MA-tek

Materials Analysis Technology Inc.

SIMSvision v10.6.x

User Manual

Index

1. Overview

This document covers SIMSvision(version 10.6.x). The tool is designed for Materials Analysis Technology Inc. (MA-tek) customers viewing the results of SIMS report.

SIMSvision allows customers to change the range of the data display and element attributes such as its color, axis, and integrate new elements in to reports easily.

The MA-tek analyst may have already defined certain calculated parameters for the data (such as y value's unit). These features will not be changed by customers, though these elements can be removed from the SIMSvision.

Additionally, there are some processing tools available in SIMSvision that can help customers analyzing their data, adding and updating various calculated parameters.

1.1 A High Level View

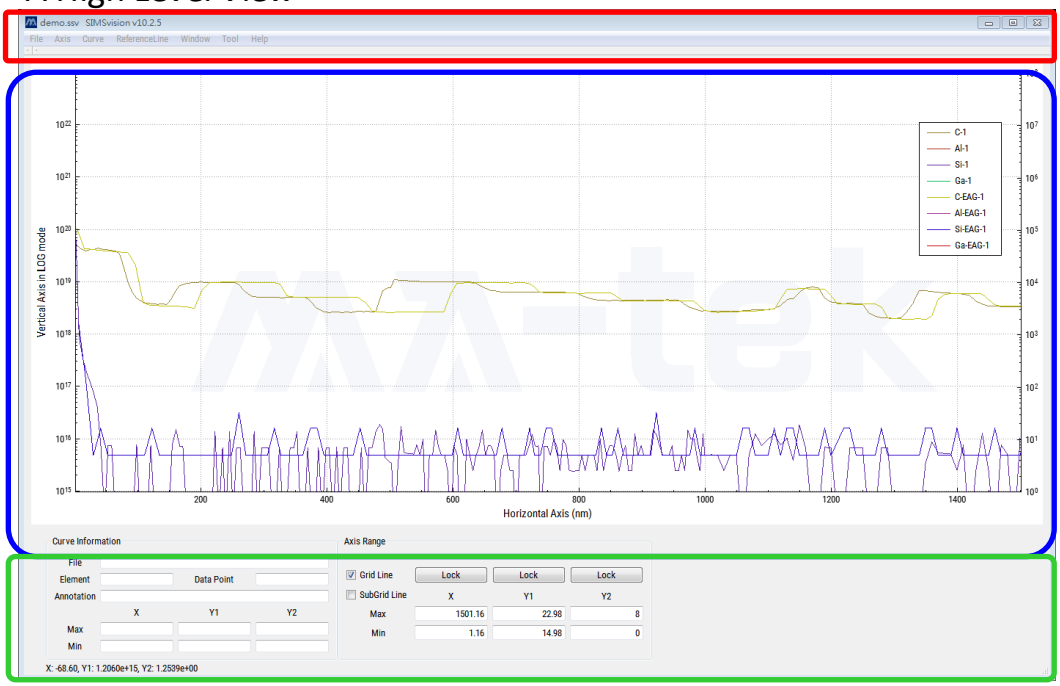

Figure 1: High Level Overview

Menu Area(red):
Users may Open/Export Files, Change Window Settings (Full Screen/Hide Panel) here and call analysis tool in this bar.

Plot Area(blue):
Plot area is where element profiles are shown. Plot range can be changed by mouse dragging and can be zoomed by mouse wheel rolling.
While mouse hovering over the legend, users can change element attributes such as show/hide, changed color settings by mouse right click on the desired element.

Panel Area(green):
Element information is shown in Curve Information area. And user can also change axis' range in Axis Range area.

1.2 A Simple Use Case

Open File -> Hide some curves -> Export as Excel

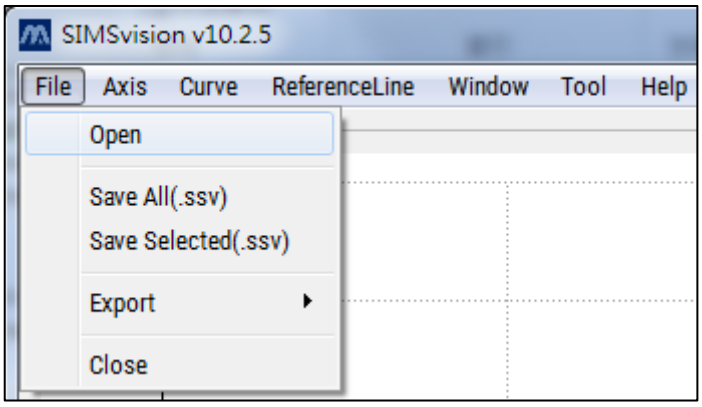

Figure 2: Open File

Users can open *.ssv file and the profile in the *.ssv file will be loaded into the plot area.

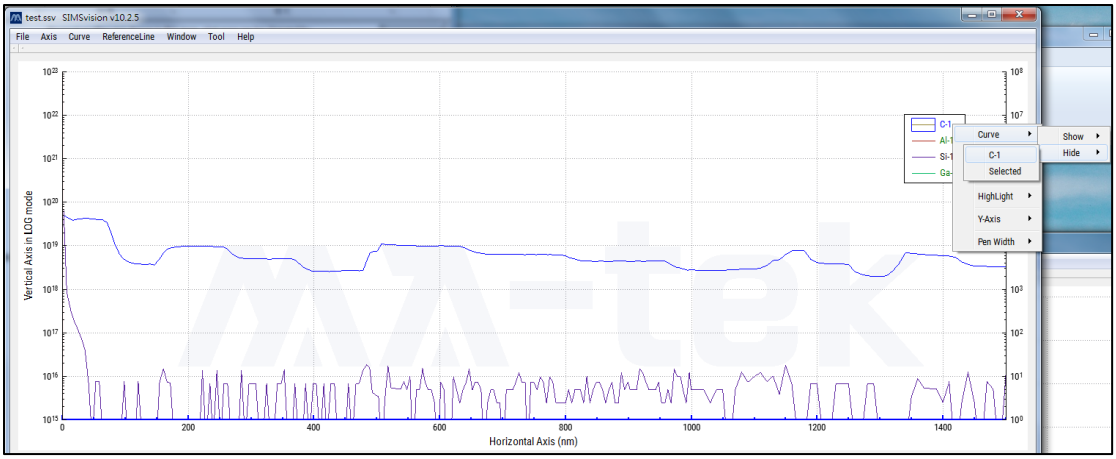

Figure 3: Hide Element C-1

Right click the element in the legend or the element in the plot area, the context menu will show up, then users can hide the desired element.

