

CARTA v5-beta release note

The CARTA development team is pleased to announce the release of the v5-beta packages for you to try.

For the “**Site Deployment Mode**”, the supported operating systems are:

- Ubuntu Linux: 22.04 LTS (Jammy), 24.04 LTS (Noble)
- Redhat Linux: 8, 9

Please follow the instructions [here](#) for deployment.

For the “**User Deployment Mode**”, the supported operating systems are:

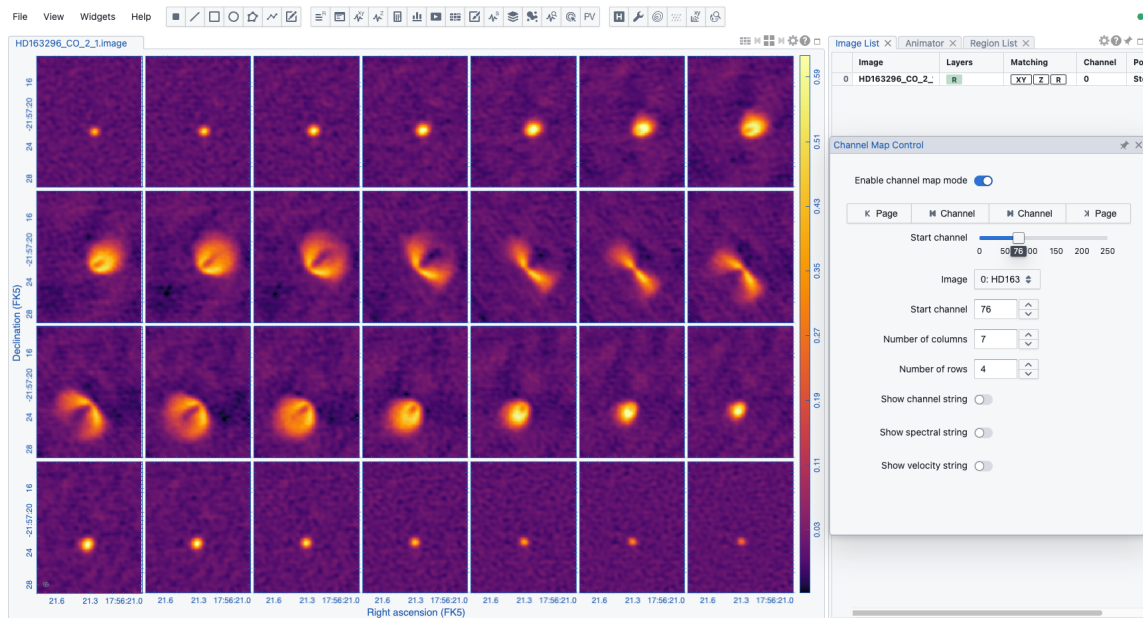
- macOS: 12 (Monterey), 13 (Ventura), 14 (Sonoma), 15 (Sequoia)
- Ubuntu Linux: 22.04 LTS (Jammy), 24.04 LTS (Noble)
- Redhat Linux: 8, 9

Please visit the homepage (<https://cartavis.org/>) to obtain the packages.

This beta release includes the following major improvements:

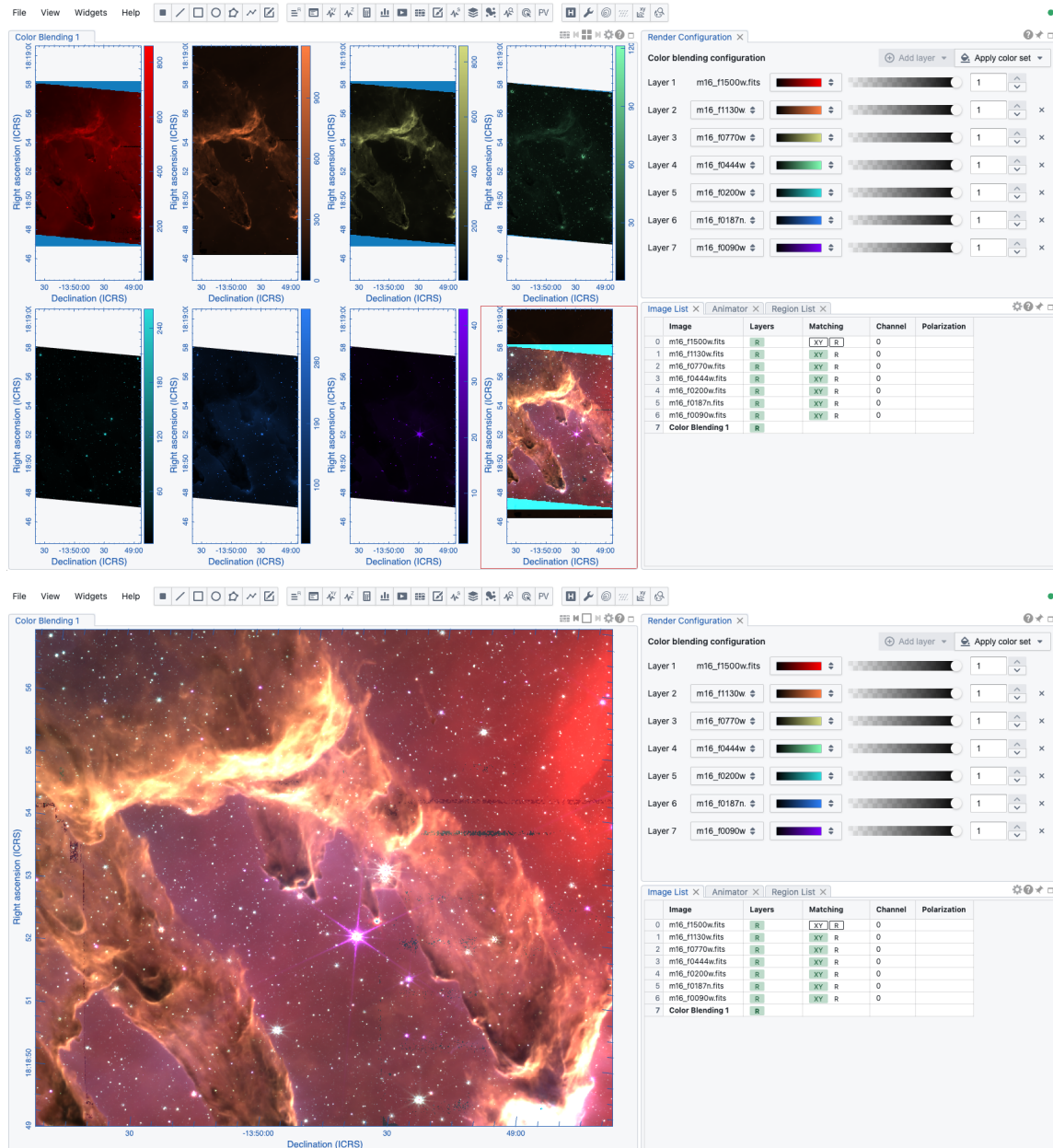
1. Channel map view mode

Channel map view is a classic way to view an image cube with adjacent channels displayed in a regular grid. In our implementation, we incorporated all the latency-hiding techniques to make channel map view efficient and interactive. This is an *experimental* feature under active implementation. In the beta release, only raster rendering is available in the channel map view mode. Other rendering modes, such as contours, vector field overlay, and catalog overlay, will be implemented in the next development cycle.



2. Multi-color image blending

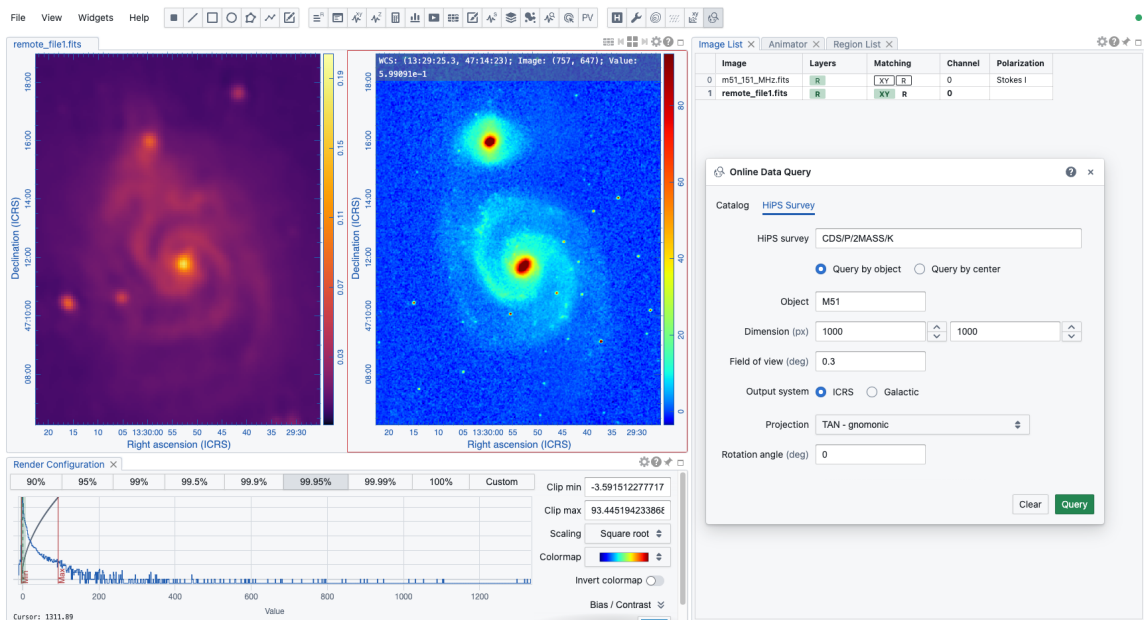
This is an expanded version of the traditional three-color (RGB) blending of astronomical images to create a pseudo-color image. In our implementation, multiple images with different image sizes and pixel sizes can be combined with various color-mapping configurations by taking advantage of the GPU power. This new feature serves as a unique tool for making publication-quality images.



