Cycle 8 2021
ALMA Proposal Review Process

ALMA Proposal Handling Team
Updated: 1 March 2021

ALMA Review Process (Cycle 8 2021 to ...)
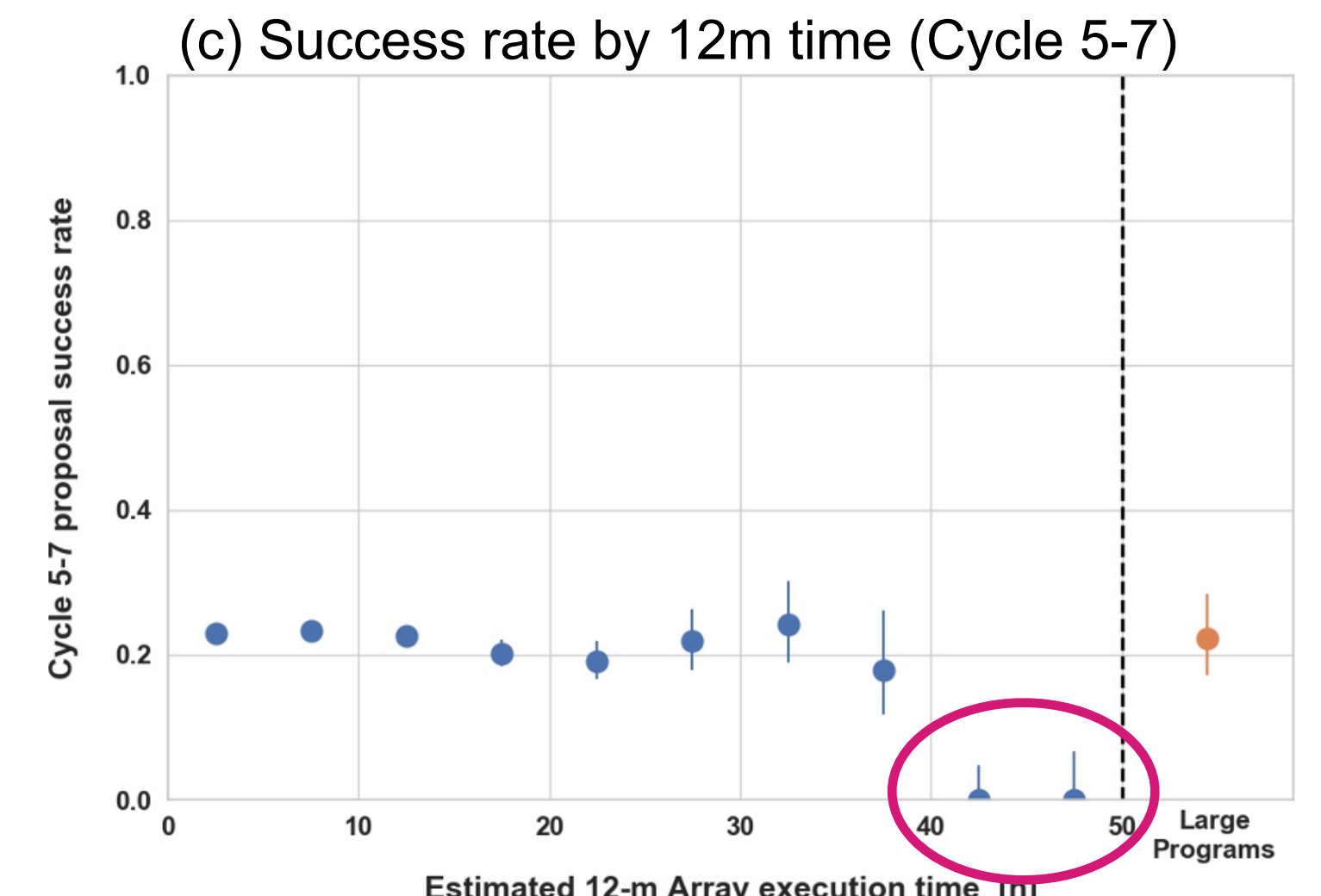