

Planning VLA Observations: Tutorial

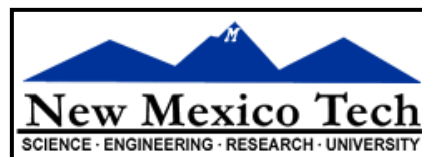
Michael P. Rupen

NRAO/Socorro



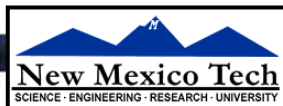
Thirteenth Synthesis Imaging Workshop

2012 May 29– June 5

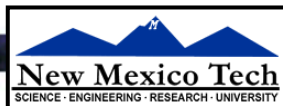


This tutorial

- Congratulations! You have been granted X amount of time...
- Instrument Configurations: Resource Configuration Tool
 - Observing frequencies
 - Channelization & dump rate
- Sources: Source Configuration Tool
 - Scientific target
 - Calibrators (complex gain, absolute flux scale, etc.)
- Scheduling Blocks: Observation Preparation Tool
 - Putting together & submitting a Scheduling Block (SB)



Congratulations!

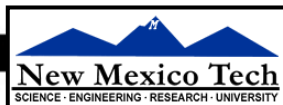


E-mail from schedsoc

- Time Allocation:

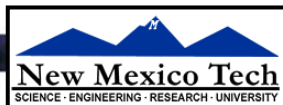
+-----+-----+-----+-----+-----+				
		Time	CenterLST Scheduling	
	Session Name	Config (hours)	(hours)	Priority
+-----+-----+-----+-----+-----+				
	Demo	C	1 x 2.00 5.50	B
+-----+-----+-----+-----+-----+				

- Time Allocation Summary:
- 2.00 hours at priority B.



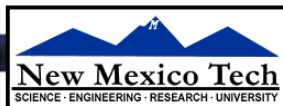
Deciphering the message

- Priority A: the observations will almost certainly be scheduled
- Priority B: the observations will be scheduled on a best effort basis
- Priority C: the observations will be scheduled as filler
- Priority N*: will not be scheduled



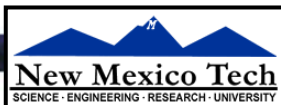
Getting on the telescope

- High priority (A+)
- Submit schedules ASAP
- Short Scheduling Blocks
- Wide range of LSTs (see pressure plots)
- Accept poor weather conditions (constraints - discussed later)



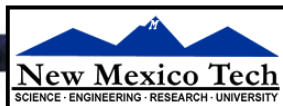
Today's project

- 2 hrs in C configuration to observe Orion BN/KL
 - Lowest (1,1) through (7,7) metastable ammonia (NH_3) transitions: < 1 km/s res'n, over > 120 km/s (gets the lower hyperfines as well)
 - Plus as much continuum as you can get

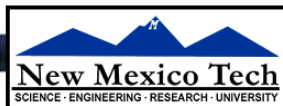


This tutorial

- Construct an appropriate Scheduling Block using the capabilities which will be available at the next call for proposals
- Use the current version of the tools
 - By December: add a few capabilities (Doppler setting, flexible subband tuning), nicer displays, ability to load line lists, warnings & errors based on the advertised capabilities

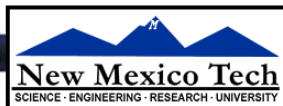


Instrument Configurations (Resource Configuration Tool)



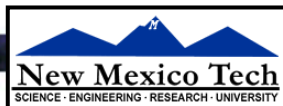
Planning: what do you want?

- Ammonia transitions: splatalogue or other sources
 - (1,1) 23694.50 MHz
 - (2,2) 23722.63 MHz
 - (3,3) 23870.13 MHz
 - (4,4) 24139.42 MHz
 - (5,5) 24532.99 MHz
 - (6,6) 25056.03 MHz
 - (7,7) 25715.18 MHz



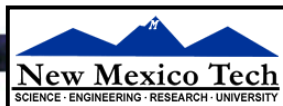
Planning: what can you do?

- This is JVLA **K band: 18.0-26.5 GHz**
- 2 x 1.024 GHz baseband pairs within that band
- Naïve approach:
 - A0/C0: (1,1)-(5,5) → 23686.5-24710.5 MHz
 - Centered on **24198.5 MHz**
 - B0/D0: (6,6) & (7,7) → 24873.5-25897.5 MHzMHz
 - Centered on **25385.5 MHz**
 - Naïve because **no subband can cross a 128 MHz boundary**
 - We'll return to this later...



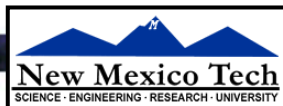
Offsets from baseband centers

- RCT currently wants offsets from baseband center frequencies rather than absolute frequencies – this will be easier by the fall
- Ammonia transitions then are as follows:
 - (1,1) 23694.50 MHz A0/C0 -504.00 MHz
 - (2,2) 23722.63 MHz A0/C0 -475.87 MHz
 - (3,3) 23870.13 MHz A0/C0 -328.37 MHz
 - (4,4) 24139.42 MHz A0/C0 -59.08 MHz
 - (5,5) 24532.99 MHz A0/C0 +334.49 MHz
 - (6,6) 25056.03 MHz B0/D0 -329.47 MHz
 - (7,7) 25715.18 MHz B0/D0 +329.68 MHz



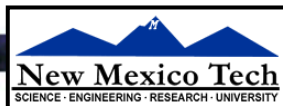
Planning: what can you do?

- WIDAR subband bandwidth & channelization possibilities
 - Subband bandwidths: 128, 64, 32, ..., 0.03125 MHz
 - Channels: 256 channels/subband, spread over pol'n products
 - Can trade subbands for channels (“Baseline Board stacking”)
 - 64 Baseline Board pairs: if assign all to one subband, you get $64 \times 256 = 16384$ channels (over all pol'n products)
- We want:
 - Cover 120 km/s @ 22 GHz
 - $\rightarrow 120/3e5 \times 22e9 \sim 10$ MHz
 - Want 1 km/s after Hanning smoothing
 - $\rightarrow (1/2)/3e5 \times 22e9 \sim 0.04$ MHz/channel



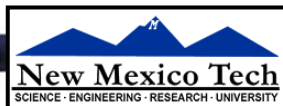
Planning: what can you do?

- So we use a bit of over-kill:
 - **16 MHz** subbands
 - 0.04 MHz/channel → want 400 channels, dual polarization
 - use 512 channels in each of **2 pol'n products**
 - Total of 1024 channels = 256×4 → **factor 4 BIB stacking**



What about the continuum?

- We want to cover the full 2×1024 MHz
- Use widest available subband bandwidth: **128 MHz**
- Need **8 subband pairs** to cover the full 1024 MHz in a **baseband**
- Spectral resolution is not very important. Default would be 256 channels & full pol'n products $\rightarrow 128/(256/4) = 2$ MHz/channel.

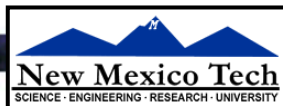


Summary

- K band
- A0/C0
 - Center frequency: 24198.5 MHz
 - 5 “line” subbands: 16 MHz BW, dual pol’n products, x4 BIB stacking
 - 8 “continuum” subbands: 128 MHz BW, full pol’n products, no BIB stacking
- B0/D0
 - Center frequency: 25385.5 MHz
 - 2 “line” subbands: 16 MHz BW, dual pol’n products, x4 BIB stacking
 - 8 “continuum” subbands: 128 MHz BW, full pol’n products, no BIB stacking

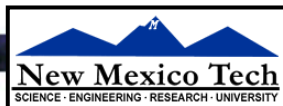
Life will become easier...

- We are working on tools to allow you to enter line frequencies directly & figure out how to set up the correlator
- Also displays to show what you're getting
- But for now, you're at the bleeding edge...

