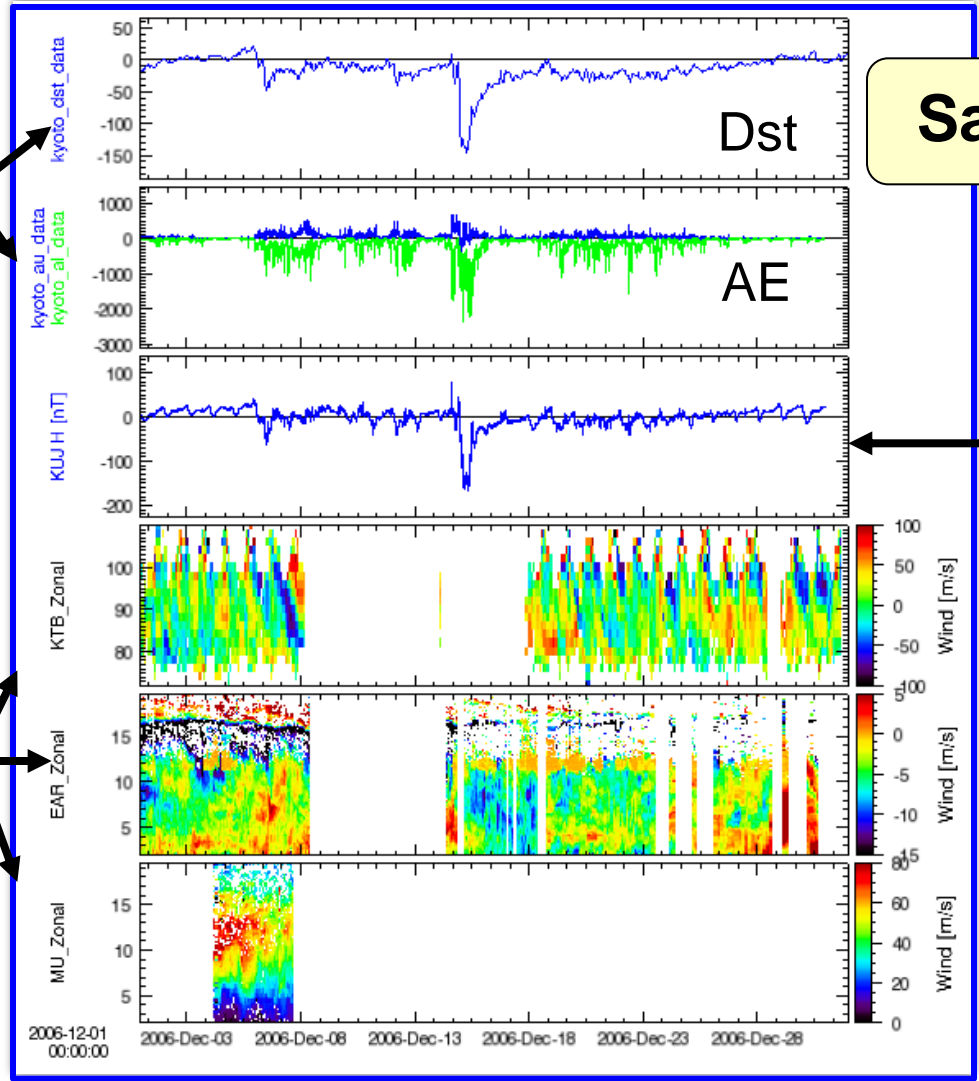
**UDAS** is a plug-in software of **TDAS** and includes the load procedures for the ground-based observational data distributed by the IUGONET institutions.

