



ASKAP update for April 2021

In this issue we report the commencement of quality gate observations for Pilot Surveys Phase II and provide an update on processing priorities. We also give an update on the impact of tropical cyclone Seroja.

Beginning Pilot Surveys Phase II

After ending the 2020 consolidation period with an intensive Christmas observing session (during which SWAG-X and RACS-MID observations were completed), we have been ramping up towards science operations for Pilot Surveys Phase II.

Our goals for the first quarter of 2021 were to finish processing data from Pilot Surveys Phase I and conduct technical test observations for the Survey Science Teams to verify changes made during consolidation.

Each of the Survey Science Teams was free to nominate its own technical test requirements and there has been a wide range of requests. A few teams had no major concerns, while others struggled to obtain viable data in Phase I due to major issues with certain observing modes.

Processing of Phase I data is ongoing, with several FLASH and DINGO scheduling blocks still to be completed. POSSUM Phase I data has been processed, but not all the required products were delivered due to lack of a suitable off-axis polarisation leakage calibration routine.

Key issues arising from Phase I have been identified, but the solutions to these issues require varying amounts of

time and effort. This means that some of the Survey Science Teams are ready to begin Phase II before others.

Given these circumstances, we have decided to begin quality gate observations based on each team's individual readiness. This increases the load on our already stretched disks but was deemed an acceptable compromise during the iterative quality gate phase.

Our goal is to finish processing the SWAG-X observatory project and Phase I data during quality gate analysis, in time to deliver the best throughput for Phase II science targets. RACS-MID data are averaged to 1 MHz frequency resolution at recording time and therefore use much less disk space. These files will likely be moved to an alternative partition for processing.

Processing priorities and data management

The scheduling blocks that remain in the processing queue are all full-resolution spectral line observations which use a large amount of disk space. FLASH uses a shorter integration time of 2 hours and has many scheduling blocks, each of which take roughly the same amount of time to process as a deeper integration. Having been observed recently, SWAG-X data are still on the main disks, not the Phase I tape archive. It is therefore most

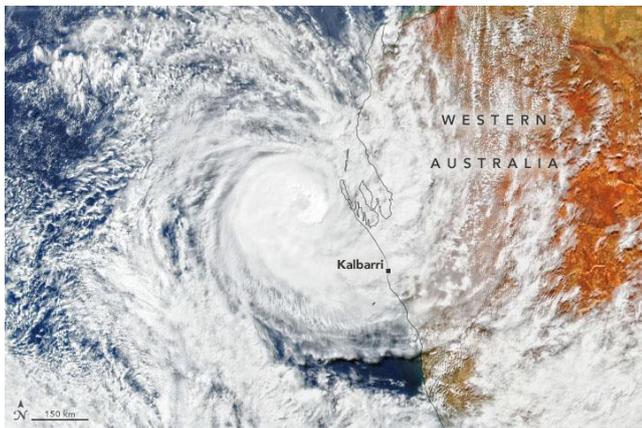
efficient to prioritise the SWAG-X blocks, which are also of interest to several science teams.

Our planned Phase II workflow does not involve tapes but relies on scheduling blocks flowing through the disks smoothly to avoid creating a backlog. Clearing SWAG-X will let the Phase II quality gates move up in the queue.

Tropical Cyclone Seroja

During the evening of April 12th, category 3 tropical cyclone Seroja crossed the coast of Western Australia between Kalbarri and Geraldton. Although ASKAP itself was relatively far from the cyclone's path, the Murchison Support Facility (MSF) in the coastal city of Geraldton was close to the cyclone's landfall point. The MSF provides a base of operations for staff working weekly shifts at the observatory.

We are pleased to report that there were no injuries and no damage to the MSF or MRO. However, the cyclone caused significant damage to other properties and power infrastructure along the WA coastline and its inland track.



Tropical cyclone Seroja approaching the WA coastline; NASA Earth Observatory Image of the Day for April 13th, 2021.

ASKAP operations were suspended, and the antennas stowed about 12 hours prior to landfall. Effects at the observatory were minimal, with wind speeds remaining below 65 km/hr and only 5 mm of rain.

Loss of grid power to Geraldton, the MSF and surrounding regions has been the main cause for concern. Roughly 30,000 people were without power for several days and the network repeater stations that support the link from ASKAP back to Geraldton and Perth have been running on battery backup or generator power. Given the increased

risk of sudden network loss and the disruption to MSF operations, we kept ASKAP in standby mode.

Damage to power lines was significant, but as of the 15th, services have been restored to some parts of Geraldton (including the MSF) and we have now resumed normal ASKAP operations.

Australia Telescope User's Committee

Every year the Australia Telescope User's Committee (ATUC) meets to assemble a report containing user feedback for the ATNF. Although ASKAP operates differently to other ATNF observatories (conducting autonomous survey observations instead of being operated by astronomers) it still has many widely distributed users in the survey science teams. At the ATUC open session we presented updates on the Pilot Survey program and an overview of ASKAP's autonomous operations model, as well as observing efficiency statistics for Pilot Surveys Phase I. We were able to observe for 30% of all available time during Phase I and expect to improve on this for Phase II.

ASKAPsoft Version 1.1

In advance of Pilot Surveys Phase II, we are rolling out a major update to ASKAP's data processing software package, ASKAPsoft. This is based on a core imaging library called YandaSoft, which was decoupled from ASKAP-specific code to better support future SKA-related developments and portability to other platforms.

The development of YandaSoft has been proceeding rapidly, but changes have not routinely been rolled into the ASKAPsoft release. This caused delays in being able to access improvements and bug fixes.

We have now transitioned ASKAPsoft to a git-based repository and tightened up the integration with YandSoft to enable more frequent releases. Unfortunately, the first release under the new scheme involves many backlogged changes, which have caused some unexpected issues during regression testing on existing data. ASKAPsoft version 1.1 is available for testing on the Galaxy supercomputer but has not yet been made the default module. We hope to fix a few issues with the release and deploy version 1.2 soon, as the new operational version. A full list of new features and enhancements will be presented at the May science forum.

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