



INTRODUCTION TO **CARTA**

ALMA Data Reduction Training Day

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Leiden Observatory
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EUROPEAN ARC
ALMA Regional Centre || Allegro



<https://cartavis.org/>

CARTA

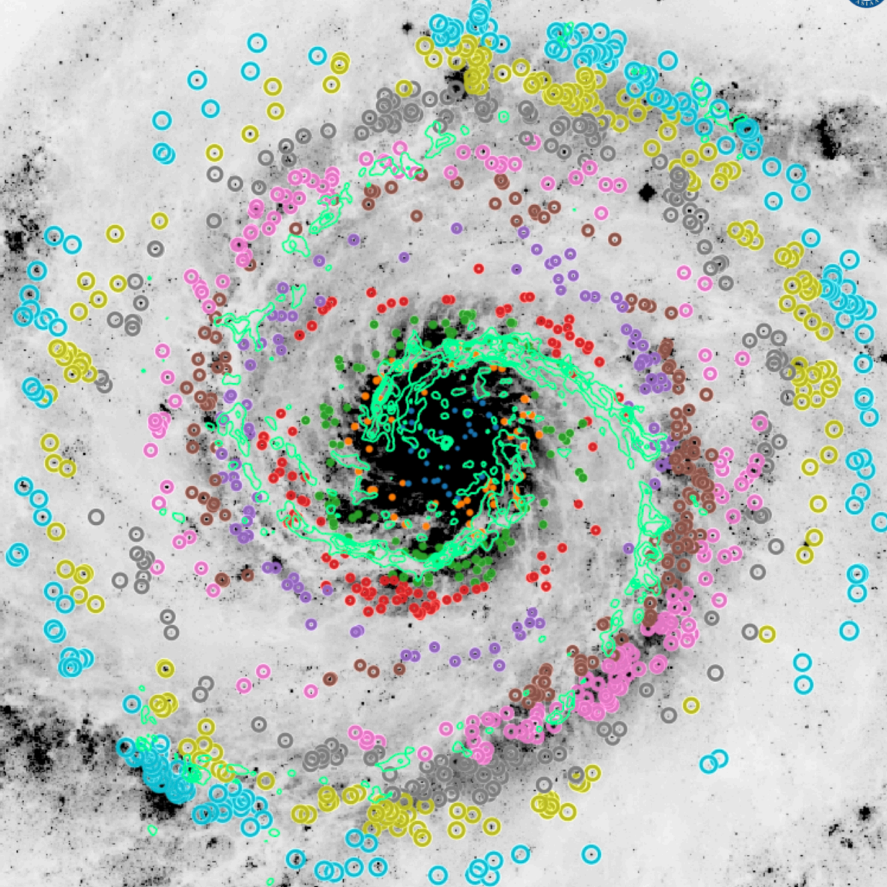
Cube Analysis and Rendering Tool for Astronomy, is a next generation image visualization and analysis tool designed for ALMA, VLA, and SKA pathfinders.

Installation

User Manual

Helpdesk

New release: v4
September 2023





CARTA on the ALMA Science Archive

- No need to install CARTA
- No need to download data
- Can open multiple images
- Can save work in PNG format (not FITS)
- May get disconnected

Working with CARTA on your computer

- Can customise panels and preferences
- Data must be downloaded locally
- Can open multiple images
- Can save work in FITS & PNG formats
- Does not time out





Using CARTA on the archive

- Go to the **ALMA Science Archive**: <https://almascience.eso.org/aq/>
- Query for **Member ous ID**: <uid://A001/X87d/Xb3d>
 - Alternatively, query for **project ID**: **2016.1.00229.S**
frequency range: 219 to 220 GHz
- Select the one observation that is returned and click on **Explore & Download** button
- Click on the CARTA button next to the **continuum file**
member.uid__A001_X87d_Xb3d.TW_Hya_sci.spw19_23_25_27_29.cont.I.pbcor.fits
- Click on the CARTA button next to the **cube corresponding to spw 27**
member.uid__A001_X87d_Xb3d.TW_Hya_sci.spw27.cube.I.pbcor.fits
- You now have two CARTA sessions open (one for the continuum, one for the line cube)
- You can append the line cube image in the continuum session and work in one session

Using CARTA on the Allegro computers

- Open a **CARTA session on the Allegro machine** assigned to you, following the instructions in the User's Guide

File Browser First click this icon and then select the following folders to the project and continue into your own analysis folder

> allegro1 > allegro > home > your username

Filename	Type	Size	Date	File Information	Header
<u>open_ALMA_DRT2023</u>		4 items	31 Oct 2023		



Using CARTA on the Allegro computers

- You can use two different datasets:
 - The results of the tutorial work today:
 - Continuum file: [sis14_twhya_cont.image](#)
 - Append the line cube we created in the imaging session: [twhya_n2hp.image](#)

- A different TWhya dataset with higher spectral resolution in the archive folder
 - Load the continuum file: [TWhya_2016.1.00229.S_cont.fits](#)
 - Append the line cube: [TWhya_2016.1.00229.S_C180.fits](#)
 - Note that you may need to copy this dataset to your analysis folder first
> `cp -r ../../archive/DRT2023/TW_hydra/*.fits analysis_tools/.`

→ I will be using this higher resolution dataset in the demo today

- If you prefer to work on your laptop and have CARTA installed, you can download the data at <https://bit.ly/AllegroDRT23-data>




Live Demo + tutorial

1. Open CARTA
2. Open the continuum file
3. Append the line cube
4. Change the layout: View > Layouts > Existing Layouts > Cube Analysis
5. Match the coordinate systems in the Image List tab
6. Select the continuum image, switch the viewer to single panel if it is in multi panel, and play with how it is displayed using Render Configuration tab



Live Demo + tutorial

7. Create a region excluding the main continuum source and rename it 'noise'
 - > Get an estimate for the noise in the continuum image
 - > Get an estimate for the noise in the cube (explore how the noise varies in different channels using the Animator tab)
8. Delete the 'noise' region (select region & click delete or back button)
9. Create a new region covering the central area where there is emission and rename this new region 'disk'
10. Select the line cube in the image list tab and make sure the cube and 'disk' region are selected in the Spectral Profiler widget 



Live Demo + tutorial

11. Play with the Spectral Profiler:

- > zoom in to regions of the spectrum where there is a line
- > click on parts of the line to see the image of that channel
- > Use the Animator to go through the channel maps of the line cube

12. Make moment 0, 1, and 8 maps covering the line of interest (remember to match their coordinates to the reference continuum image)

- > Play with excluding emission levels below a certain threshold (e.g. 3 sigma) using the noise estimate from before

13. Create contours for the continuum and moment 1 image using two different colours and save the image as a figure

- > Modify the look of the figure by clicking File > Preferences, as well as the settings wheel at the top of the viewer



Live Demo + tutorial

14. Create two new regions:

-> One covering the redshifted emission, rename it 'red'

-> One covering the blueshifted emission, rename it 'blue'

15. Visualise the emission over the three regions (red, blue, disk) in the Spectral Profiler by ticking the 'Region' box at the top and selecting the regions

-> Play with the different statistics shown

16. Fit the emission line profile of the redshifted emission and the blueshifted emission with Gaussian profiles (note the central velocities)

17. Save a new sub-cube (both spatial and spectral) that only includes the disk region and the line of interest as a new FITS file

18. Append this new smaller cube & create a PV diagram for a cut across the strongest velocity gradient

-> Remember that you first need to create a line region across the gradient

No image loaded



X Profile: Cursor X



Image Active Region Active

1.00s:0

File Browser



Users > aida

Filename

- Desktop
- Downloads
- Documents
- Applications
- Library
- Software
- Dropbox
- Pictures
- Movies
- Music
- node_modules
- Public

CARTA Usage Data



CARTA would like to collect anonymous usage data, in order to help the development team prioritize additional features and platforms. No personal or scientific information will be collected. Please see our [data collection policy](#) for more details.

Yes, send usage data

Metrics include session duration, number and size of images opened.

No, do not send usage data

Only an anonymous opt-out message will be submitted.



No file selected.

Select a file from the folder.

