ALMA BOARD

ALMA EDM Document	AEDM 2023-012-O_Rev1
Distribution	**Ordinary Session**

Subject: Science Committee Response to the March 2023 ASAC Report

AUTHOR(S): Toru Yamada & Science Committee

Purpose of Document: To provide the Board with a response to the March 2023 ASAC Report

Status: Approved by the Board on August 3rd, 2023 by Written Procedure

ALMA Board Science Committee Response to the ASAC: April 2023

The ALMA Board thanks the ASAC for a very comprehensive report summarizing their latest guidance to the Board on issues related to science. The Board received the ASAC's latest Report prior to its April 2023 meeting. The ASAC Chair, M. Tafalla, summarized the Report first to the Board's Science Committee and again the following week to the entire Board during the Ordinary Session of the Board meeting. After Tafalla's first presentation, the Science Committee prepared a preliminary response which the Chair of the Science Committee presented to the Board immediately after Tafalla's second presentation. In this document, we elaborate on our response to the ASAC.

Permanent Charge #1

ASAC supports the Wideband Sensitivity Upgrade (WSU) as the top future scientific capability for ALMA. ASAC also supports the implementation of Band1 and the new ACA Spectrometer in Cycle 10. While ASAC agrees that prioritization is needed and considers that the priorities described in AMT Memo on IxTs Operations Priorities（AEDM 2023-010-O, 7 March,2023）is reasonable, ASAC concerns about the tight resource limitations of ALMA, and requests the Board to take the necessary measures to maintain the high quality of the Observatory performance and to guarantee the success of the WSU implementation.

The Board appreciates that ASAC shows strong support for the Wideband Sensitivity Upgrade (WSU) as the top future scientific capability for ALMA. On the other hand, it is necessary to strike a balance between developing new capabilities (WSU) and implementing new operation modes within the current limited resources of ALMA. The Board considers that the priorities described in the AMT memo (AEDM2023-010-O) is a fair solution and it is important for transparency reasons that the ALMA Science community is informed of this plan. For the new operation modes, the Board already took an action for the ALMA Director to consider the operational impact of implementing multi-cycle proposals. If the impact is deemed minimal, the ALMA Director should include multi-cycle proposals in the Calls for Proposals of future Cycles.

Permanent Charge #2

ASAC praises the ALMA staff for their continued commitment to the Observatory despite the covid pandemic and the cyber attack in 2022, and the efforts to achieve ~3500 hours for Cycle 9 and Cycle 10 readiness are good and encouraged. ASAC sees the completion rate of high frequency projects in Cycle 9 and encourages ALMA to continue exploring possible ways to favor high frequency observations within the limited resources available. ASAC shows a concern with the upcoming end of life for the 7m correlator and asks the plan/challenges to be informed.

The Board agrees with ASAC that Observatory staff deserve praise for their efforts to keep ALMA operational during the COVID-19 pandemic and also to deal with the issues caused by the cyber attack in 2022. For the completion of high frequency programs, the Board already took an action for the ALMA Director to develop a metric that will track whether or not weather conditions are being used optimally for high-frequency projects to assess if further tweaks to the queue boosting of high-frequency projects are needed. The Board considered it appropriate to develop such a metric for tracking the optimal use of high-frequency weather when it was available. The Board would like the JAO to keep the ASAC informed about the plans to commission the baseline correlator for 7-m array observations in Cycle 11.

Permanent Charge #3

ASAC is happy to see the continued positive trends for ALMA publications in 2022, and recommends continuing to monitor publication statistics to assess the impact of the pandemic-related 2020 shutdown. ASAC requests to see the publication statistics of the Large programs to see their impacts. For the regional balance, ASAC requests to have the further statistics to see the publication efforts in different regions, including the publication statistics normalized by the size of science communities and the citation rate statistics for each region. ASAC notes that the delay between data release and publication date has increased systematically over the years, and requests more data to investigate its origin. ASAC proposes to have the statistics of public outreach activities in every several cycles.

