

## ECSV Discussion

3 April 2012, at 10am in room 317.

### Attendees:

Sanjay Bhatnagar, Andreas Brunthaler, Claire Chandler, Barry Clark, Mark Claussen, Vivek Dhawan, Dale Frail, Miller Goss, Eric Greisen, Amanda Kepley, Stan Kurtz, Drew Medlin, Heidi Medlin, Emmanuel Momjian, Steve Myers, Frazer Owen, Rick Perley, Nirupam Roy, Michael Rupen, Lorant Sjouwerman, Philip Schmidt, Deb Shepherd, Ken Sowinski, Theresa van Vliet Wiegert, Joan Wrobel,

### **Minutes:**

#### Correlator and general system health (Ken & Michael)

- Sub-array test for Claire was completed. This was for 3 arrays, continuum and one had referenced pointing at high frequency. Worked fine but do one more test before we are absolutely sure that the referenced pointing application will work as expected.
- Fast dumping testing has been progressing nicely. We can now get over 130+/- MB/s out with a simple continuum setup (we promised 75 MB/s). If you start to use more resources (still with continuum), this takes us down to about 90 MB/s. Casey now has a test code to start testing his pulsar observing. Then we will try one of his science SBs.
- Mark's recirculation problem is fixed – it was a station board firmware issue.
- The WIDAR MITR database has now been moved to Socorro.
- The DC remover is now turned on automatically in the station boards for sub-band 0 (that abuts the DC-edge).
  
- There was a power outage last week Tuesday and Wednesday. Very difficult to recover from. We are now back to normal except:
  - When we got the system going again, we found we lost the 14mar12 Configuration Mapper (CM) software so we are now running the 13mar12 CM software. An issue of backups was found and will be corrected.
- We lost CBE-node-03 connection to Luster and this caused insidious slow-downs and missing BDFs that was difficult to troubleshoot. This all happened after Nirupam's run with lots of baseline board stacking and referenced pointing but not clear that it actually caused the problem. Investigation continues.
- The OST lost track of projects to schedule – this was tracked down as a bug in the software. The problem was fixed today.

#### Software:

- Barry reports that the code base for the PST has been moved to a server in Socorro. We officially take over the software the end of June.

CASA status (Steve, Jeff is in Chile)

- Cycle 3.4 - the last release is scheduled for 1may12. So we have 1 month of user testing of the new cal tables.
  - With the new test build to be done on Friday you will be able to split your datasets into a separate MS and do your calibration on this smaller dataset. Then you can use the derived cal-table to apply to the source dataset.
  - A new flagging update will be added.
- Last Friday, the 3.5 priorities from Steve were discussed with Jeff to get the development plan. In the next few days Steve should be able to publish the development plan in a public place.
- Susan Loveland started today. Her priority for development is the viewer.

Documentation status:

- Spectral line guide (Juergen)
  - Juergen reports: we just started to discuss the offered modes last week. When I am back next week I will tailor the guide to these modes as much as possible, keeping in mind that a lot of OPT implementations of the modes are still pending.
- High Frequency Observing Guide (Mark)
  - Will work on it this week hopefully.
- OPT quick Start guide (Amanda)
  - Good round of comments were received. This week the next version of changes will go in and then it will go into EVLAguides for easier access.
- OSS being ported to Plone (Gustaaf)
  - OSS RFI update (Rick)
- People often get confused about setting up mosaicing. They pick the wrong spacing based on the wrong end of their band or get the sensitivity wrong, etc... Steve is going to be writing up a simple description. Should be coordinated with Andreas (with his CASA task to set up complicated mosaics) and Juergen.

Jim Condon and Shri Kulkarni have been writing a paper on evaluating EVLA sensitivity.

Claire notes that we should have a de-brief of the technical reviews so we can see what issues our users are having problems with and update/augment/correct our documentation to help them. ***This is an Action for Claire.*** She will try to set up this review next week.

