

ECSV Discussion

20 November 2012, 10am in room 317

**Attendees:**

Bryan Butler, Barry Clark, Vivek Dhawan, Feng Gao, Minnie Mao Heidi Medlin, Amy Mioduszewski, Steve Myers, Kristina Nyland, Juergen Ott, Frazer Owen, Rick Perley, Deb Shepherd, Ken Sowinski, Ravi Subrahmanyam, Gustaaf Van Moorsel, Joan Wrobel,

**Minutes:**

**News:**

- Hsi-Wei's last day was last Thursday, 15nov12. He concentrated on helping Vivek evaluate the 3-bit sampler performance, and evaluating the performance and applicability of statwt in CASA. The bottom line is illustrated in his science result:
  - Hsi-Wei has analyzed one of his science tracks: a Ka band, 26min on-source integration of a protostellar core, L1451-mm. The theoretical noise calculated by VLA exposure calculator was 9.7  $\mu$ Jy. The noise in the map is  $\sim$ 14 microJy without applying "statwt". With applying "statwt", the noise is  $\sim$ 10 microJy. The source size and flux density are consistent with theoretical predictions. Hsi-Wei's test observation shows that with current 3-bit instruments we are able to achieve the theoretical noise with applying weights, even though not all the samplers were well performed during the observation.

**Correlator and general system health (Vivek, Ken)**

- The Configuration Mapper (CM) in the correlator has been updated and seems to be working except some minor issues Ken is tracking down. Sonja continues to work on it and she will be testing all day on Thursday (Thanksgiving).
- The Correlator BackEnd (CBE) and the Executor software were also updated.
- 3-bit:
  - ***Hsi-Wei, Jeremy Lim and Claire have gotten 3-bit data and the data looks very good so far.***
  - A pair of misbehaving sampler modules were brought back to the bench and found that they had not been properly initialized. The crew is looking for other 3-bit samplers in the field that might have this issue and could be fixed easily.
  - Some of Claire's scripts have caused the CBE to go catatonic and stop producing data until the next reference pointing. This issue is being seriously troubleshooted.
- Sub-arrays:

- Michael, Sonja, et al. have made progress on getting sub-arrays working. There are now conditions under which they work but it still doesn't work when 2 sub-arrays start at close to the same moment and they share baseline boards (the CBE gets seriously confused at this point and loses data). Still, this is progress and sub-arrays can be made to work under specific conditions. This is the minimum that is needed to support sub-array observations approved for the next semester in January. Work will continue but we are in a more comfortable position now.
- VLA phased array development:
  - This effort continues to wait for progress on troubleshooting the VLBA Digital Down Converter (DDC) (recall that the DDC is needed for the wider bandwidth observations being proposed for in 85% of the phased-VLA+VLBA projects. So we need to get the DDC working on the VLBA before we can effectively test the phased-VLA in a manner that will be used.)
  - Some progress on the DDC has been made: we no longer have phase jumps by 8 ns. There are still some small delay ripples that we see and Matt Luce is working on updating the DDC firmware to fix this problem.
  - Autocorrelations were not being scaled correctly and this has been fixed and now works properly.
  - We also have found that there is a VLA delay offset relative to the VLBA that appears to be drifting (it is now -20 ns). We don't understand the offset – it is not a “show stopper” because we can still find the fringes. But the offset is bandwidth dependent and annoying to deal with. The change could be due to updated DDC firmware. Troubleshooting continues.
  - There was a test with the Phased VLA using the PFB filter banks on the VLBA. No fringes were found when this data was correlated with WIDAR. Walter is tracking down the problem.
  - The read-back weights were not being recorded properly and this is being troubleshooted. Appears to have been caused by timing issues.
  - Vex2OPT (the program that takes a SCHED output in Vex format and converts it to OPT format for phased VLA observations) still needs more work.
- Frazer reports:
  - He has an 8-bit, 5 GHz dataset, producing a spurious source at the phase center and a colleague of his has also seen this. This is a source that looks like a time-variable source at the phase center and it won't clean up very well. Removing a specific spurious scan didn't remove the source; running quack didn't always completely remove the source. This problem appears to be intermittent (we know of two instances but most datasets do not show this potential issue). Claire hasn't seen it in her high frequency 8-bit data.

- Frazer will provide the datasets where he sees this problem to try to isolate the cause. This could be a correlator issue if some data isn't in its correct scan and instead, data is put into the wrong scan when MCAF and the CBE get out of sync.
- Please, look into your data – if you see a spurious source like this, bring it up to determine if we can isolate where this is being introduced.
- Reminder: For all 3-bit observations, we still need to use the WebTEST OPT. Michael or Vivek will take your SBs and run 'model2script' on it so the project can be scheduled manually by the operator.