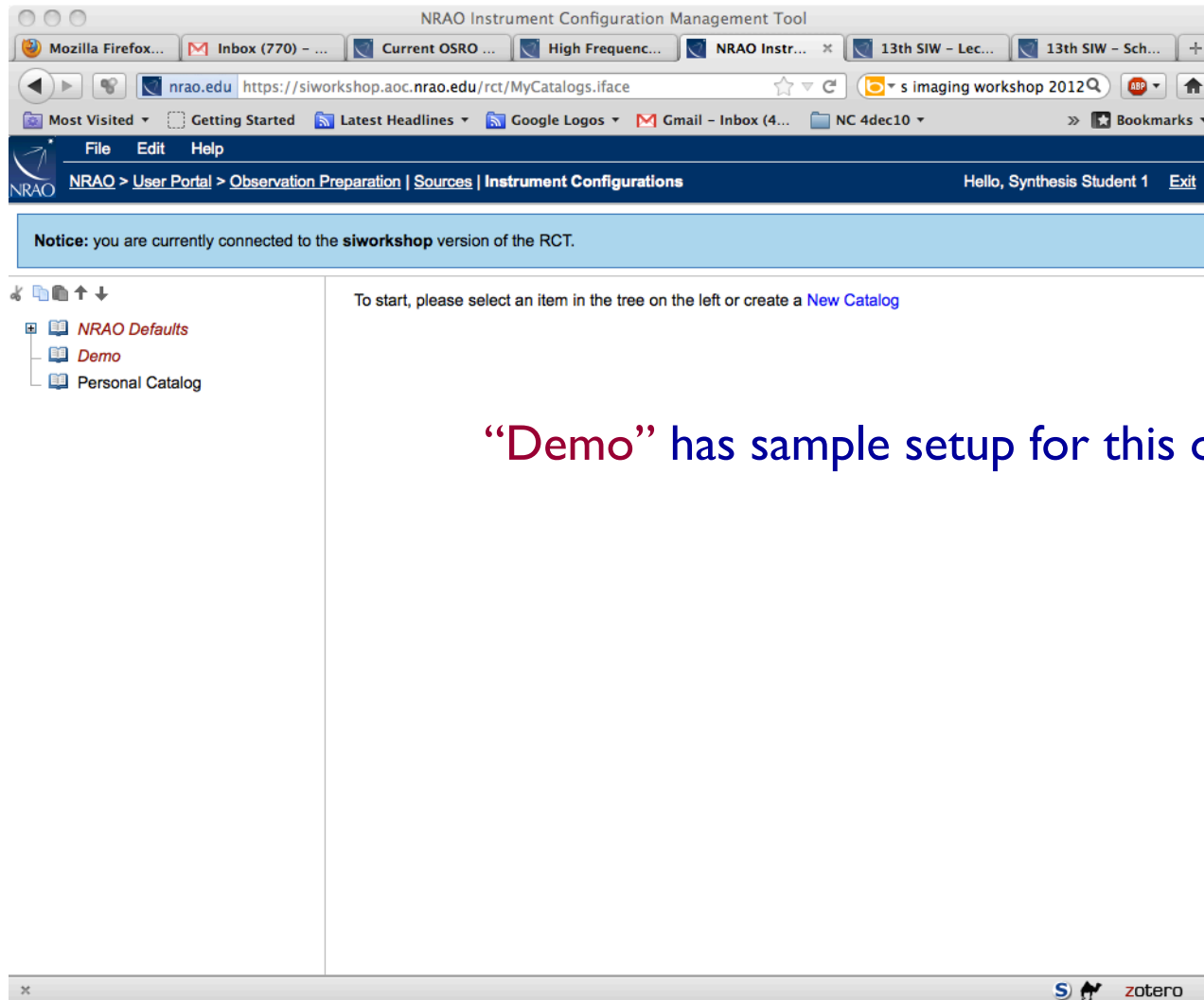


Log in

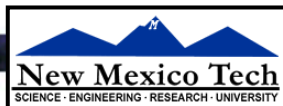
- <https://siworkshop.aoc.nrao.edu/>
 - N.b.: normally just use <http://my.nrao.edu>
- Click on “Observation Preparation Tool (OPT)”
- Username: demo1...demo200
- Password: 300GHz
- Click on “Instrument Configurations”



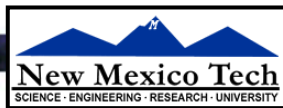
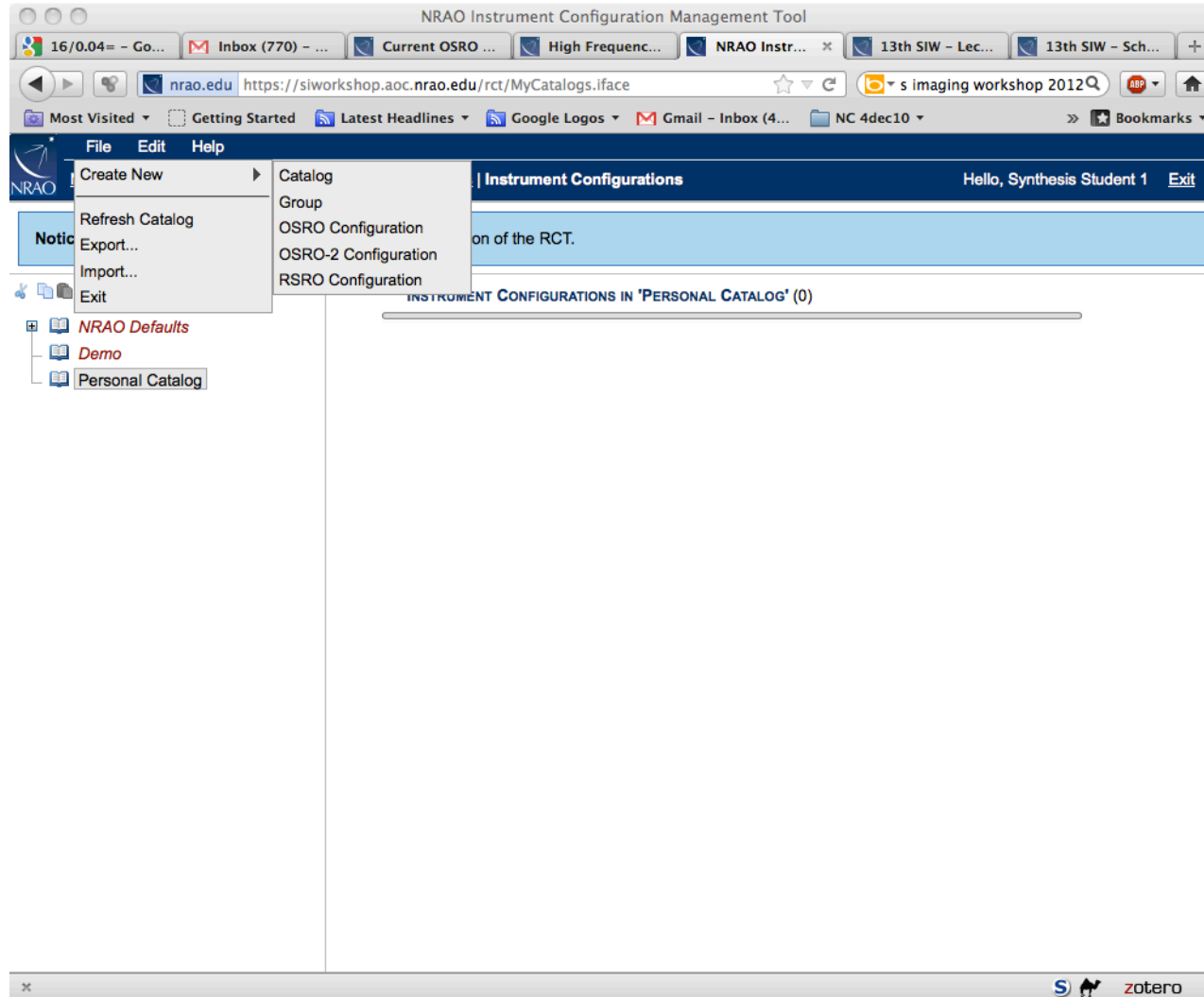
Top level



“Demo” has sample setup for this observation



Create new RSRO setup



Create new RSRO setup

NRAO Instrument Configuration Management Tool

Mozilla Firefox Start Page | Inbox (769) - mrupen@... | Current OSRO Restrictio... | High Frequency Observi... | NRAO Instrument Confi... | +

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Notice: you are currently connected to the siworkshop version of the RCT.

