GSYS2 Manual

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Abstract

In 2005, digitizing system ”GSYS” based on Java has been developed. We have tried to add the ”feedback” function, which makes it possible to load the numerical data and plot the data as markers on an image. This function is very helpful to compare the numerical data with the original data on the graphical image visually and modify the numerical data if needed. We have also revised the whole system of GSYS, especially, design and user interface.By using this new digitizing system “GSYS version 2”, you can easily read and treat the numerical value of data points on a graph.

Contents

1 Preface

For 20 years, Japan Charged Particle Reaction Group (JCPRG) has been accumulationg the nuclear reaction data of charged particles produced in accelerators in Japan as Nuclear Reaction Data File (NRDF). Recently it becomes possible to obtain experimental data directly in cooperation with experimentalists. However, in case that numerical data cannot be obtained from the author, it is necessary to convert the graphical data on the paper into numerical data. In the past, an input device called 'digitizer' was used for reading the numerical data from printed matters. Recently, the numerical data is read from an image file which is converted from a graph on a paper.

From 1998, JCPRG had used a digitizing system called SyGRD[1] developed by Hirokazu Ohmi. However, the system had the limitation of the program size because it was developed as a macro program of image analysis software. It became difficult to adopt user requirements as the program grows. Since the system was sometimes unstable, finally JCPRG began to develop a successive digitizing system mainly in cooperation with COE researchers at Meme Media Laboratory[2, 3]. As a result, "GSYS" [3] has been developed by Dr. Koji Arai (Nagaoka National College of Technology) as a successive digitizing system of SyGRD, and adopted to digitizing processes of NRDF from the end of fiscal year 2004.

In the fiscal year 2005, the author took a position of COE researcher at the Meme Media Laboratory, and added feedback function to GSYS in order to reuse the numerical data and check the data accuracy by plotting the numerical data directly on an image. In the recompilation in fiscal year 2005, approximately 300 digitized data are modified and checked by six people using this feedback function. The experiences achieved from this concentrative work are reflected in GSYS. Early GSYS was rated highly for the flexibility of reading data compared to former systems. However, since the GSYS developer's term of Meme Media Laboratory was short, he could barely improve GSYS based on the experiences obtained in the recompiling processes by GSYS. GSYS2 is published as the improved version of GSYS. Many ideas of improvements suggested in the recompilation process were incorporated in GSYS2 and the whole system was revised. Figure 1 and 2 are the start-up windows of GSYS and GSYS2, respectively.

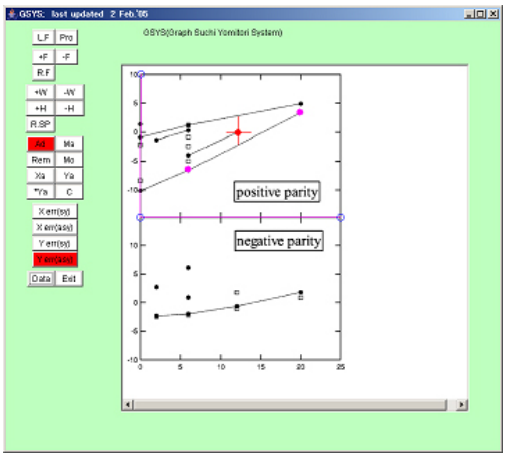

Figure 1: Start-up window of GSYS

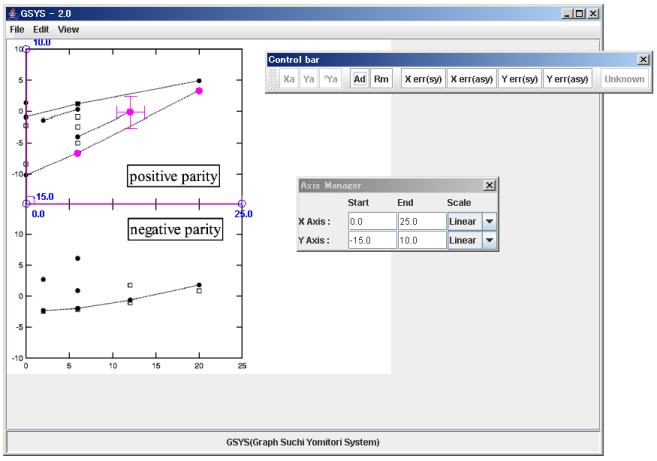

Figure 2: Start-up window of GSYS2

This document describes how to use the numerical data reading software, GSYS2, developed in fiscal year 2005. The contents of this document are shown as follows: Chapter 2 gives the basic usage of GSYS2, such as starting-up and reading the numerical data from the graphical data. Chapter 3 explains the feedback function incorporated in GSYS2. Chapter 4 gives how to customize GSYS2. Chapter 5 describes the file formats treated in GSYS2. Keyboard Shortcuts and the changes from former GSYS are written in the Appendix.

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2 How to use GSYS2

GSYS2 requires Java 1.4 or later. Please download and install Java runtime environment from the Website of Sun Microsystems (http://java.com/). Then download an executable file "Gsys2.jar" from the Website of JCPRG (http://www.jcprg.org). Now you are ready to start GSYS2. If you want to uninstall GSYS2 from your computer, just remove the file "Gsys2.jar". GSYS2 make a property file "gsys2.properties" in order to save each user's property. You can also remove this file if you don't need it.

> Note: Sometimes GSYS2 doesn't work properly because of the property file ("gsys2.properties"). If you find that GSYS2 is not working properly, remove "gsys2.properties" and then restart GSYS2.

2.1 Start-up the system

Let's start GSYS2. If you use Windows OS, double-click the file, "Gsys2.jar". In the case of Unix-like systems such as FreeBSD and Linux, type "**`java -jar Gsys2.jar`**". When GSYS2 starts, you would see the window shown in figure 3.

