ObsMode Summary Report

ALMA Technical Note Number: 4

Status: FINAL

Prepared by:	Organization:	Date:
Anthony Remijan (ALMA Program Scientist for Extension and Optimization of Capabilities)	JAO/NRAO	24 June 2014

MEMORANDUM

To: EOC Team Members

From: Anthony Remijan, ALMA Program Scientist (EOC)

Date: 11/16/2014

Subject: ObsMode Summary Report

Members of the EOC team attended the ObsMode meeting held in Socorro NM, 14-16 Apr 2014. During that meeting, EOC was charged to generate a schedule of priorities that will need to be commissioned over the course of the next several months and until the end of the calendar year. It was noted that the commissioning efforts would be closely coordinated with both the Pipeline and ALMA OT development cycles. For the ALMA OT specifications, Alan et al. are working towards the following timeline:

OT Timescale Phase I:

Call		25 Apr
Acceptance		15-22 Apr
Validation/User Test	Phase C	1-10 Mar
Verification	Phase B	1-28 Feb
Code Freeze		31 Jan
Spec Complete		31 Oct 2014

OT Timescale Phase II:

Start Observing		1 Oct
Deployment/boot cam		1 Aug
Acceptance		20-27 Jul
Validation/User Test		1-10 Jun
Verification		1-31 May
Code Freeze		30 Apr
Spec. complete		31 Jan

EOC was charged to bring the specifications of the expected new modes for Cycle 3 observing to the ALMA OT working group, including all the anticipated metrics and algorithms, by the "Spec Complete date" - nominally set for 31 Oct 2014. These specifications can be modified slightly after that date but all activities EOC believes to operate under the normal Cycle 3 observing modes must be included by that date. Also, based on the EOC testing and the projected observing campaigns, it is possible to "de-scope" these specifications before the call for Cycle 3 observing. For the Pipeline, while EOC will continue to test new observational protocols, it is unlikely that many of these will be included into routine Pipeline calibration operations including Polarization observations requiring the use of Sessions in the OT and advanced observing techniques necessary for the long baseline effort. It was suggested that <33% of the total amount of observing time be allocated for these types of observations so that the calibration of the other programs can be done solely from running the pipeline. However, this is still under consideration depending on type of observing parameters considered and the nature of the problems. For example, if we have shown that some EBs with Band-to-Band transfer are working properly and we know what is preventing the others from working (e.g. we have the requirements for a fix to correct the issue) then we can consider offering it outside of the experimental mode.

The prioritization of the EOC activities over the course of the next 9 months included priorities ranging from 1-3. Priority 1 items are those that we MUST get done whereas priority 3 items are nice to have but are seen not as important as the priority 1 items. However, a priority 3 item may be done if it can be done quickly or possibly with help from outside EOC (e.g. ARC support). In addition, weekly priorities will be set keeping in mind the global priorities for the rest of the year (e.g. A Science Verification observation may be a top priority for a week, especially during the long baseline campaign, even though it is listed globally as a priority 3). As a result of that process, we came up with the following "strawman" schedule of priorities (shown below):

2014

Activity	Priority	April		May		June	
10.4 testing	1						
Add check source intent into 10.4 after acceptance.	1						
High Precision Ephemeris (Iapetus)	1						
Sessions testing (Polarization)	1						
10.6 testing	1						
TP testing/non-linearity/TP on Baseline Correlator	1						
Online WVR correction / baseline run with wvr correction/mixed modes	1						
Bandwidth Transfer	1						
AIV+ (Bands 9 & 10)	1						
10.4 - first order temperature dependent focus parameters	2						
Daytime Observing (Pointing/Focus/cycle times)	2						
Polarization FDM observation	2						
B2B	2						
Single Dish Sideband Separation	3						
Science Verification	3						
Sessions testing (daytime and short runs for pipeline)	3						

90 degree phase switching	3															

		July			August			September		
Bandwidth Transfer	I									
Fast Scanning for calibration	I									
Online WVR correction / baseline run with wvr correction/mixed modes	I									
AIV+ (Bands 9 & 10)	I									
Total Power/non linearity tests	I									
2014.2 testing & validation	I									
Astroholography	I									
5km Baselines in bands 3,4 & 6 (w/o CASA fringe)	I									
Fast focus	2									
90 degree phase switching	3									
Grid Survey Calibrator Refactoring - work with Pipeline on Reduction	3									
2014.2 - Multiple Intents inside an SB	3									
2014.2 - new algorithm and implementation for the dynamic shadowing limit	3									
Science Verification	3									

