

# CARTA

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CARTA is the new image viewer that has been designed specifically for use with CASA images.

Unlike many other image viewers, CARTA is designed to work only within web browsers. This gives CARTA two advantages over other image viewers:

- It can be embedded within websites (like the ALMA Science Archive).
- It can be used to display images from a remote computer.

CARTA is available from <https://cartavis.org/> . It can be installed on Linux and Mac but not on Windows (unless using WSL).

When using CARTA on a local computer, it can just be launched by typing the command in a terminal.

When using CARTA over a VNC connection (which is common for people in Manchester at least), the following options need to be used:

```
carta --no_browser -port #####
```

The ##### refers to the port number. On Manchester computers, 5906 to 5909 will normally work for this number. This will generate a web address that can be copied and pasted into any web browser.

Beware that anyone else with the web address will also have access to the computer where CARTA is running, so it should be terminated when not in use.

When CARTA is started, it will display a file browser window. When a file is selected in this interface, CARTA will display useful information about the image.

The screenshot shows the CARTA web interface in a browser window. The address bar displays the URL `172.21.80.169:3002/?token=6744a761-41ac-4614-a9da-c5b6c6dbc678`. The main interface is currently empty, displaying "No image loaded". A "File Browser" window is open, showing a directory listing for `mnt > d > product`. The listing includes columns for Filename, Type, Size, and Date. A search filter is applied: "Filter by filename with fuzzy search".

Filename	Type	Size	Date
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.cube.l	FITS	714.2 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.cube.l	FITS	198.8 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.cube.l	FITS	731.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.mfs.l.r	FITS	9.7 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.mfs.l.f	FITS	1.7 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.mfs.l.f	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23_	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23_	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23_	FITS	9.9 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23_	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23_	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23_	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.cube.l	FITS	165.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.cube.l	FITS	731.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.mfs.l.r	FITS	9.6 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.mfs.l.f	FITS	1.4 MB	17:54

The file browser window also shows a "No file selected" message and a "Load" button. The main interface shows a "No image loaded" message and a "Load a file using the menu" instruction.

When CARTA is started, it will display a file browser window. When a file is selected in this interface, CARTA will display useful information about the image.

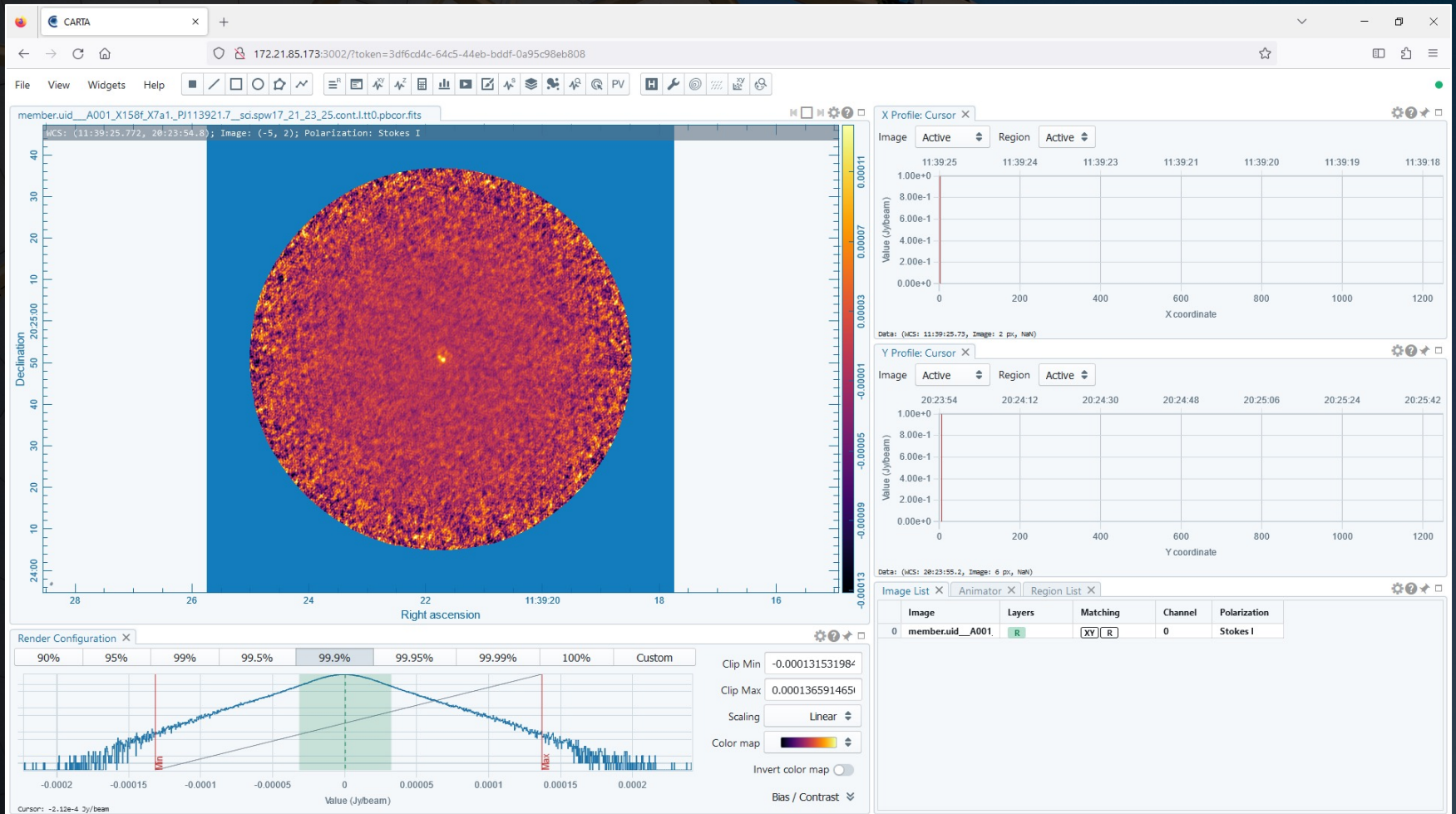
The screenshot shows the CARTA software interface. A file browser window is open, displaying a list of files in the directory `mnt > d > product`. A yellow arrow points to the file `member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23.fits`, which is highlighted in blue. To the right of the file browser, a 'File Information' panel is visible, showing details for the selected file. The main window behind the browser shows 'No image loaded' and a 'Render Configuration' panel.

Filename	Type	Size	Date
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.cube.l	FITS	714.2 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.cube.l	FITS	198.8 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.cube.l	FITS	731.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.mfs.l.r	FITS	9.7 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17.mfs.l.r	FITS	1.7 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23	FITS	9.9 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.cube.l	FITS	165.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.cube.l	FITS	731.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.mfs.l.r	FITS	9.6 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.mfs.l.r	FITS	1.4 MB	17:54

**File Information**

Name = member.uid\_\_A001\_X158f\_X7a1\_P1113921.7\_sci.spw17\_21\_23\_25.coo  
HDU = 0  
Data type = float  
Shape = [1250, 1250, 1, 1]  
Number of channels = 1  
Number of polarizations = 1  
Coordinate type = Right Ascension, Declination  
Projection = SIN  
Image reference pixels = [626, 626]  
Image reference coords = [11:39:21.7420, +020.24.50.9005]  
Image ref coords (deg) = [174.841 deg, 20.4141 deg]  
Pixel increment = -0.09", 0.09"  
Pixel unit = Jy/beam  
Celestial frame = ICRS  
Spectral frame = LSRK  
Velocity definition = RADIO  
Restoring beam = 0.792553" X 0.495623", -28.4605 deg  
RA range = [11:39:17.747, 11:39:25.744]  
DEC range = [20:23:54.648, 20:25:47.081]

Once a file is selected, It will be possible to see CARTA's main display.



The default display features the image panel and six widgets. It is possible to select alternate panel arrangements by going to View and then Layouts in the menu bar at the top.

The screenshot displays the CARTA software interface. A yellow arrow points to the 'View' menu, which is open, showing options like 'Layouts', 'Images', 'File header', 'Contours', 'Vector overlay', 'Image fitting', and 'Online Catalog Query'. The main panel shows a circular radio astronomy image with a color scale from -0.0013 to 0.0011. The axes are labeled 'Right ascension' and 'Declination'. To the right, there are two profile plots: 'X Profile: Cursor X' and 'Y Profile: Cursor X', both showing 'Value (Jy/beam)' vs 'Coordinate'. At the bottom, there is a 'Render Configuration' panel with a histogram and a 'Bias / Contrast' panel with various settings.

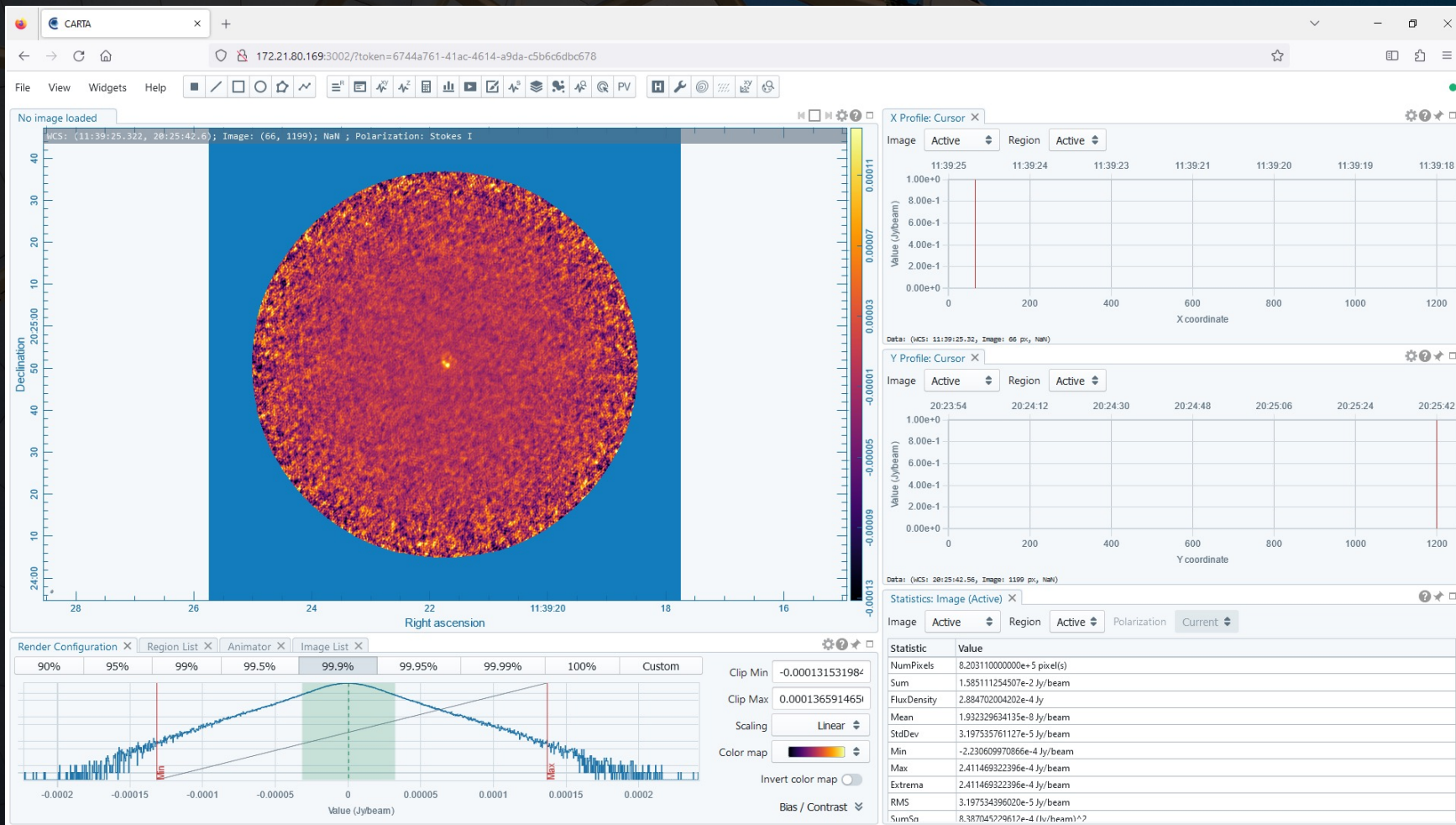
Render Configuration

90%	95%	99%	99.5%	99.9%	99.95%	99.99%	100%	Custom

Bias / Contrast

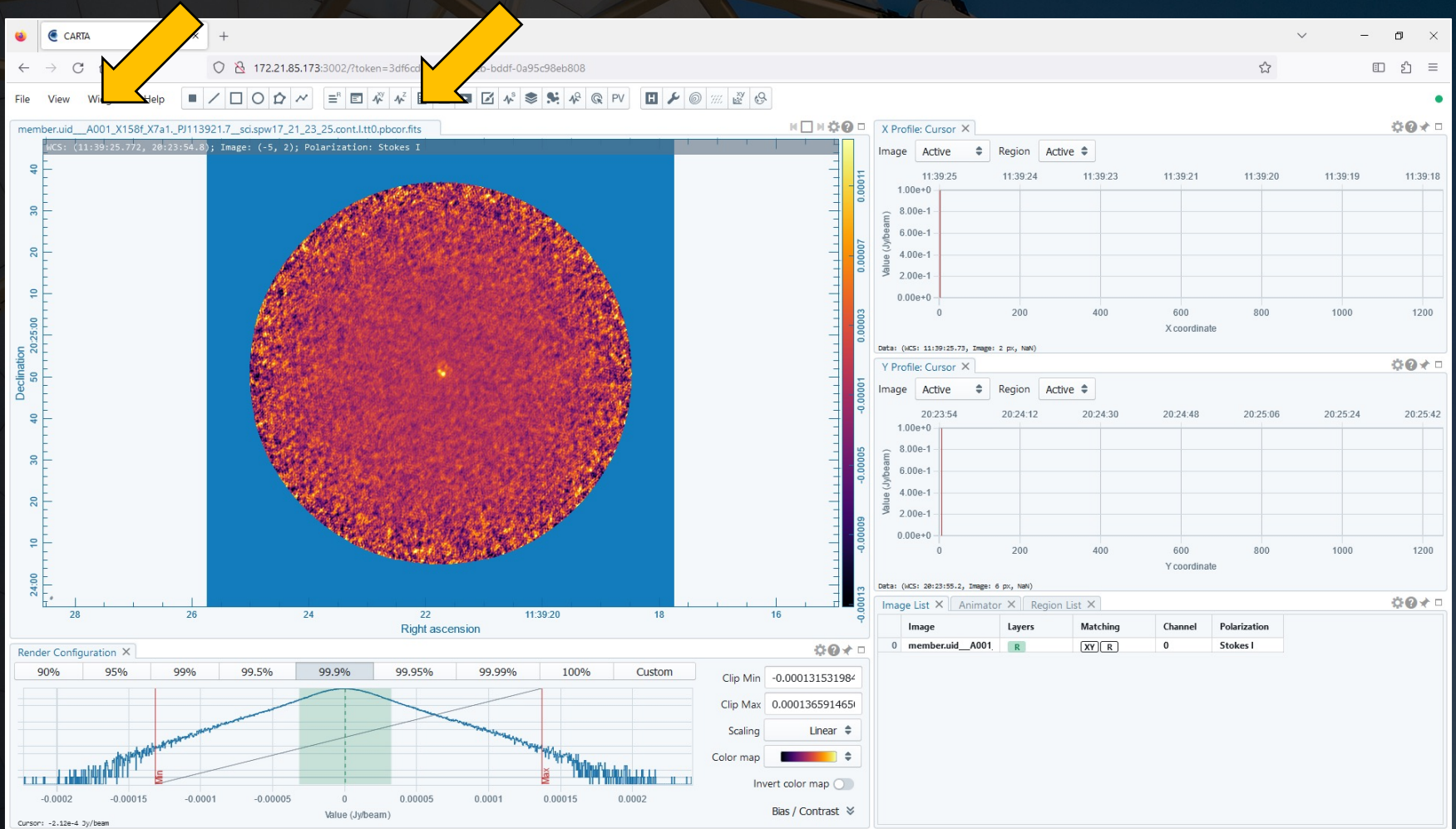
Image	Layers	Matching	Channel	Polarization		
0	member.uid_A001	R	XY	R	0	Stokes I

The default display features the image panel and six widgets. It is possible to select alternate panel arrangements by going to View and then Layouts in the menu bar at the top.





It is also possible to open new widgets by clicking on the various corresponding buttons in the button bar or by clicking on one of the options under Widgets in the menu bar.





Widgets can be dragged around the screen by moving the cursor over the menu bar and holding down the left mouse button.

The screenshot displays the CARTA software interface. The main window shows a radio telescope image with a color scale on the right. A yellow arrow points to the 'Statistics: Image (Active)' window, which is a floating widget. The statistics window contains the following data:

Statistic	Value
NumPixels	8.203110000000e+5 pixel(s)
Sum	1.585111254507e-2 Jy/beam
FluxDensity	2.884702004202e-4 Jy
Mean	1.932329634135e-8 Jy/beam
StdDev	3.197535761127e-5 Jy/beam
Min	-2.230609970866e-4 Jy/beam
Max	2.411469322396e-4 Jy/beam
Extrema	2.411469322396e-4 Jy/beam
RMS	3.197534396020e-5 Jy/beam
SumSq	8.387045229612e-4 (Jy/beam)^2

Below the main image, there is a 'Render Configuration' window showing a histogram of the image values. The histogram has a green shaded region around the mean value. The 'Clip Min' is set to -0.000131531984 and the 'Clip Max' is 0.0001365914651. The 'Scaling' is set to 'Linear' and the 'Color map' is a rainbow spectrum. The 'Bias / Contrast' is also visible.

