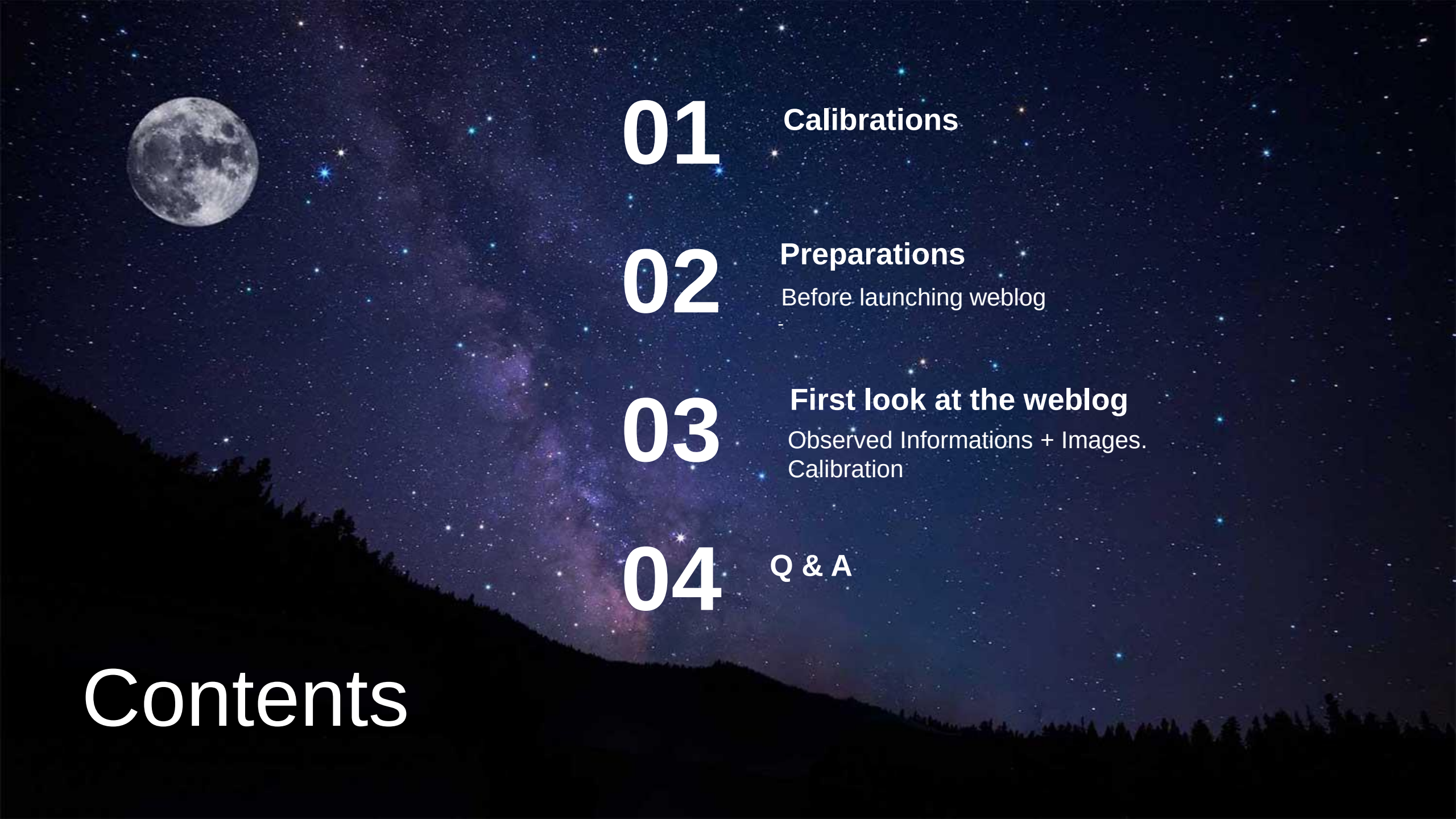
The 6th ALMA Summer School

Weblog (Calibration)

2022. 8. 23. Seokho Lee (KASI)



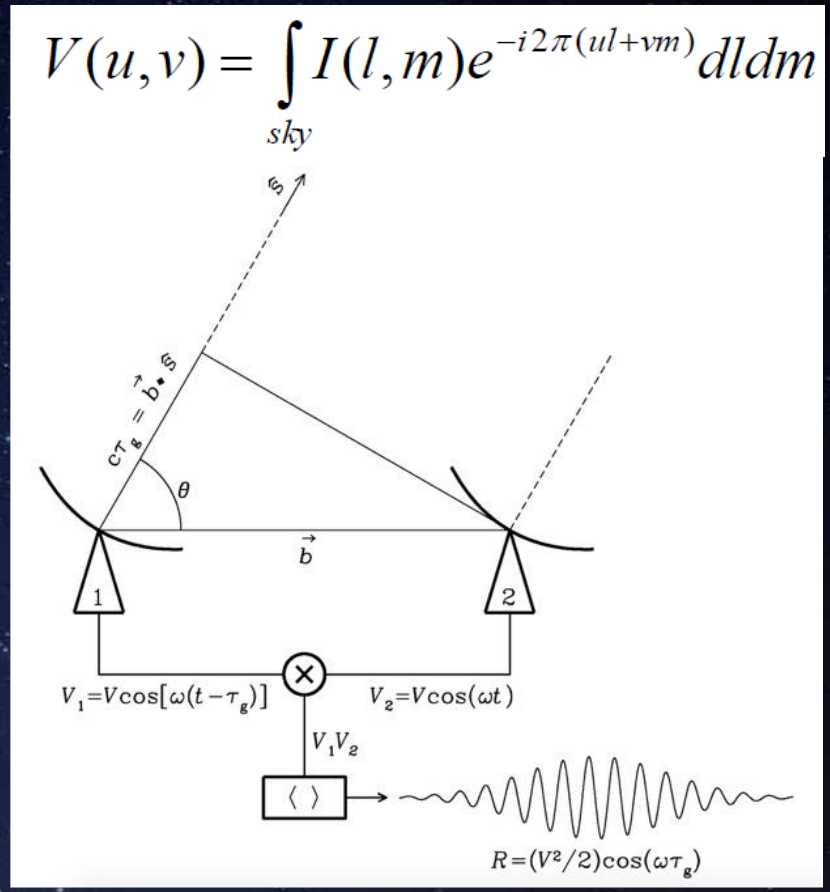
Contents

Calibration

Why Calibration is needed?

The true V_{ij} is corrupted by

- Atmospheric attenuation
- Radio “seeing”
- Variable pointing/delay offsets
- Electronic gain/delay/ phase changes
- Radiometer noise
- Correlator mal-funtions
- Most Ineterference signals



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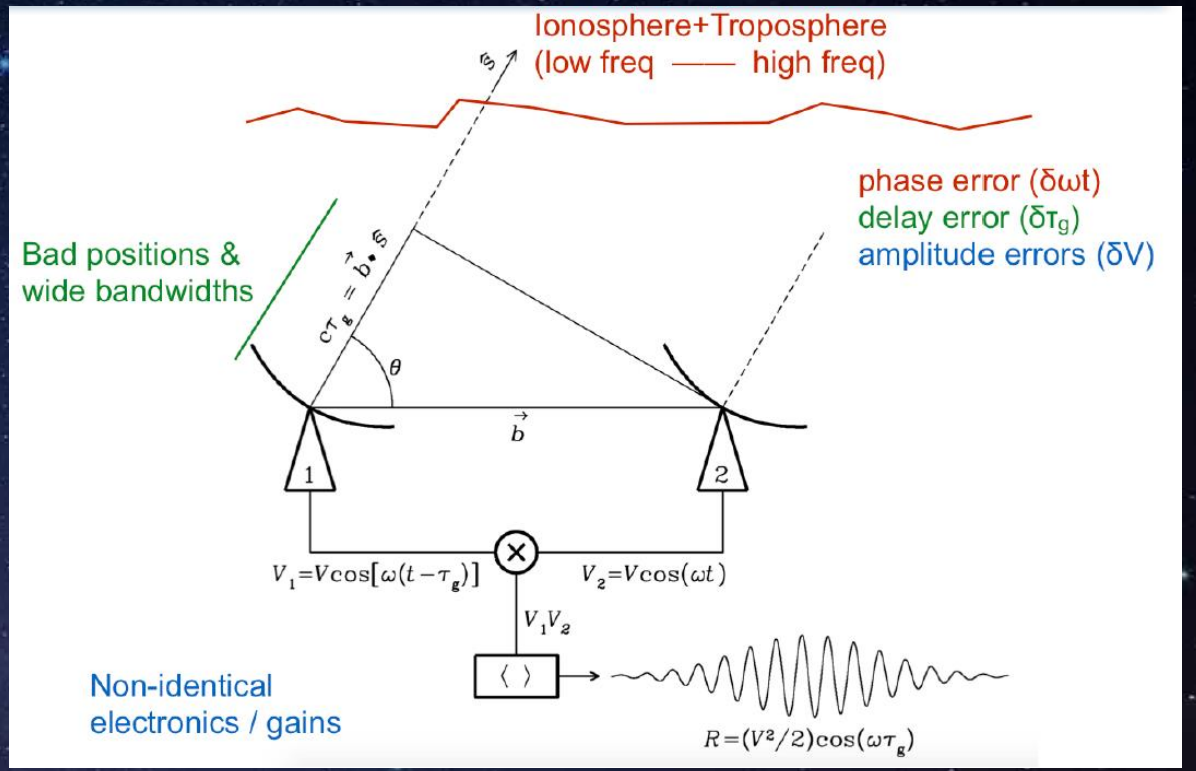

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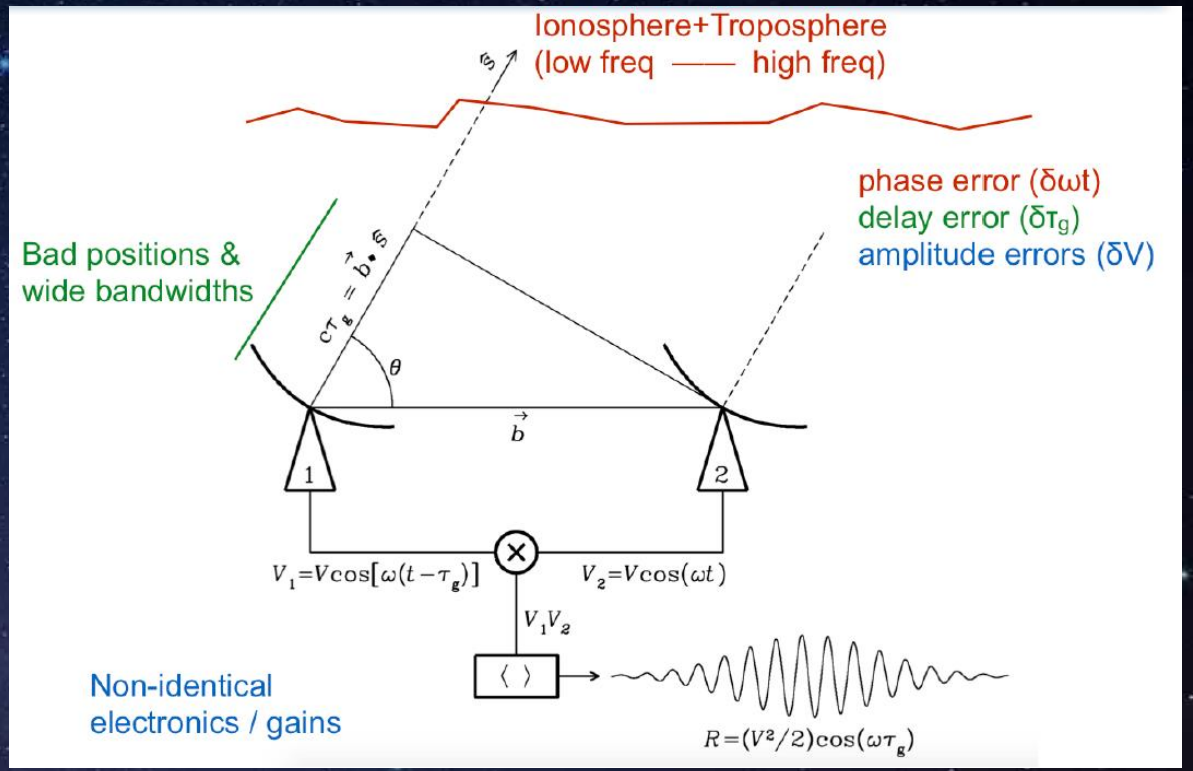
$V_{ij}^{obs} = J_{ij}\, V_{ij}^{True}$ (Baseline-based)

$V_{ij}^{obs} = J_i\, J_j\, V_{ij}^{True}$ (Antena-based)



J_i has many componets

- Atmosphere-related effects
  (Ionospheric, tropospheric)
- Antena-related effects
  (Primary beam pattern)
- Polarization-related effects
  (Parallactic angle, Linear polarization position angle, Polarization Leakage)
- Electronic Gain, G :
  most time dependent amplitude and phase effects
- Bandpass Response, B :
  frequency-dependent function

Ampletude : How bright?
Phase : Where?

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- Electronic Gain, G : most time dependent amplitude and phase effects
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Solving for J_i

Observe a celestial calibration source for which we have a model,

$$V_{ij}^{obs} - J_i J_j^* V_{ij}^{mod} = 0$$

define chi-squared:

$$\chi^2 = \sum_{\substack{i,j \\ i \neq j}} \left| V_{ij}^{obs} - J_i J_j^* V_{ij}^{mod} \right|^2 w_{ij} \qquad \left(w_{ij} = \frac{1}{\sigma_{ij}^2} \right)$$

and minimize chi-squared w.r.t. each J_i^* $\left(\frac{\partial \chi^2}{\partial J_i^*} = 0 \right)$

Then apply ***J*** to each visibility:

$$V_{ij}^{obs} = J_i J_j^* V_{ij}^{true} \quad \rightarrow \quad V_{ij}^{cor} = J_i^{-1} J_j^{*-1} V_{ij}^{obs}$$

The simplest model : Point source (QSOs)

J_i has many componets

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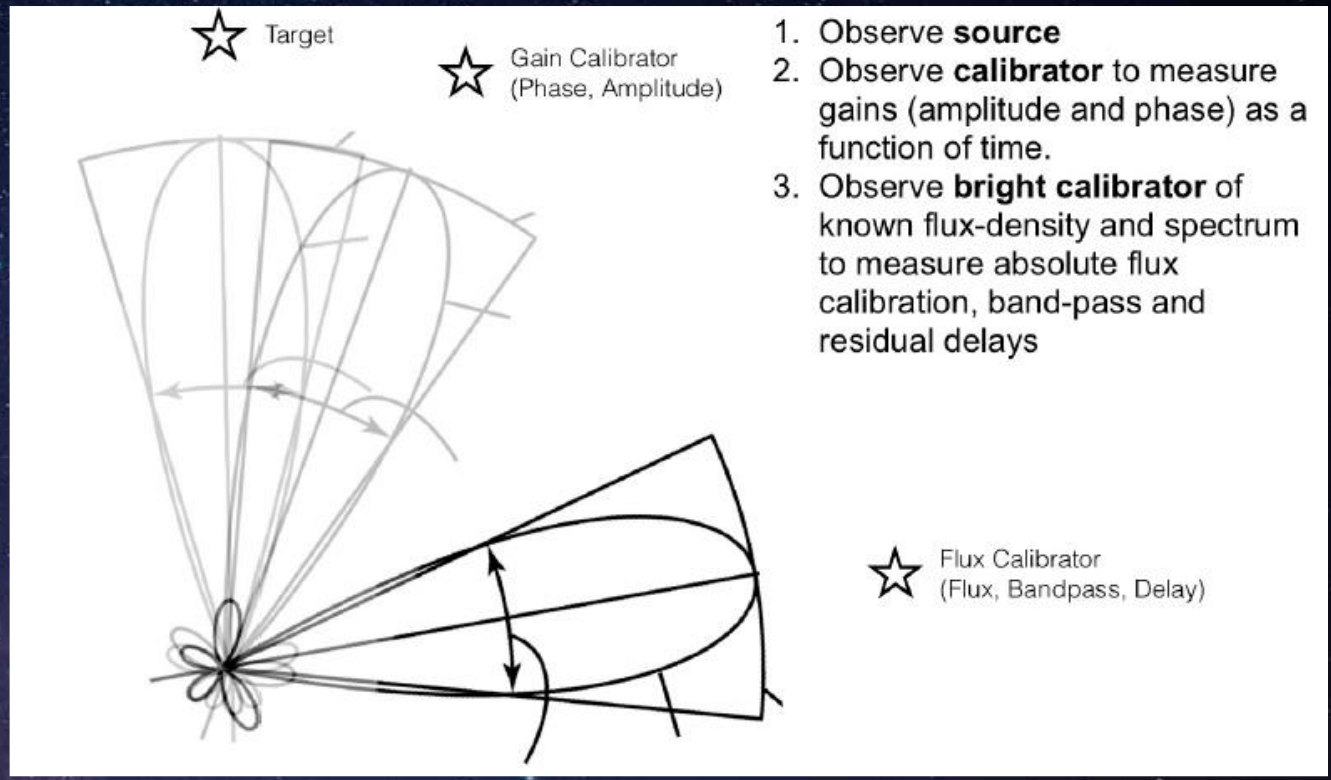
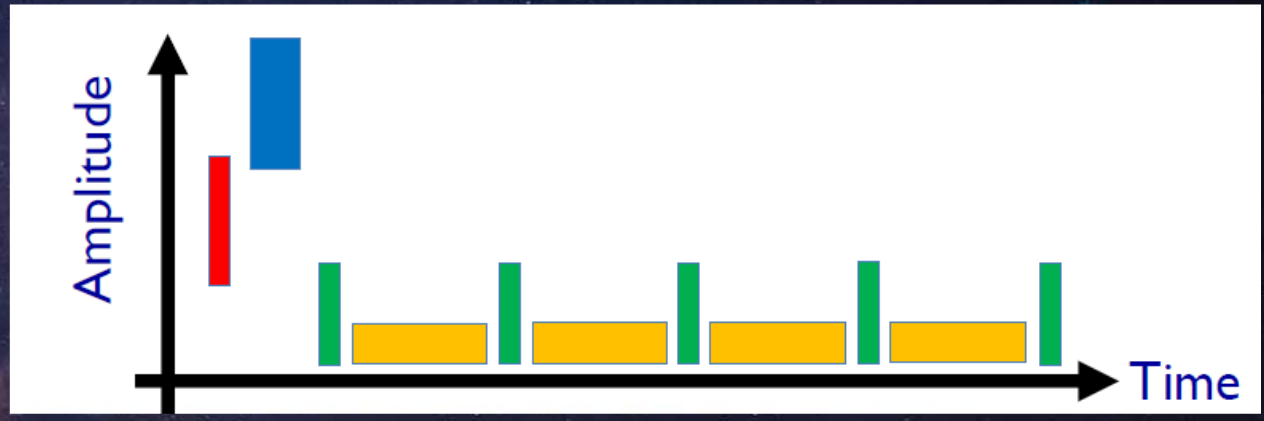


Observing Calibrator Sources

- Flux Density: ‘standard candle’ with known structure and spectral energy distribution. Typically observe once per observation.
- Bandpass: very bright, (line) featureless, and preferably unresolved. Typically observe once per observation.
- Gain: bright, preferably unresolved, accurate position near the target source. Observed before and after the target source more frequently than the coherence time.
- Polarization (pol angle and pol leakage)



Measurement Set (MS)

- CASA stores uv data in directories called ‘Measurement Sets (MS)’.
- These data sets store two copies of the data (‘columns’)
- Addtionally a ‘model’ may be stored separately.

‘Data’ : contains the raw MS or unprocessed MS
‘Corrected’ : created by applying one or more calibration terms to the ‘Data’ MS
‘model’ : used to calculating the calibration (tables). point source (phase = 0, amp = const).

Calibration Tasks

- Apply online calibrations for water vapor and Tsys

- Define the model
  - setjy: set model visibilities using known model for a calibrator (absolute fluxes along the frequency, point source)
  - fluxscale: apply absolute flux scaling to calibration talbe from known souce

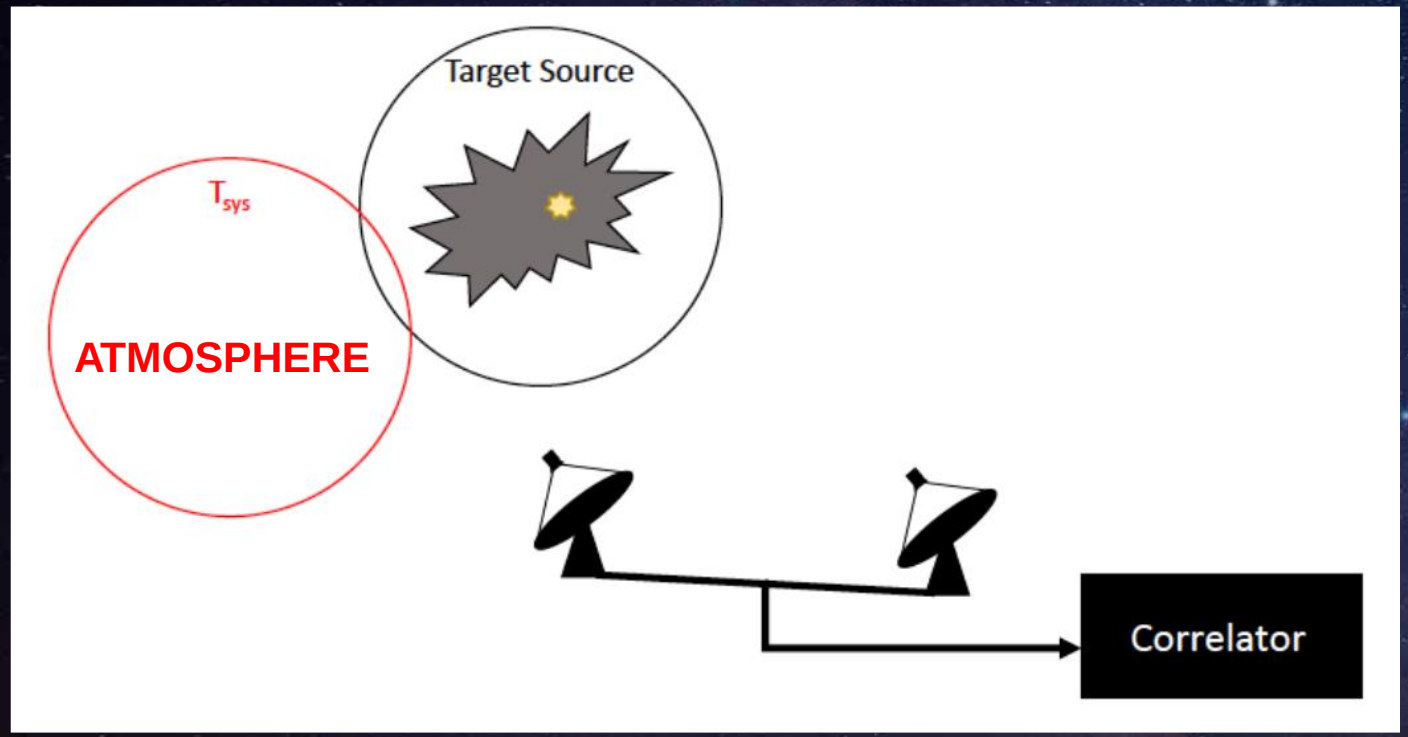
- Derived Calibration Tables (‘data’/’model’)
  - gaincal: calculate temporal gain calibration table (amp/phase vs time)
  - Bandpass: calculate bandpass calibration table (amp/phase vs frequency)

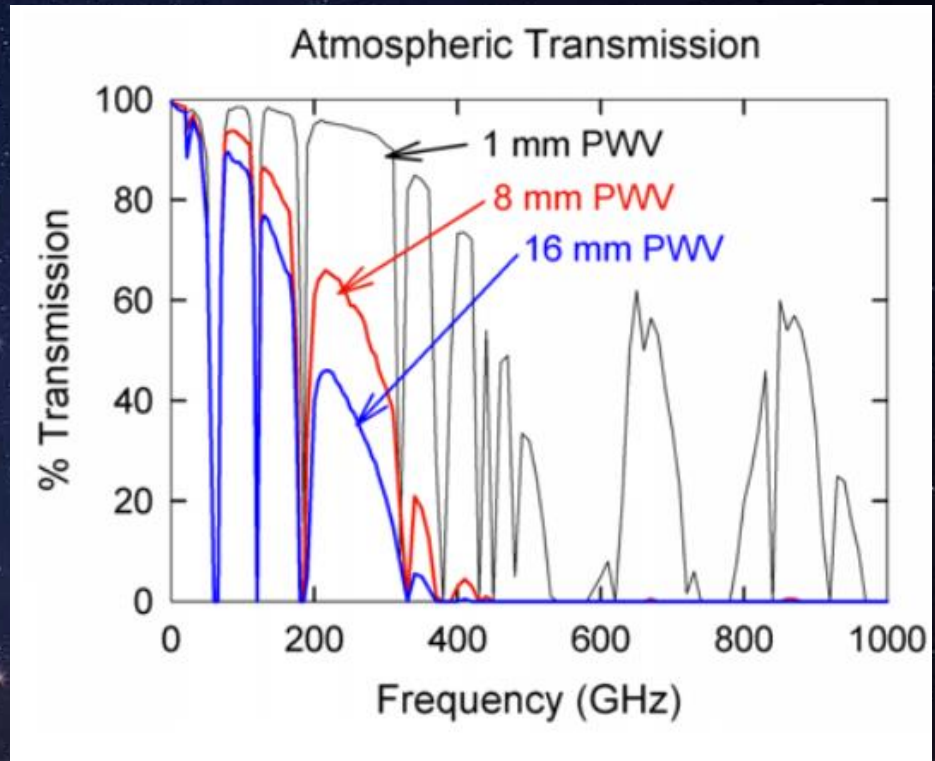
- Manipulate our MS.
  - Flagging : flag (remove) bad data
  - Applycal : apply calibration table(s) from previous step (save in ‘corrected’)
  - Split: split off calibrated data from your MS (‘corrected’ → ‘data’ in new MS file)

T_{sys} : System temperature

- A first-order correction for the atmosphere opacity as a function of time and frequency

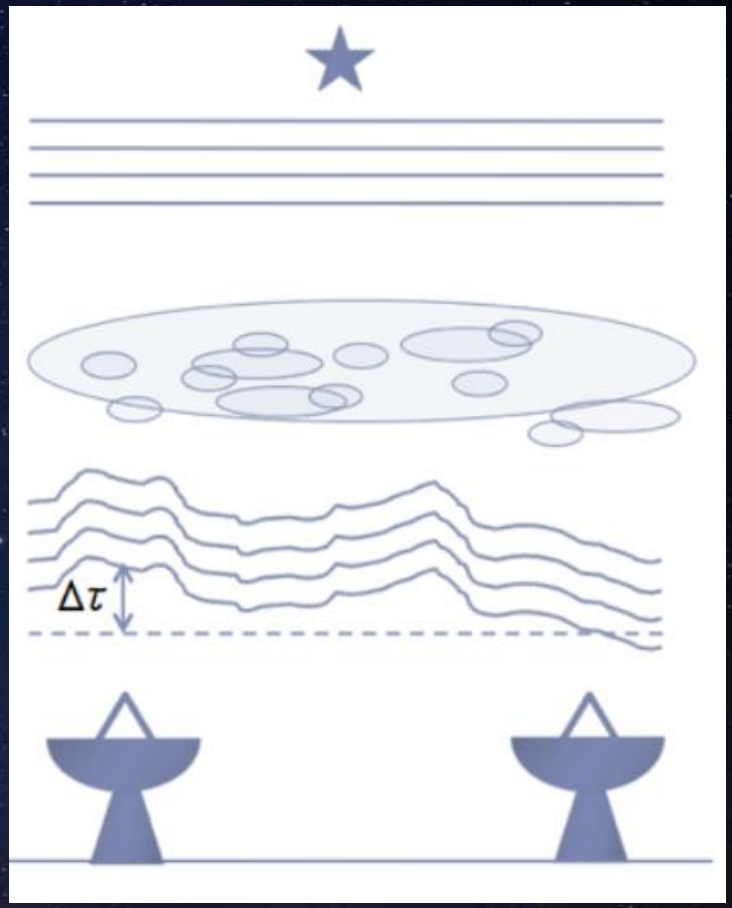
$$T_{sys} = T_{atm} (e^{\tau} - 1) + T_{rx} e^{\tau}$$





WVR : Water Vapor Radiometry

- Measure the rapid (1 sec) fluctuation of the 182.5 GHz H_2O line using the radiometer in each 12 m antenna
- The measure is converted into column density and phase correction



$$\Delta\Phi = 2\pi\upsilon\,\Delta\tau$$

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Calibration Flow II

- Apply online calibrations for water vapor and Tsys

- Bandpass calibration
  - remove the frequency depedency
  - Bandpass calibrator

Phase correction (in short time) using a few channel (ignoring frequency-dependency) ==> bandpass

- Gain calibration
  - remove time dependent amplitude and phase
  - Gain (Phase) calibrator

Phase correction (in short time) → Amp cal.

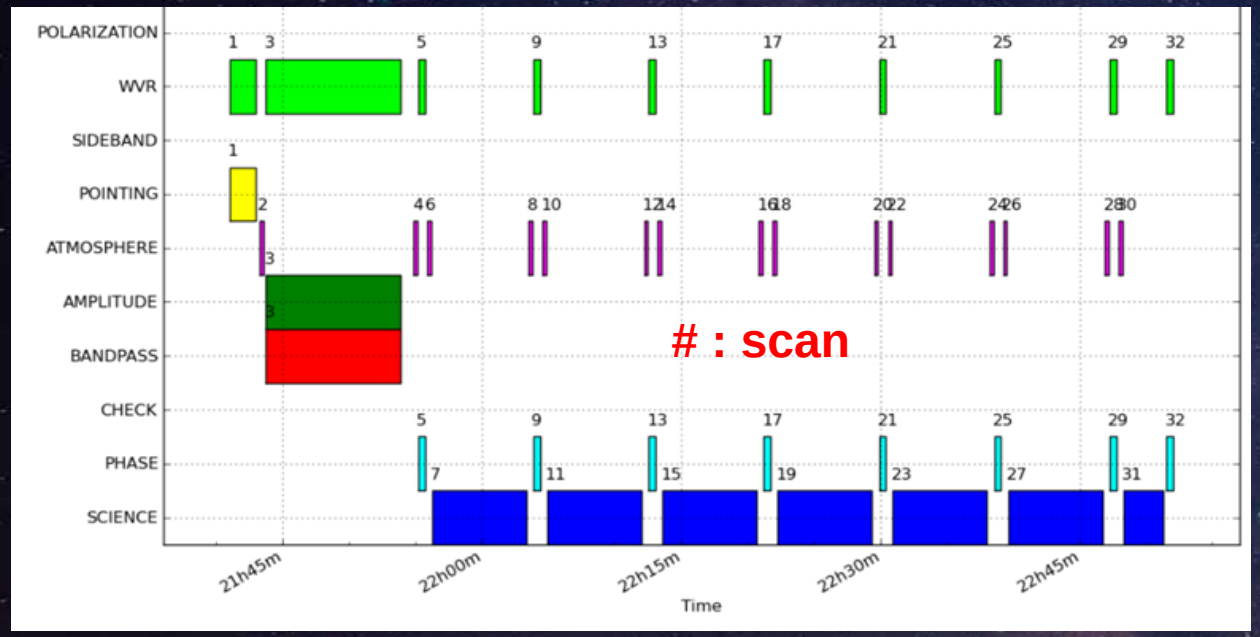
- Absolute flux calibration (Flux calibrator → Gain calibrator)

- Apply all calibration to target

Practical

- CASA tasks :
  - gaincal : caltable = 'data' / 'model'
  - applycal : 'corrected' = 'data' x caltable'
- As possible as shorter time scale (for phase) and higher SNR

SNR ∝ sqrt (Bandwidth * integration time)



Other than time domain: SPWs and Pols (XX, YY)

Name	Type	Frequency (TOPO)			Bandwidth (TOPO)
		Start	Centre	End	
X176064364#ALMA_RB_07#BB_4#SW-01	TDM	302.471 GHz	303.471 GHz	304.471 GHz	2.000 GHz
X176064364#ALMA_RB_07#BB_1#SW-01	FDM	316.665 GHz	316.782 GHz	316.899 GHz	234.375 MHz
X176064364#ALMA_RB_07#BB_2#SW-01	FDM	315.831 GHz	316.066 GHz	316.300 GHz	468.750 MHz
X176064364#ALMA_RB_07#BB_2#SW-02	FDM	315.767 GHz	316.001 GHz	316.235 GHz	468.750 MHz
X176064364#ALMA_RB_07#BB_3#SW-01	FDM	301.505 GHz	301.739 GHz	301.973 GHz	468.750 MHz

gaincal(*vis, caltable='', field='', spw='', intent='', selectdata=True, timerange='', uvrange='', antenna='', scan='', observation='', msselect='', solint='inf', combine='', preavg=-1.0, refant='', refantmode='flex', minblperant=4, minsnr=3.0, solnorm=False, normtype='mean', gaintype='G', smodel=[], calmode='ap', solmode='', rmsthresh=[], corrdepflags=False, append=False, splinetime=3600.0, npointaver=3, phasewrap=180.0, docallib=False, callib='', gaintable=[], gainfield=[], interp=[], spwmap=[], parang=False*) [source]

- vis (string) - Name of input visibility file ← 'data' + 'model'
- caltable (string='') - Name of output gain calibration table
- solint (variant='inf') - Solution interval 'int' (6.05s), '30s', 'inf'
- combine (string='') - Data axes which to combine for solve (obs, scan, spw, and/or field)
- refant (string='') - Reference antenna name(s)
- gaintype (string='G') - Type of gain solution (G,T,GSPLINE,K,KCROSS) 'T' = sqrt(2) 'G' (XX, YY)
- calmode (string='ap') - Type of solution" ('ap', 'p', 'a') 'p' = phase, 'a' = 'amp', ap= both
- minblperant (int=4) - Minimum baselines _per antenna required for solve
- minsnr (double=3.0) - Reject solutions below this SNR
- solnorm (bool=False) - Normalize (squared) solution amplitudes (G, T only)

gaincal(*vis, caltable='', field='', spw='', intent='', selectdata=True, timerange='', uvrange='', antenna='', scan='', observation='', msselect='', solint='inf', combine='', preavg=-1.0, refant='', refantmode='flex', minblperant=4, minsnr=3.0, solnorm=False, normtype='mean', gaintype='G', smodel=[], calmode='ap', solmode='', rmsthresh=[], corrdepflags=False, append=False, splinetime=3600.0, npointaver=3, phasewrap=180.0, docallib=False, callib='', gaintable=[], gainfield=[], interp=[], spwmap=[], parang=False*) [source]

