STScI | SPACE TELESCOPE SCIENCE INSTITUTE

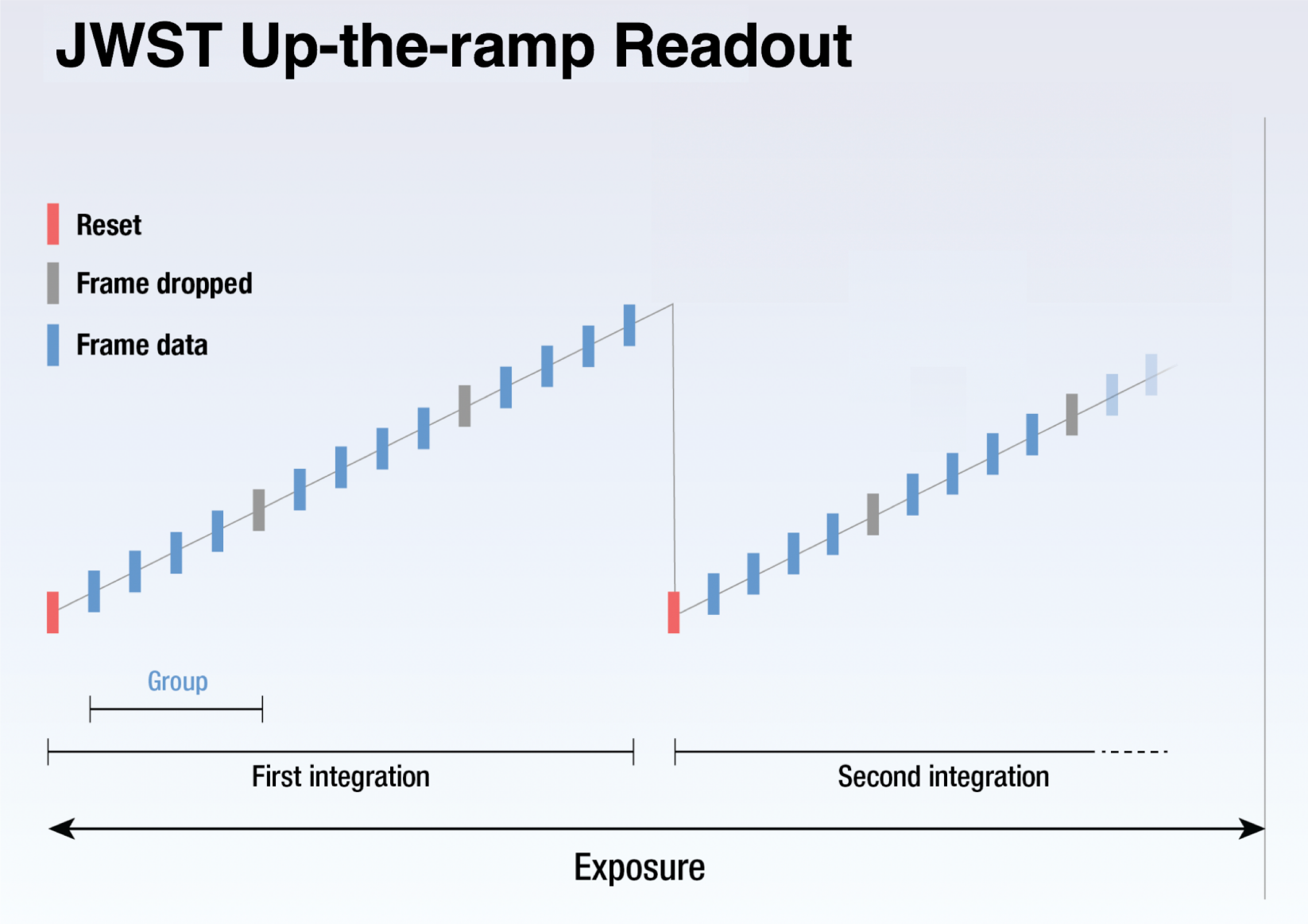
EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