Return to 'Personal Catalog'

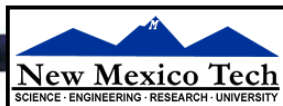
ID	Name	Telescope	Band	Correlator	Editor	Download
507	[New Resource]	EVLA	X (8.0GHz - 12.0GHz) 3-dB range: 17.7GHz - 26.8GHz	WIDAR	RSRO	Download VCI

BASEBAND TUNING

	NAME	BITS	CENTER SKY FREQUENCY	BANDWIDTH	SKY RANGE	SIDEBAND
<input type="radio"/>	A0/C0	8				
<input checked="" type="radio"/>	A1/C1	3	11.024GHz	2.048GHz	10GHz - 12.048GHz	Upper
	A2/C2	3	11.47568GHz	2.048GHz	10.45168GHz - 12.49968GHz	Upper
<input type="radio"/>	B0/D0	8				
<input checked="" type="radio"/>	B1/D1	3	8.72432GHz	2.048GHz	7.70032GHz - 9.74832GHz	Upper
	B2/D2	3	8.976GHz	2.048GHz	7.952GHz - 10GHz	Upper

Error: You must specify at least one subband. [Configuration "[New Resource]"]

zotero



Set to 8-bit, K band, center freqs.

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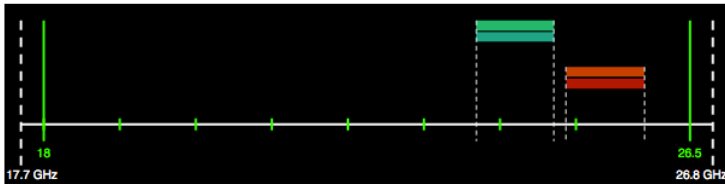
↑ ↓

NRAO Defaults

Personal Catalog

ID	Name	Telescope	Band	Correlator	Editor	Download
507	Orion K	EVLA	K (18.0GHz - 26.5GHz) 3-dB range: 17.7GHz - 26.8GHz	WIDAR	RSRO	Download VCI

BASEBAND TUNING



17.7 GHz 26.8 GHz

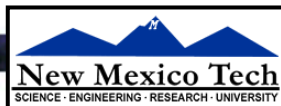
	NAME	BITS	CENTER SKY FREQUENCY	BANDWIDTH	SKY RANGE	SIDEBAND
<input checked="" type="radio"/>	A0/C0	8	24.1985GHz	1.024GHz	23.6865GHz - 24.7105GHz	Upper
<input type="radio"/>	A1/C1	3				
	A2/C2	3				
<input checked="" type="radio"/>	B0/D0	8	25.3855GHz	1.024GHz	24.8735GHz - 25.8975GHz	Upper
<input type="radio"/>	B1/D1	3				
	B2/D2	3				

INTEGRATION TIME 1.0 s

DATA RATE 0.0000 Mbytes/s (0.0000 Gbytes/hour)

CONFIGURATION SUMMARY

zotero



Add a subband

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NRAO Defaults
Personal Catalog

CONFIGURATION SUMMARY

Total BL BPs Used:	1	Total BL BPs Available:	64
Total Data Rate:	0.9 MB/s	Total Spectral Points:	64
Total Data Rate:	3.23 GB/h	Total Bandwidth:	0.128GHz

SUBBAND CONFIGURATION

A0/C0 B0/D0

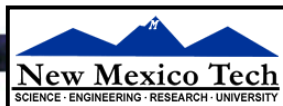
Add Subband Fill Subbands Bulk Edit Selected Subbands Delete Selected Subbands

SBP	BW	OFFSET FREQ FROM CENTER	SKY RANGE	POLARIZATION	ARRAY PHASING	BL BPS	SPECTRAL POINTS	MB/S	COMMENTS	DELETE	BULK E
0	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899			<input type="checkbox"/>

BL BP ASSIGNMENTS

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Q1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

COMMENTS



Continuum: 8 x 128 MHz, 4pp, 64 chan

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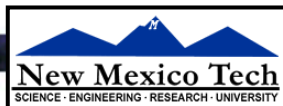
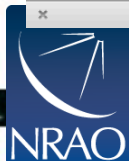
CONFIGURATION SUMMARY

Total BL BPs Used:	8	Total BL BPs Available:	64
Total Data Rate:	7.19 MB/s	Total Spectral Points:	512
Total Data Rate:	25.88 GB/h	Total Bandwidth:	1.024GHz

SUBBAND CONFIGURATION

SBP	BW	OFFSET FREQ FROM CENTER	SKY RANGE	POLARIZATION	ARRAY PHASING	BL BPS	SPECTRAL POINTS	MB/S	COMMENTS	DELETE	BULK
0	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
1	128MHz	-320.0MHz	23.815GHz - 23.943GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
2	128MHz	-192.0MHz	23.943GHz - 24.071GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
3	128MHz	-64.0MHz	24.071GHz - 24.199GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
4	128MHz	64.0MHz	24.199GHz - 24.327GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
5	128MHz	192.0MHz	24.327GHz - 24.455GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
6	128MHz	320.0MHz	24.455GHz - 24.583GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>
7	128MHz	448.0MHz	24.583GHz - 24.711GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="button" value="X"/>	<input type="checkbox"/>

BL BP ASSIGNMENTS



Add NH3(I,I): 16 MHz, 2pp, BIB x4

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CONFIGURATION SUMMARY

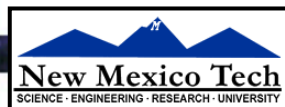
Total BI. BPs Used:	12	Total BI. BPs Available:	64
Total Data Rate:	10.78 MB/s	Total Spectral Points:	1024
Total Data Rate:	38.82 GB/h	Total Bandwidth:	1.04GHz

SUBBAND CONFIGURATION

A0/C0 B0/D0

Add Subband Fill Subbands Bulk Edit Selected Subbands Delete Selected Subbands

SBP	BW	OFFSET FREQ FROM CENTER	SKY RANGE	POLARIZATION	ARRAY PHASING	BL. BPS	SPECTRAL POINTS	MB/S	COMMENTS	DELETE	BULK
0	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
1	128MHz	-320.0MHz	23.815GHz - 23.943GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
2	128MHz	-192.0MHz	23.943GHz - 24.071GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
3	128MHz	-64.0MHz	24.071GHz - 24.199GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
4	128MHz	64.0MHz	24.199GHz - 24.327GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
5	128MHz	192.0MHz	24.327GHz - 24.455GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
6	128MHz	320.0MHz	24.455GHz - 24.583GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
7	128MHz	448.0MHz	24.583GHz - 24.711GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
8	16MHz	-504.0MHz	23.6865GHz - 23.7025GHz	Dual	<input type="checkbox"/>	4	512	3.594		<input type="checkbox"/>	<input type="checkbox"/>



4 new subbands: select...

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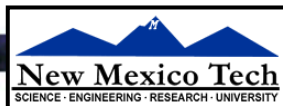
Notice: you are currently connected to the siworkshop version of the RCT.

Subband Configuration

A0/C0 B0/D0

Add Subband Fill Subbands Bulk Edit Selected Subbands Delete Selected Subbands

SBP	BW	OFFSET FREQ FROM CENTER	SKY RANGE	POLARIZATION	ARRAY PHASING	BL. BPS	SPECTRAL POINTS	MB/S	COMMENTS	DELETE	BULK
0	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
1	128MHz	-320.0MHz	23.815GHz - 23.943GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
2	128MHz	-192.0MHz	23.943GHz - 24.071GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
3	128MHz	-64.0MHz	24.071GHz - 24.199GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
4	128MHz	64.0MHz	24.199GHz - 24.327GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
5	128MHz	192.0MHz	24.327GHz - 24.455GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
6	128MHz	320.0MHz	24.455GHz - 24.583GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
7	128MHz	448.0MHz	24.583GHz - 24.711GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input type="checkbox"/>
8	16MHz	-504.0MHz	23.6865GHz - 23.7025GHz	Dual	<input type="checkbox"/>	4	512	3.594		<input type="checkbox"/>	<input type="checkbox"/>
9	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full	<input type="checkbox"/>	1	64	0.899		<input type="checkbox"/>	<input checked="" type="checkbox"/>



4 new subbands: ...and Bulk Edit

NRAO Instrument Configuration Management Tool

Mozilla Firefox Start Page | Inbox (769) - mrupen@gmail.co... | Current OSRO Restrictions - Sc... | High Frequency Observing - EV... | NRAO Instrument Configuration...

nrao.edu https://siworkshop.aoc.nrao.edu/rct/MyCatalogs.iface

File Edit Catalog Management System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the RCT.