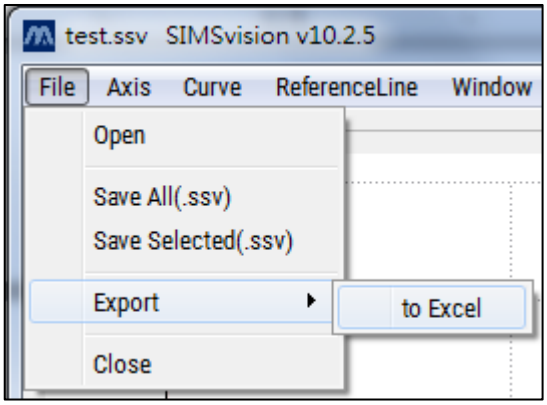

Figure 4: Export to Excel

After finishing a series of settings, profiles can be saved as *.ssv or exported as *.xlsx. (Note: while exporting, the elements that are hidden will not be exported.)

2. Menu

There are many things users can do in Menu area, which will be illustrated below

2.1 File

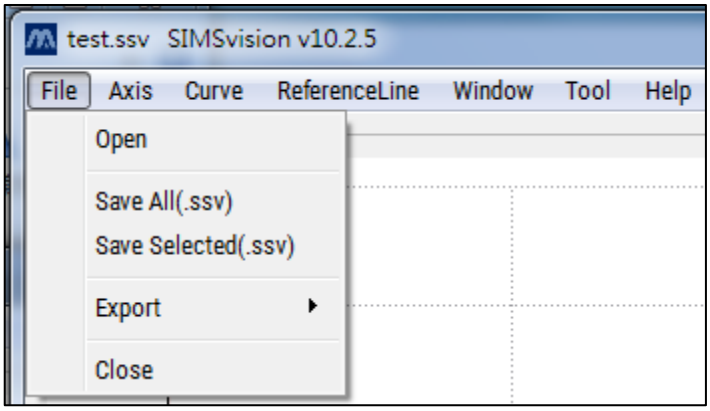

Figure 5: Open File

In File menu, users can open/save *.ssv file, exported to excel, and close the SIMSvision.
While saving files, an element's attributes such as its color, axis, hidden or not will also be saved.

2.2 Curve

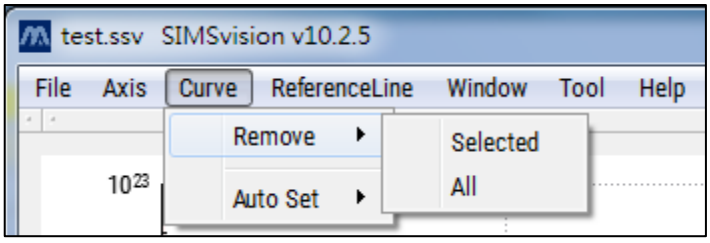

Figure 6: Remove Curves

Remove
Curve(Element in a plot area) can be removed from plot area by select the element first, and then click the Remove Selected in Curve Menu, or users may simply press Key_Delete. (Note: a removed data is no longer existed until user reloads it again)

Auto Set

Curve can be set to Y1, Y2 automatically by triggering the Auto Set. If a curve's highest point is less than 1e13, it will be set to Y2, otherwise Y1. (Note: Users can set a curve to Y1 or Y2 manually by using context menu as well.)

2.3 Axis

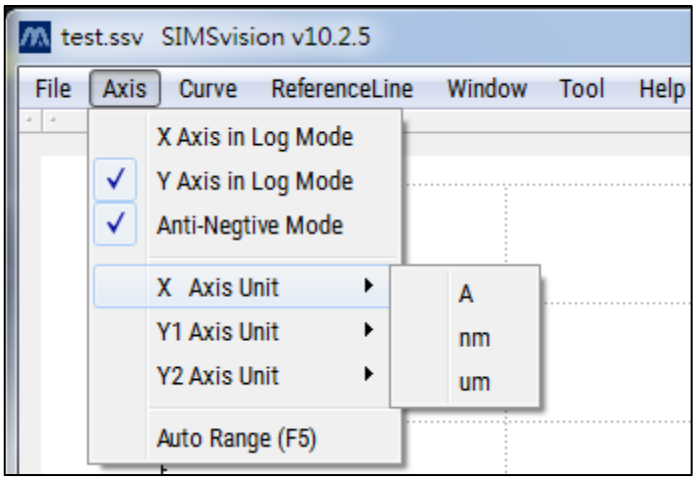

Figure 7: Change Axis Unit

In Axis Menu, users can change elements' X unit by choosing a desired one. Please be aware that while changing Y1/Y2 axis unit, only the label of Y1, Y2 will be changed. (Note: the actual unit of y value is set by MA-tek engineer. Although it is unchangeable by users, it shows in Curve Information Area in the panel at the bottom of SIMSvision.)

2.4 Tool

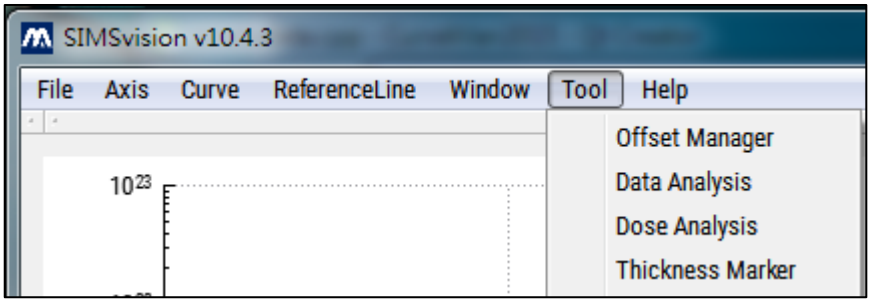

Figure 8: Using Tools

There are many tools such as Offset Manager, Data Analysis, and Thickness Marker in Tool menu that can be used.