On the right side, there are two 'X Profile: Cursor' and 'Y Profile: Cursor' windows, each showing a plot of 'Value (Jy/beam)' versus 'X coordinate' or 'Y coordinate'. The 'Image List' window at the bottom right shows a table with the following data:

Image	Layers	Matching	Channel	Polarization
0	member.aid__A001	R	XY	R
			0	Stokes I

Widgets can be dragged around the screen by moving the cursor over the menu bar and holding down the left mouse button.

The screenshot displays the CARTA software interface. The main window shows a circular radio telescope image with a color scale on the right. The axes are labeled 'Right ascension' and 'Declination'. A 'Statistics: Image (Active)' window is open, showing various statistical data for the image. A yellow arrow points to the 'Statistics: Image (Active)' window. Below the main image, there is a histogram showing the distribution of pixel values, with a 'Render Configuration' window overlaid on it. The histogram has a 'Clip Min' and 'Clip Max' set, and a 'Scaling' of 'Linear'. The 'Color map' is set to a color gradient. The 'Bias / Contrast' is also visible.

**Statistics: Image (Active)**

Statistic	Value
NumPixels	8.203110000000e+5 pixel(s)
Sum	1.585111254507e-2 Jy/beam
FluxDensity	2.884702004202e-4 Jy
Mean	1.932329634135e-8 Jy/beam
StdDev	3.197535761127e-5 Jy/beam
Min	-2.230609970866e-4 Jy/beam
Max	2.411469322396e-4 Jy/beam
Extrema	2.411469322396e-4 Jy/beam
RMS	3.197534396020e-5 Jy/beam
SumSq	8.387045229612e-4 (Jy/beam) <sup>2</sup>

**Render Configuration**

Clip Min: -0.000131531984  
Clip Max: 0.0001365914651  
Scaling: Linear  
Color map: [Color gradient]  
Invert color map: [Off]  
Bias / Contrast: [Off]

Widgets can be fixed into place by moving the cursor over the pin icon, holding down the left mouse button, and then dragging the outline around CARTA. Widgets can be placed either in between other widgets or in the same place as others (with the widget selected using the tabs).

The screenshot displays the CARTA software interface. The main window shows a radio telescope image with a color scale on the right. A yellow arrow points to a pin icon in the top right corner of the image area. A statistics window is open over the image, displaying the following data:

Statistic	Value
NumPixels	8.203110000000e+5 pixel(s)
Sum	1.585111254507e-2 Jy/beam
FluxDensity	2.884702004202e-4 Jy
Mean	1.932329634135e-8 Jy/beam
StdDev	3.197535761127e-5 Jy/beam
Min	-2.230609970866e-4 Jy/beam
Max	2.411469322396e-4 Jy/beam
Extrema	2.411469322396e-4 Jy/beam
RMS	3.197534396020e-5 Jy/beam
SumSq	8.387045229612e-4 (Jy/beam)^2

Below the image, there is a histogram showing the distribution of values. The x-axis is labeled "Value (Jy/beam)" and ranges from -0.0002 to 0.0002. The y-axis represents frequency. A vertical line is drawn at the cursor position, which is at -1.89e-4 Jy/beam. The histogram shows a peak at 0. The "Render Configuration" window is also visible, showing a histogram of the image data with a vertical line at the cursor position. The "X Profile: Cursor" and "Y Profile: Cursor" windows are also visible, showing the profile of the image data along the X and Y axes. The "Image List" window is also visible, showing a table of images:

Image	Layers	Matching	Channel	Polarization		
0	member.aid__A001	R	XY	R	0	Stokes I

Widgets can be fixed into place by moving the cursor over the pin icon, holding down the left mouse button, and then dragging the outline around CARTA. Widgets can be placed either in between other widgets or in the same place as others (with the widget selected using the tabs).

The screenshot displays the CARTA software interface. The main window shows a circular radio telescope image with a color scale on the right. The axes are labeled 'Right ascension' and 'Declination'. Below the image is a 'Render Configuration' panel with a histogram and various settings like 'Clip Min', 'Clip Max', 'Scaling', and 'Color map'. To the right of the image are two 'X Profile' and 'Y Profile' plots, each with a 'Value (Jy/beam)' y-axis and an 'X coordinate' x-axis. A yellow arrow points to a pin icon in the 'Image List' tab. The 'Statistics: Image (Active) X' panel is open, showing a table of statistics for the active image.

Statistic	Value
NumPixels	8.203110000000e+5 pixel(s)
Sum	1.585111254507e-2 Jy/beam
FluxDensity	2.884702004202e-4 Jy
Mean	1.932329634135e-8 Jy/beam
StdDev	3.197535761127e-5 Jy/beam
Min	-2.230609970866e-4 Jy/beam
Max	2.411469322396e-4 Jy/beam
Extrema	2.411469322396e-4 Jy/beam
RMS	3.197534396020e-5 Jy/beam
SumSn	8.387045729617e-4 (Jy/beam)^2

Widgets can be fixed into place by moving the cursor over the pin icon, holding down the left mouse button, and then dragging the outline around CARTA. Widgets can be placed either in between other widgets or in the same place as others (with the widget selected using the tabs).

The screenshot displays the CARTA software interface. The main window shows a circular radio telescope image with a color scale on the right ranging from -0.0013 to 0.0011. The axes are labeled 'Right ascension' and 'Declination'. Below the image is a histogram showing the distribution of values, with a green shaded region indicating a selected range. The histogram has a 'Cursor' at -2.23e-4 Jy/beam. To the right of the image are two profile plots: 'X Profile: Cursor X' and 'Y Profile: Cursor X'. Both plots show 'Value (Jy/beam)' on the y-axis and 'X coordinate' or 'Y coordinate' on the x-axis. A yellow arrow points to a pin icon in the bottom right corner of the interface, which is used to fix widgets in place.

Render Configuration X

90%	95%	99%	99.5%	99.9%	99.95%	99.99%	100%	Custom

Clip Min: -0.000131531984  
Clip Max: 0.0001365914651  
Scaling: Linear  
Color map: [Color bar]  
Invert color map:   
Bias / Contrast:

Image List X | Animator X | Region List X | Statistics: Image (Active) X

Statistic	Value
NumPixels	8.203110000000e+5 pixel(s)
Sum	1.585111254507e-2 Jy/beam
FluxDensity	2.884702004202e-4 Jy
Mean	1.932329634135e-8 Jy/beam
StdDev	3.197535761127e-5 Jy/beam
Min	-2.230609970866e-4 Jy/beam
Max	2.411469322396e-4 Jy/beam
Extrema	2.411469322396e-4 Jy/beam
RMS	3.197534396020e-5 Jy/beam
SumSn	8.387045729617e-4 (Jy/beam)^2

# Left clicking on a question mark will bring up a help screen.

**Image List**

The image list widget displays all loaded images as a list, which includes the image name, rendering layers (R for raster, C for contours, V for vector field), layer visibility state, spatial matching state, spectral matching state, color range matching state, channel index, and polarization type. The channel index and polarization type are synchronized with the animator.

You may click R to hide/show a raster layer, C to hide/show a contour layer, and V to hide/show a vector field layer.

Per image, you can click the XY button to enable/disable spatial matching and click the Z button to enable/disable spectral matching. To match the color range to the reference image, click the R button.

To change a reference image, right-click on a row to bring up the context menu. The spatial reference image, the spectral reference image, and the raster scaling reference image can be defined independently. By default, spectral matching is performed with respect to radio velocity convention. If other spectral conventions (e.g., frequency, channel, etc) are desired, use the Matching tab of the image list settings dialog (the cog at the top-right corner of the image list widget).

When images are matched spectrally in the velocity domain, the rest frequency for the frequency-to-velocity conversion per image can be re-defined. This allows you to compare different spectral features efficiently without changing the RESTFRQ header iteratively and permanently. You can right-click on a row to bring up the context menu or use the Rest Frequency tab of the image list settings dialog.

To close an image (or images), right-click on a row to bring up the context menu.

The list order reflects the order of the image slider in the animator. When the image viewer is in the multi-panel mode, the list order also determines the image order in the grid layout following the left-right then top-down rule. To change the order, drag-and-drop an image in the list to the desired new position.

**X Profile: Cursor X**

Image	Active	Region	Active
11:39:25		11:39:24	
11:39:23		11:39:21	
11:39:20		11:39:19	
11:39:18			

**Y Profile: Cursor X**

Image	Active	Region	Active
20:23:54		20:24:12	
20:24:30		20:24:48	
20:25:06		20:25:24	
20:25:42			

Image	Layers	Matching	Channel	Polarization		
0	member.aid__A001	R	XY	R	0	Stokes I



Left clicking on a gear icon will display settings for that window.

The screenshot shows the CARTA software interface. The main window displays a circular image of a star with a color scale on the right. A settings dialog box is open over the image. A yellow arrow points to a gear icon in the top right corner of the main window.

**X Spatial Profile Settings: Cursor**

Styling Smoothing Computation

Coordinate X

Line Color (Primary) [Blue]

Line Width (px) 1

Point Size (px) 1.5

Show WCS Axis

Show Mean/RMS

Only visible in single profile

Line Style [Solid] [Dashed] [Dotted]

**X Profile: Cursor X**

Image Active Region Active

Value (Jy/beam)	11:39:25	11:39:24	11:39:23	11:39:21	11:39:20	11:39:19	11:39:18
1.00e+0							
8.00e-1							
6.00e-1							
4.00e-1							
2.00e-1							
0.00e+0							

X coordinate

Data: (WCS: 11:39:25.564, Image: 28 pix, NaN)

**Y Profile: Cursor X**

Image Active Region Active

Value (Jy/beam)	20:23:54	20:24:12	20:24:30	20:24:48	20:25:06	20:25:24	20:25:42
1.00e+0							
8.00e-1							
6.00e-1							
4.00e-1							
2.00e-1							
0.00e+0							

Y coordinate

Data: (WCS: 20:23:55.2, Image: 6 pix, NaN)

**Image List X**

Image	Layers	Matching	Channel	Polarization
0 memberuid__A001	R	XY [R]	0	Stokes I

**Render Configuration X**

90% 95% 99% 99.5% 99.9% 99.95% 99.99% 100% Custom

Clip Min -0.000131531984

Clip Max 0.0001365914651

Scaling Linear

Color map [Color bar]

Invert color map

Bias / Contrast

Cursor: -2.12e-4 Jy/beam

Left clicking on the rectangle icon will maximize the widget. When a widget is maximized, left clicking on the single bar will restore the widget to its original size.

The screenshot displays the CARTA software interface. The main window shows a circular radio telescope image with a color scale on the right ranging from -0.00013 to 0.00011. The axes are labeled 'Right ascension' and 'Declination'. A yellow arrow points to a toolbar icon consisting of a square with a horizontal bar, which is used for maximizing and restoring the widget size.

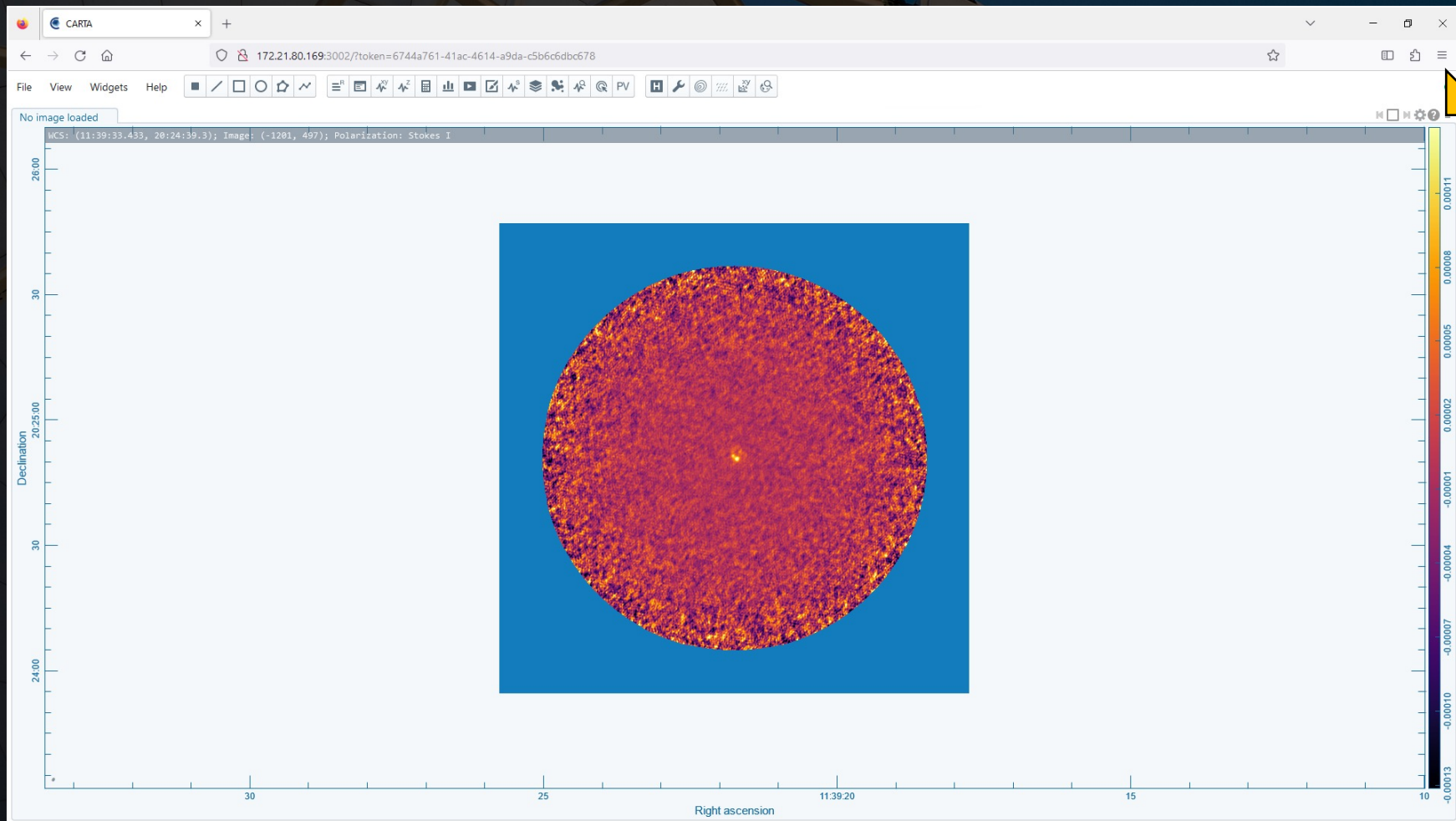
Below the main image is the 'Render Configuration' panel, which includes a histogram of the image data and various settings:

- Clip Min: -0.000131531984
- Clip Max: 0.0001365914651
- Scaling: Linear
- Color map: A color bar showing the mapping from values to colors.
- Invert color map: A toggle switch.
- Bias / Contrast: A dropdown menu.

On the right side of the interface, there are two 'X Profile' and 'Y Profile' plots, each showing 'Value (Jy/beam)' versus 'X coordinate' or 'Y coordinate'. Below these plots is an 'Image List' table:

Image	Layers	Matching	Channel	Polarization		
0	member_uid__A001	R	XY	R	0	Stokes I

Left clicking on the rectangle icon will maximize the widget. When a widget is maximized, left clicking on the single bar will restore the widget to its original size.

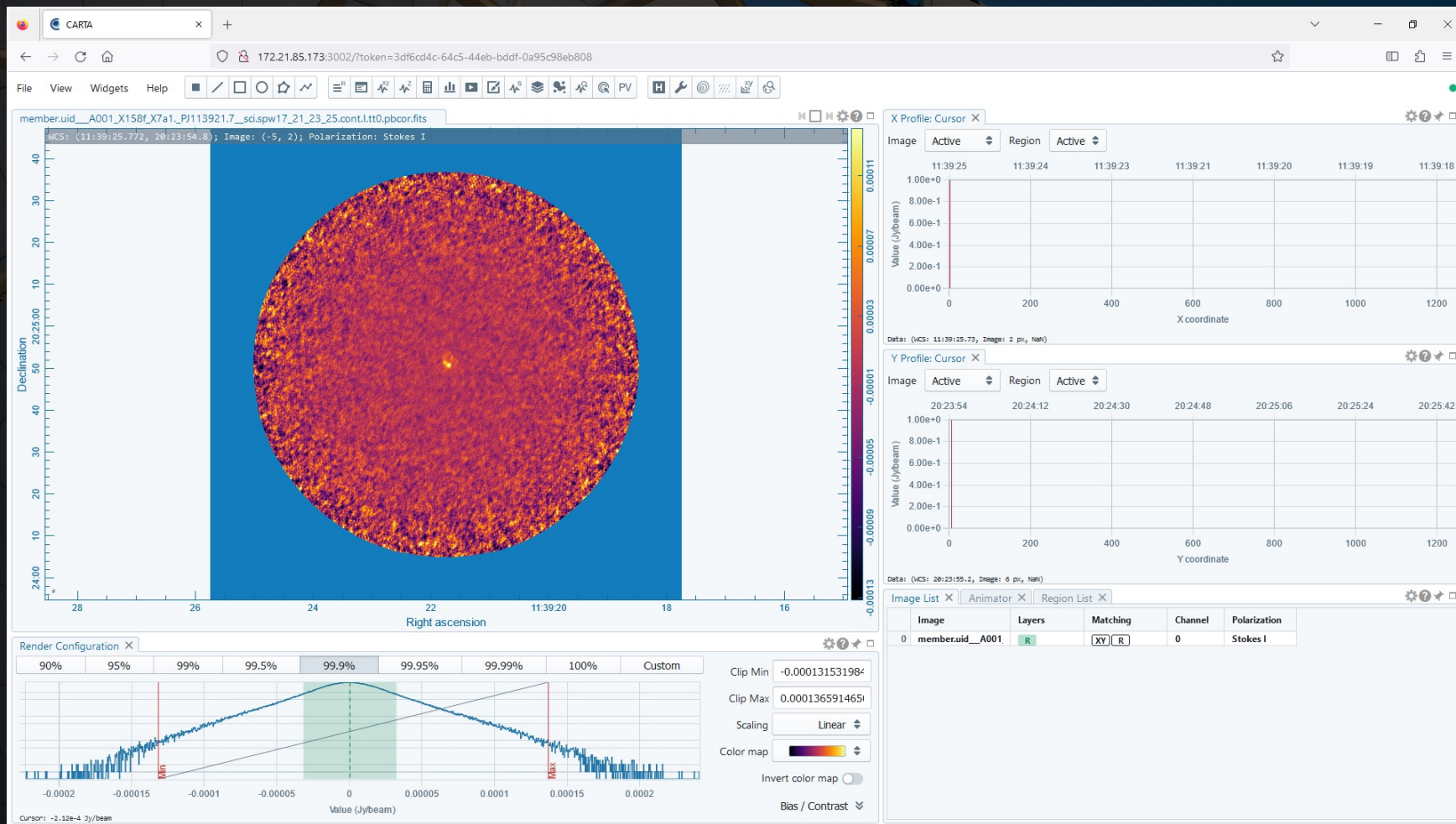


Various widget configurations can be saved by going to View, then Layouts, and then Save Layout.