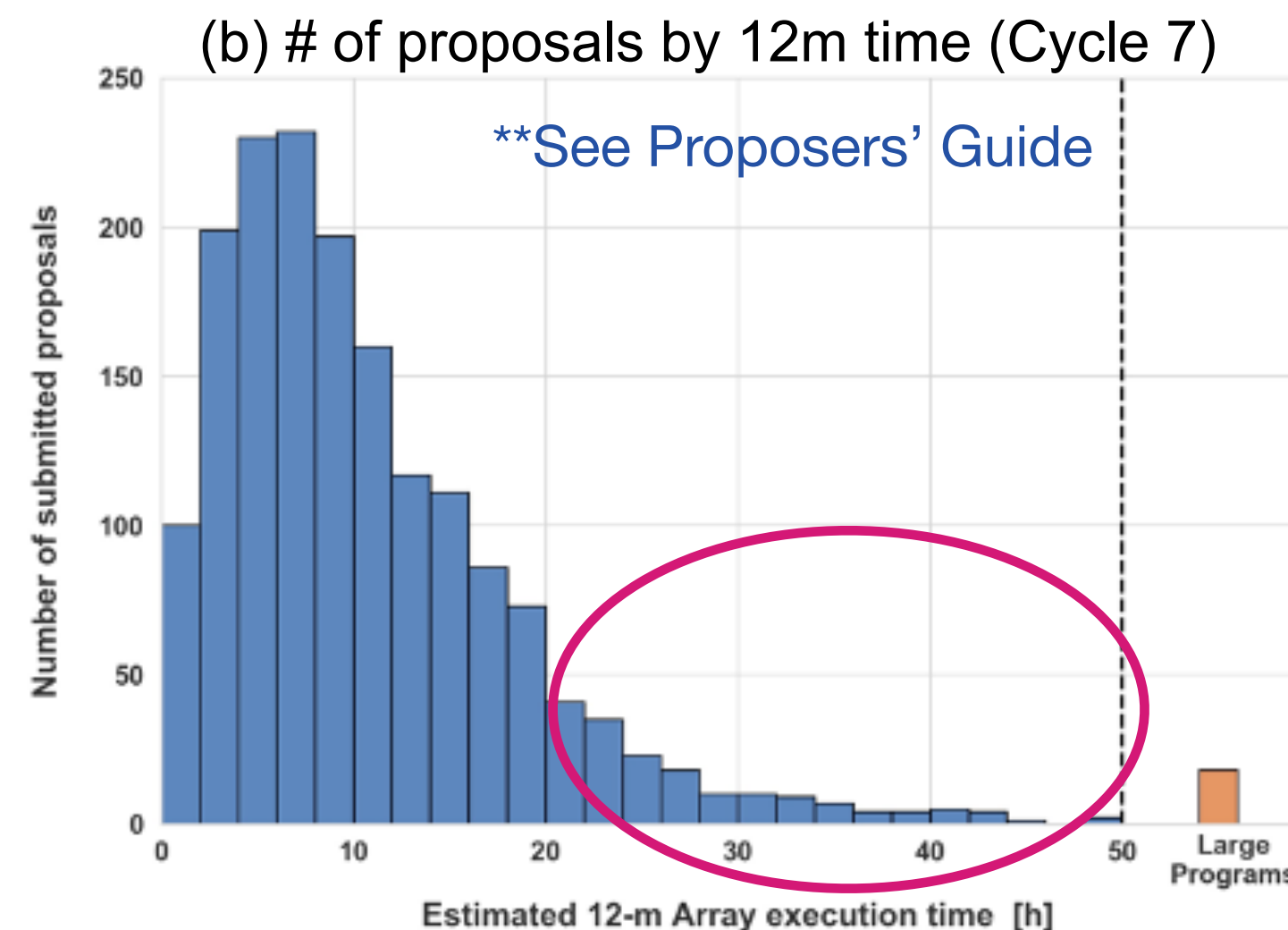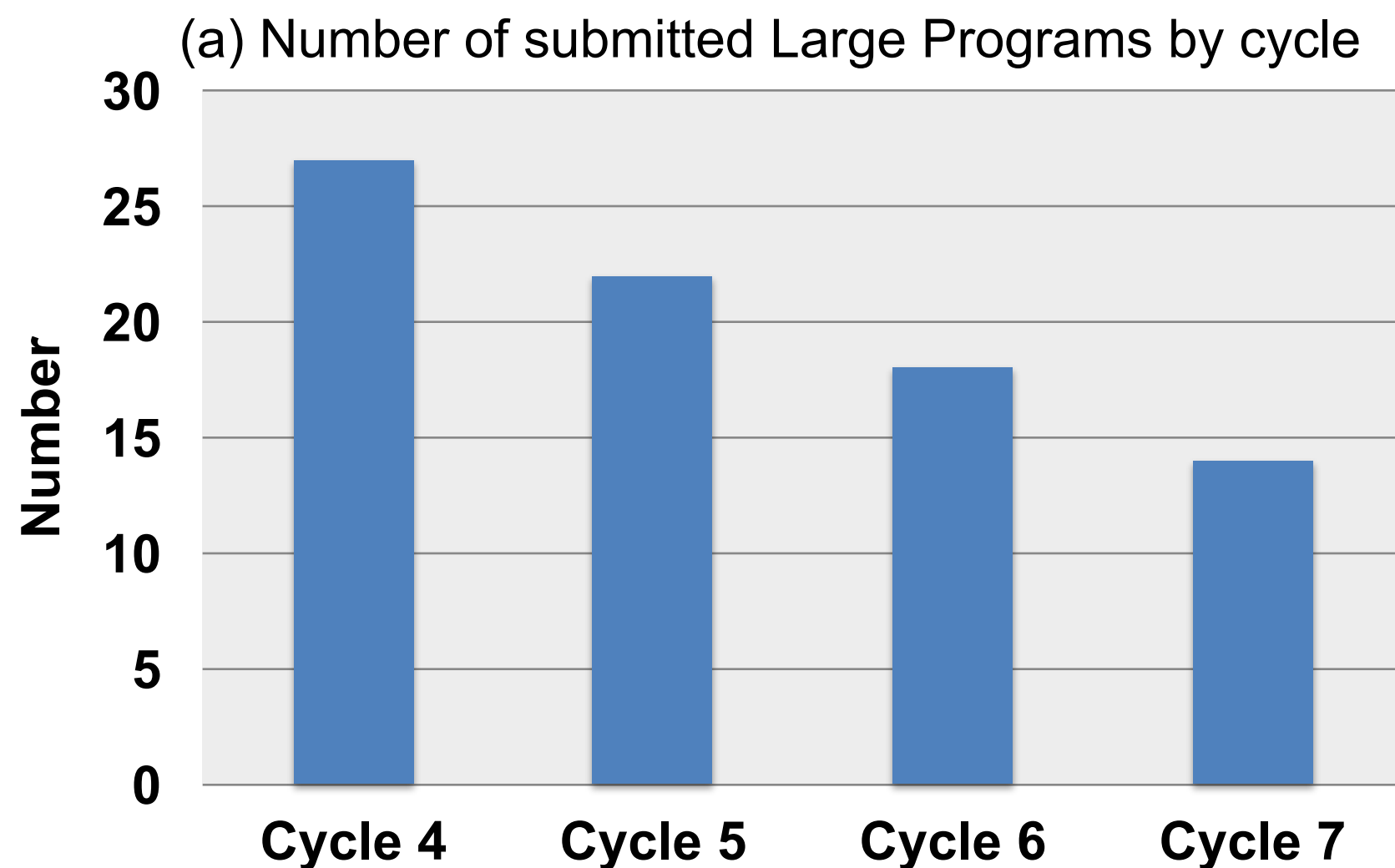
Some context for the changes introduced in the ALMA Review Process (Cycle 8 2021 to …)