Offset Manager

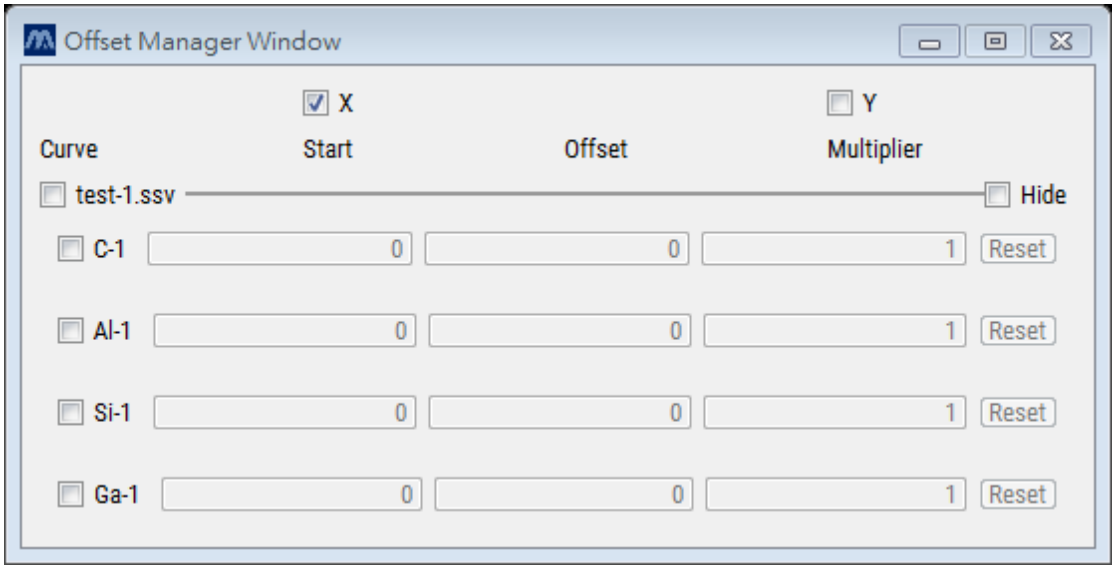

Figure 9: Offset Manager Window

Offset manager help users change the element's start and offset easily. To use Offset Manager, check the desired element first, then shows up a start vertical line. Users can change start position by dragging the vertical reference line or set it directly into the corresponding input box. Similarly, after select the desired element in the plot area or legend, users can change the offset by dragging the curve or set it directly into the corresponding input box. (Note: only the curve on the right hand side of the vertical line can be dragged or set.)

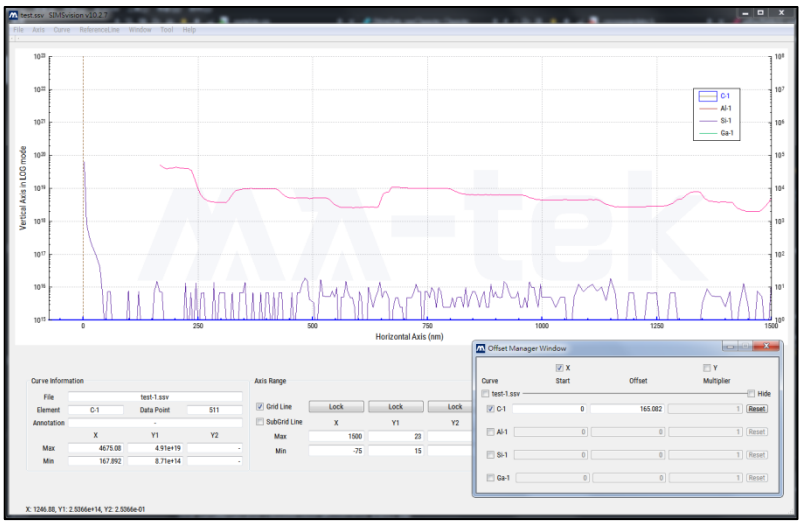

Figure 10: Dragging Selected Element in the plot

Data Analysis

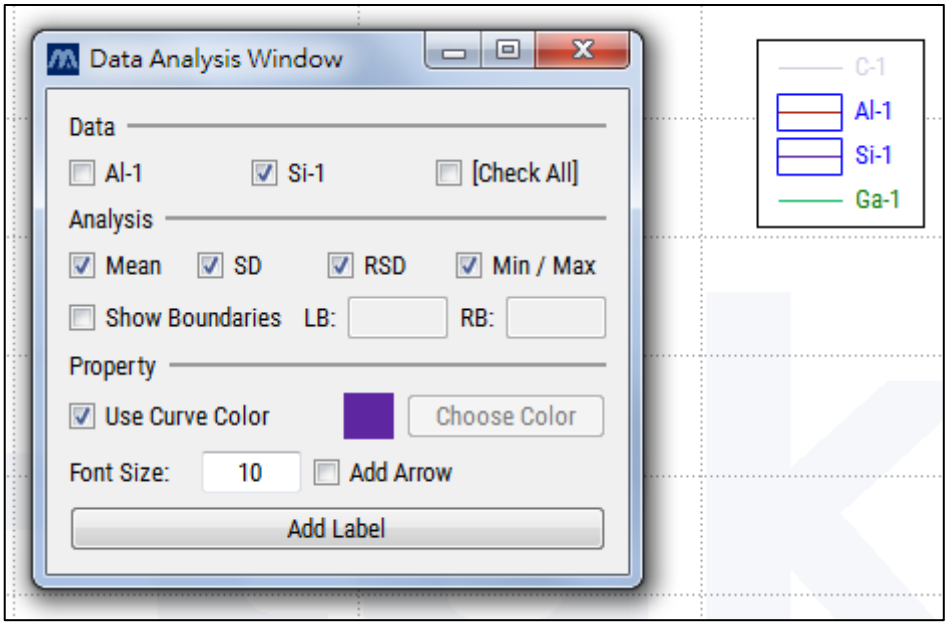

Figure 11: Data Analysis Window

Data Analysis tool help users calculate element's Mean, SD, RSD Min/Max value and produce a label that displayed in the plot area. To use it, first select the desired elements in the legend, and click the Data Analysis menu, then click Add Label after choose the desired calculation and related property.

If "Add Arrow" is checked, you may have an arrow in the plot, select it and move to somewhere you like by dragging it. If you do a double click on it, its color changes to red, you may revise the arrow's heading by dragging the arrow's head or tail.

