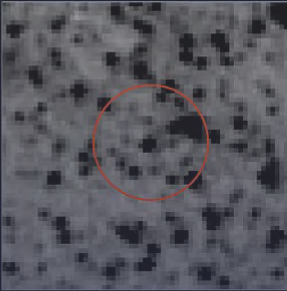


Cepheid

JWST NIRCAM



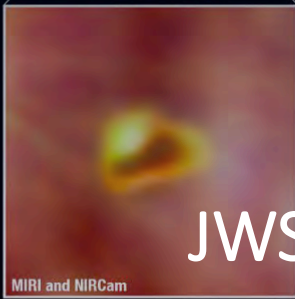
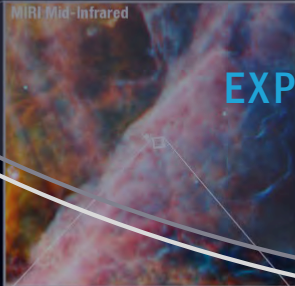
Depth



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

MIRI Mid-Infrared



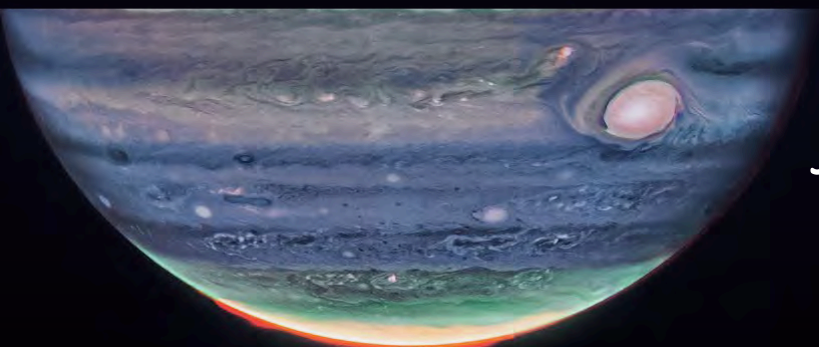
MIRI and NIRCAM

JWST Cycle 3 Call User Survey Results

Macarena Garcia Marin
JSTUC Meeting, March 18th-19th 2024



NIRCAM Near-Infrared





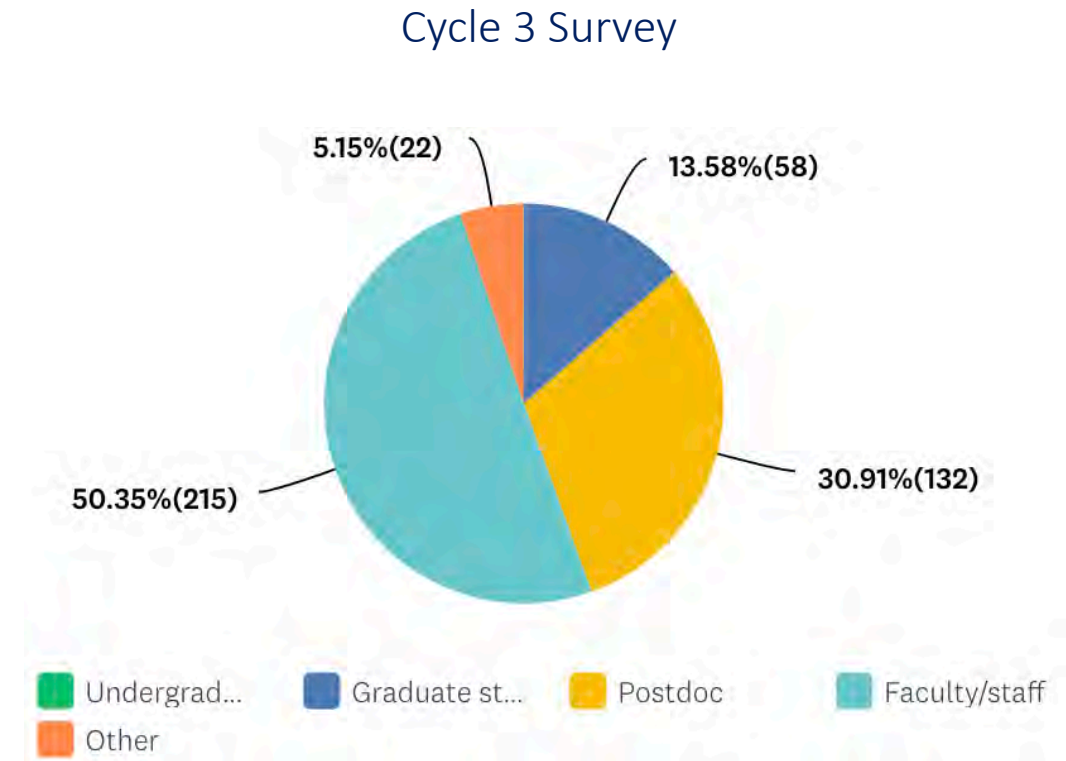
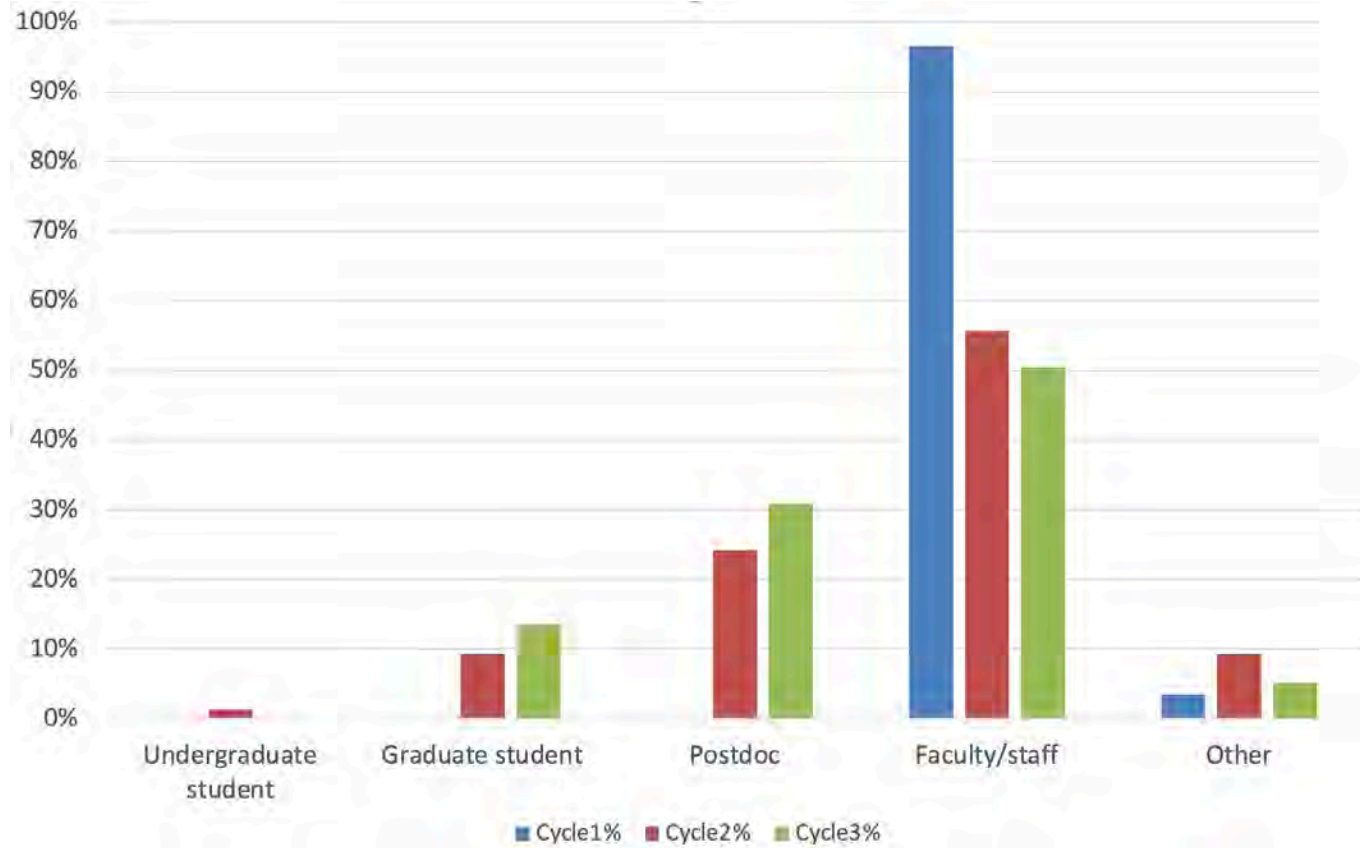
User Survey Overview

