IUGONET

Metadata DB for Upper Atmosphere

超高層大気長期変動の全地球上ネットワーク観測・研究

Inter-university Upper atmospher Global Observation NETwork

Training session

SPEDAS-GUI & IUGONET Type-A

The 3rd ISEE Symposium
PWING-ERG conference and school on the inner magnetosphere

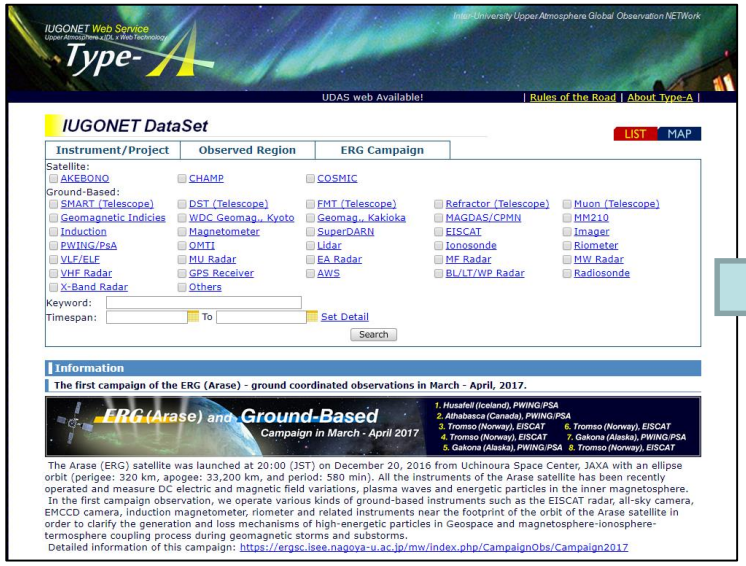
on March 8-12, 2021

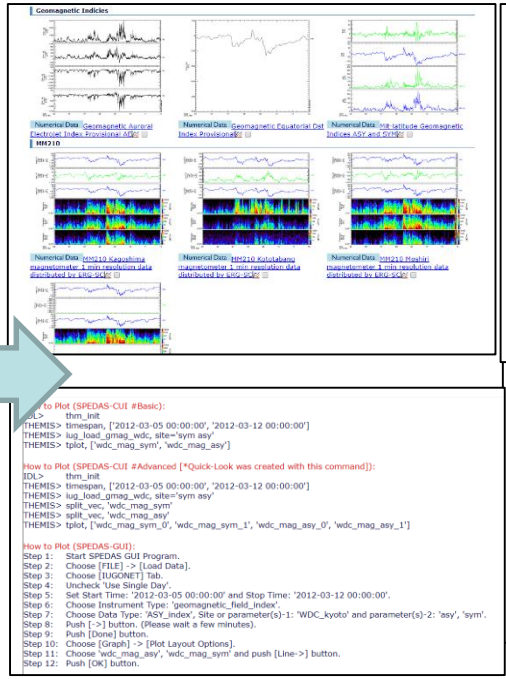
Contents of this documents

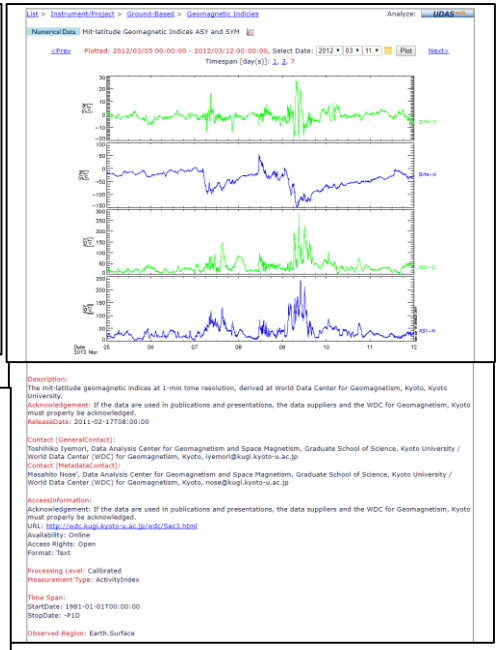
1. Basic operation of IUGONET data service (IUGONET Type-A)

2. Basic operation of the GUI tool of SPEDAS

What is IUGONET Type-A?







http://search.iugonet.org/

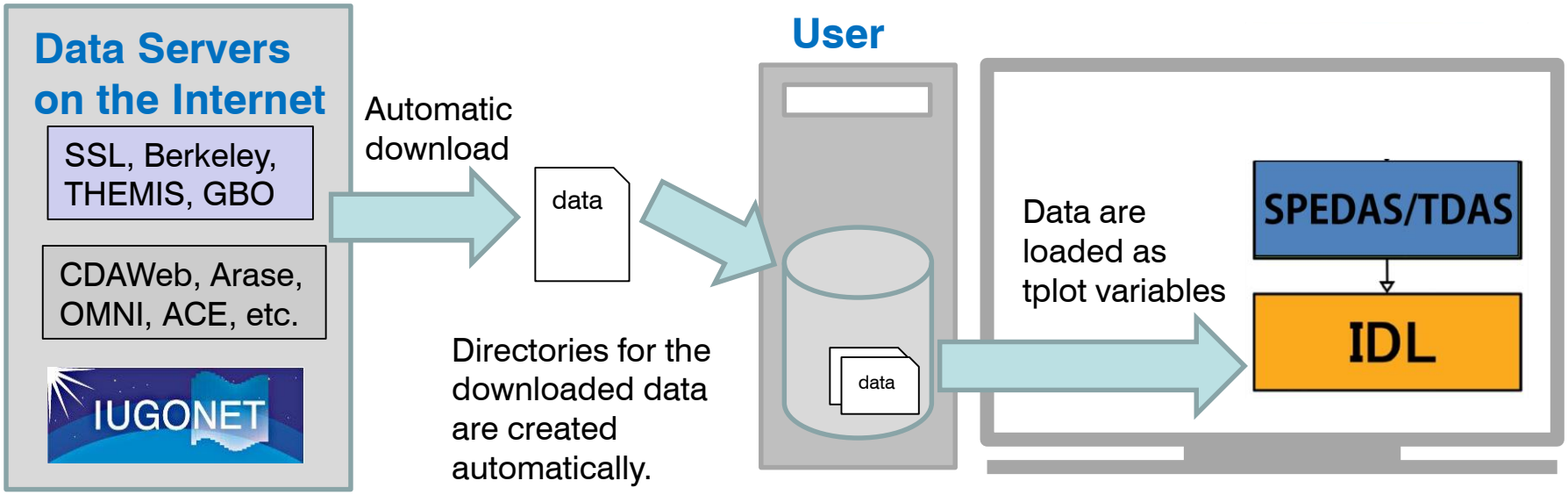
- IUGONET data service (called IUGONET Type-A) is capable of cross-searching observational data distributed across the IUGONET universities and institutes, including the PWING data, .
- IUGONET Type-A provides one-stop web services such as
  searching data, finding interesting events, interactively plotting the data, and leading users to more detailed analysis.

What is SPEDAS?

Space Physics Environment Data Analysis Software : SPEDAS

Users can easily load and visualize various kinds of data by a few commands with SPEDAS.

1. Set a time period	timespan, 'yyyy-mm-dd'
2. Load *** data	xxx_load_***
3. Plot the loaded data	tplot, +++



If you use the GUI tool, only a few simple clicks of your mouse are required to make the same plot as that created by the SPEDAS commands above.

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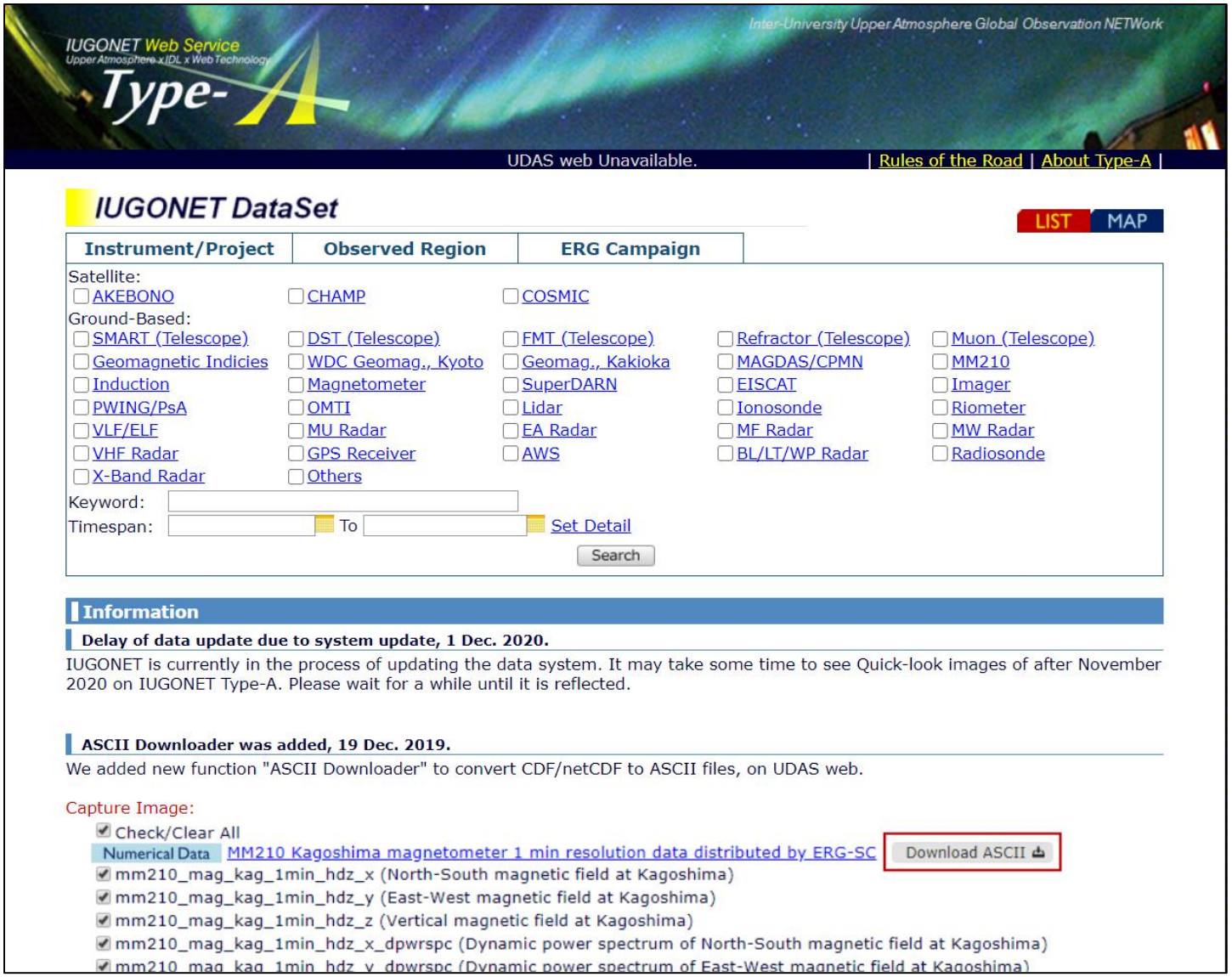
How to use IUGONET Type-A

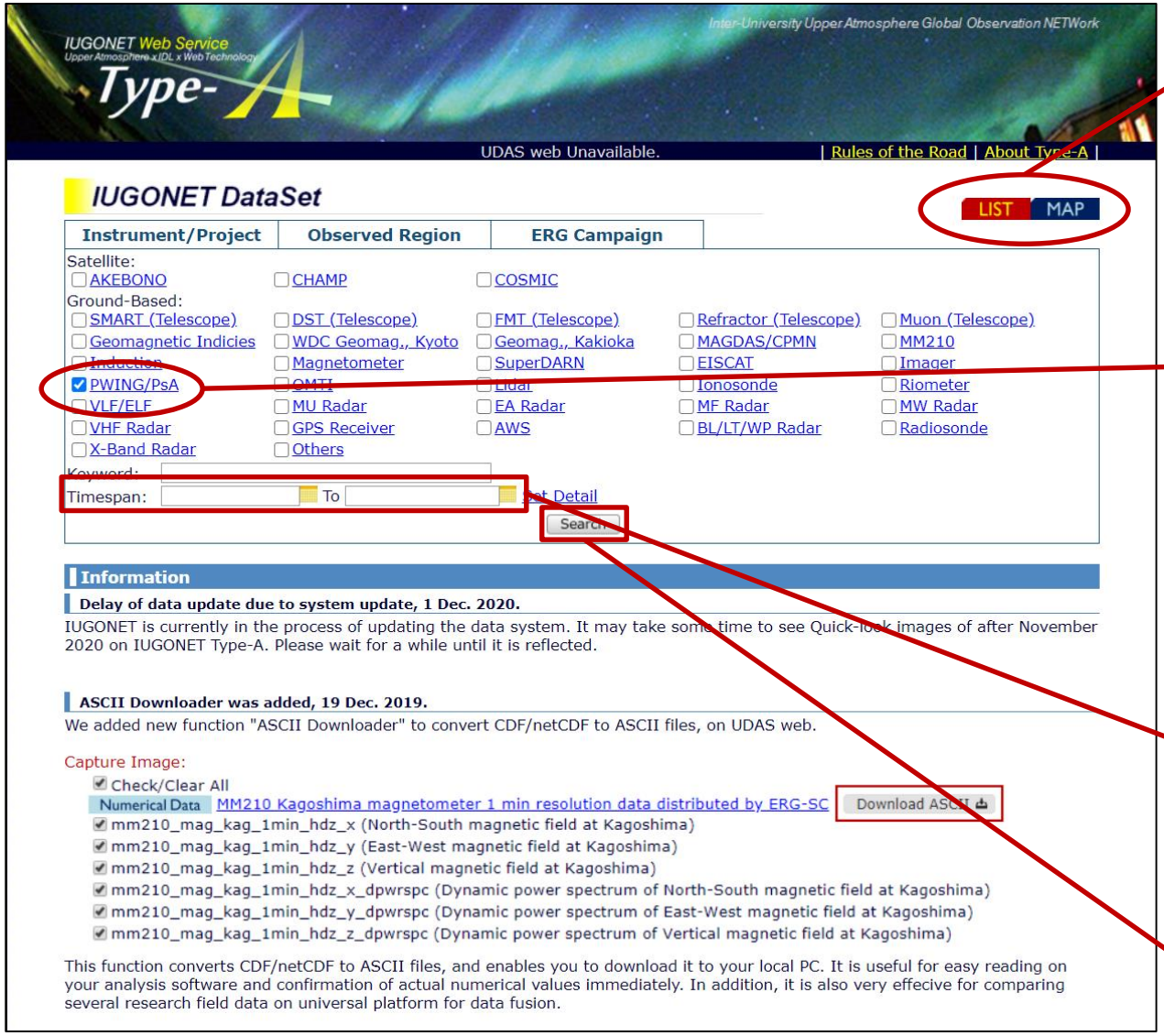
Basic Operation of IUGONET Type-A

Access to IUGONET Type-A (http://search.iugonet.org)



Basic Operation of IUGONET Type-A

Search data



Select the LIST or MAP search.

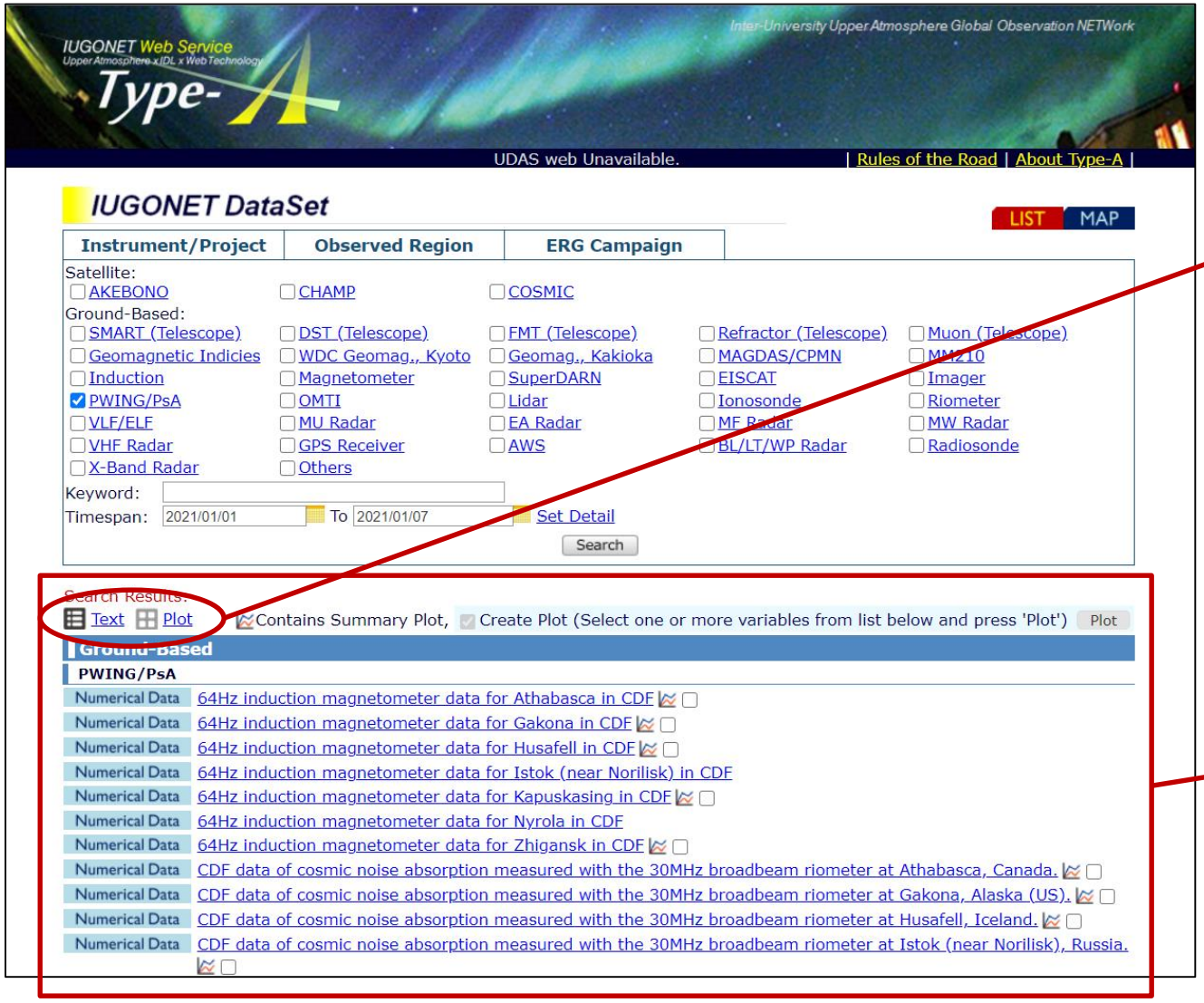
You can limit the search results by selecting the Instrument/Project from the list or inputting the keyword that you want to search.

Input the timespan you want to search the data
2021/01/01 (from)
2021/01/07 (to)

Click “Search” button

Basic Operation of IUGONET Type-A

Search result (list display)

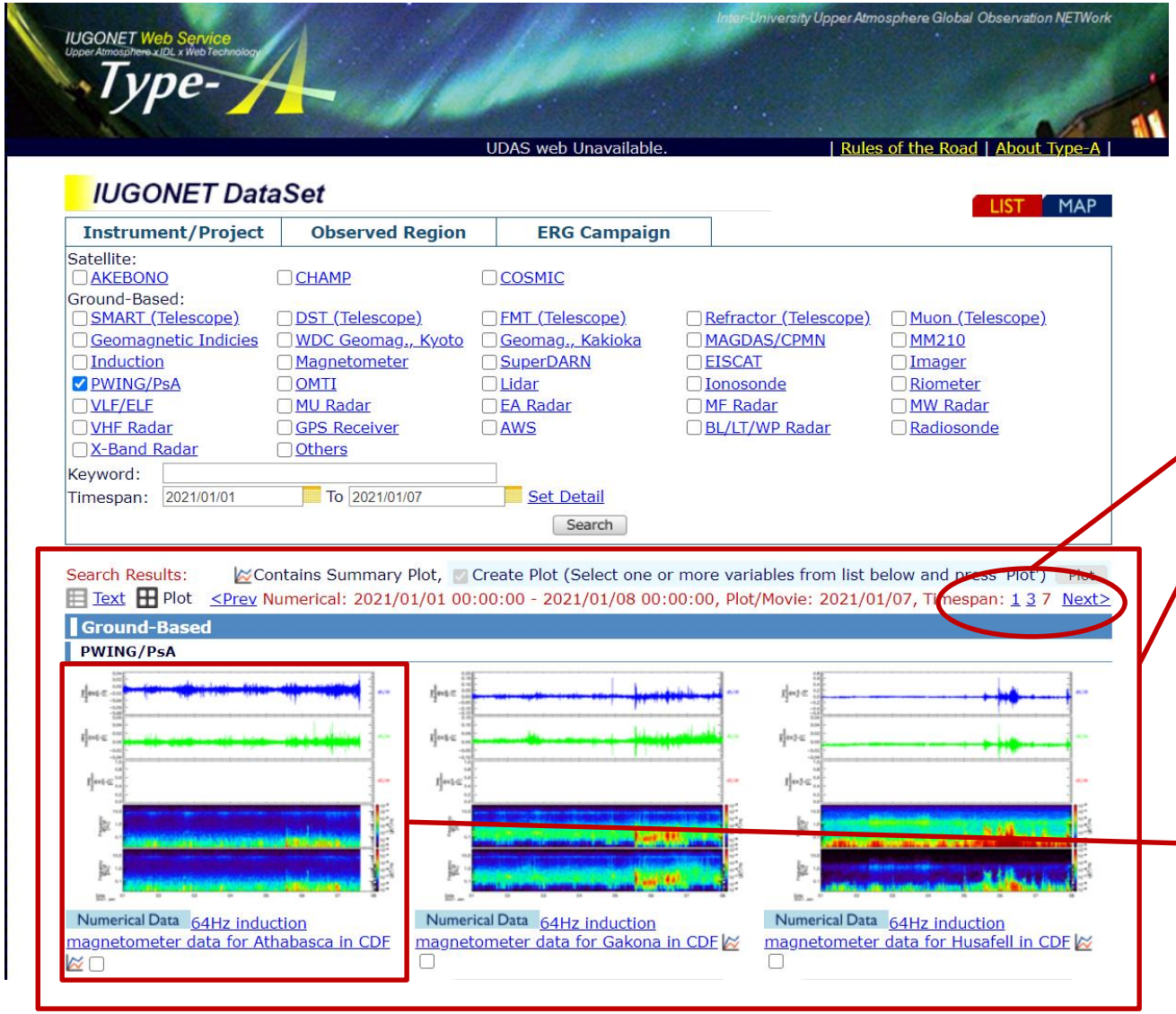


You can switch between the text and QL-plot display modes.
If you click “Plot”, the search results are shown by QL plots of each dataset.

List of the search results is shown here.
If you click the title of each dataset, you can see the detailed information of the data.

Basic Operation of IUGONET Type-A

Search result (QL plot display)



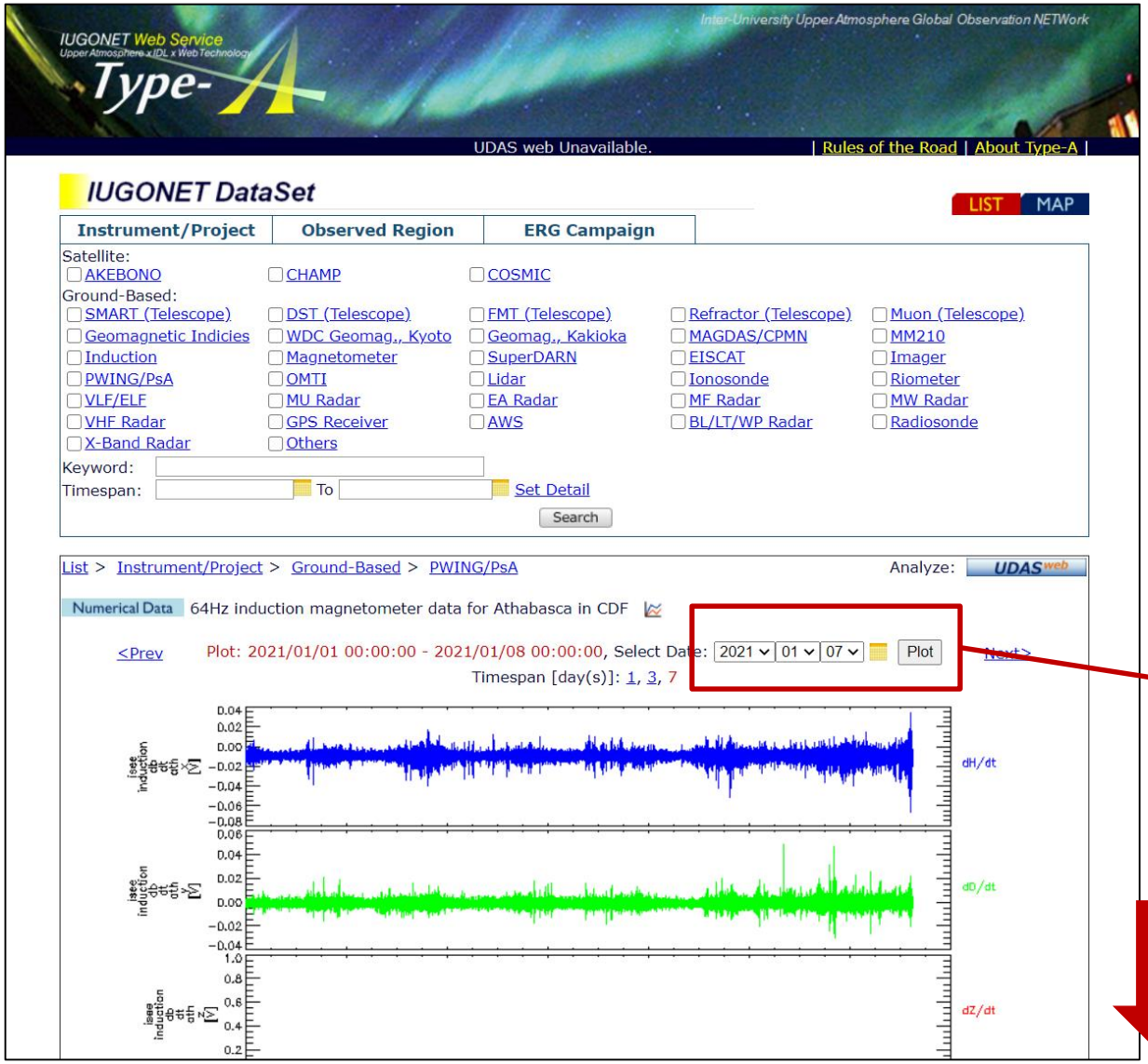
You can select the time interval from 1 or 3 or 7 days. The default is 7 days.

Search results are shown as QL plots here.

If you click the QL plot or the title of the dataset, you can see the detailed information of the data.

Basic Operation of IUGONET Type-A

Metadata display



The metadata display page shows the detailed information of the dataset, such as QL plot, contact person, and data use policy.

You can select the start date of the QL plot and time interval (1, 3, or 7 days).

Scroll down

Basic Operation of IUGONET Type-A

Metadata display

Description:
The induction magnetometer data observed at Athabasca, Canada. The data consist of variations of three-dimensional (H, D, and Z components) geomagnetic field taken with a sampling rate of 64 Hz, and some engineering parameters for the instrument, such as the sensitivity and phase difference. The digital data are distributed in the Common Data Format (CDF) through the ERG-SC repository. Importnat Notes: 1. For frequencies below ~1Hz, use the following equation to obtain amplitude values in units of nT/s: dB/dt (nT/s) = data (V) / quick_sensitivity. The value of quick_sensitivity is given in global attributes. For frequencies above ~1Hz, use the exact sensitivity curve to obtain absolute amplitude of waves. 2. Please note that the positive direction (polarity) of H, D, and Z are different depending on the station. For example, in February 2011, the polarity is ATH: positive=northward, eastward, upward; MGD: positive=northward, eastward, downward; PTK: positive=northward, eastward, downward; MSR: positive=southward, westward, upward; STA: positive=northward, eastward, downward. Please see http://stdb2.isee.nagoya-u.ac.jp/magne/magne_stations.html for the latest information.
Acknowledgement: 1. Please contact Kazuo Shiokawa (shiokawa at isee.nagoya-u.ac.jp) before using the data for any publications and/or presentations. 2. References: Shiokawa, K., R. Nomura, K. Sakaguchi, Y. Otsuka, Y. Hamaguchi, M. Satoh, Y. Katoh, Y. Yamamoto, B. M. Shevtsov, S. Smirnov, I. Poddelsky, and M. Connors, The STEL induction magnetometer network for observation of high-frequency geomagnetic pulsations, Earth Planets Space, 62(6), 517-524, doi:10.5047/eps.2010.05.003, 2010.
ReleaseDate: 2011-04-01T00:00:00
ExpirationDate: 2199-12-31T00:00:00

Contact (PrincipalInvestigator):
Kazuo Shiokawa, Institute for Space and Earth Environmental Research, Nagoya University, shiokawa (at) isee.nagoya-u.ac.jp
Contact (Publisher):
Kanako Seki, Institute for Space and Earth Environmental Research, Nagoya University, seki (at) isee.nagoya-u.ac.jp
Contact (MetadataContact):
Tomoaki Hori, Institute for Space and Earth Environmental Research, Nagoya University, horit (at) isee.nagoya-u.ac.jp
Contact (MetadataContact):
ISEE IUGONET Metadata Management Group, Institute for Space and Earth Environmental Research, Nagoya University, stel-iugonet (at) isee.nagoya-u.ac.jp

AccessInformation:
Acknowledgement: 1. Please contact Kazuo Shiokawa (shiokawa at isee.nagoya-u.ac.jp) before using the data for any publications and/or presentations. 2. References: Shiokawa, K., R. Nomura, K. Sakaguchi, Y. Otsuka, Y. Hamaguchi, M. Satoh, Y. Katoh, Y. Yamamoto, B. M. Shevtsov, S. Smirnov, I. Poddelsky, and M. Connors, The STEL induction magnetometer network for observation of high-frequency geomagnetic pulsations, Earth Planets Space, 62(6), 517-524, doi:10.5047/eps.2010.05.003, 2010.
URL: https://ergsc.isee.nagoya-u.ac.jp/index.shtml.en
Availability: Online
Access Rights: Open
Format: CDF

Processing Level: Uncalibrated
Measurement Type: Magnetogram

Time Span:
StartDate: 2005-09-09T00:00:00
StopDate: -P180D

Observed Region: Earth.NearSurface.Ionosphere.ERegion
Observed Region: Earth.Magnetosphere

Keywords: EARTH SCIENCE Atmosphere Sun-earth Interactions Ionosphere/Magnetosphere Dynamics Magnetic Fields/Magnetic Currents

Instrument:
Name: Induction Magnetometer at Athabasca of ISEE Magnetometer Data
Description: Induction Magnetometer at Athabasca of ISEE Magnetometer Data. This induction magnetometer measures variations of 3-D vector geomagnetic field with a sampling rate of 64 Hz controlled by the PC clock signal.

Data description:
This information is useful for writing scientific papers.

Data use policy

Contact person:
You can easily contact PIs of the dataset.

Data location and file format:
You can access the webpage of the data

Information of instrument

Scroll down

Basic Operation of IUGONET Type-A

Metadata display

```
Observatory:
Name: ISEE Magnetometer Athabasca station
Description: ISEE Magnetometer station at Athabasca, Canada.
Contact (GeneralContact):
Kazuo Shiokawa, Institute for Space and Earth Environmental Research, Nagoya University, shiokawa (at) isee.nagoya-u.ac.jp
Contact (MetadataContact):
Tomoaki Hori, Institute for Space and Earth Environmental Research, Nagoya University, horit (at) isee.nagoya-u.ac.jp
Contact (MetadataContact):
ISEE IUGONET Metadata Management Group, Institute for Space and Earth Environmental Research, Nagoya University, stel-iugonet
(at) isee.nagoya-u.ac.jp
Location:
ObservatoryRegion: Earth.Surface
CoordinateSystemName: WGS84
Latitude: 54.60
Longitude: 246.36

Observed Data:

How to Plot (SPEDAS-CUI #Basic):
IDL>      thm_init
THEMIS>   timespan, ['2020-12-26 00:00:00', '2021-01-02 00:00:00']
THEMIS>   iug_load_gmag_isee_induction, site='ath'
THEMIS>   tplot, 'isee_induction_db_dt_ath'

How to Plot (SPEDAS-CUI #Advanced [*Quick-Look was created with this command]):
IDL>      thm_init
THEMIS>   timespan, ['2020-12-26 00:00:00', '2021-01-02 00:00:00']
THEMIS>   iug_load_gmag_isee_induction, site='ath'
THEMIS>   tdpwrspc, 'isee_induction_db_dt_ath', nboxpoints=8192
THEMIS>   zlim, 'isee_induction_db_dt_ath_x_dpwrspc', 0.000000001, 0.001
THEMIS>   zlim, 'isee_induction_db_dt_ath_y_dpwrspc', 0.000000001, 0.001
THEMIS>   zlim, 'isee_induction_db_dt_ath_z_dpwrspc', 0.000000001, 0.001
THEMIS>   options, 'isee_induction_db_dt_ath_x_dpwrspc', 'ytitle', 'Frequency!CdH/dt'
THEMIS>   options, 'isee_induction_db_dt_ath_y_dpwrspc', 'ytitle', 'Frequency!CdD/dt'
THEMIS>   options, 'isee_induction_db_dt_ath_z_dpwrspc', 'ytitle', 'Frequency!CdZ/dt'
THEMIS>   options, 'isee_induction_db_dt_ath_x_dpwrspc', 'ysubtitle', '[Hz]'
THEMIS>   options, 'isee_induction_db_dt_ath_y_dpwrspc', 'ysubtitle', '[Hz]'
THEMIS>   options, 'isee_induction_db_dt_ath_z_dpwrspc', 'ysubtitle', '[Hz]'
THEMIS>   tplot_options, 'region', [0.05, 0, 1, 1]
THEMIS>   tplot, ['isee_induction_db_dt_ath_x', 'isee_induction_db_dt_ath_y', 'isee_induction_db_dt_ath_z',
          'isee_induction_db_dt_ath_x_dpwrspc', 'isee_induction_db_dt_ath_y_dpwrspc',
          'isee_induction_db_dt_ath_z_dpwrspc']

How to Plot (SPEDAS-GUI):
Step 1:   Start SPEDAS GUI Program.
Step 2:   Choose [Data] -> [Load Data from Plug-in].
Step 3:   Choose [IUGONET] Tab.
Step 4:   Uncheck 'Use Single Day'.
Step 5:   Set Start Time: '2020-12-26 00:00:00' and Stop Time: '2021-01-02 00:00:00'.
Step 6:   Choose Instrument Type: 'geomagnetic_field_induction'.
Step 7:   Choose Data Type: 'STEL#', Site or parameter(s)-1: 'ath' and parameter(s)-2: '*'.
Step 8:   Push [->] button. (Please wait a few minutes).
Step 9:   Push [Done] button.
Step 10:  Choose [Plot] -> [Plot Layout Options].
Step 11:  Choose 'stel_induction_db_dt_ath' and push [Line->] button.
Step 12:  Push [OK] button.

How to Plot (M-UDAS #Basic):
Note: Integrated Software M-UDAS based on MATLAB, http://www.iugonet.org/product/analysis/m-udas/
>   iug_load_gmag_isee_induction('2020-12-26 00:00:00', '2021-01-02 00:00:00', 'site', 'ath');
>   plot(isee_induction_ath_time, isee_induction_ath_db_dt);
>   datetick('x', 'mm/dd');
```

Information of observatory

Basic SPEDAS commands (for the command line interface) to load and plot the data.

Advanced SPEDAS commands to customize the plot

How to load and plot with GUI of SPEDAS.

MATLAB command to load and plot the data with M-UDAS.

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Hand on of SPEDAS-GUI

Preparation for SPEDAS GUI

Prepare 64 bit Operating System.

1. Access the following URL

http://themis.ssl.berkeley.edu/software.shtml

2. Download SPEDAS 4.1 zip file for your operating system(Win or Mac), and then unzip it to your desktop.

3. **Executable files (SPEDAS 4.1, October 2020).** These zip files contain executable files that can be run directly without installing anything else. They include a Virtual Machine (VM) version of IDL and they open the SPEDAS GUI but they do not include a command line tool, nor the TDAS or SPEDAS IDL source code. They also include Geopack.

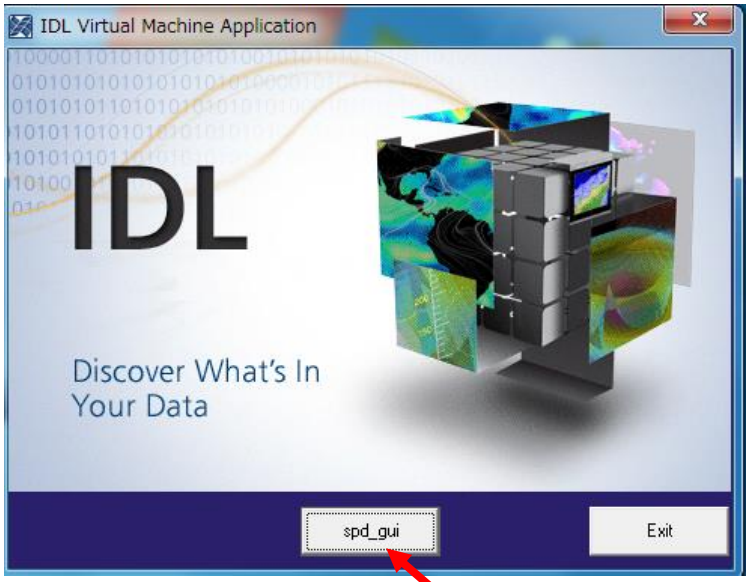
IDL 8.5.1

- TDAS 12.1 + SPEDAS 4.1 , Windows 64bit executable with IDL 8.5.1, CDF 3.7.1, Geopack 10.6 (~55 MB)
- TDAS 12.1 + SPEDAS 4.1 , MacOs 64bit executable with IDL 8.5.1, CDF 3.7.1, Geopack 10.6 (~70 MB)
- TDAS 12.1 + SPEDAS 4.1 , Linux 64bit executable with IDL 8.5.1, CDF 3.7.1, Geopack 10.6 (~70 MB)
- TDAS 12.1 + SPEDAS 4.1 , Linux 64bit executable with IDL 8.5.1, CDF 3.7.1, Geopack 7.6 (~70 MB)

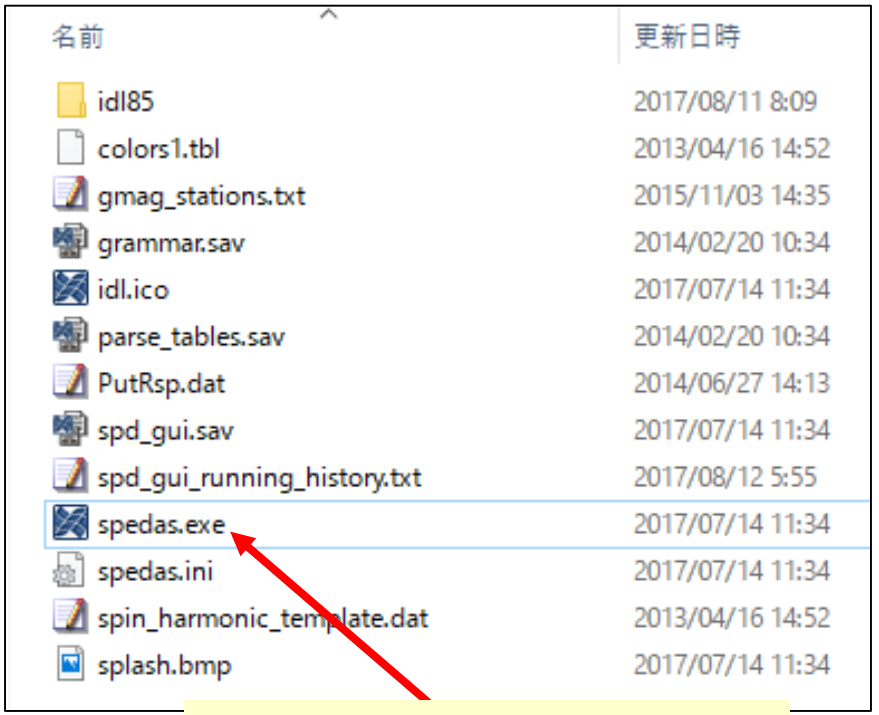
Start of SPEDAS GUI

[1] Unzip the zipped SPEDAS file.

