

ALMA WebLog Review

George Bendo

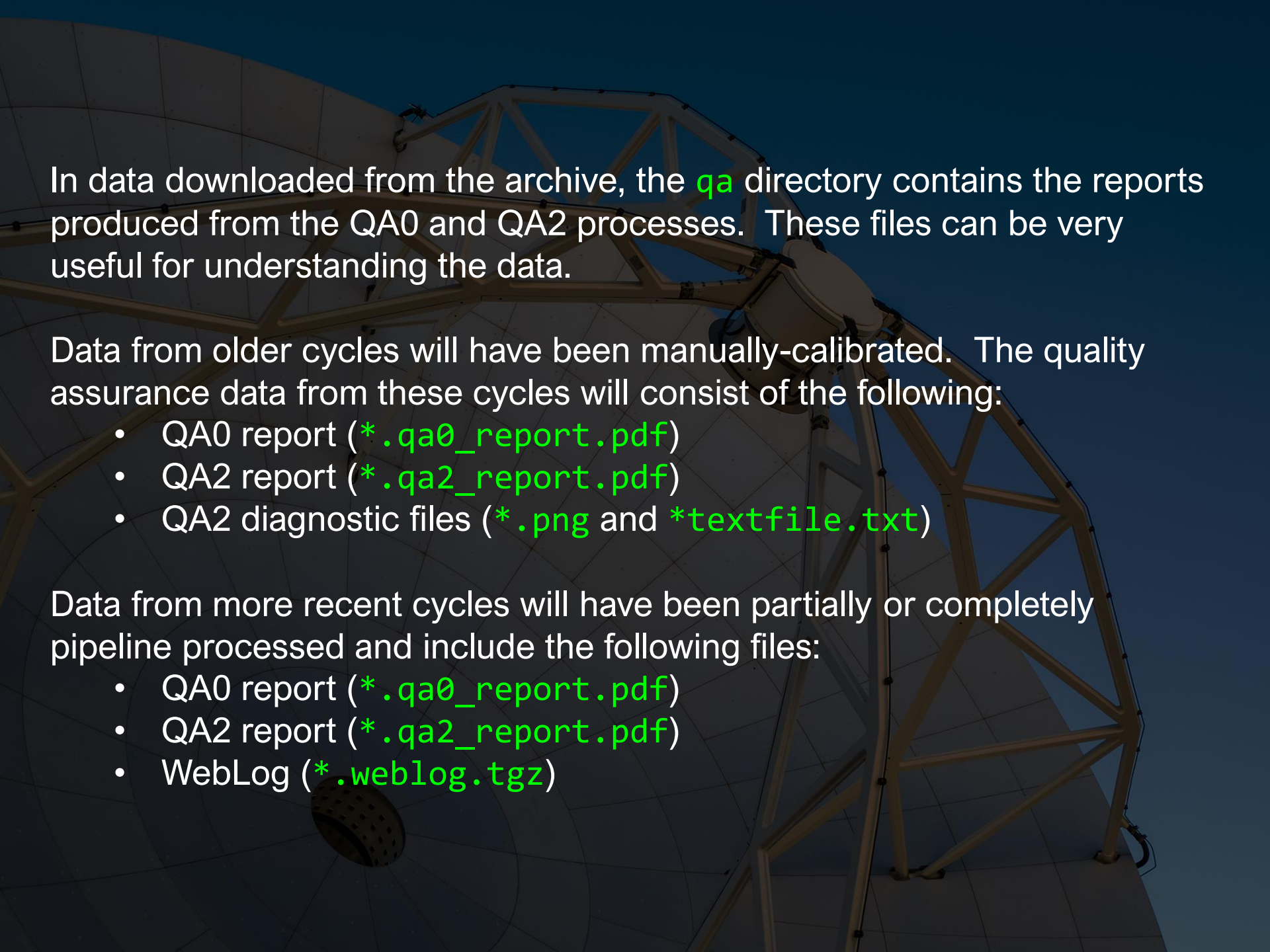
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In the context of ALMA, QA stands for quality assurance. ALMA has four phases of quality assurance:

- QA0 Simple quality checks performed at the observatory as soon as the data are acquired
- QA1 Long-term monitoring of the performance of the observatory (not specific to any project)
- QA2 A complete quality assessment performed on the data after completely calibrating and imaging the data
- QA3 Re-assessment of data after they are delivered to users triggered when someone discovers a previously-unidentified problem



In data downloaded from the archive, the `qa` directory contains the reports produced from the QA0 and QA2 processes. These files can be very useful for understanding the data.

Data from older cycles will have been manually-calibrated. The quality assurance data from these cycles will consist of the following:

- QA0 report (`*.qa0_report.pdf`)
- QA2 report (`*.qa2_report.pdf`)
- QA2 diagnostic files (`*.png` and `*textfile.txt`)

Data from more recent cycles will have been partially or completely pipeline processed and include the following files:


- QA0 report (`*.qa0_report.pdf`)
- QA2 report (`*.qa2_report.pdf`)
- WebLog (`*.weblog.tgz`)

The QA0 PDF provides a summary of comments from the astronomer who acquired the data. Each Execution Block (EB) will have its own report.

Versions of this document from earlier cycles contain just some simple diagnostic plots.

Versions from recent cycles contain several new sets of diagnostic plots as well as preview images.

These documents are most useful for understanding whether any problems were encountered during the observations.

QA0 Report 

Execution Block Summary

Project Code	2021.1.00499.S	SchedBlock	Pj113921_a_03_TM2
ExecBlock	uid://A002/Xf396d6/X45bb	ExecBlock Status	SUCCESS
QA0 Status	✓ Pass	Exec. Fraction	1.50
Repr. frequency	89.631 GHz (Sky)	Band	ALMA_RB_03
Array	12 [m]	Baselines	15m -- 2617m
Antennas	Antennas: 46 effective, 46 usable, 46 unflagged, 46 total. Expected for Cycle 9 : 43, minimum acceptable: 41 Band observed: 3. Highest recommended: 4-4		
Weather	PWV 4.15 mm; Wind 3.50 m/s; Humidity 21.51 %; Pressure 493.55 hPa; Phase rms: 193.366 microns		
QA0 comment	No issues found in the data, except high Trx/Tsys on DA52.		
AOS Check comment	2021-12-04T12:21:47 uid://A002/Xf396d6/X45bb Band 3 Freq 89.6314199553 GHz standard observation Mean Zenith PWV: 4.15 +/- 0.08 mm - Representative Tsys: 65.4 K 46/46 antennas are working in band 3 on the BLC PHASECAL: Antenna-based phase rms on phaseCal: 20.8 degrees (193.4 microns) No antennas exceed rms limit BANDPASS: WVR-corrected baseline-based phase rms on bandpass: 11.8 degrees (109.4 microns) on 1000m baselines Mean improvement in phase rms using WVRs: 2.94 Baseline limit with good phase (80%): 1319m. L80 resolution: 0.523 arcsec Bandpass calibrator: J1058+0133 Flux: 4.110 +/- 0.112 Jy Possible channels with SNR>30: 3659 Phase calibrator: J1148+1840 Flux: 0.125 +/- 0.004 Jy Sky separation: 2.80 degrees Resolution slope : 0.00 SNR in calibrated phaseCal flux: Between antennas: 148.0 Between scans: 269.8 9 completed cycles of science/phaseCal. 1 bandpass scan Percentage of all cal data to be flagged: 50.00% Binary size: 4.77GB Band observed: 3 HIGHEST RECOMMENDED OBSERVING BAND: 4 - 4 QA0 PASS		
QA0 warnings	Percentage of calibration data flagged: 0.500 % Achieved angular resolution is outside the expected range. Observed: 0.38, requested: 0.57 - 0.85		

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The QA0+ section shows some very quick (but very rough) images produced from the data soon after the observations were performed as well as some measurements from those images.

While these images and data are useful for providing a preliminary view of the results, they may be inaccurate compared to what is in the WebLogs.

QA0+ EB

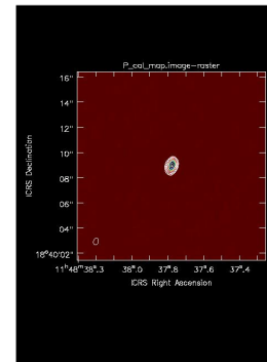
QA0+ results are only to be used as a guide to assess the data quality, and are not for scientific use. QA0+ image and fluxes are obtained from an online reduction of the combined wideband continuum spectral windows (using mfs TCLEAN in CASA), with no bandpass or Tsys calibration, nor removal of potential line contamination. Fluxes are only approximate. 'QA0+ EB' is the result from concatenating all EBs up to the current one.

Science target	PJ113921.7			
Peak	0.055	Integrated	0.05	RMS 0.003
Xoff	0.569	Yoff	0.218	(arcsec from phase centre)
Beam X	0.603"	Beam Y	0.382"	Beam PA -17.66°
Selfcal	true			
Peak	0.107 mJy	Integrated	0.192 mJy	RMS 0.004 mJy
Xoff	0.007	Yoff	0.004	(arcsec from phase centre)
Phase Cal	J1148+1840	Separation	2.80°	
Peak	28.255 mJy	Integrated	29.343 mJy	RMS 0.217 mJy
Beam X R=0.5	0.563"	Beam Y R=0.5	0.376"	
Beam PA R=0.5	-17.28°	RMS R=0.5	0.217 mJy	
Beam X R=2.0	0.805"	Beam Y R=2.0	0.56"	
Beam PA R=2.0	-27.01°	RMS R=2.0	0.316 mJy	
Beam X R=-0.5	0.428"	Beam Y R=-0.5	0.287"	
Beam PA R=-0.5	-13.38°	RMS R=-0.5	0.166 mJy	
WVR	Try remcloud	false	PhaseCal RMS	18.208
Bandpass			Bandpass RMS Top	10.598
Bandpass RMS	[5.53, 7.57, 10.8, 10.73]"		Bandpass Timescales	[20.0, 40.0, 80.0, 120.0] seconds

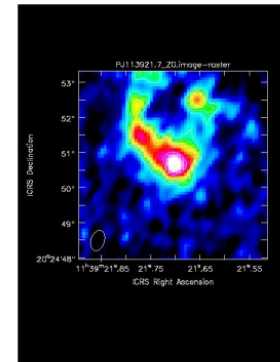
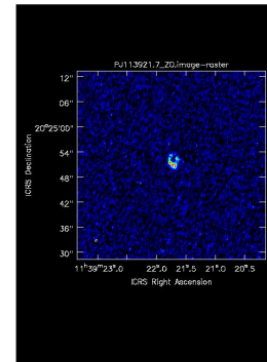
The QA0+ section shows some very quick (but very rough) images produced from the data soon after the observations were performed as well as some measurements from those images.

While these images and data are useful for providing a preliminary view of the results, they may be inaccurate compared to what is in the WebLogs.

Phase Cal (left).



Target images

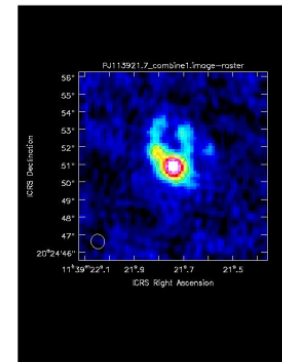
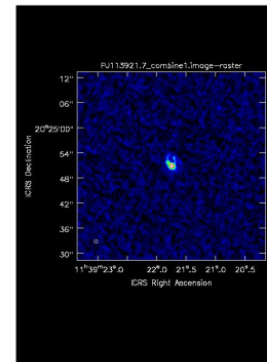


The QA0+ EB section contains the images created using just one Execution Block (EB).

The QA0+ concat section contains images based on combining the data from this EB with previously-executed EBs (if they exist).

QA0+ concat					
N EBs	1	ExecBlock UIDs	[]		
Beam X R=0.5	0.829"		Beam Y R=0.5	0.76"	
Beam PA R=0.5	16.24°		RMS R=0.5	0.003 mJy	
Beam X R=2.0	1.254"		Beam Y R=2.0	1.131"	
Beam PA R=2.0	-26.32°		RMS R=2.0	0.003 mJy	
Beam X R=-0.5	0.593"		Beam Y R=-0.5	0.407"	
Beam PA R=-0.5	4.93°		RMS R=-0.5	0.005 mJy	
Science target	PJ113921.7	RA	11:39:21.745	Dec	+020:24:50.9136
Xoff	-0.044	Yoff	-0.014	Offset (fraction of beam)	0.058
Peak	0.117 mJy	Integrated	0.253 mJy	RMS	0.003 mJy

Concatenated target images



The QA2 PDF includes some comments on the data processing and summary information about the observations.

The last few pages of the document include standard instructions sent to all users.

The first part of the section under "Final QA2 comment" may be useful to read in case something went wrong with the observations.

QA2 Report



Project Information

Name Probing Gas, Dust, Stars, and Star Formation Activity down to 100-pc Scales using Strong Gravitational Lensing
Code 2021.1.00499.5
PI Patrick Kamieneski
Organization Department of Astronomy, Massachusetts at Amherst, University of
Co-Is O. Cooper, B. Frye, K. Harrington, J. Lowenthal, A. Vishwas, Q. Wang, M. Yun

ObsUnitSet Information

Name Member OUS (PJ113921.7)
QA2 Status ✓Pass
Member OUS Status ID uid://A001/X158f/X7a1
SchedBlock name PJ113921_a_03_TM2
SchedBlock UID uid://A001/X158f/X782
Array TM2
Mode Standard
Band ALMA_RB_03
Repr.Freq. (sky) 89.63 [GHz]
Spectral setup Mixed
Sources PJ113921.7
Other SBs in this Group
OUS (Member OUS) PJ113921_a_03_TM1 (uid://A001/X158f/X79f)
Status ID in brackets):
Execution count 1.50 of 1 expected

Final QA2 comment

Comments from Reducer

CASA version: 6.2.1.7, Pipeline version 2021.2.0.128

Reduction mode: PL calibration and imaging

Calibration issues: None

Imaging issues: None

General info:

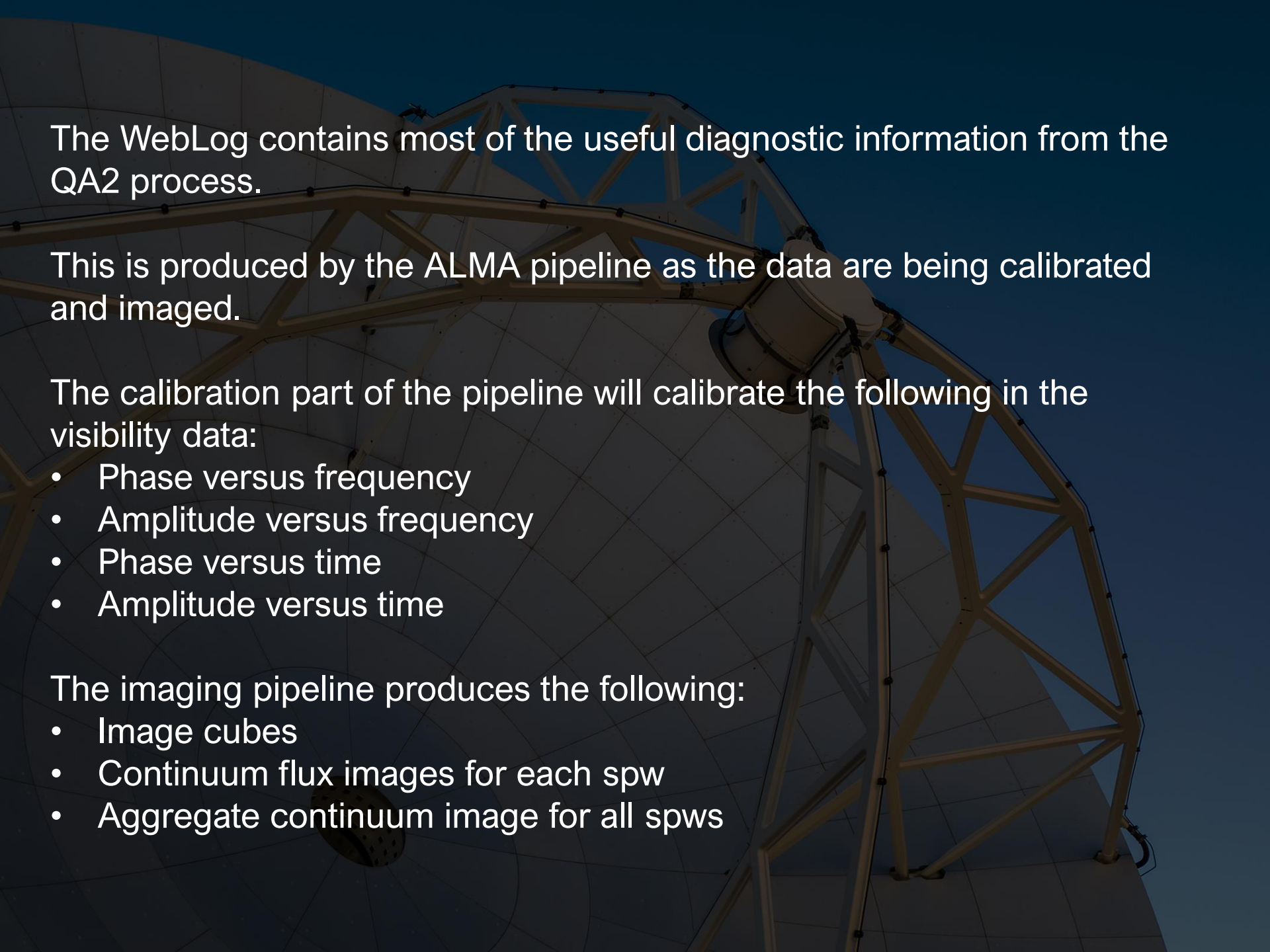
This dataset has been checked for the so-called "renormalization issue". A detailed description about this issue, and how the renormalization process is carried out, can be found at the following link:
<https://help.almascience.org/kb/articles/what-are-the-amplitude-calibration-issues-caused-by-almas-normalization-strategy>

The requirement of rescaling due to any astronomical lines detected in this dataset has been evaluated and the largest peak rescaling value has been estimated to be 1.002, as displayed in the table in the hifa_renorm task of the delivered weblog. The effect of rescaling is a channel-dependent increase of the line flux, which is largest in the brightest channels. This is not an increase in flux-scale uncertainty, but a flux offset correction. When comparing such an offset to the nominal absolute flux accuracy, which is 5% in Bands 3, 4 & 5 and increasing to 20% in Bands 9 & 10, it is concluded that offsets up to 2% are considered negligible. Since the rescaling factor is below this threshold, this dataset has not been corrected for the above issue.