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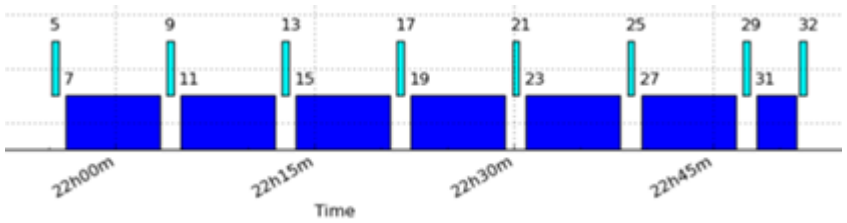

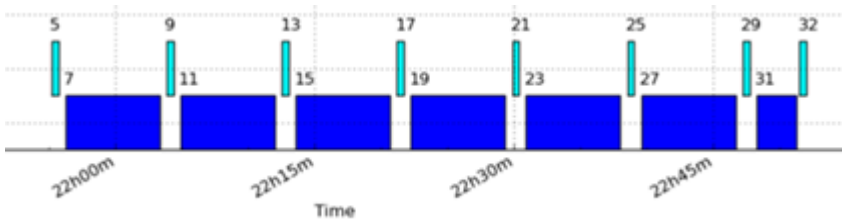

combine= '' or 'spw' ,solint='inf'

combine='scan', solint = 'inf'

combine='scan', solint = integration time > scan time

combine='obs'

gaincal(*vis, caltable='', field='', spw='', intent='', selectdata=True, timerange='', uvrange='', antenna='', scan='', observation='', msselect='', solint='inf', combine='', preavg=-1.0, refant='', refantmode='flex', minblperant=4, minsnr=3.0, solnorm=False, normtype='mean', gaintype='G', smodel=[], calmode='ap', solmode='', rmsthresh=[], corrdepflags=False, append=False, splinetime=3600.0, npointaver=3, phasewrap=180.0, docallib=False, callib='', gaintable=[], gainfield=[], interp=[], spwmap=[], parang=False*) [source]

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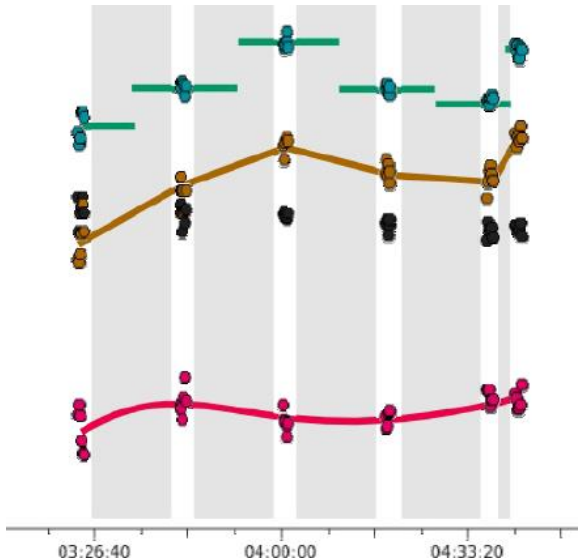
- docallib (bool=False) - Use callib or traditional cal apply parameters

▼ *docallib = False*

- gaintable (stringArray=['']) - Gain calibration table(s) to apply on the fly
- gainfield (stringArray=['']) - Select a subset of calibrators from gaintable(s)
- interp (stringArray=['']) - Interpolation parameters for each gaintable, as a list
- spwmap (intArray=['']) - Spectral window mappings to form for gaintable(s)

When combine='spw' in gaincal, spwmap=[0,0,0,0] ,
or the narrow spw (2) is replaced with the broader (high SNR, 0) spw, spwmap=[0,1,0,3]
If two gaintable are used, spwmap=[[0,0,0,0],[0,0,0,0]]



nearst

linear/linearperobs

cubic/polynomial

applycal(*vis, field='', spw='', intent='', selectdata=True, timerange='', uvrange='', antenna='', scan='', observation='', msselect='', docallib=False, callib='', gaintable=[''], gainfield=[''], interp=[''], spwmap=[''], calwt=[True], parang=False, applymode='', flagbackup=True*) [source]

- vis (string) - Name of input visibility file
- applymode (string='') - Calibration mode:
  ""="calflag","calflagstrict","trial","flagonly","flagonlystrict", or "calonly"

- docallib (bool=False) - Use callib or traditional cal apply parameters

  ▼ *docallib = False*
  - gaintable (stringArray=['']) - Gain calibration table(s) to apply on the fly
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  - spwmap (intArray=['']) - Spectral windows combinations to form for gaintables(s)
  - calwt (boolArray=[True]) - Calibrate data weights per gaintable.

```
# Spectral Windows:  (5 unique spectral windows and 1 unique polarization setups)        #
#  SpwID  #Chans   Frame   Ch0(MHz)  ChanWid(kHz)  TotBW(kHz) CtrFreq(MHz) BBC Num  Corrs#
#  0      128   TOPO  231608.777     15625.000   2000000.0 232600.9649        2  XX  YY  #
#  1      128   TOPO  218981.394    -15625.000   2000000.0 217989.2060        4  XX  YY  #
```

```
contvis = 'continuum_averaged.ms'
refant = 'DV10'
spwmap = [0,0]

gaincal(vis=contvis,
        caltable='pcal3',
        gaintype='T',
        refant=refant,
        calmode='p',
        combine='spw,scan',
        solint='120s')

applycal(vis=contvis,
         spwmap=spwmap,
         gaintable=['pcal3'],
         interp='linear')
```

```
gaincal(vis=contvis,
        caltable='apcal',
        gaintype='T',
        refant=refant,
        calmode='ap',
        combine='spw,scan',
        solint='300s',
        gaintable='pcal3',
        spwmap=spwmap,
        solnorm=True)

applycal(vis=contvis,
         spwmap=[spwmap,spwmap],
         gaintable=['pcal3','apcal'],
         interp='linear')
```

Methods for the Selfcalibration

Method 1

Loop :
tclean (datacolumn =‘data’) → gaincal → applycal (gain table X) → split (‘corrected’→ new MS)
Apply selfcal to orginal data : applycal (gaintable= [**pcal1, pcal2, pcal3..., apcal**])

Method 2

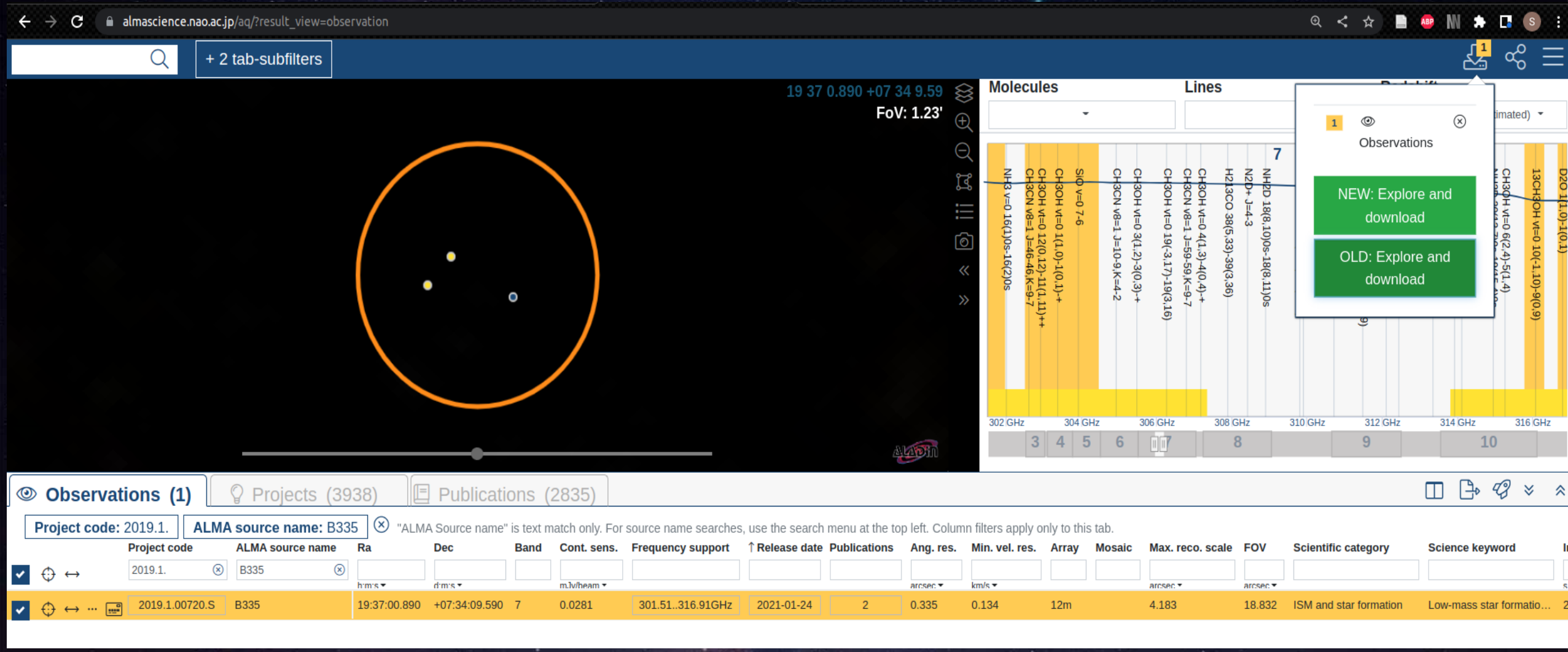
Tclean (datacolumn = ‘data’) → gaincal (pcal1) → apply cal (gain table X)
Loop (pcal 2 ...)
tclean (datacolumn =‘corrected’) → gain cal → applycal
apcal : tclean(datacolumn=‘corrected’) → gaincal (gaintable=pcal3) → applycal (gaintable=pcal3)
Apply selfcal to orginal data : applycal (gaintable= [**pcal3, apcal**])

Method 3

tclean (datacolumn = ‘data’) → gaincal (pcal1) → apply cal (gain table X)
tclean(datacolumn=‘corrected’) → gaincal (gaintable=pcal1) → applycal (gaintable=pcal1)
tclean(datacolumn=‘corrected’) → gaincal (gaintable=[pcal1,pcal2])
→ applycal (gaintable=[pcal1,pcal2])
Apply selfcal to orginal data : applycal (gaintable= [**pcal1, pcal2, pcal3..., apcal**])

Preparations

Downloads


almascience.nao.ac.jp/aq/?result_view=observation
+ 2 tab-subfilters
19 37 0.890 +07 34 9.59
FoV: 1.23'
Molecules
Lines
Observations
NEW: Explore and download
OLD: Explore and download
302 GHz
304 GHz
306 GHz
308 GHz
310 GHz
312 GHz
314 GHz
316 GHz
Observations (1)
Projects (3938)
Publications (2835)
Project code: 2019.1.
ALMA source name: B335
"ALMA Source name" is text match only. For source name searches, use the search menu at the top left. Column filters apply only to this tab.
Project code
ALMA source name
Ra
Dec
Band
Cont. sens.
Frequency support
Release date
Publications
Ang. res.
Min. vel. res.
Array
Mosaic
Max. reco. scale
FOV
Scientific category
Science keyword
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2019.1.00720.S
B335
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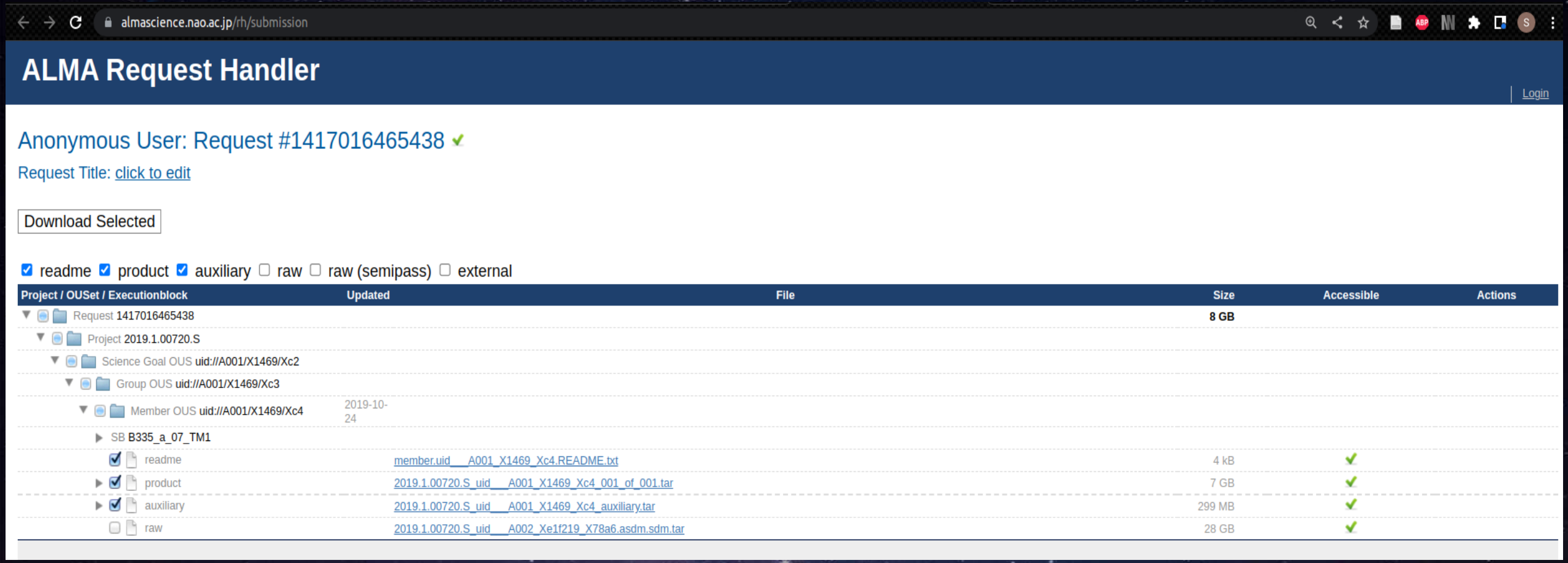
18.832
ISM and star formation
Low-mass star formatio…

Downloads


almascience.nao.ac.jp/rh/submission
ALMA Request Handler
Login
Anonymous User: Request #1417016465438
Request Title: click to edit
Download Selected
readme product auxiliary raw raw (semipass) external
Project / OUSet / Executionblock
Updated
File
Size
Accessible
Actions
Request 1417016465438
8 GB
Project 2019.1.00720.S
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product
2019.1.00720.S_uid___A001_X1469_Xc4_001_of_001.tar
7 GB
auxiliary
2019.1.00720.S_uid___A001_X1469_Xc4_auxiliary.tar
299 MB
raw
2019.1.00720.S_uid___A002_Xe1f219_X78a6.asdm.sdm.tar
28 GB

Downloads

In the download script file, please check the server

```
#!/bin/bash

# This script runs on Linux and MaxOS and downloads all the selected files to the current working directory in up to 5 parallel download streams.
# Should a download be aborted just run the entire script again, as partial downloads will be resumed.
# We've finally got our server-side software sorted out and now positively encourage the use of parallel downloads
# of single files from version 2020-OCT.

# connect / read timeout for wget / curl
export TIMEOUT_SECS=300
# how many times do we want to automatically resume an interrupted download?
export MAX_RETRIES=3
# after a timeout, before we retry, wait a bit. Maybe the servers were overloaded, or there was some scheduled downtime.
# with the default settings we have 15 minutes to bring the dataportal service back up.
export WAIT_SECS_BEFORE_RETRY=300
# the files to be downloaded
LIST=("
https://almascience.nao.ac.jp/dataPortal/2015.1.00350.S_uid___A001_X2d6_X2c8_auxiliary.tar
https://almascience.nao.ac.jp/dataPortal/2015.1.00350.S_uid___A002_Xac2df7_Xdf7.asdm.sdm.tar
https://almascience.nao.ac.jp/dataPortal/member.uid___A001_X2d6_X2c8.README.txt.tar
")
```

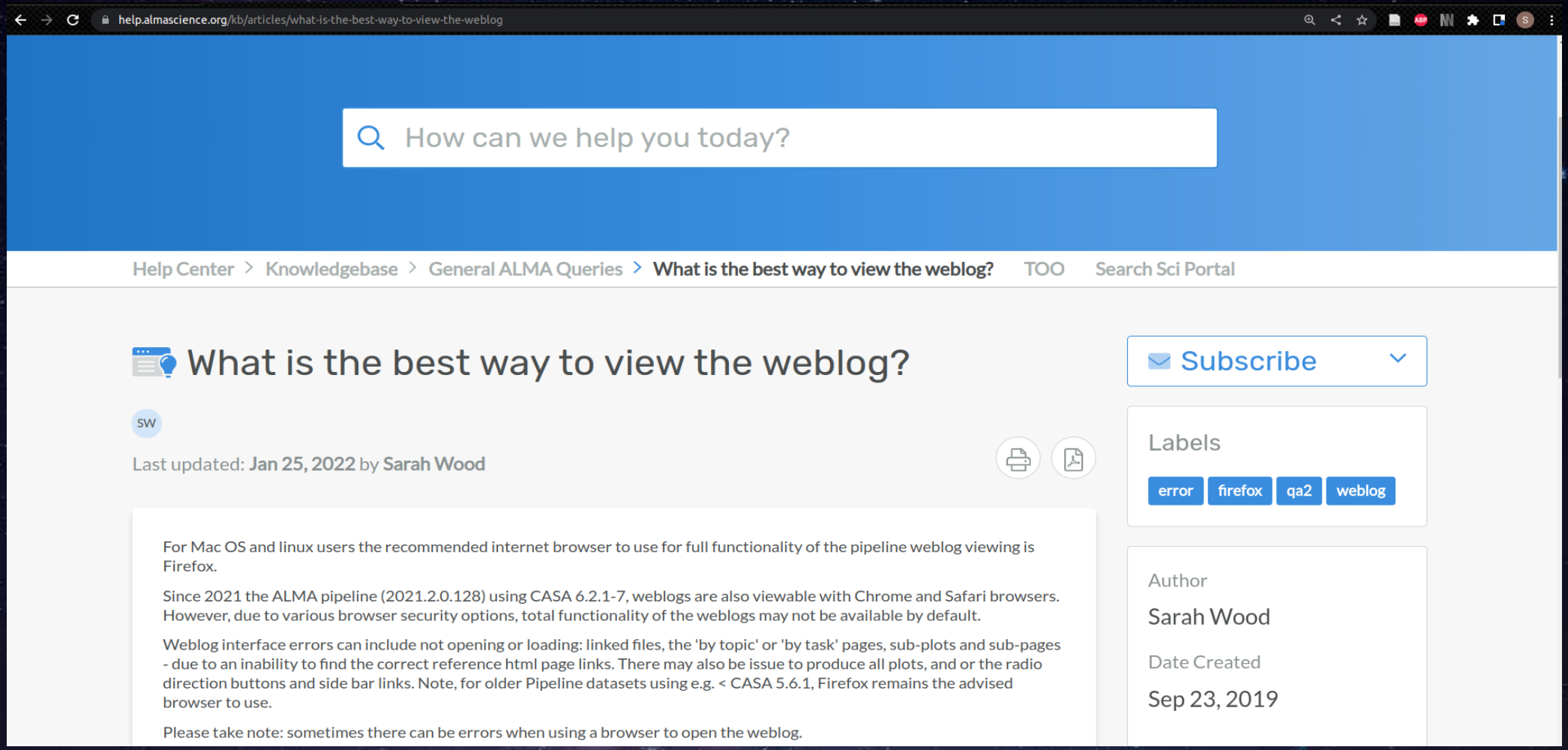
Extract

```
|-- project_id/
|   |-- science_goal.ouss_id/
|   |   |-- group.ouss_id/
|   |   |   |-- member.ouss_id/
|   |   |   |   |-- README          (1)
|   |   |   |   |-- product/        (2)
|   |   |   |   |-- calibration/    (3)
|   |   |   |   |-- qa/             (4)
|   |   |   |   |-- script/         (5)
|   |   |   |   |-- log/            (6)   (only present in manually calibrated data)
|   |   |   |   |-- raw/            (7)   (only present when part b is unpacked)
```

uid____XXXXX.weblog.tgz
pipeline-XXXXX/html (directory)

```
[guest20@neptune weblog_cal]$ ls
'~'                        index.html                        stage12   stage19   stage4    t1-2.html      t2-3-5m.html
 casa-20191021-184150.log  PPR_uid___A001_X1469_Xc5.xml     stage13   stage2    stage5    t1-3.html      t2-3-6m.html
 casa-20220820-040920.log  resources                         stage14   stage20   stage6    t1-4.html      t2-4m.html
 casa-20220820-041921.log  sessionsession_1                  stage15   stage21   stage7    t2-1.html
 casa_commands.log         stage1                            stage16   stage22   stage8    t2-3-1m.html
 casa_pipescript.py        stage10                           stage17   stage23   stage9    t2-3-2m.html
 h_weblog.last             stage11                           stage18   stage3    t1-1.html t2-3-3m.html
```

Open the weblog



https://help.almascience.org/kb/articles/what-is-the-best-way-to-view-the-weblog

Open the weblog

> casa –pipeline
CASA: h_weblog()

i) Use h_weblog() within a local CASA session:

From inside a CASA session, navigate to the root of the untarred weblog directory, e.g., pipeline-procedure_hifa_calimage, and run h_weblog. This command will serve the weblog via HTTP and launch a browser (in your default selected browser) connecting to the weblog. The weblog URL is also printed to the CASA logger, should you need to navigate to the weblog manually, or using a different brower. The URL to access is highlighted in the example CASA logger output below.

```
CASA <1>: h_weblog()
```

```
2020-07-30 12:57:20      INFO     h_weblog:::casa          ##################################
2020-07-30 12:57:20      INFO     h_weblog:::casa          ##### Begin Task: h_weblog             #####
2020-07-30 12:57:20      INFO     h_weblog:::casa          h_weblog( pipelinemode='automatic', relpatl
2020-07-30 12:57:20      INFO     h_weblog::pipeline::casa         Found weblogs at:
2020-07-30 12:57:20      INFO     h_weblog::pipeline::casa+                main/pipeline=procedure_l
2020-07-30 12:57:20      INFO     h_weblog::pipeline::casa         Using existing HTTP server at 127.(
2020-07-30 12:57:20      INFO     h_weblog::pipeline::casa         Opening http://127.0.0.1:30000/mai
2020-07-30 12:57:20      INFO     h_weblog:::casa          Result h_weblog: None
2020-07-30 12:57:20      INFO     h_weblog:::casa          Task h_weblog complete. Start time: 2020-07
2020-07-30 12:57:20      INFO     h_weblog:::casa          ##### End Task: h_weblog               #####

2020-07-30 12:57:20      INFO     h_weblog:::casa          ##################################
```

For security, the weblog HTTP server is only accessible from the same computer as the CASA session. To view the weblog from another computer you must forward the port using SSH. For example, to access the weblog hosted on a remote machine called remotepc, where the CASA log reports the weblog is available at port 30000, execute:

```
ssh -L 30000:localhost:30000 remotepc
```

Open the weblog

ii) Use a python3 call, external to a CASA session:

Outside of CASA one can also create the http server in which to view a local weblog. From the command line simply type:

```
python3 -m http.server 8080 --bind 127.0.0.1
```

The weblog can then be accessed in a web browser via the URL:

```
http://127.0.0.1:8080/"location_of_PL_weblog"/html/index.html
```

Note, this method requires python3, for which the version delivered with CASA can be used by setting it as an alias or by calling the full path. On MacOS this is found in "/Applications/CASA.app/Contents/MacOS/python3", or on Linux systems "'install_path'/casa-6.2.1-7-pipeline-2021.2.0.128/bin/python3"

cd ALMA2022

option 1) python3 –m http.server 8080 –bind 127.0.0.1

option 2) qaviewer

In the browser (Activity -> Firefox)

http://127.0.0.1:8080/weblog_img/index.html

Ports :

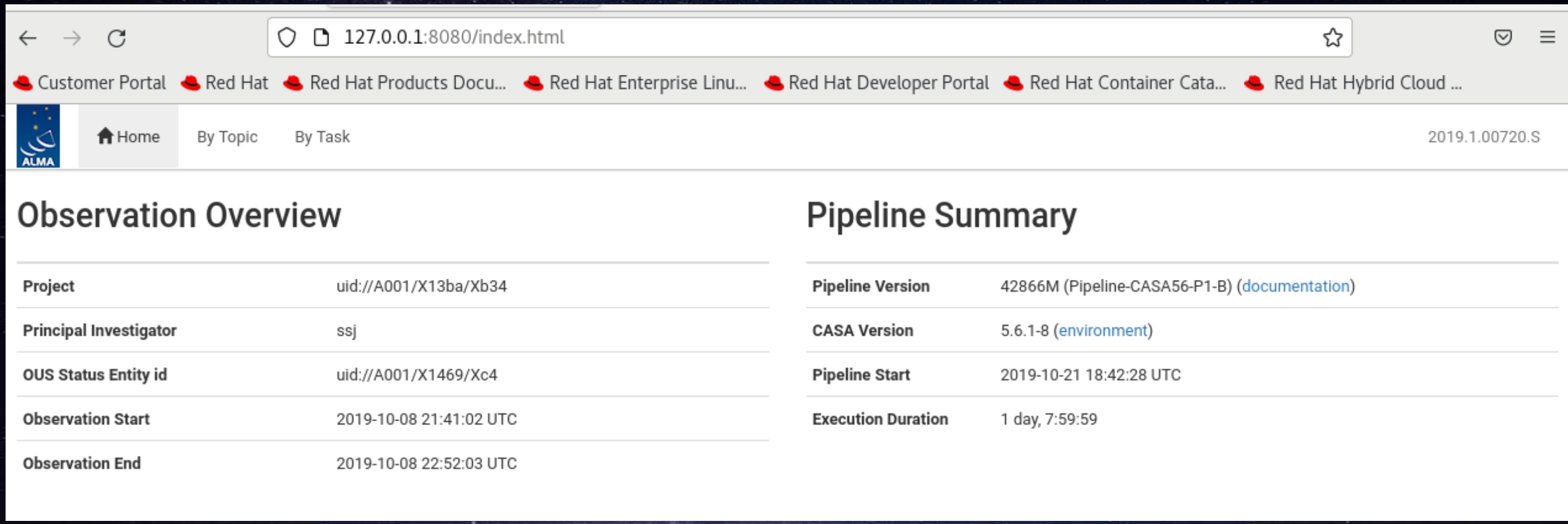
Guest 11 → 8081

Guest 12 → 8082

...

Guest 18 → 8088

Open the weblog



In .bashrc
alias qaviewer='google-chrome --disable-web-security –user-data-dir=~/tmp’
> qaviewer index.html

First look at the weblog

Check Results (Images)

Install the same CASA version
Run the ‘scriptForPI.py’ in the script directoy using ‘casa –pipeline’

Home | By Topic | By Task | 2019.1.00720.S

Observation Overview

Project	uid://A001/X13ba/Xb34
Principal Investigator	ssj
OUS Status Entity id	uid://A001/X1469/Xc4
Observation Start	2019-10-08 21:41:02 UTC
Observation End	2019-10-08 22:52:03 UTC

Pipeline Summary

Pipeline Version	42866M (Pipeline-CASA56-P1-B) (documentation)
CASA Version	5.6.1-8 (environment)
Pipeline Start	2019-10-21 18:42:28 UTC
Execution Duration	1 day, 7:59:59

Observation Summary

Measurement Set	Receivers	Num Antennas	Time (UTC)			Baseline Length			Size
			Start	End	On Source	Min	Max	RMS	
Observing Unit Set Status: uid://A001/X1469/Xc4 **Scheduling Block ID:** uid://A001/X1469/Xba **Scheduling Block Name:** B335_a_07_TM1									
Session: session_1									
uid___A002_Xe1f219_X78a6.ms	ALMA Band 7	42	2019-10-08 21:41:01	2019-10-08 22:52:03	0:45:36	15.1 m	783.5 m	288.4 m	55.6 GB

Click Figures (to see large ones) and blue words!

Session: session_1

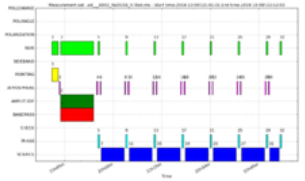
uid___A002_Xe1f219_X78a6.ms

Overview of 'uid___A002_Xe1f219_X78a6.ms'

Observation Execution Time

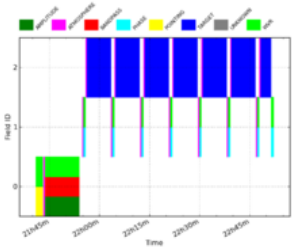
Start Time	2019-10-08 21:41:01
End Time	2019-10-08 22:52:03
Total Time on Source	1:05:53
Total Time on Science Target	0:45:36

LISTOBS OUTPUT



Intent vs Time

Track scan intent vs time



Field vs Time

Track observed field vs time

Spatial Setup

Science Targets	'B335'
Calibrators	'J1924-2914' and 'J1938+0448'

Spectral Setup

All Bands	'ALMA Band 7' and 'WVR'
Science Bands	'ALMA Band 7'

Antenna Setup

Min Baseline	15.1 m
Max Baseline	783.5 m
Number of Baselines	861
Number of Antennas	42

Sky Setup

Min Elevation	55.62 degrees
Max Elevation	76.35 degrees

Session: session_1

uid___A002_Xe1f219_X78a6.ms

Spectral Setup Details

BACK

Science Windows | All Windows

Science Windows

Real ID	Virtual ID	Name	Type	Frequency (TOPO)			Bandwidth (TOPO)	Transitions	Channels (TOPO)			Correlator Axis	Band	Band Type
				Start	Centre	End			Number	Frequency Width	Velocity Width			
23	23	X176064364#ALMA_RB_07#BB_4#SW-01	TDM	302.471 GHz	303.471 GHz	304.471 GHz	2.000 GHz	ContForCal(ID=0)	128	15.625 MHz	15.436 km/s	XX, YY	ALMA Band 7	TSB
25	25	X176064364#ALMA_RB_07#BB_1#SW-01	FDM	316.665 GHz	316.782 GHz	316.899 GHz	234.375 MHz	D2O_1(1,0)-1(0,1)(ID=4104568)	1920	122.070 kHz	115.523 m/s	XX, YY	ALMA Band 7	TSB
27	27	X176064364#ALMA_RB_07#BB_2#SW-01	FDM	315.831 GHz	316.066 GHz	316.300 GHz	468.750 MHz	13CH3OH_v_t=0_10(-1,10)-9(0,9)(ID=575176), 13CH3OH_v_t=1_4(1,4)-5(2,3)_++(ID=3764462)	960	488.281 kHz	463.141 m/s	XX, YY	ALMA Band 7	TSB
29	29	X176064364#ALMA_RB_07#BB_2#SW-02	FDM	315.767 GHz	316.001 GHz	316.235 GHz	468.750 MHz	13CH3OH_v_t=1_4(1,4)-5(2,3)_++(ID=3764462), 13CH3OH_v_t=0_10(-1,10)-9(0,9)(ID=575176)	960	488.281 kHz	463.236 m/s	XX, YY	ALMA Band 7	TSB
31	31	X176064364#ALMA_RB_07#BB_3#SW-01	FDM	301.505 GHz	301.739 GHz	301.973 GHz	468.750 MHz	13CH3OH_v_t=0_8_(2,6)-7_(-2,6)(ID=575128)	1920	244.141 kHz	242.566 m/s	XX, YY	ALMA Band 7	TSB

Spectral Windows with Science Intent in uid___A002_Xe1f219_X78a6.ms

File | /home/shlee/ALMA/alma_summer_school/weblog_cal/t1-4.html

Home | By Topic | By Task | 2019.1.00

Task Summaries

Task		QA Score	Duration
1. **hifa_importdata**: Register measurement sets with the pipeline		1.00	1:22:59
2. **hifa_flagdata**: ALMA deterministic flagging		1.00	6:27:26
3. **hifa_fluxcalflag**: Flag spectral features in solar system flux calibrators		1.00	0:00:14
4. **hif_rawflagchans**: Flag channels in raw data		1.00	0:36:44
5. **hif_refant**: Select reference antennas		1.00	0:01:28
6. **h_tsyscal**: Calculate Tsys calibration		1.00	0:23:31
7. **hifa_tsysflag**: Flag Tsys calibration		0.96	0:33:28
8. **hifa_antpos**: Correct for antenna position offsets	Nonzero antenna position offsets	0.90	0:00:19
9. **hifa_wvrgcalflag**: Calculate and flag WVR calibration		0.97	0:44:12
10. **hif_lowgainflag**: Flag antennas with low gain		1.00	0:58:51
11. **hif_setmodels**: Set calibrator model visibilities		1.00	0:42:46
12. **hifa_bandpassflag**: Phase-up bandpass calibration and flagging		0.91	4:12:00
13. **hifa_spwphaseup**: Spw phase offsets calibration	Spw mapping across sidebands	0.66	0:11:32
14. **hifa_gfluxscaleflag**: Phased-up flux scale calibration + flagging		1.00	1:19:15
15. **hifa_gfluxscale**: Transfer fluxscale from amplitude calibrator		1.00	1:10:40
16. **hifa_timegaincal**: Gain calibration		1.00	2:03:46
17. **hif_applycal**: Apply calibrations from context		0.91	5:43:33
18. **hif_makeimlist**: Set-up parameters for bandpass calibrator & flux calibrator & phase calibrator imaging		1.00	0:05:20
19. **hif_makeimages**: Make calibrator images		1.00	1:08:43
20. **hif_makeimlist**: Set-up parameters for check source imaging	No clean targets expected	N/A	0:00:20
21. **hif_makeimages**: Make check source images	Nothing to image	N/A	0:00:25
22. **hifa_imageprecheck**: ImagePreCheck		1.00	3:57:20
23. **hif_checkproductsize**: Check product size		1.00	0:15:17

