

‘Custom Mosaics’ for pipeline processing

Project Structure

Proposal Program

Unsubmitted Proposal

- The definitive test of OT Cycle 2 Release 1
 - Proposal
 - Planned Observing
 - ScienceGoal (Science Goal)
 - General
 - Field Setup**
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Editors

Spectral Spatial **Field Setup**

Source

Source Name Resolve

Choose a Solar System Object? ☐ Name of object

System Sexagesimal display? ☒

Source Coordinates

RA PM RA

Dec PM DEC

Source Radial Velocity z Doppler Type

Target Type ☒ Multiple Pointings ☐ 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Beam

Peak Line Flux Density per Beam

Polarisation Percentage %

Line Width

Field Center Coordinates

Custom Mosaic: ☒

PointingPattern: Offset ☒

Offset Unit

#Pointings

RA [arcsec]	Dec [arcsec]
0.00000	0.00000
0.00000	45.00000
-23.00000	0.00000

Add Delete

Templates for standard single continuum

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Editors

Spectral | Spatial | **Spectral Setup**

Spectral Type:

☐ Spectral Line

☒ **Single Continuum**

☐ Spectral Scan

Polarization products desired:

☐ XX

☒ **DUAL**

☐ FULL

Spectral Setup Errors

Single Continuum

Receiver Band: 3 [84.0–116.0 GHz]

Sky Frequency: 3 [84.0–116.0 GHz]

Rest Frequency: 97.500000 GHz

Baseband-1

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning smoothed)	Spec Avg.	Representative Window
1(Full)	90.50000 G...	90.50000 G...	Single Contin...	2000.000 MHz(6211 km/s), 31.250 MHz(103.519 km/s)	1	<input type="radio"/>

Baseband-2

1(Full)	92.50000 G...	92.50000 G...	Single Contin...	2000.000 MHz(6077 km/s), 31.250 MHz(101.281 km/s)	1	<input type="radio"/>
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Baseband-3

1(Full)	102.50000 ...	102.50000 ...	Single Contin...	2000.000 MHz(5484 km/s), 31.250 MHz(91.400 km/s)	1	<input type="radio"/>
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Baseband-4

1(Full)	104.50000 ...	104.50000 ...	Single Contin...	2000.000 MHz(5379 km/s), 31.250 MHz(89.651 km/s)	1	<input checked="" type="radio"/>
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Full pol at std. frequencies in bands 3,6,7

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Spectral Setup

Spectral Type: ☐ Spectral Line ☒ Single Continuum ☐ Spectral Scan

Polarization products desired: ☐ XX ☐ DUAL ☒ FULL

Spectral Setup Errors: Single Continuum

Receiver Band: 3 [84.0-116.0 GHz]

Sky Frequency: 97.50000 GHz

Rest Frequency: 97.500000 GHz

Baseband-1

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning smoothed)	Spec Avg.	Representative Window
1(Full)	90.50000 G...	90.50000 G...	Single Contin...	2000.000 MHz(6211 km/s), 62.500 MHz(207.039 km/s)	1	<input type="radio"/>

Baseband-2

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning smoothed)	Spec Avg.	Representative Window
1(Full)	92.50000 G...	92.50000 G...	Single Contin...	2000.000 MHz(6077 km/s), 62.500 MHz(202.562 km/s)	1	<input type="radio"/>

Baseband-3

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning smoothed)	Spec Avg.	Representative Window
1(Full)	102.50000 ...	102.50000 ...	Single Contin...	2000.000 MHz(5484 km/s), 62.500 MHz(182.800 km/s)	1	<input type="radio"/>

Baseband-4

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning smoothed)	Spec Avg.	Representative Window
1(Full)	104.50000 ...	104.50000 ...	Single Contin...	2000.000 MHz(5379 km/s), 62.500 MHz(179.302 km/s)	1	<input checked="" type="radio"/>

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The definitive test of OT Cycle 2 Re

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Spectral

Spatial

Spectral Setup

In the table below, it is possible to define spectral windows, up to 32 per baseband as long as the total Fraction per baseband is no more than 1. Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution. Note that for bands 3, 4, 6, 7 and 8, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

Spectral Type

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☒ Spectral Line
 ☐ Single Continuum
 ☐ Spectral Scan

Spectral Type

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Spectral Setup Errors

Spectral Line

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Baseband-1

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning Smoothed)	Spec Avg.	Representative Window
1/2	94.05000 G...	94.05000 G...	...Enter Name...	117.188 MHz(374 km/s), 122.070 kHz(0.389 km/s)	1	<input type="radio"/>
1/4	94.25000 G...	94.25000 G...	...Enter Name...	58.594 MHz(186 km/s), 122.070 kHz(0.388 km/s)	2	<input type="radio"/>
1/4	95.00000 G...	95.00000 G...	...Enter Name...	58.594 MHz(185 km/s), 122.070 kHz(0.385 km/s)	4	<input type="radio"/>
					8	
					16	

Select Lines to Observe in Baseband-1...

