

EU FP6 ALMA Enhancement: Work Package 5

Highlights since last F2F & Plans

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Overview

- Completion of documentation of empirical algorithms
- Commissioning trip August 2009: check-out of WVR hardware
- Report on the WVR on-site check-out
- Memo on effects of dispersion
- High-site interferometry & data recorded in ASDM January 2010
- First release of `wvrgcal` program to JAO February 2010
- Commissioning trip March-June 2010
- On-line plotting of PWV and cloud cover
- Systematic analysis of test data January-June 2010
- Numerous improvements to `wvrgcal`

Introduction to `wvrgcal`

- The user-facing application that does WVR phase correction
- Fully compatible with official ALMA software:
 - Reads ALMA/CASA Measurement Sets
 - Writes CASA Gain Calibration (“T”-Jones) tables
 - Callable and scriptable from CASA
- Build on top of:
 - LibAIR, the phase correction library
 - CASA-Core and CASA libraries for input/output
- Publicly available, installed on computers at the JAO and at NRAO/Charlottesville

User documentation at JAO

<http://wikis.alma.cl/bin/view/AIV/Application>



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TWiki > AIV Web > ScienceCoordinationGroupPage > CurrentActivitiesAndOSFInformation > Application (24 Sep 2010, BojanNikolic)

Edit

Making Gain Calibration Tables from WVR data and applying them to data

The objective of this procedure is to explain how to setup and run the `wvrgcal` software written by Bojan Nikolic.

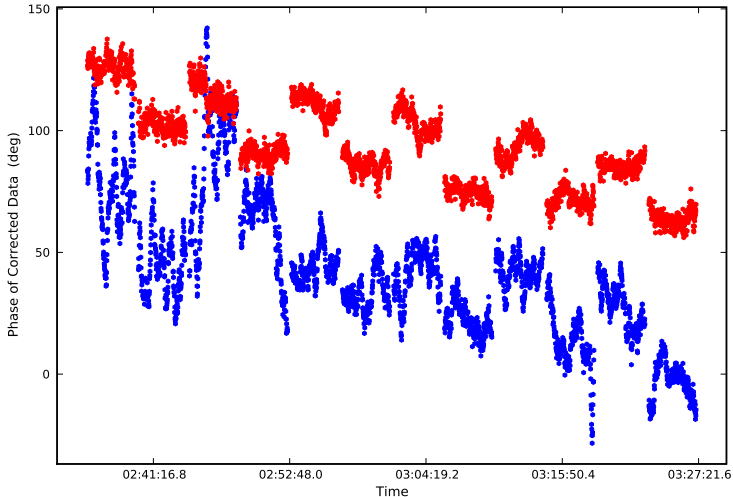
`wvrgcal` is currently installed **only on osf-red.aiv.alma.cl and sco-red.aiv.alma.cl**. If you wish to install it on other machines, for the time being you have to follow the **compilation** instructions given here <http://www.mrao.cam.ac.uk/~bn204/alma/sweng/llbairbuild.html> -- some knowledge of compilation procedures on Linux systems is required.

There are separate pages with [Summary of testing observations](#). See also JIRA [CSV-106](#).