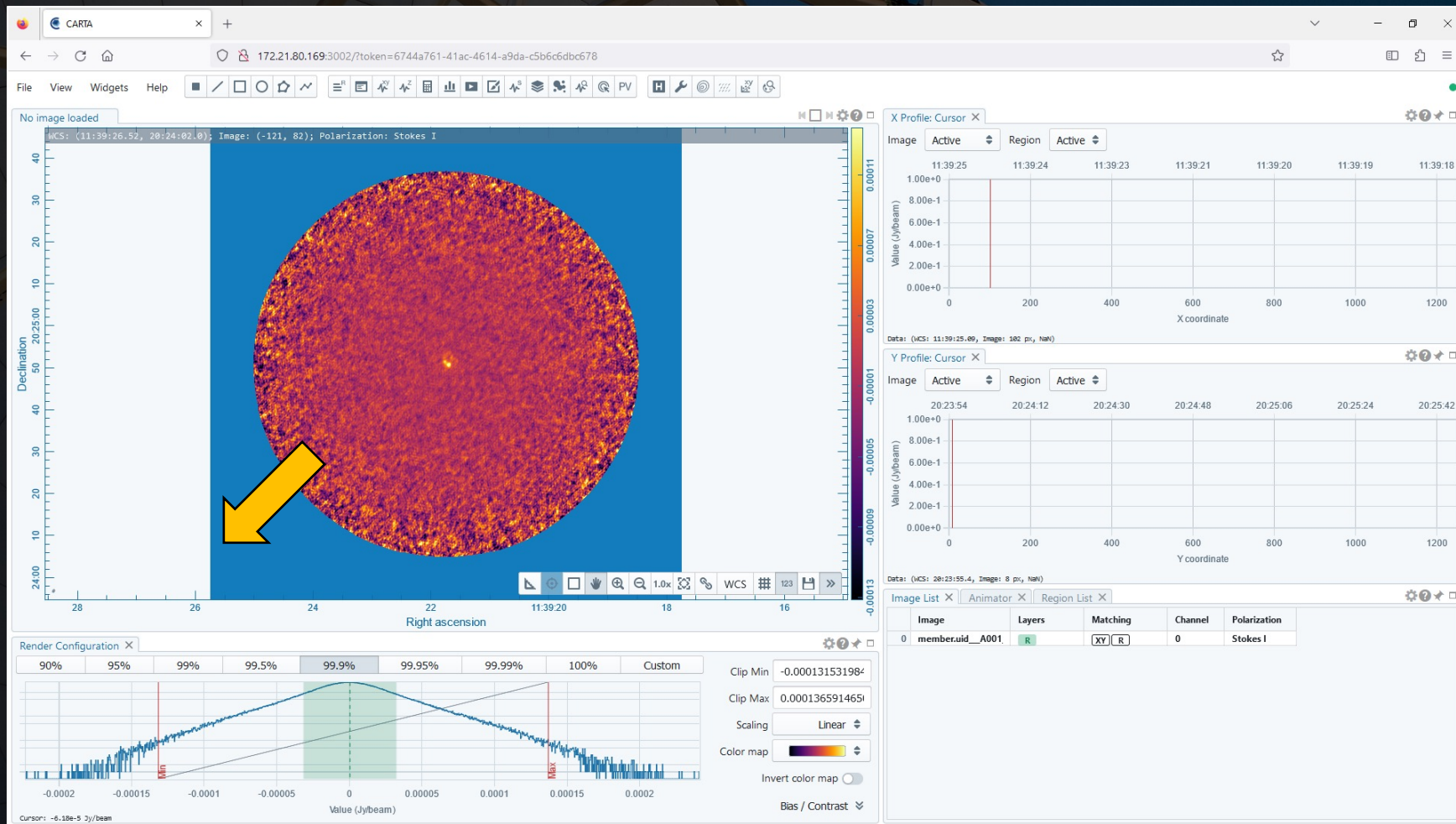
The screenshot displays the CARTA software interface. The main window shows a circular image of a radio telescope dish with a color scale on the right. The color scale ranges from -0.0013 to 0.0011. The image is centered at Right ascension 22 and Declination 24. The interface includes a top menu bar with 'File', 'View', and 'Widgets'. A yellow arrow points to the 'View' menu. Below the menu bar is a toolbar with various icons. The main image viewer has axes for Right ascension (18 to 28) and Declination (24.00 to 40). To the right of the image are two profile plots: 'X Profile: Cursor X' and 'Y Profile: Cursor X'. Both plots show 'Value (Jy/beam)' on the y-axis (0.00e+0 to 1.00e+0) and 'X coordinate' or 'Y coordinate' on the x-axis (0 to 1200). Below the image viewer is a 'Render Configuration' panel with a histogram and a 'Value (Jy/beam)' axis. The histogram shows a distribution of values from -0.0002 to 0.0002. The 'Render Configuration' panel includes a 'Clip Min' of -0.000131531984, a 'Clip Max' of 0.0001365914651, 'Scaling' set to 'Linear', and a 'Color map' dropdown. At the bottom right is an 'Image List' table with columns for 'Image', 'Layers', 'Matching', 'Channel', and 'Polarization'. The table contains one row with 'memberuid\_A001', 'R', 'XY', '0', and 'Stokes I'.

Image	Layers	Matching	Channel	Polarization
memberuid_A001	R	XY	0	Stokes I

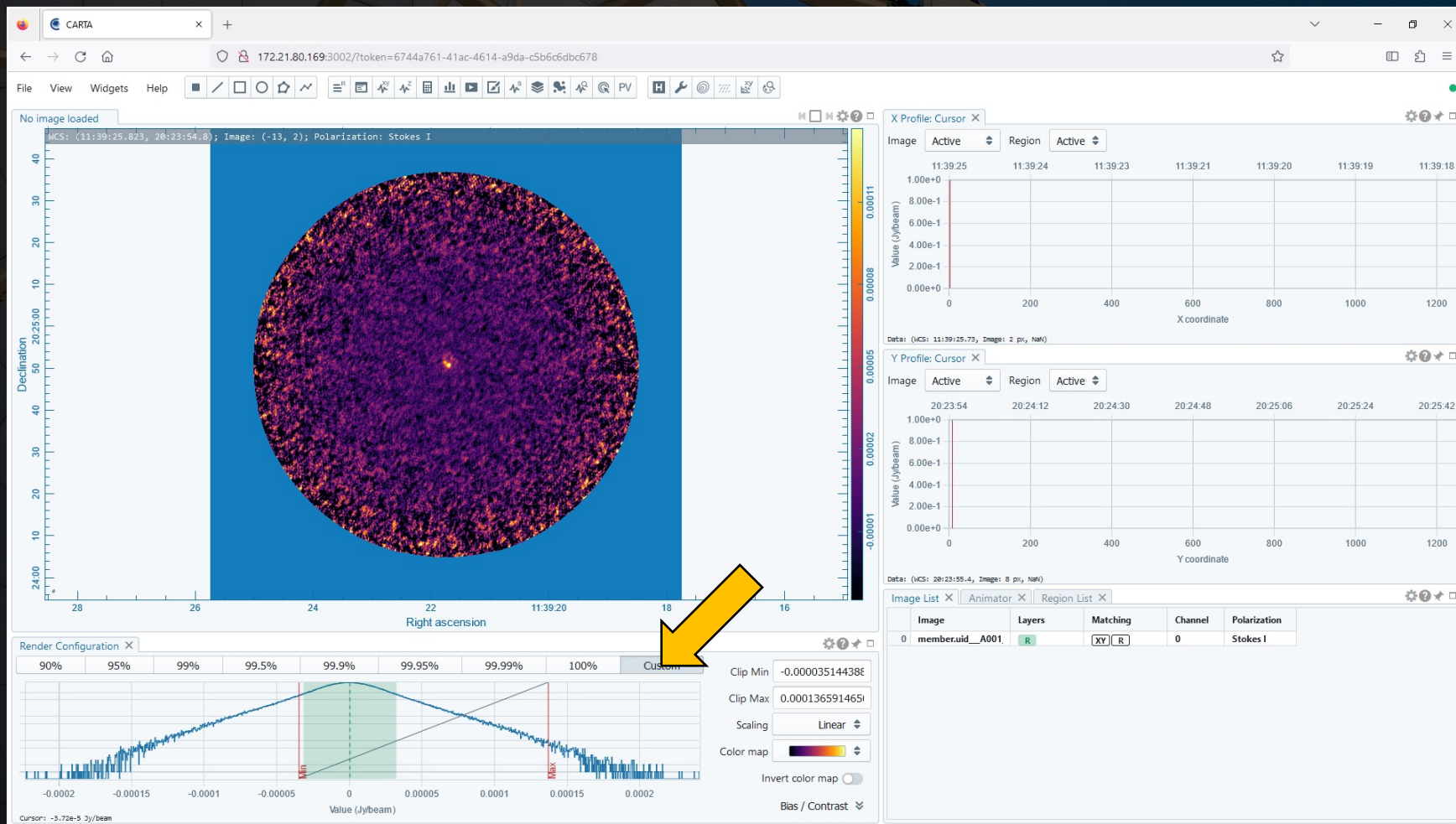
In the image panel, text at the top shows the coordinates and pixel value at the location of the cursor. The beam is visible by default in the lower left corner. The colour bar is shown on the right. Additional display tools will appear on the lower right when hovering the cursor over the window.



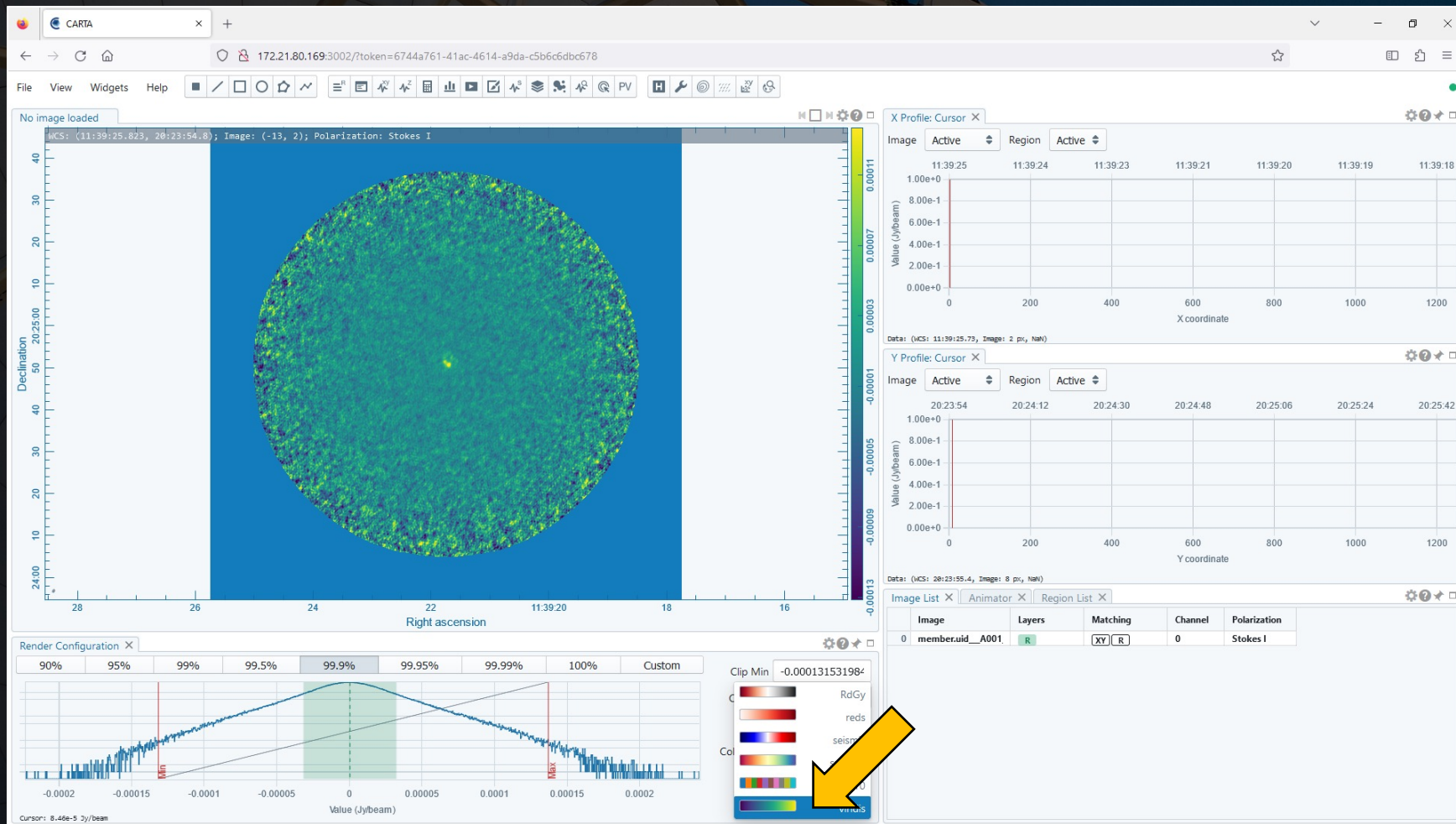
In the image panel, text at the top shows the coordinates and pixel value at the location of the cursor. The beam is visible by default in the lower left corner. The colour bar is shown on the right. Additional display tools will appear on the lower right when hovering the cursor over the window.



The Render Configuration widget at the bottom of the display shows how the pixel values are converted into colours. This can be used to change the minimum and maximum ranges used in the conversion, the scaling function, and the color map.



The Render Configuration widget at the bottom of the display shows how the pixel values are converted into colours. This can be used to change the minimum and maximum ranges used in the conversion, the scaling function, and the color map.





Also note that clicking on the arrows next to Bias/Contrast in the Render Configuration widget will display a box with a dot that can be moved around to change the bias and contrast as well as boxes where these values can be typed in.

