

How to use Wscnt : Contour drawing program

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1. Preparation before use

1. Status at the time of distribution

Ws_soft — Wsems —————
 └── Samples — 230601-cnt&mnt

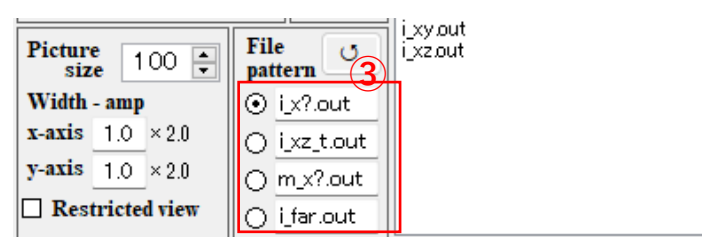
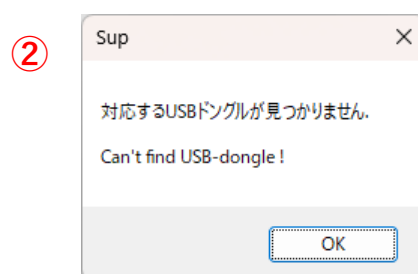
Included files

Wscnt.exe , Sup.exe
 i_xz.out, i_xz_t.out , i_xy.out, m_xz.out , m_xy.out, i_far.out

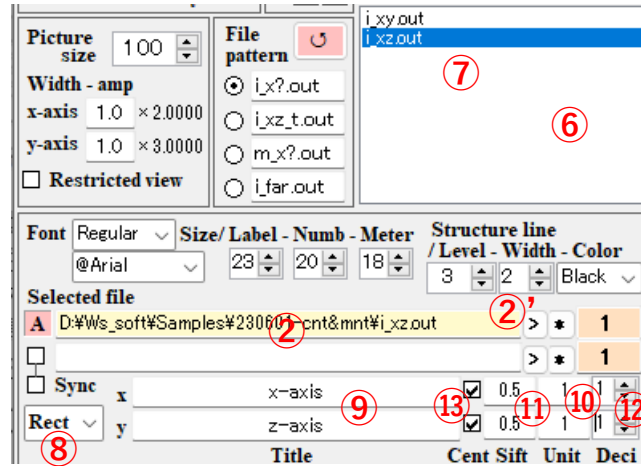
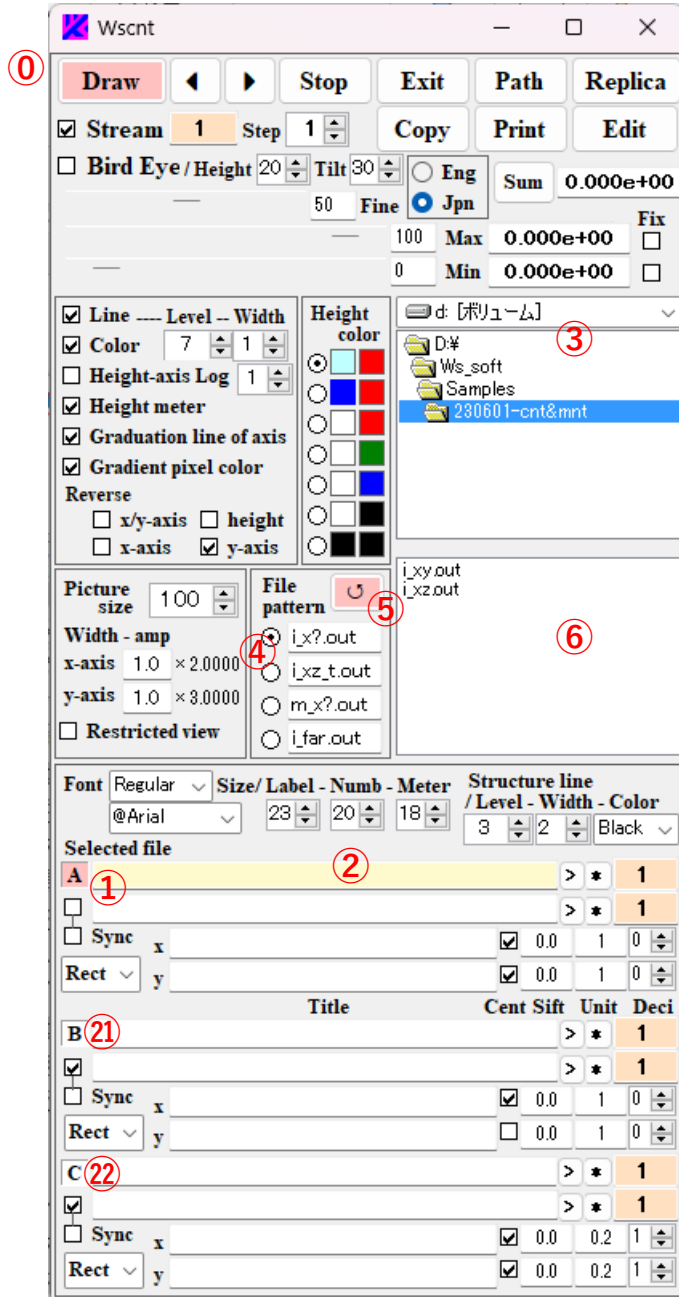
(note) Sup.exe is a file for determining registration, which should be stored in the same folder Wsems as other exe files.

2. Restriction on use

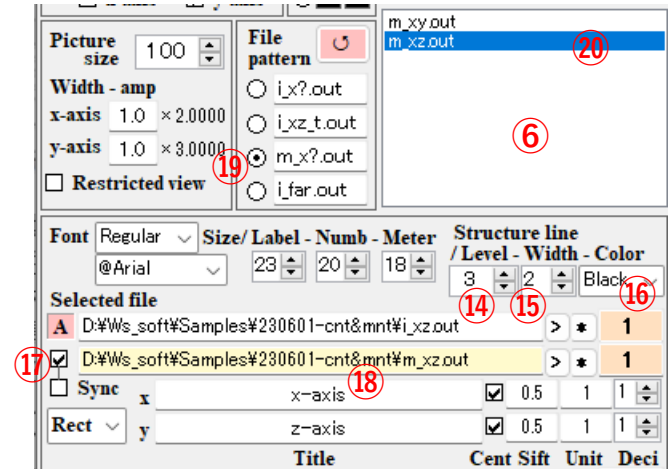
- If a registered USB dongle is connected (or MAC address is registered) and the corresponding sup.exe is installed in the folder “Wsems”, calculation starts without any function restrictions.
- If the sup.exe included in the folder “Wsems” does not correspond to the registered USD dongle or registered MAC address, the message ① is displayed for 5 seconds. If the USB dongle is not connected, the message ② is displayed for 5 seconds. Drawable files are restricted to the patterns shown in ③, and don't include the types of files, *.ot?, which are output by Wsbch.exe.



2. Specifying a drawing file and setting axis conditions



Click wscnt.exe and set it to run. After the window ① appears, click button A ① or box ② to change the background color of ① to pink or of ② to yellow. Select a drive or directory from list box ③ and edit and select a file pattern ④. Click the ↻ button ⑤ to reflect the file pattern changes in the file list ⑥, and select a file ⑦ from that, the path and file name are listed in the box ②. If the path name is long and extends beyond the box, it can be slid by clicking the > button ②'. In box ⑧, select the axis type, "Rect" (rectangular coordinates). Enter the axis title in box ⑨, axis unit in box ⑩, axis shift length in box ⑪, and the number of decimal places for the axis unit in box ⑫. A black check mark is filled in the box ⑬ by clicking it, while a gray check mark is filled by right-clicking. If the box is unchecked, the axis is referred to the lower (or left) axis intersection, if the box is checked black, the axis is referred to the axis center, and if the box is checked gray, the axis value is referred to the upper (or right) axis intersection.



To add a structural boundary, after selection of the number of division levels, line width, and line color at ⑭, ⑮, and ⑯, check box ⑰ and click box ⑱ to change its background to yellow. The path and file name are listed in the box ⑱ by selecting the file pattern ⑲ and the file ⑳ from the file list ⑥. The number of division levels ⑭ should be set to the number of materials used in the optical calculations. The operations of the buttons B ㉑ and C ㉒ are the same as above and the file whose background color of the buttons is pink is used for the drawing. Right-clicking the file name listed in the box ② or ⑱ aligns the boxes ③ and ⑥ to the path of the file. Double-clicking on boxes ② and ⑱ erases the box contents and changes the background color to yellow. The box with yellow background color is the target of path and file name to be inputted.

3. Displaying a contour Image

The screenshot shows the Wscnt software interface. On the left is a control panel with various settings. At the top, there are buttons for Draw (1), Stop, Exit (22), Path, and Replica. Below these are checkboxes for Stream (1), Bird Eye/Height (20), and other options. The main plot area (2) displays a contour plot with a color scale on the right. The plot has axes labeled x-axis and z-axis. A structural boundary line (3) is overlaid on the contour plot. The plot shows a central peak with a color gradient from blue to red. The axes are labeled with values: x-axis from -1 to 1, and z-axis from -1 to 1. The plot area also displays 'max 5.551e+0' and 'min 5.460e-3' in the upper left corner. The control panel includes sections for Line (Level, Width, Height, Color), Height-axis Log, Height meter, Graduation line of axis, Gradient pixel color, Picture size, File pattern, Font, Size/Label-Numb-Meter, Structure line, and Selected file. The 'Selected file' section shows a list of files with checkboxes and buttons for Sync, Rect, and other actions.

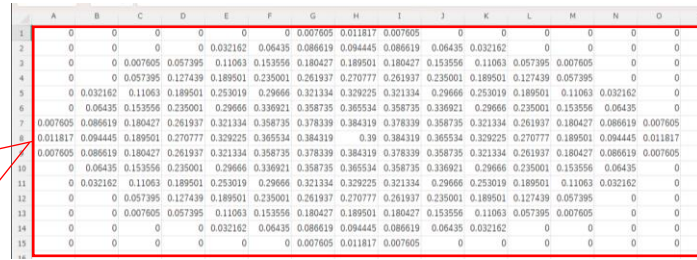
The screenshot shows an 'Edit' dialog box with a 'Return' button and a text input field. Below the input field are 'Clear', 'Save', and 'Copy' buttons. The input field contains the text '0 0 1.0 1.0 0 0'.

The screenshot shows a window titled 'Picture A-1' displaying a zoomed-in view of the contour plot. The plot shows a central peak with a color gradient from blue to red. The axes are labeled with values: x-axis from -1 to 1, and z-axis from -1 to 1. The plot area also displays 'max 5.551e+0' and 'min 5.460e-3' in the upper left corner. A color scale is visible on the right side of the plot.

Clicking the Draw button ① displays the contour line image ② with structural boundary lines ③. The number of division levels, thickness, and color of the structural contour lines can be specified with the boxes ④. The sizes of axis labels are set by ⑤, the scales of axis numbers are by ⑥, the label sizes of “Max” and “Min” in the upper left corner of the image are set by ⑦, and their font and style can be set by ⑧ and ⑨. Checking boxes ⑩, ⑪, and ⑫ set whether the height meter, scale lines, and contour lines are displayed or not. Box ⑬ means the number of contour levels (the number of divisions between the maximum value “Max” and the minimum value “Min”). “Max” and “Min” for the image data are displayed in box ⑭ and at the upper left corner of the figure. ⑮ is a scroll bar for image definition. The larger the value, the higher the definition and the slower the imaging speed, so about 50 is preferred as a scroll value on the right box. Scroll bars ⑯ and ⑰ determine the level of contour color for the largest and smallest sides, respectively, and their scroll values are displayed on the right. The clipboard copying by ⑱, printing by ⑲ and duplication of images are done by ⑳. Click the Exit button ㉑ to exit the program.