		October			November			December		
2014.2 testing & validation	I									
Total Power/non linearity tests	I									
AIV+ (Bands 9 & 10)	I									
5km Baselines in bands 3,4 & 6 (w/o CASA fringe)	I									
2 km baseline in band 9	I									
3 km baselines in band 7	I									
Imaging of grid sources as resolved calibrators	I									
Provide Pipeline long baseline "science like" SBs	I									
Solar Commissioning/Science Verification	I									
Science Verification	3									
OTFi	3									

This schedule will be posted to the EOC wiki and is of course subject to change based on EOC team input as discussed during weekly meetings and daily tagups. However, it is the current schedule that we are working towards over the course of the next 9 months.

ObsMode Meeting Notes and Action Items (Remijan):
NOTE: A full executive summary of the ObsMode is in preparation. These notes will have actions related to EOC activities that went into the above schedule. Below these notes are the individual action items as compiled by Stuartt.

Online WVR
- Need to test the online WVR corrections with more complex spectral spec testing including combinations of TDM and FDM modes simultaneously. Not sure if we have an easy way to test this in manual modes.
  - I (Neil?) have code for use by manual mode scripts to specify the correlator configuration per BB which we can use, although its not in CVS/SVN yet. It only supports one SpW per BB currently though. I guess for FDM we should also consider testing how the WVR correction behaves with multiple SpWs per BB (you can do that, right?).
  - I think that multiple spectral windows per base-band in FDM mode and WVR correction enabled will NOT work. If that's true then it would be caused by a frequency range issue as well. In my TODO list now to confirm the issue by simulation (Neil).
- We should not go fully yet to online WVR correction only.
- **AI:** There are projects where the WVR correction actually degrades the data quality. The action is for this topic to be discussed at the on long baseline campaign and to have Bojan and Richard weigh in on why this is happening.
  - It would be helpful to have a list of projects where this is happening…
- Why is the pipeline using a series of strange heuristics on how it applies the WVR corrections?
- Can we "undo" the online calibration? Right now this is enacted in Telcal. If we cannot, does this violate the high level plans of being able to undo the online calibrations? Think it is okay so long as it can be done at the ARCs. Does it have to stay with Telcal?
- **AI:** If we are going to be testing the online application of WVR corrections to Cycle 2 projects, we need a test plan that highlights how the WVR corrections/test will take place (under what weather, types of projects, what else?). Will need to coordinate with PMG on the test plan. Needs to be in place by end of June to be enacted in July and Aug before the beginning of the long baseline campaign. Also, need a plan of what to do with the ACA - which may be nothing.

Resolved Source Implementation:
- Major question for the calibrator survey is how the requisite calibrator parameters are stored in the database and used for the data reduction and the how the OT uses these data to assign fluxes. It also has things the catalog that are resolved and should not be used as calibrators for right now...take these out of the catalog altogether. Need to put min and max uv ranges on calibrators per observing frequency. Some calibrators actually have multiple positions in the database as well.
- Needs DRMs
- Needs Pipeline
- Subsystem Scientist Group Meeting to discuss some of these issues?
- Maybe will be available for Cycle 3 IF we start working on the effort now.
- **AI:** Form a calibrator database working group. Need to define from the EOC side who will work with the SSR requirements for the calibrator database and on the database side, how to properly structure the database for ease of use. Deliver a shell of requirements by the ICT-CPM3 meeting.
- **AI:** Will need to cleanup the catalog...Rudiger and Masao to work on that effort. No resolved sources should be used in Cycle 2.

- **AI:** Where we are for the status report on what is contained in the database and how the requirements are set?

Non-self selection Criteria:
- No min phase calibrator needs to be/will be assigned for Cycle 2. All projects will have an explicit phase calibrator and passband.   Will check this thru the pipeline first though to ensure that the pipeline can handle it.

Dynamic shadowing limit:
- Control has the action of flagging things that are up at the AOS. Needs to know the algorithm for how the shadowing calculation is done. What is the simple algorithm that does this? Need to get to the 80% level to ensure this works...will be able to do this on the OSS on the real STE.
- How many SB fails because it cannot find a proper bandpass calibrator?
- **AI:** Action to Masao to find out and what priority is the item (Tony and Masao)...
- **AI:** Paulo to take the action of working on this once the priority is set.