3. HiPS2FITS online image query

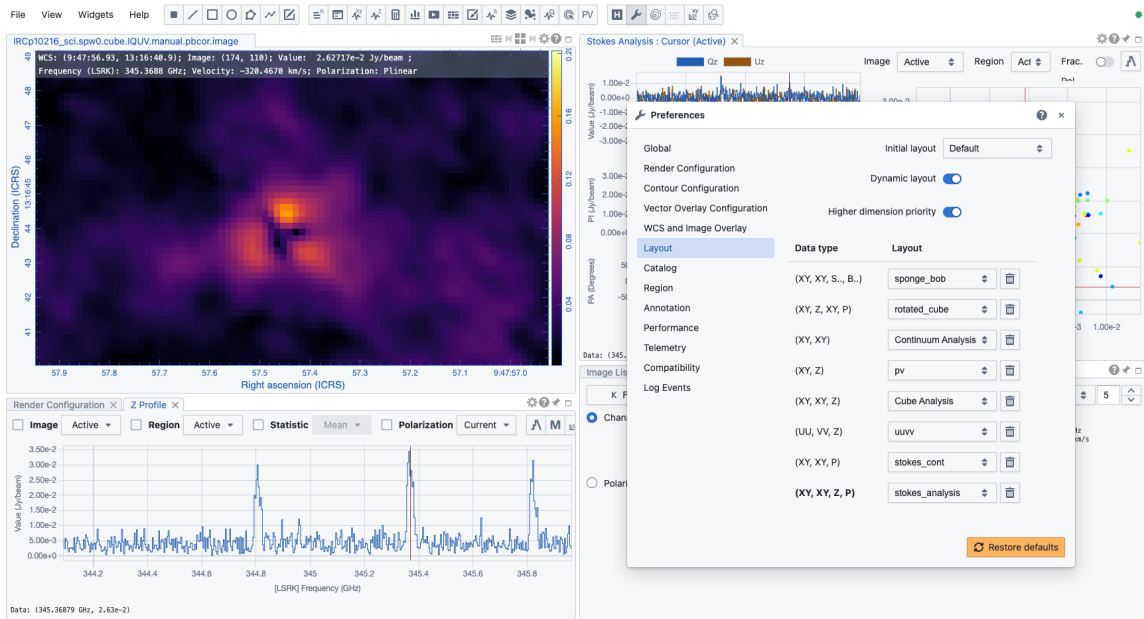
In the beta release, not only catalogs but now including images from the HiPS2FITS service (<https://alasky.cds.unistra.fr/hips-image-services/hips2fits>) can be queried and retrieved for visualization. This new feature expands the capabilities of CARTA for

archival sciences.