Add

Delete

Baseband-2

1/2	95.50000 G...	95.50000 G...	...Enter Name...	234.375 MHz(736 km/s), 484.619 kHz(1.521 km/s)	4	<input checked="" type="radio"/>
1/4	95.74000 G...	95.74000 G...	...Enter Name...	117.188 MHz(367 km/s), 244.141 kHz(0.764 km/s)	1	<input type="radio"/>

Select Lines to Observe in Baseband-2...

Add

Delete

Baseband-3

Fraction	Center Freq (Rest)	Center Freq (Sky)	Transition	Bandwidth, Resolution (Hanning-smoothed)	Spec Avg.	Representative Window
1/2	94.05000 G...	94.05000 G...	...Enter Name...	117.188 MHz(374 km/s), 122.070 kHz(0.389 km/s)	1	
1/4	94.25000 G...	94.25000 G...	...Enter Name...	58.594 MHz(186 km/s), 122.070 kHz(0.388 km/s)	1	
1/4	95.00000 G...	95.00000 G...	...Enter Name...	58.594 MHz(185 km/s), 122.070 kHz(0.385 km/s)	2	
					4	
					8	
					16	

Baseband-2						
1/2	95.50000 G...	95.50000 G...	...Enter Name...	234.375 MHz(736 km/s), 484.619 kHz(1.521 km/s)	4	<input checked="" type="radio"/>
1/4	95.74000 G...	95.74000 G...	...Enter Name...	117.188 MHz(367 km/s), 244.141 kHz(0.764 km/s)	1	<input type="radio"/>

Select Lines to Observe in Baseband-2...

Add

Delete

Spectral scans with automated tuning

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Spectral Spatial Spectral Setup

Spectral Type

- ☐ Spectral Line
- ☐ Single Continuum
- ☒ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Spectral Setup Errors

Spectral Scan

Requested start frequency (sky) 95.0 GHz

Requested end frequency (sky) 102.0 GHz

Requested range (rest) 95.0000 GHz - 102.0000 GHz

Achieved scan range (sky) 95.0 GHz - 102.5 GHz

Bandwidth 468.750 MHz, 244.141 kHz

Spectral averaging 1

Representative frequency (sky) 98.75000 GHz

The representative frequency defined in the observed frame is used in conjunction with the sensitivity entered on the 'Control and Performance' page to estimate the required observing time and to set the size of the antenna beam shown in the 'Spatial Visual' editor. The representative frequency defaults to the mid-frequency of the scan range but may be subsequently set by the user to any frequency within the achieved scan range.

Tuning (Max. 5)	SPW 1 (GHz)	SPW 2 (GHz)	SPW 3 (GHz)	SPW 4 (GHz)
1	95.2344 GHz	95.7031 GHz	96.1719 GHz	96.6406 GHz
2	97.1094 GHz	97.5781 GHz	98.0469 GHz	98.5156 GHz
3	98.9844 GHz	99.4531 GHz	99.9219 GHz	100.3906 GHz
4	100.8594 GHz	101.3281 GHz	101.7969 GHz	102.2656 GHz

Targets

Spectral scans with tuning visualized

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Spectral Spatial Spectral Setup

Visualisation

In the table below, it is possible to define up to 32 spectral windows, one per baseband as long as the total Fraction per baseband is no more than 1. Each baseband is 2GHz wide and can be separately configured i.e. each spectral window can have a different bandwidth and resolution. Note that for bands 3, 6 and 7, it is not possible to put 3 basebands in one sideband and the fourth one in the other.