Other:
- Accuracy of the pointing precision in using the actual type of number (integer, float, etc…)
- Check sources - is the OT doing it wrong? Have a different field source than the phase cal
- What is the criteria for the check source source selection?

Sessions Consideration:
- The objective of a session is to optimize the execution of the required calibrations in order to improve the overall efficiency of an ALMA observation. Thus, a session is defined as the consecutive N executions of the same scheduling block, where N is the number of consecutive executions.
- What is the time stability for bandpass? - when and how many times do you need to observe the bandpass?
- **AI:** Need to continue the commissioning especially for Cycle 3. Need to get at least as many use cases as possible to:
    - Test the operations of the sessions - Paulo tests
    - Have Eric look at the data after sessionized data taken, edit script and convey these information to the Pipeline working group
    - Make sure Lindsay and Jeff know about the data taken during EOC weeks.
    - Stuartt, Lars and Masao will take a piece of the ES data and run them in the sessionized data format and provide these cases to the Pipeline working group.
    - Need to have a short set of data that runs many sessions so that the pipeline can use it to work on the heuristics.
- **AI:** For the work next week, need to absolutely let Lindsay, Todd, etc… know if the data are ready to be looked at by the Pipeline group. Everyone is already on the JIRA ticket as watchers...best I send a clear email later when the right SB is ready to be looked at…

Cycle 2 until Pipeline can do it – When to use Sessions?
- Polarization -> YES (about 33 projects accepted for Cycle 2 will have the sessions flag ON)
- (large) mosaics -> NO (about 109 projects accepted for Cycle 2)
- Long and (long) multi-target (NO)
    - Not by definition only for about 20 selected projects that will be used for the commissioning and testing of sessions.
    - Need to let P2G know NOT to put the Sessions flag into the OT - flag OFF

- o   Will be reduced by hand and delivered to PIs.
- (long) spectral scan and Multi-target, multi-tuning
  - o   P2G builds as multiple SGs - NO
- Solar System Objects spectral line observations – NO

Current Time estimate Metric when using Sessions
- Session Max savings 2 hours per 4 hours continuous observations
  - o   100 projects = 200 hours on sky saved
  - o   Reduced by hand 1 work week/session
  - o   100 projects = 40 hours per sessions = 4000 person hours.

Cycle 3 Building Blocks Considerations:

Daytime Observations:
Cycle time:
- Need to get the daytime commissioning plan done and the temperature correction dependence of the focus into the calibration schema for daytime…
- **AI:** Need to run and test sessions during the day to test the extra calibration needed for daytime observations. Need to define a cycle time expert parameters (ie put in the SSR so it is hidden from the user - these include bands, and time spent on different types of calibrators) so that the cycle times will be different for the daytime/nighttime observations.
- **AI:** Work with Ralph on getting the temperature correction focus factors into the next version of the online software. Linear approach first but still continues to take data for the higher order terms but at a lower priority. Need the second order terms for the higher frequency bands (9 and 10) but those will only be done at night. Also have Cristian work with the computing team to make sure that the fixes are in and work properly.
  - o   *Implement the change for 2014.2. Backport to 10.4.   The relevant ticket is:* http://ictjira.alma.cl/browse/ICT-1797

DiffGainCal:
Have to commission all three submodes here and need to offer it for Cycle 3 and manual reduction.
- Bandwidth Transfer - frequency doesn't change but only the bandwidth. Not just Phase transfer but also need to get the amplitude correct.
  - o   Are the phases stable enough?
  - o   Are the bands stable enough
- Band-2-Band Transfer
- Spectral Scan
  - o   Crystal has a script - needs to be modified for a real differential gain target. Will work for spectral scan case. Bandpass gives you the ratios and acts as the DiffGainCal. Still errors in the amplitude probably because we don't do perfect Tsys measurements. DiffGainCal needs to be close to the target and bright.
- Do we offer long baselines at high frequencies? Need to focus on the band 7 observations for the long baselines? Probably will have fully commissioned Band 3, 4 and 6 at long baselines (5 km - without "fringe")...may not have the data taken for band 7 to fully commission.
- ARCs and DSO will have to take the risks to take the data reduction effort because this will not be done by the Pipeline.
- Pipeline will need to have it demonstrated by Dec. if we needed the pipeline to have it reduced.

Perhaps 75% of the data taken in Cycle 3 will need to be reduced by the pipeline. The rest of the time the data will need to be reduced by hand.