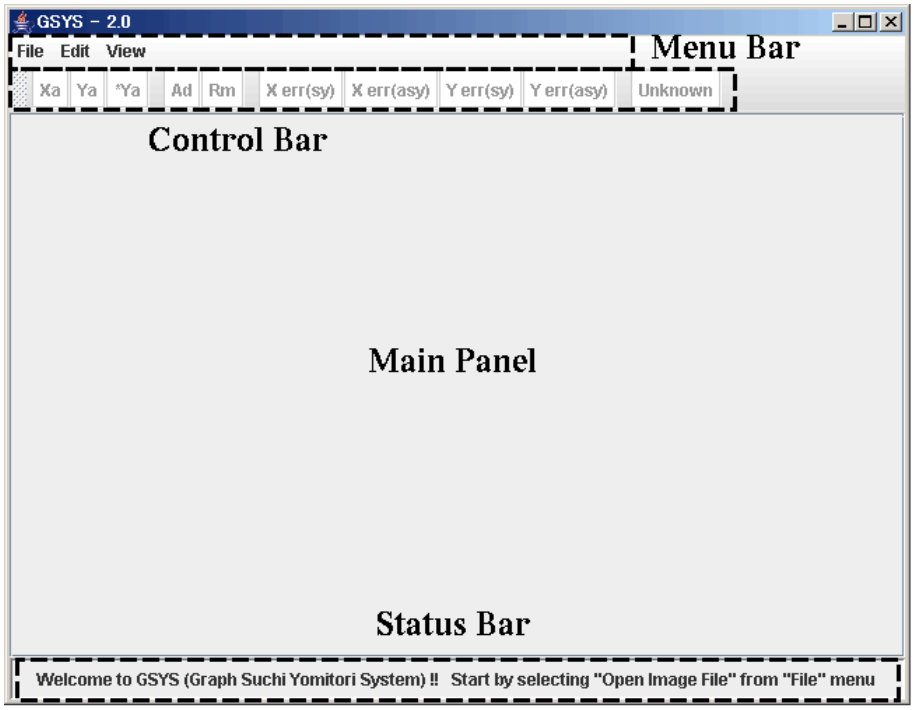

Figure 3: Start up window of GSYS2. You can select "Load Image File" in "File" menu, "Properties" in "Edit" menu, and "Show status bar" in "View" menu.

The window of GSYS2 contains four components: menu bar, control bar, main panel, and status bar. Menu bar has menus to operate GSYS2. The control bar has the functions required to read the data, such as defining the axis, data points and error bars. A loaded image file is displayed on the main panel. You can read the numerical data on this panel. In the status bar, a description of the button focused by a mouse, the place of a mouse and the coordinates of a selected point are displayed.

GSYS2 can be operated using a keyboard. However, in this document, how to operate with the menu bar and the control bar by a mouse is explained. Various keyboard shortcuts are shown in Table 1 at Appendix A.1.

2.2 Loading the image file

At first, select "Load Image File" from "File" menu in the menu bar. In the next, select a file (PNG, GIF or JPEG file) from a file dialog in the new window. If an image file is successfully loaded, the image is displayed on the main

panel as shown in figure 4. The image used as the example in this document was made from the experimental data published in Phys. Rev. **104**(1956)123, Phys. Rev. **109**(1958)850 and Phys. Rev. **129**(1960)2252.

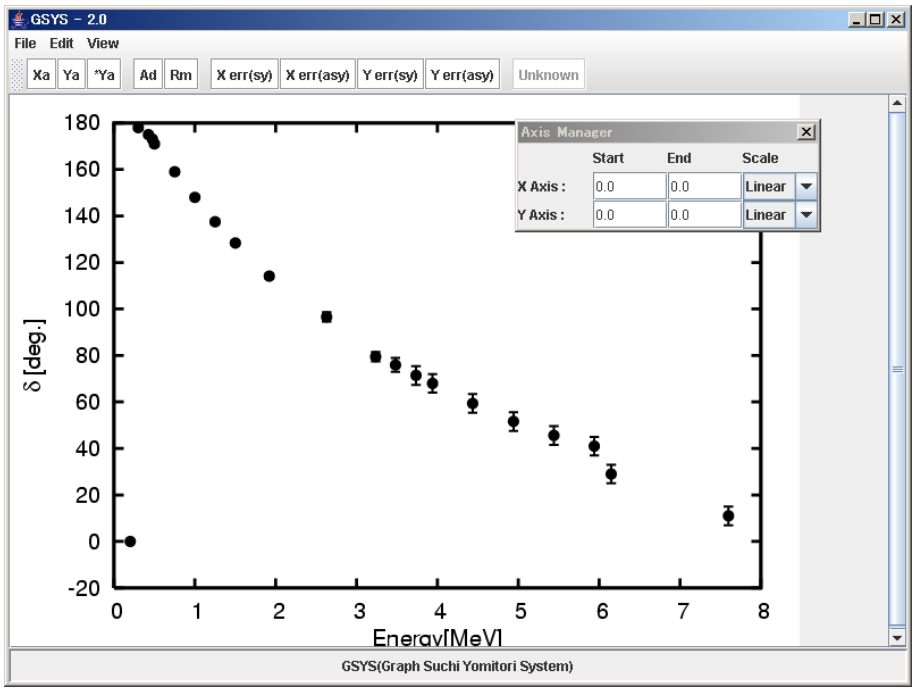

Figure 4: Window after an image loaded. The image is displayed on the main panel and an axis manager is displayed in the new window.

> Note: In order to read-in the data precisely, enlarge an image so that fine tuning of data points is possible. To enlarge the size of the main panel, expand the window of GSYS2. The main panel expand and shrink automatically to fit the size of the window of GSYS2. If you want to expand the main panel more, remove the check from "Show status bar" in the "View" menu, and remove the status bar from the window of GSYS2. It is also possible to move the control bar by dragging a handle at the left of the control bar as shown in figure 2. If you want to zoom in and out, select "Zoom in" or "Zoom out" in the "View" menu. Select "Resize" to recover its original size.