A few challenges to address in Cycle 8 2021:

- Large number of submitted proposals (~ 1800) places heavy burden on panelists. Workload may impact quality of the reviews.

- International Visiting Committee (IVC) and ASAC concerns about relatively few ambitious (in terms of time) projects proposed and accepted:

  - Number of submitted Large Programs continues to decline in each cycle (Figure a).

  - Fewer proposals requesting > 20-30 hr (Figure b).

  - Low (i.e., zero) acceptance rate (Grade A/B) for 40-50 hr proposals (Figure c).

- Potential biases in the review process to date.

(a) Number of submitted Large Programs by cycle

(b) # of proposals by 12m time (Cycle 7)
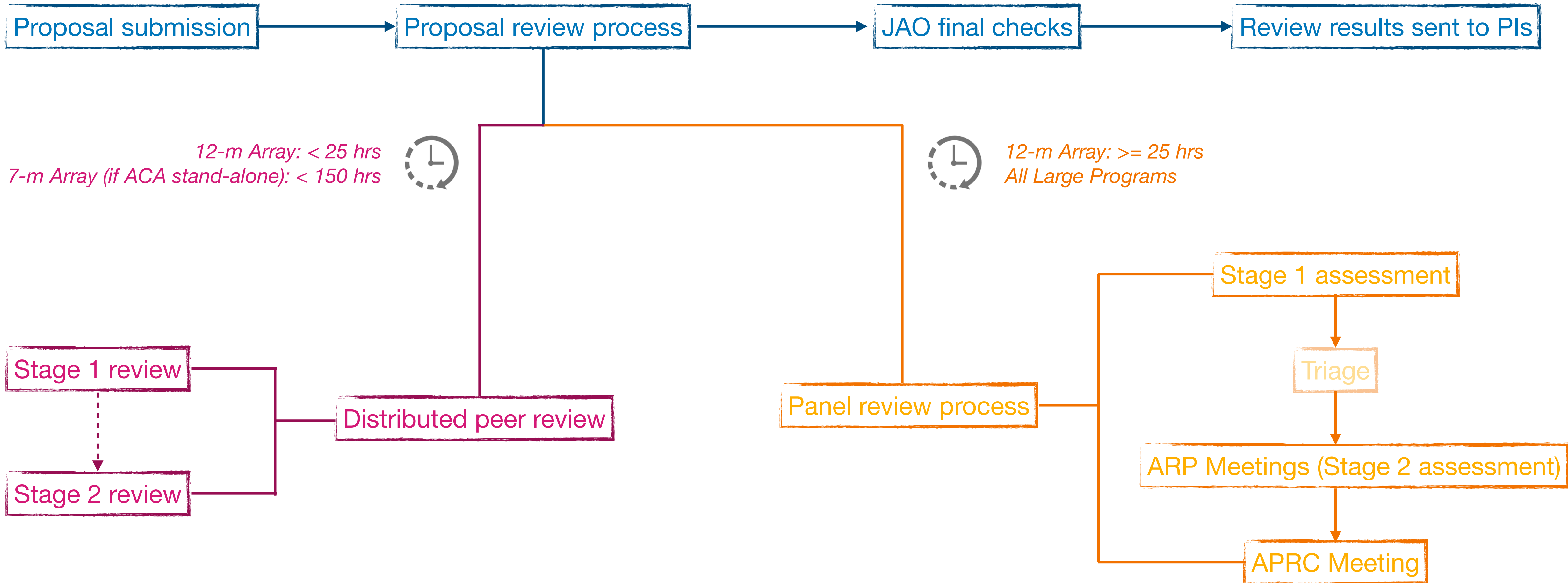
(c) Success rate by 12m time (Cycle 5-7)

Three major changes introduced in the ALMA Review Process for Cycle 8 2021

1 Distributed peer review

2 Encouraging larger programs

3 Dual anonymous

Overview of the ALMA Review Process in Cycle 8 2021

Proposal submission → Proposal review process → JAO final checks → Review results sent to PIs

12-m Array: < 25 hrs
7-m Array (if ACA stand-alone): < 150 hrs

12-m Array: >= 25 hrs
All Large Programs

Stage 1 review ⇢ Stage 2 review → Distributed peer review

Panel review process

Stage 1 assessment → Triage → ARP Meetings (Stage 2 assessment) → APRC Meeting

Panel review in ALMA Cycle 8 2021

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Proposal submission  →  Proposal review process  →  JAO final checks  →  Review results sent to PIs
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In the **panel review process**, proposals are reviewed by panels of experts on the scientific subject of the proposals.

12-m Array: >= 25 hrs
All Large Programs

How it works:

- Proposals assigned to panel based on their scientific category.
- Conflicts of interest checked
- All panel members review all (non-conflicted) proposals assigned to their panel.

Stage 1
  - Conflict identification.
  - Science assessors score all their assigned proposals and write a comment.
  - Triage performed as needed after Stage 1, minimizing workload in Stage 2.

Stage 2: ALMA Review Panel (ARP) Meetings
  - Face to face meeting —> Virtual in 2021
  - Proposals are re-scored based on discussion; consensus reports are written.

ALMA Proposal Review Committee (APRC) Meeting
  - Recommend which Large Programs should be scheduled
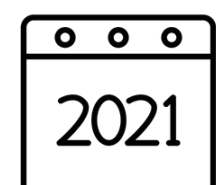- The panel review process results in a ranked list of all submitted proposals.

Panel review process

```
Stage 1 assessment
        ↓
     Triage
        ↓
ARP Meetings (Stage 2 assessment)
        ↓
  APRC Meeting
```

2021 Panels in Cycle 8 2021 will be similar to previous cycles, but with reduced number of proposals and total science assessors, although more panelists per panel compared with previous cycles.

Distributed peer review in ALMA Cycle 8 2021

Proposal submission → Proposal review process → JAO final checks → Review results sent to PIs

12-m Array: < 25 hrs
7-m Array (if ACA stand-alone): < 150 hrs

Distributed peer review is a process in which one member of the proposal team (either the PI or one of the CoIs) reviews ten other proposals.

Why is ALMA using distributed peer review? After Cycle 7 Supplemental Call, distributed peer review proved to be a viable review system for the ALMA community (see **ALMA Memo 616**). Additionally it provides a series of advantages over panel review, such as more involvement of the community, and a significant reduction of the workload for each reviewer.

How it works:
- Each proposal team designates one member as the acting reviewer.
- Proposals are assigned to reviewers based on reviewers' expertise.

Stage 1 (Mandatory)
- Conflict identification
- Reviewers rank the assigned ten proposals and write a comment to the PI.

Stage 2 (Optional)
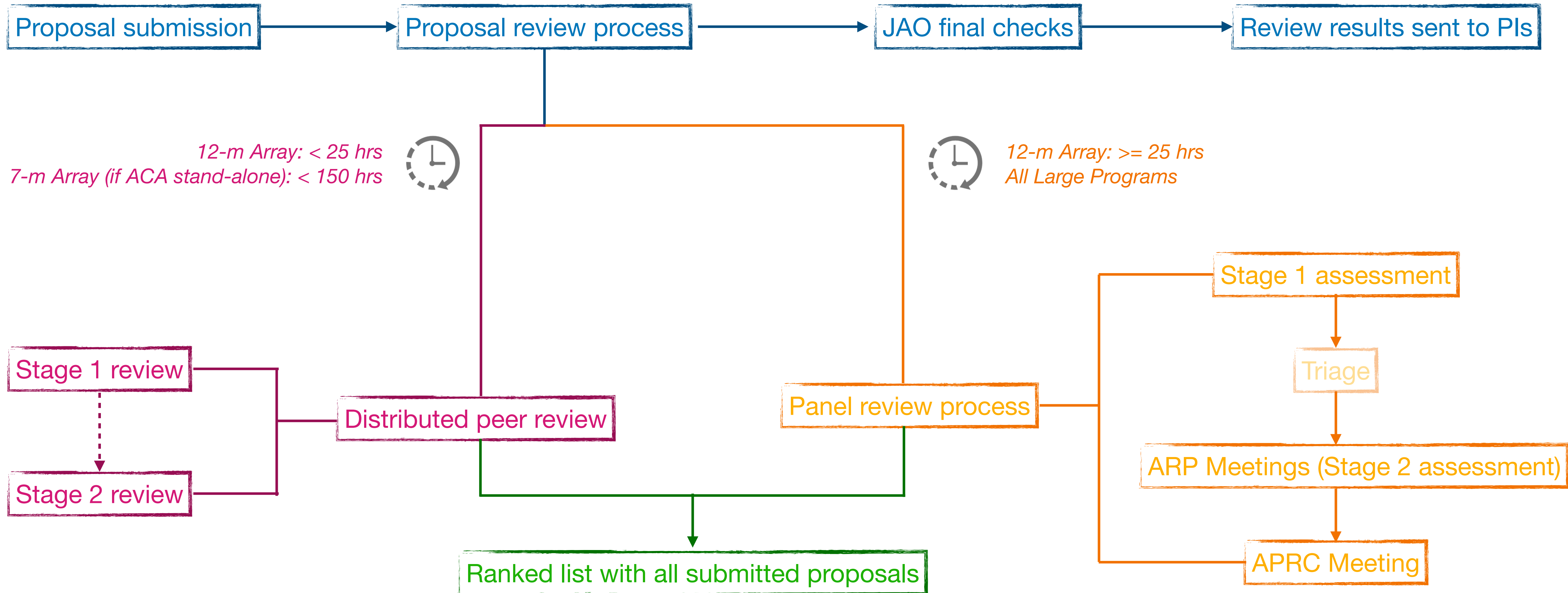- It is possible to re-rank proposals and edit the comments to the PIs based on the comments made by the other (9) reviewers.