The 25% of these datasets will be "experimental" and possibly not delivered. These types of data will be given a "shared risk" type of flag in the OT.

Check Source:
- As a function of frequency, if the number of klambda>x - added a second calibrator called a "check source"; if <x, don't do anything. Is reduced like a science target…
- One month look ahead need to cover both phase calibrators and "check sources" (1/2 as far away and 1/2 as bright) to start to cover and check the fluxes of these calibrator sources. Need to explicitly the "delay cal" in the OT and the SSR then changes it to check source.
- What is the purpose of this source?
  - Is to check that the phase transfer applied to the science target worked properly. In theory you can check that by doing a selfcal on the check source and seeing if the solutions were correct.
- Put this in after the acceptance as a change request to 10.4.
  - Add enumeration to the scan type
  - Add the enumeration type to the delaycal

Multiple Intents (Cycle 3):
- Need to verify that an algorithm is in place that the search can return the same source for phase, bandpass, etc…right now, these are completely independent searches and will produce independent sources for each calibration.

90 Degree Switching (Cycle 3):
- Bug in the system…will be fixed in about a month - mid May. This will need to be tested
- This is full sideband separation in bands 9 and 10. Will be used in other bands to determine sideband ratio.
- 32 spectral windows
- Make sure we do the online WVR correction as well…
  - Takes 2 seconds to go thru the Walsh cycle. If the atmosphere changes faster than that, that will eliminate the rejections
- Need to apply this also to the ACA correlator?
- Allow both correlators
- How many requirements do we need and when to get it in for Cycle 3?
  - No way for the user to control this right now.
  - How much control do you want the user to have over the image window? - For Cycle 3, lets give them none and reassess for Cycle 4?
- Need a simple SV target as well for testing.

Improved Single Dish Approach:
- What is the priority of this effort compared to the rest of the priorities for TP acceptance? This is completely independent of the rest of the TP acceptance testing.
- This appears to be an "edge case" - yeah we can do it and collect the data but what is the overall scientific impact of the TDM case of pure continuum observations done with fast dump rates using the BLC? Where are the science cases here to justify all this work?
- Have not taken TP down through the full scientific way…
- What else can this help us with?
  - Band 9 and 10 for focus/beamshape
  - Scientific calibration of TP detectors
  - Servo corrections applied for a larger subset of antennas

- o Software tested for a standard observing more
- o CASA reading the correct position within the map position
- o SD maps get out in the right way
- Can we use this to improve the SD spectral line capability?
  - o Will open up a lot more calibrators for spectral line sources.
- Can we do the more important parts for the commissioning but not offer it as a standard mode?
  - o YES - TelCal does the work? Eg. Focus
  - o YES - SD spectral line AmpCal
  - o NO - full science mode
- Have the TP detectors been fully commissioned? Yes but not calibrated...end to end as not been tested.
- Take out TP out of the Cycle 3 call?
- **AI:** Take maps back-to-back in raster and fast scanning modes, with AtmCals to decide if the fast scanning mode can be used for spectral line single dish amplitude calibration / beam characterization. Fast scanning data also to be used for general reduction implementation. Neil to take data for this.
- **AI:** Run the TP on the baseline correlator? Will need to be tested with potential offline corrections...Discuss with Sawada-san, Neil and Cristian about getting these data especially from archival data.
- **AI:** Get information from Takeshi about the timeline for: understanding the issues with the non-linearity corrections, the implentation of the new corrections, will this fix the spectral line problems. Try to get this before the tiger team meeting next week.
- **AI:** Need to take data in bands 9 and 10 and send the data to Shinya for reduction to test the sideband separation algorithms.

Long Baselines:
- **AI:** Need to start imaging all grid sources up through band 9.

B2B:
Only liability from CASA is that if we need "fringe"-finder?
- If George worked on nothing else, it would take him 2 months…
- Limit on the baseline length so you don't need "fringe".
  - o Q: How will we know if we need fringe if we don't currently have fringe? The best solution would be to do direct phase transfer in the band that you are observing in and that can be done using fringe.
- **AI:** Will have fully commissioned Band 3, 4 and 6 at long baselines (5 km - without "fringe")
- Is there anything at all in CASA that needs to change for it to be science ready for B2B transfer?
  - o Don't know the answer to that but will have to get back to Crystal.
  - o Need to take data only from bands 3-7 and 6-9...the bands 3-6 data were too close in frequency to see much of a change.
  - o Need to think about how to do the amplitude calibration properly between the 2 bands.
  - o Need to get far on the testing of the B2B long baseline for the long baseline effort.
- Baselines need to be very good to make this campaign work!
- If it finishes in Dec, it will be hard to get the scripts for data reduction, etc...to the pipeline in anything shorter than an month.
- Needs to have a punchlist of things that need to happen to commission the pipeline for this effort
- **AI:** Decent set of science like SBs in addition to the imaging characteristics - to provide to the pipeline for reduction and comparison.

