CARTA Demo

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Use CARTA in Archive

https://almascience.nrao.edu/aq/

-> Source = GM_Aur (circumstellar disk)

-> Band = 6

-> Project code: 2018.1

Preview Window

Use CARTA in Archive

Go down a few and go to spw 4 (31) -> CARTA—> open in new tab

Use CARTA in Archive

Click back on archive screen and go back to dataset. Then Click on dataset spw 6 (spw37) and append image. Now we've got both.

Since in archive, no workspace so can't save any results. So this is data exploration - use to decide what to download. Final analysis on your machine.

View - Layouts - Cube Analysis

- Mouse around on image
- Slide through channels
- Move image list
- Only one image moving?
  - Match XY (coords) and Z (spectral)
  - See CO lines

Use CARTA in Archive - Get Contin. Image

-> Source = GM_Aur

-> Band = 4 -> continuum image

-> Pick first one with better sensitivity

Use CARTA in Archive - Get Contin. Image

Don't have aggregate continuum so explore and download

Use CARTA in Archive - Get Contin. Image

File type -> image -> scroll to multiple spws 5-11, cont, tt0, pbcor -> CARTA

Use CARTA in Archive - Get Contin. Image

Append spw5 - 7500,7500,1,1 (no spw information = cont)

Use CARTA Zoom in on Cont - Disk!

Match XY and get CO in the other two images

Spectra

Can change active image in Z-profile

Spectra

Make 3 circular regions over disk and outflows -> look at region list
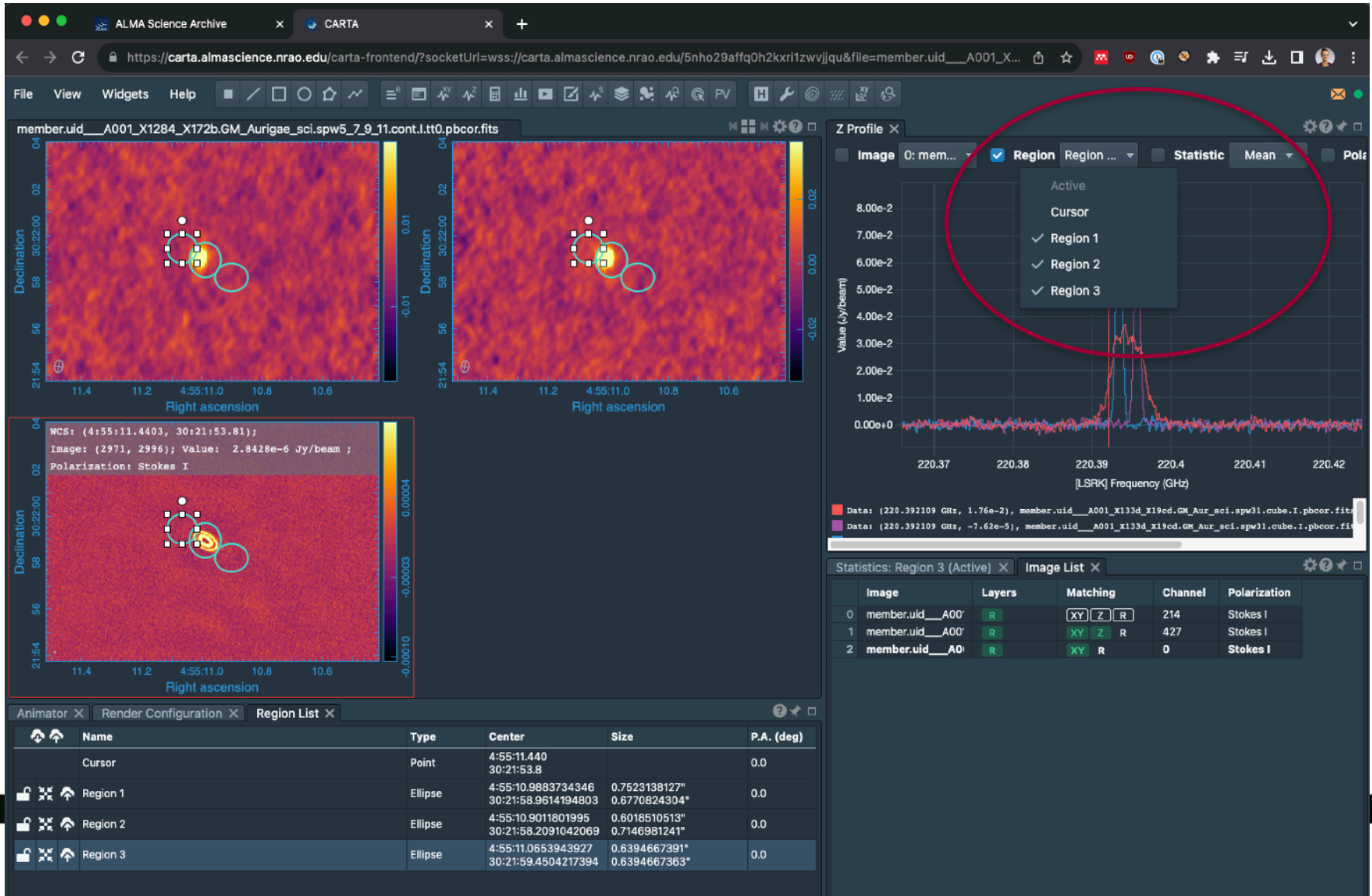
Spectra

Can plot different statistics for different regions

Spectra

Can plot different statistics for different regions at once -> see components.

Spectra

Can Zoom in

CARTA on your laptop

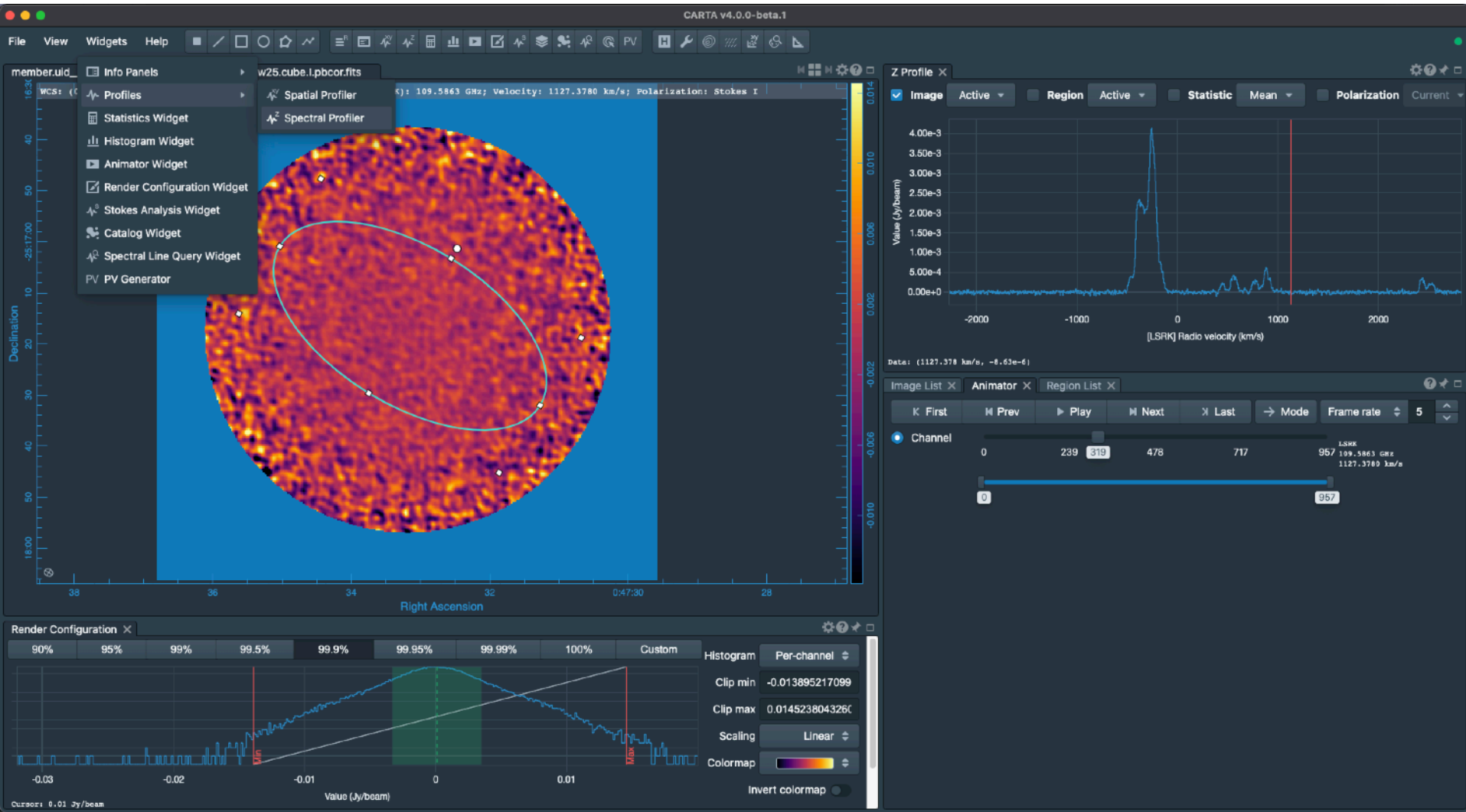Open it up!