2.3 Setting the position and type of axis

Next, set the starting and ending points of the X and Y axes, respectively. Press Xa button to enter a mode to set the starting and ending points of the X-axis. Xa button turns red during this mode. Click the starting and ending points of the X-axis on the image on the main panel to set X-axis. The starting and ending points, and a line which connects these points are displayed on the main panel. As in the case of the X-axis, press Ya button to set the Y-axis and then click at the starting and ending points of the Y-axis. If you want to impose that the starting point of the Y-axis is the same as that of X-axis, press Ya* button instead of Ya button and click the ending point of the Y-axis.

If you want to modify the starting or ending points of the axes, click the point to be modified and move it by dragging a mouse or by cursor keys.

> Note: If the X and Y-axes are required to be orthogonal to each other, when you move the starting or ending points of the X-axis, the ending point of the Y-axis automatically moves to keep its orthogonality relation and vice versa. The user can change this orthogonality condition by the property dialog. Detailed description is given in Chapter 4.

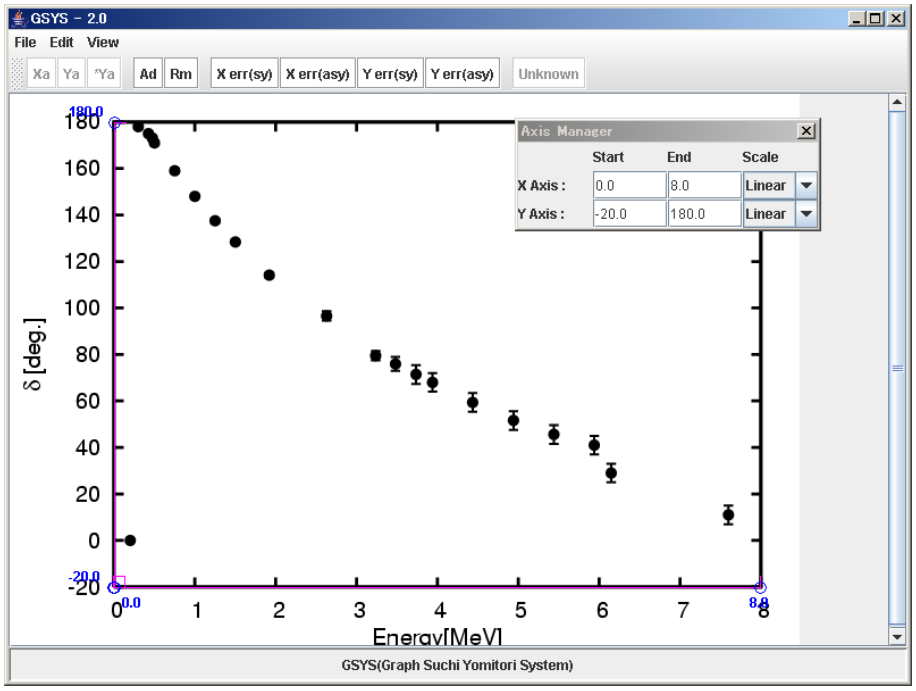

Figure 5: Window after the settings of position and value of ends of the X and Y axes.

The axis manager appears in a new window when you load an image in section 2.2. Set the value of the starting and ending points of the X and Y axes using "Start", "End", "Scale" menus in the axis manager. And select the type of the axis from the options ("Linear" or "Log" (Common Logarithm)). When you finish setting the axis, you will see the window shown in figure 5.

2.4 Reading the data

You are ready to read the data if you finish setting the axes. Press Ad button to enter the data input mode. The button turns red. If you click on the image during the data input mode (When Ad button is red), a red data point is added on the image. You can add the next point by clicking an another point. Continue to click the image until all the data points are added. This mode is canceled by clicking the Ad button again. When you finish adding data points, you will see the window shown in figure 6.

2.5 Reading the error information

This section gives how to read the error information from the graph. First, click a data point which has an error bar on the graph. (The selected data point turns red.) To set a symmetric X (Y) error bar, press Xerr(Sy) (Yerr(Sy)) button and then click one end of the error bar. To set an asymmetric X (Y) error bar, press Xerr(Asy) (Yerr(Asy)) button, and click both ends in order. If you treat a data which has an error bar for only one direction, click the one end and press Xerr(Asy) (Yerr(Asy)) again.

After setting the error bars for the first point, the error input button, which is pressed before, has turned pink. This implies that you are still in the error input mode. Select the next point to set an error bar for the point. When the point is specified, the button turns red. You can set an error bar in the same way as mentioned above. Repeat operations until you finish setting error bars for all the data. To cancel the error input mode, press the error input button again. After inputting errors, you will see the window shown in figure 7.

Note: When you read an error bar which sticks out of the graph, you should set "UNKNOWN" flag

