Minutes of Teleconference on ALMA ATF & OSF Holography Planning

Thursday, November 9th 2006, 16:30 UTC.

Minutes by DTE, last changed 2006-11-14

Participants: Emerson, Glendenning, Kern, Krady, Lucas, Mangum, Marson, Meadows, Perfetto, Ramirez, Ridgeway, Shepherd, Sramek

All future meetings will use the same call-in details:
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Minutes of our last (2006-11-02) meeting are at:

http://www.tuc.nrao.edu/~demerson/osfholo/mins2006-11-02_1.pdf

AGENDA.

I. Status Report from the ATF

II. Testing of the AEC antenna?

III. What does "Acceptance" mean for the holography system currently being tested

IV. Action Items

V. Schedule

I, Status at the ATF

Darrel reported some results of tests this week at the ATF. Several more problems have been identified, but many problems have now been fixed.

The differential drift between transmitter and receiver was reported last week, fixes both for short term and for long term, following the discussion at the last teleconference, are underway.

There have been several computing problems. The most serious now is probably overall reliability and robustness of the system. There are still some bad data points being written, which although representing a very small fraction of the data are nevertheless sufficient to spoil holography maps [Note added after the meeting: most if not all of the "bad" data being written is in the coordinate information. Robert L. has since implemented an algorithm in the data analysis to interpolate over bad coordinates, retaining the data values which were considered probably good. This has improved the holography maps, but nevertheless the problem of occasional bad coordinates being written remains and does need to be fixed.] Very good progress has been made in fixing bugs as they arise; the software CIPT continues to provide very welcome help.

Transmitter power stability. A drift in output power of 20% or more over 2 minutes of time has been noted, and a difference of 10 dB between day-time and night-time power output has been seen, for the same control settings.
After a power outage at the VLA, the Agilent frequency synthesizer did not power up correctly. This was found to result from the controlling PC still trying to communicate with the synthesizer as it was power up. After disconnecting the PC communications, the synthesizer powered up correctly.

As of yesterday (Nov8) it is now possible to analyse holography data taken at the ATF using a local version of the CLIC software. To analyse raw data for stability, the standard technique now is to run a Python script to dump an ASCII file to disk, which is then transferred to a laptop PC via FTP for analysis in an Excel spreadsheet.

These and other difficulties (and successes!) are being documented on a Wiki page that Jeff M. has set up, on https://wikio.nrao.edu/bin/view/Main/AlmaHolography. Eventually the information derived from experience should be documented within a User Manual on EDM, but for now the Wiki page is a convenient location. The Wiki page already contains a good deal of documentation, including the CLIC holography data analysis guide.

This discussion led into Agenda Item III,
"What does "Acceptance" mean for the holography system currently being tested".
Unfortunately Rick couldn't be present at this meeting, but that didn't prevent an airing of views. Dick mentioned that there was a SOW that would be a good starting point to answer this question. Darrel commented that a month ago he would have defined the acceptance as being of something intended for the non-expert, but with experience now he is less ambitious; we should expect something that only holography experts are expected to bring up in Chile.
Brian said he was less pessimistic about solving the various problems, but yes, debugging will require experts. Jeff commented we're not yet even writing reliable data. Further, the system, WON'T be the same down in Chile; the antenna will have a different

ACU, for example. Jeff would like to make case for more effort on the low-level environment to allow debugging at a low level. Brian was more optimistic that all the current and future problems could be worked through in time. Robert Lucas remarked that at this stage it's not the telescope operator we need to aim at, but it'll have to be the experts, at least for the first antenna or so. Brian agreed, we have to have the low level tools available. Brian asked if Jeff and Darrel would be preparing a prioritized list on what needs to be done; the answer is "yes."

Returning to the original topic, Dick said "Acceptance" in practice meant for whatever we had available by the time we had to ship to Chile. Currently antenna acceptance is scheduled for 1st June 2007. That means the holography ship date could in principle move into Spring, but that would destroy interferometry schedule. There was general agreement that the "Acceptance date" should be close to January 24th 2007, although the holography system, after acceptance in January, would not be shipped to Chile until it was actually needed. Clearly all this is subject to agreement by ALMA management.

II. Holography Testing of the AEC Antenna?

One response from a member of the group was "Just say no!" Dick mentioned that the push for this is coming from Alcatel and from the JAO, as some insurance that the AEC antenna is not changing shape, with no hidden flaws. Maybe late 2007 would be an appropriate time to perform this, to avoid disrupting the interferometer testing at the ATF. The only reason anyone could conceive of for an earlier test on AEC is if the Vertex holography maps show significant surface changes. In that circumstance measurements on AEC might be used to distinguish between actual surface changes and some artifact introduced by the holography system. All clearly subject to approval from ALMA management.

III. What does "Acceptance" mean? See discussion above.

IV. Current and New Action Items:

A big outstanding issue is still documentation.

1. Antonio will provide the remaining hardware user manuals and a template of the Users' Manual.
   This is still pending.
   Details of the DSP algorithms need to be disseminated.
2. Continuing AI: ICD update on temperature monitors, no later than one month before shipment of receiver #2. Some minor items from Ralph to be corrected in the next ICD issue.
   Still pending.
3. Continuing: Holography feeds from Antonio.
   Pending, but agreed to be of very low priority
4. Schedule: Rick will continue to keep updated as necessary.

In progress. See http://www.nrao.edu/~demerson/osfholo/schedule/

5. The current known problems need to be fixed: e.g. computing reliability and robustness, bad data points (bad coordinates being recorded), transmitter stability in frequency and amplitude, receiver stability in frequency and amplitude etc. All these points continue to be addressed, often involving many members of the team (computing, hardware and scientists).
   Testing continues

6. Next Meeting

Darrel will organize the next teleconference for November 16th at 16:30 UTC.

V. Schedule

Much of the following is plagiarized from a draft schedule prepared by Brian.

At the ATF: Jeff leaves the ATF on Nov. 14th.

Darrel will be at the ATF from Nov 15th to Nov 19th or so. On-site support by CIPT.

November 20 - 22: CIPT to execute holography "SB after SB", noting issues, logging uptimes, saving logs, coming up with ways to cause errors to happen repeatably. (The emphasis should be more on characterizing and prioritizing problems rather than fixing them, although obviously we should fix easy ones).

Nove 23... Turkeys for non-aliens.

November 26 - December 2: Laing, Vila-Vilaro on site. Will require some CIPT on-site support..

December 4 - 8: PSIL racks scheduled to go on Vertex antenna.CIPT major software update in parallel..

Dec 9 - 17: Integrated CIPT tests (organized by ITS), covering items in Shepherd's test plan, resulting in an internal CIPT punchlist. These are not the user tests, which are now scheduled for January, this is CIPT preparatory work.