Filter Filter by filename with fuzzy search

Fuzzy search

Close

Load

Load a file using the menu

Main browser window

localhost:3002

File View Widgets Help

Menu bar Region bar Widget bar Dialog bar

h_m5

Statistics: Region 1 (Active)

Statistic	Value
NumPixels	2.019402000000e+6 pixel(s)
Sum	8.413354241732e+5 ELECTRONS
FluxDensity	NaN
Mean	4.1662
StdDev	6.359098618652e-1 ELECTRONS
Min	6.013021245599e-2 ELECTRONS
Max	7.834586334229e+1 ELECTRONS
Extrema	7.834586334229e+1 ELECTRONS
RMS	7.602357497785e-1 ELECTRONS
SumSq	1.167130339267e+6 (ELECTRONS)^2

Floating widget

Panel (docked widget)

X Profile: Cursor

Image: 0: h_m51_ Region: Cursor

Value (ELECTRONS)

X coordinate

Y Profile: Cursor

Image: 0: h_m51_ Region: Cursor

Value (ELECTRONS)

Editing Region 1 (h_m51_b_s05_drz_sci.fits)

Appearance

Color: Line Width (px): 2 Dash Length (px): 0

Properties

Region Name:

Coordinate: Image World

Center	13:29:53.025511	47:11:35.7260	(4124.091 px, 4613.142 px)
Size	72.8199168181"	69.2786741217"	Image: (1456.427 px, 1395.629 px)
Bottom Left	13:29:56.597028	47:11:01.084569	Image: (3395.878 px, 3920.327 px)
Top Right	13:29:49.452698	47:12:10.360690	Image: (4852.305 px, 5305.956 px)
P.A. (deg)	0		

Dialog

Render Configuration X Region List X

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

Clip Min: -0.010414184187

Clip Max: 1.4575992558922

Scaling: Linear

Color map:

Invert color map:

Bias / Contrast:

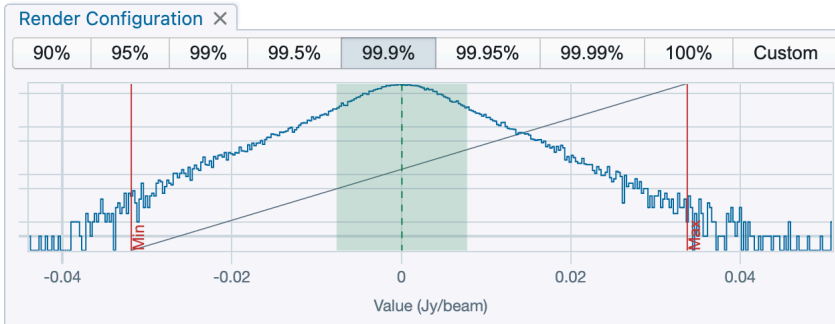
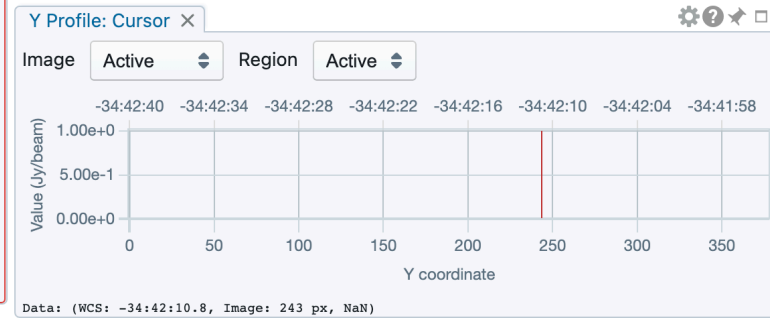
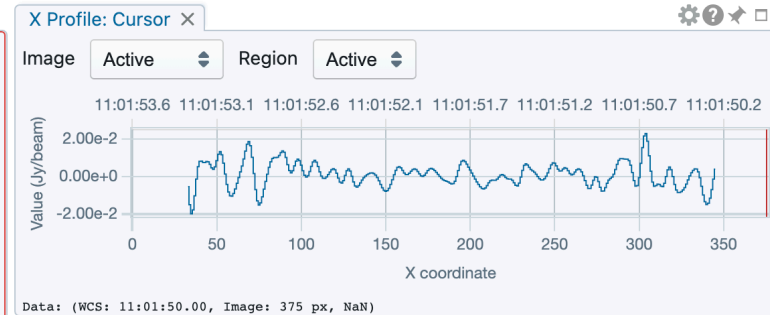
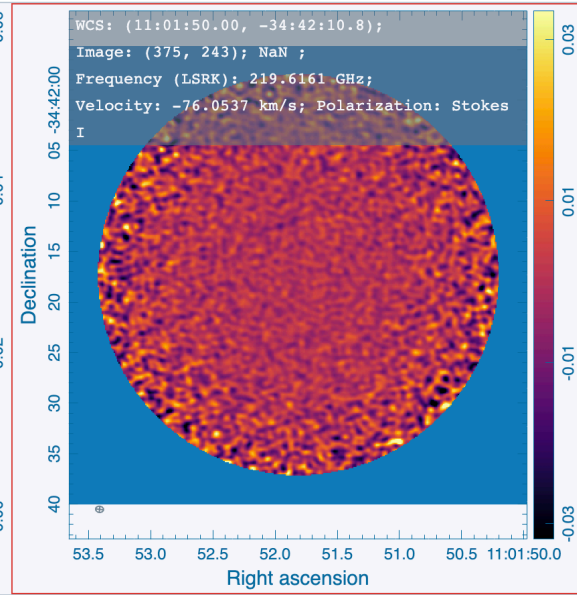
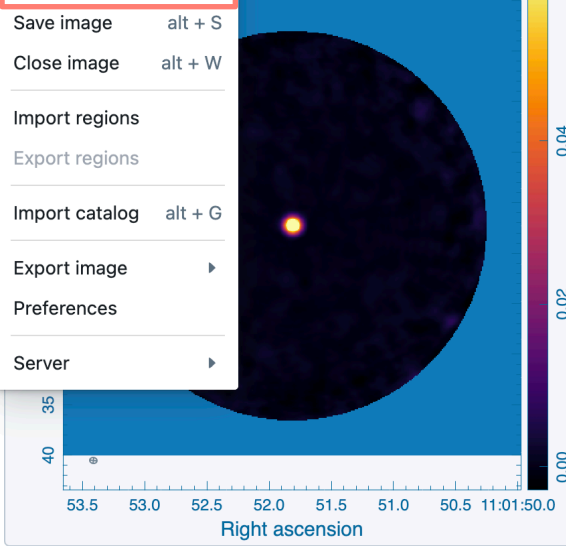
Cursor: 1.09 ELECTRONS

Value (ELECTRONS)

From cartavis read the docs

- File
- View
- Widgets
- Open image alt + O
- Append image alt + L
- Save image alt + S
- Close image alt + W
- Import regions
- Export regions
- Import catalog alt + G
- Export image
- Preferences
- Server