MOS Science Example Screenshots

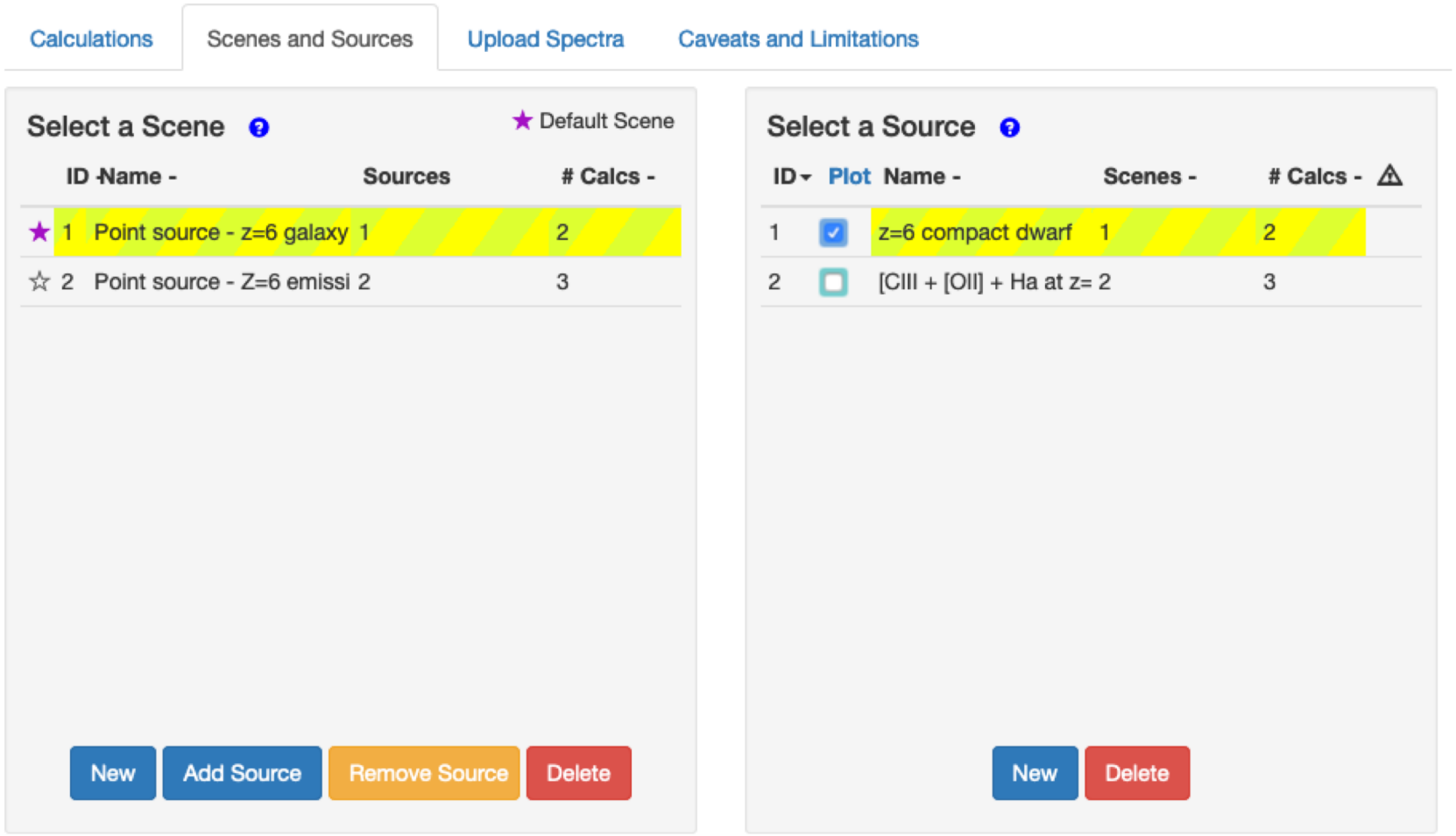
JWST Master Class at STScI

11/18/19 – 11/22/19

Exposures, Groups and Integrations

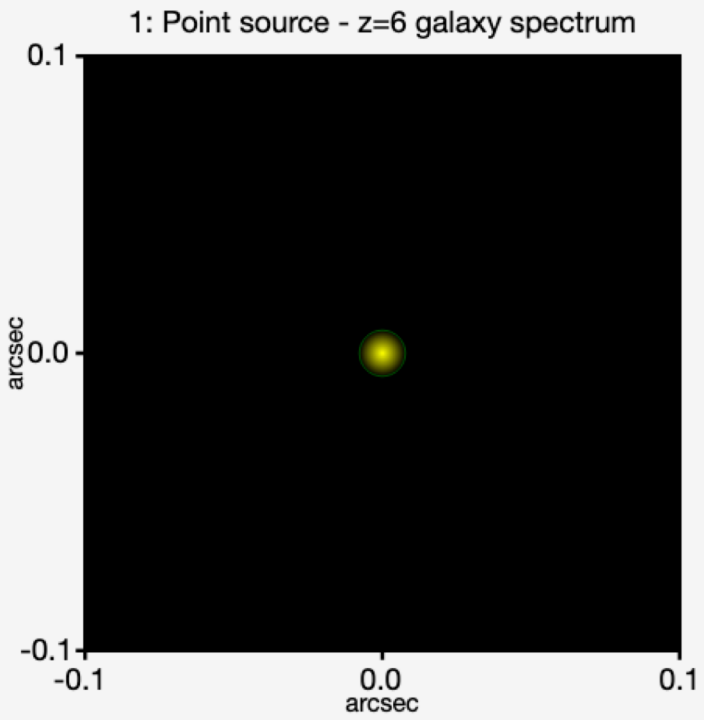


ETC Screenshots – continuum source