Calibration

+

Imaging

Task Summaries

Task	QA Score	Duration
1. **hifa_restoredata**: Restore Calibrated Data	No QA N/A	1:20:42
2. **hif_mstransform**: Create science target MS	1.00	0:06:09
3. **hifa_flagtargets**: ALMA Target flagging	1.00	0:01:45
4. **hifa_imageprecheck**: ImagePreCheck	1.00	0:35:24
5. **hif_checkproductsize**: Check product size	1.00	0:02:37
6. **hif_makeimlist**: Set-up parameters for target per-spw continuum imaging	1.00	0:01:06
7. **hif_findcont**: Detect continuum frequency ranges	1.00	0:33:10
8. **hif_uvcontfit**: UV continuum fitting	1.00	0:32:09
9. **hif_uvcontsub**: UV continuum subtraction	1.00	0:07:20
10. **hif_makeimages**: Make target per-spw continuum images	1.00	0:18:58
11. **hif_makeimlist**: Set-up parameters for target aggregate continuum imaging	1.00	0:01:07
12. **hif_makeimages**: Make target aggregate continuum images	1.00	0:13:15
13. **hif_makeimlist**: Set-up parameters for target cube imaging	1.00	0:01:06
14. **hif_makeimages**: Make target cubes	1.00	2:52:11
15. **hif_makeimlist**: Set-up parameters for representative bandwidth target cube imaging	1.00	0:00:26
16. **hif_makeimages**: Make representative bandwidth target cube	1.00	0:12:00

4. **hifa_imageprecheck**: ImagePreCheck

5. **hif_checkproductsize**: Check product size

6. **hif_makeimlist**: Set-up parameters for target per-spw continuum imaging

7. **hif_findcont**: Detect continuum frequency ranges

8. **hif_uvcontfit**: UV continuum fitting

9. **hif_uvcontsub**: UV continuum subtraction

10. **hif_makeimages**: Make target per-spw continuum images

11. **hif_makeimlist**: Set-up parameters for target aggregate continuum imaging

12. **hif_makeimages**: Make target aggregate continuum images

13. **hif_makeimlist**: Set-up parameters for target cube imaging

14. **hif_makeimages**: Make target cubes

15. **hif_makeimlist**: Set-up parameters for representative bandwidth target cube imaging

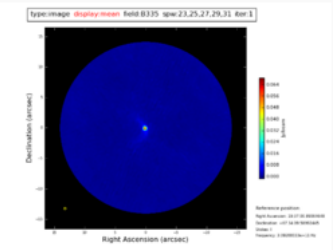
16. **hif_makeimages**: Make representative bandwidth target cube

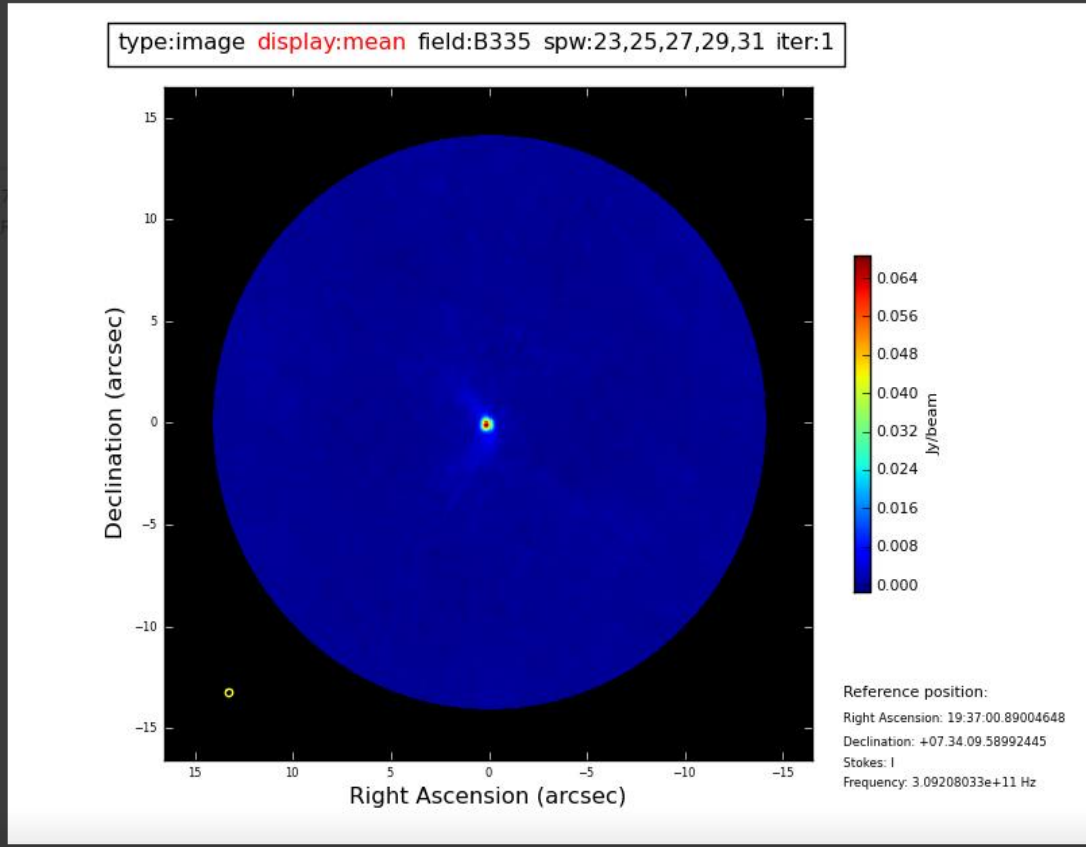
12. Tclean/MakeImages

Make target aggregate continuum images

BACK

Image Details

Field	Spw	Pol	Image details		Image result
B335 (TARGET)	23, 25, 27, 29, 31 / X176064364#ALMA_RB_07#BB_4#SW-01, X176064364#ALMA_RB_07#BB_1#SW-01, X176064364#ALMA_RB_07#BB_2#SW-01, X176064364#ALMA_RB_07#BB_2#SW-02, X176064364#ALMA_RB_07#BB_3#SW-01	I	**centre frequency of image**	309.2080GHz (LSRK)	 View other QA images...
			beam	0.379 x 0.358 arcsec	
			beam p.a.	-52.7deg	
			final theoretical sensitivity	3.6e-05 Jy/beam	
			cleaning threshold	0.00091 Jy/beam Dirty DR: 1.9e+03 DR correction: 13	
			clean residual peak / scaled MAD	5.12	
			non-pbcor image RMS	0.00028 Jy/beam	
			pbcor image max / min	0.0687 / -0.00288 Jy/beam	
			fractional bandwidth / nterms	5% / 1	
			aggregate bandwidth	1.72 GHz (LSRK)	
			score	1.00	
			image file	uid___A001_X1469_Xc4.s12_0.B335_sci.spw23_25_27_29_31.cont.I.iter1.image	

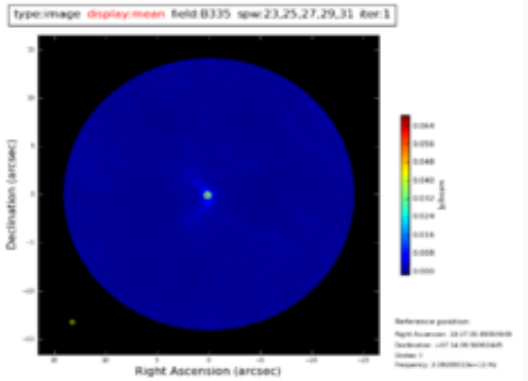


Iteration: 1
Spw: 23,25,27,29,31
Field: B335 (TARGET)

- Beam sizes : 0.379 x 0.358 arcsec

- Sensitivity :
  - Theoretical vs. non-pbcor RMS
    (36 uJy vs 280 uJy)
  - Peak/RMS ~ 0.0687/0.00028 ~ 245
    (> 100 : dynamic range limited)
    ➔ Try Selfcalibration!!

- Aggregate bandwidth : 1.72 GHz
- Frequecny : 309.208 GHz

Pol	Image details		Image result
I	centre frequency of image	309.2080GHz (LSRK)	
	beam	0.379 x 0.358 arcsec	
	beam p.a.	-52.7deg	
	final theoretical sensitivity	3.6e-05 Jy/beam	
	cleaning threshold	0.00091 Jy/beam Dirty DR: 1.9e+03 DR correction: 13	
	clean residual peak / scaled MAD	5.12	
	non-pbcor image RMS	0.00028 Jy/beam	
	pbcor image max / min	0.0687 / -0.00288 Jy/beam	
	fractional bandwidth / nterms	5% / 1	
	aggregate bandwidth	1.72 GHz (LSRK)	
	score	1.00	
	image file	uid___A001_X1469_Xc4.s12_0.B335_sci.spw23_25_27_29_31.cont.I.iter1.image	

View other QA images...

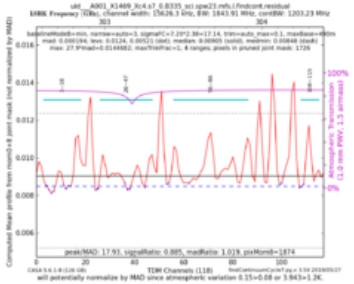
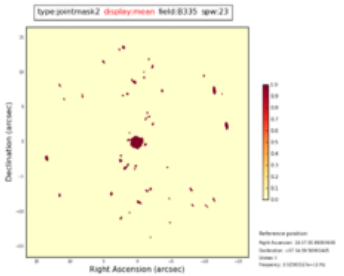
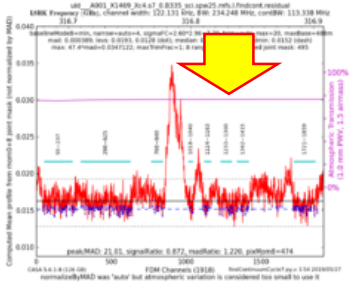
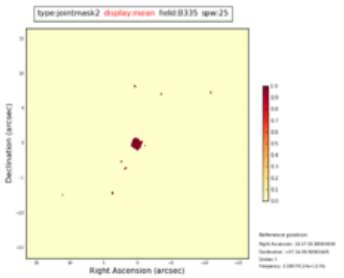
Aggregate Bandwidth : Only line-free chanels

Home | By Topic | By Task

Tasks in execution order

1. hifa_restoredata
2. hif_mstransform
3. hifa_flagtargets
4. hifa_imageprecheck
5. hif_checkproductsize
6. hif_makeimlist (mfs)
7. hif_findcont
8. hif_uvcontfit
9. hif_uvcontsub
10. hif_makeimages (mfs)
11. hif_makeimlist (cont)
12. hif_makeimages (cont)
13. hif_makeimlist (cube)
14. hif_makeimages (cube)
15. hif_makeimlist (cube_repBW)
16. hif_makeimages (cube_repBW)

7. Find Continuum

		Continuum Frequency Range					
Field	Spw	Start	End	Frame	Status	Average spectrum	Joint mask
B335	23	302.60459 GHz	302.85461 GHz	LSRK	NEW		
		302.96400 GHz	303.30778 GHz				
		303.43279 GHz	303.91720 GHz				
		304.24536 GHz	304.37037 GHz				
	25	316.68077 GHz	316.70312 GHz				
		316.71045 GHz	316.75051 GHz				
		316.76785 GHz	316.77677 GHz				
		316.79838 GHz	316.80119 GHz				
		316.81133 GHz	316.81621 GHz				
		316.82464 GHz	316.83295 GHz				
		316.83795 GHz	316.84699 GHz				
		316.88424 GHz	316.90122 GHz				

Aggregate Bandwidth : Only line-free chanels

Home | By Topic | By Task

Tasks in execution order

1. hifa_restoredata
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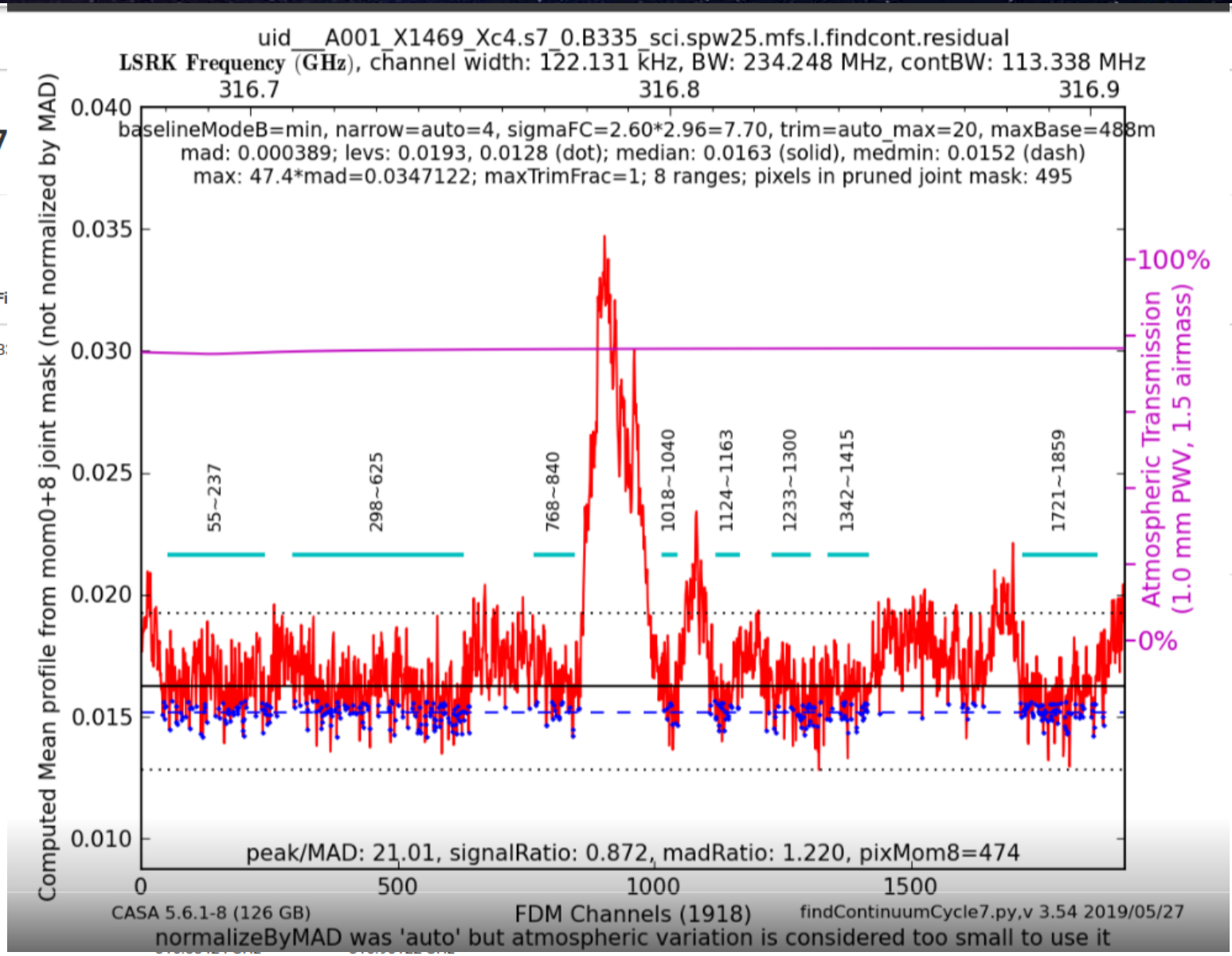
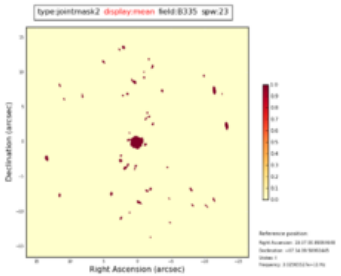
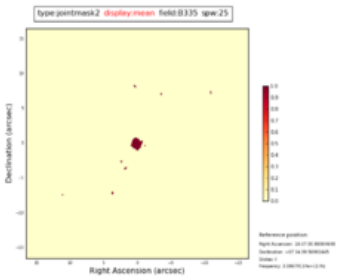
7. hif_findcont
8. hif_uvcontfit
9. hif_uvcontsub
10. hif_makeimages (mfs)
11. hif_makeimlist (cont)
12. hif_makeimages (cont)
13. hif_makeimlist (cube)
14. hif_makeimages (cube)
15. hif_makeimlist (cube_repBW)
16. hif_makeimages (cube_repBW)



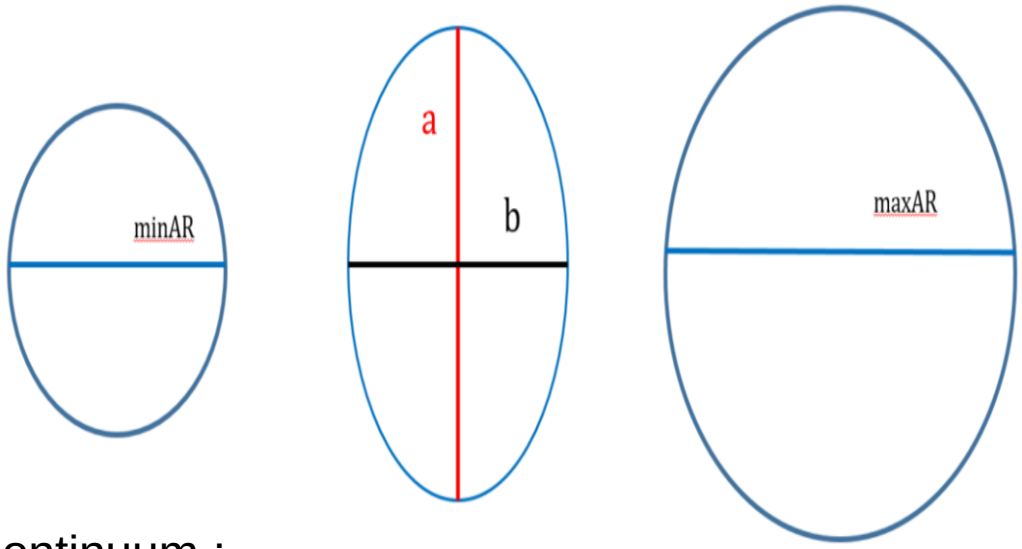
Joint mask





QA2 Criteria : Beam size and sensitivity

$$\text{minAR} < \sqrt{ab} < \text{maxAR}$$



Bands 3/4/5/6	10%
Bands 7/8	15%
Bands 9/10	20%

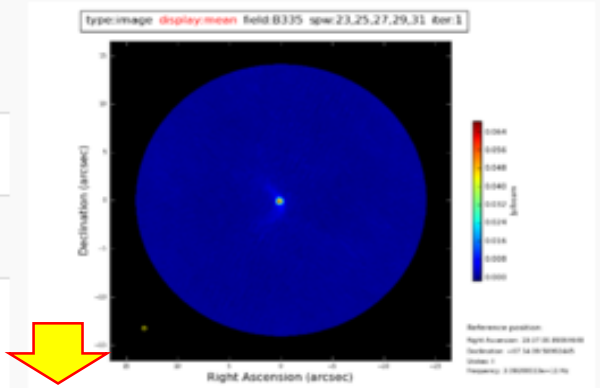
Continuum :

proposed RMS > 1.1~1.2 x non-pbcor RMS x sqrt(aggregate BW/ proposed BW)

- Beam sizes : 0.379 x 0.358 arcsec

- Sensitivity :
  - Theoretical vs. non-pbcor RMS
    (36 uJy vs 280 uJy)
  - Peak/RMS ~ 0.0687/0.00028 ~ 245
    (> 100 : dynamic range limited)
    ➔ Try Selfcalibration!!

- Aggregate bandwidth : 1.72 GHz
- Frequecny : 309.208 GHz

Pol	Image details		Image result
I	centre frequency of image	309.2080GHz (LSRK)	
	beam	0.379 x 0.358 arcsec	
	beam p.a.	-52.7deg	
	final theoretical sensitivity	3.6e-05 Jy/beam	
	cleaning threshold	0.00091 Jy/beam Dirty DR: 1.9e+03 DR correction: 13	
	clean residual peak / scaled MAD	5.12	
	non-pbcor image RMS	0.00028 Jy/beam	
	pbcor image max / min	0.0687 / -0.00288 Jy/beam	
	fractional bandwidth / nterms	5% / 1	
	aggregate bandwidth	1.72 GHz (LSRK)	
	score	1.00	
	image file	uid___A001_X1469_Xc4.s12_0.B335_sci.spw23_25_27_29_31.cont.I.iter1.image	

View other QA images...

Tasks in execution order

1. hifa_restoredata
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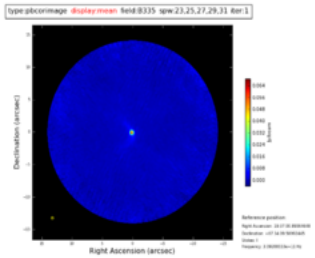
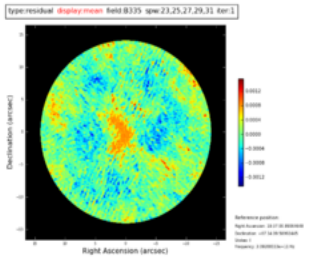
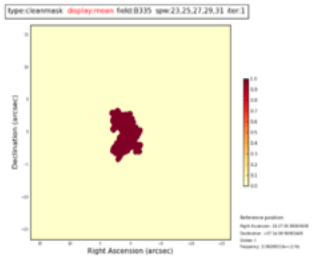
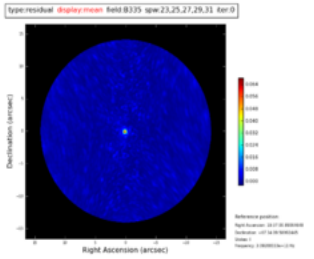
3. hifa_flagtargets
4. hifa_imageprecheck
5. hif_checkproductsize
6. hif_makeimlist (mfs)
7. hif_findcont
8. hif_uvcontfit
9. hif_uvcontsub
10. hif_makeimages (mfs)
11. hif_makeimlist (cont)
12. hif_makeimages (cont)
13. hif_makeimlist (cube)
14. hif_makeimages (cube)
15. hif_makeimlist (cube_repBW)
16. hif_makeimages (cube_repBW)

Clean results for B335 (TARGET) SpW 23,25,27,29,31

BACK

Iteration	Image	Residual	Clean Mask
1			
0			

Cleaned Image

Residual

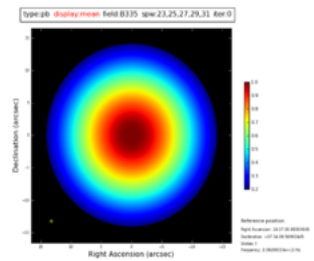
mask

Dirty map

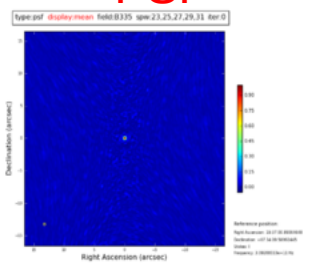
PB: Primary beam

PSF

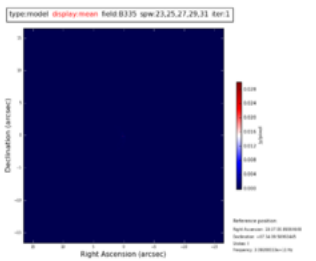
model



Primary Beam



PSF



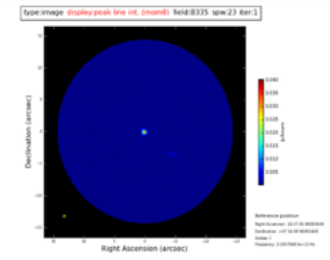
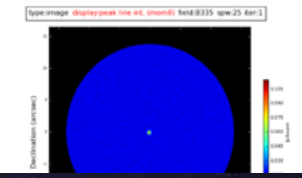
Final Model

14. Tclean/MakeImages

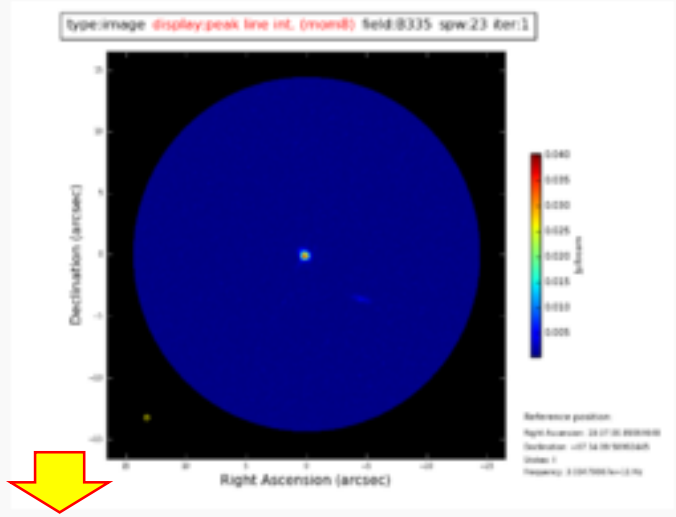
Make target cubes

BACK

Image Details

Field	Spw	Pol	Image details		Image result
B335 (TARGET)	23 / X176064364#ALMA_RB_07#BB_4#SW-01	I	**centre / rest frequency of cube**	303.4797GHz / 303.4911GHz (LSRK)	 View other QA images...
			beam	0.388 x 0.361 arcsec	
			beam p.a.	-52.4deg	
			final theoretical sensitivity	0.00022 Jy/beam	
			cleaning threshold	0.0011 Jy/beam Dirty DR: 1.8e+02 DR correction: 2.5	
			clean residual peak / scaled MAD	-6.53	
			non-pbcor image RMS / RMS_{min} / RMS_{max}	0.00026 / 0.00021 / 0.00034 Jy/beam	
			pbcor image max / min	0.0403 / -0.0120 Jy/beam	
			channels	118 x 15.6263MHz (LSRK)	
			score	1.00	
			image file	uid___A001_X1469_Xc4.s14_0.B335_sci.spw23.cube.I.iter1.image	
B335 (TARGET)	25 / X176064364#ALMA_RB_07#BB_1#SW-01	I	**centre / rest frequency of cube**	316.7912GHz / 316.7998GHz (LSRK)	
			beam	0.371 x 0.344 arcsec	
			beam p.a.	-49.3deg	

SPW : 23

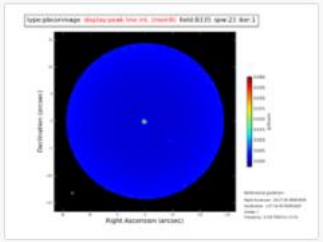
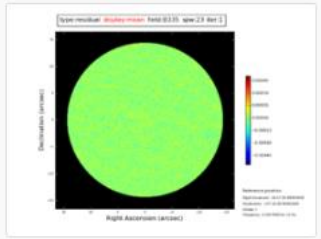
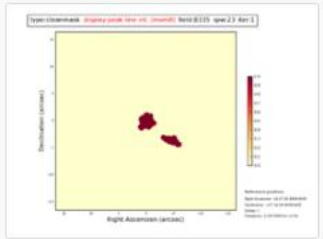
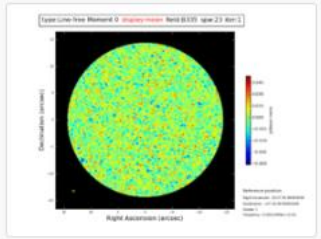
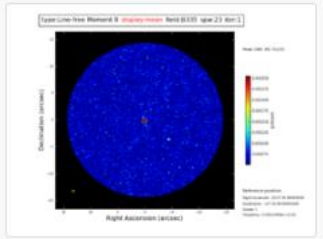
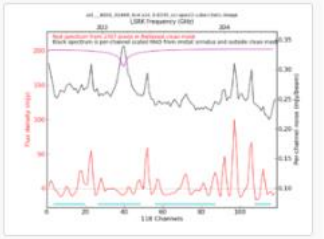
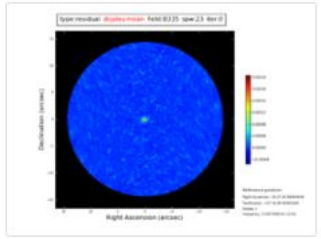
Pol	Image details		Image result
I	centre / rest frequency of cube	303.4797GHz / 303.4911GHz (LSRK)	
	beam	0.388 x 0.361 arcsec	
	beam p.a.	-52.4deg	
	final theoretical sensitivity	0.00022 Jy/beam	
	cleaning threshold	0.0011 Jy/beam Dirty DR: 1.8e+02 DR correction: 2.5	
	clean residual peak / scaled MAD	-6.53	
	non-pbcor image RMS / RMS_{min} / RMS_{max}	0.00026 / 0.00021 / 0.00034 Jy/beam	
	pbcor image max / min	0.0403 / -0.0120 Jy/beam	
	channels	118 x 15.6263MHz (LSRK)	
	score	1.00	
	image file	uid___A001_X1469_Xc4.s14_0.B335_sci.spw23.cube.I.iter1.image	

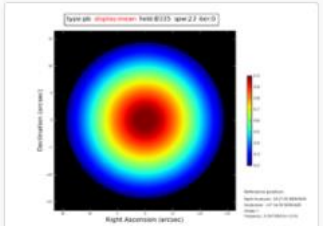
View other QA images...

Tasks in execution order

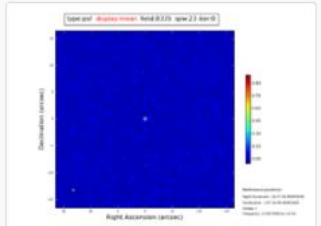
Clean results for B335 (TARGET) SpW 23

BACK

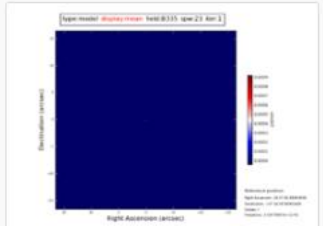
Iteration	Image	Residual	Clean Mask	Line-free Moment 0	Line-free Moment 8	Spectra
1						
0						



Primary Beam



PSF



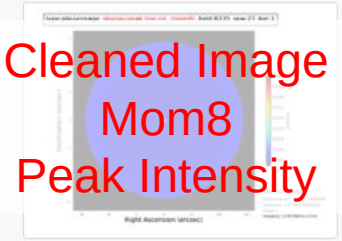
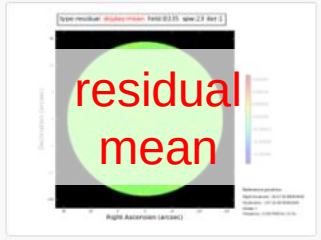
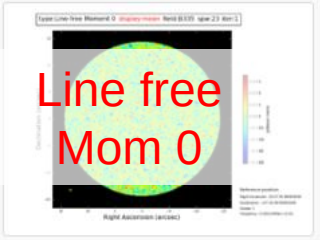
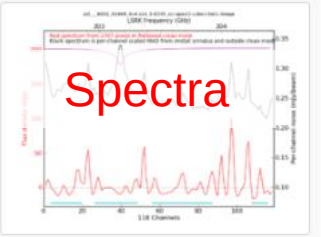
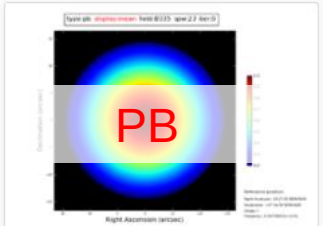
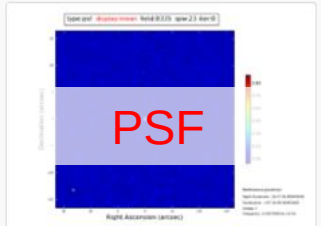
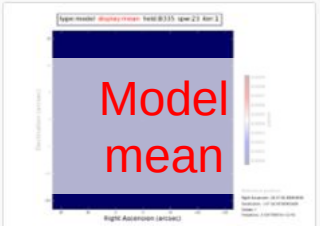
Final Model

Tasks in execution order

1. hifa_restoredata
2. hif_mstransform
3. hifa_flagtargets
4. hifa_imageprecheck
5. hif_checkproductsize
6. hif_makeimlist (mfs)
7. hif_findcont
8. hif_uvcontfit
9. hif_uvcontsub
10. hif_makeimages (mfs)
11. hif_makeimlist (cont)
12. hif_makeimages (cont)
13. hif_makeimlist (cube)
14. hif_makeimages (cube)
15. hif_makeimlist (cube_repBW)
16. hif_makeimages (cube_repBW)

Clean results for B335 (TARGET) SpW 23

BACK

Iteration	Image	Residual	Clean Mask	Line-free Moment 0	Line-free Moment 8	Spectra
1						
0						
	 Primary Beam	 PSF	 Final Model			