Return to 'Personal Catalog'

ID	Name	Telescope	Band	Correlator	Editor	Download
507	Orion K	EVLA	K (18.0GHz - 26.5GHz) 3-dB range: 17.7GHz - 26.8GHz	WIDAR	RSRO	Download VCI

BASEBAND TUNING

Bulk Edit Subbands

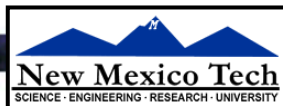
☒ Bandwidth: 16MHz
☐ Offset Freq from Center
☒ Polarization: Dual
☒ BI. BPs: 4
☐ Array Phasing

Close Apply Changes

NAME	BITS	CENTER SKY FREQUENCY
<input checked="" type="radio"/> A0/C0	8	24.1985GHz
<input type="radio"/> A1/C1	3	
<input type="radio"/> A2/C2	3	
<input checked="" type="radio"/> B0/D0	8	25.3855GHz
<input type="radio"/> B1/D1	3	
<input type="radio"/> B2/D2	3	

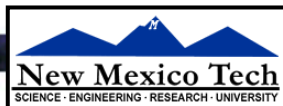
INTEGRATION TIME 1.0 s

DATA RATE 14.3770 Mbytes/s (51.7571 Gbytes/hour)



Offsets from baseband centers

- Ammonia transitions then are as follows:
 - (1,1) 23694.50 MHz A0/C0 -504.00 MHz
 - (2,2) 23722.63 MHz A0/C0 -475.87 MHz
 - (3,3) 23870.13 MHz A0/C0 -328.37 MHz
 - (4,4) 24139.42 MHz A0/C0 -59.08 MHz
 - (5,5) 24532.99 MHz A0/C0 +334.49 MHz
 - (6,6) 25056.03 MHz B0/D0 -329.47 MHz
 - (7,7) 25715.18 MHz B0/D0 +329.68 MHz
- Next year you will be able to set these perfectly. For now, subbands “snap to a grid” set by the subband bandwidth.
- **No subband can EVER cross a 128 MHz boundary!**



Data rates: 3sec averaging for sanity

NRAO Instrument Configuration Management Tool

Mozilla Firefox Start Page | Inbox (770) - mrupen@gmail.co... | Current OSRO Restrictions - Sc... | High Frequency Observing - EV... | NRAO Instrument Configuration...

nrao.edu https://siworkshop.aoc.nrao.edu/rct/MyCatalogs.iface

File Edit Catalog Management System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the RCT.

INTEGRATION TIME 3.0 s

DATA RATE 13.1789 Mbytes/s (47.4440 Gbytes/hour)

CONFIGURATION SUMMARY

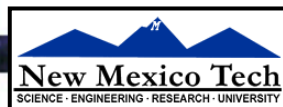
Total BI. BPs Used:	44	Total BI. BPs Available:	64
Total Data Rate:	13.18 MB/s	Total Spectral Points:	4608
Total Data Rate:	47.44 GB/h	Total Bandwidth:	2.16GHz

SUBBAND CONFIGURATION

A0/C0 B0/D0

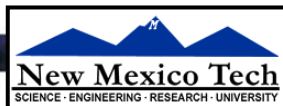
Add Subband Fill Subbands Bulk Edit Selected Subbands Delete Selected Subbands

SBP	BW	OFFSET FREQ FROM CENTER	SKY RANGE	POLARIZATION	ARRAY PHASING	BL. BPS	SPECTRAL POINTS	MB/S	COMMENTS	DELETE	BULK
0	128MHz	-448.0MHz	23.687GHz - 23.815GHz	Full		1	64	0.300			
1	128MHz	-320.0MHz	23.815GHz - 23.943GHz	Full		1	64	0.300			
2	128MHz	-192.0MHz	23.943GHz - 24.071GHz	Full		1	64	0.300			
3	128MHz	-64.0MHz	24.071GHz - 24.199GHz	Full		1	64	0.300			
4	128MHz	64.0MHz	24.199GHz - 24.327GHz	Full		1	64	0.300			
5	128MHz	192.0MHz	24.327GHz - 24.455GHz	Full		1	64	0.300			
6	128MHz	320.0MHz	24.455GHz - 24.583GHz	Full		1	64	0.300			
7	128MHz	448.0MHz	24.583GHz - 24.711GHz	Full		1	64	0.300			
8	16MHz	-504.0MHz	23.6865GHz - 23.7025GHz	Dual		4	512	1.198	NH3 (1,1)		



Sources

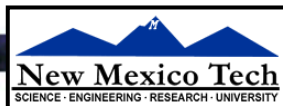
(Source Configuration Tool)



Planning: where is your source?

- Orion BN/KL

—J2000: **05h 35m 14.50s, -05d 22' 30.00''**



New source: Orion

NRAO Source Catalog Management Tool

Mozilla Firefox Start Page | Inbox (770) - mrupen@gmail.co... | Current OSRO Restrictions - Sc... | High Frequency Observing - EV... | NRAO Source Catalog Managem... | +

nrao.edu https://siworkshop.aoc.nrao.edu/sct/MyCatalogs.Iface?catalogId=1&sourceId=22372

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File Edit Catalog Management System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the SCT.

Orion Images Notes

SOURCE NAME(s)

NAME Orion

ORIGIN OF INFORMATION

ALIASES Click to View

SOURCE MAP Open in New Window

SOURCE POSITIONS

COORDINATE SYSTEM: Equatorial POSITION TYPE: Simple Position

	VALUE	UNCERTAINTY
RIGHT ASCENSION	5h 35m 14.50s	0.00mas
DECLINATION	-5d 22' 30.00"	0.00mas
DISTANCE	144.0 pc	7.0pc
EQUINOX	J2000	

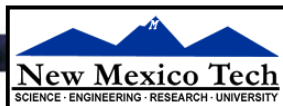
SOURCE VELOCITIES

There are no velocities specified for this source!

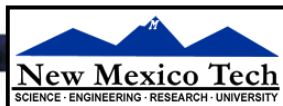
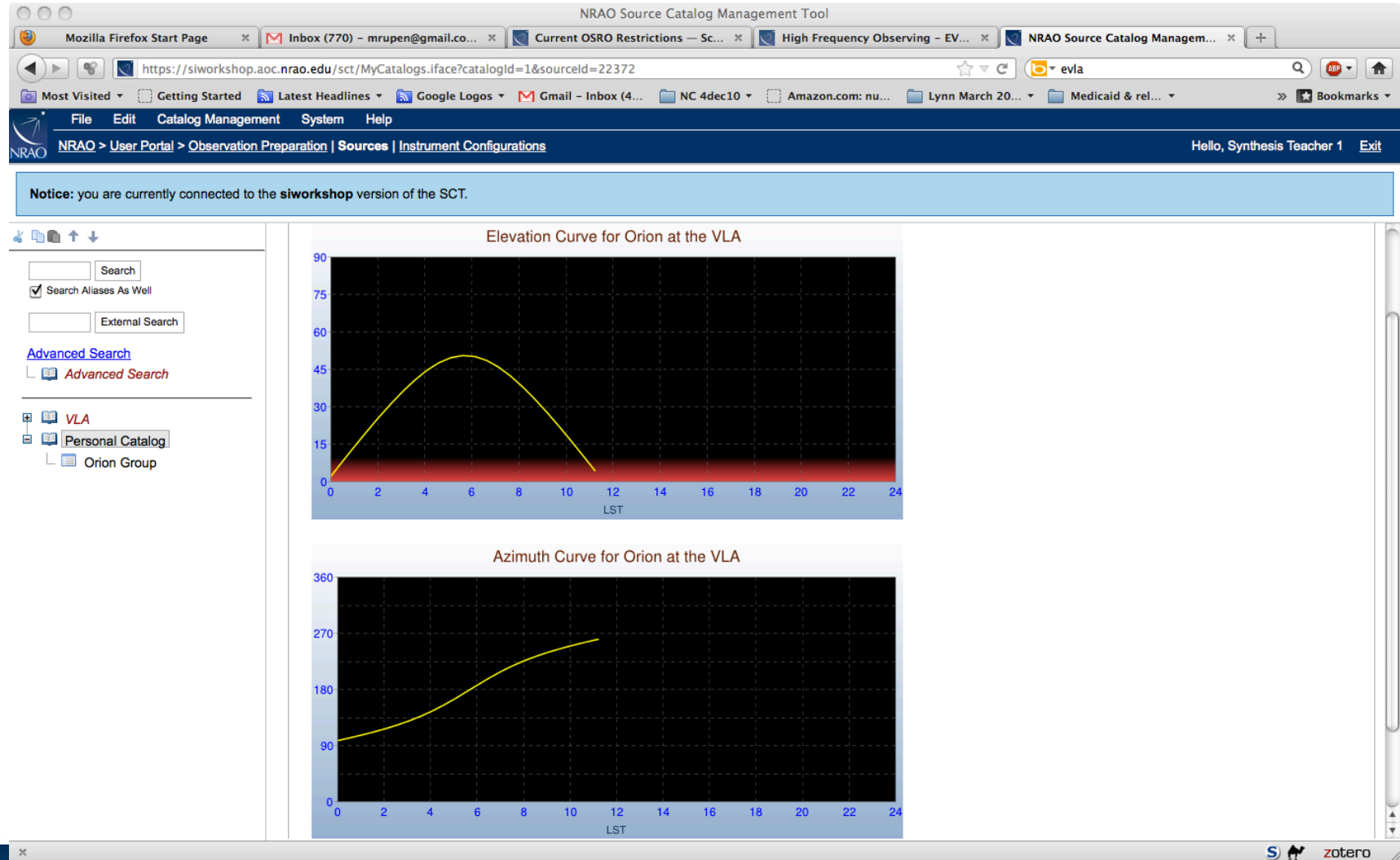
SOURCE BRIGHTNESS

