ALMA WebLog Review

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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

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Project Code	2022.1.00401.S	SchedBlock	PN_Hb_5_a_06_TM2					
ExecBlock	uid://A002/X1003af4/Xa540	ExecBlock Status	SUCCESS					
QA0 Status	Pass	Exec. Fraction	1.47					
Repr. frequency	230.560 GHz (Sky)	Band	ALMA_RB_06					
Array	12 [m]	Baselines	14m 312m					
Antennas	acceptable: N/A	ntennas: 43 effective, 43 usable, 43 unflagged, 43 total. Expected for Cycle 9 : 43, minimum :ceptable: N/A and observed: 6. Highest recommended: 7-7						
Weather	PWV 1.23 mm; Wind 9.80 m/s; Humidity 13.53 %; Pressure 445.58 hPa; Phase rms: 72.605 microns							
QA0 comment	No major issues. Pass.							
AOS Check comment	No major issues. Pass. 2022-10-25T22:19:31 uid://A002/X1003af4/Xa540 Band 6 Freq 230.55953278143184 GHz standard observation Mean Zenith PWV: 1.22 +/- 0.06 mm Representative Tsys: 82.8 K 43/43 antennas are working in band 6 on the BLC PHASECAL: Antenna-based phase rms on phaseCal: 20.1 degrees (72.6 microns) No antennas sexced rms limit BANDPASS: WVR-corrected baseline-based phase rms on bandpass: 19.0 degrees (68.8 microns) on 100m baselines Mean improvement in phase rms using WVRs: 2.16 Baseline limit with good phase (80%): 170m. LB0 resolution: 1.571 arcsec Bandpass calibrator; 1124-2914 Flux: 6.925 +/- 0.230 Jy. Possible channels with SNR>30: 3694 Phase calibrator; 1124-2914 Flux: 6.925 +/- 0.230 Jy. Possible channels with SNR>30: 3694 Phase calibrator; 1124-2914 Flux: 8.6.925 +/- 0.230 Jy. Possible channels with SNR>30: 3694 Phase calibrator; 11292-7297 +/- 0.014) SKy separation: 9.00 degrees Solution slope: 0.00 SNR in calibrated phaseCal flux: Between antennas: 37.2 Between scans: 136.2 1 completed cycles of science/phaseCal. 1 bandpass scan Percentage of antenna/bb data flagged: 0.00% Binary size: 5.93GB Band observed: 6 HIGHEST RECOMMENDED OBSERVING BAND: 7 - 7 **** QA0 PASS							

QA0 warnings Achieved angular resolution is outside the expected range. Observed: 1.12, requested: 1.17 - 1.76

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

QAO+ results are only to be used as a guide to assess the data quality, and are not for scientific use. QAO+ 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. 'QAO+ EB' is the result from only the current EB. 'QAO+ concat' is the result from concatenating all EBS

Science target		NGC_6445					
Peak	6.112		Integrated	40.478		RMS	0.351
Xoff	12.032		Yoff	15.365		(arcsec from pl	nase centre)
Beam X	1.568"		Beam Y	1.04"		Beam PA	-72.53°
Selfcal		false					
Peak	NaN mJy	/	Integrated	NaN mJy	/	RMS	NaN mJy
Xoff	NaN		Yoff	NaN		(arcsec from pl	nase centre)
Phase Cal		J1820-2528	Separation	9.00°			
Peak	313.65	mJy	Integrated	312.094	mJy	RMS	8.228 mJy
Beam X R=0.5		1.324"			Beam Y R=0.5		0.99"
Beam PA R=0.5		-76.64°			RMS R=0.5		8.228 mJy
Beam X R=2.0		1.564"			Beam Y R=2.0		1.166"
Beam PA R=2.0		-75.65°			RMS R=2.0		9.695 mJy
Beam X R=-0.5		1.138"			Beam Y R=-0.5		0.869"
Beam PA R=-0.5		-81.45°			RMS R=-0.5		7.16 mJy
WVR			Try remcloud	false		PhaseCal RMS	11.794
Bandpass					Bandpass RMS	ЗТор	11.543
Bandpass RMS		[9.97, 13.86	, 16.5, 16.79]°		Bandpass Timescales	-), 80.0, 120.0] seconds

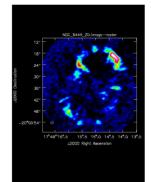
Page 15 of

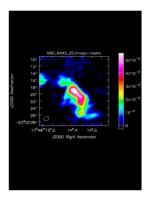
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larget images

Phase Cal (left)





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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	- / A
	Project information	
Name Mapping Molecular Irradiation Tracers in Extreme Bipolar Planetary Nebulae Code 2022.1.00401.S PI Joel Kastner Organization Chester F. Carlson Center for Imaging, Rochester Institute of Te Co-Is J. Alcolea, J. Bublitz, T. Forveille, P. Hily-Blant, P. Moraga Baez, M. Santander-Garcí		
	ObsUnitSet information	
Name QA2 Status	Member OUS (PN_Hb_5) Pass	
Member OUS Status ID SchedBlock name SchedBlock UID Array Mode Band Repr.Freq. (sky) Spectral setup Sources Other SBs in this Group OUS (Member OUS Status ID in brackets): Execution count	uid://A001/X2d20/X2bb8 PN_Hb_5_a_06_TM2 uid://A001/X2d20/X2b46 TM2 Pipelineable ALMA_RB_06 230.56 [GHz] FDM NGC_6445, PN_Hb_5 PN_Hb_5_d_06_TM1 (uid://A001/X2d20/X2bb6) 1.47 of 1 expected	
	Final QA2 comment	

Calibration issues: None.

Imaging issues: None.

It is recommended that the PI carefully assess the results on the hif_findcont weblog page, and the "line-free moment 8" images on the cube imaging weblog page.

Self-calibration was not performed

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-alma-s-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 5.4 %.

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 above this threshold, this dataset has been corrected for the above issue

QA2 was performed on the image whose channel width is the one closest to the representative bandwidth selected by the PI in ALMA OT, in the spectral window closest in frequency to the representative frequency. Both the beam size and the RMS meet the PI requested performance parameters. Therefore, this scheduling block has been deemed a QA2 PASS.

Representative Window - spw 27

Image name: uid___A001_X2d20_X2bb8.s40_0.PN_Hb_5_sci.spw27.repBW.l.iter1.image Robust = 0.5 Beam size = 1.60 x 1.15 arcsec RMS = 5.65 mJy/beam over an effective bandwidth 2.71 MHz

Aggregate Continuum -

Image name: uid ___A001_X2d20_X2bb8.s36_0.PN_Hb_5_sci.spw25_27_29_31.cont.l.iter1.image Robust = 0.5 Beam size = 1.49 x 1.04 arcsec RMS = 0.33 mJy/beam over 2.51 GHz 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

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 sudirectory 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.

	2022.1.00401.5 - Ho	ome - Google Chrome		- x
✓ ② 2022.1.00401.S - Home × +				
← → C ④ 127.0.0.1:30000/t1-1.html				☆ 😩 :
Home By Topic By Task				2022.1.00401.S
Observation Overview		Pipeline Summary	/	
Project	uid://A001/X15ba/X677	Pipeline Version	2022.2.0.64 (documentation)	
Principal Investigator	jkastner	CASA Version	6.4.1.12 (environment)	
OUS Status Entity Id	uid://A001/X2d20/X2bb8	IERSeop2000 Version	0001.0163 (last date: 2022-09-06 00:00:00)	
Observation Start	2022-10-25 22:20:37 UTC	IERSpredict Version	0623.0983 (last date: 2023-01-22 00:00:00)	
Observation End	2022-10-25 22:34:40 UTC	Pipeline Start	2022-10-26 14:15:18 UTC	
		Execution Duration	6:10:41	

Observation Summary

		Time (UTC)		ime (UTC)					Baseline Length		
Measurement Set	Receivers	Num Antennas	Start	End	On Target	Min	Мах	RMS	Size		
Observing Unit Set Status: uid://A001/X2d20/X2bb8 Scheduling Block ID: uid://A001/X2d20/X2b246 Scheduling Block Name: PN_Hb_5_a_06_TM2											
Session: session_1 ACS Version: 38083c1, Build Version: ONLINE-CYCLE9-B-13-2022-10-21-28-00-00											
uidA002_X1003af4_Xa540.ms	ALMA Band 6	43	2022-10-25 22:20:37	2022-10-25 22:34:40 MS dates not fully covered by IERSeop2000. CASA will use IERSpredict.	0:04:41	15.1 m	312.7 m	112.1 m	12.8 GiB		
uidA002_X1003af4_Xa540_targets.ms	ALMA Band 6	43	2022-10-25 22:29:12	2022-10-25 22:33:58 MS dates not fully covered by IERSeop2000. CASA will use IERSpredict.	0:04:39	15.1 m	312.7 m	112.1 m	4.8 GiB		
uidA002_X1003af4_Xa540_targets_line.ms	ALMA Band 6	43	2022-10-25 22:29:12	2022-10-25 22:33:58 MS dates not fully covered by IERSeop2000. CASA will use IERSpredict.	0:04:39	15.1 m	312.7 m	112.1 m	4.8 GiB		

The WebLogs could be used primarily for three different purposes. Focus on the pages below for each of these purposes.

- To review the observations.
- To check the results of the calibration process and the quality of the data.
- To examine the preview images and get information for imaging.

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

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Session: session_1					
uidA002_X1003af4_Xa540.ms	Overview of 'uid_	A002 X1003af	1 Xa5/0 ms'		
uidA002_X1003af4_Xa540_targets.ms	Overview of ulu_		+_/d340.1115		
uidA002_X1003af4_Xa540_targets_line.ms					
	Observation Execution Ti	me		Numeric Reserved at al., ANI, (1994), (2014),	
<u>e</u>	Start Time	2022-10-25			9
	End Time	2022-10-25	22:34:40		
	Total Time on Source	0:12:34			
	Total Time on Science Target	0:04:41		Intent vs Time	The The
	LISTOBS OUTPUT			Track scan intent vs time	Field vs Time
/	LISTOBS OUTPUT				Track observed field vs time
	Spatial Setup			Spectral Setup	
	Science Targets	'NGC_6445' and 'PN_Hb_5'		All Bands	'ALMA Band 6' and 'WVR'
	Calibrators	'J1820-2528' and 'J1924-2914'		Science Bands	'ALMA Band 6'
	Antenna Setup			Sky Setup	
	Min Baseline	15	1 m	Min Elevation	55.18 degrees
	Max Baseline	31:	2.7 m	Max Elevation	78.71 degrees
	Number of Baselines	90	3		
	Number of Antennas	43			
	Antenna Diameters	43	of 12 m		
	Weather			PWV	
	vvcalliel				•

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.

