2021-02-24 TSO WG Meeting notes

Date

24 Feb 2021

Attendees

- Sarah Kendrew
- Nestor Espinoza
- Stephan Birkmann
- Diane Karakla
- Everett Schlawin
- Arpita Roy
- Brian Brooks
- Knicole Colon
- Loic Albert
- Nikolay Nikolov
- Leonardo Ubeda

Meeting agenda:

1. News & announcements.
2. 1/f noise work updates (all).
3. Outlier detection algorithm updates (Nikolay, Sarah).
4. Discussion on Jira tickets (all)
5. Closing remarks

Discussion items

Time	Item	Who	Notes
5min	**1. News & announcements**		
		Sarah Kendrew	- Mentions a paper published in 2019 by Matsuo et al.; this has some TSO-like tests, and quote some photometric precisions in there which people are quoting for JWST-level TSO-like MIRI precisions. She makes the point that we have to be careful assuming that would be the MIRI precision — the actual detector might be more complex to deal with; we will have to wait until Cycle 1 in order to learn how to best calibrate our data. Bottom line: don't fall into the temptation of using that number to define MIRI-like precisions.
		Nestor Espinoza	- Mentions that the ERS Transiting Exoplanet team is trying to get simulated data; the person leading this is Kevin Stevenson at JHU in case you want to join the effort. Sarah Kendrew is leading the MIRI effort on simulating data; glad to have folks join this effort as well. Nestor Espinoza leading the SOSS part.
15min	**2. 1/f noise work updates**		

		All	

- Nestor Espinoza shows some of his experiments on the NIRCam notebook. Tried simulating different subarrays on the data, removing 1/f pattern via row-by-row — there is some left-over structure in these simulations. Stephan Birkmann shows concerns on the experiment done simulating subarrays with the full-frame, as this does not take into account the "wait times" between rows. Nestor Espinoza agrees this is not the exact same but suggests that given the wait time is just cutting the time-series for a given period of time (i.e., each row is a "chunk" of the time-series), this should not impact the overall structure that much.

- Diane Karakla mentions the Power Spectral Density (PSD) decays after row-by-row time-scales (frequencies smaller than that get removed). Nestor Espinoza mentions that this is indeed the case: you are removing frequencies smaller than that (i.e., time-scales larger than the row-by-row lengthscale). Diane Karakla suggests that this should be better for smaller subarrays; Nestor Espinoza agrees, but this is what we need to test (i.e., how good the correction is for the smallest subarrays).
- Tony Keyes asks how to handle different dark integrations. Basically, they have several integrations of lower-number-of-groups darks. Can they just combine them to emulate a larger-number-of-groups? Nestor Espinoza suggests the best strategy could be to assume each integration is a sample from the underlying process/PSD, and thus calculate the PSD of each integration and then average out the PSDs. Everett Schlawin has done some similar experiments in which he sees that the precisions falls with the square-root-of-N between integrations on NIRCam, but this would be good to test in NIRSpec.
- Diane Karakla also asks if the time between rows is the same between instruments. Nestor Espinoza mentions that this is the case at least for NIRISS — Stephan Birkmann says it's also for NIRSpec.

- Tony Keyes asks how to handle the case of SUB512S, which has only 16 pixels — basically not "non-illuminated" pixels. Stephan Birkmann mentions that not instruments in general don't have truly "non-illuminated" pixels (e.g., NIRISS is slitless, so light gets everywhere). Nestor Espinoza asks if there are darks with that subarray — Tony Keyes and Diane Karakla mention there are not. Nestor Espinoza then suggests that perhaps the SUB512 darks could be used to simulate that subarray and see how corrections might work on this. However, this is a more involved issue (Stephan Birkmann is not convinced you can simulate SUB512S darks with SUB512); they will take it offline to a separate meeting.
- Nikolay Nikolov makes a note that doing row-by-row on GRISMR with different methods (mean, median, line-fit) impacts "negatively" on the correction. This is basically because GRISMR goes in the direction of the 1/f pattern. This might be different in GRISMC.

15min	**3. Outlier detection algorithm updates**		

- Nikolay Nikolov starts summarizing updates on this algorithm (see also previous TSO WG meeting notes). The code he has (which has been tried on HST data) both *detects* and *corrects* outliers — while what we are trying to do is just *detect* the outliers on the TSO3 outlier detection algorithm.

- Right now for NIRCam time-series observations, it seems to not be working as well as expected. Could be that he is using the *rateint* products — and since the pipeline is not correcting the reference pixels correctly in this mode (see this ticket), this might be the issue. He has right now, however, just compared pre-correction and post-corrected images, and these look not very good — it seems the algorithm injects structure. However, it might very well be that the detected pixels (which is what we are looking for) are correctly flagged, but this has to be checked. Will be updating on the next meetings.

- Nestor Espinoza comments that the CalWebb WG would want a presentation on our testing efforts by their April meeting. Suggest Nikolay Nikolov could go to give this update given he has been working on this; Nikolay Nikolov agrees; April sounds like a good time-scale.
- Sarah Kendrew also has been working on this on some MIRI calibration data; she might want to also show her work on this; she'll figure if there is time to report on this for the next TSO WG meetings.

15min	**4. Discussion on Jira tickets**		

		• Discussion on ⚠ **JSOCINT-488** - Jira project doesn't exist or you don't have permission to view it. and ⚠ **JDOXCM-220** - Jira project doesn't exist or you don't have permission to view it.	▪ [Sarah Kendrew](#) summarizes the ticket information; currently taking care of it on a case-by-case basis. ▪ [Nikolay Nikolov](#) asks if there is a better way to handle this so the target stays in place, without doing TA. [Stephan Birkmann](#) and [Diane Karakla](#) mention this ticket: ⚠ [APT-91348](#) - Jira project doesn't exist or you don't have permission to view it. . This might be a good solution in general, which would keep targets steady on the same place.
5min	**5. Closing remarks**		