ATUC: Session 3 Upcoming Instrumentation

ATUC meeting
9 April 2025

Management of ATNF Projects

Mark Bowen

ATNF Program – Project Portfolio Management

ATNF Project Management

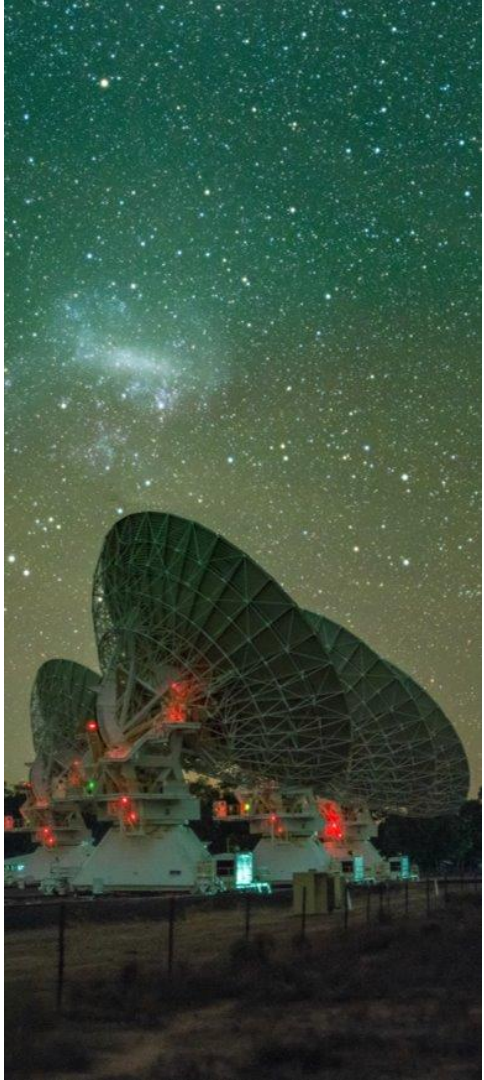
- The new ATNF structure enables a change in the way ATNF projects are managed
- ATNF projects will be managed as a 'portfolio' by the ATNF Leadership Team
- Integration and visibility of: Software and Computing + Operations + Science project delivery
- Coordination between ATNF Program Director, 'Heads of …', and 'Chiefs …'
- S&A Project Review Board (PRB) reporting focussed on issues that require input from S&A leadership
- Goal is to assist Project Leaders in managing their projects:
    1. Improved coordination between ATNF projects
    2. Regular meetings of the leadership of ATNF projects as a group (i.e. PL, PS, PM, PE)
    3. Focus on management of issues, exceptions, relative priorities within ATNF rather than progress reporting (i.e. what do you need)
    4. Reporting overhead minimised – fit for purpose
- Common framework for management of the portfolio of ATNF projects
- Guidelines flexible enough to accommodate different types of projects

Implementation

- Timeline for implementation under development – Stage 1 in place for next PRB (October)
- DRAFT plan – preparing for discussion with Project Leadership

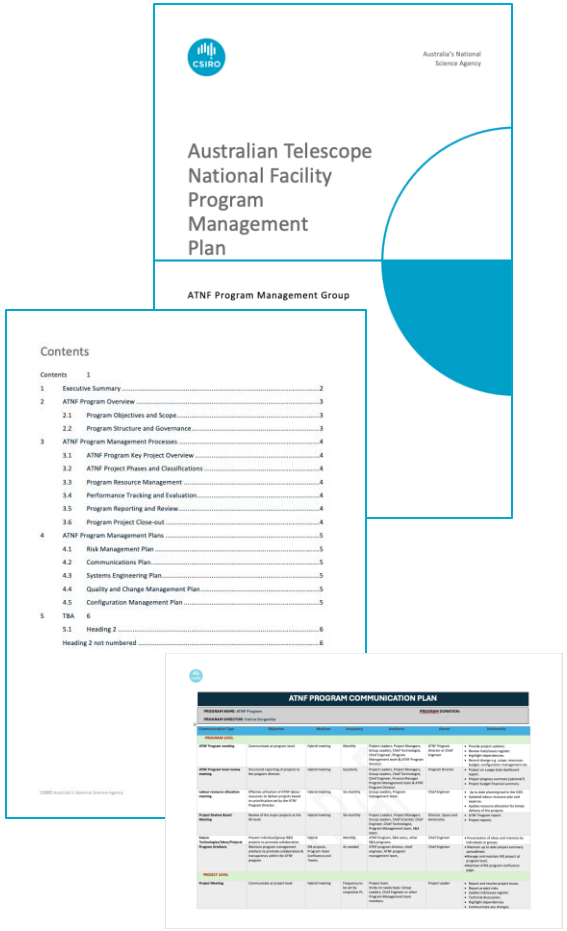
PRB Reporting – Project Portfolio Showcase

- ATNF Program Showcase based on Enterprise Project Management Office (EPMO) – Program reporting template
- Individual projects may present at the S&A PRB if there is a specific need (e.g. showcase a major result, etc.)
- Work-in-Progress – PRB asked for feedback on content



ATNF Project Management Plan

- Framework and guidelines for management of the portfolio of ATNF projects
- Plan currently a skeleton with major headings defined
- Plan based on CSIRO EPMO template
- Plan developed and implemented in stages:
    1. Initial priority – Project management, risk management
    2. System engineering, configuration management