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Session: session_1 uidA002_X1003a14_Xa540.ms uidA002_X1003a14_Xa540_targets.ms uidA002_X1003a14_Xa540_targets_line.ms	listobs.txt	BACK
	MeasurementSet Name: /mmt/jaosco/data/pipeproc/dataproc/2022.1.06401.5_2022_10_20T14_07_37.756/30US_uidA001_X2d20_X2bb4/60US_uidA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2d20_X2bb5/MOUS_UIdA001_X2bb5/MOUS_UIdA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UIDA001_X2bb5/MOUS_UID	1003af4_Xa540.m
	ObservationID = 0 ArrayID = 0 Date Timerange (UTC) Scan FldId FieldMame nRows SpwIds Average Interval(s) ScanIntent 25-0t1-2022/22:20:37.2 22:22:34.7 1 0 J1924-2014 661942 [6],1,2,3,4,6,6,7,8,9,10,11,12] [0.016, 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_WKNON.SOURCE] E, CALIBRATE_WKNON.SOURCE] 22:32:146.4 22:02:20.5 2 0 J1924-2014 289390 [4,13,14,15,16,17,16,19,20,21,22,23,24] [1.15, 0.016, 0.016, 0.016, 0.016, 0.016, 0.576	76] [CALIBRATE_ IBRATE_BANDPASS
	ATMOSPHERE#ANBIENT, CALIBRATE_ATMOSPHERE#NOT, CALIBRATE_ATMOSPHERE#NOT, CALIBRATE_WRAMBIENT,	IBRATE_PHASE#ON
	22:29:12.2 - 22:31:32.4 7 2 PN_Hb_5 27517 [4,13,14,15,16,25,26,27,28,29,30,31,32] [1.15, 0.016, 0.016, 0.016, 0.016, 0.05, 1.01, 0.05, 0.0	ERVE_TARGET#ON_
	22:29:12:2 - 22:31:32:4 7 4 PN_Hb_5 27515 [4,13,14,15,16,25,26,27,28,29,30,31,32] [1.15, 0.016, 0.016, 0.016, 0.016, 0.016, 0.016, 0.05, 1.01, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01] [0851 22:29:12:2 - 22:31:32:4 7 5 PN_Hb_5 27520 [4,13,14,15,16,25,26,27,28,29,30,31,32] [1.15, 0.016, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01] [0851 50URCE] 22:29:12:2 - 22:31:32:4 7 6 PN_Hb_5 27520 [4,13,14,15,16,25,26,27,28,29,30,31,32] [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] [0851 22:29:12:2 - 22:31:32:4 7 6 PN_Hb_5 27520 [4,13,14,15,16,25,26,27,28,29,30,31,32] [1.15, 0.016, 0.016, 0.016, 0.016, 6.05, 1.01, 6.05, 1.01, 6.05, 1.01] [0851	ERVE_TARGET#ON_
	SOURCE] 22:29:12.2 - 22:31:32.4 7 7 PN_Hb_5 275200 [4,13,14,15,16,25,26,27,28,29,30,31,32] [1.15, 0.016, 0	
	SOURCE] 22:31:37.3 - 22:33:58.1 8 9 NGC_6445 275200 [4,13,14,15,16,25,26,27,28,29,30,31,32] [1.15, 0.016,	ERVE_TARGET#ON_

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

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🕂 😸 🛧 Home By Topic By Task			□211 ♠01.5×
Session: session_1			
uidA002_X1003af4_Xa540.ms			
uidA002_X1003af4_Xa540_targets.ms uidA002_X1003af4_Xa540_targets_line.m	POLLEAKAGE	Measurement set: uidA002_X1003af4_Xa540.ms - Start time:2022-10-25T22:20:37 End time:2022-10-25T22:34:40	
	POLANGLE -		
	POLARIZATION		
		1 3 5 9	
	WVR -		
	SIDEBAND -	1	
	POINTING	2 4 6	
	ATMOSPHERE -	3	1 vs time
	AMPLITUDE -		
	BANDPASS -		
	CHECK -	5 9	
	PHASE -		
	REFERENCE -	7 8	
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	L.,.	20 ^{1721 m} 20 ^{1736 m}	
		۲۵۰۰ Time	
	Weather	PWV	
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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).

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ALMA Session: session_1							
uid A002_X1003a14_X8540 ms uid A002_X1003a14_X8540_targets.ms uid A002_X1003a14_X8540_targets.line.ms			_Xa540.ms'				
	Observation Executi	BERTONE FERSENES SERVICE	ANDE ROMINE	ARCE JACONS WR	The second se		
	End Time Total Time on Source Total Time on Science Target				Ļ		
	LISTOBS OUTPUT	٩	_				
	Spatial Setup	Field			'ALMA Band 6'		
	calibrators Antenna Setup	0			'ALMA Band 6'		
	Min Baseline	22h21m		22h36m			
	Max Baseline	L	Time	L			
	Number of Baselines	903					

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).

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🙀 🗚 Home By Topic By Task			2022.1.00401.S	
Session: session_1 uidA002_X1003al4_Xa540 ms uidA002_X1003al4_Xa540_targets.ms uidA002_X1003al4_Xa540_targets_line.ms	Antenna Setup Details		BACK	
	Antenna Positions	UV coverage		
	$ \begin{array}{c} area (b4x), b4x), b4x(21, 204, 204, 204, 204, 204, 204, 204, 204$	And the second s		
	Antenna Position Plot antenna latitude vs antenna longitude	Antenna Position Polar-logarithmic plot of antenna positions.	UV Coverage UV coverage plot for TARGET field PN_Hb_5 (#2), spw 27.	
	Antenna Details			
		Offset from Array Centre		

				Offset from Array Centre	
ID	Name	Pad	Diameter	Longitude	Latitude
0	DA41	A004	12.0	52.7 m	-704.4 m
1	DA42	A047	12.0	38.5 m	-775.2 m
2	DA43	A006	12.0	79.0 m	-702.1 m
3	DA44	A044	12.0	-22.0 m	-761.0 m
4	DA45	A040	12.0	15.7 m	-758.5 m
5	DA46	A001	12.0	24.2 m	-693.4 m
e	DA 47	1040	12.0	00 / m	754 5 m

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

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Home By Topic By Task				2022.1.00401.S
Session: session_1				
uidA002_X1003af4_Xa540.ms uidA002_X1003af4_Xa540_targets.ms uidA002_X1003af4_Xa540_targets_line.ms	Sky Setup Details			BACK
	Elevation vs. Azimuth	Elevation vs. Time	UV coverage	
	Ultraviological via Administrative Asian and A	Elevation on Tiese for uld0003_210001aft Xa540.mm		
	Elevation vs. azimuth	Elevation vs. time	UV Coverage	
			UV coverage plot for TARGET field PN_Hb_5 (#2), spw 27.	
	Solar Elevation vs. time			

To check the results of the calibration process and the quality of the data, go to the By Topic tab and the following listed under the By Task tab:

- hifa_tsysflag
- hifa_bandpass
- hifa_spwphaseup
- hifa_timegaincal
- hifa_applycal

Some of the other tasks also produce figures or tables with information about the quality of the data that may be useful for more advanced users.

If any problems appear in the data and the problems are not corrected by the pipeline calibration, the flagdata command can be used in CASA to flag the data (which will indicate that the data should not be used in imaging). See the example below to flag the data for spw 27 from antenna DA59.

flagdata(vis='example.ms', mode='manual', antenna='DA59', spw='27', flagbackup=False)

If very severe problems are found in the WebLogs, especially problems affecting multiple antennas, it would be appropriate to submit a Helpdesk ticket to ask about the problem. 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.

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27	2.326	2.326 2	326 2.3	326 2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2		
29	2.326	2.326 2	326 2.3	326 2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2		
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Flagging percentages for Source name: J1924-2914, Intents: AMPLITUDE, ATMOSPHERE, BANDPASS, POINTING, WVR

spw DA41 DA42 DA43 DA44 DA45 DA46 DA45 DA46 DA46 DA47 DA48 DA50 DA51 DA52 DA55 DA55 DA55 DA55 DA56 DA59 DA60 DA61 DA62 DA63 DA64 DA65 DV01 DV02 DV03 DV04 DV05 DV06 DV07 DV10 DV11 DV12 DV13 DV14 DV15 DV16 DV17 DV18 DV19 DV29 DV21

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.

2022.1.0	00401.S - Task Summaries - Google Chrome	
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A Home By Topic By Task		2022.1.00401.S
Task Summaries		
Task	QA Score	Duration
1. hifa_importdata: Register measurement sets with the pipeline		1.00 0:02:16
2. htfa_flagdata: ALMA deterministic flagging		1.00 0:10:37
3. hifa_fluxcalflag: Flag spectral features in solar system flux calibrators		1.00 0:00:02
4. hif_rawflagchans: Flag channels in raw data		1.00 0:02:49
5. hif_refant: Select reference antennas		1.00 0:00:13
6. h_tsyscal: Calculate Tsys calibration		1.00 0:03:43
7. hifa_tsysflag: Flag Tsys calibration		1.00 0:05:06
8. hifa_antpos: Correct for antenna position offsets		1.00 0:00:02
9. hifa_wvrgcafflag: Calculate and flag WVR calibration	2.07x improvement	0.87 0:04:42
10. hif_lowgainflag: Flag antennas with low gain		1.00 0:06:48
11. hif_setmodels: Set calibrator model visibilities		1.00 0:03:14
12. htta_bandpassflag: Phase-up bandpass calibration and flagging		0.96 0:15:34
13. hifa_bandpass: Phase-up bandpass calibration		1.00 0:16:46
14. htfa_spwphaseup: Spw phase offsets calibration		1.00 0:02:09
15. htfa_gfluxscaleflag: Phased-up flux scale calibration + flagging		1.00 0:03:03
16. hifa_gfluxscale: Transfer fluxscale from amplitude calibrator		1.00 0:07:38
• 17. hifa_timegaincal: Gain calibration	Phase offsets; insufficient data	0.85 0:23:15
18. hifa_targetflag: Target outlier flagging		1.00 0:03:41

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.