open/append images



Histogram Per-Channel

Clip Min -0.031891258615

Clip Max 0.0335483261792

Scaling Linear

Color map

Invert color map

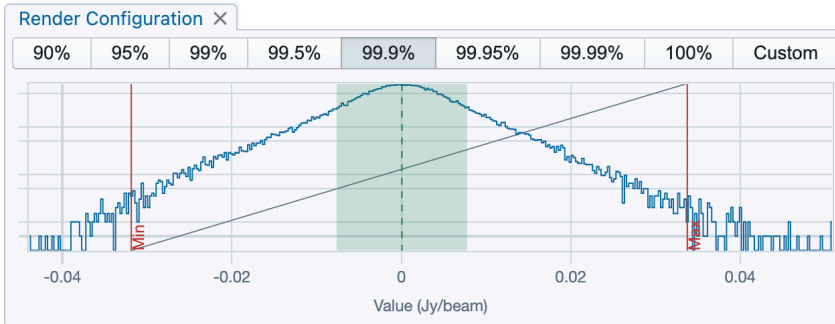
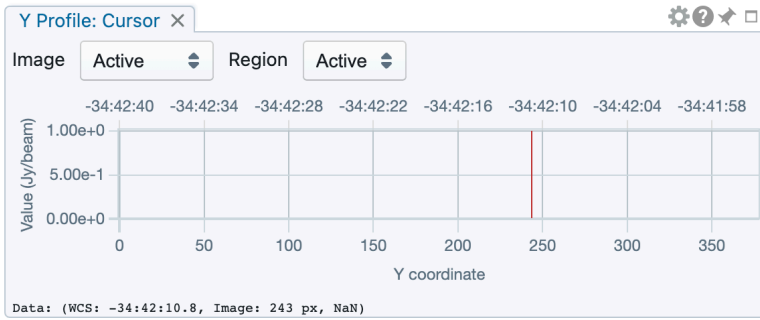
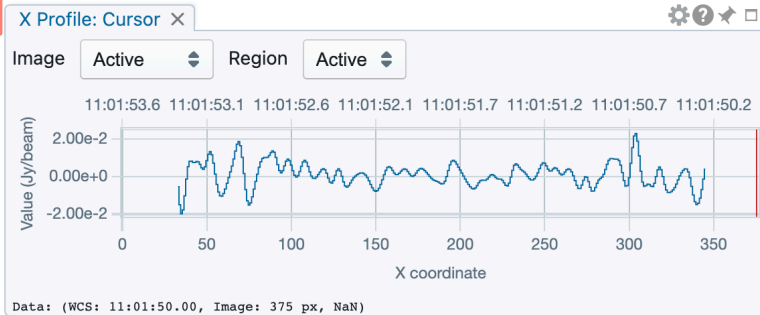
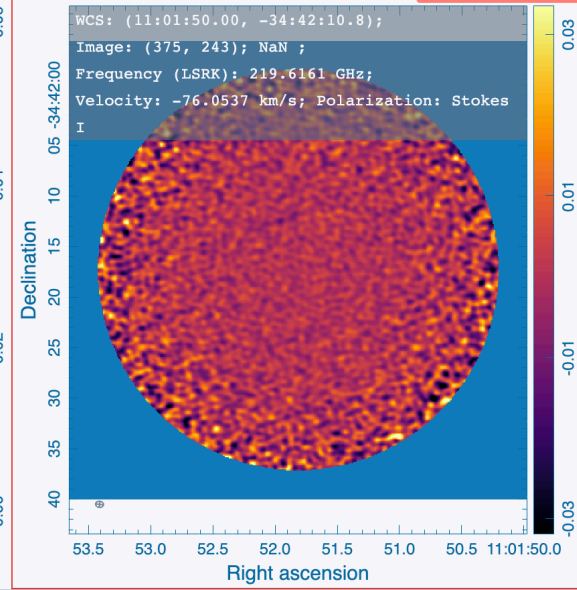
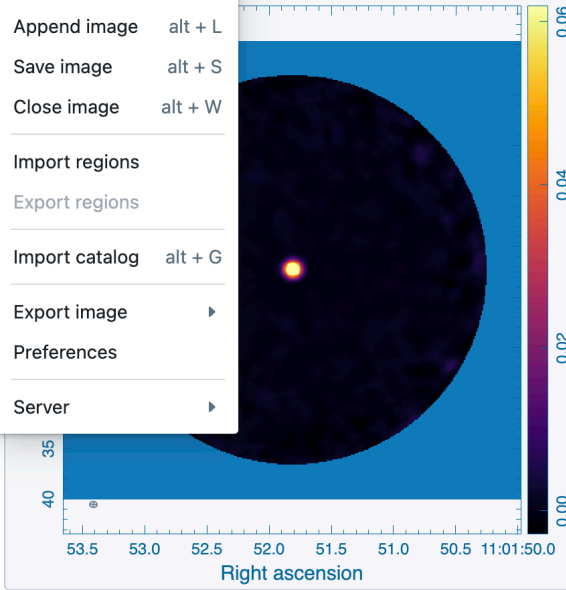
Image List X Animator X Region List X

Image	Layers	Matching	Channel	Polarization
0 TWhya_2016.1.0022	R	XY R	0	Stokes I
1 TWhya_2016.1.0022	R	XY Z R	0	Stokes I

0: first opened image
 1: appended image
 → images can be rearranged
 the bold image is the selected one

- Open image alt + O
- Append image alt + L
- Save image alt + S
- Close image alt + W
- Import regions
- Export regions
- Import catalog alt + G
- Export image
- Preferences
- Server

switch to single/multiple panels



Histogram: Per-Channel

Clip Min: -0.031891258615

Clip Max: 0.0335483261792

Scaling: Linear

Color map: [Color bar]

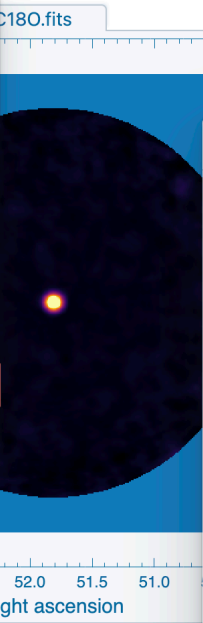
Invert color map:

Image List

Image	Layers	Matching	Channel	Polarization
0 TWhya_2016.1.0022	R	XY R	0	Stokes I
1 TWhya_2016.1.002	R	XY Z R	0	Stokes I

click XY to match XY coordinates to the first image

- Open image alt + O
- Append image alt + L
- Save image alt + S
- Close image alt + W
- Import regions
- Export regions
- Import catalog alt + G
- Export image
- Preferences**
- Server



Preferences change preferences to your liking

- Global** (highlighted)
- Render Configuration
- Contour Configuration
- Vector Overlay Configuration
- WCS and Image Overlay
- Catalog
- Region
- Performance
- Telemetry
- Log Events

Theme: Automatic

Enable Code Snippets:

Auto-launch File Browser:

File List: Filter by file content

Initial Layout: Default

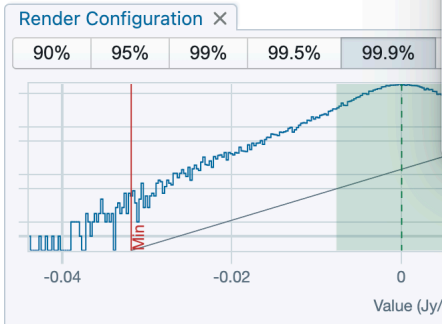
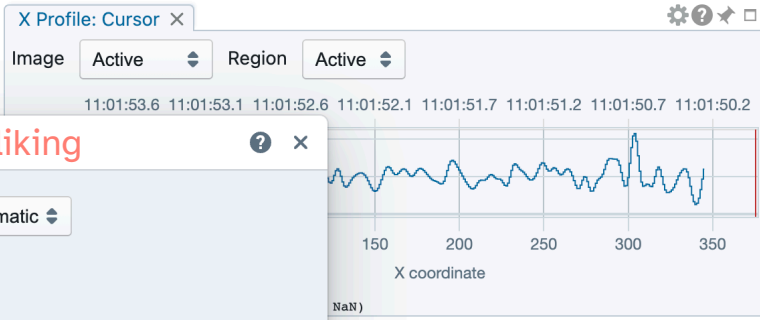
Initial Cursor Position: Fixed Tracking

Initial Zoom Level: Zoom to fit Zoom to 1.0x

Zoom to: Cursor Current Center

Restore defaults Close

```
WCS: (11:01:50.00, -34:42:10.8);
Image: (375, 243); NaN;
Frequency (LSRK): 219.6161 GHz;
```



Matching	Channel	Polarization
XY <input type="checkbox"/> R <input type="checkbox"/>	0	Stokes I
XY <input type="checkbox"/> Z <input type="checkbox"/> R <input type="checkbox"/>	0	Stokes I