Left/right click to zoom in/out, grab sliding bar to pan
Note: Moving LO1 here is for experimentation only – actual setup determined by the windows

Observed Frequency

Rest Frequency

Overlays: ☒ Receiver Bands ☒ Transmission ☐ Overlay Lines ☒ DSB Image

Spectral Scan: ☒ Requested Scan ☒ Tuning 1 ☒ Tuning 2 ☒ Tuning 3 ☒ Tuning 4

Water Vapour Column Density: ☒ Automatic Choice ☐ Manual Choice 2.748mm (6th Octile)

Viewport:

Spectral Type

Spectral Type

☐ Spectral Line
☐ Single Continuum
☒ Spectral Scan

Polarization products desired ☐ XX ☒ DUAL ☐ FULL

Spectral Setup Error

The screenshot displays the 'Spectral Setup' window of a software application. On the left is a 'Project Structure' tree showing a hierarchy from 'Proposal' to 'Planned Observing' to 'ScienceGoal'. The main area is titled 'Editors' and contains a 'Visualisation' section. This section includes two frequency plots: the top one is 'Observed Frequency' (85,000 to 115,000) showing a large blue shaded region labeled '03', and the bottom one is 'Rest Frequency' (85,000 to 115,000) showing several smaller, multi-colored shaded regions. Below the plots are configuration options for 'Overlays' (Receiver Bands, Transmission, Overlay Lines, DSB Image), 'Spectral Scan' (Requested Scan, Tuning 1-4), 'Water Vapour Column Density' (Automatic Choice, Manual Choice), and a 'Viewport' section with 'Pan to Line', 'Zoom to Band', and 'Reset' buttons. At the bottom, there are radio buttons for 'Spectral Type' (Spectral Line, Single Continuum, Spectral Scan) and 'Polarization products desired' (XX, DUAL, FULL). Two blue arrows point from the 'Spectral Scan' radio button and the 'Select Lines to Overlay' button to the 'Spectral Setup Error' message at the bottom.

Multiple 12m array configs from res, las

ALMA OT - Information

Estimated time

Requested sensitivity	10.0000 mJy
Bandwidth used for sensitivity	0.244 MHz
Representative frequency (sky, first source)	98.75 GHz
Precipitable water vapour (first source)	2.748mm (6th Octile)

ALMA 12m Array

Time on source per pointing (first source)	2.89 min
Total number of pointings (all sources)	4
Total time on source	11.48 min
Total time on calibrators	1.91 h
Total overheads	44.38 min
Total 12m array time (inc. calibration & overheads)	2.84 h

Calibration Breakdown

Estimated number of tunings required	1
1 x SidebandRatio	1.68 min
2 x Pointing	36.00 s
2 x Amplitude (inc. AtmosphericCal)	6.53 min
4 x Bandpass (inc. AtmosphericCal)	23.07 min
40 x Phase (inc. AtmosphericCal)	50.67 min
48 x Atmospheric	32.00 min
Additional calibration overheads	42.00 min

Additional 12M Array Configurations

No of 12M Array Configurations	2
Additional overhead for extra configurations	56.80 min

System estimated total time for science goal 3.79 h

OK

ycle 2 Release 1 - Observing Tool for ALMA, version Cycle2Test1

pects of the observations, including the required antenna configurations and integration times.

12m	62.619 arcsec	7m	107.348 arcsec
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Most Extended Configuration Most Compact Configuration

1.5078900000000002 km	165.641 m
0.415 arcsec	3.780 arcsec
40.611 m	14.189 m
9.252 arcsec	26.479 arcsec

/L_{min}

0.92000	arcsec
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☐ Point Source ☒ Extended Source 18.0 arcsec

0.01000 Jy equivalent to 1.48139 K

FinestResolution Frequency Width 0.244141 MHz

tions? ☐ Yes ☒ No

Suggest

Time Estimate

☐ Yes ☒ No

☐ Yes ☒ No

Constrained observing I. Specific dates

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Spectral Spatial **Control and Performance**

Bandwidth used for Sensitivity: **FinestResolution** Frequency Width: **0.244141 MHz**

Do you request complementary ACA Observations? ☐ Yes ☒ No **Suggest**

Science goal integration time estimate **Time Estimate**

Does your setup need a different time from that indicated by the time estimate? ☐ Yes ☒ No

Is this observing time constrained (occultations, coordinated observing,...)? ☒ Yes ☐ No ☒ Specific Dates ☐ Multiple Visits ☐ Continuous Monitoring

Number of time windows specified : 1

Start Date/Time (UTC)		End Date/Time (UTC)	Margin
Date	Time		
	11 : 41	2013-08-25 11:41	0 min

Please specify one or more suitable time windows for your observation

Your observation will be scheduled once during one of these intervals.