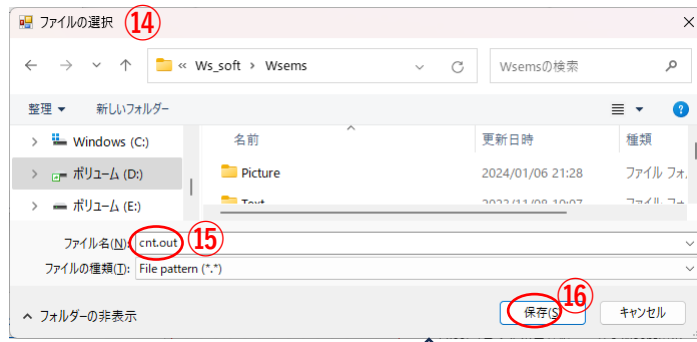
4. How to use edit contour data

To convert a contour data of Excel file to drawing data for Wscnt, copy the contour data and paste it to the left box of the edit window like ①. By setting the values of boxes ② for widths of x, y directions and by clicking the button ③, the pasted data are converted to space-separated, numerical lines and are displayed in the right box of the edit window with an added 1st line ⑤ like ④. The 1st line is 6 alignments of 10 column value including row number, line number, and widths of x, y directions, numerical lines and are added to the bottom of the preceding data in the right box of the edit window with an added 1st line like ⑩. If you want to delete a contour data, click the 1st line ⑪ of the data to change the back color of the target data to an orange color, and click the button ⑫ to delete the part of discoloration.

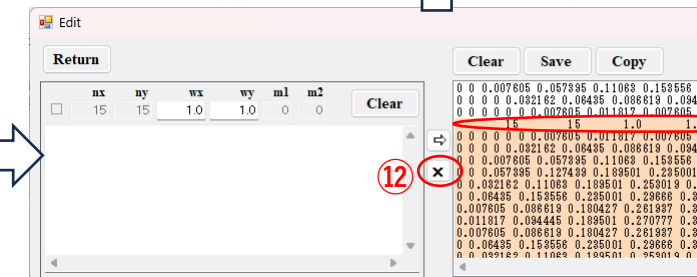
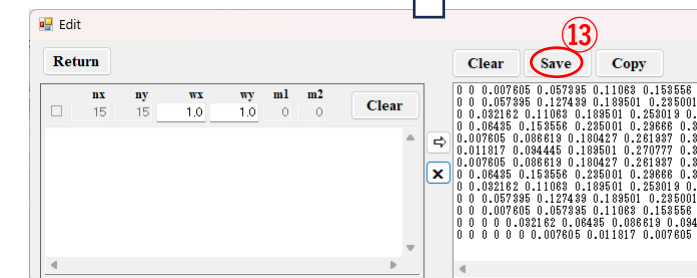
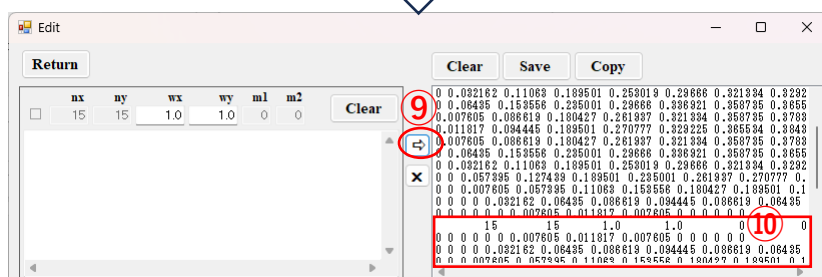
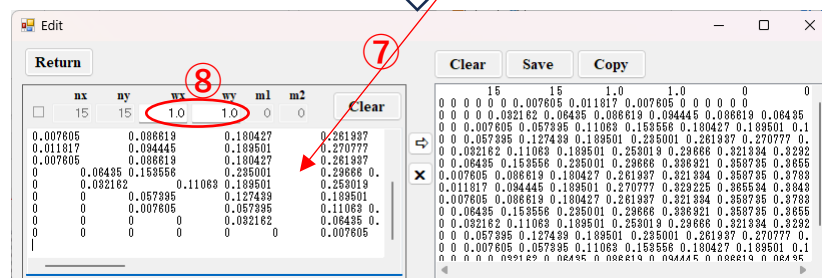
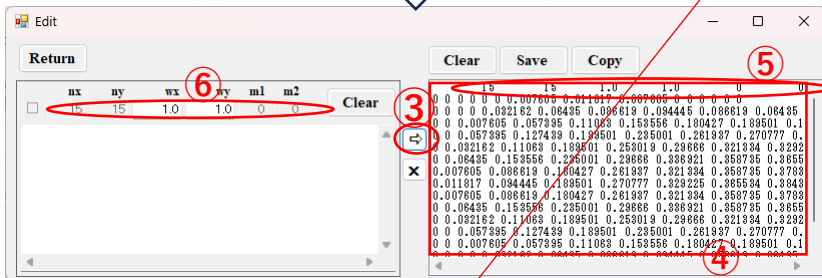
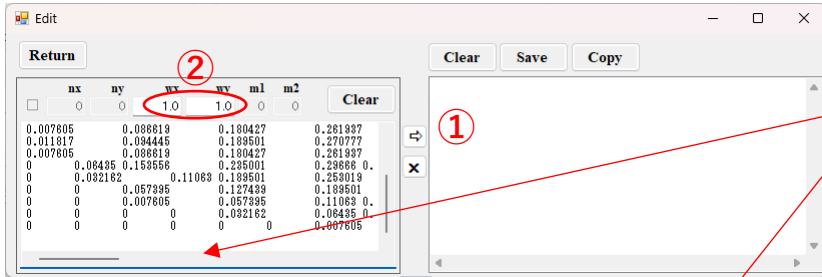


sub_data.xlsx (a contour data of Excel file)

sub_data.xlsx (a contour data of Excel file)



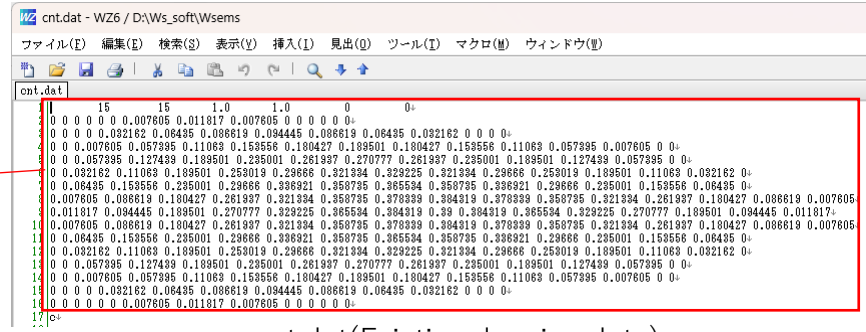
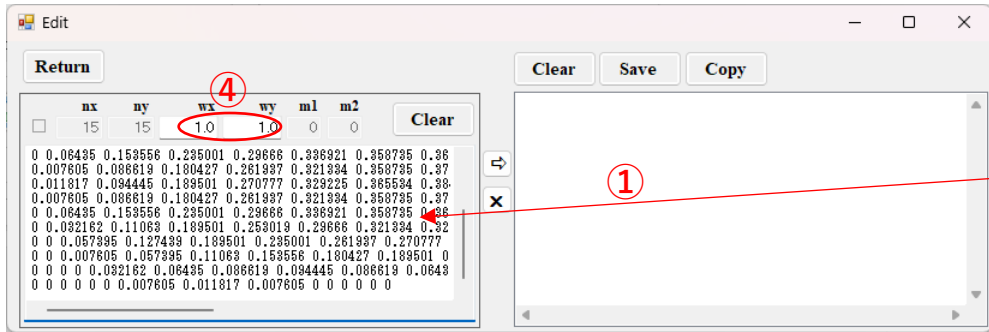
cont.out



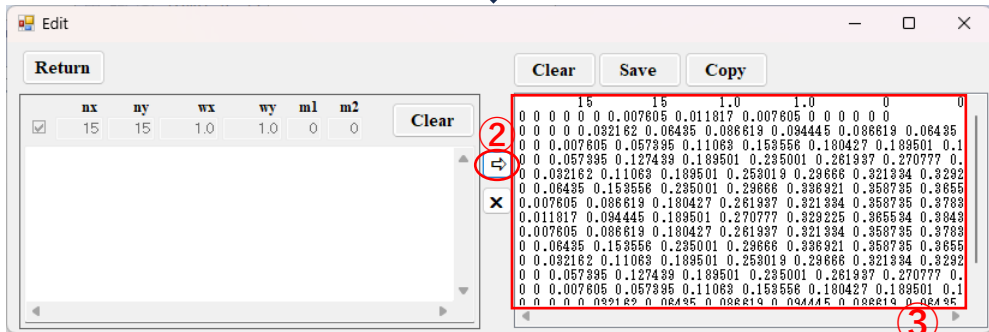
numerical lines and are added to the bottom of the preceding data in the right box of the edit window with an added 1st line like ⑩. If you want to delete a contour data, click the 1st line ⑪ of the data to change the back color of the target data to an orange color, and click the button ⑫ to delete the part of discoloration.

Click the button ⑬ to display a file selection window ⑭. Type a file name ⑮ and click the button ⑯ to save the converted data to the drawing data for Wscnt. Such data as i_xz.out, i_xz_t.out, generated by Wsf or so, are drawing data for Wscnt.