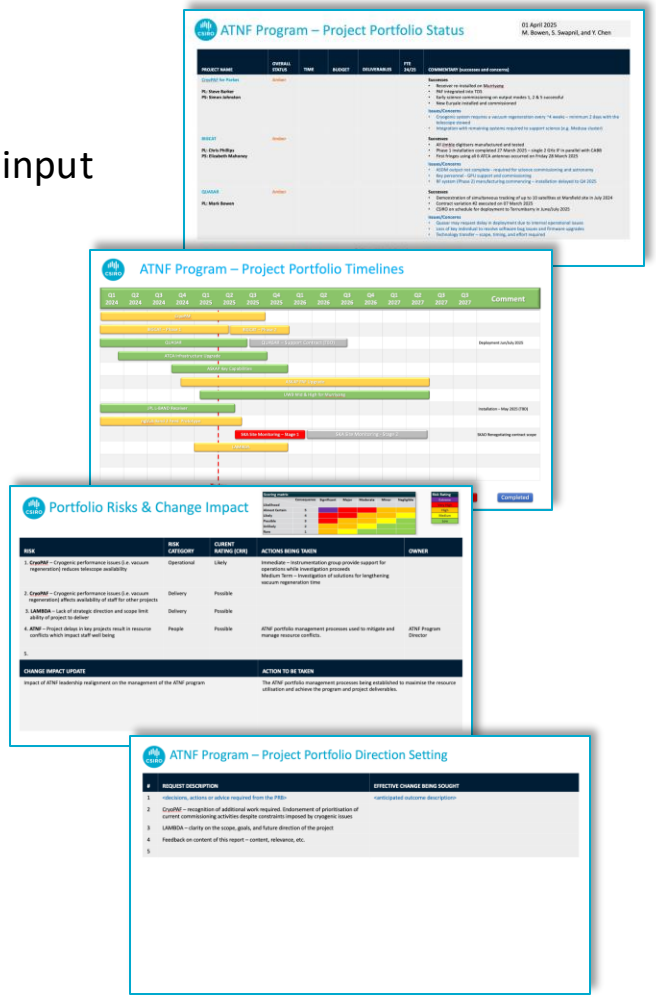


Communications Plan

- Project management related meetings – cadence, scope, etc.
- DRAFT plan – preparing for discussion with Project Leadership

ATNF Project Portfolio Showcase

- PRB reporting focussed on issues that require S&A leadership input
- Proposed as the primary means of reporting to the S&A PRB
- Based on an EPMO Program Report
- Snapshot of the portfolio of active ATNF projects
  - Based on individual project dashboards
  - Summary of the status of each project
  - Successes and issues/concerns
  - Visibility of the timelines of the portfolio of projects
  - Risks and impact of changes
  - Specific requests for feedback from the S&A PRB
- Work-in-progress – report will be refined based on feedback



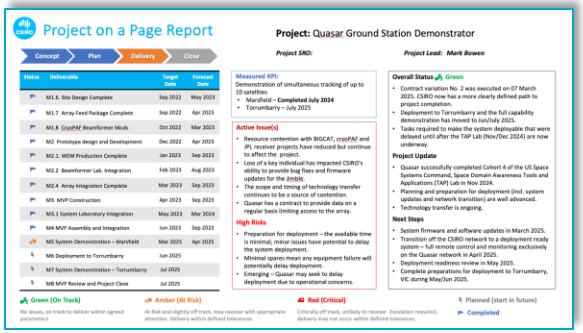
ATNF Project Reporting

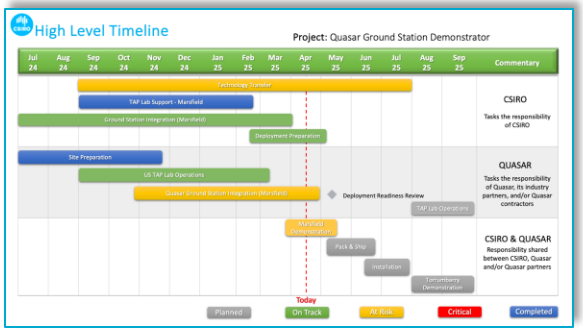
ATNF Portfolio Review Board/Committee (TBD)

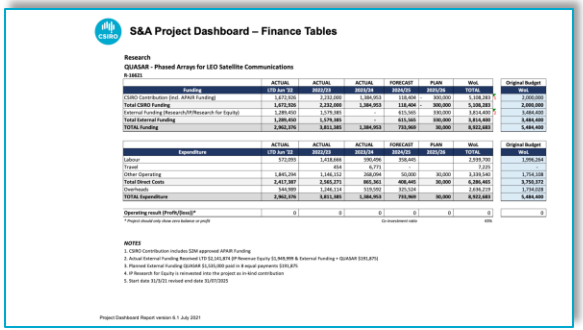
- Project reports based on the existing EPMO 'project dashboard'
- Reviews all ATNF projects (i.e. progress, schedule, finance, issues, etc.)
- Small-scale R&D projects reviewed/discussed (TBD)
- Meets every 3 months (TBC)

S&A Project Review Board (TBC)

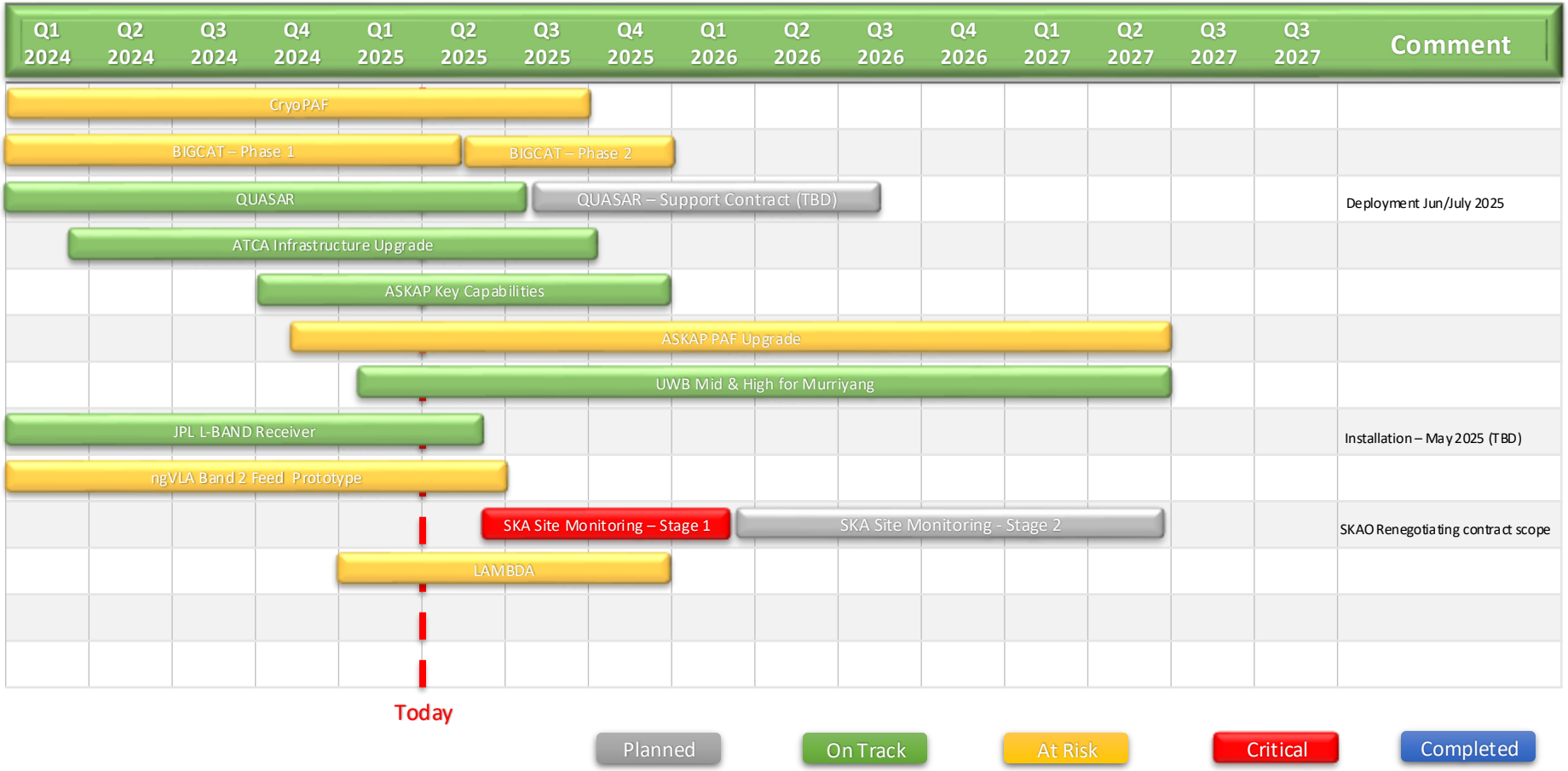
- Approves/endorses S&A project proposals and significant changes
- Sets relative priority of RU projects/portfolio (e.g. to resolve manpower conflicts – across programs)
- Meets every 6 months (March and October)