The screenshot displays the CARTA software interface. The main window shows a circular radio telescope image with a color scale on the right ranging from -0.0013 to 0.0011. The axes are labeled 'Right ascension' and 'Declination'. Below the image is a histogram showing the distribution of values, with a green shaded region indicating the current clip range. The 'Render Configuration' panel is open, showing various settings for the image. A yellow arrow points to the 'Bias / Contrast' dropdown menu.

member\_uid\_\_A001\_X158f\_X7a1\_PJ113921.7\_sq.spw17\_21\_23\_25.cont.ltt0.pbcor.fits  
MCS: (11:39:25.772, 20:23:54.8); Image: (-5, 2); Polarization: Stokes I

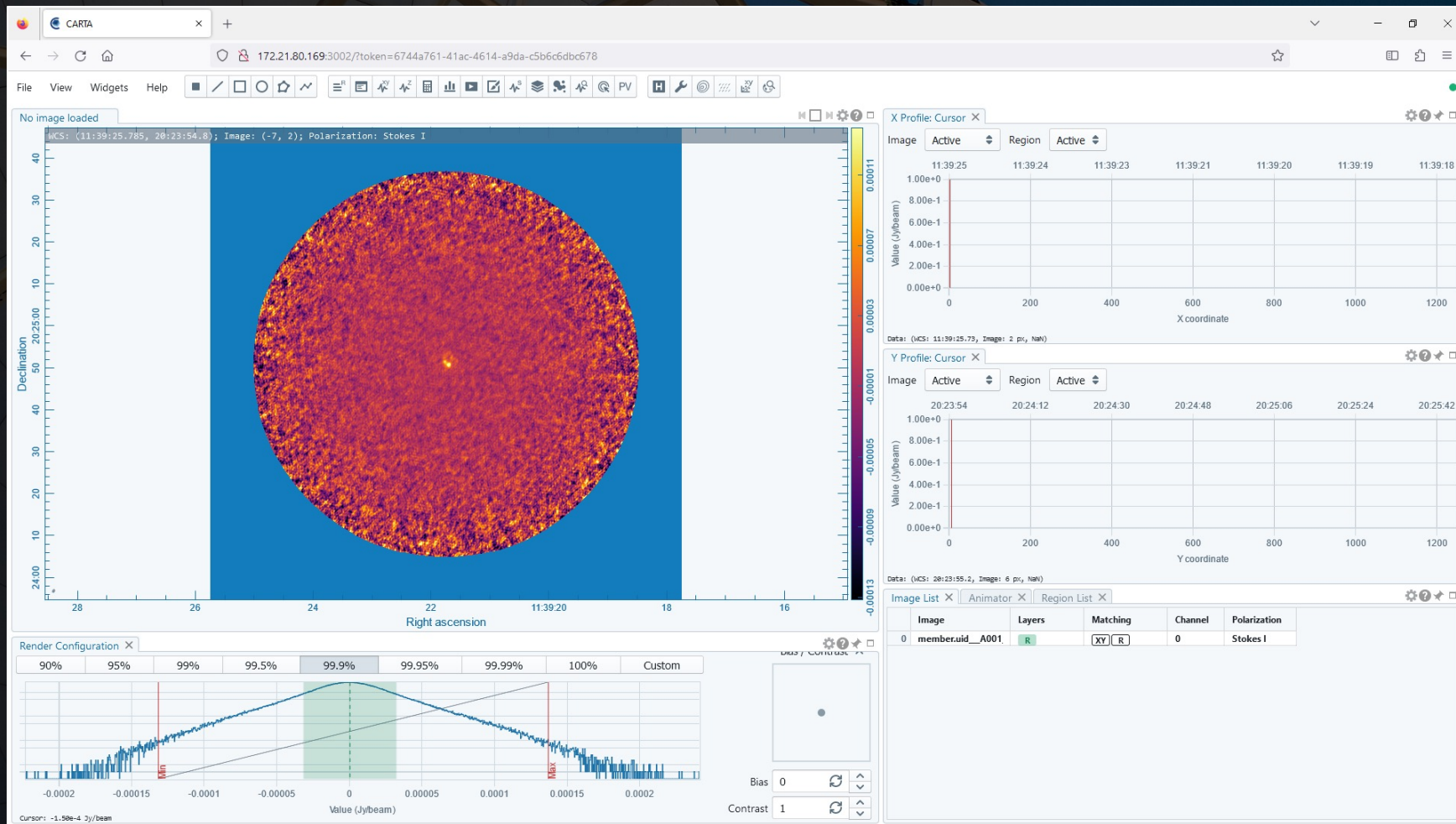
X Profile: Cursor X  
Image: Active Region: Active  
Value (Jy/beam) vs X coordinate

Y Profile: Cursor X  
Image: Active Region: Active  
Value (Jy/beam) vs Y coordinate

Image	Layers	Matching	Channel	Polarization
0	member_uid__A001	R	XY	R
			0	Stokes I

Render Configuration  
90% 95% 99% 99.5% 99.9% 99.95% 99.99% 100% Custom  
Clip Min: -0.000131531984  
Clip Max: 0.0001365914651  
Scaling: Linear  
Color map: [Color bar]  
Invert color map:   
Bias / Contrast

Also note that clicking on the arrows next to Bias/Contrast in the Render Configuration widget will display a box with a dot that can be moved around to change the bias and contrast as well as boxes where these values can be typed in.



Also note that clicking on the arrows next to Bias/Contrast in the Render Configuration widget will display a box with a dot that can be moved around to change the bias and contrast as well as boxes where these values can be typed in.

The screenshot displays the CARTA software interface. The main window shows a circular radio telescope image with a color scale on the right ranging from -0.00013 to 0.00011. The axes are labeled 'Right ascension' and 'Declination'. Below the image is a histogram showing the distribution of values, with a green shaded region around the peak and red vertical lines for 'Min' and 'Max'. The histogram is titled 'Render Configuration' and shows a percentage scale from 90% to 100%. To the right of the histogram are 'Bias' and 'Contrast' controls with numerical values and arrows. A yellow arrow points to the 'Bias' control. At the bottom right, there is a table with columns for 'Image', 'Layers', 'Matching', 'Channel', and 'Polarization'. The table contains one row with the following data:

Image	Layers	Matching	Channel	Polarization
memberuid_A001	R	XY   R	0	Stokes I

More than one image can be loaded into CARTA by clicking on File and then Append Image and then selecting a file in the File Browser.

The screenshot displays the CARTA web interface. A yellow arrow points to the 'Append Image' option in the 'File' menu. The main window shows a circular astronomical image with a color scale on the right ranging from -0.00013 to 0.00011. Below the image is a 'Render Configuration' panel with a histogram and various settings like 'Clip Min', 'Clip Max', 'Scaling', and 'Color map'. On the right side, there are two profile plots: 'X Profile: Cursor X' and 'Y Profile: Cursor X', each with a table of values. At the bottom right, there is an 'Image List' table.

Image	Layers	Matching	Channel	Polarization		
0	member.aid_A001	R	XY	R	0	Stokes I

More than one image can be loaded into CARTA by clicking on File and then Append Image and then selecting a file in the File Browser.

The screenshot displays the CARTA software interface. A File Browser dialog box is open in the center, showing a list of files in the directory `mnt > d > product`. The files are listed with columns for Filename, Type, Size, and Date. The File Information panel on the right of the dialog is empty, and the message "No file selected." is displayed. The background shows a radio telescope dish with a color-coded image of a celestial object. A histogram at the bottom left shows the distribution of values in Jy/beam, with a cursor at `-1.18e-4 Jy/beam`. The main window has a menu bar (File, View, Widgets, Help) and a toolbar with various icons. The browser address bar shows `172.21.80.169:3002/?token=6744a761-41ac-4614-a9da-c5b6c6dbc678`.

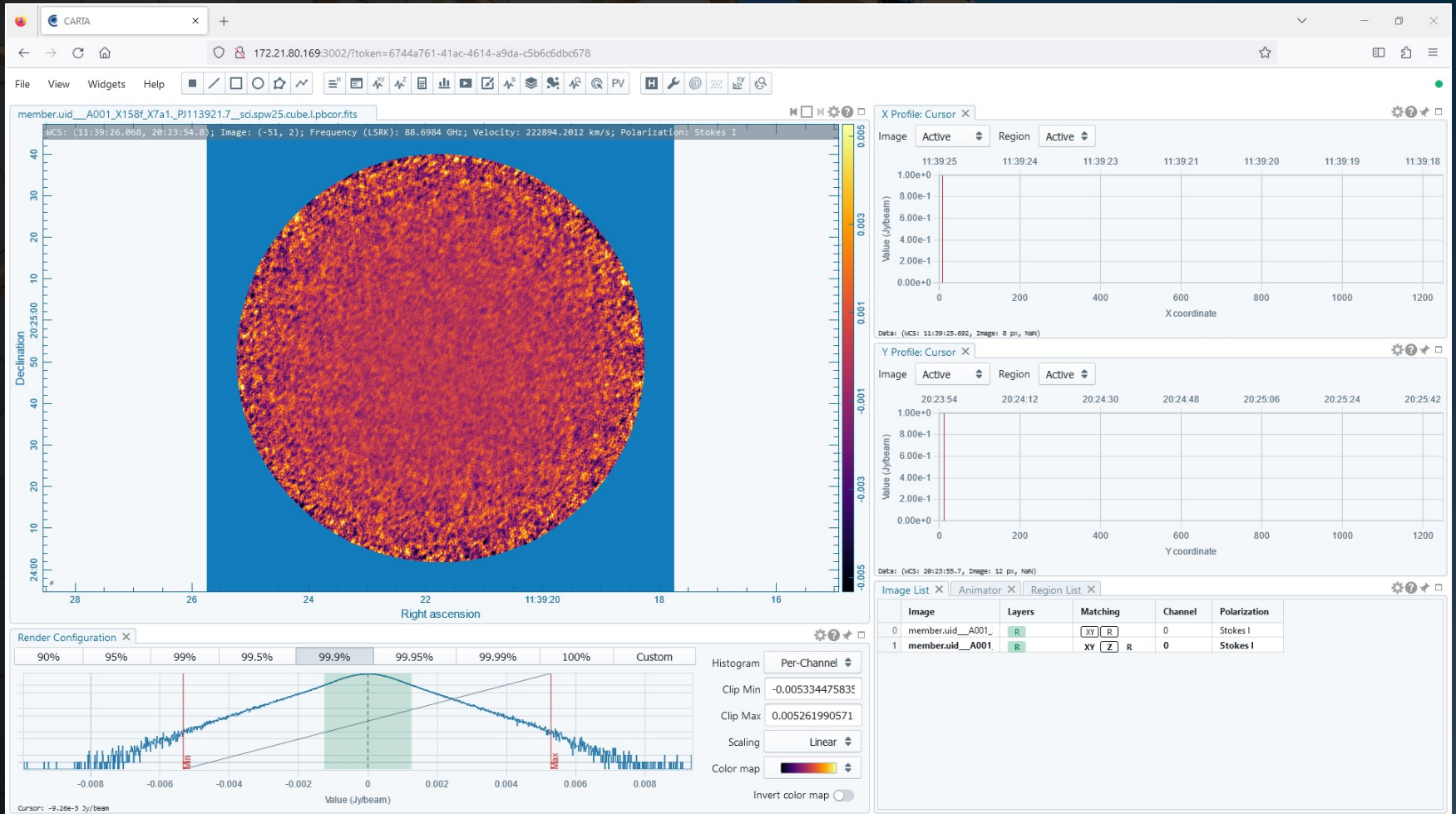
Filename	Type	Size	Date
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23_25.cont.ltt0.pbcor.fits	FITS	714.2 kB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17.cube.l	FITS	198.8 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17.cube.l	FITS	731.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17.mfs.l.r	FITS	9.7 kB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17.mfs.l.f	FITS	1.7 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17.mfs.l.f	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23	FITS	9.9 kB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw17_21_23	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw21.cube.l	FITS	165.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw21.cube.l	FITS	731.3 MB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw21.mfs.l.r	FITS	9.6 kB	17:54
member.uid__A001_X158f_X7a1_PJ113921.7_sci.spw21.mfs.l.f	FITS	1.4 MB	17:54

More than one image can be loaded into CARTA by clicking on File and then Append Image and then selecting a file in the File Browser.

The screenshot displays the CARTA software interface. A File Browser window is open, showing a list of files in the directory `mnt > d > product`. A yellow arrow points to the file `member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.cube.l`, which is 3.0 GB in size. The File Information panel on the right shows details for the selected file, including its name, HDU count, data type (float), shape, number of channels (477), number of polarizations (1), coordinate type (Right Ascension, Declination), projection (SIN), image reference pixels (626, 626), image reference coordinates, image reference coordinates in degrees, pixel increment, pixel unit (Jy/beam), celestial frame (ICRS), spectral frame (LSRK), velocity definition (RADIO), restoring beam, and RA range.

Filename	Type	Size	Date
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.mfs.l.f	FITS	1.4 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw21.mfs.l.f	FITS	6.3 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw23.cube.l	FITS	161.4 MB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw23.cube.l	FITS	731.3 MB	17:55
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw23.cube.l	FITS	9.6 kB	17:55
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw23.cube.l	FITS	1.4 MB	17:55
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.cube.l	FITS	6.3 MB	17:55
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.cube.l	FITS	2.9 MB	17:55
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.cube.l	FITS	790.5 MB	17:55
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.cube.l	FITS	3.0 GB	17:56
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.mfs.l.r	FITS	9.7 kB	17:56
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.mfs.l.f	FITS	1.7 MB	17:56
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.mfs.l.f	FITS	6.3 MB	17:56
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.mfs.l.f	FITS	2.2 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.mfs.l.f	FITS	106.5 kB	17:54
member.uid__A001_X158f_X7a1_P1113921.7_sci.spw25.mfs.l.f	FITS	371.5 kB	17:54

More than one image can be loaded into CARTA by clicking on File and then Append Image and then selecting a file in the File Browser.



Images can be displayed either individually or in a grid by clicking on an icon above the image panel.

The screenshot shows the CARTA software interface. At the top, there is a browser address bar with the URL `172.21.80.169:3002/?token=6744a761-41ac-4614-a9da-c5b6c6dbc678`. Below the browser bar is a menu bar with options: File, View, Widgets, Help. A toolbar contains various icons for image manipulation. A yellow arrow points to a grid view icon in the toolbar.

The main display area is split into two panels, each showing a circular radio astronomy image. The left image has a color scale from -0.0013 to 0.0011. The right image has a color scale from -0.005 to 0.005. A text box above the right image displays the following WCS information:

```
WCS: (11:39:21.745, 20:24:58.86); Image: (625, 625); NaN*;
Frequency (LSRK): 88.6984 GHz; Velocity: 222894.2012 km/s;
Polarization: Stokes I
```

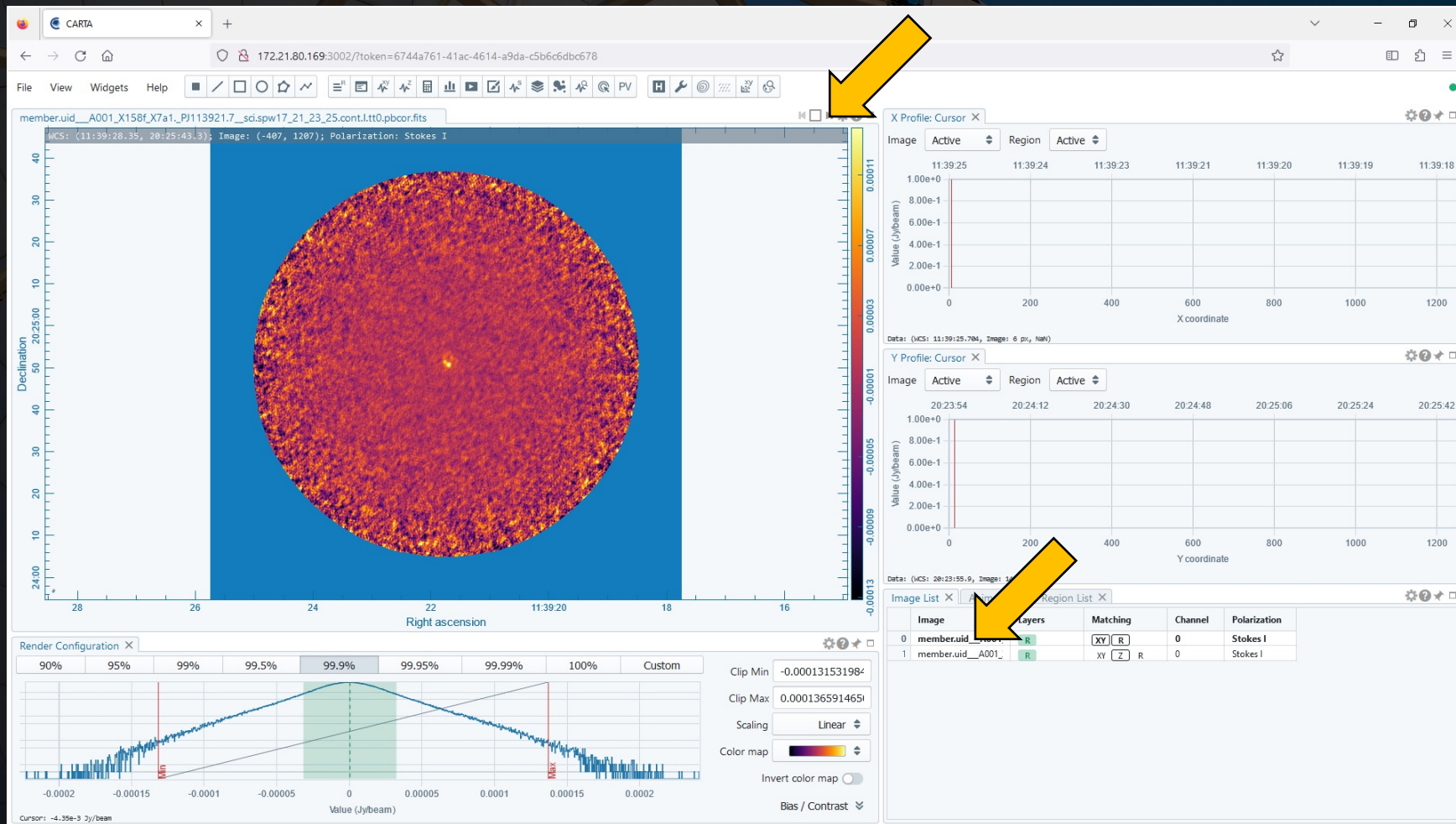
Below the images is a histogram showing the distribution of values. The x-axis is labeled "Value (Jy/beam)" and ranges from -0.008 to 0.008. The y-axis represents frequency. A green shaded region is visible in the histogram, and a cursor is positioned at approximately 1.83e-4 Jy/beam.