RSRO close-out report - Stu Corder (presented by Deb since Stu has left)

- Deb presented a summary written by Stu about his RSRO accomplishments. There was a discussion about whether the switched power measurements scaled the data correctly. Stu's report can be viewed at:

- <https://safe.nrao.edu/wiki/pub/EVLA/ECSVMeetings/Corder-SwitchedPowerSummary.pdf>
- Stu also provided information about a problem that he saw with ea19's switched power. He says:
  - The data are located in : /lustre/scorder/switchedPower/[tr55982.ms](#)
  - Plots are given below:

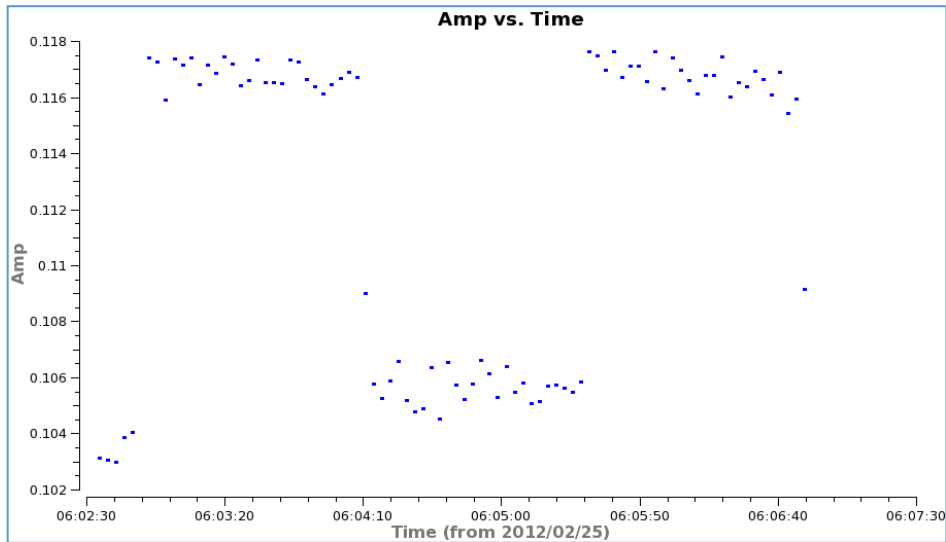


Fig 1: Visibility data Pre-Application Switched power

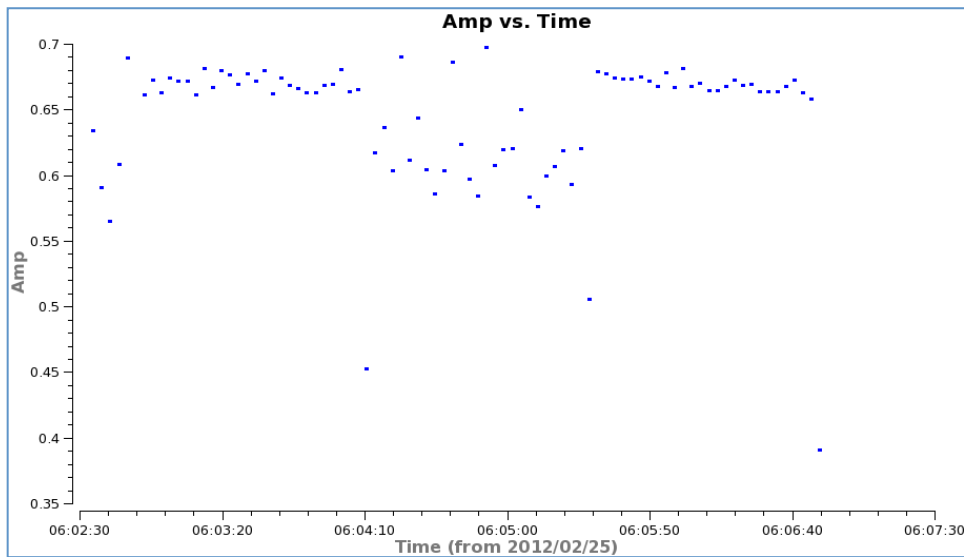


Fig 2: Visibility data Post-Application Switched power

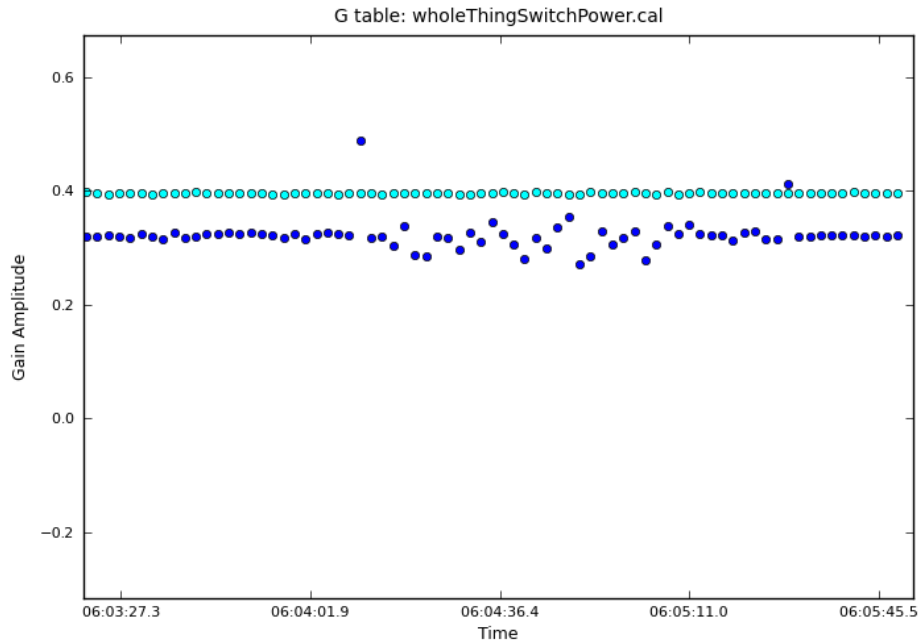


Fig 3: The associated cal table (the whole thing) for ea19.

Figures 1 & 2 are a plot of one baseline's amplitude visibilities before and after application of switched power. Fig 3 is a plot of the caltable results for ea19...the oscillation in switched power is clear and large. The other polarization doesn't show this (just R).

You can clearly see that post application the visibilities are much noisier (peak to peak) than before. Also none of the other antennas show this oscillation over this period. It just sort of "went nuts" for a bit.

After the meeting, Rick also reports on the correctness of the switched power application:

- I have taken the 'flux density' dataset, and examined the gain solutions, using sources whose fluxes (I claim) are accurate to 1 or 2 percent. In this note, I report only on the L-band results -- later this afternoon (if no other meetings intervene), I'll report on the other bands.
- The flux density data were taken in 'wide-band' mode (yes, huge overkill, but you never know when it might be useful). For this purpose, I extracted the two 64-MHz-wide subbands centered on 1465 and 1865 MHz. I applied the delays, bandpasses, opacity, and the switched power values (after suitable editing of variant points), then calculated the antenna-based gains, using my three northern sources J0217+7349, J1153+8058, J1800+7828, with fluxes determined from my full analysis against 3C286. These are chosen to minimize elevation dependencies, which are very important at the high frequencies.