NGC 253 - has many transitions
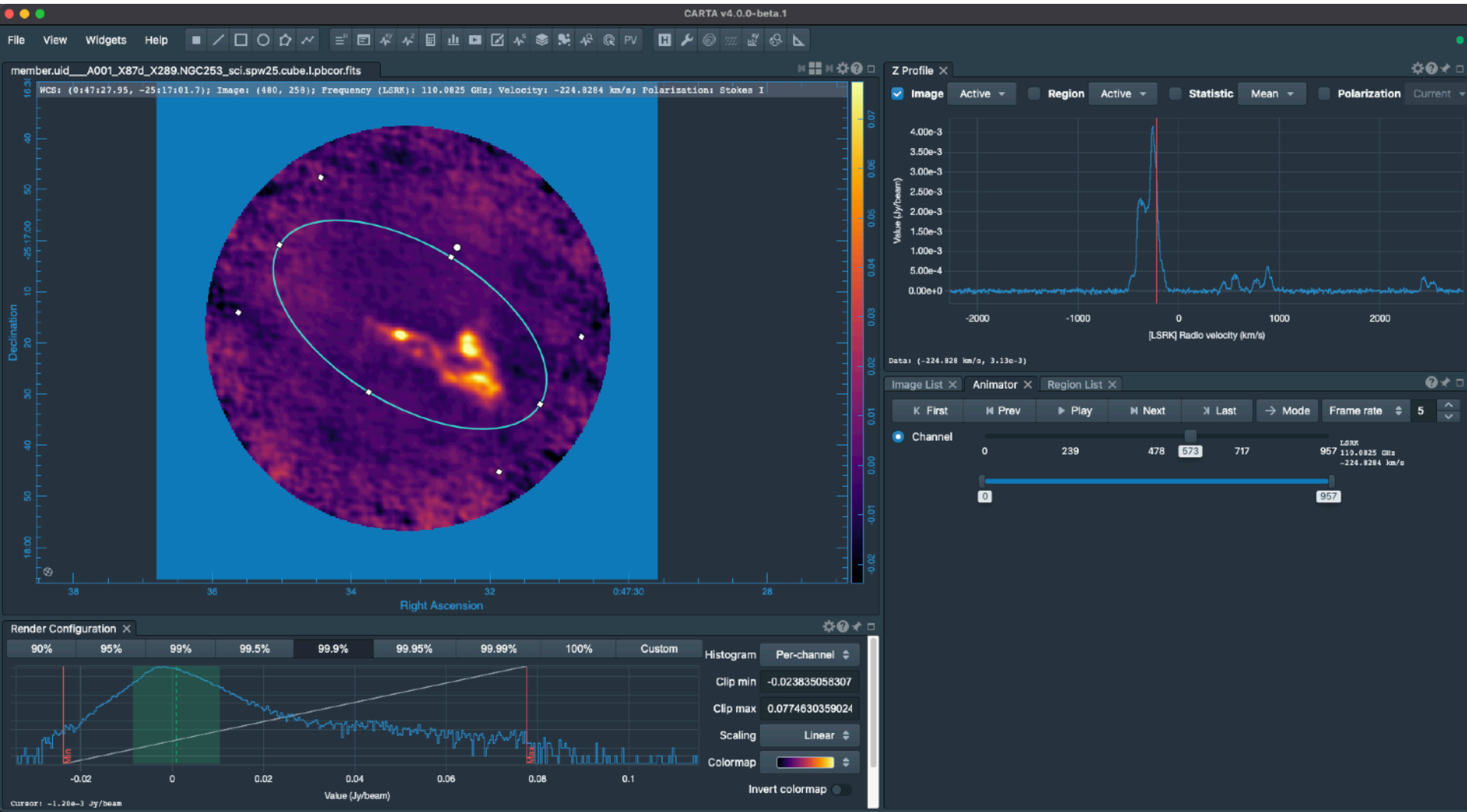

Sculptor Galaxy
Image: Wikipedia

NGC 253

Draw region for whole galaxy

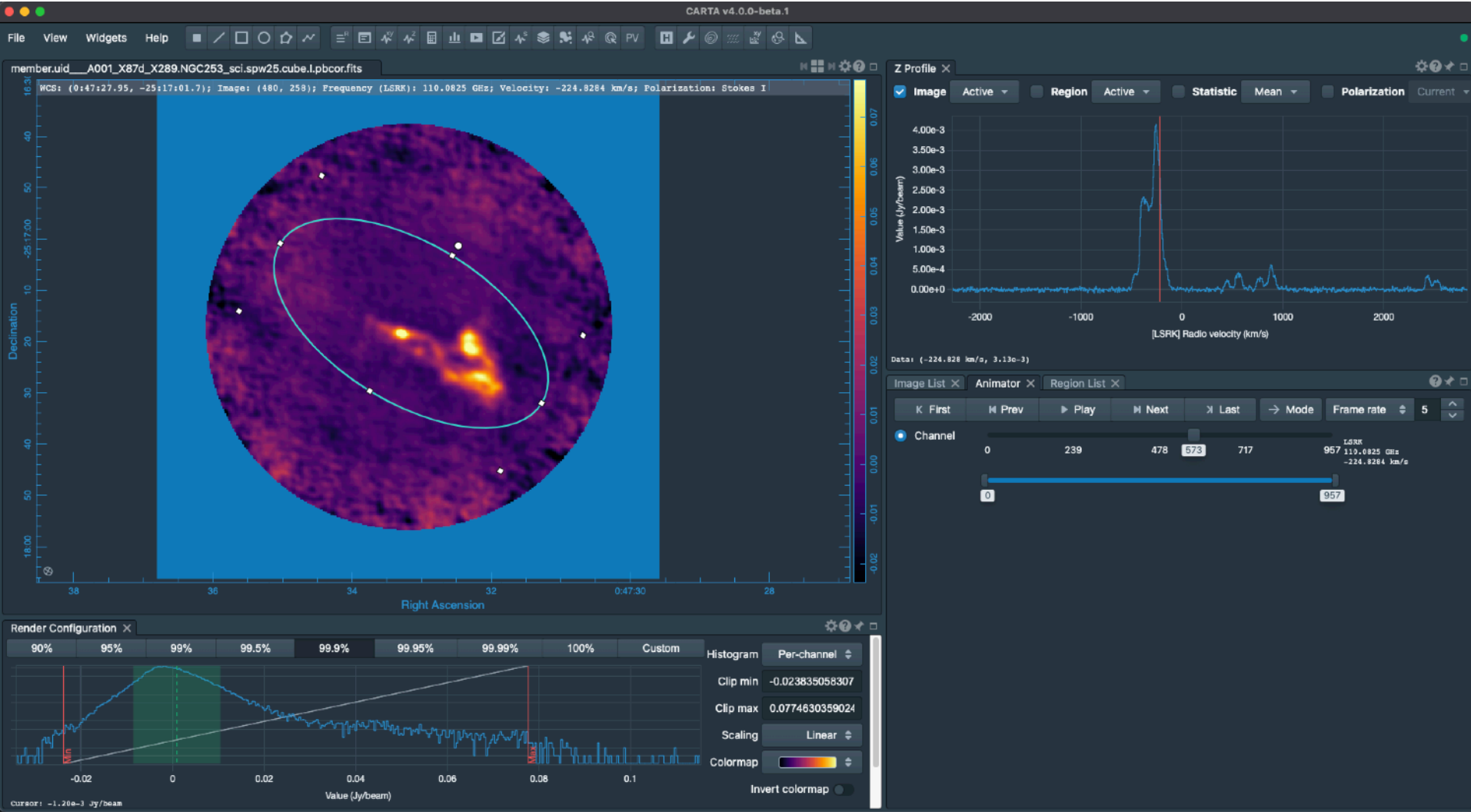Widget -> Profiles -> Spectral (Z) -> lots of transitions