[2] Double-click the executable file named ‘spedas’ in the directory ‘spedas_v_3/spd_gui’.



Click the icon ‘spd_gui’.



Doule-click the executable file named ‘spedas’

[3] IDL Virtual Machine window opens on your PC, so please **click the ‘spd_gui’ button.**

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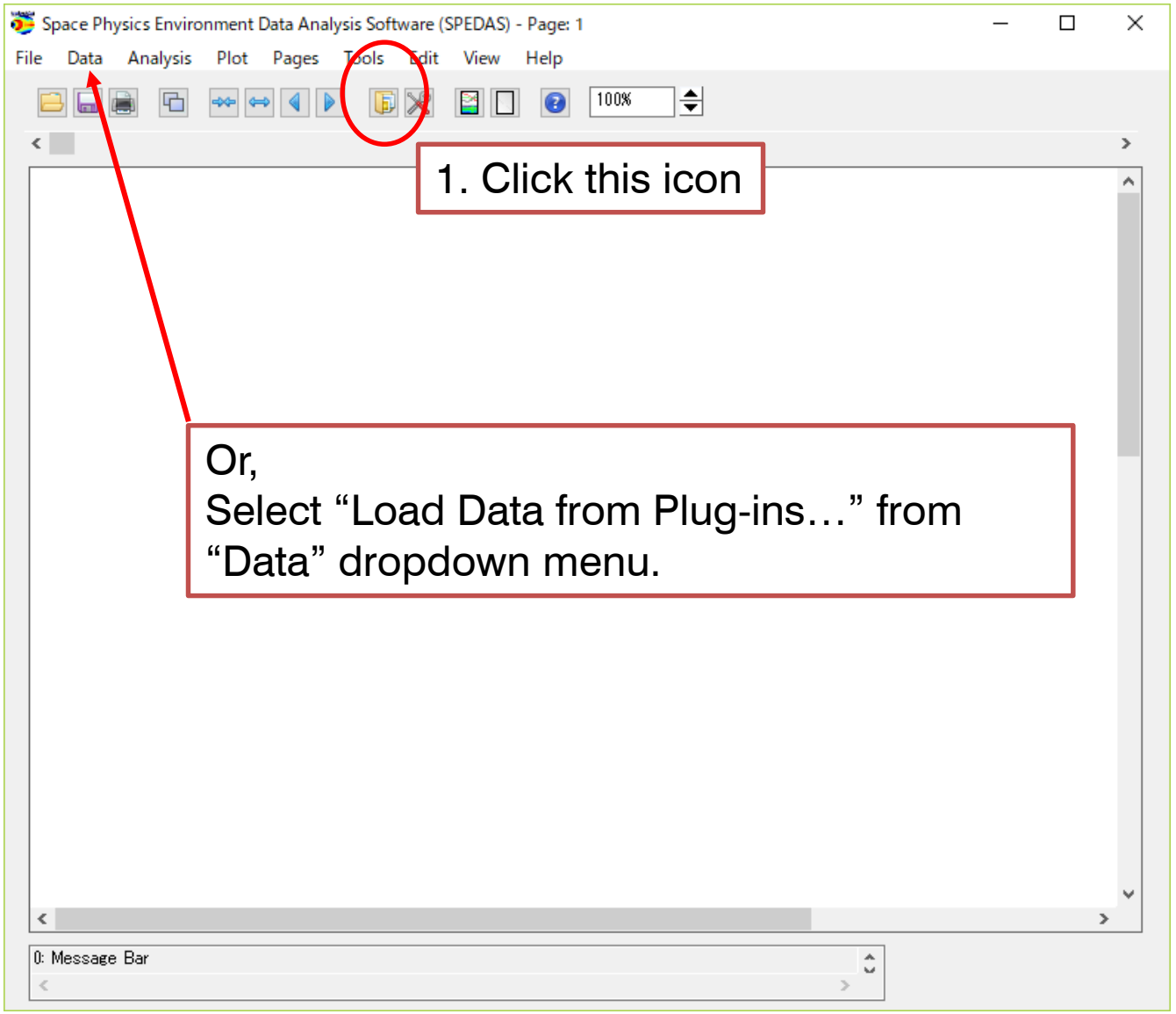
How to Use SPEDAS-GUI part1

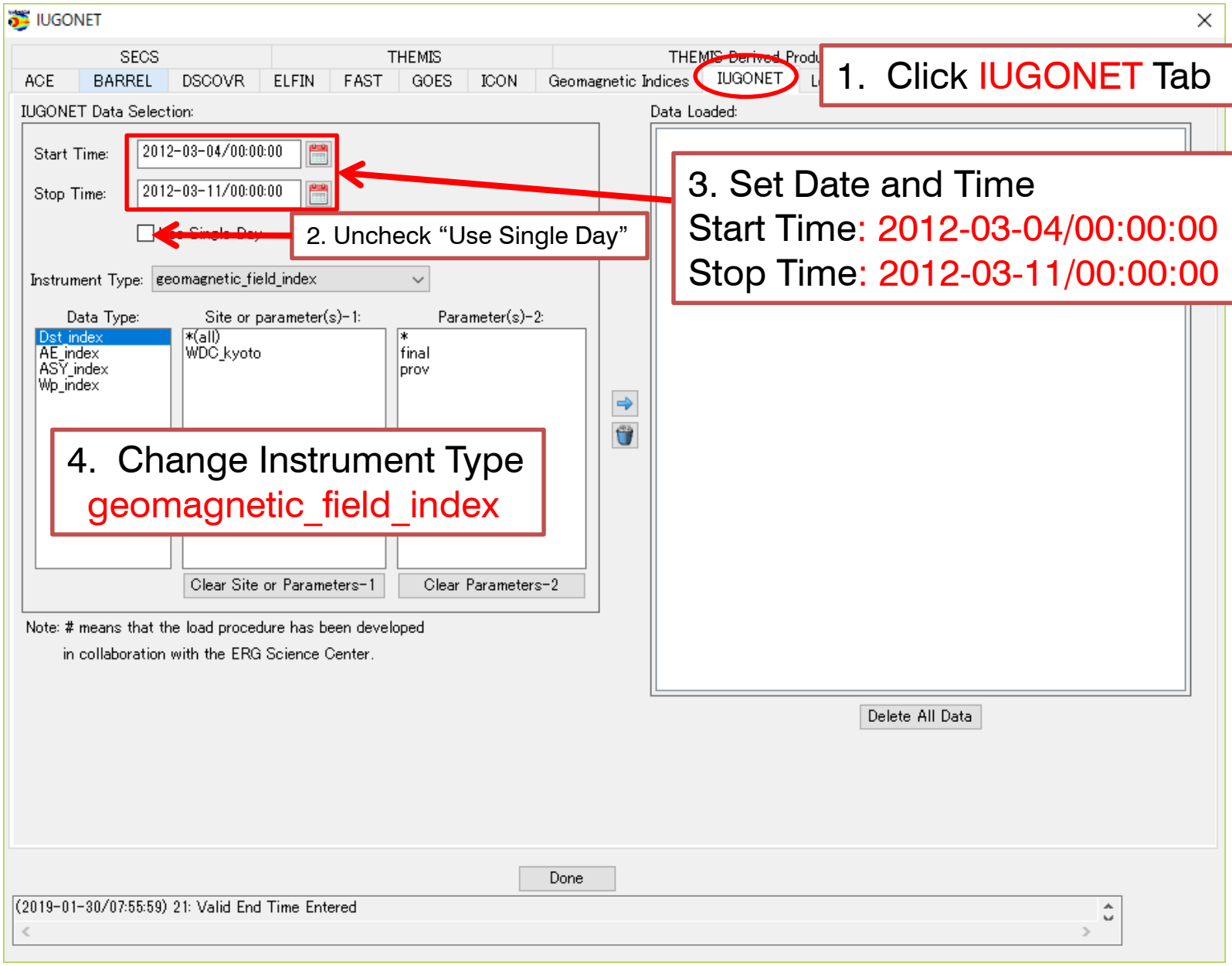
- Load data
- Plot data
- Save figure, data, and your work

Basic Operation of SPEDAS GUI

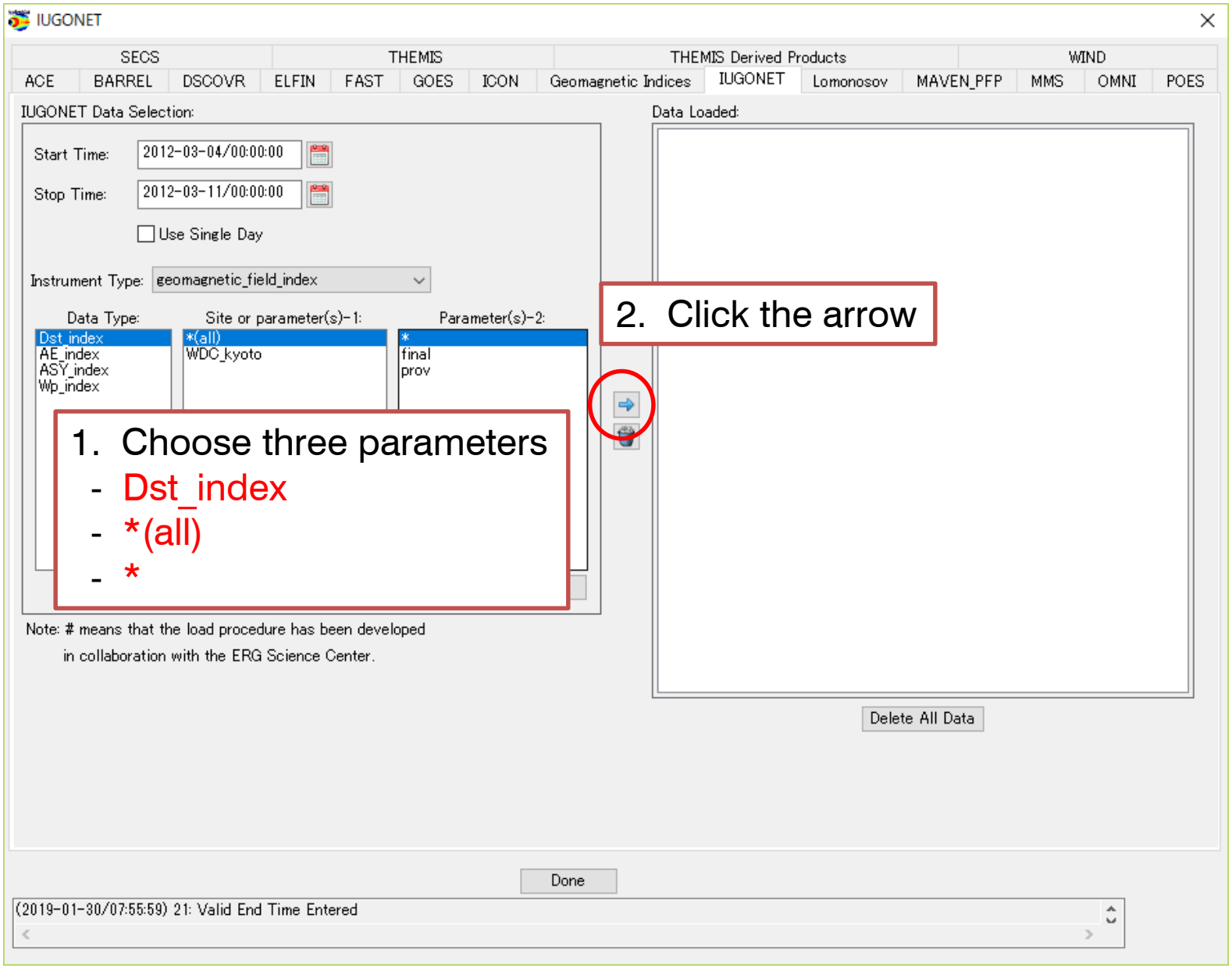
Load Dst index



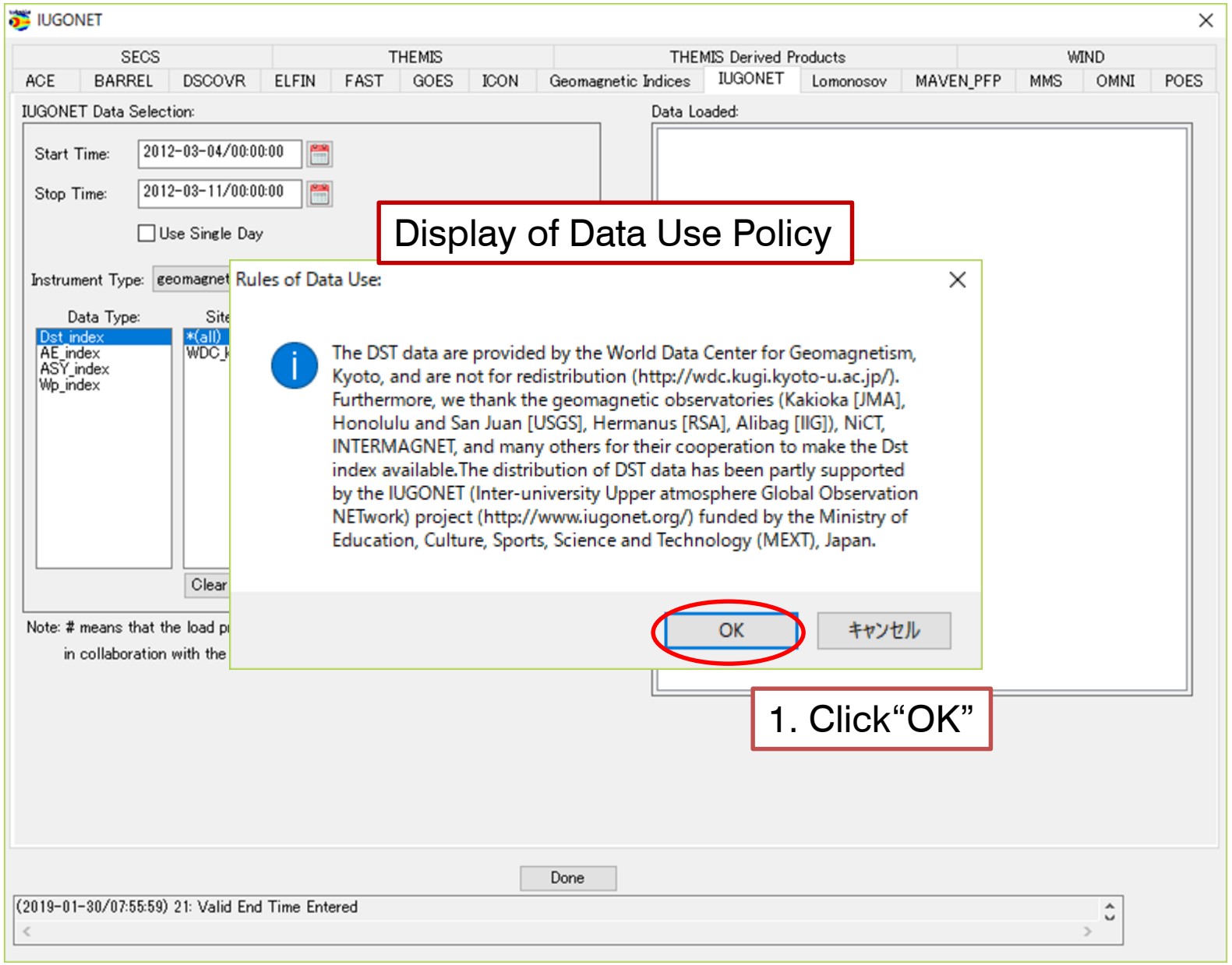
Basic Operation of SPEDAS GUI



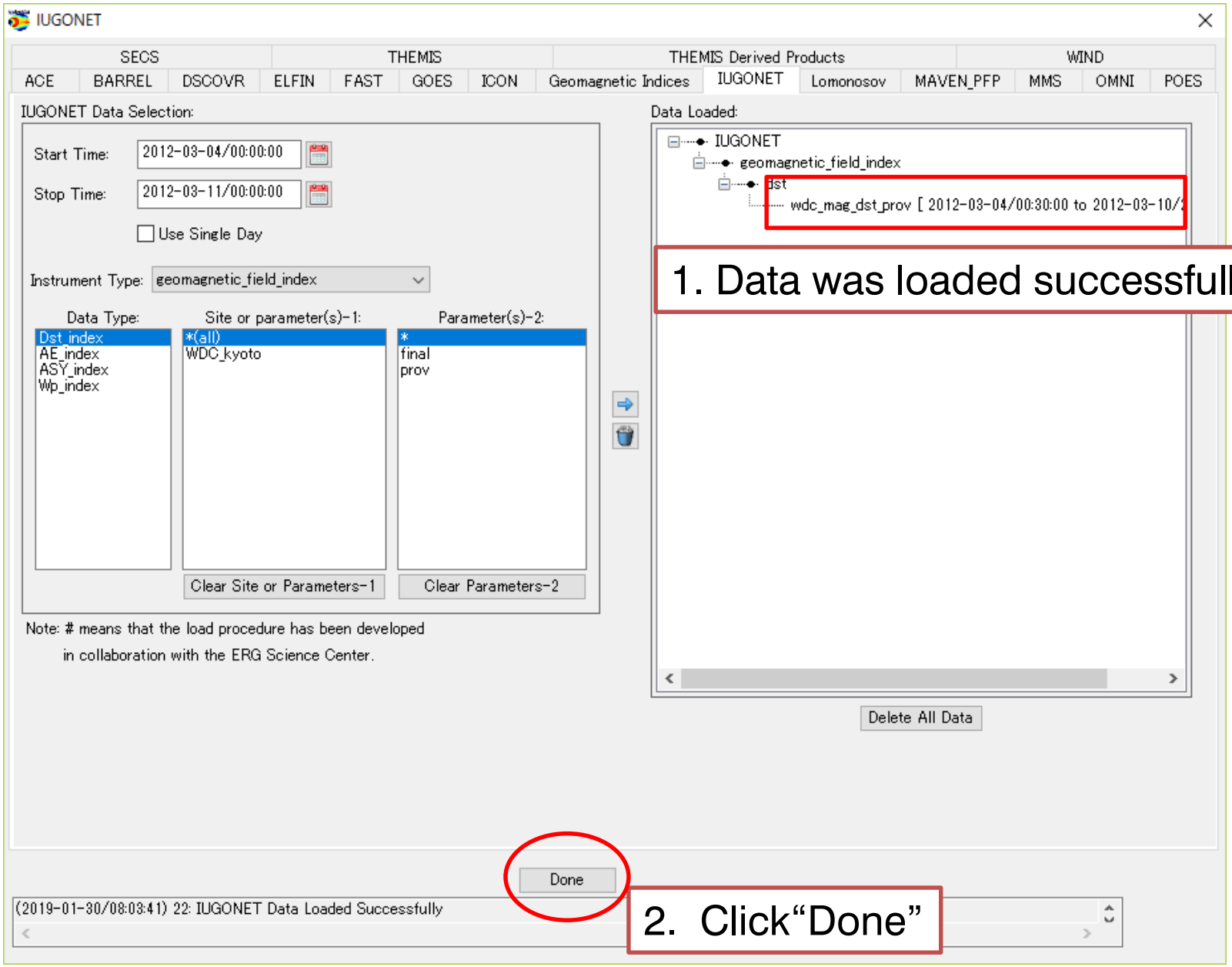
Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI

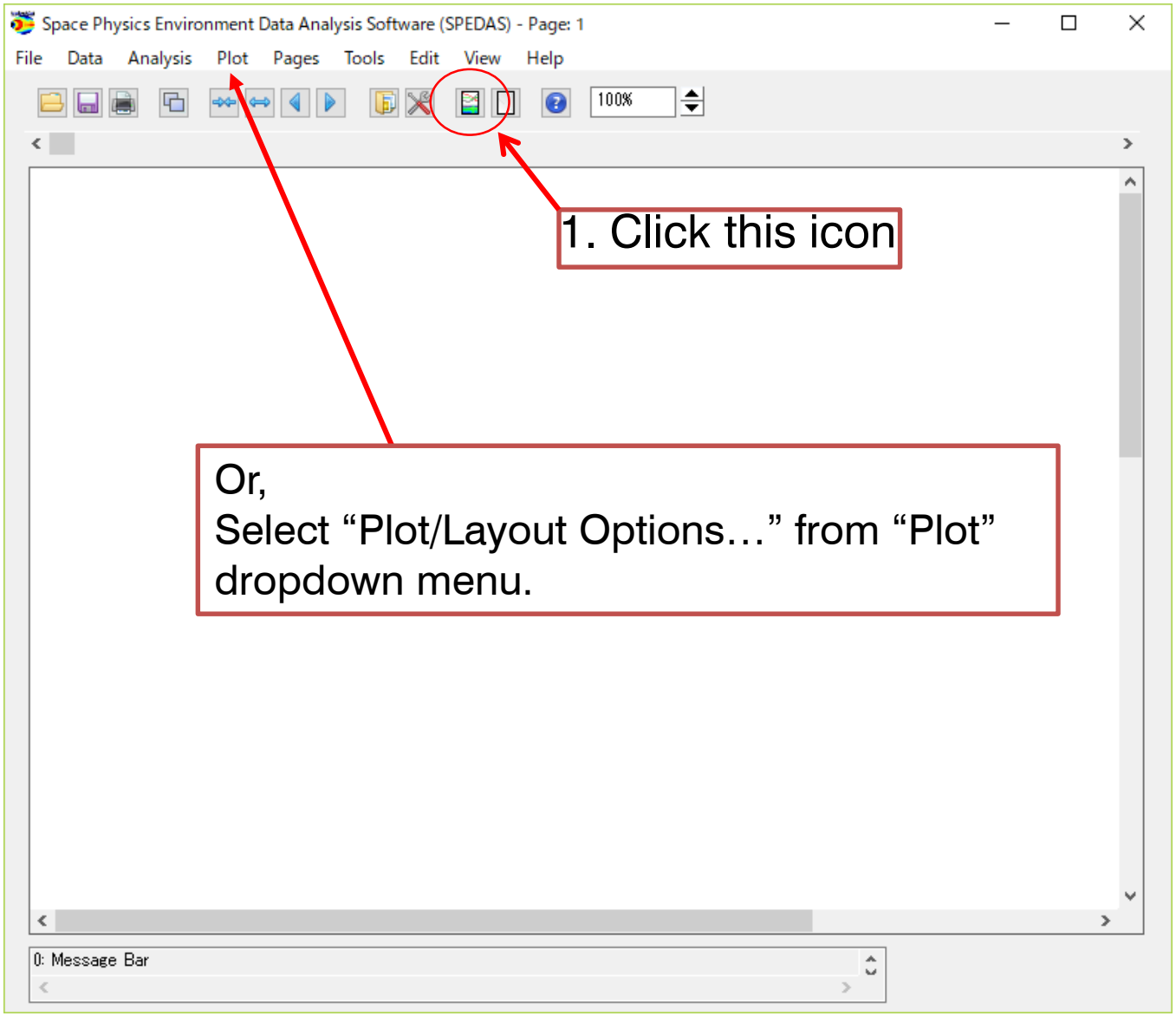


Basic Operation of SPEDAS GUI

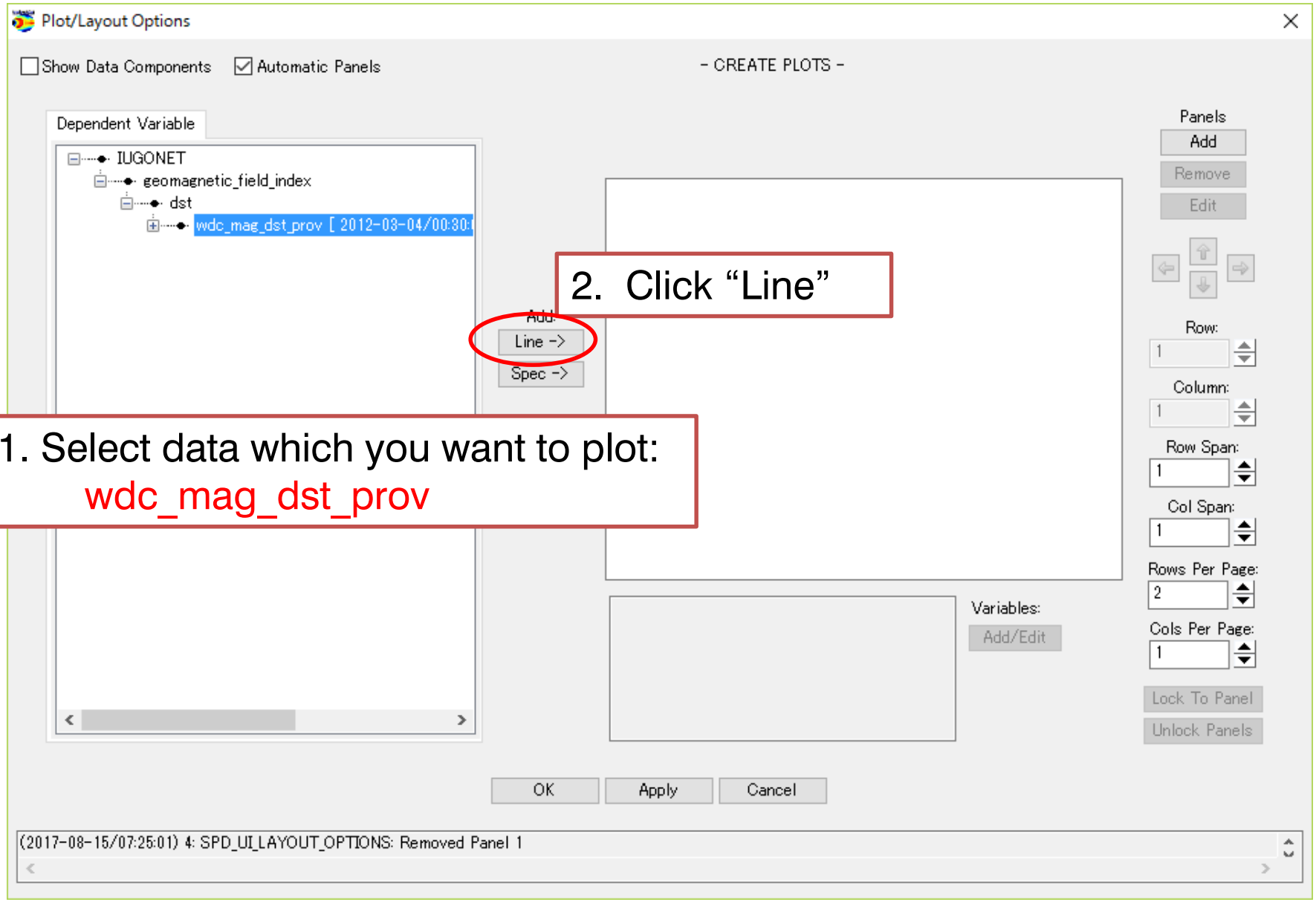


Basic Operation of SPEDAS GUI

Plot data



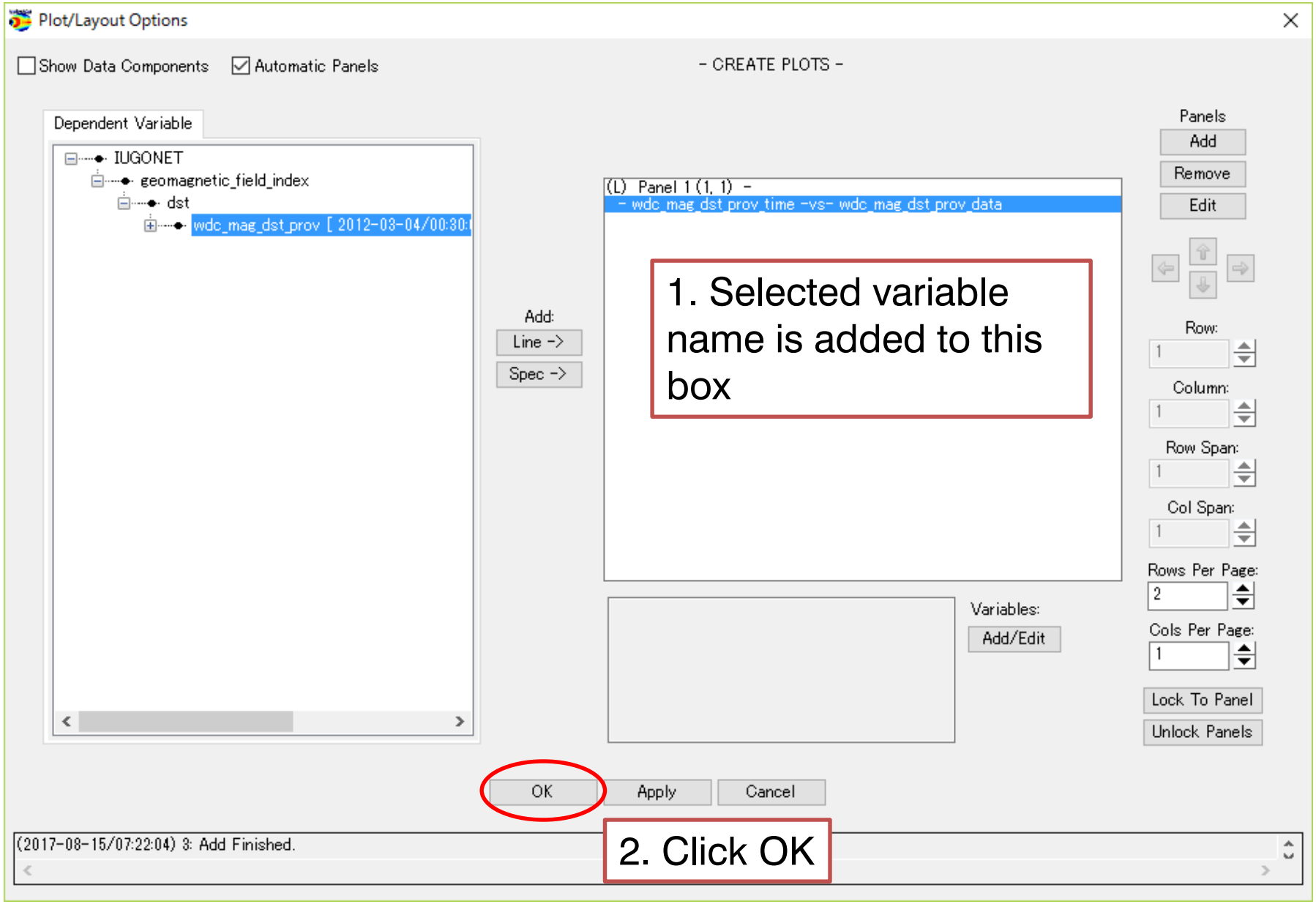
Basic Operation of SPEDAS GUI



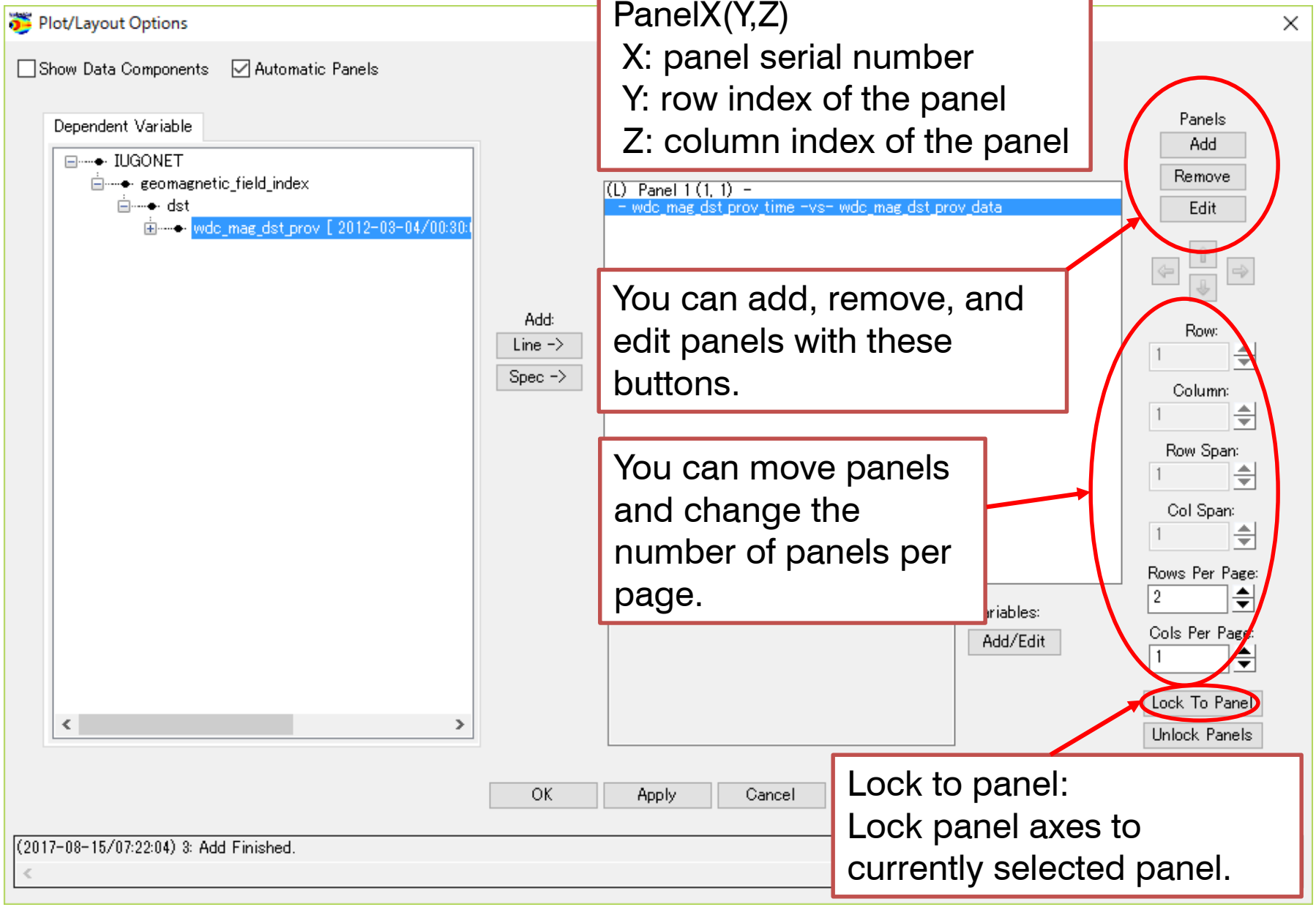
1. Select data which you want to plot:
   wdc_mag_dst_prov

2. Click “Line”

Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI



PanelX(Y,Z)
X: panel serial number
Y: row index of the panel
Z: column index of the panel

You can add, remove, and edit panels with these buttons.

You can move panels and change the number of panels per page.

Lock to panel:
Lock panel axes to currently selected panel.