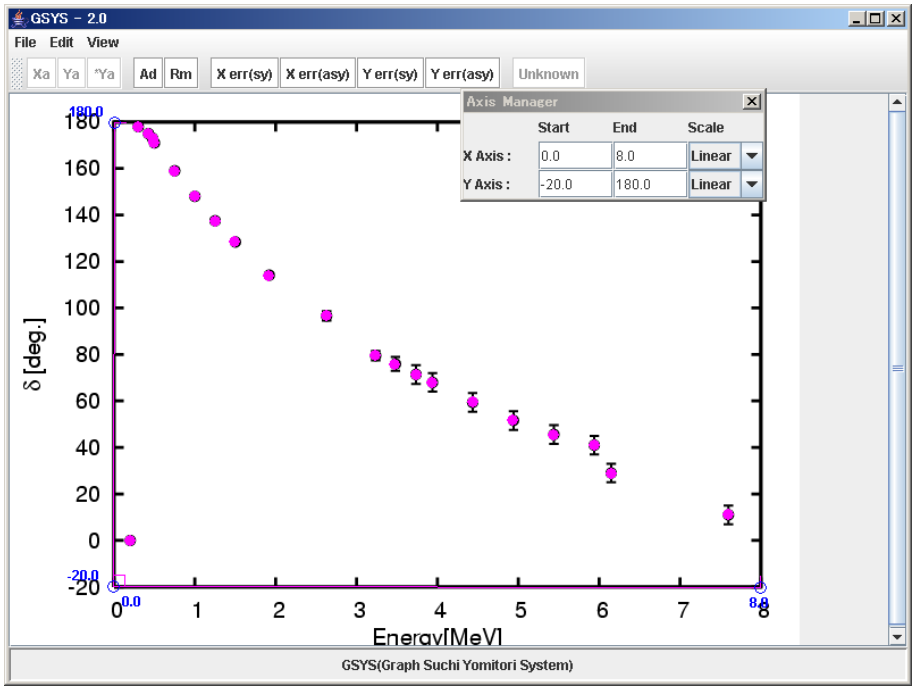

Figure 6: Window after reading the data points.

for NRDF. First, set errors using Xerr(Asy) or Yerr(Asy). When you treat an NRDF format file, the unknown button is selectable. After pressing the button, click the ends of the error bar. An arrow is displayed at the end of the error bar and "UNKNOWN" flag is set for the data. (As for the value of the error with "UNKNOWN" flag, the output value is not the numerical value but UNKNOWN.) Please refer to chapter 5 to know about NRDF format.

2.6 Modifying and removing the data

This section explains how to modify and remove the data.

Modifying the position of data points and error bars

In order to modify a data, select the data point which you want to move by clicking it. Selected data turns red. Then drag it or move it by cursor keys to the correct position. You can modify an error bar in the same way. Click the end of the error bar which you want to modify. The selected end is enclosed by a red circle and move it by dragging or by cursor keys to the correct position.

Removing data points and error bars

In order to remove a data point, select the data point which you want to remove. When you press Rm button to remove it, the data is removed. It is posssible to remove an error bar in the same way. If the end of the error bar which you want to remove is selected by clicking it, the selected end is enclosed by a red circle. Then press the Rm button to remove it.

Removing all the data points and axis

In order to remove all the data points on the main panel, select "Clear" in the "Edit" menu. Confirmation window is displayed. To remove all the data points and the axes, press Yes(All) button. To remove only data points, press

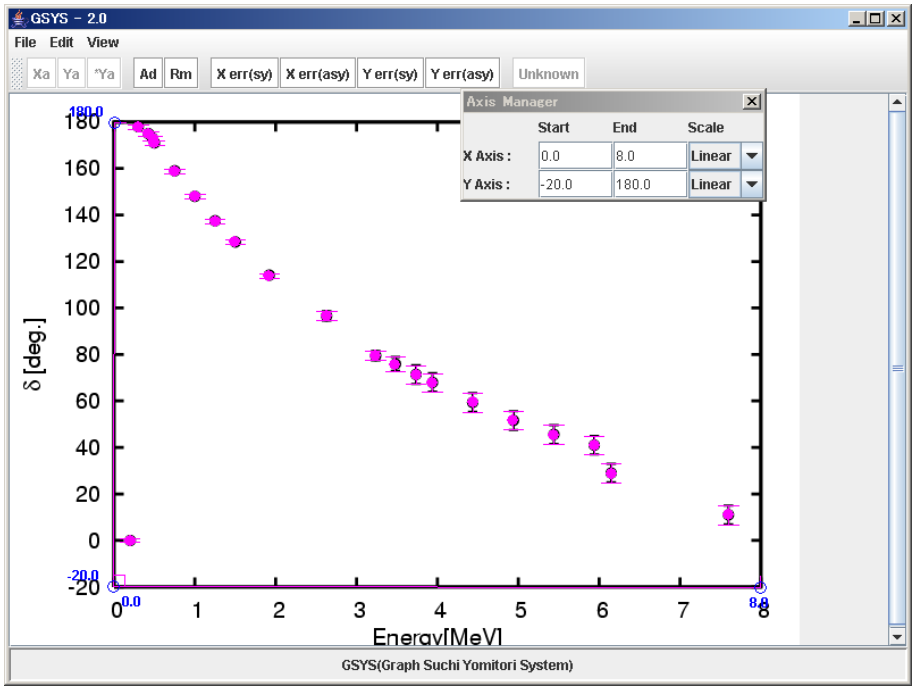

Figure 7: Window after setting errors.

Yes(Data points only) button. If you cancel removing data, press No button.

2.7 Outputting the numerical data

When you finish reading data, select "Output Numerical Data" from the "File" menu. Output dialog shown in figure 8 opens in a new window. This window contains a control panel to configure the settings for outputting the numerical data and a text area for displaying the numerical data.

First, configure the settings for outputting the numerical data on the control panel as follows.

- Input the value of starting and ending points of X and Y axes in "x(start)=", "x(end)=", "y(start)=", and "y(end)=" respectively.
- Select the type of X and Y axes from the options ("Linear" or "Log" (Common Logarithm)) in "Scale" selection box.

The default values for the box are the same as the input values of section 2.3. Please check the values again here. Besides, set the type of output from the options ("Floating" number or "Fixed" number) and the number of digit after the decimal point by changing "digit".

Next, select the output format to use. Please refer to chapter 5 to know about data format treated in GSYS2.

When you use the Standard Format, set "Error notation", "Separator", and "X-err position" as follows.

- "Error notation" specifies the settings for error output.

  Relative : Output the value of the difference between the values of the data point and the end of the error bar.
  Absolute : Output the value of the end of the error bar.

- "Separator" specifies the field separator from the options (comma or white space).
- "X-err position" specifies the position of the error of the X-direction.

  "x dx y dy" : Output X-error value after the value of X.
  "x y dx dy" : Output X-error value after the value of Y.