Geomagnetic field indices

Sample plot

Global magnetometer network data

Various ionospheric and atmospheric radar



<http://www.iugonet.org/en/software/install.html>

IUGONET - UDAS Installation - Windows Internet Explorer

http://www.iugonet.org/en/software/install.html

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日本語版 Japanese Version

**Download UDAS**

Latest version:

- UDAS v1.00.b3 for TDAS v6.00 (260kB, released on August 8, 2011)

Old versions:

- UDAS v1.00.b2 for TDAS v6.00 (260kB, released on July 4, 2011)
- UDAS v1.00.b1 for TDAS v6.00 (250kB, released on May 20, 2011)
- UDAS v0.21.b1 for TDAS v5.21 (260kB, released on May 20, 2011)

**Release Note**

- UDAS v1.00.b3 : Load procedure "iug\_load\_eiscat" for EISCAT radar data was added. Some load procedures for radar data from RISH were updated.
- UDAS v1.00.b2 : all-in-one command "plot\_map\_sdfit" for SD data was added.
- UDAS v1.00.b1 : plug-in software for TDAS v6.00
- UDAS v0.21.b1 : plug-in software for TDAS v5.21

**Install UDAS**

- How to install UDAS (PDF, 0.9MB)

**Notice**

- If TDAS has not been installed yet, please download and install it.
- IDL (6.3-7.1) is required. IDL 8 is not available for current version of TDAS and UDAS.

IUGONET  
Metadata DB  
for Upper Atmosphere

UDAS  
Iugonet Data Analysis Software

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0. If **TDAS** has not been installed yet, download TDAS and set it up.