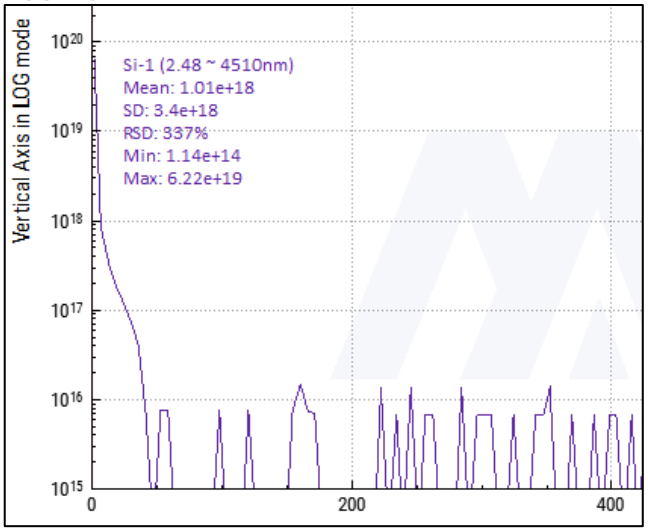

Figure 12: Data Analysis Label

Dose Analysis

Dose Analysis tool help users calculate element's Dose (Area Density), Cp, Rp between two depths, users may exclude the background as desired.

The Dose result will be show in the window while users dragging the range boundaries.

If users want to calculate the Average, SD or RSD of the dose result, users may press Add To Statistics and get the values by checking the corresponding check boxes.

Append Dose Label button and add a special Dose Label to the upper right of the plot. The Dose Label will be synchronized by legend curve, so when a curve is deleted from the legend, the corresponding Dose Info will be deleted as well. The Disappend Dose Label Button is to delete the last row in Dose Label manually.

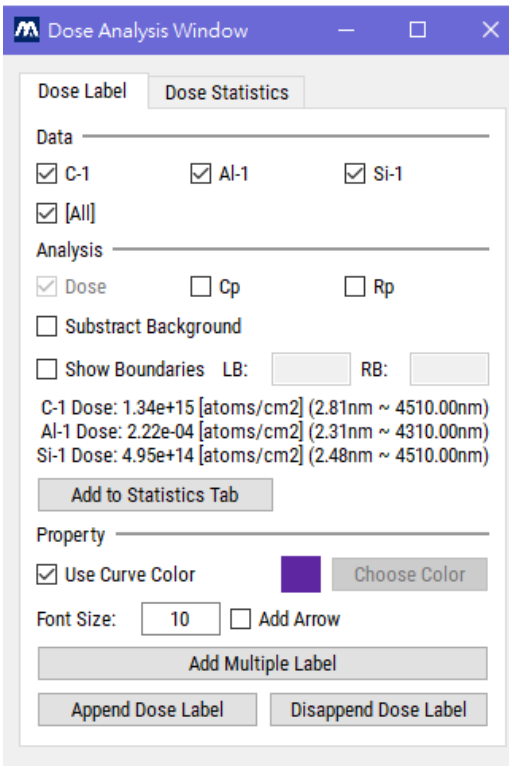

Figure 13:
Dose Analysis Window

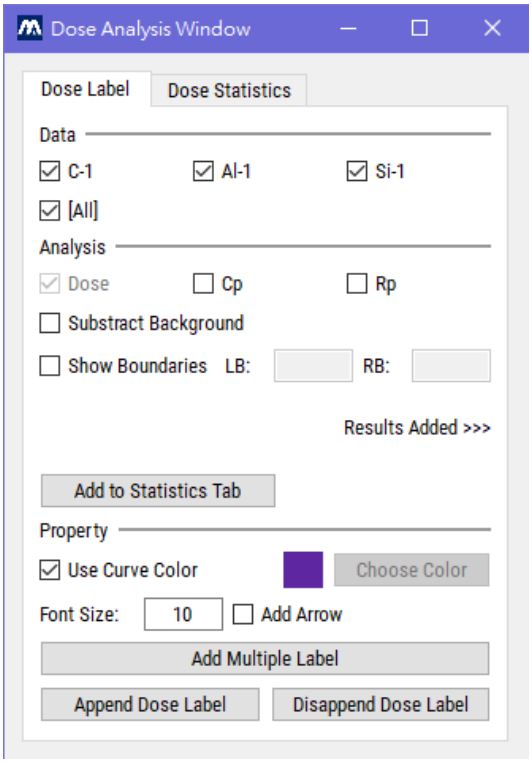

Figure 14:
Dose Results Added

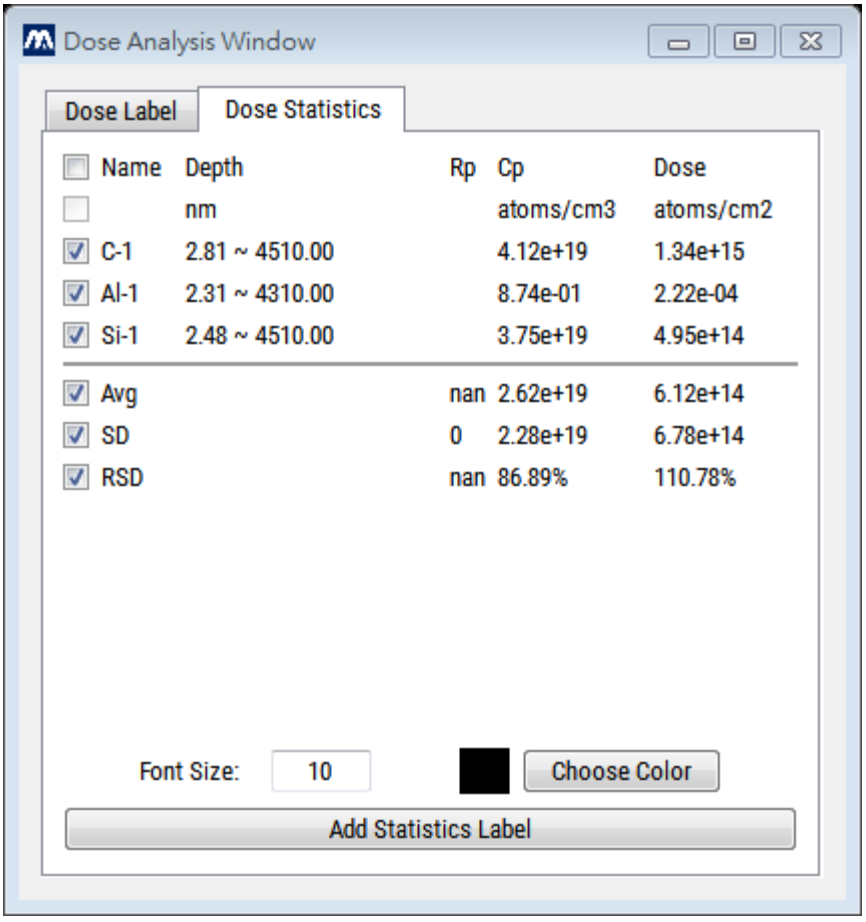

Figure 15: Dose Statistics Tab

Name	Depth	Rp	Cp	Dose
	nm		atoms/cm3	atoms/cm2
C-1	2.81 ~ 4510.00		4.12e+19	1.34e+15
Al-1	2.31 ~ 4310.00		8.74e-01	2.22e-04
Si-1	2.48 ~ 4510.00		3.75e+19	4.95e+14
Avg		nan	2.62e+19	6.12e+14
SD		0	2.28e+19	6.78e+14
RSD		nan%	86.89%	110.78%

Figure 16: Dose Analysis Label

Thickness Marker

Thickness Marker help users calculate thickness between two vertical lines easily. To use Thickness Marker, first select the desired element in the legend and call the Thickness Marker window.