At the bottom right, there are two profile plots: "X Profile: Cursor X" and "Y Profile: Cursor X". Both plots show "Value" on the y-axis (ranging from 0.00e+0 to 1.00e+0) and "X coordinate" or "Y coordinate" on the x-axis (ranging from 0 to 1). Below these plots is an "Image List" table:

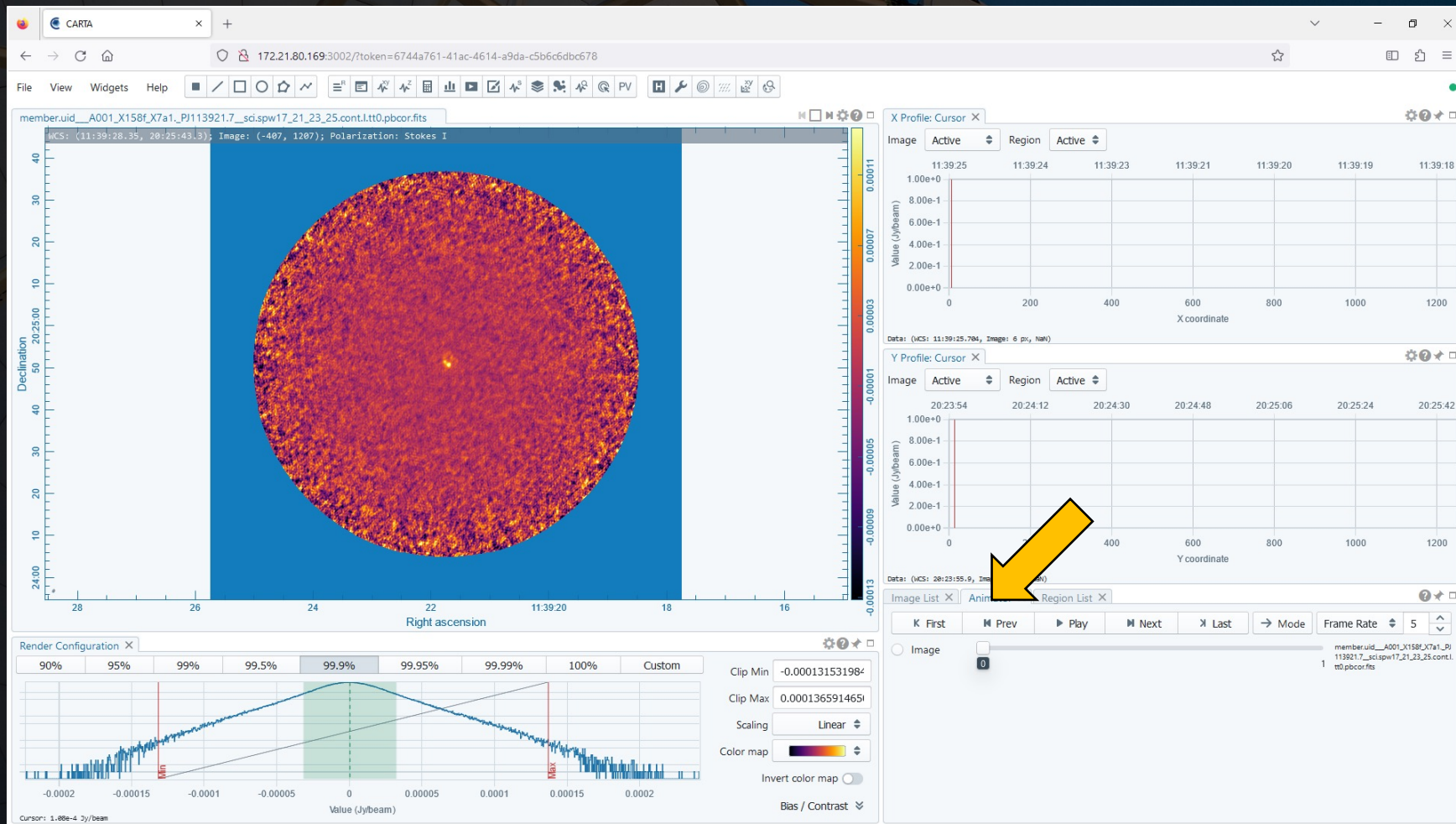
Image	Layers	Matching	Channel	Polarization
0 member.uid__A001_	R	XY R	0	Stokes I
1 member.uid__A001_	R	XY Z R	0	Stokes I



When images are displayed individually, it is possible to switch between images by clicking on the arrows above the image, by clicking on the name of an image in the Image List, or by paging between images in the Animator widget.



When images are displayed individually, it is possible to switch between images by clicking on the arrows above the image, by clicking on the name of an image in the Image List, or by paging between images in the Animator widget.



The Animator widget can also be used to move between channels in an image cube and change the Stokes parameter displayed in images from full polarization observations.

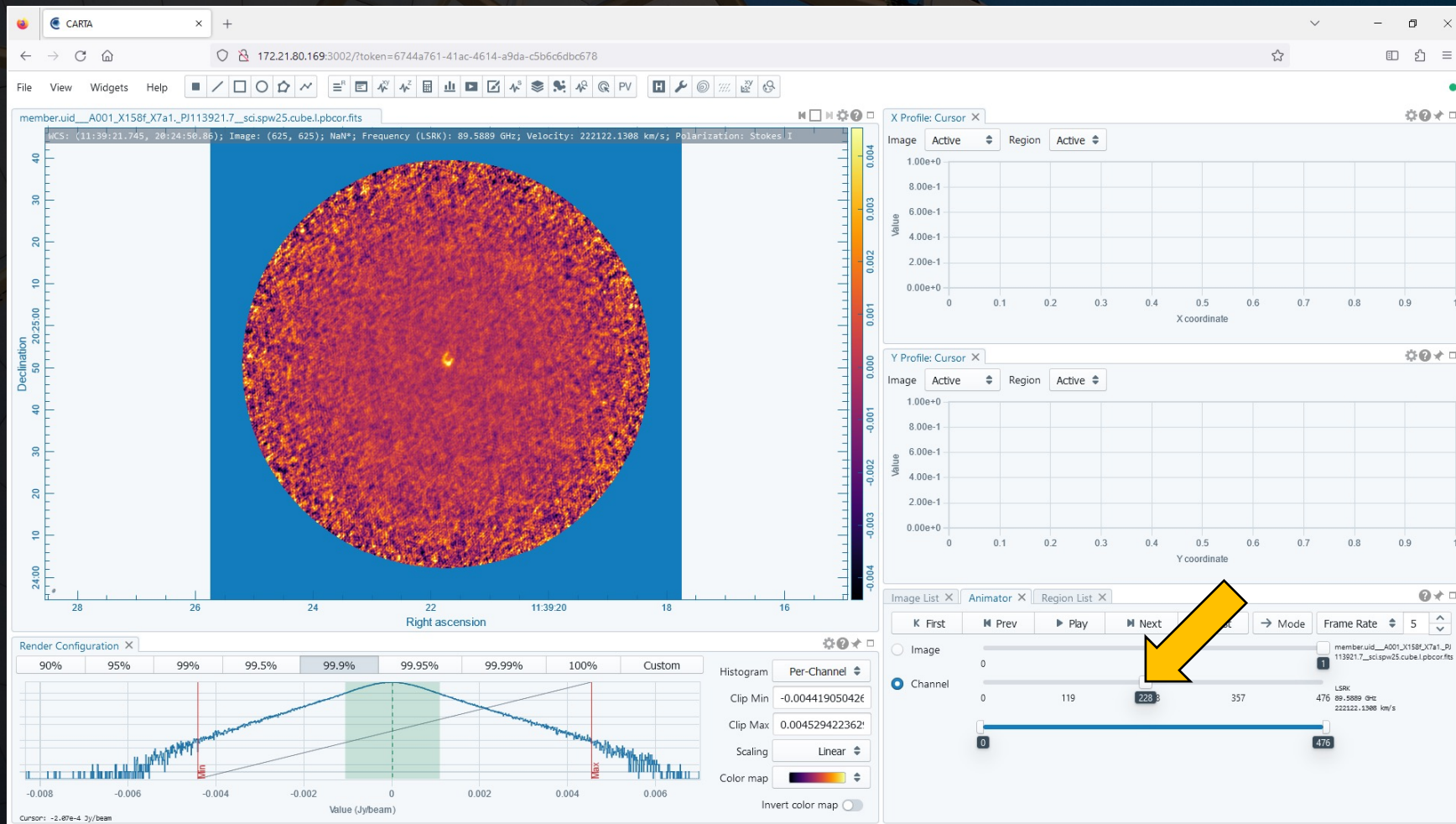


Image coordinate systems can be aligned by clicking on the XY option in the Matching column in the Image List widget.

The screenshot displays the CARTA software interface. The main window shows a circular radio astronomy image with a color scale on the right ranging from -0.005 to 0.005. The axes are labeled 'Right ascension' and 'Declination'. Below the image is a 'Render Configuration' panel with a histogram and various settings like 'Clip Min', 'Clip Max', and 'Scaling'. On the right side, there are two 'X Profile' and 'Y Profile' widgets, each with a graph showing 'Value' vs 'X coordinate' or 'Y coordinate'. At the bottom right, the 'Image List' widget is visible, containing a table of image data. A yellow arrow points to the 'XY' option in the 'Matching' column of the 'Image List' table.

Image	Layers	Matching	Channel	Polarization
0 member.uid__A001_	R	X	0	Stokes I
1 member.uid__A001_	R	XY	0	Stokes I

Image headers can be displayed by clicking on the icon with the H in the button bar.

The screenshot displays the CARTA software interface. A yellow arrow points to the 'H' icon in the toolbar, which is used to open the File Header window. The main window shows a radio astronomy image of a circular source with a color scale from -0.005 to 0.005 Jy/beam. The File Header window is open, displaying the following information:

```
File Information Header
SIMPLE = T / Standard FITS
BITPIX = -32 / Floating point (32 bit)
NAXIS = 4
NAXIS1 = 1250
NAXIS2 = 1250
NAXIS3 = 477
NAXIS4 = 1
EXTEND = T
BSCALE = 1.000000000000E+00 / PHYSICAL = PIXEL*BSCALE + BZERO
BZERO = 0.000000000000E+00
BMAJ = 2.518340625389E-04
BMIN = 1.689219347791E-04
BPA = -3.389586726234E+01
BTPE = Intensity
OBJECT = PJ113921.7
BUNIT = Jy/beam / Brightness (pixel) unit
RADESYS = ICRS
LONPOLE = 1.800000000000E+02
LATPOLE = 2.041413888889E+01
PC1_1 = 1.000000000000E+00
PC2_1 = 0.000000000000E+00
PC3_1 = 0.000000000000E+00
PC4_1 = 0.000000000000E+00
PC1_2 = 0.000000000000E+00
PC2_2 = 1.000000000000E+00
PC3_2 = 0.000000000000E+00
PC4_2 = 0.000000000000E+00
```

The File Header window also shows a 'Render Configuration' panel with the following settings:

- Clip Min: -0.005334475835
- Clip Max: 0.005261990571
- Scaling: Linear
- Color map: [Color bar]
- Invert color map: [Off]

The main window also displays a 'Region List' table:

Matching	Channel	Polarization
XY R	0	Stokes I
XY Z R	0	Stokes I

Clicking on the contour icon in the button bar will open a window that can be used to generate contours. This is good when overlaying one form of emission over another.

The screenshot displays the CARTA software interface. The main window shows a radio astronomy image of a circular field with a color scale from blue to red. A 'Contour Configuration' dialog box is open in the center, showing a histogram of the image data and a Gaussian fit. The dialog box has tabs for 'Levels', 'Configuration', and 'Styling'. The 'Levels' tab is active, showing a histogram of the image data with a Gaussian fit. The 'Parameters' section includes 'Start' (1.599e-4), 'Step' (1.279e-4), 'N' (5), and 'Multiplier' (1). The 'Levels' section is empty. The 'Generate' button is highlighted in green. The 'Render Configuration' window at the bottom shows a histogram of the image data with a Gaussian fit and a 'Cursor' at -2.23e-4 Jy/beam. The 'Region List' window at the bottom right shows a table of regions.

Layers	Matching	Channel	Polarization
d_A001	XY   R	0	Stokes I
f_A001	XY   Z R	0	Stokes I

Clicking on the contour icon in the button bar will open a window that can be used to generate contours. This is good when overlaying one form of emission over another.

The screenshot shows the CARTA software interface. The main window displays a radio astronomy image of a circular source. A 'Contour Configuration' dialog box is open in the foreground, showing a histogram of the image data. The histogram has a peak at 0 Jy/beam. A yellow arrow points to the 'Generate' button in the dialog box. The dialog box also shows parameters for the contour generation, such as 'Start' (5.000e-5), 'Step' (5.000e-5), 'N' (5), and 'Multiplier' (1). The 'Levels' field shows a range from 5.00e-5 to 2.50e-4. The 'Render Configuration' window at the bottom shows a histogram of the image data with a 'Min' and 'Max' value. The 'Region List' window at the bottom right shows a table of regions.

Layers	Matching	Channel	Polarization
d__A001	XY   R	0	Stokes I
f__A001	XY   Z R	0	Stokes I

Clicking on the contour icon in the button bar will open a window that can be used to generate contours. This is good when overlaying one form of emission over another.

The screenshot displays the CARTA software interface. The main window shows a radio astronomy image with axes for Right ascension (22 to 28) and Declination (24.00 to 40). A 'Contour Configuration' dialog box is open, showing a histogram of the data with a 'Generate' button and a 'Apply' button highlighted with a yellow arrow. The dialog box also includes a 'Levels' section with a list of values: 5.00e-5, 1.00e-4, 1.50e-4, 2.00e-4, and 2.50e-4. The 'Apply' button is highlighted with a yellow arrow.