- 30 questions implemented in Survey Monkey
 - First survey where we request specific pipeline feedback, broken down by observing modes
 - Plenty opportunities to leave written answers
- Survey run time: October 29 through December 4 2024
- Advertised on JWST Observer news, social media, email list
- 428 total responses (increase of 11% vs. Cycle 1 and decrease of 8% vs. Cycle 2)
- Average questions completion rate: 76%
- Average completion time: 16 min
- 80% responded to an email; 20% responded via Observer News item or social media (Twitter/FaceBook)



Basic Demographics I (*): Career Stage

- As in previous surveys, there is a bias towards participation of senior staff
- Cycle 3 survey sees increases in both postdocs and graduate students participation, and a decrease on undergraduate students participation

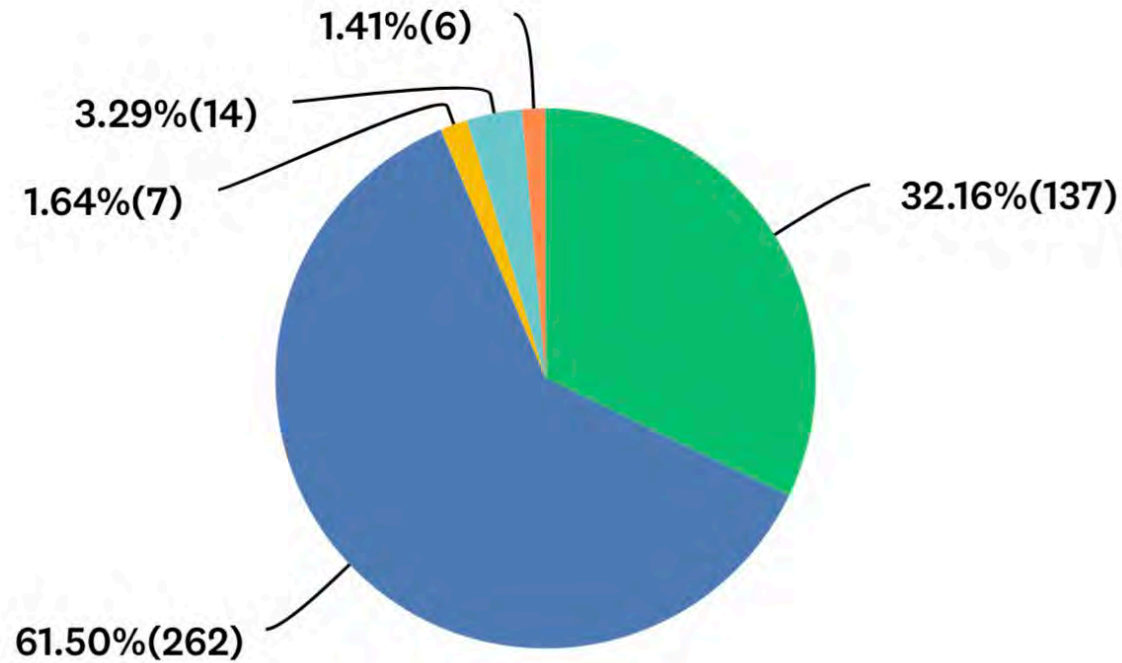


(*) SMO conducting a specific demographic survey



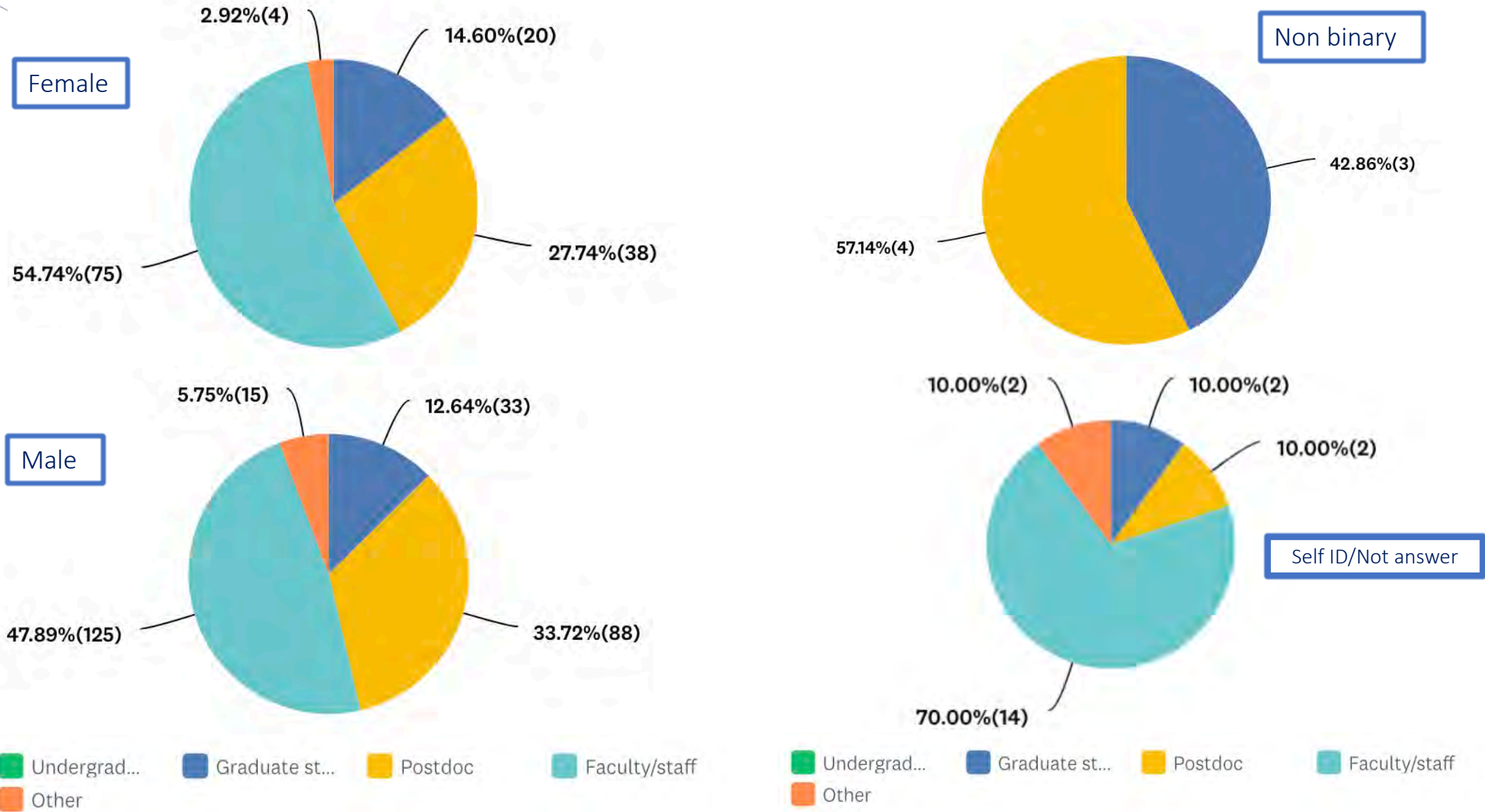
Basic Demographics I: Gender

- There is a bias towards participation of males, with increases seen on the Cycle 3 survey
- About 5% of respondents prefer not to answer or self-identify (*)