Stage 1 review ⇣ Stage 2 review

Distributed peer review
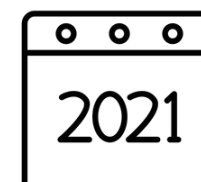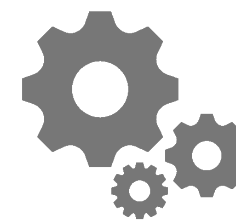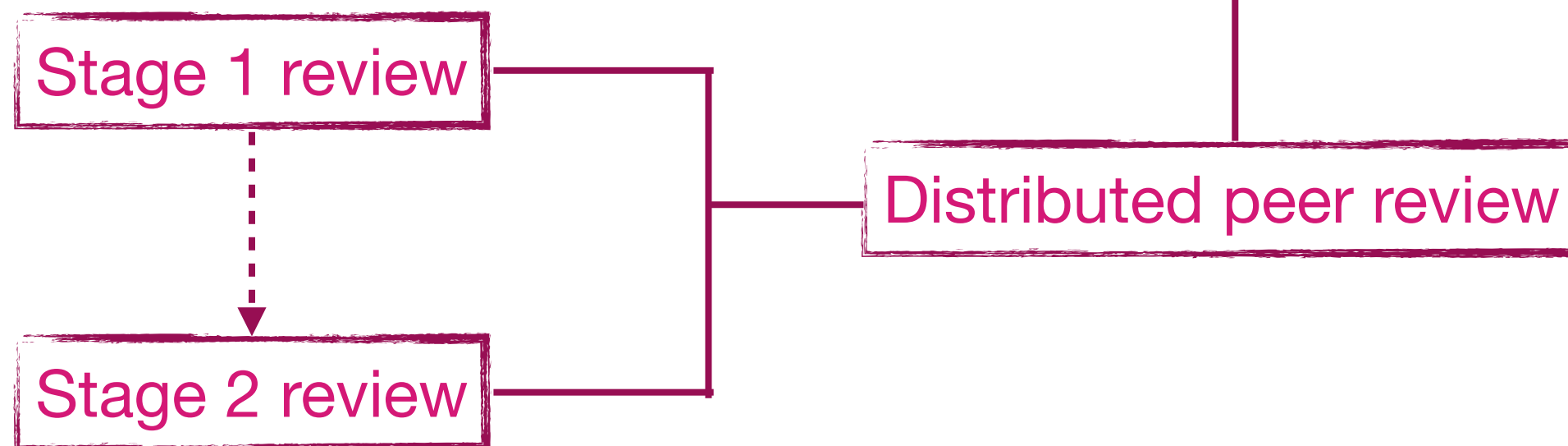
- Cycle 8 2021 will be the first time that distributed peer review is used by ALMA in a main Call for Proposals.
- In order to make assignments, ALMA users should **update their expertise in their science portal profile.**

The outcome of the processes is a merged, ranked list.

Proposal submission → Proposal review process → JAO final checks → Review results sent to PIs

12-m Array: < 25 hrs
7-m Array (if ACA stand-alone): < 150 hrs

12-m Array: >= 25 hrs
All Large Programs

Stage 1 review ⇢ Stage 2 review → Distributed peer review

Panel review process

Stage 1 assessment → Triage → ARP Meetings (Stage 2 assessment) → APRC Meeting

Ranked list with all submitted proposals

Creating a ranked list from the *panels*

Category 1 rank 1	Category 2 rank 1	Category 3-5 rank 1
Category 1 rank 2	Category 2 rank 2	Category 3-5 rank 2
Category 1 rank 3	Category 2 rank 3	Category 3-5 rank 3
. . .	. . .	. . .
. . .	. . .	. . .

- Panelists **score** proposals in their panel
- Average score determines proposal rankings within a panel.

Creating a ranked list from the *panels*

| Category 1 rank 1 |
| Category 2 rank 1 |
| Category 3-5 rank 1 |
| Category 1 rank 2 |
| Category 2 rank 2 |
| Category 3-5 rank 2 |
| Category 1 rank 3 |
| Category 2 rank 3 |
| Category 3-5 rank 3 |

. . .

. . .

- Procedure to create a single ranked list across all panels remains the same as used in Cycles 0-7

- Rankings are normalized by the total number of proposals within each panel, and **sorted by the normalized ranks** among all panels.

- Interleave the rankings from the different panels

Creating a ranked list from *distributed review*

- Each reviewer **ranks** their assigned proposals from 1 (best) to 10 (weakest), essentially a series of choices.

- Choices from the individual reviewers are used to determine the **consensus ranked list** of all proposals.

| DPR rank 1 |
| DPR rank 2 |
| DPR rank 3 |
| DPR rank 4 |
| DPR rank 5 |
| DPR rank 6 |
| DPR rank 7 |
| DPR rank 8 |

. . .

. . .

Creating two ranked lists

Category 1 rank 1	DPR rank 1
Category 2 rank 1	DPR rank 2
Category 3-5 rank 1	DPR rank 3
Category 1 rank 2	DPR rank 4
Category 2 rank 2	DPR rank 5
Category 3-5 rank 2	DPR rank 6
Category 1 rank 3	DPR rank 7
Category 2 rank 3	DPR rank 8
Category 3-5 rank 3	

. . .
. . .