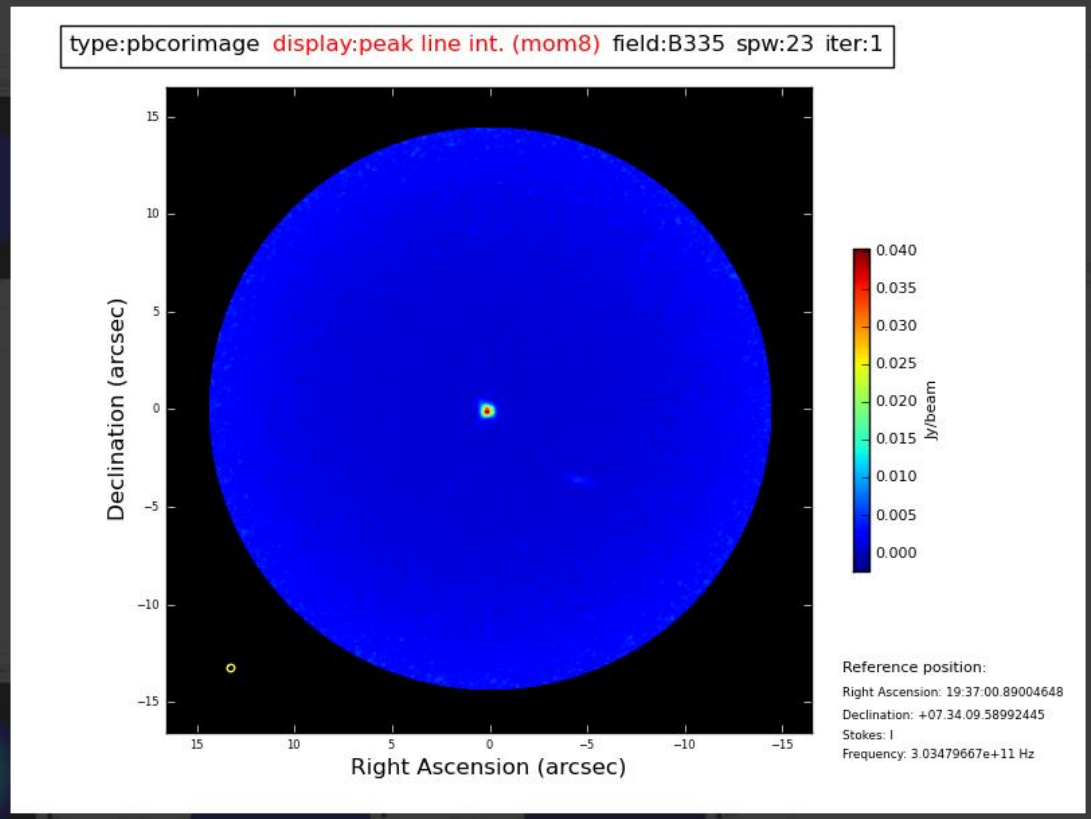
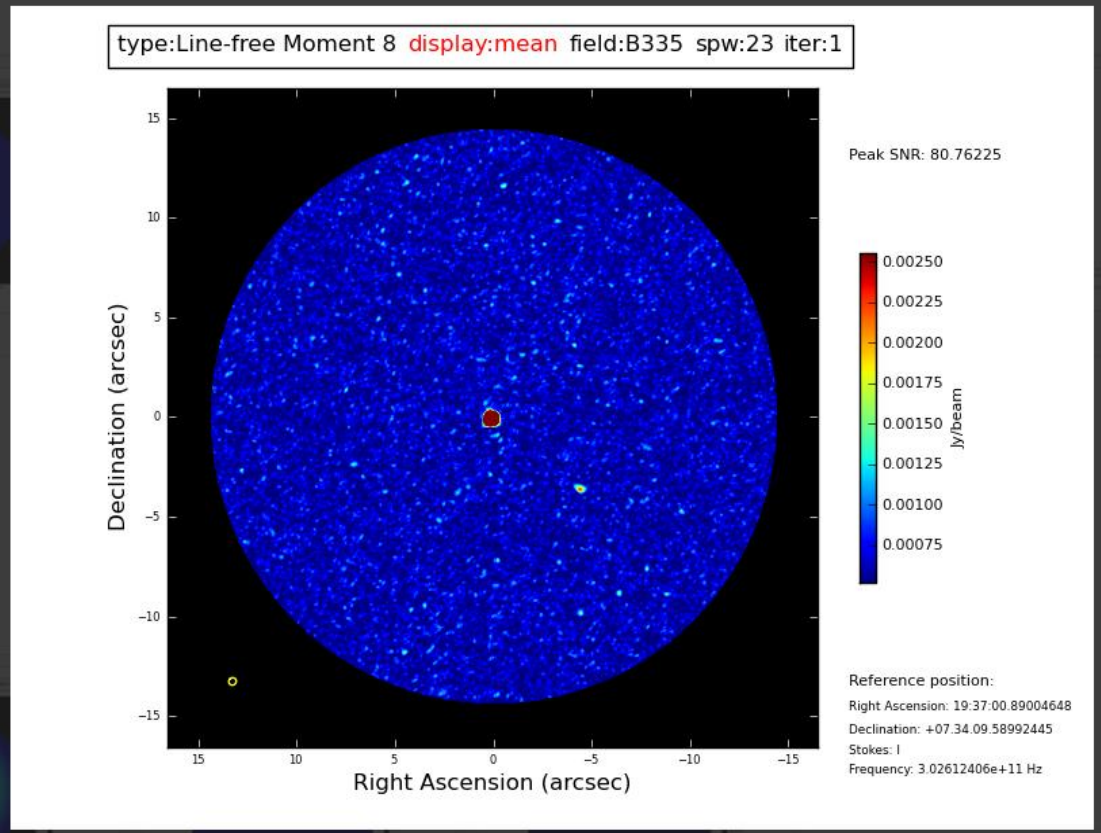


Image
Iteration 1



Integrated intensity (moment 8) of line-free channels after continuum subtraction
Iteration 1

Home By Topic By Task

Tasks in execution order

1. hifa_restoredata
2. hif_mstransform
3. hifa_flagtargets
4. hifa_imageprecheck
5. hif_checkproductsize
6. hif_makeimlist (mfs)
7. hif_findcont
8. hif_uvcontfit
9. hif_uvcontsub
10. hif_makeimages (mfs)
11. hif_makeimlist (cont)
12. hif_makeimages (cont)
13. hif_makeimlist (cube)
14. hif_makeimages (cube)
15. hif_makeimlist (cube_repBW)
16. hif_makeimages (cube_repBW)

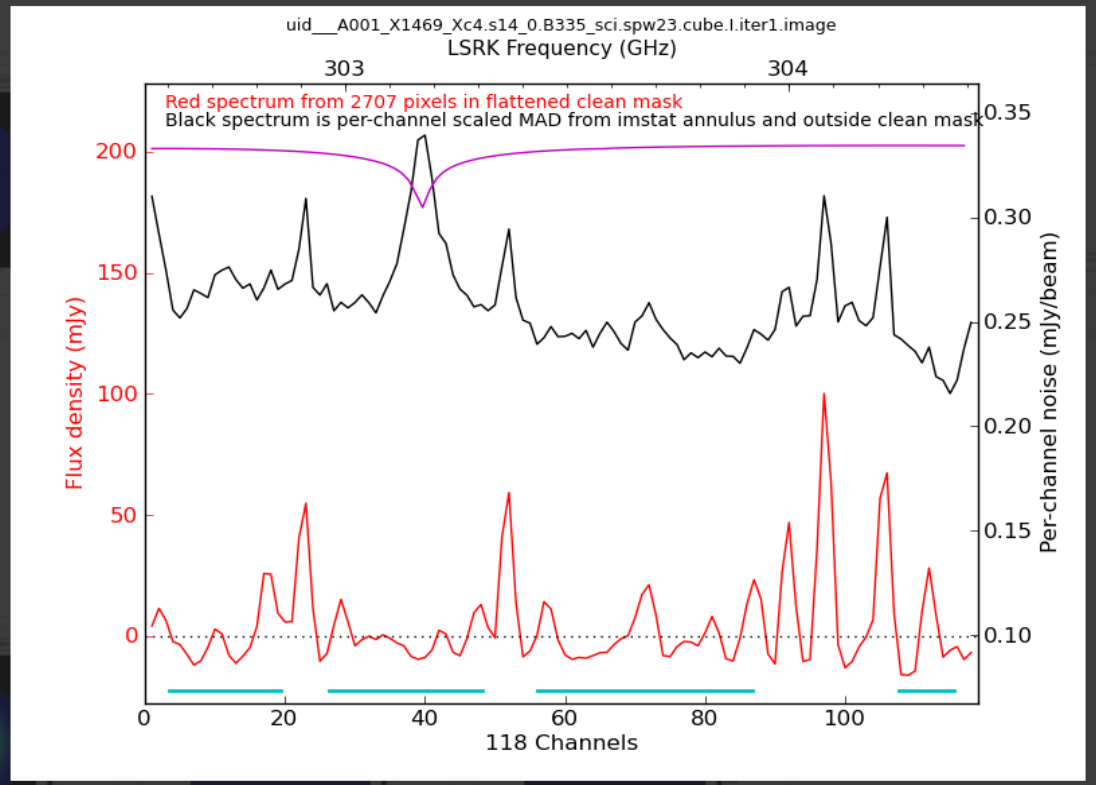
Clean results for B335 (TARGET) SpW 23

BACK

Iteration Image Line-free Moment 8 Spectra

1

0



Primary Beam PSF Final Model

Spectrum from flattened clean mask and per channel MAD
Iteration 1

Representative Target: B335

Representative Frequency: 316.7910 GHz (SPW 25)

Bandwidth for Sensitivity: 1.057 MHz (rounded to nearest integer #channels (9), repBW = 1.099 MHz)

Min / Max Acceptable Resolution: 0.300 arcsec / 0.500 arcsec

Maximum expected beam axial ratio (from OT): 1.5

Goal PI sensitivity: 2.50 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 (>=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	[]	0.356 x 0.312 arcsec @ -49.8 deg	0.062 x 0.062 arcsec	1.14	1.099 MHz	repBW	0.0021 Jy/beam
0.0	[]	0.346 x 0.312 arcsec @ -58.2 deg	0.062 x 0.062 arcsec	1.14	3237 MHz	aggBW	3.67e-05 Jy/beam
0.5	[]	0.372 x 0.343 arcsec @ -51.3 deg	0.069 x 0.069 arcsec	1.08	1.099 MHz	repBW	0.00173 Jy/beam
0.5	[]	0.374 x 0.353 arcsec @ -53.7 deg	0.071 x 0.071 arcsec	1.08	3237 MHz	aggBW	2.93e-05 Jy/beam
1.0	[]	0.407 x 0.393 arcsec @ -8.71 deg	0.079 x 0.079 arcsec	1.04	1.099 MHz	repBW	0.00159 Jy/beam
1.0	[]	0.419 x 0.405 arcsec @ -3.74 deg	0.081 x 0.081 arcsec	1.04	3237 MHz	aggBW	2.68e-05 Jy/beam
2.0	[]	0.432 x 0.408 arcsec @ 4.19 deg	0.082 x 0.082 arcsec	1.06	1.099 MHz	repBW	0.00158 Jy/beam
2.0	[]	0.447 x 0.425 arcsec @ 12.2 deg	0.085 x 0.085 arcsec	1.06	3237 MHz	aggBW	2.65e-05 Jy/beam

13. Make image list

Set-up parameters for target cube imaging

BACK

List of Clean Targets

field	intent	spw	phasecenter	cell	imsize	imagename	specmode	start	width	nbin	nchan	restfreq (LSRK)	robust	nterms	uvrange
B335	TARGET	23	ICRS 19:37:00.8900 +007.34.09.590	['0.069arcsec']	[480, 480]	uid___A001_X1469_Xc4.sSTAGENUMBER.B335_sci.spw23.cube	cube			-1	-1	None	0.5		
B335	TARGET	25	ICRS 19:37:00.8900 +007.34.09.590	['0.069arcsec']	[480, 480]	uid___A001_X1469_Xc4.sSTAGENUMBER.B335_sci.spw25.cube	cube			-1	-1	None	0.5		
B335	TARGET	27	ICRS 19:37:00.8900 +007.34.09.590	['0.069arcsec']	[480, 480]	uid___A001_X1469_Xc4.sSTAGENUMBER.B335_sci.spw27.cube	cube			-1	-1	None	0.5		
B335	TARGET	29	ICRS 19:37:00.8900 +007.34.09.590	['0.069arcsec']	[480, 480]	uid___A001_X1469_Xc4.sSTAGENUMBER.B335_sci.spw29.cube	cube			-1	-1	None	0.5		
B335	TARGET	31	ICRS 19:37:00.8900 +007.34.09.590	['0.069arcsec']	[480, 480]	uid___A001_X1469_Xc4.sSTAGENUMBER.B335_sci.spw31.cube	cube			-1	-1	None	0.5		

Clean Targets Summary

Pipeline QA

Input Parameters

Tasks Execution Statistics

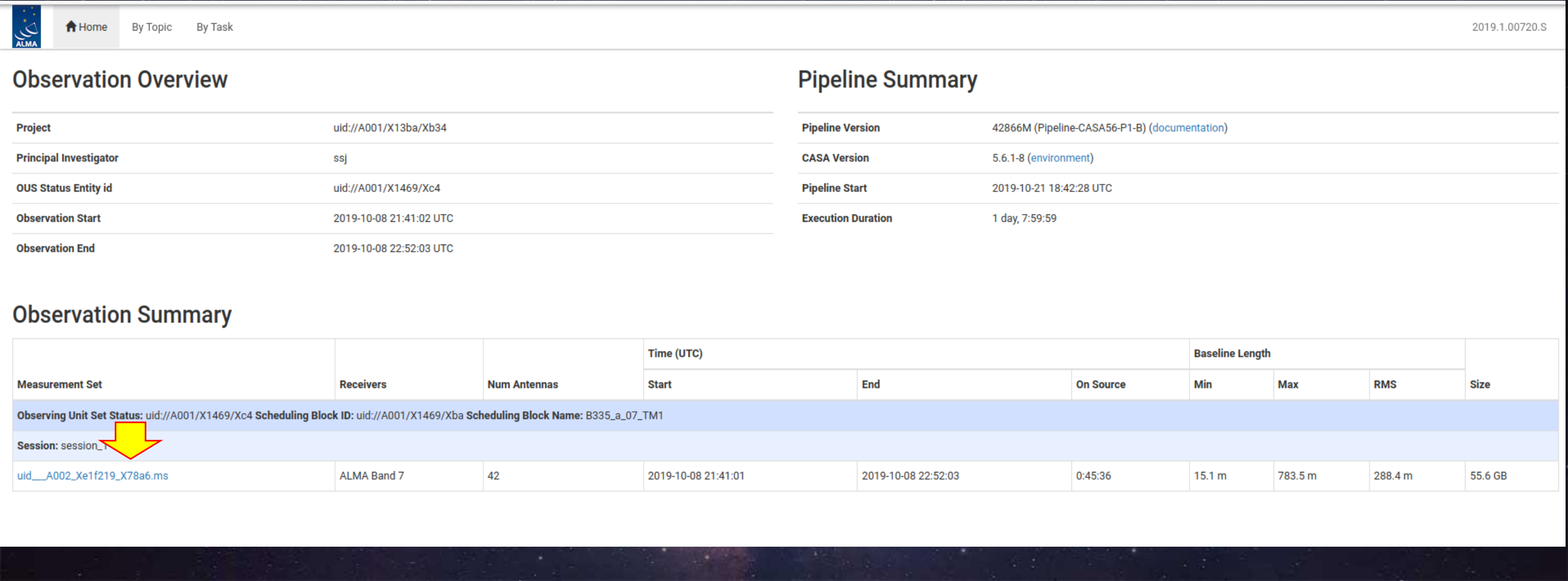
CASA logs for stage 13

- View or download stage13/casapy.log (21.0 KB)

First look at the weblog

Check Observation and Calibartion

> cd ../web_cal/
>python3 -m http.server 8080 - -bind 127.0.0.1
In the browser
http://127.0.0.1:8080/weblog_cal/index.html



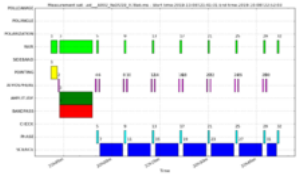
Session: session_1
uid___A002_Xe1f219_X78a6.ms

Overview of 'uid___A002_Xe1f219_X78a6.ms'

Observation Execution Time

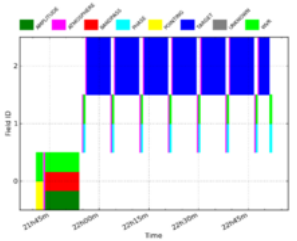
Start Time	2019-10-08 21:41:01
End Time	2019-10-08 22:52:03
Total Time on Source	1:05:53
Total Time on Science Target	0:45:36

LISTOBS OUTPUT



Intent vs Time

Track scan intent vs time



Field vs Time

Track observed field vs time

Spatial Setup

Science Targets	'B335'
Calibrators	'J1924-2914' and 'J1938+0448'

Spectral Setup

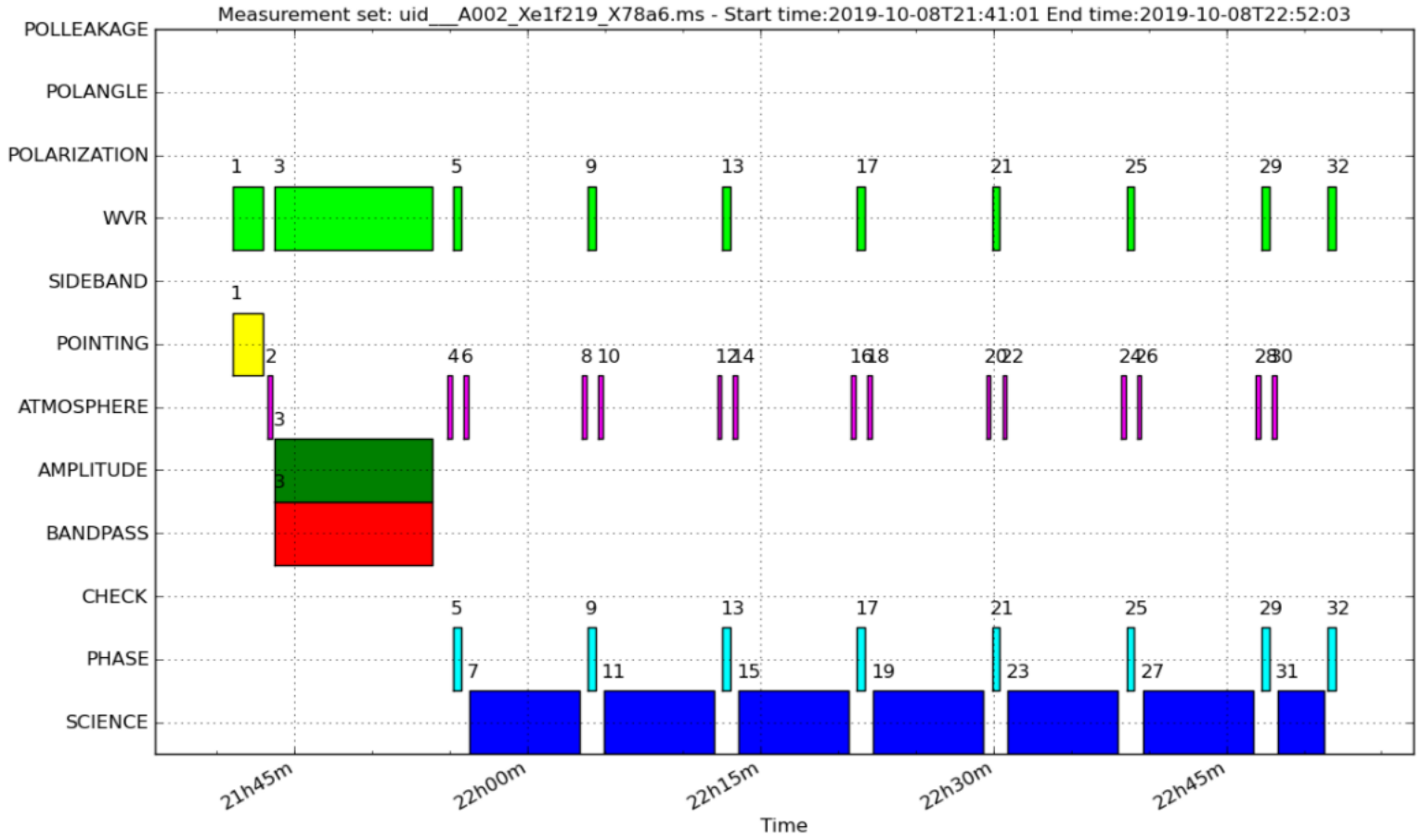
All Bands	'ALMA Band 7' and 'WVR'
Science Bands	'ALMA Band 7'

Antenna Setup

Min Baseline	15.1 m
Max Baseline	783.5 m
Number of Baselines	861
Number of Antennas	42

Sky Setup

Min Elevation	55.62 degrees
Max Elevation	76.35 degrees



→Water vapor radiometer

→T_{sys}

Home By Topic By Task

Session: session_1

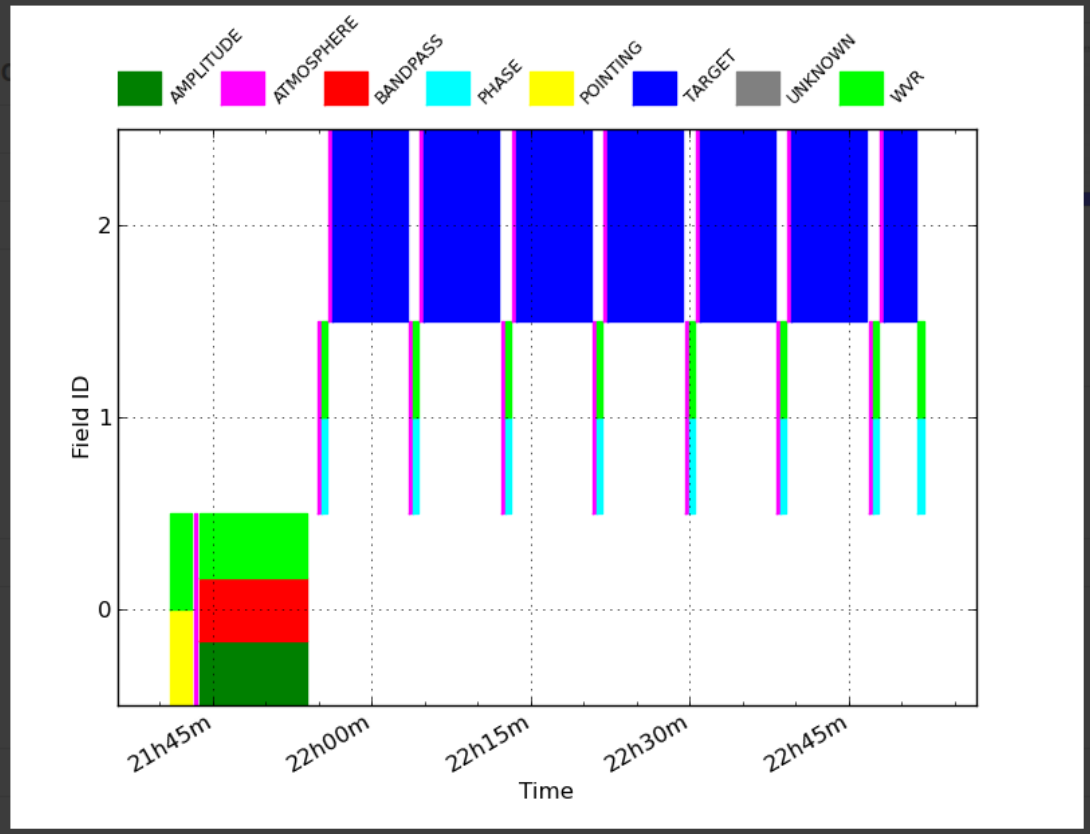
uid___A002_Xe1f219_X78a6.ms

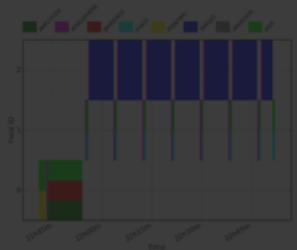
Overview of 'uid___A002_Xe1f219_X78a6.ms'

Observation Executi

Start Time	
End Time	
Total Time on Source	
Total Time on Science Target	

LISTOBS OUTPUT





Field vs Time

Track observed field vs time

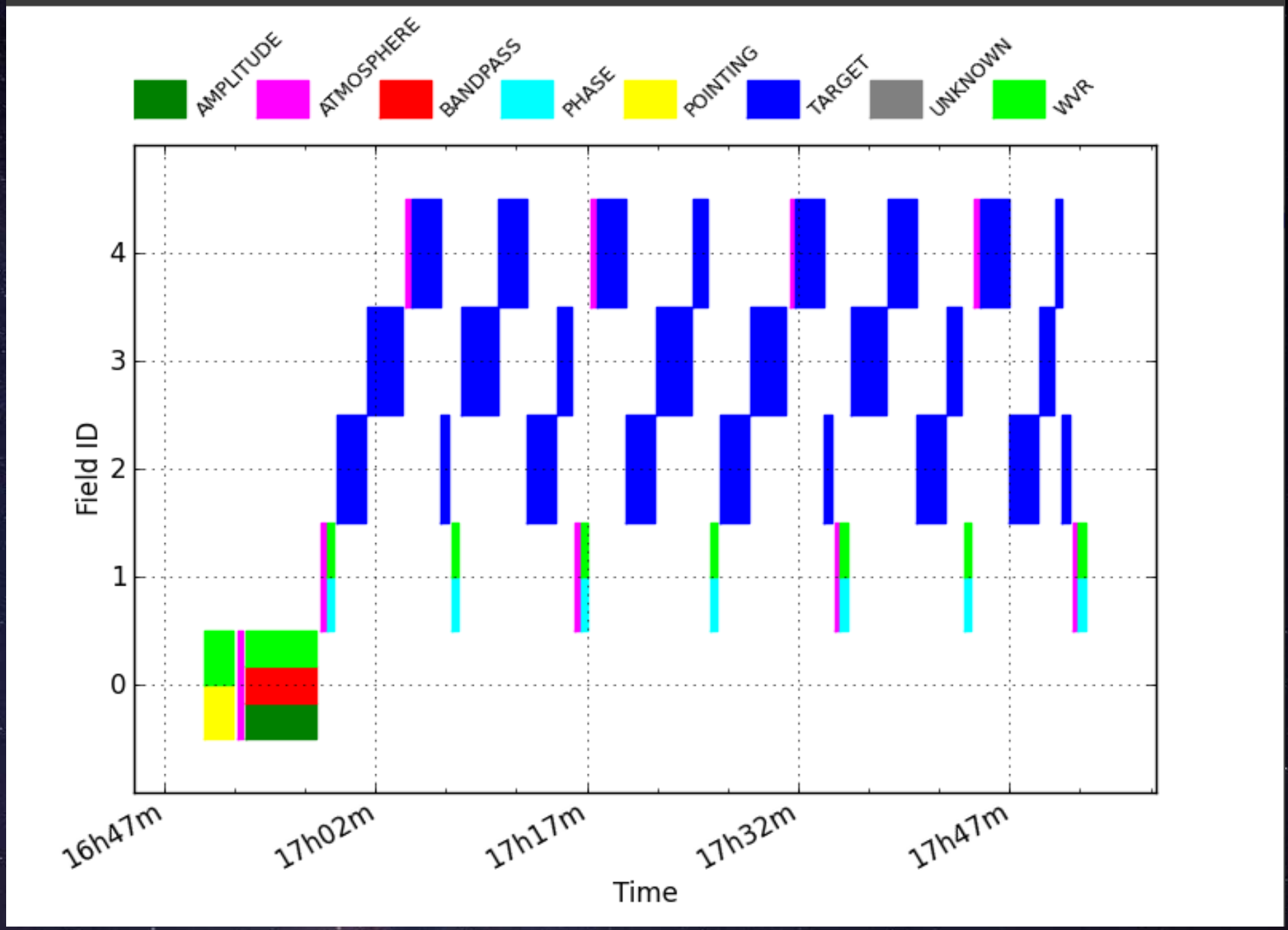
Spatial Setup

Science Targets	'ALMA Band 7' and 'WVR'
Calibrators	'ALMA Band 7'

Antenna Setup

Min Baseline		55.62 degrees
Max Baseline		76.35 degrees
Number of Baselines	861	
Number of Antennas	42	

EX) Mulitple points



Session: session_1
uid___A002_Xe1f219_X78a6.ms

Spatial Setup Details

BACK

Sources

ID	Source Name	Source Position			Proper Motion		# Pointings	Intent
		RA	Dec	Ref. Frame	X	Y		
0	J1924-2914	19:24:51.056	-029.14.30.121	ICRS			1	AMPLITUDE, ATMOSPHERE, BANDPASS, POINTING, WVR
1	J1938+0448	19:38:30.670	+004.48.11.614	ICRS			1	ATMOSPHERE, PHASE, WVR
2	B335	19:37:00.890	+007.34.09.590	ICRS			1	ATMOSPHERE, TARGET

Sources in uid___A002_Xe1f219_X78a6.ms

Fields

Field ID	Field Name	Position			Intent	Source Reference
		RA	Dec	Ref. Frame		
0	J1924-2914	19:24:51.056	-029.14.30.121	ICRS	AMPLITUDE, ATMOSPHERE, BANDPASS, POINTING, WVR	J1924-2914 (#0)
1	J1938+0448	19:38:30.670	+004.48.11.614	ICRS	ATMOSPHERE, PHASE, WVR	J1938+0448 (#1)
2	B335	19:37:00.890	+007.34.09.590	ICRS	ATMOSPHERE, TARGET	B335 (#2)