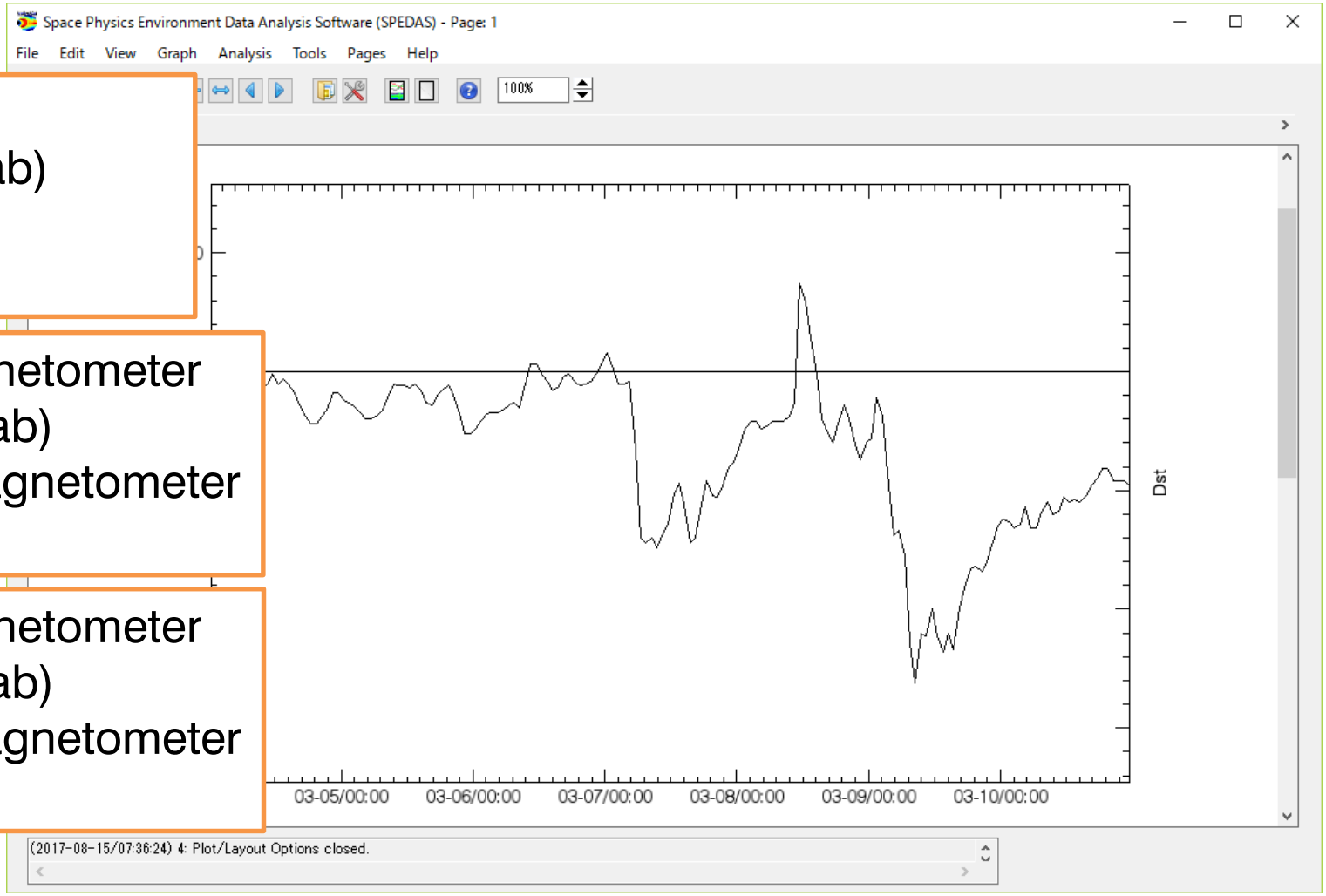
Basic Operation of SPEDAS GUI

Load other three data

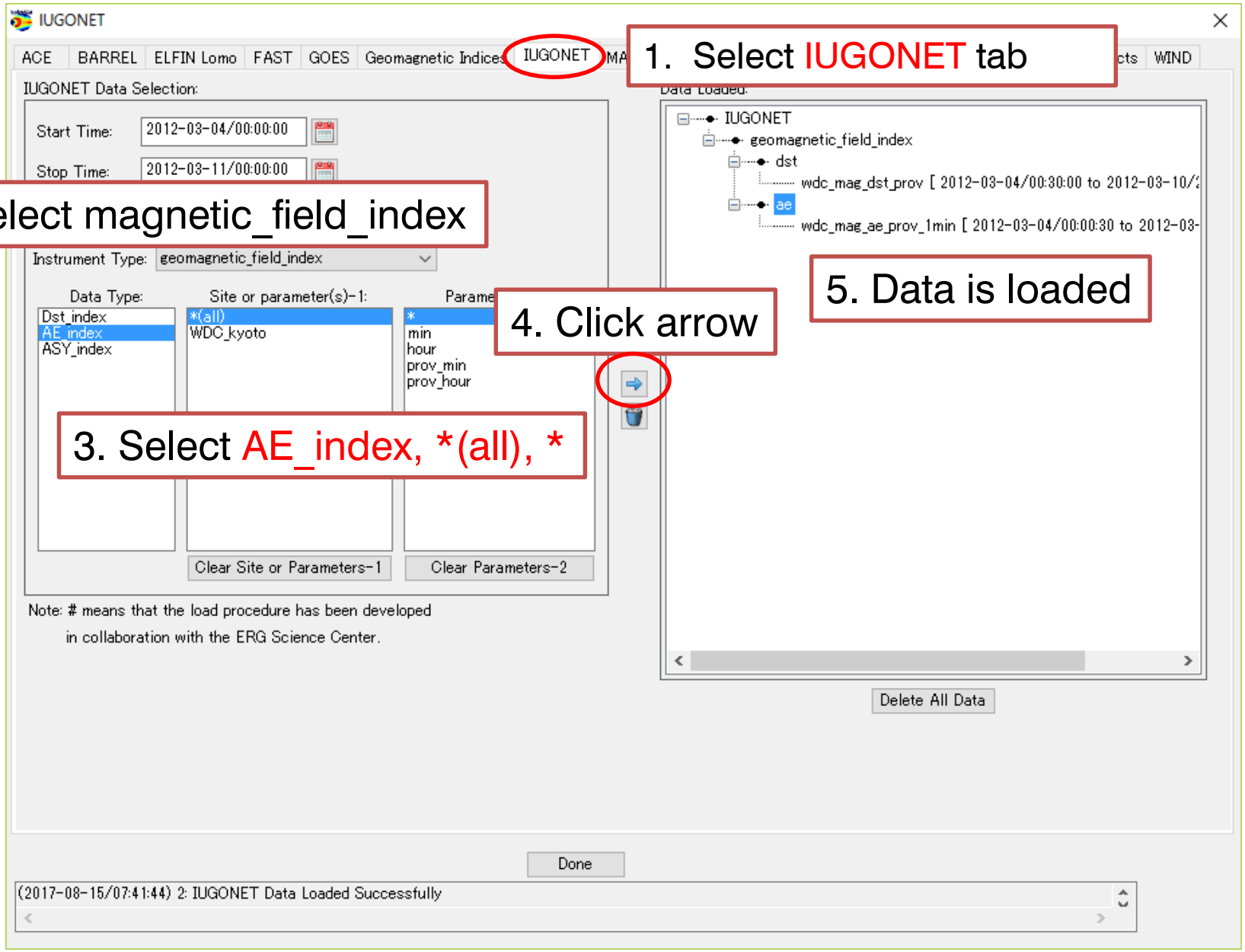
AE index
(in IUGONET tab)
Instrument:
magnetometer

MAGDAS magnetometer
(in IUGONET tab)
Instrument: magnetometer
Station: HER

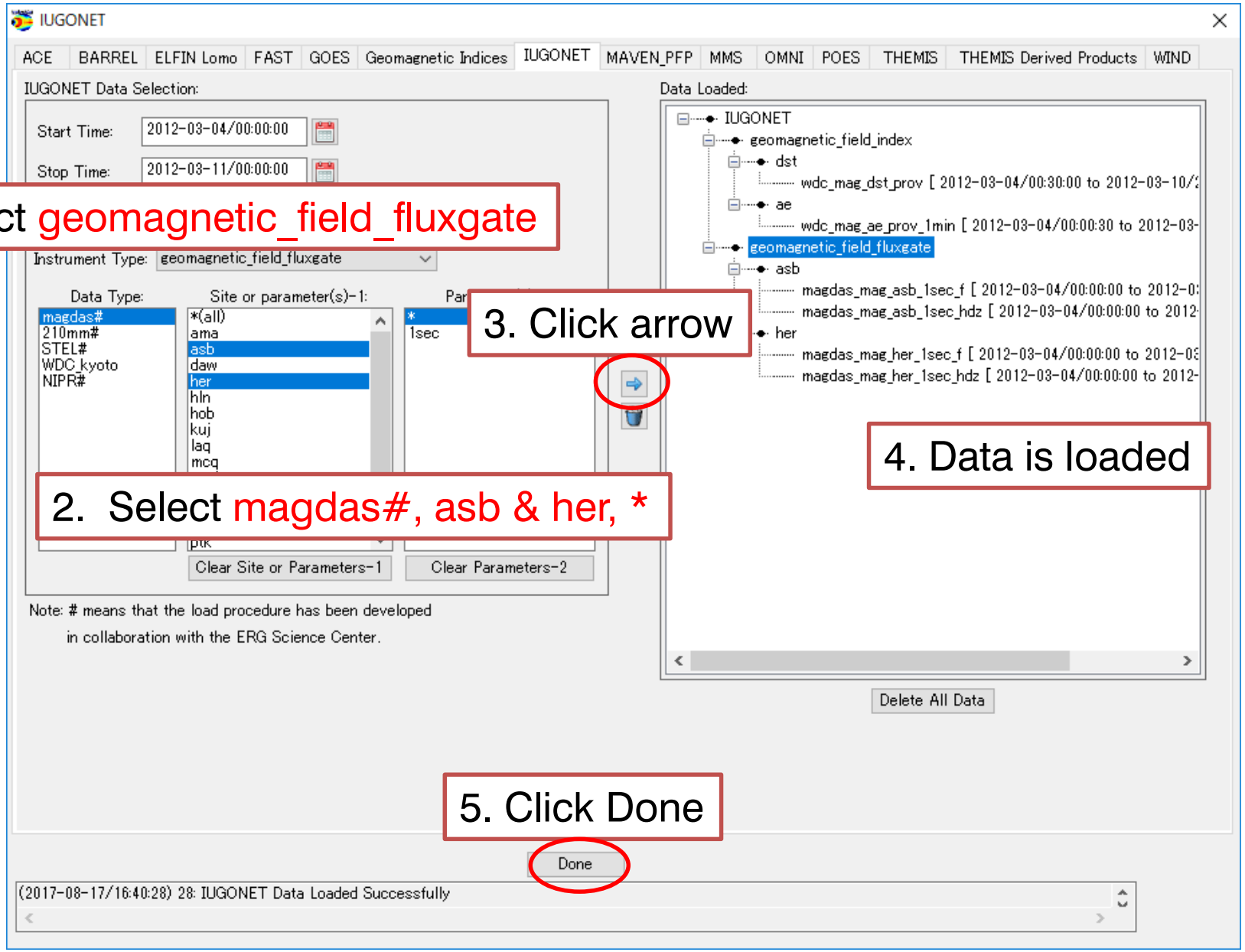
MAGDAS magnetometer
(in IUGONET tab)
Instrument: magnetometer
Station: ASB



Basic Operation of SPEDAS GUI



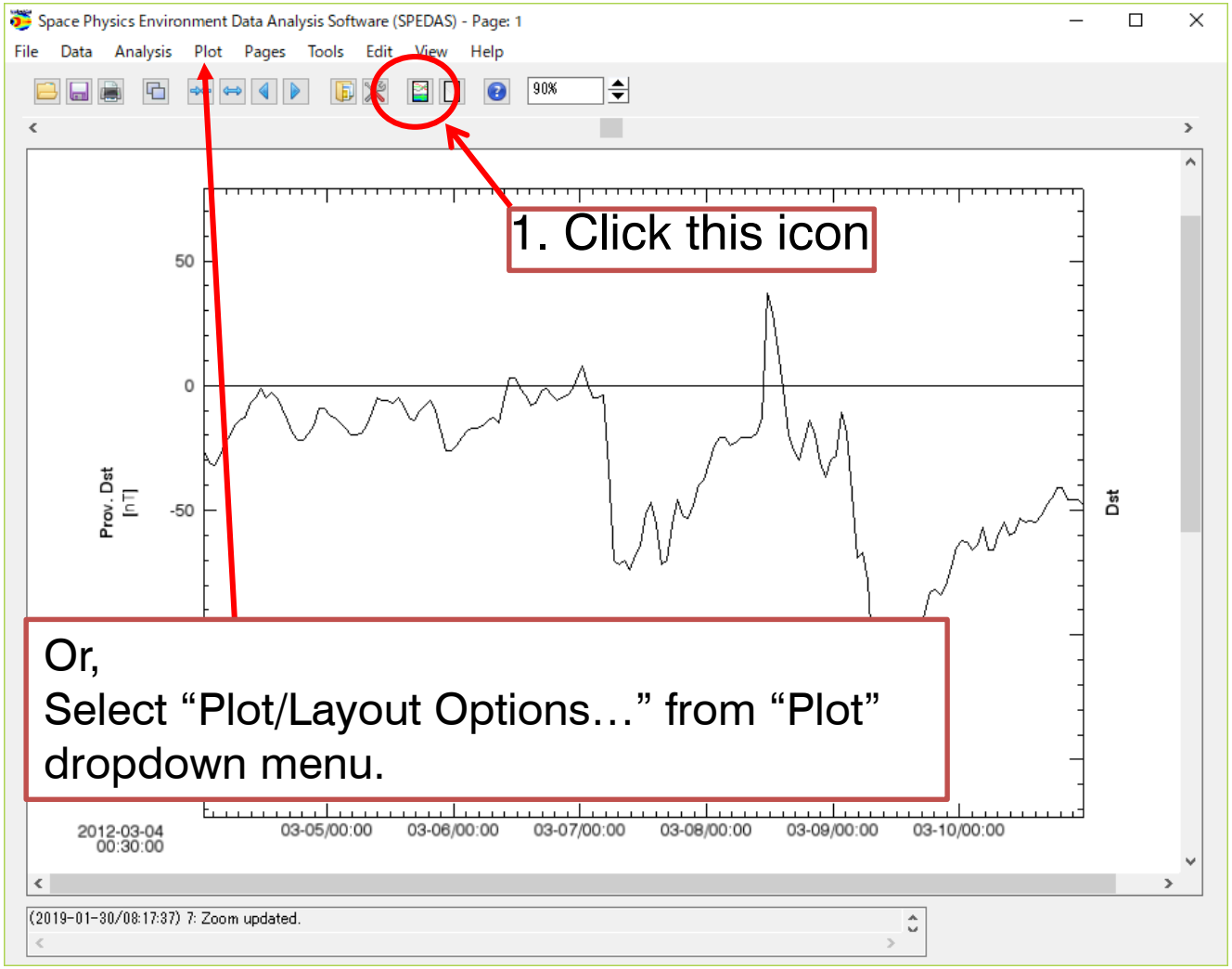
Basic Operation of SPEDAS GUI



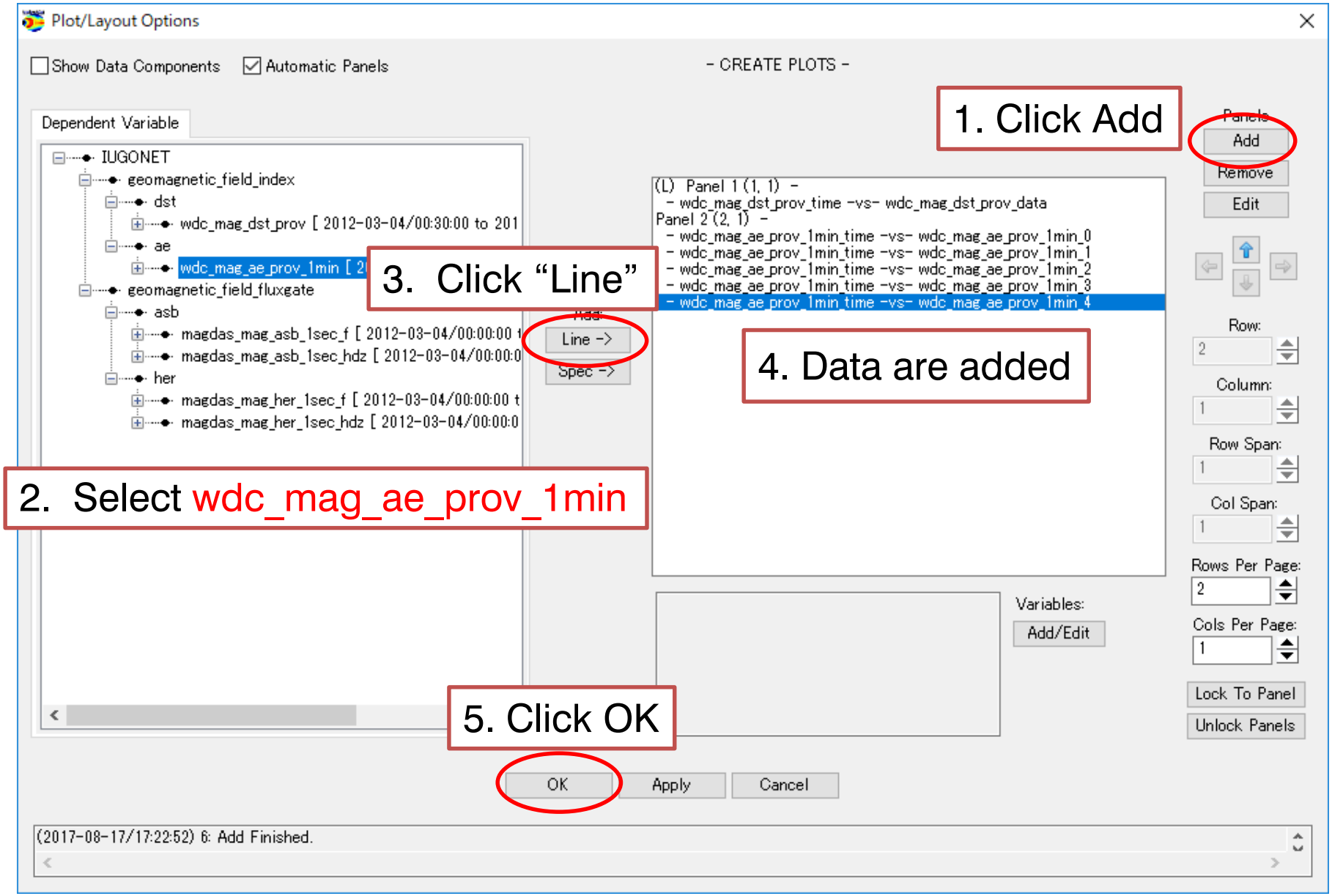
Basic Operation of SPEDAS GUI

Add plot

wdc_mag_ae_prov_1min

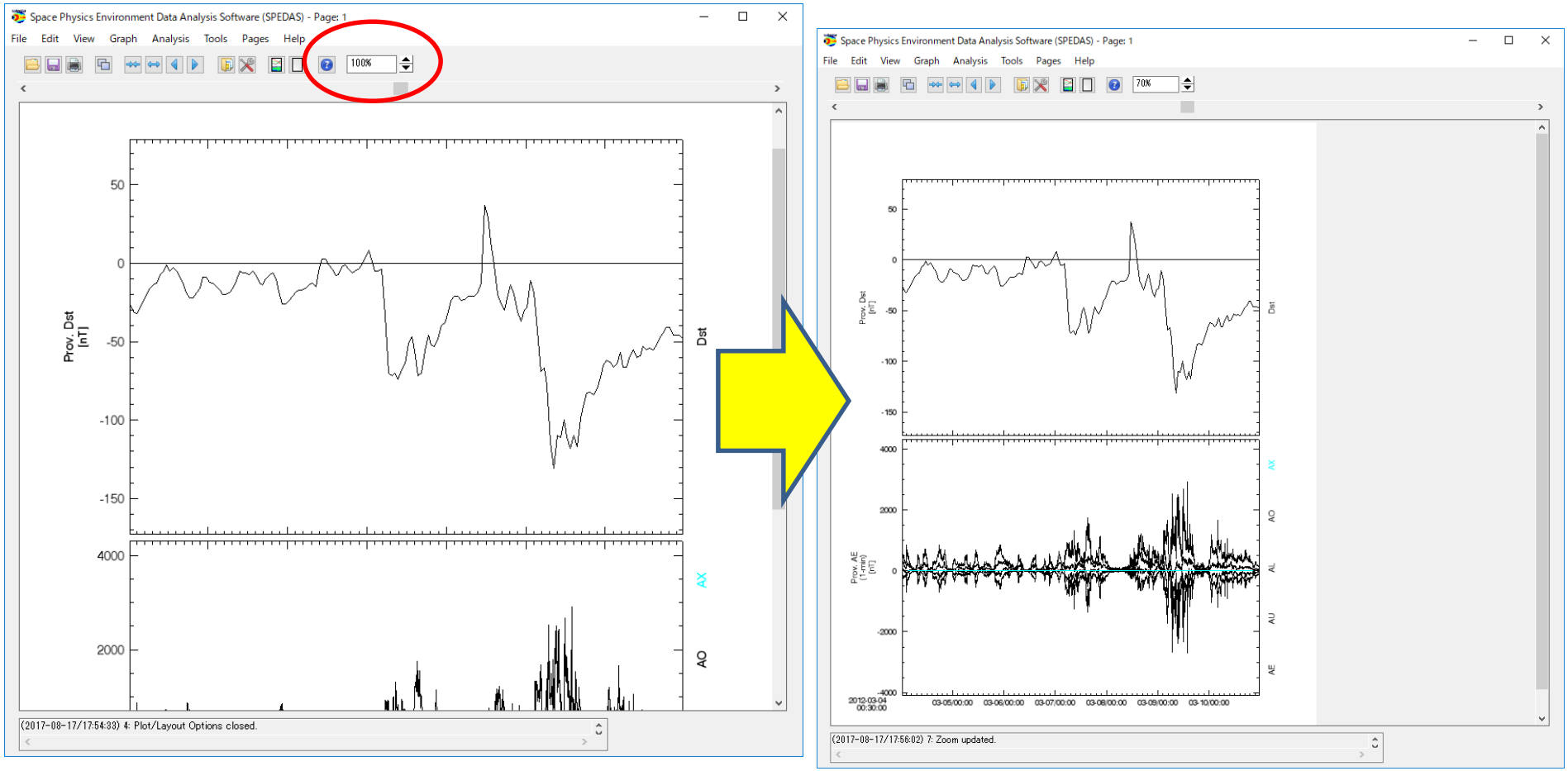


Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI

1. Click black triangles

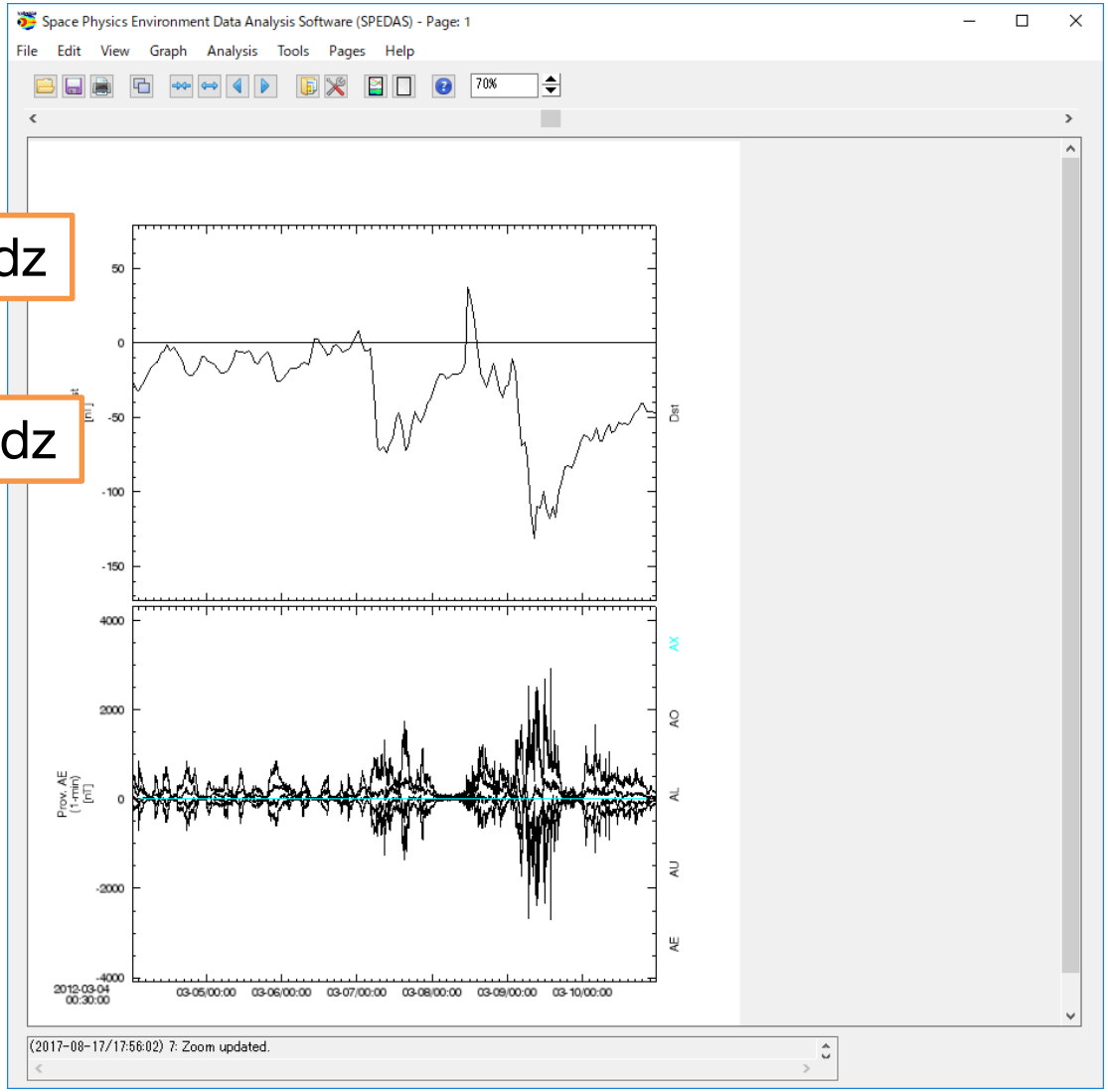


Basic Operation of SPEDAS GUI

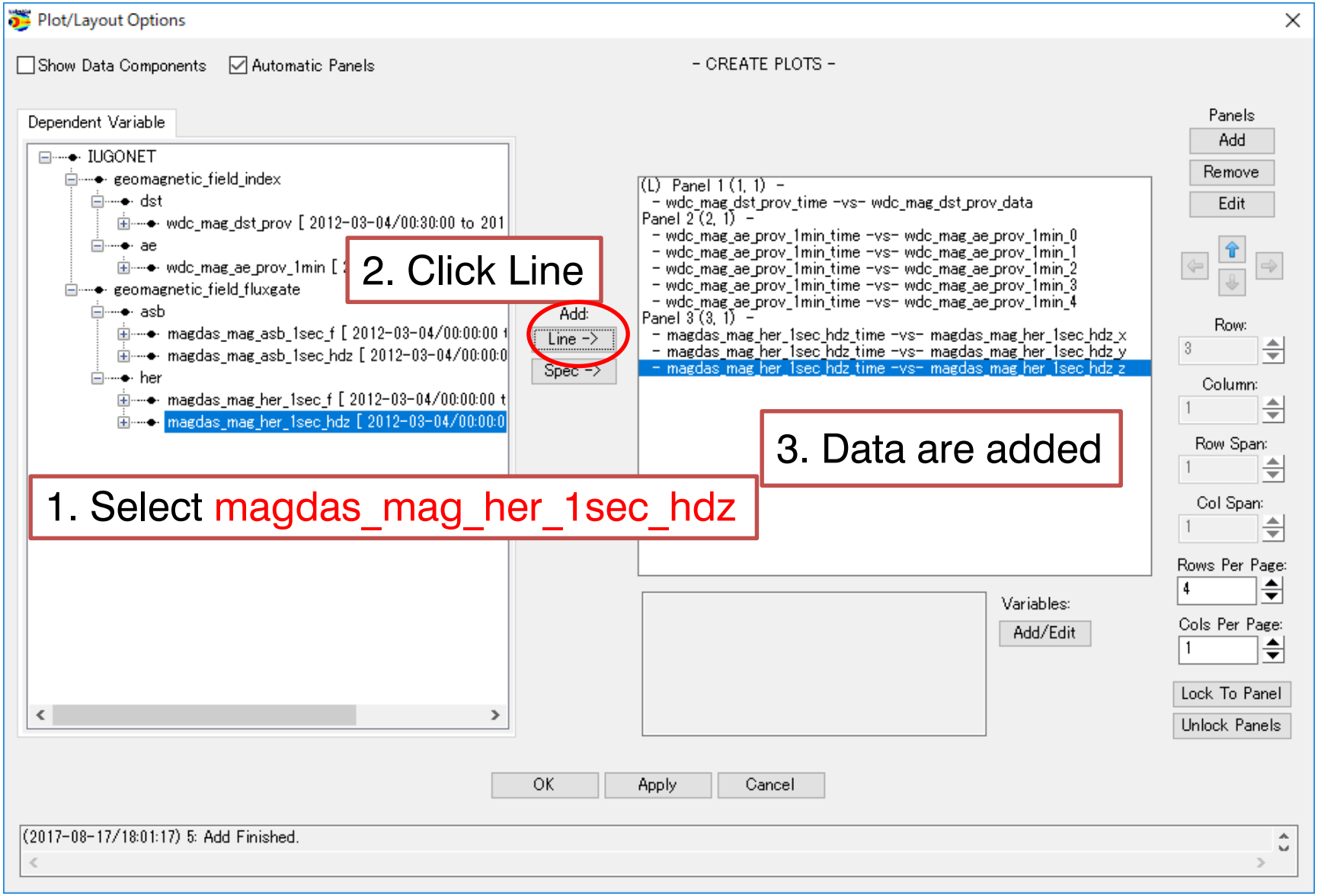
Plot other two data

magdas_mag_her_1sec_hdz

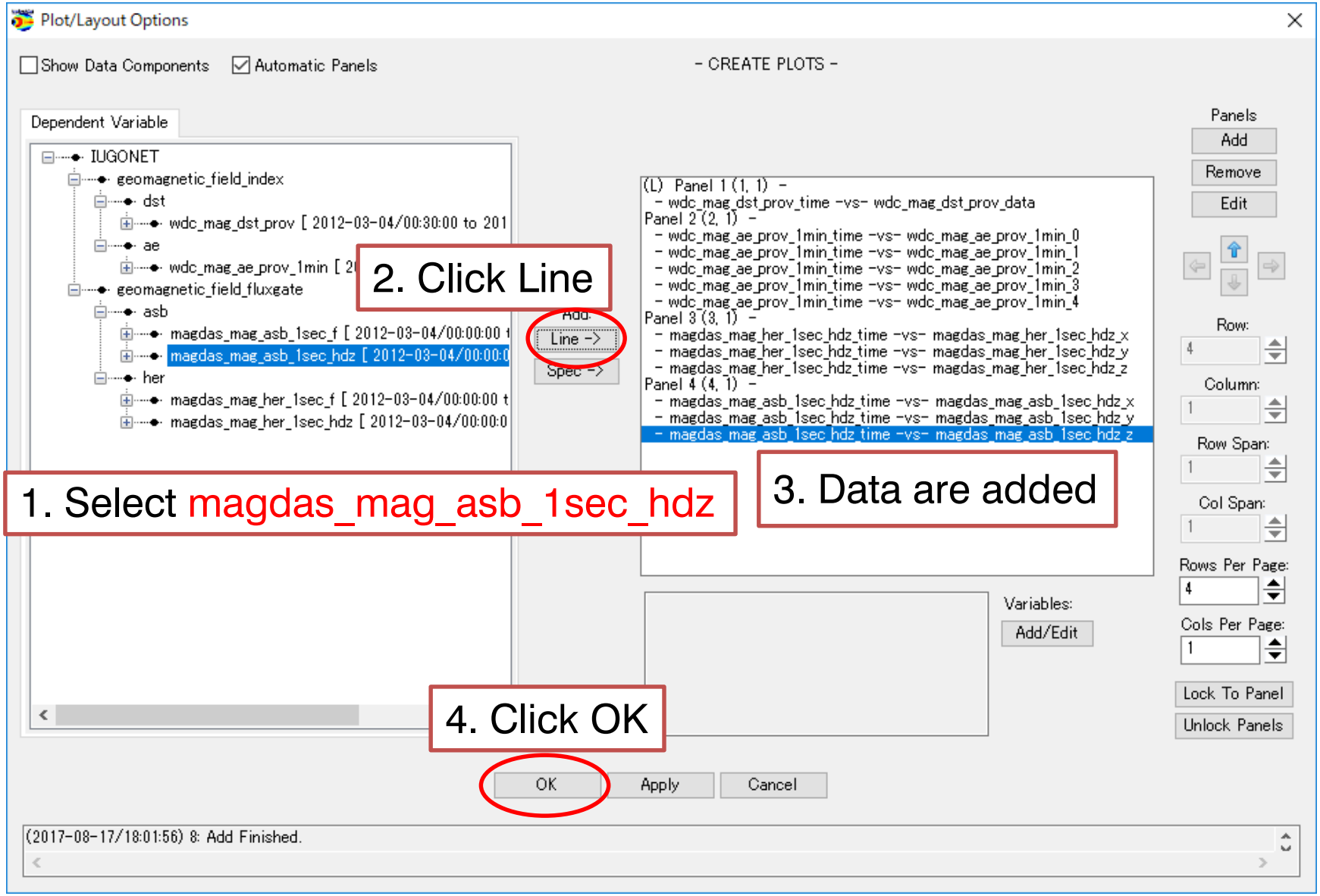
magdas_mag_asb_1sec_hdz



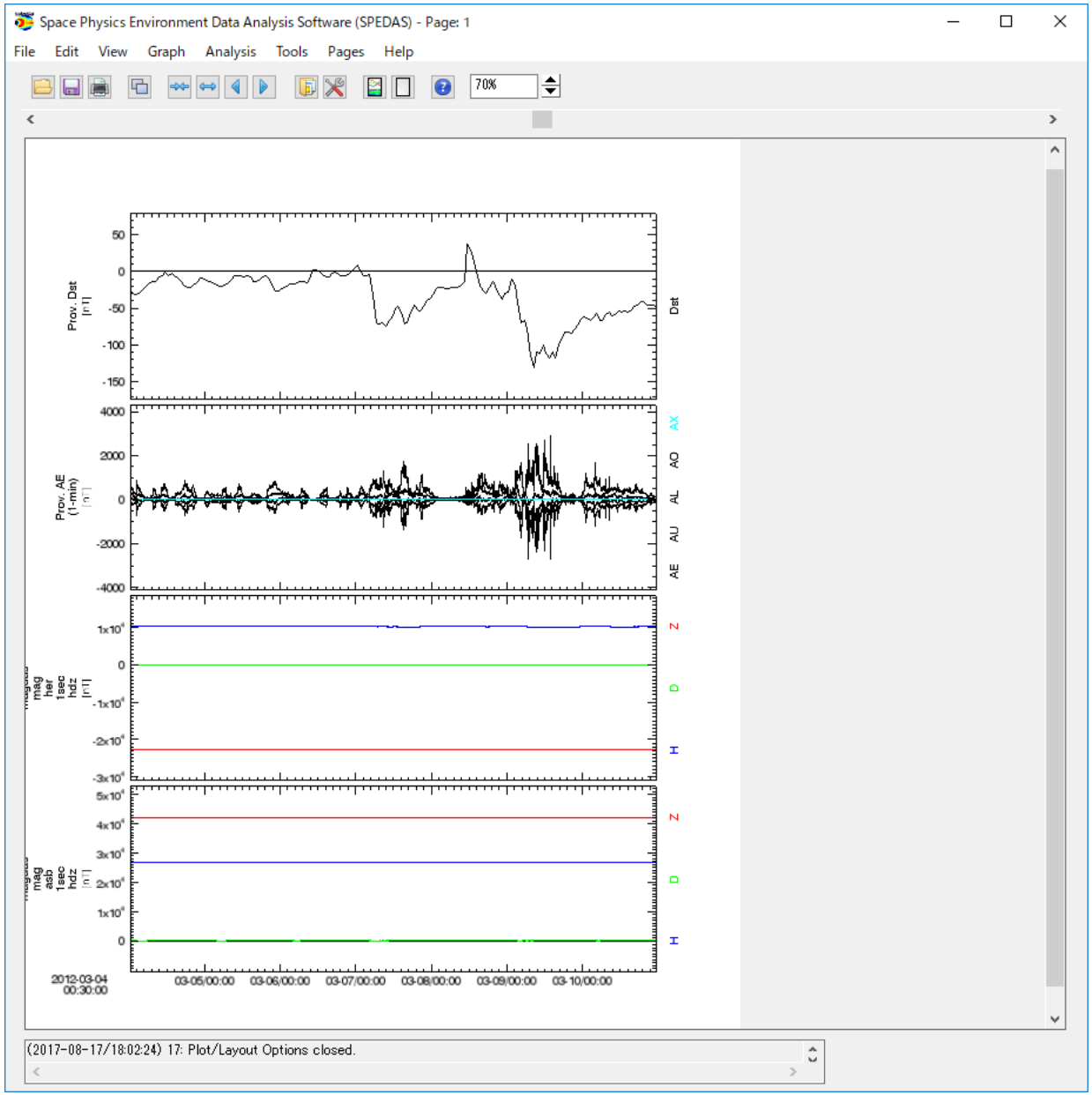
Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI



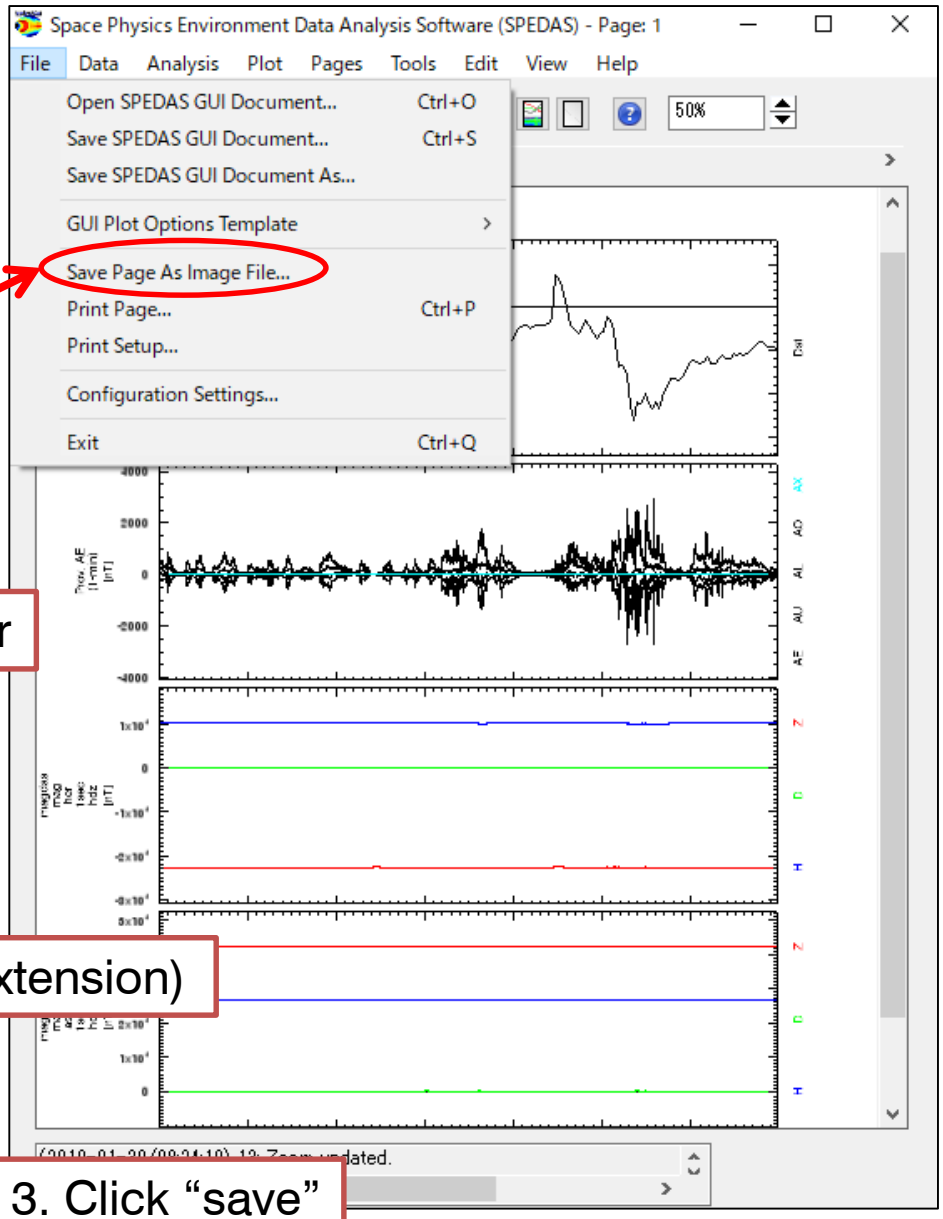
Basic Operation of SPEDAS GUI

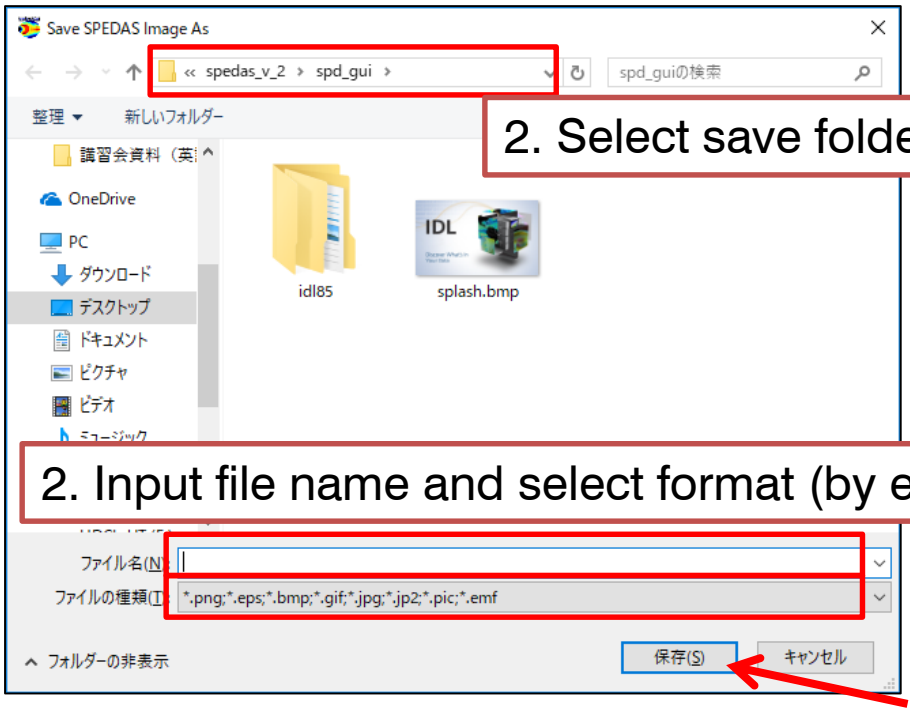


Basic Operation of SPEDAS GUI

Save plot as image file

1. Select
File – Save Page As Image File…



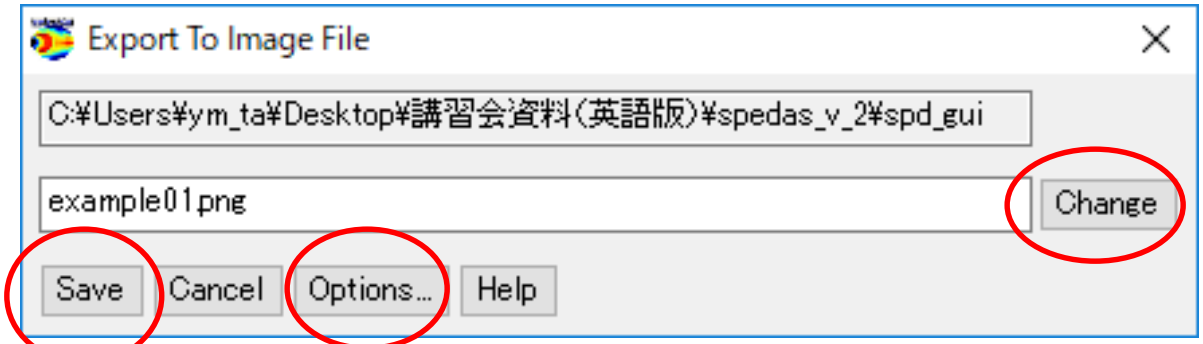


2. Select save folder

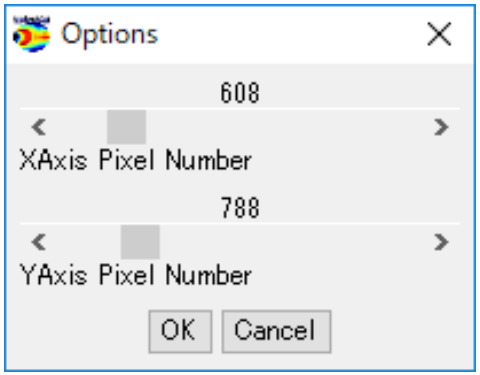
2. Input file name and select format (by extension)