If you have a preference for a particular interval or intervals use the **Up** and **Down** buttons to order your chosen windows so your preferred options are at the top of the list.

Please add any other relevant timing information

Launch Editor

Calendar Widget:

August 2013

S	M	T	W	T	F	S
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Add **Delete**

Constrained observing II. Regular visits

Project Structure

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Editors

Spectral Spatial **Control and Performance**

Bandwidth used for Sensitivity: FinestResolution Frequency Width: 0.244141 MHz

Do you request complementary ACA Observations? ☐ Yes ☒ No Suggest

Science goal integration time estimate Time Estimate

Does your setup need a different time from that indicated by the time estimate? ☐ Yes ☒ No

Is this observing time constrained (occultations, coordinated observing,...)? ☒ Yes ☐ No ☐ Specific Dates ☒ Multiple Visits ☐ Continuous Monitoring

Please specify the arrangement of visits for your observation

Visits can either be for a specific date or relative to a previous visit.

Double click on a visit to change the details.
If you chose a specific date but do not enter a date it will be assumed that this visit can be run at any time.

If you specify a Relative date but do not specify a delay it will be assumed that this visit can be at any time after the visit selected from the drop down.

Please add any other relevant timing information

Visits specified : 1

Visit Constraints

☐ Specific Date ☒ Relative Date Delay: 0.00000 min after visit: None Margin: 0.00000

Add Delete

Launch Editor

Constrained observing III. Monitoring

The screenshot shows a software interface with a 'Project Structure' pane on the left and an 'Editors' pane on the right. The 'Editors' pane has tabs for 'Spectral', 'Spatial', and 'Control and Performance'. The 'Control and Performance' tab is active, displaying various monitoring settings.

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Editors - Control and Performance:

Bandwidth used for Sensitivity: Frequency Width:

Do you request complementary ACA Observations? ☐ Yes ☒ No

Science goal integration time estimate

Does your setup need a different time from that indicated by the time estimate? ☐ Yes ☒ No

Is this observing time constrained (occultations, coordinated observing,...)? ☒ Yes ☐ No ☐ Specific Dates ☐ Multiple Visits ☒ Continuous Monitoring

Monitoring specified : 1

Please specify the arrangement of visits for your observation.

Monitoring can either be for a specific date or at an arbitrary date.

Double click on a visit to change the details.
If you select that you want a specific date but then do not enter a date it will be assumed that this visit can be run at any time.

Please add any other relevant timing information

Monitoring Constraints:

☐ Arbitrary ☒ Specific Date Date: :

Length of Monitoring: min Cycle Time: min

Calendar:

August 2013

S	M	T	W	T	F	S
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Tech. Justification in each SG w/ reporting

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Editors

Spectral **Spatial** **Technical Justification**

the Scientific Justification. Below you will find various parameters and choices that have been entered elsewhere in this Science Goal, including those which are considered non-standard, that you must include in the Technical Justification.

Relevant science parameters ? -

Sensitivity	0.01 Jy	Angular Resolution	0.92 arcsec
Bandwidth for sensitivity	7.50 GHz	Largest angular scale	12.00 arcsec
Representative frequency	104.50 GHz		

Expected source properties ? -

Line:

Peak flux density	2.50 Jy	SNR	250.00
Polarisation	1.00 %	SNR	2.50
Line width	0.00 GHz	Resolutions per FWHM	64

Continuum:

Peak flux density	20.00 Jy	SNR	8.00
Polarisation	50.00 %	SNR	0.00

Non-standard choices ? -

Field setup:

Target(s) max. elevation is low (< 20 degrees)	Target(s) max. elevation is high (> 84 degrees)
Non-zero proper motion of target(s)	Spatial dynamic range > 500 (on basis of peak flux to rms)
Spectral dynamic range > 1000 (B3, B6), 500 (B7), 100 (B9)	Mosaic pointing separation outside range 0.48 - 0.8 $1.2 \lambda / D$
Velocity frame is not LSR_K	Velocity definition is relativistic

Spectral Setup:

Single Polarization selected	Linewidth > 90% spectral window width
Single spectral window only selected	

Calibration:

Any user calibration selected	
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Control and Parameters:

Tech. justification text input for every SG

Justification text (max. 4000 characters)

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Launch Editor