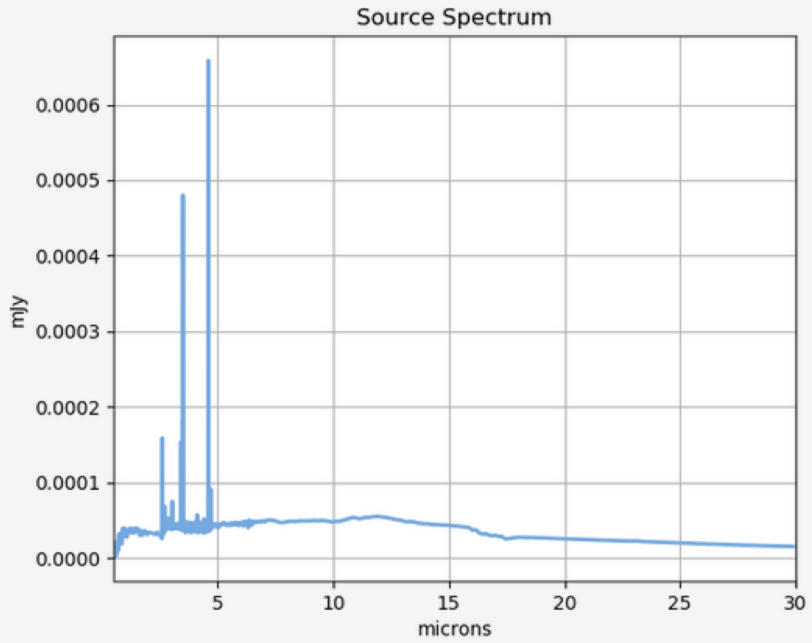
ETC Screenshots – continuum source

Scene Sketch



Show source outlines

Source Spectrum Plots



Spectra Plot

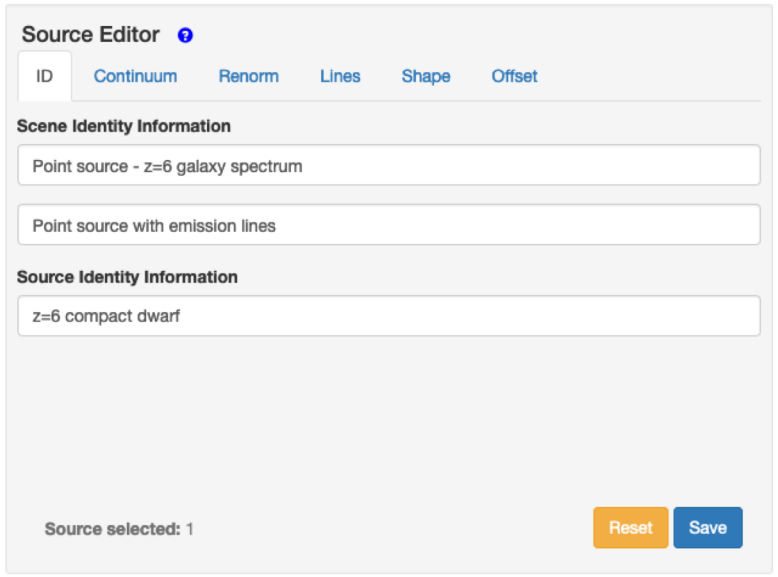
Bounds/Scale:

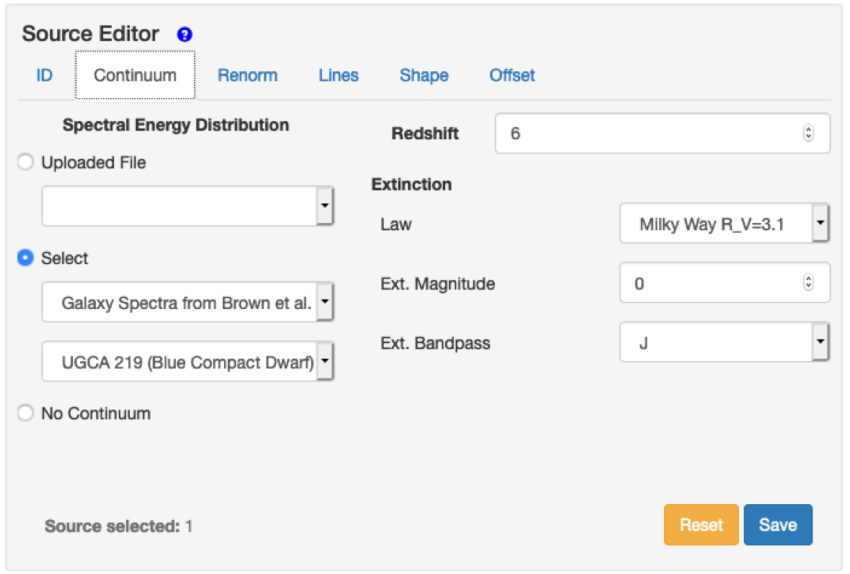
X: min max Linear Clear

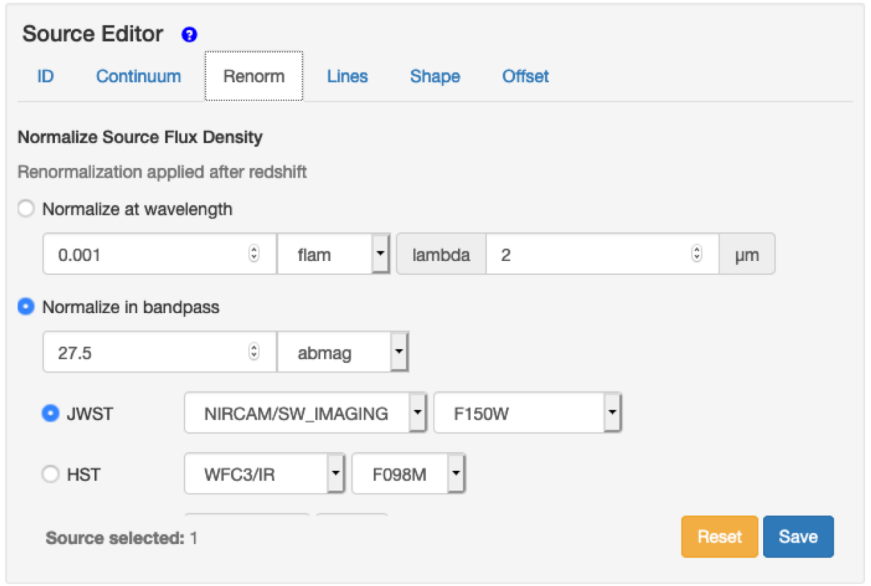
Y: min max Linear Clear

Apply

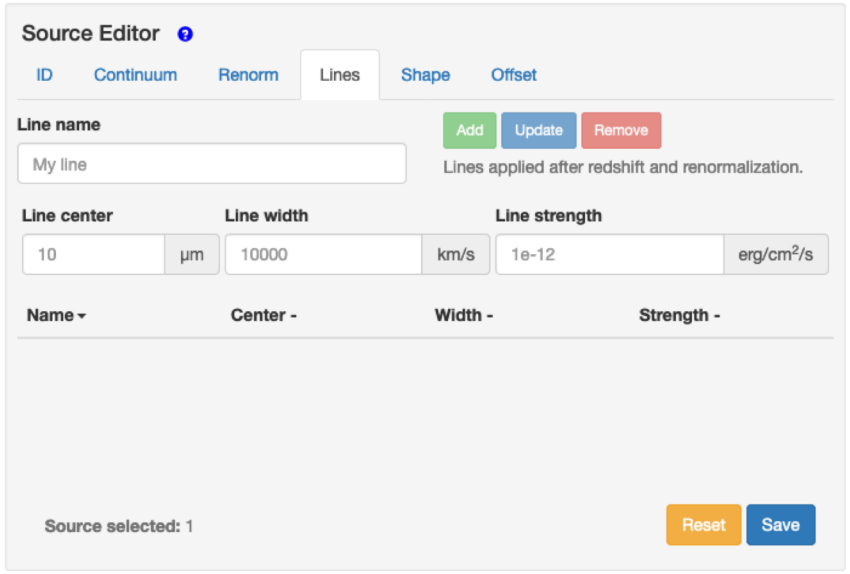
ETC Screenshots – continuum source

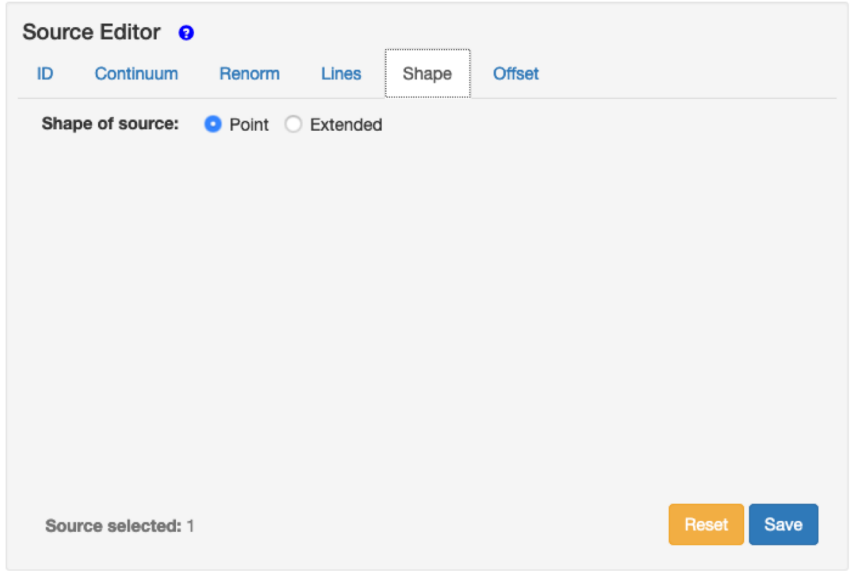


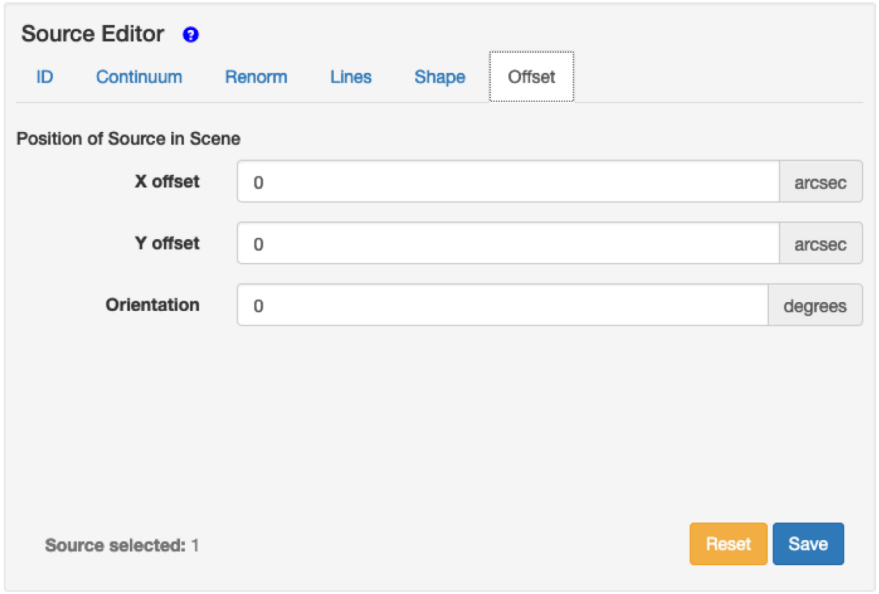




ETC Screenshots – continuum source







ETC Screenshots – emission line source