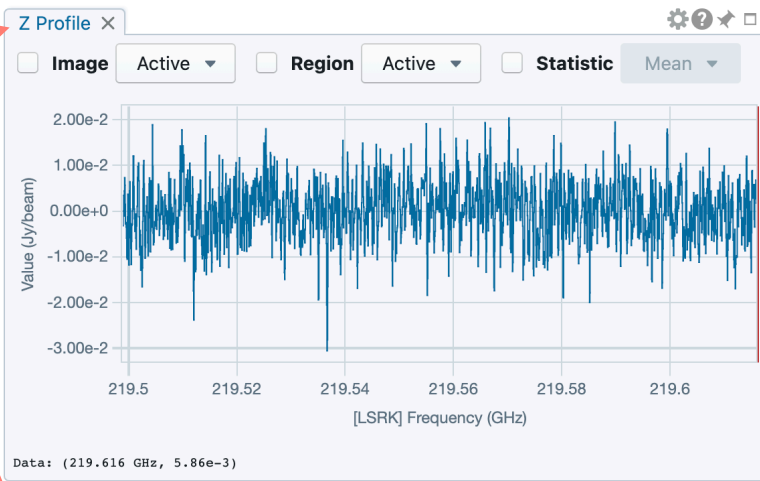
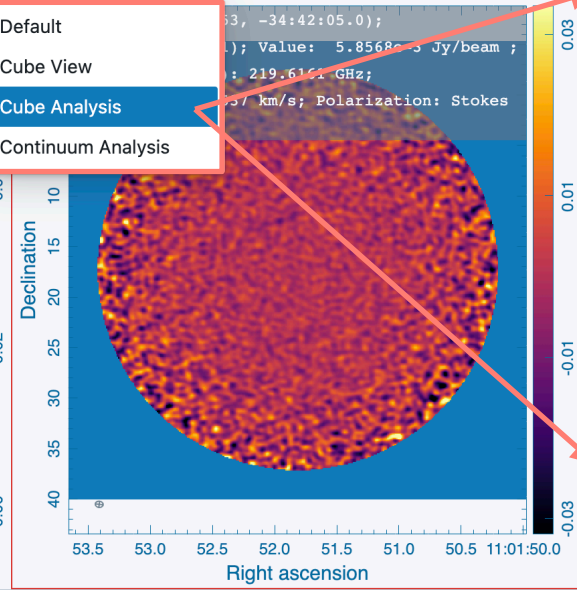
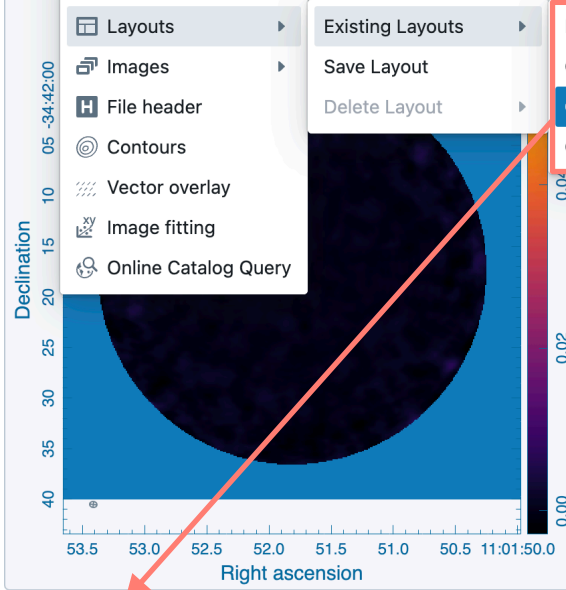
Scaling: Linear

Color map:

Invert color map:

- Theme
- Layouts
 - Existing Layouts
 - Default
 - Cube View
 - Cube Analysis
 - Continuum Analysis
 - Save Layout
 - Delete Layout
- Images
- File header
- Contours
- Vector overlay
- Image fitting
- Online Catalog Query

change the default layout or save your own



Animator X Render Configuration X Region List X Image List X

K First Prev Play Next Last Mode Frame Rate 5

Image Channel

0 479 958 1437 1917

LSRK 219.6161 GHz -76.0537 km/s

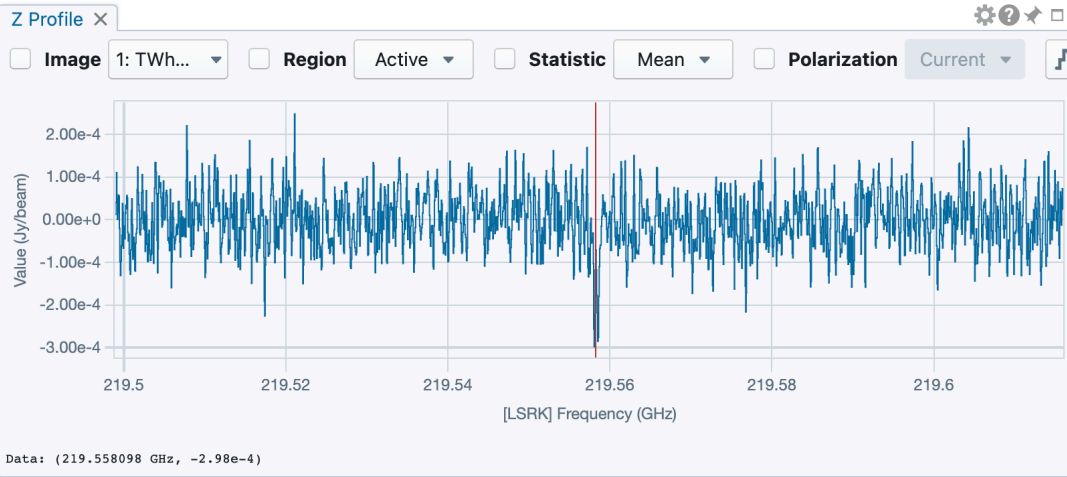
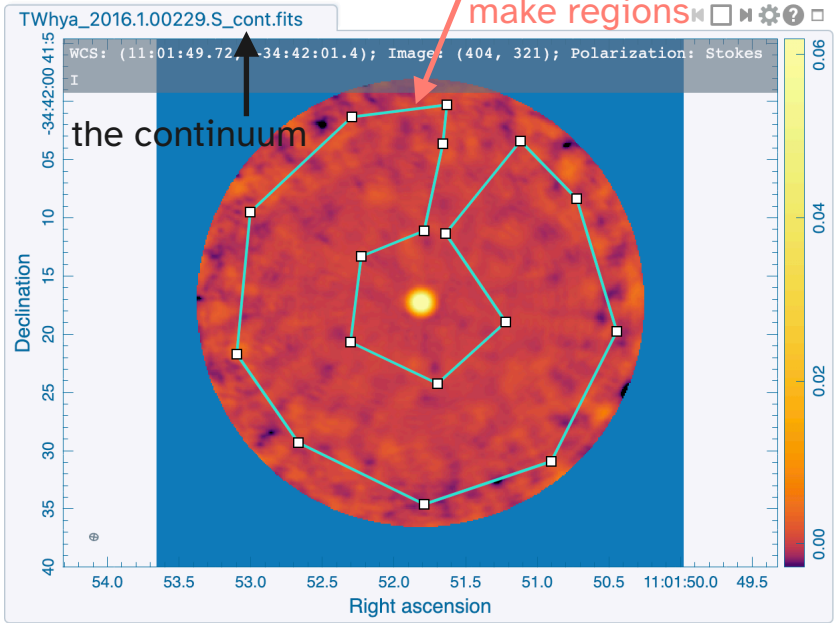
0 1917

TWhya_2016.1.00229.S_C180.fit

Statistics: Image (Active) X

Image Active Region Active Polarization Current

Statistic	Value
NumPixels	8.585800000000e+4 pixel(s)
Sum	2.599113071639e+0 Jy/beam
FluxDensity	6.863887639616e-2 Jy
Mean	3.027222939783e-5 Jy/beam
StdDev	7.702167813467e-3 Jy/beam
Min	-4.401939734817e-2 Jy/beam
Max	5.096446350217e-2 Jy/beam
Extrema	5.096446350217e-2 Jy/beam
RMS	7.702182449603e-3 Jy/beam
SumSq	5.093406892622e+0 (Jy/beam)^2



Statistics: Region 1 (Active) x

Image Active Region Active Polarization Current

the statistics within the region

Statistic	Value
NumPixels	4.607900000000e+4 pixel(s)
Sum	-1.450013055831e+0 Jy/beam
FluxDensity	-4.279021168646e-2 Jy
Mean	-3.146798011743e-5 Jy/beam
StdDev	6.519142842490e-4 Jy/beam
Min	-2.779091009870e-3 Jy/beam
Max	4.479128867388e-3 Jy/beam
Extrema	4.479128867388e-3 Jy/beam
RMS	6.526662582504e-4 Jy/beam
SumSq	1.962842114062e-2 (Jy/beam)^2