There are no brightnesses specified for this source!

VLA
Personal Catalog
Orion Group



LST restrictions



Put it in a group

NRAO Source Catalog Management Tool

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nrao.edu https://siworkshop.aoc.nrao.edu/sct/MyCatalogs.lface?catalogId=1

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File Edit Catalog Management System Help


NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the SCT.

SOURCES IN 'DEMO GROUP' (1)

Select: All | None Show: 25 | 50 | 100 | 200 SELECT COORDINATE SYSTEM: Equatorial

	Name	Right Ascension	Declination	Velocity	Flux / Structure		Sky Map
<input type="checkbox"/>	J0541-0541	5h 41m 38.083384s	-5d 41' 49.42839"		DETAILS	ALIASES	

Search

☒ Search Aliases As Well

External Search

[Advanced Search](#)

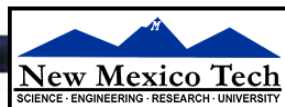
[Advanced Search](#)

VLA

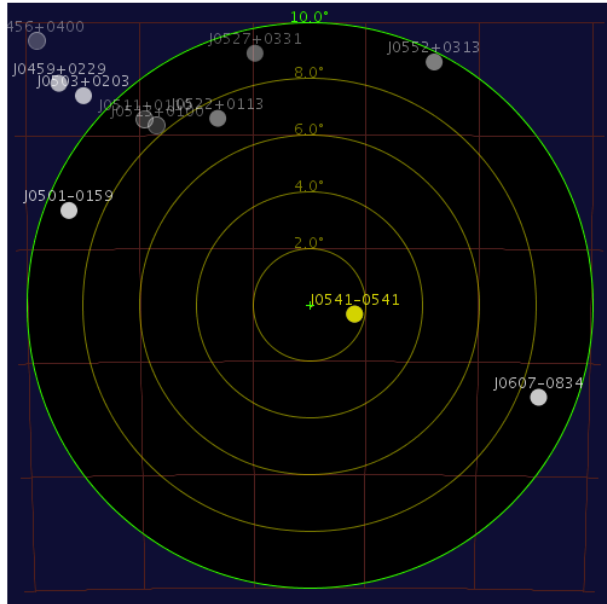
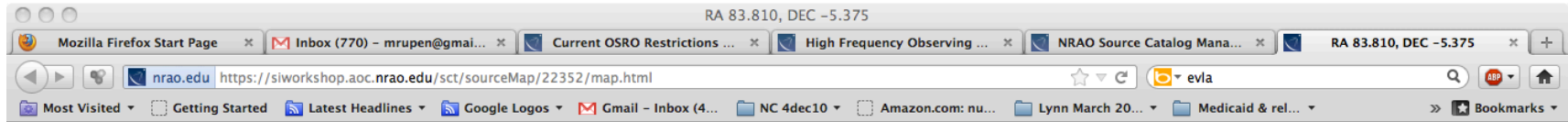
Personal Catalog

Orion Group

Demo Group

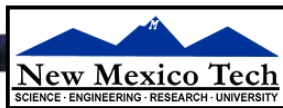
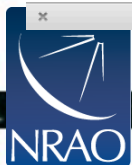
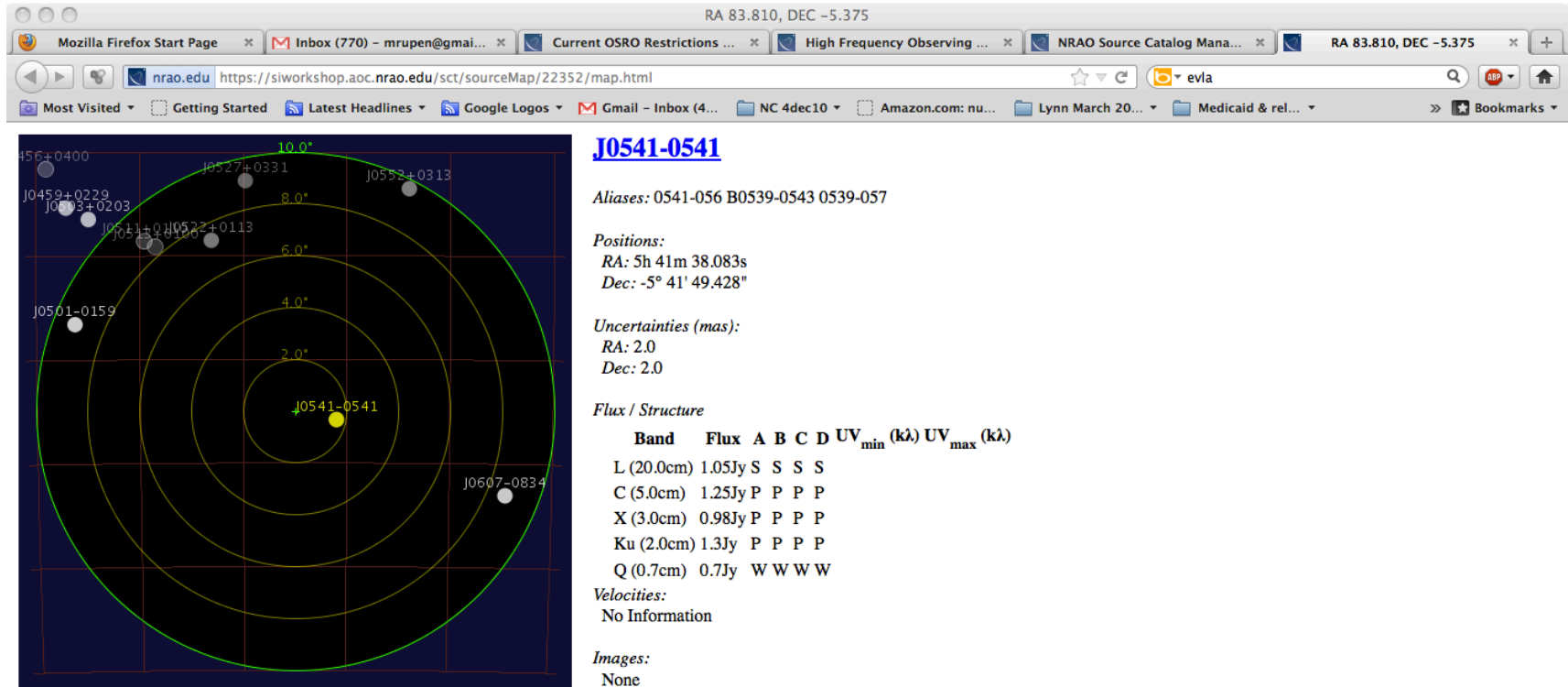


Skymap: finding a nearby calibrator



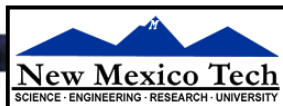
(Hover over source to see information here.)