It is recommended that the PI carefully assess the results on the hif_findcont weblog page, and in the "line-free moment 0" images on the cube imaging weblog page. Self-calibration was not performed.

This is a line project, thus QA2 was performed on the Aggregate Continuum and the PI specified representative spectral window. The RMS and beam size meet the PI requested performance parameters, therefore, this scheduling block has been deemed a QA2 PASS.

Aggregate Continuum -
Image name: uid__A001_X158f_X7a1.s36_0_PJ113921.7__sci.spw17_21_23_25.cont.l.iter1.image.tt0



The WebLog contains most of the useful diagnostic information from the QA2 process.

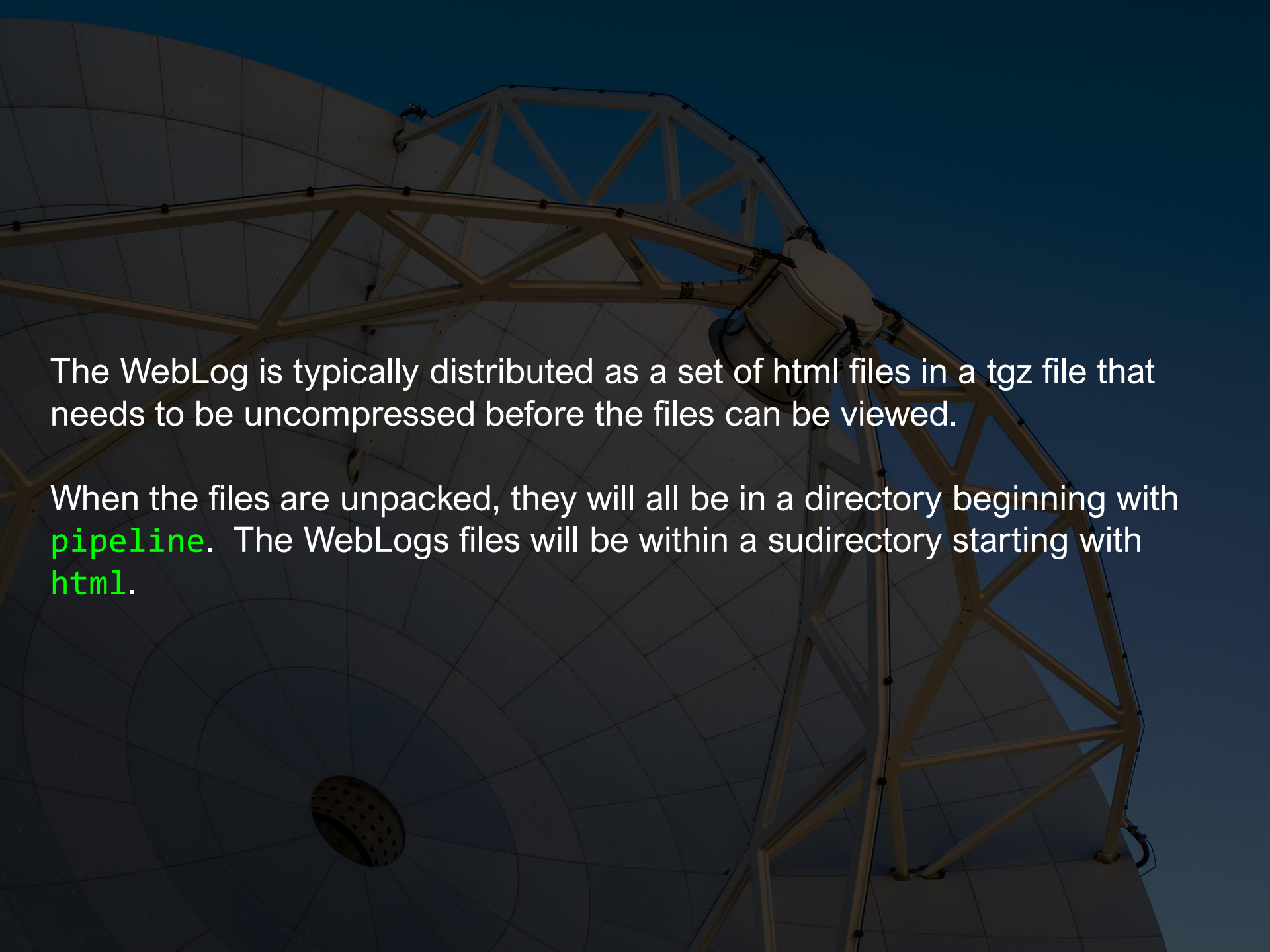
This is produced by the ALMA pipeline as the data are being calibrated and imaged.

The calibration part of the pipeline will calibrate the following in the visibility data:

- Phase versus frequency
- Amplitude versus frequency
- Phase versus time
- Amplitude versus time


The imaging pipeline produces the following:

- Image cubes
- Continuum flux images for each spw
- Aggregate continuum image for all spws

A large satellite dish antenna structure is shown against a dark blue sky. The dish is composed of a complex metal lattice of beams and supports. The surface of the dish is a grid of square panels. A circular, perforated component is visible on the lower left side of the dish. The overall scene is dimly lit, suggesting dusk or dawn.

The WebLog is typically distributed as a set of html files in a tgz file that needs to be uncompressed before the files can be viewed.

When the files are unpacked, they will all be in a directory beginning with `pipeline`. The WebLogs files will be within a subdirectory starting with `html`.



Most web browsers may not open the WebLogs correctly because of issues with their security settings.

The current recommendation is to use the following steps to open a WebLog:

1. In a terminal, go to the `pipeline*/html` directory with the WebLog.
2. Start CASA in pipeline mode using the `--pipeline` option.
3. At the CASA prompt, type `h_weblog()`.
4. Copy the url printed by this command into the address bar of a web browser.

The main index (or Home) page provides an overview of the observations. The page has three tabs at the top. The Home tab is currently displayed. Clicking on a measurement set in the bottom table leads to a page with more detailed information about those data.

The screenshot shows a web browser window with the following content:

Browser Tab: 2021.1.00499.S - Home

Address Bar: file:///D:/pipeline/html/t1-1.html

Navigation: Home (selected), By Topic, By Task

Page Header: 2021.1.00499.S

Observation Overview

Pipeline Summary

Project	uid://A001/X1525/X705
Principal Investigator	pkamieneski
OUS Status Entity id	uid://A001/X158f/X7a1
Observation Start	2021-12-04 12:23:08 UTC
Observation End	2021-12-04 13:23:12 UTC

Pipeline Version	2021.2.0.128 (documentation)
CASA Version	6.2.1.7 (environment)
IERSeop2000 Version	0001.0153 (last date: 2021-10-10 00:00:00)
IERSpredict Version	0623.0662 (last date: 2022-03-04 00:00:00)
Pipeline Start	2021-12-06 15:32:10 UTC
Execution Duration	5:54:43

Observation Summary

Measurement Set	Receivers	Num Antennas	Time (UTC)		On Target	Baseline Length			Size
			Start	End		Min	Max	RMS	
Observing Unit Set Status: uid://A001/X158f/X7a1 Scheduling Block ID: uid://A001/X158f/X782 Scheduling Block Name: PJ113921_a_03_TM2									
Session: session_1									
uid__A002_Xf396d6_X45bb.ms	ALMA Band 3	46	2021-12-04 12:23:08	2021-12-04 13:23:12 MS dates not fully covered by IERSeop2000. CASA will use IERSpredict.	0:41:25	15.3 m	2.6 km	749.4 m	13.2 GB
uid__A002_Xf396d6_X45bb_target.ms	ALMA Band 3	46	2021-12-04 12:32:20	2021-12-04 13:22:31 MS dates not fully covered by IERSeop2000. CASA will use IERSpredict.	0:41:20	15.3 m	2.6 km	749.4 m	6.5 GB

The overview page lists a lot of basic information about the observations themselves.

2021.1.00499.S - Session Data Details X +

file:///D:/pipeline/html/t2-1.html?sidebar=sidebar_uid___A002_Xf396d6_X45bb_ms&subpage=t2-1_details.html

ALMA Home By Topic By Task 2021.1.00499.S

Session: session_1

uid___A002_Xf396d6_X45bb.ms

uid___A002_Xf396d6_X45bb_target.ms

Overview of 'uid___A002_Xf396d6_X45bb.ms'

Observation Execution Time

Start Time	2021-12-04 12:23:08
End Time	2021-12-04 13:23:12
Total Time on Source	0:55:15
Total Time on Science Target	0:41:25

[LISTOBS OUTPUT](#)

Spatial Setup

Science Targets	'PJ113921.7'
Calibrators	'J1058+0133', 'J1148+1840' and 'J1150+2417'

Antenna Setup

Min Baseline	15.3 m
Max Baseline	2.6 km
Number of Baselines	1035
Number of Antennas	46
Antenna Diameters	46 of 12 m

Weather

uid___A002_Xf396d6_X45bb.ms

Spectral Setup


All Bands	'ALMA Band 3' and 'WVR'
Science Bands	'ALMA Band 3'

Sky Setup

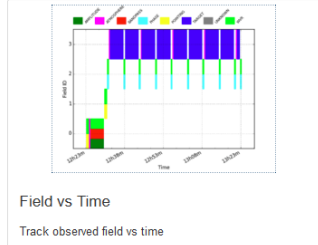
Min Elevation	36.99 degrees
Max Elevation	54.03 degrees

PWV

uid___A002_Xf396d6_X45bb.ms

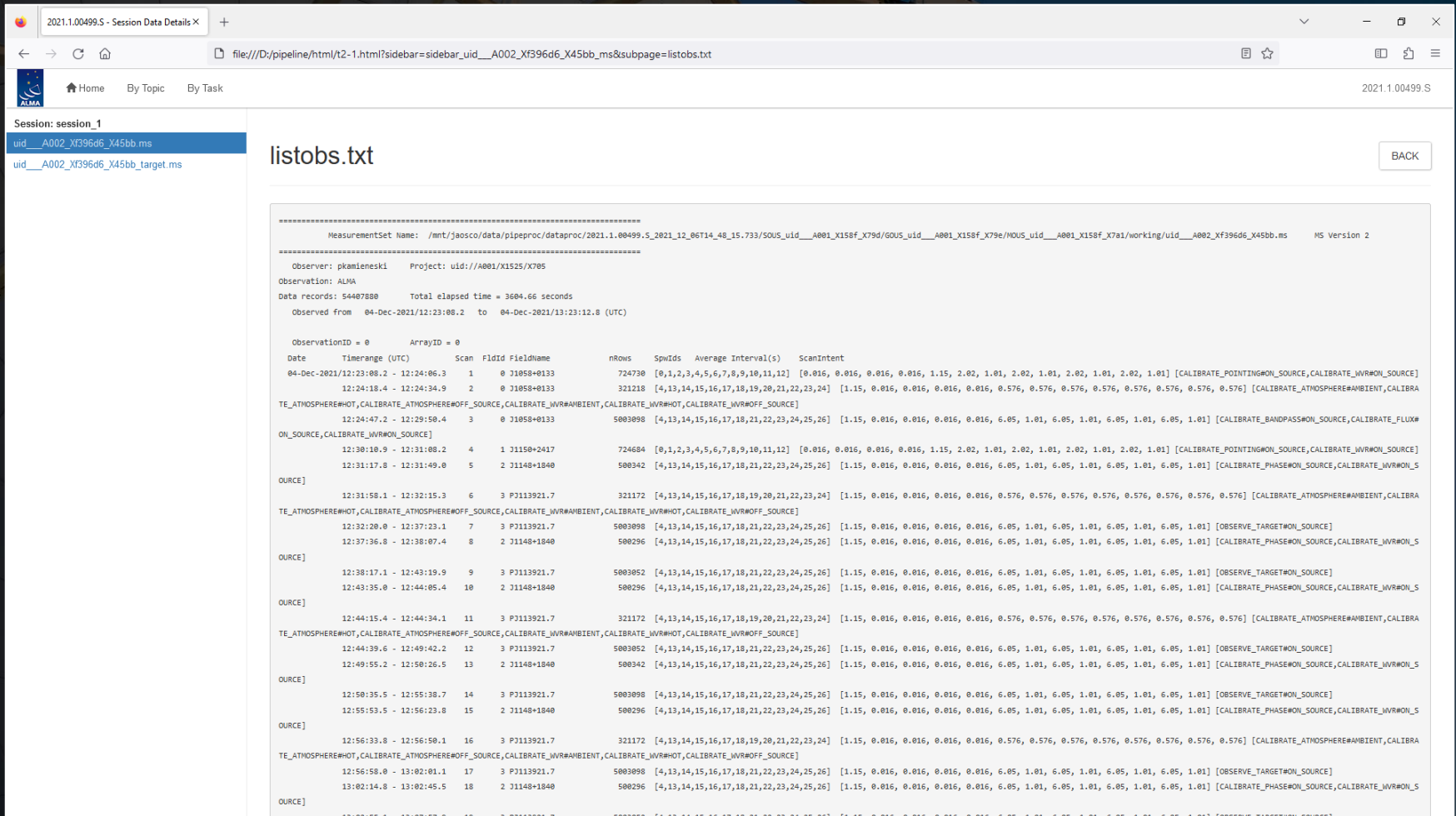


Intent vs Time
Track scan intent vs time



Field vs Time
Track observed field vs time

The listobs output button displays a text file with summary information about the sequence of observations, the fields, the spectral windows, and the antennas. Versions of this file can also be created using the **listobs** command in CASA.