Animator x Render Configuration x Region List x Image List x

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

Clip Min -0.002829540319

Clip Max 0.061946738044

Scaling Log

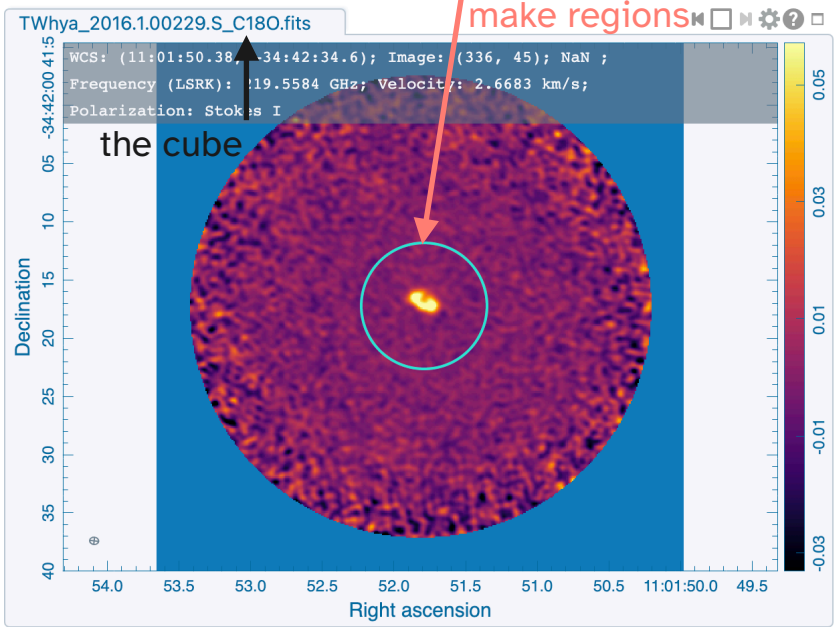
Color map

Invert color map

Alpha 1000

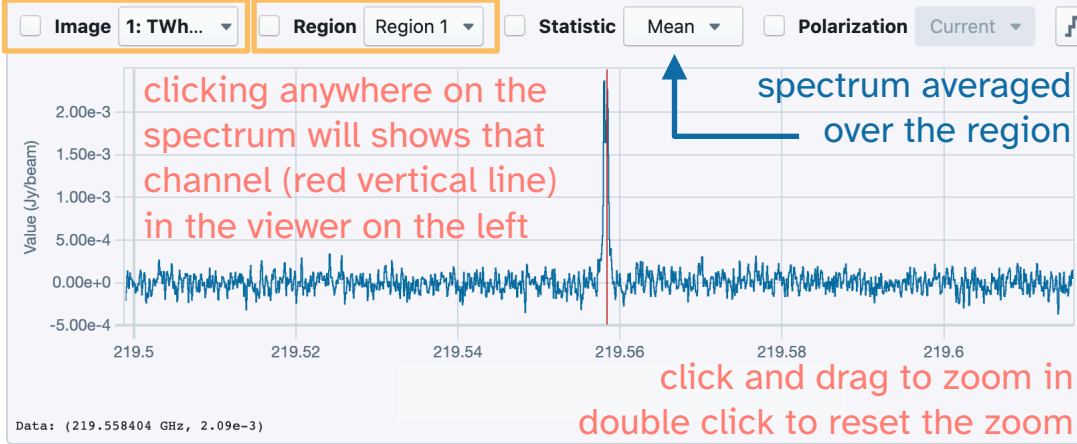
Cursor: 0.08 Jy/beam

Value (Jy/beam)



make regions

image & region selection



Statistics: Image (Active) X

Image Active Region Active Polarization Current

the statistics within the region

Statistic	Value
NumPixels	8.589700000000e+4 pixel(s)
Sum	6.211912821326e+0 Jy/beam
FluxDensity	1.640477749811e-1 Jy
Mean	7.231815804191e-5 Jy/beam
StdDev	8.045299884301e-3 Jy/beam
Min	-5.390654876828e-2 Jy/beam
Max	7.783276587725e-2 Jy/beam
Extrema	7.783276587725e-2 Jy/beam
RMS	8.045578077679e-3 Jy/beam
SumSq	5.560226761306e+0 (Jy/beam)^2

Animator X Render Configuration X Region List X Image List X

K [play] [stop] [next] [prev] [refresh] Frame Rate 5

Image TWhya_2016.1.00229.S_C180.f its

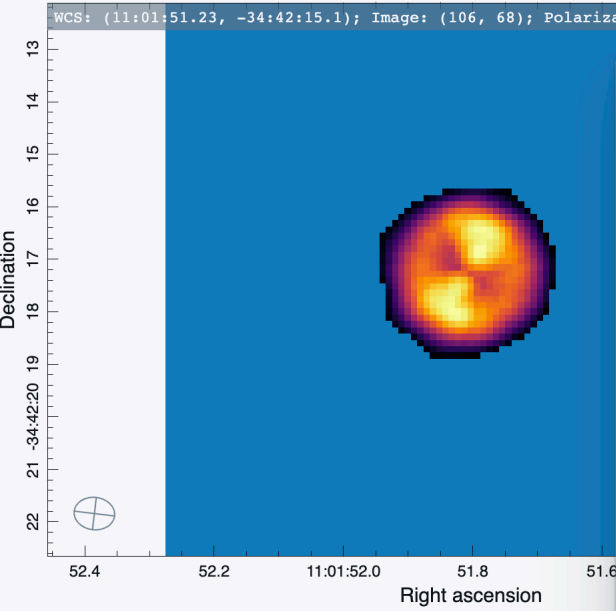
Channel LSRK 219.5584 GHz 2.6683 km/s

0 479 944 1437 1917

0 1917

animator allows you to look at the channels/images

TWhya_2016.1.00229.S_C180.fits.moment.maximum



Animator X Render Configuration X Region List X Image List

Image	Layers
0 TWhya_2016.1.00229.S_cont.fits	R
1 TWhya_2016.1.00229.S_C180.fits	R
2 TWhya_2016.1.00229.S_C180.fits.moment.integrated	R
3 TWhya_2016.1.00229.S_C180.fits.moment.weighted_coord	R
4 TWhya_2016.1.00229.S_C180.fits.moment.maximum	R

moment maps

Z Profile Settings: Region #1

Conversion Styling Smoothing **Moments** Fitting

Image (1: TWhya...) 1: TWhya_20... **line cube**

Region (disk) disk **region**

Coordinate Frequency (GHz)

System LSRK **integration range**

Range (GHz) From 219.5562 To 219.5599

Mask Exclude

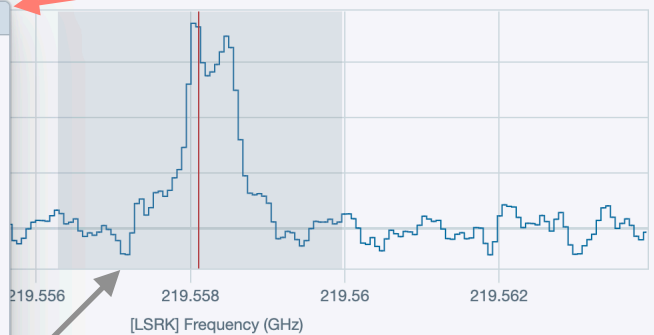
Range (Jy/beam) From -1 To 0.015

Moments 0 x 1 x 8 x

Options Keep previous moment image(s)

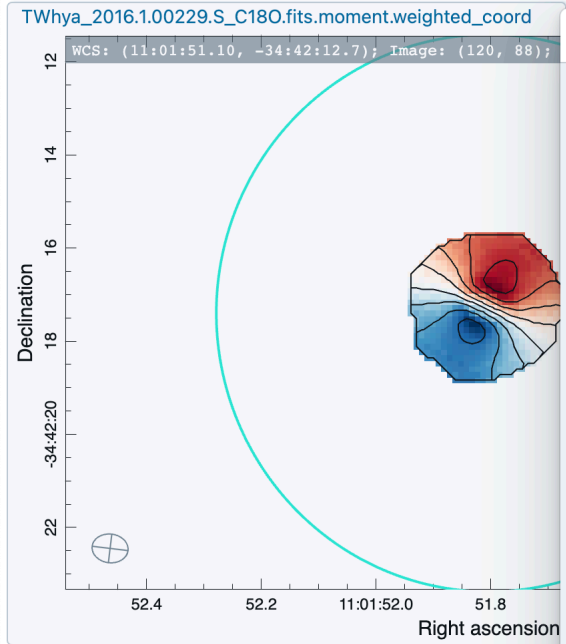
Generate

create moment maps



click button then click and drag on the spectrum

ve	Polarization
Current	Current
s)	
im	
am	
im	
m	
m	
am	
am)^2	



Contour Configuration

draw contours

Data source: TWhya_2016.1.00229.S_C180.fits.moment.weighted_coord

Levels Configuration Styling

Value (km/s)