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Home By Topic By Task				2022.1.00401.S
Tasks in execution order 1. hifa_importdata 2. hifa_flagdata 3. hifa_fluxcalflag	7. Flag T _{sys} calibration			ВАСК
4. hif_rawflagchans	QA Score: 1.00 5.42% of data in uid A002X1003af4_	Xa540 ms.b. tsyscal.s6, 1 tsyscal.tbl was newly flagged		
5. hif_refant		Autorianity and a second		
6. h_tsyscal	Contents			
7. hifa_tsysflag	 T_{sys} after flagging 			
8. hifa_antpos 9. hifa wvrgcalflag	Flagged data summary			
9. hifa_wvrgcalflag	Flag step details			
11. hif_setmodels	• manual			
12. hifa bandpassflag	• nmedian			
13. hifa_bandpass	derivative			
14. hifa spwphaseup	edgechans fieldshape			
15. hifa_gfluxscaleflag	 birdies 			
16. hifa_gfluxscale	• toomany			
17. hifa timegaincal				
18. hifa_targetflag	T _{sys} vs frequency after flagging			
19. hif_applycal	Plots of time-averaged $\mathrm{T}_{\mathrm{sys}}\mathrm{vs}$ frequency, colored by antenna.			
20. hif_makeimlist (cals)	uidA002_X1003af4_Xa540.ms			
21. hif_makeimages (cals)	or 25-27 (2002-21) (2003-45) 444 min.h. (represent and 1. Inspectation	ur 1917-1918-1918-1918-1914 ann th' second and the second and	ur 19/2-2002 2002 2002 Albert mei h-Impresi ant -Impresi ant -Impressi ant	or \$25-yr \$252-27 \$252-27 \$2529 \$4 (as a b) synoid all, I special that
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24. hifa_imageprecheck				8 20 -
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28. hif_mstransform				
29. hifa_flagtargets	T _{sys} spw 17	T _{sys} spw 19	T _{sys} spw 21	T _{sys} spw 23
30. hif_makeimlist (mfs)	Science spw 25.	Science spw 27.	Science spw 29.	Science spw 31.
31. hif_findcont				
				· · · · · · · · · · · · · · · · · · ·

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.

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26 Internet Annual 26 Internet A	flagged before manual	nmedian	derivative	edgechans	fieldshape					
T _{sys} spw: 17 Science spws: 25										
Additional										
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hifa_bandpass: Corrections for the phase and amplitude versus frequency are derived in this step.

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Tasks in execution order 1. hifa_importdata 2. hifa_flagdata 3. hifa_fluxcelflag	Î	13. Bandpass Ca	libratio	on						BACK			
4. hif_rawflagchans		QA Score: 1.00 Lowest score for amplit	tude SNR is 1.0	00 (uidA002_X1003af4_Xa54	10.ms unknown ori	gin) <u>All QA Scores (2 gree</u>	<u>en)</u>						
5. hif_refant 6. h_tsyscal 7. hifa_tsysflag 8. hifa_antpos	L	This task creates bandpass solutions for eac	ch measureme	nt set.									
9. hifa_wvrgcalflag	9												
10. hif_lowgainflag 11. hif_setmodels	L	Phase-up on bandpass calibrator Phase-up Solution Parameters											
	9	Measurement Set		Туре	Interval		Min Baselines per Antenna	Min SNR	Phase-up Bandwidth				
13. hifa_bandpass 14. hifa_spwphaseup		uid A002 X1003af4 Xa540.ms		Phase only	Per integration	(6.05s)	4	3.0					
15. hifa_gfluxscaleflag		Applied calibrations and parameters used fo	r phase up cali	ibration									
16. hlfa_gfluxscale 17. hlfa_timegaincal	9	Bandpass calibration	r priase-up can	Diaton									
18. hifa_targetflag 19. hif_applycal			Solution Pa	arameters	Applied To								
20. hif_makeimlist (cals)		Measurement Set	Туре	Interval	Scan Intent	Spectral Windows	Calibration Table						
21. hif_makeimages (cals)		uidA002_X1003af4_Xa540.ms	Channel	inf,0.488281MHz(1.0ch)	ALL	25	uidA002_X1003af4_Xa540.ms.hifa_bandpass.s13	2 cow25 27 20 21	channel colintinf heal thi				
22. hif_makeimlist (checksrc) 23. hif_makeimages (checksrc)		uluN02_N1003al4_Na340.1115	Charmer	111,0.4002010112(1.001)	ALL		uu0021003ai4Aa340.iiis.iiia_bailupass.sts,	_3.3pw23_21_25_31.	chamer.sonnum.bcal.ub				
24. hifa_imageprecheck						27							
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26. hifa_renorm	9					31							
27. hifa_exportdata 28. hif mstransform		Parameters used for bandpass calibration											
29. hifa_flagtargets													
30. hif_makeimlist (mfs)		Plots											
31. hif_findcont	-	Plots show the bandpass correction applied	to the target so	purce. The first two plots show an	nplitude vs frequer	cy; one for the reference an	tenna and one for a typical antenna, identified the antenr	na with mode score. T	he third plot shows phase vs fre	quency for the			

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.

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Home By Topic E	By Task		2022.1.00401.S
Tasks in execution order	Î	Plots	
1. hifa_importdata		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 ante	enna, identified the antenna with mode score. The third plot shows phase vs frequency for the
2. hifa_flagdata		typical antenna.	
3. hifa_fluxcalflag		Click the summary plots to enlarge them, or the plot title to see see detailed plots per spectral window and antenna.	
4. hif_rawflagchans			
5. hif_refant		uidA002_X1003af4_Xa540.ms	
6. h_tsyscal		Amplitude vs frequency (show uidA002X1003af4Xa540.ms)	Phase vs frequency (show
7. hifa_tsysflag			uid _A002_X1003af4_Xa540.ms)
8. hifa_antpos		The plots below show amplitude vs frequency for the bandpass correction, overlayed for all spectral windows and correlations. Click on the link above to show show	The plot below shows phase vs frequency for the bandpass correction,
9. hifa_wvrgcalflag	0	detailed plots for all antennas, or on the links below to show plots with specific antennas preselected.	overlayed for all spectral windows and correlations. Click on the link above to
10. hif_lowgainflag		er_and (2010) (add man press of) spects (2) (2)(2)(2)(an examination and a second sec	show show phase vs frequency plots for all antennas, or on the link for just
11. hif_setmodels			the typical antenna.
12. hifa_bandpassflag	9		wit_w002_15000ad_bddxxxxxxx_waxa_waxa_xxx_12_xxxxx2_77_70_21_cdxxxxxxxx00000000000000000000000000000
13. hifa_bandpass			20
14. hifa_spwphaseup			
15. hifa_gfluxscaleflag		88	
16. hifa_gfluxscale			
17. hifa_timegaincal	0	Reference antenna (DA61) (show DA61) Typical antenna (DA41) (show DA41)	
18. hifa_targetflag		Amplitude vs frequency for the reference antenna (DA61). Click the link above Amplitude vs frequency for a typical antenna (DA41). Click the link above to	
19. hif_applycal		to show detailed plots for DA61. Show detailed plots for DA61.	velx000_20031844_346461es 046584e-3422.3015 (polite-sques v1.102 - 371681203.14.61.41
20. hif_makeimlist (cals)			Typical antenna (DA41) (show DA41)
21. hif_makeimages (cals)		NB. random antenna until scores are working	Phase vs frequency for a typical antenna (DA41). Click the link above to show
22. hif_makeimlist (checksrc)			detailed plots for DA41.
23. hif_makeimages (checksrc)			
24. hifa_imageprecheck		Innut Decemeters	
25. hif_checkproductsize		Input Parameters	
26. hifa_renorm	0	Tasks Execution Statistics	
27. hifa_exportdata			
28. hif_mstransform		CASA logs for stage 13	
29. hifa_flagtargets			
30. hif_makeimlist (mfs)		View or download stage13/casapy.log (150.2 KiB)	
31. hif_findcont	•		

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.

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Tasks in execution order 1. hifa_importdata 2. hifa_flagdata 3. hifa_fluxcalflag	Calibrated amplitue	de vs frequency	for uidA002_>	(1003af4_Xa540	ms	BACK
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- 6. h_tsyscal 7. hifa_tsysflag	SNR (Error Function)					
8. hifa_antpos 9. hifa_wvrgcalflag 10. hif_lowgainflag						340
11. hif_setmodels 12. hifa_bandpassflag	0.90 0.91	0.92 0.93	0.94 0.95 QA Score	0.96	0.97 0.98	0.99 1.00
13. hifa_bandpass 14. hifa_spwphaseup 15. hifa_gfluxscaleflag	Spectral window filter			Antenna filter		
16. hifa_gfluxscale 17. hifa_timegaincal	Show all spectral windows			Show all antennas		
18. htm_targettlag 19. htm_applycal 20. htm_makeimlist (cals) 21. htm_makeimlist (cals) 22. htm_makeimlist (checksrc) 23. htm_makeimlist (checksrc)						
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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.

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1/170 A Home By Topic By Task		► >_ □ ± < ×
Tasks in execution order		
1: hifa_importdata	Calibrated amplitude vs frequency for uid A002_X1003af4_Xa540 ms	(PACK)
2. htta_llagdata	uidA002_X1003af4_Xa540.ms.hifa_bandpass.s13_3.spw25_27_29_31.channel.solintinf.bcal.tbl	BACK
3. hifa_fluxcelflag	uluA0v2_A10v3ai4_Aa340.ins.inia_uanupass.s13_3.shwz3_21_23_31.chainee.sointain.bcai.cu	
4. ht_rawlagenans	Clip Nickogram range to max Ant 0: DA41, spw25, field 0: J1924-2914, scan3 22:24:49	
5. htt_relant	XX PWV 1.25mm, airmass 1.021	
6. ti_tsyscal	SNR (Error Function)	
7. hifa_tsysflag	94%	
8. htta_antpos	1.03	
9. hifa_wvrgearlag		
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24. bile in oppositions	TOPO LSB Frequency (GHz) uidA002_X1003af4_Xa540.ms ObsDate=2022-10-25 plotbandpass v1.102 = 2018/01/21 14:45:41	DA42
Antenna: DA41	5pw/25 5pw/27 5pw/29 5pw/29 5pw/21 5pw/29	Spw 27
Spectral Window: 25		
Scores: XX=1.0, YY=1.0		
Sachill Indeont		

hifa_spwphaseup: This module creates diagnostic plots of the .