. . .
. . .

- Ranked list will be generated for each process (panel and distributed review)

Merging two ranked lists

Category 1 rank 1
DPR rank 1
DPR rank 2
DPR rank 3
Category 2 rank 1
DPR rank 4
DPR rank 5
DPR rank 6
Category 3-5 rank 1

. . .

. . .

- Rankings from the panels and distributed peer review are combined by normalizing the ranked lists by the number of proposals in each review process, and then **sorting by the normalized rank**.

- Interleaving assures there are no systematic differences in the overall science rankings of the panels vs. distributed peer review.

- Large programs recommended by the APRC will have top priority in the final ranked list.

A few updates for Large Programs and queue building

*ALMA encourages PIs to submit **larger, more ambitious proposals***

- No cap on the total time that can be allocated to Large Programs. *Note, Large Programs still cannot fill more than 50% of the time in a configuration/LST.*

- Large Programs, and proposals that require more than 25 hours on the 12-m Array, will have first priority to fill at least 10% of the observing queue.

Towards dual-anonymous review

The Joint ALMA Observatory (JAO) is committed to reducing biases in the review process.

1. Modifications in the review process in recent cycles

2. Cycle 7 context

3. Updates for Cycle 8 2021: dual-anonymous guidelines

Modifications in the review process in recent cycles

Cycle 7:
- removed investigator names from reviewer tools
- randomized investigator list on cover sheet to not identify PI
- first names listed with first initial to not identify gender

Impact: some systematics changed, but not others

Cycle 5-6: Institutions, emails, executive removed from proposal cover sheet

Impact: no significant change

Cycle 4: Panel Chairs and Reviewers informed of systematics during ALMA Review Panel meeting orientation
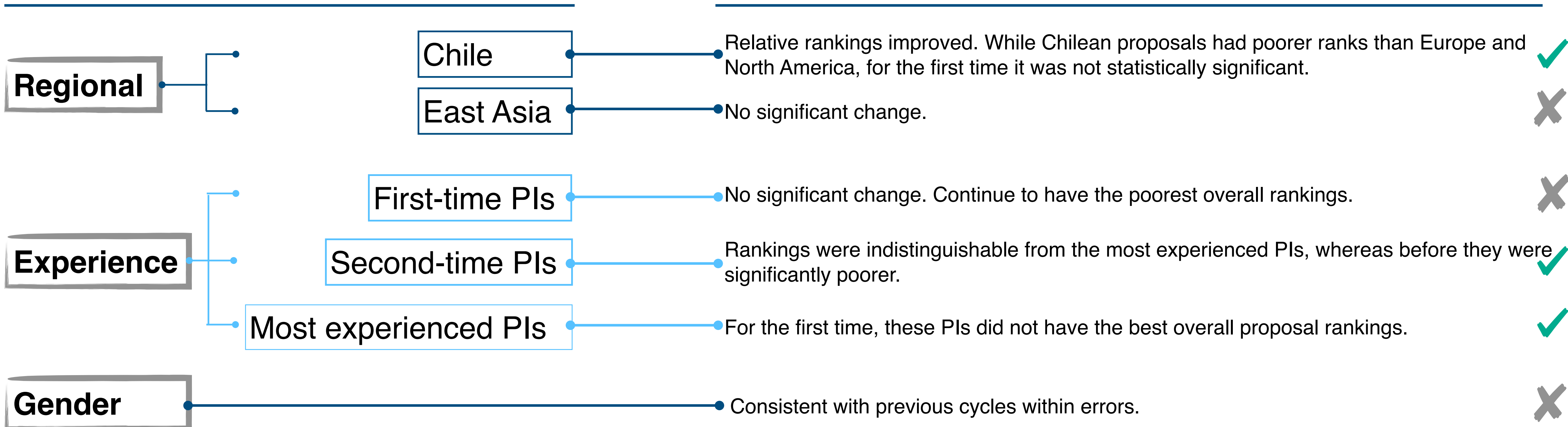
Impact: no significant change

Cycle 0   Cycle 1   Cycle 2   Cycle 3   Cycle 4   Cycle 5   Cycle 6   Cycle 7   Cycle 8
2021
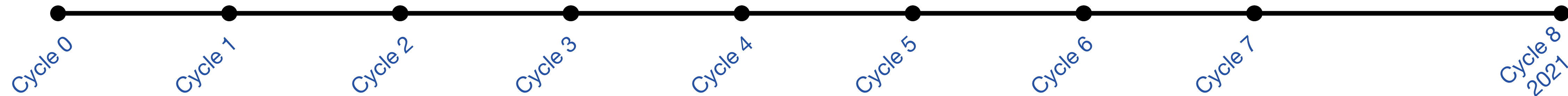
Lonsdale et al. (2016)

Carpenter (2020)

