

Viewing Spectra

This article describes the various Jdaviz configurations to view different types of spectra. For an explanation on navigating to the Jdaviz analysis tool, visit the page [searching for Jdaviz-compatible data](#).

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Jdaviz Display Panel

The main display panel contains the Jdaviz python application. Jdaviz has multiple configurations designed to load and view different types of spectroscopic datasets. Which configuration is displayed in the MAST spectral quicklook page depends on the type of data product. See the [Icon Nomenclature](#) for quick reference guide to the different Jdaviz configurations, and the table [JWST Instrument Modes in Jdaviz](#) for a mapping between different JWST datasets and the recommended Jdaviz configuration for viewing the data. Below, we briefly summarize the currently supported Jdaviz configurations available in MAST. For further details, see the main [Jdaviz documentation](#).

Each Jdaviz configuration is built from one or more viewers, displaying either a 2d image, a 2d spectrum, or 1d spectrum profile. Each viewer is fully interactive, enabling pan/zoom, subset region selection, image scaling, colormaps, and more. Each configuration also comes equipped with a series of analysis plugins for on-the-fly analysis.



The primary configuration for 1d spectroscopic data sets. For JWST these data have **x1d** and **c1d** product suffixes. By default, Specviz consists a single 1d spectrum profile viewer (see **Figure 1**). See [Display Spectra](#) on how to manipulate data in the spectrum viewer. See [Specviz Analysis Plugins](#) for the types of plugins for spectrum analysis.

