Keyes NIRSpec 8 April 2020 TSOWG Comments and BOTS Status Description

TK verbal comments summary:

The current status is that we are only doing one visit of observations with BOTS in Commissioning (on a flux standard star) and there is little that is special for BOTS in the pipeline processing.  There are no special calibration activities planned for BOTS mode.

I have previously informed the TSOWG of our plans to evaluate centroiding and TA with saturated images and/or with NGROUPS reduced to 2 or 1. Commencement of this investigation is planned for later this spring (right after we finish debugging an MSATA reporting issue).

TK update on JDox BOTS gain question (entered in notes section for this task item in the FY2020 summary table on the TSOWG page):

Undecided at present (7Apr2020) whether current JDox text should be updated further.  The actual origin of this task is unclear.  In a footnote to the brightness limit table, the Dec 2019 BOTS JDox update references the gain=2 setting as appropriate to NIRSpec subarray modes, which are all that are available with BOTS.  However, there is no explicit statement (rather, it is only implied) in the JDox article that only one gain is available for BOTS.  After consultation with NIRSpec Operations Lead T. Beck, we agree that we should seek review/approval of current JDox gain text by S. Birkmann

NIRSpec BOTS Commissioning Activity, Pipeline Processing, and Calibration Status Summary:

The following material was prepared as closure of actions from 18 March 2020 TSOWG meeting, but was not verbally presented at the 8 April meeting.

BOTS in NIRSpec Commissioning (with input from T. Boeker, C. Proffitt, and T. Rawle)

The first test visit of the Wide Aperture Target Acquisition (WATA) verification activity will use the BOTS template to acquire the A star flux standard 2MASS J17430448+6655015 directly with the F140X filter and the SUB32 subarray, and will be followed by a default reference confirmation image. This is the simplest possible WATA acquisition scenario, as it requires neither an aperture nor a target switch. The target will be centered in the S1600A1 (square) aperture and a time-series PRISM spectrum of at least one hour duration will be obtained using the S512 subarray. This will confirm the performance of TS observations of NIRSpec, which is not otherwise tested during Commissioning. Since we are using a flux calibration standard, it will also provide an initial look at the overall throughput and stability of NIRSpec and BOTS spectroscopy. >> This is the ONLY BOTS mode usage in the NIRSpec Commissioning plan.

BOTS Pipeline processing (with input from J. Muzerolle):

The pipeline processing flow is somewhat different for BOTS.  Several steps are skipped (e.g., background subtraction, pathloss correction), and no data are combined at level 3 (the output products consist of 1D spectra for each integration).  Otherwise, the calibration is similar to that of the Fixed Slit (FS) mode. More details can be found on the Calibration WG pages - <https://outerspace.stsci.edu/pages/viewpage.action?spaceKey=JWSTCC&title=JWST+Calibration+Working+Group>, and links therein.

BOTS-specific calibration (with input from J. Muzerolle):

There are no BOTS mode or BOTS-specific calibration observations planned for Commissioning, other than as part of the general FS checkouts and basic calibrations; there is nothing particularly unique to BOTS calibration-wise.  For the same reason, there are no cycle 1 calibration programs dedicated to BOTS.

We will be getting higher S/N flat field data for some of the subarrays used for BOTS in cycle 1 calibration, with the main driver being to minimize the flat noise contribution for transiting exoplanet observations (the flat field calibrations to be obtained in Commissioning will provide a bare minimum).  See <https://outerspace.stsci.edu/display/JWSTCC/CAL-NRS-003> for details.  **We have been intending to get TSOWG input on this**, so it might be good to consider this as a TSOWG agenda item in the near-future.