5. How to edit existing contour data

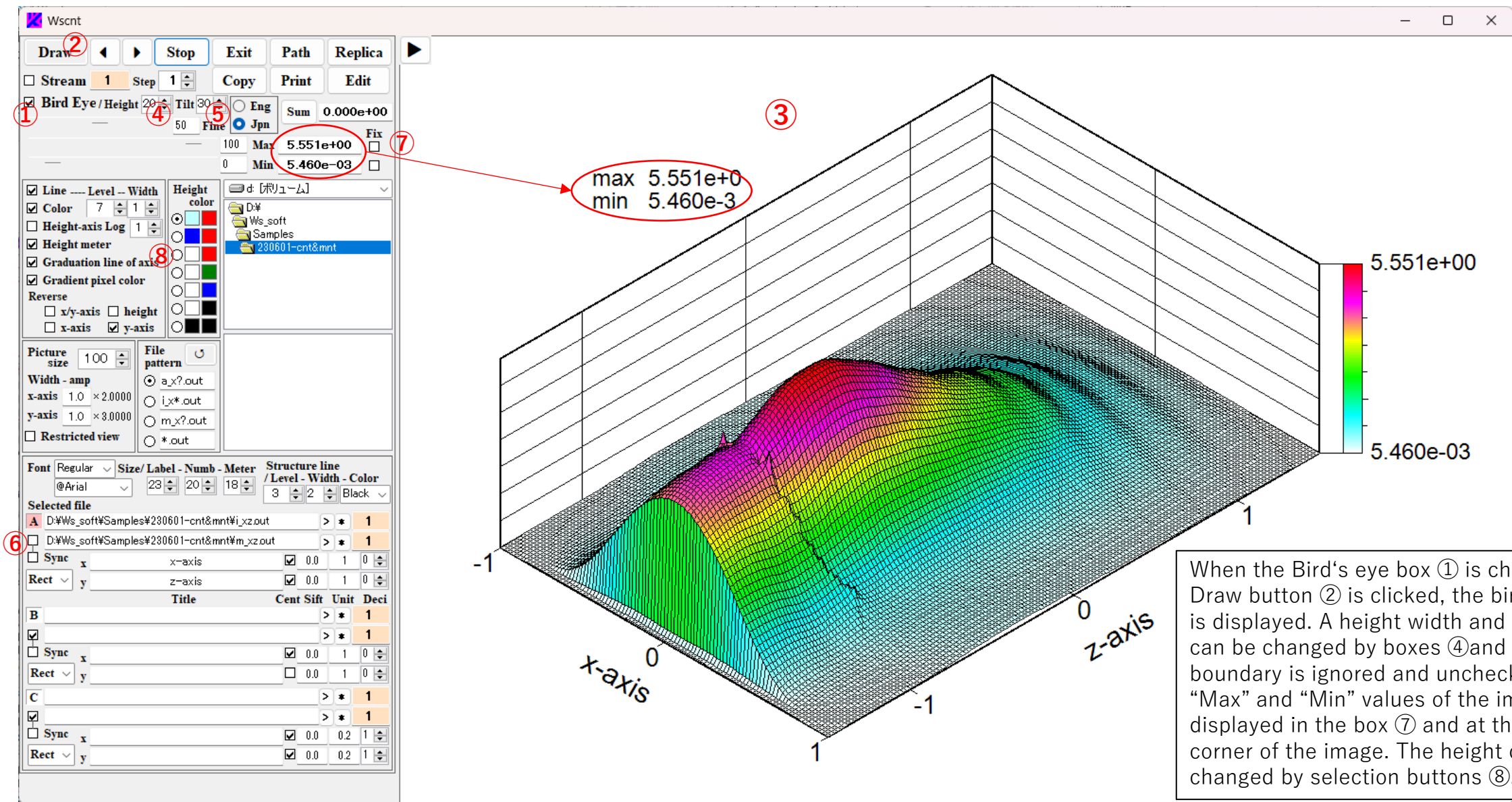


cnt.dat(Existing drawing data)

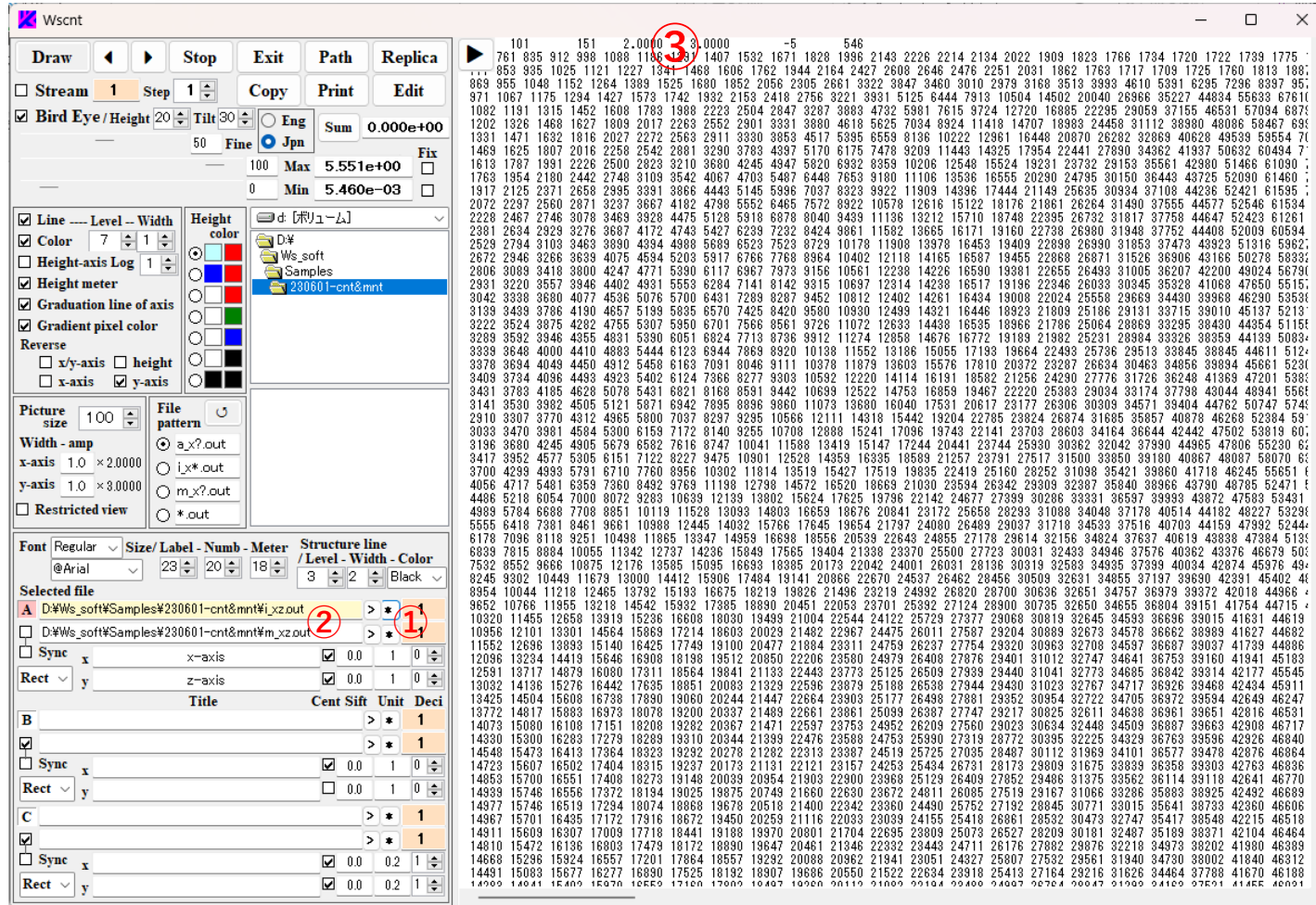


To edit existing drawing data for Wscnt, copy the data and paste it to the left box of the edit window like ①. Click the button ② to display the drawing data at the right box of the edit window like ③. In this case, setting the values of boxes ④ for widths of x, y directions is non-functional because the pasted data have already included the 1st line.

6. Displaying a bird's-eye view image



7. Displaying a file content



Click the * button ① in the right of the box ② to display the contents of the file ③ listed in the box ②

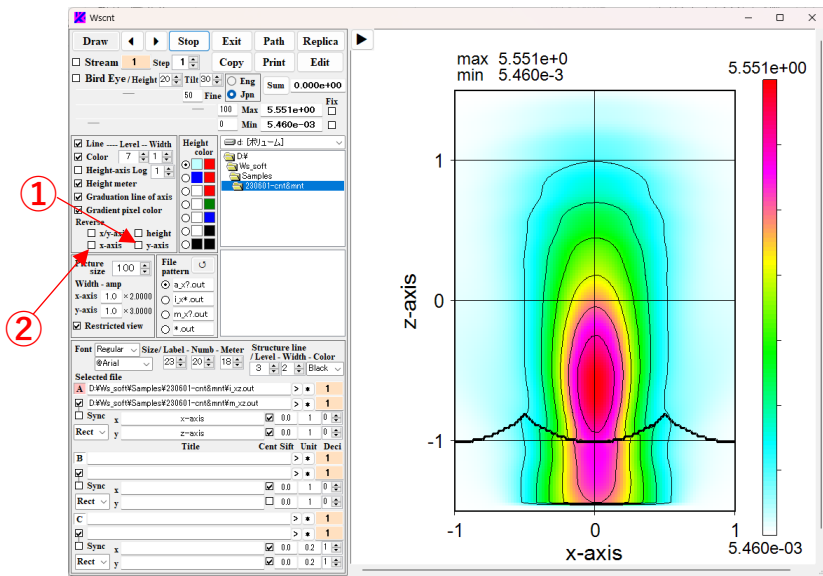
8. Stretching and shrinking an image

The image displays the Wscnt software interface with several key elements and annotations:

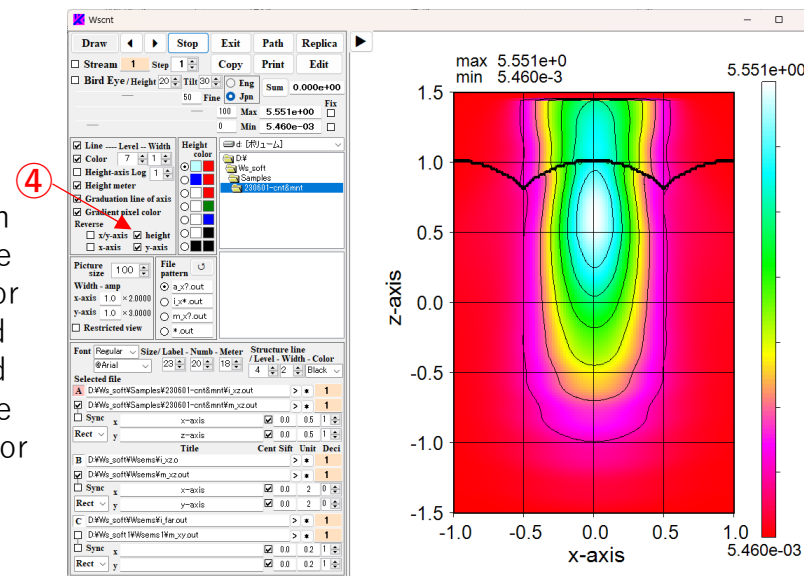
- Annotation 1:** Points to the "Width - amp" field in the "Picture size" section, which is set to 1.5.
- Annotation 2:** Points to the "Draw" button in the top toolbar.
- Annotation 3:** Points to the main contour plot window, which shows a color-coded topographic map with a vertical z-axis and a horizontal x-axis. The plot is titled with "max 5.551e+0" and "min 5.460e-3".
- Annotation 4:** Points to the "Picture size" field in the software's settings, which is set to 200.
- Annotation 5:** Points to a zoomed-in view of the contour plot, showing the vertical z-axis and the horizontal x-axis. The plot is titled with "max 5.551e+0" and "min 5.460e-3".
- Annotation 6:** Points to the "Restricted view" checkbox in the software's settings, which is checked.

If the box value ① under "Amp" is changed and the Draw button ② is clicked, the image is displayed with the horizontal (or vertical) scale expanded or contracted as shown in ③. If the box ⑥ is checked, the drawing range is restricted with keeping the scale ratio, and the drawing panel can be scrolled vertically or horizontally to show any position of the stretched or shrunken image.