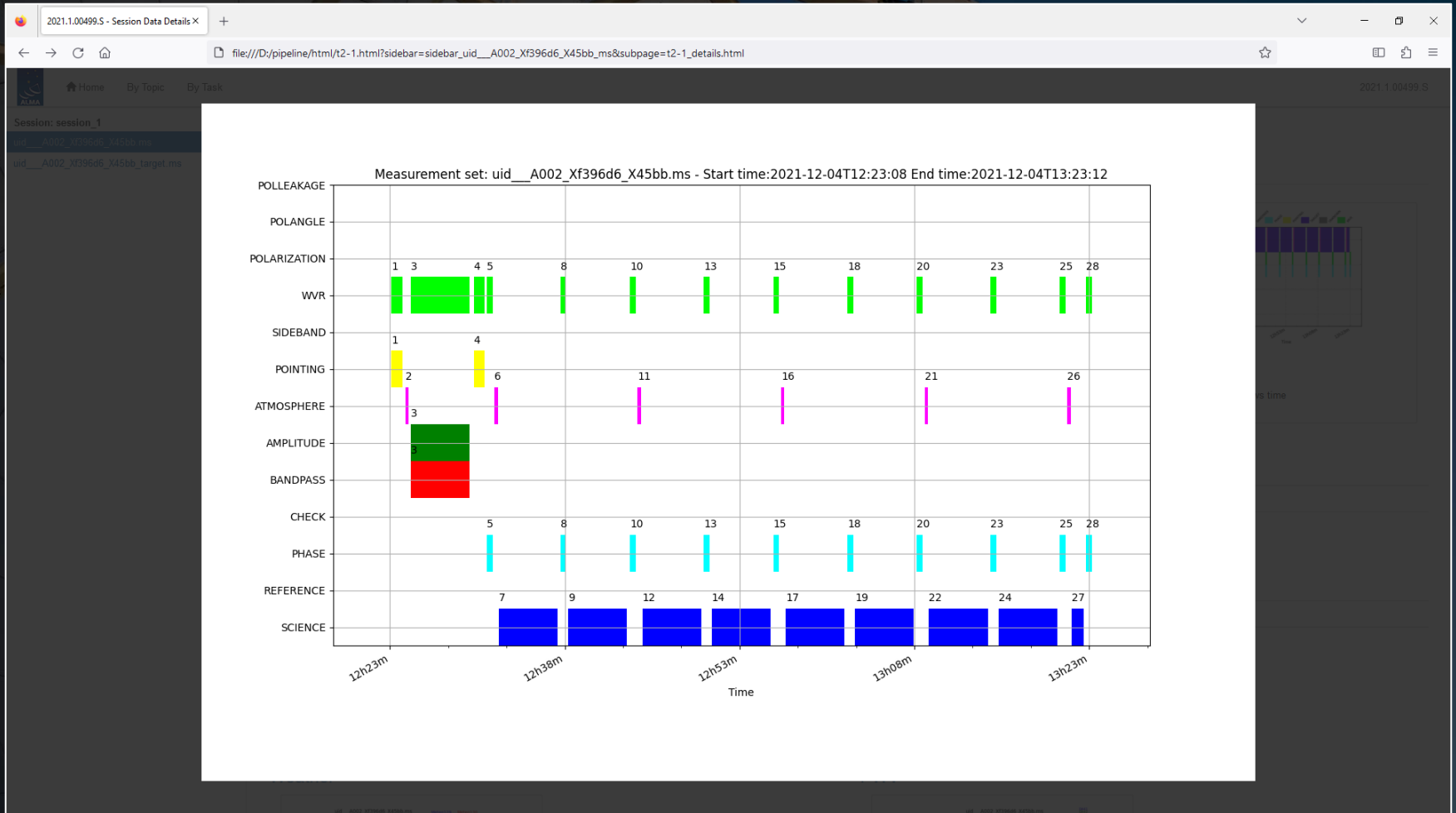


The screenshot shows a web browser window with the URL `file:///D:/pipeline/html/t2-1.html?sidebar=sidebar_uid__A002_Xf396d6_X45bb_ms&subpage=listobs.txt`. The page title is "listobs.txt" and it includes a "BACK" button. The content is a text file output from the CASA software, detailing observation parameters and scan information.

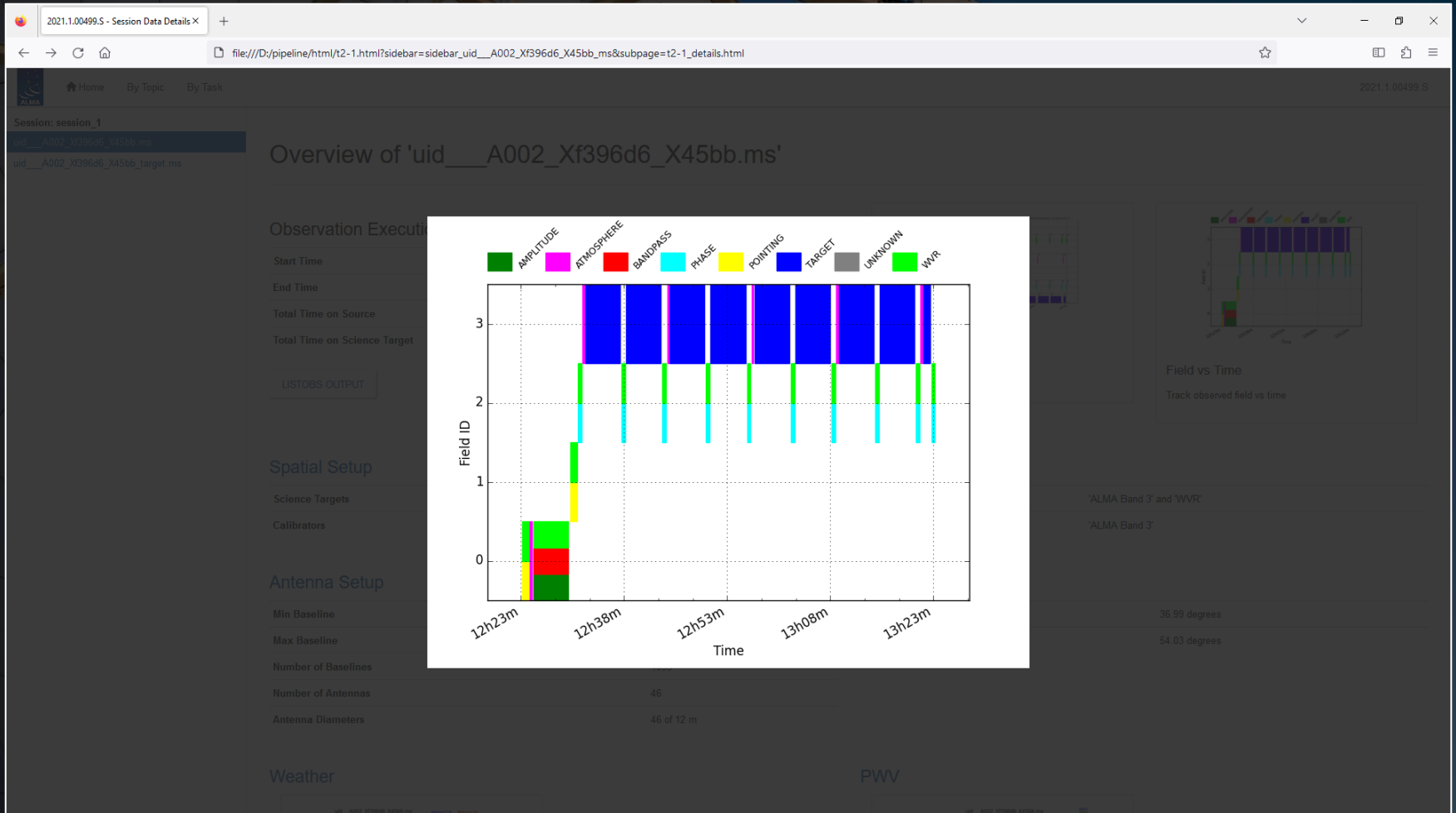
```
=====
MeasurementSet Name: /mnt/jaosco/data/pipeproc/dataproc/2021.1.00499.5_2021_12_06T14_48_15.733/SOUs_uid__A001_X158f_X79d/GOUS_uid__A001_X158f_X79e/MOUS_uid__A001_X158f_X781/working/uid__A002_Xf396d6_X45bb.ms  MS Version 2
=====
Observer: pkamieneski  Project: uid://A001/X1525/X705
Observation: ALMA
Data records: 54407800  Total elapsed time = 3604.66 seconds
Observed from 04-Dec-2021/12:23:08.2 to 04-Dec-2021/13:23:12.8 (UTC)

ObservationID = 0  ArrayID = 0
Date  Timerange (UTC)  Scan  FldID  FieldName  nRows  SpwIds  Average Interval(s)  ScanIntent
04-Dec-2021/12:23:08.2 - 12:24:06.3  1  0  J1058+0133  724730  [0,1,2,3,4,5,6,7,8,9,10,11,12]  [0.016, 0.016, 0.016, 0.016, 1.15, 2.02, 1.01, 2.02, 1.01, 2.02, 1.01, 2.02, 1.01]  [CALIBRATE_POINTING#ON_SOURCE,CALIBRATE_JVR#ON_SOURCE]
12:24:18.4 - 12:24:34.9  2  0  J1058+0133  321210  [4,13,14,15,16,17,18,19,20,21,22,23,24]  [1.15, 0.016, 0.016, 0.016, 0.016, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576]  [CALIBRATE_ATMOSPHERE#AMBIENT,CALIBRA
TE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_JVR#AMBIENT,CALIBRATE_JVR#HOT,CALIBRATE_JVR#OFF_SOURCE]
12:24:47.2 - 12:29:50.4  3  0  J1058+0133  5003098  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_BANDPASS#ON_SOURCE,CALIBRATE_FLUX#
ON_SOURCE,CALIBRATE_JVR#ON_SOURCE]
12:30:10.9 - 12:31:08.2  4  1  J1150+2417  724684  [0,1,2,3,4,5,6,7,8,9,10,11,12]  [0.016, 0.016, 0.016, 0.016, 1.15, 2.02, 1.01, 2.02, 1.01, 2.02, 1.01, 2.02, 1.01]  [CALIBRATE_POINTING#ON_SOURCE,CALIBRATE_JVR#ON_SOURCE]
12:31:17.8 - 12:31:49.0  5  2  J1148+1040  500342  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_JVR#ON_S
OURCE]
12:31:50.1 - 12:32:15.3  6  3  P3113921.7  321172  [4,13,14,15,16,17,18,19,20,21,22,23,24]  [1.15, 0.016, 0.016, 0.016, 0.016, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576]  [CALIBRATE_ATMOSPHERE#AMBIENT,CALIBRA
TE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_JVR#AMBIENT,CALIBRATE_JVR#HOT,CALIBRATE_JVR#OFF_SOURCE]
12:32:20.0 - 12:37:23.1  7  3  P3113921.7  5003098  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [OBSERVE_TARGET#ON_SOURCE]
12:37:36.0 - 12:38:07.4  8  2  J1148+1040  500296  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_JVR#ON_S
OURCE]
12:38:17.1 - 12:43:19.9  9  3  P3113921.7  5003052  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [OBSERVE_TARGET#ON_SOURCE]
12:43:35.0 - 12:44:05.4  10  2  J1148+1040  500296  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_JVR#ON_S
OURCE]
12:44:15.4 - 12:44:34.1  11  3  P3113921.7  321172  [4,13,14,15,16,17,18,19,20,21,22,23,24]  [1.15, 0.016, 0.016, 0.016, 0.016, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576]  [CALIBRATE_ATMOSPHERE#AMBIENT,CALIBRA
TE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_JVR#AMBIENT,CALIBRATE_JVR#HOT,CALIBRATE_JVR#OFF_SOURCE]
12:44:39.6 - 12:49:42.2  12  3  P3113921.7  5003052  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [OBSERVE_TARGET#ON_SOURCE]
12:49:55.2 - 12:50:26.5  13  2  J1148+1040  500342  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_JVR#ON_S
OURCE]
12:50:35.5 - 12:55:30.7  14  3  P3113921.7  5003098  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [OBSERVE_TARGET#ON_SOURCE]
12:55:53.5 - 12:56:23.8  15  2  J1148+1040  500296  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_JVR#ON_S
OURCE]
12:56:33.0 - 12:56:50.1  16  3  P3113921.7  321172  [4,13,14,15,16,17,18,19,20,21,22,23,24]  [1.15, 0.016, 0.016, 0.016, 0.016, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576, 0.576]  [CALIBRATE_ATMOSPHERE#AMBIENT,CALIBRA
TE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_JVR#AMBIENT,CALIBRATE_JVR#HOT,CALIBRATE_JVR#OFF_SOURCE]
12:56:58.0 - 13:02:01.1  17  3  P3113921.7  5003098  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [OBSERVE_TARGET#ON_SOURCE]
13:02:14.8 - 13:02:45.5  18  2  J1148+1040  500296  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_JVR#ON_S
OURCE]
13:02:55.1 - 13:07:57.4  19  3  P3113921.7  6003043  [4,13,14,15,16,17,18,21,22,23,24,25,26]  [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01]  [OBSERVE_TARGET#ON_SOURCE]
=====
```


The intent versus time plot shows the sequence of the observations as well as the purpose of those observations. Some observations have multiple purposes.



The field versus time plot is similar except that the y-axis indicates the field ID. In this case, 0 is field for the bandpass calibrator, 1 is the field for the phase calibrator, and 2 is the field for the science target (Z CMa).



The antenna setup page shows the location of the antennas and the resulting uv coverage (which is related to the final angular resolution and maximum recoverable scale of the data).

2021.1.00499.S - Session Data Details X +

file:///D:/pipeline/html/t2-1.html?sidebar=sidebar_uid___A002_Xf396d6_X45bb_ms&subpage=t2-2-3.html

ALMA Home By Topic By Task 2021.1.00499.S

Session: session_1

uid___A002_Xf396d6_X45bb_ms

uid___A002_Xf396d6_X45bb_target.ms

Antenna Setup Details

Antennas Baselines

Antenna Positions

Antenna Position
Plot antenna latitude vs antenna longitude

Antenna Position
Polar-logarithmic plot of antenna positions.

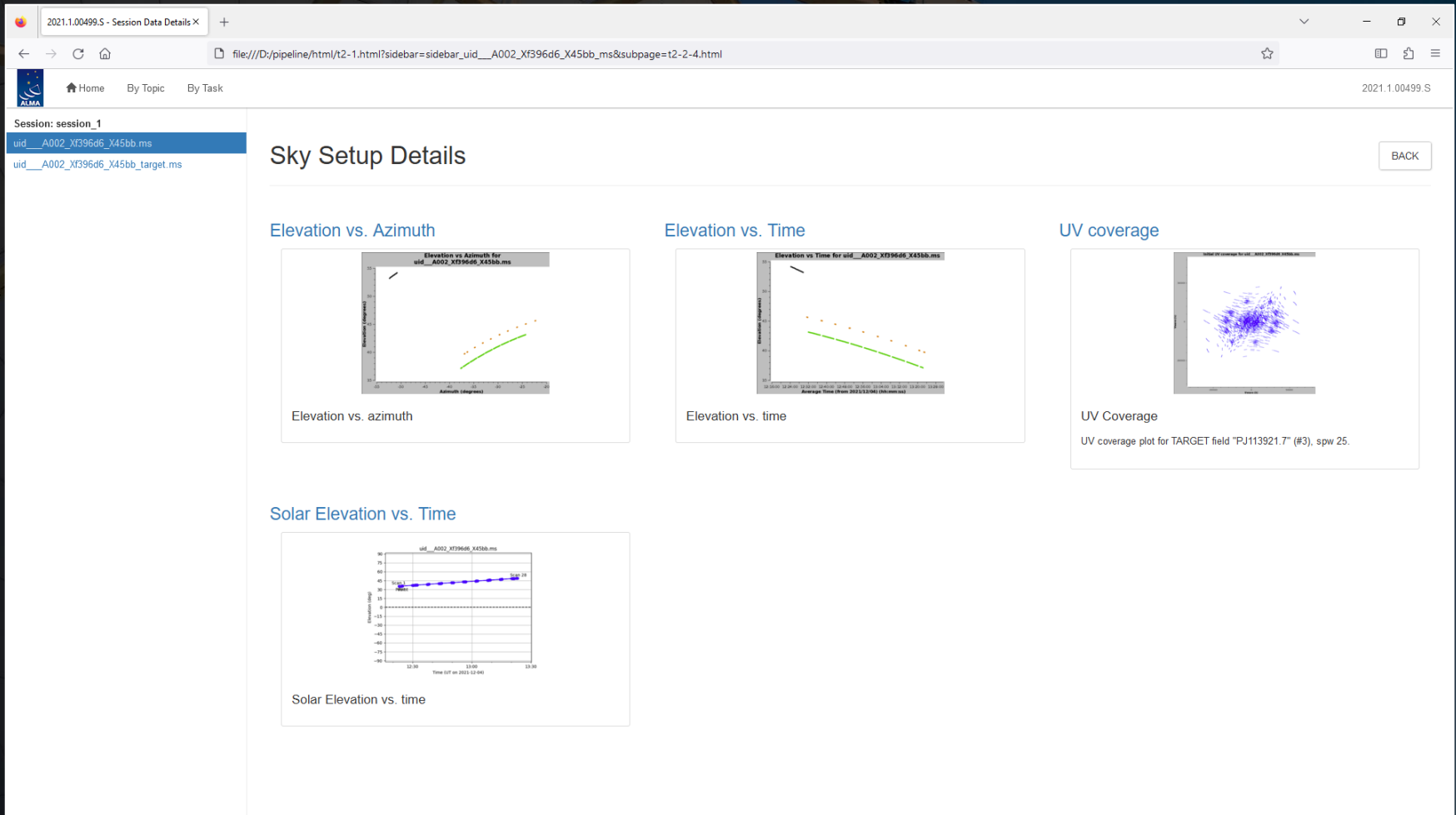
UV coverage

UV Coverage
UV coverage plot for TARGET field "PUJ113921.7" (#3), spw 25.