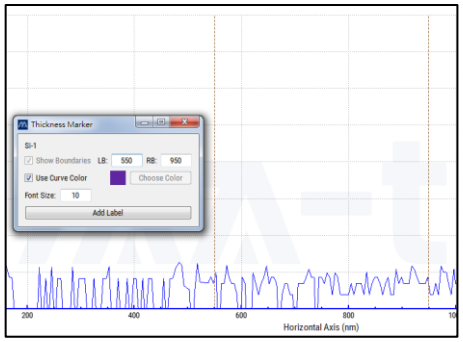

Figure 17: Thickness Marker

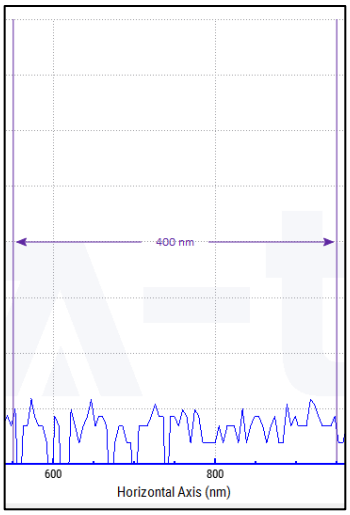

Figure 18:
Thickness Marker Label

After dragging the vertical lines to the desired positions, users can press the Add Label button to add thickness label onto the plot area.

Decay Length

Decay Length tool help users calculate the slope of two data points in an element, users can change two by dragging range from the plot, the slope value will be shown in the window directly. When users press Add Label, the slope label will be created and added to the plot.

Figure 19: Decay Length Label

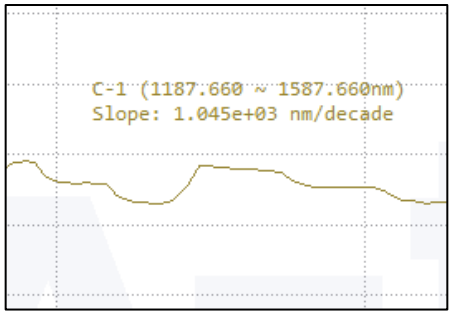

Figure 20: Decay Length Label

Junction Depth

Junction Depth tool help users calculate the junction of a concentration and an element. Users may choose the desired junction points by mouse clicking on the junction circle and change it by keyLeft, keyRight. Then decide to add concentration line or text

while adding the junction depth label. After adding the label, users may change its vertical position by mouse dragging on it. Please note that a junction point is the closest point of two consecutive ones that contribute to the junction with the given concentration.

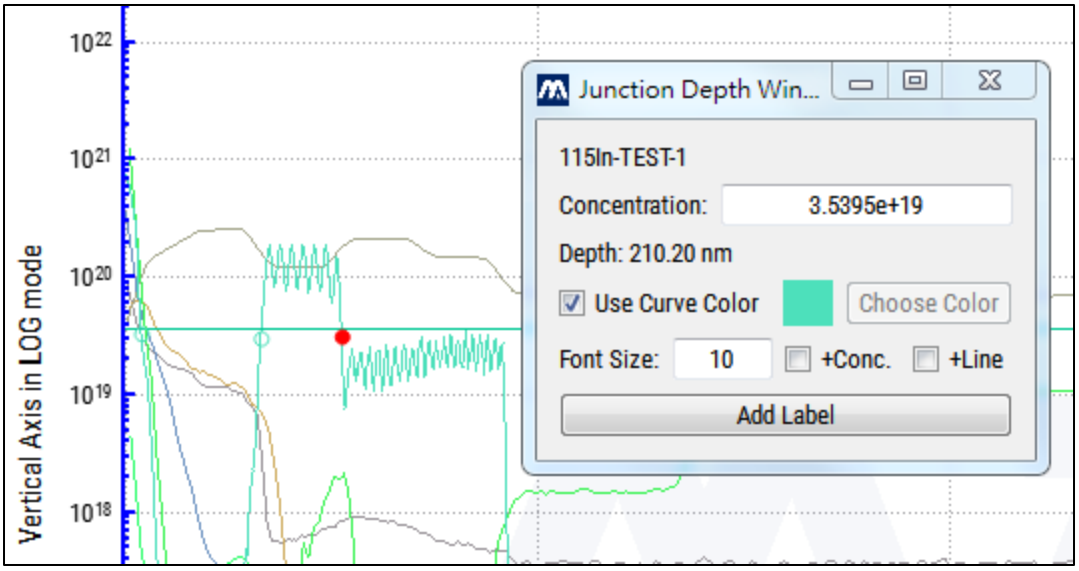

Figure 21: Junction Depth Window

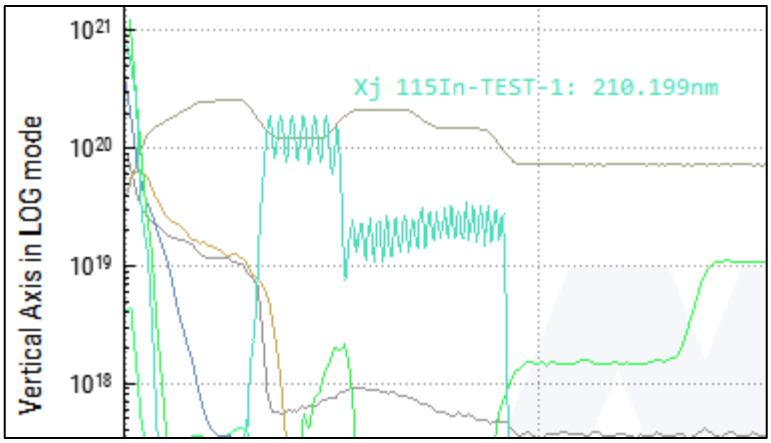

Figure 22: Junction Depth Labels

Editable Text

Editable text let users add a text label that its contents can be changed. By double clicking the editable text label, users can change the original contents easily.