Fields in uid___A002_Xe1f219_X78a6.ms

Session: session_1
uid___A002_Xe1f219_X78a6.ms

Spectral Setup Details

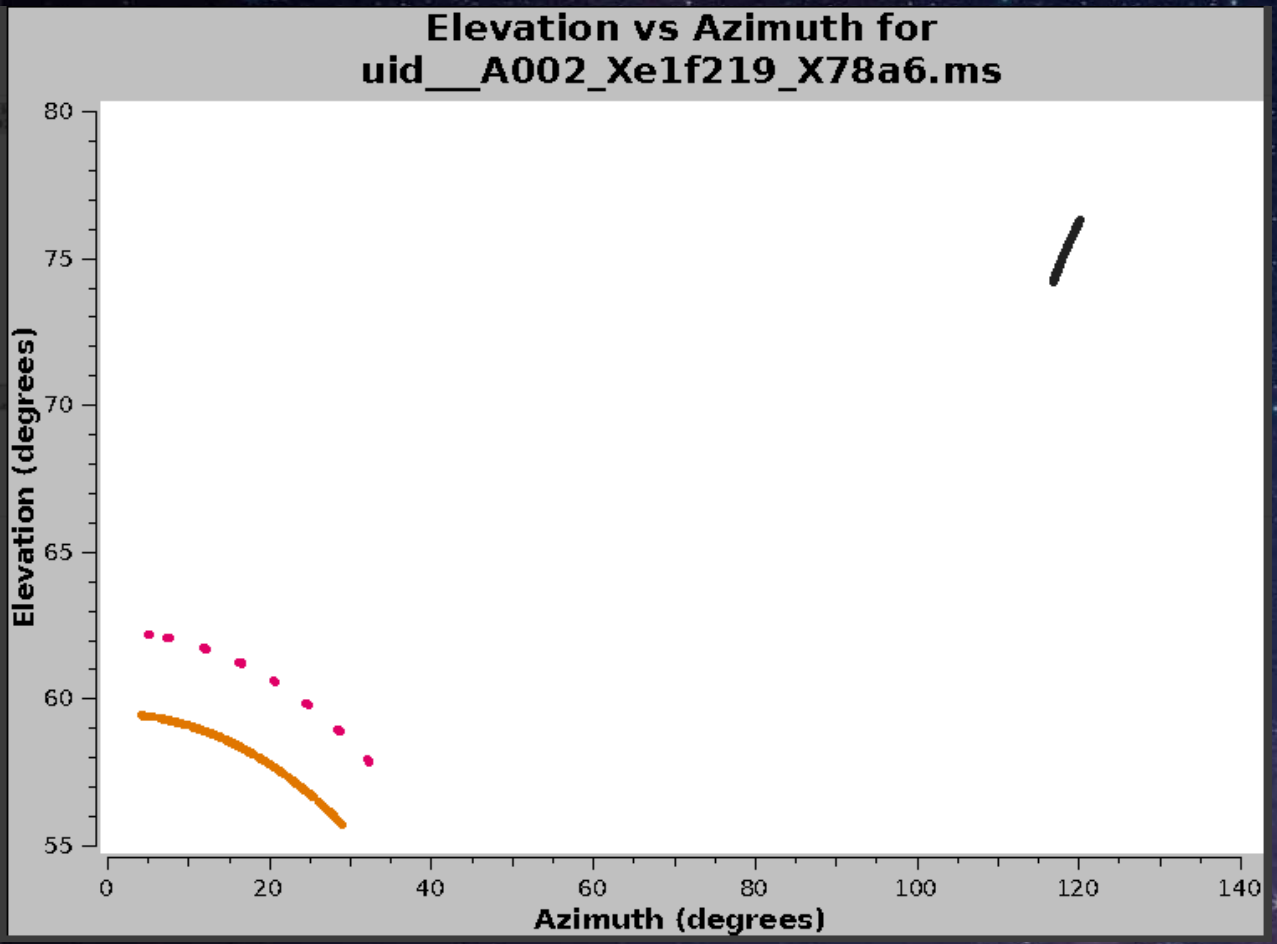
BACK

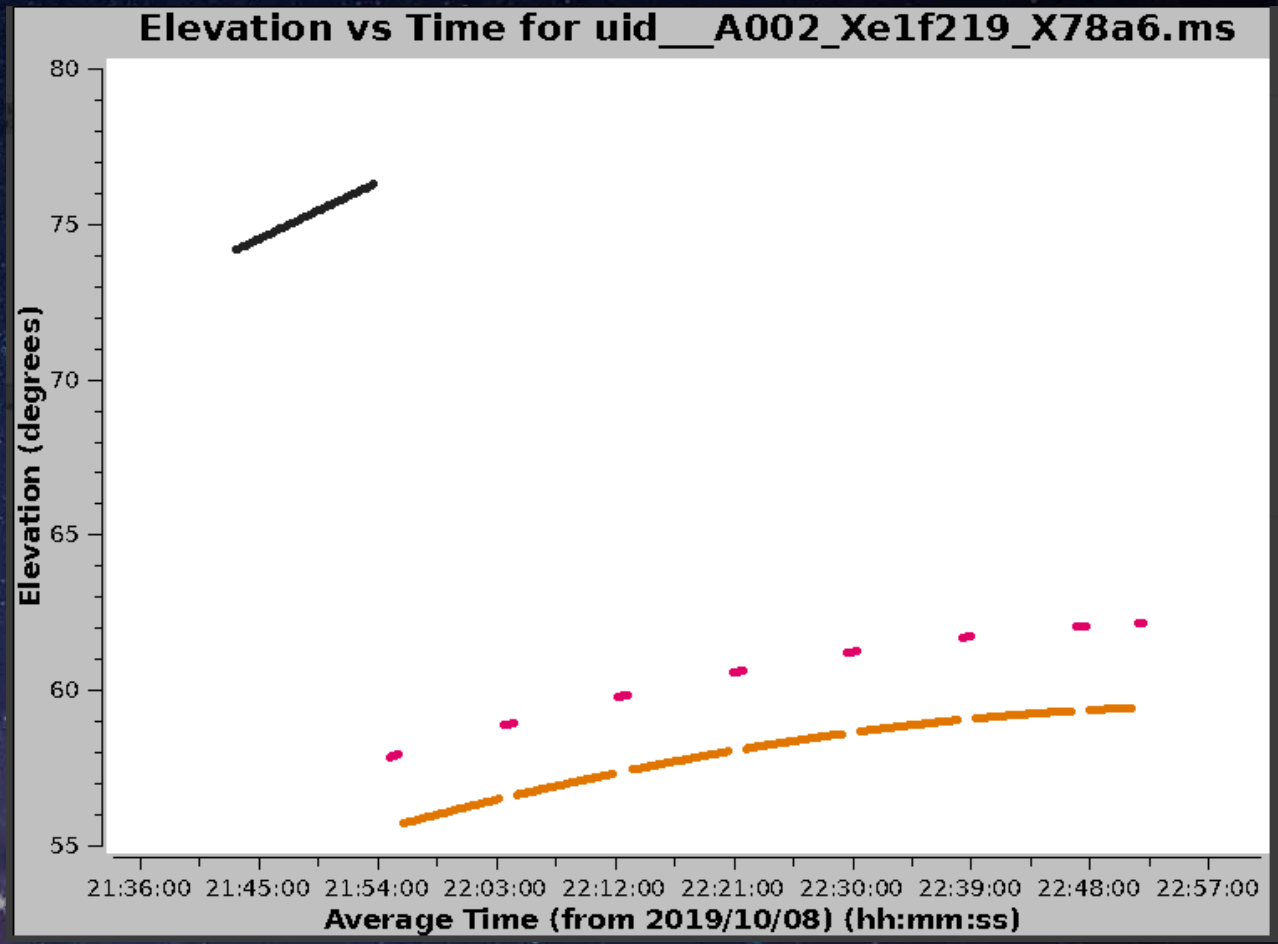
Science Windows | All Windows

Science Windows

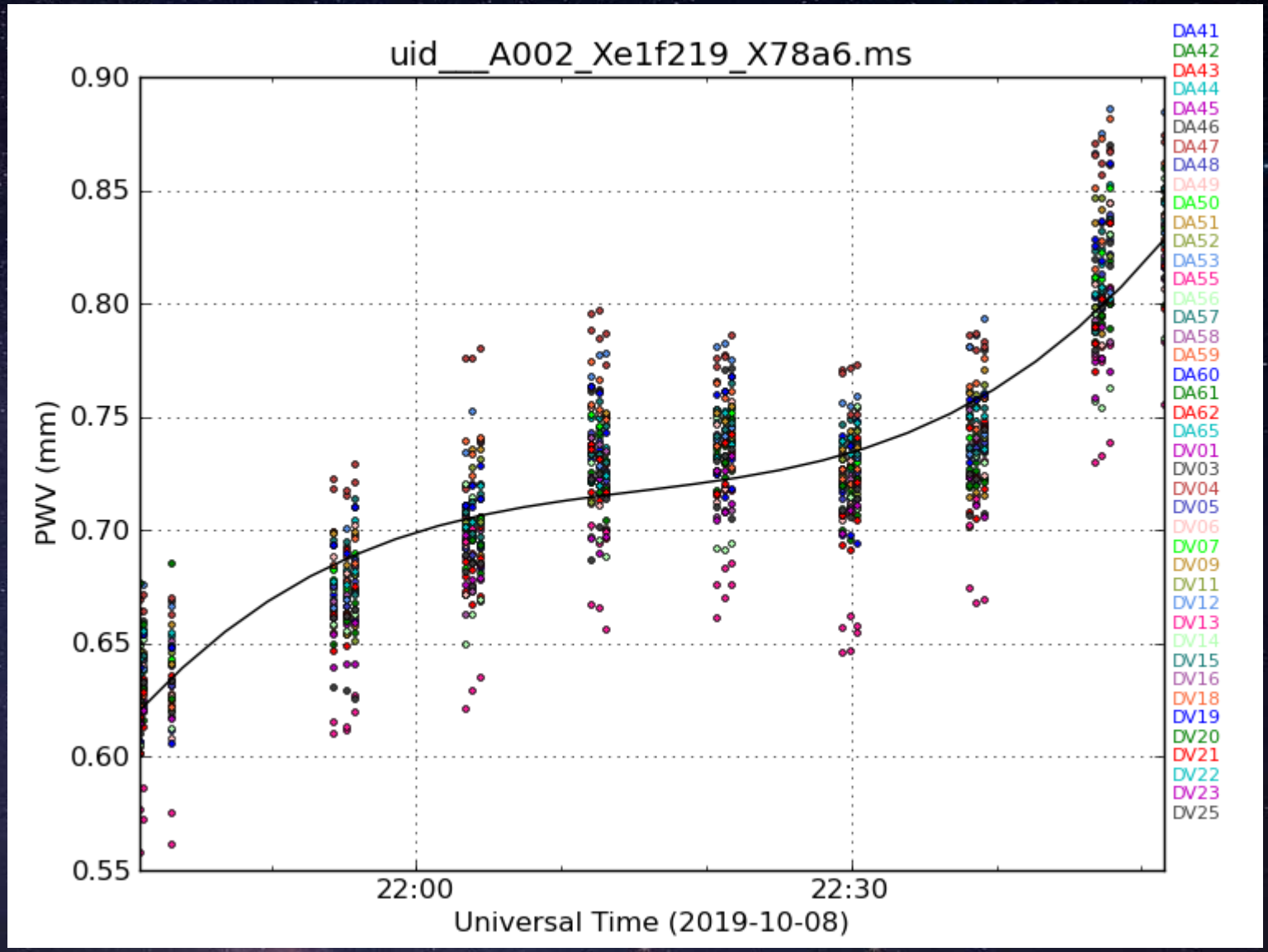
Real ID	Virtual ID	Name	Type	Frequency (TOPO)			Bandwidth (TOPO)	Transitions	Channels (TOPO)			Correlator Axis	Band	Band Type
				Start	Centre	End			Number	Frequency Width	Velocity Width			
23	23	X176064364#ALMA_RB_07#BB_4#SW-01	TDM	302.471 GHz	303.471 GHz	304.471 GHz	2.000 GHz	ContForCal(ID=0)	128	15.625 MHz	15.436 km/s	XX, YY	ALMA Band 7	TSB
25	25	X176064364#ALMA_RB_07#BB_1#SW-01	FDM	316.665 GHz	316.782 GHz	316.899 GHz	234.375 MHz	D2O_1(1,0)-1(0,1)(ID=4104568)	1920	122.070 kHz	115.523 m/s	XX, YY	ALMA Band 7	TSB
27	27	X176064364#ALMA_RB_07#BB_2#SW-01	FDM	315.831 GHz	316.066 GHz	316.300 GHz	468.750 MHz	13CH3OH_v_t=0_10(-1,10)-9(0,9)(ID=575176), 13CH3OH_v_t=1_4(1,4)-5(2,3)_++(ID=3764462)	960	488.281 kHz	463.141 m/s	XX, YY	ALMA Band 7	TSB
29	29	X176064364#ALMA_RB_07#BB_2#SW-02	FDM	315.767 GHz	316.001 GHz	316.235 GHz	468.750 MHz	13CH3OH_v_t=1_4(1,4)-5(2,3)_++(ID=3764462), 13CH3OH_v_t=0_10(-1,10)-9(0,9)(ID=575176)	960	488.281 kHz	463.236 m/s	XX, YY	ALMA Band 7	TSB
31	31	X176064364#ALMA_RB_07#BB_3#SW-01	FDM	301.505 GHz	301.739 GHz	301.973 GHz	468.750 MHz	13CH3OH_v_t=0_8_(2,6)-7_(-2,6)(ID=575128)	1920	244.141 kHz	242.566 m/s	XX, YY	ALMA Band 7	TSB

Spectral Windows with Science Intent in uid___A002_Xe1f219_X78a6.ms


Elevation vs Azimuth for
uid___A002_Xe1f219_X78a6.ms
Elevation (degrees)
80
75
70
65
60
55
0
20
40
60
80
100
120
140
Azimuth (degrees)


Elevation vs Time for uid___A002_Xe1f219_X78a6.ms
Elevation (degrees)
80
75
70
65
60
55
21:36:00
21:45:00
21:54:00
22:03:00
22:12:00
22:21:00
22:30:00
22:39:00
22:48:00
22:57:00
Average Time (from 2019/10/08) (hh:mm:ss)

PWV


uid___A002_Xe1f219_X78a6.ms
PWV (mm)
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
22:00
22:30
Universal Time (2019-10-08)
DA41
DA42
DA43
DA44
DA45
DA46
DA47
DA48
DA49
DA50
DA51
DA52
DA53
DA55
DA56
DA57
DA58
DA59
DA60
DA61
DA62
DA65
DV01
DV03
DV04
DV05
DV06
DV07
DV09
DV11
DV12
DV13
DV14
DV15
DV16
DV18
DV19
DV20
DV21
DV22
DV23
DV25

Session: session_1

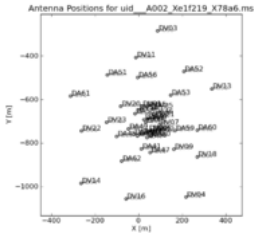
uid___A002_Xe1f219_X78a6.ms

Antenna Setup Details

BACK

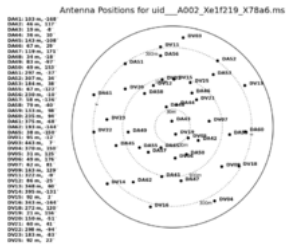
Antennas Baselines

Antenna Positions



Antenna Position

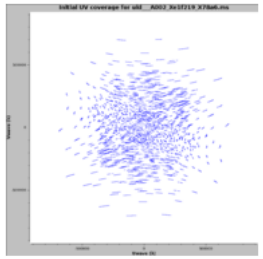
Plot antenna latitude vs antenna longitude



Antenna Position

Polar-logarithmic plot of antenna positions.

UV coverage



UV Coverage

UV coverage plot for TARGET field B335 (#2), spw 25.

Antenna Details

ID	Name	Pad	Diameter	Offset from Array Centre	
				Longitude	Latitude
0	DA41	A058	12.0	12.7 m	-827.0 m
1	DA42	A043	12.0	75.2 m	-747.2 m
2	DA43	A035	12.0	32.0 m	-706.8 m
3	DA44	A002	12.0	40.6 m	-690.2 m
4	DA45	A069	12.0	-101.5 m	-770.1 m
5	DA46	A008	12.0	67.6 m	-667.7 m

Home By Topic By Task

Session: session_1

uid___A002_Xe1f219_X78a6.ms

Antenna Setup Details

BACK

Antennas Baselines

Antenna Positions

Antenna Position

Plot antenna latitude vs antenna

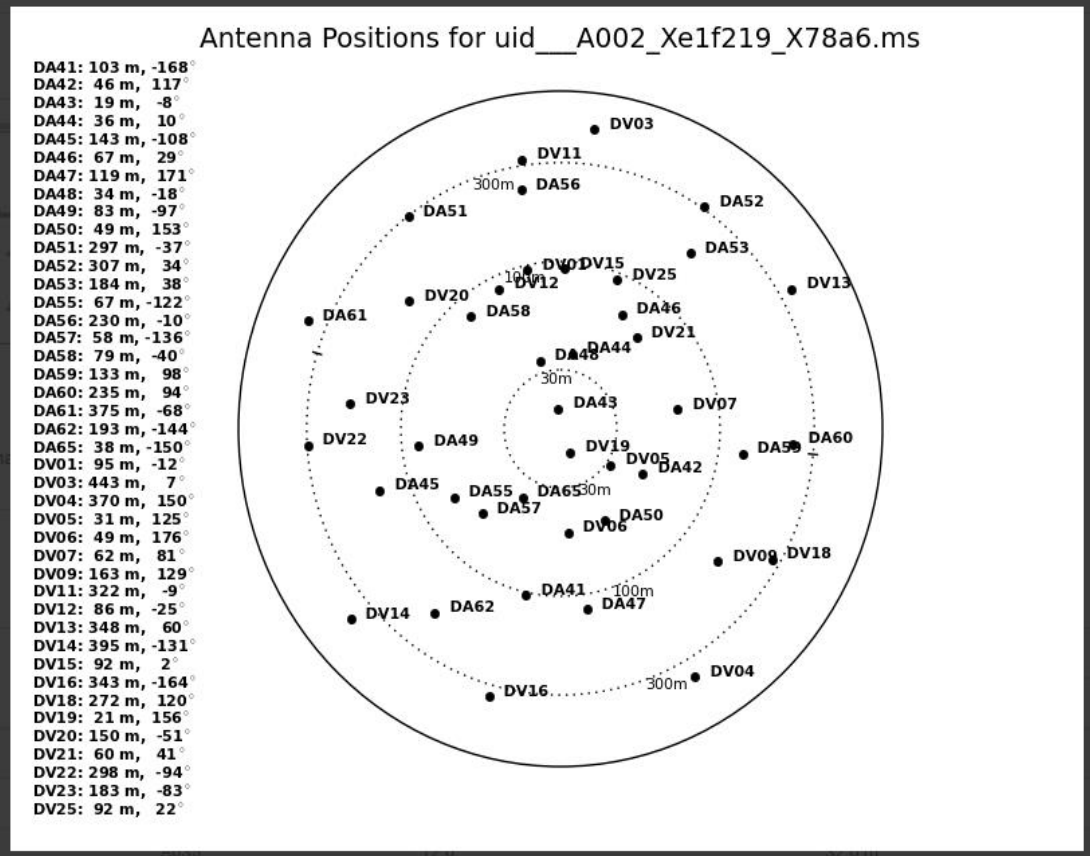
UV coverage

UV Coverage

UV coverage plot for TARGET field B335 (#2), spw 25.

Antenna Details

ID	Name				Latitude
0	DA41				-827.0 m
1	DA42				-747.2 m
2	DA43				-706.8 m
3	DA44	A002	12.0	40.6 m	-690.2 m
4	DA45	A069	12.0	-101.5 m	-770.1 m
5	DA46	A008	12.0	67.6 m	-667.7 m



Session: session_1
uid___A002_Xe1f219_X78a6.ms

Overview of 'uid___A002_Xe1f219_X78a6.ms'

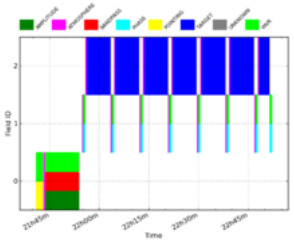
Observation Execution Time

Start Time	2019-10-08 21:41:01
End Time	2019-10-08 22:52:03
Total Time on Source	1:05:53
Total Time on Science Target	0:45:36

LISTOBS OUTPUT

Intent vs Time

Track scan intent vs time



Field vs Time

Track observed field vs time

Spatial Setup

Science Targets	'B335'
Calibrators	'J1924-2914' and 'J1938+0448'

Spectral Setup

All Bands	'ALMA Band 7' and 'WVR'
Science Bands	'ALMA Band 7'

Antenna Setup

Min Baseline	15.1 m
Max Baseline	783.5 m
Number of Baselines	861
Number of Antennas	42

Sky Setup

Min Elevation	55.62 degrees
Max Elevation	76.35 degrees

```
  2    none B335                19:37:00.890000 +07.34.09.59000 ICRS    2       44852346
Spectral Windows:  (33 unique spectral windows and 2 unique polarization setups)
  SpwID  Name                                          #Chans   Frame   Ch0(MHz)  ChanWid(kHz)  TotBW(kHz) CtrFreq(MHz) BBC Num  Corrs
  0      X176064364#ALMA_RB_07#BB_1#SQLD                    1   TOPO  302513.106   2000000.000   2000000.0 302513.1062        1  XX  YY
  1      X176064364#ALMA_RB_07#BB_2#SQLD                    1   TOPO  304408.606   2000000.000   2000000.0 304408.6062        2  XX  YY
  2      X176064364#ALMA_RB_07#BB_3#SQLD                    1   TOPO  314513.106   2000000.000   2000000.0 314513.1062        3  XX  YY
  3      X176064364#ALMA_RB_07#BB_4#SQLD                    1   TOPO  316471.106   2000000.000   2000000.0 316471.1062        4  XX  YY
  4      WVR#NOMINAL                                        4   TOPO  184550.000   1500000.000   7500000.0 187550.0000        0  XX
  5      X176064364#ALMA_RB_07#BB_1#SW-01#FULL_RES        128   TOPO  303505.294    -15625.000   2000000.0 302513.1062        1  XX  YY
  6      X176064364#ALMA_RB_07#BB_1#SW-01#CH_AVG            1   TOPO  302489.669   1781250.000   1781250.0 302489.6687        1  XX  YY
  7      X176064364#ALMA_RB_07#BB_2#SW-01#FULL_RES        128   TOPO  305400.794    -15625.000   2000000.0 304408.6062        2  XX  YY
  8      X176064364#ALMA_RB_07#BB_2#SW-01#CH_AVG            1   TOPO  304385.169   1781250.000   1781250.0 304385.1687        2  XX  YY
  9      X176064364#ALMA_RB_07#BB_3#SW-01#FULL_RES        128   TOPO  313520.919     15625.000   2000000.0 314513.1062        3  XX  YY
  10     X176064364#ALMA_RB_07#BB_3#SW-01#CH_AVG            1   TOPO  314489.669   1781250.000   1781250.0 314489.6687        3  XX  YY
  11     X176064364#ALMA_RB_07#BB_4#SW-01#FULL_RES        128   TOPO  315478.919     15625.000   2000000.0 316471.1062        4  XX  YY
  12     X176064364#ALMA_RB_07#BB_4#SW-01#CH_AVG            1   TOPO  316447.669   1781250.000   1781250.0 316447.6687        4  XX  YY
  13     X176064364#ALMA_RB_07#BB_1#SQLD                    1   TOPO  316263.106   2000000.000   2000000.0 316263.1062        1  XX  YY
  14     X176064364#ALMA_RB_07#BB_2#SQLD                    1   TOPO  316033.392   2000000.000   2000000.0 316033.3919        2  XX  YY
  15     X176064364#ALMA_RB_07#BB_3#SQLD                    1   TOPO  302263.106   2000000.000   2000000.0 302263.1062        3  XX  YY
  16     X176064364#ALMA_RB_07#BB_4#SQLD                    1   TOPO  303471.106   2000000.000   2000000.0 303471.1062        4  XX  YY
  17     X176064364#ALMA_RB_07#BB_1#SW-01#FULL_RES        128   TOPO  315270.919     15625.000   2000000.0 316263.1062        1  XX  YY
  18     X176064364#ALMA_RB_07#BB_1#SW-01#CH_AVG            1   TOPO  316255.294   1875000.000   1875000.0 316255.2937        1  XX  YY
  19     X176064364#ALMA_RB_07#BB_2#SW-01#FULL_RES        128   TOPO  315041.204     15625.000   2000000.0 316033.3919        2  XX  YY
  20     X176064364#ALMA_RB_07#BB_2#SW-01#CH_AVG            1   TOPO  316025.579   1875000.000   1875000.0 316025.5794        2  XX  YY
  21     X176064364#ALMA_RB_07#BB_3#SW-01#FULL_RES        128   TOPO  303255.294    -15625.000   2000000.0 302263.1062        3  XX  YY
  22     X176064364#ALMA_RB_07#BB_3#SW-01#CH_AVG            1   TOPO  302255.294   1875000.000   1875000.0 302255.2937        3  XX  YY
  23     X176064364#ALMA_RB_07#BB_4#SW-01#FULL_RES        128   TOPO  304463.294    -15625.000   2000000.0 303471.1062        4  XX  YY
  24     X176064364#ALMA_RB_07#BB_4#SW-01#CH_AVG            1   TOPO  303455.481   1796875.000   1796875.0 303455.4812        4  XX  YY
  25     X176064364#ALMA_RB_07#BB_1#SW-01#FULL_RES       1920   TOPO  316665.114      122.070    234375.0 316782.2408        1  XX  YY
  26     X176064364#ALMA_RB_07#BB_1#SW-01#CH_AVG            1   TOPO  316782.210    234375.000    234375.0 316782.2102        1  XX  YY
  27     X176064364#ALMA_RB_07#BB_2#SW-01#FULL_RES        960   TOPO  315831.579      488.281    468750.0 316065.7100        2  XX  YY
  28     X176064364#ALMA_RB_07#BB_2#SW-01#CH_AVG            1   TOPO  316065.588    468750.000    468750.0 316065.5879        2  XX  YY
  29     X176064364#ALMA_RB_07#BB_2#SW-02#FULL_RES        960   TOPO  315766.943      488.281    468750.0 316001.0738        2  XX  YY
  30     X176064364#ALMA_RB_07#BB_2#SW-02#CH_AVG            1   TOPO  316000.952    468750.000    468750.0 316000.9517        2  XX  YY
  31     X176064364#ALMA_RB_07#BB_3#SW-01#FULL_RES       1920   TOPO  301973.189     -244.141    468750.0 301738.9363        3  XX  YY
  32     X176064364#ALMA_RB_07#BB_3#SW-01#CH_AVG            1   TOPO  301738.875    468750.000    468750.0 301738.8753        3  XX  YY
Sources: 201
```

WVR

Tsys

Science

```
   ObservationID = 0         ArrayID = 0
  Date        Timerange (UTC)          Scan  FldId FieldName             nRows     SpwIds   Average Interval(s)    ScanIntent
  08-Oct-2019/21:41:01.8 - 21:42:56.7     1      0 J1924-2914            1603980  [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_WVR#ON_SOURCE]
              21:43:15.5 - 21:43:32.2     2      0 J1924-2914             279174  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              21:43:45.4 - 21:53:52.0     3      0 J1924-2914            9532908  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [CALIBRATE_BANDPASS#ON_SOURCE,CALIBRATE_FLUX#ON_SOURCE,CALIBRATE_WVR#ON_SOURCE]
              21:54:51.3 - 21:55:07.9     4      1 J1938+0448             279174  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              21:55:13.1 - 21:55:43.4     5      1 J1938+0448             476637  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_WVR#ON_SOURCE]
              21:55:53.5 - 21:56:09.8     6      2 B335                   279132  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              21:56:14.2 - 22:03:20.4     7      2 B335                  6673086  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [OBSERVE_TARGET#ON_SOURCE]
              22:03:32.0 - 22:03:48.2     8      1 J1938+0448             279132  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              22:03:52.7 - 22:04:23.7     9      1 J1938+0448             476637  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_WVR#ON_SOURCE]
              22:04:34.2 - 22:04:50.5    10      2 B335                   279132  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              22:04:54.9 - 22:12:01.0    11      2 B335                  6673086  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [OBSERVE_TARGET#ON_SOURCE]
              22:12:12.7 - 22:12:28.9    12      1 J1938+0448             279132  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              22:12:33.4 - 22:13:04.6    13      1 J1938+0448             476679  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_WVR#ON_SOURCE]
              22:13:14.9 - 22:13:31.0    14      2 B335                   279132  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              22:13:35.6 - 22:20:41.4    15      2 B335                  6673086  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [OBSERVE_TARGET#ON_SOURCE]
              22:20:52.2 - 22:21:09.3    16      1 J1938+0448             279132  [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,CALIBRATE_ATMOSPHERE#HOT,CALIBRATE_ATMOSPHERE#OFF_SOURCE,CALIBRATE_WVR#AMBIENT,CALIBRATE_WVR#HOT,CALIBRATE_WVR#OFF_SOURCE]
              22:21:14.1 - 22:21:45.0    17      1 J1938+0448             476637  [4,13,14,15,16,23,24,25,26,27,28,29,30,31,32]  [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, 6.05, 1.01] [CALIBRATE_PHASE#ON_SOURCE,CALIBRATE_WVR#ON_SOURCE]
```

Warnings and Errors

Stage	Task	Type	Message
10	hif_lowgainflag	Warning	uid___A002_Xe1f219_X78a6.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more spws: DA58 and DA61
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 23, the following antennas are fully flagged: DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 25, the following antennas are fully flagged: DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 27, the following antennas are fully flagged: DA58, DA61, DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 29, the following antennas are fully flagged: DA58, DA61, DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 31, the following antennas are fully flagged: DA61, DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - the following antennas are fully flagged in all spws for one or more fields with intents among BANDPASS: DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.ms - the following reference antennas are removed from the refant list because they became fully flagged in all spws for one of the intents among BANDPASS: DV03
12	hifa_bandpassflag	Warning	uid___A002_Xe1f219_X78a6.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: DA58 and DA61
13	hifa_spwphaseup	QA Warning	Spw mapping across sidebands required for uid___A002_Xe1f219_X78a6.ms
13	hifa_spwphaseup	Warning	Some low SNR spws - using highest good SNR window for these in uid___A002_Xe1f219_X78a6.ms

Tasks by Topic

Topic	Lowest Scoring Task		Min Score
Data Sets	17. **hif_applycal**: Apply calibrations from context		0.91
Calibration	13. **hifa_spwphaseup**: Spw phase offsets calibration	Spw mapping across sidebands	0.66
Flagging	17. **hif_applycal**: Apply calibrations from context		0.91
Imaging	19. **hif_makeimages**: Make calibrator images		1.00
Miscellaneous	5. **hif_refant**: Select reference antennas		1.00

Total unflaggedAntena : 42
Flagged : 3
Total flagged Antena : 39 > 35

Home | By Topic | By Task

Flagging Summaries

uid___A002_Xe1f219_X78a6.ms

Flagging percentages for Source name: J1924-2914, Intents: ATMOSPHERE,AMPLITUDE,POINTING,WVR,BANDPASS

spw	DA41	DA42	DA43	DA44	DA45	DA46	DA47	DA48	DA49	DA50	DA51	DA52	DA53	DA55	DA56	DA57	DA58	DA59	DA60	DA61	DA62	DA65	DV01	DV03	DV04	DV05	DV06	DV07	DV09	DV11	DV12	DV13	DV14	DV15	DV16	DV18	DV19	DV20	DV21
23	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	100.00	29.90	29.90	100.00	29.90	29.90	29.90	100.00	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90	29.90
25	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	100.00	9.52	9.52	100.00	9.52	9.52	9.52	100.00	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
27	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	100.00	9.52	9.52	100.00	9.52	9.52	9.52	100.00	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
29	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	100.00	9.52	9.52	100.00	9.52	9.52	9.52	100.00	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
31	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	100.00	9.52	9.52	100.00	9.52	9.52	9.52	100.00	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52

Flagging percentages for Source name: B335, Intents: ATMOSPHERE,TARGET

spw	DA41	DA42	DA43	DA44	DA45	DA46	DA47	DA48	DA49	DA50	DA51	DA52	DA53	DA55	DA56	DA57	DA58	DA59	DA60	DA61	DA62	DA65	DV01	DV03	DV04	DV05	DV06	DV07	DV09	DV11	DV12	DV13	DV14	DV15	DV16	DV18	DV19	DV20	DV21
23	36.35	36.35	36.35	36.31	36.28	36.28	36.35	36.35	36.35	36.28	36.31	36.31	36.35	36.31	36.31	36.35	100.00	36.35	36.31	100.00	36.35	36.31	36.31	100.00	36.35	36.35	36.31	36.31	36.35	36.31	36.35	36.31	36.35	36.35	36.31	36.31	36.35	36.31	36.35
25	9.93	9.93	9.93	9.88	9.83	9.83	9.93	9.93	9.93	9.83	9.87	9.88	9.93	9.88	9.87	9.93	100.00	9.93	9.88	100.00	9.93	9.87	9.88	100.00	9.93	9.93	9.88	9.87	9.93	9.87	9.93	9.87	9.93	9.93	9.87	9.88	9.93	9.87	9.93
27	9.93	9.93	9.93	9.88	9.83	9.83	9.93	9.93	9.93	9.83	9.87	9.88	9.93	9.88	9.87	9.93	100.00	9.93	9.88	100.00	9.93	9.87	9.88	100.00	9.93	9.93	9.88	9.87	9.93	9.87	9.93	9.87	9.93	9.93	9.87	9.88	9.93	9.87	9.93
29	9.93	9.93	9.93	9.88	9.83	9.83	9.93	9.93	9.93	9.83	9.87	9.88	9.93	9.88	9.87	9.93	100.00	9.93	9.88	100.00	9.93	9.87	9.88	100.00	9.93	9.93	9.88	9.87	9.93	9.87	9.93	9.87	9.93	9.93	9.87	9.88	9.93	9.87	9.93
31	9.93	9.93	9.93	9.88	9.83	9.83	9.93	9.93	9.93	9.83	9.87	9.88	9.93	9.88	9.87	9.93	100.00	9.93	9.88	100.00	9.93	9.87	9.88	100.00	9.93	9.93	9.88	9.87	9.93	9.87	9.93	9.87	9.93	9.93	9.87	9.88	9.93	9.87	9.93

Task Summaries

Task	QA Score	Duration
1. **hifa_importdata**: Register measurement sets with the pipeline	1.00	1:22:59
2. **hifa_flagdata**: ALMA deterministic flagging	1.00	6:27:26
3. **hifa_fluxcalflag**: Flag spectral features in solar system flux calibrators	1.00	0:00:14
4. **hif_rawflagchans**: Flag channels in raw data	1.00	0:36:44
5. **hif_refant**: Select reference antennas	1.00	0:01:28
6. **h_tsyscal**: Calculate Tsys calibration	1.00	0:23:31
7. **hifa_tsysflag**: Flag Tsys calibration	0.96	0:33:28
8. **hifa_antpos**: Correct for antenna position offsets	Nonzero antenna position offsets 0.90	0:00:19
9. **hifa_wvrgcalflag**: Calculate and flag WVR calibration	0.97	0:44:12
10. **hif_lowgainflag**: Flag antennas with low gain	1.00	0:58:51
11. **hif_setmodels**: Set calibrator model visibilities	1.00	0:42:46
12. **hifa_bandpassflag**: Phase-up bandpass calibration and flagging	0.91	4:12:00
13. **hifa_spwphaseup**: Spw phase offsets calibration	Spw mapping across sidebands 0.66	0:11:32
14. **hifa_gfluxscaleflag**: Phased-up flux scale calibration + flagging	1.00	1:19:15
15. **hifa_gfluxscale**: Transfer fluxscale from amplitude calibrator	1.00	1:10:40
16. **hifa_timegaincal**: Gain calibration	1.00	2:03:46
17. **hif_applycal**: Apply calibrations from context	0.91	5:43:33
18. **hif_makeimlist**: Set-up parameters for bandpass calibrator & flux calibrator & phase calibrator imaging	1.00	0:05:20
19. **hif_makeimages**: Make calibrator images	1.00	1:08:43
20. **hif_makeimlist**: Set-up parameters for check source imaging	No clean targets expected N/A	0:00:20
21. **hif_makeimages**: Make check source images	Nothing to image N/A	0:00:25
22. **hifa_imageprecheck**: ImagePreCheck	1.00	3:57:20
23. **hif_checkproductsize**: Check product size	1.00	0:15:17

	DV12	5.12e-04	-4.73e-04	-4.66e-04
	DV13	7.39e-04	-2.11e-03	-9.14e-04
	DV15	9.47e-04	-6.90e-04	-5.70e-04
	DV16	3.80e-04	-3.91e-04	-2.02e-04
	DV18	2.69e-04	-1.56e-04	1.42e-04
	DV19	1.11e-04	-1.76e-03	-3.78e-04
	DV21	2.88e-04	1.78e-05	2.63e-04
	DV23	2.53e-05	7.57e-04	6.87e-04
	DV25	4.57e-04	-1.76e-04	9.46e-05

Antenna position offsets per measurement set

Pipeline QA

Score	Reason
0.90	29 nonzero antenna position offsets for uid___A002_Xe1f219_X78a6.ms

Pipeline QA summary for this task.

10. Flag antennas with low gain

BACK

Task notifications

Warning! uid___A002_Xe1f219_X78a6.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more spws: DA58 and DA61

Reference Antenna update

For the measurement set(s) listed below, the reference antenna list was updated due to significant flagging (antennas moved to end). 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_Xe1f219_X78a6.ms	DA43, DV19, DV05, DA48, DA44, DA65, DA42, DA50, DV06, DA57, DV21, DV07, DA55, DA46, DA49, DV12, DV15, DV25, DV01, DA41, DA47, DA59, DA45, DV20, DV09, DV23, DA53, DA62, DA56, DA60, DV18, DA51, DV22, DA52, DV11, DV16, DV13, DV04, DV14, DV03, DA58, DA61

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

Flags

Measurement Set	Flagging Commands	Number of Statements	Flagging Views
uid___A002_Xe1f219_X78a6.ms	uid___A002_Xe1f219_X78a6.ms-flag_commands.txt	0	Display

Report Files

1. Import Data

BACK

Data from 1 measurement set was registered with the pipeline. The imported data is summarised below.

Measurement Set	SchedBlock ID	Src Type	Dst Type	Number Imported			Size	flux.csv
				Scans	Fields	Flux Densities		
uid___A002_Xe1f219_X78a6.ms	uid://A001/X1469/Xba	ASDM	MS	32	3	10	55.6 GB	View or download

Summary of Imported Measurement Sets

Flux calibter should be monitored within a week

Imported Flux Densities

The following flux densities were imported into the pipeline context:

Measurement Set	Field	SpW	Flux Density				Spix	Age Of Nearest Monitor Point (days)
			I	Q	U	V		
uid___A002_Xe1f219_X78a6.ms	J1924-2914 (#0)	23	2.803 Jy	0.000 Jy	0.000 Jy	0.000 Jy	-0.574140895422	-2.0
		25	2.735 Jy					N/A
		27	2.738 Jy					
		29	2.739 Jy					
		31	2.812 Jy					
	J1938+0448 (#1)	23	124.000 mJy				-0.530530893799	
		25	121.200 mJy					81.0
		27	121.400 mJy					N/A
		29						
		31	124.400 mJy					

Flux densities imported from the ASDM. Online flux catalog values are used when available for ALMA

The following antennas were used for flux scaling, entries for unresolved flux calibrators are blank

Measurement Set	UV Range	Antennas
uid___A002_Xe1f219_X78a6.ms		

Antennas for Flux Calibration

Computed Flux Densities

Check the consistency in Flux ratio!

The following flux densities were set in the measurement set model column and recorded in the pipeline context:

				Derived Flux Density					
				Catalog Flux Density					
Measurement Set	Field	Spw	Frequency Bandwidth (TOPO)	I	Q	U	V	Flux Ratio (Derived / Catalog)	Spix
uid___A002_Xe1f219_X78a6.ms	J1938+0448 (#1) PHASE	23	303.471 GHz 2.000 GHz	91.771 mJy ± 2.617 mJy (2.9%)	0.000 Jy	0.000 Jy	0.000 Jy	0.740	0.0
				124.000 mJy	0.000 Jy	0.000 Jy	0.000 Jy		
		25	316.782 GHz 234.375 MHz	99.991 mJy ± 3.299 mJy (3.3%)	0.000 Jy	0.000 Jy	0.000 Jy	0.825	
				121.200 mJy	0.000 Jy	0.000 Jy	0.000 Jy		
		27	316.066 GHz 468.750 MHz	95.480 mJy ± 3.194 mJy (3.3%)	0.000 Jy	0.000 Jy	0.000 Jy	0.786	
				121.400 mJy	0.000 Jy	0.000 Jy	0.000 Jy		
		29	316.001 GHz 468.750 MHz	94.382 mJy ± 2.637 mJy (2.8%)	0.000 Jy	0.000 Jy	0.000 Jy	0.777	
				121.400 mJy	0.000 Jy	0.000 Jy	0.000 Jy		
		31	301.739 GHz 468.750 MHz	97.397 mJy ± 3.126 mJy (3.2%)	0.000 Jy	0.000 Jy	0.000 Jy	0.783	
				124.400 mJy	0.000 Jy	0.000 Jy	0.000 Jy		

Phased-up Fluxscale Results

The following antennas were used for flux scaling, entries for unresolved flux calibrators are blank

Measurement Set	UV Range	Antennas
uid___A002_Xe1f219_X78a6.ms		

Antennas for Flux Calibration

Computed Flux Densities

Check the consistency in Flux ratio!