The Board is also pleased to see the healthy number of ALMA publications in 2022 and agrees that it is important to continuously monitor the trends to see the impact of the pandemic shutdown as well as the impact of the Large Programs. The Board recommends *not* to compare the citation rate statistics for each region, as we consider that ALMA is a single observatory. The Issue of publication delay is potentially significant and needs further analysis. Comparison with the situation of the other large facilities is also useful. The Board consider it needs to further clarify the benefits of requiring successful PIs of LPs to submit semi-annual reports on the progress of their surveys to the ARCs.

Permanent Charge #4

ASAC supports the new algorithm in DPR to match the expertise of reviewers, and limiting the number of proposal-sets per reviewer. The outcome of the Cycle 10, especially for the new features such as joint proposals and Band 1 should be keep informed. ASAC strongly encourages the observatory to keep improving the algorithm for DPR; ASAC considers it important to make sets of proposals that include only similar topics whenever possible. ASAC reiterates the urgent need to keep improving the stage 2 process, with a concern about a loss of diversity of science targets due to DPR.

ASAC remains concerned about the impact of Large Programs on the diversity of the science portfolio of ALMA, and requests a charge to evaluate the scientific impact of programs of different sizes with a focus on the balance between Small and Large Programs.

The Board considers that the algorithm in DPR should be continuously updated and improved based on feedback from ASAC and the user community. The Board also understands that ASAC does not want to go back to the previous PRC process but considers that DPR still needs to be improved. For the effects of Large Programs on the science field diversity, the Board sets a new *ad hoc* charge to ASAC (see below). It is also important to keep the community educated that careful reviewing by every ALMA proposal PI is essential to make DPR work effectively.

Permanent Charge #5

The ASAC conveys that the three regional Science Advisory Committees (SACs) continue to report *significant user dissatisfaction with the DPR process, which includes (1) unsatisfied feedback, (2) poor expertise matching for minority fields (3) ineffective stage2. ASAC strongly encourages the observatory to prioritize experimentation and modification of DPR in response to user feedback. All regional SACs express their concern that ALMA seems to be resource-limited state and ASAC is concerned about the resulting delays, descoping, and phasing out of scientific activities that are broadly considered critical for innovation by the user community (examples include, but are not limited to, multicycle/monitoring proposals).*

For the improvement of DPR, see also the response to the Charge #4 comments. For the concern about the "resource-limited state", the Board considers that WSU development is indeed a high priority task for critical innovation and as second priority, bringing in new operational modes is inevitable given the available resources of ALMA. As mentioned in the response to Charge #1, however, the Board supports investigating the impact of multicycle proposals so that they can be implemented in the future cycles if possible. Other new observing modes will have to be re-assessed after the upgrade of the digital signal chain.

Permanent Charge #6

ASAC strongly endorses the Band 2 wide-band receiver development project and supports all the ongoing studies/projects, and commends the regional executives for developing an exciting set of future capabilities. ASAC expresses strong support for continued development of the ALMA archive and strongly recommends that the Archive group to conduct a survey of the full ALMA community to inform priorities for future development. ASAC remains concerned about the development of the Next Generation Observing Tool and would like to see a full update and status report at its Fall meeting.

The Board appreciates the endorsements of the ASAC on the Band-2 wide-band receiver development and the support for the regional development studies and projects. For the NGOT and the Next-Generation Correlators status, the Board takes the actions to have their reports for the current status and the future prospects in the upcoming Board meeting in November.

The Board sets a new ad hoc Charge to ASAC.

Ad Hoc Charges #1

Evaluate the scientific impact of programs of different sizes with a focus on the optimal balance between Small, Medium, and Large Programs.

Board requests ASAC to evaluate the scientific impact of programs of different sizes with a focus on the optimal balance between small and medium proposals, and Large Programs. The Board also welcomes ideas on how such an optimal balance can be realized.