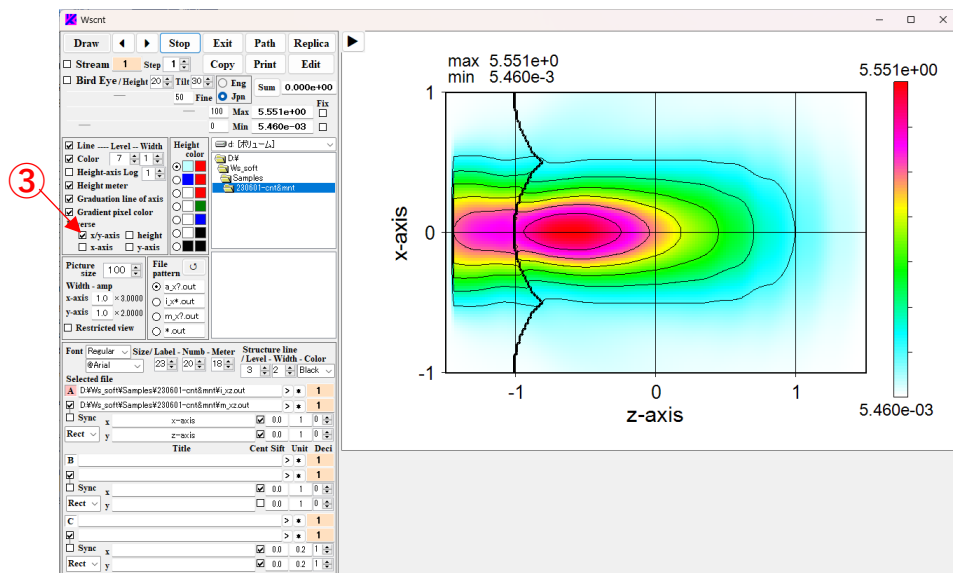
9. Displaying an image inverted vertically and horizontally, displaying contour lines



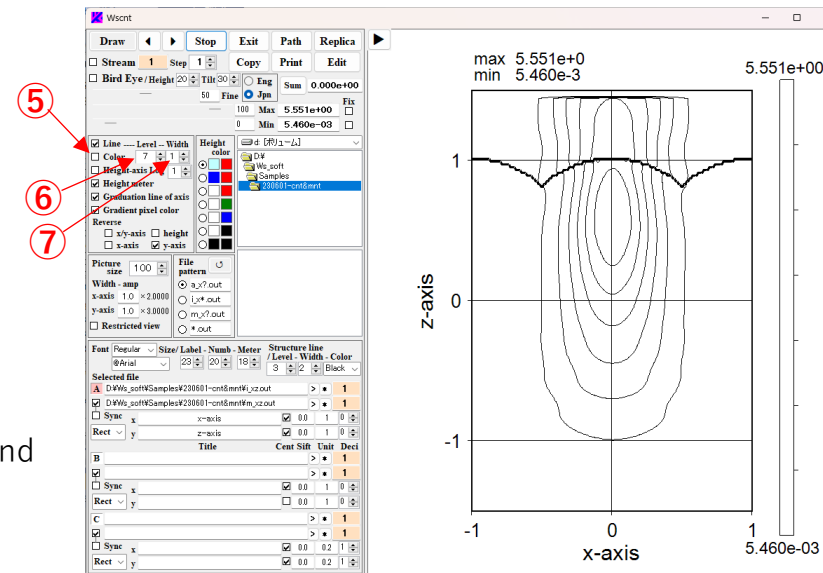
The image is upside down depending on whether the y-axis box ① is checked or not. Likewise, the left and right buttons are reversed depending on whether the x-axis box ② is checked or unchecked.



Checking the height box ④ reverses height-axis (or contour axis).

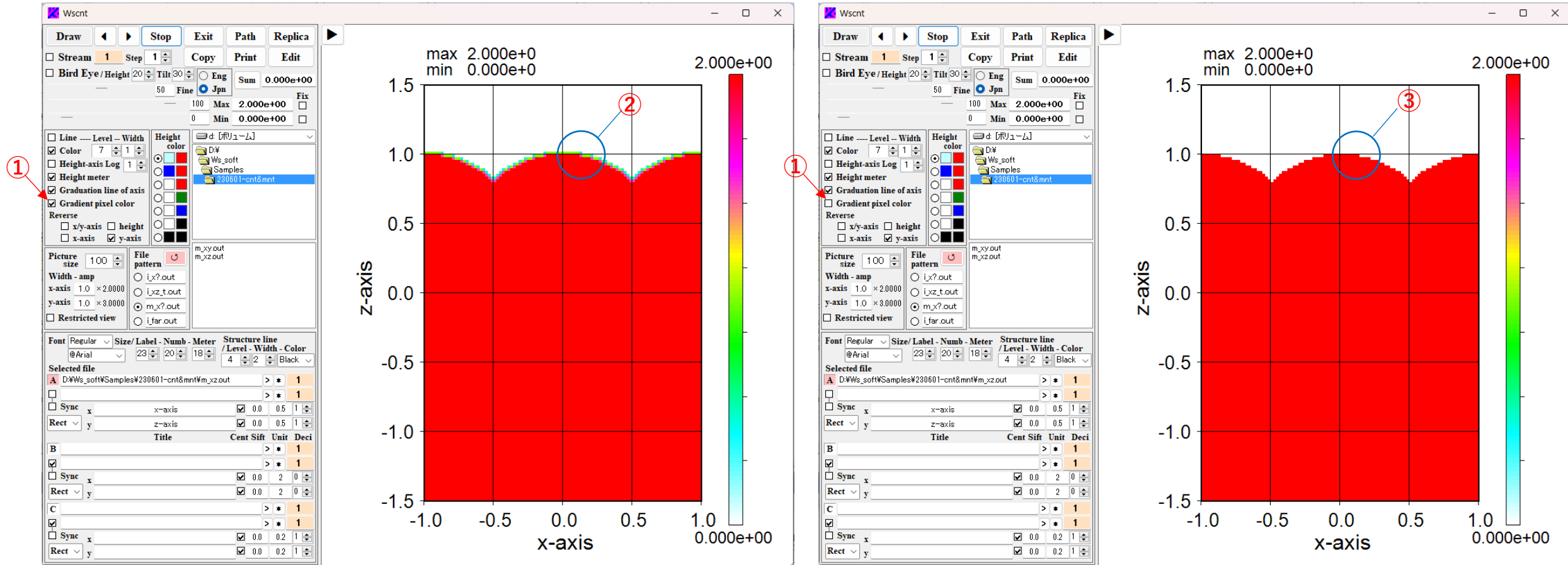


Checking the x/y_axis box ③ reverses x-axis and y-axis (or a horizontal axis and a vertical axis).



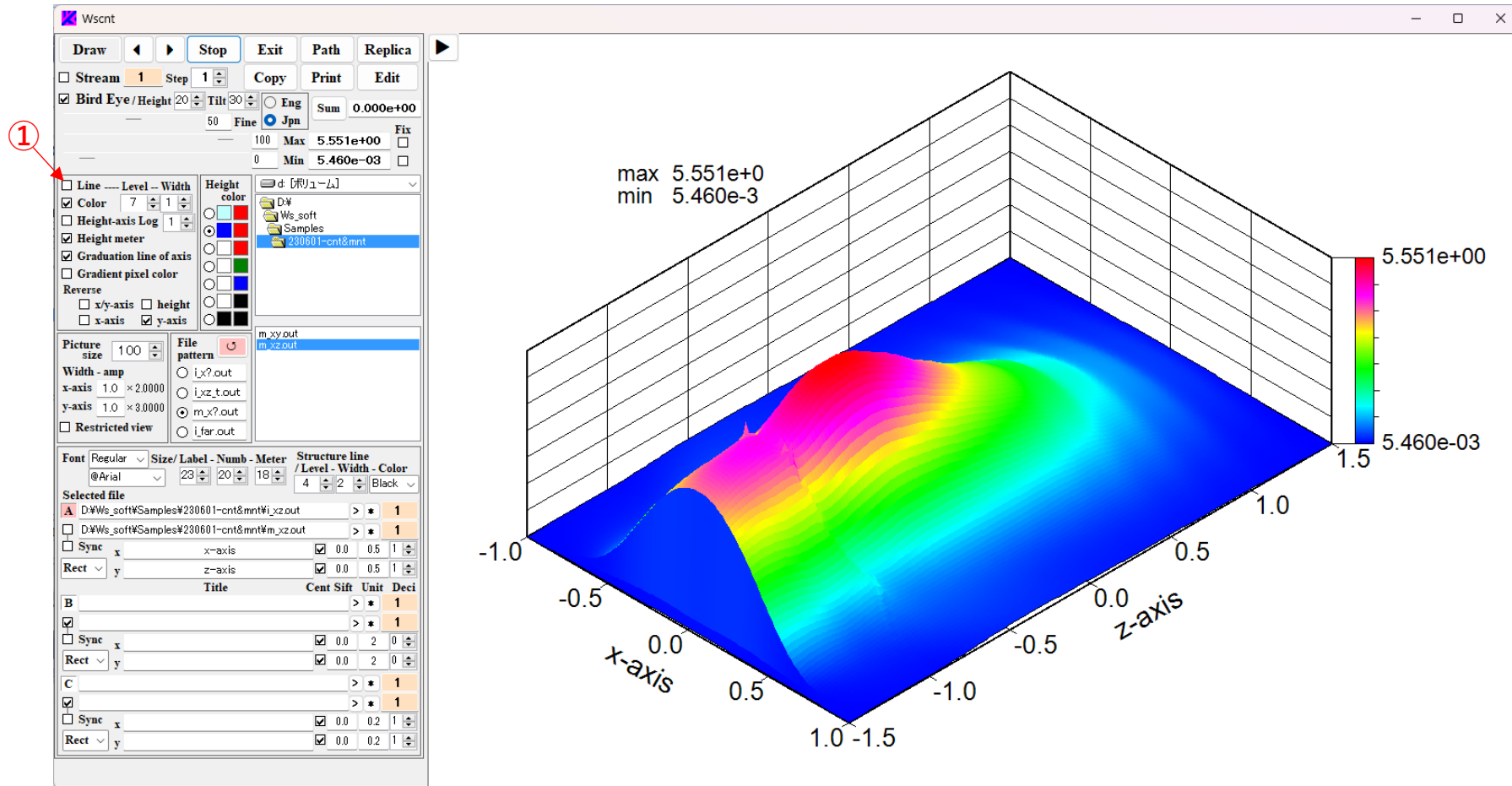
Checking the Color box ⑤ removes contour colors and draws only contour lines. The number and width of contour lines are specified by the values in boxes ⑥ and ⑦.