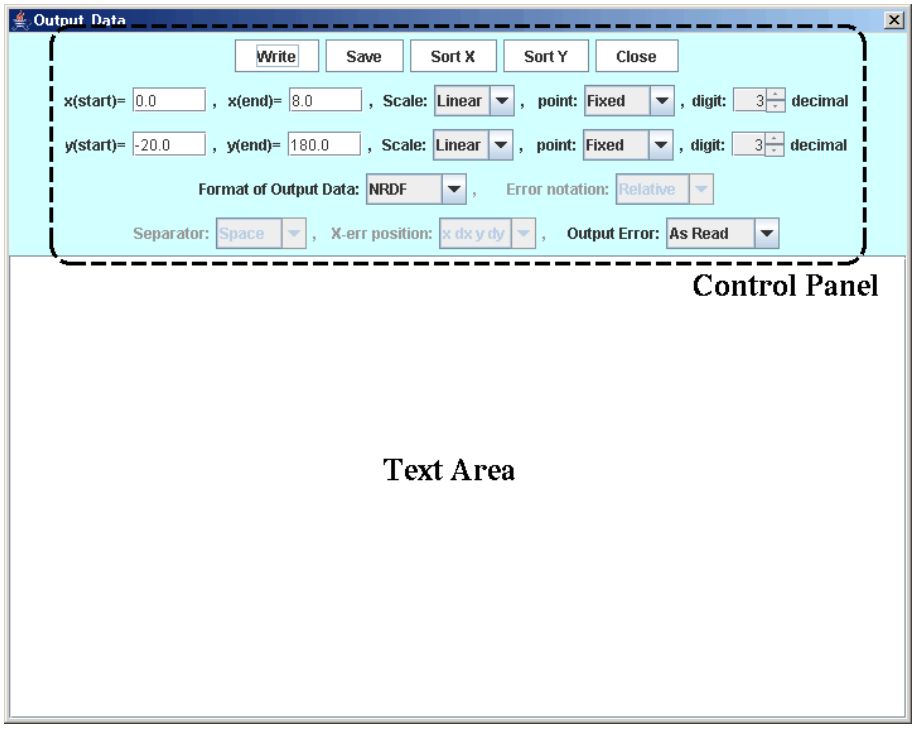

Figure 8: Window for outputting numerical data file

At last, select the type of output from the options in "Output". "As Read" is selected by default and output the data as read. If you want to omit a particular error or specify the output digit number, please select the type of the output error from the options as mentioned below.

"No Error"	:	Don't output error.
"X Error"	:	Output error for only X-direction.
"Y Error"	:	Output error for only Y-direction.
"X & Y Error"	:	Output error for X and Y direction.

If you finish all the configuration, press Write button. Numerical data is displayed in the text area.

By using Sort X or Sort Y button, it is possible to sort data in ascending order by X or Y value. If you use NRDF format or EXFOR format, the data is sorted by X value by default.

Press Save button to save the output numerical data into a file. Specify the file name in the file dialog in a new window. If you want to close the output window, press Close Button.

3 Feedback function

This chapter explans the feedback function which was newly added to GSYS2.

3.1 What is the feedback function?

Feedback function is a function to load the numerical data from files and plot them directrly on the image on the main panel. Former digitizing processes were one way processes that read the data from an image, then digitize it. Therefore, if there are some mistakes in the data or the quality of the data is not very good, the user must recompile the data from the beginning to improve the data. The feedback function enables us to compare the numerical data visually with the real data on the graph by plotting the old numerical data on the image (Refer to figure 9). It is also possible to modify the data by moving or adding the data points using GSYS2. GSYS2 can read not only the numerical data

produced by GSYS2, but also the general numerical data. Thus, the feedback function enables us to reuse the data easily and check the data accuracy in greater detail.

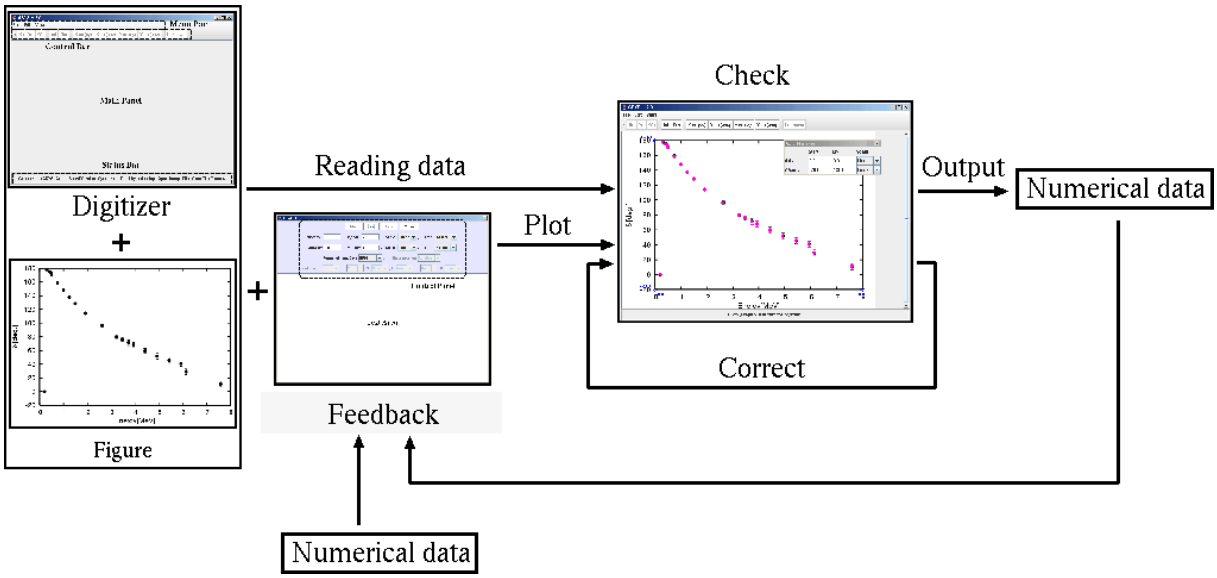

Figure 9: Data reading process and feedback function

3.2 Using the feedback function

In order to use the feedback function, select "Input Numerical Data" from the "File" menu. Input window shown in figure 10 opens. This window contains a control panel to configure the settings for inputting the data and a text area in which input numerical data are displayed.