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Home By Topic	By Task									2022.1.00401.S	
Tasks in execution order		A									
1. hifa_importdata		17. Gain Calibr	otion								
2. hifa_flagdata		17. Gain Calibi	alion							BACK	1
3. hifa_fluxcalflag											
4. hif_rawflagchans		OA Score: 0.85 Phase offsets: in	sufficient data	to evaluate stabili	w for uid 0002 X1003af4 Xa540 ms SPW	25.31 Antennas DA	A41 DA42 DA43		, DA46, DA47, DA48, DA50, DA51, DA52, DA55, DA56, DA59, DA60, DA62, D/	A63 DA64	
5. hif_refant		DA65, DV01, DV02, DV03, DV04,	DV05, DV06, [DV07, DV10, DV11	, DV12, DV13, DV14, DV15, DV16, DV17, DV	18, DV19, DV20, D	V21, DV22, DV2	24, DV25 <u>All (</u>	Q <u>A Scores (2 blue)</u>	A03, DA04,	
6. h_tsyscal											
7. hifa_tsysflag		This task creates gain solutions for ea	ach measurem	ent set.							
8. hifa_antpos		Plots									
9. hifa_wvrgcalflag	0	 Phase vs time 									
10. hif_lowgainflag		Amplitude vs time									
11. hif_setmodels		Diagnostic plots Phase vs time									
12. hifa_bandpassflag	9	 Phase vs time Phase offsets vs time 									
13. hifa_bandpass		Amplitude vs time									
14. hifa_spwphaseup											
15. hifa_gfluxscaleflag		Results									
16. hifa_gfluxscale											
17. hifa_timegaincal	(?		Solution Par	rameters	Applied To						
18. hifa_targetflag							Spectral				
19. hif_applycal		Measurement Set	Туре	Interval	Scan Intent	Field	Windows	Gainfield	Calibration Table		
20. hif_makeimlist (cals)		uidA002_X1003af4_Xa540.ms	Phase only	Infinite	PHASE	J1820-2528	25, 27, 29,	J1820-	uid	solintinf ancal the	
21. hif_makeimages (cals)			. nuse only			01000 2020	31	2528	ac		
22. hif_makeimlist (checksrc)											
23. hif_makeimages (checksrc)		uidA002_X1003af4_Xa540.ms	Phase only	Infinite	CHECK, TARGET	NGC_6445,	25, 27, 29,	J1820-	uidA002_X1003af4_Xa540.ms.hifa_timegaincal.s17_2.spw25_27_29_31.	.solintinf.gpcal.tbl	
24. hifa_imageprecheck						PN_Hb_5	31	2528			
25. hif_checkproductsize		uidA002_X1003af4_Xa540.ms	Phase only	Per integration	AMPLITUDE, BANDPASS, POLANGLE,		25, 27, 29,	nearest	uidA002_X1003af4_Xa540.ms.hifa_timegaincal.s17_3.spw25_27_29_31.	.solintint.gpcal.tbl	
26. hifa_renorm	0			(6.05s)	POLARIZATION, POLLEAKAGE		31				
27. hifa_exportdata		uid A002 X1003af4 Xa540.ms	Amplitude	Infinite	AMPLITUDE, BANDPASS, PHASE,		25, 27, 29,	nearest	uid A002 X1003af4 Xa540.ms.hifa timegaincal.s17 5.spw25 27 29 31.	.solintinf.gacal.tbl	
28. hif_mstransform			only		POLANGLE, POLARIZATION,		31			g	
29. hifa_flagtargets					POLLEAKAGE						
30. hif_makeimlist (mfs)		uid	Amplitude	Infinite	CHECK, TARGET		25, 27, 29,		uid A002 X1003af4 Xa540.ms.hifa_timegaincal.s17_5.spw25_27_29_31.	colintinf gocol thi	
31. hif_findcont		▼	only	minite	CHEON, IARGET		25, 27, 29, 31		uuhooz_htoobai4_hab40.ms.mia_umegaincai.st/_5.spW25_2/_29_31.	.somium.gacar.tbi	
			VIII.	1			01	1			

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.

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2022.1.00401.3 - Iask D	T								
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Home By Topic	By Task								2022.1.00401.S
Tasks in execution order	<u>^</u>								
1. hifa_importdata		17. Gain Calibr	ration						BACK
2. hifa_flagdata		II. Gain Calibi	alion						BACK
3. hifa_fluxcalflag									
4. hif_rawflagchans		QA Score: 0.85 Phase offsets: in	sufficient data	to evaluate stabili	ty for uid A002 X1003af4 Xa540.ms SPW	25,31 Antennas DA	41, DA42, DA43	, DA44, DA45	, DA46, DA47, DA48, DA50, DA51, DA52, DA55, DA56, DA59, DA60, DA62, DA63, DA64,
5. hif_refant		DA65, DV01, DV02, DV03, DV04,	DV05, DV06, [DV07, DV10, DV11	I, DV12, DV13, DV14, DV15, DV16, DV17, DV	18, DV19, DV20, D	V21, DV22, DV2	4, DV25 <u>All</u>	<u>QA Scores (2 blue)</u>
6. h_tsyscal									
7. hifa_tsysflag		This task creates gain solutions for ea	ich measurem	ent set.					
8. hifa_antpos		Plots							
9. hifa_wvrgcalflag	0	 Phase vs time Amplitude vs time 							
10. hif_lowgainflag		Diagnostic plots							
11. hif_setmodels 12. hifa bandpassflag	0	Phase vs time							
13. hifa_bandpass		 Phase offsets vs time 							
14. hifa_spwphaseup		 Amplitude vs time 							
15. hifa_gfluxscaleflag		Results							
16. hifa_gfluxscale		Results							
17. hifa_timegaincal	(?		Solution Par	rameters	Applied To				
18. hifa_targetflag							Spectral		
19. hif_applycal		Measurement Set	Туре	Interval	Scan Intent	Field	Windows	Gainfield	Calibration Table
20. hif_makeimlist (cals)									
21. hif_makeimages (cals)		uidA002_X1003af4_Xa540.ms	Phase only	Infinite	PHASE	J1820-2528	25, 27, 29, 31	J1820- 2528	uidA002_X1003af4_Xa540.ms.hifa_timegaincal.s17_2.spw25_27_29_31.solintinf.gpcal.tbl
22. hif_makeimlist (checksrc)							31	2328	
23. hif_makeimages (checksrc)		uidA002_X1003af4_Xa540.ms	Phase only	Infinite	CHECK, TARGET	NGC_6445,	25, 27, 29,	J1820-	uidA002_X1003af4_Xa540.ms.hifa_timegaincal.s17_2.spw25_27_29_31.solintinf.gpcal.tbl
24. hifa_imageprecheck						PN_Hb_5	31	2528	
25. hif_checkproductsize		uidA002_X1003af4_Xa540.ms	Phase only	Per integration	AMPLITUDE, BANDPASS, POLANGLE,		25, 27, 29,	nearest	uidA002_X1003af4_Xa540.ms.hifa_timegaincal.s17_3.spw25_27_29_31.solintint.gpcal.tbl
26. hifa_renorm	0			(6.05s)	POLARIZATION, POLLEAKAGE		31		
27. hifa_exportdata		uid A002 X1003af4 Xa540.ms	Amplitude	Infinite	AMPLITUDE, BANDPASS, PHASE,		25, 27, 29,	nearest	uid A002 X1003af4 Xa540.ms.hifa timegaincal.s17 5.spw25 27 29 31.solintinf.gacal.tbl
28. hif_mstransform			only		POLANGLE, POLARIZATION,		31		
29. hifa_flagtargets					POLLEAKAGE				
30. hif_makeimlist (mfs) 31. hif_findcont		uidA002_X1003af4_Xa540.ms	Amplitude	Infinite	CHECK, TARGET		25, 27, 29,		uidA002_X1003af4_Xa540.ms.hifa_timegaincal.s17_5.spw25_27_29_31.solintinf.gacal.tbl
	-		only				31		•

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.

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Home By Topic By Task				2022.1.00401.S
Tasks in execution order 1. htfa_importdata 2. htfa_flagdata 3. htfa_fluxcaliflag	Plots Phase vs time			
4. hif_rawflagchans	Plots show the phase correction to be applied to the target source	e. A plot is shown for each spectral window, with phase correction dat	ta points plotted per antenna and correlation as a function of time.	
5. hif_refant	Click the summary plots to enlarge them, or the spectral window	heading to see detailed plots per spectral window and antenna.		
6. h_tsyscal	uid A002 X1003af4 Xa540.ms			
7. hifa_tsysflag				
8. hifa_antpos	Spectral windows default mapped for J1820-2528 (PHASE).			
9. hifa_wvrgcalflag	uidA002_X1003af4_Xa540 spw 25	uidA002_X1003af4_Xa540 spw 27	uldA002_X1003af4_Xa540 spw 29	uldA002_X1003af4_Xa540 spw 31
10. hif_lowgainflag	100	100-	100-	
11. hif_setmodels	50 State 1		degrade and the second s	1
12. hifa_bandpassflag	- 0 - 0	A second s	a the second secon	
13. hifa_bandpass	3	3	3	3
14. hifa_spwphaseup	-130	- 180 -	- 136	- 100
15. hifa_gfluxscaleflag	22.24.00 22.25.50 20.27.00 20.26.50 20.35.00 20.55.50.500 20.55.50 20.55.50 20.55.50 20.55.50 20.55.50 20.55.50	22.34.00 22.25.30 22.37.00 22.34.30 Time (from 2022/10/25) (dd):mm:sta)	22.24.00 22.25.20 22.27.00 22.21.00 22.21.00 22.21.00 22.21.00 22.24.00 22.24.00 22.24.00 2022(10/25) (bb.rem.nos)	22.24.00 22.25.50 22.25.50 72.57.50 72.59.50 72.55.50 72.55.50 72.55.50 72.54.50 72.55.500 72.55.500 72.55.500 72.55.500 72.55.500 72.55.500 72.55.500707500
16. hifa_gfluxscale	Spectral window 25	Spectral window 27	Spectral window 29	Spectral window 31
17. hifa_timegaincal	Phase vs time, all antennas and correlations.	Phase vs time, all antennas and correlations.	Phase vs time, all antennas and correlations.	Phase vs time, all antennas and correlations.
18. hifa_targetflag				
19. hif_applycal				
20. hif_makeimlist (cals)	Amplitude ve time			
21. hif_makeimages (cals)	Amplitude vs time			
22. hif_makeimlist (checksrc) 23. hif_makeimages (checksrc)	Plots show the amplitude calibration to be applied to the target s	ource. A plot is shown for each spectral window and each set of anter	nnas with the same antenna diameter, with amplitude correction da	a points per antenna and correlation as a function of time.
24. hlfa_imageprecheck	Click the summary plots to enlarge them, or the spectral window	heading to see detailed plots per spectral window and antenna.		
25. hif checkproductsize	uidA002_X1003af4_Xa540.ms			
26. hifa renorm	uidA002_X1003af4_Xa540 spw 25	uidA002_X1003af4_Xa540 spw 27	uidA002_X1003af4_Xa540 spw 29	uldA002_X1003af4_Xa540 spw 31
27. hifa_exportdata	0.168	0.177	0.369	0.00
28. hif mstransform	0.366	0.00	0.200	0.04
29. hifa_flagtargets	land a second seco	1.00 ·	No. 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	-140-
30. hif_makeimlist (mfs)	0.160	0.00	3 0.140	3 0.00 -
31. hif_findcont	0.156	0.38	0.156	0.36-
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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.