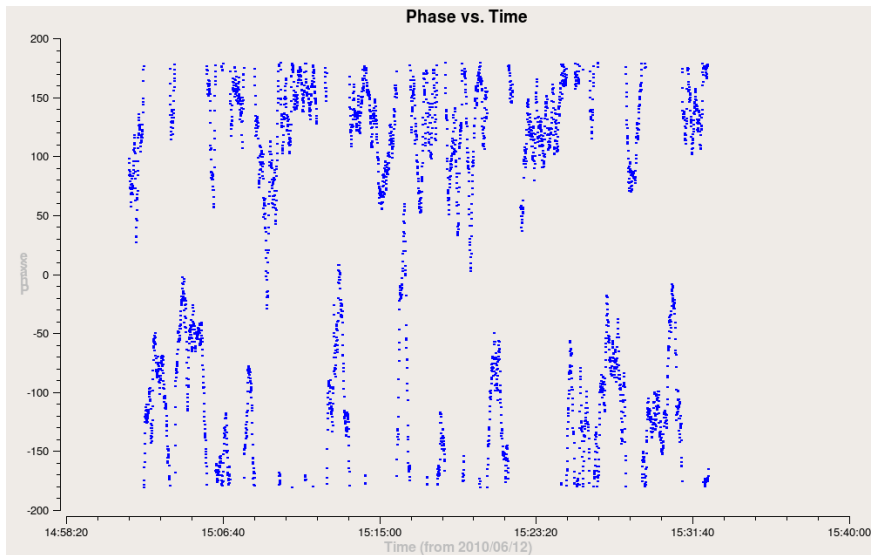
- ↓ [Setup](#) (This has to be done only once.)
 - ↓ [Version 0.19](#)
 - ↓ [Version 0.18](#)
 - ↓ [Version 0.15.1](#)
 - ↓ [Check that all is OK](#)
- ↓ [Running wvrgcal from the shell command line](#)
- ↓ [Running wvrgcal from Python/CASA](#)
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- ↓ [Applying the gain table and displaying the corrected data in CASA](#)
- ↓ [About spectral windows and wvrgcal](#)
- ↓ [Notes on available options in wvrgcal](#)

First application – February 2010

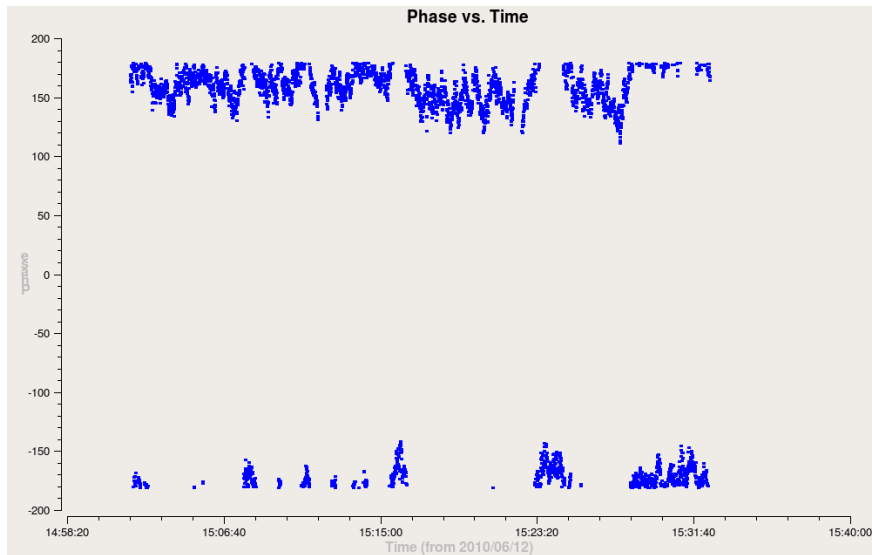
Courtesy of Al Wooten



More recent example (uid__A002_Xb9f5d_X1)



More recent example (uid__A002_Xb9f5d_X1)



Overview of test data web-page

<http://www.mrao.cam.ac.uk/~bn204/temp/wvrres/>

- Plots of WVR and astronomical receiver total power signals
- Allan variances
- Cross correlation phase and amplitude on each baseline
- Correlation between WVR difference signal and the astronomical path
- Single channel phase correction plots

Overview of `wvrgcal` tests

<http://www.mrao.cam.ac.uk/~bn204/temp/wvrgcal-regress.html>

- List of all usable test observations and conditions
- List of tested versions of `wvrgcal` and options to it
- Matrix of results showing residual phase errors after application of WVR phase correction

Plans

- Test observation:
 - 1 Longer baselines
 - 2 In better conditions
 - 3 More consistent (same time of day, same antennas, same script)
 - 4 More realistic (fast-switching, requires R8.0)
 - 5 Minimising other sources of errors (LLCs, software updates, all WVRs working)
- Analysis of test observations
 - 1 Pipeline analysis multiple-source observations
 - 2 Extract more information (e.g., record “optimal” coefficients on all baselines)
- Completion of `wvrgcal`
 - 1 **Tune algorithms according to results of tests**
 - 2 WVR-specific filter frequencies and bandwidths
 - 3 Implement empirical algorithms
 - 4 Make use of ground weather instruments