First, select the numerical data to be input. Press File button to open the file dialog and select a file which you need. Contents of the selected file are displayed in the text area. Instead of selecting a file, you can input the numerical values into the text area directly or copy & paste the values.

Secondly, confirm that the X and Y axes are set on the image. If not, set the axes as explained in section 2.3. AXIS button is unavailable for the general data. However, if you use the numerical data file which is degitized by GSYS2 from the image displayed in the main panel, the AXIS button is available. In this case, the user can embrace the axes data saved in the numerical data file as the current axes data by pressing the AXIS button.

Thirdly, input the information of the axes. If you load a file generated by GSYS or GSYS2, the information of the axes is read from the file header. Confirm the information of the axes.

- Input the values of the starting and ending points for the X and Y axes into "x(start)=", "x(end)=", "y(start)=", and "y(end)=", respectively.
- Select a type of the X and Y axes from the options ("Linear" or "Log"(Common Logarithm).

Finally, specify the data format. This process depends on a file format. Refer to Chapter 5 to know about file formats treated in GSYS2.

- In case of NRDF format or EXFOR format, set "(X-Error)" and "(Y-Error)" in "Error" from the options ("Sym"(Symmetric Error) or "Asym"(Asymmetric Error)). If the data contains no error information, select "No Error".

  Note: If you want to use some specific column in the loaded data with NRDF or EXFOR format, load the numerical data as the standard format as mentioned below and then revert it back to the original format.

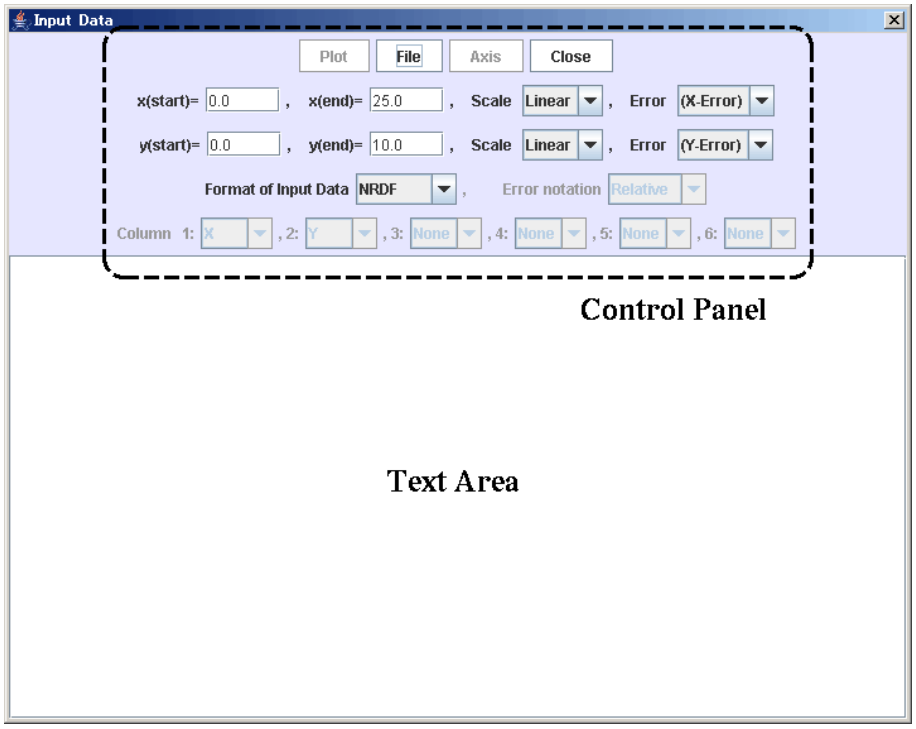

Figure 10: Window for loading the numerical data file

- For the standard format, Specify a display format for each column from the options (”X”(X value), ”Y”(Y value), ”X-err”(Error for X), ”Y-err”(Error for Y), and ”NONE”(no data or not to use)).

Only ”Relative” error (the difference from the real value) is available for NRDF and EXFOR formats, but, ”Absolute” error (the end of the error bar) is also available for the standard format. Change ”Error notation” if necessary. If you finish all the settings, press Plot button. The data will be plotted on the image shown in figure 7. To modify the data, follow the explanation in chapter 2.

4 How to customize GSYS2

This section explains how to customize GSYS2. Select ”Properties” in the ”Edit” menu. You can customize GSYS2using the property dialog in a new window. Since the configuration is saved in a file, ”gsys2.properties”, you can change the configuration by editing that file.

Color & Size

When ”Color & Size” tab is selected, you can see the window shown in figure 11. The user can select not only the color of the axes and the data points but also the size of the points from the dialog boxes.

Marked data	Set the color of marked data.
Unmarked data	Set the color of unmarked data.
X, Y-axis	Set the color of axes.
End of X, Y-axis	Set the color of the starting and ending points of axes.
Size of circle	Set the size of data point circles.

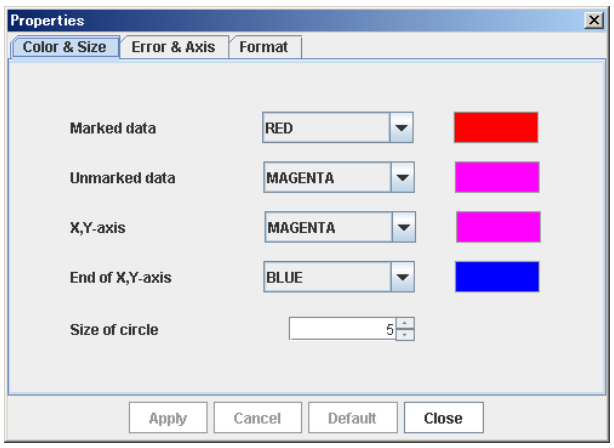

Figure 11: The window of the property dialog when the "Color & Size" tab is selected.