Calculations | Scenes and Sources | Upload Spectra | Caveats and Limitations

Select a Scene ★ Default Scene

	ID	Name	Sources	# Calcs
☆	1	Point source - z=6 galaxy sp	1	2
★	2	Point source - Z=6 emission	2	3

New | Add Source | Remove Source | Delete

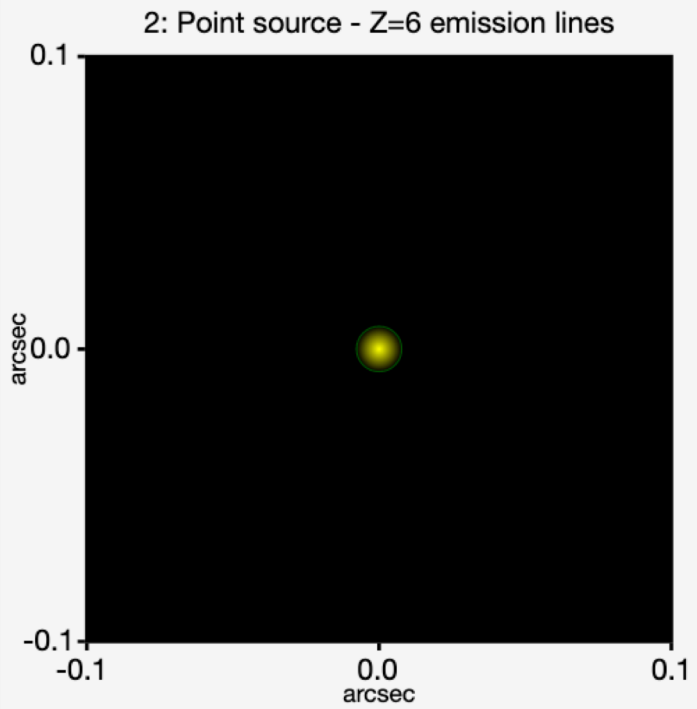
Select a Source

ID	Plot	Name	Scenes	# Calcs
1	☐	z=6 compact dwarf	1	2
2	☑	[CIII + [OII] + Ha at z=6	2	3

