

ECSV Discussion
18 December 2012, 10am in room 317

Attendees:

Bryan Butler, Barry Clark, Mark Claussen, Vivek Dhawan, Dale Frail, Feng Gao, Miller Goss, Eric Greisen, Chris Hales, Dave Harland, Amy Mioduszewski, Emmanuel Momjian, Steve Myers, Susan Neff, Kristina Nyland, Frazer Owen, Rick Perley, Deb Shepherd, Lorant Sjouwerman, Ken Sowinski, Ravi Subrahmanyam, Gustaaf Van Moorsel, Joan Wrobel

Minutes:

News:

- Susan Neff's last day will be today 19dec.
- Feng Gao's last day will be 21dec (Friday).
- The low-band commissioning/coordination web site will be released to the community today. See:
 - <https://science.nrao.edu/facilities/vla/commissioning/low>
 - This site will include Susan Neff's document on best practices for P-band data reduction (see below)

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

- Its beautiful!
- New versions of Correlator BackEnd and Configuration Mapper have been installed and this has fixed many problems (see below).
- There have been no missing BDFs except in test projects. Science is running clean...
- 3-bit sampler status:
 - The 3-bit samplers are working very well.
- Phased array:
 - Amy did a pointing and phasing up test and it worked well.
 - GBT+VLBA+phased VLA test was done on Saturday. It has not been correlated yet.
 - Note: the previous test did not show fringes between the VLBA & VLA. It is not known why this occurred. We will see if the same issue occurs on the most recent test.
- Sub-arrays:
 - Two sub-arrays always work – run by hand (not through the OST)
 - Even 2 sub-arrays using the 3-bit samplers that use all correlator resources work.
 - Three sub-arrays work if they do not use too many correlator resources (otherwise we run out of shared memory).
 - We are currently running Bob Mutel's 2 sub-array program now.
- A list of current tests out there or scheduled soon:

- C, X & Ku-band, wider than normal BW with the 3-bit samplers to see if you can get better sensitivity by using wider bandwidth. (Lorant)
- How low can we go at Q band with our calibrator flux densities? (Minnie and Lorant)
- Zeeman test (Ann Mao, worked well, setup will now be used for science)
- Fast dump tests (Casey Law). This used dual polarization, 2 sub-band pairs, 512 channels, 10ms dumps. This is working well, there appears to be no restrictions on the length of time this can run but we are limiting it to 1 hour SBs to be safe.
- Phasing test between the VLBA, GBT & phased VLA. Occurred last Saturday, still needs to be correlated. (TPHA0001, Feng, Amy & Vivek).
- More planetary tracking tests (TPLA0001) to support ephemerids tracking of the asteroid Toutatis, needed to support radar observations at X-band (Bryan)
- P-dif compression test, in progress (Rick Perley)
- Low band spectral line commissioning test. Done last night. (Frazer)
- Box-dipole test for 4-band is scheduled for Thursday this week (Ravi)
- Moon test, waiting for a fuller moon (Rick)
- 3-bit polarization test, planned for the future (Ann Mao, Dave Roberts, Chris Hales)
- Pulsar testing in progress.

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

- Good weather (K-Q), tests should be run between 3-5:30 LST
- Poor weather (lower frequency bands), use 0-5:30 LST for testing.

Software status (Dave Harland):

- OPT
 - New release was made yesterday to allow people to share catalogs (13A support).
 - Slowness issue needs addressing.
- Exposure Calculator
 - Modifications being made for P-band sensitivity estimates (changes dramatically depending on where you look (galactic plane, Cen A, out of the plane). P-band defaults also being incorporated. Frazer is providing feedback.
 - Confusion correction still needs to be checked, rest is looking good!
- RCT Spectral Line User Interface (needed for the OPT)
 - Testing on the sky done. Michael, Emmanuel and Lorant provided test results and identified issues. Some re-naming and re-organization of the RCT display was suggested that should make the tool more intuitive and simpler for the observers.
 - Data rate warnings have been changed to reflect current restrictions:

- 20 MB/s max for general observing
 - 60 MB/s max for shared risk
 - Fixes being made now.
- PST
 - Incorporating changes for shared-risk determination. Sub-array feature still under development. Working toward a production release on 3jan13
 - Rick Lively and Dana are having a requirements meeting. Most
- Phased Array
 - Still need to finish updates in Vex2OPT (the code that takes VLBA SCHED output and converts it to VLA OPT format). For a January release.
 - Two more software items are needed:
 - The VLA must be able to stop data recording between scans, like the VLBA does. This could be handled either in model2script software or in the Vex2OPT (by inserting a dummy scan).
 - There is a 5s delay between scan start and data recording. This is a minor annoyance, leave for now.
- GOST – **Done**
 - It is not clear whether all shared-risk restrictions will be incorporated. If they are not, it must be well documented.
- 3-bit – **Done**
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CASA (Bryan):

- There is a new stable and test – CASA 4.1
- The next stable build will be in mid-January
- Investigating a memory leak in CASA, hits the pipeline especially.

Pipeline (Bryan & discussion by all):

- The pipeline 4.0 pipeline is in use through out the building and Claire is encouraging people to test it.
- Bryan has used the pipeline to test moving (solar system) sources observed at C-band – he reports that the pipeline works great on the reduction.
- Kristine Nyland has been using the pipeline extensively and she reports that it is working very well. The main issue now is with the low-frequency data that requires iteration with RFLAG to get the RFI flagged.
- Claire is running the pipeline run on one of Rick's S-band observations that is expected to have significant RFI.
- The group here discussed whether it would be useful to do Hanning smoothing on continuum data in the Pipeline. We need to develop heuristics as to when this should and should not be done.

RSRO P-band report (Susan Neff):

- Susan has been working mostly at P-band. She is writing a best-practices observing guide (how to avoid mistakes) that will be used for this coming call for proposals in which P-band observing will be offered as a shared risk mode.
 - The observing guide has been written and it is being reviewed by Eric and Frazer. It will be posted at the new low-band web site (<https://science.nrao.edu/facilities/vla/commissioning/low>).
 - The guide is mostly done in AIPS with some of the wide-band imaging done in CASA.
 - Minnie will be converting this to CASA once all the functionality we need is in CASA.
 - Note: Eric is going to use Susan's procedures to reduce a spectral line P-band test dataset that was taken last night. Folks from NRL are also going to be testing the procedures to ensure the steps are robust and work for a wide range of datasets. This is the first steps to developing pipeline heuristics.
- Susan has worked on 5 datasets, observing with P and 4-band. A summary of some of the things she has found include:
 - She characterized how useful was it to look at the edges of the bands where the sensitivity of the bands roll off. She broke the bands into narrow chunks. Some edge band chunks turned out to be reasonably clean and they made marginal improvement but the end result is that it is not worth the amount of effort required to salvage the data.
 - The optimum default frequencies for P-band are: (236-492 MHz)
 - There are some narrow bands that must be removed because of RFI but this is a good region.
 - The frequency we can cover is hugely better than what was available with the previous P-band system in which we could only recover about 12 MHz of bandwidth.
 - RMS determinations in the images were used as inputs to determine efficiency and Tsys and this was then used as input in the Exposure Calculator.
 - Note: 8 min on the GOODS North field gives 1.6 mJy/beam RMS with 7 antennas.
 - Susan noted that the Perley-Butler coefficients for absolute flux density determination at P-band can be as high as 30% off – indeed, these coefficients are not guaranteed below 1 GHz frequency.
 - This area needs work.
 - Susan also observed a test data set for her RSRO program. She is now writing instruction about how users will create their P-band SBs in the OPT when they obtain shared-risk observations.

RSRO Phased Array report (Feng Gao)

- Feng has been looking at 3 test datasets at K band to evaluate the best practices for phasing up the VLA. The observations use 2 sub-band pairs, each with 128 MHz bandwidth. He has been able to:
- Determine how long the phasing up time needs to be:
 - Use 10s phasing up time, at least 6 phasing scans
- Determine how long the phase remain stable at K band after the array has been phased:
 - Phase can be stable for less than or on the order of 5 min (very weather dependent)
- Determine how weak of a source we can use to phase the array.
 - We need 50 mJy flux density in calibrators at K-band to obtain good phasing results.
- Determine how far away from the target the phasing up source can be:
 - We need a source less than 8deg away (again, this is very weather dependent)

CfP documentation update status:

- Work is still needed by Juergen, Mark, Claire & Bryan.
- The rest is looking good!

Next meeting (VLA Improvements/Enhancements meeting)

- 8 January, 10am in room 317