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Home By Topic	By Task				2022.1.00401.S
Tasks in execution order 1. hifa_importdata	Î	Diagnostic plots			
2. hifa_flagdata	- 1	Phase vs time			
3. hifa_fluxcalflag		These diagnostic plots show the phase solution for a calibration	generated using a short solution interval (in the case of the checkso	urce(s), they are taken from the tables generated by hifa_gfluxscale)	. In case of very low SNR on a particular phase calibrator or
4. hif_rawflagchans			it = $1/4$ the scan time are shown for that field. This calibration is not a		
5. hif_refant		correlation as a function of time.			
6. h_tsyscal		Click the summary plots to enlarge them, or the spectral window	heading to see detailed plots per spectral window and antenna.		
7. hifa_tsysflag 8. hifa_antpos		uidA002_X1003af4_Xa540.ms			
9. hifa_wvrgcalflag	0	Spectral windows default mapped for J1820-2528 (PHASE).			
10. hif_lowgainflag		Plots show the diagnostic phase calibration for uid A002_X10	003af4 Xa540.ms.		
11. hif_setmodels		ukd_A002_X1003af4_Xa540 spw 25	uidA002_X1003ef4_Xe540 spw 27	uid A002 X1003af4 Xa540 spw 29	uld A002 X1003af4 Xa540 spw 31
12. hifa_bandpassflag	0	100-	199	130-	190
13. hifa_bandpass		300	100	100-	2
14. hifa_spwphaseup					
15. hifa_gfluxscaleflag					
16. hifa_gfluxscale		-30	- 100	100	
17. hifa_timegaincal	(?	22.0000 22.2000 22.2000 22.000 22.000 22.0000 22.0000 22.0000 22.0000 22.0000 22.0000 22.0000 20.00000 20.00000 20.00000 20.00000 20.000000 20.00000 20.00000000	22-26-00 22-22 not 22-26-00 22-26-00 22-26-00 22-26-00 22-27-20 122-26-00 22-26-000 22-26-000 22-26-0000000000	22.2650 23.22.00 22.26.00 12.36.00 12.36.00 12.36.00 12.36.00 12.36.00 12.36.00 12.36.00 12.36.00 12.36.00 12.36.00	22 20-00 22 21 00 22 10 00 22 10 00 22 10 00 22 10 00 22 10 00 22 10 00 22 10 00 22 10 00 22 10 00 22 10 00 20
18. hifa_targetflag		Spectral window 25	Spectral window 27	Spectral window 29	Spectral window 31
19. hif_applycal					
20. hif_makeimlist (cals) 21. hif_makeimages (cals)		Phase vs time, all antennas and correlations.	Phase vs time, all antennas and correlations.	Phase vs time, all antennas and correlations.	Phase vs time, all antennas and correlations.
22. hif_makeimlist (checksrc)					
23. hif makeimages (checksrc)					
24. hifa_imageprecheck		Phase offsets vs time			
25. hif_checkproductsize		These diagnostic plots show the phase offsets as a function of ti	me. The phase offsets are computed by preapplying an spw-combine	ed phase-only solution to the phase calibrator data and computing a	new phase solution for each spw. The new phase solutions
26. hifa_renorm	0	should scatter about zero with no drift. The points shown for the	other calibrators will be zero. The new solutions are not applied to the	e target. One plot is shown for each spectral window, with phase off	set plotted per antenna and correlation as a function of time.
27. hifa_exportdata		Click the summary plots to enlarge them, or the spectral window	heading to see detailed plots per spectral window and antenna.		
28. hif_mstransform		uidA002_X1003af4_Xa540.ms			
29. hifa_flagtargets		Plots show the diagnostic phase offsets for uid A002X1003	af4_Xa540.ms calculated using solint='inf'.		
30. hif_makeimlist (mfs)		uidA002_X1003af4_Xa540 spw 25	ukdA002_X1003af4_Xa540 spw 27	uidA002_X1003af4_Xa540 spw 29	uidA002_X1003af4_Xa540 spw 31
31. hif_findcont		130	159 -	158-	130-

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Home By Topic	By Task											2022	2.1.00401.S	
Tasks in execution order 1. hifa_importdata 2. hifa_flagdata 3. hifa_fluxcalflag	Î	19. Apply calib	oratio	on tables	5								BACK	
4. hif_rawflagchans 5. hif_refant	- 1	QA Score: 1.00 For uidA00	02_X1003a	af4_Xa540.ms, intent(s): TARGET, 2.19% of the data	a was newly	flagged by	applycal flagging	agents, for a total of 6.96% flagged. <u>All QA Scores (3 green)</u>					
6. h_tsyscal 7. hifa_tsysflag	- 1	This task applies all calibrations regi	istered witl	h the pipeline to their	target measurement sets.									
8. hifa_antpos 9. hifa_wvrgcalflag 10. hif_lowgainflag	θ	Contents • Applied calibrations • Flagged data after calibration application												
11. hif_setmodels 12. hifa_bandpassflag 13. hifa_bandpass	0	Plots Calibrated amplitude vs frequency Calibrated phase vs frequency												
14. hifa_spwphaseup 15. hifa_gfluxscaleflag 16. hifa_gfluxscale		Calibrated amplitude vs UV distance Calibrated amplitude vs time Calibrated phase vs time (Corrected amplitude / mode) vs antenna												
17. hifa_timegaincal 18. hifa_targetflag 19. hif_applycal	Θ	(Corrected amplitude / model) vs UV distance Science target: calibrated amplitude vs frequency Science target: calibrated amplitude vs UV distance												
20. hif_makeimlist (cals)21. hif_makeimages (cals)22. hif_makeimlist (checksrc)	- 1	Applied calibrations												
23. hif_makeimages (checksrc) 24. hifa_imageprecheck	- 1	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.												
25. hif_checkproductsize	0	Measurement Set		Target				Calibration						
26. hifa_renorm 27. hifa_exportdata	U	Name	Final Size	Intent	Fields	Spw	Antenna	Туре	spwmap	gainfield	interp	calwt	table	
28. hif_mstransform 29. hifa_flagtargets 30. hif_makeimlist (mfs)		uidA002_X1003af4_Xa540.ms (callibrary: view / download)		TARGET	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15		0~42	T _{sys}	0, 1, 2, 3, 4, 5, 17, 7, 8, 9, 10, 11, 23, 17, 19, 21, 23, 17, 17, 19, 19, 21, 21, 23, 23, 17, 17, 19, 19, 21, 21, 23, 23	2	linear, linear		Filename	
So. m_makemist (mis)								WAVE			nearest	Falso	Filename	

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A Home By Topic	By Task				2022.1.00401.S				
Tasks in execution order	^	Plots							
1. hifa_importdata									
2. hifa_flagdata		Calibrated amplitude vs frequency							
3. hifa_fluxcalflag		Plots of calibrated amplitude vs frequency for all antennas and co	rrelations, coloured by antenna. The atmospheric transmission for e	ach spectral window is overlayed on each plot in pink.					
4. hif_rawflagchans		uid A002_X1003af4_Xa540.ms							
5. hif_refant		Amp:corrected, Atm Transmission vs. Frequency Spw: 25	Amp:corrected, Atm Transmission vs. Frequency Spw: 27	Amp:corrected, Atm Transmission vs. Frequency Spw: 29	Amp:corrected, Atm Transmission vs. Frequency Spw: 31				
6. h_tsyscal		42	8.2	83	12				
7. hifa_tsysflag		74	7.8	v					
8. hifa_antpos		7 0 a	- 70 Million	17 To	20 March 199				
9. hifa_wvrgcalflag	0	American Street	Annova 1 and	Annual Contraction of the second seco	American A American American Ame American American				
10. hif_lowgainflag		78-	7.8-	2.0	78-				
11. hif_setmodels		236.0 226.2 226.4 226.4 226.5 227.5 227.3	6.6 2362 2364 2344 266 231.0 231.0 231.0 231.2	6.6 2015 2018 2018 2018 2019 2015 2018 2018 2019 2019 2019 2019	4.6 2465 2465 2465 2455 2468				
12. hifa_bandpassflag	9	Prequency (ONU) TOPO	Frequency (GHz) TOPO		Prequency (Offs) TOPO				
13. hifa_bandpass		Spw 25 ALMA Band 6	Spw 27 ALMA Band 6	Spw 29 ALMA Band 6	Spw 31 ALMA Band 6				
14. hifa_spwphaseup		Intents: AMPLITUDE, BANDPASS	Intents; AMPLITUDE, BANDPASS	Intents; AMPLITUDE, BANDPASS	Intents: AMPLITUDE, BANDPASS				
15. hifa_gfluxscaleflag		Fields: J1924-2914	Fields: J1924-2914	Fields: J1924-2914	Fields: J1924-2914				
16. hifa_gfluxscale									
17. hifa_timegaincal	Θ								
18. hifa_targetflag		Amp:corrected, Atm Transmission vs. Frequency Spw: 25	Amp:corrected, Atm Transmission vs. Frequency Spw: 27	Amp:corrected, Atm Transmission vs. Frequency Spw: 29	Amp:corrected, Atm Transmission vs. Frequency Spw: 31				
19. hif_applycal				··· · · ·					
20. hif_makeimlist (cals)		No. 20 State		1 (14)	The second s				
21. hif_makeimages (cals)									
22. hif_makeimlist (checksrc)		2	2	2	2				
23. hif_makeimages (checksrc)		40 H	and a second	All first further a state of second state of the second state of t	and the second sec				
24. hifa_imageprecheck		2240 2242 2244 2248 2248 2258 2272 2272 Prequency (6Hz) TOPO	236-8 229-2 229.4 239.4 239.4 231.0 221.2 Frequency (GHz) TOPO	240.5 241.0 241.5 242.0 241.5 241.0 Frequency (GRz) TOPO	2415 2468 2468 2458 2458 2458 2468 Prequency (GHz) TGPO				
25. hif_checkproductsize 26. hifa_renorm	0	Spw 25	Spw 27	Spw 29	Spw 31				
27. hifa exportdata	U	ALMA Band 6	ALMA Band 6	ALMA Band 6	ALMA Band 6				
28. hif mstransform		Intents: PHASE	Intents: PHASE	Intents: PHASE	Intents: PHASE				
29. hifa_flagtargets		Fields: J1820-2528	Fields: J1820-2528	Fields: J1820-2528	Fields: J1820-2528				
30. hif_makeimlist (mfs)									
so. m_materinist (mis)									