NGC 253

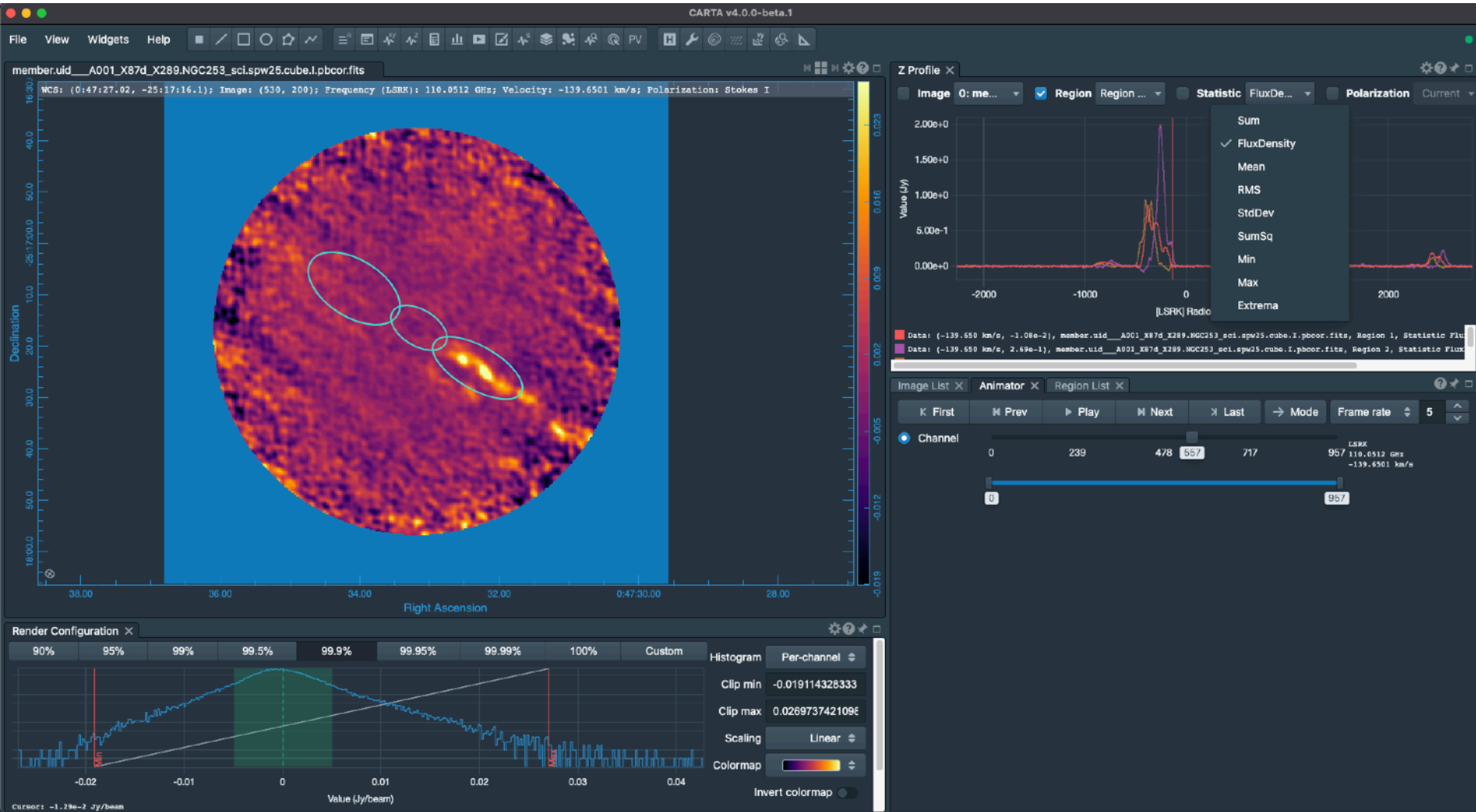To animate can use red line or animator

NGC 253

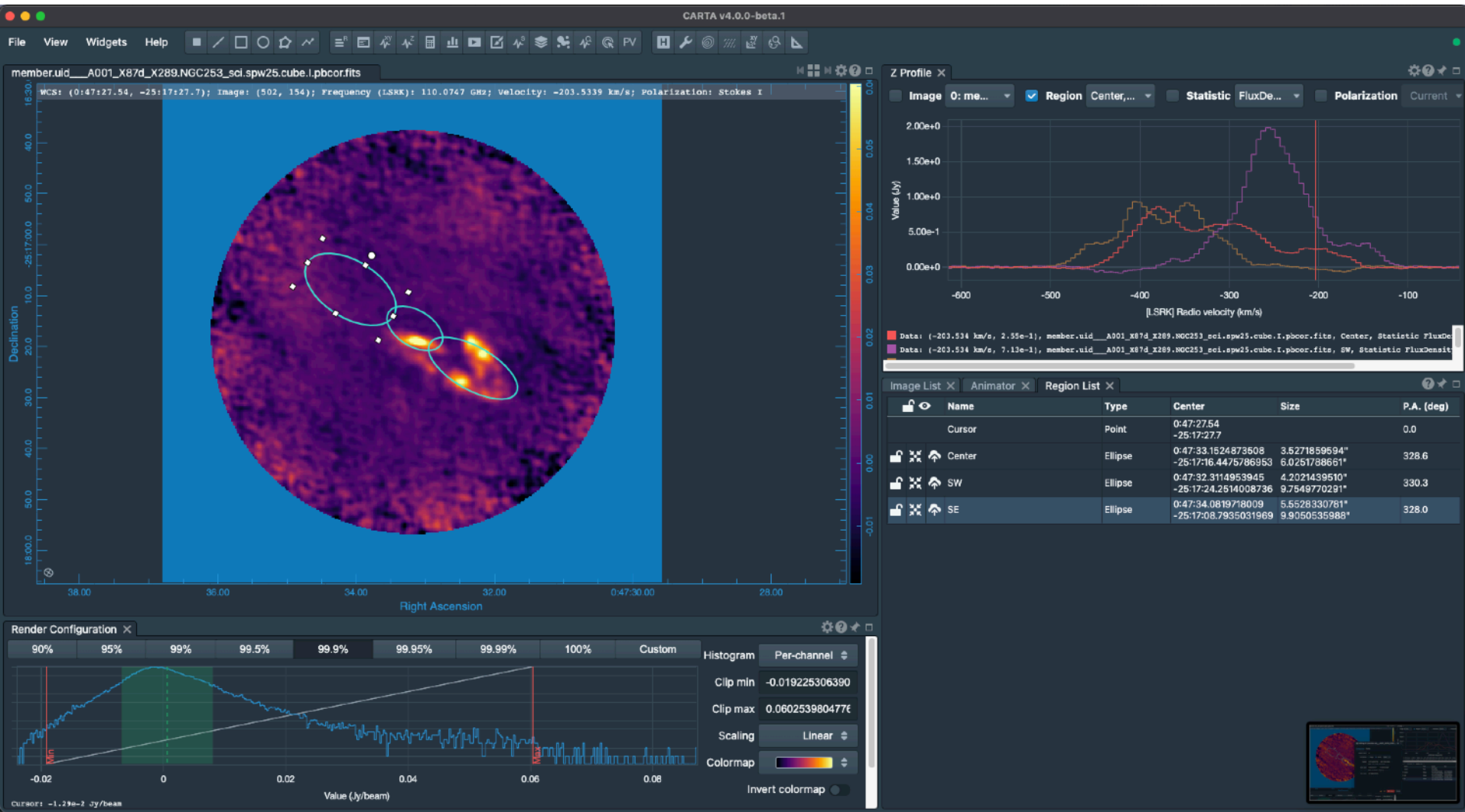Note kinematics - velocity and components - some at -1000 km/s