10. Selection of pixel representation methods



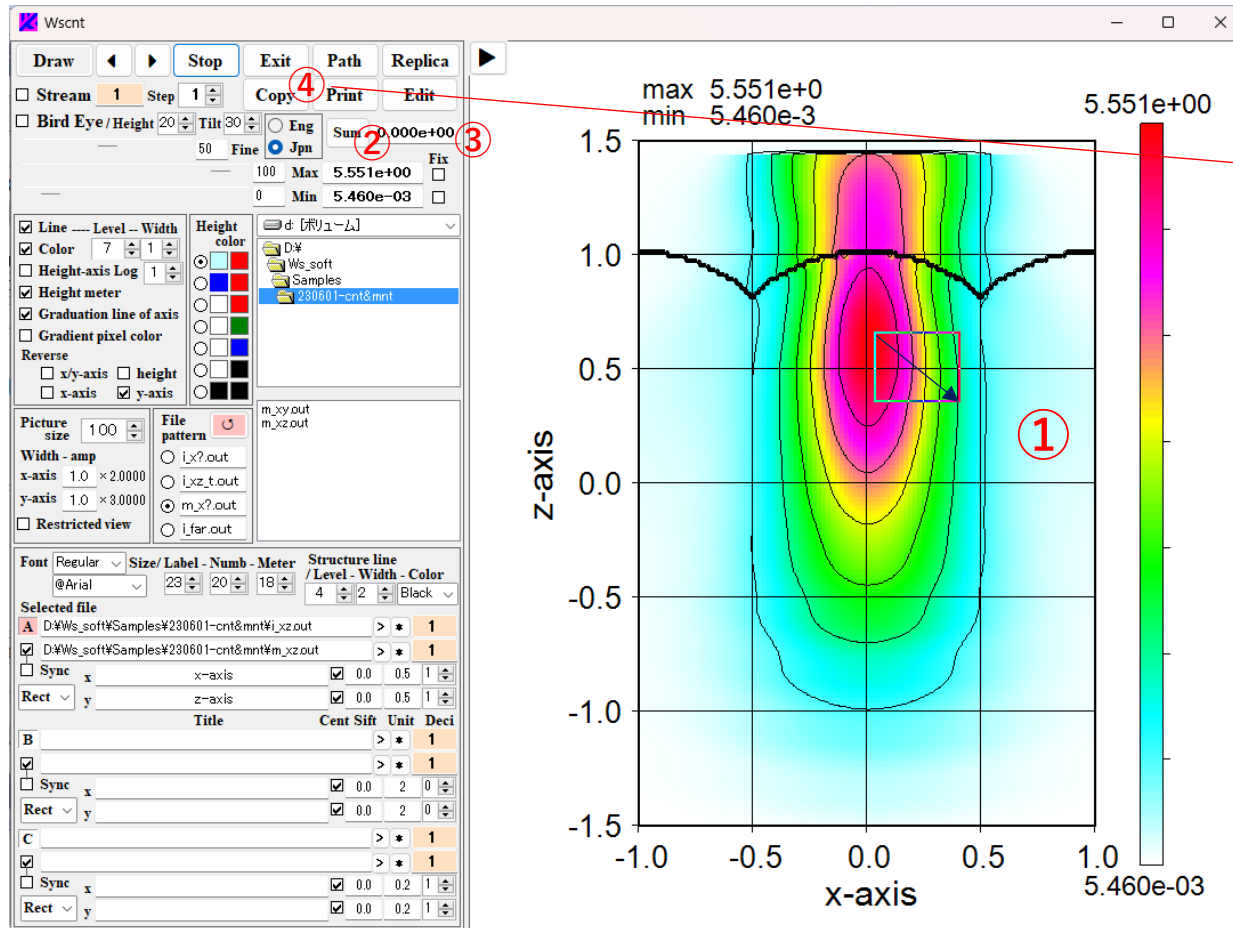
- Check box ① → Boundary pixels are equalized with surrounding pixels as shown in ②.
 Uncheck box ① → Boundary pixels are not equalized with surrounding pixels as shown in ③.

12. Bird's-eye view without wire frames



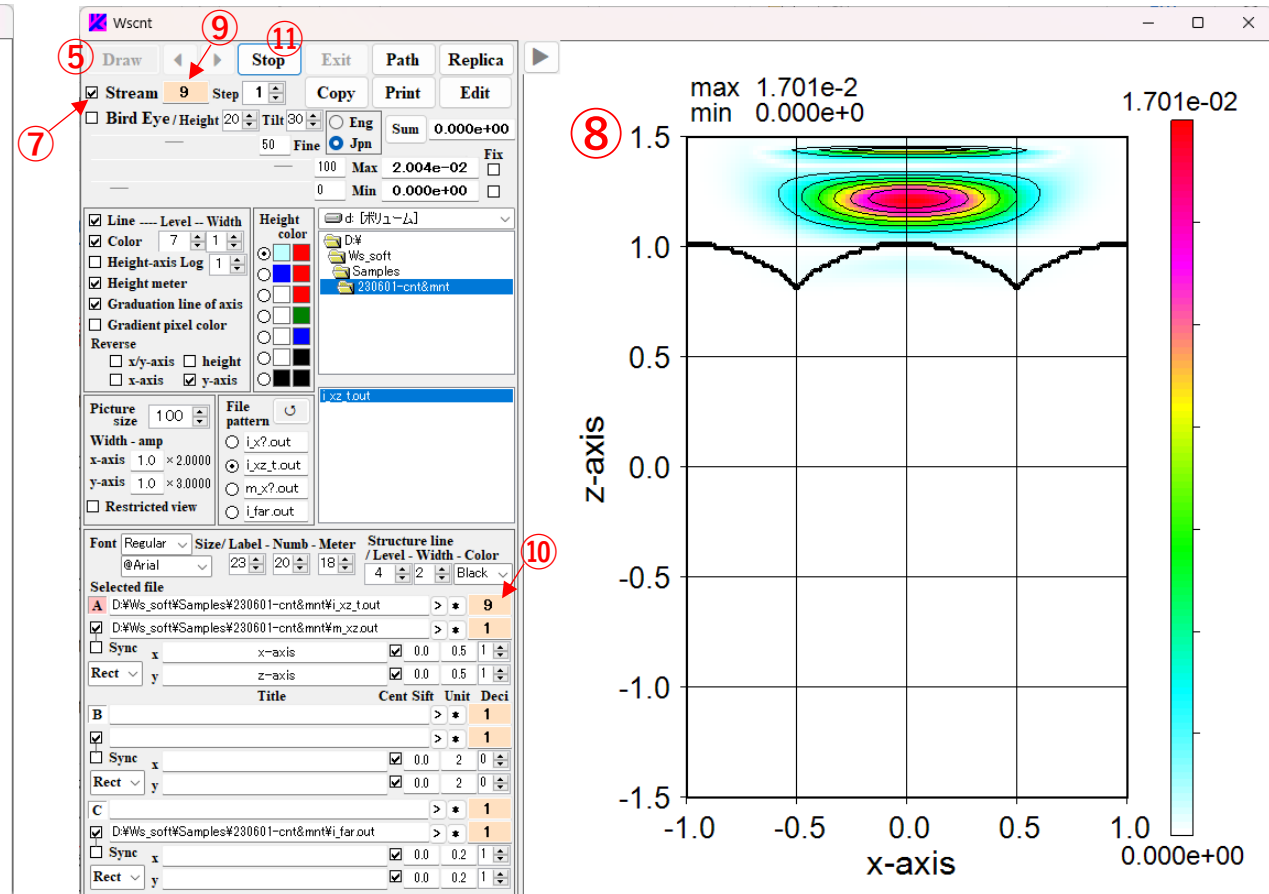
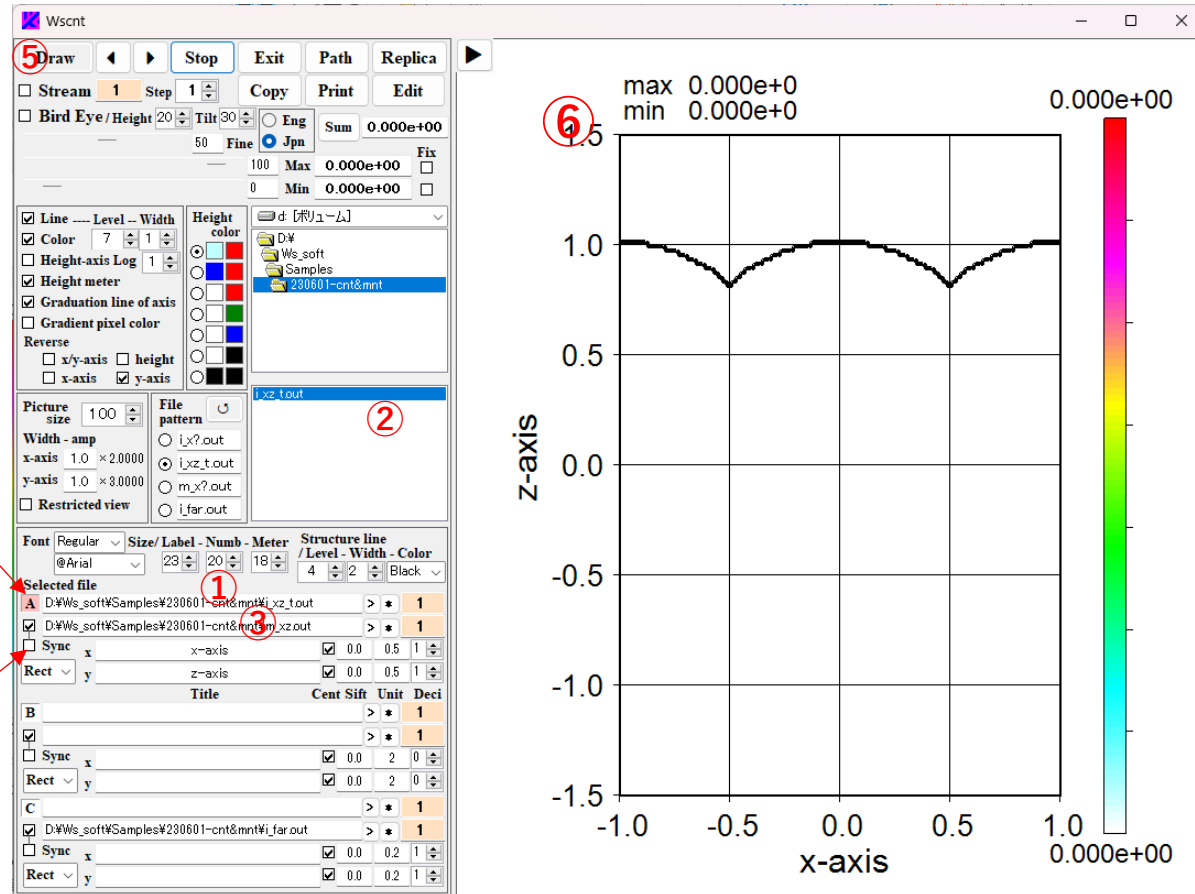
Uncheck the Line level box ① to draw only contour colors without wire frames.

13. Summation inside a specified area, trimming an image



Drop down and up to specify a part of the image as shown ①. If the Sum button ② is clicked, the summation of intensity distribution for the area ① is shown in the box ③ (this does not work in Bird's eye view). If the Copy button ④ is clicked, the specified area ① of the image is cut out and copied to the clipboard as shown in ⑤. If the Sum button ② is clicked with specifying no area, the sum for the entire area is shown in ③. Similarly, if the Copy button ④ is clicked, the entire area is copied to the clipboard.