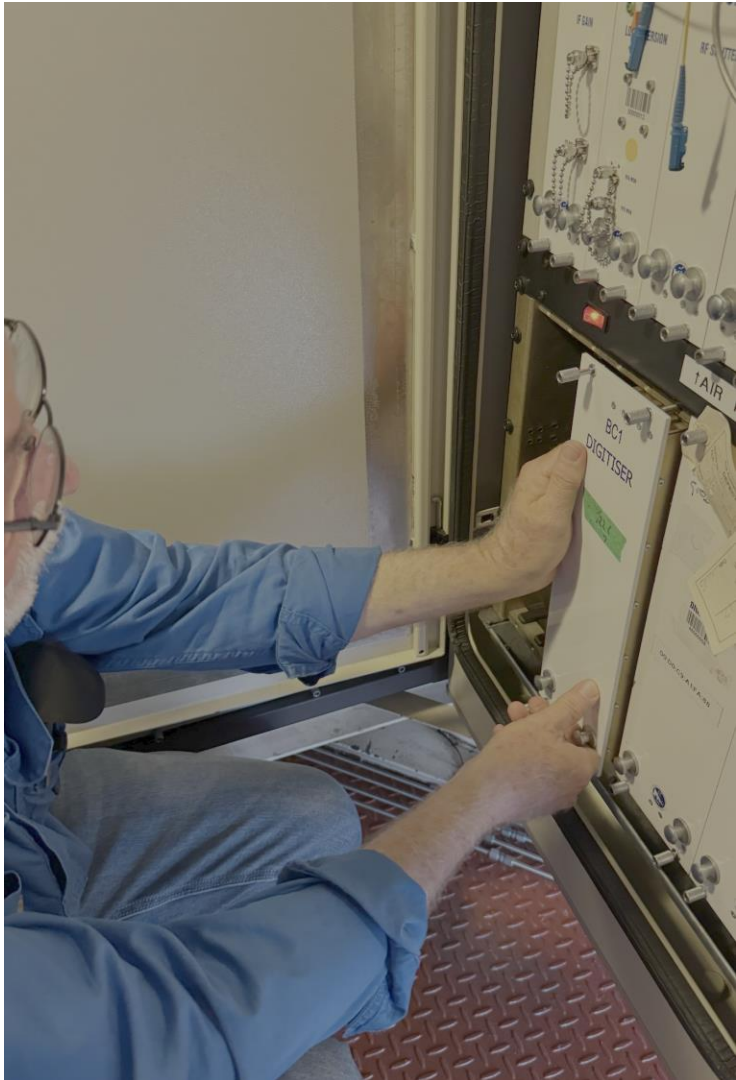
ATNF Program – Project Portfolio Timelines



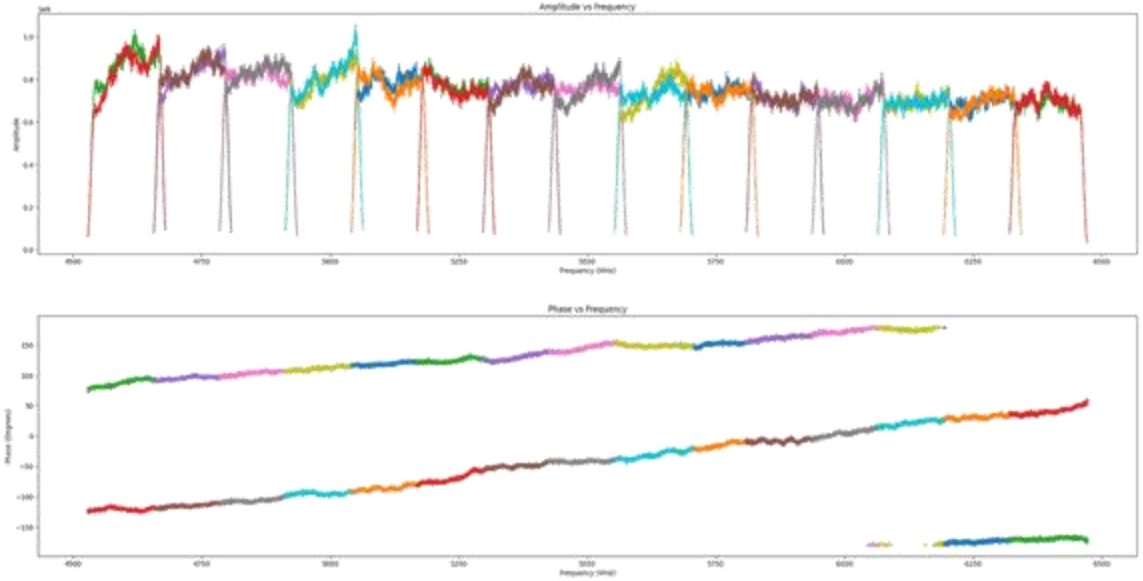
Status of the BIGCAT project - Chris Phillips