Antenna Details

ID	Name	Pad	Diameter	Offset from Array Centre	
				Longitude	Latitude
0	DA41	A073	12.0	-147.1 m	-705.3 m
1	DA42	A047	12.0	38.5 m	-775.2 m
2	DA43	A035	12.0	32.0 m	-706.8 m
3	DA45	A104	12.0	-530.9 m	-492.5 m
4	DA46	A016	12.0	37.5 m	-614.6 m
5	DA48	A076	12.0	-78.0 m	-882.7 m
6	DA49	A096	12.0	-347.1 m	-322.8 m
7	DA50	A000	12.0	720.0 m	0.0 m

The sky setup shows the elevation and azimuth of the fields during the observations. The beam for sources observed at low elevations ($<45^\circ$) could appear elongated. Calibration problems may occur if the phase calibrator and science target are too far apart ($>10^\circ$).



The By Topic page lists warnings that were produced by the pipeline along with grades for those warnings and tables showing the amount of data flagged for each antenna in each field. This page is more important for reviewing the quality of the data.

2021.1.00499.S - Topic Summary






file:///D:/pipeline/html/t1-3.html

Home By Topic By Task 2021.1.00499.S

Warnings and Errors

Stage	Task	Type	Message
7	hifa_tsysflag	Warning	uid___A002_Xf396d6_X45bb.ms - for intent AMPLITUDE (field 0: J1058+0133) and spw 23, the following antennas are fully flagged: DA52
7	hifa_tsysflag	Warning	uid___A002_Xf396d6_X45bb.ms - for intent BANDPASS (field 0: J1058+0133) and spw 23, the following antennas are fully flagged: DA52
7	hifa_tsysflag	Warning	uid___A002_Xf396d6_X45bb.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more Tsys spws, in one or more fields with intent "BANDPASS", "PHASE", and/or "AMPLITUDE": DA52
10	hif_lowgainflag	Warning	uid___A002_Xf396d6_X45bb.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more spws: DA52
12	hifa_bandpassflag	Warning	uid___A002_Xf396d6_X45bb.ms - for intent BANDPASS (field J1058+0133) and spw 17, the following antennas are fully flagged: PM01
12	hifa_bandpassflag	Warning	uid___A002_Xf396d6_X45bb.ms - for intent BANDPASS (field J1058+0133) and spw 21, the following antennas are fully flagged: DV08
12	hifa_bandpassflag	Warning	uid___A002_Xf396d6_X45bb.ms - for intent BANDPASS (field J1058+0133) and spw 25, the following antennas are fully flagged: PM01
12	hifa_bandpassflag	Warning	uid___A002_Xf396d6_X45bb.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more spws, in one or more fields with intents among BANDPASS: PM01 and DV08

Tasks by Topic

Topic	Lowest Scoring Task	Min Score
Data Sets	24. hifa_imageprecheck: ImagePreCheck	Beam within range using non-default robust  0.85
Calibration	13. hifa_bandpass: Phase-up bandpass calibration	 0.95
Flagging	7. hifa_tsysflag: Flag Tsys calibration	 0.96
Imaging	34. hif_makeimages: Make target per-spw continuum images	 1.00
Miscellaneous	5. hif_refant: Select reference antennas	 1.00

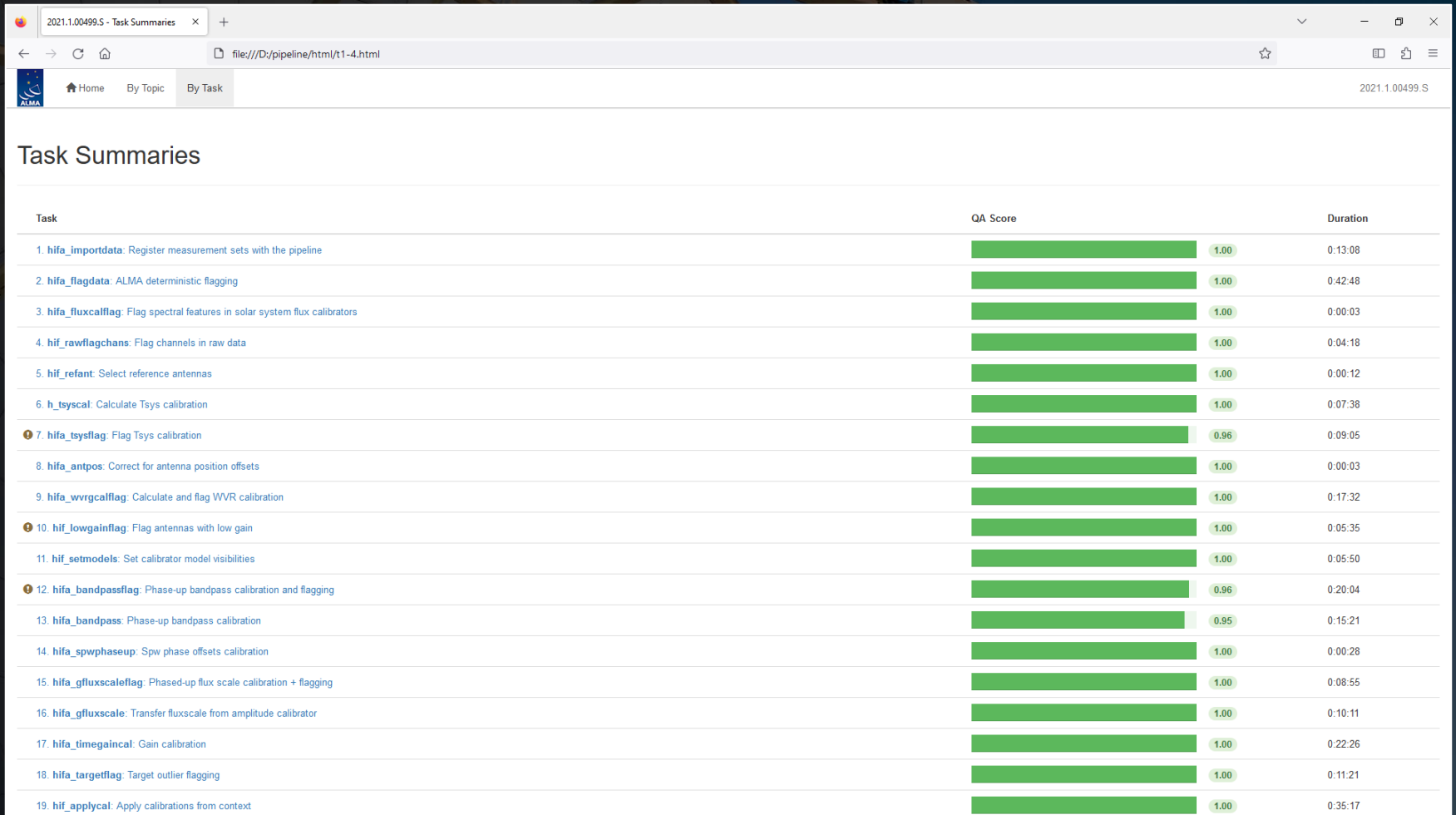
Flagging Summaries

uid___A002_Xf396d6_X45bb.ms

Flagging percentages for Source name: J1058+0133, Intents: AMPLITUDE,ATMOSPHERE,BANDPASS,POINTING,WVR

spw	DA41	DA42	DA43	DA45	DA46	DA48	DA49	DA50	DA51	DA52	DA54	DA55	DA56	DA58	DA59	DA60	DA61	DA62	DA63	DA65	DV01	DV02	DV03	DV04	DV05	DV06	DV07	DV08	DV09	DV10	DV11	DV12	DV13
17	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	38.342	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	
21	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	38.342	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	36.907	100.000	36.907	36.907	36.907	36.907	36.907	

The By Task page lists each of the calibration and imaging steps that were applied in the pipeline. Not all of these steps need to be checked. Many of these have diagnostic information primarily used for quality assessment.



Task	QA Score	Duration
1. <code>hifa_importdata</code> : Register measurement sets with the pipeline	1.00	0:13:08
2. <code>hifa_flagdata</code> : ALMA deterministic flagging	1.00	0:42:48
3. <code>hifa_fluxcallflag</code> : Flag spectral features in solar system flux calibrators	1.00	0:00:03
4. <code>hif_rawflagchans</code> : Flag channels in raw data	1.00	0:04:18
5. <code>hif_refant</code> : Select reference antennas	1.00	0:00:12
6. <code>h_tsyscal</code> : Calculate Tsys calibration	1.00	0:07:38
7. <code>hifa_tsysflag</code> : Flag Tsys calibration	0.96	0:09:05
8. <code>hifa_antpos</code> : Correct for antenna position offsets	1.00	0:00:03
9. <code>hifa_wvrflag</code> : Calculate and flag WVR calibration	1.00	0:17:32
10. <code>hif_lowgainflag</code> : Flag antennas with low gain	1.00	0:05:35
11. <code>hif_setmodels</code> : Set calibrator model visibilities	1.00	0:05:50
12. <code>hifa_bandpassflag</code> : Phase-up bandpass calibration and flagging	0.96	0:20:04
13. <code>hifa_bandpass</code> : Phase-up bandpass calibration	0.95	0:15:21
14. <code>hifa_spwphaseup</code> : Spw phase offsets calibration	1.00	0:00:28
15. <code>hifa_gfluxscaleflag</code> : Phased-up flux scale calibration + flagging	1.00	0:08:55
16. <code>hifa_gfluxscale</code> : Transfer fluxscale from amplitude calibrator	1.00	0:10:11
17. <code>hifa_timegaincal</code> : Gain calibration	1.00	0:22:26
18. <code>hifa_targetflag</code> : Target outlier flagging	1.00	0:11:21
19. <code>hif_applycal</code> : Apply calibrations from context	1.00	0:35:17

hifa_tsysflag: This step includes plots of the T_{sys} data (used to correct amplitudes) as a function of frequency. It is useful to check these plots to understand the atmospheric transmission. Spectral features in these data could potentially reappear in the final spectra of the science targets.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage7&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcalflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
- 7. hifa_tsysflag**
8. hifa_antpos
9. hifa_wvrqcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renom
27. hifa_exportdata
28. hif_mstansform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

7. Flag T_{sys} calibration

BACK

Task notifications

Warning! uid___A002_Xf396d6_X45bb.ms - for intent AMPLITUDE (field 0: J1058+0133) and spw 23, the following antennas are fully flagged: DA52

Warning! uid___A002_Xf396d6_X45bb.ms - for intent BANDPASS (field 0: J1058+0133) and spw 23, the following antennas are fully flagged: DA52

Warning! uid___A002_Xf396d6_X45bb.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more Tsys spws, in one or more fields with intent "BANDPASS", "PHASE", and/or "AMPLITUDE": DA52

Contents

- Reference antenna update
- T_{sys} after flagging
- Flagged data summary
- Flag step details
 - manual
 - nmedian
 - derivative
 - edgechans
 - fieldshape
 - birdies
 - toomany

Reference Antenna update

For the measurement set(s) listed below, the reference antenna list was updated due to significant flagging (antennas moved to end and/or removed). See warnings in task notifications for details. Shown below are the updated reference antenna lists, only for those measurement sets where it was modified.

Measurement Set	Reference Antennas (Highest to Lowest)
uid___A002_Xf396d6_X45bb.ms	DA43, DV06, DV03, DV02, DV04, DV01, DA60, DA58, DV21, DA46, DA42, DV25, DA62, DA54, DA65, DV20, DA41, DA51, PM02, DA59, DV09, DA48, DV18, DV22, DV17, DV11, DA56, DV23, DA61, DV16, DV14, DV13, DV05, DA49, DV10, DV08, PM03, DA45, DA50, DV19, PM01, DV12, DA55, DA63, DV07, DA52

Updated reference antenna selection per measurement set. Antennas are listed in order of highest to lowest priority.

T_{sys} vs frequency after flagging

hifa_tsysflag: This step includes plots of the T_{sys} data (used to correct amplitudes) as a function of frequency. It is useful to check these plots to understand the atmospheric transmission. Spectral features in these data could potentially reappear in the final spectra of the science targets.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage7&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
- 7. hifa_tsysflag**
8. hifa_antpos
9. hifa_wvrgcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvconftit

For the measurement set(s) listed below, the reference antenna list was updated due to significant flagging (antennas moved to end and/or removed). See warnings in task notifications for details. Shown below are the updated reference antenna lists, only for those measurement sets where it was modified.

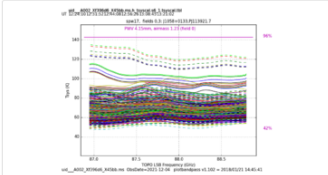
Measurement Set	Reference Antennas (Highest to Lowest)
uid__A002_Xf396d6_X45bb.ms	DA43, DV06, DV03, DV02, DV04, DV01, DA60, DA58, DV21, DA46, DA42, DV25, DA62, DA54, DA65, DV20, DA41, DA51, PM02, DA59, DV09, DA48, DV18, DV22, DV17, DV11, DA56, DV23, DA61, DV16, DV14, DV13, DV05, DA49, DV10, DV08, PM03, DA45, DA50, DV19, PM01, DV12, DA55, DA63, DV07, DA52

Updated reference antenna selection per measurement set. Antennas are listed in order of highest to lowest priority.

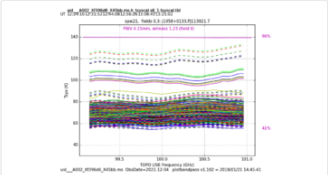
T_{sys} vs frequency after flagging

Plots of time-averaged T_{sys} vs frequency, colored by antenna.

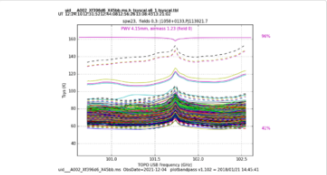
uid__A002_Xf396d6_X45bb.ms



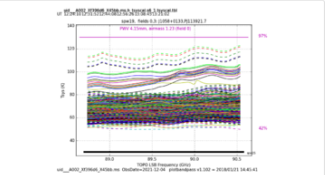
T_{sys} spw 17
Science spw 17.



T_{sys} spw 21
Science spw 21.



T_{sys} spw 23
Science spw 23.



T_{sys} spw 19
Science spw 25.