Skymap: hover for info



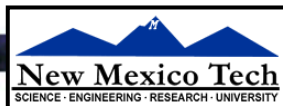
Calibrators

- Complex gain: nearby, fairly strong at observing band
–J0541-0541
- Ref.ptg. calibrator: nearby, point-like, strong at X band
–J0541-0541 (lucky!)
- Flux calibrator: check VLA Flux Cal catalog, LST range
–Ideally: similar elevation (30-45d) during the observing run
–0137+331=3C48 0500-0600 LST
–0542+498=3C147 45-75d when Orion is up
- Bandpass calibrator: very strong for SNR in narrow channels
–Search for > 5 Jy at K band: J0319+4130 (3C84)
–Elevation 30-75d when Orion is up

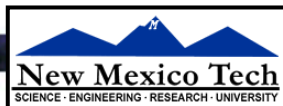


Calibrators

- Pol'n leakage: strong, known pol'n
–J0319+4130
- Pol'n angle: known, non-0 pol'n
–3C48/3C138 will do...not great.
- See the EVLA polarization page for hints & details:
<https://science.nrao.edu/facilities/evla/early-science/polarimetry>



Scheduling Block (Observation PreparationTool)



Thirteenth Synthesis Imaging Workshop



Planning

- Basic “OSRO” guidelines will be updated, but currently look like this:

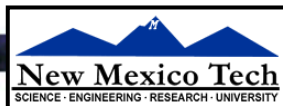
<https://science.nrao.edu/facilities/evla/observing/restrictions>

- The High Frequency Observing Guide is preliminary but very useful:

[http://evlaguides.nrao.edu/index.php?
title=High Frequency Observing](http://evlaguides.nrao.edu/index.php?title=High%20Frequency%20Observing)

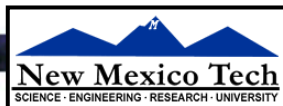
- NRAO helpdesk:

<https://help.nrao.edu/>



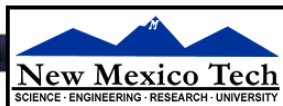
Planning

- Initial scans
 - 1 min “dummy” for each instrument configuration
 - Long first scan since you don’t know where the array is – can take ~12mins to get on-source
 - **Set CW/CCW explicitly!**
- Referenced pointing: errors can be up to an arcminute
 - Every hour and/or every source
 - At least 2.5minutes on-source
 - **MUST** use 1sec averaging – default primary X ptg



Planning

- Flux calibrator (prefer same elevation as source)
- Bandpass calibrator (prefer to observe more than once)
- Basic loop: RefPtg, then cal-source-cal-source-....
 - Maximize time on-source, but track the atmosphere!
 - Ensure enough time on the calibrator (SNR; move time; flagging)
 - K band, iffy weather: switch every 2mins in A/B cfg. Can usually get away with longer in C/D (7/10 minutes).
- Try 40sec/80sec (see next slides)
- Range of LST **start times** set by source AND calibrators (and length of SB!)
- For us, **0330-0630 LST** to avoid zenith & get 3C48

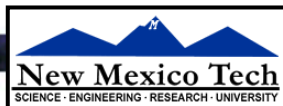


Scan lengths & sensitivities

- EVLA exposure calculator:

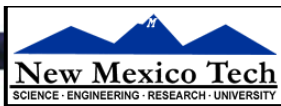
<https://science.nrao.edu/facilities/evla/calibration-and-tools/exposure>

- Flux/complex gain calibrators: want $\text{SNR} > 4$ on single baseline, one pol'n product, one subband (16 MHz)
 - $N_{\text{ant}}=2, N_{\text{pol}}=1, 16 \text{ MHz}, 1 \text{ sec} \rightarrow \text{rms} \sim 150 \text{ mJy}$
 - \rightarrow Want signal $> 600 \text{ mJy}$ for 1 sec, $> 200 \text{ mJy}$ for 9 sec
- RefPtg: want $\text{SNR} > 4$ on single baseline, 128 MHz, single pol'n product, in $\sim 10 \text{ sec}$ at X band
 - Rms in 10 sec = 7 mJy



Scan lengths & sensitivities

- Bandpass calibration: want SNR better than your line, in each channel
 - 31.25 kHz channels, one baseline, one pol'n product: rms in 1 min ~ 400 mJy
 - Flux density matters!
- Paranoia is good!
 - Move time, esp. slow antennas
 - Flagging
 - It's cheap to spend a bit more time (move time often dominates anyhow), and horrible to have uncalibrated data



The Project

NRAO Observation Preparation Tool

Mozilla Firefox Start Page x Inbox (770) - mrupen@gmail.co... x Current OSRO Restrictions - Sc... x High Frequency Observing - EV... x NRAO Observation Preparation ... x

nrao.edu https://siworkshop.aoc.nrao.edu/opt/MyProjects.iface

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

PROJECT DETAILS

TITLE [New Project] PROJECT CODE 201_2

PROPOSAL CODE [None] TYPE Simple

TELESCOPE EVLA TEST PROJECT? ☒

ALLOCATED TIME (HRS) 0.0 TIME USED (HRS) 0.0

PRINCIPAL INVESTIGATOR AND COAUTHORS

PRINCIPAL INVESTIGATOR

Synthesis Teacher 1 <do-not-reply@nrao.edu>

RECEIVE EMAILS? ☒ Yes ☐ No

PROPOSAL CONTACT AUTHOR

Not Specified

CURRENT COAUTHORS

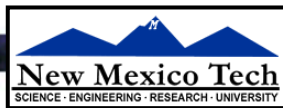
Name	E-mail	Receive Emails?
Remove Coauthors		

Last Name: Search

Name	E-mail
Add Coauthors	

Can import sample SB from:

- AOC: /lustre/aoc/siw-2012/opt.xml
- NMT: /fs/scratch/nrao/opt.xml



Program Block

NRAO Observation Preparation Tool

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

PROGRAM BLOCK DETAILS

NAME [New Program Block] COMPLETED? Yes

ALLOCATED TIME (HRS) 0.0 USED TIME (HRS) 0.0

OBSERVATION TYPE Test

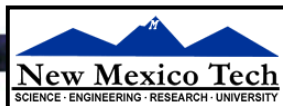
ACCEPTABLE CONFIGURATIONS

Drag configurations from the list on the right to the left to choose that configuration.
Drag configurations on the left up and down in order to adjust their priority.
Drag configurations from the list on the left to the right to remove that configuration.

ACCEPTABLE CONFIGURATIONS AVAILABLE CONFIGURATIONS

A B C D BNA CNB DNC A=>BNA BNA=>B B=>CNB CNB=>C C=>DNC DNC=>D

SCHEDULING BLOCKS



Program Block, tweaked for Orion

NRAO Observation Preparation Tool

Mozilla Firefox Start Page | Inbox (770) - mrupen@gmail.co... | Current OSRO Restrictions - Sc... | High Frequency Observing - EV... | NRAO Observation Preparation ...

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

PROGRAM BLOCK DETAILS

NAME Orion K demo COMPLETED? No

ALLOCATED TIME (HRS) 2.0 USED TIME (HRS) 0.0

OBSERVATION TYPE Test

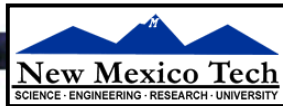
ACCEPTABLE CONFIGURATIONS

Drag configurations from the list on the right to the left to choose that configuration.
Drag configurations on the left up and down in order to adjust their priority.
Drag configurations from the list on the left to the right to remove that configuration.

ACCEPTABLE CONFIGURATIONS AVAILABLE CONFIGURATIONS

C A B D BNA CNB DNC A=>BNA BNA=>B B=>CNB CNB=>C C=>DNC DNC=>D D=>A

SCHEDULING BLOCKS

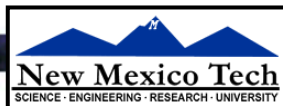


Scheduling Block: new...