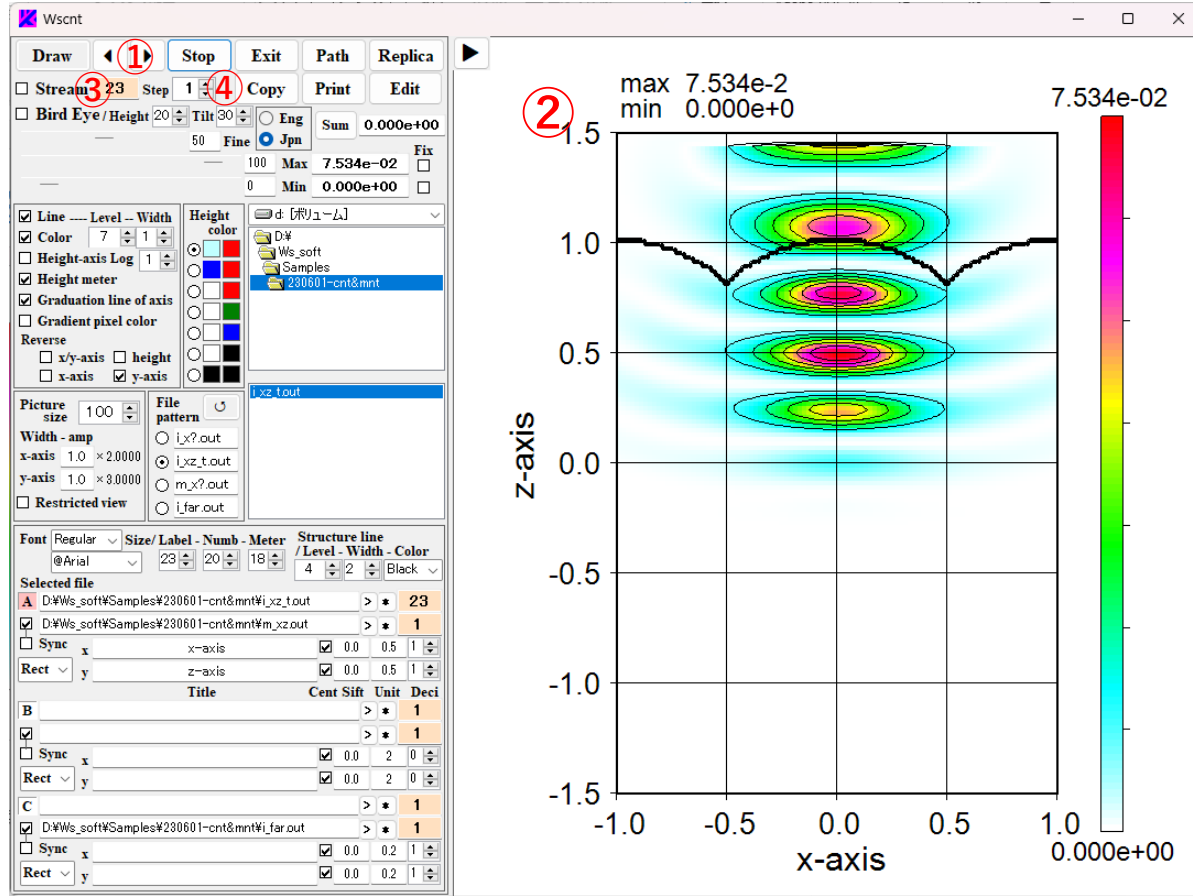
14. Displaying continuous images



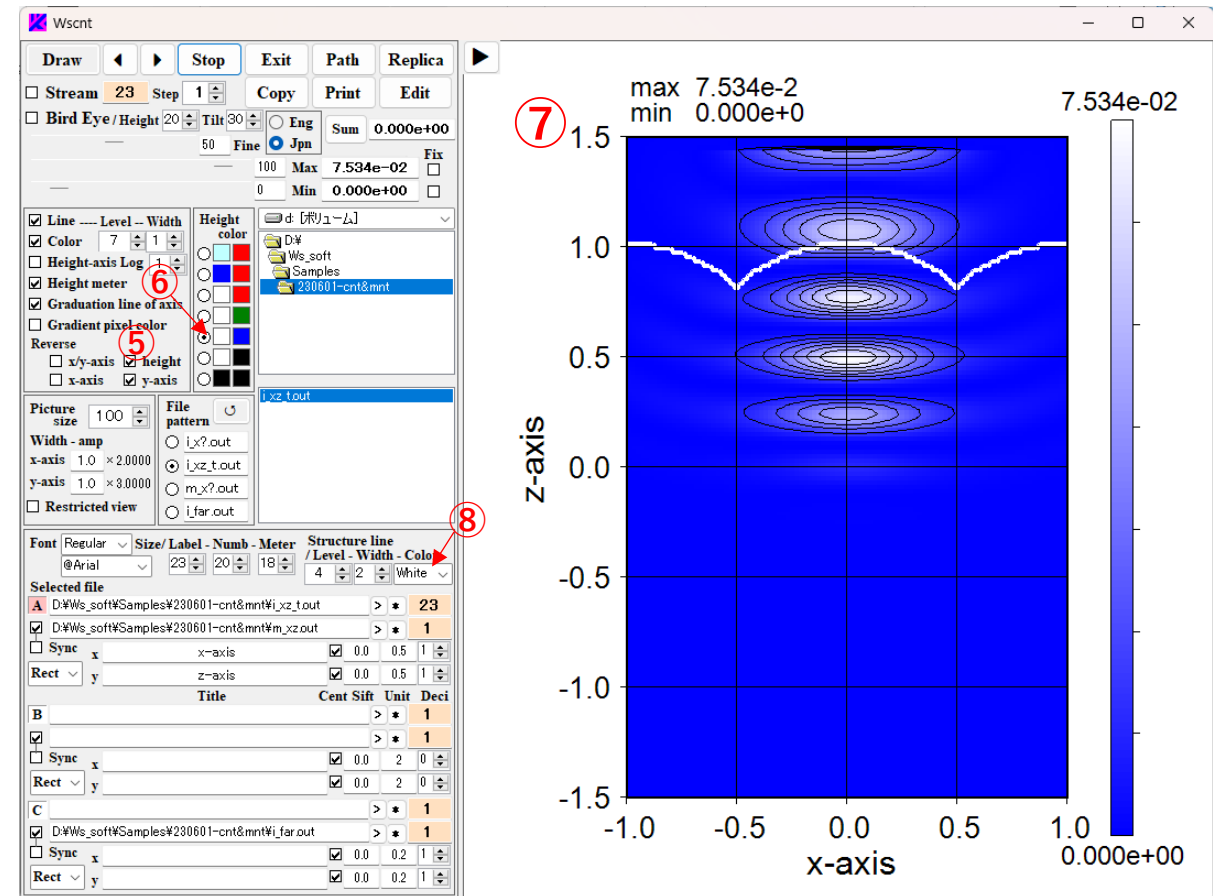
Click button A ① to select file ② (i_xz_t.out) in box ① and switch the file pattern to m_x?.out and select structural data (m_xz.out) in box ③. The Sync box ④ should be unchecked because m_xz.out is a single-shot data whereas i_xz_t.out is a continuous data in time sequence. Click the Draw button ⑤ to display the first contour image ⑥ with structural boundaries (the counter image does not appear because the first intensity distribution is zero).

When the Stream button ⑦ is checked and the Draw button ⑤ is clicked, the contour image ⑧ is continuously rewritten up to the final data, and the order of the displayed images is reflected in the boxes ⑨ and ⑩. By the way, if the drawing data is a combination of i_xy.out and m_xy.out which both are continuous data stacked synchronously, the sync button ④ should be checked at the time of drawing.

15. Setting contour colors in displaying continuous images

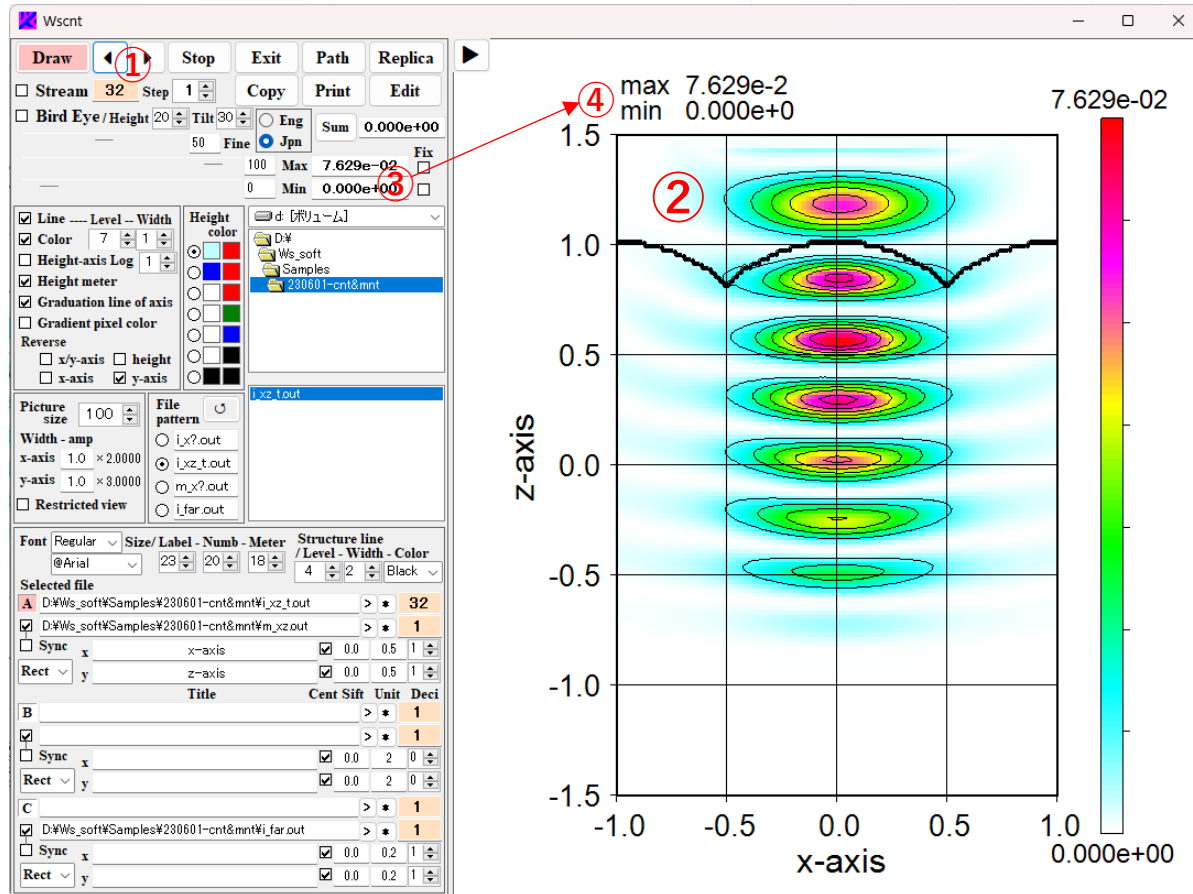


By clicking the ◀ or ▶ button ①, order ③ of the sequential images ② moves back and forth. An order spacing can be set with button ④.

