Data Browsing Tools

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There are a variety of tools available for interacting with the results of a search. The most prominent tool in the search results window is the **AstroView** Tool, which shows the footprint(s) of entries in the results grid superimposed on a sky background (by default, the Digital Sky Survey). AstroView is described separately.

Of the remaining tools, not all are available for every result. The following tools are indicated as icons in the **Actions** column:

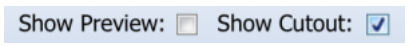
Icon	Tool	Description
	Timeseries Viewer	View the data in the Time Series Visualization tool
	Spectral Viewer	View the data in the Spectrum Visualization tool
	Jdaviz	View the data in the Jdaviz tool
	Toggle Overlay Image	Toggle an image overlay in AstroView

Applicable Tools Only

Only icons for tools that are applicable to the results table row are displayed.

Cutout Tool

Some observations have cutouts of FITS images available for display. Cutouts are hidden from search results by default. To toggle the display of image cutouts, check the relevant cutout checkbox or radio button depending on the current view.

View	Icon
List View	
Album View	

Checking the box will show a new ***Cutout*** column which displays cutout images for all search results where available (Figure 1). Results that have no cutouts available will display "No Cutout Available".

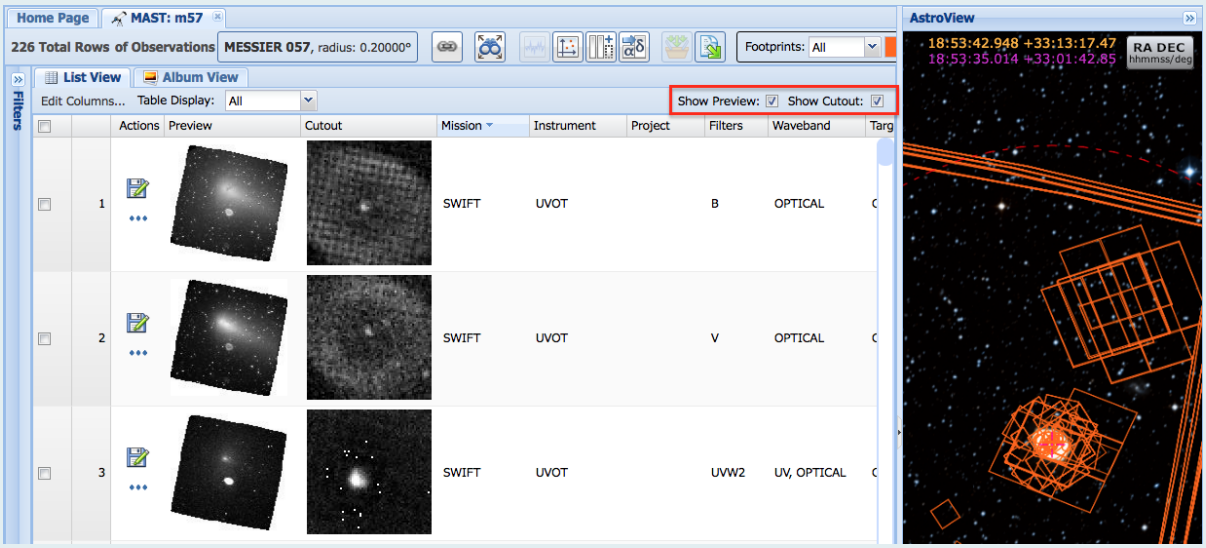


Figure 1 — Search Results List View. Check the "Show Cutout" checkbox to display a new "Cutout" column in the table, which will display any available FITS image cutouts.

Viewing cutouts in **Album View** (see Figure 2) opens up the option to change the resolution of the cutout. Use the drop-down menu on the right-hand side.