4. **Dynamic layout**

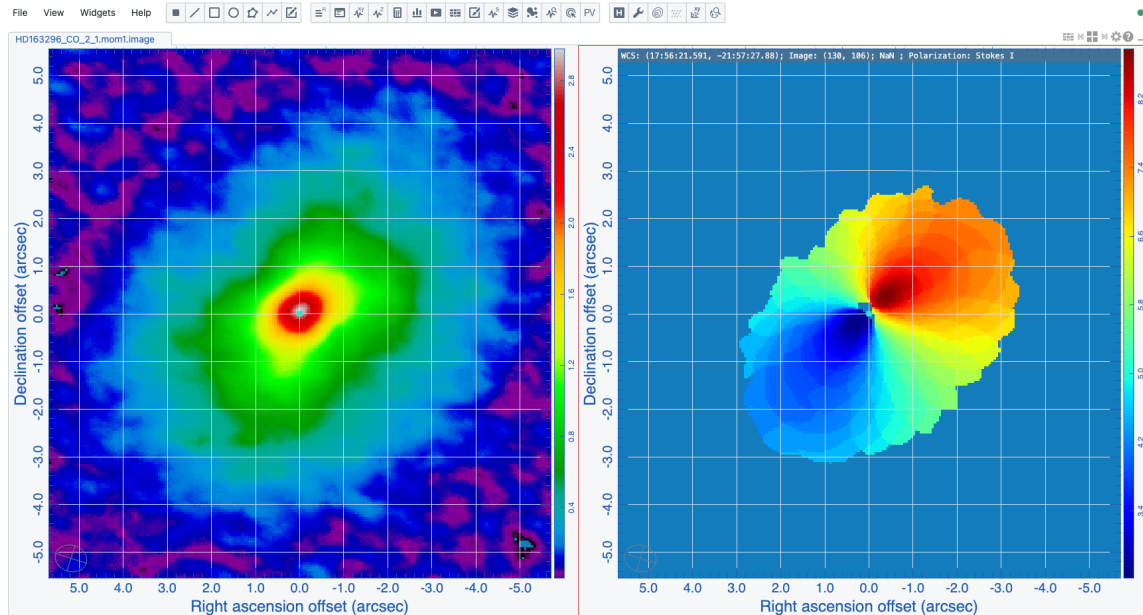
CARTA has a flexible GUI layout system where users can define their own layouts and automate them for different science cases. In this beta release, we generalize this feature to make it context-aware. Once the dynamic layout feature is enabled, users can associate image types (eg. spatial-spatial-spectral-stokes) with a dedicated layout. Next time when users load such images, the associated layout will be loaded automatically.



5. **Image coordinate and flexible offset coordinate**

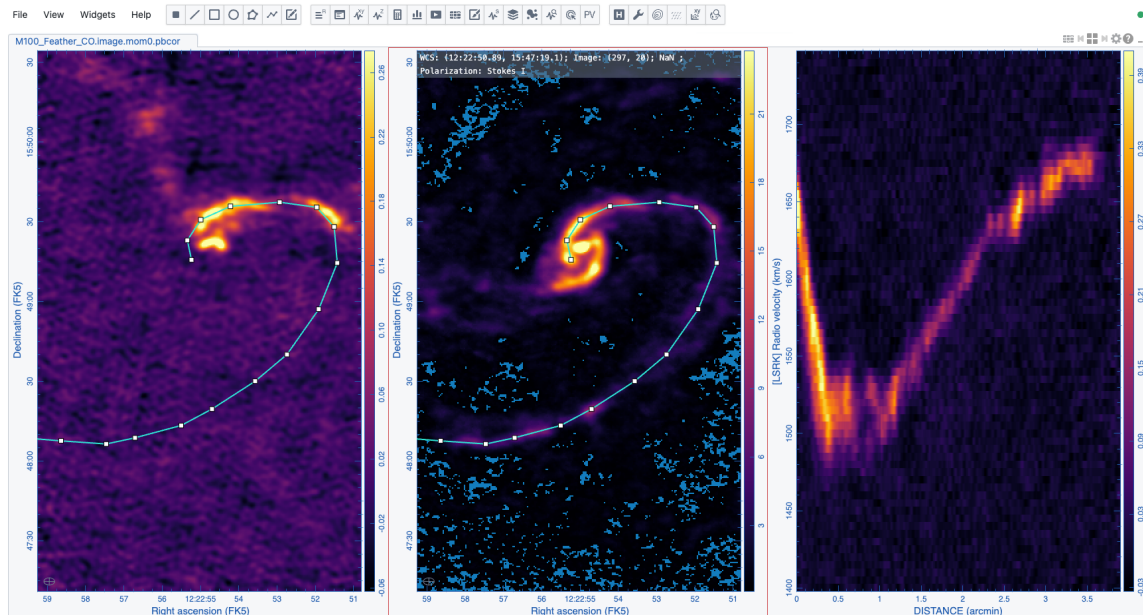
The image viewer now supports displaying image coordinate and offset coordinate. This

would widen the use cases, for example, VLBI and solar system objects like comets.



6. PV generator with a polyline region

The PV generator now supports both line and polyline regions for PV image generation. The position axis becomes “distance” when generating a PV image along a polyline region. In principle, users can generate a PV image along an arbitrary curve in the spatial domain by shaping a polyline region. This new capability generalizes PV to arbitrary shapes.



7. Online help

In this beta release, we replaced the offline in-app help by an online one hosted by the readthedocs service. The online user manual will be revised accordingly to support this new approach.

Other minor feature improvements, performance improvements, bug fixes, and codebase maintenance changes, are included in this beta release as well. Please refer <https://github.com/CARTAVIS/carta/releases> for the detailed changelogs.

We encourage users to give this beta release a try, especially those new features highlighted above. If you encounter issues or have comments, please share with us via the Google form (<https://forms.gle/AX4az7PP7qWDYSnq9>). In the following few months, we will focus on additional bug fixes before making a v5-stable release.

The CARTA development team
2025/02/26