NGC 253

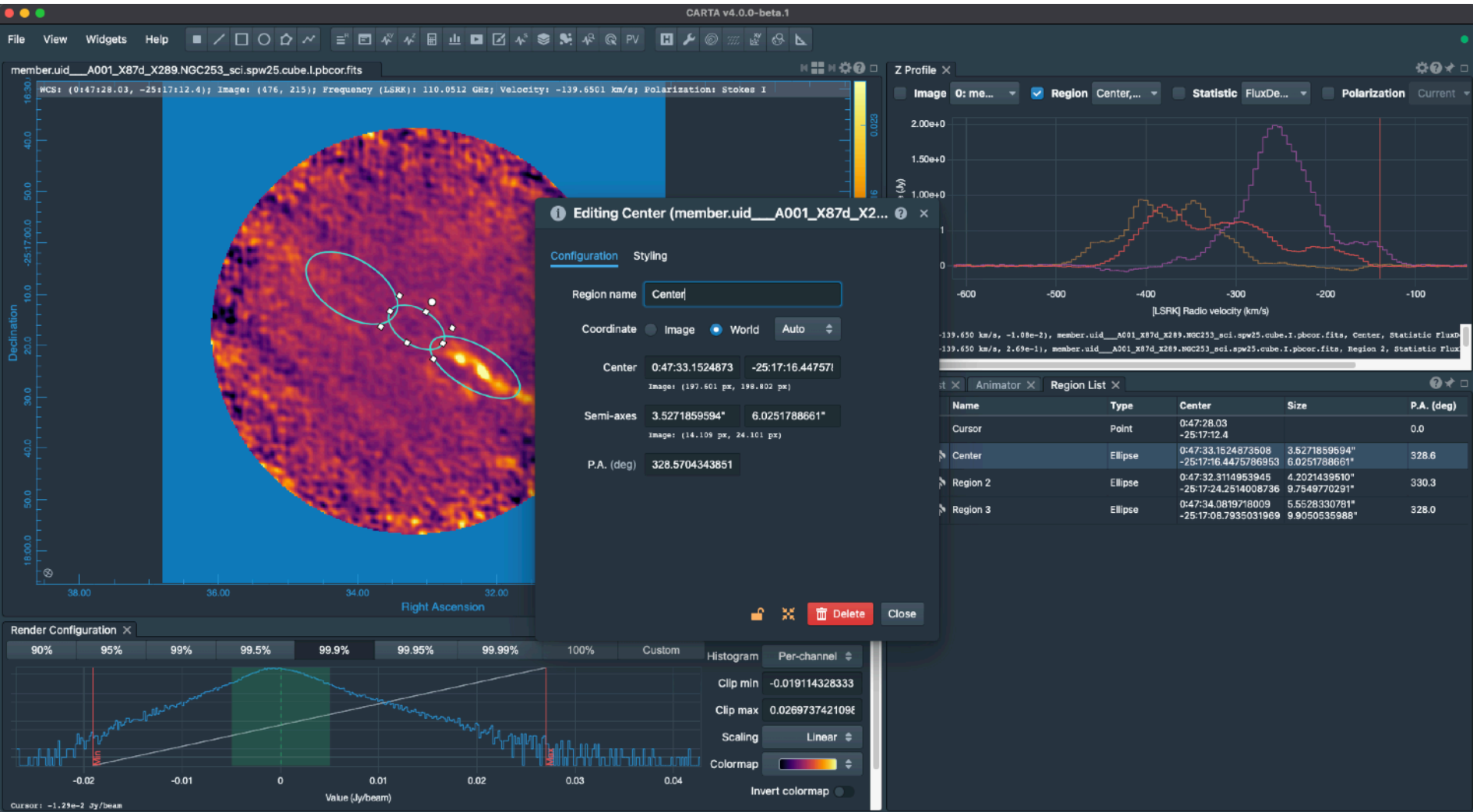Make 3 regions and look at flux density statistic - zoom in
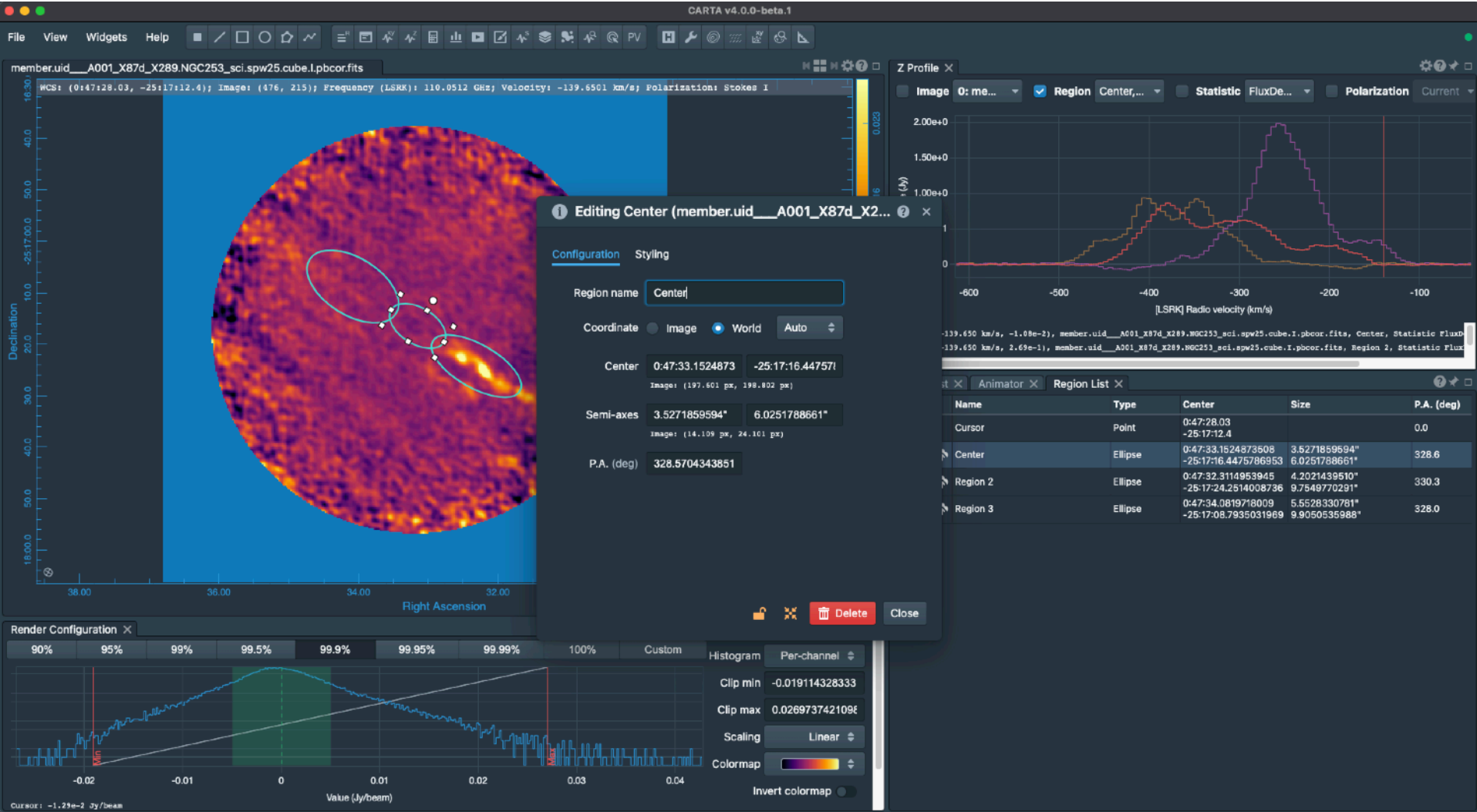
NGC 253

Name regions (double click)

NGC 253

Zoom and Name region (double click)

NGC 253

Append the same image for each of the 5 transitions

Preferences

You can set your global preferences

NGC 253

You can make moment maps.

NGC 253

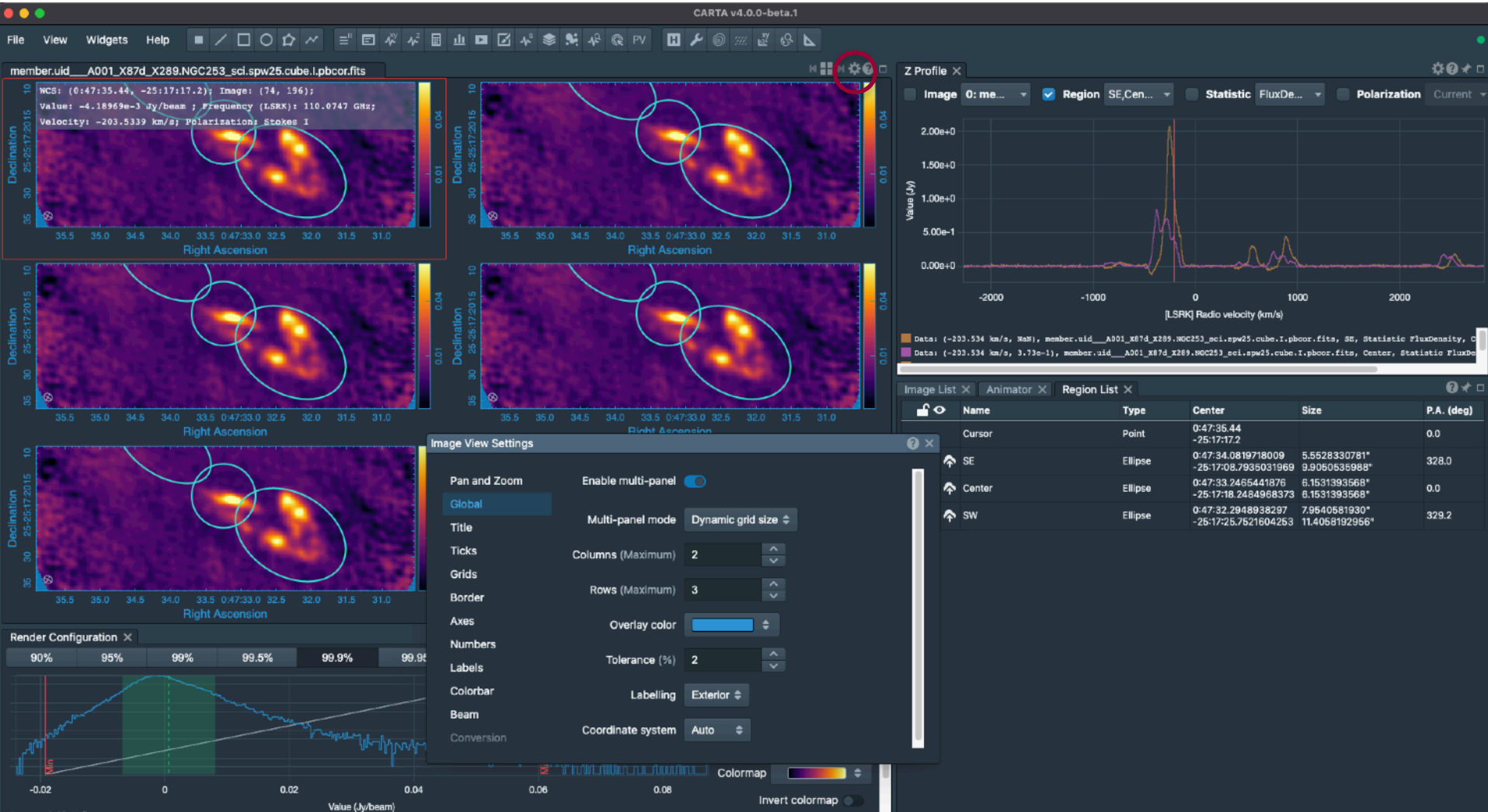You can make moment maps.

NGC 253

Append 4 more copies of the same image and set image grid size

NGC 253

Set rest frequencies for each image to transitions of interest: HC3N (109.1736), 12C18O (109.7822), HNCO (109.90575), 13CO (1-0) (110.2014), CH3CN65? (110.3813)