- **AI:** Low S/N heuristics should also be connected to the Pipeline processing routine for long baselines.
- Make sure that we don't take band 3 data in band 9 weather! This tends to skew the results…
- The CfP documentation must be done very carefully and started earlier than the rest in order to get the wording and explanations. Additional effort needs to be done on both the technical handbook and primer to explain the issues with long baselines.
- Next time the array will be in the extended configuration for any commissioning will be Oct 2015.
- **AI:** Look at the bandwidth switching routines for long baselines for calibration.

FDM Polarization:
- CASA will develop a tool to analyze the data - Pipeline says you are on your own.
- **AI:** B3 FDM Spectral polarization

Below is the full list of action items that has been extracted from the list of notes taken during the ObsMode meeting. Items that directly impact EOC related activities or identify EOC staff have been highlighted in *blue*.   Please come and see me or Catherine if you have any questions on these items or do not understand the scope of work required to fulfil the action item before the anticipated deadline. Also, if you see an item omitted or something that needs to be done in order to commission any of the above modes, please let us know ASAP so we can get them prioritized and listed accordingly.

AI Number	Item	Assignee	Priority	Deadline	Status	NOTES
C3-AI-1	Based on current performance issues with Tsys roll off, define a reasonable overlap	Brogan	Medium	1-Jun-14	Open	
C3-AI-2	*Follow up on possible hardware solutions to band edge effects of Tsys, especially outside of 1/16th filter width*	*Phillips*	*Medium*	*1-Jun-14*	*Open*	
C3-AI-3	*Provide/gather a summary/calculation of the speed limits for dump and integraiton durtions from the BLC*	*Phillips*	*High*	*1-Jun-14*	*Open*	
C3-AI-4	*Add issue of why WVR correction sometimes does not improve reults to the long baseline agenda. Contact Hills/Bojan ahead of time for input. Dirk Petry (CASA) needs to be involved*	*Remijan*	*High*	*1-May-14*	*Open*	
C3-AI-5	*Gather (Remy) statistical information on how often wvr application is skipped and get the datasets together where this is an issue and look for inconsistencies*	*Fomalont/Barkats*	*High*	*15-May-14*	*Open*	

C3-AI-6	*Gather a few online wvr applied+not applied datasets to make sure the pipeline doesn't choke before using PI science projects for this. Gather some comparison datasets*	*Remijan*	*High*	*15-May-14*	*Open*	
C3-AI-7	*Ensure continued function of applywvr to remove average online application is kept up to date*	*Barkats*	*Medium*	*Ongoing*	*Open*	
C3-AI-8	Write a CASA JIRA ticket on ASDM2MS to include history table (for online application of WVR included/not included)	Brogan	Medium	1-Jun-14	Open	
C3-AI-9	Include issues regarding Telcal distributed cleanly to the ARCS on the CPM3 agenda	Corder	Medium	1-May-14	Open	
C3-AI-10	*Generate a test plan for online WVR application within the context of ES observations (coordinated with PMG)*	*Remijan*	*High*	*31-Jul-14*	*Open*	
C3-AI-11	*Get update on 16 vs 32 bit data scaling in the correlator and other data rate related issues, schedule (with reasonable priority)…if this is only TDM, not such a big deal, if it is FDM, needs to be higher priority*	*Phillips*	*Medium*	*1-Jun-14*	*Open*	
C3-AI-12	*Provide a summary of the current query algorithms including elevations limits*	*Cortes*	*High*	*1-Jun-14*	*Open*	
C3-AI-13	*Establish relative priority (in SSR development) of changing the bandpass shadowing limit vs other improvements*	*Saito, Remijan*	*Medium*	*1-Jun-14*	*Open*	
C3-AI-14	Add requirement to have a forward looking tool for calibrator cross checks added to the CPM-3 agenda	Corder	High	1-May-14	Open	
C3-AI-15	Make sure Ruediger has access to (and understands) the aU tool for projecting calibrator fluxes	Hunter	High	1-May-14	Open	
C3-AI-16	Provide the calibrator extrapolation/interpolation methods to the Virtual Observatory Group (Ibsen) following incorporation of C3-AI-15	Saito	Medium	15-May-14	Open	