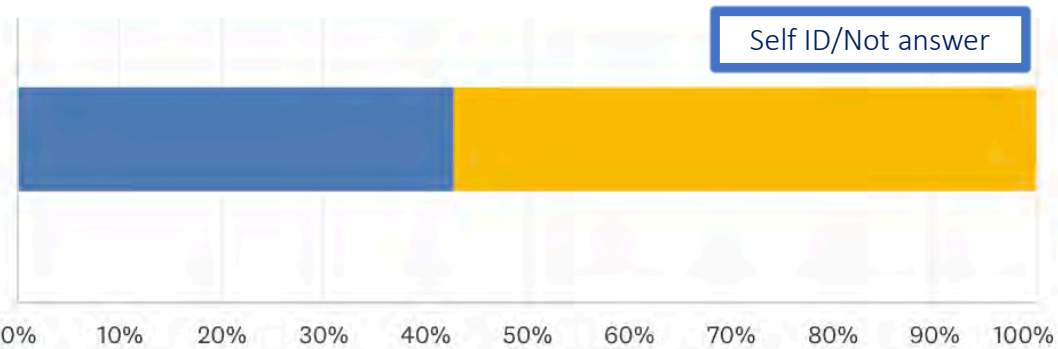
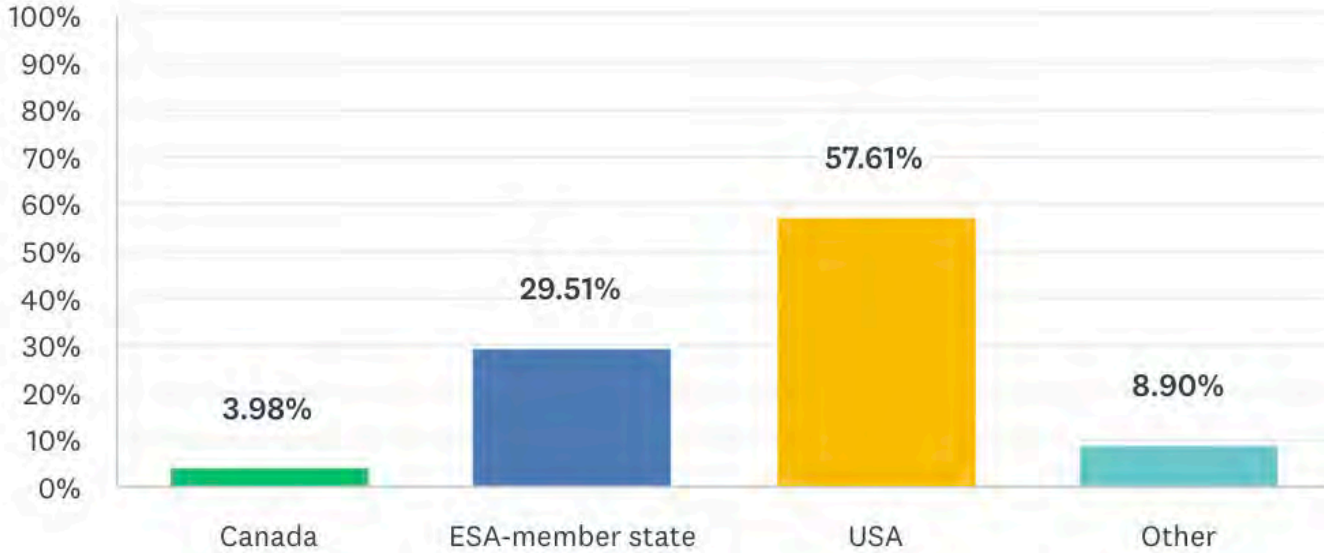
Basic Demographics I: Seniority vs. Gender





Basic Demographics II

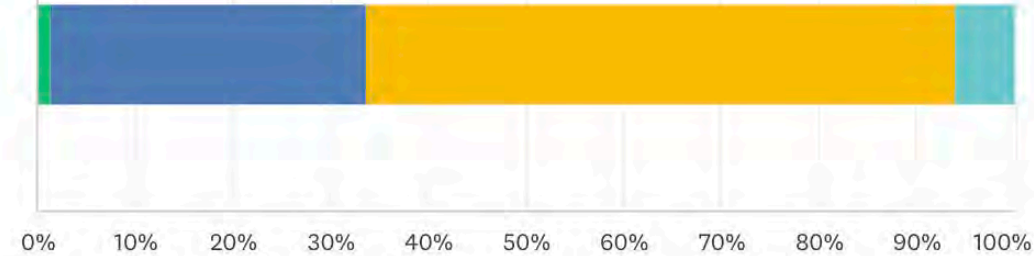
Affiliation distribution trends as in previous surveys