NGC 253
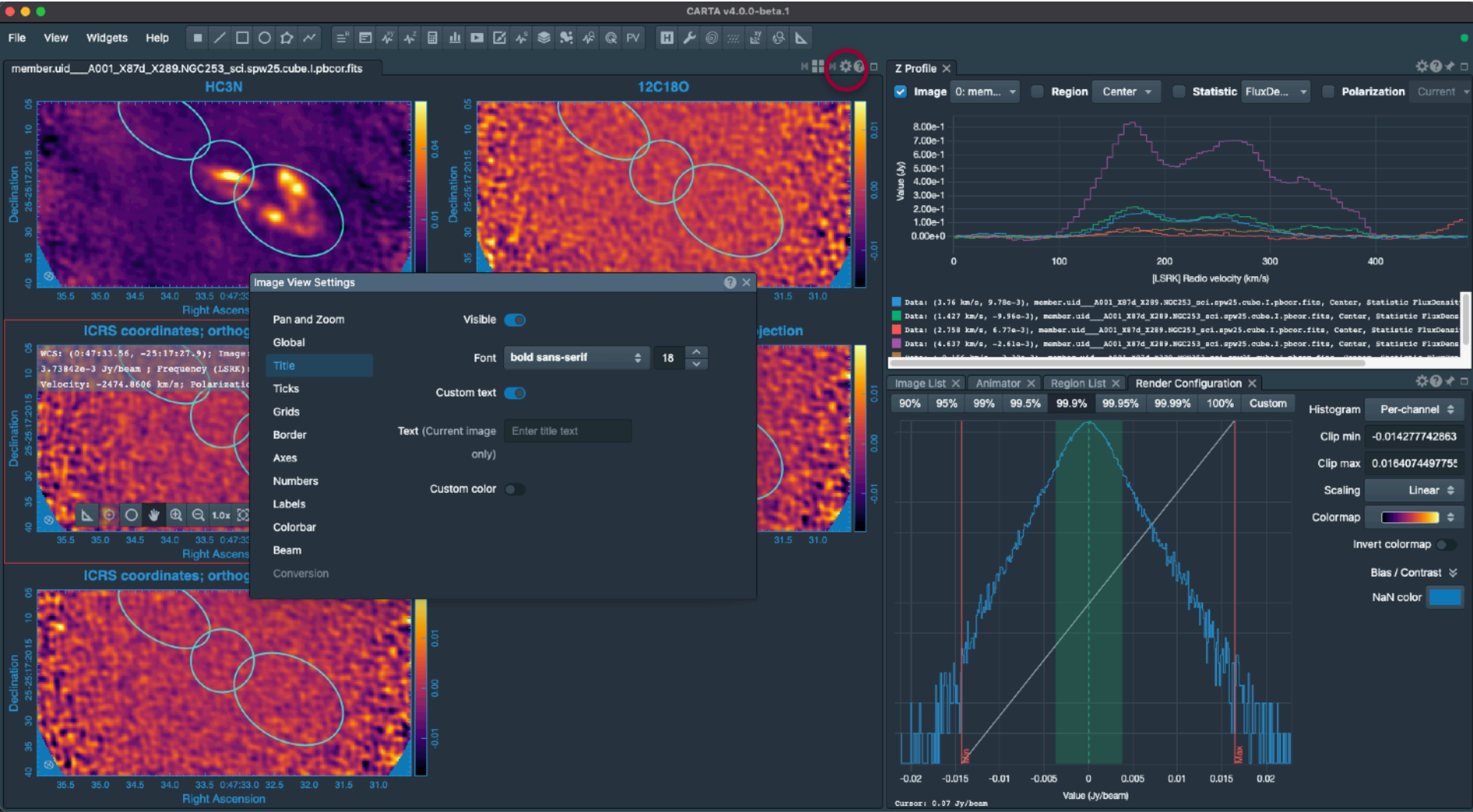
Update to include all images and can change region - zoom in to where all 5 lines overlap.
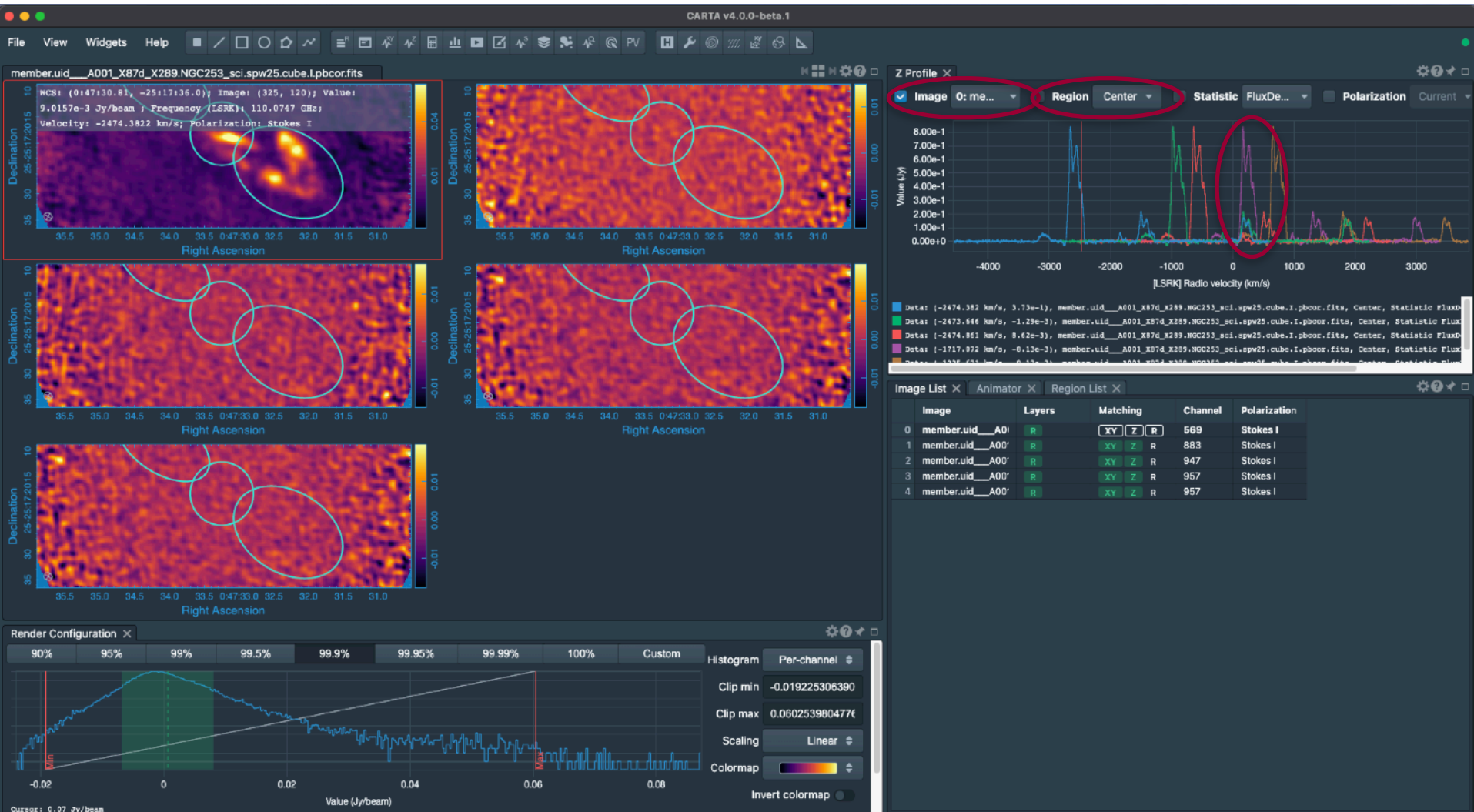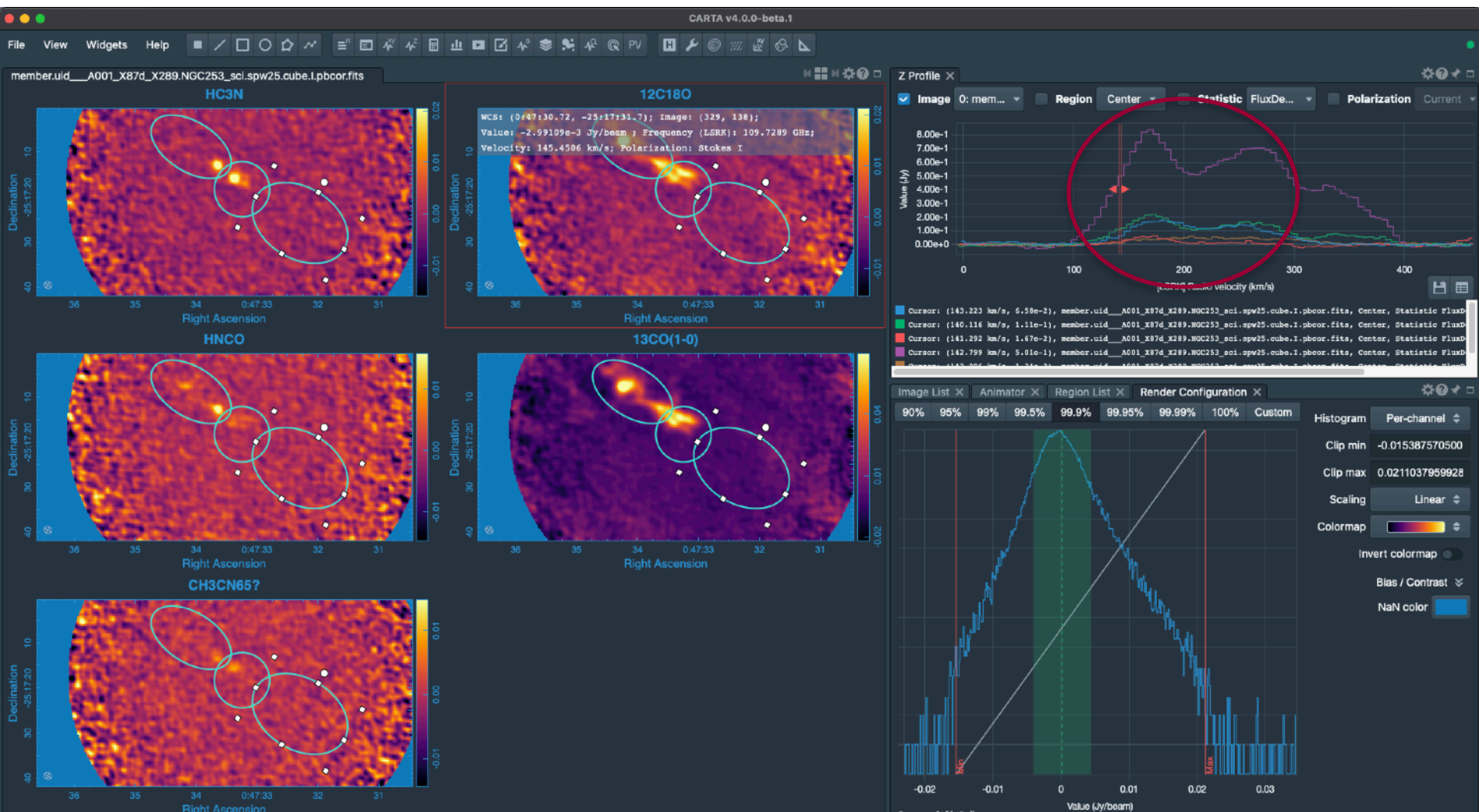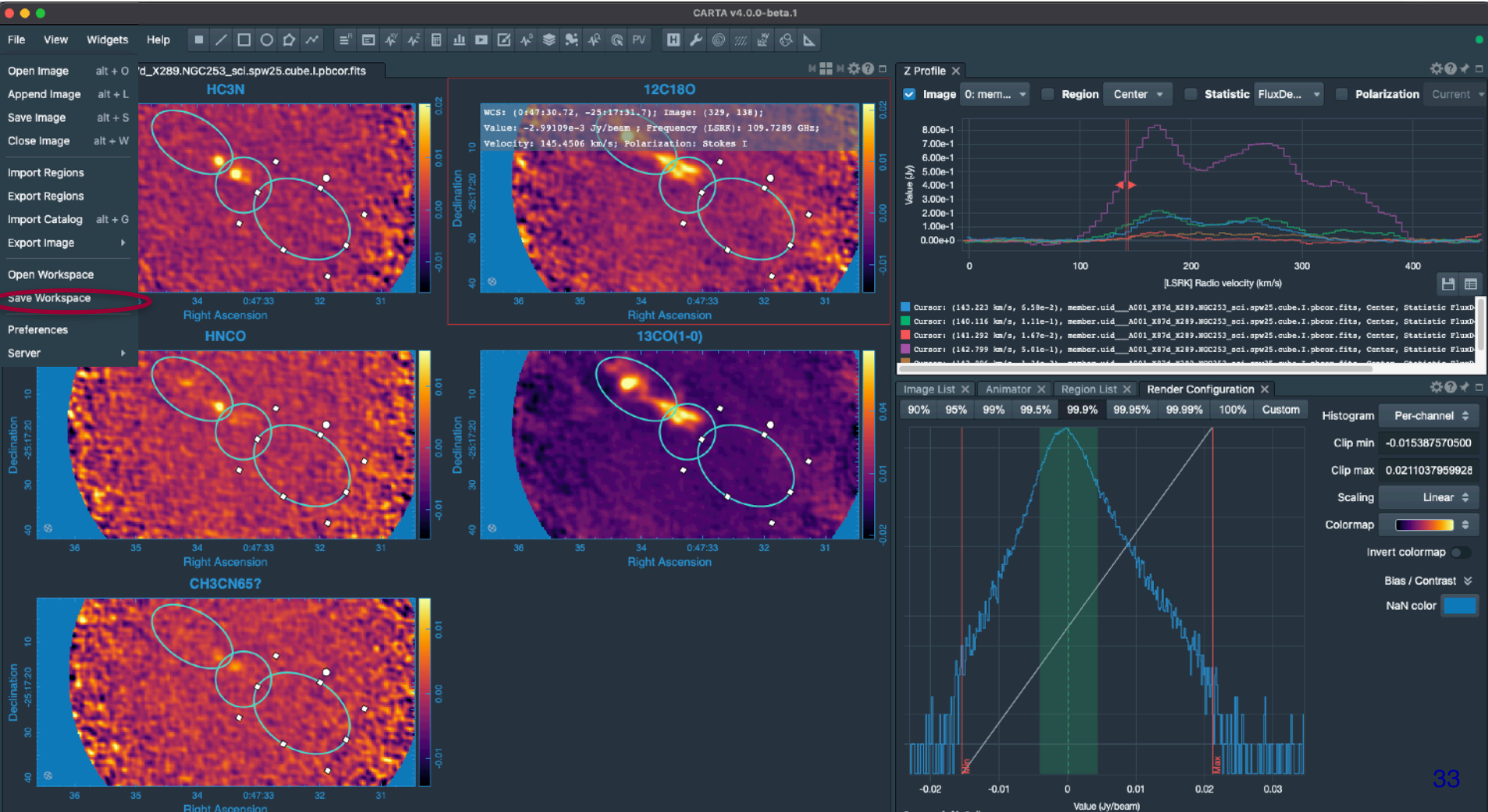
NGC 253