Generator: start-step-multiplier **Generate**

Parameters: Start 2.500e+0 Step 1.000e-1

N 8 Multiplier 1

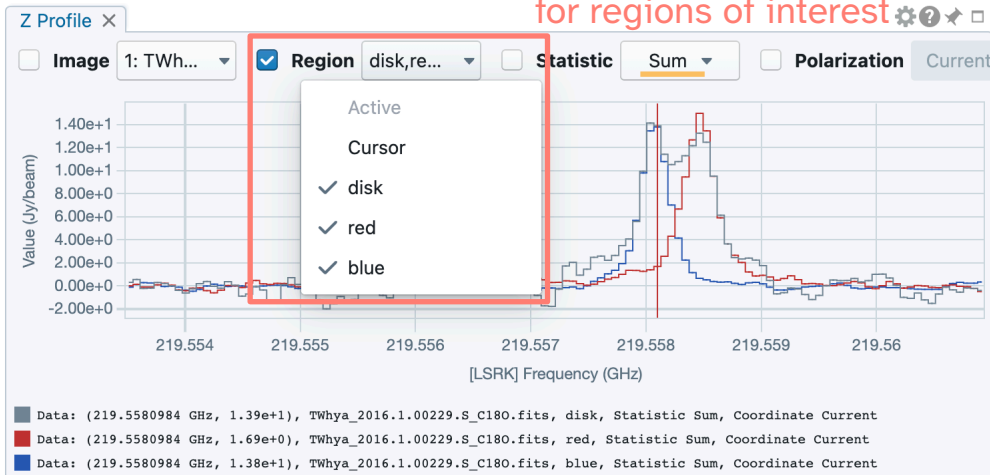
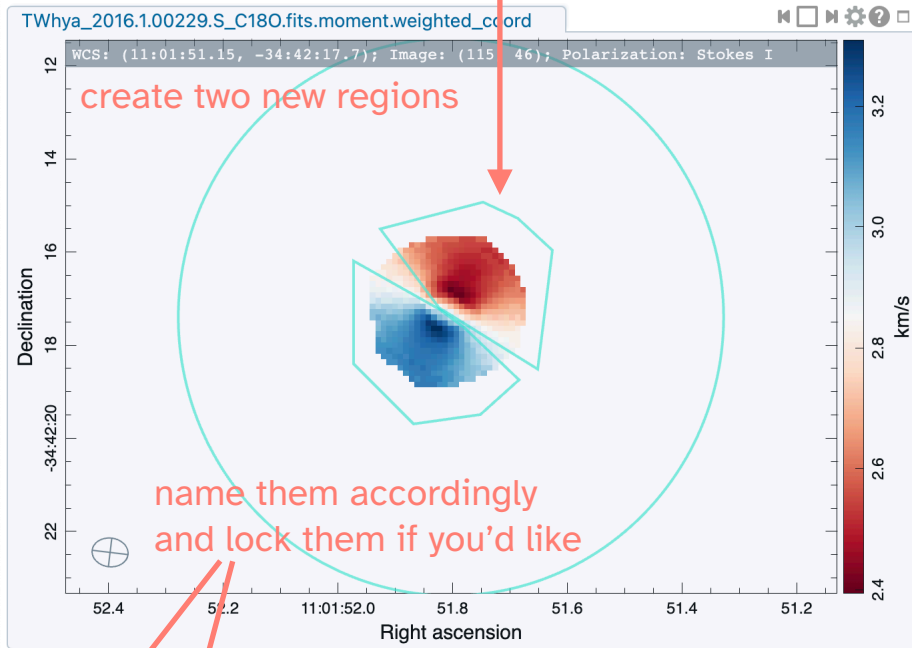
Levels: 2.50 x 2.60 x 2.70 x 2.80 x 2.90 x 3.00 x 3.10 x 3.20 x

Clear **Apply** Close



Animator X Render Configuration X Region List X Image

	Image
0	TWhya_2016.1.00229.S_cont.fits
1	TWhya_2016.1.00229.S_C180.fits
2	TWhya_2016.1.00229.S_C180.fits.moment.integrated
3	TWhya_2016.1.00229.S_C180.fits.moment.weighted_coord
4	TWhya_2016.1.00229.S_C180.fits.moment.maximum



Animator X Render Configuration X **Region List X** Image List X

		Name	Type	Center	Size	P.A. (deg)
		Cursor	Point	11:01:51.15 -34:42:17.7		0.0
		disk	Ellipse	11:01:51.8029072828 -34:42:17.3958416686	5.9841688654" 5.8644854881"	0.0
		red	Polygon	11:01:51.7761079873 -34:42:16.7216518372	3.7017391319" 3.5869565226"	0.0
		blue	Polygon	11:01:51.8284661460 -34:42:17.9412173318	3.5582608717" 3.5008695660"	0.0

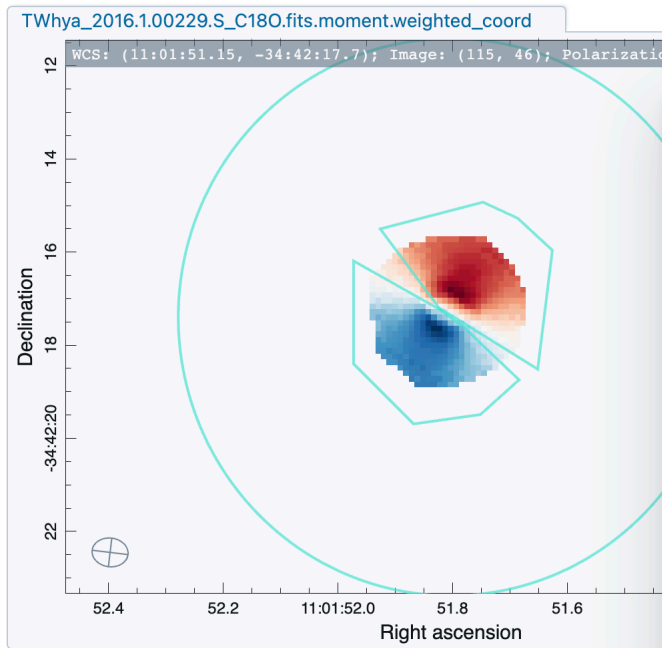
Statistics: blue (Active) X

Image: Active Region: Active Polarization: Current

Statistic	Value
NumPixels	2.660000000000e+2 pixel(s)
Sum	8.224154417515e+2 km/s
FluxDensity	NaN
Mean	3.091787375006e+0 km/s
StdDev	1.028916484311e-1 km/s
Min	2.835080862045e+0 km/s
Max	3.311462163925e+0 km/s
Extrema	3.311462163925e+0 km/s
RMS	3.093492538506e+0 km/s
SumSq	2.545539158821e+3 (km/s)^2



modify the styling



Z Profile Settings: Region #2

Conversion Styling smoothing Moments Fitting

Line color (disk)

Line color (red)

Line color (blue)

Line width (px)

Point size (px)