3. Click “save”

Basic Operation of SPEDAS GUI

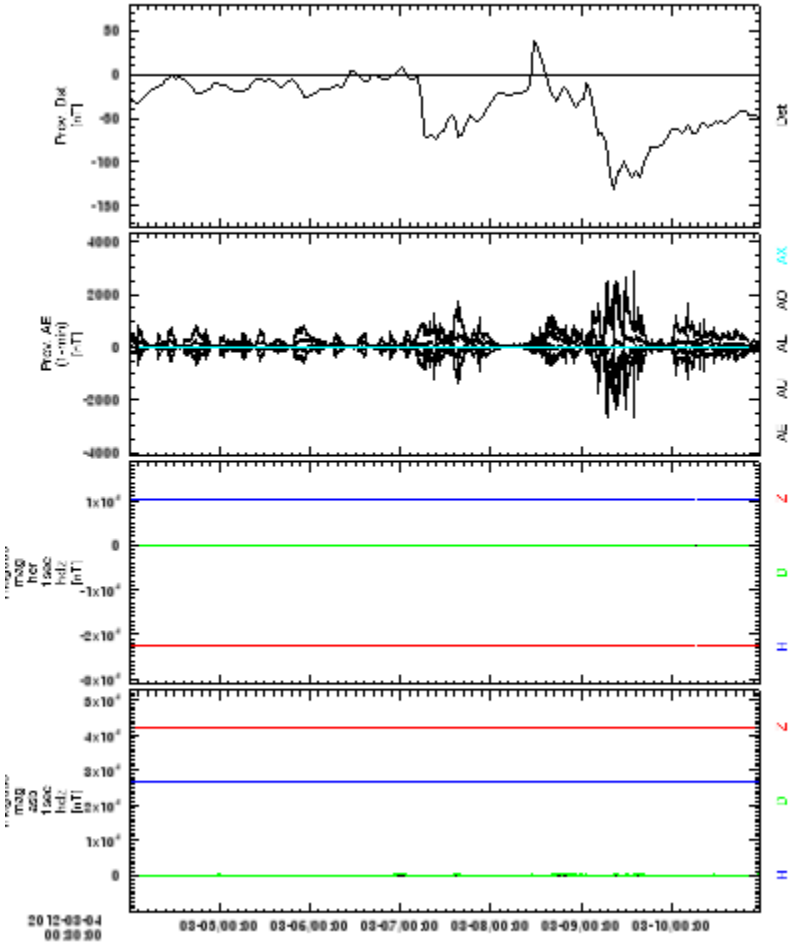


Back to previous

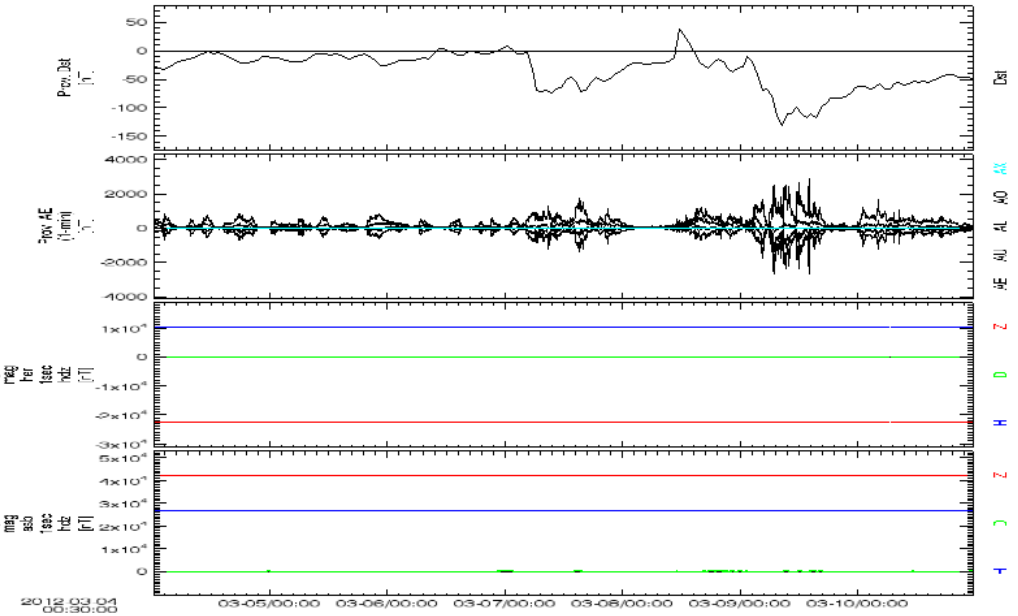


Click “Save”

Basic Operation of SPEDAS GUI



X pixel 428, Y pixel 554

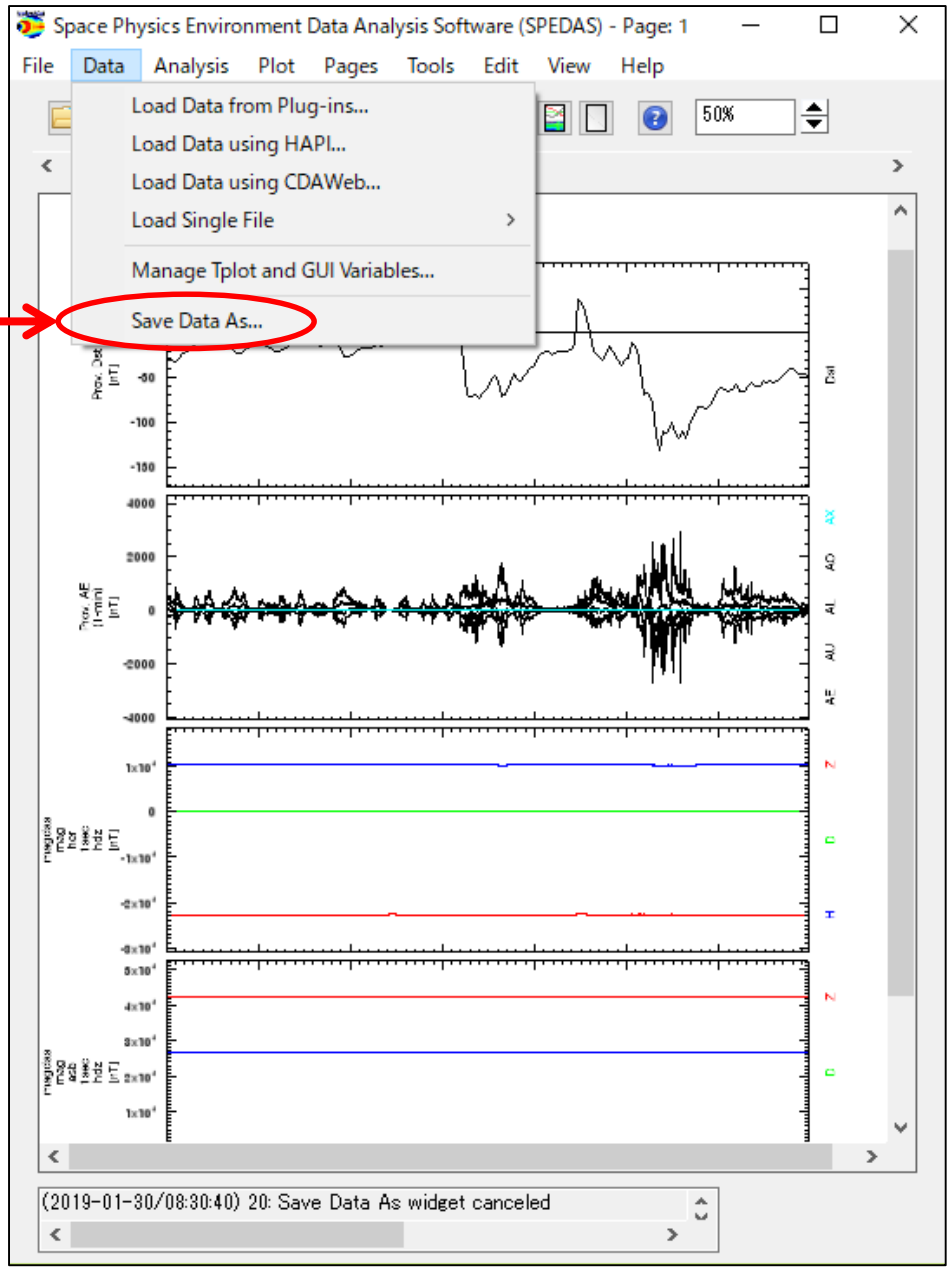


X pixel 856, Y pixel 554 (65%)

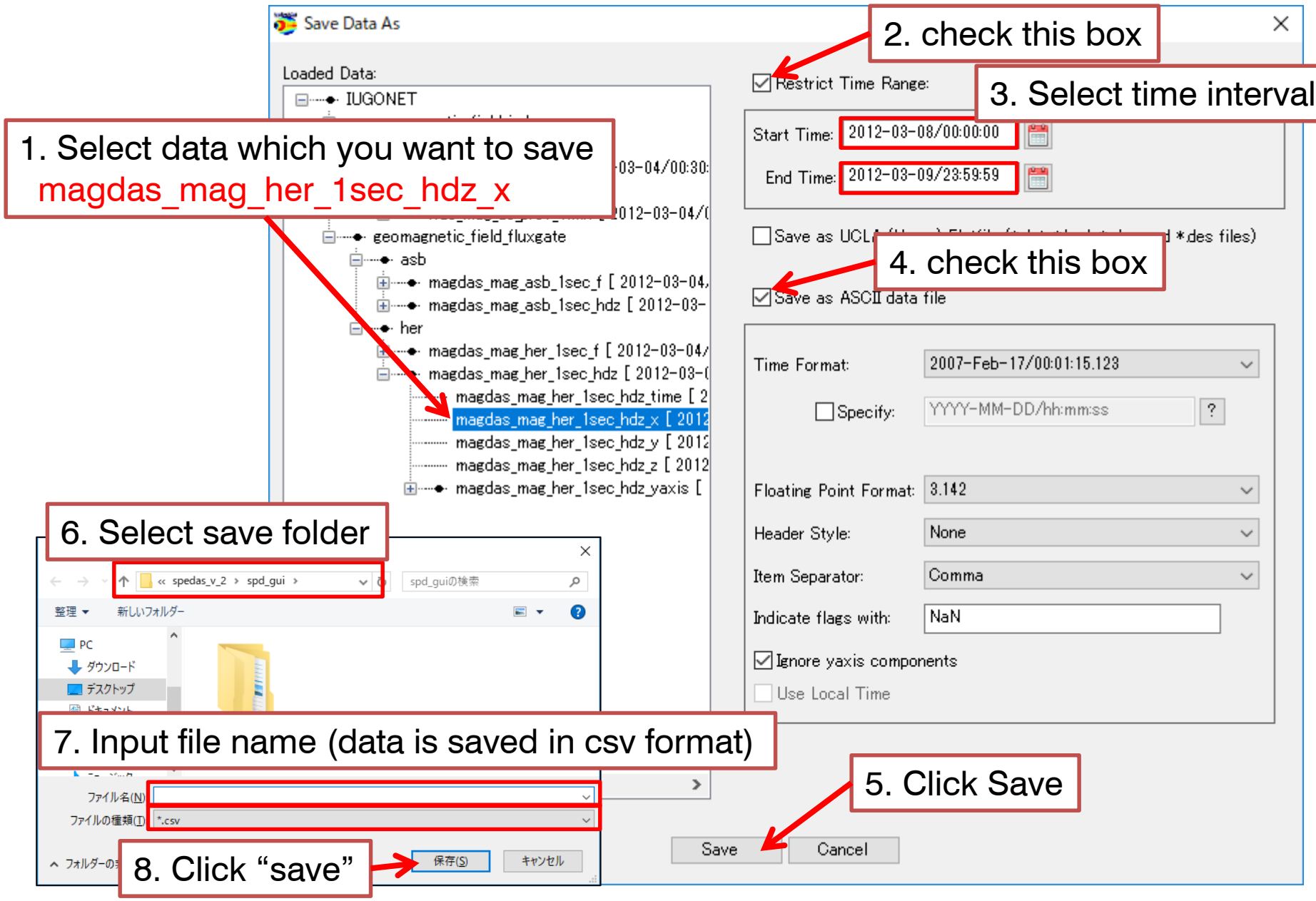
Basic Operation of SPEDAS GUI

Save data as ASCII

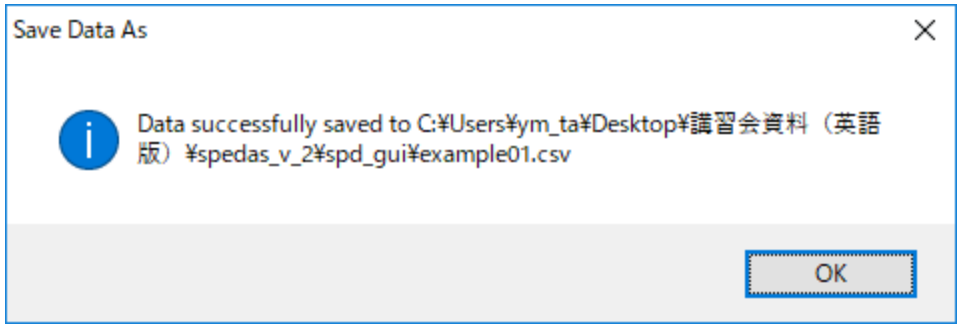
1. Select
Data – Save Data As



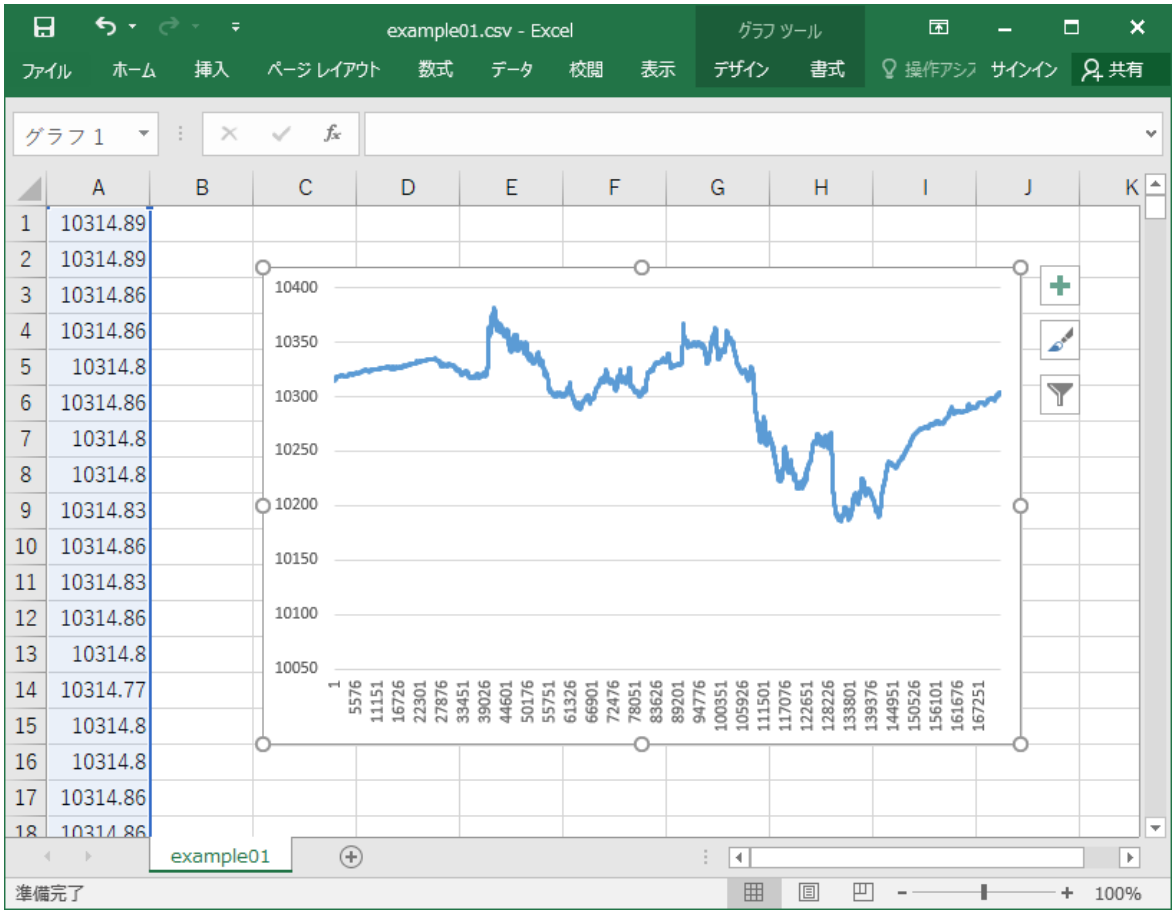
Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI



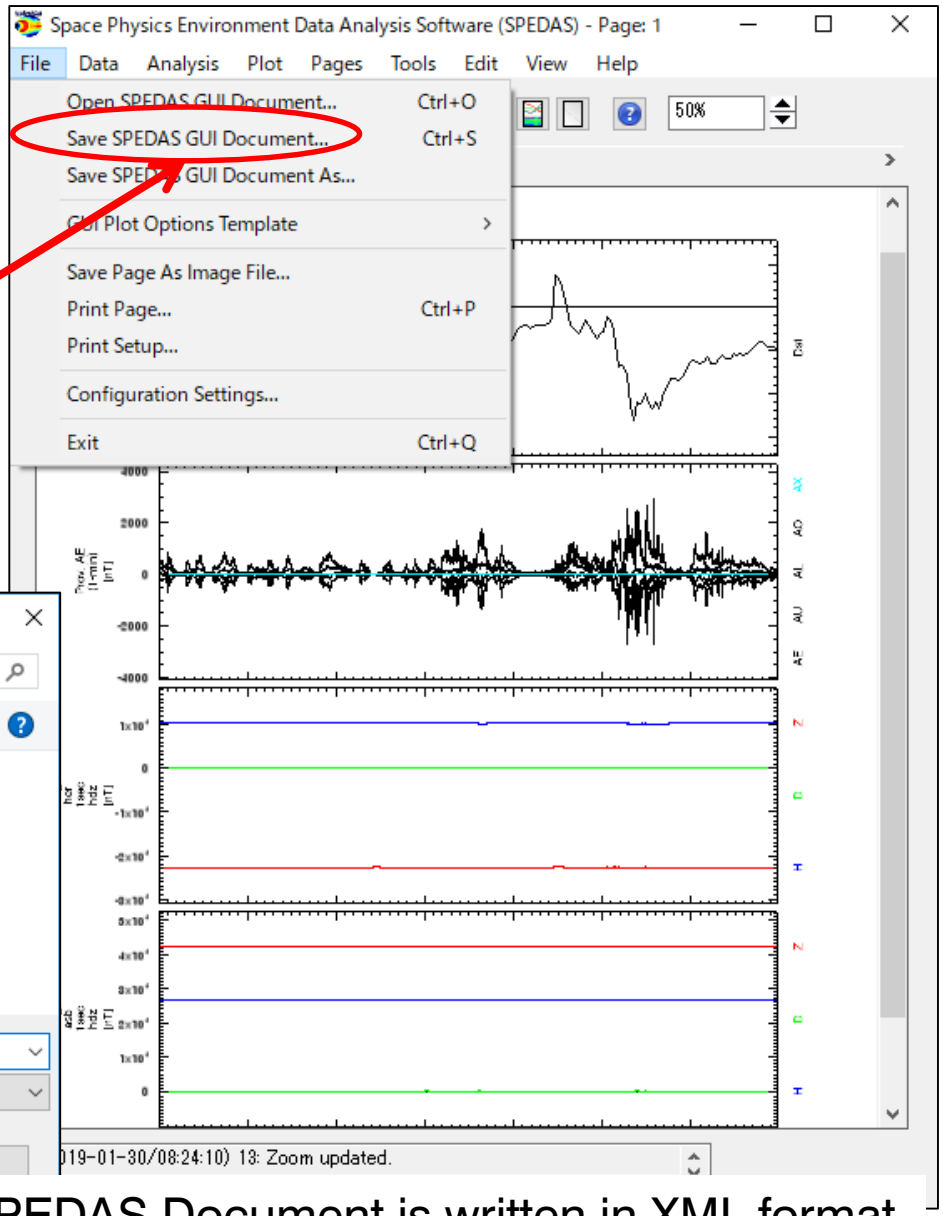
An ASCII data file was successfully saved!!!



Basic Operation of SPEDAS GUI

Save your workspace

1. Select
File – Save SPEDAS GUI Document



2. Select save folder

3. Input file name

4. Click “save”

※ SPEDAS Document is written in XML format

IUGONET

Metadata DB for Upper Atmosphere

超高層大気長期変動の全地球ネットワーク観測・研究

Inter-university Upper atmospher Global Observation NETwork

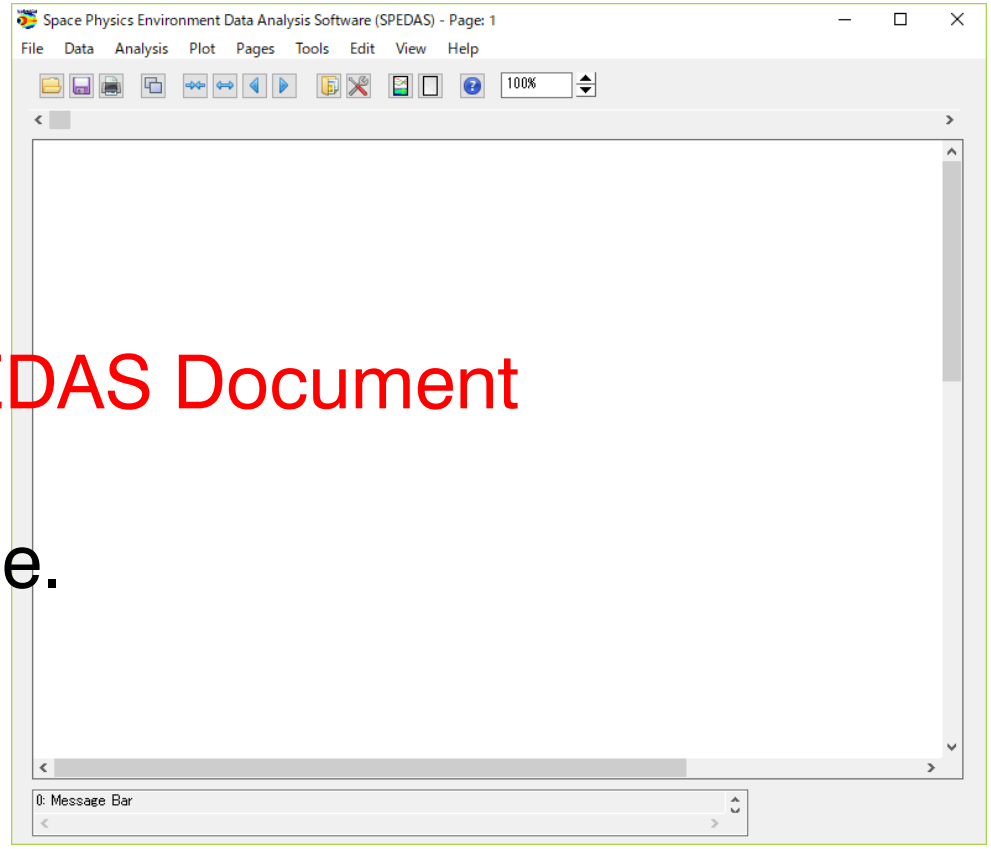
How to Use SPEDAS-GUI part2

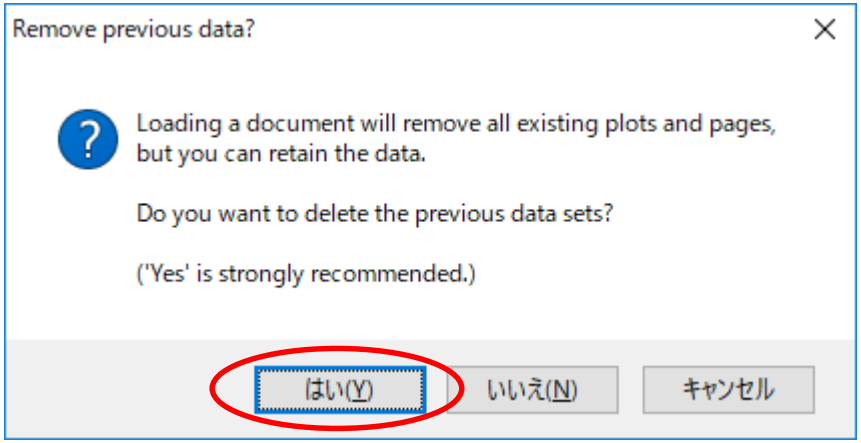
- Restore your work
- Manage axis
- Process and data

Basic Operation of SPEDAS GUI

Restore part1 workspace

1. Exit SPEDAS
2. Run SPEDAS again
3. Select File- Open SPEDAS Document
4. Click “Yes”
5. Select the saved tgd file.

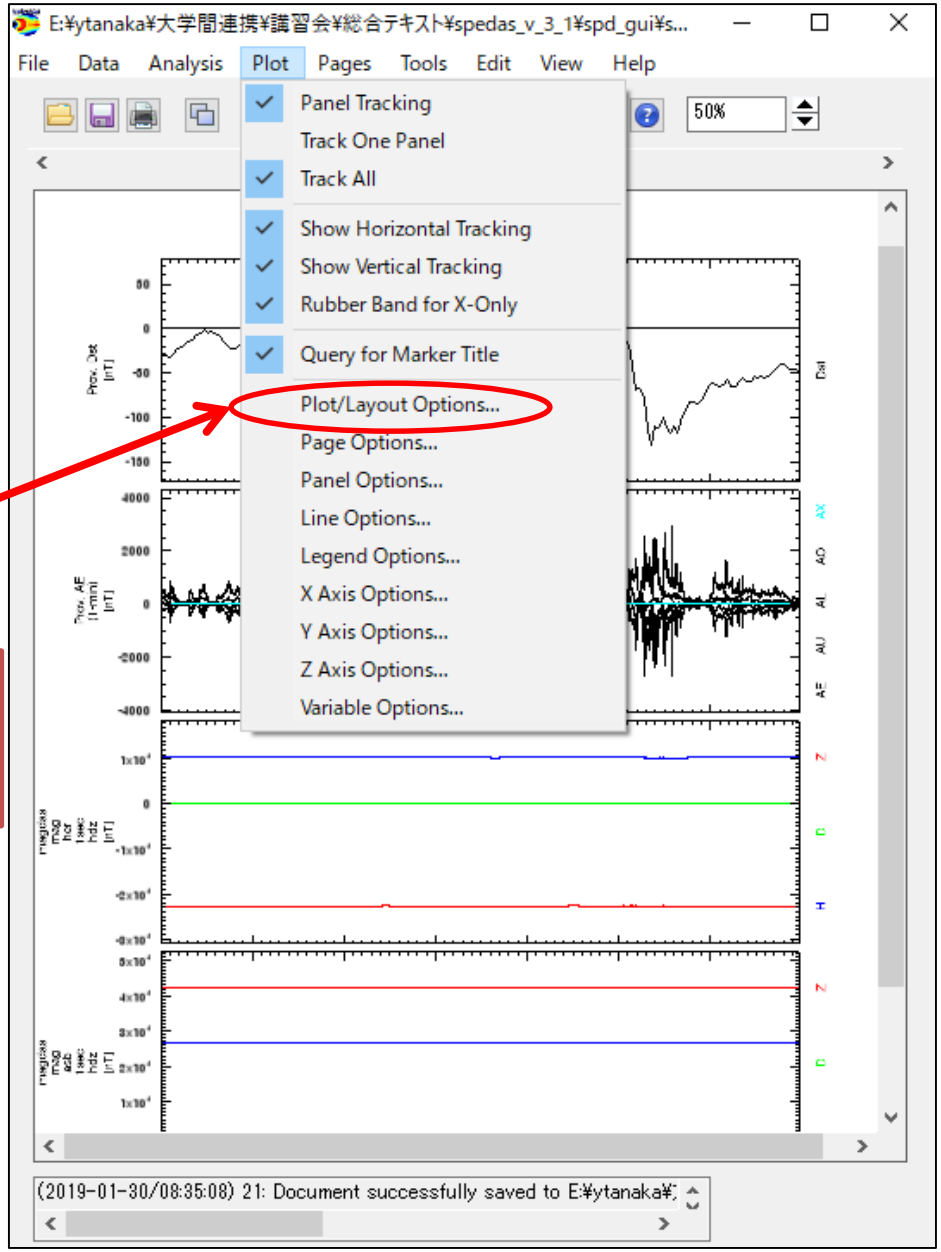




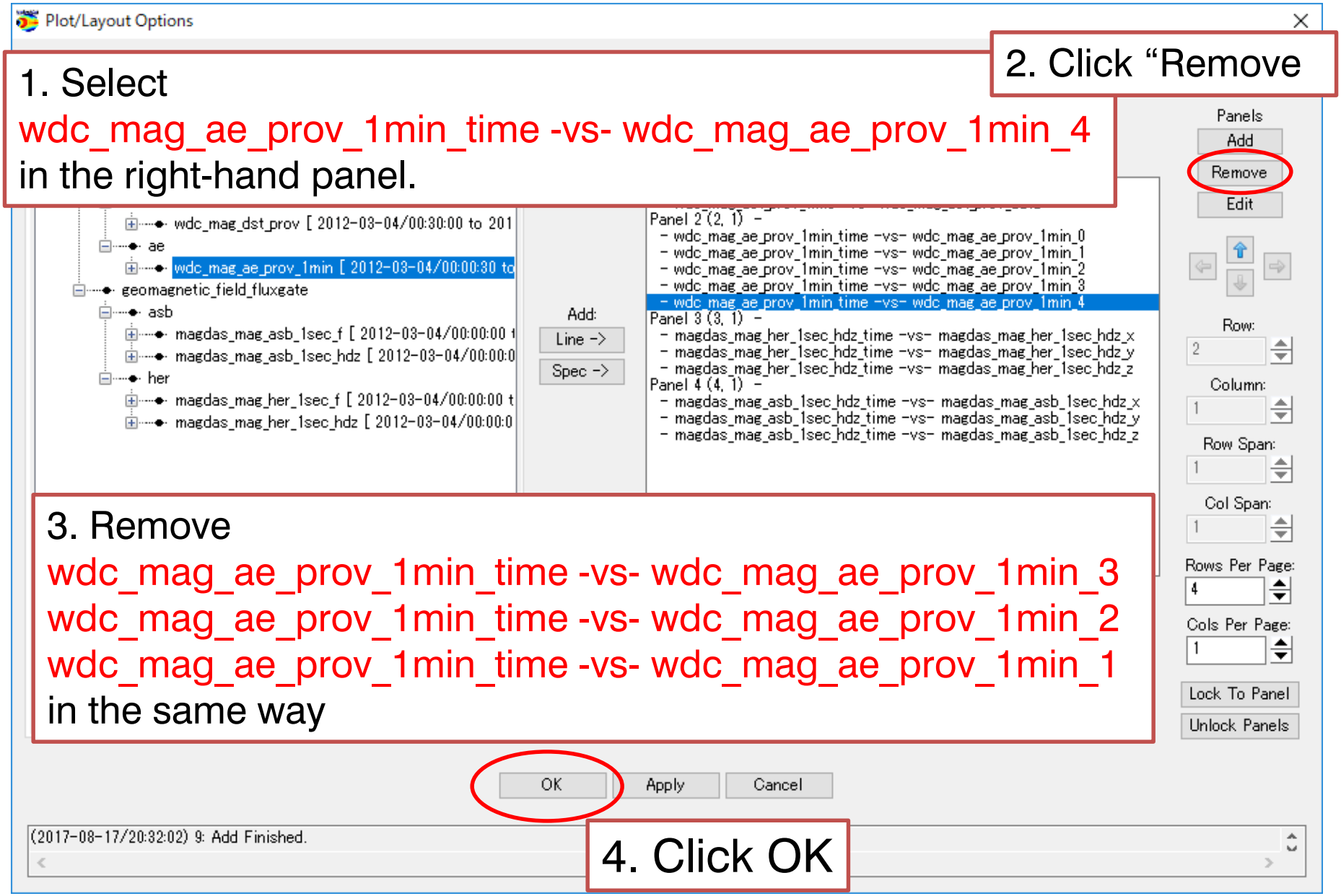
Basic Operation of SPEDAS GUI

Remove plot

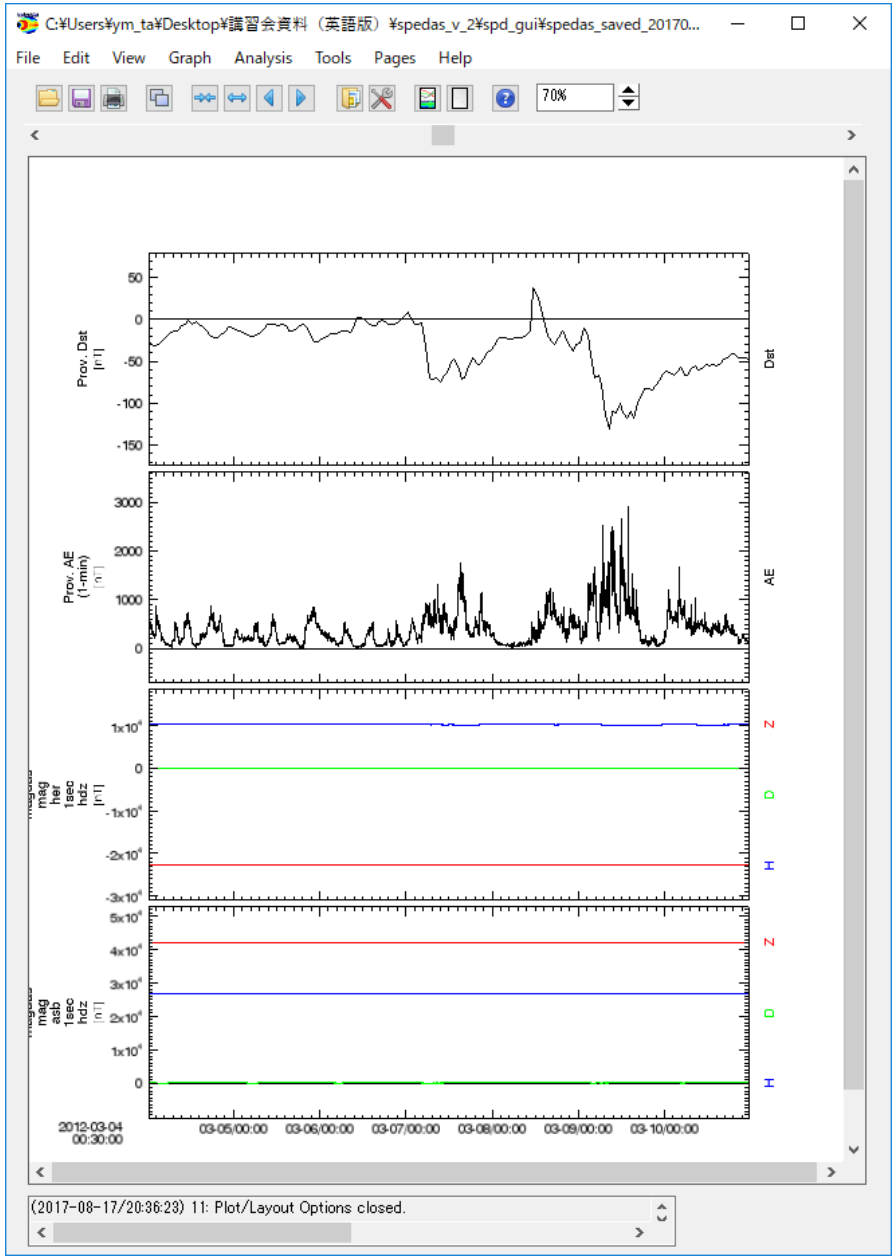
1. Select
Plot – Plot/Layout Options



Basic Operation of SPEDAS GUI

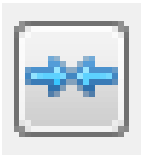


Basic Operation of SPEDAS GUI

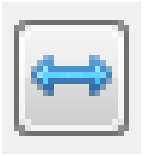


Basic Operation of SPEDAS GUI

Change X range (time scale) (1)