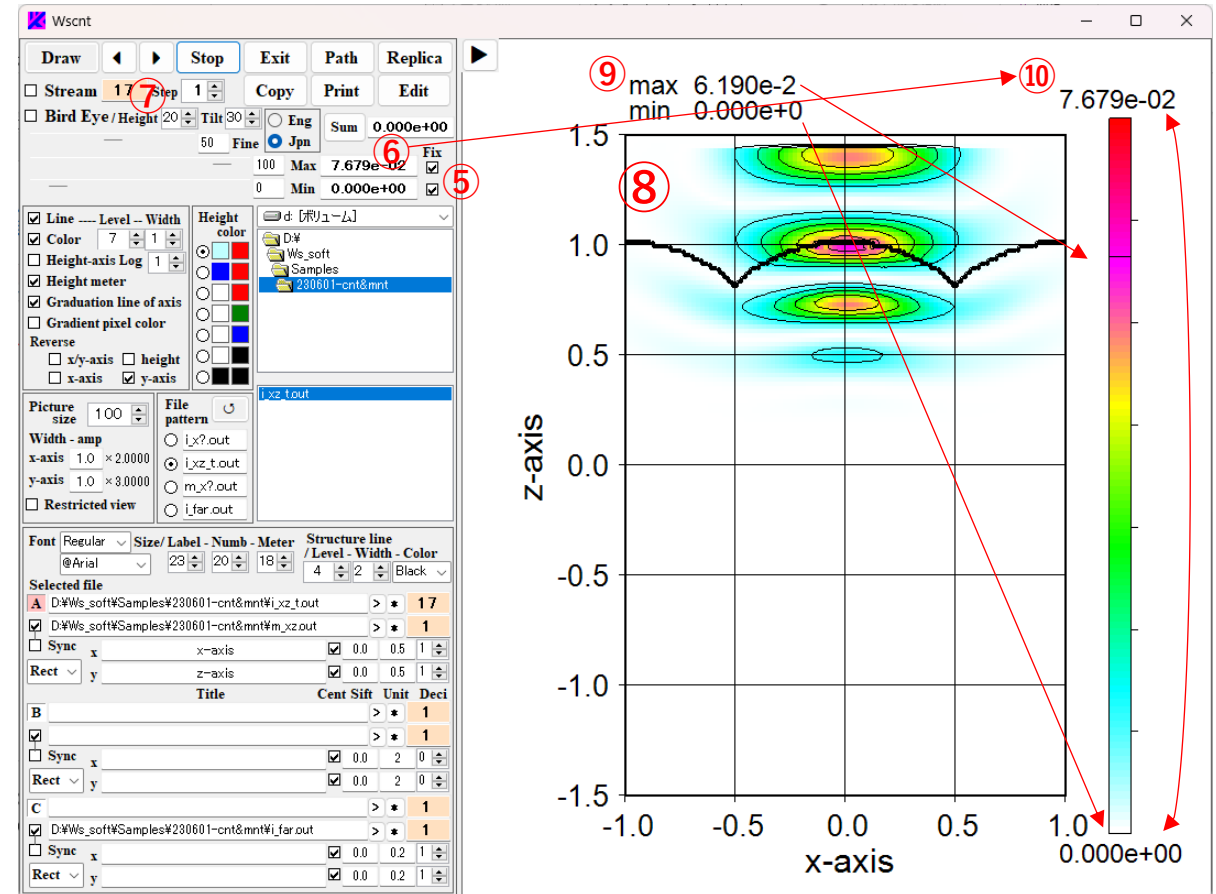


Checking height box ⑤ inverts height relation for contour colors. Clicking on the color selection button ⑥ changes the color pattern as shown in the image ⑦. The color of the structural boundary line is changed by selection of box ⑧.

16. Maximum and minimum values in displaying continuous images

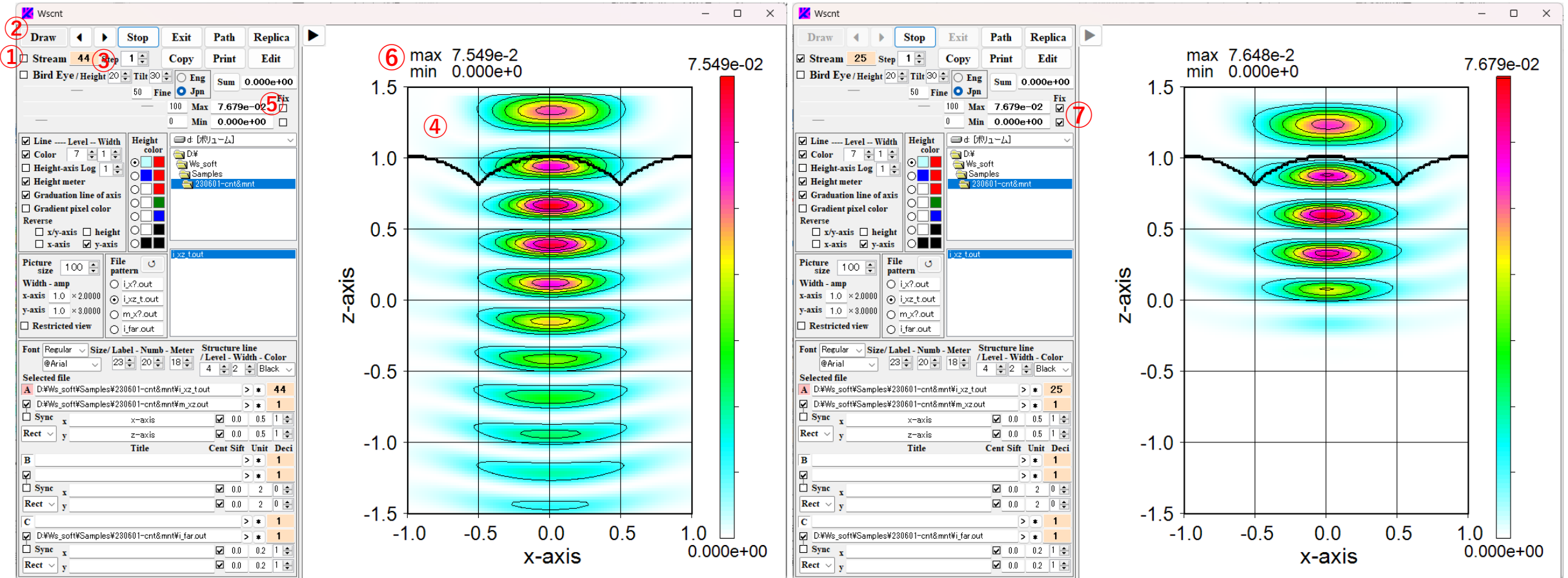


When a contour image ② for drawing order ① is displayed, its maximum and minimum values (called “Local value”) are shown in a box ③, and the same values are also listed in the upper left corner ④ of the drawn picture.



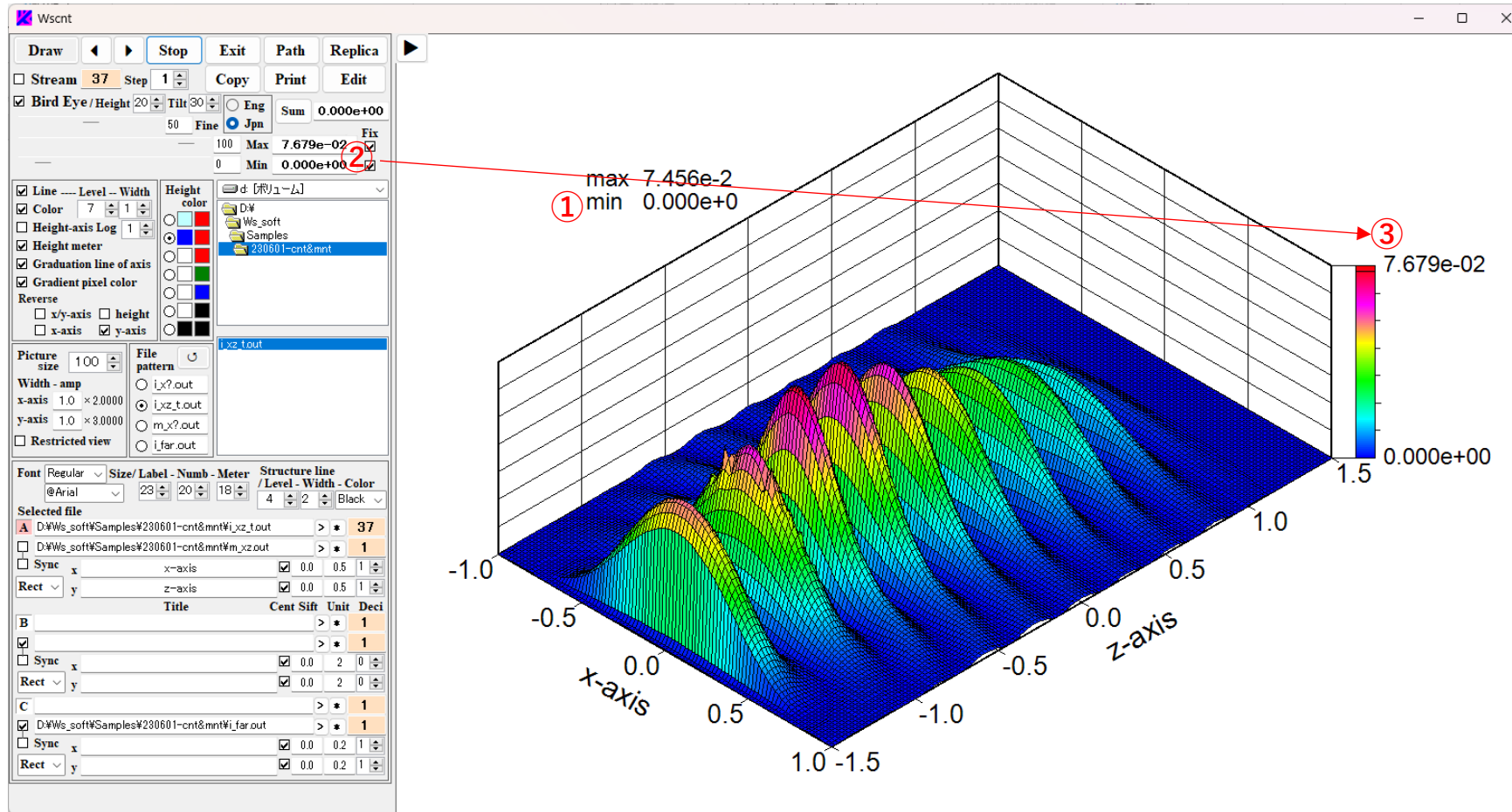
When the Fix box ⑤ is checked, the maximum or minimum value ⑥ is fixed. If the drawing order ⑦ of the continuous data is changed, a contour image ⑧ for fixed color levels (called “Global value”) is displayed. In a height meter on the right of the figure, the Global values are indicated by the top and bottom edges, and the Local values are indicated by a black horizontal line.