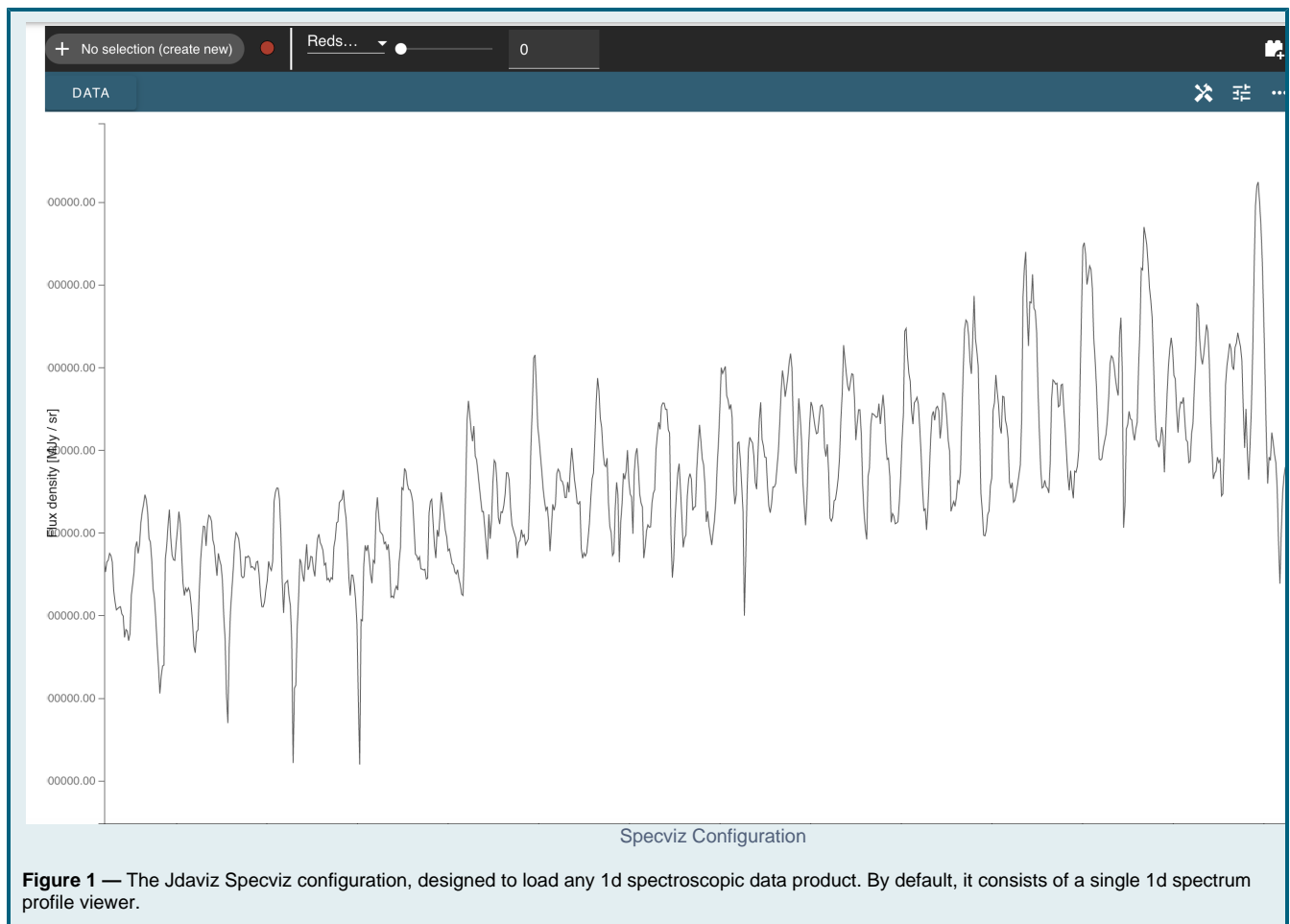


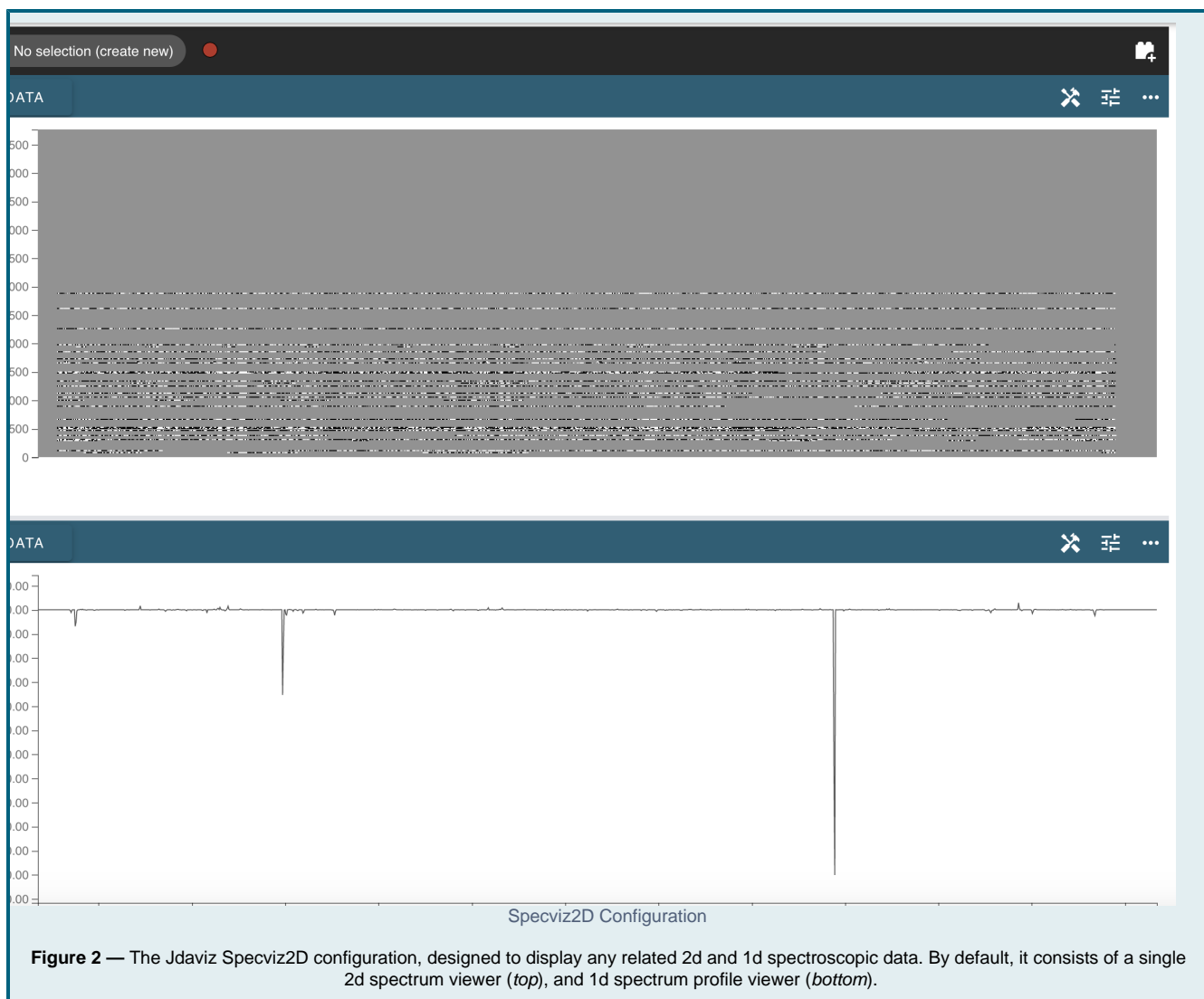
Figure 1 — The Jdaviz Specviz configuration, designed to load any 1d spectroscopic data product. By default, it consists of a single 1d spectrum profile viewer.