The following flux densities were set in the measurement set model column and recorded in the pipeline context:

				Derived Flux Density					
				Catalog Flux Density					
Measurement Set	Field	Spw	Frequency Bandwidth (TOPO)	I	Q	U	V	Flux Ratio (Derived / Catalog)	Spix
uid___A002_Xe1f219_X78a6.ms	J1938+0448 (#1) PHASE	23	303.471 GHz 2.000 GHz	91.771 mJy ± 2.617 mJy (2.9%)	0.000 Jy	0.000 Jy	0.000 Jy	0.740	0.0

Pipeline QA

Score	Reason
1.00	All expected derived fluxes present for uid___A002_Xe1f219_X78a6.ms
1.00	No low SNR derived fluxes for uid___A002_Xe1f219_X78a6.ms
1.00	Ratio of $S_{derived}/S_{catalogue}$ for J1938+0448 (WVR,PHASE,ATMOSPHERE) spw 25 in uid___A002_Xe1f219_X78a6.ms differs by 9% from the ratio for the highest SNR spw (23)
1.00	Ratio of $S_{derived}/S_{catalogue}$ for J1938+0448 (WVR,PHASE,ATMOSPHERE) spw 27 in uid___A002_Xe1f219_X78a6.ms differs by 4% from the ratio for the highest SNR spw (23)
1.00	Ratio of $S_{derived}/S_{catalogue}$ for J1938+0448 (WVR,PHASE,ATMOSPHERE) spw 29 in uid___A002_Xe1f219_X78a6.ms differs by 3% from the ratio for the highest SNR spw (23)
1.00	Ratio of $S_{derived}/S_{catalogue}$ for J1938+0448 (WVR,PHASE,ATMOSPHERE) spw 31 in uid___A002_Xe1f219_X78a6.ms differs by 6% from the ratio for the highest SNR spw (23)

Pipeline QA summary for this task.

5. Select Reference Antenna

BACK

Each antenna was ranked according to a flagging score and a geometric score, based on the distance between the antenna to the centre of the array.

Measurement Set	Reference Antennas (Highest to Lowest)
uid___A002_Xe1f219_X78a6.ms	DA43, DV19, DV05, DA48, DA44, DA65, DA42, DA50, DV06, DA57, DV21, DV07, DA55, DA46, DA49, DV12, DV15, DV25, DV01, DA41, DA47, DA59, DA45, DV20, DV09, DV23, DA53, DA62, DA56, DA60, DV18, DA51, DV22, DA52, DV11, DV16, DV13, DV04, DA58, DA61, DV14, DV03

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

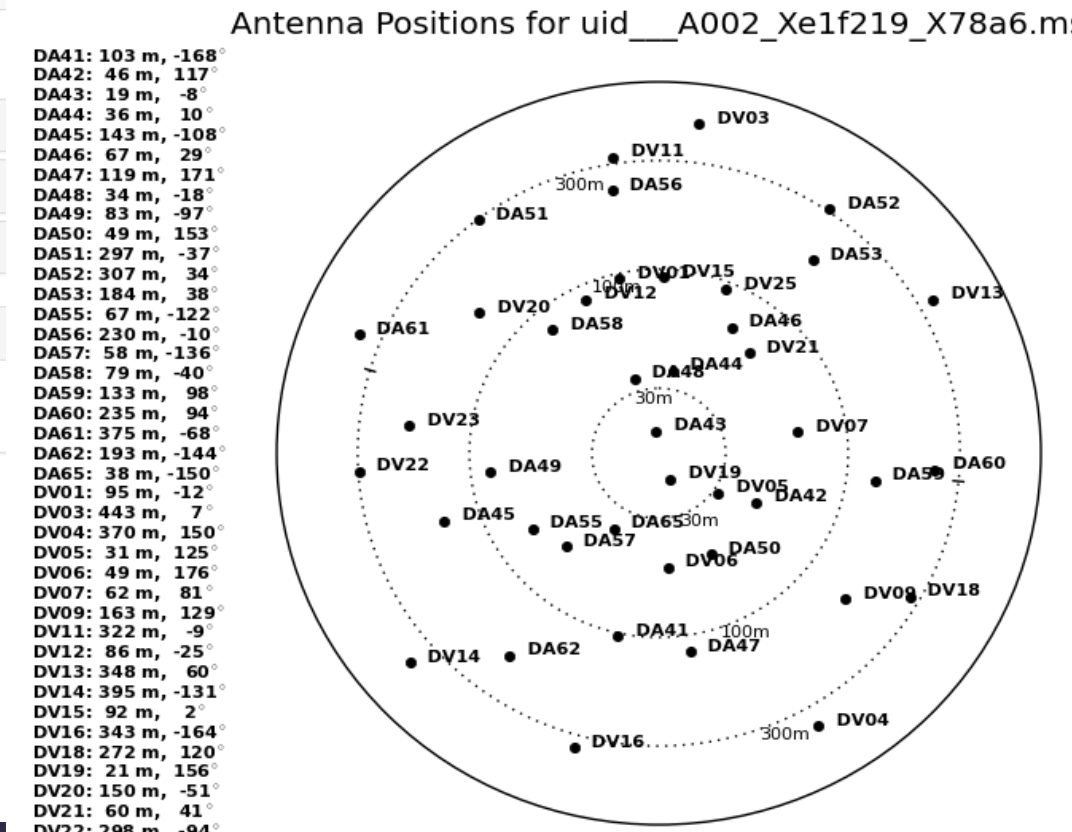
Pipeline QA

Input Parameters

Tasks Execution Statistics

CASA logs for stage 5

- View or download stage5/casapy.log (33.7 KB)



10. Flag antennas with low gain

BACK

Task notifications

Warning! uid___A002_Xe1f219_X78a6.ms - the following antennas are moved to the end of the refant list because they are fully flagged for one or more spws: DA58 and DA61

Reference Antenna update

For the measurement set(s) listed below, the reference antenna list was updated due to significant flagging (antennas moved to end). 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_Xe1f219_X78a6.ms	DA43, DV19, DV05, DA48, DA44, DA65, DA42, DA50, DV06, DA57, DV21, DV07, DA55, DA46, DA49, DV12, DV15, DV25, DV01, DA41, DA47, DA59, DA45, DV20, DV09, DV23, DA53, DA62, DA56, DA60, DV18, DA51, DV22, DA52, DV11, DV16, DV13, DV04, DV14, DV03, DA58, DA61

Use this reference antenna during the selfcalibration

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

Flags

Measurement Set	Flagging Commands	Number of Statements	Flagging Views
uid___A002_Xe1f219_X78a6.ms	uid___A002_Xe1f219_X78a6.ms-flag_commands.txt	0	Display

Report Files

Pipeline QA

Input Parameters

Tasks Execution Statistics

CASA logs for stage 10

17. Apply calibration tables

BACK

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

Contents

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_Xe1f219_X78a6.ms	157.6 GB	TARGET	B335	23, 25, 27, 29, 31	0~41	T_{sys}	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 17, 19, 21, 23, 17, 17, 19, 19, 21, 21, **23**, 23, **17**, 17, **19**, 19, **19**, 19, **21**, 21	B335	linear, linear	True	Filename
						antpos				False	Filename
						WVR			nearest	False	Filename
						Bandpass			linearperobs	True	Filename

ALMA

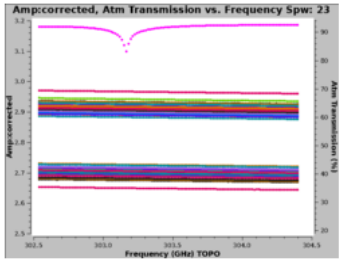
Tasks in execution order

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_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

Calibrated amplitude vs frequency

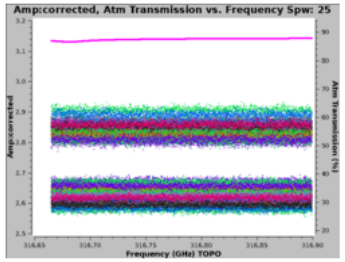
Plots of calibrated amplitude vs frequency for all antennas and correlations, coloured by antenna. The atmospheric transmission for each spectral window is overlayed on each plot in pink.

uid___A002_Xe1f219_X78a6.ms



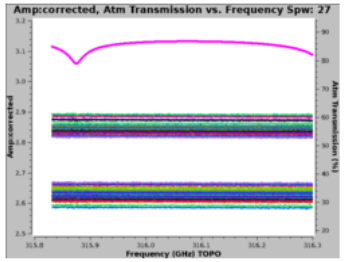
Spw 23
ALMA Band 7

Amplitude calibrator: J1924-2914.



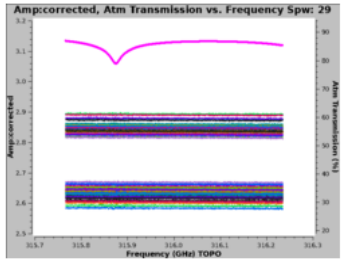
Spw 25
ALMA Band 7

Amplitude calibrator: J1924-2914.



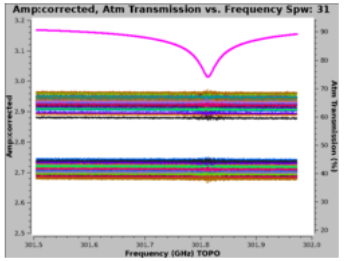
Spw 27
ALMA Band 7

Amplitude calibrator: J1924-2914.



Spw 29
ALMA Band 7

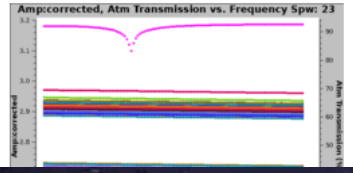
Amplitude calibrator: J1924-2914.

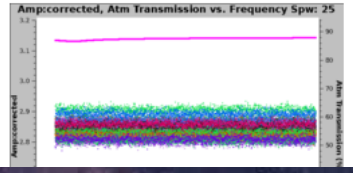


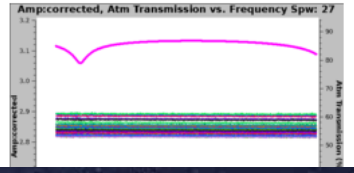
Spw 31
ALMA Band 7

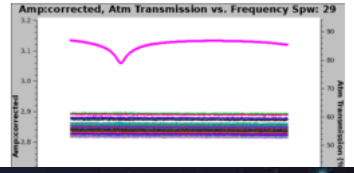
Amplitude calibrator: J1924-2914.

Bandpass (Amp vs. Freq)
: check the outlier or line





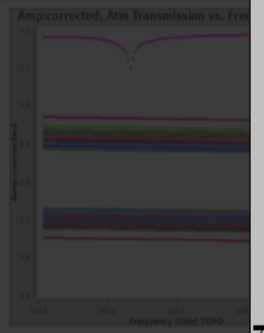




Calibrated amplitude vs frequency

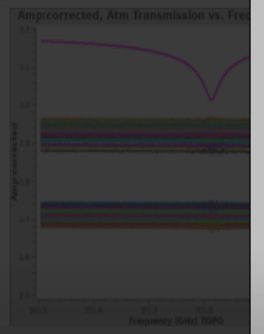
Plots of calibrated amplitude vs frequency for all antennas and correlations, coloured by antenna. The atmospheric transmission for each spectral window is overlayed on each plot in pink.

uid___A002_Xe1f219_X78a6.ms

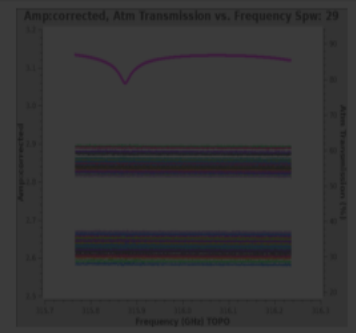


Spw 23
ALMA Band 7

Amplitude calibrator: J1924-2914.

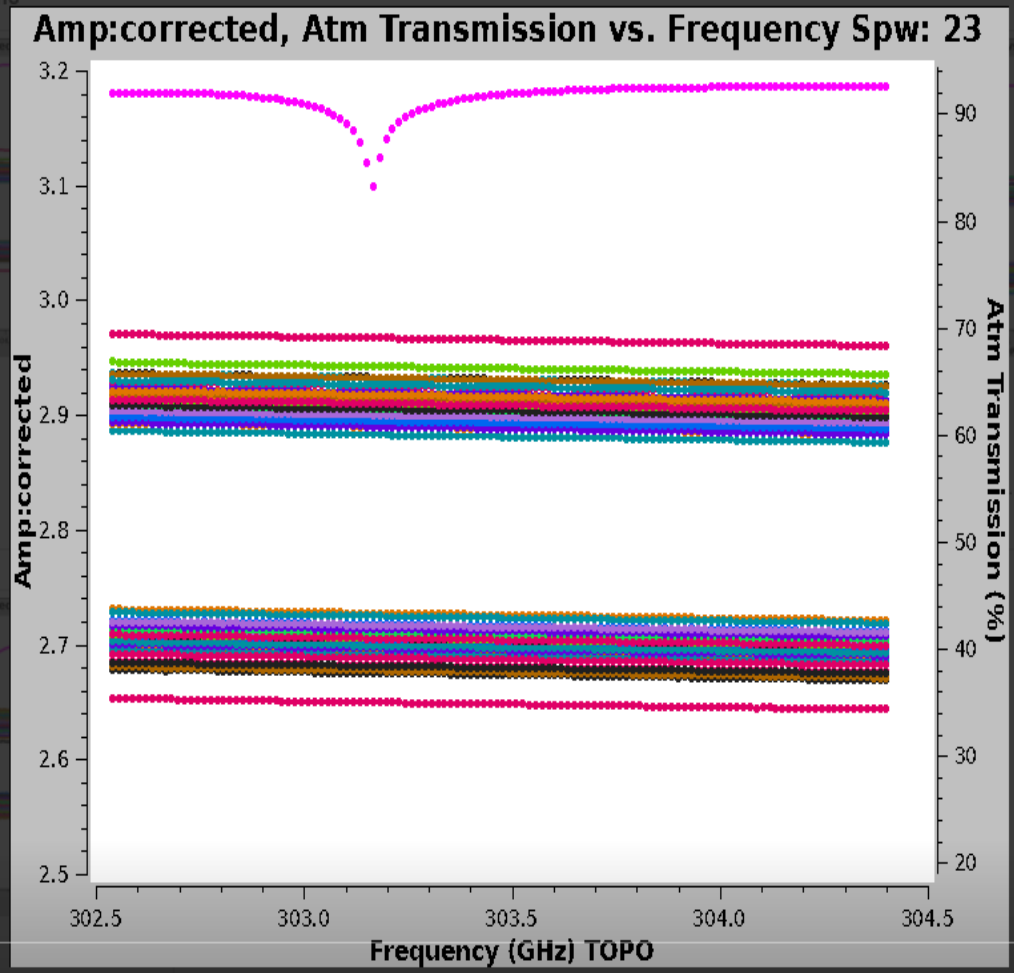


Spw 31
ALMA Band 7



Spw 29
ALMA Band 7

Amplitude calibrator: J1924-2914.

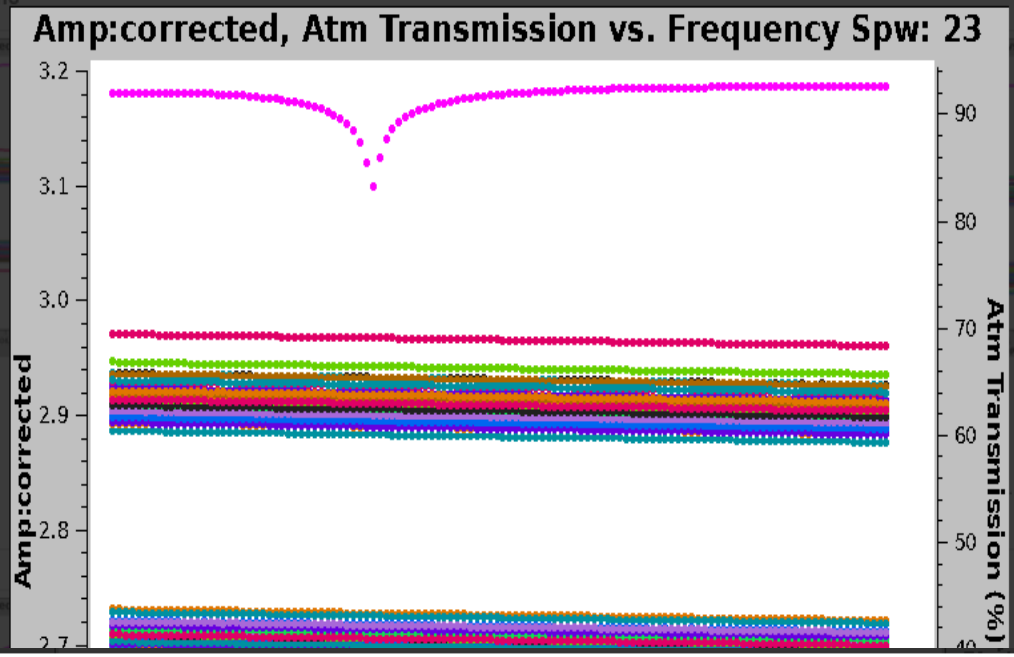


Receiver: ALMA Band 7

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 overlayed on each plot in pink.

uid___A002_Xe1f219_X78a6.ms



Spw 23
ALMA Band 7

Amplitude calibrator: J1924-2914.

Spw 29
ALMA Band 7

Amplitude calibrator: J1924-2914.

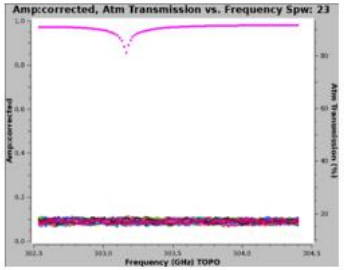
Plot Command

plotms(vis='uid___A002_Xe1f219_X78a6.ms', xaxis='freq', yaxis='amp', ydatacolumn='corrected', field='J1924-2914', spw='23', correlation='XX,YY', intent='CALIBRATE_FLUX#ON_SOURCE', avgtime='1e8', avgscan=True, avgantenna=True, yselfscale=True, coloraxis='antenna1', plotrange=[0, 0, 0, 0], plotfile='uid___A002_Xe1f219_X78a6.ms-J1924-2914-spw23-AMPLITUDE-amp_vs_freq-XX_YY.png', overwrite=True, showgui=False, clearplots=True, showatm=True)

CLOSE

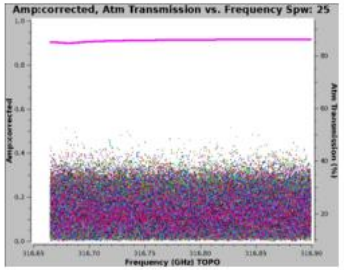
ALMA Band 7

Bandpass calibrator: J1924-2914.



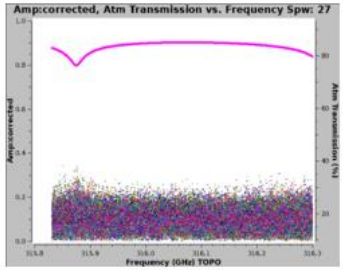
Spw 23
ALMA Band 7

Phase calibrator: J1938+0448.



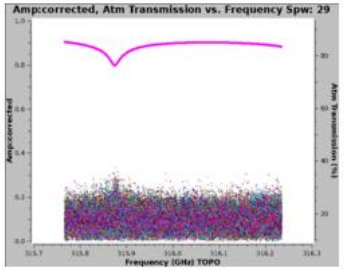
Spw 25
ALMA Band 7

Phase calibrator: J1938+0448.



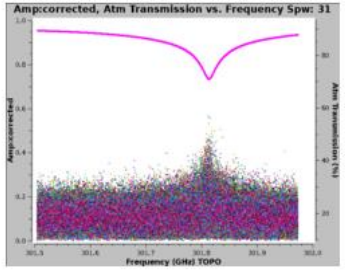
Spw 27
ALMA Band 7

Phase calibrator: J1938+0448.



Spw 29
ALMA Band 7

Phase calibrator: J1938+0448.



Spw 31
ALMA Band 7

Phase calibrator: J1938+0448.

Phase calibrator (Amp vs. Freq)
: check the outlier or line
(contribution of line to the total BW)

Calibrated phase vs frequency

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

uid___A002_Xe1f219_X78a6.ms

ALMA

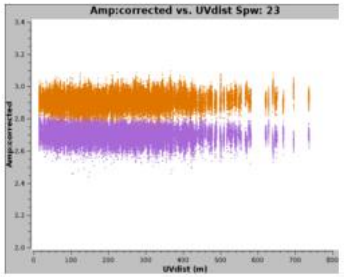
Tasks in execution order

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_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

Calibrated amplitude vs UV distance

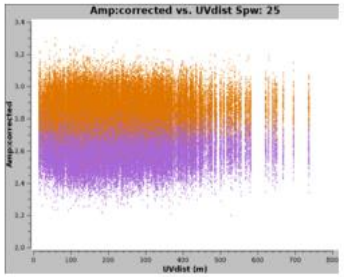
Plots of calibrated amplitude vs UV distance for the calibrators in each measurement set. Data are plotted for all antennas, coloured by correlation.

uid___A002_Xe1f219_X78a6.ms



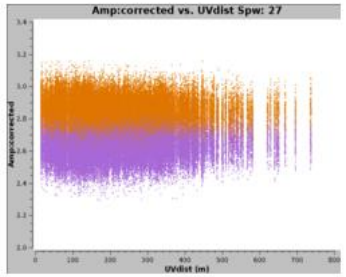
Spectral Window 23
ALMA Band 7

Amplitude calibrator: J1924-2914



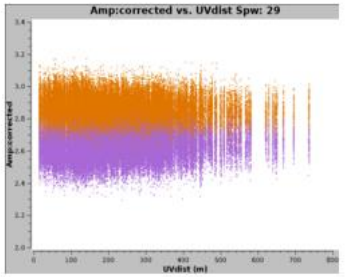
Spectral Window 25
ALMA Band 7

Amplitude calibrator: J1924-2914



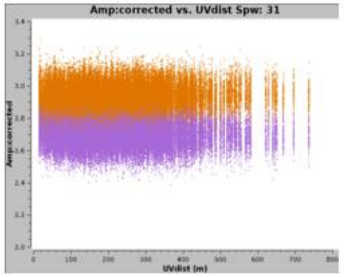
Spectral Window 27
ALMA Band 7

Amplitude calibrator: J1924-2914



Spectral Window 29
ALMA Band 7

Amplitude calibrator: J1924-2914



Spectral Window 31
ALMA Band 7

Amplitude calibrator: J1924-2914

Bandpass (Amp vs. UVdist)

: check the outlier and uv dist -independent

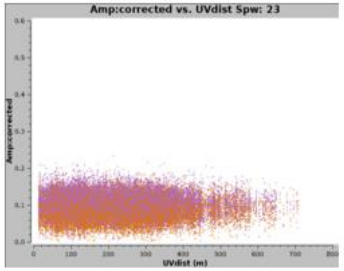
ALMA

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_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

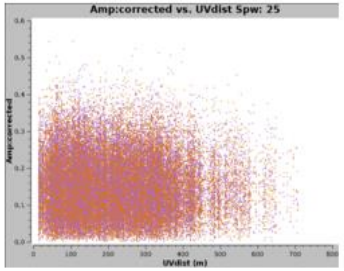
Spectral Window 31
ALMA Band 7

Bandpass calibrator: J1924-2914



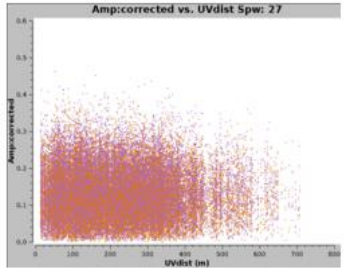
Spectral Window 23
ALMA Band 7

Phase calibrator: J1938+0448



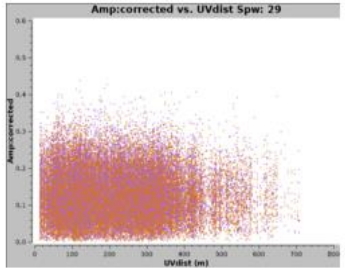
Spectral Window 25
ALMA Band 7

Phase calibrator: J1938+0448



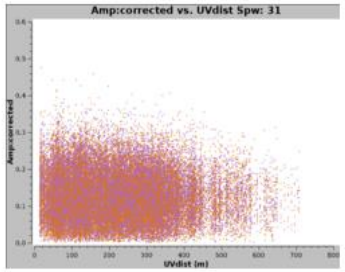
Spectral Window 27
ALMA Band 7

Phase calibrator: J1938+0448



Spectral Window 29
ALMA Band 7

Phase calibrator: J1938+0448



Spectral Window 31
ALMA Band 7

Phase calibrator: J1938+0448

Calibrated amplitude vs time

Plots of calibrated amplitude vs time for all fields, antennas and correlations. Data are coloured by field.

Phase (Amp vs. UVdist)

: check the outlier and uv dist -independent

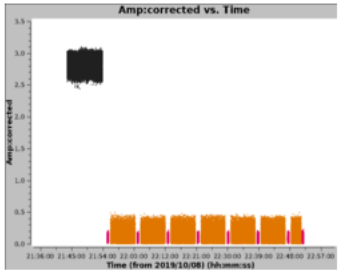
Spectral Window 31
ALMA Band 7

Phase calibrator: J1938+0448

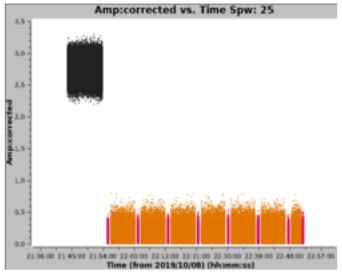
Calibrated amplitude vs time

Plots of calibrated amplitude vs time for all fields, antennas and correlations. Data are coloured by field.

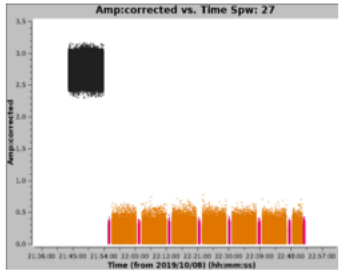
uid___A002_Xe1f219_X78a6.ms



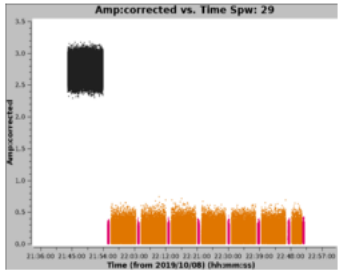
Spectral Window 23
ALMA Band 7



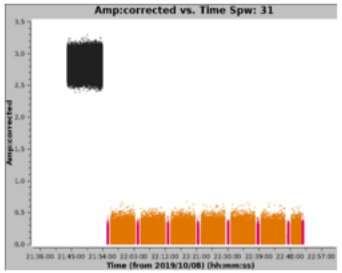
Spectral Window 25
ALMA Band 7



Spectral Window 27
ALMA Band 7



Spectral Window 29
ALMA Band 7



Spectral Window 31
ALMA Band 7

ALL (Amp vs. UVdist)
: check the outlier

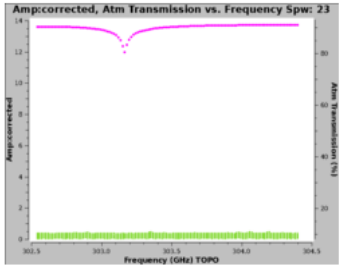
Calibrated phase vs time

Science target: calibrated amplitude vs frequency

Calibrated amplitude vs frequency plots for the each measurement set's representative source. For mosaics, the representative field is identified as the field with the highest median channel-averaged amplitude, calculated over all science spectral windows. The atmospheric transmission for each spectral window is overlayed on each plot in pink.

Data are plotted for all antennas and correlations, with different spectral windows shown in different colours.

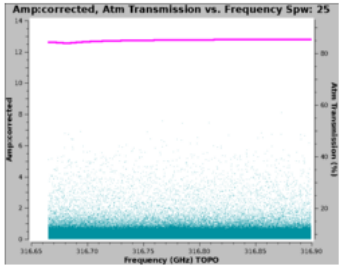
uid___A002_Xe1f219_X78a6.ms



Spw 23
ALMA Band 7

Source: B335 (#2)

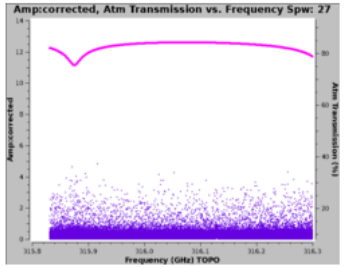
Field: B335



Spw 25
ALMA Band 7

Source: B335 (#2)

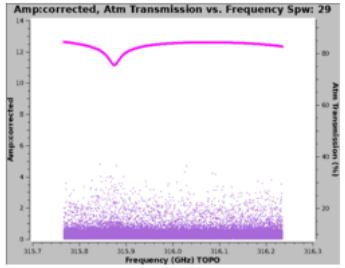
Field: B335



Spw 27
ALMA Band 7

Source: B335 (#2)

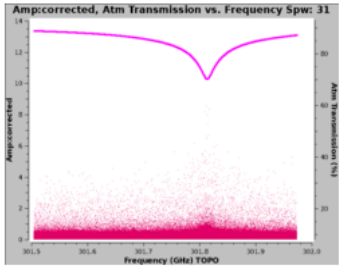
Field: B335



Spw 29
ALMA Band 7

Source: B335 (#2)

Field: B335



Spw 31
ALMA Band 7

Source: B335 (#2)

Field: B335

Target (Amp vs. Freq)
: check the outlier

ALMA

Tasks in execution order

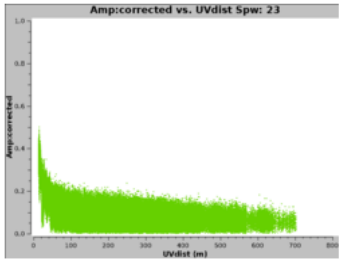
1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcalflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

Science target: calibrated amplitude vs UV distance

Calibrated amplitude vs frequency plots for the each measurement set's representative source. For mosaics, the representative field is identified as the field with the highest median channel-averaged amplitude, calculated over all science spectral windows. The atmospheric transmission for each spectral window is overlayed on each plot in pink.

Data are plotted for all antennas and correlations, with different spectral windows shown in different colours.

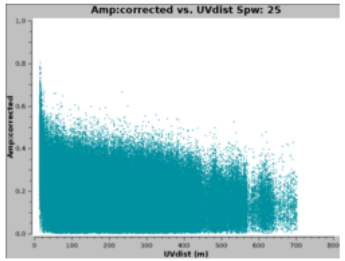
uid___A002_Xe1f219_X78a6.ms



Spw 23
ALMA Band 7

Source: B335 (#2)

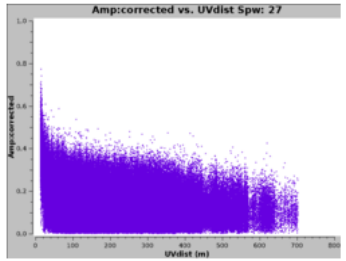
Field: B335



Spw 25
ALMA Band 7

Source: B335 (#2)

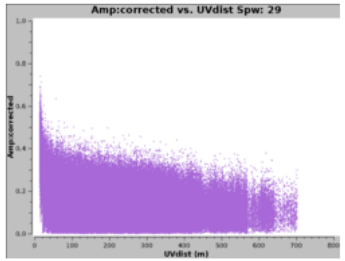
Field: B335



Spw 27
ALMA Band 7

Source: B335 (#2)

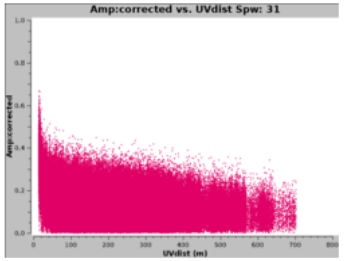
Field: B335



Spw 29
ALMA Band 7

Source: B335 (#2)

Field: B335



Spw 31
ALMA Band 7

Source: B335 (#2)

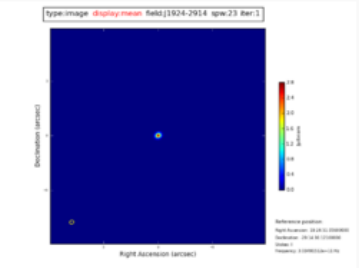
Field: B335

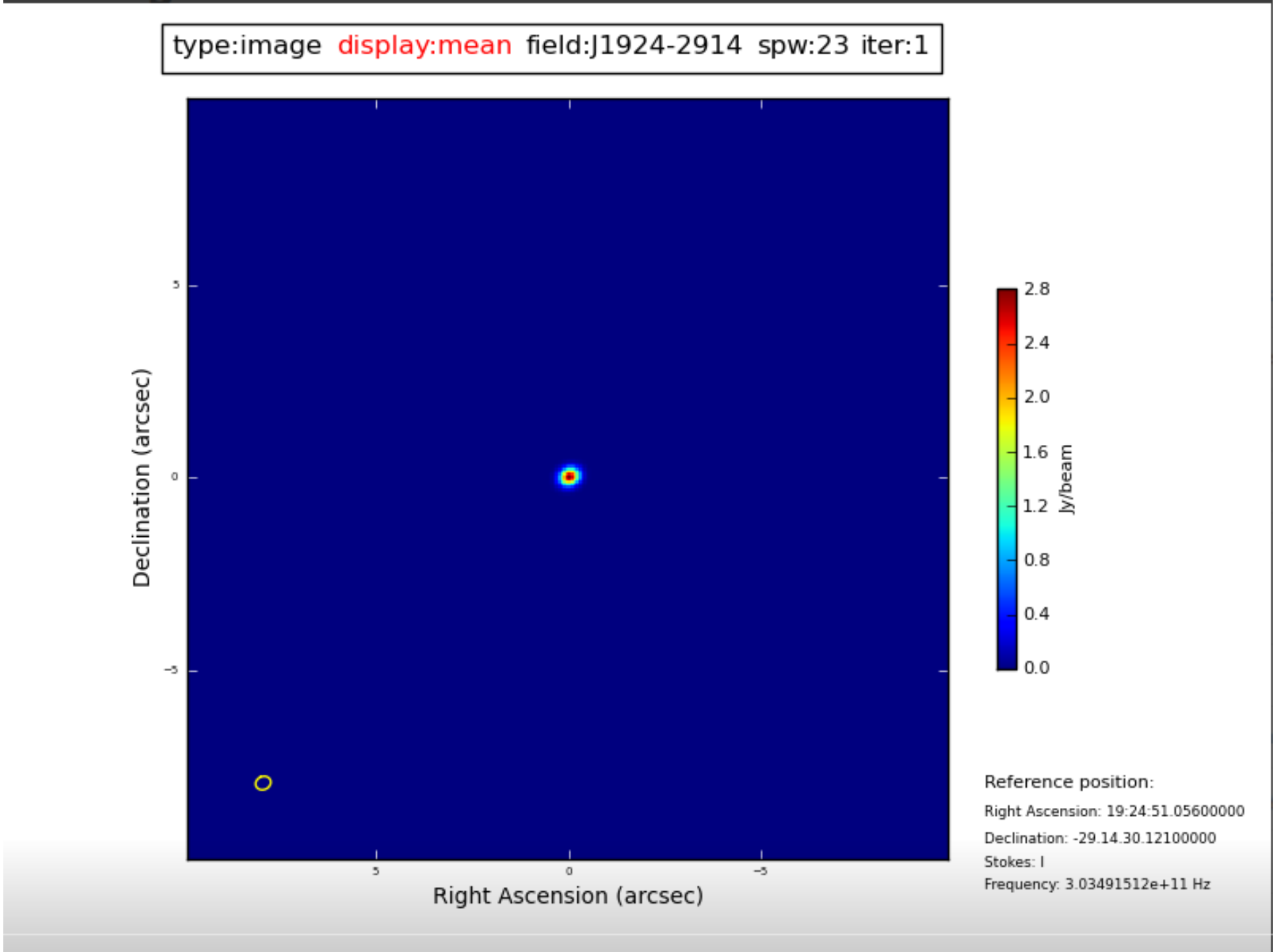
Target (Amp vs. uvdist)
: check the outlier

19. Tclean/MakeImages

Make calibrator images

Image Details

Field	Spw	Pol	Image details		Image result
J1924-2914 (BANDPASS)	23 / X176064364#ALMA_RB_07#BB_4#SW-01	I	**centre frequency of image**	303.4915GHz (LSRK)	 View other QA images...
			beam	0.403 x 0.340 arcsec	
			beam p.a.	-64.7deg	
			final theoretical sensitivity	6.3e-05 Jy/beam	
			cleaning threshold	0.0021 Jy/beam Dirty DR: 4.4e+04 DR correction: 17	
			clean residual peak / scaled MAD	8.96	
			non-pbcor image RMS	0.00025 Jy/beam	
			pbcor image max / min	2.80 / -0.00213 Jy/beam	
			fractional bandwidth / nterms	0.66% / 1	
			aggregate bandwidth	2 GHz (LSRK)	
			score	1.00	
			image file	uid___A001_X1469_Xc4.s19_0.J1924-2914_bp.spw23.mfs.I.iter1.image	


type:image display:mean field:J1924-2914 spw:23 iter:1
Declination (arcsec)
Right Ascension (arcsec)
5
0
−5
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
Jy/beam
Reference position:
Right Ascension: 19:24:51.05600000
Declination: -29.14.30.12100000
Stokes: I
Frequency: 3.03491512e+11 Hz

12. Bandpass Calibration and Flagging

BACK

Task notifications

Warning! uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 23, the following antennas are fully flagged: DV03

Warning! uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 25, the following antennas are fully flagged: DV03

Warning! uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 27, the following antennas are fully flagged: DA58, DA61, DV03

Warning! uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 29, the following antennas are fully flagged: DA58, DA61, DV03

Warning! uid___A002_Xe1f219_X78a6.ms - for intent BANDPASS (field J1924-2914) and spw 31, the following antennas are fully flagged: DA61, DV03

Warning! uid___A002_Xe1f219_X78a6.ms - the following antennas are fully flagged in all spws for one or more fields with intents among BANDPASS: DV03

Warning! uid___A002_Xe1f219_X78a6.ms - the following reference antennas are removed from the refant list because they became fully flagged in all spws for one of the intents among BANDPASS: DV03

Warning! uid___A002_Xe1f219_X78a6.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: DA58 and DA61

This task performs a preliminary bandpass solution and applies it, then computes the flagging heuristics by calling hif_correctedampflag which looks for outlier visibility points by statistically examining the scalar difference of the corrected amplitude minus model amplitudes, flags those outliers, then derives a final bandpass solution (if any flags were generated). The philosophy is that only outlier data points that have remained outliers after calibration will be flagged. Note that the phase of the data is not assessed.