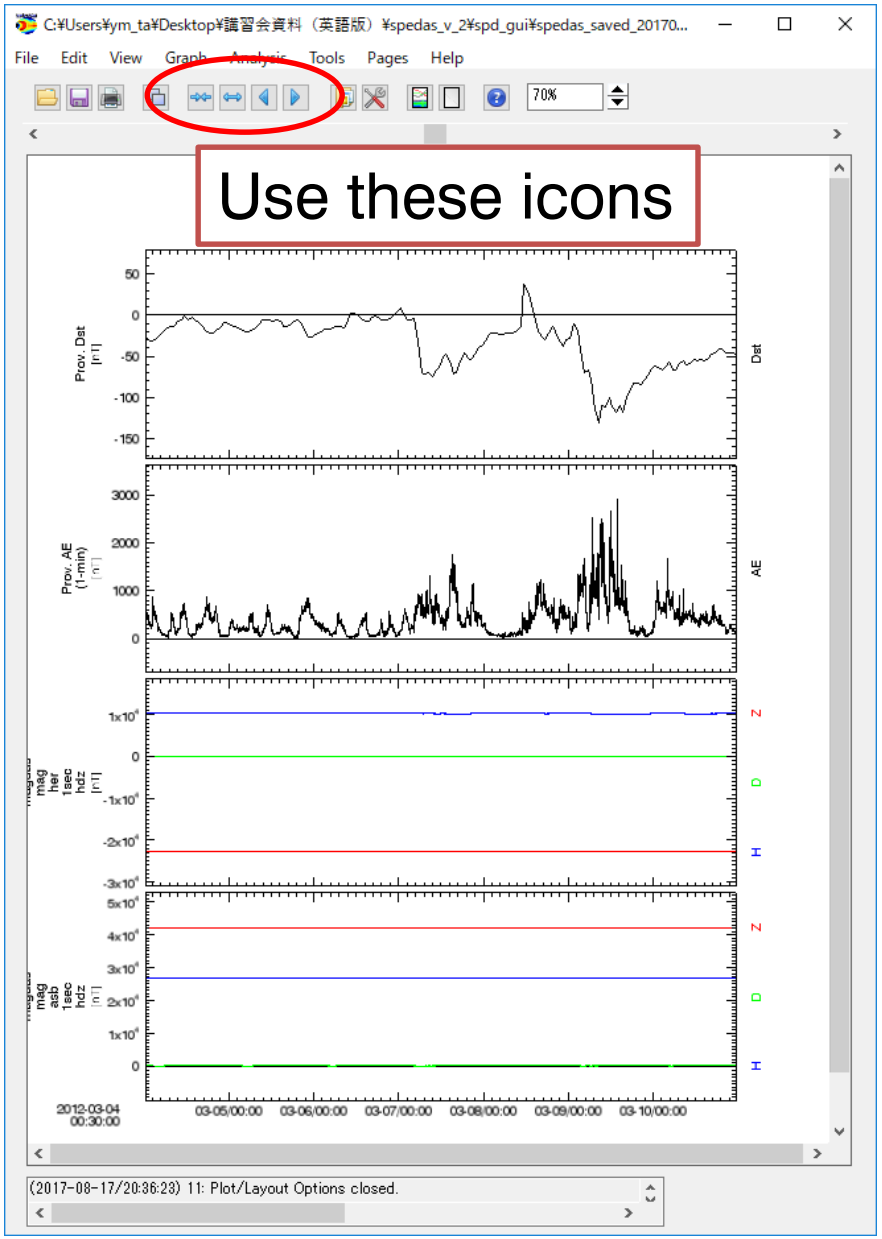
Reduces X range by major tick marker



Expands X range by major tick marker

Shift left X range by major tick marker

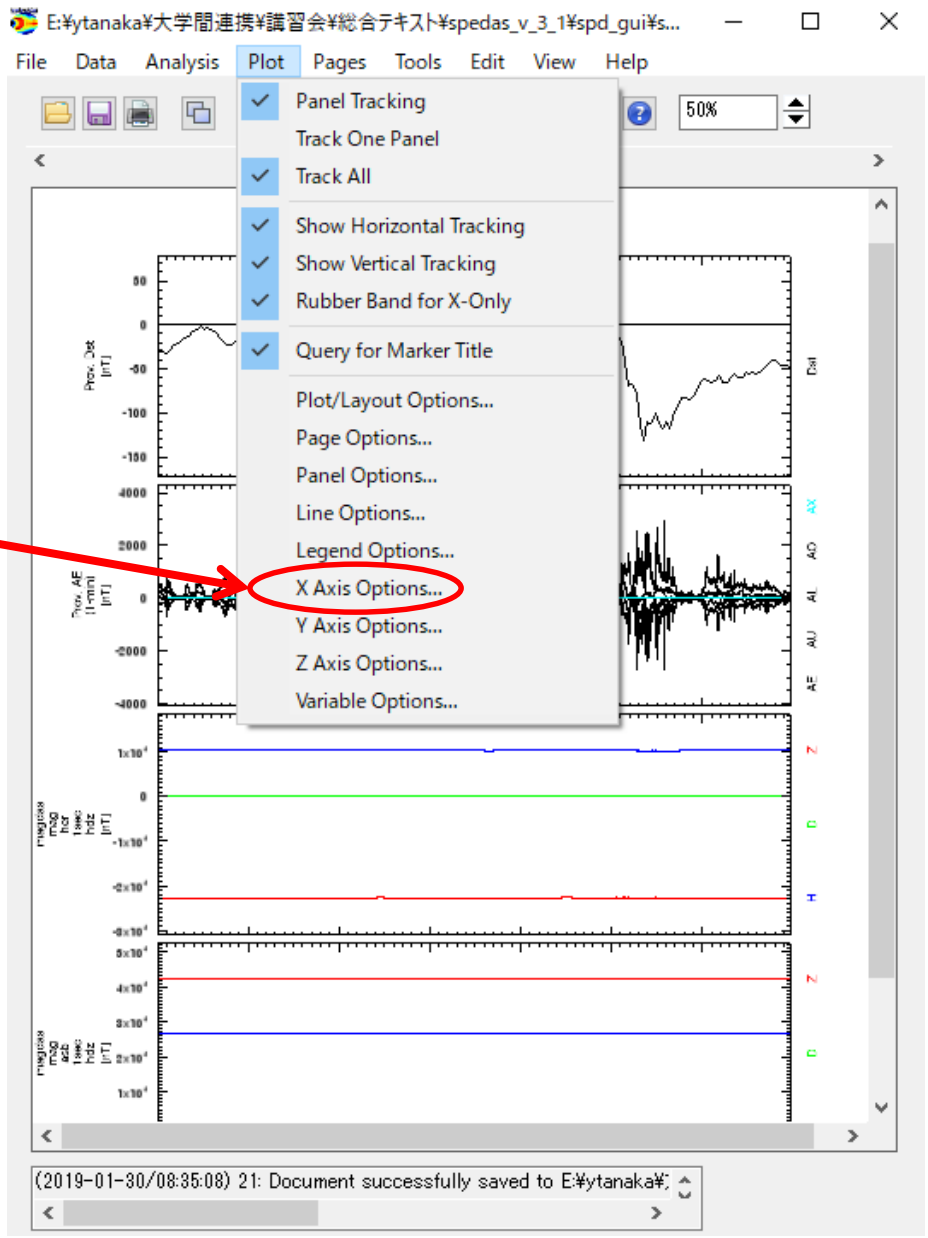
Shift right X range by major tick marker



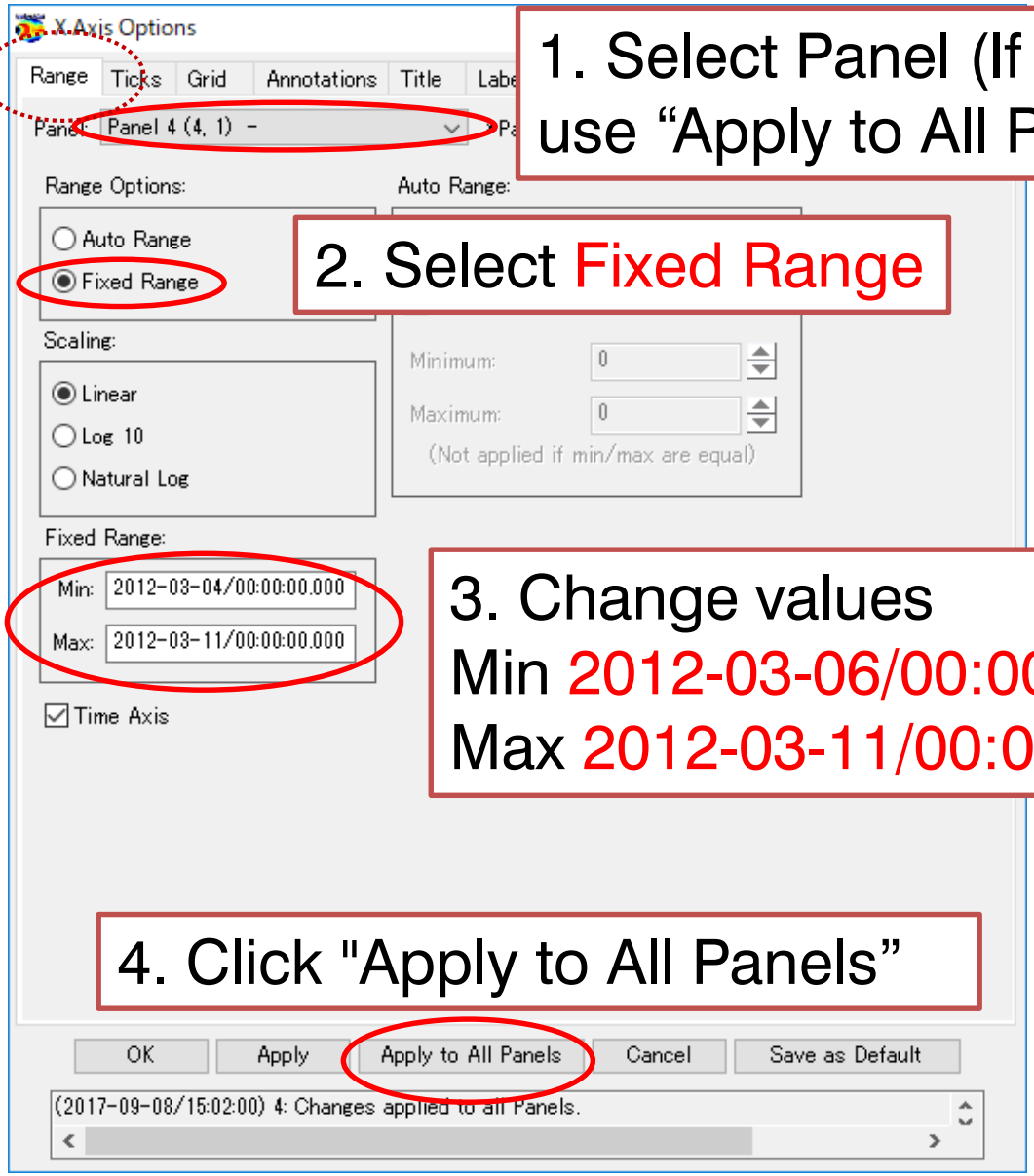
Basic Operation of SPEDAS GUI

Change X range (time scale) (2)

1. Select
Plot – X Axis Options



Basic Operation of SPEDAS GUI



1. Select Panel (If panel is locked, use “Apply to All Panels”.)

2. Select Fixed Range

3. Change values
Min 2012-03-06/00:00:00.000
Max 2012-03-11/00:00:00.000

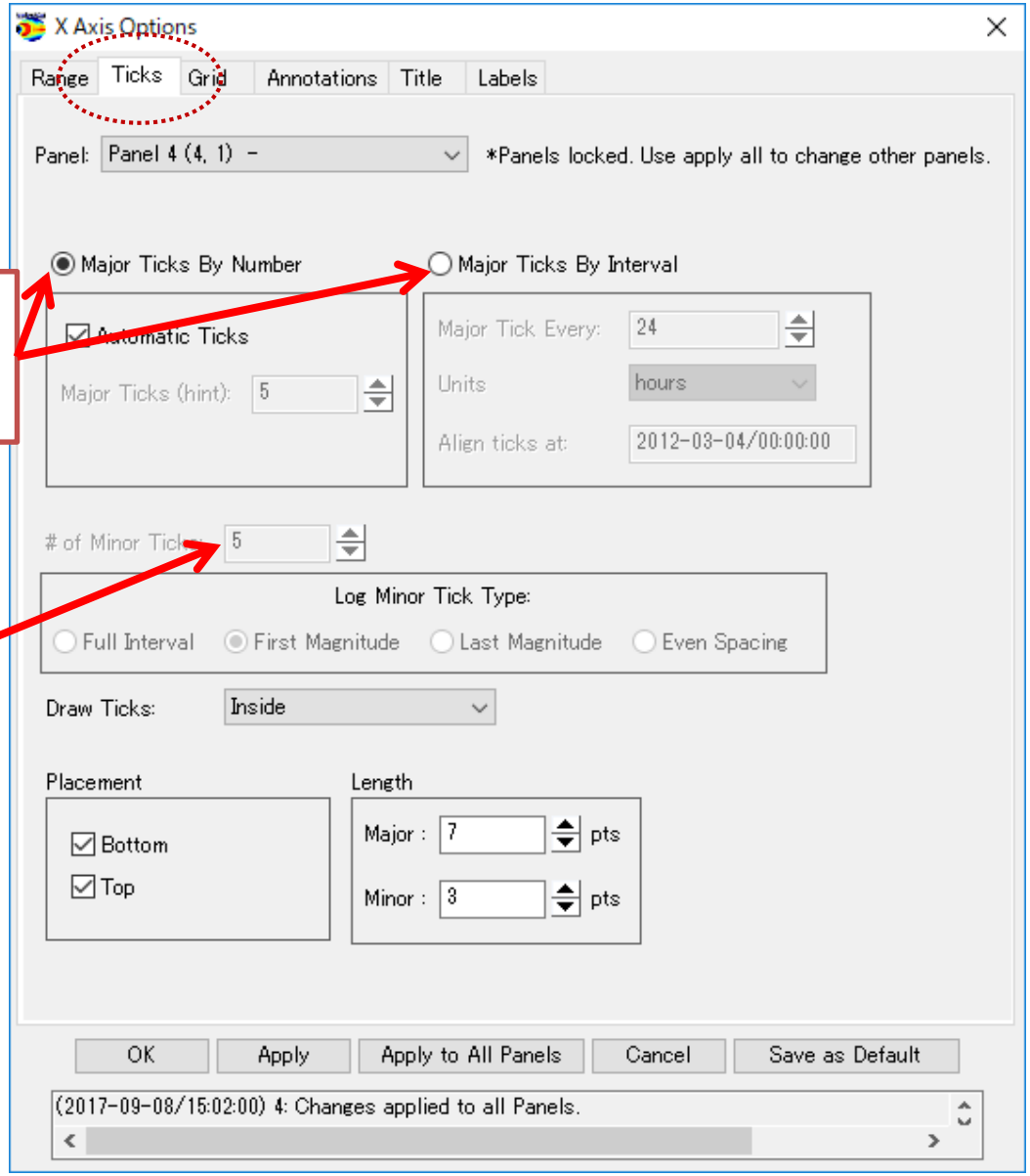
4. Click "Apply to All Panels”

Basic Operation of SPEDAS GUI

Customize ticks

1. Select Major Ticks By Number or Interval.

2. Input the number into # (Number or Interval) of Minor Ticks

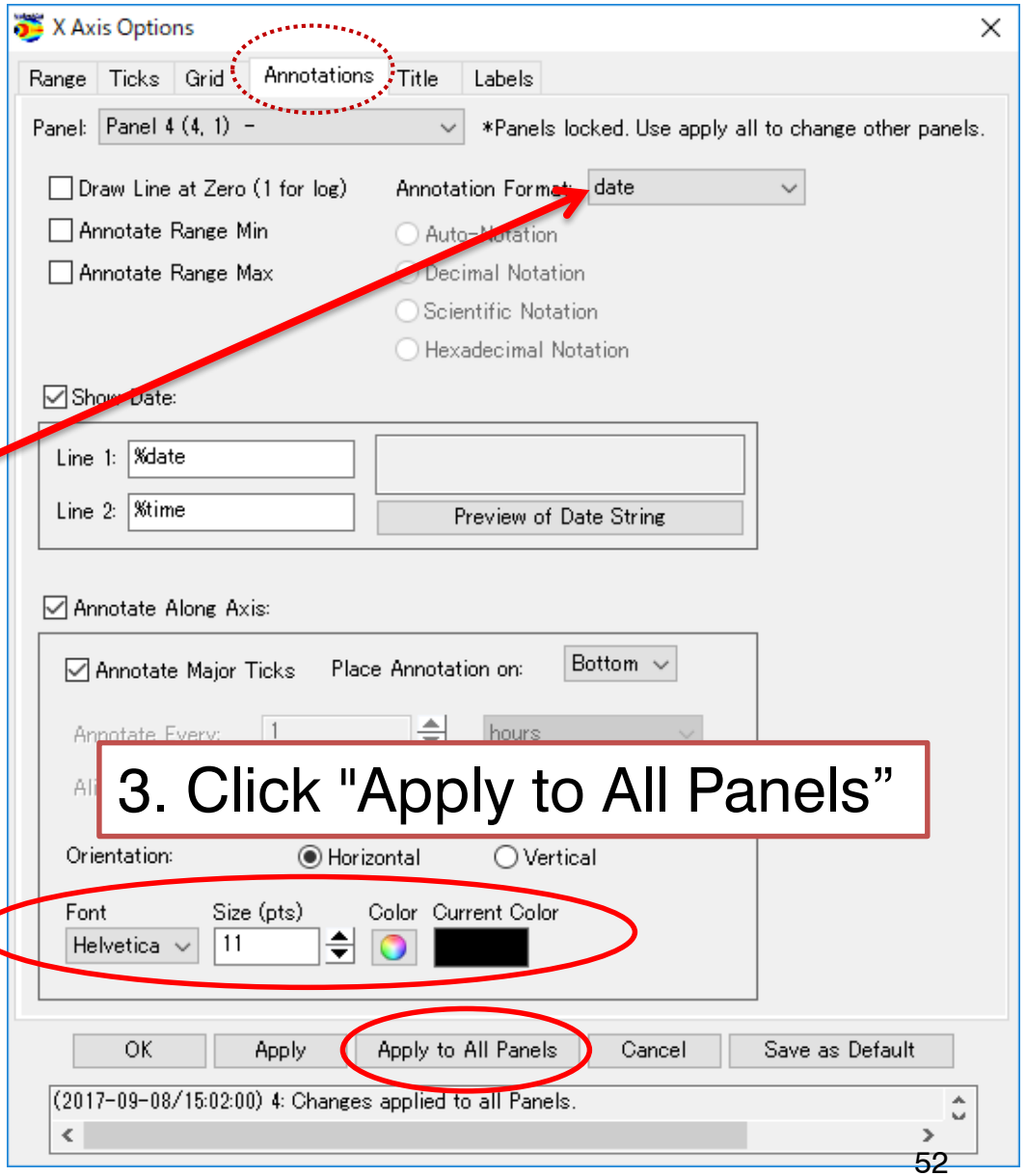


Basic Operation of SPEDAS GUI

Change annotations

1. Select your favorite format in the pull-down menu of Annotation Format.

2. If you want to change the character font, size, and color, select your favorite format in the pull-down menu here.



3. Click "Apply to All Panels"

Basic Operation of SPEDAS GUI

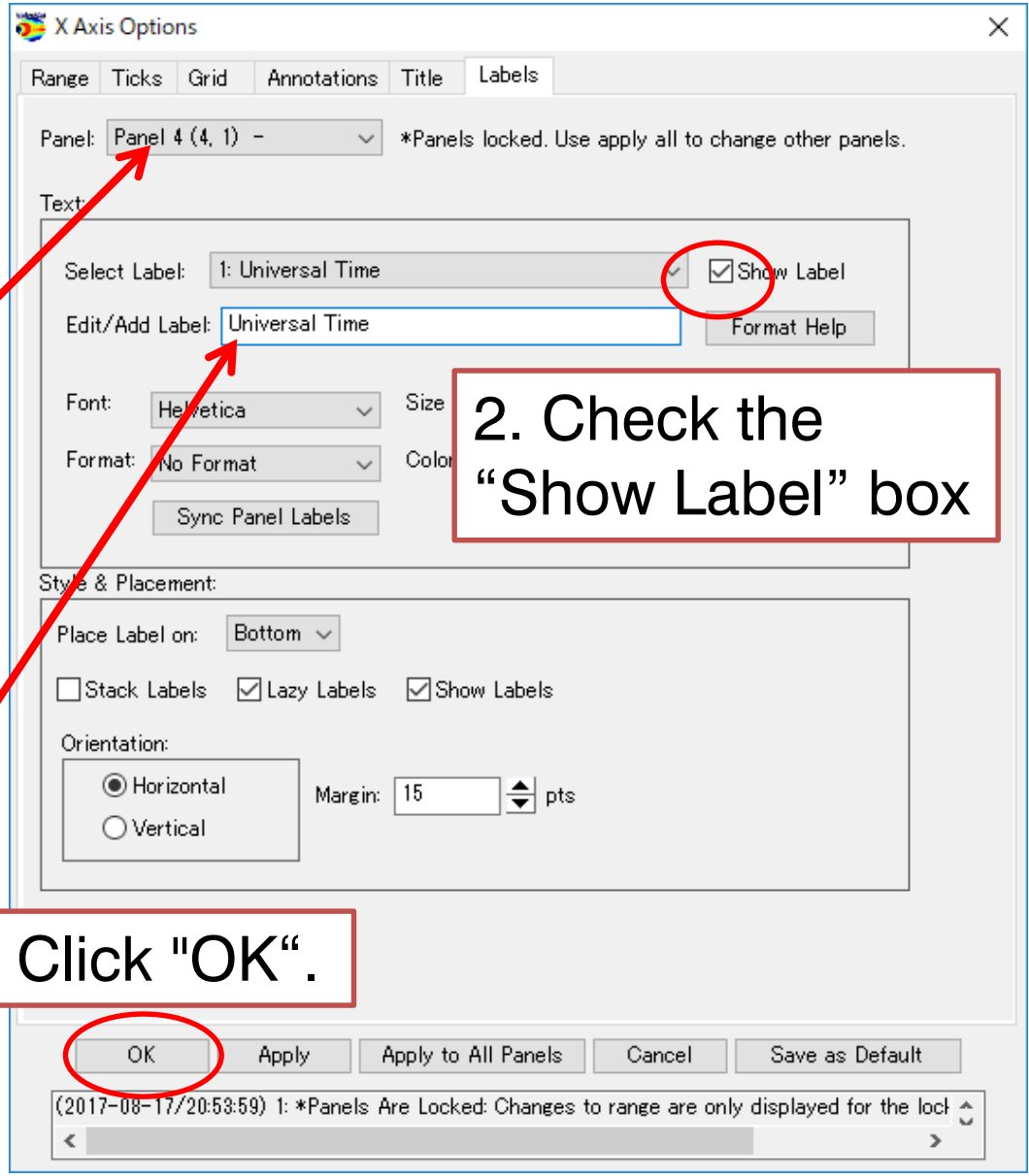
Customize labels (of X axis)

1. Select Panel 4 (bottom panel)

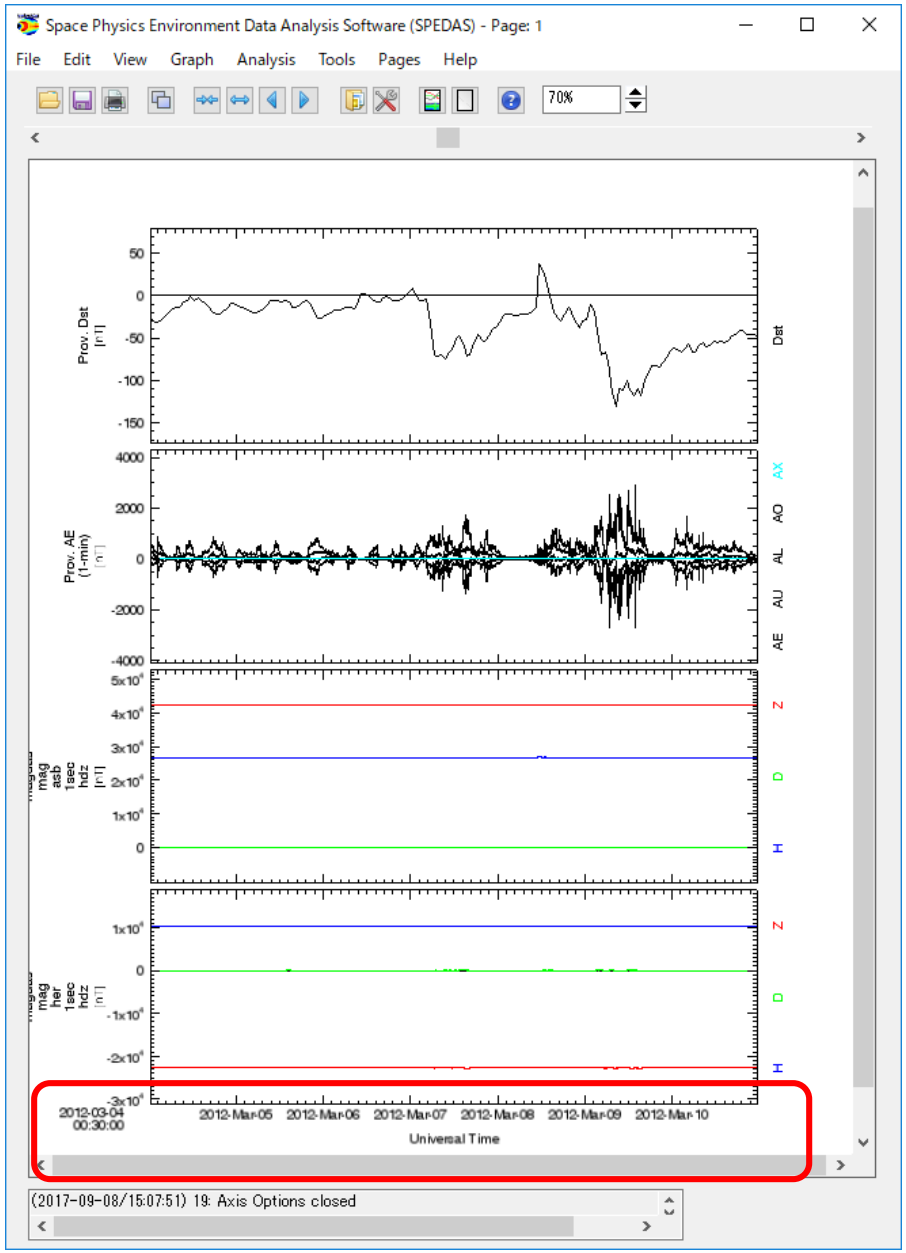
2. Check the “Show Label” box

3. Type “Universal Time ” on the Edit/Add Label

4. Click "OK“.



Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI

Other options

- **Page Options…**

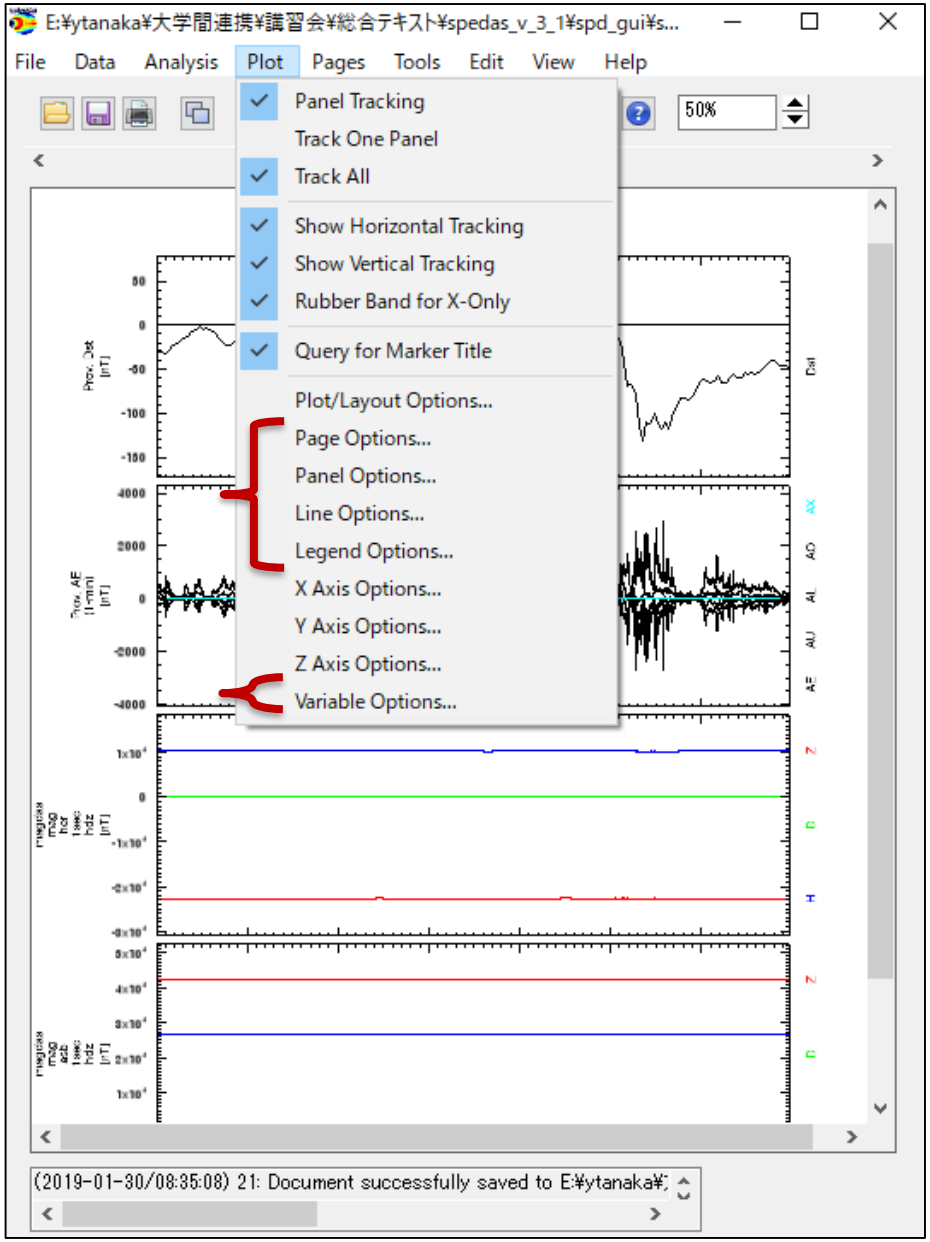
  Customize the text and layout of the page.
- **Panel Options…**

  Customize the title and color of each panel.
- **Line Options…**

  Customize the line and symbol of each plot panel.
- **Legend Options…**

  Customize the legend which appears when you put the mouse cursor on the plot.
- **Variable Options…**

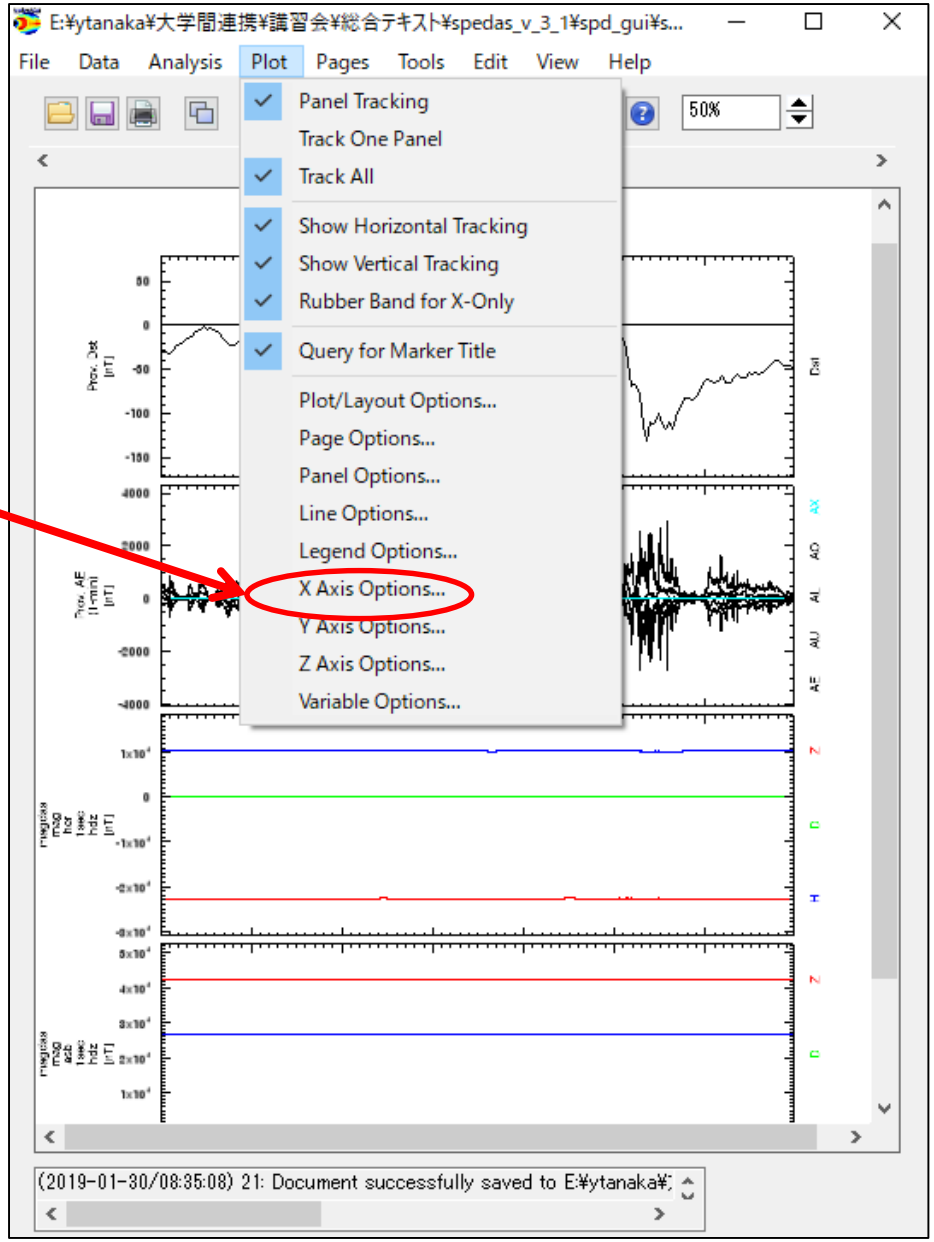
  Display the values of the selected parameters under the time label.