Flagging steps

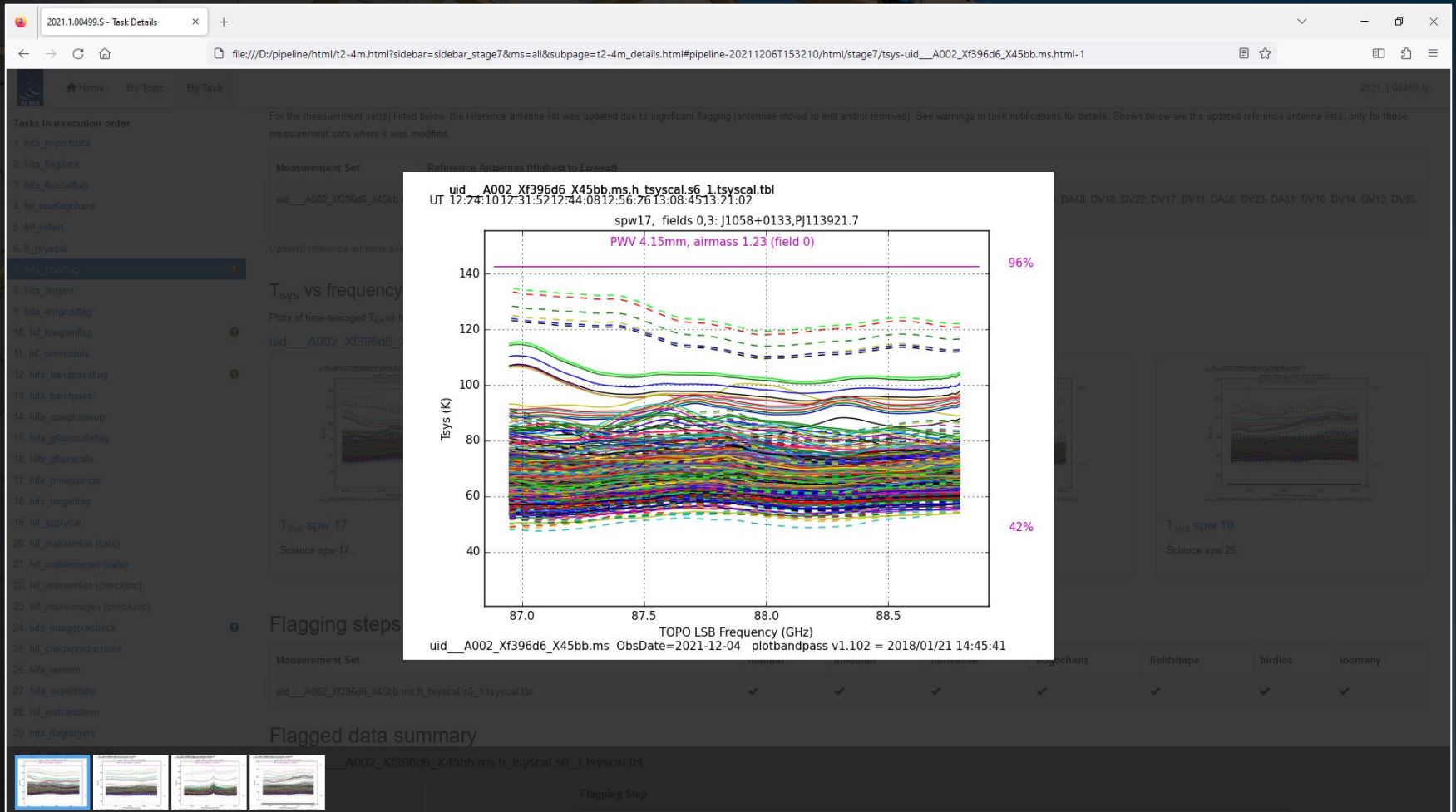
Measurement Set	manual	nmedian	derivative	edgechans	fieldshape	birdies	toomany
uid__A002_Xf396d6_X45bb.ms.h_tsyscal.s6_1.tsyscal.tbl	✓	✓	✓	✓	✓	✓	✓

Flagged data summary

Table: uid__A002_Xf396d6_X45bb.ms.h_tsyscal.s6_1.tsyscal.tbl

Flagging Step

hifa_tsysflag: This step includes plots of the T_{sys} data (used to correct amplitudes) as a function of frequency. It is useful to check these plots to understand the atmospheric transmission. Spectral features in these data could potentially reappear in the final spectra of the science targets.



hifa_bandpass: Corrections for the phase and amplitude versus frequency are derived in this step.

The screenshot shows a web browser window displaying the ALMA task details for '13. Bandpass Calibration'. The browser address bar shows the file path: file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage13&ms=all&subpage=t2-4m_details.html. The page title is '2021.1.00499.S - Task Details'. The left sidebar lists tasks in execution order, with '13. hifa_bandpass' selected. The main content area is titled '13. Bandpass Calibration' and includes a 'BACK' button. Below the title, a description states: 'This task creates bandpass solutions for each measurement set.' The 'Results' section is titled 'Phase-up on bandpass calibrator' and contains a table of 'Phase-up Solution Parameters'. Below this, it says 'Applied calibrations and parameters used for phase-up calibration'. The 'Bandpass calibration' section contains a table of 'Solution Parameters' and 'Applied To' information. At the bottom, the 'Plots' section is partially visible, starting with 'Plots show the bandpass correction applied to the target source...'.

13. Bandpass Calibration

BACK

This task creates bandpass solutions for each measurement set.

Results

Phase-up on bandpass calibrator

Measurement Set	Phase-up Solution Parameters				
	Type	Interval	Min Baselines per Antenna	Min SNR	Phase-up Bandwidth
uid__A002_Xf396d6_X45bb.ms	Phase only	Per integration (6.05s)	4	3.0	

Applied calibrations and parameters used for phase-up calibration

Bandpass calibration

Measurement Set	Solution Parameters		Applied To		Calibration Table
	Type	Interval	Scan Intent	Spectral Windows	
uid__A002_Xf396d6_X45bb.ms	Channel	inf,15.625000MHz(1.0ch)	ALL	17	uid__A002_Xf396d6_X45bb.ms.hifa_bandpass.s13_3.spw17_21_23_25.channel.solintinf.bcal.tbl
				21	
	23				
	25				
		inf,3.906250MHz(1.0ch)			

Parameters used for bandpass calibration

Plots

Plots show the bandpass correction applied to the target source. The first two plots show amplitude vs frequency; one for the reference antenna and one for a typical antenna, identified the antenna with mode score. The third plot shows phase vs frequency for the typical antenna.

Click the summary plots to enlarge them, or the plot title to see detailed plots per spectral window and antenna.

uid__A002_Xf396d6_X45bb.ms

The plots of these quantities versus frequency should be smooth. Any strong spikes or dips in the data could create false spectral lines in the final image cubes.

2021.1.00499.5 - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage13&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.5

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
- 13. hifa_bandpass**
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renom
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

Plots

Plots show the bandpass correction applied to the target source. The first two plots show amplitude vs frequency; one for the reference antenna and one for a typical antenna, identified the antenna with mode score. The third plot shows phase vs frequency for the typical antenna.

Click the summary plots to enlarge them, or the plot title to see detailed plots per spectral window and antenna.

uid___A002_Xf396d6_X45bb.ms

Amplitude vs frequency (show uid___A002_Xf396d6_X45bb.ms)

The plots below show amplitude vs frequency for the bandpass correction, overlaid for all spectral windows and correlations. Click on the link above to show detailed plots for all antennas, or on the links below to show plots with specific antennas preselected.

Reference antenna (DA43) (show DA43)

Amplitude vs frequency for the reference antenna (DA43). Click the link above to show detailed plots for DA43.

Typical antenna (DA41) (show DA41)

Amplitude vs frequency for a typical antenna (DA41). Click the link above to show detailed plots for DA41.

NB: random antenna until scores are working

Phase vs frequency (show uid___A002_Xf396d6_X45bb.ms)

The plot below shows phase vs frequency for the bandpass correction, overlaid for all spectral windows and correlations. Click on the link above to show phase vs frequency plots for all antennas, or on the link for just the typical antenna.

Typical antenna (DA41) (show DA41)

Phase vs frequency for a typical antenna (DA41). Click the link above to show detailed plots for DA41.

Pipeline QA

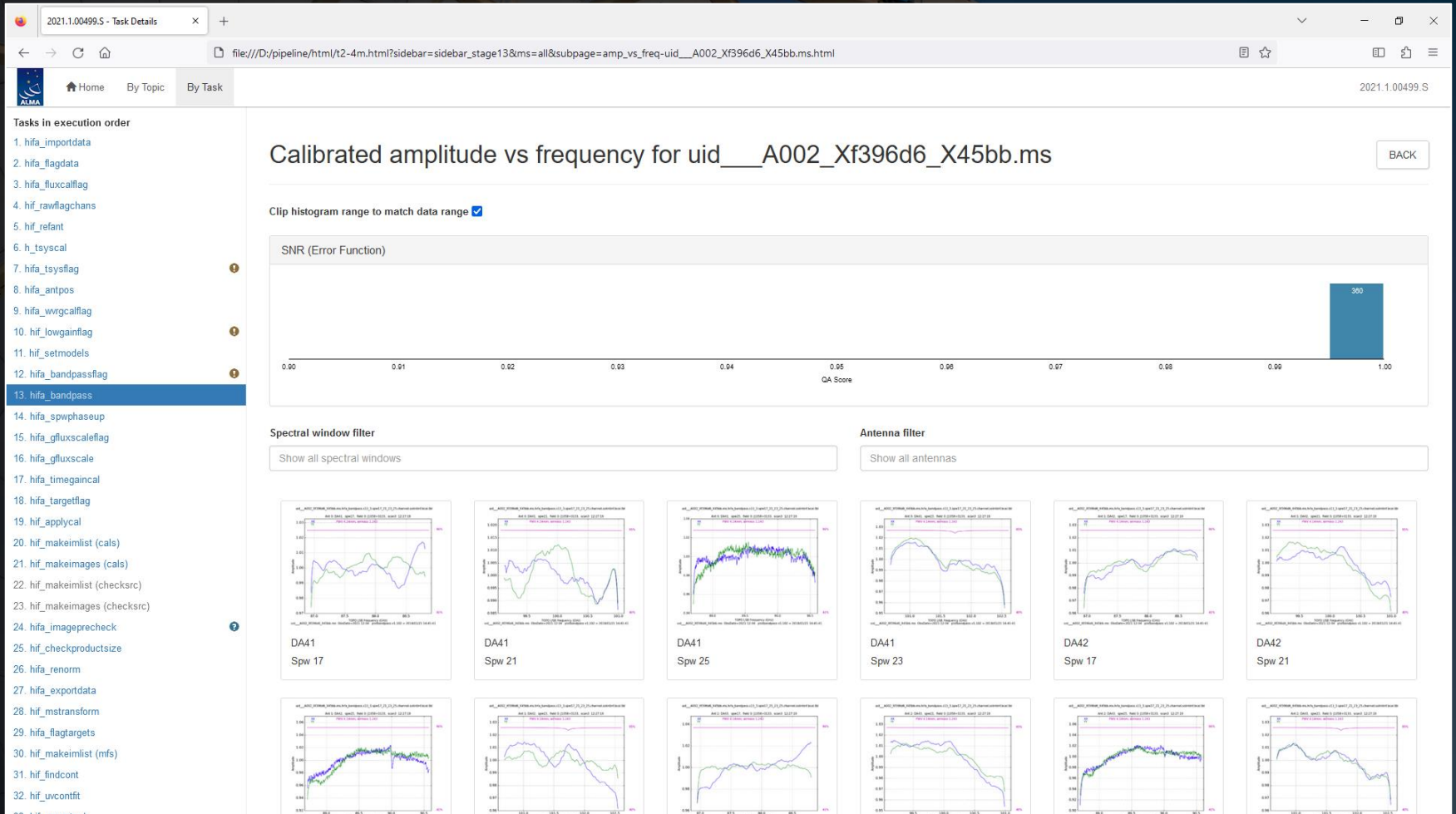
Input Parameters

Tasks Execution Statistics

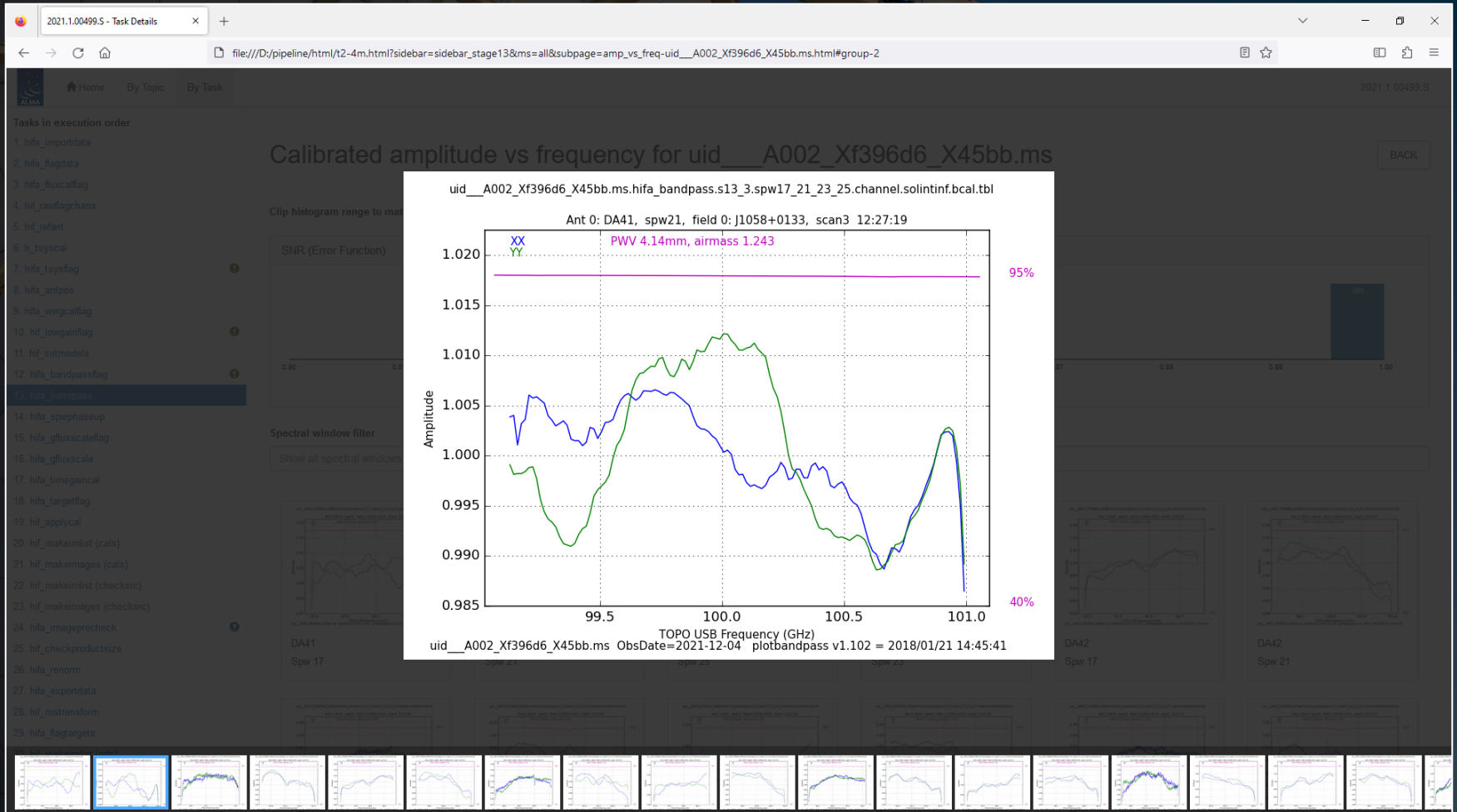
CASA logs for stage 13

- View or download stage13/casapy.log (152.1 KB)

The plots of these quantities versus frequency should be smooth. Any strong spikes or dips in the data could create false spectral lines in the final image cubes.



The plots of these quantities versus frequency should be smooth. Any strong spikes or dips in the data could create false spectral lines in the final image cubes.



hifa_timegaincal: This module derives phase and amplitude corrections versus time. The output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage17&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit
33. hif_uvcontstack

17. Gain Calibration

This task creates gain solutions for each measurement set.