In further detail, the workflow is as follows: an a priori calibration is applied using pre-existing caltables in the calibration state, a preliminary bandpass solution and amplitude gaincal solution is solved and applied, the flagging heuristics are run and any outliers are flagged, a final bandpass solution is solved (if necessary) and the name "final" is appended to this caltable. Plots are generated at two points in this workflow: after bandpass calibration but before flagging heuristics are run, and after flagging heuristics have been run and applied. If no points were flagged, the "after" plots are not generated or displayed. The score for this stage is a simple combination (multiplication) of the standard data flagging score (depending on the fraction of data flagged) and the score for the bandpass solution.

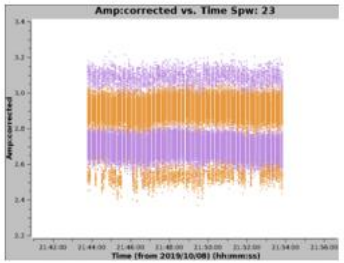
Contents

Amplitude vs time

These plots show amplitude vs time for two cases: 1, the calibrated data before application of any flags; and 2, where flagging was applied, the calibrated data after application of flags.

Data are plotted for all antennas and correlations, with different correlations shown in different colours.

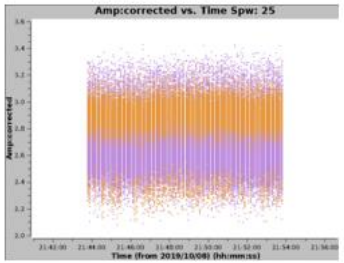
uid___A002_Xe1f219_X78a6.ms



Spectral Window 23

Intents: BANDPASS

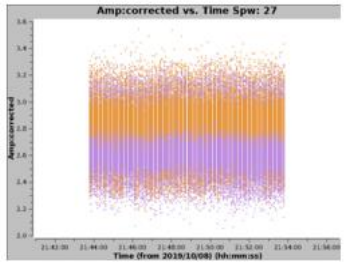
Calibrated data before flagging.



Spectral Window 25

Intents: BANDPASS

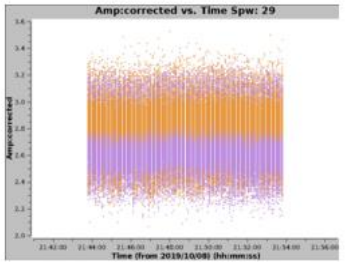
Calibrated data before flagging.



Spectral Window 27

Intents: BANDPASS

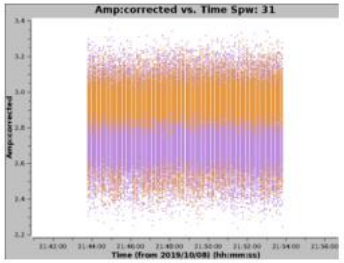
Calibrated data before flagging.



Spectral Window 29

Intents: BANDPASS

Calibrated data before flagging.



Spectral Window 31

Intents: BANDPASS

Calibrated data before flagging.

Before the flagging
Amp vs. Time.

ALMA

Tasks in execution order

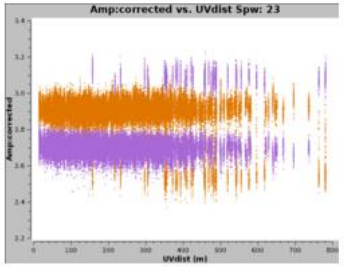
1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcalflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

Amplitude vs UV distance

These plots show amplitude vs UV distance for two cases: 1, the calibrated data before application of any flags; and 2, where flagging was applied, the calibrated data after application of flags.

Data are plotted for all antennas and correlations, with different correlations shown in different colours.

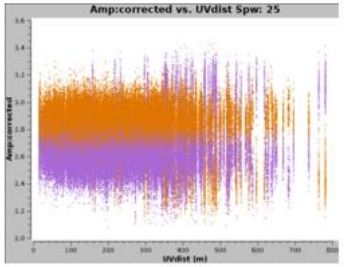
uid___A002_Xe1f219_X78a6.ms



Spectral Window 23

Intents: BANDPASS

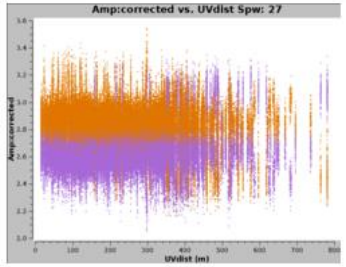
Calibrated data before flagging.



Spectral Window 25

Intents: BANDPASS

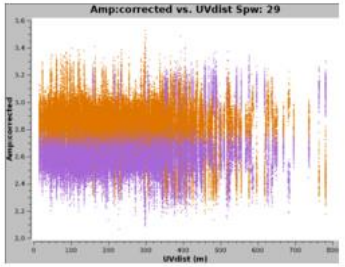
Calibrated data before flagging.



Spectral Window 27

Intents: BANDPASS

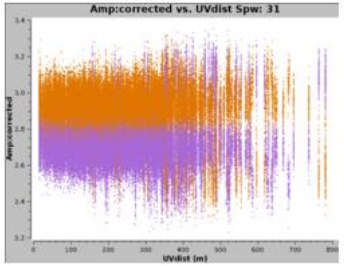
Calibrated data before flagging.



Spectral Window 29

Intents: BANDPASS

Calibrated data before flagging.

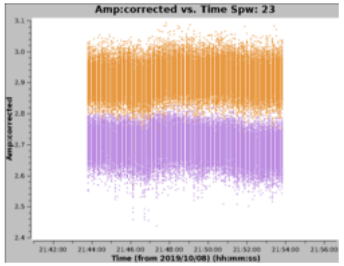


Spectral Window 31

Intents: BANDPASS

Calibrated data before flagging.

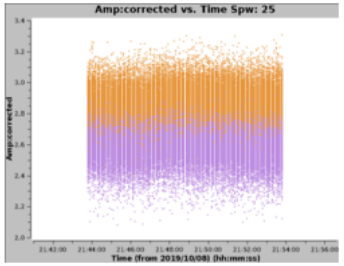
Before the flagging
Amp vs. uv dist.



Spectral Window 23

Intents: BANDPASS

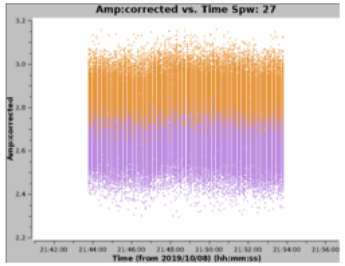
Calibrated data after flagging.



Spectral Window 25

Intents: BANDPASS

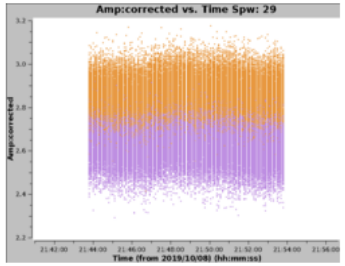
Calibrated data after flagging.



Spectral Window 27

Intents: BANDPASS

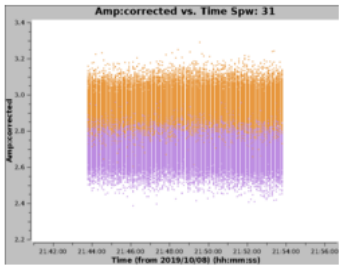
Calibrated data after flagging.



Spectral Window 29

Intents: BANDPASS

Calibrated data after flagging.



Spectral Window 31

Intents: BANDPASS

Calibrated data after flagging.

After the flagging
Amp vs. Time.

Amplitude vs UV distance

These plots show amplitude vs UV distance for two cases: 1, the calibrated data before application of any flags; and 2, where flagging was applied, the calibrated data after application of flags.

Data are plotted for all antennas and correlations, with different correlations shown in different colours.

uid___A002_Xe1f219_X78a6.ms

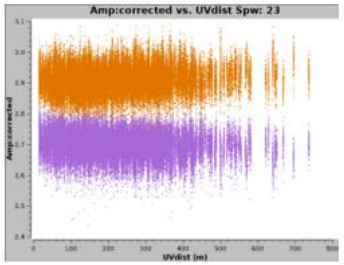
ALMA

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_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

Intents: BANDPASS

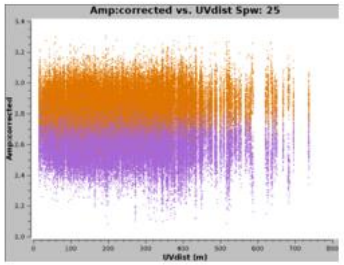
Calibrated data before flagging.



Spectral Window 23

Intents: BANDPASS

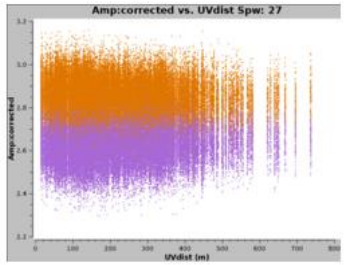
Calibrated data after flagging.



Spectral Window 25

Intents: BANDPASS

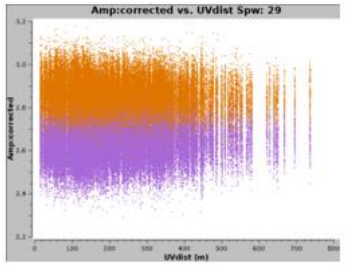
Calibrated data after flagging.



Spectral Window 27

Intents: BANDPASS

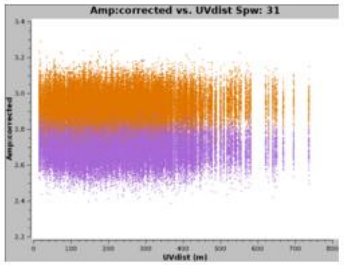
Calibrated data after flagging.



Spectral Window 29

Intents: BANDPASS

Calibrated data after flagging.



Spectral Window 31

Intents: BANDPASS

Calibrated data after flagging.

After the flagging
Amp vs. uv dist.

Pipeline QA

Input Parameters

Tasks Execution Statistics

		lin,0.24414MHz(1.0ch)		31	

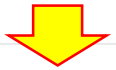
Parameters used for bandpass calibration

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 see detailed plots per spectral window and antenna.

uid___A002_Xe1f219_X78a6.ms



Amplitude vs frequency (show uid___A002_Xe1f219_X78a6.ms)

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 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.

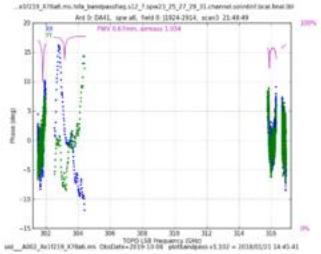
Typical antenna (DA41) (show DA41)

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_Xe1f219_X78a6.ms)

The plot below shows phase vs frequency for the bandpass correction, overlayed for all spectral windows and correlations. Click on the link above to show 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.

Amplitude vs time

These plots show amplitude vs time for two cases: 1, the calibrated data before application of any flags; and 2, where flagging was applied, the calibrated data after application of flags.

Data are plotted for all antennas and correlations, with different correlations shown in different colours.

uid___A002_Xe1f219_X78a6.ms

ALMA

Tasks in execution order

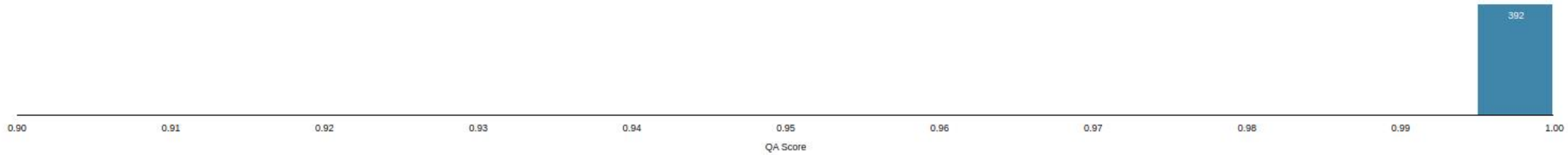
1. hifa_importdata
2. hifa_flagdata
3. hifa_fluxcalflag
4. hif_rawflagchans
5. hif_refant
6. h_tsyscal
7. hifa_tsysflag
8. hifa_antpos
9. hifa_wvrgcalflag
10. hif_lowgainflag
11. hif_setmodels
12. hifa_bandpassflag
13. hifa_spwphaseup
14. hifa_gfluxscaleflag
15. hifa_gfluxscale
16. hifa_timegaincal
17. hif_applycal
18. hif_makeimlist (cals)
19. hif_makeimages (cals)
20. hif_makeimlist (checksrc)
21. hif_makeimages (checksrc)
22. hifa_imageprecheck
23. hif_checkproductsize

Calibrated amplitude vs frequency for uid___A002_Xe1f219_X78a6.ms

BACK

Clip histogram range to match data range

SNR (Error Function)

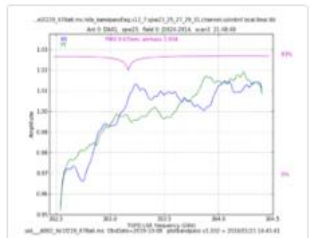


Spectral window filter

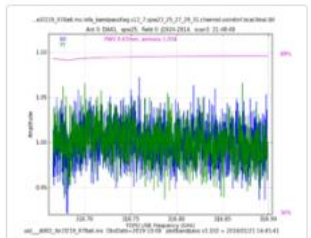
Show a

Antenna filter

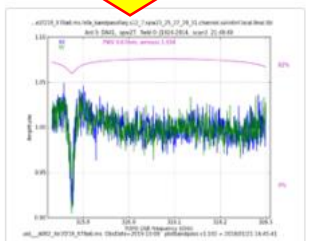
Show a



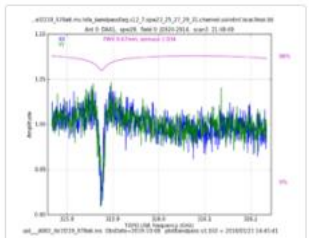
DA41
Spw 23



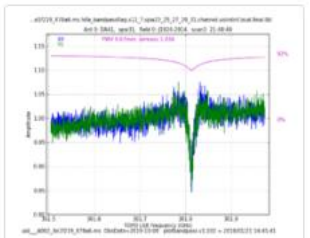
DA41
Spw 25



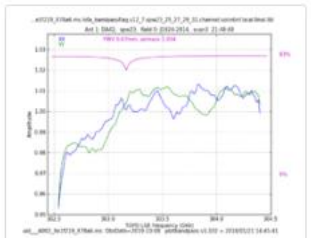
DA41
Spw 27



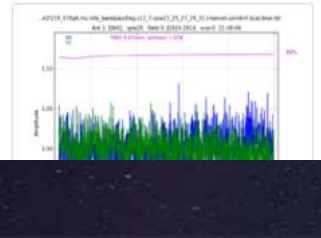
DA41
Spw 29

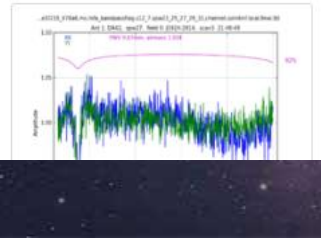


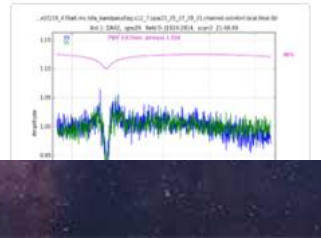
DA41
Spw 31

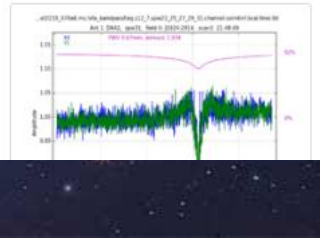


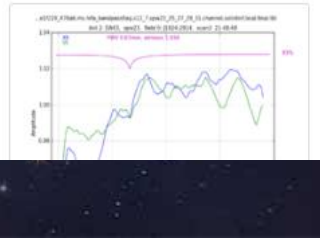
DA42
Spw 23

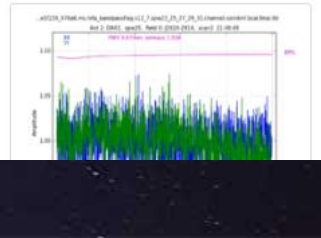


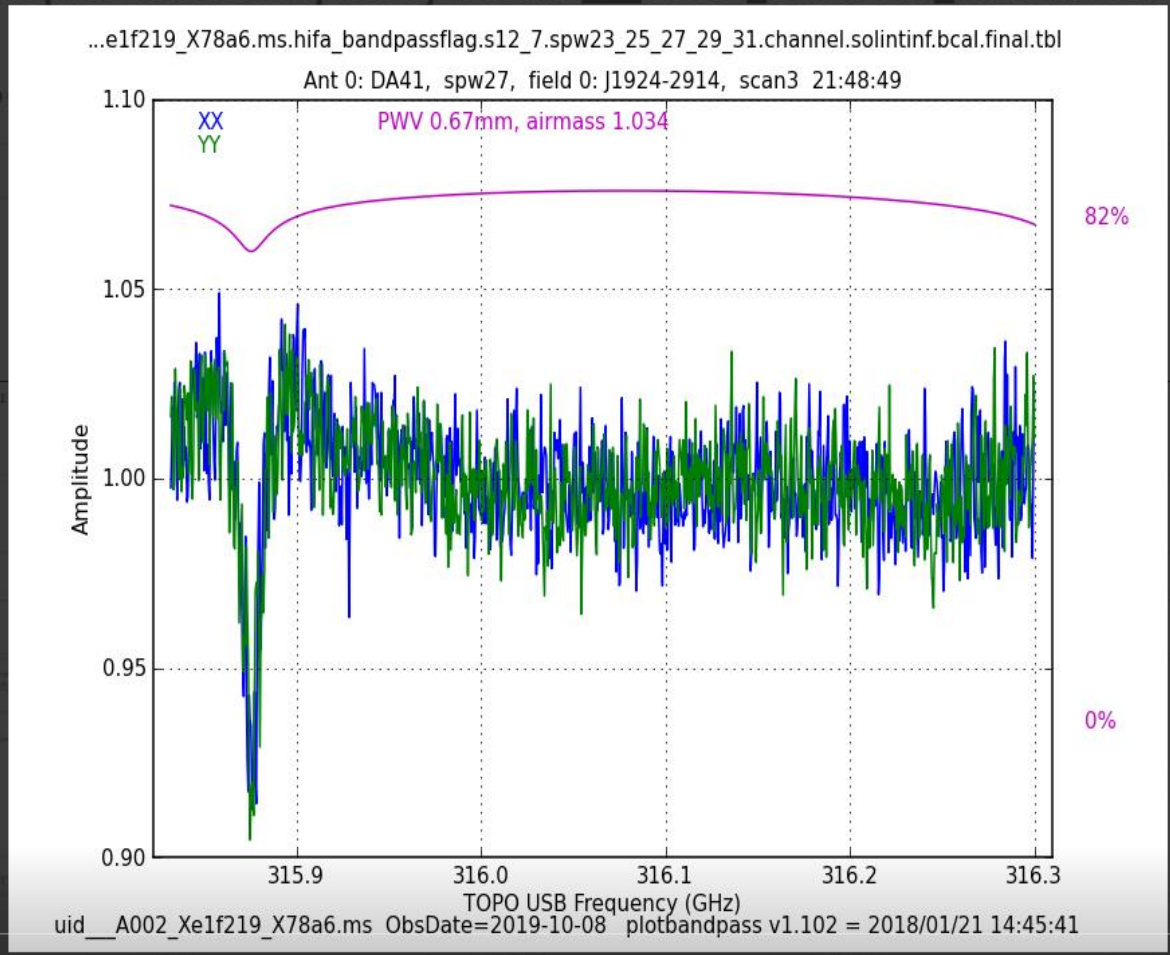












Antenna: DA41
Spectral Window: 27
Scores: XX=1.0, YY=1.0

9. WVR Calibration and Flagging

BACK

This task checks whether the WVR radiometers are working as intended, interpolating for antennas that are not. The WVR caltable is only added to subsequent pre-applys if it gives a tangible improvement.

Results

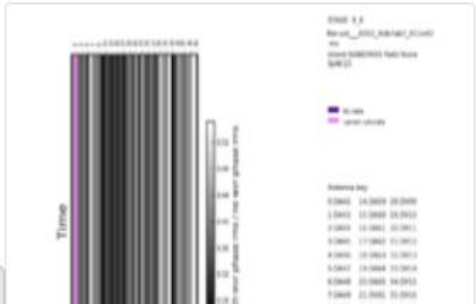
Plots

The pipeline tests whether application of WVR correction improves the data by performing a gaincal for a chosen field, usually the bandpass calibrator, and comparing the resulting phase corrections evaluated both with and without application of WVR correction. Plots based on these data in these evaluation caltables are presented below.

Flagging metric view(s)

The following plots show the flagging metric used by the pipeline to determine which antennas' WVR corrections to flag. The RMS phase during observation of the bandpass calibrator is calculated without WVR corrections applied, and with WVR corrections applied, and the metric is the ratio of those two RMS values. If the WVR measurements are corrupted, or the wvrgcal task itself flags the WVR data on a given antenna, then the pipeline will not calculate a metric here.

uid___A002_Xdb7ab7_X11e42.ms



9. WVR Calibration and Flagging

BACK

This task checks whether the WVR radiometers a

improvement.

Results

Plots

The pipeline tests whether application of WVR cc

corrections evaluated both with and without appl

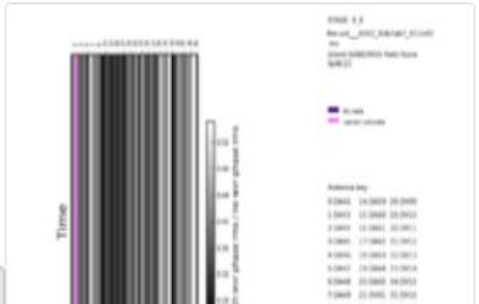
Flagging metric view(s)

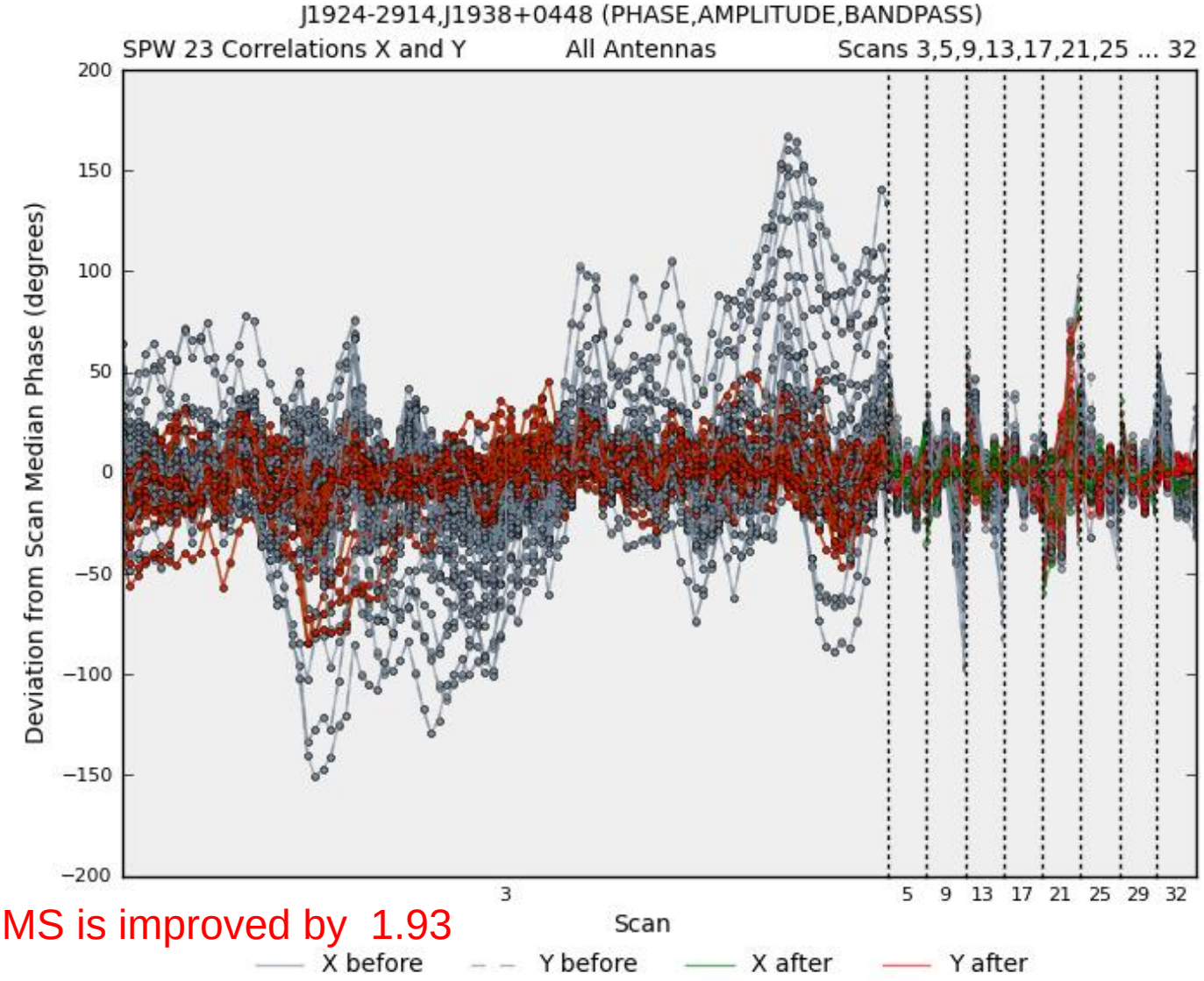
The following plots show the flagging metric use

without WVR corrections applied, and with WVR c

WVR data on a given antenna, then the pipeline w

uid___A002_Xdb7ab7_X11e42.ms





RMS is improved by 1.93

6. T_{sys} Calibration

BACK

This task generates a T_{sys} calibration table, mapping each science spectral window to the T_{sys} window that overlaps in frequency.

T_{sys} window mapping

Measurement Set	T_{sys} window	Science windows
uid___A002_Xe1f219_X78a6.ms	17	25
	19	27, 29
	21	31
	23	23

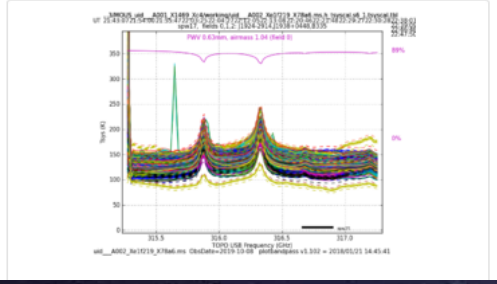
Mapping of T_{sys} window to science window

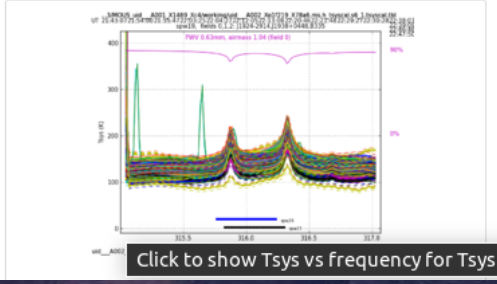
Plots

T_{sys} vs frequency

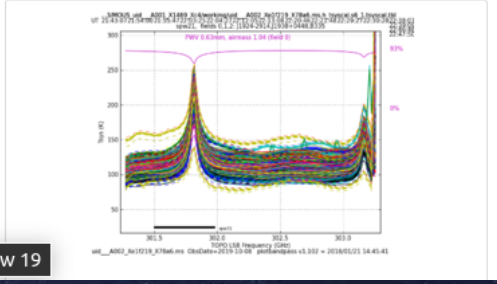
Plots of time-averaged T_{sys} vs frequency, colored by antenna.

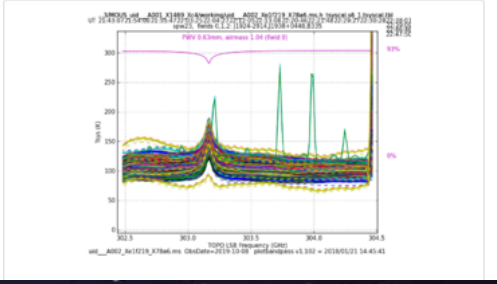
uid___A002_Xe1f219_X78a6.ms





Click to show Tsys vs frequency for Tsys spw 19





7. Flag T_{sys} calibration

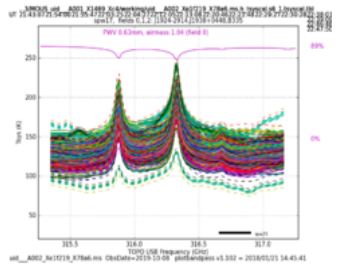
BACK

Contents

T_{sys} vs frequency after flagging

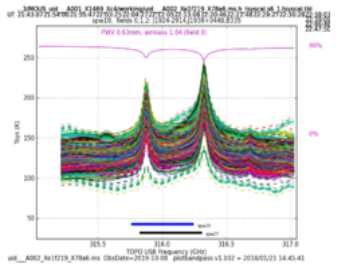
Plots of time-averaged T_{sys} vs frequency, colored by antenna.

uid___A002_Xe1f219_X78a6.ms



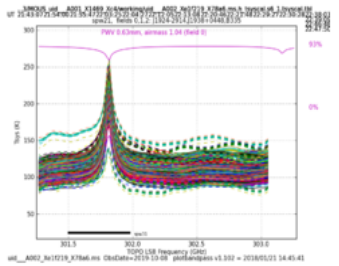
T_{sys} spw 17

Science spw 25.



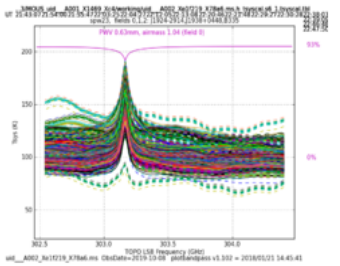
T_{sys} spw 19

Science spws 27 and 29.



T_{sys} spw 21

Science spw 31.



T_{sys} spw 23

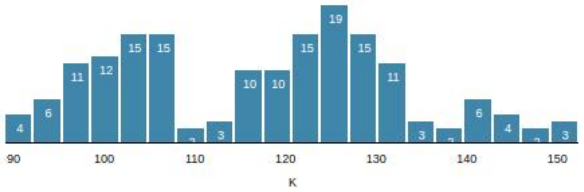
Science spw 23.