C3-AI-17	Follow up on developing a path towards a One True Way (i.e. Archive) to determine source fluxes	Stoehr	Low	1-Aug-14	Open	
C3-AI-18	Provide the current use of uvmin/max from the point of view of the calibrator catalog. What requirements have been delivered? Do requirements meet needs? Are there remaining requirements to be delivered?	Kneissl	High	1-Jun-14	Open	
C3-AI-19	Gather a summary/status report from Calibrator working group, pipeline and data reducers to make sure that various items are understood in terms of requirements and observatory needs, including how to get resolved calibrators handled in the catalog and in data reduction (may not have the same needs, calibrator catalog value needs to be more generic as models change, etc)	Saito	High	1-Jun-14	Open	
C3-AI-20	For a calibrator database team: Lindsay, Crystal, Ruediger, plus one TBD member from the database group, and a EOC member. Chaired by Baltasar	Vila	High	15-May-14	Open	
C3-AI-21	Organize a clean up of the catalog such that no (notably extended) resolved sources (e.g., M87, SGRA*, etc) should be used in Cycle 2 observations	Vila, Saito, Kneissl	Very High	1-May-14	Open	
C3-AI-22	Add Calibrator Catalog discussion item for CPM3	Corder	High	15-May-14	Open	
C3-AI-23	Change the script genearator to use intents	Villard	Medium	1-Jun-14	Open	
C3-AI-24	Ensure that all the observations set up by P2G should have a separate bandpass intent (e.g., cannot use the phase calibrator or science target for that purpose)	Rawlings	High	1-May-14	Open	
C3-AI-25	Identify and push a test case example data set through the pipeline using the same source for phase cal and science (and eventually other shared intents)	Brogan, Davis	Medium	1-Jun-14	Open	

C3-AI-26	*Look into improving the 56-degree shadowing limit and testing if possible (and deemed high enough priority)*	*Cortes*	*?*	*?*	*Open*	
C3-AI-27	*Make ssr "isObservable" explicitly avoid sources that will pass through transit or >88.5 deg during the execution (need to implement better look aheads at the same time)*	*Cortes, Phillips*	*Medium*	*1-Jul-14*	*Open*	
C3-AI-28	*Implement an explicitly allowed list of sources for use for single dish amplitude calibration*	*P2G, SSR*	*Low*	*1-Jul-14*	*Open*	
C3-AI-29	*Tell the OT and P2G what the criteria are for Check Source selection (current implementation)*	*Cortes*	*Medium*	*15-May-14*	*Open*	
C3-AI-30	Select 20 projects to use for session commissioning beyond the standard for polarization and assign someone to reduce them. These should be long, but not too long and they will report to the heuristics group on how reduction will be done. This data will be delivered to PIs	Vila, Saito	Low	1-Jun-14	Open	(note that this may be removed given discussions in later days)
C3-AI-31	*For the benefit of Pipeline, create and run a project to run a short (15min) SB and run it 4-5 times in a row. These should likely be at band 6 and at night*	*Remijan*	*Low*	*1-May-14*	*Open*	*(note that this may be removed given discussions in later days)*
C3-AI-32	Communicate to P2G that sessions are off by default. It will hve to be turned on manually for pol and specific projects to be tested (SessionControl)	Saito	High	1-May-14	Open	
C3-AI-33	*Implement an expert parameter for daytime observing for focus and pointing cycle times in the SSR*	*Cortes, Phillips*	*Low*	*1-Nov-14*	*Open*	
C3-AI-34	*Implement dynamic feedback for convergence of telcal solutions for focus, pointing and potentially others (phase, etc…)*	*Phillips*	*Low*	*Cycle 7*	*Open*	
C3-AI-35	Need to update the APRC tool to include daytime considerations	Nyman	High	1-May-14	Open	