- Plots
 - Phase vs time
 - Amplitude vs time
- Diagnostic plots
 - Phase vs time
 - Phase offsets vs time
 - Amplitude vs time

Results

Measurement Set	Solution Parameters		Applied To			Calibration Table
	Type	Interval	Scan Intent	Spectral Windows	Gainfield	
uid__A002_Xf396d6_X45bb.ms	Phase only	Infinite	PHASE	17, 21, 23, 25	nearest	uid__A002_Xf396d6_X45bb.ms.hifa_timegaincal.s17_2.spw17_21_23_25.solintf.gpcal.tbl
uid__A002_Xf396d6_X45bb.ms	Phase only	Infinite	TARGET, CHECK	17, 21, 23, 25		uid__A002_Xf396d6_X45bb.ms.hifa_timegaincal.s17_2.spw17_21_23_25.solintf.gpcal.tbl
uid__A002_Xf396d6_X45bb.ms	Phase only	Per integration (6.05s)	AMPLITUDE, BANDPASS, POLARIZATION, POLANGLE, POLLEAKAGE	17, 21, 23, 25	nearest	uid__A002_Xf396d6_X45bb.ms.hifa_timegaincal.s17_3.spw17_21_23_25.solintf.gpcal.tbl
uid__A002_Xf396d6_X45bb.ms	Amplitude only	Infinite	AMPLITUDE, BANDPASS, PHASE, POLARIZATION, POLANGLE, POLLEAKAGE	17, 21, 23, 25	nearest	uid__A002_Xf396d6_X45bb.ms.hifa_timegaincal.s17_7.spw17_21_23_25.solintf.gacal.tbl
uid__A002_Xf396d6_X45bb.ms	Amplitude only	Infinite	TARGET, CHECK	17, 21, 23, 25		uid__A002_Xf396d6_X45bb.ms.hifa_timegaincal.s17_7.spw17_21_23_25.solintf.gacal.tbl

Applied calibrations and parameters used for caltable generation

Plots

Phase vs time

hifa_timegaincal: This module derives phase and amplitude corrections versus time. The output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage17&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrgcallag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
- 17. hifa_timegaincal**
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renom
27. hifa_exportdata
28. hif_mstransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

Plots

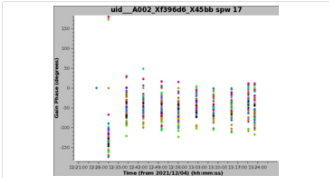
Phase vs time

Plots show the phase correction to be applied to the target source. A plot is shown for each spectral window, with phase correction data points plotted per antenna and correlation as a function of time.

Click the summary plots to enlarge them, or the spectral window heading to see detailed plots per spectral window and antenna.

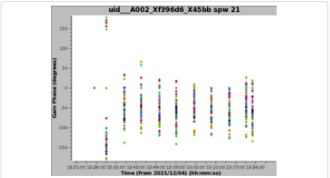
[uid__A002_Xf396d6_X45bb.ms](#)

Spectral window 17



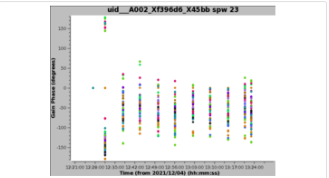
Phase vs time for spectral window 17, all antennas and correlations.

Spectral window 21



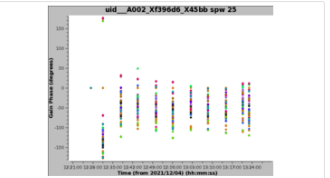
Phase vs time for spectral window 21, all antennas and correlations.

Spectral window 23



Phase vs time for spectral window 23, all antennas and correlations.

Spectral window 25



Phase vs time for spectral window 25, all antennas and correlations.

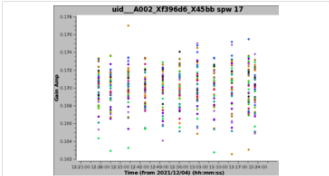
Amplitude vs time

Plots show the amplitude calibration to be applied to the target source. A plot is shown for each spectral window and each set of antennas with the same antenna diameter, with amplitude correction data points per antenna and correlation as a function of time.

Click the summary plots to enlarge them, or the spectral window heading to see detailed plots per spectral window and antenna.

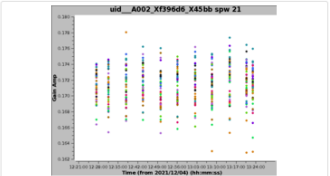
[uid__A002_Xf396d6_X45bb.ms](#)

Spectral window 17



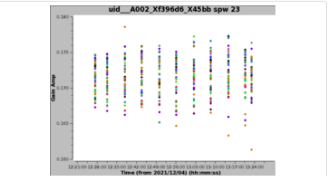
Amplitude vs time for spectral window 17, all antennas and correlations.

Spectral window 21



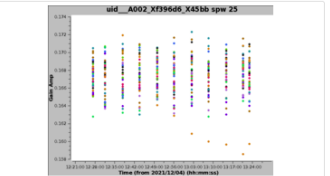
Amplitude vs time for spectral window 21, all antennas and correlations.

Spectral window 23



Amplitude vs time for spectral window 23, all antennas and correlations.

Spectral window 25



Amplitude vs time for spectral window 25, all antennas and correlations.

hifa_timegaincal: This module derives phase and amplitude corrections versus time. The output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage17&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_swpphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
- 17. hifa_timegaincal**
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit
33. hif_uvcontcheck

Diagnostic plots

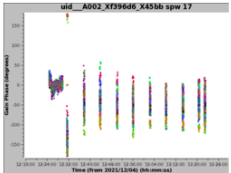
Phase vs time

These diagnostic plots show the phase solution for a calibration generated using a short solution interval. In case of very low SNR, solutions averaged in time for the phase calibrator are used with a solint = 1/4 the phasecal scan time. This calibration is not applied to the target. One plot is shown for each non-combined spectral window, with phase correction plotted per antenna and correlation as a function of time.

Click the summary plots to enlarge them, or the spectral window heading to see detailed plots per spectral window and antenna.

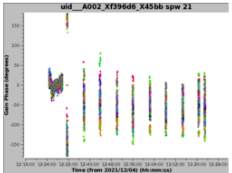
[uid__A002_Xf396d6_X45bb.ms](#)

Plots show the diagnostic phase calibration for uid__A002_Xf396d6_X45bb.ms.



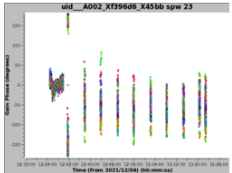
Spectral window 17

Phase vs time for spectral window 17, all antennas and correlations.



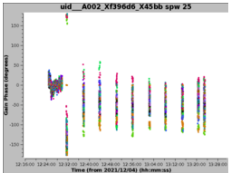
Spectral window 21

Phase vs time for spectral window 21, all antennas and correlations.



Spectral window 23

Phase vs time for spectral window 23, all antennas and correlations.



Spectral window 25

Phase vs time for spectral window 25, all antennas and correlations.

Phase offsets vs time


These diagnostic plots show the phase offsets as a function of time. The phase offsets are computed by preapplying the previous phase only solutions to the data and computing a new phase solution. The new phase solutions should scatter around zero. The new solutions are not applied to the target. One plot is shown for each spectral window, with phase offset plotted per antenna and correlation as a function of time.

Click the summary plots to enlarge them, or the spectral window heading to see detailed plots per spectral window and antenna.


[uid__A002_Xf396d6_X45bb.ms](#)

Plots show the diagnostic phase offsets for uid__A002_Xf396d6_X45bb.ms calculated using solint=inf.


Note that no spectral windows have been combined or remapped




Spectral window 17



Spectral window 21



Spectral window 23



Spectral window 25

hifa_applycal: This step applies the calibration tables and created plots of the phases and amplitudes afterwards. Most of the output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage19&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
- 19. hif_applycal**
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mstransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

19. Apply calibration tables

BACK

This task applies all calibrations registered with the pipeline to their target measurement sets.

Contents

- Applied calibrations
- Flagged data after calibration application
- Plots
 - Calibrated amplitude vs frequency
 - Calibrated phase vs frequency
 - Calibrated amplitude vs UV distance
 - Calibrated amplitude vs time
 - Calibrated phase vs time
 - (Corrected amplitude / model) vs antenna
 - (Corrected amplitude / model) vs UV distance
 - Science target: calibrated amplitude vs frequency
 - Science target: calibrated amplitude vs UV distance
 - UV coverage

Applied calibrations

The *Fields* column lists fields within the measurement set containing any of the intents listed in the *Intents* column. If a field name is ambiguous and does not uniquely identify a field, e.g., when a field is observed with multiple intents, then the unambiguous field ID is listed instead of the field name. The order of entries in the *Fields* and *Intents* columns has no significance.

Measurement Set		Target				Calibration					
Name	Final Size	Intent	Fields	Spw	Antenna	Type	spwmap	gainfield	interp	calwt	table
uid__A002_Xf396d6_X45bb.ms (callibrary: view / download)	32.8 GB	TARGET	"PJ113921.7"	17, 21, 23, 25	0~45	T _{sys}	17, 1, 2, 3, 4, 17, 17, 7, 19, 9, 10, 11, 12, 17, 19, 21, 23, 17, 17, 19, 19, 21, 21, 23, 23, 19, 19	"PJ113921.7"	linear, linear	True	Filename
						WVR		nearest	False	Filename	
						Bandpass		linearperobs, linearflag	True	Filename	
						Gain (phase only)		nearest	linear, linear	False	Filename

hifa_applycal: This step applies the calibration tables and created plots of the phases and amplitudes afterwards. Most of the output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage19&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.S

Tasks in execution order

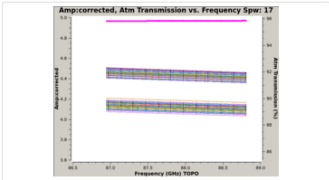
1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
- 19. hif_applycal**
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renom
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit
33. hif_uvcontcheck

Plots

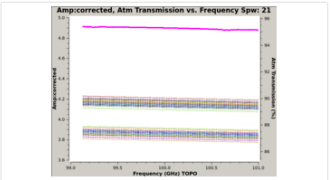
Calibrated amplitude vs frequency

Plots of calibrated amplitude vs frequency for all antennas and correlations, coloured by antenna. The atmospheric transmission for each spectral window is overlaid on each plot in pink.

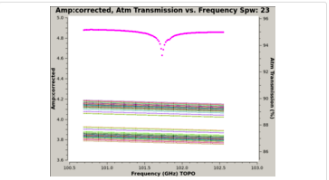
uid___A002_Xf396d6_X45bb.ms



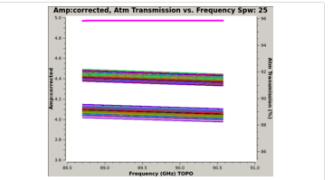
Spw 17
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



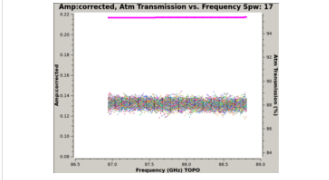
Spw 21
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



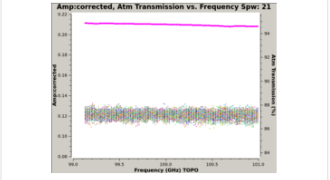
Spw 23
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



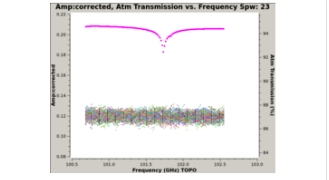
Spw 25
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



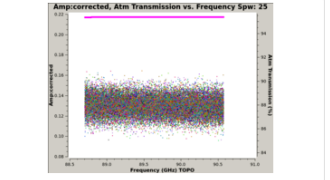
Spw 17
ALMA Band 3
Intents: PHASE
Fields: J1148+1840



Spw 21
ALMA Band 3
Intents: PHASE
Fields: J1148+1840



Spw 23
ALMA Band 3
Intents: PHASE
Fields: J1148+1840



Spw 25
ALMA Band 3
Intents: PHASE
Fields: J1148+1840

Calibrated phase vs frequency

hifa_applycal: This step applies the calibration tables and created plots of the phases and amplitudes afterwards. Most of the output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage19&ms=all&subpage=t2-4m_details.html

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Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renom
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit
33. hif_uvcontcheck

Calibrated phase vs frequency

Plots of calibrated phase vs frequency for all antennas and correlations, coloured by antenna.

uid___A002_Xf396d6_X45bb.ms

Spectral Window	ALMA Band	Intents	Fields
Spectral Window 17	ALMA Band 3	BANDPASS	J1058+0133
Spectral Window 21	ALMA Band 3	BANDPASS	J1058+0133
Spectral Window 23	ALMA Band 3	BANDPASS	J1058+0133
Spectral Window 25	ALMA Band 3	BANDPASS	J1058+0133
Spectral Window 17	ALMA Band 3	PHASE	J1148+1840
Spectral Window 21	ALMA Band 3	PHASE	J1148+1840
Spectral Window 23	ALMA Band 3	PHASE	J1148+1840
Spectral Window 25	ALMA Band 3	PHASE	J1148+1840

Calibrated amplitude vs UV distance

Plots of calibrated amplitude vs UV distance for the calibrators in each measurement set. Data are plotted for all antennas, coloured by correlation.

uid___A002_Xf396d6_X45bb.ms

hifa_applycal: This step applies the calibration tables and created plots of the phases and amplitudes afterwards. Most of the output from this module only needs to be reviewed when problems arise with the data.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage19&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.S

Tasks in execution order

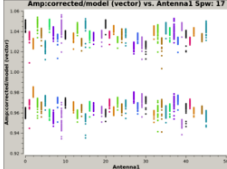
1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
- 19. hif_applycal**
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit
33. hif_uvcontcheck

(Corrected amplitude / model) vs antenna

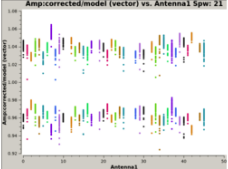
Plots of the ratio of the corrected amplitude to the model column value versus antenna ID. Data are coloured by antenna and are shown for all antennas and correlations.

uid__A002_Xf396d6_X45bb.ms

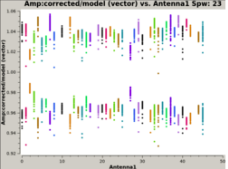
Plots for AMPLITUDE calibration intent were created with UV range set to capture the inner half of the data (UV max < 449.2 m). Plots for other intents have no UV range restriction.



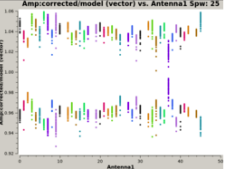
Spectral Window 17
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



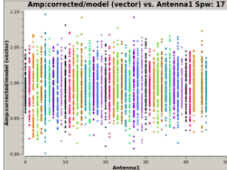
Spectral Window 21
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



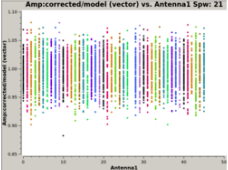
Spectral Window 23
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



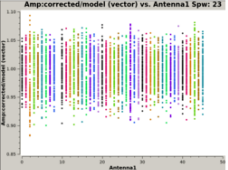
Spectral Window 25
ALMA Band 3
Intents: AMPLITUDE,BANDPASS
Fields: J1058+0133



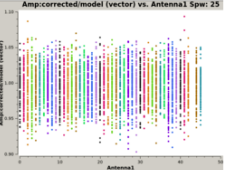
Spectral Window 17
ALMA Band 3
Intents: PHASE
Fields: J1148+1840



Spectral Window 21
ALMA Band 3
Intents: PHASE
Fields: J1148+1840



Spectral Window 23
ALMA Band 3
Intents: PHASE
Fields: J1148+1840



Spectral Window 25
ALMA Band 3
Intents: PHASE
Fields: J1148+1840

(Corrected amplitude / model) vs UV distance

Plots of the ratio of the corrected amplitude to the model column value versus UV distance. Data are coloured by antenna and are shown for all antennas and correlations.

uid__A002_Xf396d6_X45bb.ms

hif_makeimages (cals): When this is first called, it makes continuum images of each calibrator in each spw for quality assessment. The images of the phase calibrator (which is near the science targets) are useful to look at to understand the beam size and shape.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage21&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mstransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

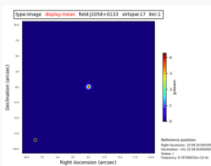
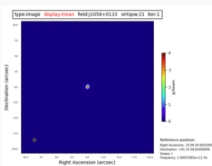
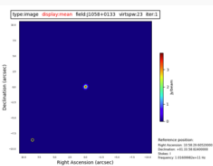
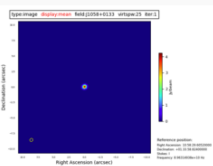
21. Tclean/MakelImages

Make calibrator images

Image Details

Fields

- J1058+0133 (BANDPASS)
- J1148+1840 (PHASE)