T_{sys} plots for uid___A002_Xe1f219_X78a6.ms

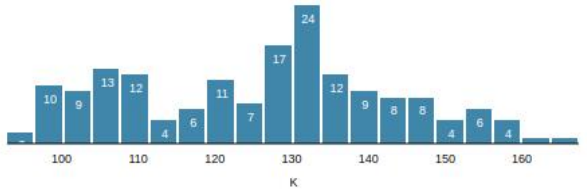
BACK

Clip histogram range to match data range

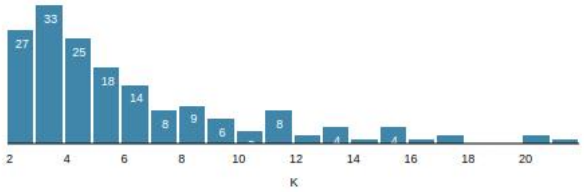
Average of Median T_{sys} over time



Maximum of Median T_{sys} over time



RMS deviation from Average Median T_{sys}



T_{sys} window filter

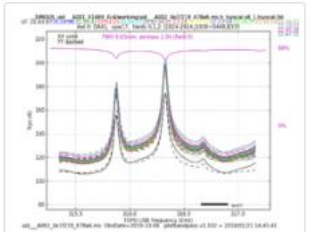
Show a

Spectral window filter

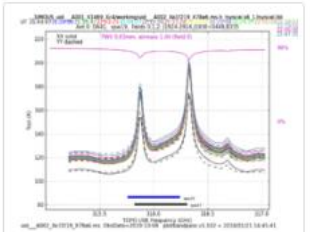
Show a

Antenna filter

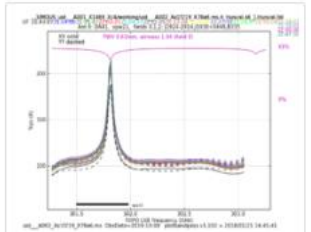
Show a



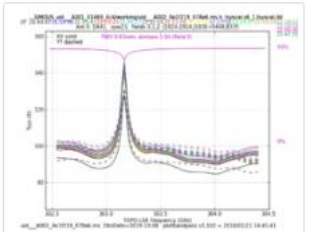
DA41
T_{sys} spw 17
Science spw 25



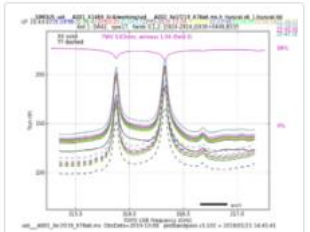
DA41
T_{sys} spw 19
Science spw 27,29



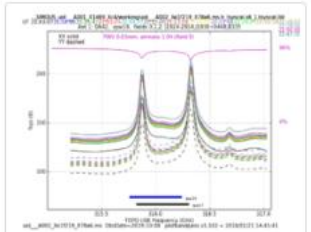
DA41
T_{sys} spw 21
Science spw 31



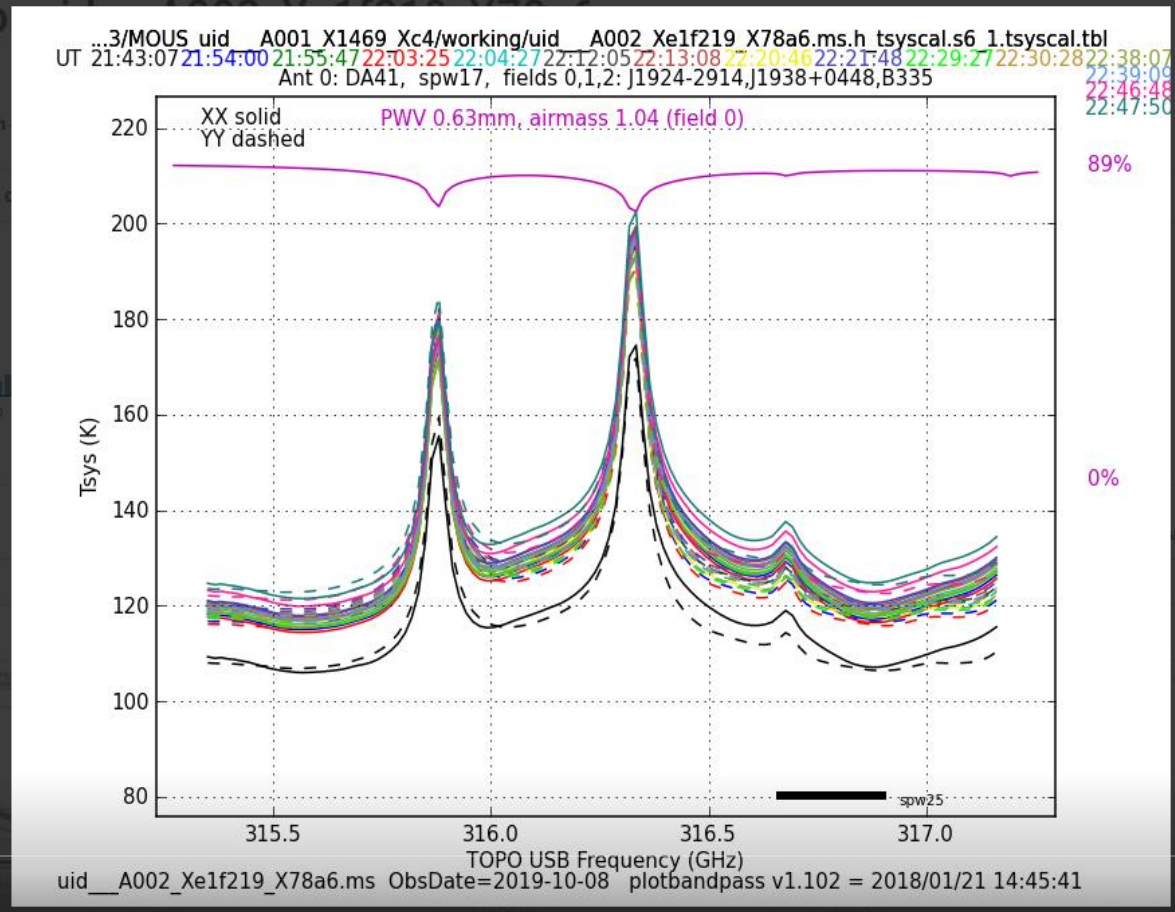
DA41
T_{sys} spw 23
Science spw 23



DA42
T_{sys} spw 17
Science spw 25



DA42
T_{sys} spw 19
Science spw 27,29

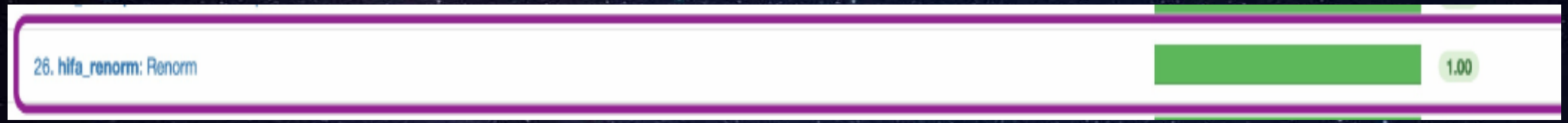


DA41
T_{sys} spw 17
Science spw 25

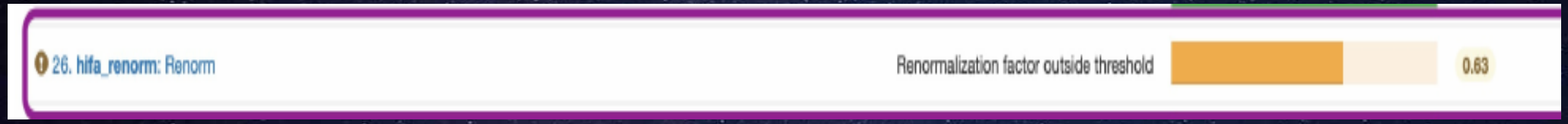
Renomalization: bright (CO) line emission

17. **hifa_timegaincal**: Gain calibration		1.00	1:01:24
18. **hifa_targetflag**: Target outlier flagging		1.00	0:13:21
19. **hif_applycal**: Apply calibrations from context		1.00	1:00:08
20. **hif_makeimlist**: Set-up parameters for flux calibrator & phase calibrator & bandpass calibrator imaging		1.00	0:04:40
21. **hif_makeimages**: Make calibrator images		1.00	0:12:14
22. **hif_makeimlist**: Set-up parameters for check source imaging	No clean targets expected	N/A	0:00:08
23. **hif_makeimages**: Make check source images	Nothing to image	N/A	0:00:08
24. **hifa_imageprecheck**: ImagePreCheck		1.00	0:28:43
25. **hif_checkproductsize**: Check product size		1.00	0:01:53
26. **hifa_renorm**: Renorm	Renormalization applied	0.90	0:10:29
27. **hifa_exportdata**: Prepare pipeline data products for export		1.00	0:02:23
28. **hif_mstransform**: Create science target MS		1.00	0:03:33
29. **hifa_flagtargets**: ALMA Target flagging		1.00	0:00:55
30. **hif_makeimlist**: Set-up parameters for target per-spw continuum imaging		1.00	0:00:39
31. **hif_findcont**: Detect continuum frequency ranges		1.00	0:47:03
32. **hif_uvcontfit**: UV continuum fitting		1.00	0:06:14
33. **hif_uvcontsub**: UV continuum subtraction		1.00	0:02:22

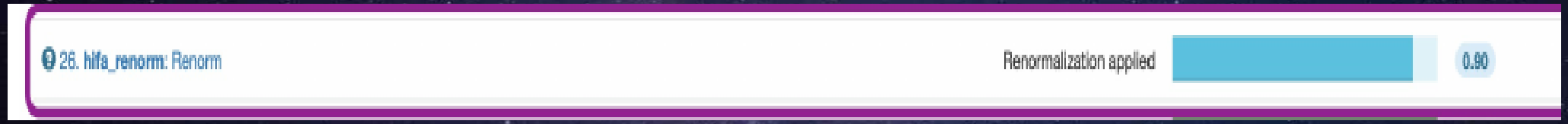
CASE1 : data don’t trigger renomalization



CASE II : data trigger renomalization (not applied)



CASE III : data trigger renomalization (applied)



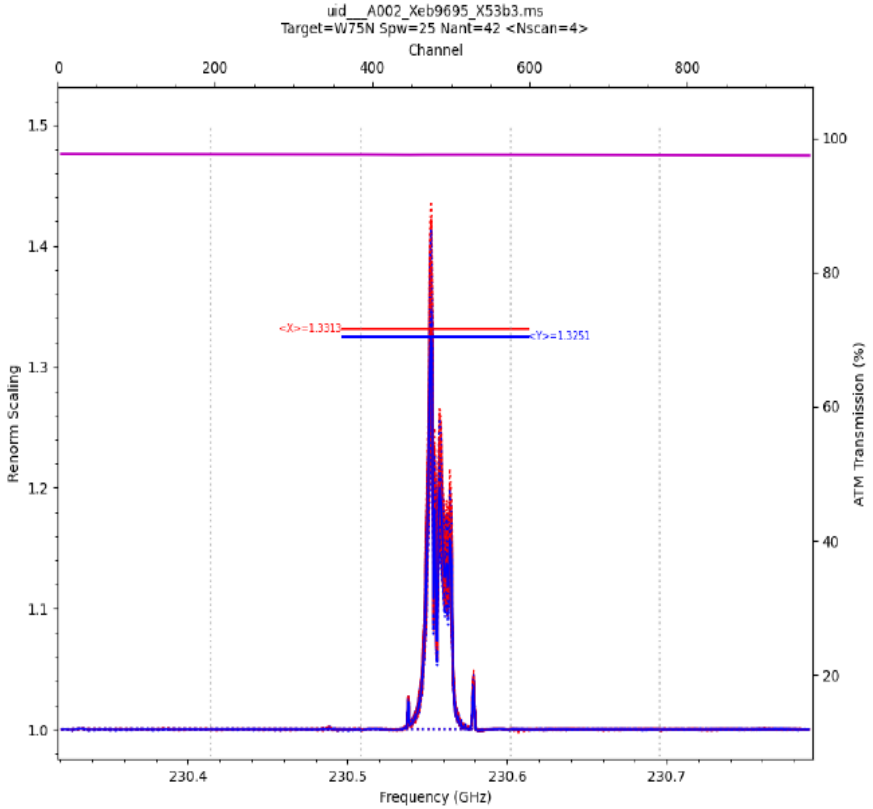
Heuristics in the renormalization script have been applied to detect and correct spikes, dips, and jumps near the segment boundaries (marked with thin vertical dotted lines). Less significant (below the threshold for applying the correction) features may remain.

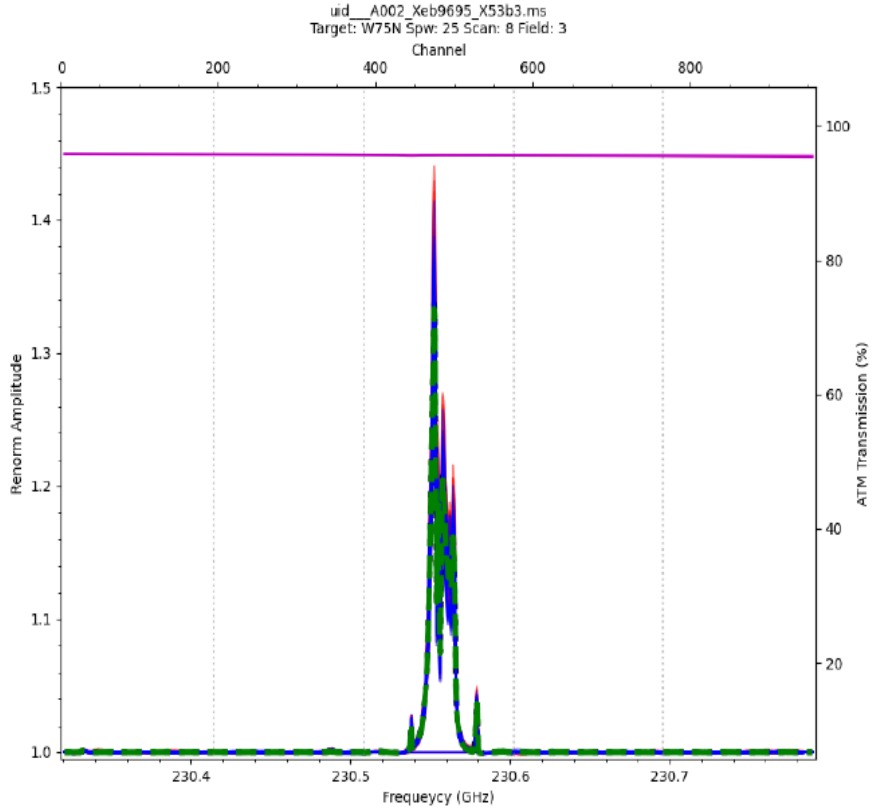
Features in the scaling spectrum associated with atmospheric features require additional care - ALMA data reduction staff will have evaluated these and minimized them insofar as possible with current heuristics, but PIs should take note of the shape and magnitude of any applied correction when performing line science at frequencies overlapping atmospheric lines.

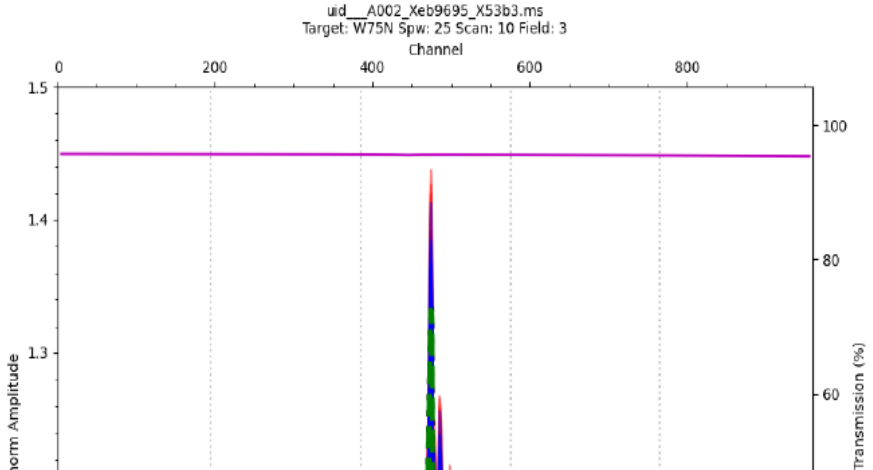
MS/Source/SPW that trigger the need for renormalization above a threshold of 1.02 highlighted in red.

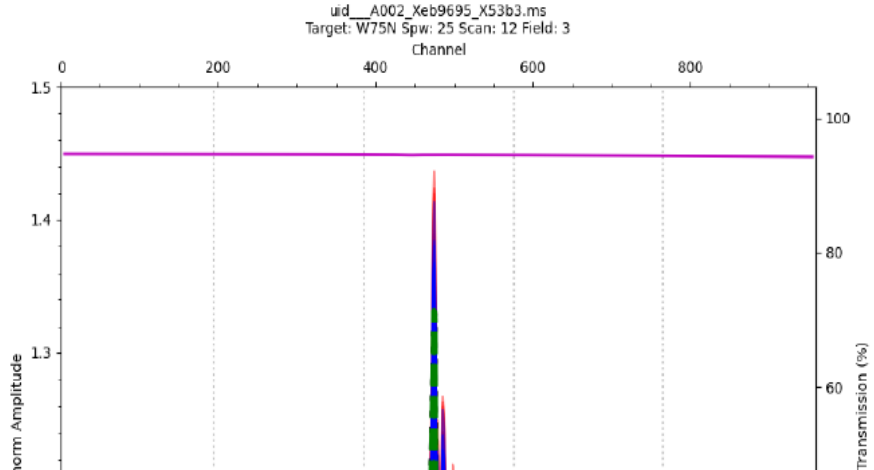
Please refer to the Pipeline User's Guide (linked to this weblog's Home page) for more details on renormalization and interpretation of the plots.

MS Name	Source Name	SPW	Max Renorm Scale Factor (field id)	PDF Link to Diagnostic Plots
uid___A002_Xeb9695_X53b3.ms	W75N	25	1.3311243 (3)	PDF
		27	1.2275826 (3)	PDF
		29	1.0989103 (3)	PDF
		31	1.0160516 (3)	PDF
		33	1.0734158 (3)	PDF
uid___A002_Xfc434c_X4fd2.ms		25	1.307646 (3)	PDF
		27	1.2110302 (3)	PDF
		29	1.0911366 (3)	PDF
		31	1.0146296 (3)	PDF
		33	1.0666027 (3)	PDF

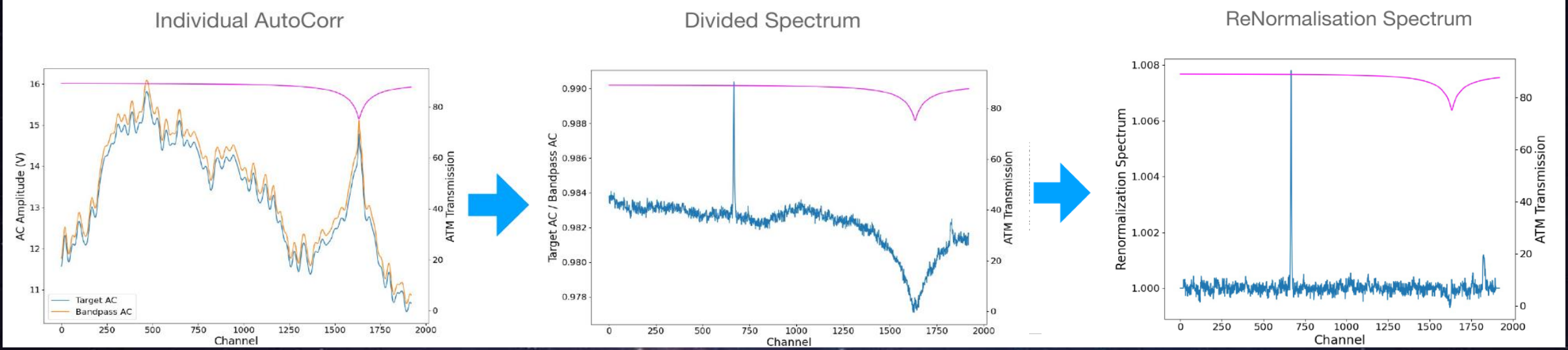

uid___A002_Xeb9695_X53b3.ms
Target=W75N Spw=25 Nant=42 <Nscan=4>
Channel
Renorm Scaling
ATM Transmission (%)
<X>=1.3313
<Y>=1.3251
Frequency (GHz)


uid___A002_Xeb9695_X53b3.ms
Target: W75N Spw: 25 Scan: 8 Field: 3
Channel
Renorm Amplitude
ATM Transmission (%)
Frequeycy (GHz)


uid___A002_Xeb9695_X53b3.ms
Target: W75N Spw: 25 Scan: 10 Field: 3
Channel


uid___A002_Xeb9695_X53b3.ms
Target: W75N Spw: 25 Scan: 12 Field: 3
Channel

Renormlization spectra = (Target AC) / (Bandpass AC)



	23	31, 33

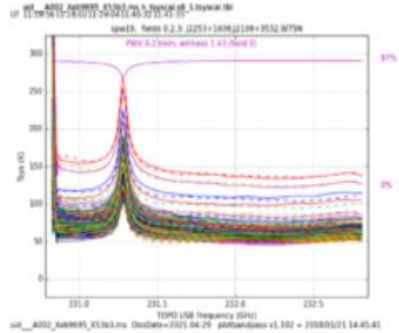
Mapping of T_{sys} window to science window

Plots

T_{sys} vs frequency

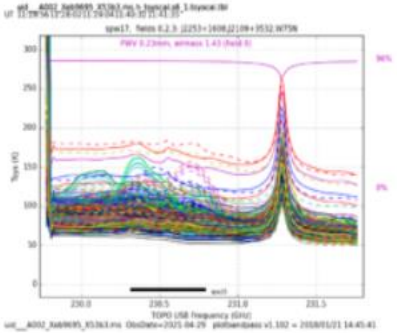
Plots of time-averaged T_{sys} vs frequency, colored by antenna.

uid___A002_Xeb9695_X53b3.ms



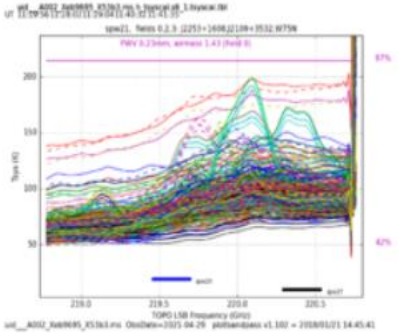
T_{sys} spw 19

Science spw 19.



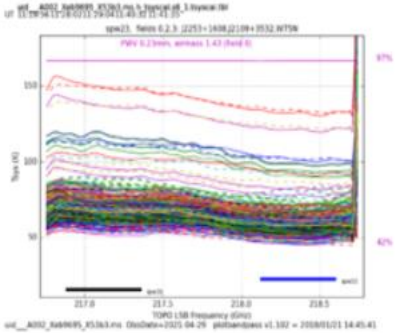
T_{sys} spw 17

Science spw 25.



T_{sys} spw 21

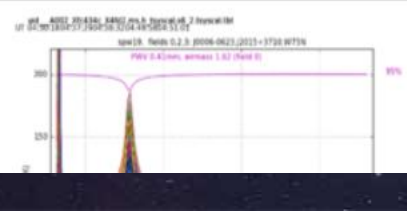
Science spws 27 and 29.

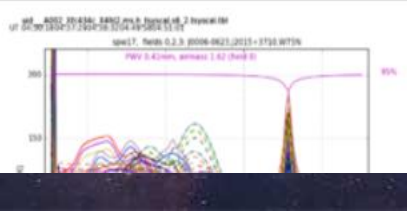


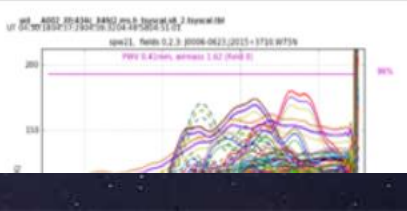
T_{sys} spw 23

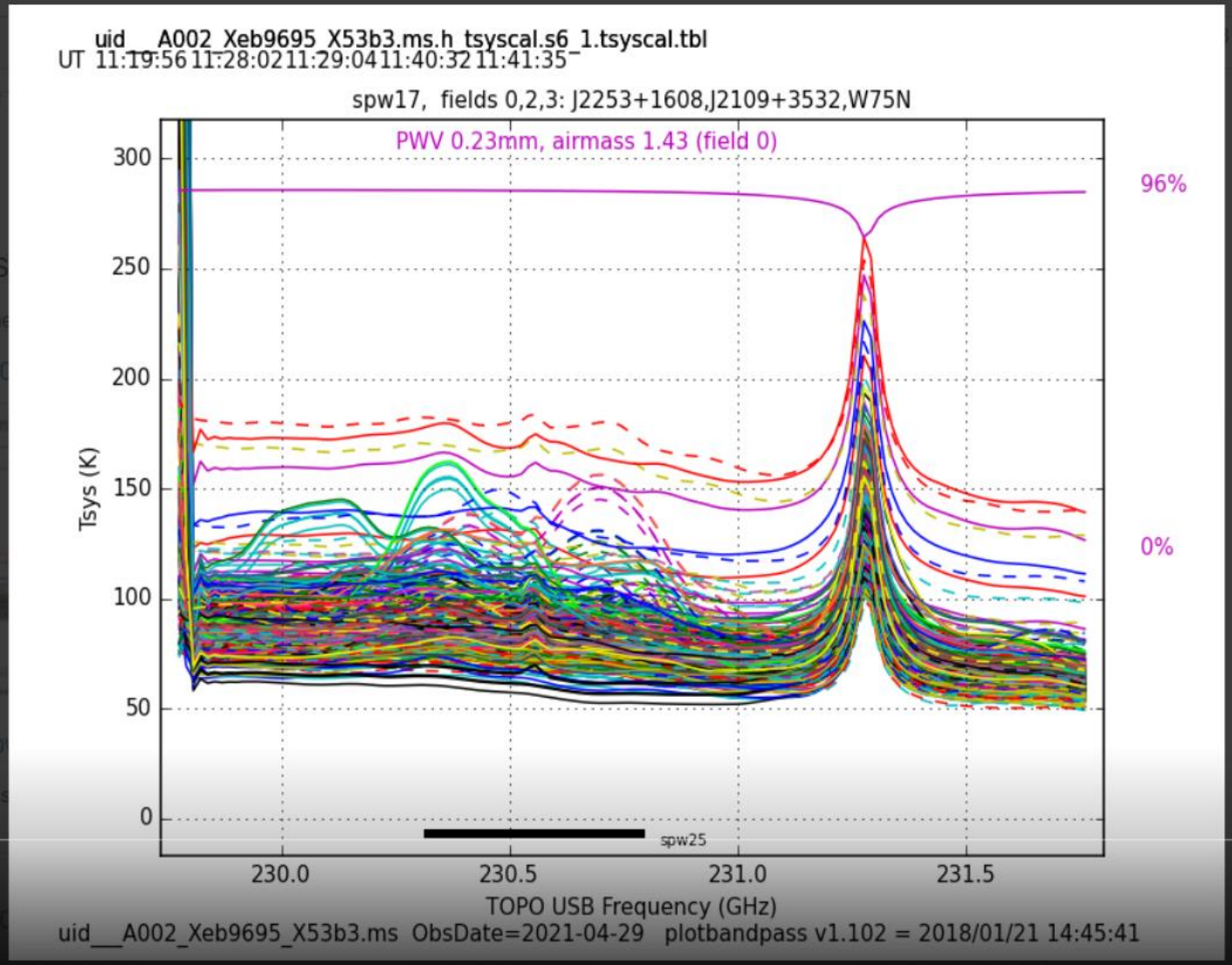
Science spws 31 and 33.

uid___A002_Xfc434c_X4fd2.ms







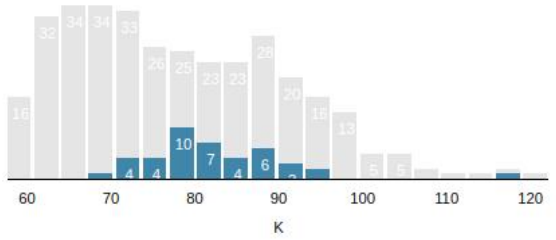


T_{sys} spw: 17
Science spws: 25

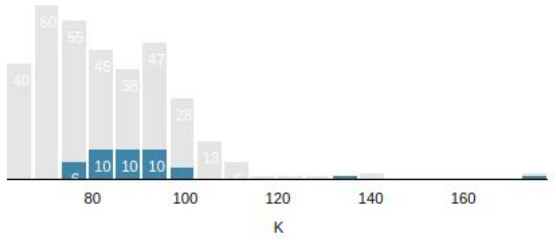
Tasks in execution order

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_wvrgcalflag
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

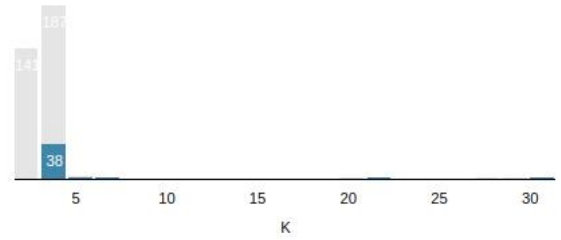
Average of Median T_{sys} over time



Maximum of Median T_{sys} over time



RMS deviation from Average Median T_{sys}



Measurement Set

× uid___A002_Xeb9695_X53b3.ms

T_{sys} window filter

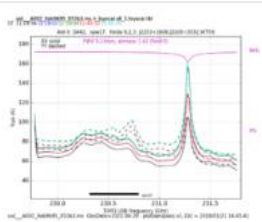
× 17

Spectral window filter

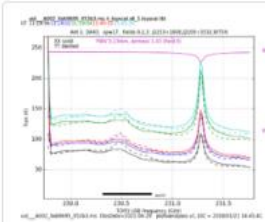
Show all spectral windows

Antenna filter

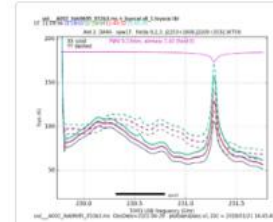
Show all antennas



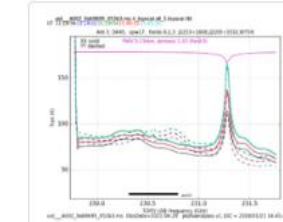
uid___A002_Xeb9695_X53b3.ms
DA42
T_{sys} spw 17
Science spw 25



uid___A002_Xeb9695_X53b3.ms
DA43
T_{sys} spw 17
Science spw 25



uid___A002_Xeb9695_X53b3.ms
DA44
T_{sys} spw 17
Science spw 25



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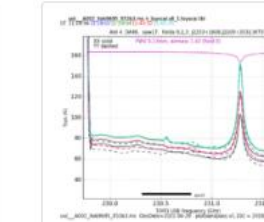
DA45
T_{sys} spw 17
Science spw 25



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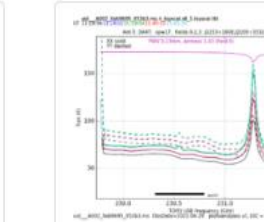
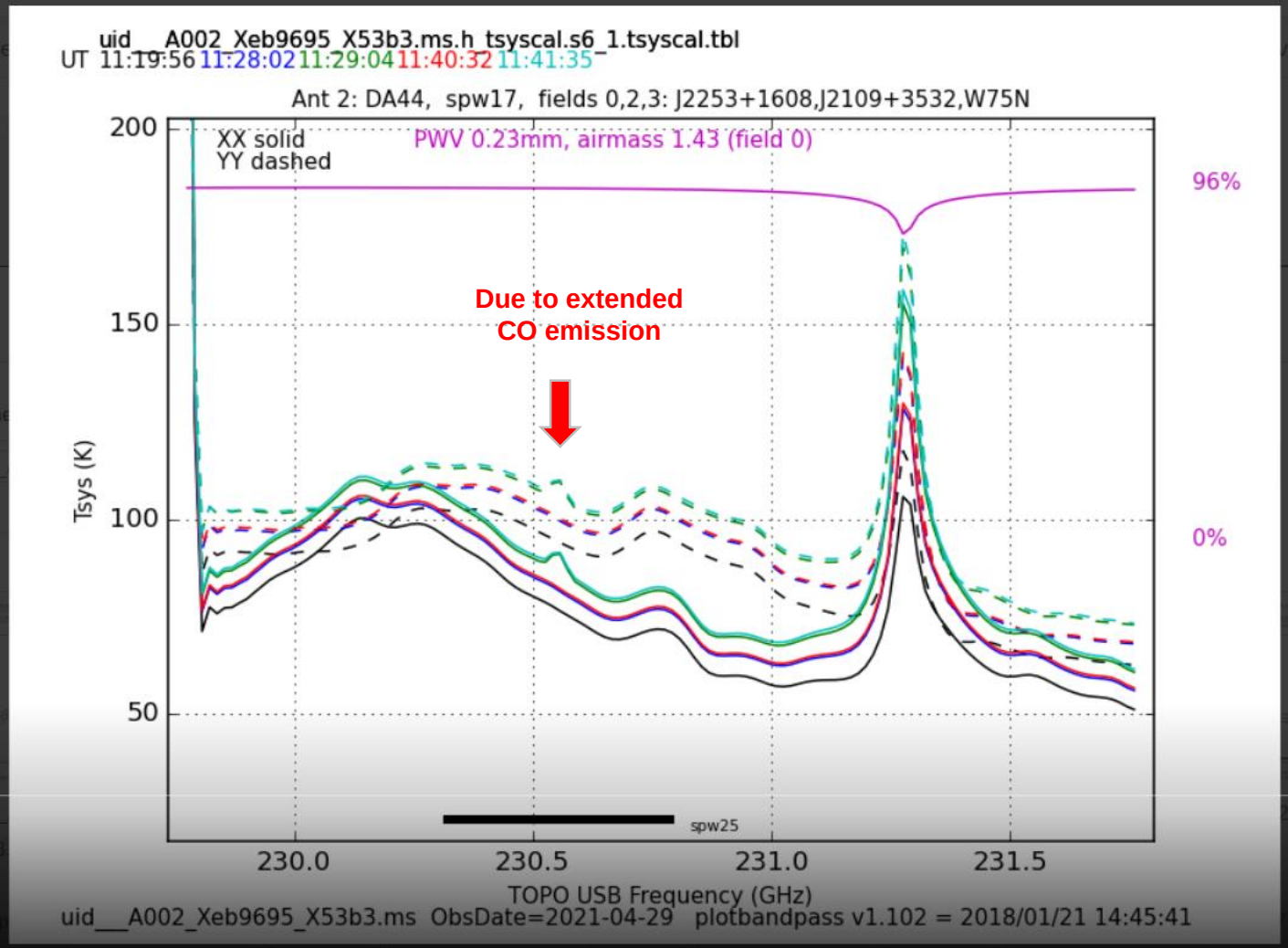
DA46
T_{sys} spw 17
Science spw 25



uid___A002_Xeb9695_X53b3.ms
DA47
T_{sys} spw 17
Science spw 25



uid___A002_Xeb9695_X53b3.ms DA44
T_{sys} spw 17
Science spw 25