Render Configuration X

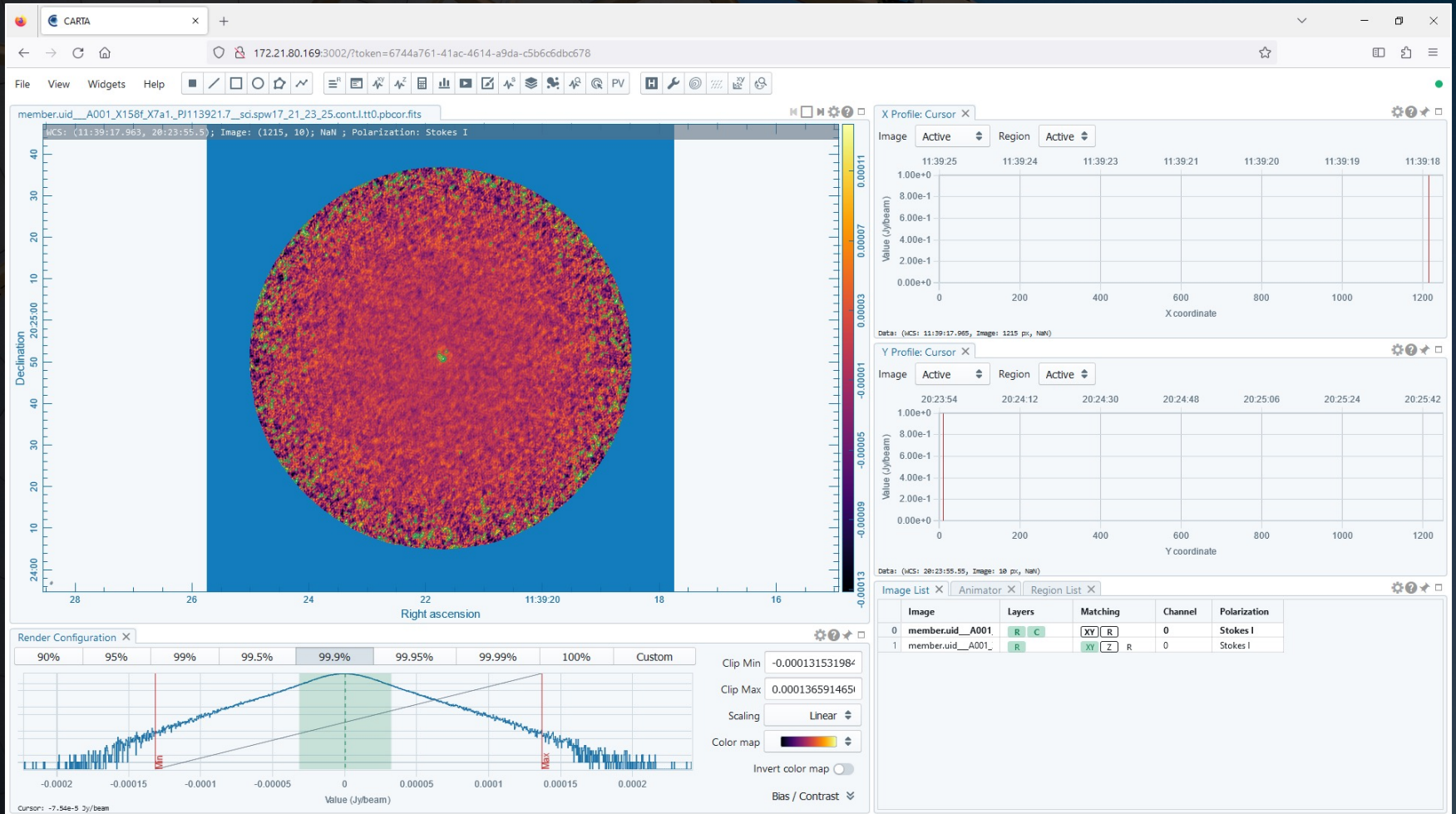
90%	95%	99%	99.5%	99.9%	99.95%	99.9%

Cursor: -1.68e-4 Jy/beam

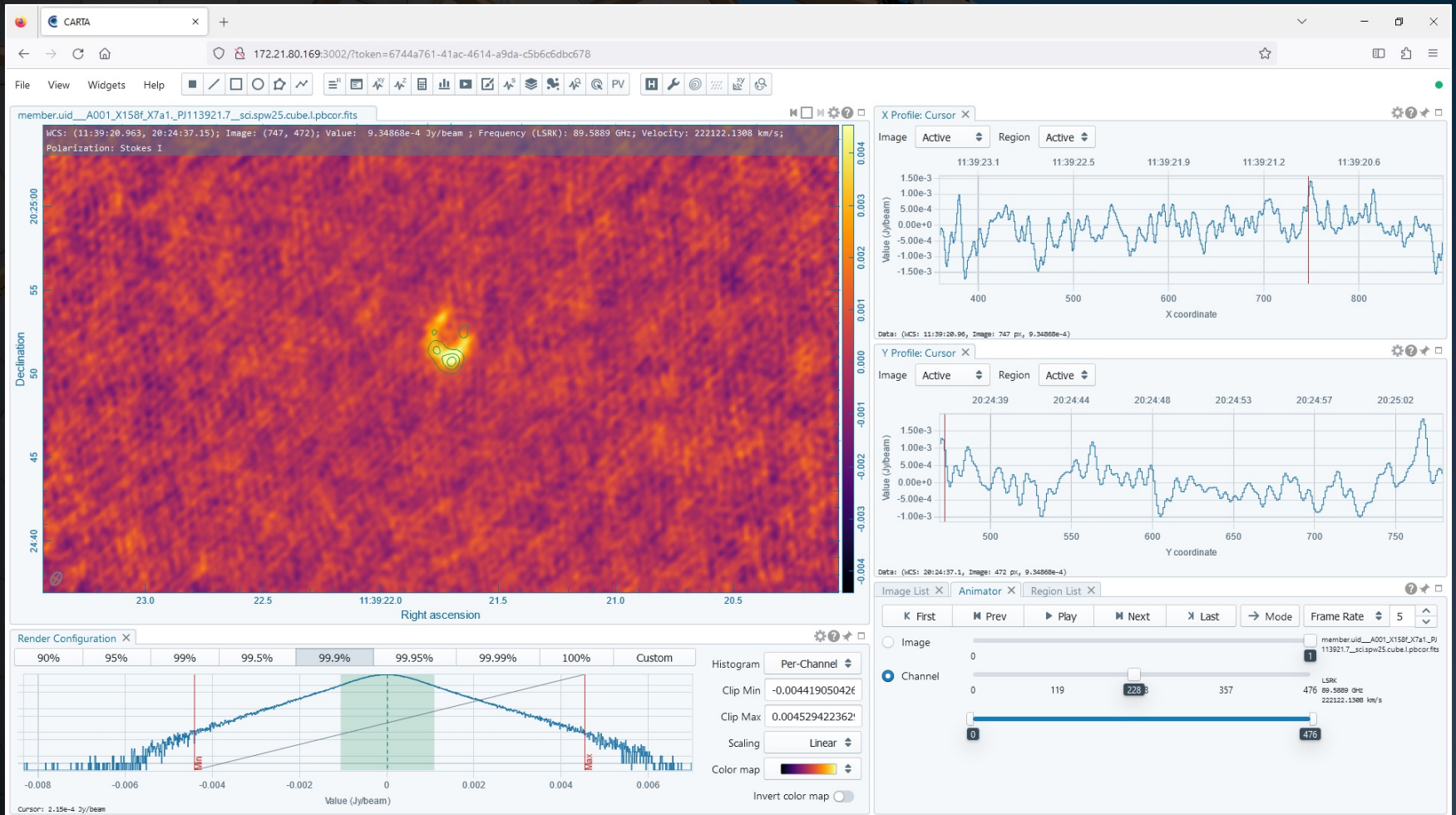
Layers	Matching	Channel	Polarization
d_A001	XY   R	0	Stokes I
d_A001	XY   Z R	0	Stokes I



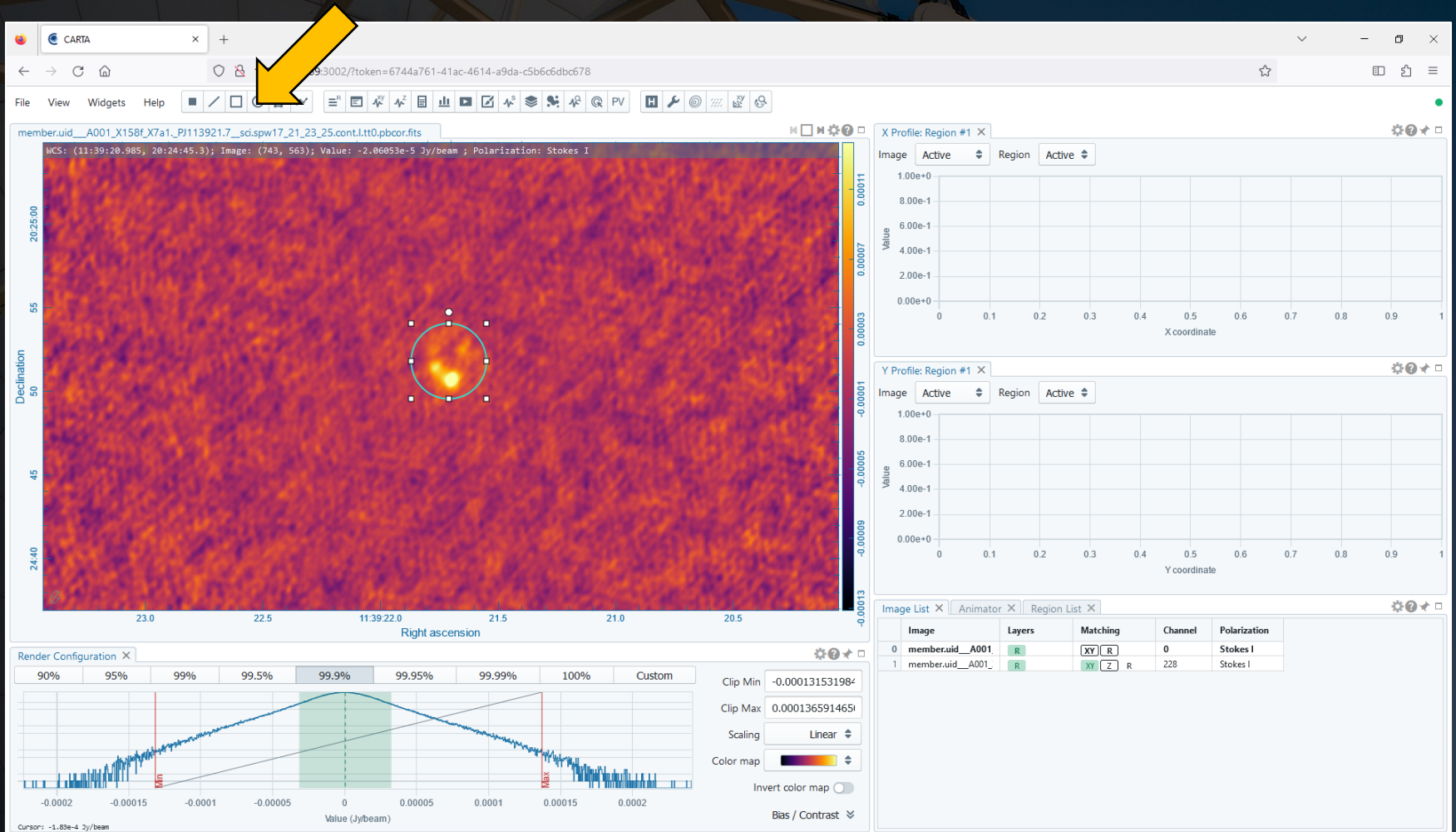
Clicking on the contour icon in the button bar will open a window that can be used to generate contours. This is good when overlaying one form of emission over another.



Clicking on the contour icon in the button bar will open a window that can be used to generate contours. This is good when overlaying one form of emission over another.



Regions can be drawn on the image by clicking on one of the shapes in the menu bar and then drawing that shape in the image panel. These regions can be used by several other widgets.



Double clicking on a region in an image or in the Region List widget will display information about that region.

The screenshot displays the CARTA software interface. The main window shows a radio astronomy image with a color scale from -0.00013 to 0.00011. A yellow circle highlights a region of interest, with a yellow arrow pointing to it. The Region List widget at the bottom right contains the following table:

Name	Type	Center	Size	P.A. (deg)
Cursor	Point	11:39:20.985 20:24:45.3		0.0
Region 1	Ellipse	11:39:21.7099796862 20:24:51.8005009413	2.2500000000" 2.2500000000"	0.0

The X Profile and Y Profile plots are currently empty, showing Value vs. X coordinate and Value vs. Y coordinate respectively. The Render Configuration widget at the bottom left shows a histogram of the image data with a green shaded region indicating the current clip range.

Double clicking on a region in an image or in the Region List widget will display information about that region.

The screenshot displays the CARTA software interface. The main window shows a radio telescope image with a color scale from 0.00007 to 0.00011. A dialog box titled "Editing Region 1" is open, showing the following details:

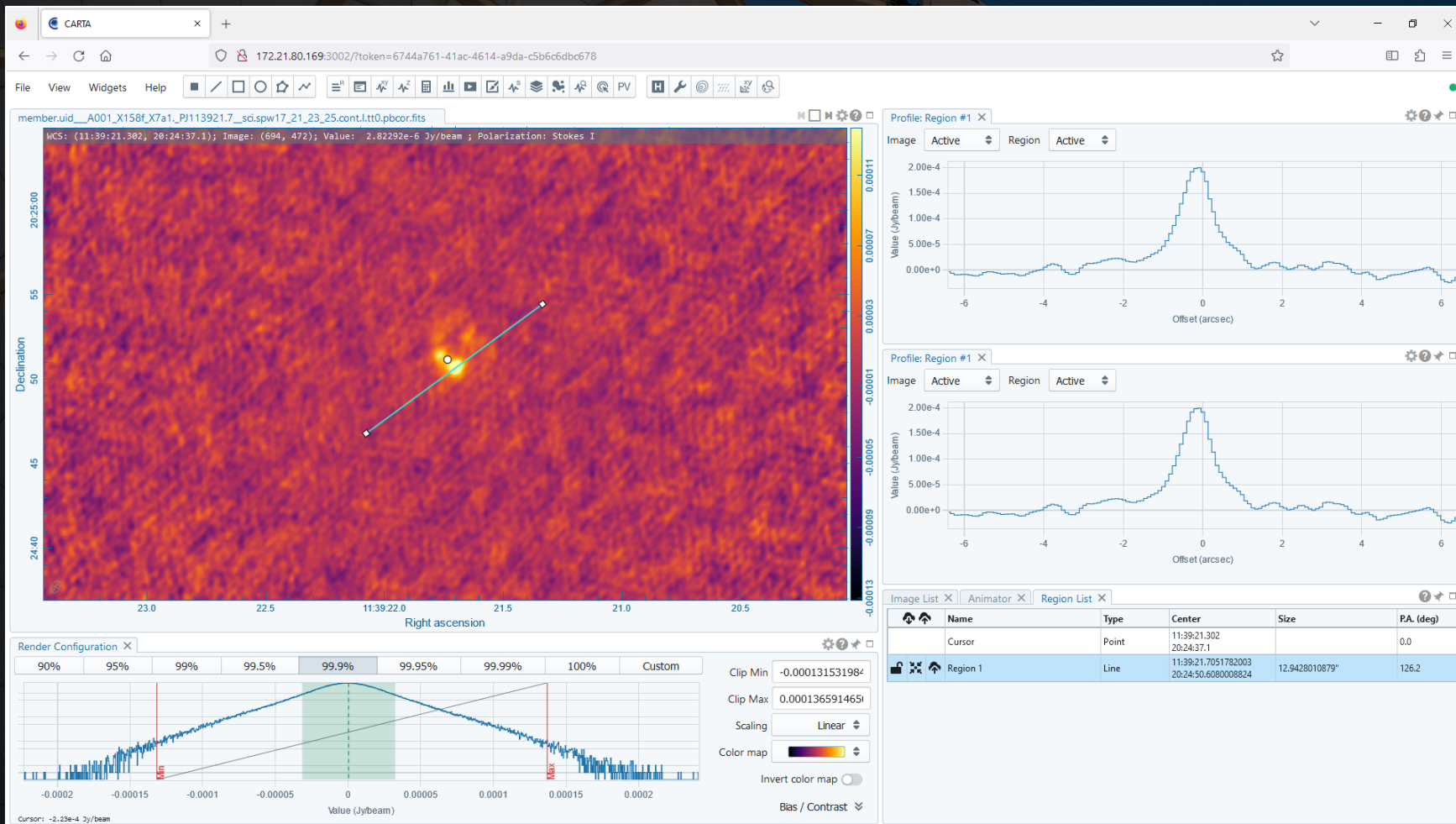
- Appearance:** Color (red), Line Width (px) 2, Dash Length (px) 0.
- Properties:** Region Name (Enter a region name), Coordinate (World), Center (11:39:21.70997, 20:24:51.80050), Semi-axes (2.2500000000", 2.2500000000"), P.A. (deg) 0.

The Region List widget at the bottom right shows the following table:

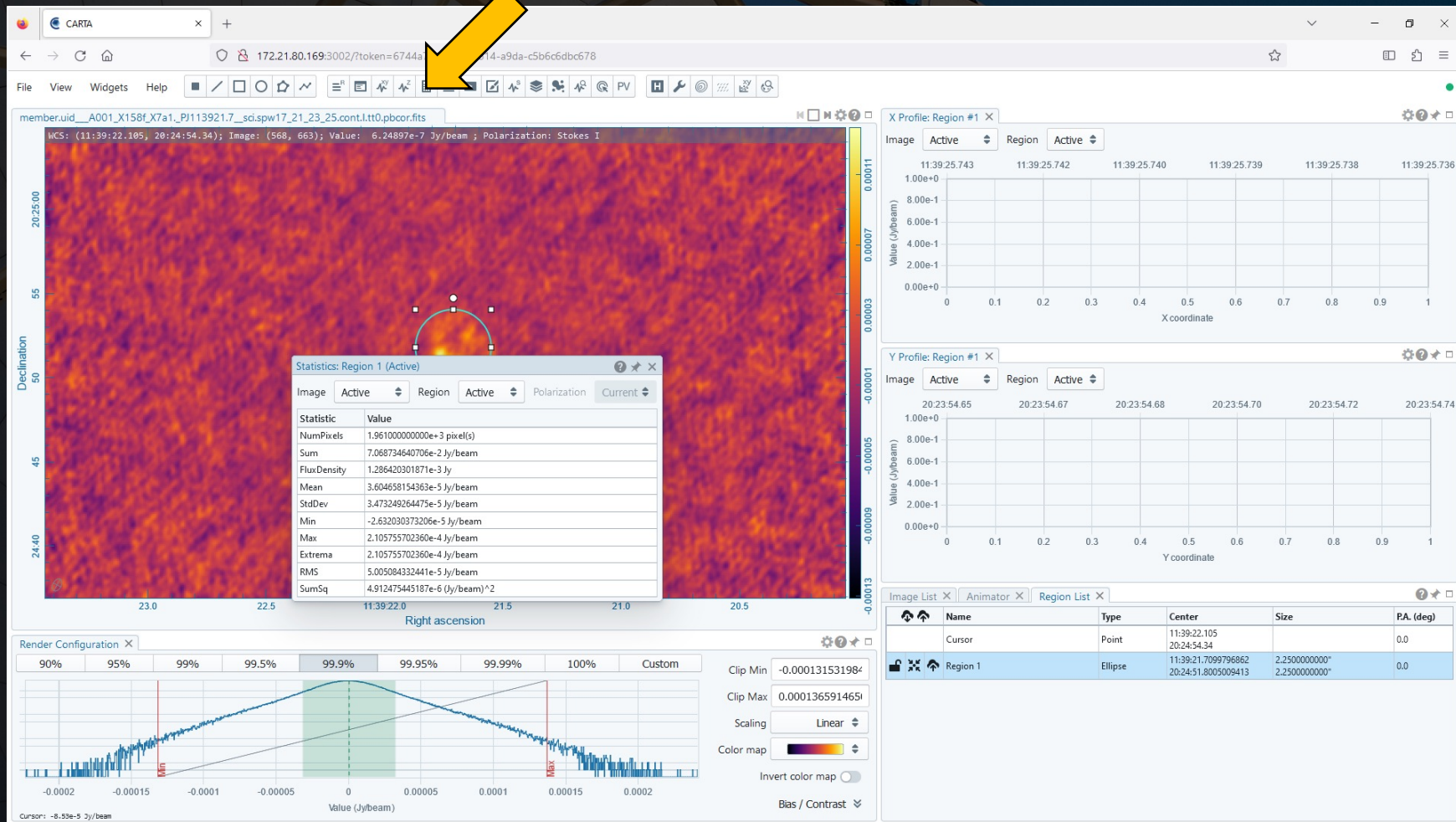
	Type	Center	Size	P.A. (deg)
Cursor	Point	11:39:20.985 20:24:45.3		0.0
Region 1	Ellipse	11:39:21.7099796862 20:24:51.8005009413	2.2500000000" 2.2500000000"	0.0

The Render Configuration widget at the bottom left shows a histogram of the image data with a cursor at -2.23e-4 Jy/beam. The histogram has a peak at 99.9% and a range from -0.0002 to 0.0002. The X-axis is labeled "Value (Jy/beam)" and the Y-axis is labeled "90%", "95%", "99%", "99.5%", "99.9%", "99.95%", "99.99%", "100%", "Custom".