Show mean/RMS

Only visible in single profile

Line style

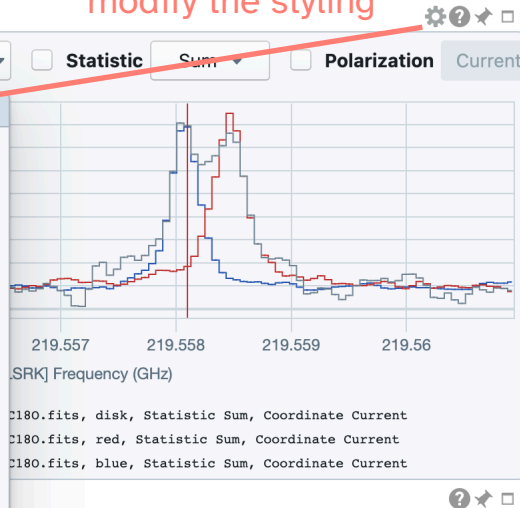
X min

X max

Y min

Y max

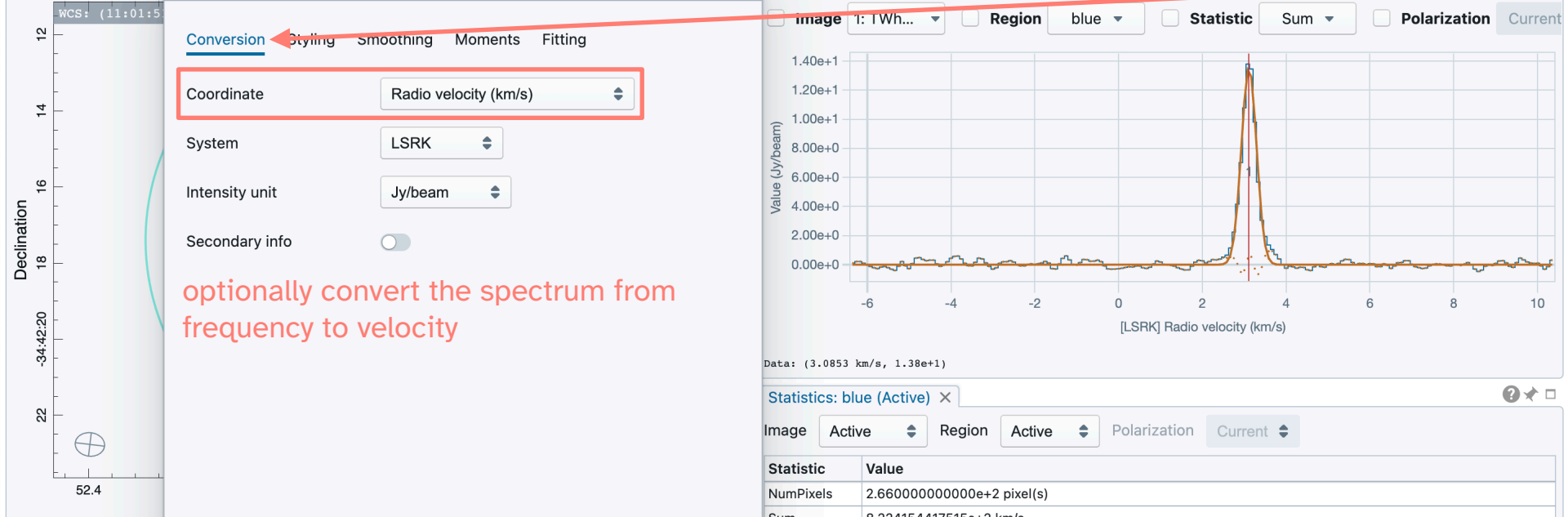
Reset range Reset range



Animator X Render Configuration X Region List X Image List X

		Name	Type	Center	Size
		Cursor	Point	11:01:51.15 -34:42:17.7	
		disk	Ellipse	11:01:51.8029072828 -34:42:17.3958416686	5.984168 5.864488
		red	Polygon	11:01:51.7761079873 -34:42:16.7216518372	3.701739 3.586956
		blue	Polygon	11:01:51.8284661460 -34:42:17.9412173318	3.558260 3.500869

zization Current



Data: (3.0853 km/s, 1.38e+1)

Statistics: blue (Active)

Statistic	Value
NumPixels	2.660000000000e+2 pixel(s)
Sum	8.224154417515e+2 km/s
FluxDensity	NaN
Mean	3.091787375006e+0 km/s
StdDev	1.028916484311e-1 km/s
Min	2.835080862045e+0 km/s
Max	3.311462163925e+0 km/s
Extrema	3.311462163925e+0 km/s
RMS	3.093492538506e+0 km/s
SumSq	2.545539158821e+3 (km/s)^2

Z Profile Settings: Region #3

Conversion Styling Smoothing Moments **Fitting**

Data source: TWhya_2016.1.00229.S_cont.fits

Profile function: Gaussian

Auto detect: w/ cont. Auto fit

detected 1 component. **choose these for automatic fitting**

Components: 1

Center: 3.0435606610395354

Amplitude: 9.29203303665109

FWHM: 0.41695972611731213

Continuum: None

Fitting result

```
Component #1
Center = 3.113515 (km/s)
Center Error = 0.002602 (0.084%)
Amplitude = 13.537950 (Jy/beam)
Amplitude Error = 0.169440 (1.252%)
FWHM = 0.423900 (km/s)
FWHM Error = 0.006126 (1.445%)
Integral = 6.108698 (Jy/beam * km/s)
Integral Error ~ 0.076456 (1.252%)
```

Reset **Fit** **View log** Residual

Image: 1: TWh... Region: blue Statistic: Sum Polarization: Current

make sure to only select ONE spectrum (i.e. untick the Region, and select one region)

Data: (3.0853 km/s, 1.38e+1)

Statistics: blue (Active)

Image: Active Region: Active Polarization: Current

Statistic	Value
NumPixels	2.660000000000e+2 pixel(s)
Sum	8.224154417515e+2 km/s
FluxDensity	NaN
Mean	3.091787375006e+0 km/s
StdDev	1.028916484311e-1 km/s
Min	2.835080862045e+0 km/s
Max	3.311462163925e+0 km/s
Extrema	3.311462163925e+0 km/s
RMS	3.093492538506e+0 km/s
SumSq	2.545539158821e+3 (km/s)^2

Z Profile Settings: Region #2

Conversion Styling Smoothing Moments **Fitting**

Data source: TWhya_2016.1.00229.S_cont.fits

Profile function: Gaussian

Auto detect: w/ cont. Auto fit

detected 1 component. **choose these for automatic fitting**

Components: 1

Center: 2.5432089897089534

Amplitude: 10.566931553543455

FWHM: 0.500351671344103

Continuum: None

Fitting result

```

Component #1
Center = 2.587613 (km/s)
Center Error = 0.004195 (0.162%)
Amplitude = 13.827553 (Jy/beam)
Amplitude Error = 0.233696 (1.690%)
FWHM = 0.506167 (km/s)
FWHM Error = 0.009878 (1.952%)
Integral = 7.450265 (Jy/beam * km/s)
Integral Error ~ 0.125915 (1.690%)
    
```

Reset Fit View log Residual

Image: 1: TWh... Region: red Statistic: Sum Polarization: Current

Data: (-4.3366 km/s, -2.61e-1)

Statistics: blue (Active)

Image: Active Region: Active Polarization: Current

Statistic	Value
NumPixels	2.660000000000e+2 pixel(s)
Sum	8.224154417515e+2 km/s
FluxDensity	NaN
Mean	3.091787375006e+0 km/s
StdDev	1.028916484311e-1 km/s
Min	2.835080862045e+0 km/s
Max	3.311462163925e+0 km/s
Extrema	3.311462163925e+0 km/s
RMS	3.093492538506e+0 km/s
SumSq	2.545539158821e+3 (km/s)^2

- Open Image alt + O
- Append Image alt + L
- Save Image alt + S**
- Close Image alt + W
- Import Regions
- Export Regions
- Import Catalog alt + G
- Export Image
- Open Workspace
- Save Workspace
- Preferences
- Server

File Browser save a sub-cube

Users > aida > Documents > Work > Leiden > Allegro > Events > 202311_Data_Reduction_Day > data

Filename	Type	Size	Date
14_twhyha_cont.image	CASA	303.7 kB	9 Dec 2022
TWhyha_2016.1.00229.S_C180.fits	FITS	1.1 GB	9 Dec 2022
TWhyha_2016.1.00229.S_C180_zoom.fits	FITS	564.5 kB	9 Dec 2022
TWhyha_2016.1.00229.S_cont.fits	FITS	581.8 kB	9 Dec 2022
TWhyha_n2hp.image	CASA	3.9 MB	9 Dec 2022

Save Image File Information Header

Source TWhyha_2016.1.00229.S_C180.fits

Region **spatial cut**

Range unit

Range from (km/s) **spectral cut**

Range to (km/s)