A pared down version of [Mosviz](#), the Specviz2D configuration is used for displaying a single related pair of 2d and 1d spectroscopic data products, for instruments producing multi-object spectral (MOS) data products. For JWST these data have **x1d** and **s2d** product types, associated with the NIRSpec instrument. By default, Specviz2D consists of a 2d spectrum viewer, and a 1d spectrum profile viewer, that are linked together (see **Figure 2**). See [Display Spectra](#) on how to manipulate data in the spectral viewers. See [Mosviz Analysis Plugins](#) for the types of plugins for spectrum analysis.

Specviz2D is meant to display a related 2d and 1d spectroscopic data product for a given target, and thus can accept two data product files as input: a 2d spectrum file, and a 1d spectrum file. See [Viewing Related MOS Data](#) for navigating here from the [Associated Data Products](#) page. When both files are supplied, the 2d spectral file is loaded into the 2d spectrum viewer, and the 1d spectral file is loaded into the 1d spectrum viewer. To load both files when navigating to the page by direct URL, add the **paired_uri** or **paired_file** query parameters to specify the additional file. For example, the URL syntax for navigating and loading two spectral filenames is [https://mast.stsci.edu/viz/jwst/spectra?filename=\[****_s2d.fits\]&paired_file=\[****_x1d.fits\]](https://mast.stsci.edu/viz/jwst/spectra?filename=[****_s2d.fits]&paired_file=[****_x1d.fits]).

When only a single 2d spectrum file is provided, Specviz2D will load the 2d spectrum file into the top 2d viewer, and perform a simple 1d spectral extraction from the 2d file to load into the bottom 1d spectrum profile viewer.



The primary configuration for 3d spectroscopic data sets, e.g. IFU spectral data cubes. For JWST these data have **s3d** product types. By default, Cubeviz consists of three image viewers, containing the flux, error, and data quality or mask, and a single 1d spectrum profile viewer, starting at the 0th spectral element (see **Figure 3**). See [Displaying Cubes](#) and [Display Spectra](#) on how to manipulate data in the cube and spectral viewers. See [Cubeviz Analysis Plugins](#) for the types of plugins for cube analysis.