17. Animated operation and unification of intensity scale in displaying continuous images



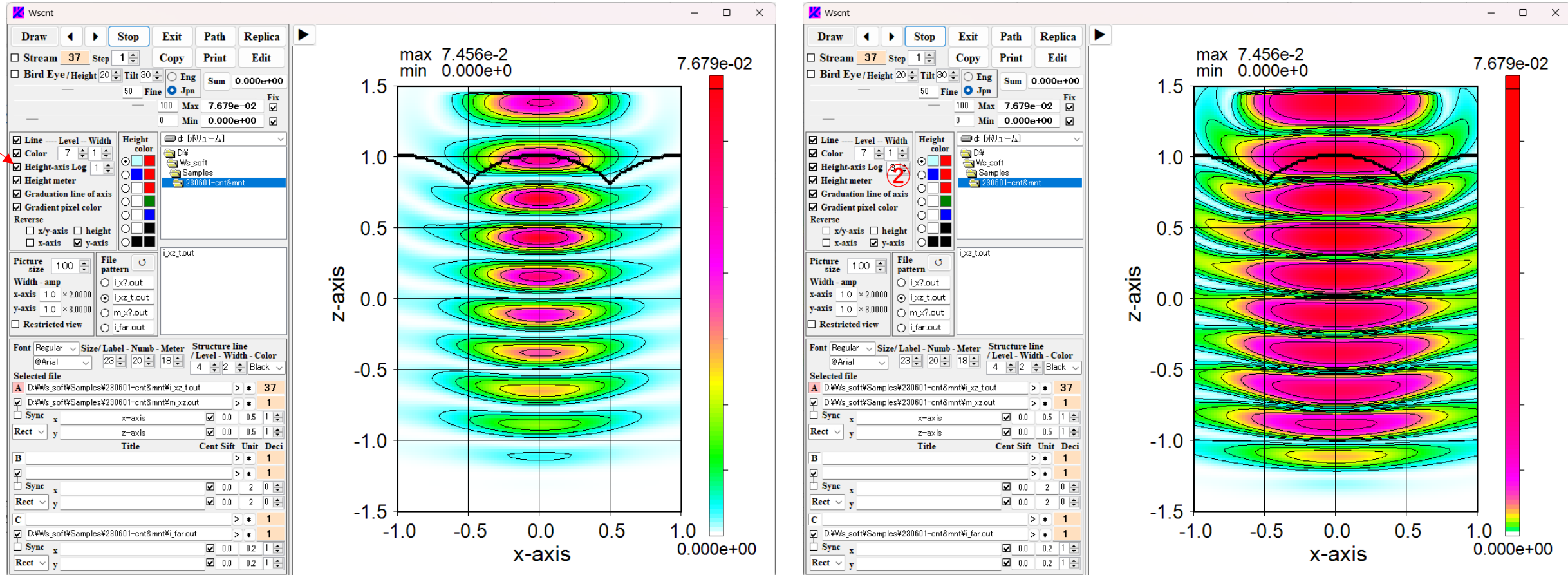
When the Stream box ① is checked and the Draw button ② is clicked, images ④ of continuous data are displayed in sequence beginning with the initial order of box ③ and the maximum and minimum values for each data are displayed in box ⑤. The maximum and minimum values (i.e., Local values in box ⑤) for the currently displayed image data are displayed on the upper left ⑥ of the figure. After the continuous image has been drawn, check Fix box ⑦ to fix the value ⑤, set the value of box ③ to 1, check Stream box ①, and click Draw button ②. Then, the continuous image is drawn with the intensity scale unified to the fixed values (the maximum and minimum values in the continuous data, i.e., Global values).

18. Maximum and minimum values of bird's-eye viewing in displaying continuous images



In the case of a bird's-eye view, the maximum and minimum values of the currently displayed image data are indicated in the upper left of the figure ①, and the fixed value ② is indicated in the upper right of the figure ③.

19. Log scale setting of height in displaying continuous images



By checking the box ①, the contour height is changed from Linear scale to Log scale. The value of box ② is the exponent n of the Log scale (defined by $z' = n \cdot \log_{10}(9 \cdot (z - z_{\min}) / (z_{\max} - z_{\min}) + 1)$), and the larger it is, the more the lower range of intensity is emphasized.

20. Synchronous setting in displaying continuous images

max 1.005e-1
min 3.694e-3

1.005e-01

1.0
0.5
0.0
-0.5
-1.0

y-axis

-1.0 -0.5 0.0 0.5 1.0

x-axis

3.694e-03

max 4.595e+0
min 1.590e-3

4.595e+00

1.0
0.5
0.0
-0.5
-1.0

y-axis

-1.0 -0.5 0.0 0.5 1.0

x-axis

1.590e-03

max 4.626e+0
min 1.520e-3

4.626e+00

1.0
0.5
0.0
-0.5
-1.0

y-axis

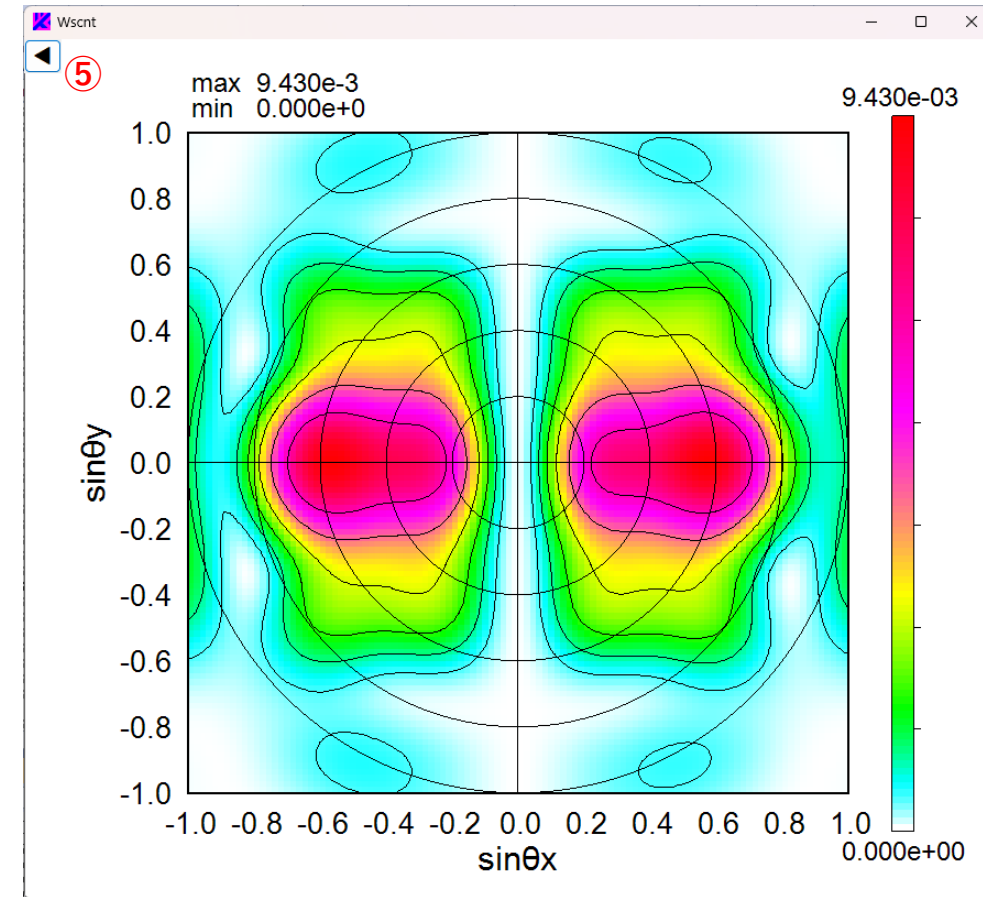
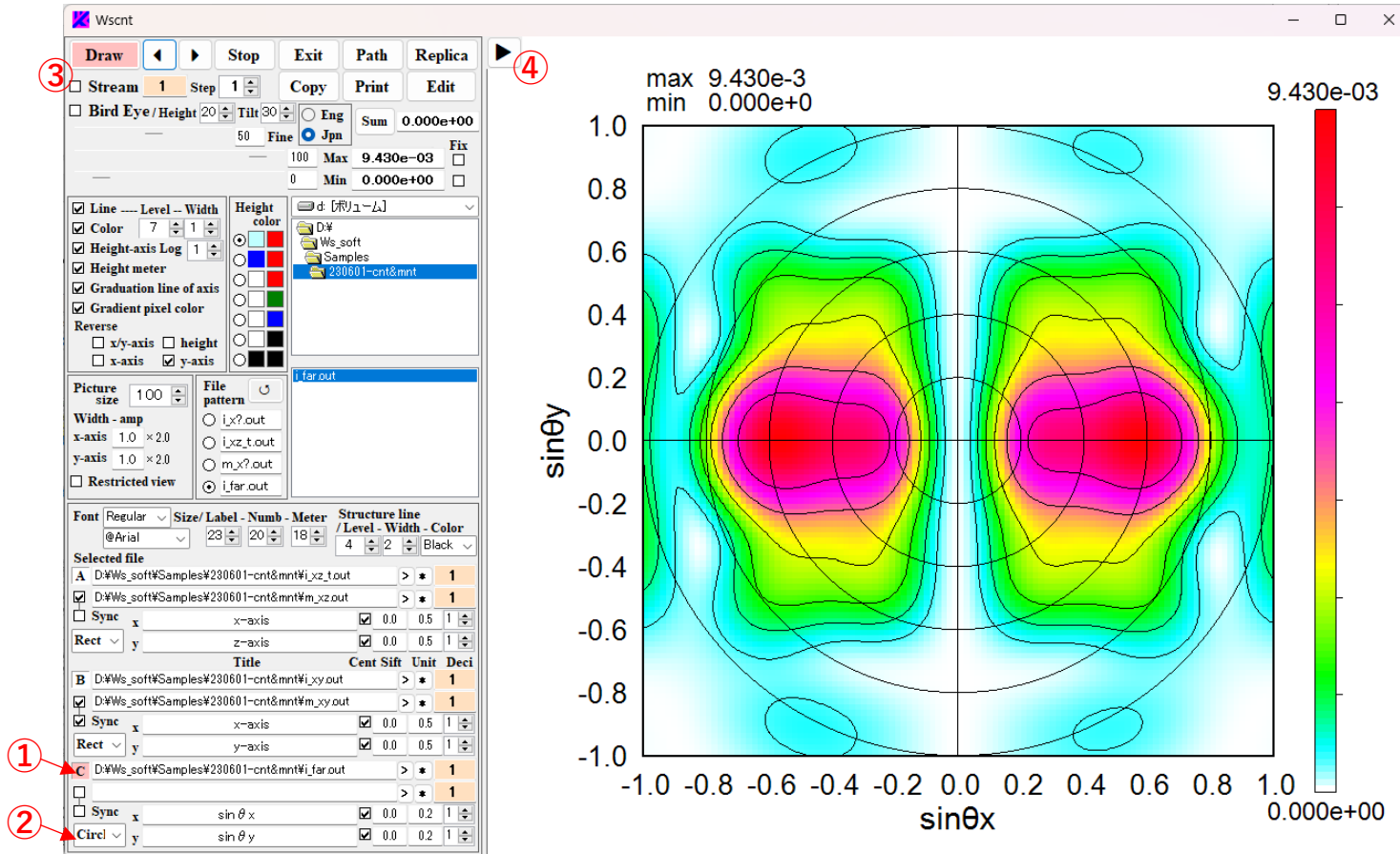
-1.0 -0.5 0.0 0.5 1.0

x-axis

1.520e-03

Click button B ① and click box ② to select a file (i_xy.out). Check box ③ and click box ④ to select a file (m_xy.out). Since both these files are synchronized continuous image data, the Sync box ⑤ should be checked. Click the Draw button ⑥ to display the first contour image ⑦. Then, click the ► button ⑧ to advance the order of the data (i_xy.out) on the contour image side, and the order of the structural boundary data (m_xy.out) also advances as shown in ⑨, and the structural boundary is rewritten in synchronization with the contour image.

21. Displaying of circular coordinates



Click button C ① and select a file (i_far.out). Select circular coordinates (Circl) for the axis type ② and click on the Draw button ③ to draw the far-field intensity distribution in polar coordinate format. If ► button ④ is clicked, the control panel on a left half disappears.

If ◀ button ⑤ is clicked, the control panel appears.

23. Notes

If duplicate images created by the Replica button are left in the computer sleep mode, the images may be corrupted (red-crossed) and the following error message appears. Then, click continue button in the message and close the duplicate image with the X button in the upper right corner to continue with the application.