Calibrated phase vs frequency

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Home By Topic By Tas	ik			2022.1.00401.S
Tasks in execution order				
1. hifa_importdata	Calibrated phase vs frequency			
2. hifa_flagdata				
3. hifa_fluxcalflag	Plots of calibrated phase vs frequency for all antennas and correla	ations, coloured by antenna.		
4. hif_rawflagchans	uidA002_X1003af4_Xa540.ms			
5. hif_refant	Phase:corrected vs. Frequency Spw: 25	Phase:corrected vs. Frequency Spw: 27	Phase:corrected vs. Frequency Spw: 29	Phase:corrected vs. Frequency Spw: 31
6. h_tsyscal				
7. hifa_tsysflag				
8. hifa_antpos		1) parties	() () () () () () () () () () () () () (2 provide a constraint of the second
9. hifa_wvrgcalflag	0		Phase contract of the second se	
10. hif_lowgainflag	- 100	- 100 -	- 40 -	- 40 -
11. hif_setmodels	226.0 226.2 226.4 226.6 226.8 227.0 227.2 Prequency (0611: 070-0	236.9 229.2 239.4 229.6 229.8 221.0 231.2 Frequency (Gitz) TOPO	240.5 241.0 241.5 241.0 242.5 243.0 Frequency (242.5 243.0	241.5 244.0 244.5 245.0 245.5 246.0 Prequency (Citta) TOPO
12. hifa_bandpassflag	Spectral Window 25	Spectral Window 27	Spectral Window 29	Spectral Window 31
13. hifa_bandpass	ALMA Band 6	ALMA Band 6	ALMA Band 6	ALMA Band 6
14. hifa_spwphaseup	Intents: BANDPASS	Intents: BANDPASS	Intents: BANDPASS	Intents: BANDPASS
15. hifa_gfluxscaleflag	Fields: J1924-2914	Fields: J1924-2914	Fields: J1924-2914	Fields: J1924-2914
16. hifa_gfluxscale				
	Phase:corrected vs. Frequency Spw: 25	Noncomparing the Company of the Comp	Phase:corrected vs. Frequency Spw: 29	Phase:corrected vs. Frequency Spw: 31
18. hifa_targetflag	Phase:corrected vs. Frequency Spw: 25	Phase:corrected vs. Frequency Spw: 27	Phase:corrected vs. Frequency Spw: 29	Phase:corrected vs. Frequency Spw: 31
19. hif_applycal	2 ¹⁰ Contraction of the second second	a man and a start of the start of the	9 ⁵⁰	*
20. hif_makeimlist (cals)				
21. hif_makeimages (cals)		and the second second second		*
22. hif_makeimlist (checksrc)		1 m		
23. hif_makeimages (checksrc)				
24. hifa_imageprecheck	2260 2262 2264 2266 2265 2270 2272 Frequency (6Hz) TOPO	236.8 236.2 236.4 236.4 236.8 236.8 231.0 231.2 Frequency (GH2) TOPO	2405 2418 2413 2410 2415 2416 Frequency (SHI) TOPO	2455 2460 2463 2458 2458 2453 2468 Frequency (GHz) TOPO
25. hif_checkproductsize	Spectral Window 25	Spectral Window 27	Spectral Window 29	Spectral Window 31
-	ALMA Band 6	ALMA Band 6	ALMA Band 6	ALMA Band 6
27. hifa_exportdata	Intents: PHASE Fields: J1820-2528	Intents: PHASE Fields: J1820-2528	Intents: PHASE Fields: J1820-2528	Intents: PHASE Fields: J1820-2528
28. hif_mstransform	Fielus: J1820-2528	FIEIUS. J1020-2028	Fielus, J1020-2028	Fields, J1020-2028
29. hifa_flagtargets				
30. hif_makeimlist (mfs)				

Calibrated amplitude vs UV distance

31. hif findcont

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1. hifa_importdata		(Corrected amplitude / model) vs a	Intenna		
2. hifa_flagdata				ra chown for all antannas and correlations	
3. hifa_fluxcalflag		uid A002_X1003af4_Xa540.ms	nin value versus antenna ib. Data are coloured by antenna and a	e site in an analitica and constantions.	
4. hif_rawflagchans					
5. hif_refant			range set to capture the inner half of the data (UV max < 90.5 m).		
6. h_tsyscal		Amp:corrected/model (vector) vs. Antenna1 Spw: 25	Amp:corrected/model (vector) vs. Antennal Spw: 27	Amp:corrected/model (vector) vs. Antennal Spw: 29	Amp:corrected/model (vector) vs. Antennal Spw: 31
7. hifa_tsysflag		1 ¹⁰	5100	5.00	E 100 E CONTRACTOR DE LA C
8. hifa_antpos					
9. hifa_wvrgcalflag	θ				
10. hif_lowgainflag					a
11. hif_setmodels	0	:	0.05	4.89	
12. hifa_bandpassflag 13. hifa_bandpass	e	0 30 20 40 50 Antenna3	0 20 20 30 40 50 Anternal	0 10 20 20 20 40 50 Antennal	0 10 20 Antennal 20 50
14. hifa spwphaseup		Spectral Window 25 ALMA Band 6	Spectral Window 27	Spectral Window 29 ALMA Band 6	Spectral Window 31 ALMA Band 6
15. hifa gfluxscaleflag		Intents: AMPLITUDE.BANDPASS	Intents: AMPLITUDE.BANDPASS	Intents: AMPLITUDE.BANDPASS	Intents: AMPLITUDE.BANDPASS
16. hifa qfluxscale		Fields: J1924-2914	Fields: J1924-2914	Fields: J1924-2914	Fields: J1924-2914
17. hifa timegaincal	0				
18. hifa_targetflag		Amp:corrected/model (vector) vs. Antennal Spw: 25	Amp:corrected/model (vector) vs. Antennal Spw: 27	Amp:corrected/model (vector) vs. Antenna1 Spw: 29	Amp:corrected/model (vector) vs. Antennal Spw: 31
19. hif_applycal			1.10	120	
20. hif_makeimlist (cals)					
21. hif_makeimages (cals)		1.00		The second se	100
22. hif_makeimlist (checksrc)				5 100 8 0 0 0	initiant in battle on the b
23. hif_makeimages (checksrc)					
24. hifa_imageprecheck		0.00 ³ 0 10 20 40 50 40 50	0.85	0.45 0 20 Antenna 30 40 50	0.055
25. hif_checkproductsize		Spectral Window 25	Spectral Window 27	Spectral Window 29	Spectral Window 31
26. hifa_renorm	0	ALMA Band 6	ALMA Band 6	ALMA Band 6	ALMA Band 6
27. hifa_exportdata		Intents: PHASE	Intents: PHASE	Intents: PHASE	Intents: PHASE
28. hif_mstransform		Fields: J1820-2528	Fields: J1820-2528	Fields: J1820-2528	Fields: J1820-2528
29. hifa_flagtargets					
30. hif_makeimlist (mfs)					

(Corrected amplitude / model) vs UV distance

hif findcon

To examine the preview images and get information for imaging, check the output from the following tasks listed under the By Task tab:

- hif_makeimages (cals)
- hifa_imageprecheck
- hif_findcont
- hif_makeimages (mfs)
- hif_makeimages (cont)
- hif_makeimages (cube)
- hif_makeimages (repBW) [if present]
- hif_selfcal [if present]

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.

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Home By Topic By Task					2022.1.00401.S
Tasks in execution order					
1. hifa_importdata	21. Tclean/M	lakelmanes			
2. hifa_flagdata					
3. hifa_fluxcalflag	Make calibrator ima	ages			BACK
4. hif_rawflagchans					
5. hif_refant	04.0				
6. h_tsyscal	QA Score: 1.00 RMS vs. E	DR corrected sensitivity. Field: J1820-2528 Intent: PHASE	: SPW: 27 <u>AII QA Scores (8 green)</u>		
7. hifa_tsysflag	Imago Dotaile				
8. hifa_antpos	Image Details				
9. hifa_wvrgcalflag	Fields				
10. hif_lowgainflag	 J1924-2914 (BANDPASS) 				
11. hif_setmodels	 J1924-2914 (BANDPASS) J1820-2528 (PHASE) 				
12. hifa_bandpassflag					
13. hifa_bandpass	Field	Spw			
14. hifa_spwphaseup					
15. hifa_gfluxscaleflag	J1924-2914 (BANDPASS)	25 /	27/	29/	31 /
16. hifa_gfluxscale 17. hifa_timegaincal		X638243208#ALMA_RB_06#BB_1#SW-01	X638243208#ALMA_RB_06#BB_2#SW-01	X638243208#ALMA_RB_06#BB_3#SW-01	X638243208#ALMA_RB_06#BB_4#SW-01
		Topermane designment feld/02442934 vehaue23 zer1]	[seeinaar doolormaa teldisterseta ertuar27 tml]	[ton-inner_designment_fed(1024-2014_vetues/20_fml]	Decimate distances feld/302-203 vitue 12 for 1
18. hifa_targetflag 19. hif_applycal					
20. hif makeimlist (cals)		2			
21. hif_makeimages (cals)			tra and the second seco	nee en	and the second s
22. hif_makeimlist (checksrc)				gg	en e
23. hif_makeimages (checksrc)		Reference proton Key States (1.0.00000 Key States (1.0.000000 Key States (1.0.00000 Key States (1.0.000000 Key States (1.0.0000000 Key States (1.0.0000000 Key States (1.0.000000 Key States (1.0.000000 Key States (1.0.000000 Key States (1.0.0000000 Key States (1.0.000000 Key States (1.0.000000 Key States (1.0.0000000 Key States (1.0.00000000 Key States (1.0.0000000 Key States (1.0.0000000 Key States (1.0.0000000 Key States (1.0.00000000000000 Key States (1.0.0000000000000000000000000000000000	Advance publics: Spit Associate 12 10 1000000 The Advance of the	Andreasco publica: April America 2014 (1998) Participation (1994) (1998) Participation (1994) (1998)	O Reference publics References and the Constraints Reference and the Constraints Reference and the Constraints
24. hifa_imageprecheck		Right Accession (arcsec) · · · · Assure (1988) lists in .	 "Right Assension forces" "Insury J SECTION IN THE SECTION OF THE SEC	 "Right Ascension Sances" Humany 1488086-9 to 	"Right Accession (arcsec)" "Reserve Linktonics in
25. hif checkproductsize		View other QA images	View other QA images	View other QA images	View other QA images
26. hifa_renorm 🕢 🕄	centre frequency of image	226.6812GHz (LSRK)	230.5559GHz (LSRK)	241.8016GHz (LSRK)	244.9473GHz (LSRK)
27. hifa_exportdata					
28. hif_mstransform	beam	1.42 x 1.15 arcsec	1.33 x 1.09 arcsec	1.27 x 1.05 arcsec	1.31 x 1.05 arcsec
29. hifa_flagtargets	beam p.a.	84.1deg	-84.7deg	-84.5deg	83.5deg
30. hif_makeimlist (mfs)	final theoretical sensitivity	98 uJy/beam	0.11 mJy/beam	80 uJy/beam	81 uJy/beam
31. hif_findcont					
	cleaning threshold	5.4 m.lv/heam	5.4 m.lv/heam	5.2 m lv/heam	5.1 m.lv/heam

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.