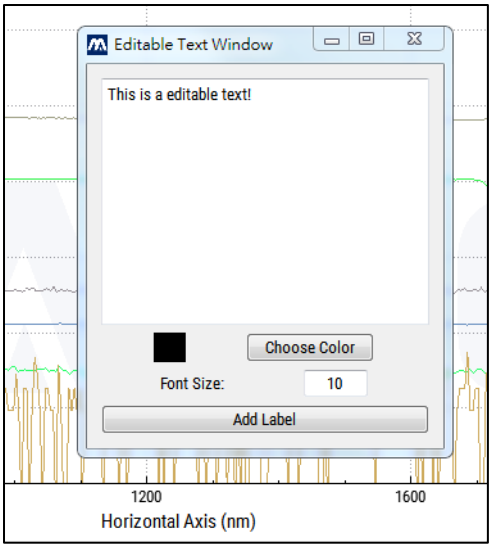

Figure 23:
Editable Text Window

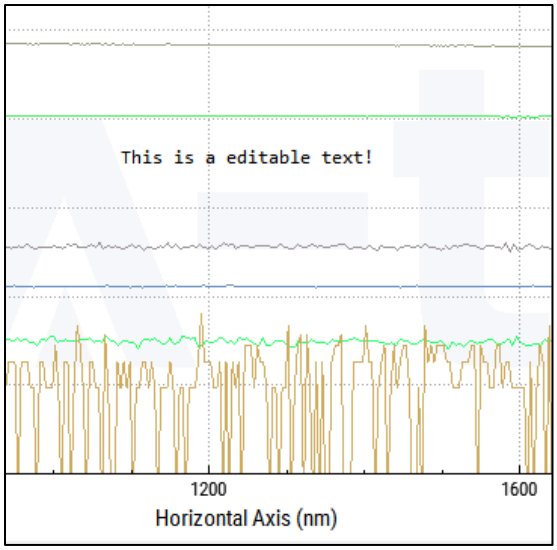

Figure 24:
Editable Text Label

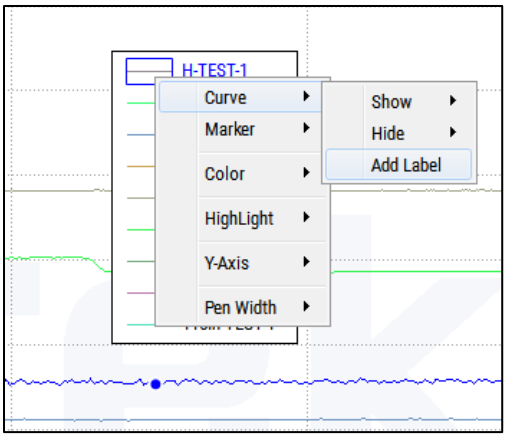

Figure 25:
Curve Add Label

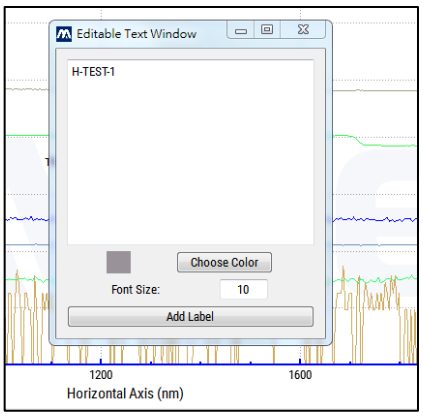

Figure 26:
Editable Text Window

File Element List

File Element List is composed of elements grouped by its file, users can show / hide elements in this window. Especially, while setting C-all checkbox checked, all elements with name C (like C-1, C-2, … etc) will be shown/hidden in the plot. Note that checked / unchecked means show / hide, respectively.

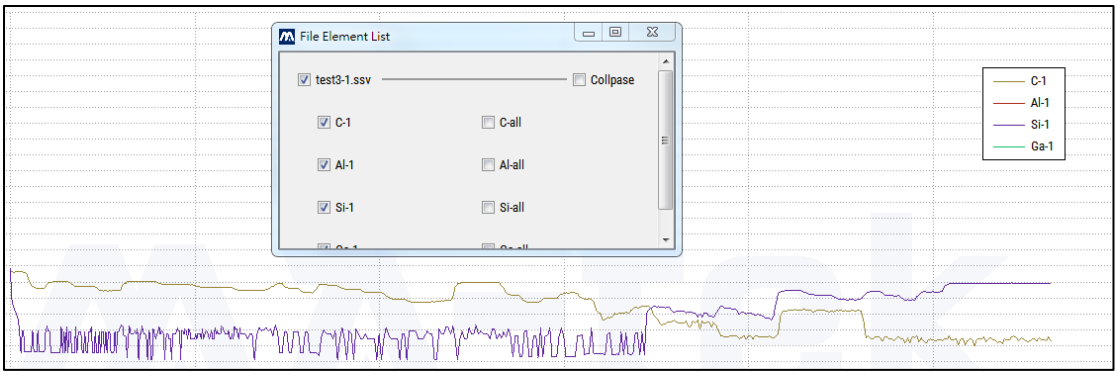

Figure 27: File Element List

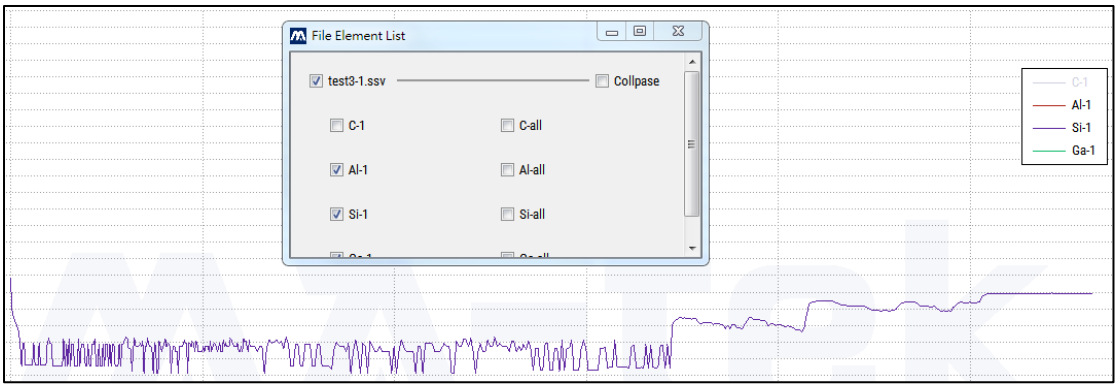

Figure 28: File Element List: Checkbox unchecked

Mirror Element List

Mirror Element List is composed of elements grouped by its file, users can mirror elements in this window. Especially, while setting C-all checkbox checked, all elements with name C (like C-1, C-2, …, etc) will be mirrored in the plot.