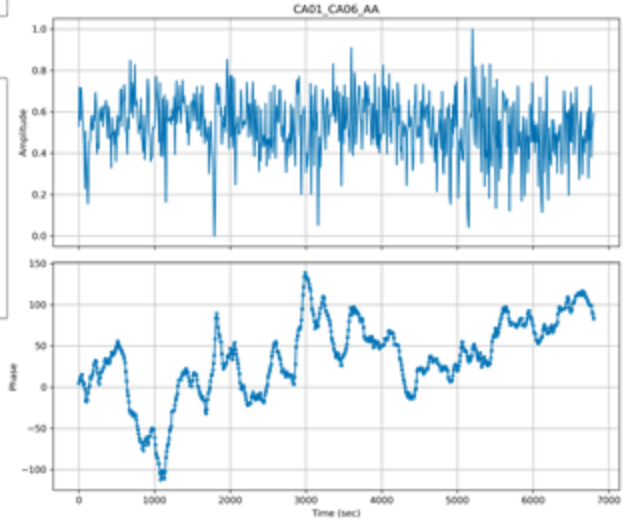
Commissioning Started!!

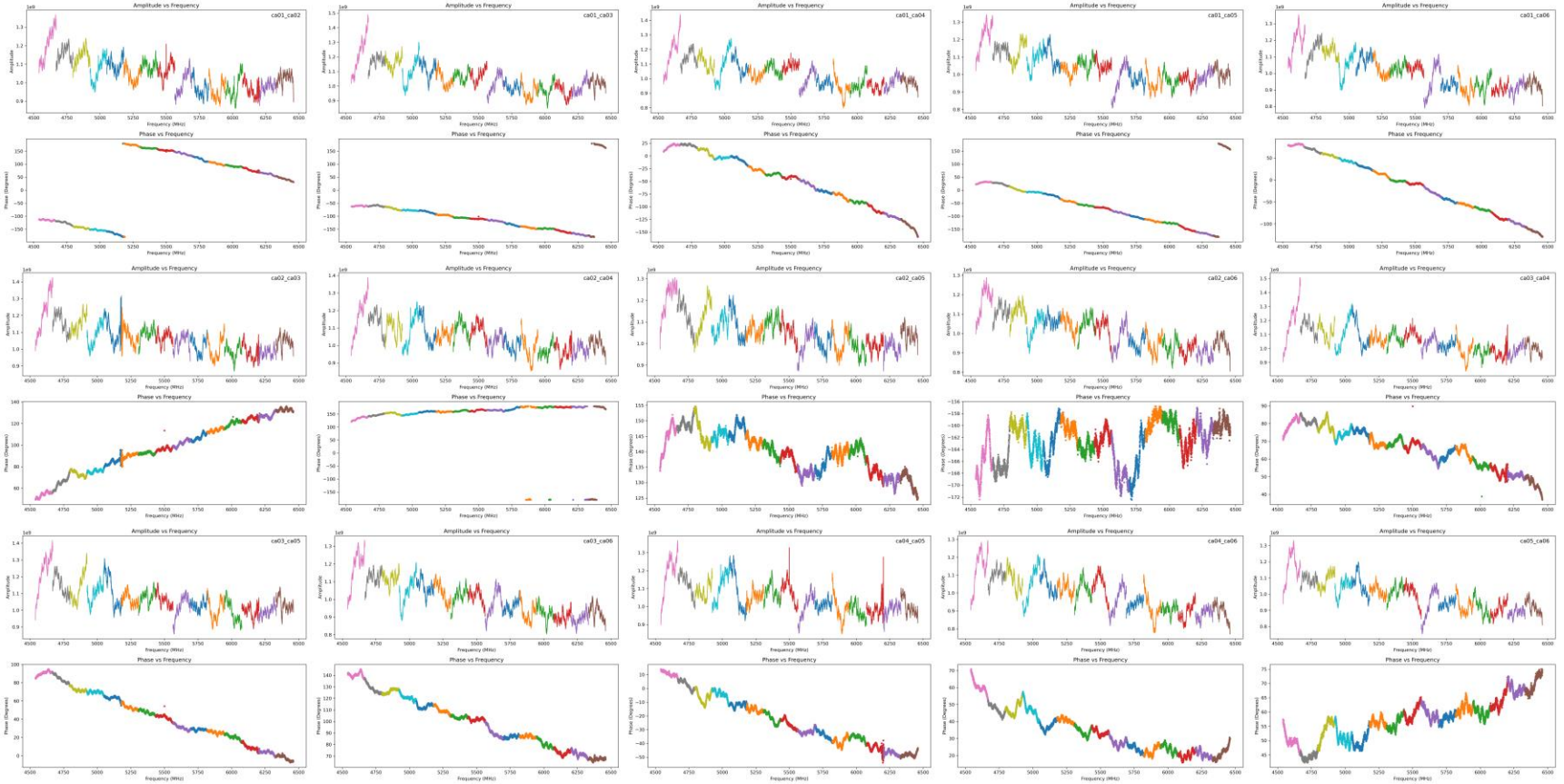
- Jimble digitisers installed in all 6 antenna (28 March)
  - Fringes obtained from all 6 ants on same day
- Engineering commissioning underway
- 1x2 GHz dual pol, using CABB conversion
  - 1x2 GHz CABB IF remaining for comparison
  - Can run in parallel, but single source
- Will transition to 2x2 GHz BIGCAT over next few weeks
- Already identified 2 subtle phase problems with CABB IF (not BIGCAT hardware)