Set titles

NGC 253

Animate (step through line) - walking through the 5 transitions all at once
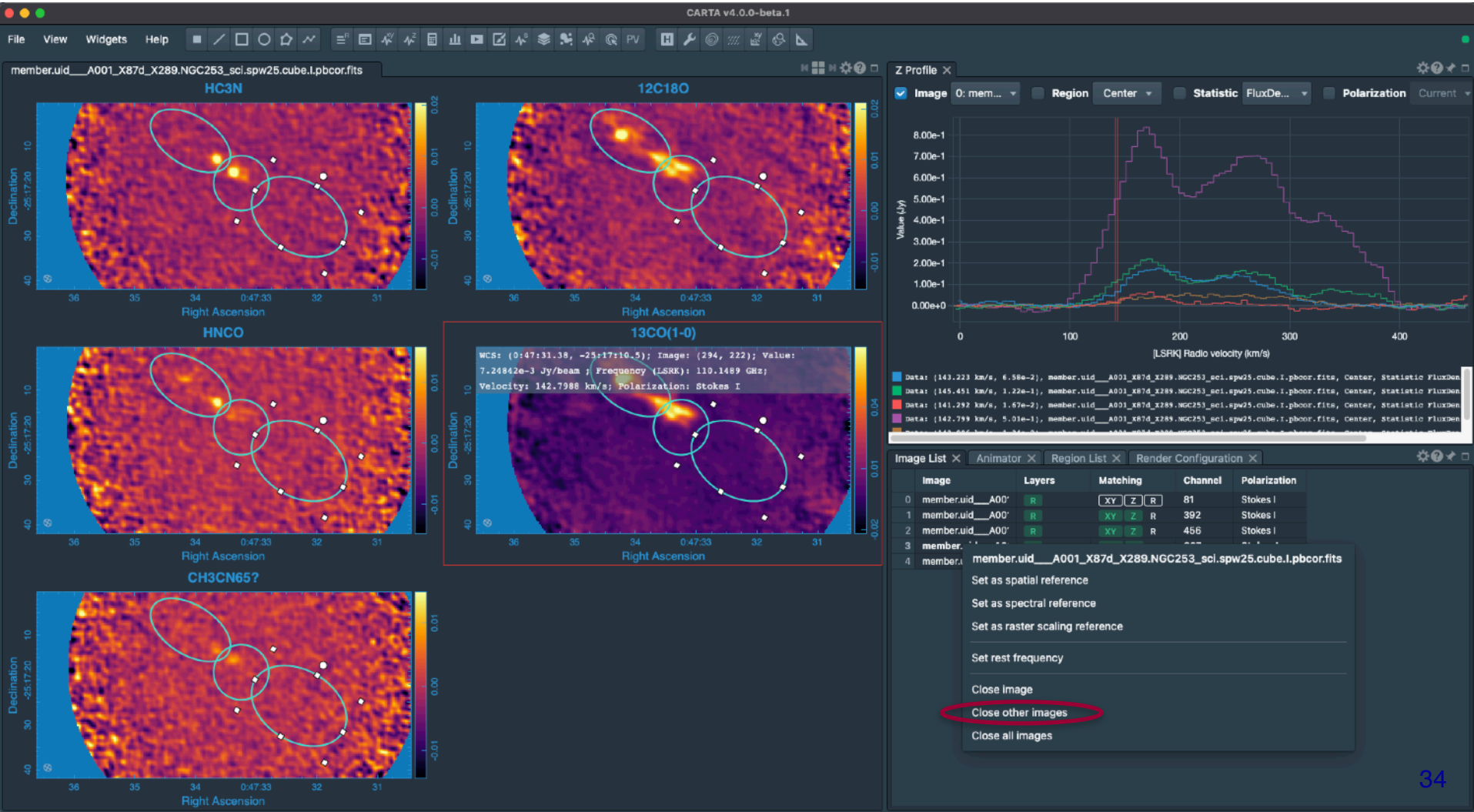
NGC 253

Save/open workspace - doesn't save everything but saves some stuff

NGC 253

PV Diagram - close all images but 13CO(1-0) by right click on image in image list

NGC 253

PV Diagram (might have to close and reopen image if not cooperating) - remove other regions and draw line region - click on PV diagram and set parameters: PV cut (region 1 - the line), Avg width (20), Coordinate (radio velocity), Range (50-450)

NGC 253

PV Diagram - can drag around line and get PV diagram to go over features you want - then generate