Basic Operation of SPEDAS GUI

Reset X range (time scale)

1. Select X Axis Options

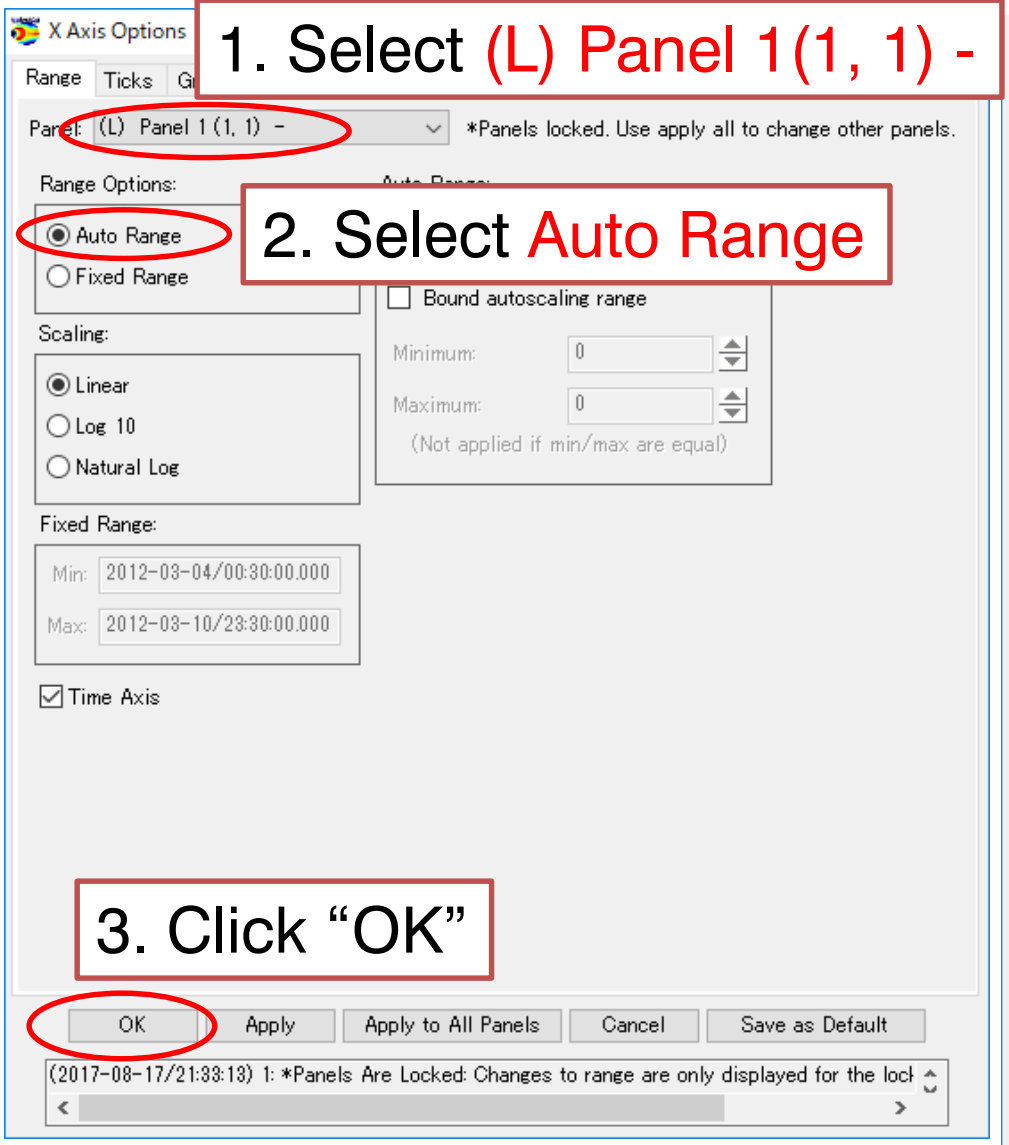


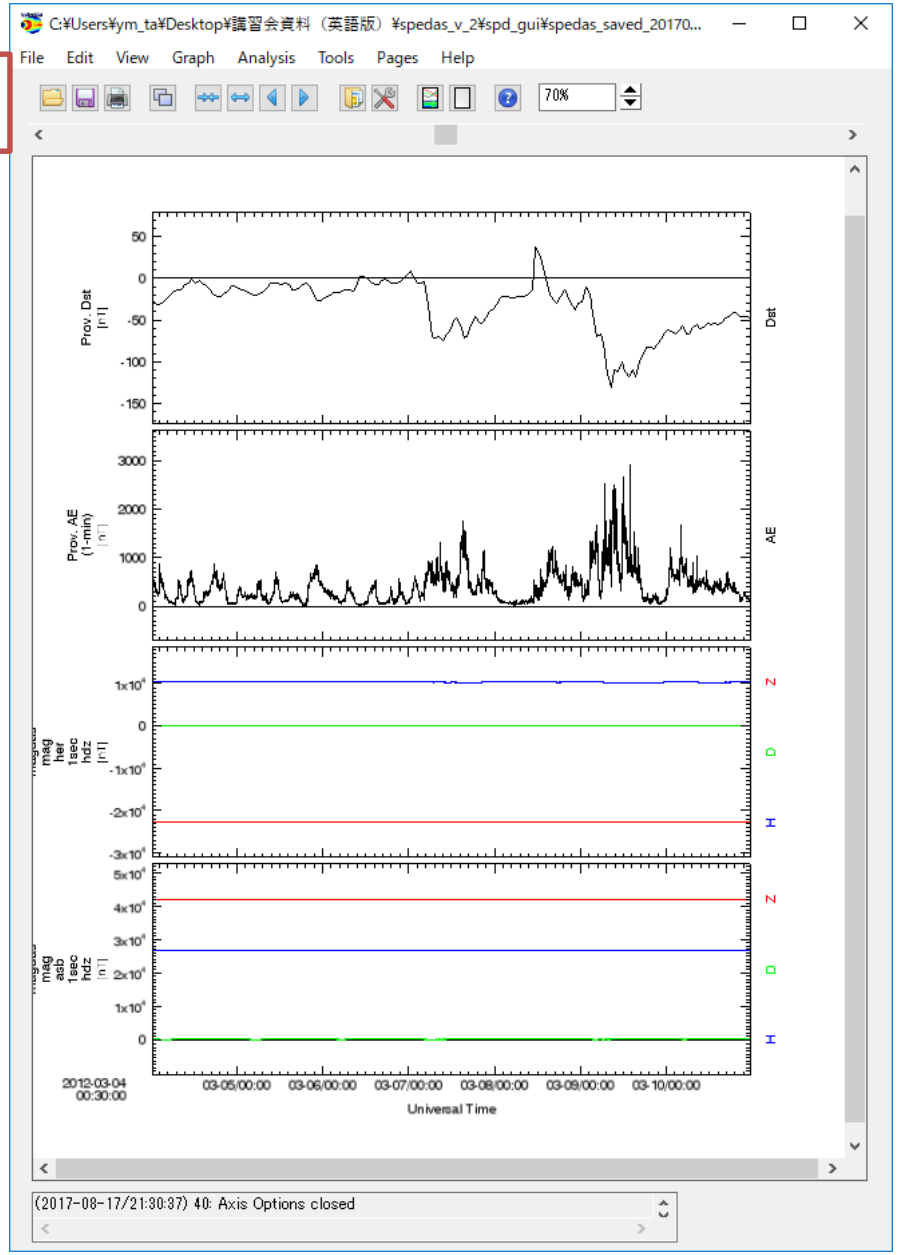
Basic Operation of SPEDAS GUI

1. Select (L) Panel 1(1, 1) -

2. Select Auto Range

3. Click “OK”

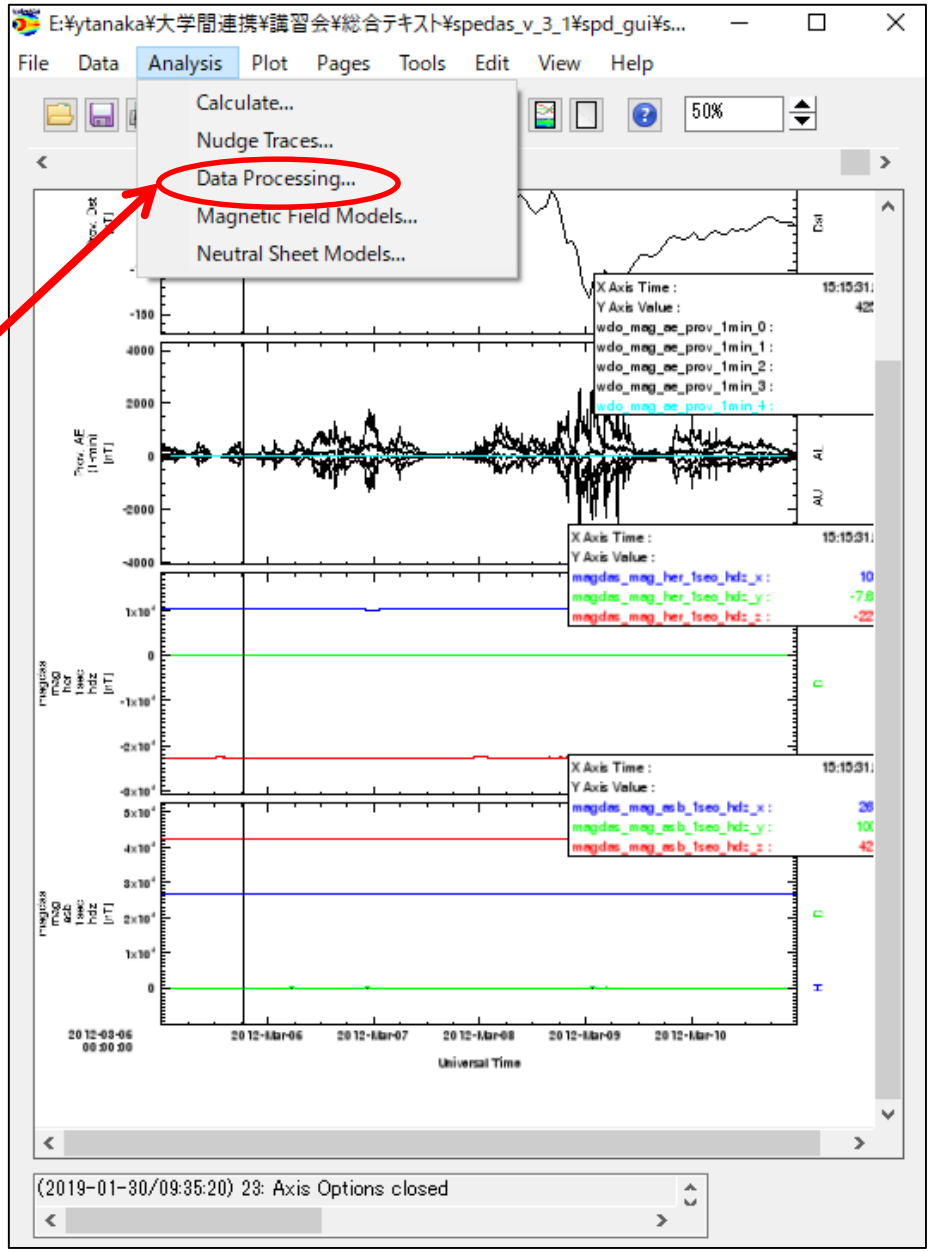




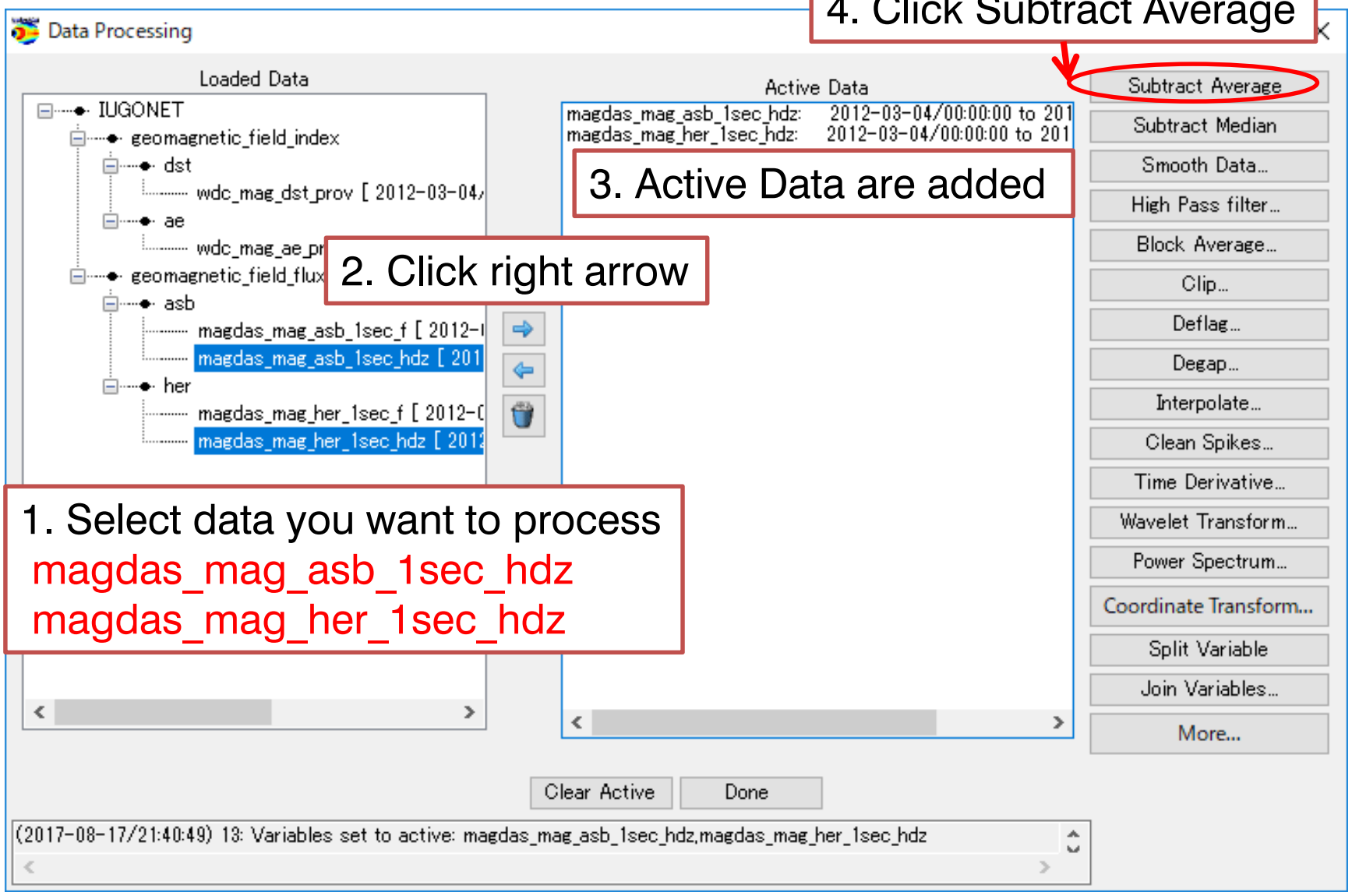
Basic Operation of SPEDAS GUI

Data processing (subtract average)

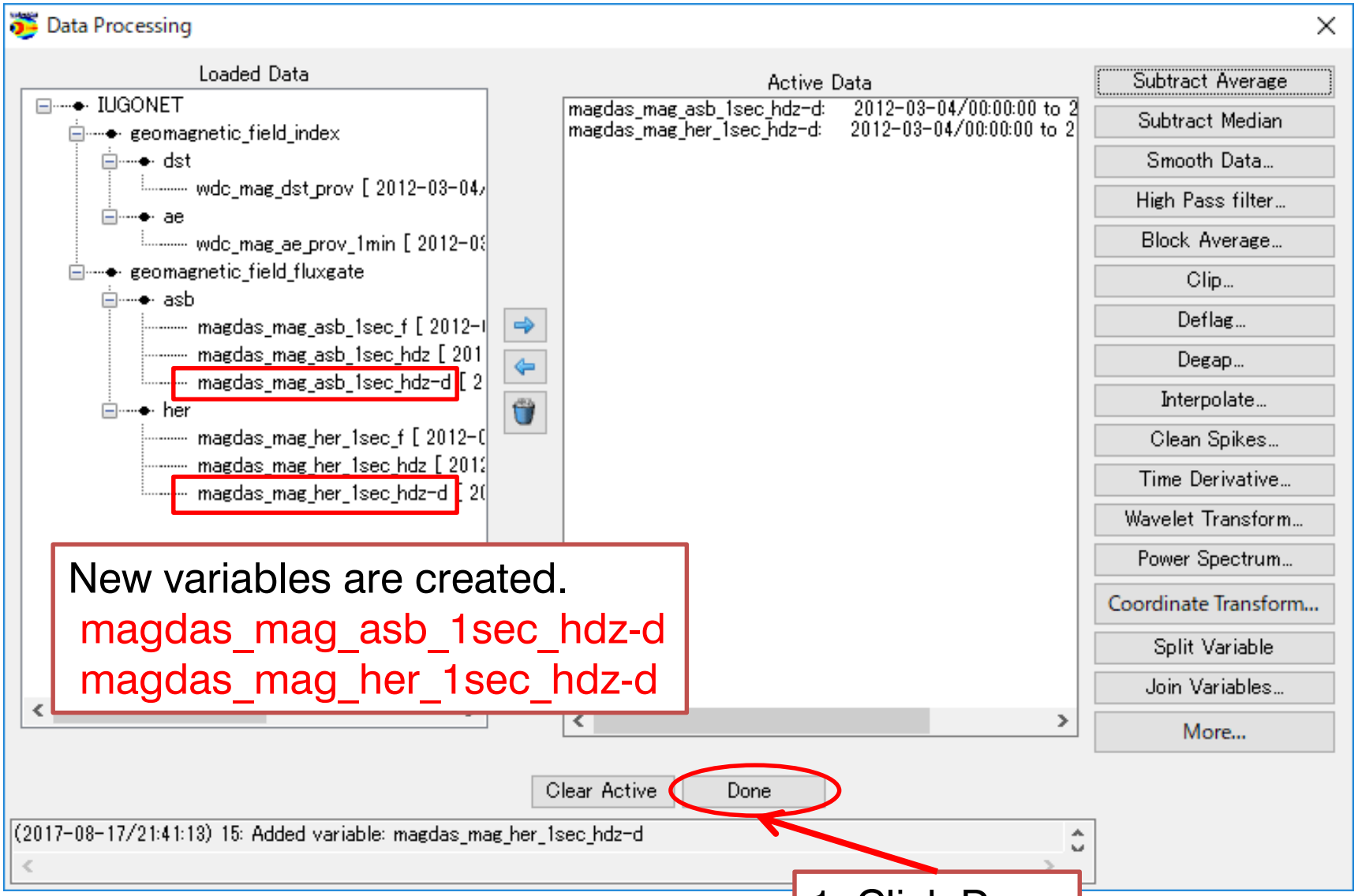
1. Select
Analysis – Data Processing



Basic Operation of SPEDAS GUI

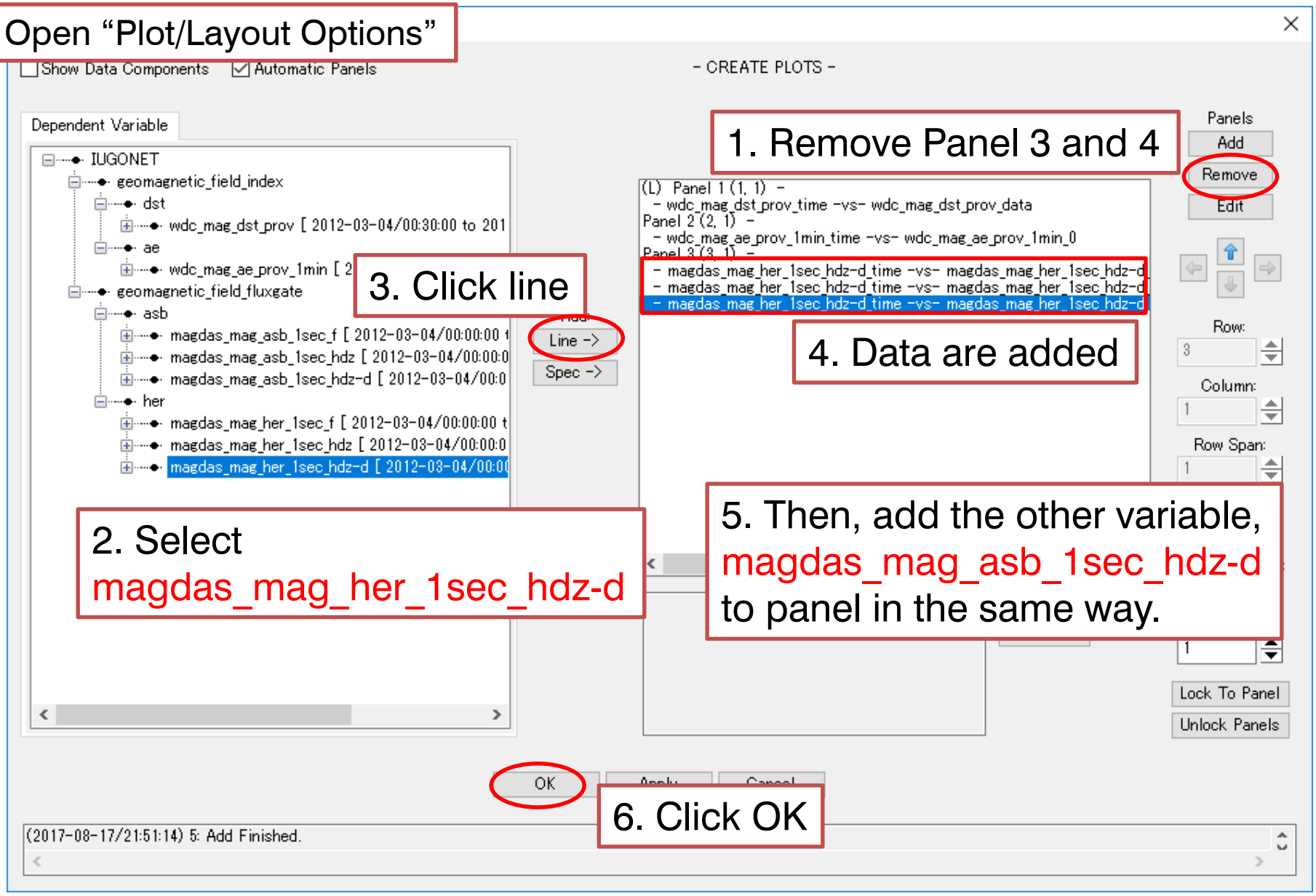


Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI

Open “Plot/Layout Options”



1. Remove Panel 3 and 4

2. Select magdas_mag_her_1sec_hdz-d

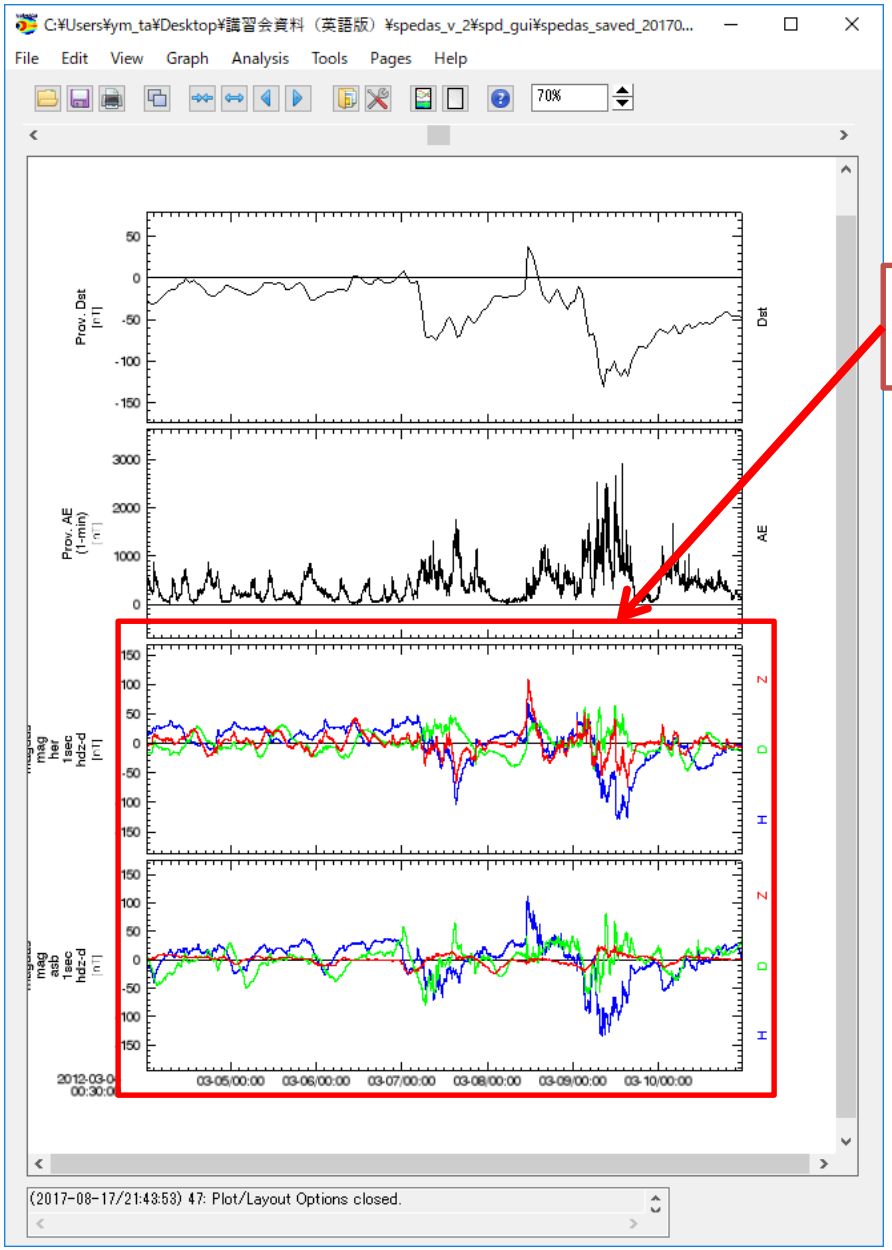
3. Click line

4. Data are added

5. Then, add the other variable, magdas_mag_asb_1sec_hdz-d to panel in the same way.

6. Click OK

Basic Operation of SPEDAS GUI



Subtracted average!

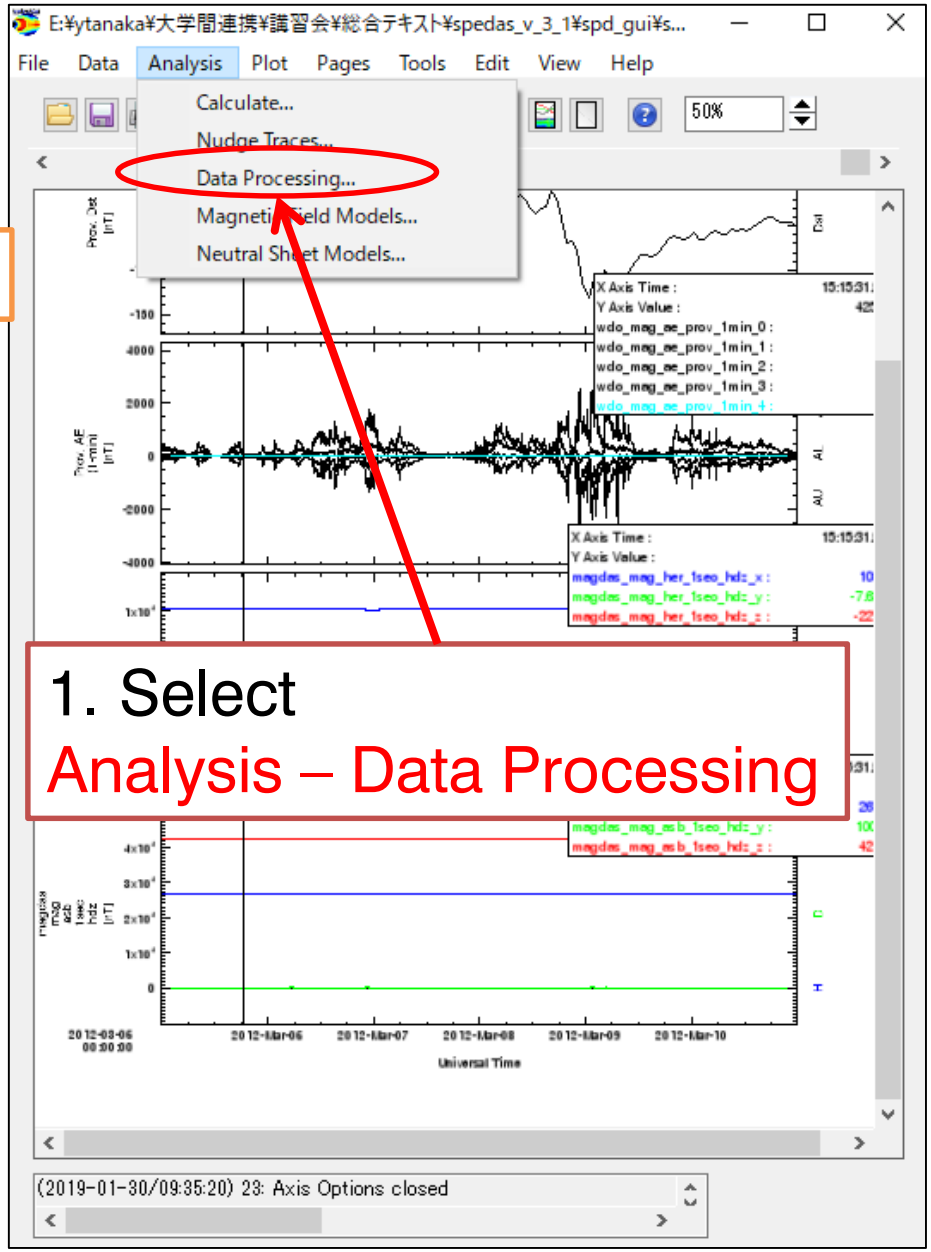
Basic Operation of SPEDAS GUI

Data processing (power spectrum)

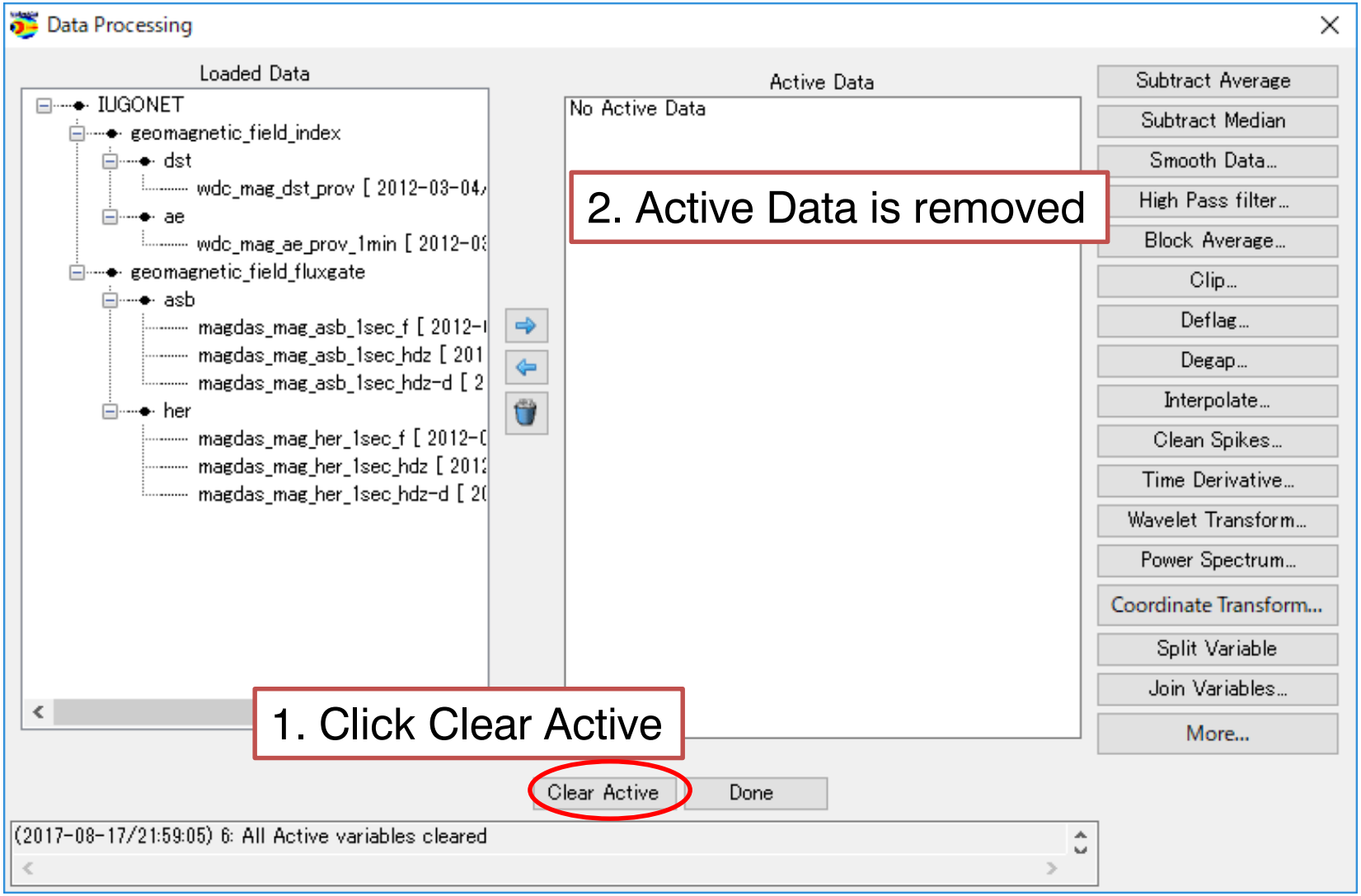
magdas_mag_her_1sec_hdz_x

Hint1: Use “Data Processing” for calculating (if you will get an option dialog, use default value)

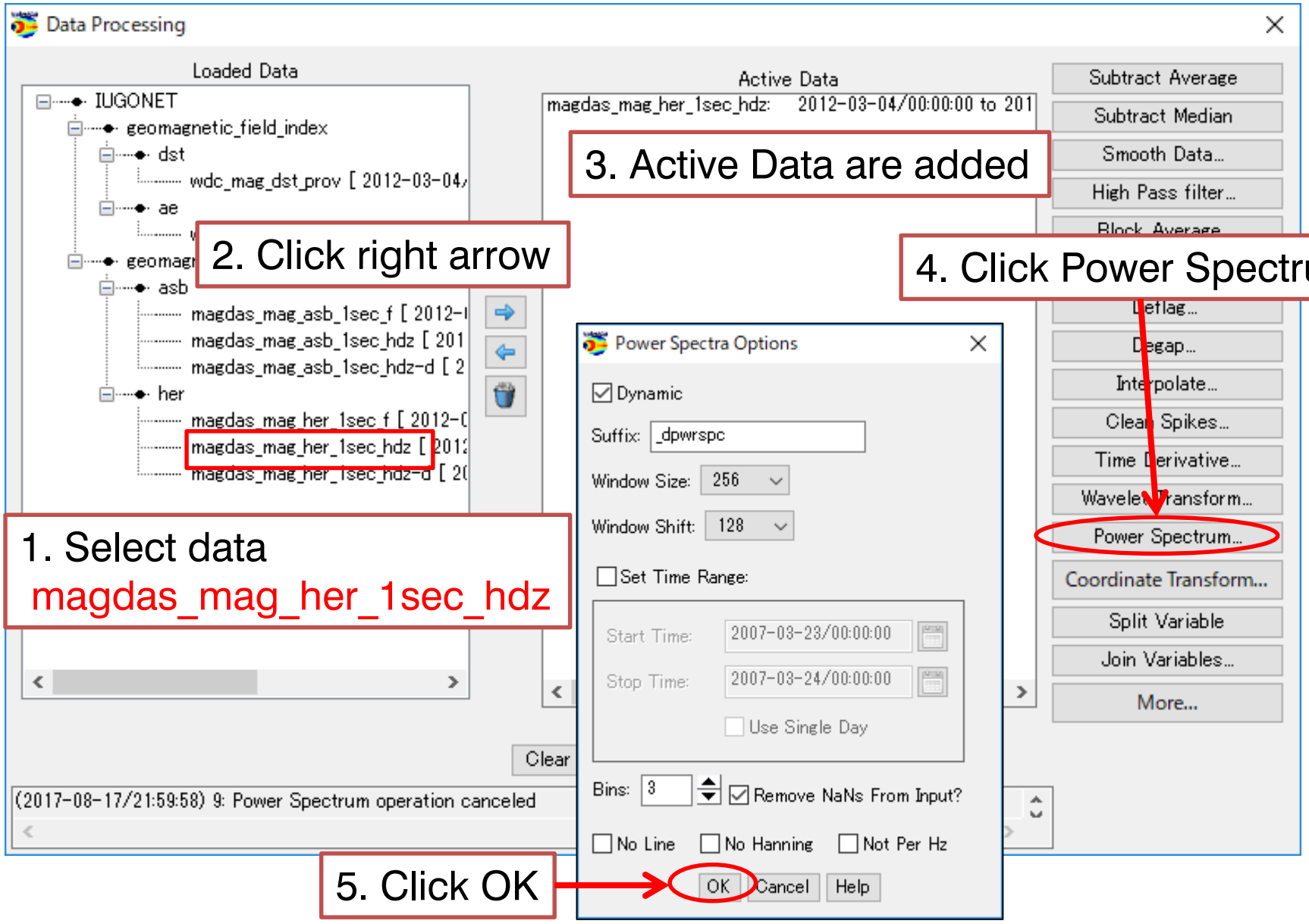
Hint2: Use “Spec” for plotting



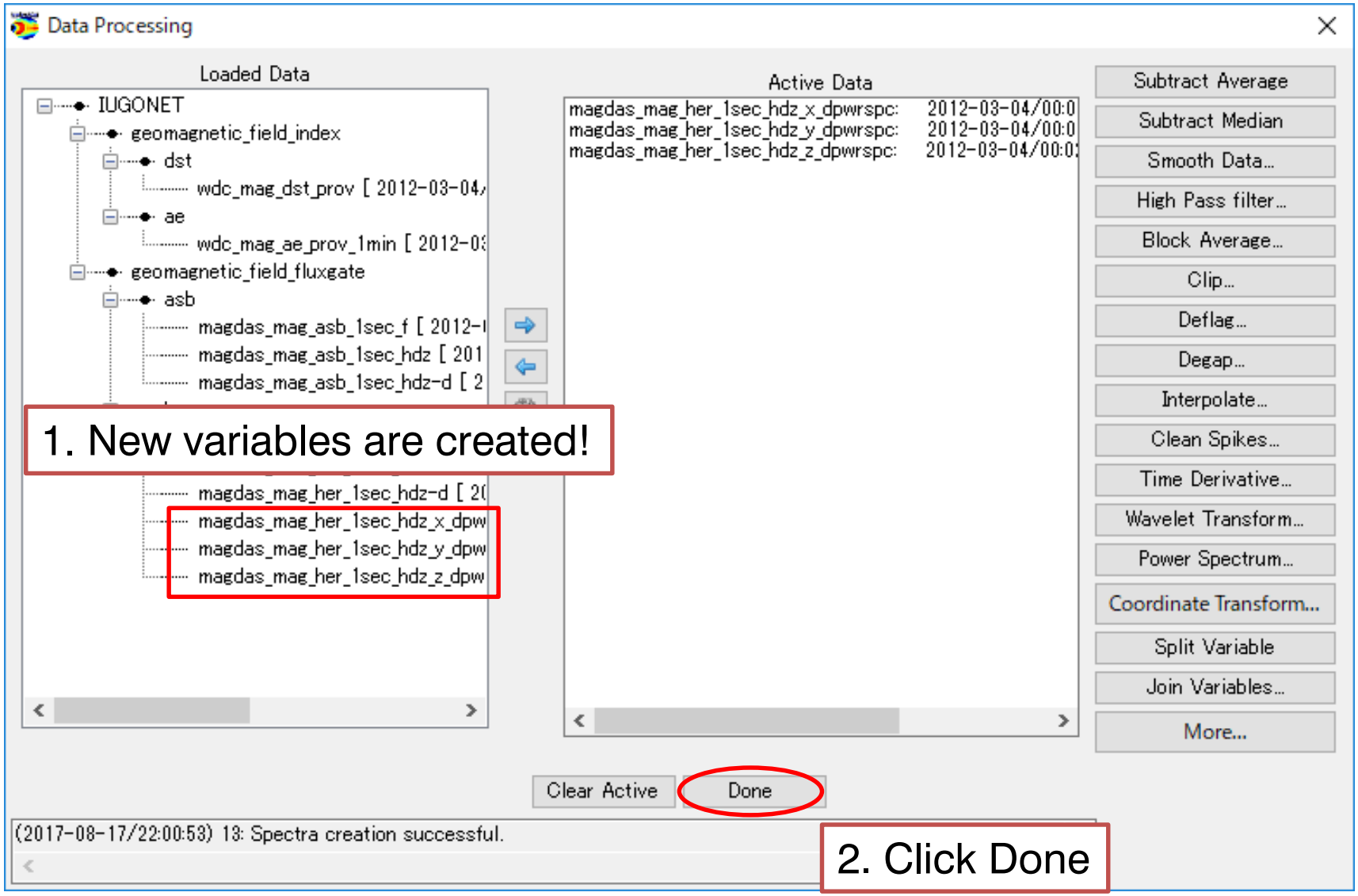
Basic Operation of SPEDAS GUI



Basic Operation of SPEDAS GUI

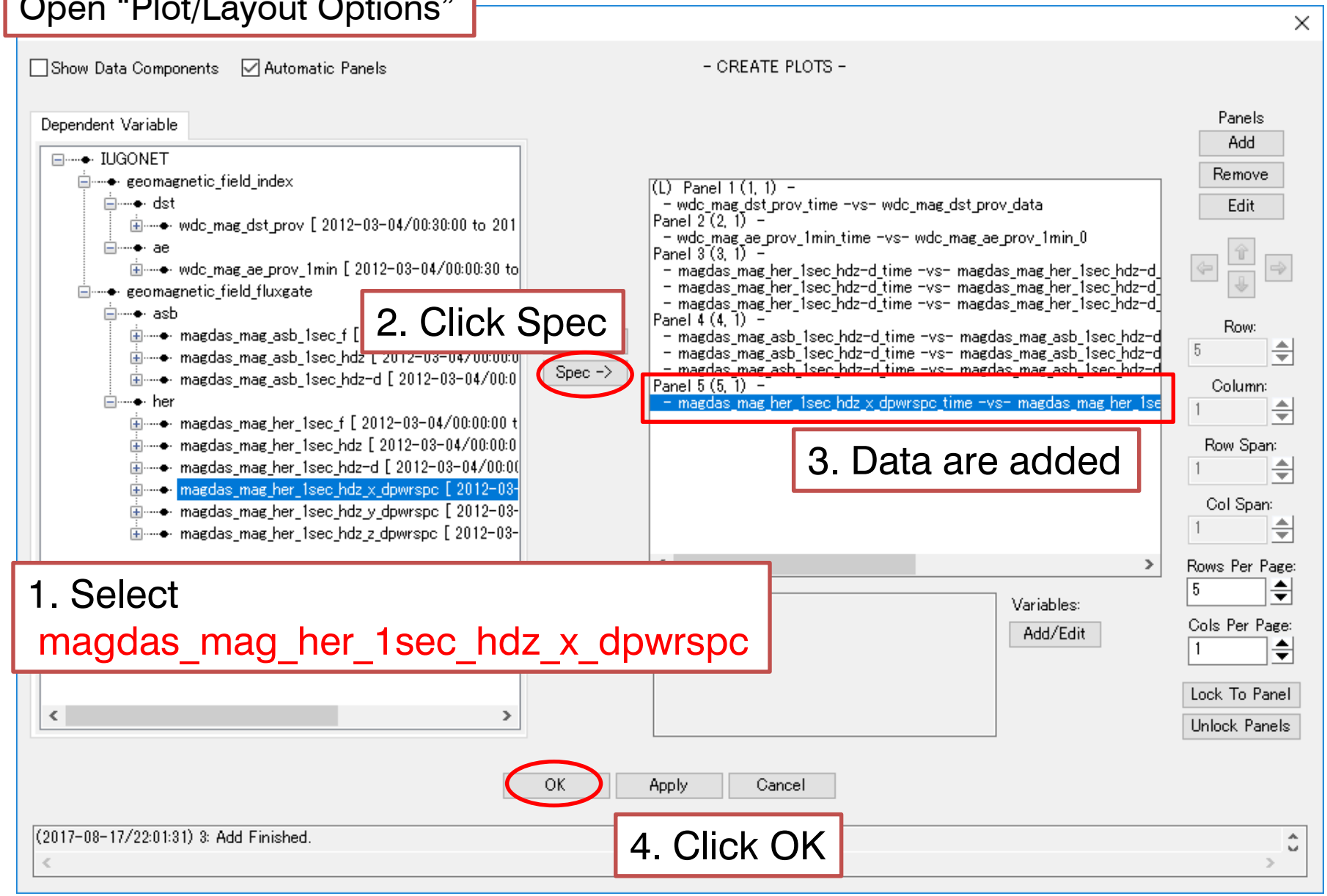


Basic Operation of SPEDAS GUI

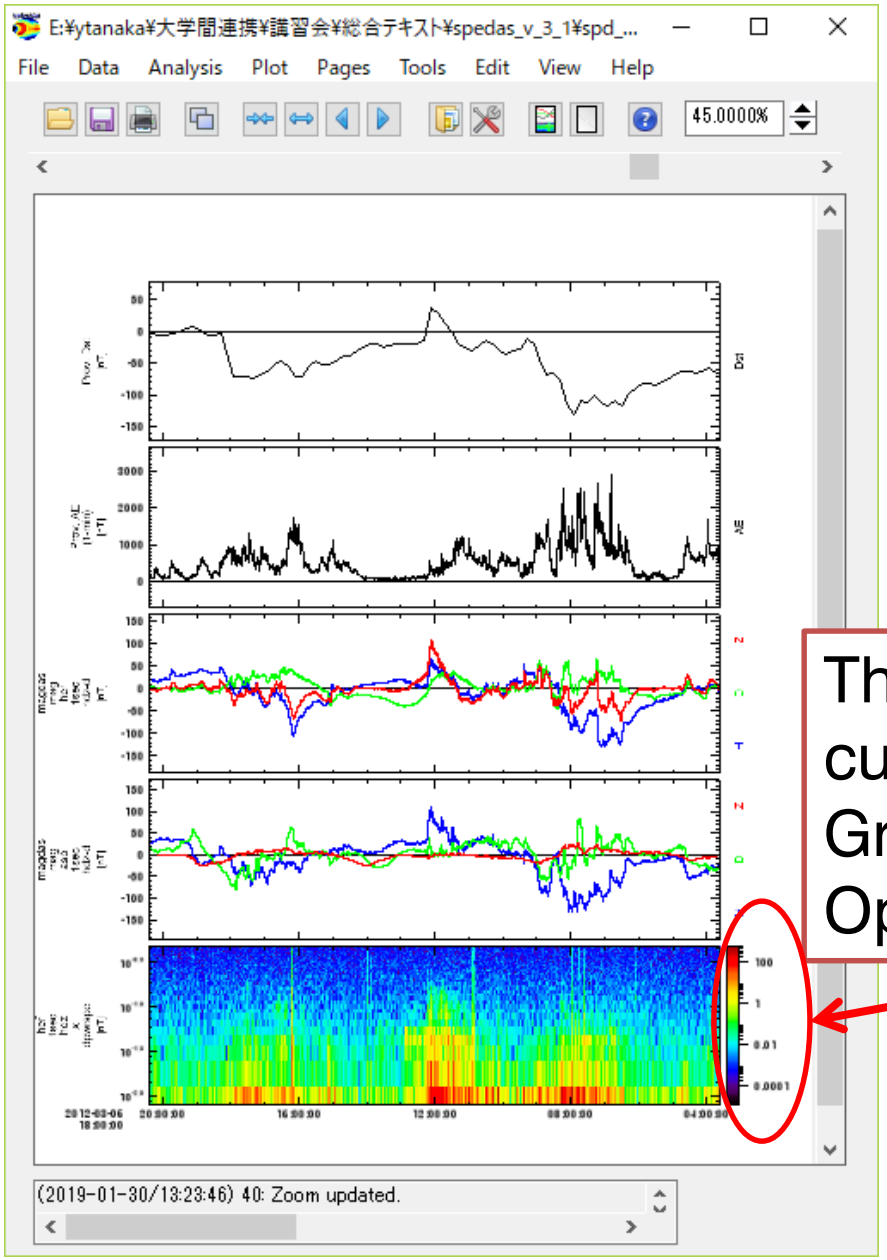


Basic Operation of SPEDAS GUI

Open “Plot/Layout Options”