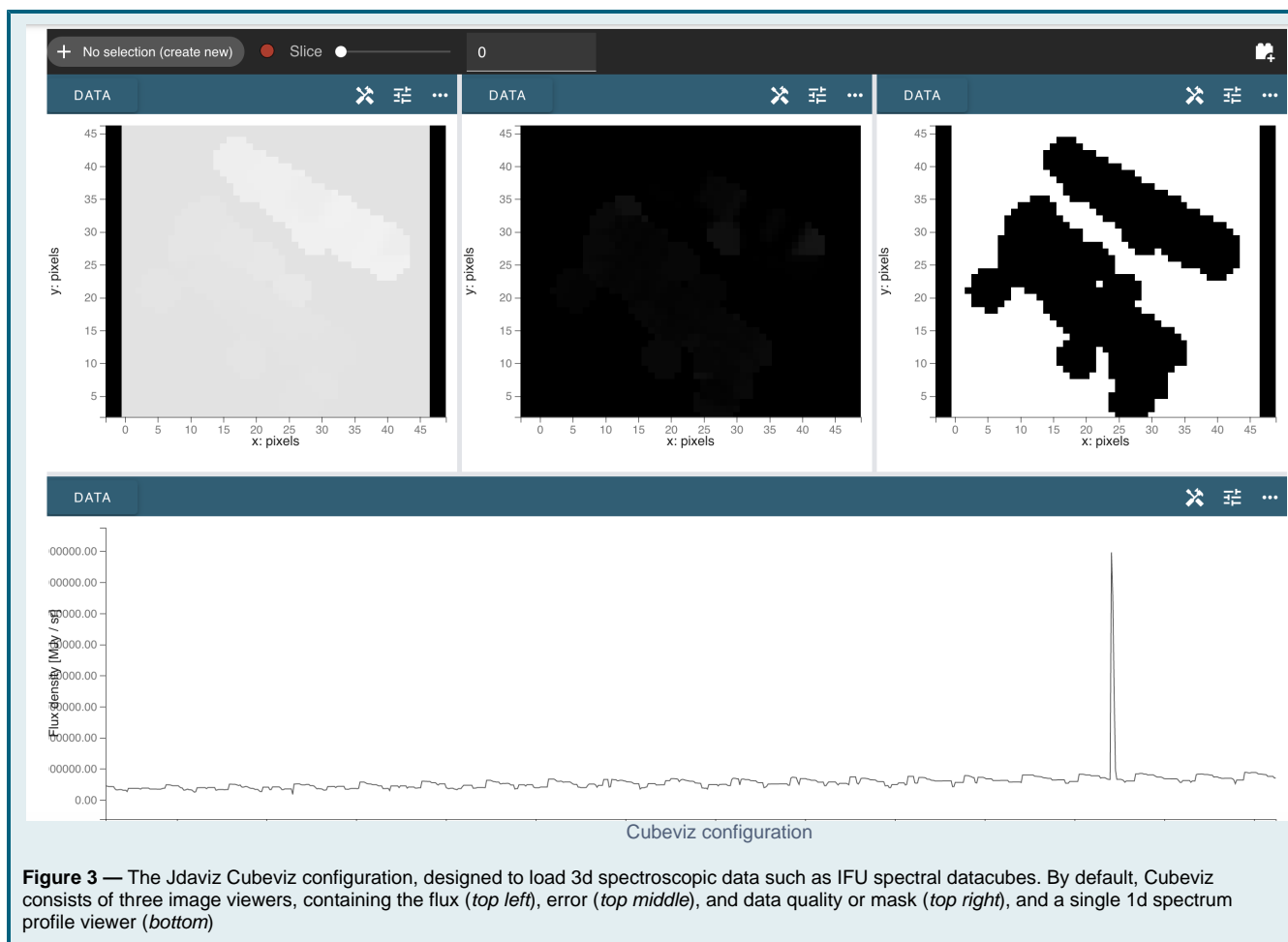


Figure 3 — The Jdaviz Cubeviz configuration, designed to load 3d spectroscopic data such as IFU spectral datacubes. By default, Cubeviz consists of three image viewers, containing the flux (*top left*), error (*top middle*), and data quality or mask (*top right*), and a single 1d spectrum profile viewer (*bottom*)



Imviz is a generalized image viewer for astronomical data (see Figure 4). It accepts the the **i2d** product type from the Portal. When using Imviz programmatically, you can input a **fits** file, an **NDData** object, or a 2D NumPy array.



Figure 4 — The Jdaviz Imviz configuration, designed to display images. By default the image takes up the entire viewer and is fully zoomed. It supports the ability to pan and zoom the image, display pixel and world coordinates, and perform simple aperture photometry on sources.

Coming soon to the MAST Portal

Not all Jdaviz features are available in the MAST Portal, as they are still being integrated by our software teams. For full functionality, you can always use [Jupyter Notebooks](#) or the [standalone application](#).



Mosviz

The Mosviz configuration is used for multi-object spectroscopy (MOS; see Figure 5). It is designed to work with the JWST NIRCam imager and the NIRSpec [microshutter assembly](#). As such, Mosviz has some features that are specific to NIRSpec and NIRCam data. However, it will work with data from any telescope or instrument. [Display Spectra](#) is a good guide on how to manipulate data in the spectral viewers. See [Mosviz Analysis Plugins](#) for the cube spectrum analysis plugins.