Modifications in the review process in recent cycles: Cycle 7 context

Systematic

Impact in Cycle 7
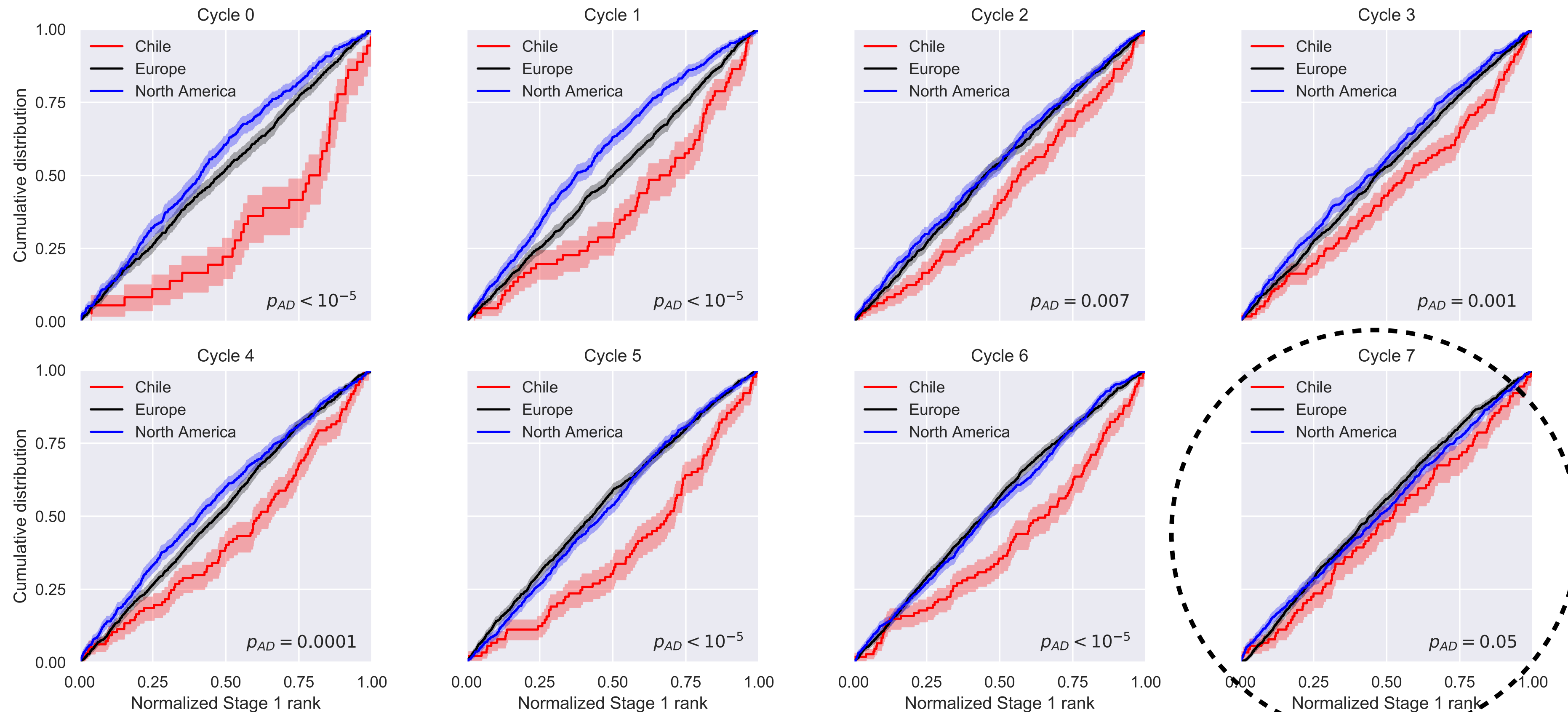
Regional

Chile — Relative rankings improved. While Chilean proposals had poorer ranks than Europe and North America, for the first time it was not statistically significant. ✓

East Asia — No significant change. ✗

Experience

First-time PIs — No significant change. Continue to have the poorest overall rankings. ✗

Second-time PIs — Rankings were indistinguishable from the most experienced PIs, whereas before they were significantly poorer. ✓

Most experienced PIs — For the first time, these PIs did not have the best overall proposal rankings. ✓

Gender — Consistent with previous cycles within errors. ✗

Impact

Overall: Some (but not all) systematics reduced after modifications in Cycle 7, suggesting some biases in the review process have been present.
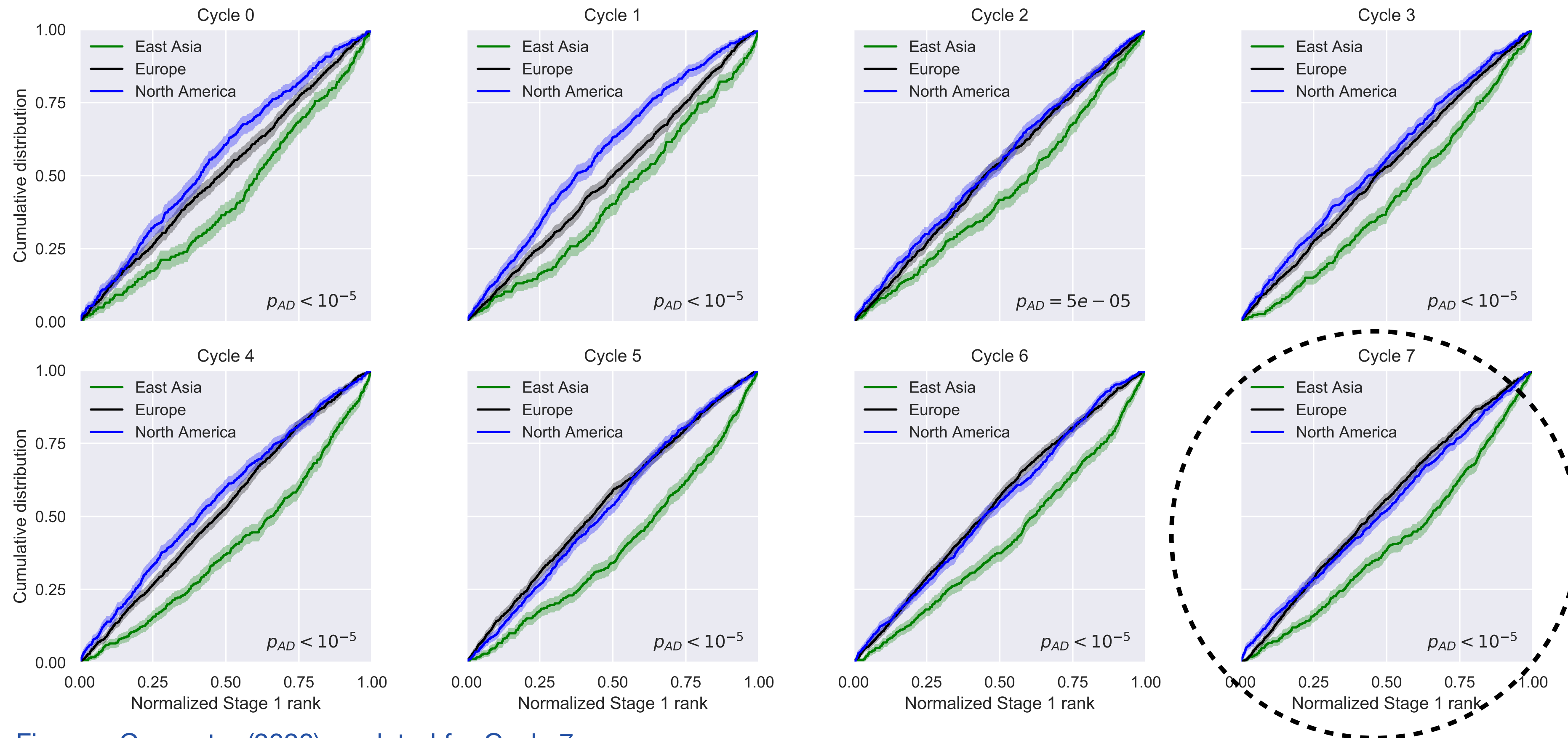
Addressing systematics
Regional affiliation: Chile

Figures: Carpenter (2020), updated for Cycle 7

Impact → Relative rankings improved in Cycle 7. While Chilean proposals had poorer ranks than Europe and North America, for the first time it was not statistically significant.