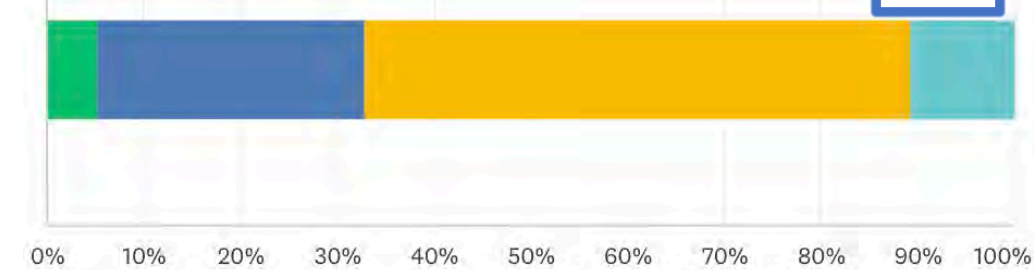
Canada ESA-memb... USA Other

Current Affiliation by Gender

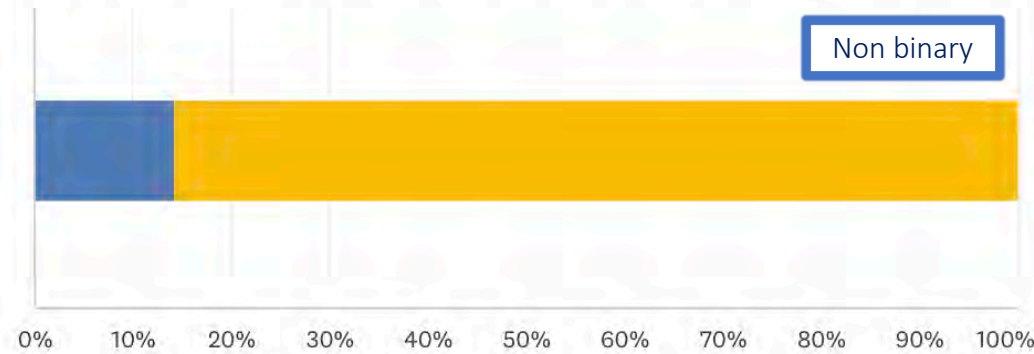
Female



Male



Non binary



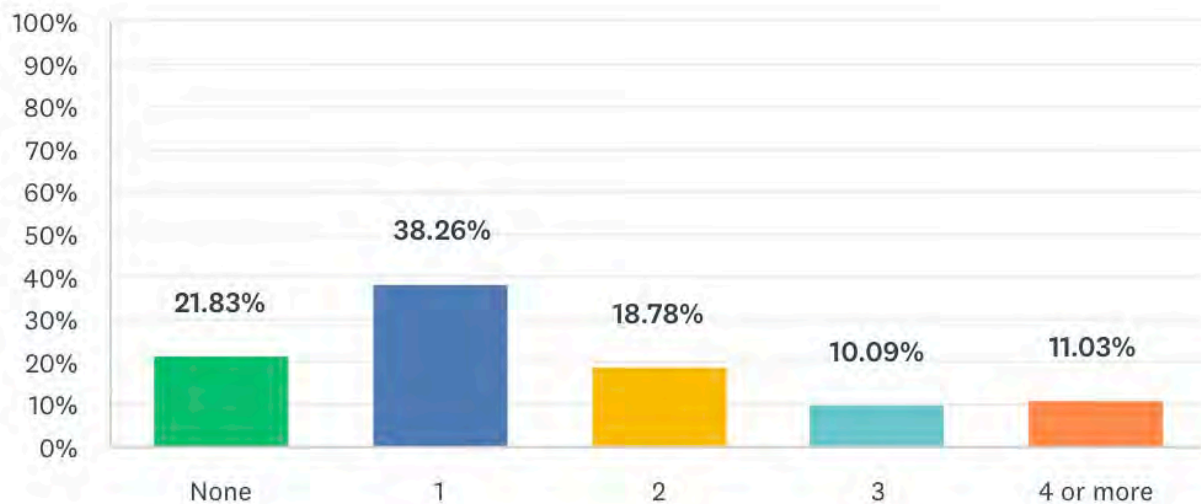
Canada ESA-memb... USA Other



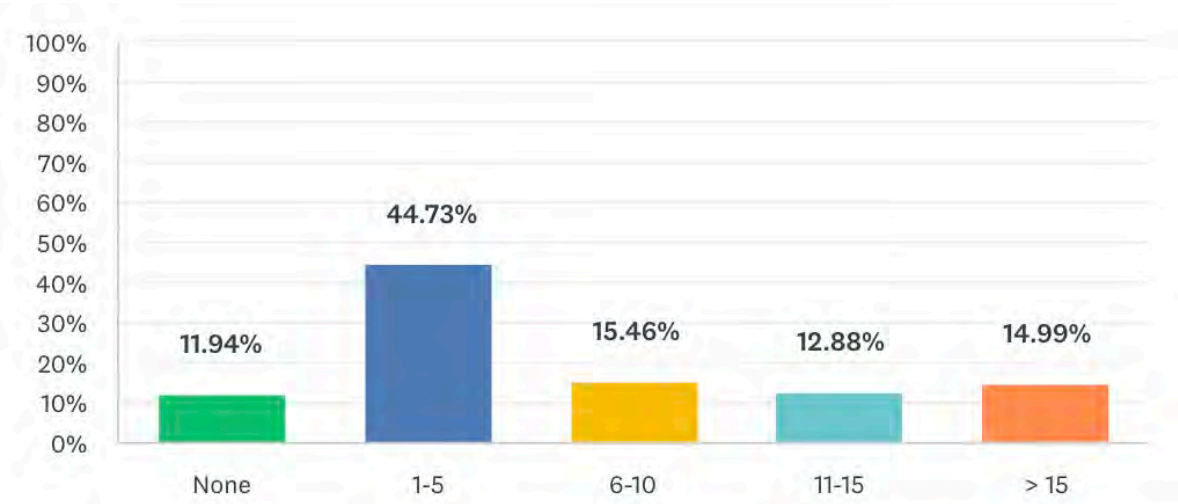
Basic Demographics III

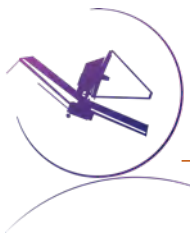
- Most responders submitted 1 proposal as PI or co-PI, and 5 or less proposals as co-I. There are significant tail on both sides of the distributions.
- Reasons not to submit proposals
 - 13% proposal submission process was too complicated (vs. 22% in Cycle 2)
 - 35% concerns about oversubscription (vs. 19% in Cycle 2)
 - 11% JWST not relevant for their science (vs. 13% in Cycle 2)
 - 13% investigator team did not have enough time (vs. 33% in Cycle 2)