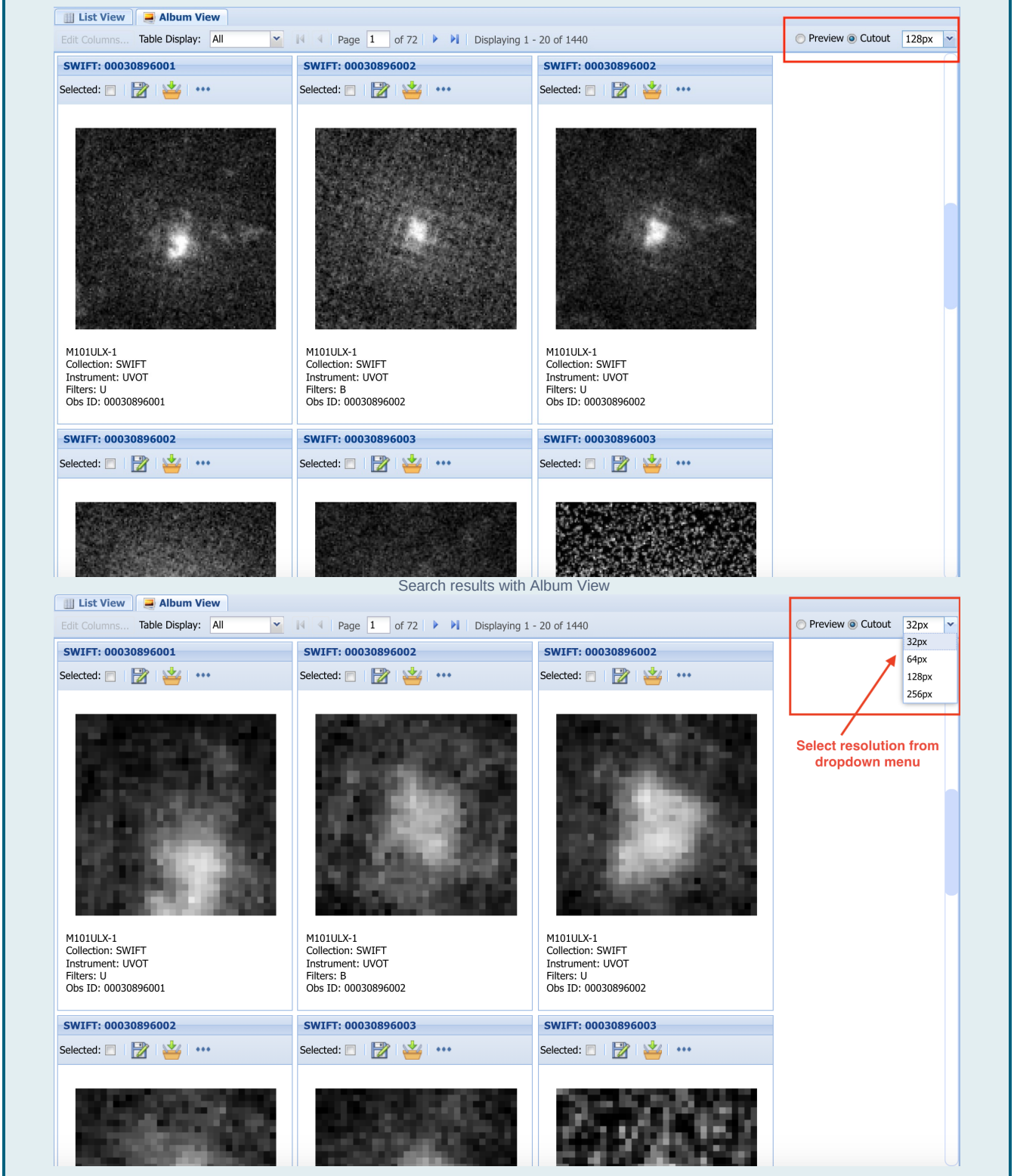


Figure 2 — Search Results Album View. **Left**: Checking the "Cutout" radio button displays the image cutouts in the results panels. **Right**: The resolution of the image cutouts can be changed with the dropdown menu on the far right.

Image Overlay

The Image Overlay action button indicates that the image of the relevant observation can be overlaid on the AstroView on-sky panel; see Figure 3.

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Figure 3 — the Image Overlay action. Clicking the "Image Overlay" action button overlays the image cutout in the AstroView tool, with the proper WCS coordinate matching.