Basic Operation of SPEDAS GUI

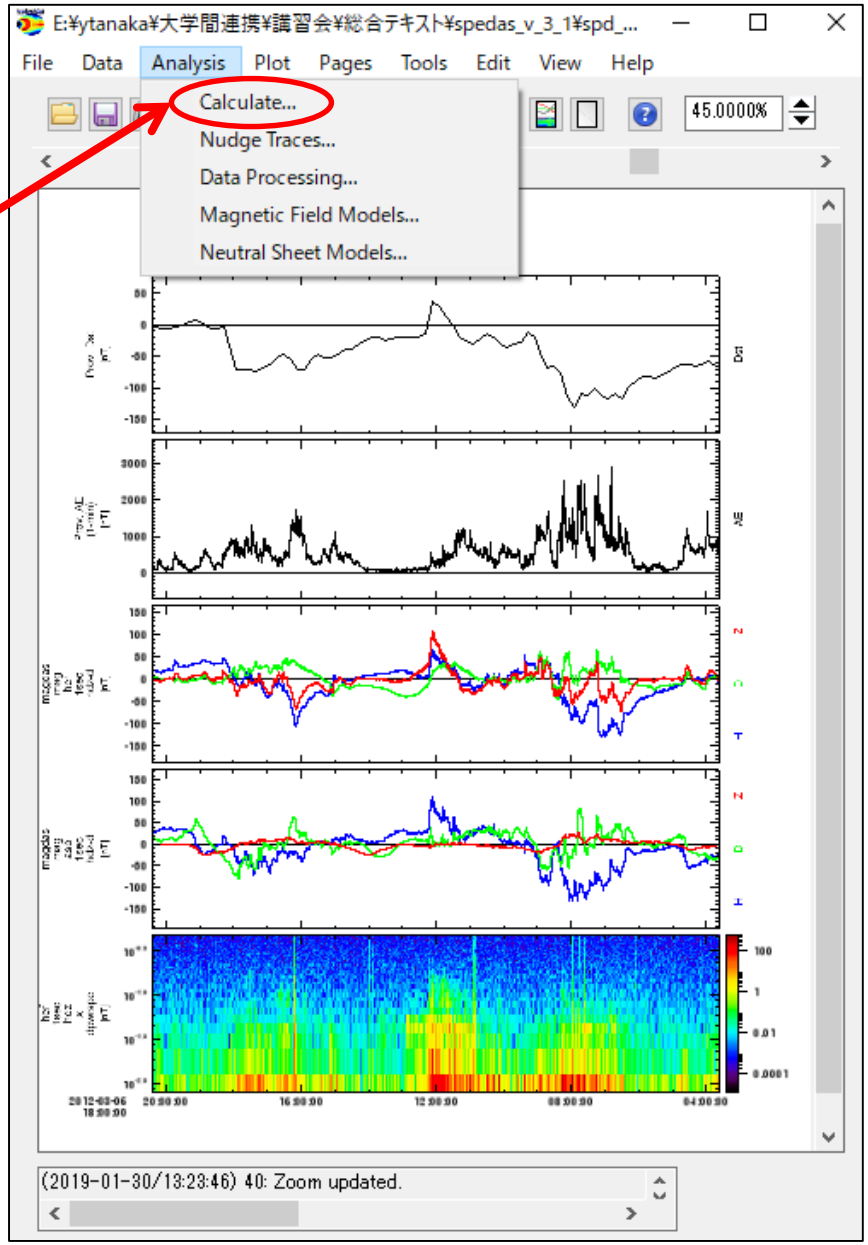


This color bar can be customized in Graph - Z Axis Options.

Basic Operation of SPEDAS GUI

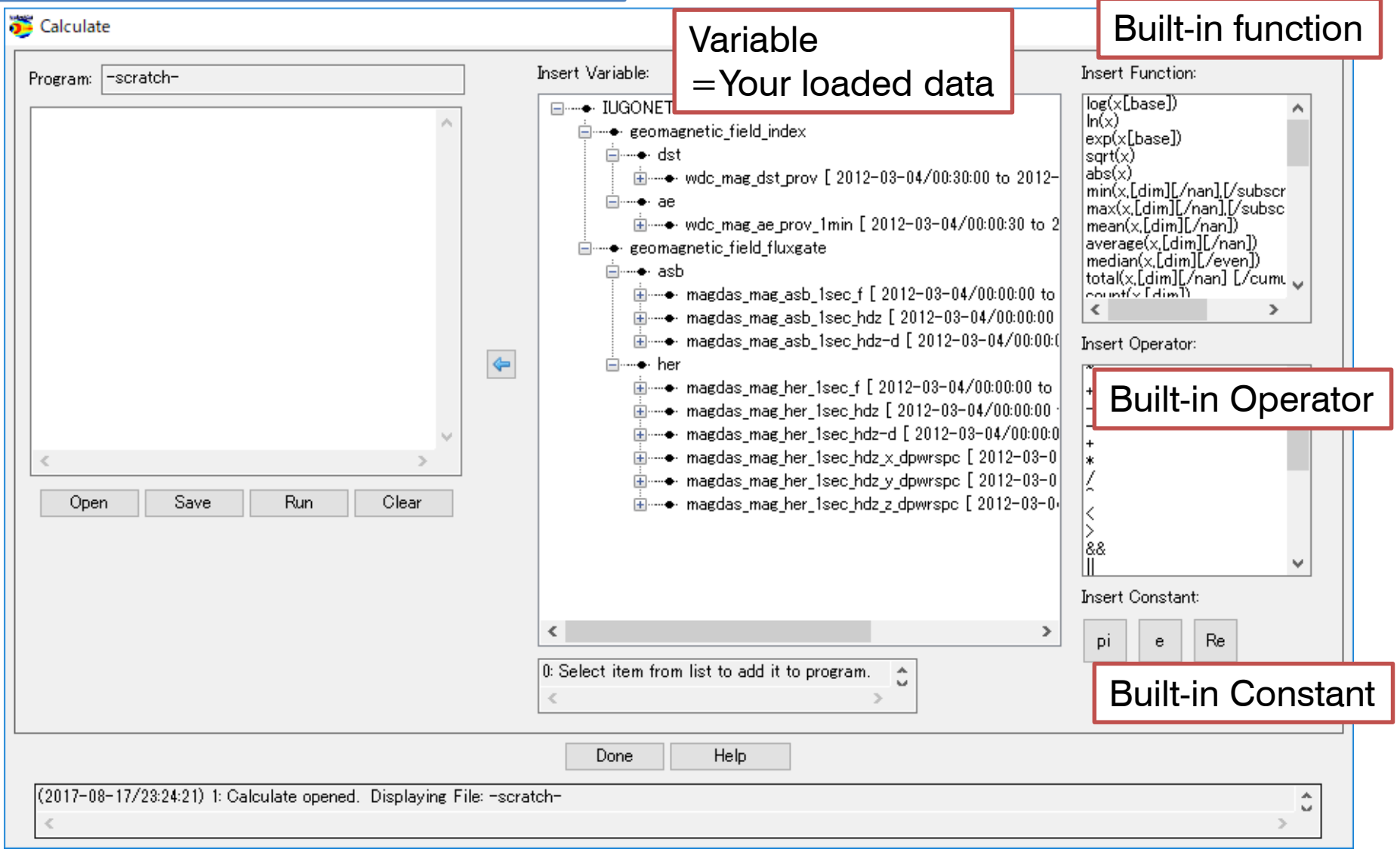
Calculate (Equation editor)

1. Select
Analysis – Calculate…



Basic Operation of SPEDAS GUI

Equation Editor for SPEDAS



Variable
＝Your loaded data

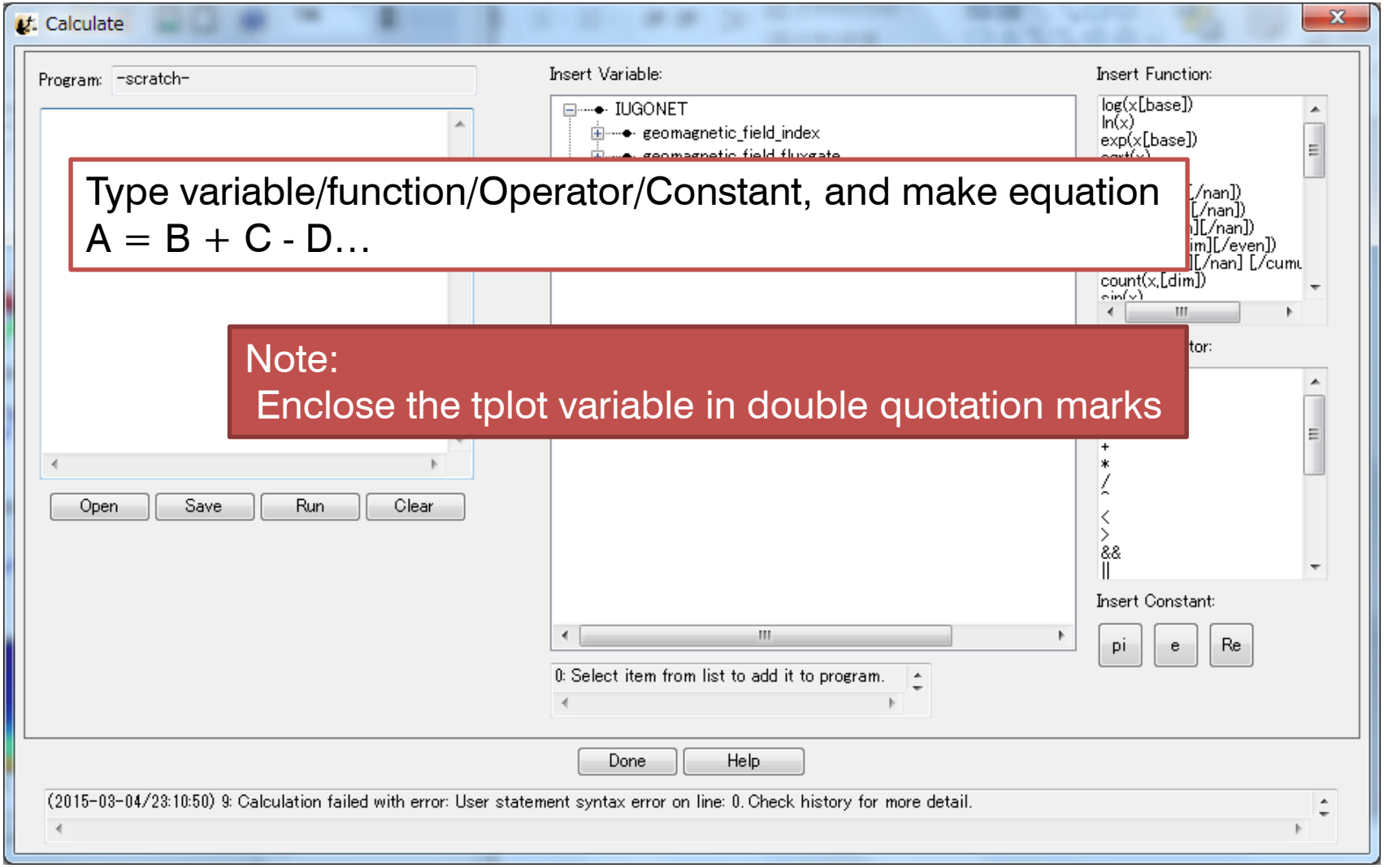
Built-in function

Built-in Operator

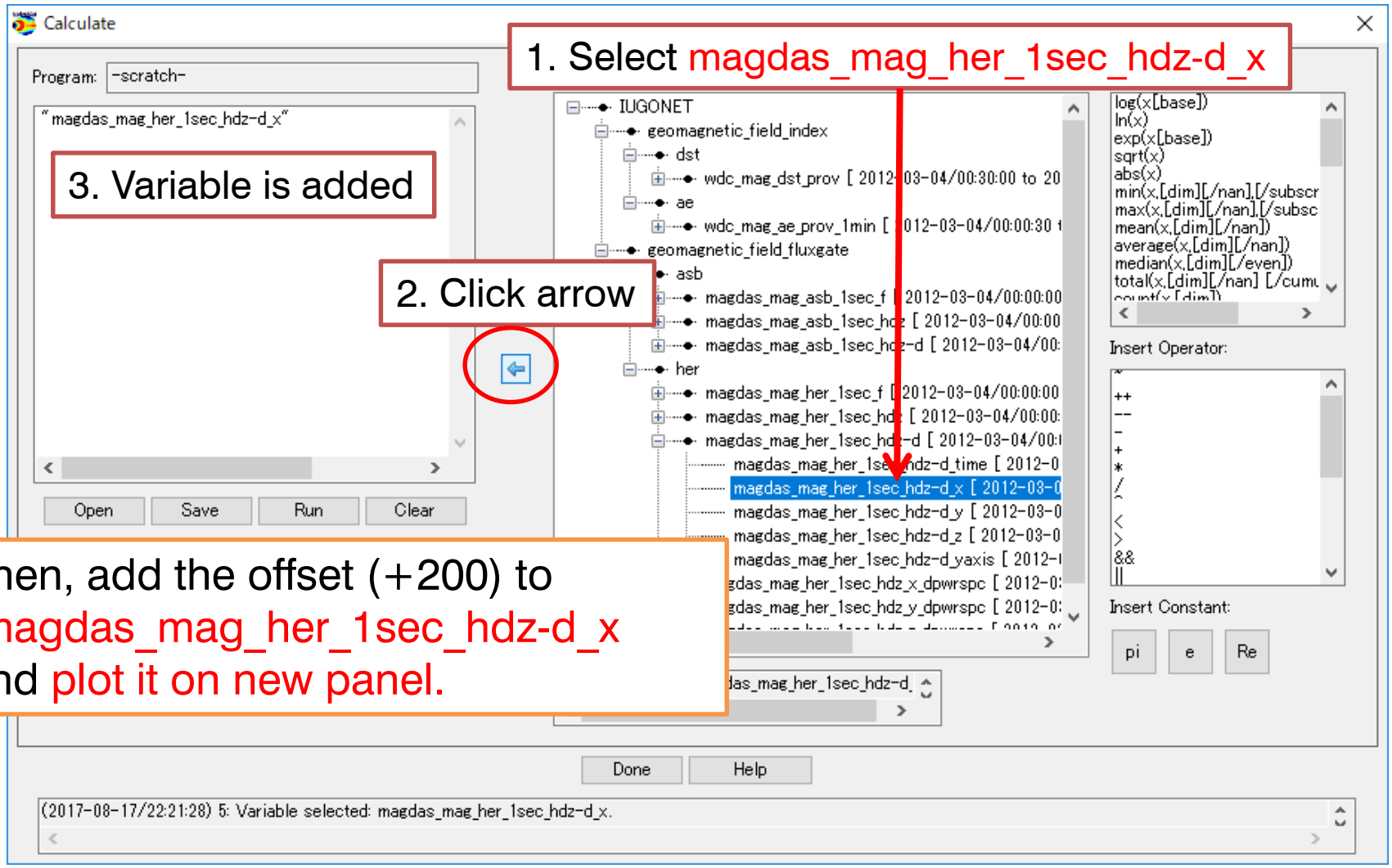
Built-in Constant

Basic Operation of SPEDAS GUI

Make an equation using the loaded variables



Basic Operation of SPEDAS GUI

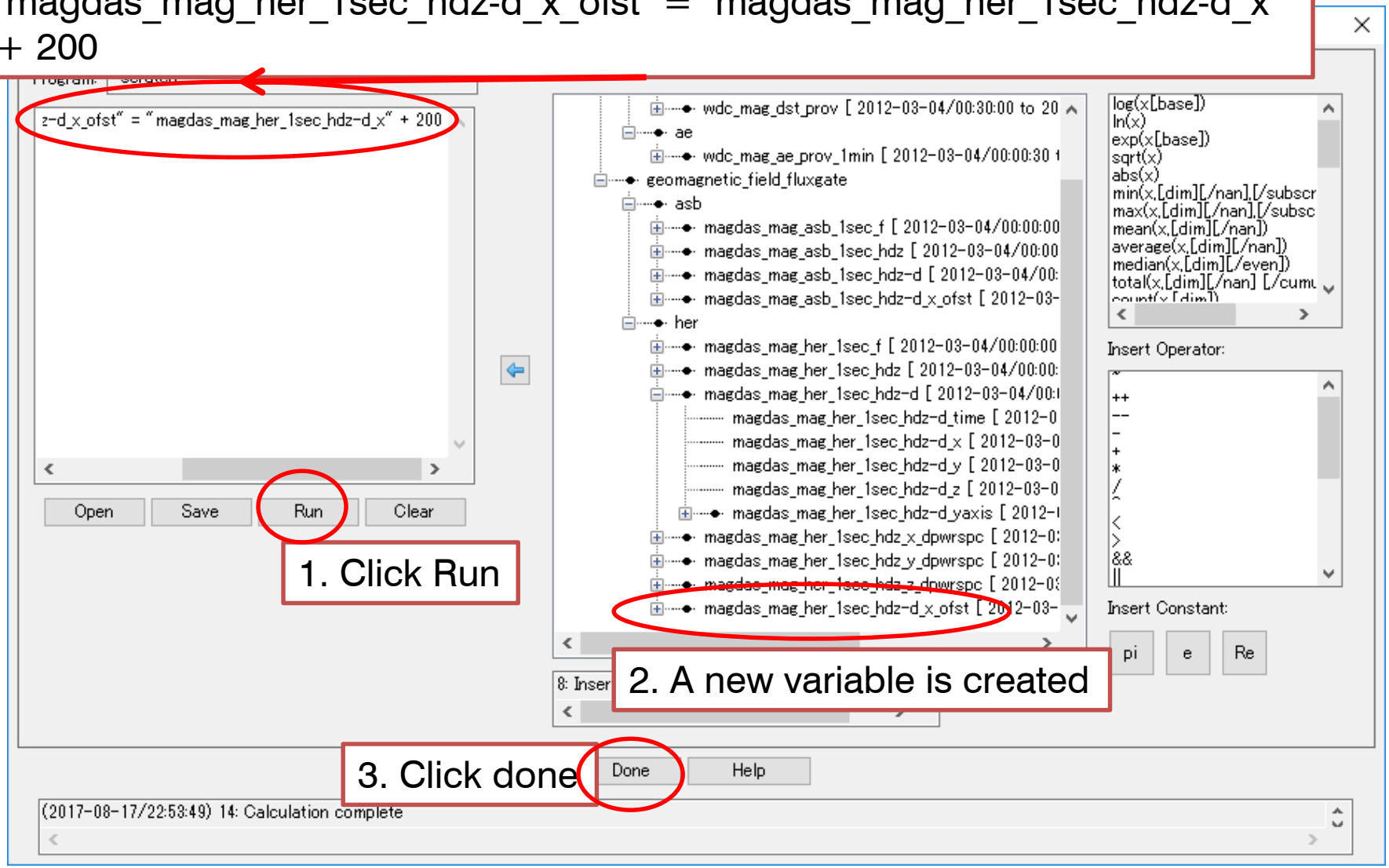


Then, add the offset (+200) to magdas_mag_her_1sec_hdz-d_x and plot it on new panel.

Basic Operation of SPEDAS GUI

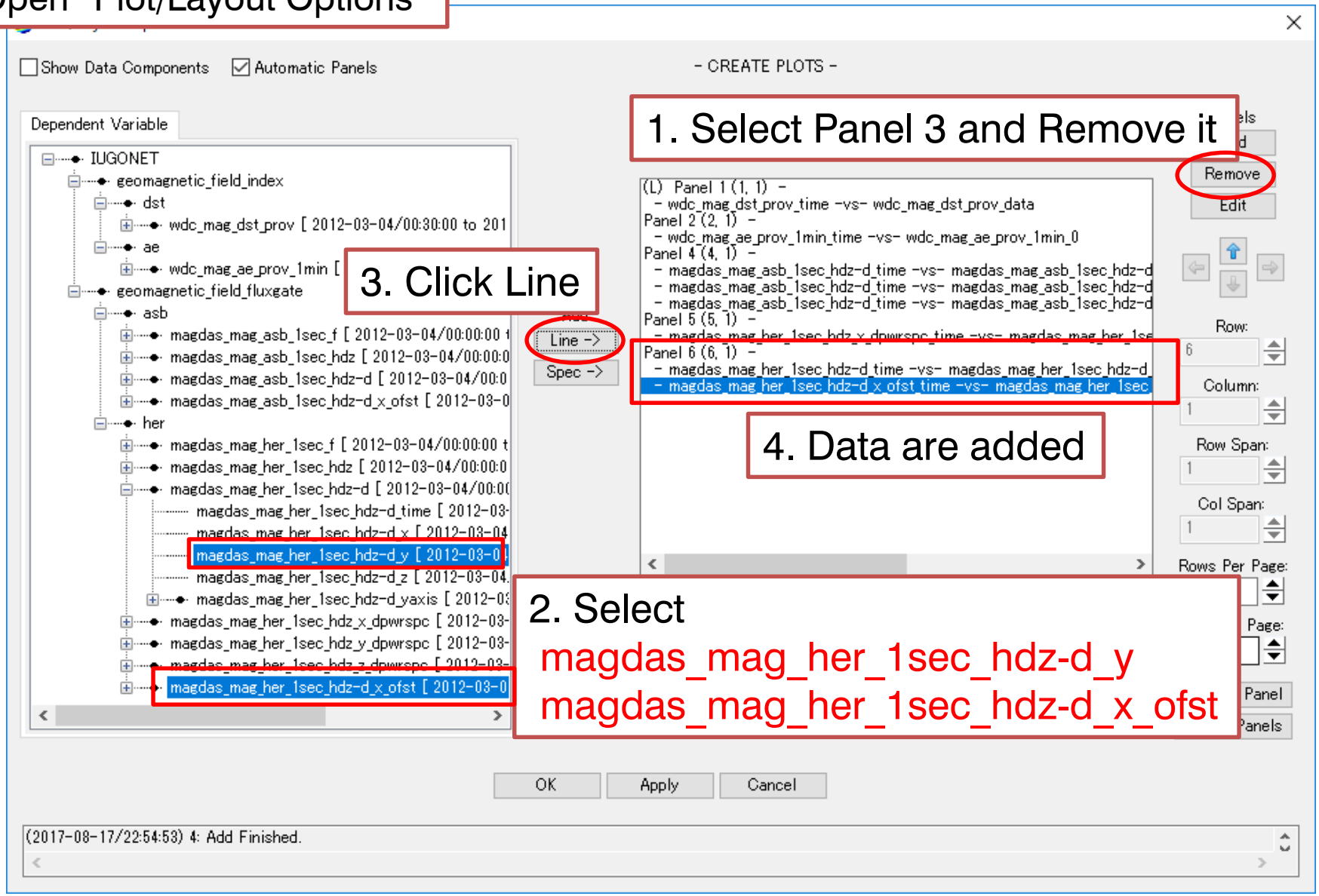
Note: one line, never return

"magdas_mag_her_1sec_hdz-d_x_ofst" = "magdas_mag_her_1sec_hdz-d_x" + 200



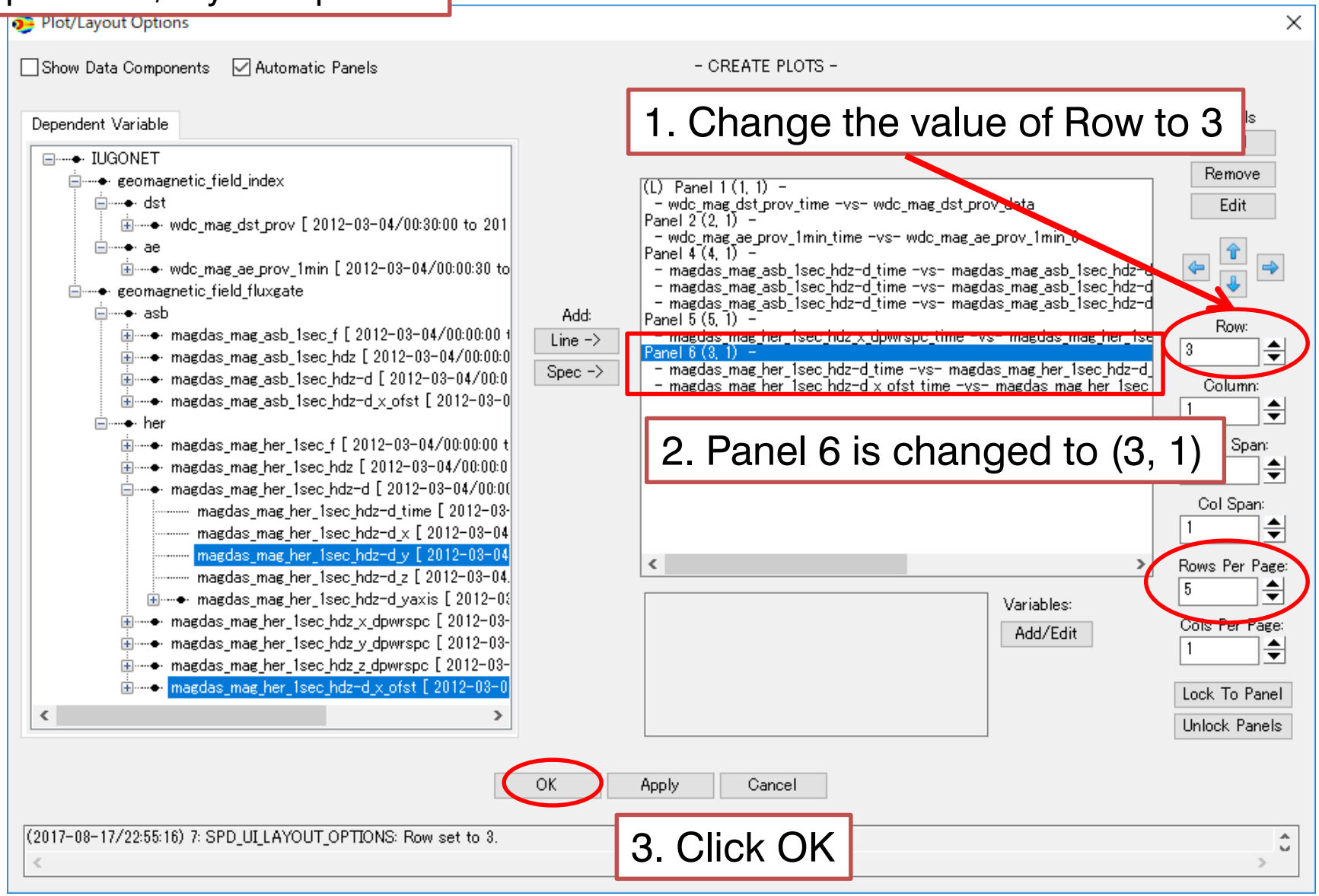
Basic Operation of SPEDAS GUI

Open “Plot/Layout Options”

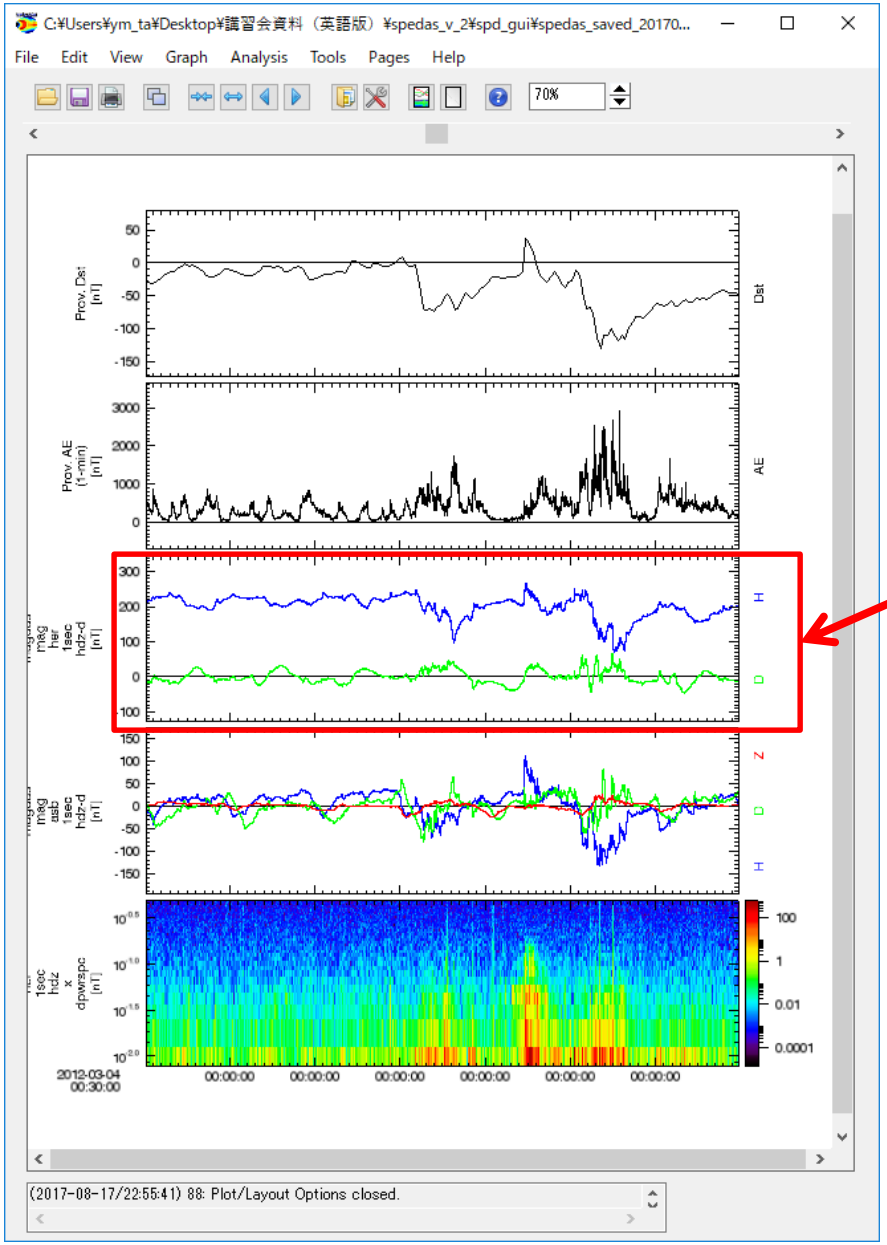


Basic Operation of SPEDAS GUI

Open “Plot/Layout Options”



Basic Operation of SPEDAS GUI



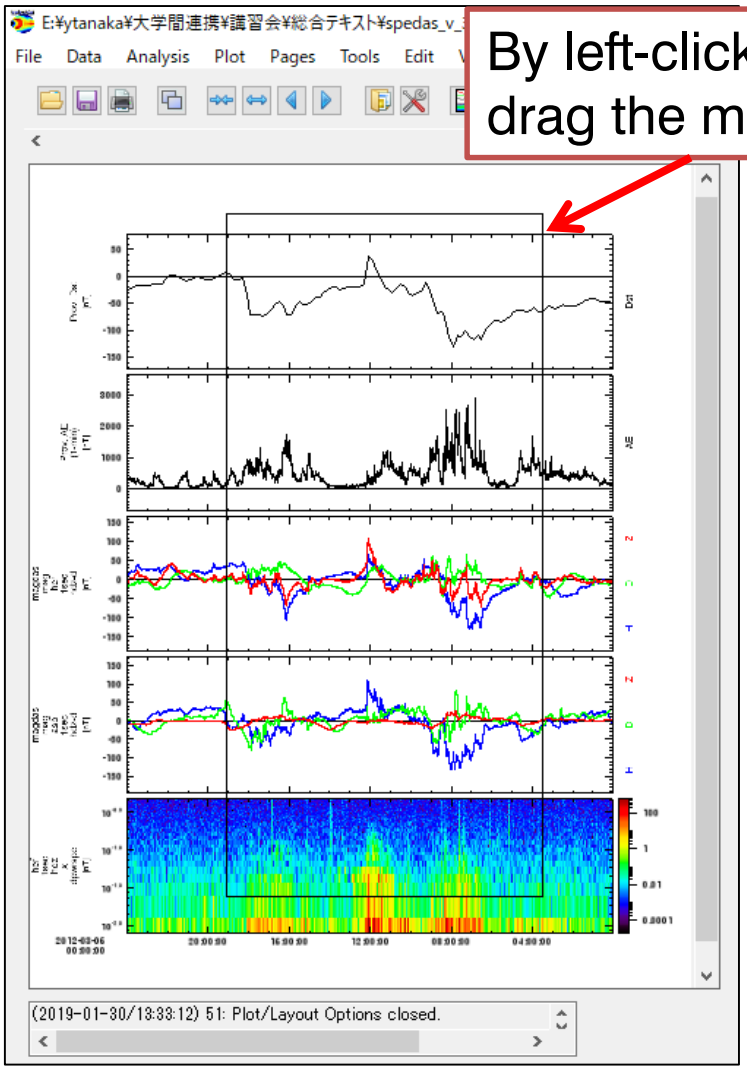
Offset (+200nT) was added to the H comp.