Rest frequency

Drop degenerate axes

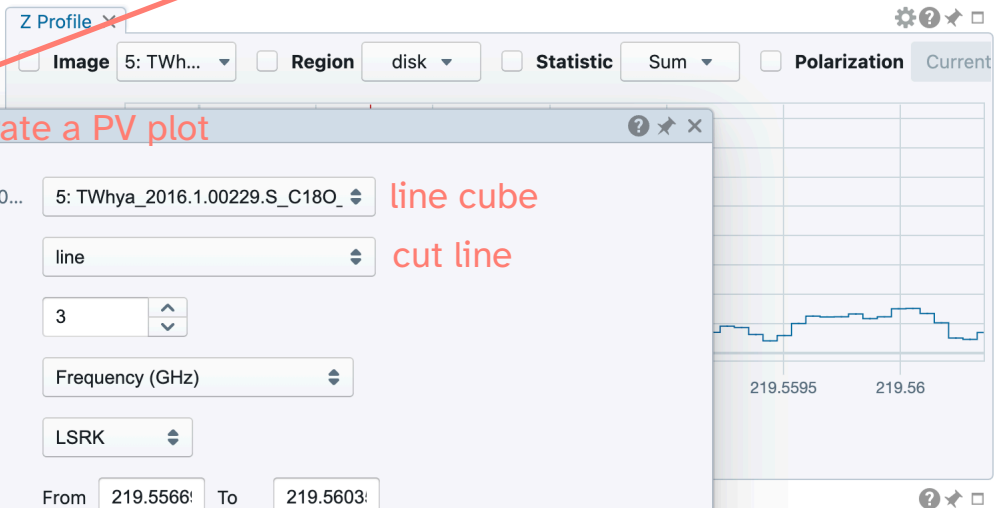
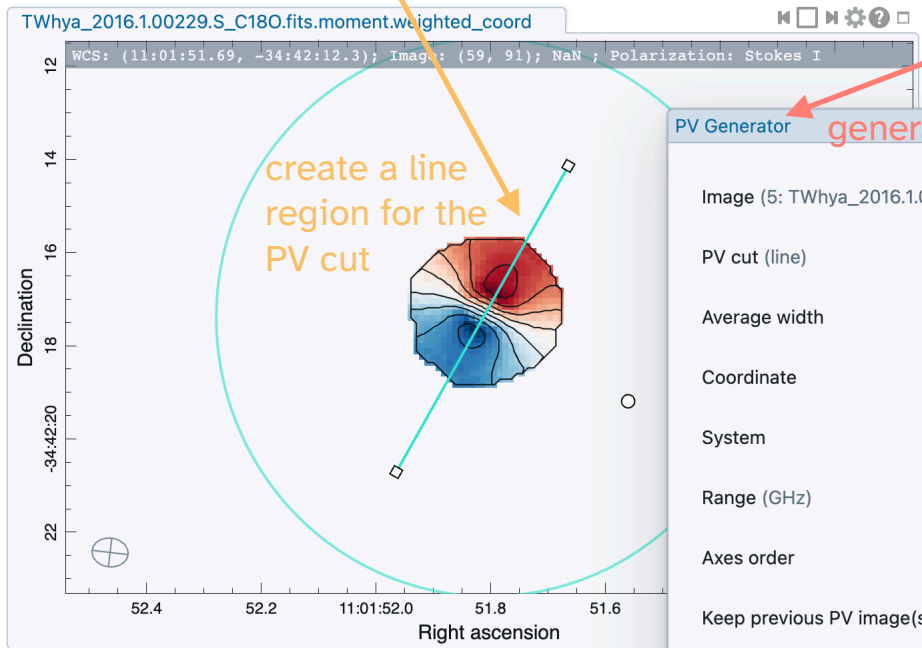
TWhyha_2016.1.00229.S_C180.fits FITS

Close Save

	Image	Layers	Matching	Channel
0	TWhyha_2016.1.00229.S_cont.fits	R	XY (R)	0
1	TWhyha_2016.1.00229.S_C180.fits	R	XY (Z) R	949
2	TWhyha_2016.1.00229.S_C180.fits.moment.integrated	R	XY R	0
3	TWhyha_2016.1.00229.S_C180.fits.moment.weighted_coord	R	XY R	0
4	TWhyha_2016.1.00229.S_C180.fits.moment.maximum	R	XY R	0

StdDev	2.885591060906e-2 Jy/beam
Min	-4.830463789403e-3 Jy/beam
Max	8.747770637274e-2 Jy/beam
Extrema	8.747770637274e-2 Jy/beam
RMS	4.049917568488e-2 Jy/beam
SumSq	7.954888671103e-1 (Jy/beam)^2

remember first to select the cube



PV Generator generate a PV plot

Image (5: TWhya_2016.1.0...): 5: TWhya_2016.1.00229.S_C180_ line cube

PV cut (line): line cut line

Average width: 3

Coordinate: Frequency (GHz)

System: LSRK

Range (GHz): From 219.5566 To 219.5603

Axes order: X-axis: Spatial, Y-axis: Spectral

Keep previous PV image(s):

Preview region: Image

Preview rebin (px): XY 1 Z 1

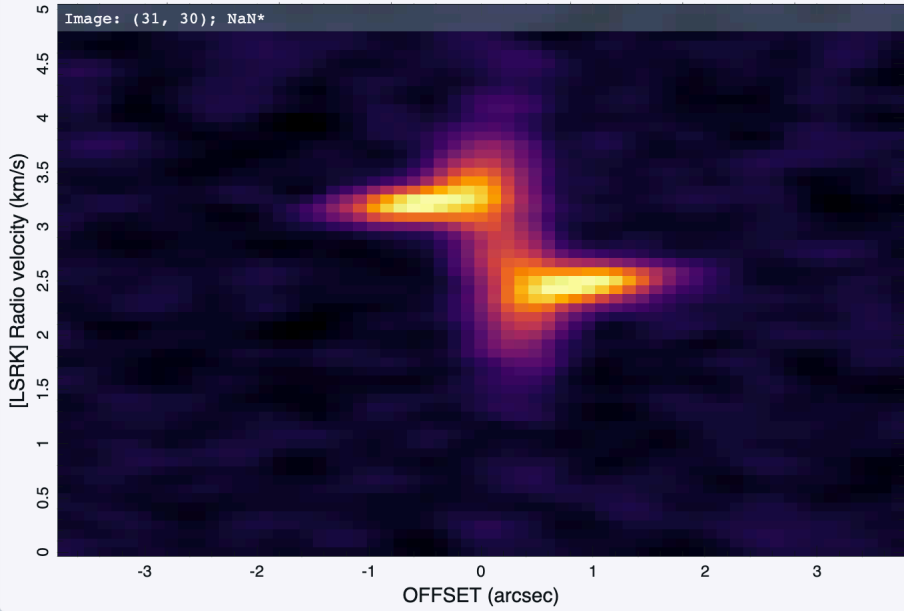
Preview cube size (MB): 33.72

Start Preview Generate

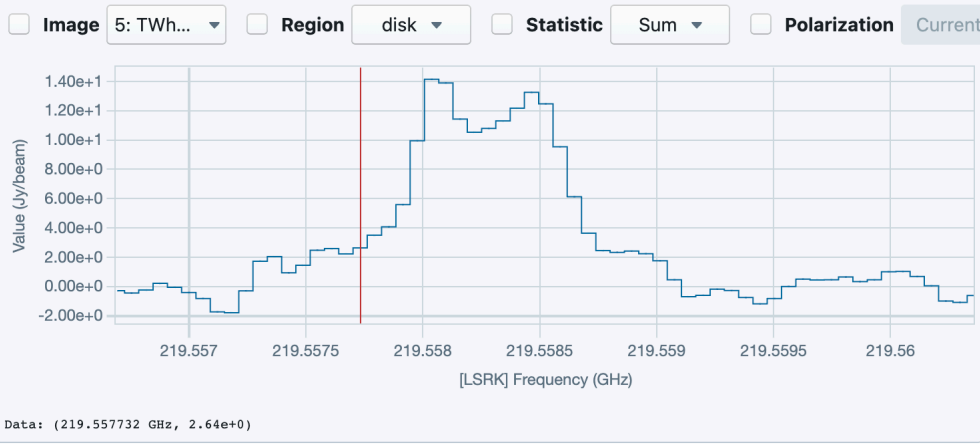
Animator X Render Configuration X Region List X Image List X

Image	Layers
0 TWhya_2016.1.00229.S_cont.fits	R
1 TWhya_2016.1.00229.S_C180.fits	R
2 TWhya_2016.1.00229.S_C180.fits.moment.integrated	R
3 TWhya_2016.1.00229.S_C180.fits.moment.weighted_coo	R C
4 TWhya_2016.1.00229.S_C180.fits.moment.maximum	R
5 TWhya_2016.1.00229.S_C180_zoom.fits	R

TWhya_2016.1.00229.S_C180_zoom_pv.fits



Z Profile



Statistics: Image (Active)

Image: Active Region: Active Polarization: Current

Statistic	Value
NumPixels	3.843000000000e+3 pixel(s)
Sum	1.670813238415e+1 Jy/beam
FluxDensity	NaN
Mean	4.347679517082e-3 Jy/beam
StdDev	1.407896540495e-2 Jy/beam
Min	-8.513540960848e-3 Jy/beam
Max	1.021177321672e-1 Jy/beam
Extrema	1.021177321672e-1 Jy/beam
RMS	1.473322793122e-2 Jy/beam
SumSq	8.341923442648e-1 (Jy/beam)^2

Animator X Render Configuration X Region List X Image List X

	Image	Layers	Matching	Channel
0	TWhya_2016.1.00229.S_cont.fits	R	XY R	0
1	TWhya_2016.1.00229.S_C180.fits	R	XY Z R	949
2	TWhya_2016.1.00229.S_C180.fits.moment.integrated	R	XY R	0
3	TWhya_2016.1.00229.S_C180.fits.moment.weighted_coord	R C	XY R	0
4	TWhya_2016.1.00229.S_C180.fits.moment.maximum	R	XY R	0
5	TWhya_2016.1.00229.S_C180_zoom.fits	R	XY Z R	43
6	TWhya_2016.1.00229.S_C180_zoom_pv.fits	R	XY R	0

PV plot that can be saved both as a FITS file and an image