C3-AI-36	*Translate PrimaryBeamCalTarget into a list of obs params/requirements for the ObsPrep team.*	*Remijan*	*Medium*	*1-Jul-14*	*Open*	
C3-AI-37	Characterize the phase rms during the daytime in anticipation of further daytime observing	Nyman	Low	1-Sep-14	Open	
C3-AI-38	Revisit the procedures for evaluating the phase of the atmosphere once we have online WVR corrections in place (to determine if we need to abort an execution or not)	Vila	Medium	1-Sep-14	Open	
C3-AI-39	Discuss the offering of "best efforts" vs "shared risks/experimental" projects for cycle 3 (SciOpsIPT)	Nyman	High	1-May-14	Open	
C3-AI-40	Especially at high frequencies, check sources will need to be hard wired	P2G	High	15-May-14	Open	
C3-AI-41	*Implement Check source in 10.4 after acceptance (patch back) to ASDM and SSR instead of delaycal*	*Bridger, Remijan (SSR)*	*Medium*	*1-Jun-14*	*Open*	
C3-AI-42	*Verify that telcal and the filler are able to handle the extra spectral windows produced by 90-deg switching*	*Remijan*	*Medium*	*1-Jun-14*	*Open*	*depends on 90-deg switching working to zero order*
C3-AI-43	*Raise the possibility with the correlator groups of throwing away edge channels to reduce data rates (i.e., only return central 1k channels)*	*Phillips*	*Medium*	*1-Jun-14*	*Open*	*(timescale to raise, scheduling of software work may be much later...)*
C3-AI-44	*Take data comparing single dish using fast rasters vs regular rasters to compare the output flux. Needed to know how to prioritize fast scanning for calibration use*	*Phillips*	*High*	*15-May-14*	*Open*	
C3-AI-45	*Discuss the possibilities of accelerating the linearity correction potentially using it offline (for the ACA)*	*Vlahakis*	*Very High*	*28-Apr-14*	*Open*	*Required before next ACA linearity tiger team meeting*
C3-AI-46	Send out an update (when clarity is achieved) on PI data delivery of total power data	SciOpsIPT	Very High	15-May-14	Open	Should make sure to clarify that it is the conversion to Jy/beam that is the hard part, not putting it in K, which is relatively easy

C3-AI-47	*Depending on the outcomes of the previous testing/planning for the ACA, consider the test plan for doing total power on the baseline correlator with the understanding that there are other complications*	*Remijan*	*Medium*	*1-Jun-14*	*Open*	
C3-AI-48	*Get basic single dish sideband separation maps with Tsys and deliver them to Komugi for reduction with existing tools.*	*Remijan*	*Low*	*1-Aug-14*	*Open*	*Komugi to work on in free time and report back to Remijan about performance. Eventually need to design an observing mode for this and schedule software work*
C3-AI-49	Create a new SB for band 9 grid sources	Kneissl	Medium	1-Jul-14	Open	
C3-AI-50	*Include in standard interferometry a switch to use scan sequences when fast switching (likely trigger off a minimum phase cal cycle time to begin with..eventually do observing strat layer)*	*Remijan, SSR group*	*Medium*	*1-Sep-14*	*Open*	*DV antenna radius is 1.5 degrees on the sky, below 60 deg elevation*
C3-AI-51	*What CASA development is needed to make B2B science ready*	*Remjian*	*High*	*1-May-14*	*Open*	*Meeting schedule 22 Apr to cover this*
C3-AI-52	*Sort out the new algorithm for calculating slew times (antenna-type dependent likely)*	*Phillips*	*High*	*1-Jun-14*	*Open*	*Needs to be delivered to Marson…can this be put in the stable CSV version for Sep-Nov*
C3-AI-53	*Issues with fast switching include potential power problems with 34+ antennas and telcal getting the flags in time. Continue to track the performance issues here. (Fast switching)*	*Asaki, Matsushita, Phillips, Barkats, Vlahakis*	*High*	*1-Sep-14*	*Open*	
C3-AI-54	*Commission Bands 3, 4 and 6 out of 5km or more without the use of fringe (is that all?)*	*Remijan, Fomalont*	*Very High*	*1-Dec-14*	*Open*	
C3-AI-55	*Produce out of the long baseline plan and execution, a set of SBs that will give a range of observations suitable for long baseline testing*	*Remijan, Fomalont*	*High*	*1-Sep-14*	*Open*	