1. Download **UDAS** from the IUGONET website.

2. Unzip the downloaded file.

3. Copy UDAS into any directory you want.

4. Set IDL path to access UDAS prior to TDAS.



## Load procedures included in UDAS v1.00.b3

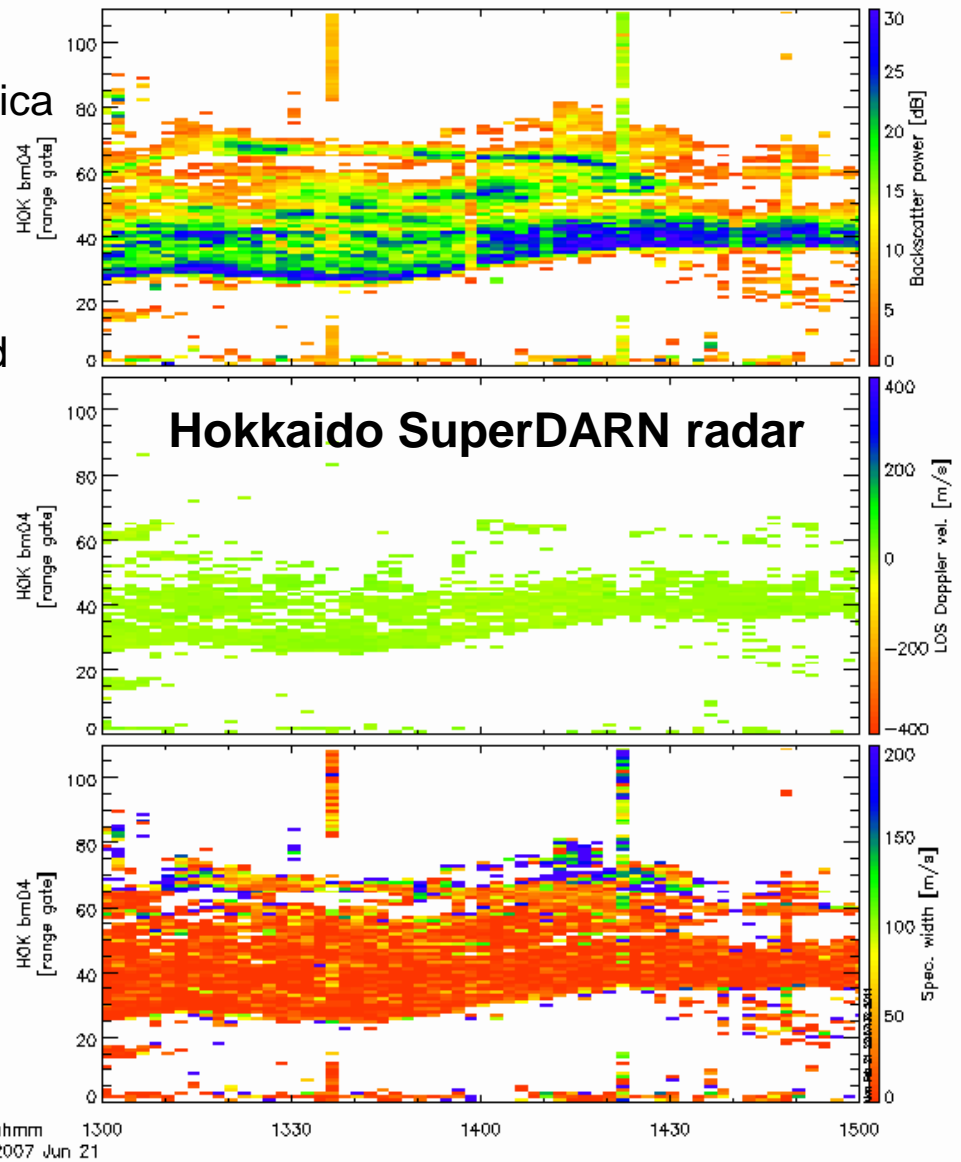
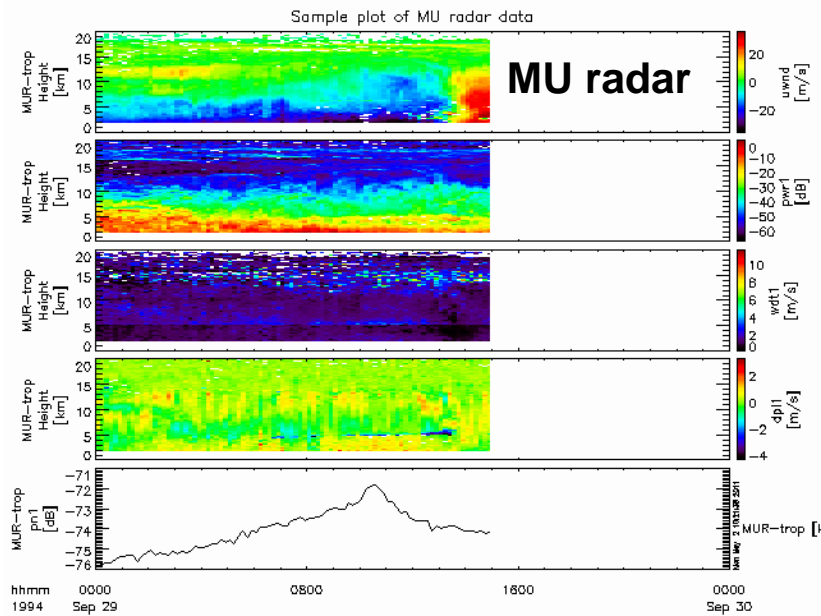
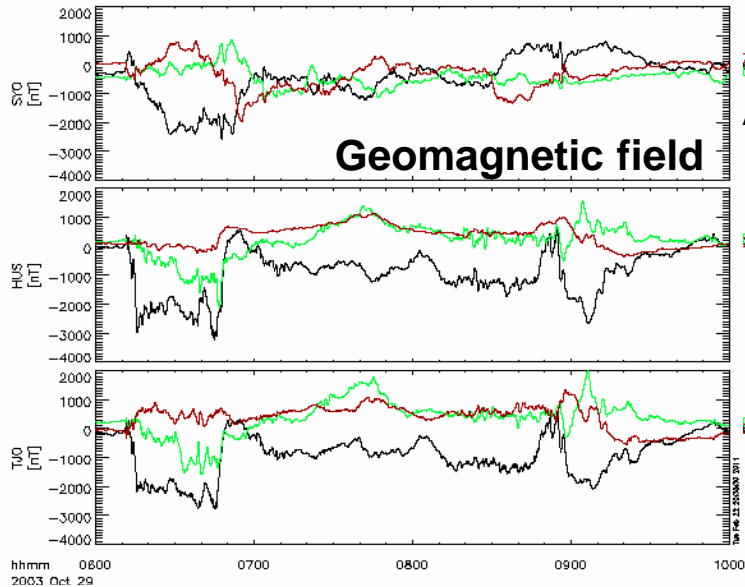
### 1. Load procedures for the IUGONET data:

- `iug_load_blr_rish_txt` ; Boundary Layer Radar data (RISH, Kyoto)
- `iug_load_ltr_rish_txt` ; L-band Low Troposphere Radar data (RISH, Kyoto)
- `iug_load_ear` ; Equatorial Atmosphere Radar data (RISH, Kyoto)
- `iug_load_eiscat` ; EISCAT radar data (NIPR; Nagoya)
- `iug_load_gmag_serc` ; MAGDAS geomagnetic data (Kyushu)
- `iug_load_gmag_wdc` ; AE, Dst, Sym, Asym induces, geomagnetic data (WDC, Kyoto)
- `iug_load_iprt` ; Iitate Planetary Radio Telescope data (Tohoku)
- `iug_load_mu` ; Middle and Upper (MU) atmosphere radar data (RISH, Kyoto)
- `iug_load_meteor_rish` ; Meteor wind radar data (RISH, Kyoto)
- `iug_load_mf_rish` ; MF radar data (RISH, Kyoto)
- `iug_load_gmag_mm210` ; Alias of `erg_load_gmag_mm210` (Nagoya)
- `iug_load_gmag_nipr` ; Alias of `erg_load_gmag_nipr` (NIPR)

### 2. Load procedures for the ERG-related data:

- `erg_load_sdfit` ; SuperDARN (Nagoya; NIPR; NICT)

Our software has been developed in collaboration with **ERG Science Center**.



You can use GUI for loading the IUGONET data.

The image shows two overlapping windows from the IUGONET software. The top window, titled "IUGONET: Load Data", has a menu bar with "THEMIS Data", "THEMIS Derived Spectra", "GOES Data", "WIND Data", "ACE Data", and "IUGONET Data". The "IUGONET Data" tab is highlighted with a red circle and a red arrow pointing to a pink box labeled "IUGONET Data tab". Below the menu bar, the "IUGONET Data Selection" section includes "Start Time" (2008-03-21/00:00:00), "Stop Time" (2008-03-22/00:00:00), a checked "Use Single Day" box, and an "Instrument Type" dropdown set to "SuperDARN#". A blue box labeled "Instrum" has an arrow pointing to this dropdown. Below are three columns: "Data Type" (ionosphere), "Site or parameter(s)-1:" (hok, sye, sys), and "Parameters" (azim\_no, pwr, pwr\_err, spec\_width, spec\_width\_er, vlos, vlos\_err, echo\_flag, quality, quality\_flag, vnorth, veast, vlos\_iscat, vlos\_gscat). There are "Clear Site or Parameters-1" and "Clear Par..." buttons. A note at the bottom states: "Note: # means that the load procedure has been developed in collaboration with the ERG Science Center." A status bar at the bottom left says "20: IUGONET Data Loaded Successfully".

The bottom window, titled "THEMIS: Main Window", has a menu bar (File, Edit, View, Graph, Analysis, Pages, Help) and a toolbar. The main display area shows a spectrogram of solar radio waves. The y-axis is labeled "IPRT\_SUN\_LCP" and the x-axis shows time from 2011-07-02 22:00:00 to 06:00:00. A color scale on the right ranges from 0 to 250. The plot shows a prominent horizontal band of activity between 150 and 200 on the color scale. A large white text overlay reads "Solar radio waves by IPRT". A status bar at the bottom right says "8: Warning: No valid y scaling data found. Using proportional scaling."

- **The IUGONET project** (<http://www.iugonet.org>) builds metadata database and **data analysis software (UDAS)** to promote effective use of upper atmospheric data taken by various ground-based observations.
- **UDAS** is a plug-in software of **TDAS** and provides the load procedures for the various ground-based observational data distributed by each institution in the IUGONET project.
- **The IUGONET products have been beta-released!**
  - Metadata database : <http://search.iugonet.org/iugonet/>
  - Analysis software : <http://www.iugonet.org/en/software.html>

**We welcome your feedback**