Visibilities






Amplitude vs Frequency
ca01_ca02
Phase vs Frequency
Amplitude vs Frequency
ca01_ca03
Phase vs Frequency
Amplitude vs Frequency
ca01_ca04
Phase vs Frequency
Amplitude vs Frequency
ca01_ca05
Phase vs Frequency
Amplitude vs Frequency
ca01_ca06
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ca02_ca03
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ca02_ca04
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ca03_ca06
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Amplitude vs Frequency
ca04_ca05
Phase vs Frequency
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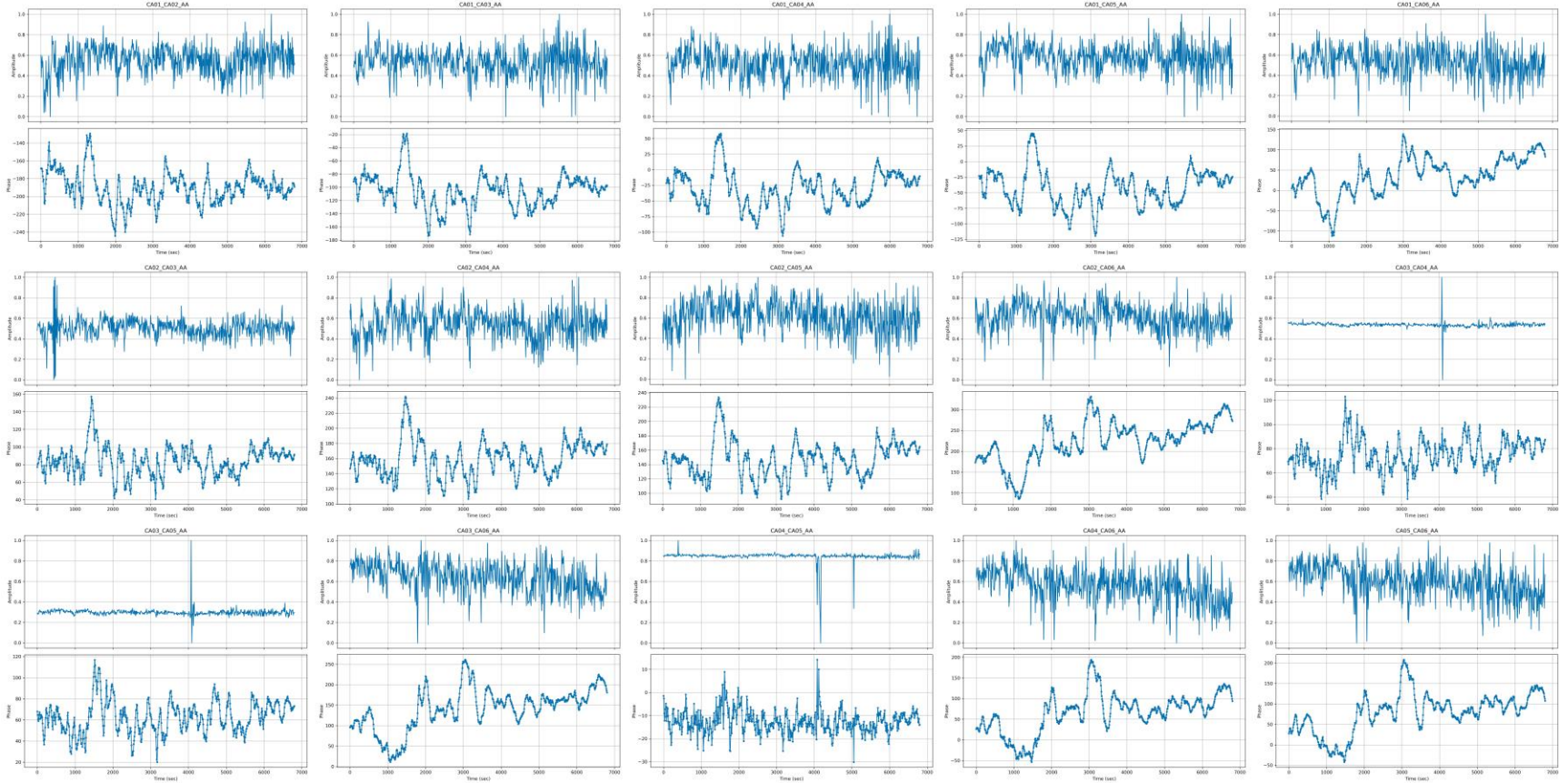
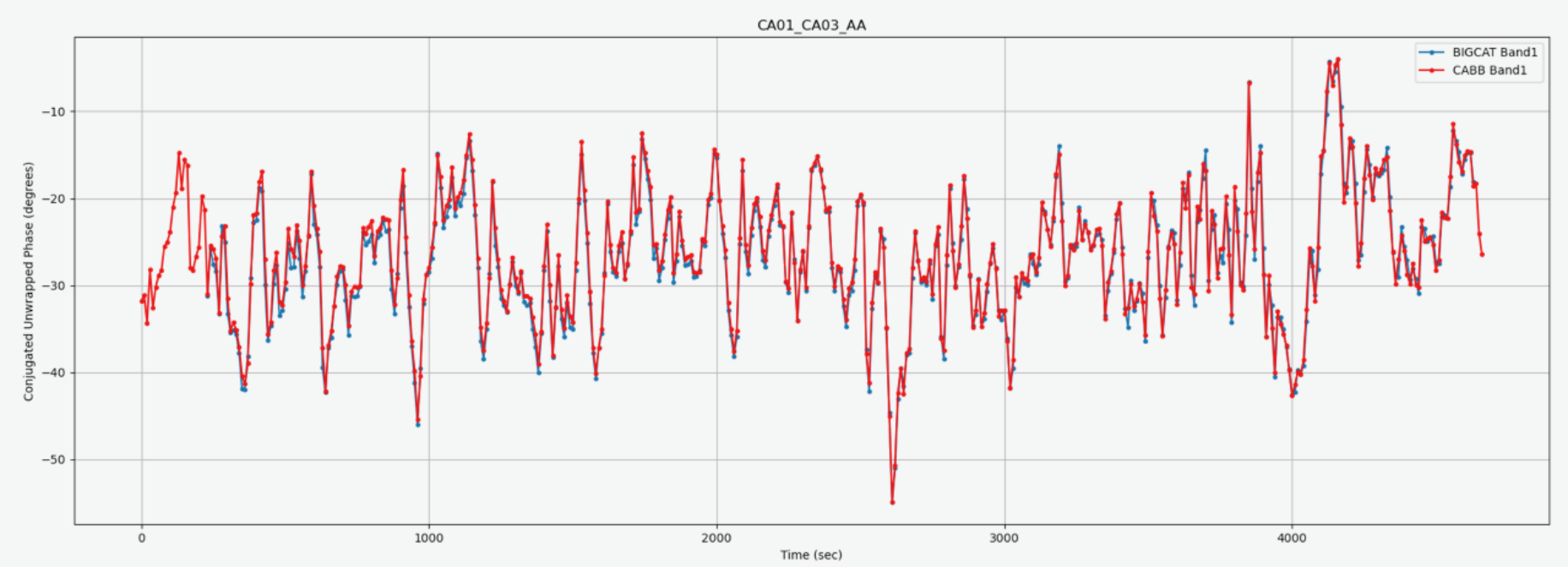
ca04_ca06
Phase vs Frequency
Amplitude vs Frequency
ca05_ca06
Phase vs Frequency
Amplitude
Phase (Degrees)
Frequency (MHz)