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1. hifa_importdata		Cloan ro	sults for J1924-2914 (BAN		25		
2. hifa_flagdata		Cleanie	Sults 101 31324-2314 (DAI	101 A33) Spir	20	M M E	BACK
3. hifa_fluxcalflag							
4. hif_rawflagchans		Iterations	Pb-corrected Images		Residuals	Clean Masks	
5. hif_refant							
6. h_tsyscal			[typepbcsrimage_displaymean_field_p1024-2014_vittpac25_db	er1	type-residual display.peak line int (month) field (1934-1914 virtupe-25 fier 3	Speciesmusk digilgymean field(1924-2014 vergev25 ter1)	
7. hifa_tsysflag						*	
8. hifa_antpos						2 · · · · · · · · · · · · · · · · · · ·	
9. hifa_wvrgcalflag	0	1	an and a second s	-			
10. hif_lowgainflag			e.	ľ,	²	8 L +	
11. hif_setmodels				Aufversor a position : April Australia (2.015), constant facebasteri (2.015), constant facebaste	Andrewski publika Andrewski publika Andrewski publika Andrewski publika Andrewski publika	and the second s	
12. hifa_bandpassflag	9		" "Bight Accession Carciald" "	Programy 2 Junii Jilan II ne	n Piget Ascension Lances 0 Ascensy Janiticholis In Right Ascension Lances 0	* Right Accession (arcsec) ** Impute g 2000204x13 W	
13. hifa_bandpass							
14. hifa_spwphaseup							
15. hifa_gfluxscaleflag					fager-modular display peak line int, (morel): field (10242014: softgaw23 darid)		
16. hifa_gfluxscale							
17. hifa_timegaincal	0				a increase of the second se		
18. hifa_targetflag		0			per		
19. hif_applycal							
20. hif_makeimlist (cals)					 Fight Accession (arCite) Fight Accession (arCite) Fight Accession (arCite) Fight Accession (arCite) 		
21. hif_makeimages (cals)							
22. hif_makeimlist (checksrc)							_
23. hif_makeimages (checksrc)			Type pb digitaymean finisj1122-2914 uitspe:25 der:1		[speard diquiry-mean feddy1014-2014 withyw25 Berl]	(type:model_display.mean_field[1504-2014_virtgav25_tor1]	
24. hifa_imageprecheck							
25. hif_checkproductsize			1	**	ин Эд	and the second sec	
26. hifa_renorm	0						
27. hifa_exportdata			a	l'	8 	⁸ L ,	
28. hif_mstransform				Advance police: April Assess 12.010 (2000) Income: 23.010 (2000) Income: 23.010 (2000)	- O More patient 	an - Reference public - Referenc	
29. hifa_flagtargets			" "Right Ascension Generated"	magang z aminosis colto	n na	 * * Nyth Accession (arcsec) * * Regime Limitscheller 	
30. hif_makeimlist (mfs)			Primary Beam		PSF	Final Model	
31. hif_findcont	_						

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.

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1. hifa_importdata		24 Im	ando Dro	Chock					ВАСК	h I
2. hifa_flagdata		24. 111	nage Pre	-CHECK					BACK	
3. hifa_fluxcalflag										-
4. hif_rawflagchans		QA Score:	1.00 Predicted rob	ust=0.5 beam is within the PI requested range						
5. hif_refant										4
6. h_tsyscal		Goals From	n OT:							
7. hifa_tsysflag		Representative	e Target: PN_Hb_5							
8. hifa_antpos		Representative	e Frequency: 230.55	95 GHz (SPW 27)						
9. hifa_wvrgcalflag	0			iz (rounded to nearest integer #channels (5), repBV	W = 2.441 MHz)					
10. hif_lowgainflag			eptable Resolution: 1 ected beam axial rati	.17 arcsec / 1.76 arcsec						
11. hif_setmodels 12. hifa bandpassflag		Goal PI sensiti		(ioiii 01). 1.5						
13. hifa bandpass		Single Continu								
14. hifa spwphaseup		Estimated S	Synthesized Be	am and Sensitivities for the Representa	tive Target/Frequency					
15. hifa gfluxscaleflag		Estimates are o	given for four possib	e values of the tclean robust weighting parameter:	robust = 0.0, +0.5 (default), +1.0, and +2.0. If the	e "Min / Max Acceptable Res	solution" is available (>=C	vcle 5 12-m Arrav data), the robust value closest to the default (+0.5)	
16. hifa_gfluxscale				as simply major x minor) that is in the range of the						
17. hifa timegaincal	0	robust=+2.0 is	chosen if the predict	ed beam area is too small, and robust=0.0 is chose	en if the predicted beam area is too large. The ch	nosen robust value is highlight	ed in green and used for all	science target imaging.	In addition to an estimate for the repBW, an	
18. hifa_targetflag				m bandwidth (aggBW) is also given assuming NO						
19. hif_applycal				ed using all spws, otherwise the beam is predicted our robust values, Warning messages appear on thi		ne "By Task" view if a non-defa	ault value of robust (i.e., not	+0.5) is chosen. Additio	nally, if the predicted beam is not within the PI	
20. hif_makeimlist (cals)		. squester fally	je acing one of the it		h					
21. hif_makeimages (cals)		These estimat	tes should always I	e considered as the BEST CASE SCENARIO. T	hese estimates account for Tsys, the observed un	v-coverage, and prior flagging	. The estimates DO NOT ac	count for (1) subsequen	t science target flagging; (2) loss of continuum	
22. hif_makeimlist (checksrc)				rocess (i.e. removal of lines and other spectral feat						
23. hif_makeimages (checksrc)				transfer, residual baseline based effects, residual					frequency synthesis continuum calculations,	
24. hifa_imageprecheck				ed above. The synthesized beam for a single chanr						
25. hif_checkproductsize		robust	uvtaper	Synthesized Beam	Cell	Beam Ratio	Bandwidth	BW Mode	Effective Sensitivity	
26. hifa_renorm	0	0.0	0	1.55 x 1.10 arcsec @ -77.8 deg	0.22 x 0.22 arcsec	1.41	2.441 MHz	repBW	0.00559 Jy/beam	
27. hifa_exportdata		0.0	0	1.38 x 0.972 arcsec @ -82.6 deg	0.19 x 0.19 arcsec	1.41	5625 MHz	aggBW	9.57e-05 Jy/beam	
28. hif_mstransform		0.0	U	2.00 x 0.012 alcost @ -02.0 deg	0.13 × 0.13 alcoc	1.71	5025 WH12	aggo 🗤	store of byneam	.
29. hifa_flagtargets		0.5	0	1.59 x 1.13 arcsec @ -78.1 deg	0.23 x 0.23 arcsec	1.41	2.441 MHz	repBW	0.00511 Jy/beam	
30. hif_makeimlist (mfs)		0.5	0	1.49 x 1.04 arcsec @ -82.5 deg	0.21 x 0.21 arcsec	1.41	5625 MHz	aggBW	8.42e-05 Jy/beam	
31. hif_findcont	-									· .

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.

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Tasks in execution order	^	ESumated 6	ynmesizeu beu	in and ocholivities for the representative rangeon	гециенсу									
1. hifa importdata			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 (>=Cycle 5 12-m Array data), the robust value closest to the default (+0.5)											
2. hifa_flagdata		1.1.1	at 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,											
3. hifa fluxcalflag				n bandwidth (aggBW) is also given assuming NO line contaminat	-		-							
4. hif rawflagchans				d using all spws, otherwise the beam is predicted for the repSPW										
5. hif refant		requested range	e using one of the fou	r robust values, Warning messages appear on this page.										
6. h tsyscal														
7. hifa tsysflag				e considered as the BEST CASE SCENARIO. These estimates	2 C	0 0 0			0 00 0 0					
8. hifa_antpos				ocess (i.e. removal of lines and other spectral features from the di transfer, residual baseline based effects, residual antenna positio		-								
9. hifa_wvrgcalflag	0			d above. The synthesized beam for a single channel in a cube wil					quency synthesis continuum calculatio	113,				
10. hif_lowgainflag		robust	uvtaper	Synthesized Beam	Cell	Beam Ratio	Bandwidth	BW Mode	Effective Sensitivity		- 17			
11. hif_setmodels				-,					,					
12. hifa_bandpassflag	θ	0.0	0	1.55 x 1.10 arcsec @ -77.8 deg	0.22 x 0.22 arcsec	1.41	2.441 MHz	repBW	0.00559 Jy/beam					
13. hifa_bandpass		0.0	0	1.38 x 0.972 arcsec @ -82.6 deg	0.19 x 0.19 arcsec	1.41	5625 MHz	aggBW	9.57e-05 Jy/beam					
14. hifa_spwphaseup		0.5	Π	1.59 x 1.13 arcsec @ -78.1 deg	0.23 x 0.23 arcsec	1.41	2.441 MHz	repBW	0.00511 Jy/beam					
15. hifa_gfluxscaleflag														
16. hifa_gfluxscale		0.5	0	1.49 x 1.04 arcsec @ -82.5 deg	0.21 x 0.21 arcsec	1.41	5625 MHz	aggBW	8.42e-05 Jy/beam					
17. hifa_timegaincal 18. hifa_targetflag	0	1.0	0	1.67 x 1.18 arcsec @ -78.3 deg	0.24 x 0.24 arcsec	1.42	2.441 MHz	repBW	0.00489 Jy/beam					
19. hif_applycal		1.0	0	1.64 x 1.14 arcsec @ -82.1 deg	0.23 x 0.23 arcsec	1.42	5625 MHz	aggBW	8.04e-05 Jy/beam					
20. hif_makeimlist (cals)		2.0		170 v 1 01 areas @ 70 0 deg	0.24 x 0.24 arcsec	1.40	0.441 MUI-		0.00407 h/hears					
21. hif_makeimages (cals)		2.0	0	1.70 x 1.21 arcsec @ -78.8 deg	0.24 x 0.24 arcsec	1.40	2.441 MHz	repBW	0.00487 Jy/beam					
22. hif_makeimlist (checksrc)		2.0	0	1.70 x 1.19 arcsec @ -82.1 deg	0.24 x 0.24 arcsec	1.40	5625 MHz	aggBW	8.01e-05 Jy/beam					
23. hif_makeimages (checksrc)														
24. hifa_imageprecheck		Input Parar	neters											
25. hif_checkproductsize														
26. hifa_renorm	Θ	Tasks Exec	cution Statistics											
27. hifa_exportdata														
28. hif_mstransform		CASA logs	for stage 24											
29. hifa_flagtargets		- Manua	as developed stops 24	/casapy.log (484.2 KiB)										
30. hif_makeimlist (mfs)		• View (or download stage24	иазарулиу (404.2 NB)										
31. hif_findcont														
1										_				

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.