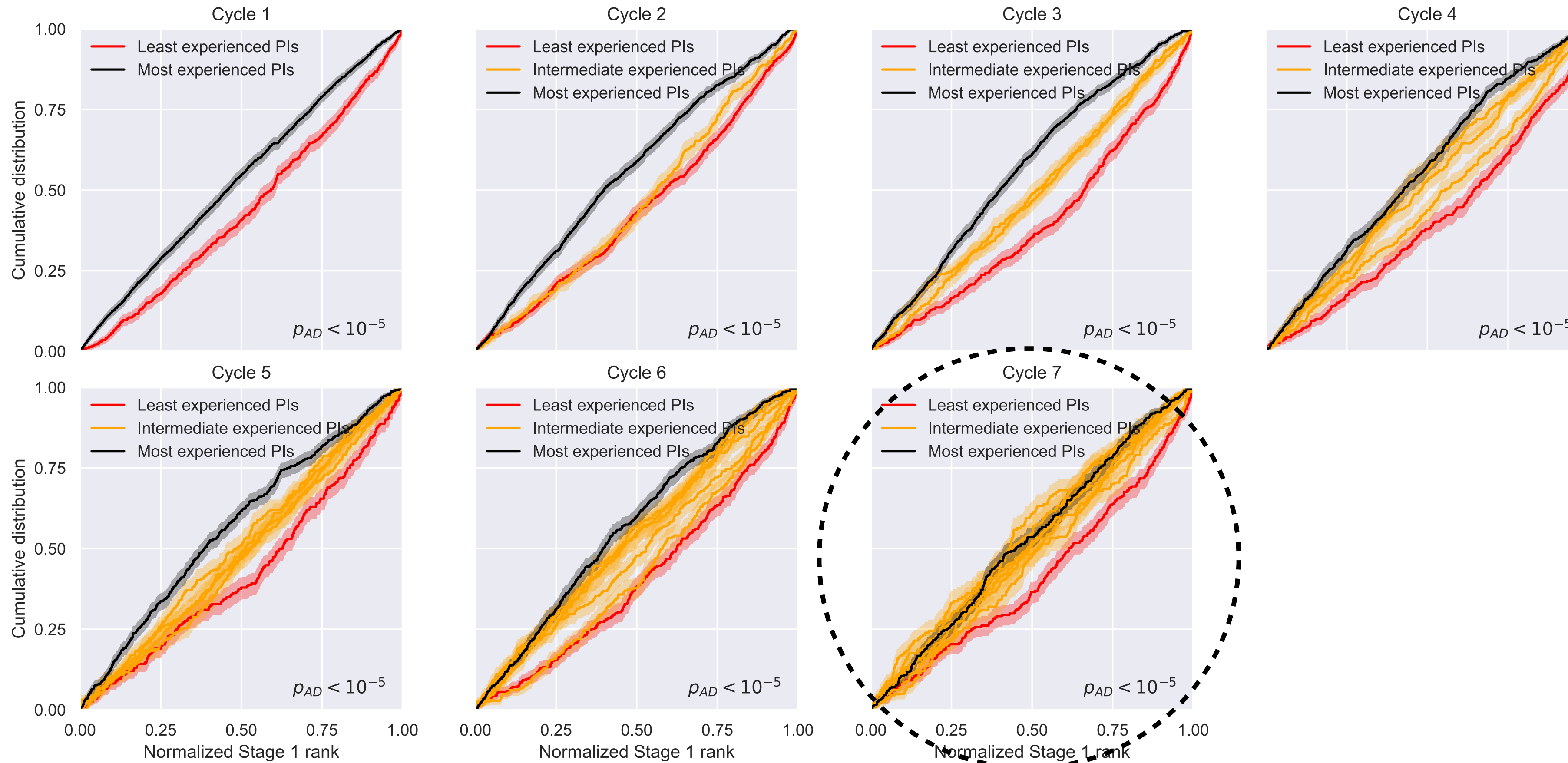# Addressing systematics
Regional affiliation: East Asia

Figures: Carpenter (2020), updated for Cycle 7

Impact

No significant change for relative rankings
of East Asian proposals in Cycle 7.

Addressing systematics
Experience of PI ("prestige" bias)