CA01_CA02_AA
CA01_CA03_AA
CA01_CA04_AA
CA01_CA05_AA
CA01_CA06_AA
CA02_CA03_AA
CA02_CA04_AA
CA02_CA05_AA
CA02_CA06_AA
CA03_CA04_AA
CA03_CA05_AA
CA03_CA06_AA
CA04_CA05_AA
CA04_CA06_AA
CA05_CA06_AA
Amplitude
Phase
Time (sec)

CSIRO

BIGCAT/CABB Comparison



Rough Timelines

- Engineering commissioning April’25
  - Finalising Zoombands, Tsys extraction, CASA import etc
    - Will have route to Miriad
  - Science commissioning May’25
    - Commissioning Team ready to start
  - Schedule observations starting June’25 if all goes well
    - Not hard deadline, may have gradual transition from science commissioning to schedule observations
  - Initially using CABB IF – 2x2 GHz (start May'25)
  - 8 GHz BIGCAT IF installed ~ September
    - Conflicts with major shutdown

Day Zero Features

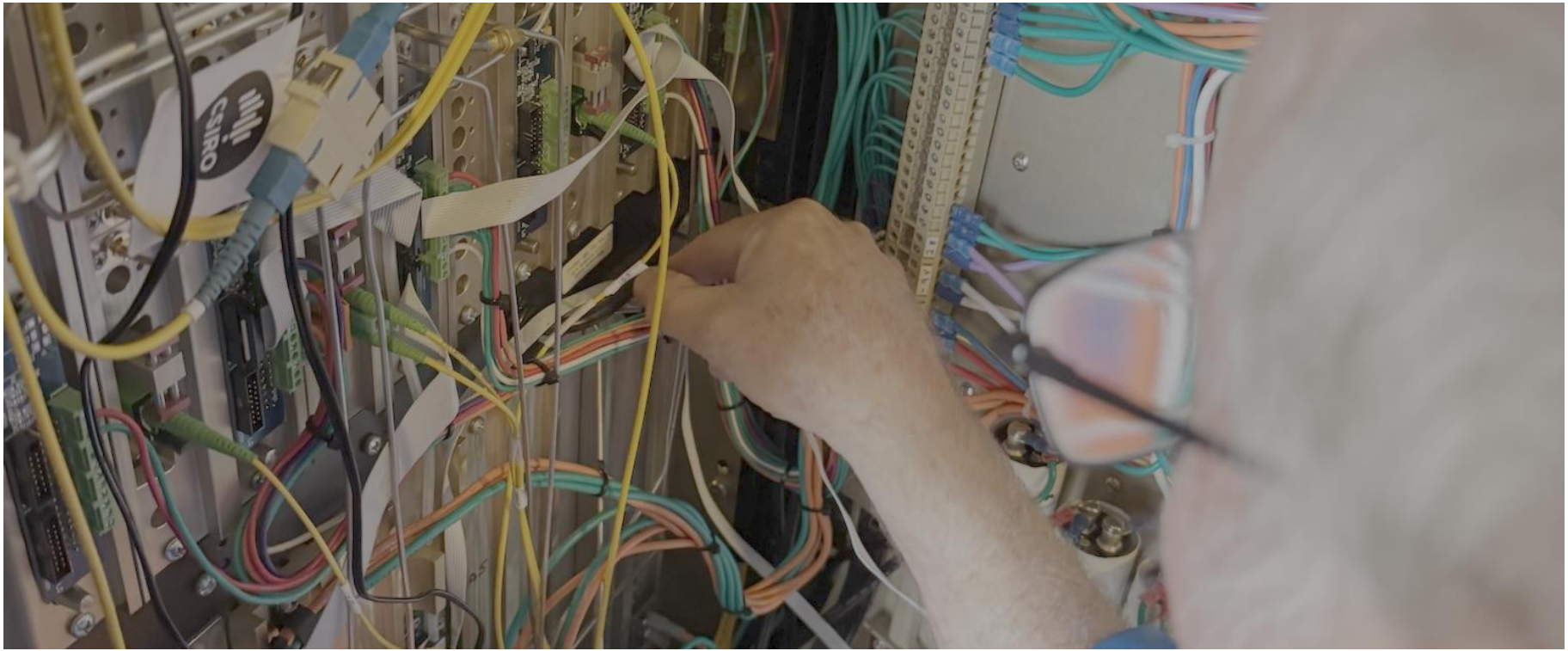
- 4 GHz bandwidth
  - Flexible integration time
  - Frequency resolution up to 10’s kHz over entire band**
- Flexible zoom setups
  - Limited set of default setups, trivial to add more
- New caobs
  - New vis/spd equivalent
- New BIGCAT scheduler
- ASDM output
- CASDA archive

** Subject to output data rate limits

Day Zero non-features

- No tied array voltage
  - Next priority after zoom bands fully commissioned
  - Single dish 128 MHz relatively easy to implement
- No subarrays
  - Basic support in place, needs extensive testing
- No Pulsar modes
- No SSA
  - Needs appropriate geometric model support
- All will be implemented over next 6 months. Expected to be ready by OCT25 semester

Stay tuned for first image (post Easter)



Status of the CryoPAF project

Simon Johnston

CryoPAF General Specifications

Frequency range of 700-1950 MHz in two bands: 700-1100 MHz and 1100-1950 MHz

Processed bandwidth of 600 MHz

T_{sys} < 20K, Tsys/eff ~ 30 K

Phased array feed with 98 dual linear polarized elements

Maximum of 72 beams (8 for pulsar timing and VLBI). FoV approx 1.5 sq deg @1.4 GHz