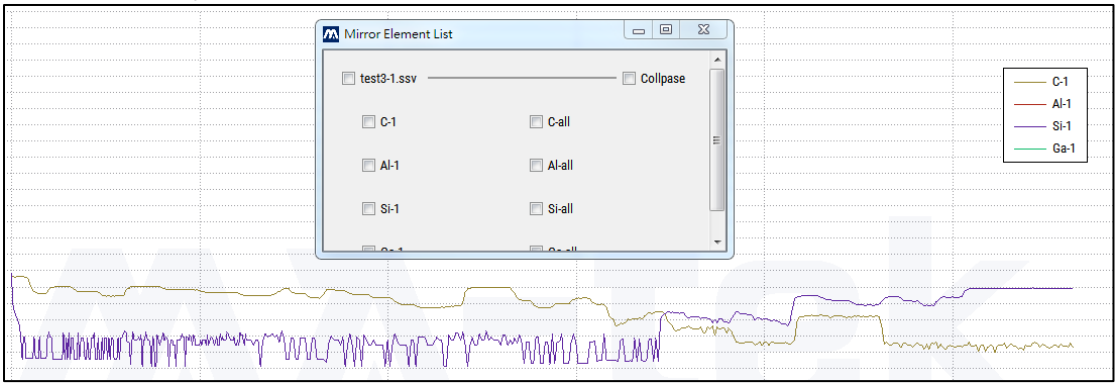

Figure 29: Mirror Element List

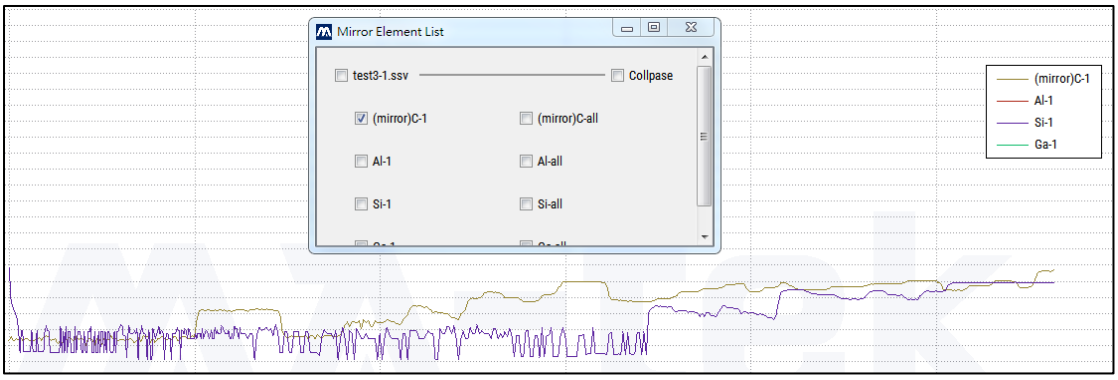

Figure 30: Mirror Element List: Checkbox checked

TOF-SIMS

TOF-SIMS feature is only for users who has tof-sims files from MA-tek's report. Users can use tof-sims feature to review the data.

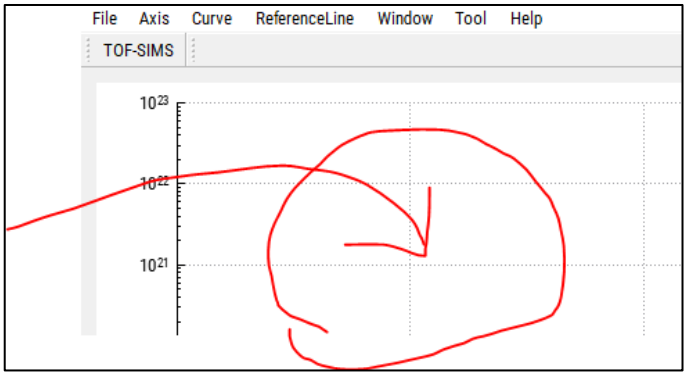

Figure 31: drag and drop tof-sims.ssv file to the plot area

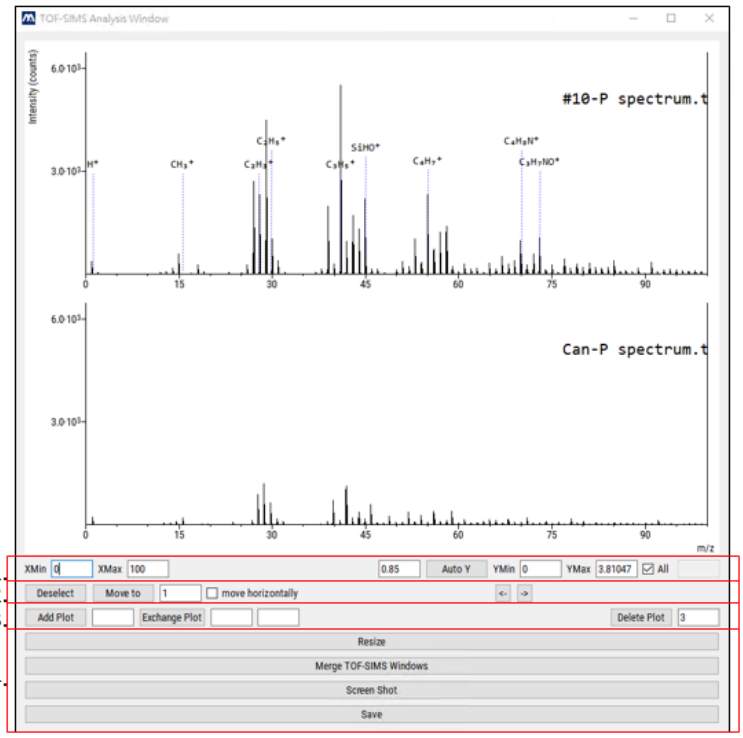

Figure 32: tof-sims data showed up in pop-up window

1.Axis Range can be adjusted.
XMin/XMax: Change X Axis Range.
YMin/YMax: Change Y Axis Range.
0.85 Auto Y: Let the highest value be at 0.85 of the Y Range.
All: Axis range renew will renew to all rows of plot, otherwise renew to certain plot.