Number of proposals submitted as PI or co-PI

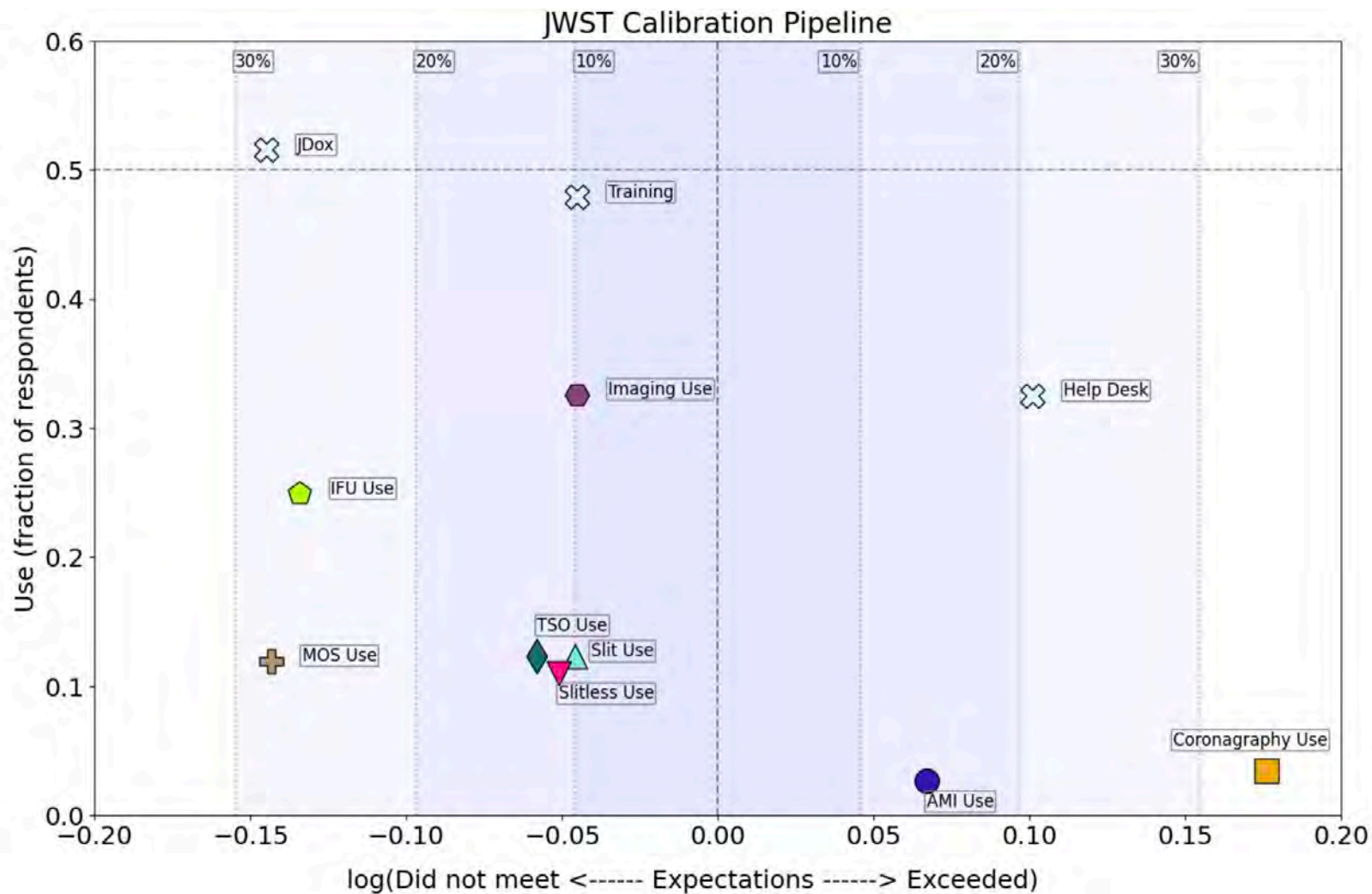


Number of proposals submitted as co-I





Usage vs. Rating diagrams: Pipeline resources and ease of use

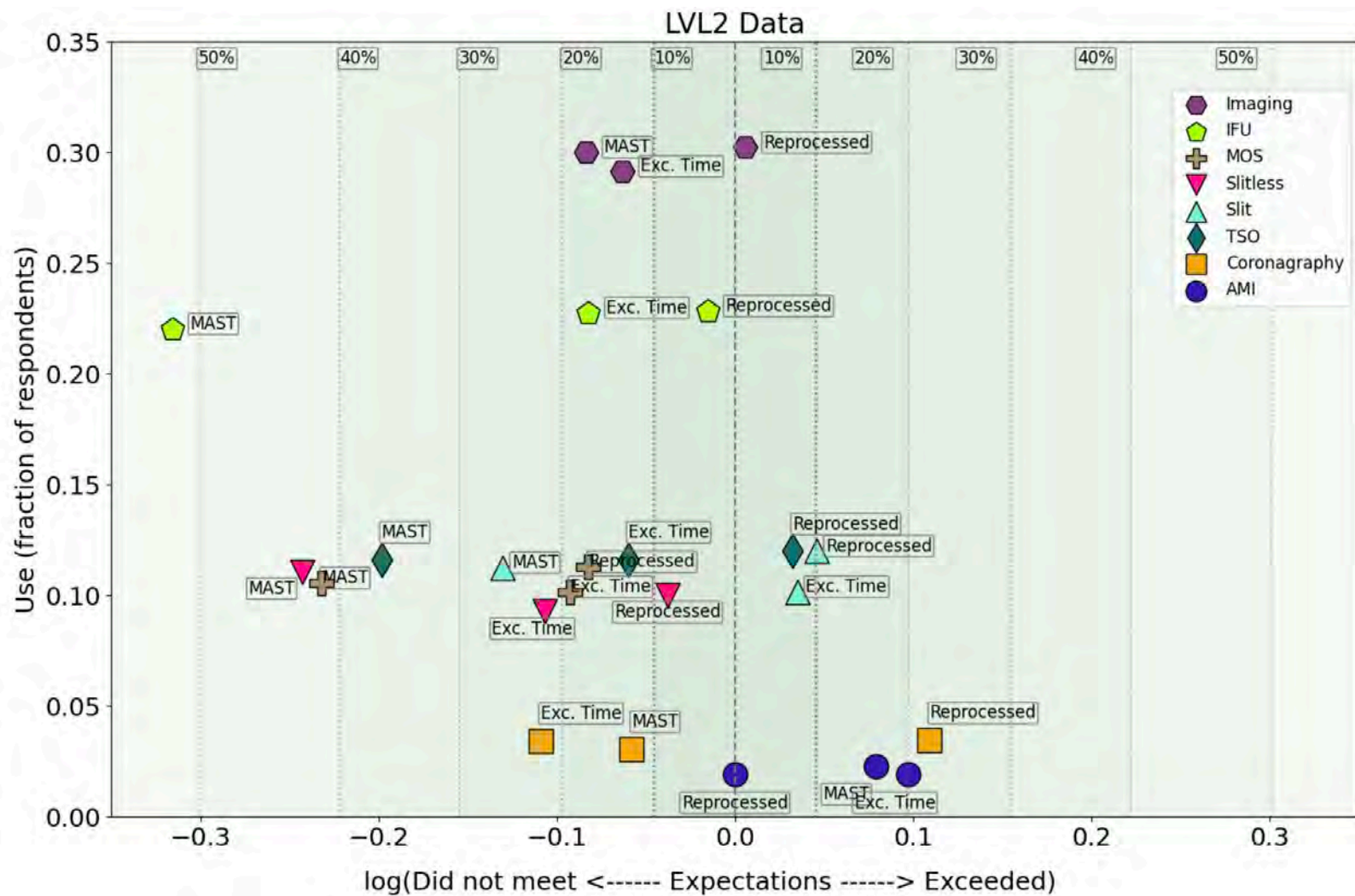


Usage vs. rating diagram

- High marks received by:
 - Helpdesk
 - Coronagraphy and AMI use
- Areas in need of attention
 - JDox
 - MOS and IFU



Usage vs. Rating diagrams: LVL2 data



For different observing modes we asked users to rate:

Quality of LVL2 data from MAST

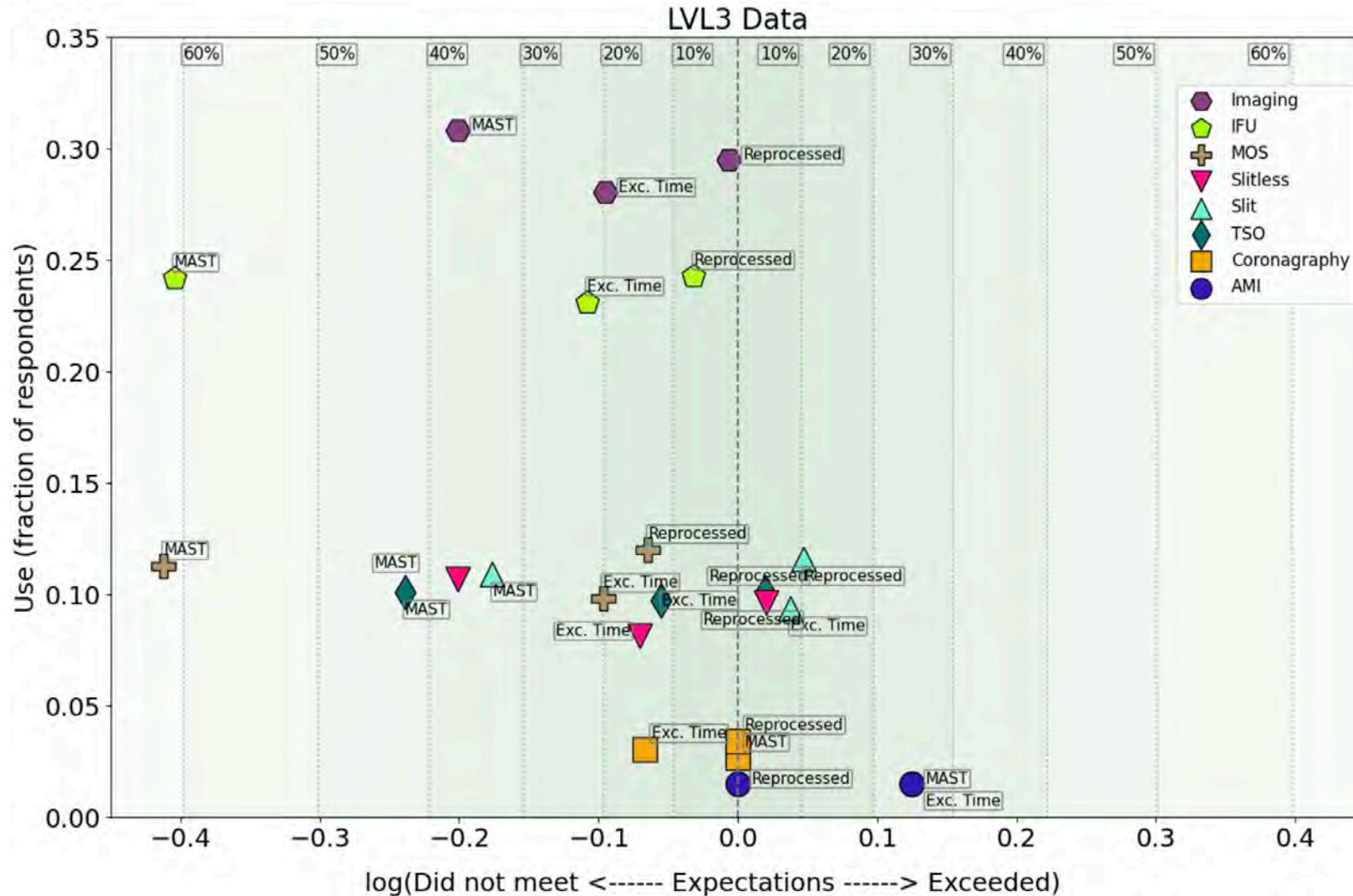
Quality of LVL2 data after reprocessing

Execution time satisfaction

- For all modes, reprocessed data gets close to meet or exceed expectations.
- MAST products are often found not to meet expectations. Depending on the observing mode this may be related with MAST reprocessing speed, but also with some algorithms improvements that are not available yet or are switched off by default.
- We are also looking at the issue of long reprocessing times for certain modes.



Usage vs. Rating diagrams: LVL3 data



For different observing modes we asked users to rate:

Quality of LVL3 data from MAST
Quality of LVL3 data after reprocessing
Execution time satisfaction

- Trends consistent with LVL2 data.
- Slightly higher level of dissatisfaction with MAST data.



Pipeline-related written feedback (as seen on D. Law's presentation)

The user survey identified top five areas identified:

- 1) Bad pixels/cosmic rays/outlier detection
- 2) Correction for 1/f noise
- 3) Runtime (detector1 pipeline stage in particular)
- 4) Need for better JDOX documentation of the pipeline data, known issues, and options for reprocessing for each instrument mode.
- 5) WCS alignment

Additional areas: Background subtraction, flux calibration, shower/snowball correction, RAM usage, ERR estimates, NIRSpec calibration, undersampling, reproducing MAST results, automatic vs offline corrections, etc.



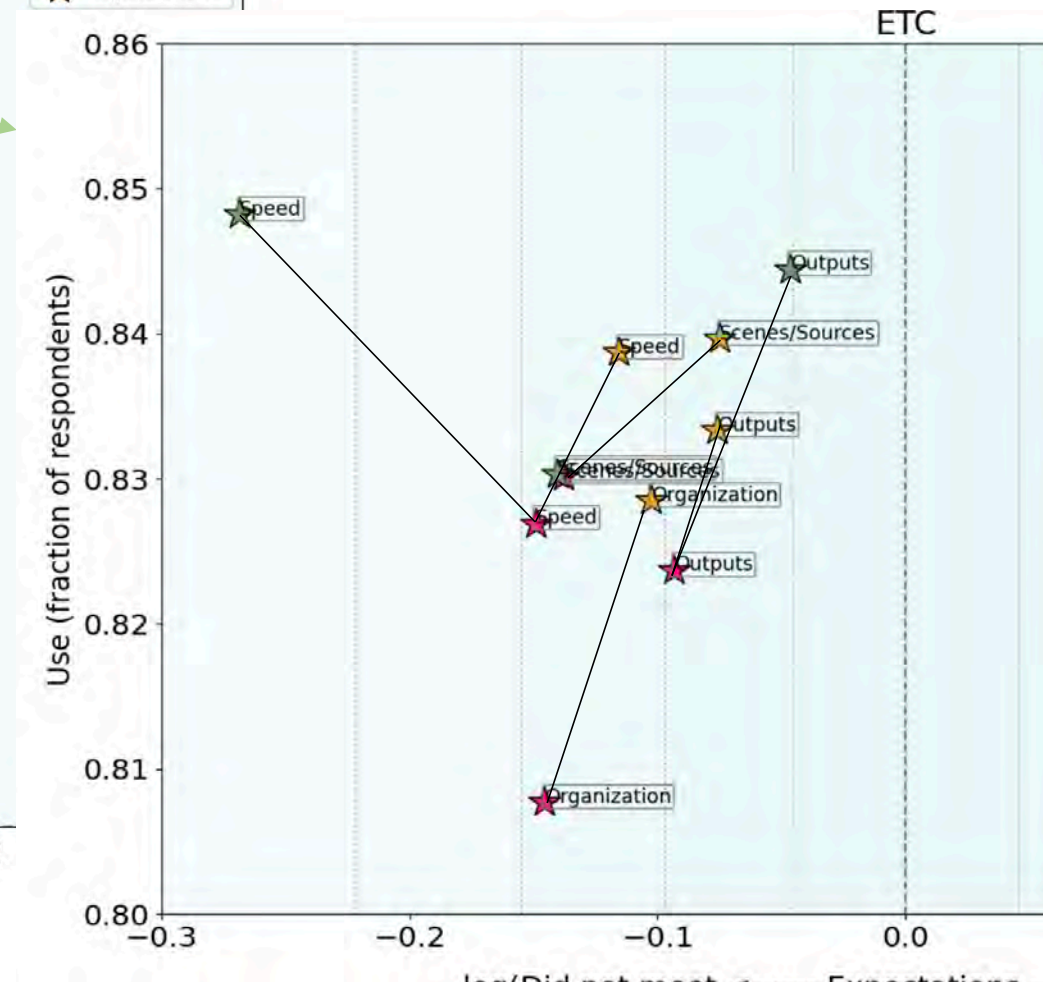
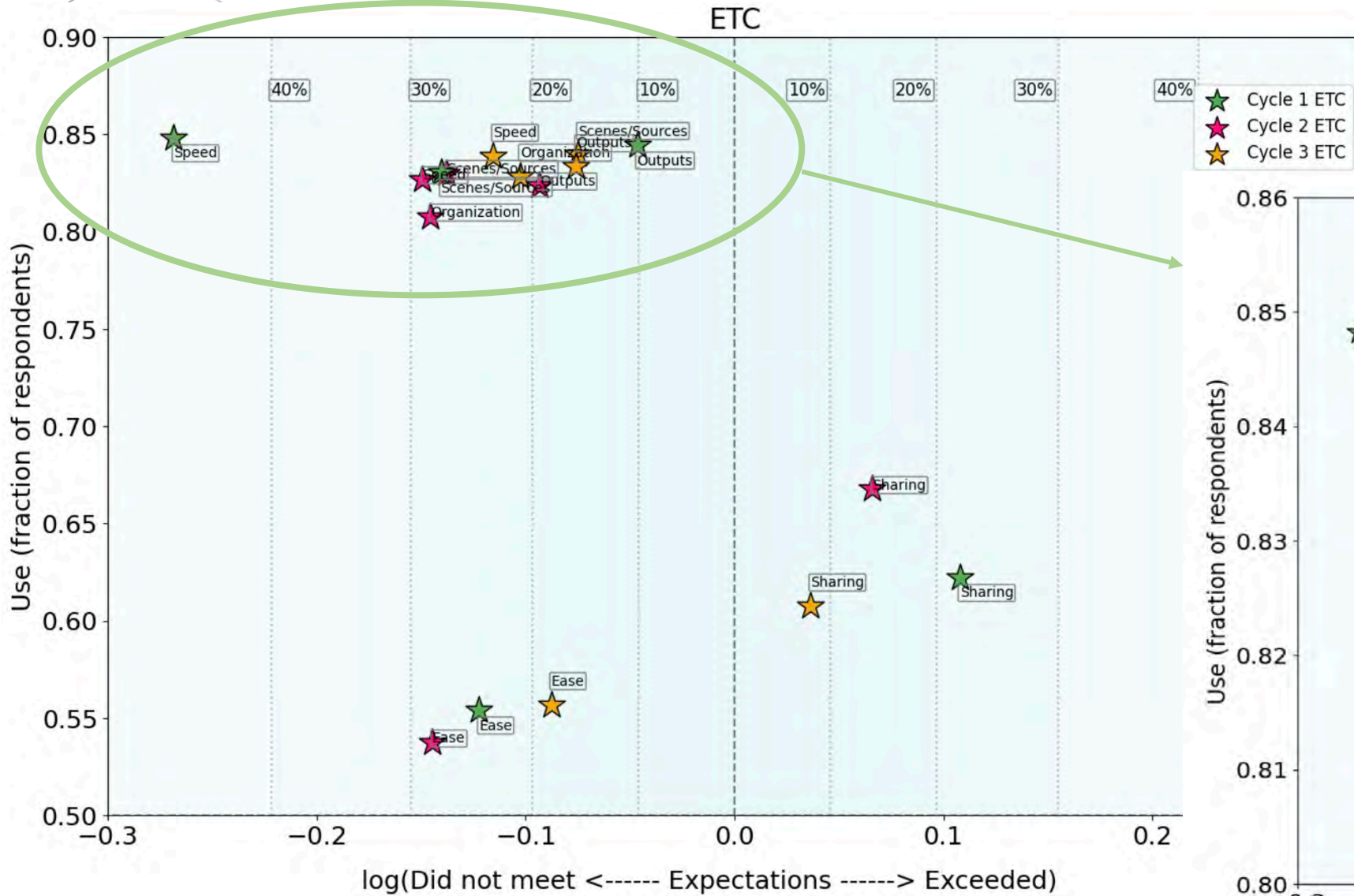
Addressing feedback and concerns: Plan forward (see D. Law's slides)