The screenshot shows the NRAO Observation Preparation Tool (OPT) web interface. The browser window displays the URL <https://siworkshop.aoc.nrao.edu/opt/MyProjects.iface>. The interface includes a navigation bar with links like 'File', 'Edit', 'System', and 'Help'. A notice at the top states: "Notice: you are currently connected to the siworkshop version of the OPT." The main content area is titled 'SCHEDULING BLOCK DETAILS' and contains the following information:

- GENERATED ID:** 2075
- NAME:** [New Scheduling Block]
- STATUS:** Not Submitted
- COUNT:** 1
- COMPLETED:** 0
- TOTAL TIME:** 00:00:00
- TIME PER EXECUTION:** 00:00:00
- SCHEDULE TYPE:** Dynamic
- LST START RANGE:** 00 : 00 - 00 : 00 (with 'Add' and 'Remove' buttons)
- NO CONSTRAINT:** ☒
- EARLIEST UT START DATE (OPTIONAL):** 2012/05/30
- SHADOWING LIMIT (MAX):** 0.0 m
- IN CONFIGURATION:** C
- ASSUMED ANTENNA STARTING POSITION:** HORIZONTAL
- COORDINATE SYSTEM:** HORIZONTAL
- AZIMUTH:** 225.0d

On the right side of the form, there is a diagram illustrating the scheduling block's geometry. It shows a circular path with angles marked: 275°, -85°, 85°, and 445°. The path is divided into two sections: 'Clockwise (CW) right wrap' and 'Counter-clockwise (CCW) left wrap'. The diagram also indicates a 180° separation between the two sections and a 265° - 265° range.



Scheduling Block: ...set the LST range...

NRAO Observation Preparation Tool

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Information Reports Validation and Submission Bulk Scan Creation Bulk Scan Edit Executions

SCHEDULING BLOCK DETAILS

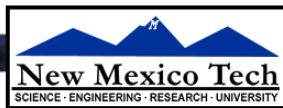
GENERATED ID: 2075
NAME: Orion Demo SB
COUNT: 1
TOTAL TIME: 00:00:00
SCHEDULE TYPE: Dynamic
LST START RANGE: 03:30 - 06:30
EARLIEST UT START DATE (OPTIONAL): 2012/05/30
SHADOWING LIMIT (MAX): 0.0 m
IN CONFIGURATION: C

STATUS: Not Submitted
COMPLETED: 0
TIME PER EXECUTION: 00:00:00

ASSUMED ANTENNA STARTING POSITION
COORDINATE SYSTEM: HORIZONTAL
AZIMUTH: 225.0d

Diagram illustrating the LST range and wrap-around:

The diagram shows a circular path representing the LST range. The path starts at 275° and ends at 445°. The path is divided into two segments: a Clockwise (CW) right wrap segment and a Counter-clockwise (CCW) left wrap segment. The path is labeled with 275°, -85°, 85°, and 445°. A 180° arc is shown at the bottom, labeled 265° - 265°.



Scheduling Block: ...and req'd weather

NRAO Observation Preparation Tool

Mozilla Firefox Start Page | Inbox (770) - mrupen@gmail.co... | Current OSRO Restrictions - Sc... | High Frequency Observing - EV... | NRAO Observation Preparation ...

nrao.edu https://siworkshop.aoc.nrao.edu/opt/MyProjects.iface

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Project List:

- Demo Project
- [New Project]
- Orion K demo
- Orion Demo SB, 00:00:00
- STD: [New Scan]

ASSUMED ANTENNA STARTING POSITION

COORDINATE SYSTEM HORIZONTAL

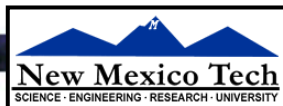
AZIMUTH 225.0d

ELEVATION 35.0d

SCHEDULING CONSTRAINTS/CONDITIONS

Description	Wind	Atmospheric Phase Limit
Lowest Frequencies (4, P, and L)	Any	Any
2.0GHz - 4.0GHz (S)	Any	60.0 degrees
4.0GHz - 8.0GHz (C)	Any	45.0 degrees
8.0GHz - 12.0GHz (X)	15.0 m/s	30.0 degrees
12.0GHz - 18.0GHz (Ku)	10.0 m/s	15.0 degrees
18.0GHz - 26.5GHz (K)	7.0 m/s	10.0 degrees
26.5GHz - 40.0GHz (Ka)	6.0 m/s	7.0 degrees
40.0GHz - 50.0GHz (Q)	5.0 m/s	5.0 degrees
Specified Constraints	m/s	degrees

COMMENTS TO THE OPERATOR



At last, an actual scan!

NRAO Observation Preparation Tool

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Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

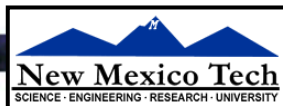
Overview Comments

SCAN DETAILS

NAME	SCAN MODE	ANTENNA WRAP	REFERENCE POINTING	PHASE & DELAY CALIBRATION	OVER THE TOP
[New Scan]	Standard Observing	No Preference	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Allow?

TARGET SOURCE	HARDWARE SETUP	SCAN TIMING	INTENTS
No Source Assigned Change	No Instrument Config. Assigned <input type="checkbox"/> Keep Previous Conf. Change	Duration (LST) 00:05:00	<input checked="" type="checkbox"/> OBSERVE TARGET <input type="checkbox"/> CALIBRATE COMPLEX GAIN <input type="checkbox"/> CALIBRATE FLUX DENSITY SCALE <input type="checkbox"/> CALIBRATE BANDPASS More >>>

zotero



Dummy: K band, Orion

NRAO Observation Preparation Tool

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

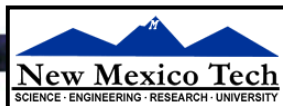
Notice: you are currently connected to the siworkshop version of the OPT.

Overview Comments

SCAN DETAILS

NAME	SCAN MODE	ANTENNA WRAP	REFERENCE POINTING	PHASE & DELAY CALIBRATION	OVER THE TOP
Dummy K	Standard Observing	No Preference	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Allow?

TARGET SOURCE	HARDWARE SETUP	SCAN TIMING	INTENTS
Orion BN/KL RA: 5h 35m 14.50s DEC: -5d 22' 30.00" VELOCITY 6.0km/s Lsr Kinematic Radio Change	K band ammonia + continuum Receiver: K-band A0/C0: 24.1985GHz B0/D0: 25.3855GHz <input type="checkbox"/> Keep Previous Conf. Change	Duration (LST) 00:01:00	<input checked="" type="checkbox"/> OBSERVE TARGET <input type="checkbox"/> CALIBRATE COMPLEX GAIN <input type="checkbox"/> CALIBRATE FLUX DENSITY SCALE <input type="checkbox"/> CALIBRATE BANDPASS More >>>



Dummy: X band, 3C48

NRAO Observation Preparation Tool

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Demo Project
 [New Project]
 Orion K demo
 Orion Demo SB, 00:05:00
 STD: Dummy K
 STD: Dummy Xptg

Overview Comments

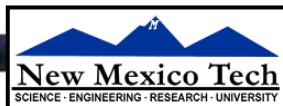
SCAN DETAILS

NAME	SCAN MODE	ANTENNA WRAP	REFERENCE POINTING	PHASE & DELAY CALIBRATION	OVER THE TOP
Dummy Xpt	Standard Observing	No Preference	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Allow?

TARGET SOURCE	HARDWARE SETUP	SCAN TIMING	INTENTS
0137+331=3C48 RA: 1h 37m 41.299431s DEC: 33d 9' 35.13299"	Primary X band pointing Receiver: X-band A0/C0: 8.396GHz B0/D0: 8.524GHz <input type="checkbox"/> Keep Previous Conf.	Duration (LST) 00:01:00	<input checked="" type="checkbox"/> OBSERVE TARGET <input type="checkbox"/> CALIBRATE COMPLEX GAIN <input type="checkbox"/> CALIBRATE FLUX DENSITY SCALE <input type="checkbox"/> CALIBRATE BANDPASS More >>>

Change Change

zotero



3C48: X band RefPtg

NRAO Observation Preparation Tool

Firefox Start Page | Inbox (770) - mrupen@gmail.co... | Current OSRO Restrictions - Sc... | High Frequency Observing - EV... | NRAO Observation Preparation ...

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NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Overview Comments

SCAN DETAILS

NAME	SCAN MODE	ANTENNA WRAP	REFERENCE POINTING	PHASE & DELAY CALIBRATION	OVER THE TOP
3C48 Xptg	Interferometric Pointing	No Preference	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Allow?