Rotation allows tracking in parallactic angle

The good, the less good and the future

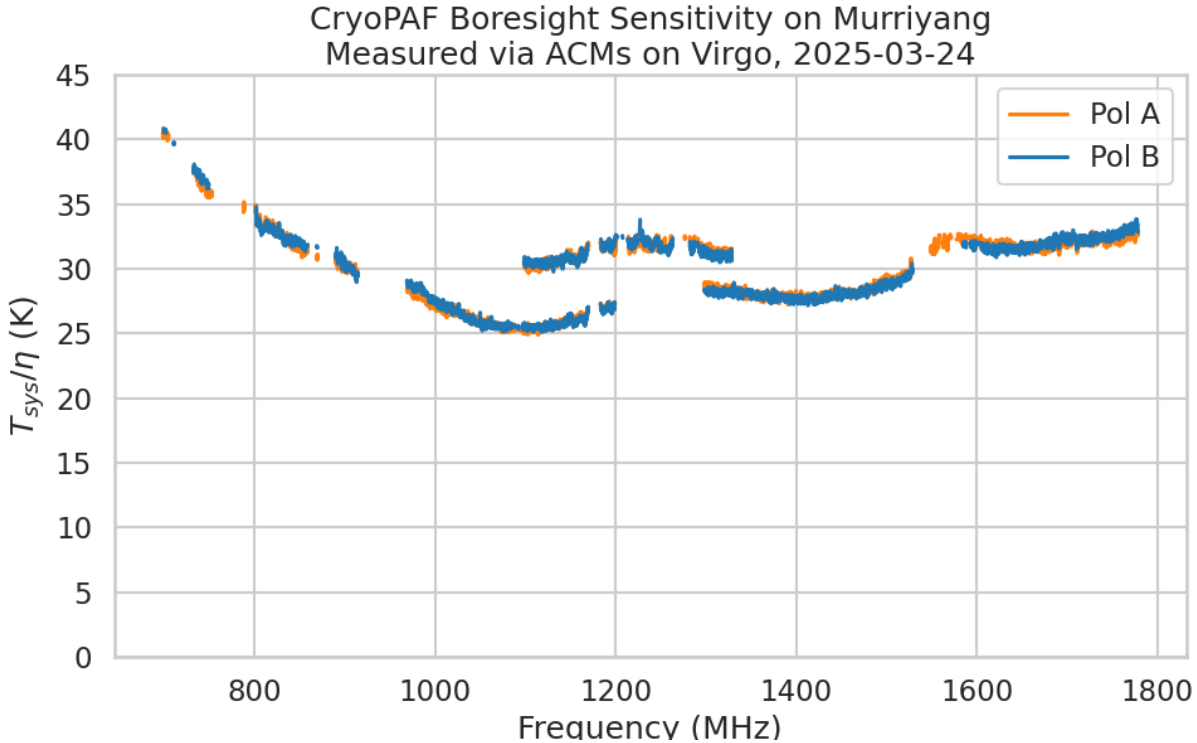
Good news

- On dish since February
- Excellent Tsys performance
- Science modes tested and working
  - Spectral line (zoom bands)
  - Search mode (high time res)
  - Pulsar-fold mode
- Full 72 beam data capture
- Progress with TOS/Garriwang

Less good news

- Cryogenic issues persist
- Only 230 MHz - 576 MHz coming in July
- Jimble (A/D) issues remain
- Black belt operation/observing
- Real time transient detection mode not yet started
- SETI mode not yet complete
- No commissioning postdocs
- No Parkes System Scientist