Error & Axis

When "Error & Axis" tab is selected, you will see the window shown in figure12. The user can set the error expression, whether to display the value of the starting and ending points of the axes and whether to impose the orthogonality condition for the X and Y axes.

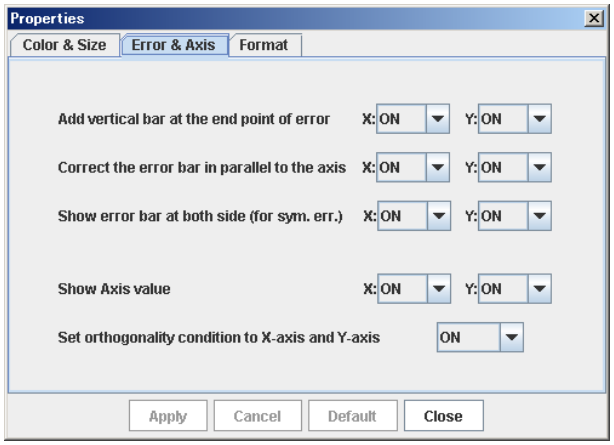

Figure 12: The window of the property dialog when the "Error & Axis" tab is selected.

Add vertical bar at the end point of error	Set whether to display the vertical line at the end of the error bar.
Correct the error bar in parallel to the axis	Set whether to display the X and Y error bars parallel to the X and Y axes.
Show error bar at both side (for sym. error)	Set whether to display the symmetric error bars the data.
Show Axis value	Set whether to display the value of the ends of axes close to the ends of the axes.
Set orthogonality condition to X-axis and Y-axis	Set whether to make X-axis and Y-axis orthogonal.

Format

In order to change the format for the numerical data, select "Format" tab. You will see the window shown in figure 13 and you can configure the format used for writing the data and the feedback function. Refer to chapter 5 to know more about the data formats.

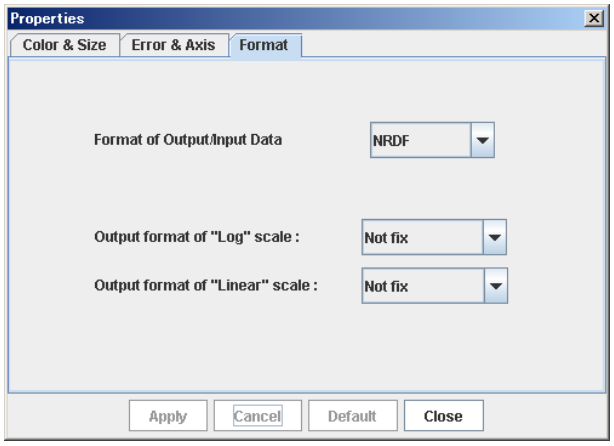

Figure 13: The window of the property dialog when the "Format" tab is selected.

Format of Output/Input Data	Set a format of input and output.
Output format of "Log" scale	Set a type of output for "Log" (Common Logarithm) from floating point number and fixed point number.
Output format of "Linear" scale	Set a type of output for "Linear" from float point number and fixed point number

5 Data format

There are three formats treated in GSYS2. They are used for NRDF, for EXFOR recording, and for general use. They are called NRDF Format, EXFOR Format and Standard Format, respectively. Refer to chapter 4 to learn how to change the format to treat.

NRDF Format

An example of NRDF Format file is shown below. (this example is the data with symmetric error for X and asymmetric error for Y.)

```
#     x           +-dx          y              +dy-dy
 1.000E+00   +-2.500E-01   8.000E+00    +4.000E+00-2.500E+00
 2.000E+00   +-4.500E-01   4.000E+00   +2.000E+00-NEGLIGIBLE
 3.000E+00   +-5.000E-01   2.000E+00      +5.000E-01-UNKNOWN
 4.000E+00   +-1.000E-01   1.000E-00    +1.000E-01-1.500E-01
```

If the error value is too small to be read by GSYS2, 'NEGLIGIBLE' is output. If the error value is very large so that the error bar sticks out of the graph, 'UNKNOWN' is output. As for UNKNOWN, it is necessary to set a type of the error output as unknown by unknown button as explained in section 2.5. The error format is +-VALUE(for symmetric error), or +VALUE-VALUE(for asymmetric error). The error values are given as 'relative' error(the difference from the real value).

EXFOR Format

An example of EXFOR Format file is shown below.

```
#     x           dx          y           dy         -dy
  1.000E+00   2.500E-01   8.000E+00   4.000E+00   2.500E+00
```

```
2.000E+00  4.500E-01  4.000E+00  2.000E+00
3.000E+00  5.000E-01  2.000E+00  5.000E-01  1.854E+00
4.000E+00  1.000E-01  1.000E-00  1.000E-01  1.500E-01
```

The columns are separated per 11 characters, and the data with no value is expressed as a white space. The error value is given as 'relative' error(the difference from the real value).

6 Epilogue

This document described how to use GSYS2 developed in the fiscal year 2005. For several years, JCPRG has developed a digitizing system which works on general frameworks such as web and Java in order to construct a platform-free system. As a result, users have been able to run the system on their personal computers.

Since the author uses FreeBSD Operating System for the daily use of the computer, it felt a little difficult to use SyGRD which requires a particular operating system. GSYS can be used on my environment without any problem. Actually, it is used for my PhD thesis research. The idea of the feedback function came to mind at that time. The feedback function enables us to reuse the output numerical data by loading in GSYS, as opposed to the one way flow of data: reading the data from the graph and output.