- Complete overhaul of the Data pages on JDox(*), to be released in late March
- Pipeline builds 10.0 and 10.1 address specific MOS, IFU, imaging, fixed slit and detector issues (incl. NIRSpec 1/f noise correction)
- Additional improvements underway
- We are investigating strategies to speed up some pipeline steps that act as “bottlenecks”

(*) Note the JDox team is working on a broader overhaul effort

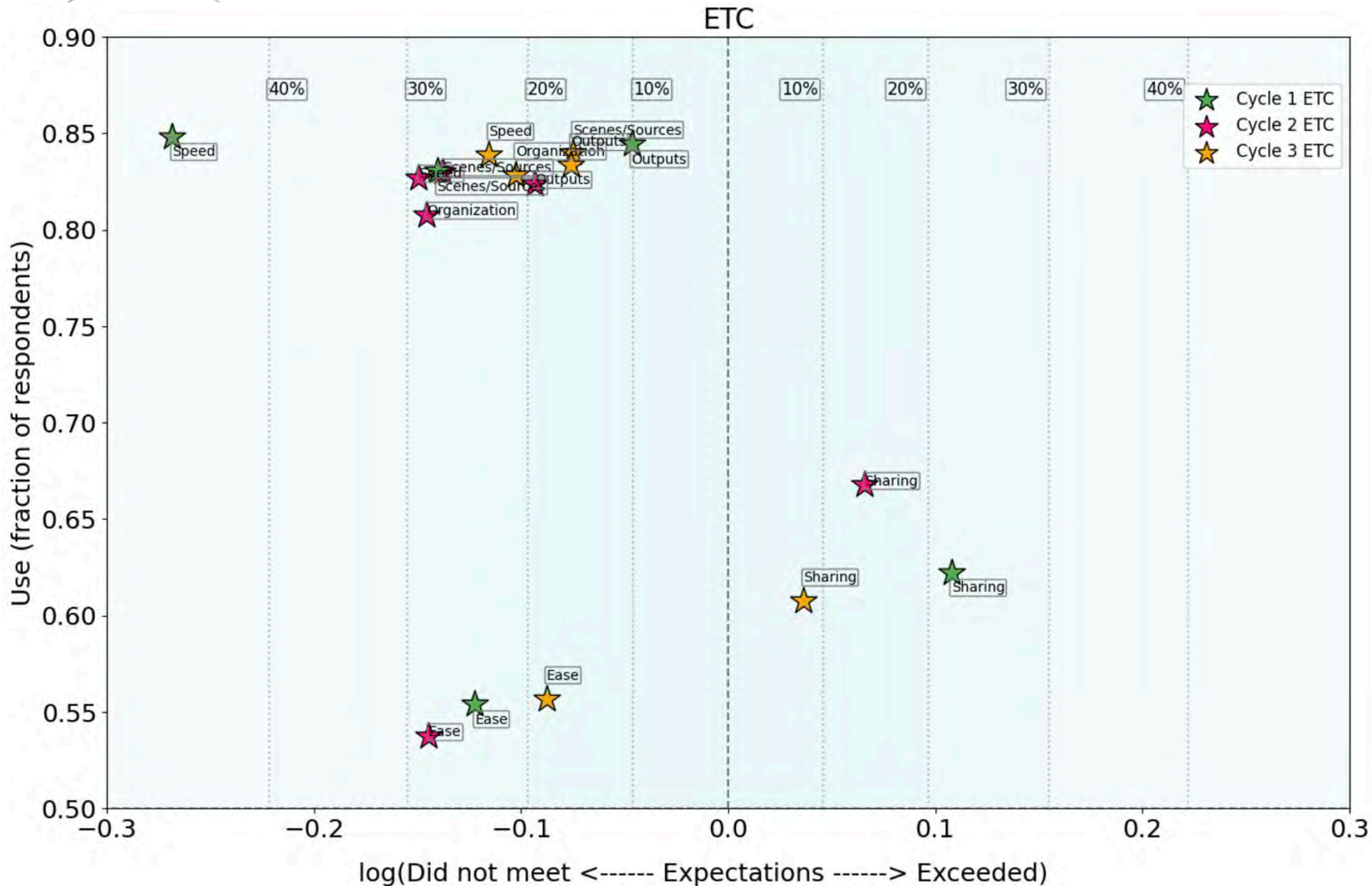


Usage vs. Rating diagrams: ETC through 3 Cycles





Usage vs. Rating diagrams: ETC through 3 Cycles



We asked users to rate ETC aspects such as speed, sharing of notebooks, outputs, organization, easy of use and scenea and sources definition:

- The ability of sharing the work has consistently rates above expectations.
- Overall Cycle 3 results show slightly better or similar trends. Note the speed improvement.
- The overall rating, however, tends to dissatisfaction.



Summary of ETC-related written feedback

Most common requests:

- Rename calculations and allow them to be reordered and grouped together.
- Calculate integrated line SNRs.
- Batch download of products for multiple calculations.
- Optimal extraction strategies for imaging and mentioned the ability to do this in the HST ETC.
- Batch download of products for multiple calculations.
- Additional examples of more complex scenes and sources.

Less common, but still useful comments

Fix the line units for extended sources (on the list for ETC 4.0), clearer error messages when uploading spectra, report pixel sizes (plate scale) more clearly in the ETC, report a breakout of the contributions from different noise sources, output results in flux units instead of e-/sec, batch expansions for source properties (i.e., flux), worked example for NIRISS/SOSS with the F277W filter.

Common complaints:

- Sources and scenes definitions are hard, confusion on dither patterns definition between ETC and APT, performance/speed.