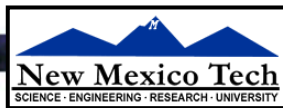
TARGET SOURCE	HARDWARE SETUP	SCAN TIMING	INTENTS
0137+331=3C48 RA: 1h 37m 41.299431s DEC: 33d 9' 35.13299"	Primary X band pointing Receiver: X-band A0/C0: 8.396GHz B0/D0: 8.524GHz	Duration (LST) 00:11:00	<input checked="" type="checkbox"/> CALIBRATE OFFSET POINTING

Change Change

Project List:

- Demo Project
- [New Project]
- Orion K demo
 - Orion Demo SB, 00:05:00
 - STD: Dummy K
 - STD: Dummy Xptg
 - IP: 3C48 Xptg

You should really use another nearby calibrator, to avoid resolution effects in Ref.Ptg....check the Source Catalog!



3C48: K band, RefPtg applied

NRAO Observation Preparation Tool

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Demo Project
 [New Project]
 Orion K demo
 Orion Demo SB, 00:05:00
 STD: Dummy K
 STD: Dummy Xptg
 IP: 3C48 Xptg
 STD: 3C48 K

Overview Comments

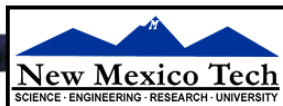
SCAN DETAILS

NAME	SCAN MODE	ANTENNA WRAP	REFERENCE POINTING	PHASE & DELAY CALIBRATION	OVER THE TOP
3C48 K	Standard Observing	No Preference	<input checked="" type="checkbox"/> Apply Last?	<input type="checkbox"/> Apply Last?	<input type="checkbox"/> Allow?

TARGET SOURCE	HARDWARE SETUP	SCAN TIMING	INTENTS
0137+331=3C48 RA: 1h 37m 41.299431s DEC: 33d 9' 35.13299"	K band ammonia + continuum Receiver: K-band A0/C0: 24.1985GHz B0/D0: 25.3855GHz <input type="checkbox"/> Keep Previous Conf.	Duration (LST) 00:03:00	<input type="checkbox"/> OBSERVE TARGET <input type="checkbox"/> CALIBRATE COMPLEX GAIN <input checked="" type="checkbox"/> CALIBRATE FLUX DENSITY SCALE <input type="checkbox"/> CALIBRATE BANDPASS Less <<< <input type="checkbox"/> CALIBRATE DELAY <input checked="" type="checkbox"/> CALIBRATE POLARIZATION ANGLE <input type="checkbox"/> CALIBRATE POLARIZATION LEAKAGE <input type="checkbox"/> DETERMINE AUTOPHASE

Change Change

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Orion loop (bracketed)

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Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Demos | Projects | Bulk Scan Creation | Bulk Scan Edit

SCAN LOOP DETAILS

LOOP NAME Orion K Loop

LOOP ITERATIONS 17

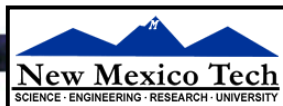
BRACKETED? ☒ (Performs your first scan one extra time at the end of the loop.)

COMMENTS

Orion K demo

Orion Demo SB, 00:05:00

- STD: Dummy K
- STD: Dummy Xptg
- IP: 3C48 Xptg
- STD: 3C48 K
- IP: J0541 Xptg
- **(17X) Orion K Loop



Orion loop (internals)

NRAO Observation Preparation Tool

Notice: you are currently connected to the siworkshop version of the OPT.

File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 [Exit](#)

Details Bulk Scan Creation Bulk Scan Edit

SCAN LOOP DETAILS

LOOP NAME Orion K Loop

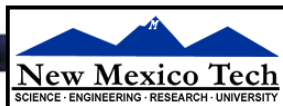
LOOP ITERATIONS 17

BRACKETED? ☒ (Performs your first scan one extra time at the end of the loop.)

COMMENTS

Tree View:

- Demo Project
 - [New Project]
 - Orion K demo
 - Orion Demo SB, 00:05:00
 - STD: Dummy K
 - STD: Dummy Xptg
 - IP: 3C48 Xptg
 - STD: 3C48 K
 - IP: J0541 Xptg
 - **(17X) Orion K Loop**
 - STD: J0541 K
 - STD: Orion K



Report/summary

NRAO Observation Preparation Tool

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File Edit System Help

NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations

Hello, Synthesis Teacher 1 Exit

Notice: you are currently connected to the siworkshop version of the OPT.

Information Reports Validation and Submission Bulk Scan Creation Bulk Scan Edit Executions

OBSEVING PROGRAM

Use your browser's regular Print feature to print this report.

PROJECT CODE: 201_1
GENERATED ID: 1204
PRINCIPAL INVESTIGATOR: Synthesis Teacher 1 <do-not-reply@nrao.edu>

ASSUMED SCHEDULE START: 62803 06:30:00 62803 06:30:00 LST Update Display UTC times

SCHEDULE STOP: 62803 08:30:00 LST

ASSUMED ANTENNA POSITION
AZIMUTH: 225.0d
ELEVATION: 35.0d

LST START RANGE: 03:30-06:30 LST
WIND CONSTRAINTS: 7.0 m/s
API CONSTRAINTS: 10.0 degrees

- Instrument Configuration Summary
- Time On Source Summary
- Schedule Summary

INSTRUMENT CONFIGURATION SUMMARY

Name	Tint	AC Freq	AC Rest/Sky	AC Summed BW	AC Coverage (%)	Req. BIBPs	# Channels	AC Doppler Vel.	AC Doppler Pos.	AC Doppler Off. (MHz)	BD Doppler Vel.	BD Doppler Pos.	BD Doppler Off. (MHz)
1 K band ammonia + continuum	3s	24.1985GHz	Sky	1.024GHz	100.0	44	4608	---	---	---	---	---	---
	K	25.3855GHz	Sky	1.024GHz	100.0	44	31.25kHz / 2.0MHz	---	---	---	---	---	---

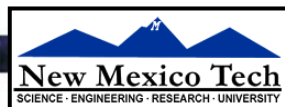
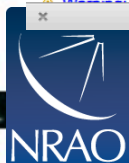
Show All Subbands |

Warning: Scan Dummy Xptg (ID 1330) has 1 shadowed antennas. The largest shadow is on antenna E02 and is 2.3m (3.3% of the dish), which exceeds your specified maximum of 0.0m.

Warning: Schedule Summary: There is no time on source for scan 'Dummy Xptg'.

Warning: Scan Dummy Xptg (ID 1330) has 1 shadowed antennas. The largest shadow is on antenna E02 and is 2.3m (3.3% of the dish), which exceeds your specified maximum of 0.0m.

Diagram illustrating antenna wrap-around for a 360-degree scan. The diagram shows a circular path with angles marked at 275°, -85°, 85°, and 445°. A red arrow indicates a clockwise (CW) right wrap from 275° to -85°. A green arrow indicates a counter-clockwise (CCW) left wrap from 85° to 445°. A 180° arc is shown between the two wrap-around points, with the calculation 265° - 265°.



Validation & submission!

The screenshot shows the NRAO Observation Preparation Tool (OPT) web interface. The browser window has multiple tabs, including 'NRAO Observation Preparation Tool'. The address bar shows the URL 'https://siworkshop.aoc.nrao.edu/opt/MyProjects.iface'. The page has a navigation bar with links like 'File', 'Edit', 'System', 'Help', and 'NRAO > User Portal > Observation Preparation | Sources | Instrument Configurations'. A notice at the top states: 'Notice: you are currently connected to the siworkshop version of the OPT.' The main content area has tabs for 'Information', 'Reports', 'Validation and Submission', 'Bulk Scan Creation', 'Bulk Scan Edit', and 'Executions'. The 'Validation and Submission' tab is active, showing sections for 'VALIDATE SCHEDULING BLOCK', 'REQUEST HELP', 'SUBMIT SCHEDULING BLOCK', and 'GENERATED OBSERVE SCRIPT'. On the left, a tree view shows a 'Demo Project' with sub-items like 'Orion ammonia' and 'Demo SB, 02:00:00'. The 'VALIDATE SCHEDULING BLOCK' section contains instructions and buttons for 'Validate' and 'Approve'. The 'REQUEST HELP' section contains instructions and a 'Request Help' link. The 'SUBMIT SCHEDULING BLOCK' section contains a 'Submit' button. The 'GENERATED OBSERVE SCRIPT' section contains a 'Download Script and VCI' link. At the bottom, there are warning messages: 'Warning: Scan Dummy Xptg (ID 1330) has 1 shadowed antennas. The largest shadow is on antenna E02 and is 2.3m (3.3% of the dish), which exceeds your specified maximum of 0.0m.' and 'Warning: Schedule Summary: There is no time on source for scan 'Dummy Xptg'.'