Spectral Viewer

The Spectral Viewer action button indicates that the relevant observation has a spectrum that can be viewed with the Spectrum Plotter tool. Clicking this button opens up a new window (Fig. 4), displaying the spectrum for the given row. To select and overplot multiple spectra (up to 10), select all valid rows of interest you wish to view, and click the Spectrum Viewer icon that is located in the Search Results Toolbar. This opens up the same window with all selected spectra over-plotted.

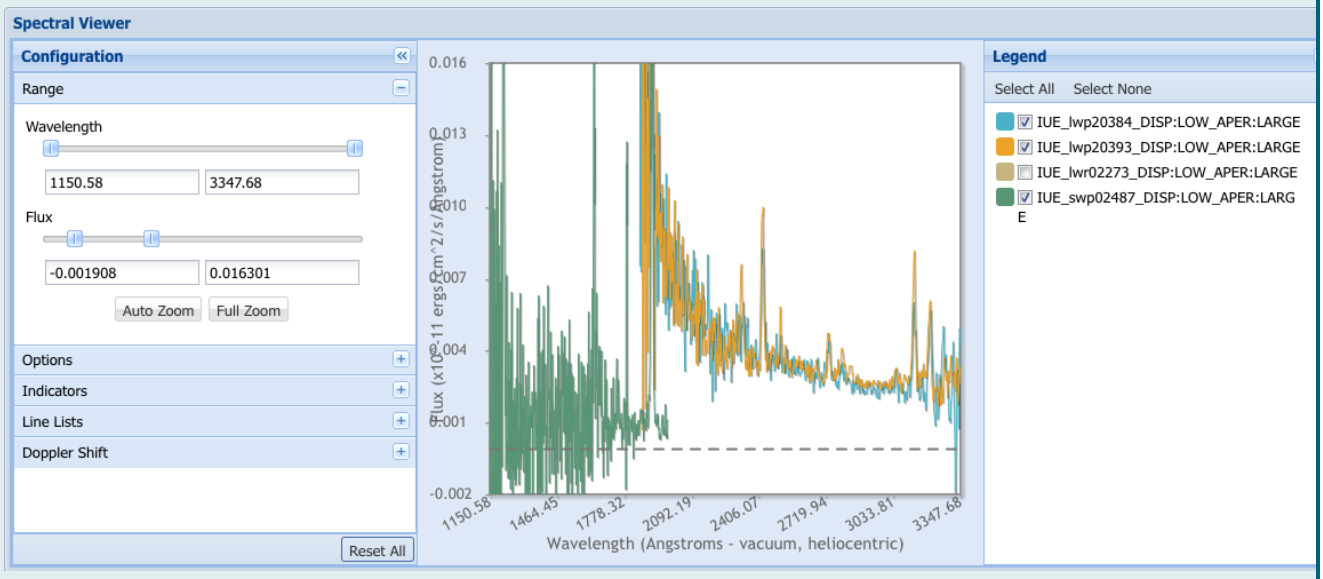

Figure 4 — the Spectrum Viewer tool. **Configuration Panel** (*left*): Options for configuring the spectrum display, adding markers or spectral lines, or performing spectral line fitting. **Spectrum Panel** (*middle*): Displays any loaded spectrum as flux vs wavelength. **Legend Panel** (*right*): Contains all spectra loaded into the tool, as well as any additional markers, as toggle-able display elements.

Watch this video for details on the features of the Spectrum Viewer Tool.

The Configuration Panel has the following sections:

Section	Description
Range	Change the x-axis or y-axis display range or scaling
Options	Change plot grid and line styles, or smooth the spectrum
Indicators	Add a vertical line at a specified wavelength
Line Lists	Add a marker for a specified spectral line
Fitting	Perform simple spectral line fitting
Doppler Shift	Shift the spectrum by a specified redshift or velocity value

Timeseries Viewer

The TimeSeries action button indicates that the relevant observation has a time-series spectrum that can be viewed with the TimeSeries Plotter tool. Clicking this button opens up a new window (Figure 5), displaying the time series for the given row. All the spectra in the series are made available in the legend, but only one series may be viewed at a time. Time series also have an option to phase fold the data to discover periodic events such as transiting exoplanets. Phase folding may be enabled by entering a period (and optionally an epoch to apply a shift) and checking the "Enable Phase Folding" checkbox in the Phase Folding configuration section.