Figures: Carpenter (2020), updated for Cycle 7

Impact

- First-time PIs (red curve) continue to have the poorest rankings.
- For the first time, the most experienced PIs (black) did not have the best overall proposal rankings.
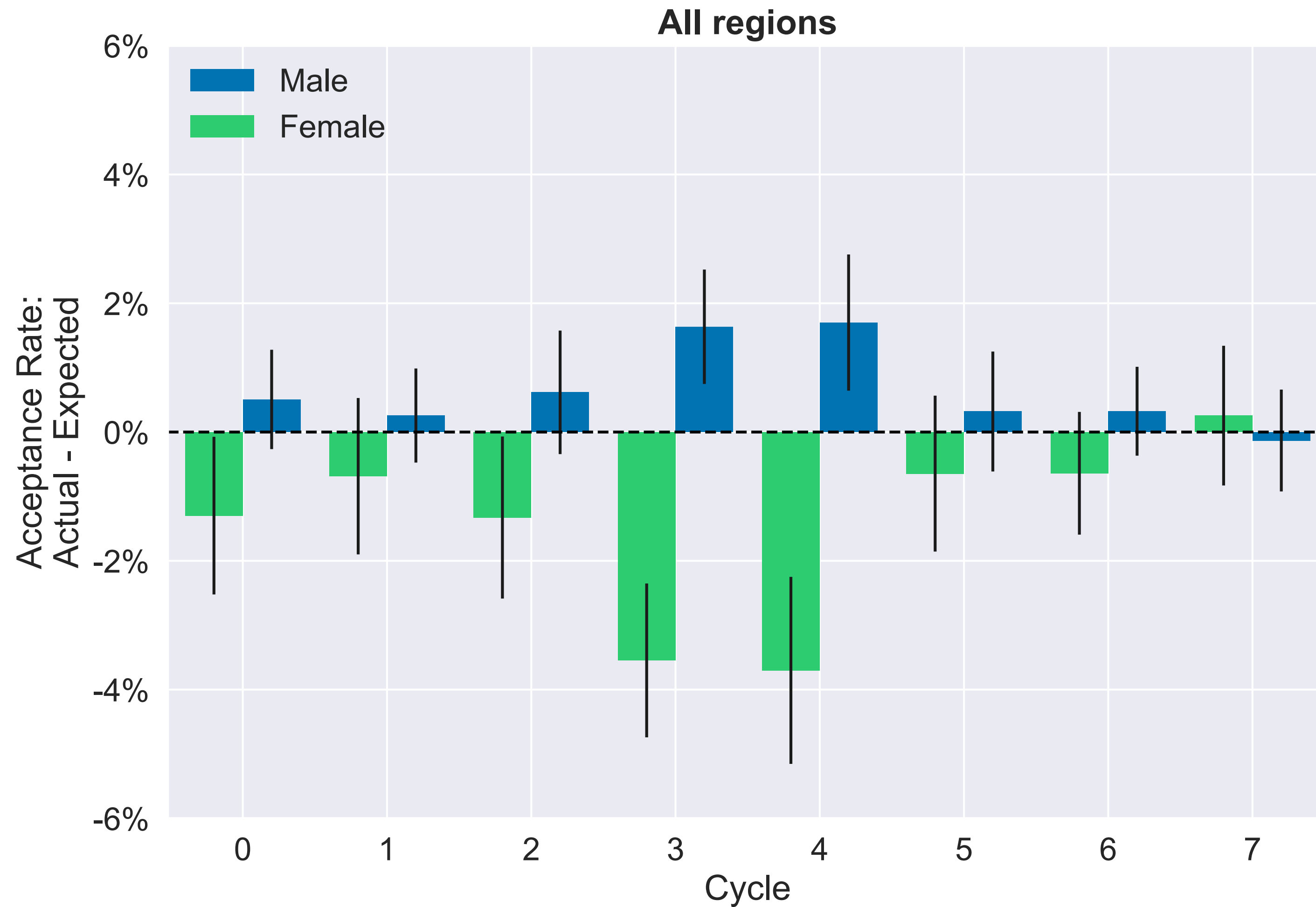
Addressing systematics
Second-time PIs
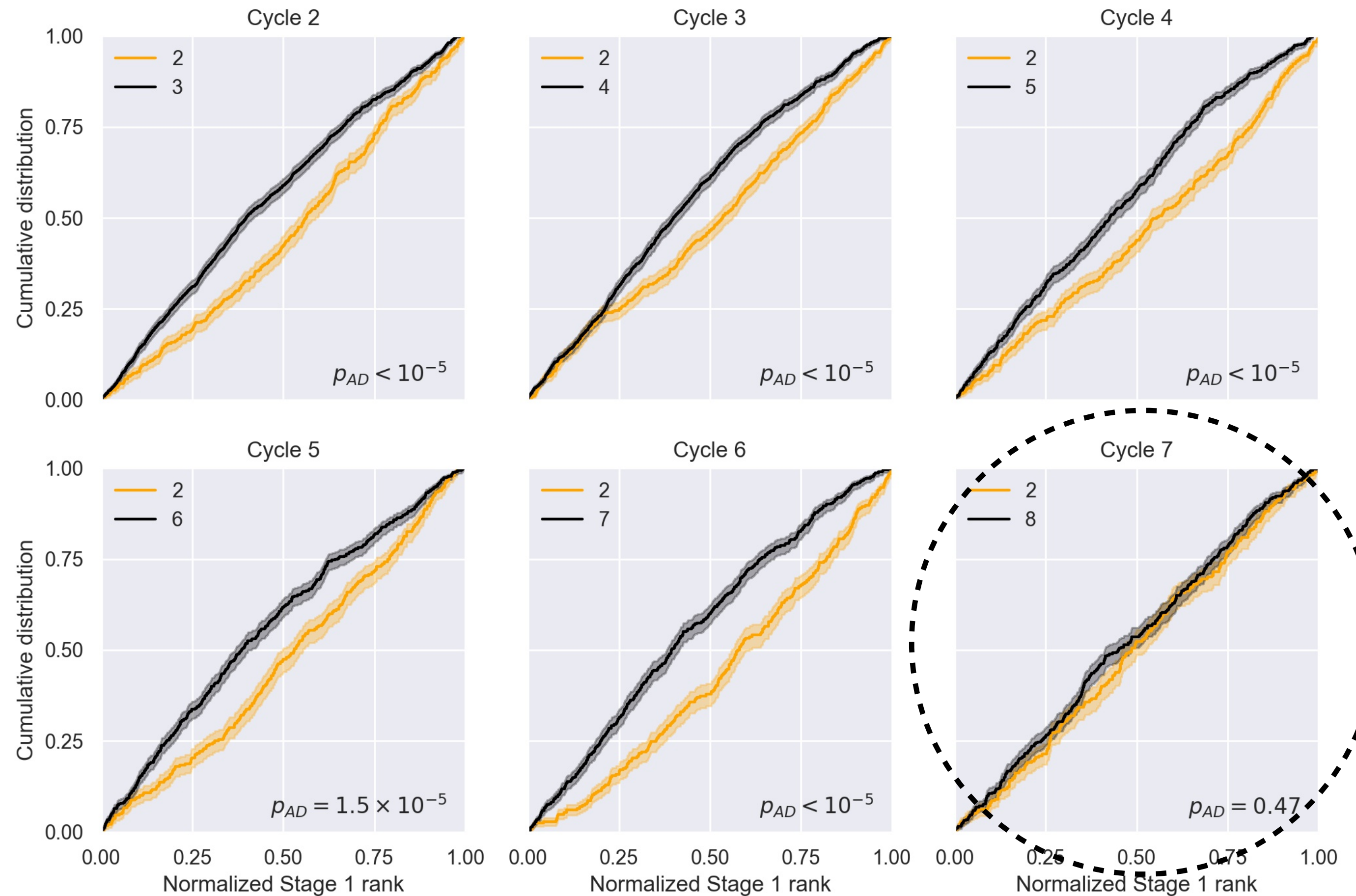
Figures: Carpenter (2020),
updated for Cycle 7

Impact

Rankings for second-time PIs were indistinguishable from the most experienced PIs, whereas before Cycle 7 they were significantly poorer.

Addressing systematics
Gender

All regions

Figures: Carpenter (2020), updated for Cycle 7

Impact

For the first time, women did better than expected based on demographics, although consistent with previous cycles within uncertainties.

Addressing systematics
Dual-anonymous in Cycle 8 2021

Dual-anonymous review is when the proposal team does not know the identity of the reviewers, and the reviewers do not know the identity of the proposal team.

Why is ALMA adopting this system? To ensure that the proposal review process is as fair and unbiased as possible for all ALMA users.

Systematics from Cycle 0-6, before dual-anonymous, are reported in Carpenter (2020). *JAO committed to reducing biases in the review process.*
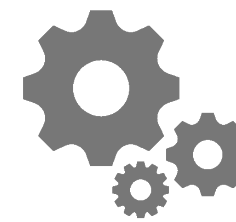
How it works:
- Proposals are written in such a way to not identify the team behind it.
- All identifying information related to the authors of the proposals is hidden from the reviewers and science assessors throughout the scientific review process.

Will some guidance be provided?
- Of course! Link will be shared.
- PIs encouraged to contact ALMA Helpdesk if in doubt.
- ARC staff should contact PHT for clarification if they cannot point the PI to the proper documentation.

Documentation and resources

https://almascience.org/proposing/alma-proposal-review

Cycle 8 2021 Call for Proposals opens **March 17, 2021**

Helpdesk: help.almascience.org