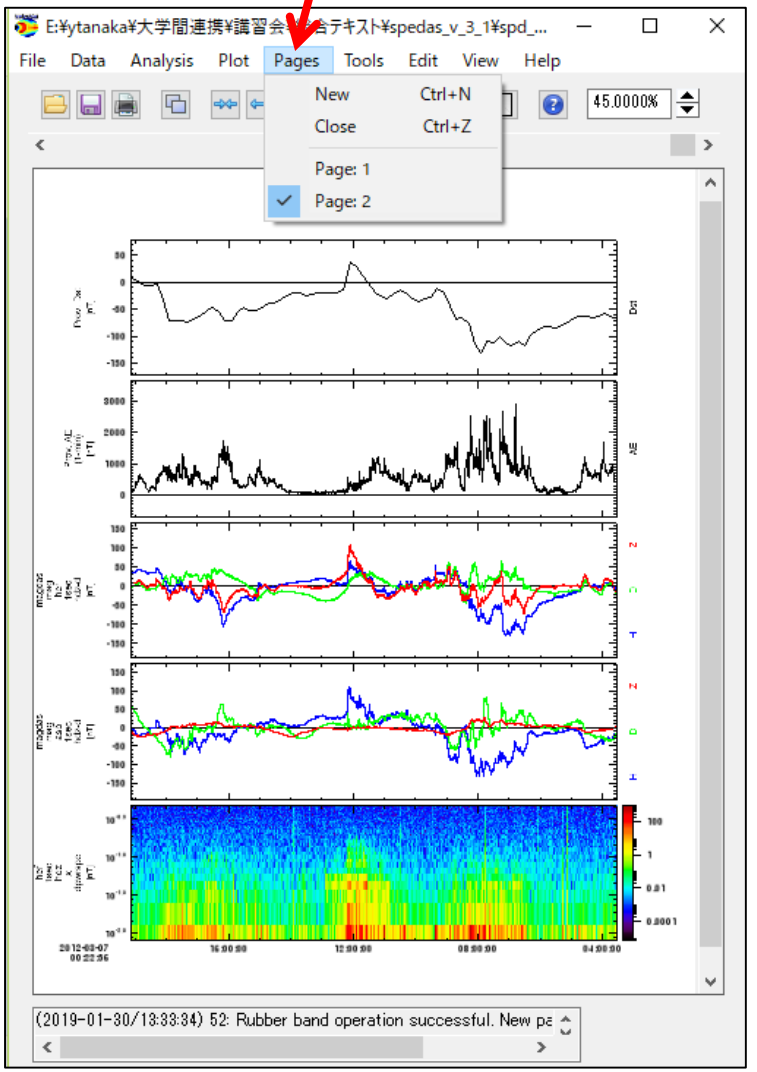
Basic Operation of SPEDAS GUI

Expand X range using the mouse

A new page opens

By left-click and drag the mouse





IUGONET

Metadata DB for Upper Atmosphere

超高層大気長期変動の全地球上ネットワーク観測・研究

Inter-university Upper atmospher Global Observation NETwork

How to Use SPEDAS-GUI part3

Additional data loading

Basic Operation of SPEDAS GUI

Load your ASCII file (1)

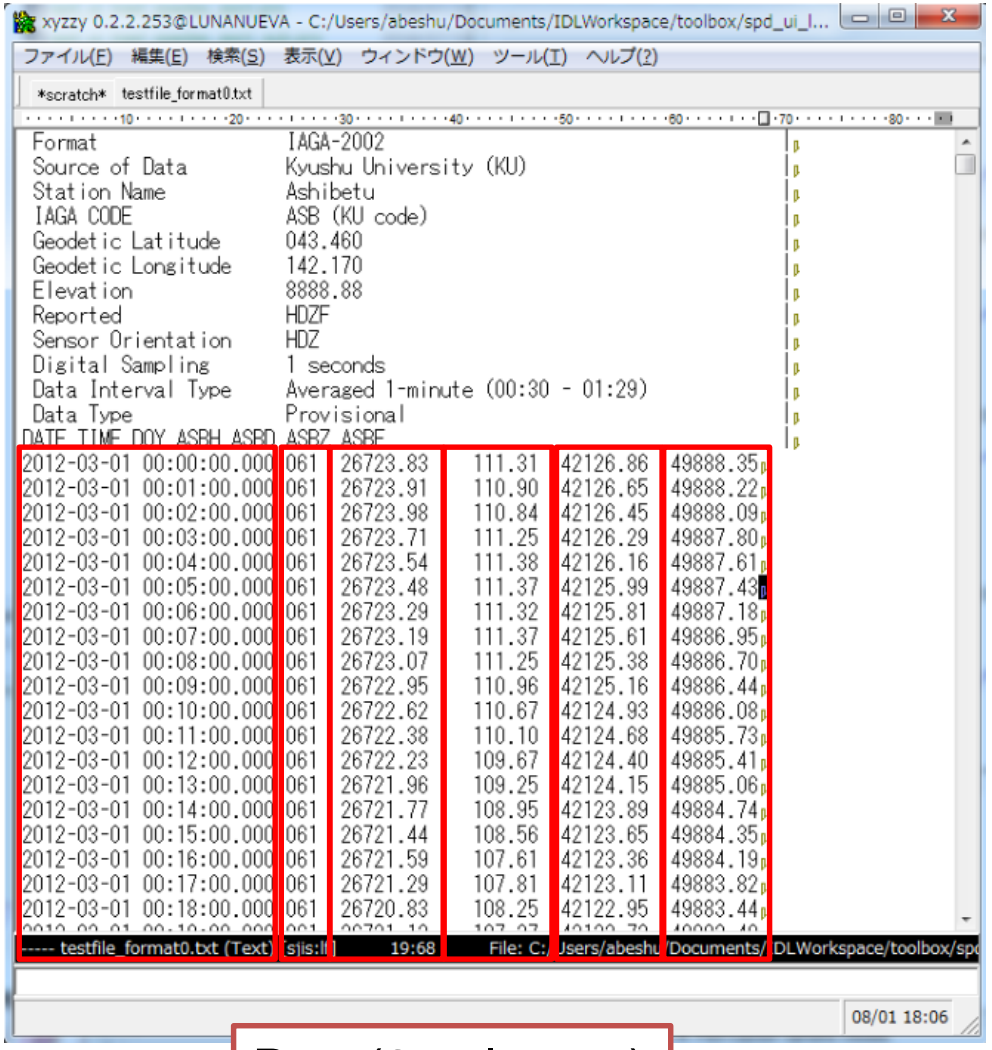
Sample1: magnetometer data

HEADER(13 lines)

Data(1440lines)

This example reads an ASCII file from

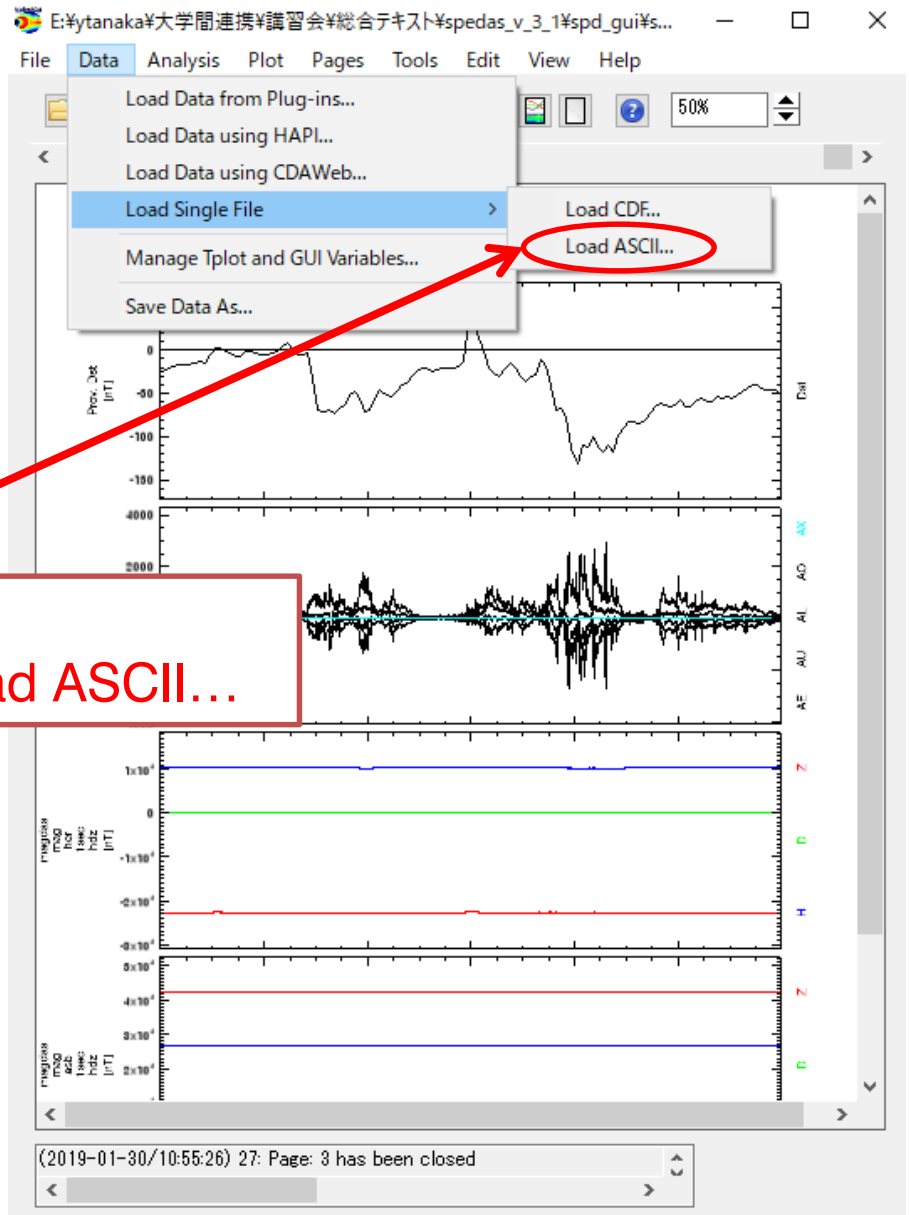
http://data.icswse.Kyushu-u.ac.jp/gmag/data/ASB/Min/2012/ASB20120301pmin.min



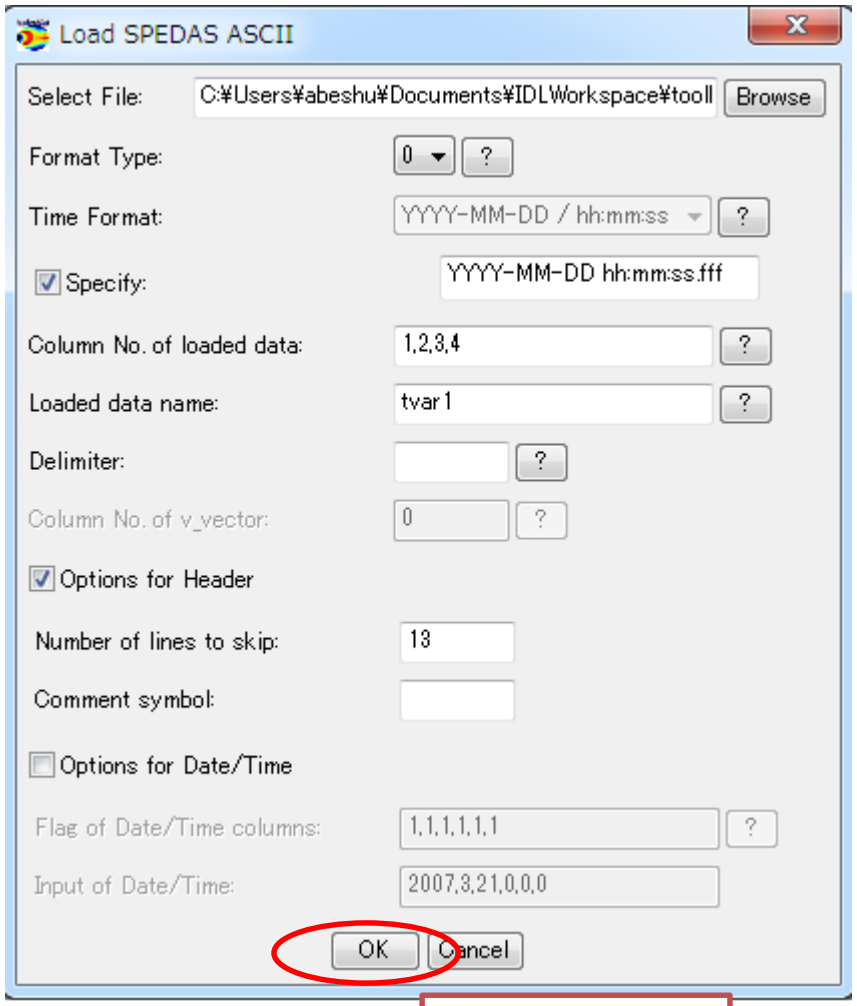
Data(6 columns)

Basic Operation of SPEDAS GUI

1. Select
Data – Load Single File – Load ASCII…



Basic Operation of SPEDAS GUI



1. Click"Browse", and select 'testfile_format0.txt'.

2. Format Type: Select 0

3. Time Format: Check Specify, and put 'YYYY-MM-DD hh:mm:ss.fff'

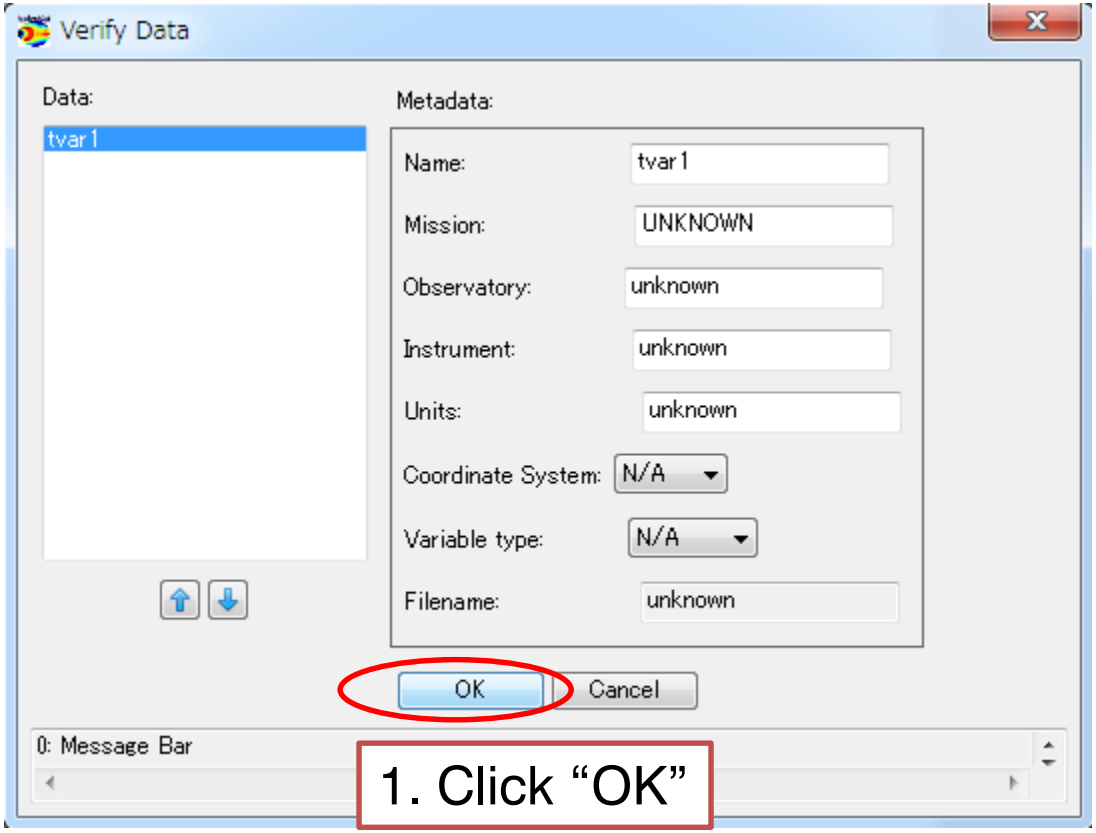
4. Column No. of loaded data: put '1,2,3,4'

Note:Column number starts from 0.

5. Options for Header:
Check the box, and put '13' to Number of lines of skip.

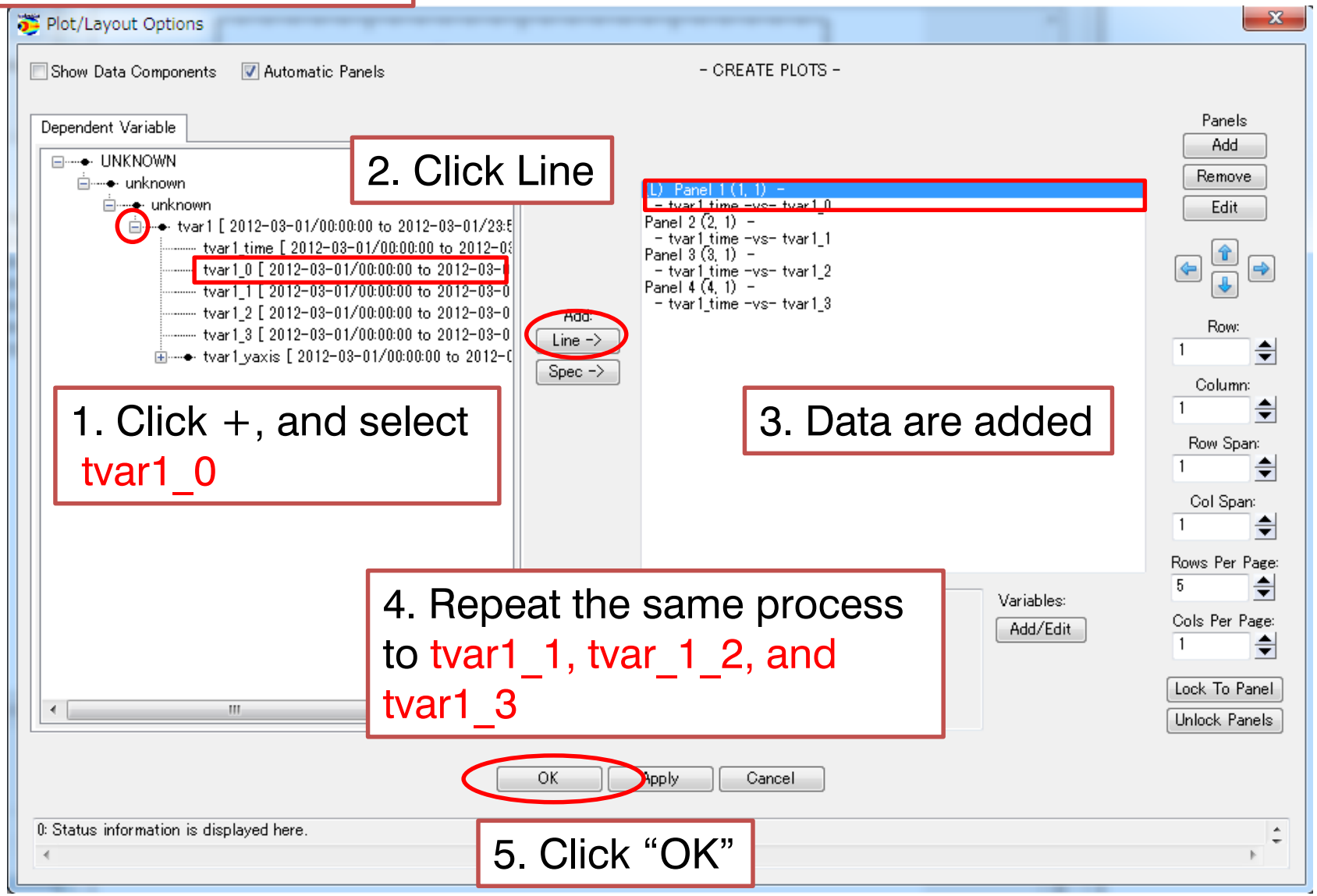
6. Click OK

Basic Operation of SPEDAS GUI

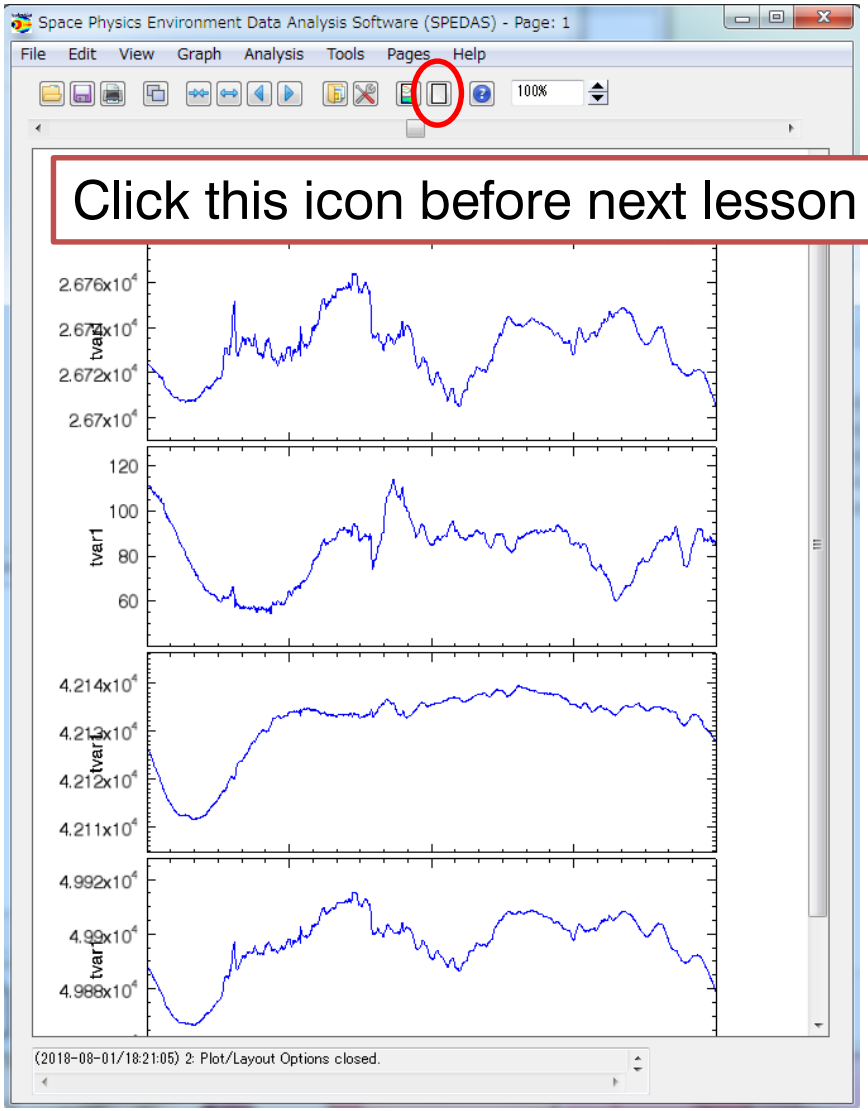


Basic Operation of SPEDAS GUI

Open “Plot/Layout Options”



Basic Operation of SPEDAS GUI

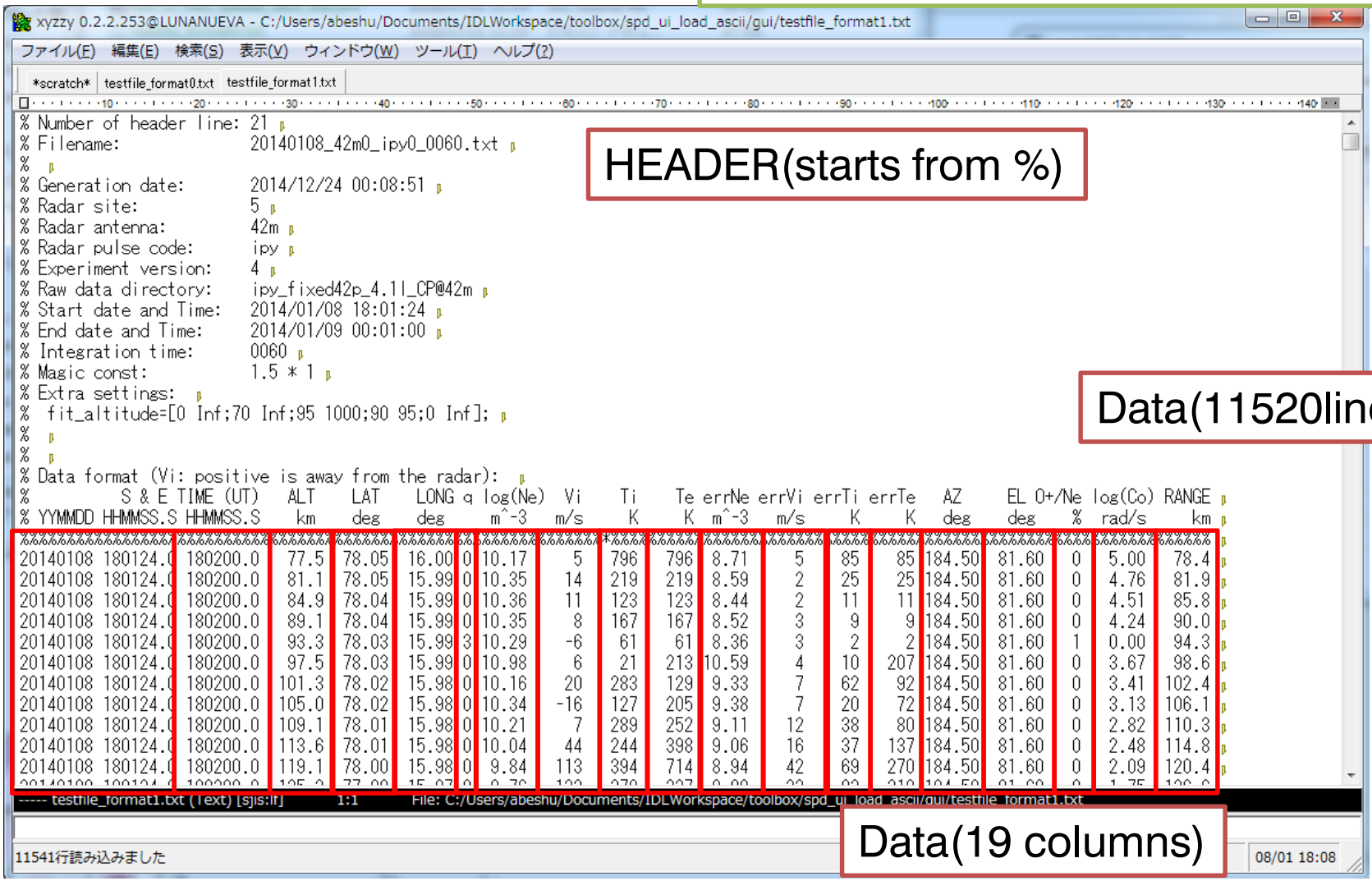


Magnetometer data written in ASCII(IAGA-2002) format are plotted.

Basic Operation of SPEDAS GUI

Load your ASCII file (2)

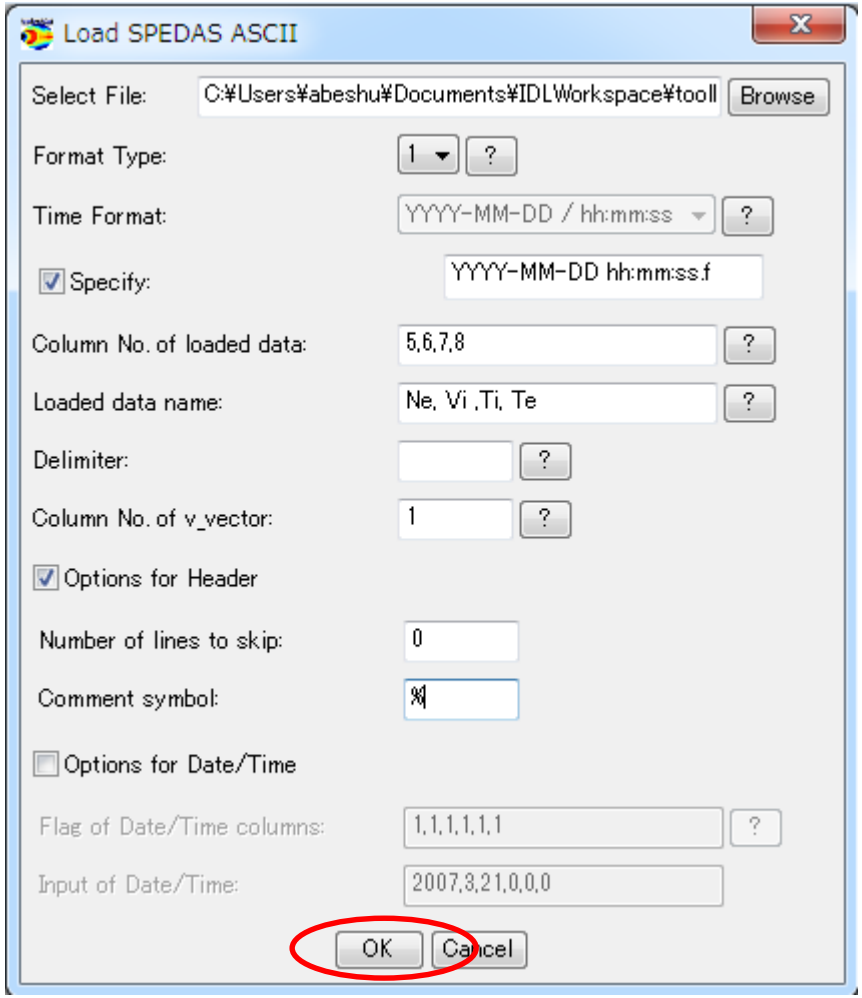
Sample2: EISCAT radar data



http://pc115.seg20.nipr.ac.jp/www/eiscatdata/esr/ascii/42m_ascii/2014/20140108_42m0_ipy0_0060.txt

Basic Operation of SPEDAS GUI

Open File – Load Your Data – Load ASCII



5. Click OK

1. Click"Browse", and select 'testfile_format1.txt'.

2. Format Type: Select 1

3. Time Format: Check Specify, and put 'YYYY-MM-DD hh:mm:ss.f'

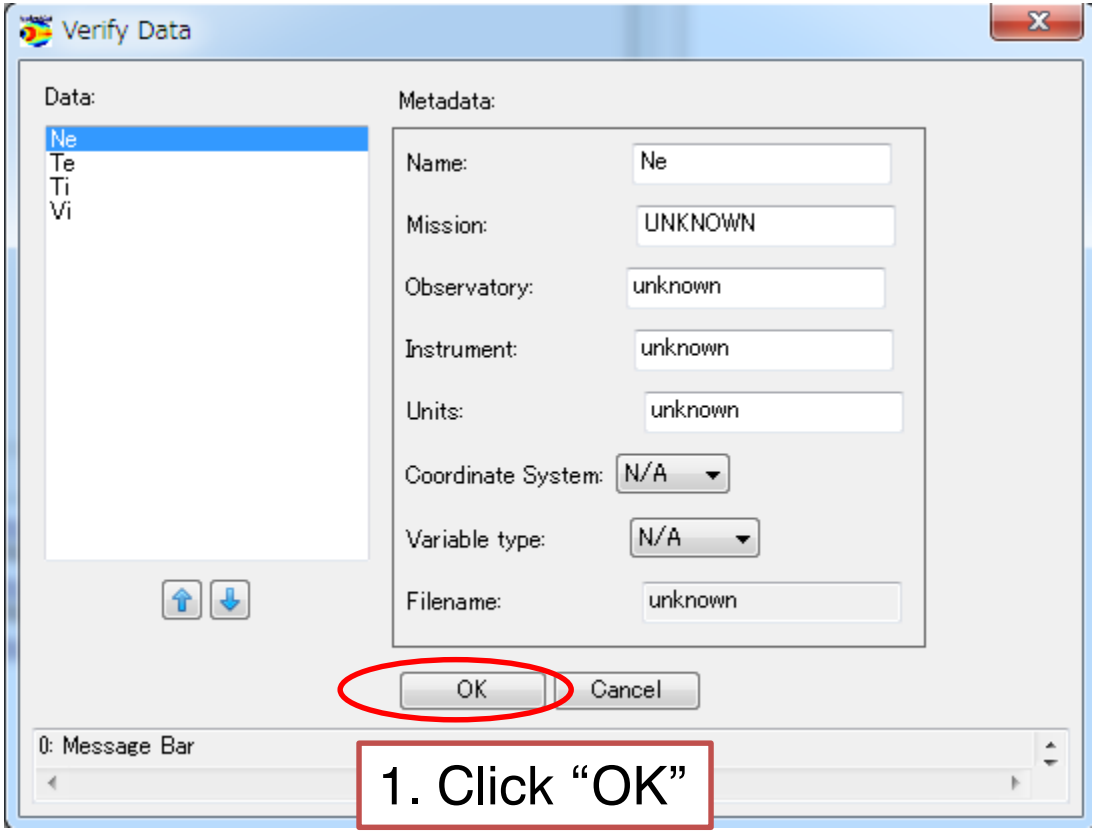
4. Column No. of loaded data: put '5,6,7,8'

5. Loaded data name: put 'Ne, Vi, Ti, Te'

6. Column No. of v_vector: put '1'

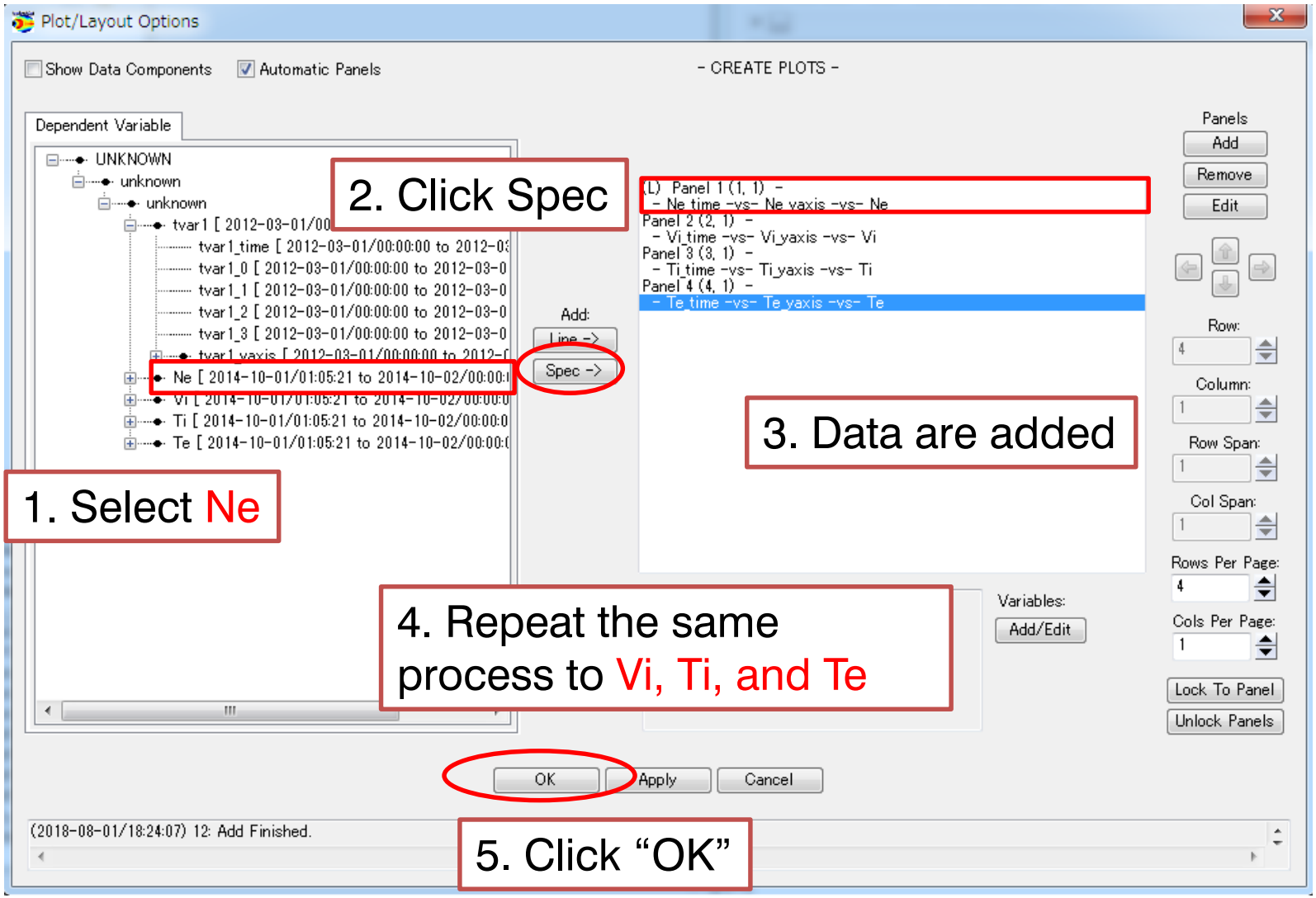
7. Options for Header: Check the box, and put '%' to Comment symbol

Basic Operation of SPEDAS GUI

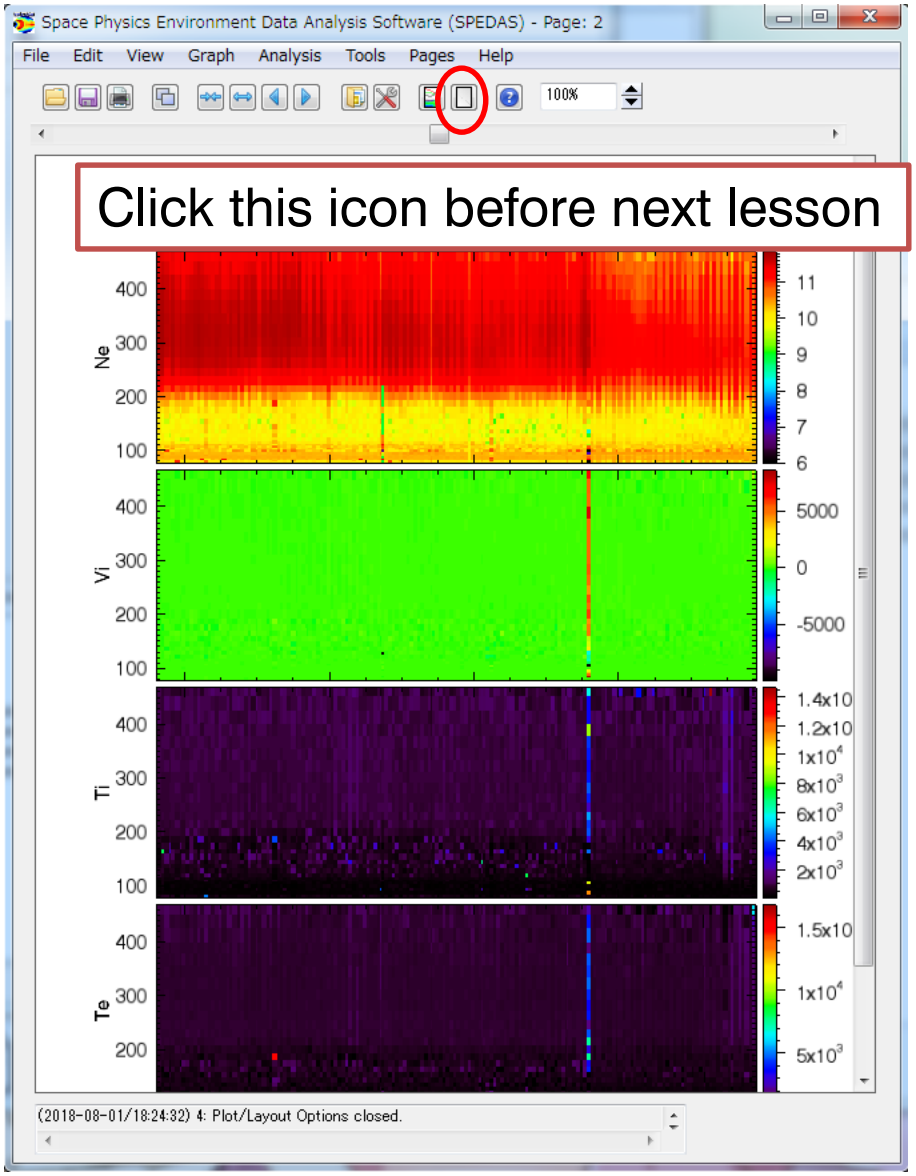


Basic Operation of SPEDAS GUI

Open “Plot/Layout Options”



Basic Operation of SPEDAS GUI



EISCAT radar data written in ASCII format are plotted in spectrogram.

Acknowledgments

SPEDAS is a grass-roots data analysis software for the Space Physics community, which was developed by scientists and programmers of the UC Berkeley's Space Sciences Laboratory, UCLA's IGPP and other contributors.

References:

Angelopoulos et al., The Space Physics Environment Data Analysis System (SPEDAS), Space Sci. Rev., 215:9, doi:10.1007/s11214-018-0576-4, 2019.