### **Testing coordination and best LST ranges for tests (Joan):**

- Test observations should still be done at night:
  - If the weather is bad, schedule tests between 4 & 7 LST.
  - If there is good weather the window is more narrow: schedule tests between 4 & 5 LST (we still have some high frequency, high priority projects between 5 and 7 LST).
- Weekday tests continue to be difficult to do given that we have such a high pressure from WIDAR, 3-bit, phased array, and sub-array testing.
  - Try not to set up your tests in the weekday but it is possible if necessary.
- Weekend daytimes are still needed for science.
  - It will be very difficult to get test time during the weekend daytime. Its not impossible but do everything you can to avoid this time. If you absolutely cannot run your test any other way except during a weekend day, contact: Deb, Michael, Vivek, Joan.

### **Software status (Bryan):**

- OPT testing from Ravi, Hsi-Wei, Claire, Gustaaf. Steve and Lorant. Thank you for testing!
  - No more testing is needed at this time.
  - OPT test will be pushed to production next Tuesday.
- Deadlines for SSS software ready for test (see 13/14nov mail from Michael on SSS target dates):
  - Dec 3 for OPT/RCT spectral line user interface.
    - Progress is being made on the RCT: The SSS group is working with Lorant & Emmanuel on the mock-up of a new spectral line focused user interface. The SSS group also began to write a program to test the creation of a WIDAR sub-band from a spectral line specification.
    - This needs to be ready for release before Christmas.
  - Dec 18 for PST testing. Dana Balsler and Mark Claussen still need to finalize the requirements. At the current time there are not enough details on the PST requirements for the VLBA and how to handle the GOST functionality in the PST.

### **CASA (Steve, Juergen):**

- CASA 4.0 is not yet released. Release distributions for Linux and Macs are being made.
- Items in the November test version (CASA 4.1) that will need to be tested are:
  - Cal table data can be plotted in plotms at a basic level
  - Requantizer gains for the EVLA
  - Syspower now in Jy scale
  - Linear pol calib document will be ready for review.
    - This is a general description that should be applicable for both ALMA and VLA P-band but it is not written specifically for one or the other. The casa-guide for VLA P-band is still planned but not worked yet.
  - Ability to run flagdata/flagcmd on Cal Tables
  - Feathering GUI – stand-alone tool
  - Development of a Value-mapper tool (needed for the pipeline)
  - Makemask update by Tak (may make it in)

Testing will be done in the 2 weeks after each monthly release.

- Frazer gave Steve a Linear polarization P-band dataset so Steve will be able to calibrate the data in CASA and see if this works and then start to create a regression script and then a 'casa-guide' for our users on how to do this.
  - Not started yet.

### **Low-band campaign update (Frazer)**

- The dipole installation campaign went well. We had 5 astronomer-volunteers (Minnie, Gustaaf, Robert, Susan & Deb) split between 3 teams, one for each arm. Frazer and Huib made a test observation as soon as the dipoles were installed to discover where the problems were. We are up and running in this low-band test and science campaign.
  - There are 8 working receivers at 4-band
  - There are 12 or 13 working receivers at P-band
  - Science observations will run on Friday. Huib had a long test that ran yesterday.
- Ravi will talk next week about a 4-band test he is doing tomorrow to determine if he can minimize the blockage introduced by the box-dipole currently installed on antenna 5.

### **Anything new from the bandpass stability issues?**

- An update on the 3c454.3 Ka-band, 8 GHz bandwidth, dual polarization test that was done on 2 consecutive days. Applying the bandpass from one day to the next the bandpass is good on 90% of the antennas to within a few percent between days. But there are still some antennas (about 10% of them) that demonstrate up to ~10% variation between days and this is not good. This is not just a change in amplitude that could be caused by gain settings; there are actual changes in the bandpass shape between the days. Timescale for

the variations appears to be on the order of one or a few hours suggesting a wandering ripple. Could this be caused by the dipoles being up? Juergen will correlate which antennas have dipoles with which ones have this varying bandpass and Juergen and Miller will continue with this investigation.

**CfP documentation update:**

- Please see the associated proposal for assignments to work on the different sections of the Observational Status Summary (OSS) and in some supporting documentation. Note that your name may be listed in TWO places or it may be that you are asked to help someone else. Please check carefully. Get back to Deb if you disagree with any assignment for you or if you cannot do it by 21 December.
  
- Also: Gustaaf is working on a new structure for our documentation, of which the OSS is just one part. He will be organizing available documentation according to the following guide categories:
  - Proposing Guide: proposal preparation and the actual process of proposing
  - Observing Guide: observing preparation and a guide to observing with the VLA.
    - This is where most of our information will be located from evlaguides, mosaicing help, OPT manual and some information in the OPT appendices.
  - Post-processing Guide: CASA and the Pipeline
  - Data Archiving Guide
  - The OSS description of the VLA system
  
- Gustaaf is focusing on developing content for the observing guide. He will be asking people to provide inputs on, e.g., the phased array, low-band, etc... Please be nice to him when he asks you for content for the VLA observing guide!