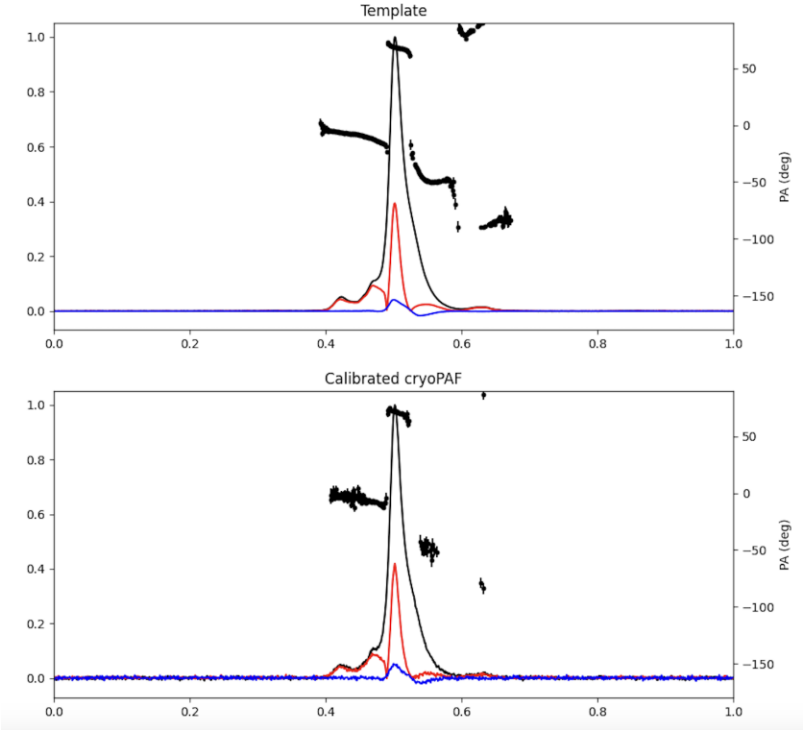
First Results – on dish testing



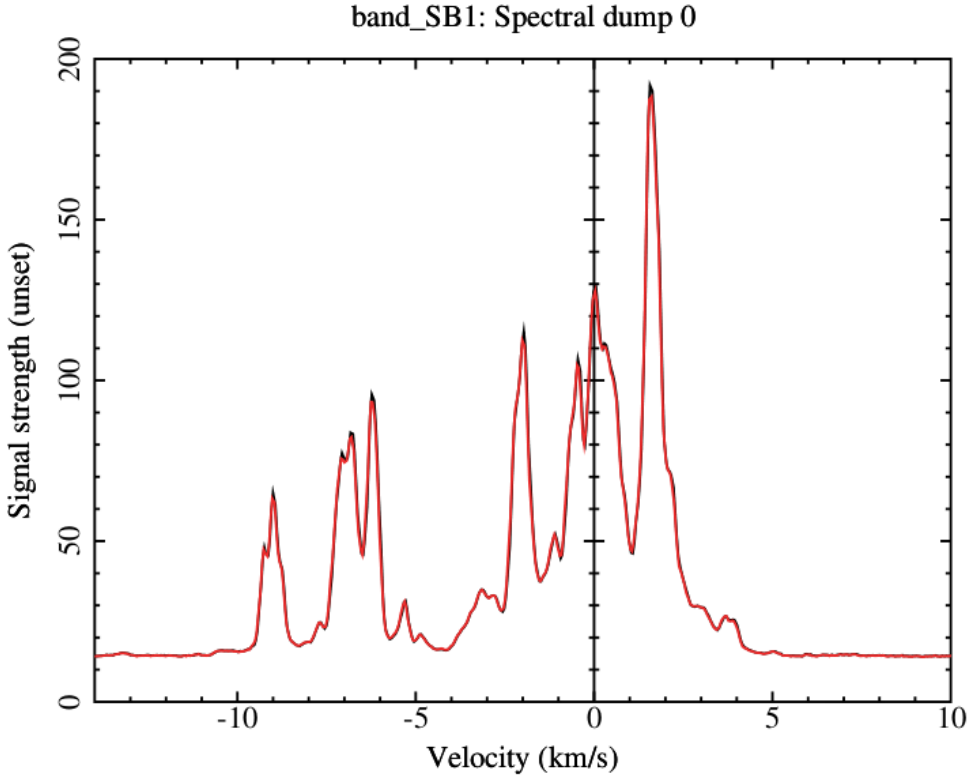
Preliminary results across the band in 230 MHz chunks (with RFI removed).

Some artifacts but overall excellent performance and a bit below the spec of 30 K over much of the band.

First Results – on dish testing

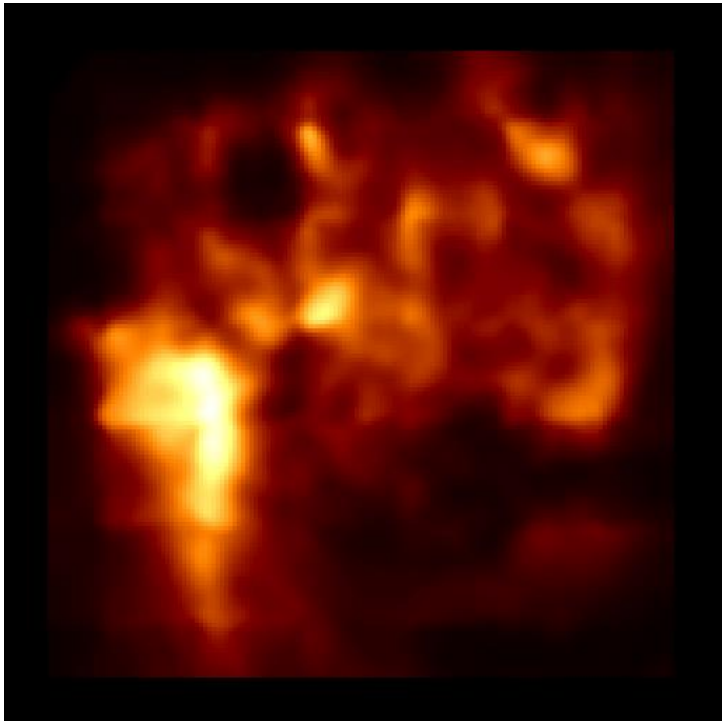


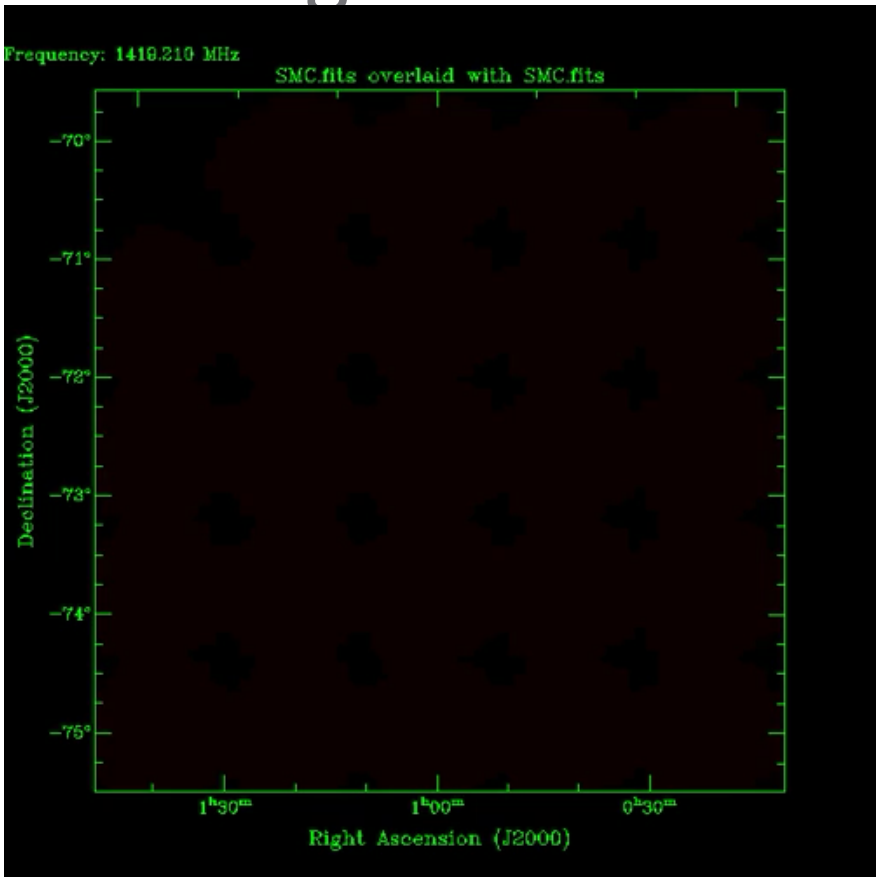
Polarization of the pulsar J0437-4715. Voltage/fold mode



OH maser spectrum with 140 Hz resolution.

First Results – on dish testing





HI total intensity of the LMC, and movie of the SMC.

The good, the less good and the future

Future

- The cryogenic issues remain a concern and solutions are being sought
- Work continues on :
  - Quantifying system performance
  - Fully shaking down the science modes
  - Making beam weights easier to compute / upload
  - System integration into TOS / Gariwang
  - Delivering meta-data to the user
  - Simplifying observing
  - Upgrading from 230 to 576 MHz bandwidth
- 1 April semester – shared risk observing will start soon
- 1 October semester – 600 MHz bandwidth, push button observing
- 2026 : real-time transient detection, user-driven modes, beam footprints etc