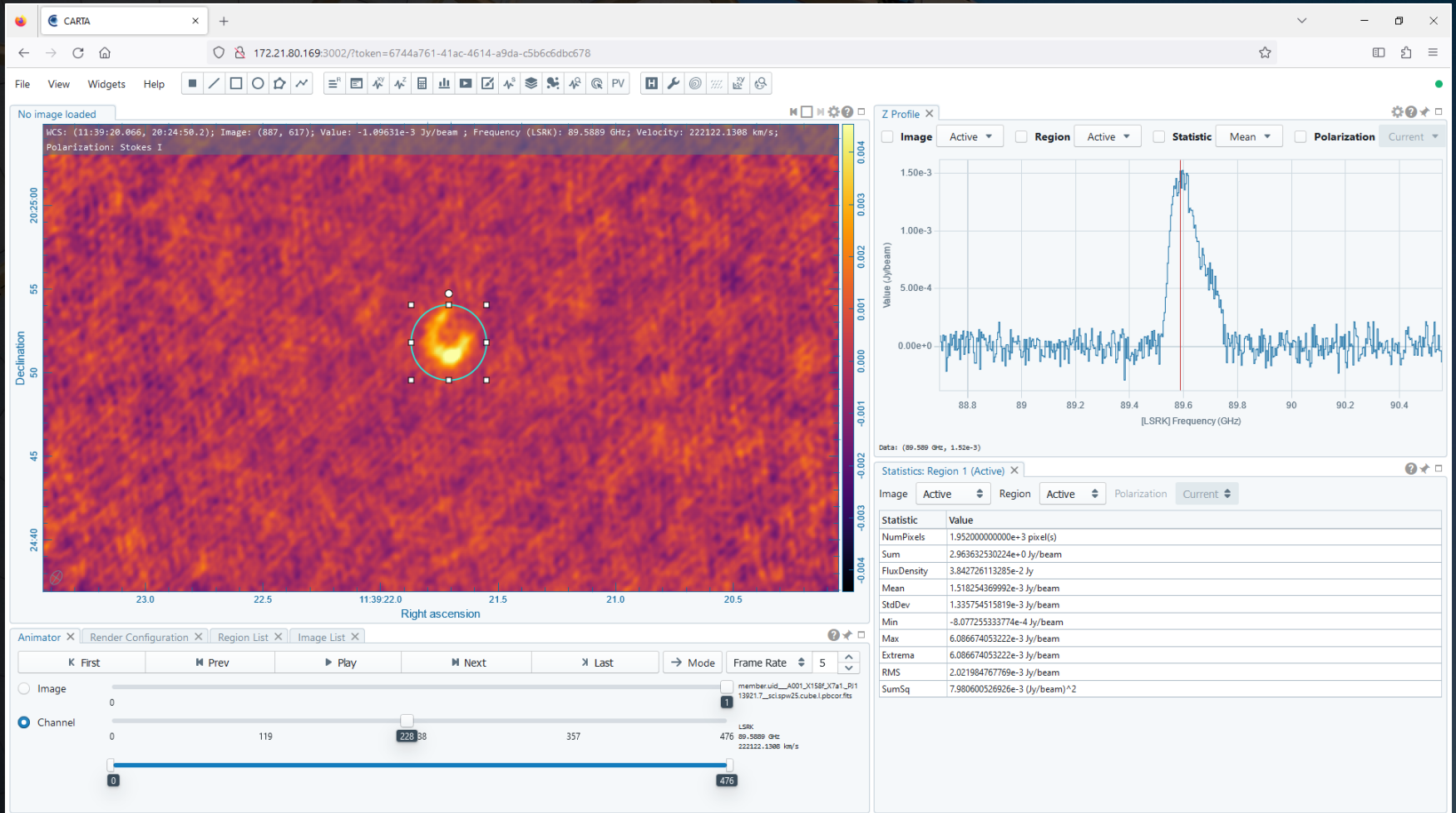
X Profile and Y Profile windows will, by default, show the x and y profiles at the position of the cursor. If a line region is drawn on the image, these widgets can be used to show the x and y profiles of the line.



The Statistics widget will display statistical information either for the pixels within an individual region (such as a circle) or for the entire image.

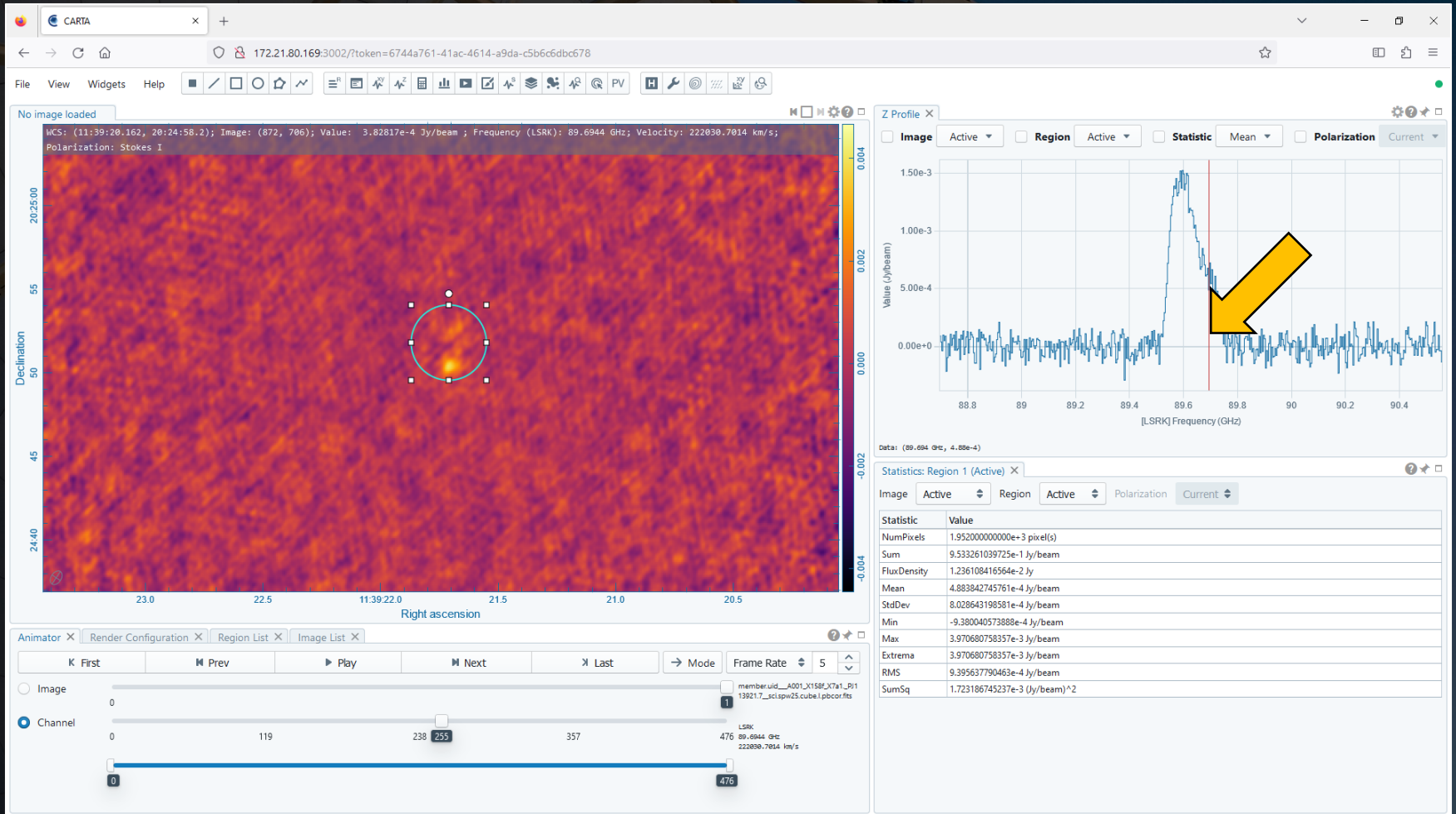


The Z Profile will show the spectrum measured within an image cube at the position of the cursor or within a region. (Because spectra can be slow to load and because the spectrum updates when the cursor is moved across an image, displaying the spectrum within a region works better.)

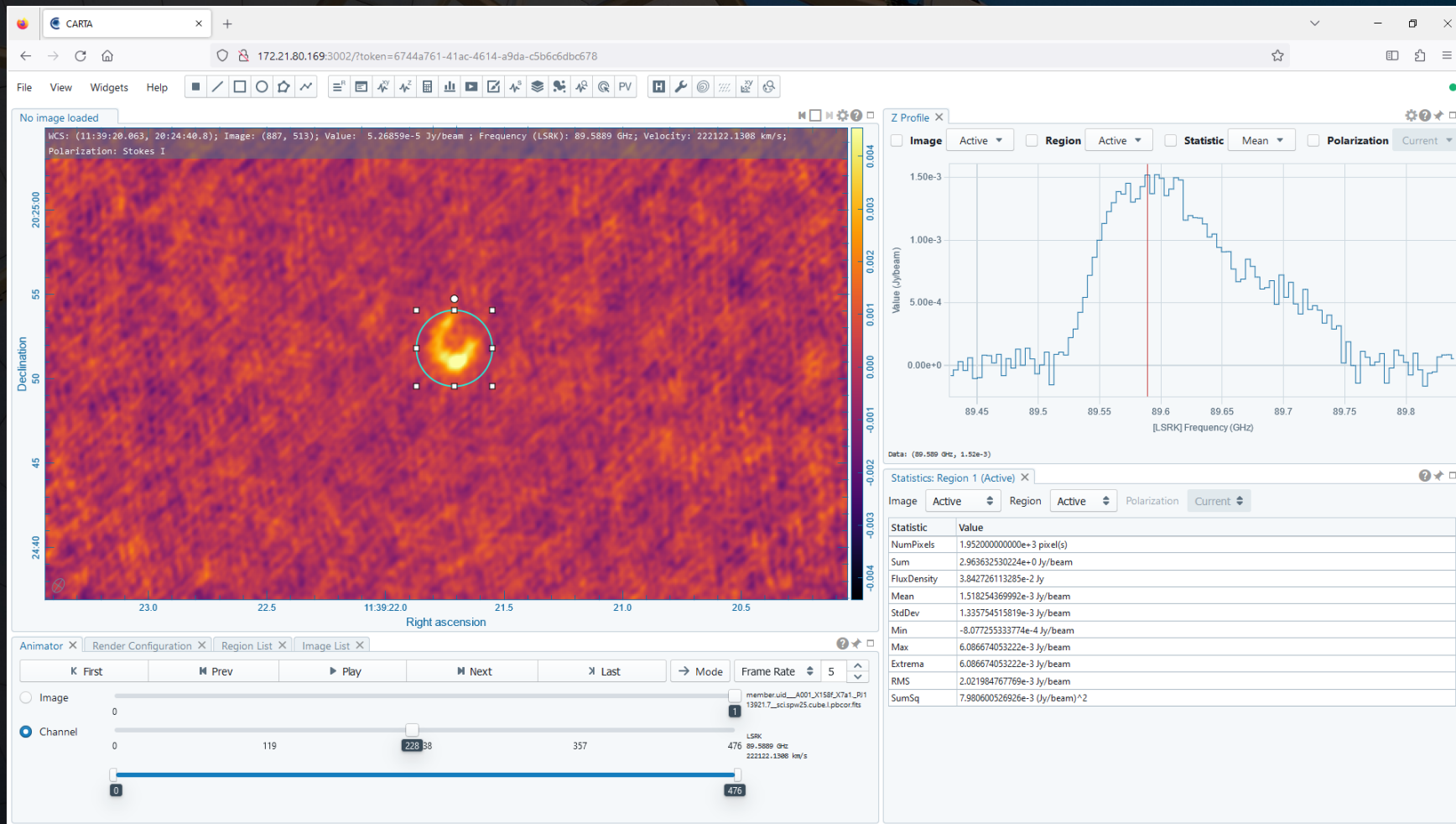




Left clicking on a specific location in the spectrum will display the image cube at that specific frequency.



Holding down the left mouse button and dragging within the plot of the spectrum will zoom in on that location. (Double-clicking will zoom out again.)



The smoothing option in the Z Profile window (accessible through settings if the button is not visible) provides options for smoothing the spectrum.

The screenshot displays the CARTA software interface. The main window shows a spectral image with a color scale from -0.003 to 0.003. The Z Profile window is open, showing a plot of Value (Jy/beam) versus [LSRK] Frequency (GHz). The plot shows a peak at approximately 89.6 GHz. The Z Profile window has tabs for Image, Region, and Statistic. The Statistic tab is active, showing a table of statistics for Region 1 (Active).

**Z Profile Settings: Region #1 (Active)**

- Conversion
- Styling
- Smoothing
- Moments
- Fitting

Method: Boxcar

Color: [Color Picker]

Line Style: [Line Style Buttons]

Line Width (px): 1

Point Size (px): 1

Overlay: [Toggle]

Kernel: 8

**Z Profile X**

Image: Active | Region: Active | Statistic: Mean | Polarization: Current

Value (Jy/beam) vs [LSRK] Frequency (GHz)

Data: (89.702 GHz, 5.456e-4)

**Statistics: Region 1 (Active) X**

Statistic	Value
NumPixels	1.952000000000e+3 pixel(s)
Sum	1.063091441329e+0 Jy/beam
FluxDensity	1.378433122441e-2 Jy
Mean	5.446165170741e-4 Jy/beam
StdDev	8.443887216754e-4 Jy/beam
Min	-9.777159430087e-4 Jy/beam
Max	4.016421269625e-3 Jy/beam
Extrema	4.016421269625e-3 Jy/beam
RMS	1.004606490874e-3 Jy/beam
SumSq	1.970025161342e-3 (Jy/beam) <sup>2</sup>

Animator: [K] First | [M] Prev | [P] Play | [N] Next | [X] Last | [M] Mode | Frame Rate: 5

Image: [Slider]

Channel: [Slider] | LSRK: 476 89.7022 GHz 222023.9288 km/s

The moment option in the Z Profile window (accessible through settings if the button is not visible) provides an option for creating moment images. These will appear as separate images in the Image List, and it is possible to switch to and from these moment images using the Animator.

The screenshot displays the CARTA software interface. The Z Profile window is open, showing a spectral plot of Value (J/beam) versus LSRKJ Frequency (GHz). The plot shows a prominent peak at approximately 89.6 GHz. The Z Profile window has several tabs: Conversion, Styling, Smoothing, Moment, and Plotting. The Moment tab is selected, and the Generate button is visible. A yellow arrow points to the Moment tab. Another yellow arrow points to the Generate button. The Animator window is also visible, showing a channel slider set to 257. The Image List window shows a list of images, including the current image and moment images.

**Z Profile Settings: Region #1 (Active)**

- Image (1: membe...): Active
- Region (Region 1): Active
- Coordinate: Frequency (GHz)
- System: LSRK
- Range (GHz): From 89.5 To 89.75
- Mask: None
- Range (Jy/beam): From 0 To 1
- Moments: 0 x

**Z Profile X**

Image: Active | Region: Active | Statistic: Mean | Polarization: Current

Value (J/beam) vs. LSRKJ Frequency (GHz)

Data: (89.702 GHz, 5.456e-4)

**Statistics: Region 1 (Active) X**

Statistic	Value
NumPixels	1.952000000000e+3 pixel(s)
Sum	1.063091441329e+0 Jy/beam
FluxDensity	1.378433122441e-2 Jy
Mean	5.446165170741e-4 Jy/beam
StdDev	8.443887216754e-4 Jy/beam
Min	-9.777159430087e-4 Jy/beam
Max	4.016421269625e-3 Jy/beam
Extrema	4.016421269625e-3 Jy/beam
RMS	1.004606490874e-3 Jy/beam
SumSq	1.970025161342e-3 (Jy/beam)^2

**Animator X**

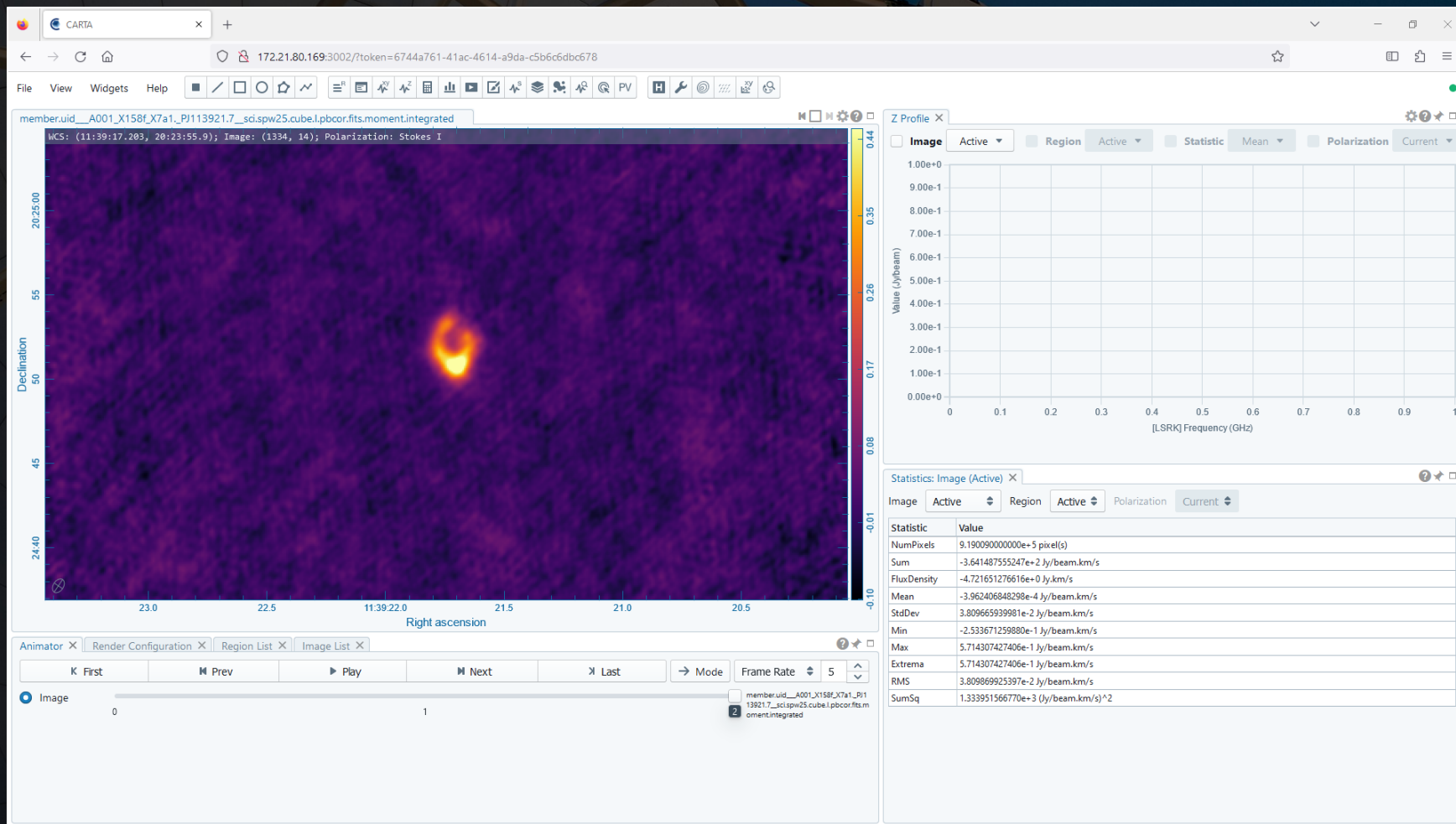
Render Configuration X | Region List X | Image List X

Image | Channel

0 | 119 | 238 | 257 | 357 | 476

LSRK 476 89.702 GHz 222023.9288 km/s

The moment option in the Z Profile window (accessible through settings if the button is not visible) provides an option for creating moment images. These will appear as separate images in the Image List, and it is possible to switch to and from these moment images using the Animator.