2.Label can be selected by mouse, selected label is shown in blue.
Deselect: deselect all selected labels.
Move to 2: move selected label to the 2nd plot.
Move horizontally: if checked, move label in horizontal direction, otherwise in vertical direction.

3.Plot can be added / deleted / exchanged
Add Plot 2: Add one plot at the 2nd plot.
Exchange Plot 2, 5: exchange position of the 2nd plot and 5th plot.
Delete Plot 2: Delete the 2nd plot.
Resize: when plot is not show correctly, please press resize to do a reflash.

4.TOF-SIMS Windows can be merged.
Merge TOF-SIMS Windows: 2 TOF-SIMS Windows will be merged to 1.
Screen Shot: Plot can be screen shot and be saved.
Save: TOF-SIMS Window can be saved.

Plot Area

Elements are shown in plot area, left mouse button controls the plot area's range as well as element selection. Right mouse button controls the element attribute settings (e.g. color, redraw on Y1 or Y2….)

2.5 Control Plot Area

Plot area can be moved around by left mouse button's dragging. And it can also be zoomed in/out by rolling mouse wheel forward/backward.

2.6 Change Element Settings

To select an element, just use left mouse button click on the element (either in plot area or in the legend). After select an element, element will changed in selected color (e.g. blue). At this moment, right click the mouse button shows up a context menu that help users set element's related attributes (e.g. color, draw on Y1/Y2, show/hide…).

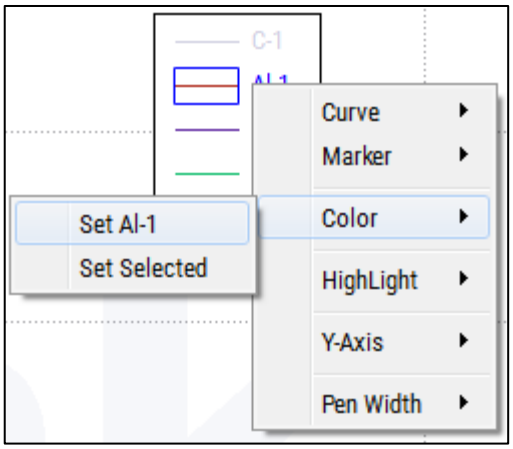

Figure 33: Change Element's color

(Note: If users want to make a batch of settings with multiple selections, just hold Key_CTRL and select the desired element one by one.)

3. Panel

Panel is located at the bottom of the SIMSvision window, is shows the information of an element if it is selected. It also shows the information of the plot area such as min/max range of each axis.

3.1 Curve Information

When an element is selected, the information of the element will be shown in Curve Information area. Be aware that when the element is set on Y2, the min/max value of the element will only be shown in Y2 min/max boxes.

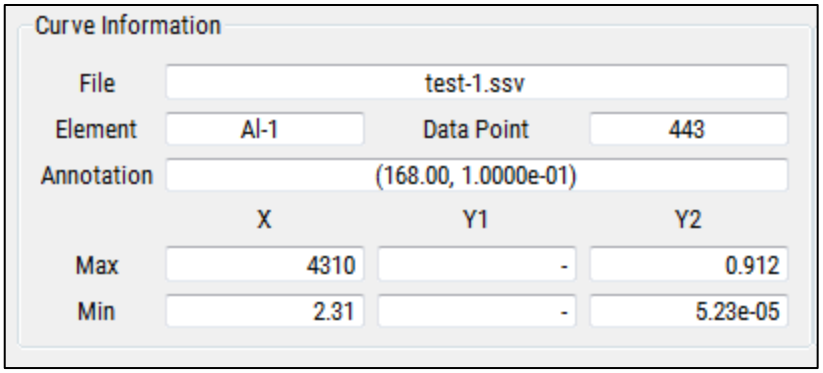

Figure 34: Curve Information

3.2 Axis Range

The range information will be shown in Axis Range area. Users can also set the desired range manually, just input the range and press Enter, please be aware that if user input an upper range smaller than lower range, the plot range may not change, and vice versa.

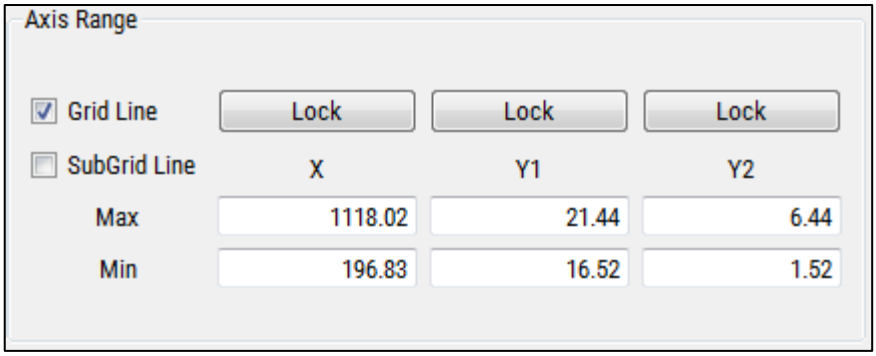

Figure 35: Axis Range

If users press any one of the Lock Buttons, the corresponding axis is locked by user, which means it will not be moved by mouse dragging. To unlock it, just press the corresponding Lock Button again.

4. Appendix

4.1 Short Cut

General

[F5]: adjust range to fit all curves
[Esc]: cancel all selection
[Alt + F4]: close SIMSvision
[Ctrl +o]: open new files

Curves(Elements):

[Ctrl + s] / [Ctrl + h]: show/hide all curves
When a curve is selected:
[s] / [h]: show/hide single selected curve
[SHIFT + s] / [SHIFT + h]: show/hide curves with same element name
[Ctrl + mouse click in the legend element]: selected multiple curves
After multiple curves are selected:
[ALT + s] / [ALT + h]: show/hide selected curves

Reference Lines

[v]: add vertical reference line
[q]: add horizon reference line on Y1
[p]: add horizon reference line on Y2
[y]: set curves to Y1, Y2 automatically
When 2 vertical reference lines are selected
[+]: add new vertical line with same gap on the right
[-]: add new vertical line with same gap on the left

Window & Panel

[f]: enter/exit full screen
[d]: show/hide bottom panel

4.2 Labels

Analysis Window can be shown by double click on a label
(for labels saved by SIMSvision v10.6.x).
Labels can be aligned by [Tool] > [Labels] > [Align]
Labels can be exported by [Tool] > [Labels] > [Export]