New | Delete

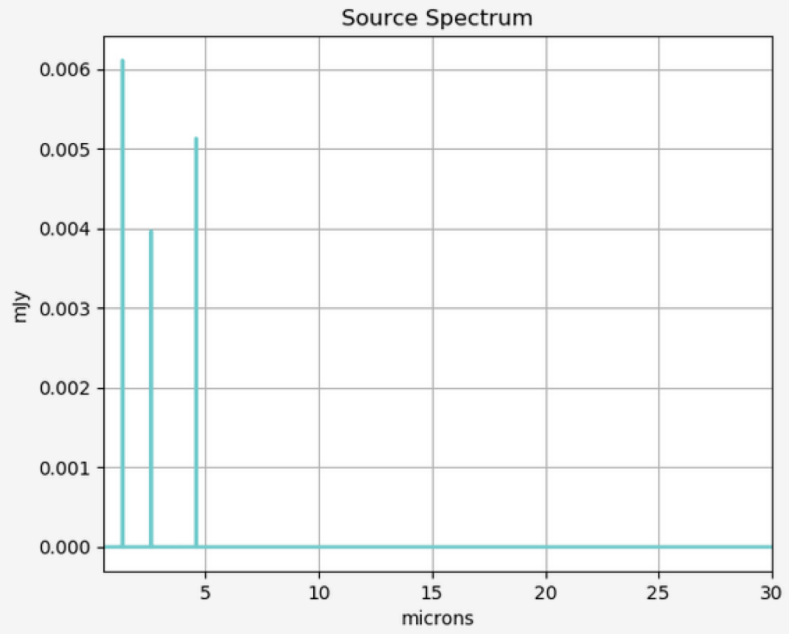
ETC Screenshots – emission line source

Scene Sketch



Show source outlines

Source Spectrum Plots



Spectra Plot

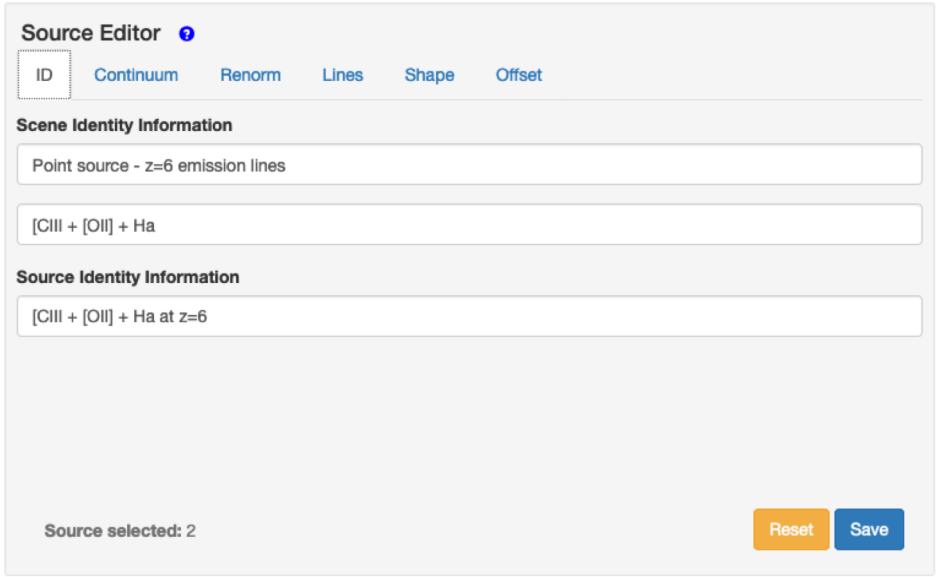
Bounds/Scale:

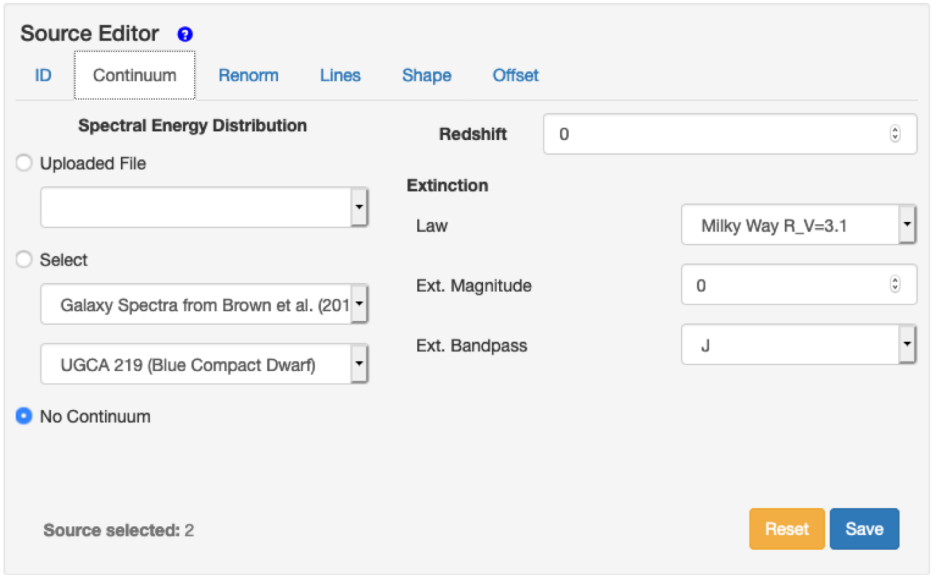
X: min max Linear Clear

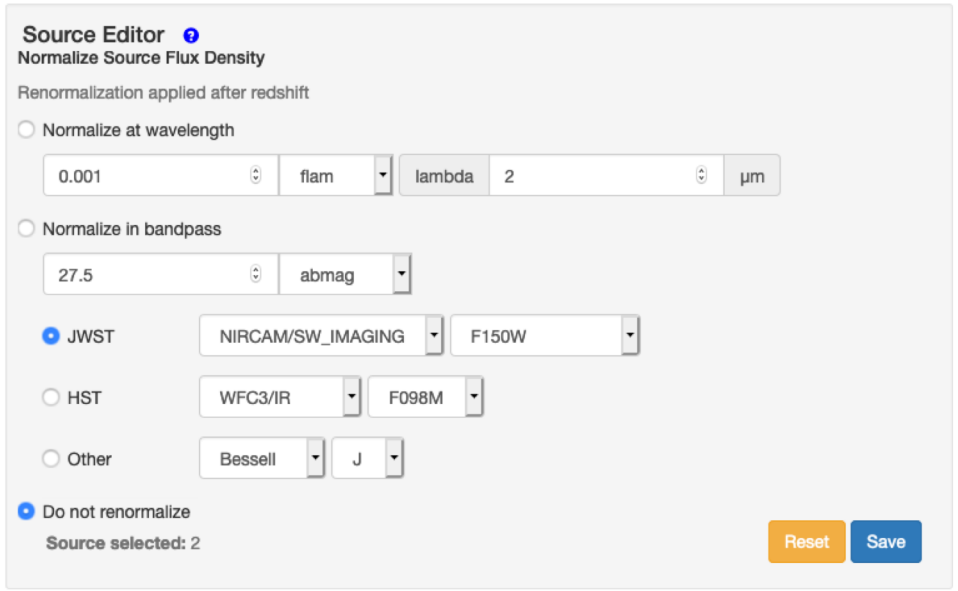
Y: min max Linear Clear

Apply

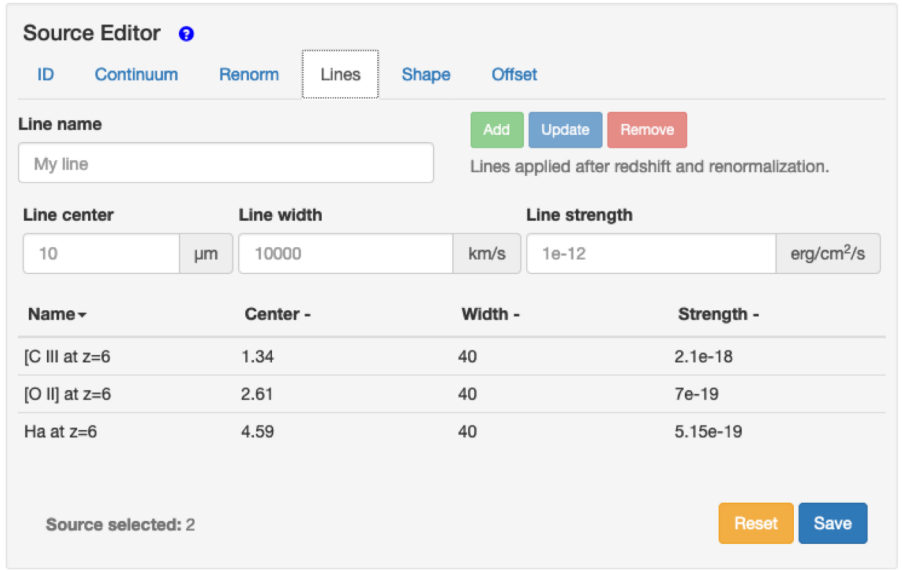
ETC Screenshots – emission line source

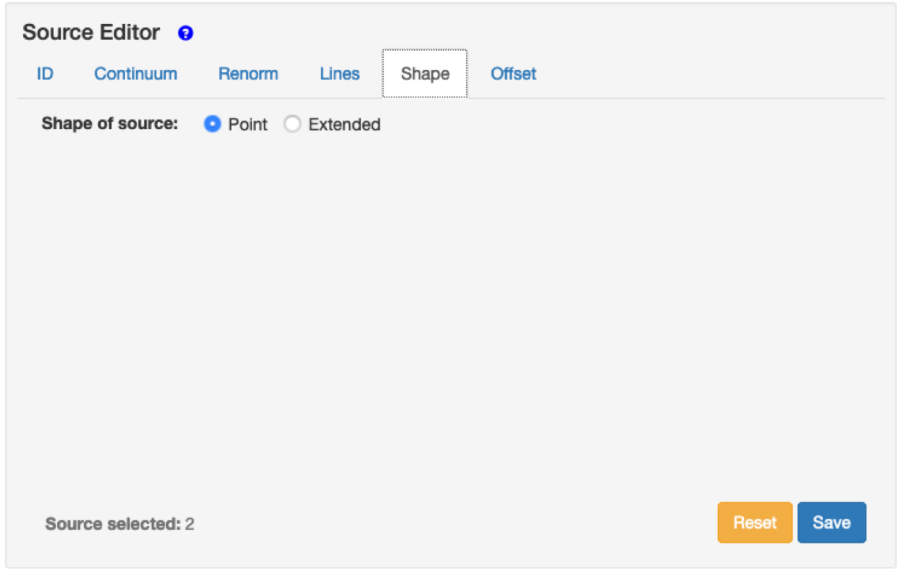


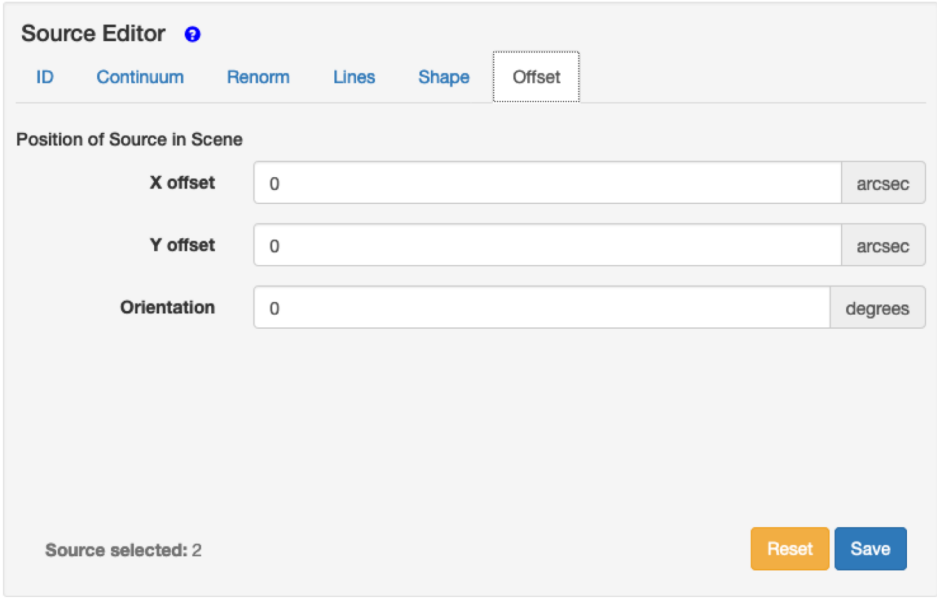




ETC Screenshots – emission line source







ETC Screenshots - Calculations