ETC 4.0 Priorities (in support of Cycle 4 CfP)

High priority

- New NIRCcam DHS mode: May not be in time for the call. NIRCcam to provide guidance to use a different mode for their observations in APT with the expectation that they can switch to DHS
- Implement NIRSspec IFU 4-point nod option
- Draw the apertures used for the imaging SNR calculation
- Implement single-group ramps for NIRISS and NIRSspec
- Calculate SNR for a spectral line, integrated over the line and with continuum subtraction

Medium priority

- Reconcile MIRI cosmic ray implementation in the ETC with the pipeline
- NIRCcam imaging optima extraction
- Default aperture size & correct encircled energy measurements
- Y-offset for MIRI LRS Slit & Slitless is meaningless, users should use the "Centered on source" option
- Clean up normalization tabs in regards to MIRI modes



ETC Survey

The ETC-related comments are slightly polarized:

- We have users that provide feedback on what they would like to see changed and improved.
- We also acknowledge that a fraction of the community find the ETC challenging, and that there is a significant learning curve for new users.
- We are exploring options to ease the ETC use :
 - Remind the community about JIST (JWST Interactive Sensitivity Tool)
 - Simplifying the source definition on the interface
 - Readily available notebooks that exemplify science cases and use Pandeia.
 - Would need community feedback
 - Maintenance
 - Your ideas here

JIST

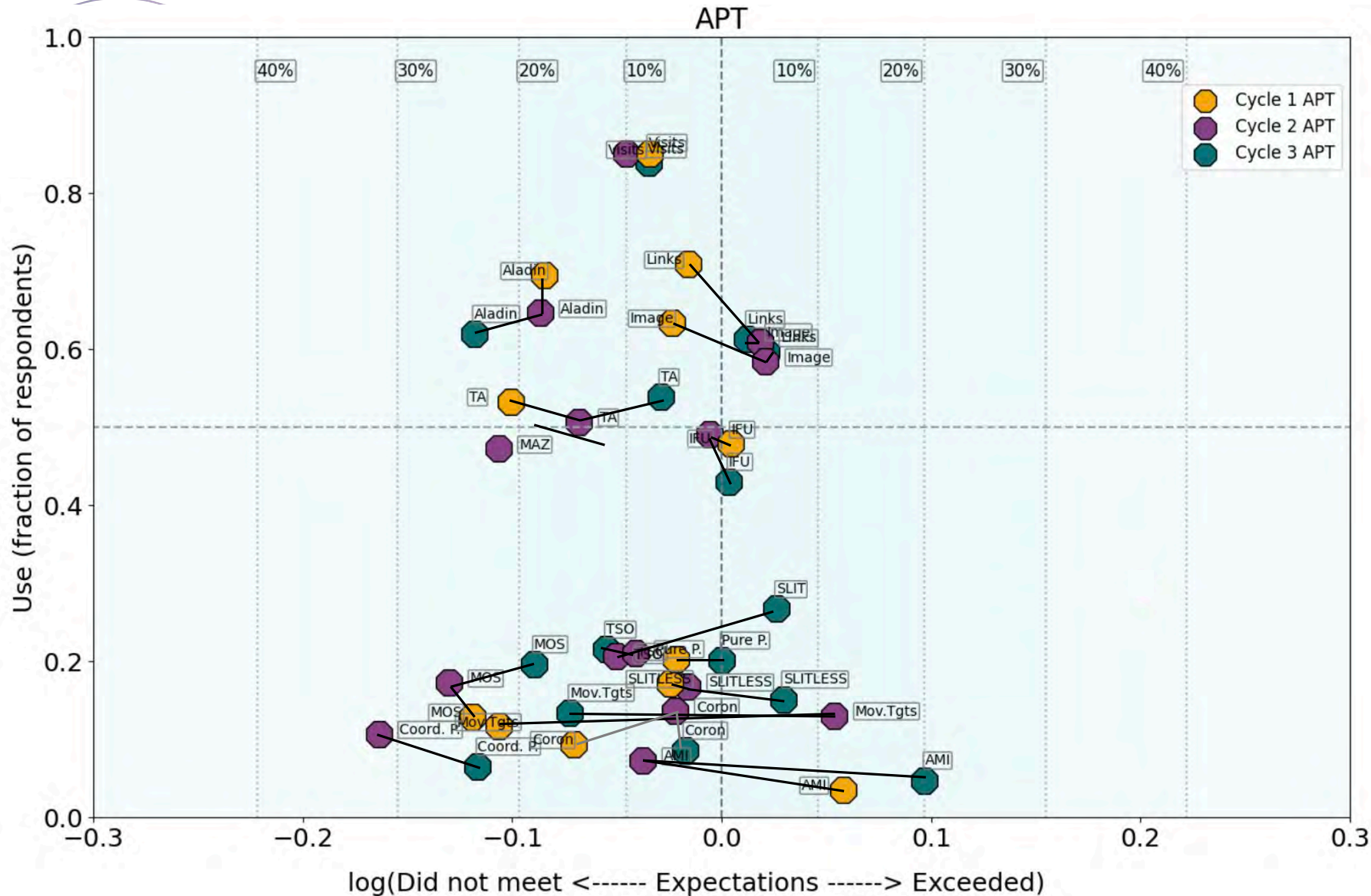


Pandeia Jdox page





Usage vs. Rating diagrams: APT through 3 Cycles



We asked users to rate APT aspects such as ease of preparing proposals for different observing modes, Parallels, Target Acquisition, and the Aladin interface:

- Except for Aladin, Cycle 3 results generally shows better or very similar rating values



Summary of APT-related written feedback

Most common feedback:

- Aladin interface is slow and challenging
- Improve usability of the NIRSpec MSA Planning Tool
- Micrometeroid Avoidance Zone is confusing (improvements on the interface tracked on APT work item 93144)
- Better connect APT and the ETC, and improve the terminology matching.
- Reorganize the choice of keywords
- The tool could use some updates



Recent and Ongoing APT Improvements and initiatives addressing users needs

APT Item 712 of the Science Planning board provides many improvements to the MSA planning tool:

- Available in APT already:
 - Catalog issues, and filtering issues to create candidate sets
 - Weights and IDs should use "long" vs "int" data types
 - Fix MSA source positions in the MSA Shutter View
 - Fix MC shuffling when weights are NOT used
 - Aladin should show MSA footprint at the MPT planning angle
 - Allow multiple primary sources in same shutter
 - New feature: Planning using masks to avoid cutoffs
 - Specific Wavelength planning
- In development:
 - Augmenting an existing Plan's configurations
 - Planning at user-specified fixed pointings



Recent and Ongoing APT Improvements and initiatives addressing users needs

APT Item 712 of the Science Planning board provides many improvements to the MSA planning tool:

- Aladin is an external interface which makes it hard to fix some of the reported issues.
 - **Workarounds** for loading an image for a second target and how to view target groups, are documented in a knowledge database article.
 - APT item 86819 is studying how to handle limitations of displaying JWST coordinated parallels
 - APT item 60607 looks into plot schedulable orientations in Aladin by default
 - APT item 89857 is looking into solving the problem of switching between images of different parts of the sky in Aladin
 - APT item 73900 looking into enabling footprint export capability in Aladin



In summary

The Cycle 3 user survey provides valuable feedback that we are using to improve our pipeline, tools and systems.

- The survey emphasizes pipeline feedback, which has been used to inform our high priority work areas
 - For all modes, reprocessed data gets close to meet or exceed expectations.
 - MAST products are often found not to meet expectations. Depending on the observing mode this may be related with MAST reprocessing speed, but also with some algorithms improvements that are not available yet or are switched off by default.
- The ETC and APT feedback has been compared with previous surveys, showing areas where the community rating has getting better, but also areas of improvement
 - Both ETC and APT are working on improvements that address specific concerns
- Exploring option to ease the use of the ETC
- The User Survey covered other areas (e.g. additional proposal tools). A report is underway and it will be shared with the JSTUC and the community

A new User Survey will be sent out after the Cycle 4 CfP