NGC 253

PV Diagram - can drag around line and get PV diagram to go over features you want - then generate
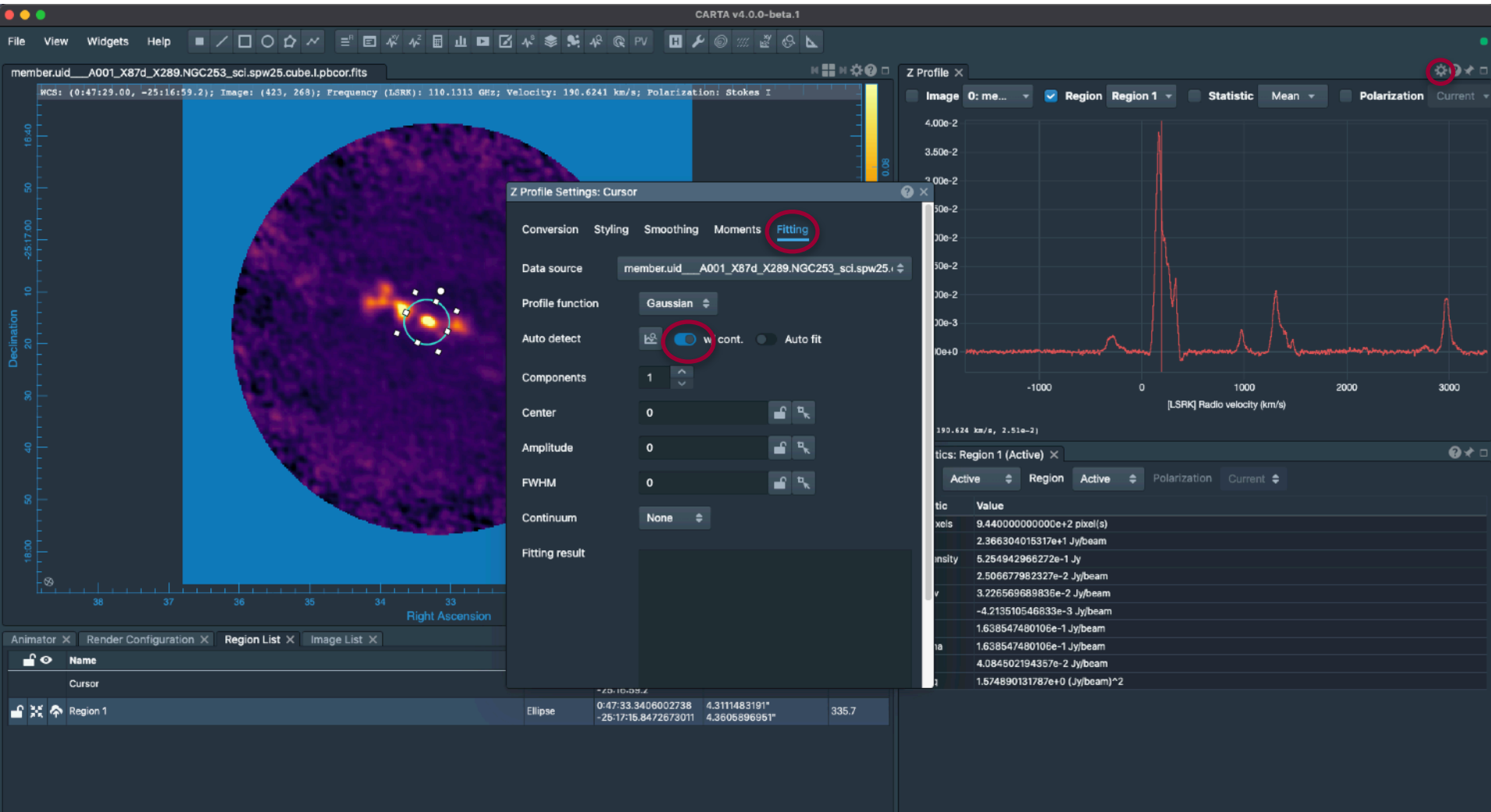
NGC 253

Save sub cube fits files
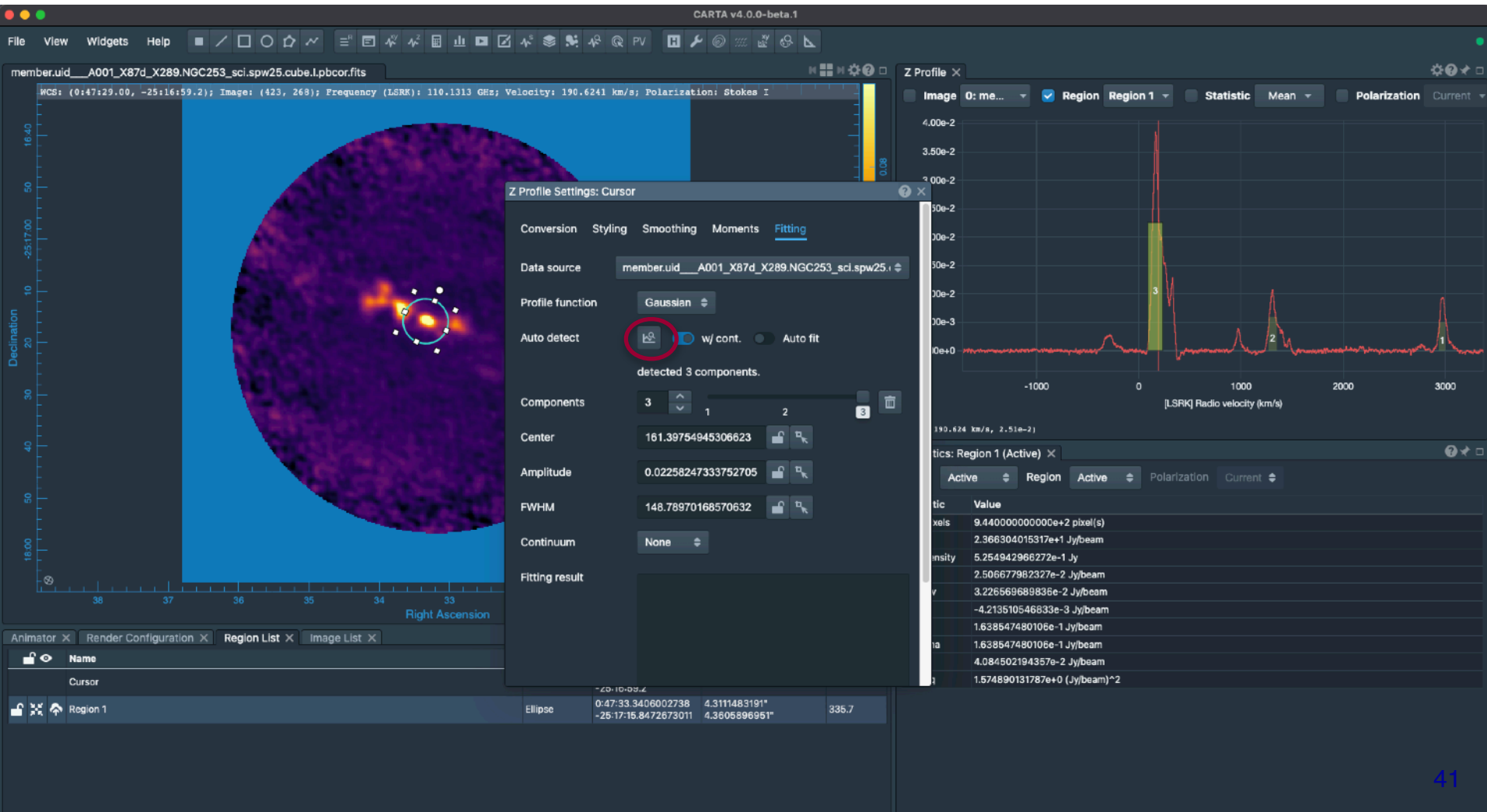
NGC 253

Annotations

NGC 253

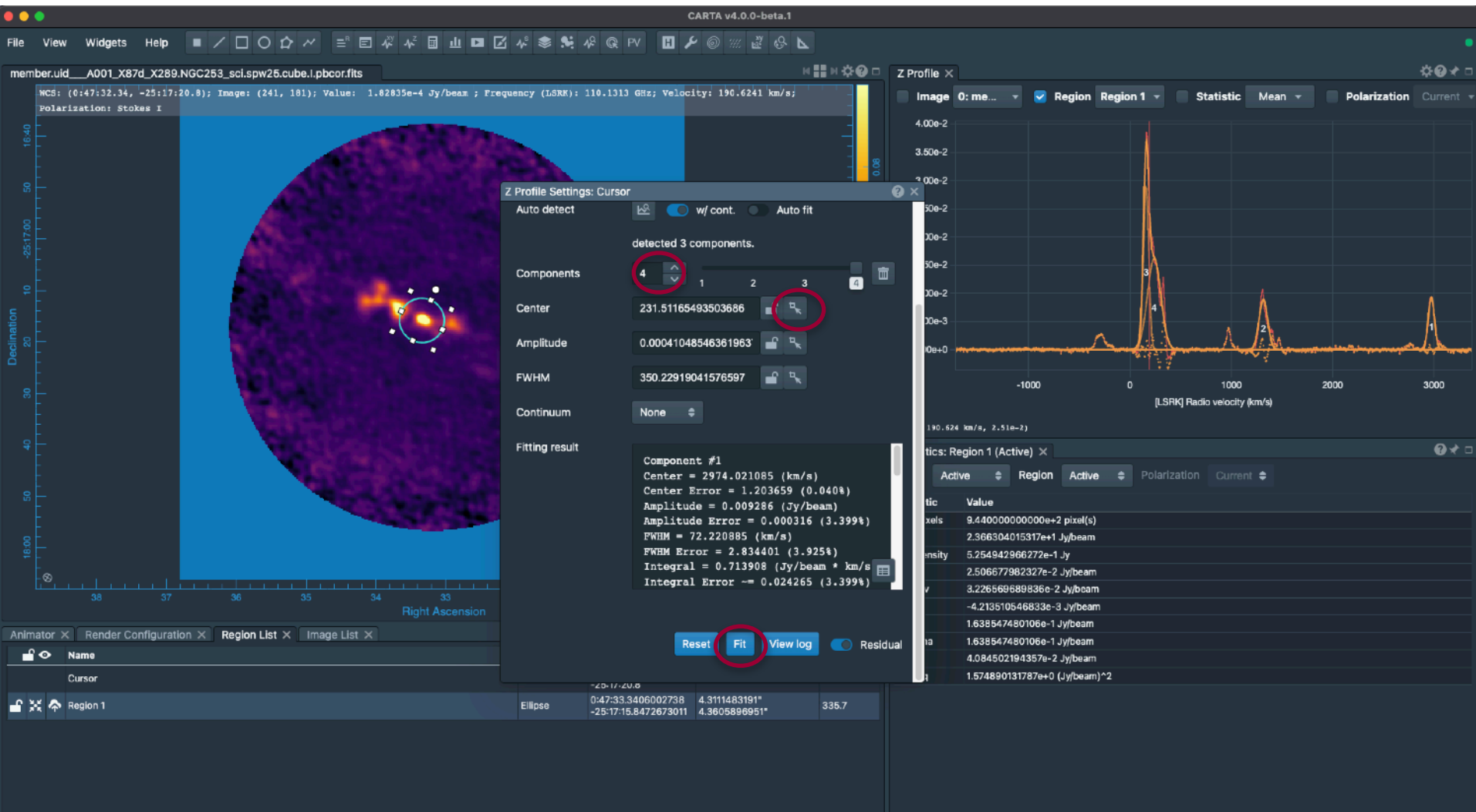Line Fitting (might have to play with region and clicking to show plot of region)

