2020-06-17 TSO WG Meeting notes

Date

03 Jun 2020

Attendees

- Nestor Espinoza
- Brian Brooks
- Nikolay Nikolov
- David Sing
- Tony Keyes

Meeting agenda:

1. News & announcements.
2. NIRSpec CV3 data analysis overview (D. Sing).
3. TSO activities on each instrument branch (all).
4. Synphot/Pandeia engine refactoring.
5. Plan for build 7.5 pipeline testing throughout the summer.

Discussion items

Time	Item	Who	Notes
	1. News & announcements	Everyone	
	2. NIRSpec CV3 data analysis overview		
		David Sing	- Dataset is a 3-hour duration bright source at 40K with NIRSpec Prism. 12,000 integrations, 3 groups per integration (0.45s integration, 0.226 readtime). Ton of jitter and drift (on purpose, to simualte effect of bad pointing). This has been reduced and analyzed by Giardino et al. first. Objective is to put some "exoplanet eyes" into this data reduction, double check and perhaps improve it — goal is to (a) identify sources of systematic noise, (b) future steps for testing and (c) write a data analysis notebook (this latter as part of his work with the JDAT group). - David tried to reproduce the results of Giardino et al. first. First thing David did was to extract the spectrum right away, but 1/f noise was really bad. As in Giardino et al., he performed a column-by-column background substraction in order to correct for this. However, important to notice is that this was the 32 pixel subarray — he notes it would be hard to perform this same reduction with the 16 pixel subarray (only a couple of pixels left to extract the background which contains this 1/f component). - After extraction, clear lamp variations at 1%. Removed via common-mode correction (i..e, take the white-lightcurve variation, and remove that on the wavelength-dependant lightcurves). - This left data at 2x photon noise. Flat-field and X-Y-position decorrelation helped bring down the noise to 30 ppm to 30 pixel bin. Average is 25 ppm read noise, so this precision seems really good. - Left to do: not corrected bad pixels, currently injecting transits and trying to recover them. Also has to put this on a notebook, so people can have a look at how this data was analyzed. For this, he has to decide what transit/system to inject, also be happy with the final code which right now seems to be slow.
25min	**3. TSO activities on each instrument branch**		
5min	NIRISS activities/updates	Nestor Espinoza	Updates on extraction algorithm being implemented for NIRISS. Currently, pipeline extracts on all the columns — however, now a parametric 2D modelling extraction algorithm was presented to be implemented on the pipeline, that would take care of the contamination between the first and second orders. For details, see meeting notes here.

5min	NIRCam activities /updates	Brian Brooks Nikolay Nikolov	- Nikolay Nikolov has been working with Everett Schlawin on how to get down to 300 ppm lightcurve precision. Managed to do it with spectral extraction that handles column-by-column background subtraction with aperture size and background specific to the MIRAGE simulated data. CALWEB has the potential to do column-by-column background subtraction, but needs to be enabled using parameter reference files. Feedback has been provided to enable this to the development team. - Following discussions with Bryan Hilbert it has been realized that the MIRAGE simulations that Nikolay Nikolov analyzed, are based on only a handful of darks. Given these are the ones that provide the 1/f component of the noise, the actual 1/f noise might be larger than what has been seen in the analysis results. - He also provided feedback to Bryan Hilbert and the development team not to include aperture corrections in the default behavior of the pipeline with respect to analysis of TSGRISM and imaging TSO data.
5min	NIRSpec activities /updates	Tony Keyes	James Muzerolle has been working with D. Sing to get him the CV3 data, and trying to pass that data through the JWST pipeline. Currently this latter step is stopped because of the image rectification step (see this ticket). Tony Keyes also continued familiarization with outstanding NIRSpec JIRA TSO-related tickets and updated the summary document that describes those issues and their status.
5min	MIRI activities/updates	Sarah Kendrew	Sarah mentioned internally that she will check on some of the codes that have been used to perform MIRI/LRS slit extraction
	4. Synphot/Pandeia engine refactoring.		
		Brian Brooks	- The ETC WG & developers, need to release on August because packages have to be updated. One of those (pySynphot) handles the background + spectra, which changes some results by ~0.5%. Nestor Espinoza belives this shouldn't be a big deal, but we need to check that this would be OK for TSO observation simulations. ☐ Brian Brookswill coordinate with Nestor Espinoza to check how these changes will impact TSO calculations.
	5. Plan for build 7.5 pipeline testing throughout the summer.		
			- In the next meeting, we will discuss a strategy to define next steps for Pipeline testing. We will have 3-4 meetings after that to discuss how pipeline testing is going. In the meantime, familiarize yourselves with the TSO testing assignements published in the TSO DMSWG Dashboard here. - Nikolay Nikolov notes that testing might be hampered by previous steps not doing what they are supposed to. Nestor Espinoza proposes we discuss that in detail in the next meeting. Proposed ways forward involve, e.g., simulating an image "from scratch" to test different pipeline steps.
	Closing remarks of the meeting		