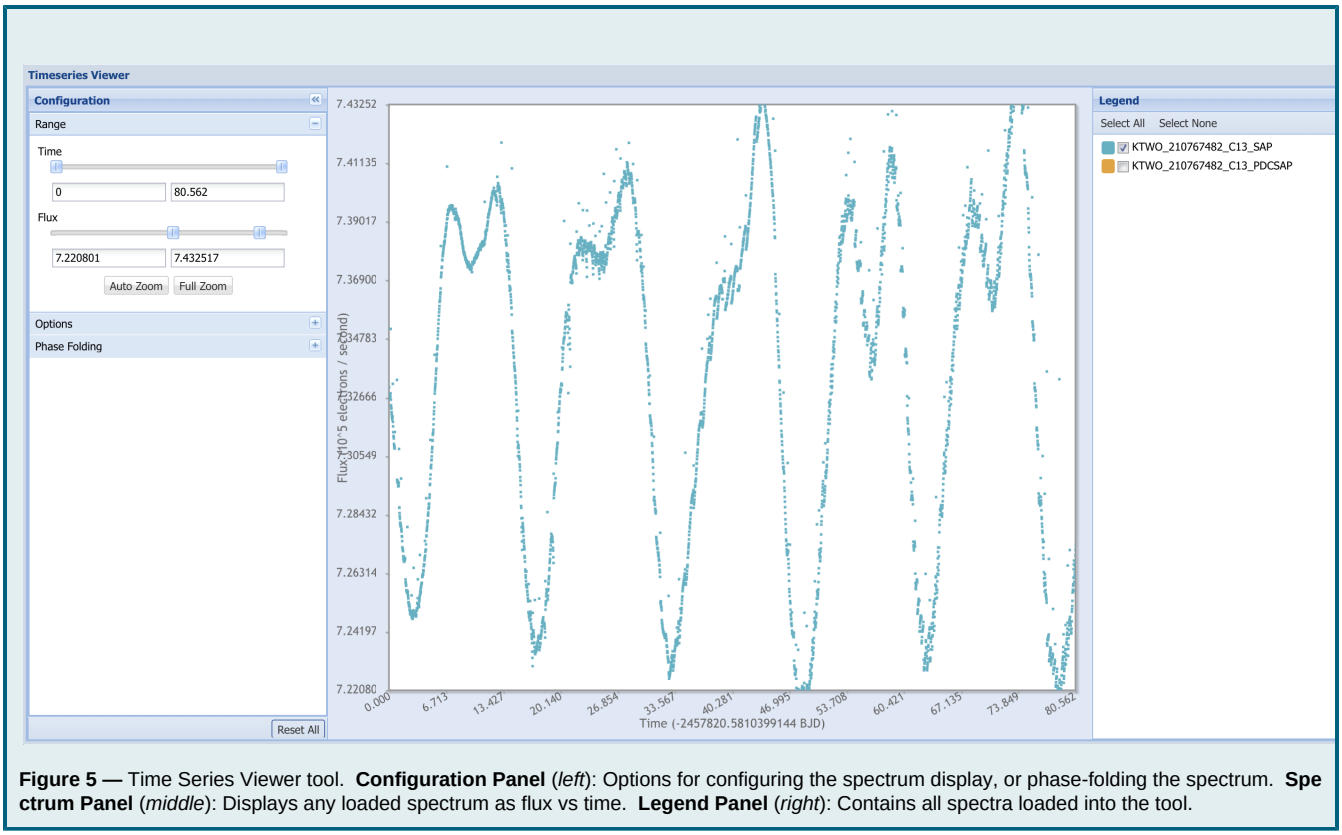

Figure 5 — Time Series Viewer tool. **Configuration Panel** (*left*): Options for configuring the spectrum display, or phase-folding the spectrum. **Spectrum Panel** (*middle*): Displays any loaded spectrum as flux vs time. **Legend Panel** (*right*): Contains all spectra loaded into the tool.