- Results:
  - 1) At 1465 MHz, the mean amplitude gains are 0.97 and 0.98 in RCP

and LCP. The median values are 0.93 for both. At 1865 MHz, the means are 0.98 and .96, while the medians are about 0.94. The significant difference between mean and median tells us there are significant outlier points ...

2) 85% of the individual antenna values are clustered with 10% of each other. But we have some very discrepant antennas: ea19, ea25, and ea28 are all at least 30% in error (this is in amplitude -- so the power is the square of this). The next worst antennas are ea14 and ea13. It turns out that the largest errors are on the 'positive' side, which skews the averages to be above the medians.

The median values of  $\sim 0.94$  look pretty good, but remember that this is amplitude, so the 'median baseline' will show a flux density error of the square of this -- or about 12% in error -- too high. The cause of this offset is I think most likely due to an error in the assumed antenna efficiency, but could also be due to a bias in the determination of the Tcal values.

JVLA General Capabilities (e.g., OSRO modes for FY13) - delivery plan status (Deb & Michael)

- Michael is updating the proposal for the General Capabilities we would like to offer our users in the next call for proposals.
- Deb will then take this and develop a "plan-to-completion" that lays out what we need to do to finish development and provide robust capabilities. This will also be used to track whether we are on schedule to meet the end-of-commissioning deadlines.

Next week's discussion: plan is to have Nirupam demo his visualization tool development for spectral line setups and get input from others.

- Nirupam is doing a straightforward python script to help users figure out where their lines are located relative to the 128 MHz boundaries in the basebands. This started with a visualization script developed by Amanda.
- See also the spreadsheet at:  
[https://safe.nrao.edu/wiki/bin/view/EVLA/RSROObservingPreparationGuidelines?sortcol=table;up=#Spectral line Setups](https://safe.nrao.edu/wiki/bin/view/EVLA/RSROObservingPreparationGuidelines?sortcol=table;up=#Spectral+line+Setups) to help set up your lines.