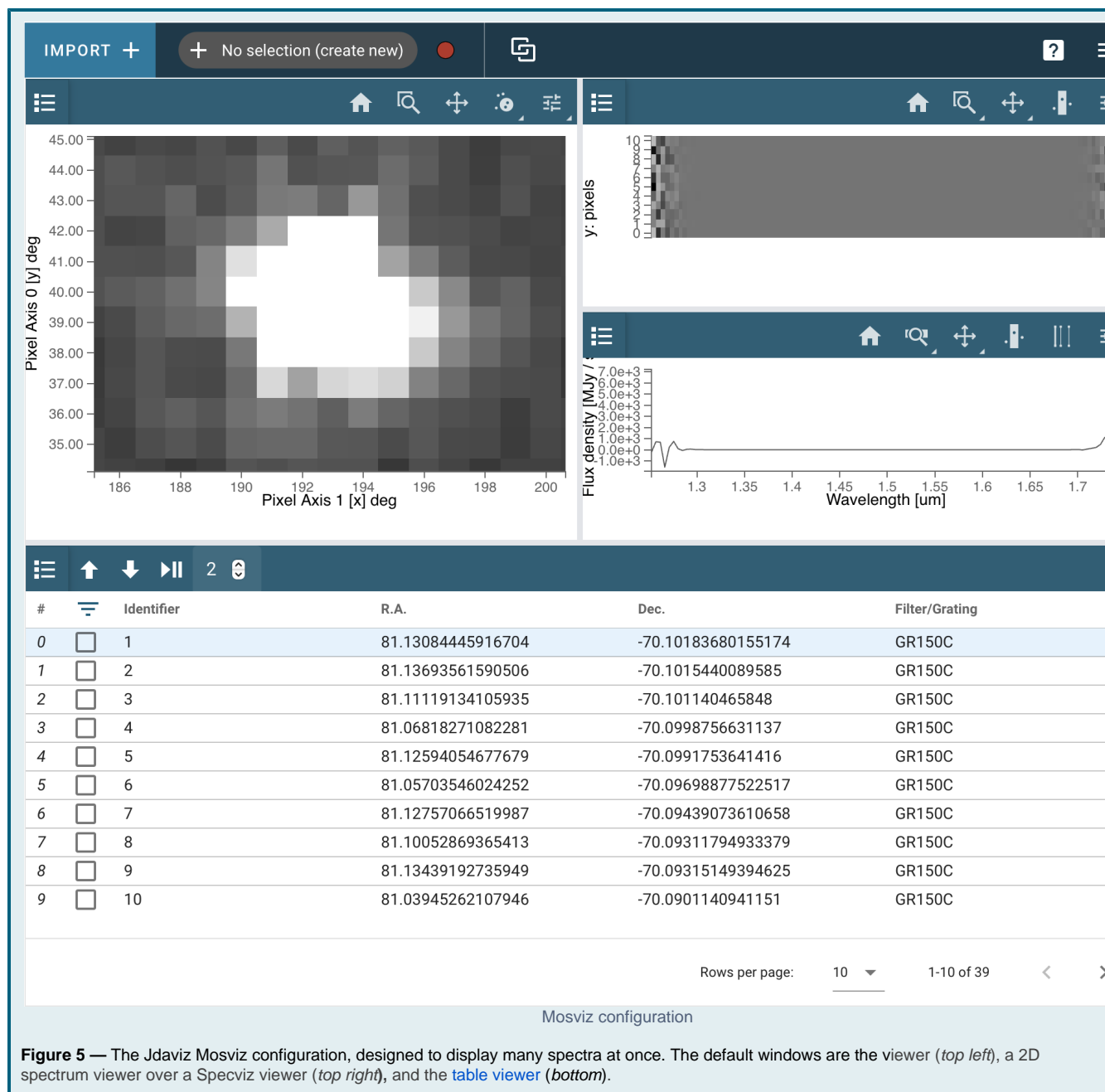


Figure 5 — The Jdaviz Mosviz configuration, designed to display many spectra at once. The default windows are the viewer (*top left*), a 2D spectrum viewer over a Specviz viewer (*top right*), and the [table viewer](#) (*bottom*).

For Further Reading...

- [Specviz readthedocs](#), for a more detailed interface overview.
- [Jdaviz Documentation](#)