Field	Spw			
J1058+0133 (BANDPASS)	17 / X1620027342#ALMA_RB_03#BB_1#SW-01	21 / X1620027342#ALMA_RB_03#BB_3#SW-01	23 / X1620027342#ALMA_RB_03#BB_4#SW-01	25 / X1620027342#ALMA_RB_03#BB_2#SW-01
				
centre frequency of image	87.8709GHz (LSRK)	100.0536GHz (LSRK)	101.6100GHz (LSRK)	89.6315GHz (LSRK)
beam	0.533 x 0.504 arcsec	0.480 x 0.402 arcsec	0.462 x 0.404 arcsec	0.542 x 0.490 arcsec
beam p.a.	-85.7deg	-23.5deg	-20.4deg	-63.7deg
final theoretical sensitivity	50 uJy/beam	50 uJy/beam	53 uJy/beam	52 uJy/beam
cleaning threshold	3.1 mJy/beam Dirty DR: 8.5e+04 DR correction: 31	2.9 mJy/beam Dirty DR: 7.9e+04 DR correction: 28	2.9 mJy/beam Dirty DR: 7.5e+04 DR correction: 27	3 mJy/beam Dirty DR: 8.2e+04 DR correction: 29
clean residual peak / scaled	10.62	14.39	13.49	11.71

hif_makeimages (cals): When this is first called, it makes continuum images of each calibrator in each spw for quality assessment. The images of the phase calibrator (which is near the science targets) are useful to look at to understand the beam size and shape.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage21&ms=all&subpage=uid___A001_X158f_X7a1-field/1058_0133_BANDPASS_spw17-poll-cleanplots.html

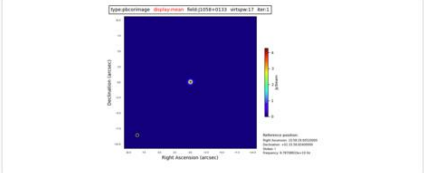
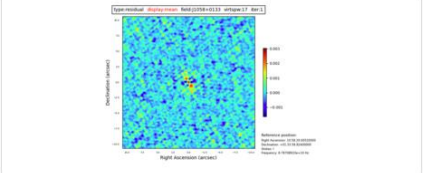
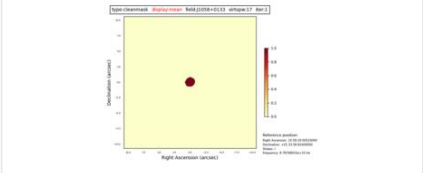
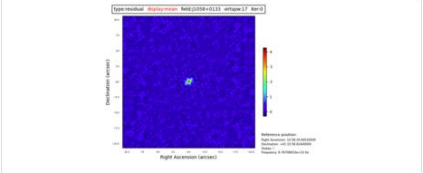
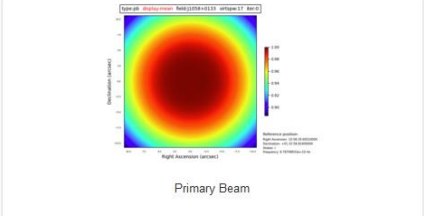
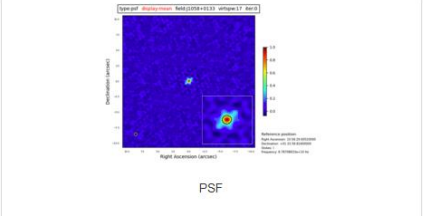
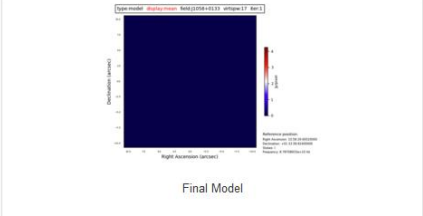
Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
- 21. hif_makeimages (cals)**
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

Clean results for J1058+0133 (BANDPASS) SpW 17

Navigation: [Home] [Next] [Previous] [BACK]

Iteration	Image	Residual	Clean Mask
1			
0			
	 <p>Primary Beam</p>	 <p>PSF</p>	 <p>Final Model</p>

hifa_imageprecheck: This module estimates beam sizes using different robust factors for imaging, which is useful to refer to when re-imaging the data. The row in green is selected for subsequent imaging steps.

2021.1.00499.5 - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage24&ms=all&subpage=t2-4m_details.html

ALMA Home By Topic By Task 2021.1.00499.5

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

24. Image Pre-Check

Goals From OT:

Representative Target: PJ113921.7
 Representative Frequency: 89.6314 GHz (SPW 25)
 Bandwidth for Sensitivity: 11.96 MHz (rounded to nearest integer #channels (3), repBW = 11.72 MHz)
 Min / Max Acceptable Resolution: 0.566 arcsec / 0.850 arcsec
 Maximum expected beam axial ratio (from OT): 2.5
 Goal PI sensitivity: 0.405 mJy
 Single Continuum: False

Estimated Synthesized Beam and Sensitivities for the Representative Target/Frequency

Estimates are given for four possible values of the tclean robust weighting parameter: robust = 0.0, +0.5 (default), +1.0, and +2.0. If the "Min / Max Acceptable Resolution" is available (\geq Cycle 5 12-m Array data), the robust value closest to the default (+0.5) that predicts a beam area (defined as simply major x minor) that is in the range of the PI requested beam areas according to the table row for repBW (Bandwidth for Sensitivity) is chosen. If none of these robust values predict a beam area that is in range, robust=+2.0 is chosen if the predicted beam area is too small, and robust=0.0 is chosen if the predicted beam area is too large. The chosen robust value is highlighted in green and used for all science target imaging. In addition to an estimate for the repBW, an estimate for the aggregate continuum bandwidth (aggBW) is also given assuming NO line contamination but accounting for spw frequency overlap. If the Bandwidth for Sensitivity (repBW) is $>$ the bandwidth of the spw containing the representative frequency (repSPW), then the beam is predicted using all spws, otherwise the beam is predicted for the repSPW alone. A message appears on the "By Task" view if a non-default value of robust (i.e., not +0.5) is chosen. Additionally, if the predicted beam is not within the PI requested range using one of the four robust values, Warning messages appear on this page.

These estimates should always be considered as the BEST CASE SCENARIO. These estimates account for Tsys, the observed uv-coverage, and prior flagging. The estimates DO NOT account for (1) subsequent science target flagging; (2) loss of continuum bandwidth due to the hif_findcont process (i.e. removal of lines and other spectral features from the data used to image the continuum); (3) Issues that affect the image quality like (a) poor match of uv-coverage to image complexity; (b) dynamic range effects; (c) calibration deficiencies (poor phase transfer, residual baseline based effects, residual antenna position errors, etc.). It is also important to note that both the repBW and aggBW beam calculations are intrinsically multi-frequency synthesis continuum calculations, using the relevant spws as described above. The synthesized beam for a single channel in a cube will typically be larger and can be significantly larger depending on the details of uv-coverage and channel width.

robust	uvtaper	Synthesized Beam	Cell	Beam Ratio	Bandwidth	BW Mode	Effective Sensitivity
0.0	[]	0.489 x 0.380 arcsec @ -14.2 deg	0.076 x 0.076 arcsec	1.29	11.72 MHz	repBW	0.00033 Jy/beam
0.0	[]	0.457 x 0.306 arcsec @ -18.5 deg	0.061 x 0.061 arcsec	1.29	7255 MHz	aggBW	1.24e-05 Jy/beam
0.5	[]	0.616 x 0.463 arcsec @ -19.2 deg	0.093 x 0.093 arcsec	1.33	11.72 MHz	repBW	0.00025 Jy/beam
0.5	[]	0.581 x 0.387 arcsec @ -20.2 deg	0.077 x 0.077 arcsec	1.33	7255 MHz	aggBW	9.38e-06 Jy/beam
1.0	[]	0.889 x 0.590 arcsec @ -33.7 deg	0.12 x 0.12 arcsec	1.51	11.72 MHz	repBW	0.000222 Jy/beam
1.0	[]	0.809 x 0.508 arcsec @ -29.5 deg	0.1 x 0.1 arcsec	1.51	7255 MHz	aggBW	8.35e-06 Jy/beam
2.0	[]	1.03 x 0.665 arcsec @ -36.8 deg	0.13 x 0.13 arcsec	1.55	11.72 MHz	repBW	0.000219 Jy/beam

hifa_imageprecheck: This module estimates beam sizes using different robust factors for imaging, which is useful to refer to when re-imaging the data. The row in green is selected for subsequent imaging steps.

2021.1.00499.5 - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage24&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.5

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrqcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mtransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit

Estimates are given for four possible values of the tclean robust weighting parameter: robust = 0.0, +0.5 (default), +1.0, and +2.0. If the "Min / Max Acceptable Resolution" is available (\geq Cycle 5 12-m Array data), the robust value closest to the default (+0.5) that predicts a beam area (defined as simply major x minor) that is in the range of the PI requested beam areas according to the table row for repBW (Bandwidth for Sensitivity) is chosen. If none of these robust values predict a beam area that is in range, robust=+2.0 is chosen if the predicted beam area is too small, and robust=0.0 is chosen if the predicted beam area is too large. The chosen robust value is highlighted in green and used for all science target imaging. In addition to an estimate for the repBW, an estimate for the aggregate continuum bandwidth (aggBW) is also given assuming NO line contamination but accounting for spw frequency overlap. If the Bandwidth for Sensitivity (repBW) is $>$ the bandwidth of the spw containing the representative frequency (repSPW), then the beam is predicted using all spws, otherwise the beam is predicted for the repSPW alone. A message appears on the "By Task" view if a non-default value of robust (i.e., not +0.5) is chosen. Additionally, if the predicted beam is not within the PI requested range using one of the four robust values, Warning messages appear on this page.

These estimates should always be considered as the BEST CASE SCENARIO. These estimates account for Tsys, the observed uv-coverage, and prior flagging. The estimates DO NOT account for (1) subsequent science target flagging; (2) loss of continuum bandwidth due to the hif_findcont process (i.e. removal of lines and other spectral features from the data used to image the continuum); (3) Issues that affect the image quality like (a) poor match of uv-coverage to image complexity; (b) dynamic range effects; (c) calibration deficiencies (poor phase transfer, residual baseline based effects, residual antenna position errors, etc.). *It is also important to note that both the repBW and aggBW beam calculations are intrinsically multi-frequency synthesis continuum calculations, using the relevant spws as described above. The synthesized beam for a single channel in a cube will typically be larger and can be significantly larger depending on the details of uv-coverage and channel width.*

robust	uvtaper	Synthesized Beam	Cell	Beam Ratio	Bandwidth	BW Mode	Effective Sensitivity
0.0	[]	0.489 x 0.380 arcsec @ -14.2 deg	0.076 x 0.076 arcsec	1.29	11.72 MHz	repBW	0.00033 Jy/beam
0.0	[]	0.457 x 0.306 arcsec @ -18.5 deg	0.061 x 0.061 arcsec	1.29	7255 MHz	aggBW	1.24e-05 Jy/beam
0.5	[]	0.616 x 0.463 arcsec @ -19.2 deg	0.093 x 0.093 arcsec	1.33	11.72 MHz	repBW	0.00025 Jy/beam
0.5	[]	0.581 x 0.387 arcsec @ -20.2 deg	0.077 x 0.077 arcsec	1.33	7255 MHz	aggBW	9.38e-06 Jy/beam
1.0	[]	0.889 x 0.590 arcsec @ -33.7 deg	0.12 x 0.12 arcsec	1.51	11.72 MHz	repBW	0.000222 Jy/beam
1.0	[]	0.809 x 0.508 arcsec @ -29.5 deg	0.1 x 0.1 arcsec	1.51	7255 MHz	aggBW	8.35e-06 Jy/beam
2.0	[]	1.03 x 0.665 arcsec @ -36.8 deg	0.13 x 0.13 arcsec	1.55	11.72 MHz	repBW	0.000219 Jy/beam
2.0	[]	0.968 x 0.591 arcsec @ -33.9 deg	0.12 x 0.12 arcsec	1.55	7255 MHz	aggBW	8.21e-06 Jy/beam

Pipeline QA

Input Parameters

Tasks Execution Statistics

CASA logs for stage 24

- View or download stage24/casapy.log (463.2 KB)

hif_findcont: This is where the pipeline creates initial image cubes and identifies continuum channels (although the identification is not always optimal). This is useful as a first look at the spectra, although re-imaging the data may be much more effective for identifying spectral lines.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage31&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.S

Tasks in execution order

1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcallflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrgcallflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mstransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvconftit

31. Find Continuum

BACK

Field	Spw	Continuum Frequency Range		Frame	Status	Average spectrum	Joint mask
		Start	End				
PJ113921.7	17	86.99446 GHz	87.65065 GHz	LSRK	NEW		
		87.97874 GHz	88.02562 GHz				
		88.41621 GHz	88.66618 GHz				
NEW , All cont.	21	99.17694 GHz	100.91116 GHz		NEW , All cont.		
		100.73331 GHz	102.46753 GHz				
NEW	25	88.71987 GHz	89.45028 GHz		NEW		

hif_makeimages: Several steps near the end of the pipeline (for multiple different types of output images) have this name. These pages are useful for seeing an overview of the imaging results, particularly with regards to information like beam sizes and noise levels.

2021.1.00499.5 - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage34&ms=all&subpage=t2-4m_details.html

Home By Topic By Task 2021.1.00499.5

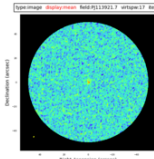
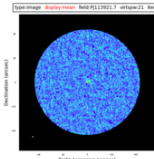
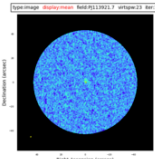
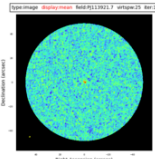
8. hifa_antpos
 9. hifa_wvrgcallag
 10. hif_lowgainflag
 11. hif_setmodels
 12. hifa_bandpassflag
 13. hifa_bandpass
 14. hifa_spwphaseup
 15. hifa_gfluxscaleflag
 16. hifa_gfluxscale
 17. hifa_timegaincal
 18. hifa_targetflag
 19. hif_applcal
 20. hif_makeimlist (cals)
 21. hif_makeimages (cals)
 22. hif_makeimlist (checksrc)
 23. hif_makeimages (checksrc)
 24. hifa_imageprecheck
 25. hif_checkproductsize
 26. hifa_renorm
 27. hifa_exportdata
 28. hif_mstransform
 29. hifa_flagtargets
 30. hif_makeimlist (mfs)
 31. hif_findcont
 32. hif_uvcontfit
 33. hif_uvcontsub
 34. hif_makeimages (mfs)
 35. hif_makeimlist (cont)
 36. hif_makeimages (cont)
 37. hif_makeimlist (cube)
 38. hif_makeimages (cube)
 39. hif_makeimlist (cube_repBW)
 40. hif_makeimages (cube_repBW)

34. Tclean/MakeImages

Make target per-spw continuum images

BACK

Image Details

Field	Spw			
PJ113921.7 (TARGET)	17 / X1620027342#ALMA_RB_03#BB_1#SW-01	21 / X1620027342#ALMA_RB_03#BB_3#SW-01	23 / X1620027342#ALMA_RB_03#BB_4#SW-01	25 / X1620027342#ALMA_RB_03#BB_2#SW-01
				
	View other QA images...	View other QA images...	View other QA images...	View other QA images...
centre frequency of image	87.8303GHz (LSRK)	100.0440GHz (LSRK)	101.6004GHz (LSRK)	89.6221GHz (LSRK)
beam	0.894 x 0.607 arcsec	0.781 x 0.456 arcsec	0.725 x 0.451 arcsec	0.897 x 0.588 arcsec
beam p.a.	-32.7deg	-26.7deg	-22.3deg	-34.7deg
final theoretical sensitivity	23 uJy/beam	18 uJy/beam	19 uJy/beam	21 uJy/beam
cleaning threshold	46 uJy/beam Dirty DR: 8.5 DR correction: 1	37 uJy/beam Dirty DR: 15 DR correction: 1	38 uJy/beam Dirty DR: 16 DR correction: 1	41 uJy/beam Dirty DR: 9.4 DR correction: 1
clean residual peak / scaled MAD	5.81	5.82	5.10	4.46
non-pbcor image RMS	26 uJy/beam	21 uJy/beam	21 uJy/beam	24 uJy/beam
pbcor image max / min	479 / -299 uJy/beam	297 / -265 uJy/beam	265 / -324 uJy/beam	319 / -294 uJy/beam

hif_makeimages: Several steps near the end of the pipeline (for multiple different types of output images) have this name. These pages are useful for seeing an overview of the imaging results, particularly with regards to information like beam sizes and noise levels.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage36&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.S