The improvements in GSYS2 is based on the reform ideas which had been proposed during using the former degitizer, GSYS. Digitizing processes used to be more awkward than coding process, however, these improvements and the feedback function enables us to reuse and modify the recorded data whenever we want. Digitizing process can be handled by anyone at anytime. Actually, digitizing processes had been specially performed by Ms. Takako Ashizawa, but now, other people become able to join the work. They provide comments and requests about GSYS and data reading processes from various aspects.

The author would like to improve the former data checking process, which was comparing the graph on the paper with the plotted data just by looking at them. The author was dissatisfied with the rough check of the recorded data actually used in NRDF because it is the most important part for keeping the high level of the data accuracy.

The framework for checking the data accuracy directly on the image was constructed by the feedback function for the first time. In the rerecording process of data from D1501 to D1600, high quality numerical data are made by the cooperation of the team: one makes a renewed numerical data from previously recorded data and another checks the accuracy of the renewed numerical data by displaying the numarical data directly on the image. In this work, it was found that how to set the axes was the important problem to be solved. Additionally, the benchmark-test proposed by IAEA[4] was performed in 2005. It is the evidence that there is a growing international awareness of the importance of the quality of numerical data. This benchmark-test proved that the numerical data produced by JCPRG has high accuracy. This success is a result of the long experience of the recording work by JCPRG. The author hopes that the effort to provide good numerical data continues in the future.

Acknowledgements

I wish to thank Dr. Koji Arai for developing GSYS and providing source code. He also advised the author to develop and publish GSYS2. I wish to thank Ms. Takako Ashizawa for making precious comments as a user of GSYS2. Members of "NRDF-to-EXFOR Working Group (NTX-WG)" also gave me precious comments, advice, and vigorous encouragement. I wish to thank, especially, Dr. Ayumi Minoguchi, the namer of the 'feedback function', Ms. Hitomi Yoshida and Dr. Naohiko Otuka for encouraging me to open GSYS2 to the public.

At last, I thank Mr. Shinya Ito and Dr. Ayumi Minoguchi. They have translated this manual from Japanese into English!

A Appendix

A.1 Keyboard shortcuts

The correspondence between keyboard shortcuts and the buttons on the control bar and menus in the menu bar is shown in Table 1.

Table 1: Keyboard shortcuts

Correspondence between buttons in control bar and keyboard shortcuts

Operation	Button	Key
Set X axis.	Xa	x
Set Y axis.	Ya	y
Set ending point of Y-axis when starting point is the same as X axis.	*Ya	Y
Add data points.	Ad	a
Remove marked data point.	Rem	d, Delete, BackSpace
Set symmetry error for X direction.	Xerr(sy)	F1
Set asymmetry error for X direction.	Xerr(asy)	F2
Set symmetry error for Y direction.	Y err(sy)	F3
Set asymmetry error for Y direction.	Yerr(asy)	F4
Set UNKNOWN flag for the error of a data. (Available for NRDF Format.)	Unknown	u

Correspondence between menus in menu bar and keyboard shortcuts

Operation	Key
Open a window to load an image file.	Ctrl + o
Open a window to load a numerical data file.	Ctrl + i
Open a window to output data.	Ctrl + s
Quit GSYS2.	Ctrl + q
Clear data points and axes.	Ctrl + c
Magnify image.	+
Shrink image.	-
Recover original size of image.	0

Correspondence between other operations and keyboard shortcuts

Operation	Key
Set error bar for X-axis (For the asymmetry error, focus on the error which is set first, then focus on the other error if pressed again).	F5
Set error bar for Y-axis (For the asymmetry error, focus on the error which is set first, then focus on the other error if pressed again).	F6
Focus on the next data point.	F7
Focus on the previous data point.	F8

A.2 What's new in GSYS2

- Simplified setup process by replacing tar.gz package with a single file which is executable by double click.
- Feedback function to reuse the old numerical data and check the data accuracy by displaying the numerical data directly on the image.(Refer to Chapter 3)
- Instead of AWT, new GUI system 'Swing' was adopted to eliminate the platform dependence. The whole system becomes lighter by this change.
- Thoroughly revised the design and user interface. (Refer to figure 1,2)
  - Minimum necessary functions remains as buttons on the control bar and menus in the menu bar instead of assigning all the functions to the buttons.

  - It becomes easy to resize the window so that the display can be used effectively.
  - Modified interfaces enables to move the data point directly by clicking and dragging a mouse.
  - The operations for the data points and error bars changed to be the same though former GSYS had different operation styles for them. In addition, the direction of an error bar is changed to be parallel to the X or Y axis. For the display of a symmetric error, showing error bars on the top and bottom (left and right) of the data point makes it possible to evaluate the accuracy of the symmetric error bars.

- Responded to the problems about the axes which were found in the rerecording process of D1501-D1600.
  - Several problems were found: the positions of the ends of the axes depends on the user of the system. This user dependence affects the accuracy of the numerical data crucially. Besides, in the digitizing system, it is difficult to read the data with high accuracy if X-axis and Y-axis are not orthogonal. Therefore, the developer added a guide which makes X-axis and Y-axis be orthogonal to each other in order to reduce the effect of the user dependence about the configuration of the axes.
  - The axis manager is added and makes it possible to check of the values of the ends of the axes twice in order to decrease the mistake for setting the values of the ends of the axes. Besides, the opportunity to check the values of the ends of the axes is increased further by displaying them on the image.

- Improved file formats treated in GSYS2.
  - Become able to change a digit number of the output numerical data.
  - Become able to output the fixed point representation.
  - The error in the treatment of NRDF format file is modified. (The position of the output of the error for X; white space is outputted in the asymmetric error which includes `NEGLIGIBLE`, `UNKNOWN`) NEGLIGIBLE is automatically output for the data with no error, and it makes the generation of the numerical data with NRDF format easy.
  - EXFOR Format file becomes available.

- Configuration file enables to save the settings after quitting GSYS2 and configure by editing the configuration file.

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