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13. hifa_bandpass		• PN_Hb_5									
14. hifa_spwphaseup				Continuum Frequen	cv Range						
15. hifa_gfluxscaleflag					.,						
16. hifa_gfluxscale		Field	Spw	Start	End	Frame	Status	Average spectrum	Joint mask		
17. hifa_timegaincal	0	NGC_6445	25	226.21141 GHz	226.25536 GHz	LSRK	NEW	LSBE Free, 500 (2000) 20044431 3.000 (4045 and applicable biotectorestate) (SBE Free, 500 (2004) 2004 (2005 (2004 2005	[type jointmask2_displaymean_field MOC_6445_withspe23		
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23. hif_makeimages (checksrc)				226.92580 GHz	227.13772 GHz			reserving: 14.3, 13.48, approxime: 1.24, contrarts: 1.25, problem/1995 coloration of the second sec	n n Right Ascension Server) n negaring 32007/nr11 m		
24. hifa_imageprecheck			27	230.08400 GHz	230.42630 GHz			LBR 778 001, 2020 2204 331 5302 6443 at up27 sh.thc0str.metau 2021 2021 2021 2021 2021 2021 2021 2021	Tota amendednask doslovnese fekt NCC 6441 urtuw 271		
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10. hif_lowgainflag 11. hif_setmodels 12. hifa_bandpassflag 13. hifa_bandpass 14. hifa_spwphaseup	0	34. Tclean/Iv Make target per-sp	1akeImages w continuum images			BACK
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34. hif_makeimages (mfs) 35. hif_makeimlist (cont)			View other QA images	View other QA images	View other QA images	View other QA images
36. hif_makeimages (cont)		centre frequency of image	226.6771GHz (LSRK)	230.5517GHz (LSRK)	241.8419GHz (LSRK)	244.9416GHz (LSRK)
37. hif_makeimlist (cube)		beam	1.74 x 1.19 arcsec	1.59 x 1.15 arcsec	1.50 x 1.09 arcsec	1.60 x 1.09 arcsec
38. hif_makeimages (cube)						
39. hif_makeimlist (cube_repBW)		beam p.a.	-85.6deg	-78.9deg	-77.8deg	-85.0deg
40. hif_makeimages (cube_repBW)		final theoretical sensitivity	0.39 mJy/beam	0.34 mJy/beam	0.36 mJy/beam	0.33 mJy/beam
		cleaning threshold	1 Q m.lv/heam	1.7 m Wheam	1.8 m.W/heam	1.6 m lv/heam

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10. hif_lowgainflag 11. hif_setmodels 12. hifa_bandpassflag 13. hifa_bandpass 14. hifa_spwphaseup	θ		I/MakeImages gregate continuum images		BACK	
15. hifa_gfluxscaleflag 16. hifa_gfluxscale		QA Score: 1.00 RM	S vs. DR corrected sensitivity. Field: NGC_6445	Intent: TARGET SPW: 25,27,29,31 All QA Scores (2 green)		
17. hifa_timegaincal 18. hifa_targetlag 19. hif_applycal 20. hif_makeimilist (cals) 21. hif_makeimilist (checksrc) 23. hif_makeimilist (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_makeimilist (mfs) 31. hif_findcont 32. hif_uroxontlit 33. hif_uroxontlit	0	Image Detail Fields • NGC_6445 (TARGET Field PN_Hb_5 (TARGET))			
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40. hif_makeimages (cube_repBW)		final theoretical	0.18 mJy/beam			Ŧ

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10. hif_lowgainflag	^				
11. hif_setmodels		Clean re	esults for PN_Hb_5 (TARGET) SpW 25,2	27 29 31	H H BACK
12. hifa_bandpassflag	0	oleanne		1,20,01	n n BACK
13. hifa_bandpass					
14. hifa_spwphaseup		Iterations	Pb-corrected Images	Residuals	Clean Masks
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28. hif_mstransform				и 	
29. hifa_flagtargets					
30. hif_makeimlist (mfs)					
31. hif_findcont					
32. hif_uvcontfit			[specific_depiry_mean_field FM_10_5_virtup=25.27.29.31_Rec.1	[bpe.psf displayment field PIL_36_5 virtupe 25.27,29.31 Rev1]	[spe-model_displaymean_feld MV_Mb_3_vetspec25.27.21.31_Rer.3
33. hif_uvcontsub					
34. hif_makeimages (mfs)			100 m	1990 March 19900 March 19900 March 19900 March 19900 March 1990 March 1990 Ma	- 5135 - 6135
35. hif_makeimlist (cont)	_			• 54 - 54 - 54 - 54 - 54 - 54 - 54 - 54	
36. hif_makeimages (cont)			8		8
37. hif_makeimlist (cube)				а а а а а а а а а а а а а а	от в
38. hif_makeimages (cube)			Hight Ascension (arcsec)	Right Assession (accsec)	 BigHt Ascession factors) BigHt Ascession factors)
39. hif_makeimlist (cube_repBW)			Primary Beam	PSF	Final Model
40. hif_makeimages (cube_repBW)					

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10. hif_owgainflag 11. hif_setmodels 12. hifa_bandpassflag 13. hifa_bandpass 14. hifa_spwphaseup 15. hifa_gfluxscaleflag	0	38. Tclean/M Make target cubes	-	20000 and as similared flux bistoreau assumption. All		BACK	
16. hifa_gfluxscale 17. hifa_timegaincal 18. hifa_targetflag 19. hif_applycal 20. hif_makeimlist (cals) 21. hif_makeimages (cals) 22. hif_makeimlist (checksrc)	θ	Image Details Fields • PN_Hb_5 (TARGET) • NGC_6445 (TARGET)	image for held PM_HD_S virtspw 25 has a peak SNK of	3.0092 and no significant flux histogram asymmetry. <u>All (</u>	<u>A Scores (16 green)</u>		4
23. hif_makeimages (checksrc) 24. hifa_imageprecheck 25. hif_checkproductsize 26. hifa_renorm 27. hifa_exportdata	Θ	Field PN_Hb_5 (TARGET)	Spw 25 / X638243208#ALMA_RB_06#BB_1#SW-01	271 X638243208#ALMA_RB_06#B8_2#SW-01	29 / X638243208#ALMA_RB_06#BB_3#5W-01	31/ X638243208#ALMA_RB_06#BB_4#5W-01	
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34. hif_makeimages (mfs) 35. hif_makeimlist (cont)			View other QA images	View other QA images	View other QA images	View other QA images	
36. hif_makeimages (cont) 37. hif_makeimlist (cube)		centre / rest frequency of cube	226.6773GHz / 226.6637GHz (LSRK)	230.5519GHz / 230.5380GHz (LSRK)	241.7974GHz / 241.7740GHz (LSRK)	244.9431GHz / 244.9356GHz (LSRK)	
38. hif_makeimages (cube)		beam	1.74 x 1.20 arcsec	1.60 x 1.16 arcsec	1.54 x 1.10 arcsec	1.62 x 1.12 arcsec	
 39. hif_makeimlist (cube_repBW) 40. hif_makeimages (cube_repBW) 		beam p.a.	-86.3deg	-77.5deg	-78.2deg	-85.8deg	
	÷	final theoretical sensitivity	8.7 mJy/beam	9.5 mJy/beam	7.4 mJy/beam	7.7 mJy/beam	

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10. hif_lowgainflag 11. hif_setmodels 12. hifa_bandpassflag 13. hifa_bandpass 14. hifa_spwphaseup 15. hifa_gfluxscaleflag	9		/MakeImages ative bandwidth target cube		BACK	
16. hifa_gfluxscale 17. hifa_timegaincal 18. hifa_targetflag 19. hif_applycal	θ	QA Score: 1.00 MON		a peak SNR of 2.8452 and no significant flux histogram asymmetry. <u>All QA Scores (2 green)</u>		
 20. hif_makeimilist (cals) 21. hif_makeimages (cals) 22. hif_makeimilist (checksrc) 23. hif_makeimages (checksrc) 		PN_Hb_5 (TARGET)	27 / X638243208#ALMA_RB_06#BB_2#5W-01			
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33. hif_uvcontsub 34. hif_makeimages (mfs)		beam	1.60 x 1.15 arcsec			
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37. hif_makeimlist (cube) 38. hif_makeimages (cube)	- 1	final theoretical sensitivity	5.1 mJy/beam			
38. hil_makeimages (cube) 39. hif_makeimlist (cube_repBW) 40. hif_makeimages (cube_repBW)		cleaning threshold	30 mJy/beam Dirty DR: 4.5e+02 DR correction: 3			
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10. hif_lowgainflag						
11. hif_setmodels		Clean	results for PN_Hb_5 (TARGE	T) SpW 27		BACK
12. hifa_bandpassflag	9					
13. hifa_bandpass						
14. hifa_spwphaseup		Iterations	Pb-corrected Images	Residuals	Line-free Moments	Spectra / Masks
15. hifa_gfluxscaleflag						
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23. hif_makeimages (checksrc)			Pb-corrected Image (mom8)	Residual (mom8)	Maximum int. (mom8) of line-free channels	Spectra from flattened clean mask
24. hifa_imageprecheck						
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31. hif_findcont			Anteresc position Anteresc position	Reference position Ref. Receiption (1-2-3) 2000000 Housing as 20 30 3000000	A Reference publics. Ref. A country of the Country	The second
32. hif_uvcontfit			Right Accession (arcsec)	R B B B B B B B B B B B B B B B B B B B	Kight Accension (arcsec)	Fight Accession (arcsec)
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38. hif_makeimages (cube)				**************************************		
39. hif_makeimlist (cube_repBW)						
40. hif_makeimages (cube_repBW)				Define		

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.