2020-08-12 TSO WG Meeting notes

Date

12 Aug 2020

Attendees

- Nestor Espinoza
- Brian Brooks
- Nikolay Nikolov
- Unknown User (birkmann)
- Tony Keyes
- David Sing

Meeting agenda:

1. News & announcements.
2. Updates on TSO WG pipeline testing.
3. Status on TSO memos.
4. TSO activities on each instrument branch.
5. Discussion/prioritization of TSO Jira tickets.
6. Closing remarks.

Discussion items

Time	Item	Who	Notes
	1. News & announcements	Everyone	
15min	**2. Updates on TSO WG pipeline testing**		
		Everyone	• Nestor Espinoza reminds everyone to fill the TSO PIpeline Testing Tracking Sheet. • Nikolay Nikolov starts describing his pipeline testing efforts so far. All done with Detector 1, already submitted and/or participated in the creation of some tickets for Spec2 and TSO3 (see, e.g., JP-1478 - Jira project doesn't exist or you don't have permission to view it. , JP-1469 - Jira project doesn't exist or you don't have permission to view it.). The pipeline runs OK from Detector1 up to TSO3; still some work left to do. • Tony Keyes reports that he hasn't had time yet to report back to the TSO WG on the internal NIRSpec efforts on TSO testing. Will check with the team and report back. • Nestor Espinoza is almost done with all steps up to TSO3. Currently working on the outlier_detection step, where he is seeing some weird results — currently trying to understand what the algorithm is actually doing. For "live" updates, see this notebook he's working on. He also mentioned that the Jump step was rather aggressive in flagging pixels (around 20% per group by default); Nikolay Nikolov mentions in NIRCam they see the same. He suggests to give a very large threshold in order to avoid these detections for now, but that this should be looked into from a perspective of the reference files. Nestor Espinoza points out that Kevin Volk made a very good argument about leaving that sort of modifications for when we have on-sky data, as the simulations are not as good as those for checking this.
15min	**3. Status of TSO memos**		

	JWST TSO simulated data analysis and noise limitations	David Sing	▪ Nestor Espinoza mentions that work by D. Sing is coming to an end at the end of this month, and that there are some deliverables to turn-in. In particular, one of the deliverables is a memo (due August 28) on data analysis and recommendations for TSOs. He explains that this would be extremely useful for work to be done by the TSO WG in FY2021, and this report will be very timely as those plans start to be defined on September. ▪ David Sing gave a brief presentation on his analysis of the CV3 NIRSpec "TSO-like" dataset. The first recommendation he makes is to look into detail on the impact of 1/f noise on the data to be obtained by JWST for TSOs in all instruments. Nikolay Nikolov notes that this recommendation might be very good to push towards the possibility of allowing a slow readout mode for NIRCam, in which spectra would be read perpendicular to the direction of the 1/f pattern (so it can be removed from column-to-column variations). David Sing also notes it might be difficult to remove the pattern if subarrays are too small — might be good to do a further analysis on the minimum number of "uniluminated pixels" needed to efficiently remove the 1/f noise component to understand this in more detail. The second recommendation he makes is related to inter and intra-pixel variations. Flat-fields, for instance, can have an important impact on digging deeper into the photon-noise level. For this, of course, one needs several flat-field frames in order to put them way below the photon-noise limitations of individual science frames (tens to hundreds of flat-field frames). Although he does not know how this could be done in practice, he mentions that this might be worth looking into. In addition, it is evident even when doing flat-fields that there are inter and intra-pixel variations imprinted on the flux time-series. As such, it is important to have readily available positional information on the target (e.g., via guide stars, "jitter files", etc.). The position of the trace as a function of time has an almost linear dependence with the flux, so an order-of-magnitude precision increase in pointing gives rise to an order of magnitude improvement on flux variations, at least for NIRSpec. Finally, he recommends helping users with the data volumes that JWST data reduction involves. It took a lot of time to go through all the images for the NIRSpec dataset, and this is going to be a problem for folks with no access to powerful stations/computers. ▪ Nestor Espinoza and David Sing briefly discussed the length and format of the memo. Nestor Espinoza mentions that for the length he considers the total amount of time he was assigned to this task, and based on that creates a short memo (1-3 pages) with some figures to illustrate his points.
	JWST time stamps	David Sing Nikolay Nikolov	▪ Nestor Espinoza also mentions that another of the deliverables are recommendations on the JWST time-stamps, also to be handed out by a memo due August 28. David Sing mentions that they will meet with Nikolay Nikolov to discuss how to move forward with this. Nikolay Nikolov already wrote code for performing experiments on time-stamp needs for time of transit centers that he'll be sharing with David Sing so he can perform a write-up on this. ▪ Nestor Espinoza also mentions it might perhaps be important to dicuss how on integrations with a large number of groups accuracy might be lost due to finite sample times over an integration. Currently, the JWST pipeline reports rates, but the time-stamps associated to those rates are not instantaneous but a combination of several time-stamps that might degrade the lightcurve shape. He thinks it might be worth looking into this, and checking if, e.g., a development of an alternative pipeline via differe imaging (i.e., similar to that used in HST) could be implemented. Nikolay Nikolov has doubts in how hard this would be to implement, as it would involve a restructuring of the current pipeline. Nestor Espinoza mentions that it wouldn't be a big change — only on the initial stages. He and Nikolay Nikolov agree that perhaps it would involve changes on Detector 1, but Spec2 and TSO3 could be kept as they are right now or with only slight modifications. Whatever the case (either this is important for this memo or for a future one), he leaves the decision on David Sing and Nikolay Nikolov's hands. If a future memo is decided, this can be left as possible FY2021 work.
20min	**4. TSO activities on each instrument branch**		
7min	NIRISS activities/updates	Nestor Espinoza	▪ Not many activities outside TSO pipeline testing from Nestor Espinoza's side, at least from a NIRISS-only perspective.
7min	NIRCam activities /updates	Brian Brooks Nikolay Nikolov	▪ Mainly pipeline testing as well on Nikolay Nikolov's side. Brian Brooks mentions there is going to be a rehearsal in terms of simulating telescope operation for grism time-series — starts on 17th August, ends on the 21st.
7min	NIRSpec activities /updates	Tony Keyes	▪ Not many TSO-related tasks from NIRSpec; he'll be reporting on pipeline testing however.
5min	**4. Discussion/prioritization of TSO Jira tickets**		

			• You can check TSO-related tickets in the TSO DMSWG Dashboard. • JP-1478 - Jira project doesn't exist or you don't have permission to view it. : some response, no one assigned to this yet. Nestor Espinozasuggests Nikolay Nikolov sends e-mail to Howard to see the status of this. Most likely won't be bumped in priority until JWST pipeline testing is done (i.e., end of the month, early September).
5min	**5. Closing remarks of the meeting**		