C3-AI-56	*Examine the possibility/need for a polynomial fit to the bandpass shape for polarization (FDM)*	*Cortes*	*Low*	*1-Aug-14*	*Open*	
C3-AI-57	*Produce a radiotool to do the image analysis necessary to exploit Zeeman (Stokes V)*	*Cortes*	*Medium*	*1-Dec-14*	*Open*	
C3-AI-58	Quicklook should catch the examples of broken/misaligned spectrally Tsys and they should be fixed before they get to pipeline (with Villard and Cortes)	Humphreys	High	1-Jun-14	Open	It is expected that this is likely not a problem anymore so instances reported from many many months ago should be discarded
C3-AI-59	Discuss with Online the list of conditions for QA0 flagging to make sure that it is sufficient (and up to date). Get the QA0/QA0 semi-pass clearly established	Vila	High	15-May-14	Open	
C3-AI-60	Identify a person to work with the pipeline group on some of the flux calibration numbers, so that we can automatically clean down to a specific target level and stop (noise calculation?)	Hibbard	Medium	15-May-14	Open	
C3-AI-61	Determine the Cycle 3 array configurations in terms of the OT, users, etc.	Nyman	Medium	1-Jun-14	Open	What does this really mean? Unclear…as we won't know the longest baseline to be offered until very near the call.
C3-AI-62	Test e2e pipeline reduction of external ephemeris files. If this isn't shown to work, Cycle 2 should have it as experimental. And Cycle 3? Won't this depend on online?	Humphreys	Medium	15-May-14	Open	
C3-AI-63	*Give the Iapetus data to pipeline to reduce*	*Remijan*	*High*	*1-May-14*	*Open*	

C3-AI-64	Identify an Eric Villard-like person to lead the imaging tiger team, this really probably can't be Eric himself, Ed, Todd or Crystal as we have them booked already.	Kern, Vila	Very High	15-May-14	Open	This person is needed to get the imaging pipeline going but most people that could do are overbooked.
C3-AI-65	*Reduce the OTFi that we already have in latest test version of CASA, if this is not sufficient (i.e., further CASA work is needed), we will table OTFi for now. Otherwise continue*	*Remijan, Takahashi*	*Medium*	*1-Oct-14*	*Open*	
C3-AI-66	*OT Phase II needs a spec to determine if we use OTFi or not for interferometric mosaics*	*Remijan, Takahashi*	*Medium*	*1-Nov-14*	*Open*	
C3-AI-67	Add topic of possible 7-m and TP only projects to CPM3 agenda and next Director's council face to face meeting	Corder	Medium	1-Jun-14	Open	
C3-AI-68	Look at the policy/history behind not explicitly offering 7-m/TP executions and not offering the 7-m time without offering also TP time.	Corder, Nyman	Medium	1-Jun-14	Open	Needed before next DC meeting
C3-AI-69	Consider novel calibrators for Band 9/10 that would be bright there but perhaps not at lower bands, including in band phase transfer for masers (but need a maser source with bright continuum as well to do the diff gain cal)	Vila, calibrator catalog working group	Low	1-Jul-14	Open	Needed for some information to the high frequency campaign
C3-AI-70	Add action for archive to handle ephemeris objects as a query service to the calibrator catalog (CPM3 agenda)	Corder	Medium	1-Jun-14	Open	
C3-AI-71	*Make sure that the long-baseline campaign observes the brightest 10 grid sources at band 9 along with other necessary calibration to assess shape/structure*	*Vlahakis, Fomalont*	*Medium*	*1-Jun-14*	*Open*	*Should be on the program for the Grenoble meeting*
C3-AI-72	The Ph1m needs to be able to handle experimental modes	Nyman	Medium	1-Jun-14	Open	Should be added to the CPM3 agenda probably.

C3-AI-73	Test the project tracker to see if it cleanly (i.e., affects the SB) affects the number of SB remaining executions. In the future the project tracker should be the only way to change this (even for the CSV lifecycle?)	(J) Cortes	Medium	1-Jun-14	Open	
C3-AI-74	*Verify that the reference position has to be relative*	*Vlahakis*	*High*	*15-May-14*	*Open*	*Komugi believes this is the case as does Corder, this is just a confirmation*
C3-AI-75	*Review the ASDM and see what metadata is and is not being filled and what is actually needed for the attenuator settings*	*Phillips, Bridger*	*Low*	*1-Aug-14*	*Open*	
C3-AI-76	Follow up on whether or not the focus correction with thermal sensors is really needed as a patch to Cycle 2 accepted software	Corder	High	15-May-14	Open	
C3-AI-77	*Decision on debiasing vs solar filter needs to be made in advance of detailed planning of the next solar observing campaign*	*Solar group, ADE*	*Low*	*1-Oct-14*	*Open*	