

Astrogrism

Minimum Viable Product & Development Strategy discussion

11 June 2020

High-level goals

- *Easy-to-use, well maintained, and well documented* tools for doing multi-wavelength slitless spectroscopy
- Reduce long-term maintenance costs by coordinating community libraries with similar functionality
- Standardize the model objects used to describe and work with slitless spectroscopy grism data
- Standardize common, shareable files that relate setup information or transformations
- Provide interoperability with the Jupyter ecosystem

Maintainability perspective

- Be part of the Astropy ecosystem
 - Compatibility with specutils in particular
- Strong links to JWST code
 - Use gWCS and ASDF
 - Use JWST pipeline approach to grismconf, if not the code itself
- Don't duplicate functionality that is already in Astropy + JWST ecosystem
 - Direct image alignment (tweakWCS, reproject)
 - Drizzling (JWST pipeline version)
- Use CRDS

Phase 1 Must Haves

- Support for geometric transformations necessary for spectral extraction
- Basic I/O
 - including HST FITS, Astropy tables & spectrum1D objects
- 2D extraction of a cutout with a WCS
- Documentation & Tutorial(s)

Phase 2 Must Haves

- Identify associated direct & dispersed images
- Create input source catalog using pre-configured Photutils
- Flatfielding based on a single flat
- Background subtraction
 - Both local and with master-sky components
- Combined dithered dispersed images at the same orientation
- Basic 1D spectral extraction with no model assumptions
 - Identify contaminated regions
 - Counts -> flux conversion
 - Aperture corrections using point sources and/or direct images
- Interface to MOSViz
- Configuration files
- Documentation & tutorials

Questions

- Where do we stand on ability to use JWST machinery for geometric transformations?
- Are maintainers of existing packages willing/able to refactor to use this common library?
 - Can/should STScI developers help with this via PRs to relevant repos?
- Is Phase-1 MVP Must-have list sufficient for a release?
- Is Phase-2 MVP list sufficient to declare victory?
 - Or at least sufficient to get community excited enough to justify building out more functionality?