The Configuration Panel has the following sections:

Section	Description
Range	Change the x-axis or y-axis display range or scaling
Options	Change plot grid and line styles, or smooth the spectrum
Phase Folding	Phase fold the time series spectrum by a specified period

Cross-Match Tool blocked URL

To cross-match a set of search results against other MAST or CDS catalogs, click the Cross-Match button, located in the Search Results Toolbar, to display a pop-up window (**Figure 6**). Select the catalog resource against which to match, specify the match radius in arcseconds, choose whether to match against all rows or a selected subset, and click the cross-match button to begin the search. The returned results will display as a new tab in the main Search Results Grid. The new tab will display all columns from the original search plus all columns from the matched catalog. To perform a successful cross-match, the original search results must contain proper RA and Dec coordinate columns. If no results are found, or an error occurred during cross-match, a pop-up message will be displayed indicating the reason, and no new tab will be created.

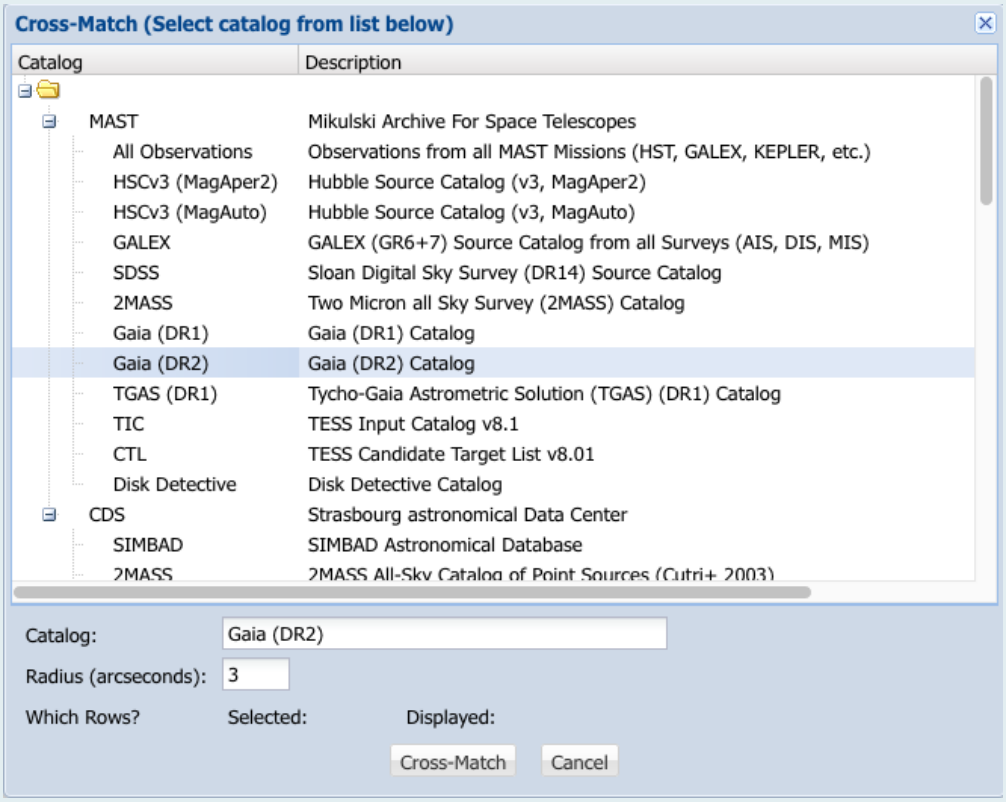

Figure 6 — the Cross-Match tool. Select any single catalog to perform a cross-match against. Specify a search radius and which rows to perform the cross-match on, and click the **Cross-Match** button.

Charting Tool blocked URL

To explore scatter plot relationships between columns in a set of search results, click the **Charting Tool** button, located in the Search Results Toolbar, to display a pop-up window (**Figure 7**). The plotter tool lets you plot any two numeric columns against each other for display as a scatter plot. Columns can also be combined by selecting the Combine Columns button, which allows for arithmetic between two columns. Each axis can be configured by adjusting the range sliders or manually specifying new axis bounds. The plot image will automatically adjust. Click "Reset Range" to reset the axis ranges to their defaults. The user may also click-and-drag in the plot window to zoom in on a region, which also updates the axis ranges automatically. Data subsets may be selected by holding Shift while click-and-dragging. The selected subsets will update the results displayed in the Results Grid.