- 8. hifa_antpos
- 9. hifa_vwgcalfag
- 10. hif_lowgainflag
- 11. hif_setmodels
- 12. hifa_bandpassflag
- 13. hifa_bandpass
- 14. hifa_spwphaseup
- 15. hifa_gfluxscaleflag
- 16. hifa_gfluxscale
- 17. hifa_timegaincal
- 18. hifa_targetflag
- 19. hif_applycal
- 20. hif_makeimlist (cals)
- 21. hif_makeimages (cals)
- 22. hif_makeimlist (checksrc)
- 23. hif_makeimages (checksrc)
- 24. hifa_imageprecheck
- 25. hif_checkproductsizes
- 26. hifa_renorm
- 27. hifa_exportdata
- 28. hif_mstransform
- 29. hifa_flagtargets
- 30. hif_makeimlist (mfs)
- 31. hif_findcont
- 32. hif_uvcontfit
- 33. hif_uvcontsub
- 34. hif_makeimages (mfs)
- 35. hif_makeimlist (cont)
- 36. hif_makeimages (cont)
- 37. hif_makeimlist (cube)
- 38. hif_makeimages (cube)
- 39. hif_makeimlist (cube_repBW)
- 40. hif_makeimages (cube_repBW)

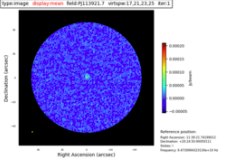
36. Tclean/MakeImages

Make target aggregate continuum images

BACK

Image Details

Field	Spw
PJ113921.7 (TARGET)	17, 21, 23, 25 / X1620027342#ALMA_RB_03#BB_1#SW-01,



View other QA images...

centre frequency of image	94.7310GHz (LSRK)
beam	0.793 x 0.496 arcsec
beam p.a.	-28.5deg
final theoretical sensitivity	10 uJy/beam
cleaning threshold	30 uJy/beam Dirty DR: 25 DR correction: 1.5
clean residual peak / scaled MAD	4.86
non-pbcor image RMS	12 uJy/beam

hif_makeimages: Several steps near the end of the pipeline (for multiple different types of output images) have this name. These pages are useful for seeing an overview of the imaging results, particularly with regards to information like beam sizes and noise levels.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage36&ms=all&subpage=uid___A001_X158f_X7a1-fieldPJ113921.7__TARGET_spw17_21_23_25-poll-cleanplots.html

ALMA Home By Topic By Task 2021.1.00499.S

8. hifa_antpos
9. hifa_vwgcallag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_bandpass
14. hifa_spwphaseup
15. hifa_gfluxscaleflag
16. hifa_gfluxscale
17. hifa_timegaincal
18. hifa_targetflag
19. hif_applycal
20. hif_makeimlist (cals)
21. hif_makeimages (cals)
22. hif_makeimlist (checksrc)
23. hif_makeimages (checksrc)
24. hifa_imageprecheck
25. hif_checkproductsizes
26. hifa_renorm
27. hifa_exportdata
28. hif_mstransform
29. hifa_flagtargets
30. hif_makeimlist (mfs)
31. hif_findcont
32. hif_uvcontfit
33. hif_uvcontsub
34. hif_makeimages (mfs)
35. hif_makeimlist (cont)
36. hif_makeimages (cont)
37. hif_makeimlist (cube)
38. hif_makeimages (cube)
39. hif_makeimlist (cube_repBW)
40. hif_makeimages (cube_repBW)

Clean results for PJ113921.7 (TARGET) SpW 17,21,23,25

BACK

Iteration	Image	Residual	Clean Mask
1			
0			

hif_makeimages: Several steps near the end of the pipeline (for multiple different types of output images) have this name. These pages are useful for seeing an overview of the imaging results, particularly with regards to information like beam sizes and noise levels.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage38&ms=all&subpage=t2-4m_details.html

Home By Topic By Task

2021.1.00499.S

8. hifa_antpos

9. hifa_wvrgcflag

10. hif_lowgainflag

11. hif_setmodels

12. hifa_bandpassflag

13. hifa_bandpass

14. hifa_spwphaseup

15. hifa_gfluxscaleflag

16. hifa_gfluxscale

17. hifa_timegaincal

18. hifa_targetflag

19. hif_applycal

20. hif_makeimlist (cals)

21. hif_makeimages (cals)

22. hif_makeimlist (checksrc)

23. hif_makeimages (checksrc)

24. hifa_imageprecheck

25. hif_checkproductsize

26. hifa_renorm

27. hifa_exportdata

28. hif_mstransform

29. hifa_flagtargets

30. hif_makeimlist (mfs)

31. hif_findcont

32. hif_uvcontfit

33. hif_uvcontsub

34. hif_makeimages (mfs)

35. hif_makeimlist (cont)

36. hif_makeimages (cont)

37. hif_makeimlist (cube)

38. hif_makeimages (cube)

39. hif_makeimlist (cube_repBW)

40. hif_makeimages (cube_repBW)

38. Tclean/MakeImages

Make target cubes

BACK

Image Details

Field	Spw		Spw	
PJ113921.7 (TARGET)	17 / X1620027342#ALMA_RB_03#BB_1#SW-01	21 / X1620027342#ALMA_RB_03#BB_3#SW-01	23 / X1620027342#ALMA_RB_03#BB_4#SW-01	25 / X1620027342#ALMA_RB_03#BB_2#SW-01
centre / rest frequency of cube	87.8616GHz / 339.0000GHz (LSRK)		100.0440GHz / 396.0000GHz (LSRK)	
beam	0.915 x 0.617 arcsec		0.819 x 0.465 arcsec	
beam p.a.	-33.9deg		-29.0deg	
final theoretical sensitivity	0.12 mJy/beam		0.12 mJy/beam	
cleaning threshold	0.23 mJy/beam Dirty DR: 6.3 DR correction: 1		findCont=AllCont, no cleaning 0 Jy/beam Dirty DR: 6.2 DR correction: 1	
clean residual peak / scaled MAD	5.58		-5.69	
non-pbcor image RMS / RMS_{min} / RMS_{max}	0.13 / 0.12 / 0.13 mJy/beam		0.13 / 0.12 / 0.14 mJy/beam	
			0.14 / 0.13 / 0.16 mJy/beam	
			0.42 / 0.4 / 0.45 mJy/beam	

hif_makeimages: Several steps near the end of the pipeline (for multiple different types of output images) have this name. These pages are useful for seeing an overview of the imaging results, particularly with regards to information like beam sizes and noise levels.

2021.1.00499.S - Task Details

file:///D:/pipeline/html/t2-4m.html?sidebar=sidebar_stage38&ms=all&subpage=uid__A001_X158f_X7a1-fieldPJ113921.7__TARGET_spw17-poll-cleanplots.html

Home By Topic By Task

2021.1.00499.S

8. hifa_antpos

9. hifa_wvgc:allflag

10. hif_lowgainflag

11. hif_setmodels

12. hifa_bandpassflag

13. hifa_bandpass

14. hifa_spwphaseup

15. hifa_gfluxscaleflag

16. hifa_gfluxscale

17. hifa_timegaincal

18. hifa_targetflag

19. hif_applycal

20. hif_makeimlist (cals)

21. hif_makeimages (cals)

22. hif_makeimlist (checksrc)

23. hif_makeimages (checksrc)

24. hifa_imageprecheck

25. hif_checkproductsize

26. hifa_renorm

27. hifa_exportdata

28. hif_mstransform

29. hifa_flagtargets

30. hif_makeimlist (mfs)

31. hif_findcont

32. hif_uvcontfit

33. hif_uvcontsub

34. hif_makeimages (mfs)

35. hif_makeimlist (cont)

36. hif_makeimages (cont)

37. hif_makeimlist (cube)

38. hif_makeimages (cube)

39. hif_makeimlist (cube_repBW)

40. hif_makeimages (cube_repBW)

Clean results for PJ113921.7 (TARGET) SpW 17

Navigation: [Home] [Next] [Previous] [BACK]

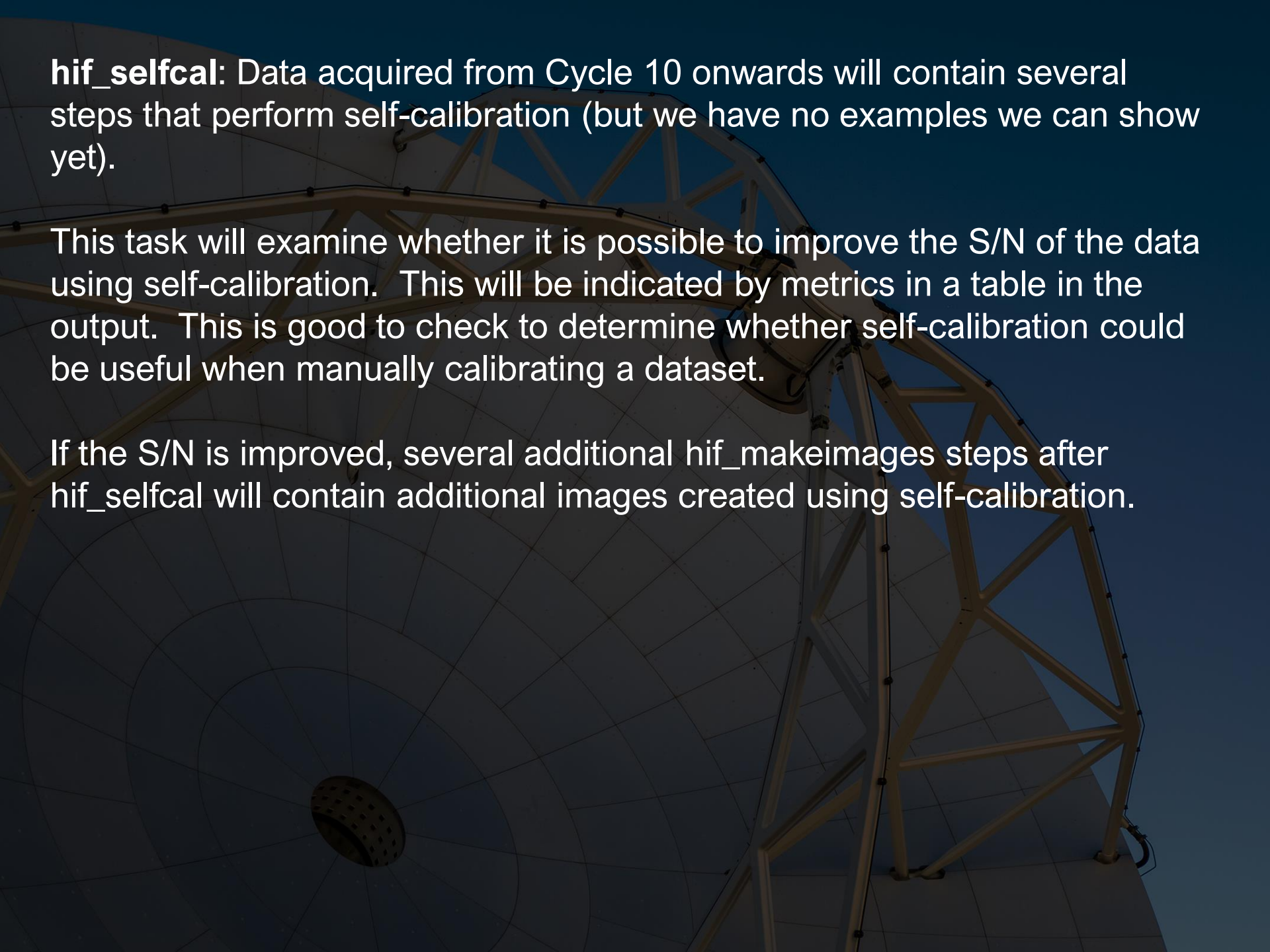
Iteration	Image	Residual	Clean Mask	Line-free Moment 0	Line-free Moment 8	Spectra
1						
0						

Primary Beam

PSF

Final Model

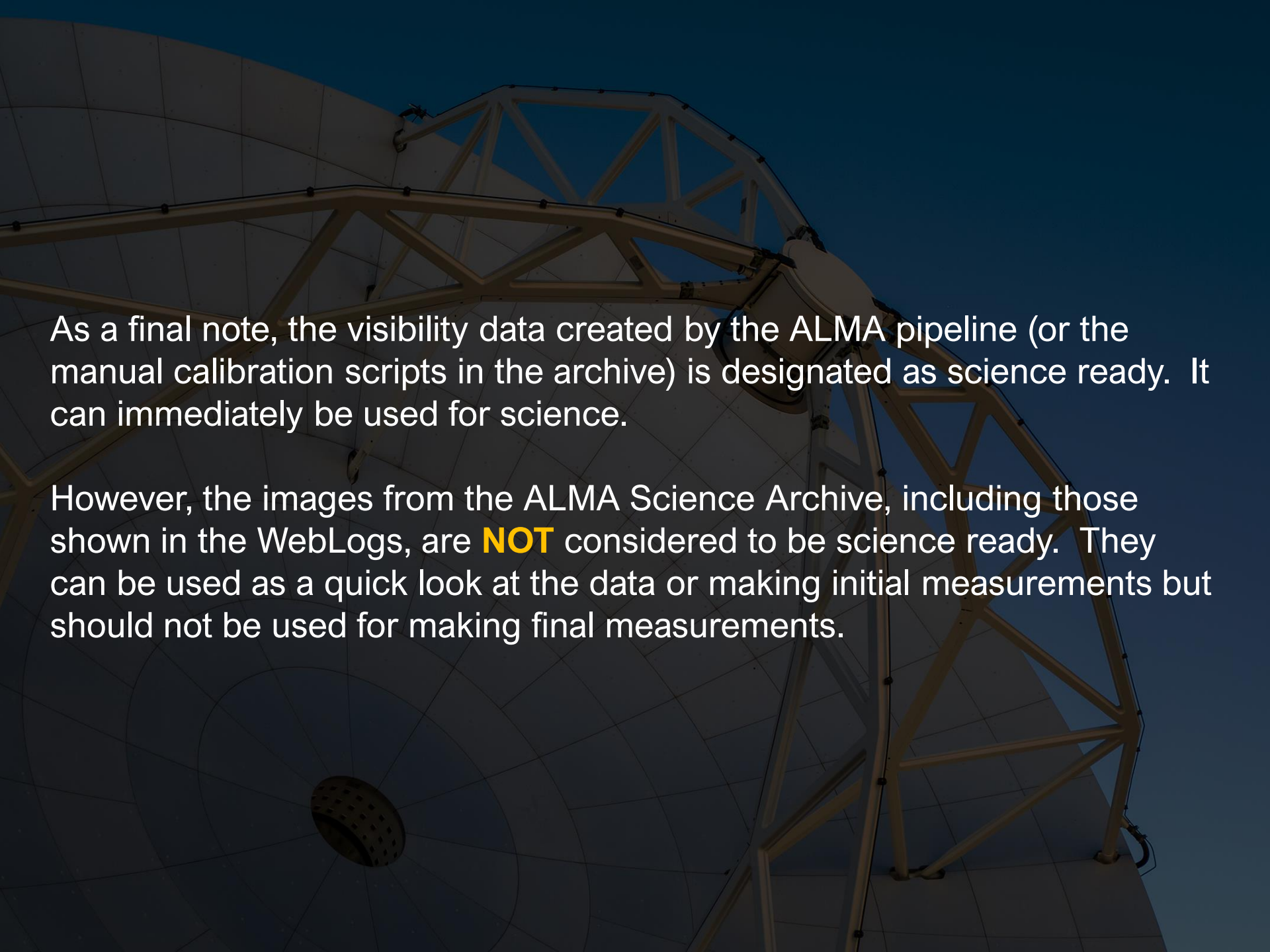
The inset in the PSF image (when present) corresponds to the central 41 pixels of the PSF. When the beam shape is significantly non-Gaussian, the dotted contour of the 50% level of the PSF image will become distinctly visible apart from the fitted synthesized beam, which is shown as the solid contour.



hif_selfcal: Data acquired from Cycle 10 onwards will contain several steps that perform self-calibration (but we have no examples we can show yet).

This task will examine whether it is possible to improve the S/N of the data using self-calibration. This will be indicated by metrics in a table in the output. This is good to check to determine whether self-calibration could be useful when manually calibrating a dataset.

If the S/N is improved, several additional `hif_makeimages` steps after `hif_selfcal` will contain additional images created using self-calibration.



As a final note, the visibility data created by the ALMA pipeline (or the manual calibration scripts in the archive) is designated as science ready. It can immediately be used for science.

However, the images from the ALMA Science Archive, including those shown in the WebLogs, are **NOT** considered to be science ready. They can be used as a quick look at the data or making initial measurements but should not be used for making final measurements.