NGC 253

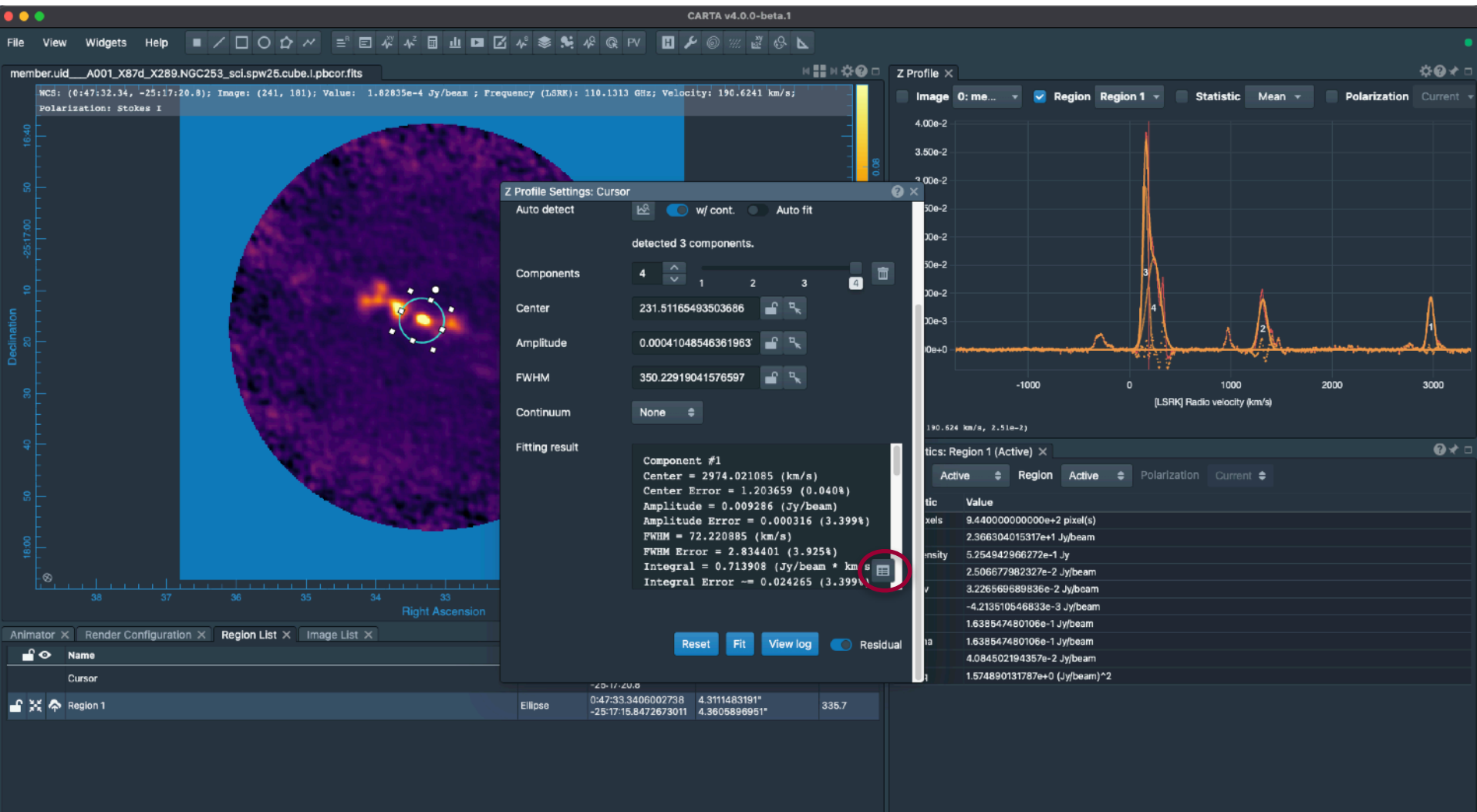Line Fitting - auto generate

NGC 253

Line Fitting - you set components - set to 4 - enable cursor selection (use hand to choose component) - fit

NGC 253

Line Fitting - save fit

NGC 253

Contours - N, generate, apply

NGC 253

Contours - drag contour level, set start, etc.
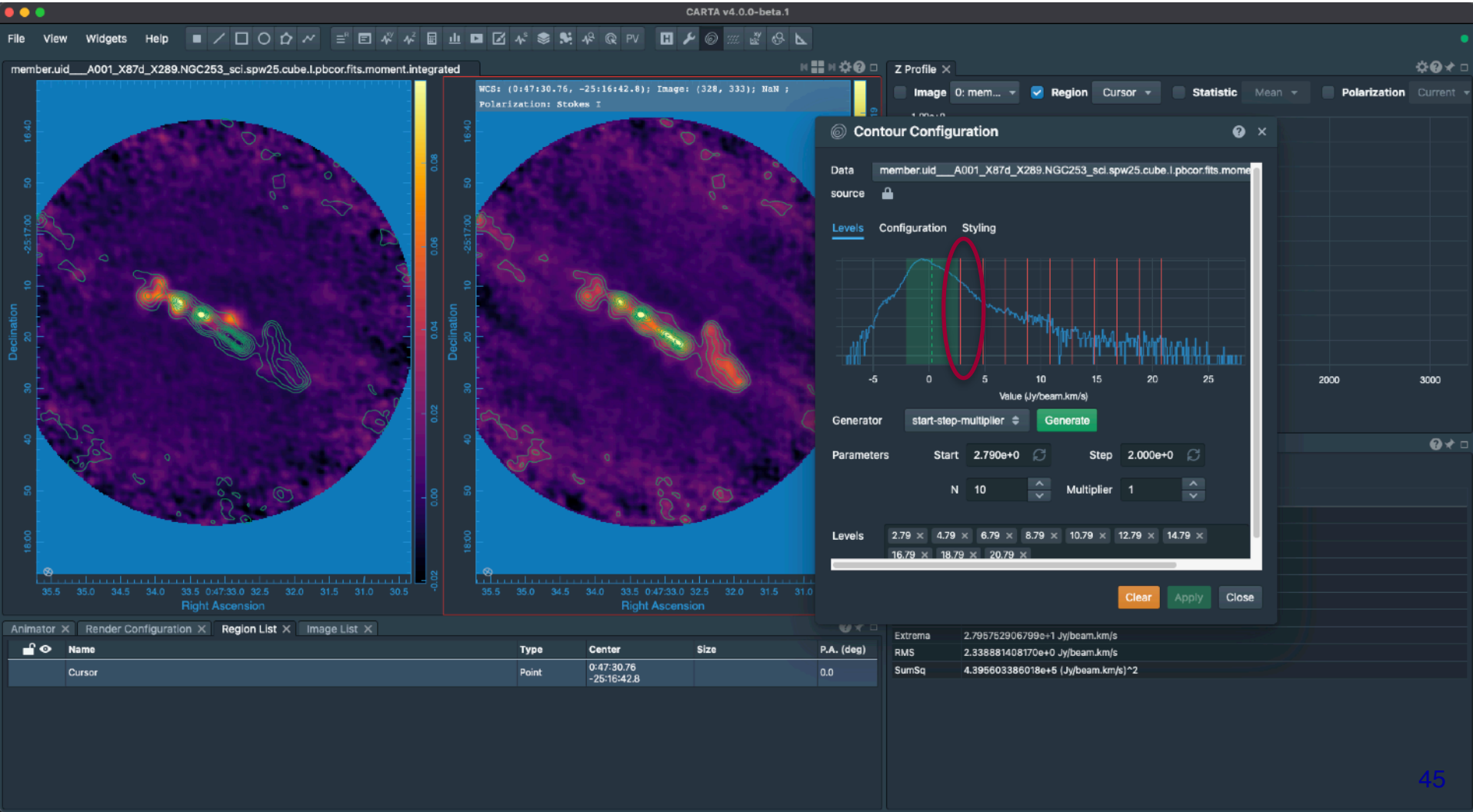
Extra time? Can go look at HL Tau image.