The fitting option in the Z Profile window (accessible through settings if the button is not visible) can be used to fit a spectral line, although a priori values need to be set first (or estimated using the auto detect button).

The screenshot displays the CARTA software interface. The main window shows a spectral line plot with a Gaussian fit overlaid. The plot's x-axis is labeled 'LSRJQ Frequency (GHz)' and ranges from 88.8 to 90.4. The y-axis is labeled 'Value (J/beam)' and ranges from 0.00e+0 to 1.50e-3. A red vertical line marks the center of the fit at approximately 89.6 GHz. The plot is titled 'Z Profile X' and includes tabs for 'Image', 'Region', 'Statistic', 'Mean', and 'Polarization'. A yellow arrow points to the 'Fitting' tab in the 'Z Profile Settings: Region #1 (Active)' window, which is open over the main plot. The settings window includes fields for 'Data source', 'Profile function' (set to 'Gaussian'), 'Auto detect' (with 'w/ cont.' and 'auto fit' options), 'Components' (set to 1), 'Center', 'Amplitude', 'FWHM', 'Continuum', and 'Fitting result'. Another yellow arrow points to the 'Fitting' tab in the settings window. The bottom of the interface shows an 'Animator' section with playback controls and a channel slider. The channel slider is set to 228, with a range from 0 to 476. The 'LSRJQ' frequency is shown as 476 89.5889 GHz, 222122.1308 km/s. A statistics table is visible on the right side of the interface, showing various statistical values for the active region.

Statistic	Value
NumPixels	1.952000000000e+3 pixel(s)
Sum	2.963632530224e+0 Jy/beam
FluxDensity	3.842726113285e-2 Jy
Mean	1.518254369992e-3 Jy/beam
StdDev	1.335754515819e-3 Jy/beam
Min	-8.077255333774e-4 Jy/beam
Max	6.086674053222e-3 Jy/beam
Extrema	6.086674053222e-3 Jy/beam
RMS	2.021984767769e-3 Jy/beam
SumSq	7.980600526926e-3 (Jy/beam) <sup>2</sup>

The fitting option in the Z Profile window (accessible through settings if the button is not visible) can be used to fit a spectral line, although a priori values need to be set first (or estimated using the auto detect button).

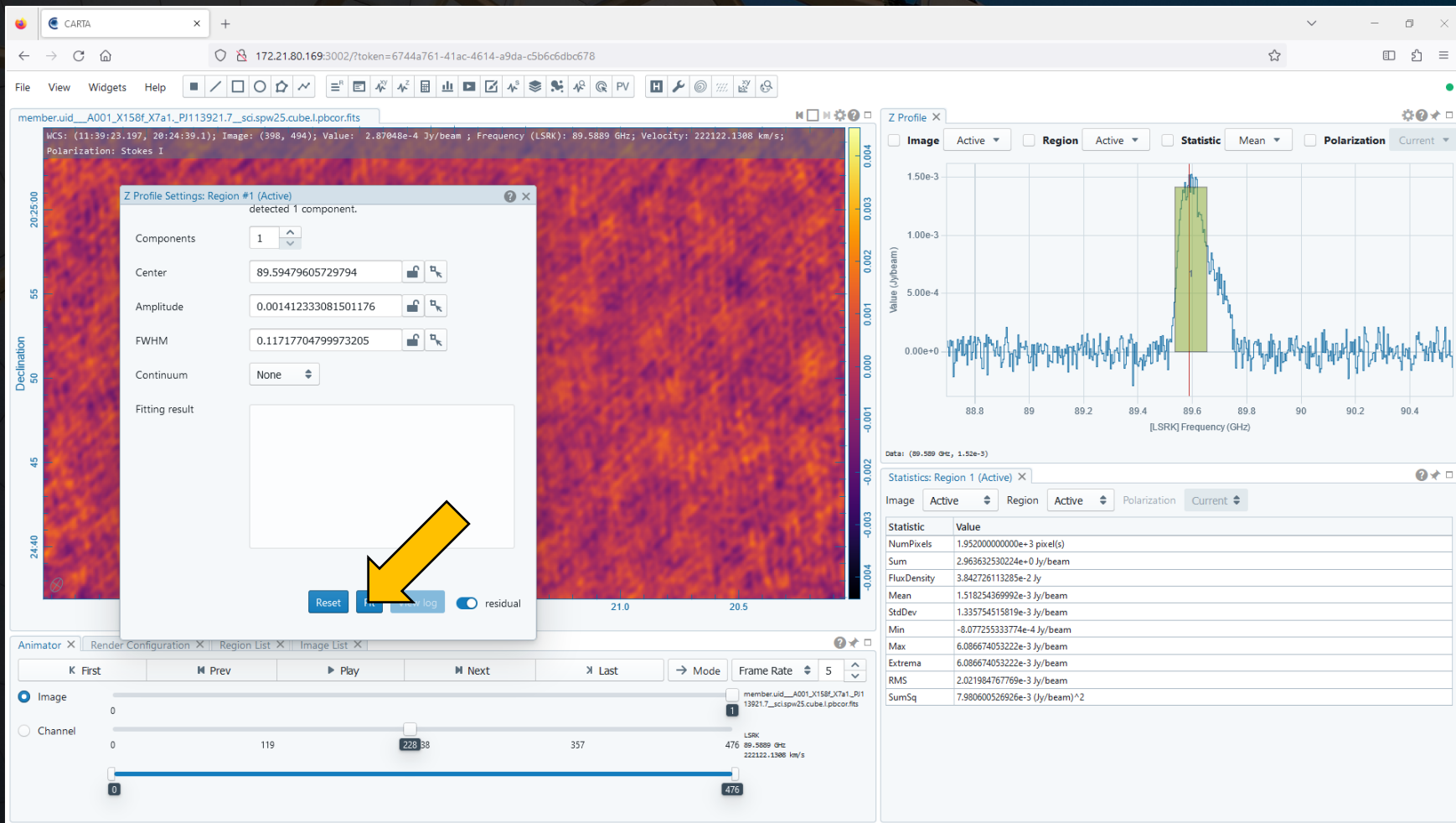
The screenshot displays the CARTA software interface. The main window shows a spectral line plot with a green shaded region indicating a fit. The Z Profile window is open, showing the 'Fitting' tab. A yellow arrow points to the 'Fitting' button in the 'Fitting' tab. The 'Fitting' tab includes the following settings:

- Conversion: member.uid\_A001\_X158f\_X7a1\_PJ113921.7\_sc1.spw25.cube.lpbcor.fits
- Data source: member.uid\_A001\_X158f\_X7a1\_PJ113921.7\_sc1.spw17
- Profile function: [dropdown]
- Auto detect:  w/ cont.  auto fit
- detected 1 component.
- Components: 1
- Center: 89.59479605729794
- Amplitude: 0.001412333081501176
- FWHM: 0.11717704799973205
- Continuum: None
- Fitting result: [empty box]

The Z Profile window also shows a plot of Value (Jy/beam) versus [LSRK] Frequency (GHz). The plot shows a spectral line with a green shaded region indicating a fit. The Y-axis ranges from 0.00e+0 to 1.50e-3. The X-axis ranges from 88.8 to 90.4. The plot title is 'Data: (89.589 GHz, 1.52e-3)'. The plot also shows a 'Statistics: Region 1 (Active)' window with the following data:

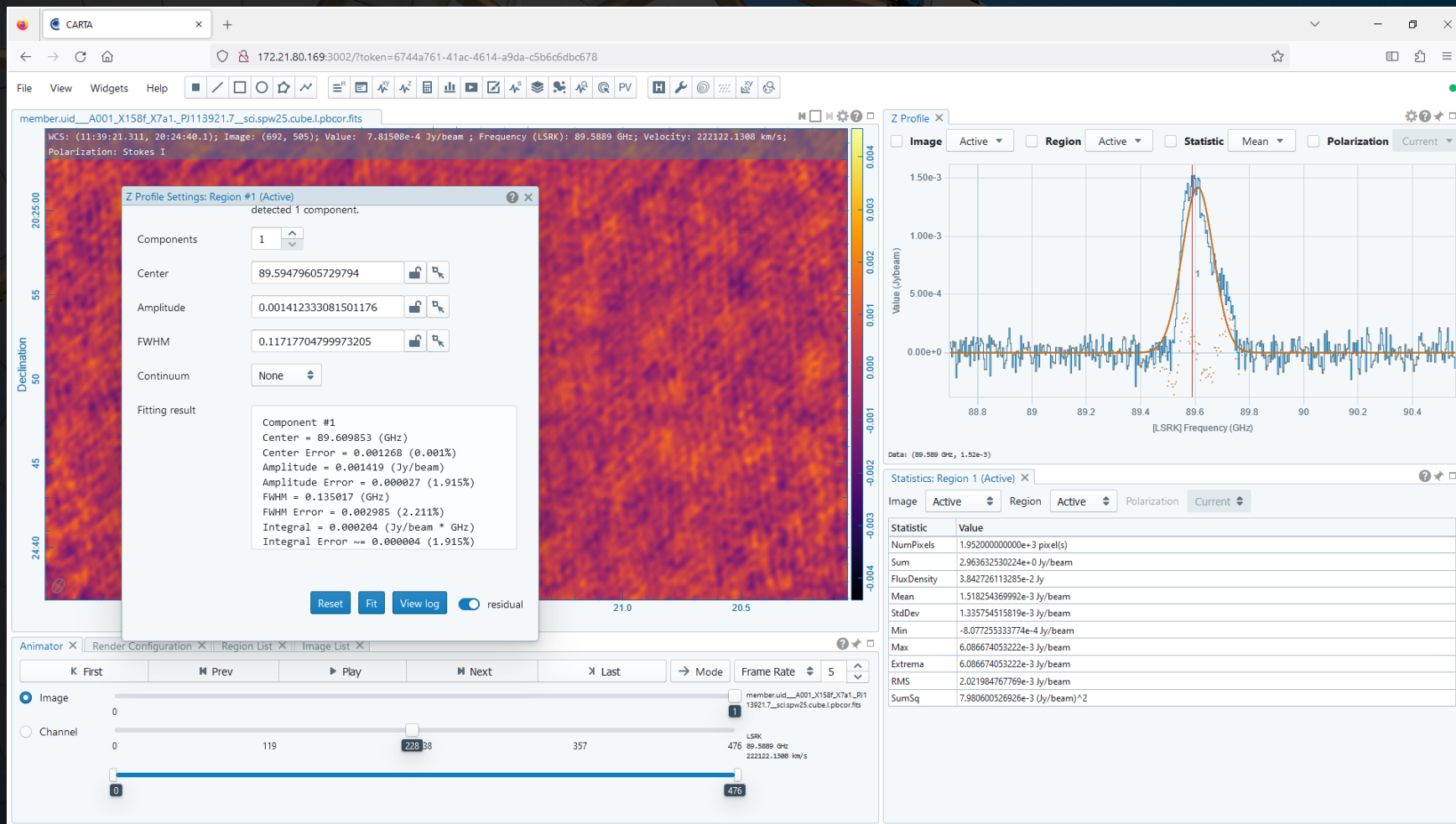
Statistic	Value
NumPixels	1.952000000000e+3 pixel(s)
Sum	2.963632530224e+0 Jy/beam
FluxDensity	3.842726113285e-2 Jy
Mean	1.518254369992e-3 Jy/beam
StdDev	1.335754515819e-3 Jy/beam
Min	-8.077255333774e-4 Jy/beam
Max	6.086674053222e-3 Jy/beam
Extrema	6.086674053222e-3 Jy/beam
RMS	2.021984767769e-3 Jy/beam
SumSq	7.980600526926e-3 (Jy/beam)^2

The fitting option in the Z Profile window (accessible through settings if the button is not visible) can be used to fit a spectral line, although a priori values need to be set first (or estimated using the auto detect button).





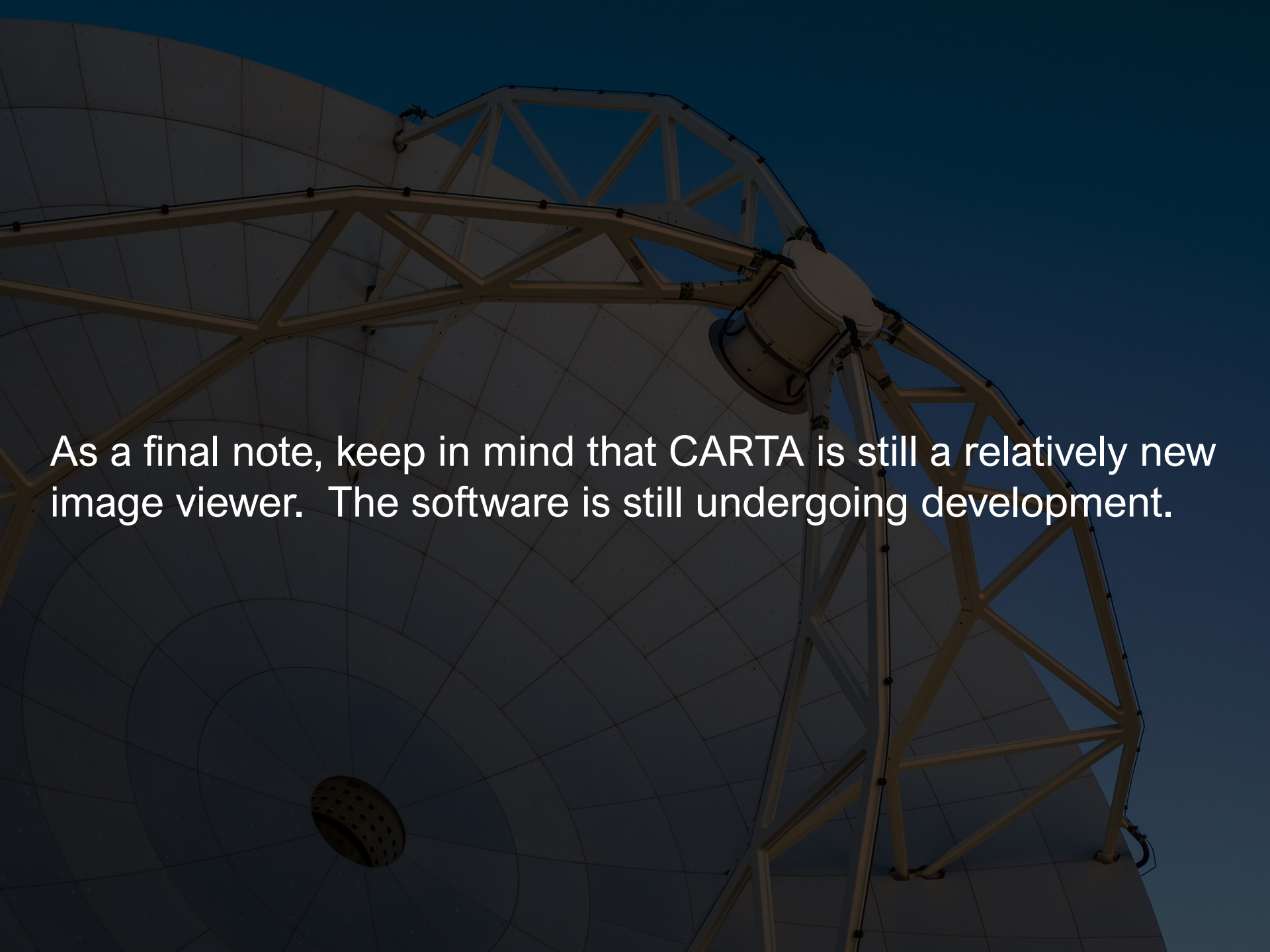
The fitting option in the Z Profile window (accessible through settings if the button is not visible) can be used to fit a spectral line, although a priori values need to be set first (or estimated using the auto detect button).





CARTA also has other options, including the following:

- Display of data from user catalogues or from Simbar or Vizier
- Vector overlays
- Spectral line overlays (on spectra)
- Point source fitting
- Position-velocity plot generation
- Stokes analysis tools (including automatic creation of polarization fraction and angle images from Stokes image cubes)

A large radio telescope dish is shown from a low angle, looking up. The dish is a large, curved, white structure with a grid of lines. It is supported by a complex, yellowish metal truss structure. The background is a clear, dark blue sky. The text is overlaid on the center of the image.

As a final note, keep in mind that CARTA is still a relatively new image viewer. The software is still undergoing development.