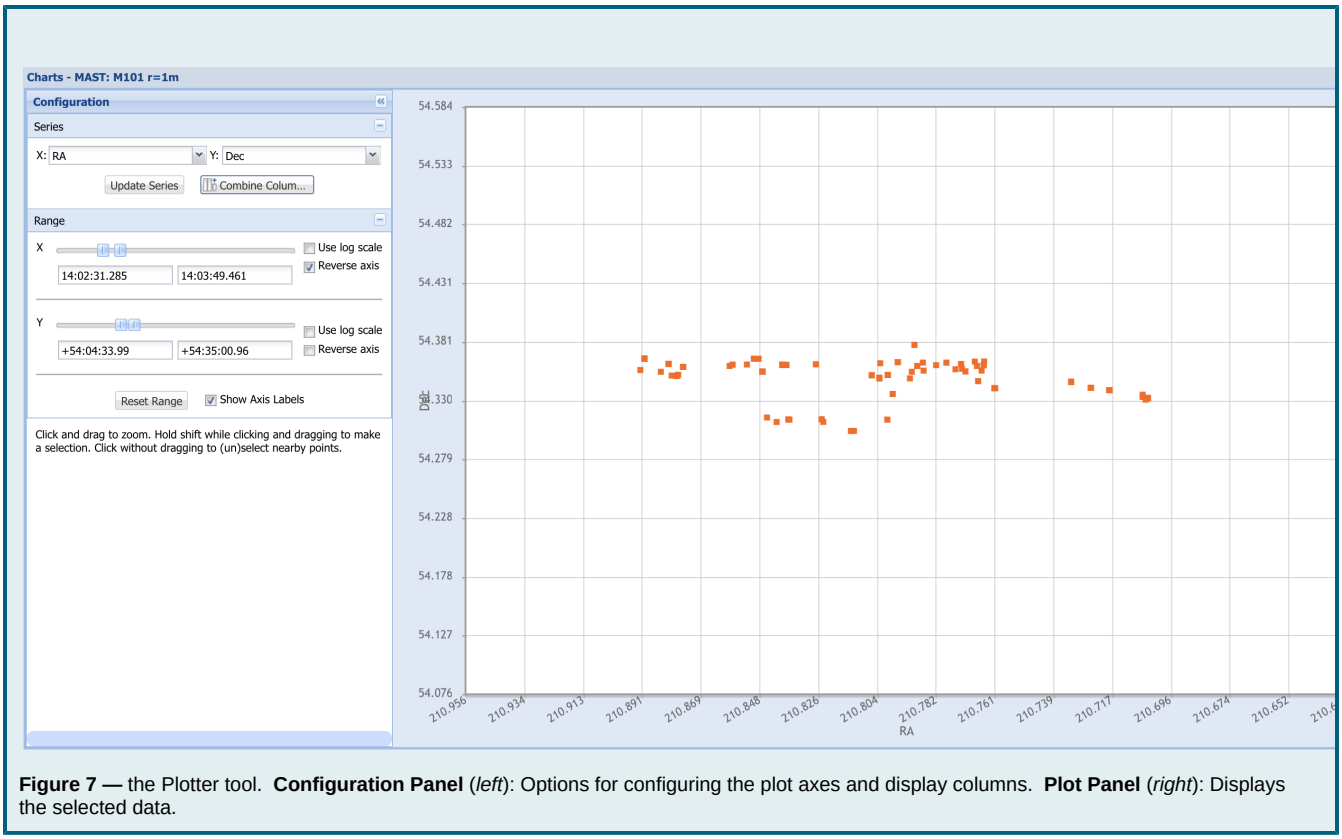

Figure 7 — the Plotter tool. **Configuration Panel** (*left*): Options for configuring the plot axes and display columns. **Plot Panel** (*right*): Displays the selected data.

The Configuration Panel has the following sections:

Section	Description
Series	Change the selected columns to plot
Range	Change the x-axis or y-axis display range or scaling