Calculations | Scenes and Sources | Upload Spectra | Caveats and Limitations

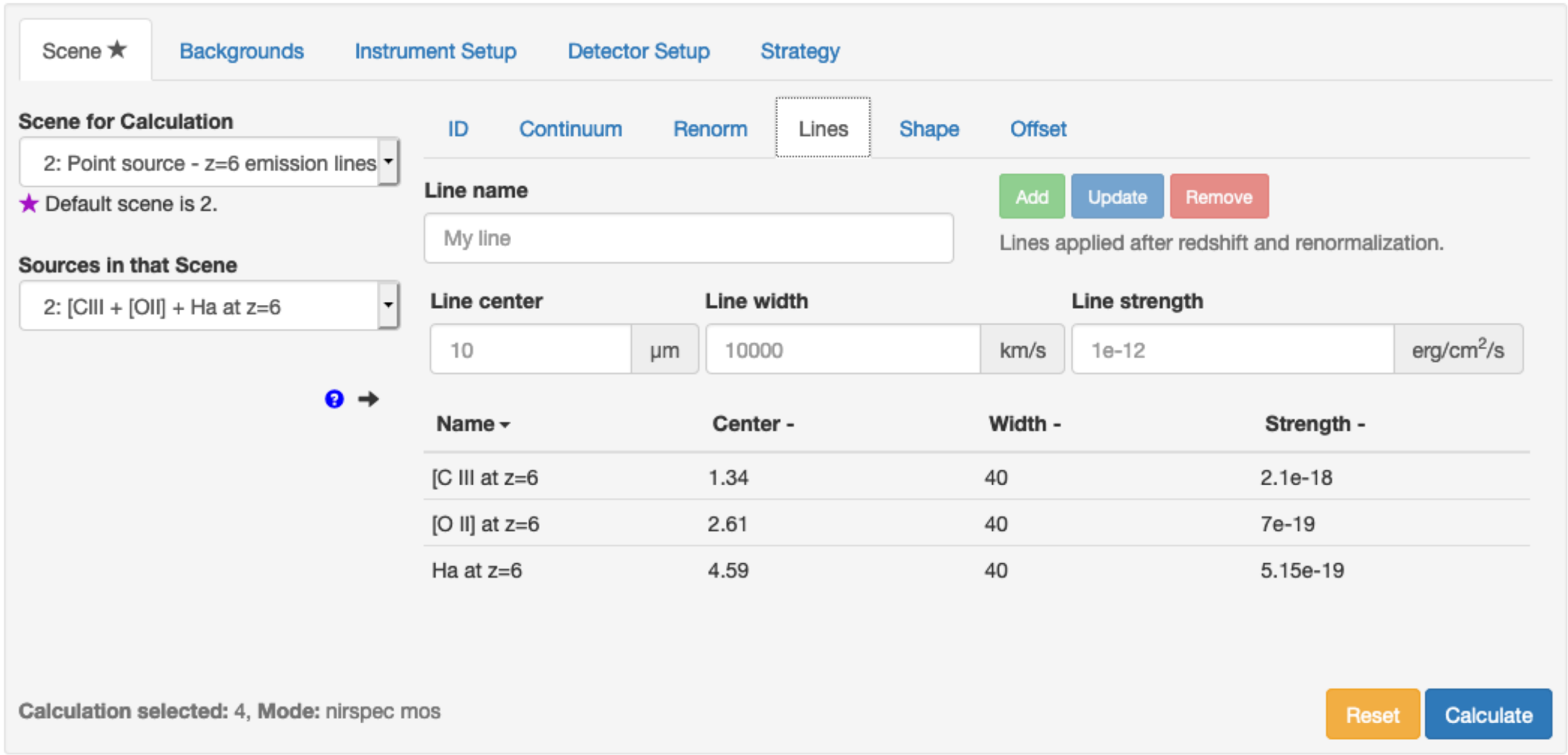
MIRI ▾ | NIRCam ▾ | NIRISS ▾ | NIRSpec ▾

ID ▲	✓	Mode -	λ -	Scn -	(s) -	SNR -	⚠
5	☐	nirspec target_acq	2.59	1	171.79	7.86	!
4	☑	nirspec mos	4.59	2	31862.14	11.92	✓
3	☑	nirspec mos	2.61	2	31862.14	11.21	✓
2	☑	nirspec mos	1.34	2	31862.14	17.90	✓
1	☐	nirspec mos	1.16	1	95586.41	12.79	✓
-	-	---	---	-	--.-	--.-	-

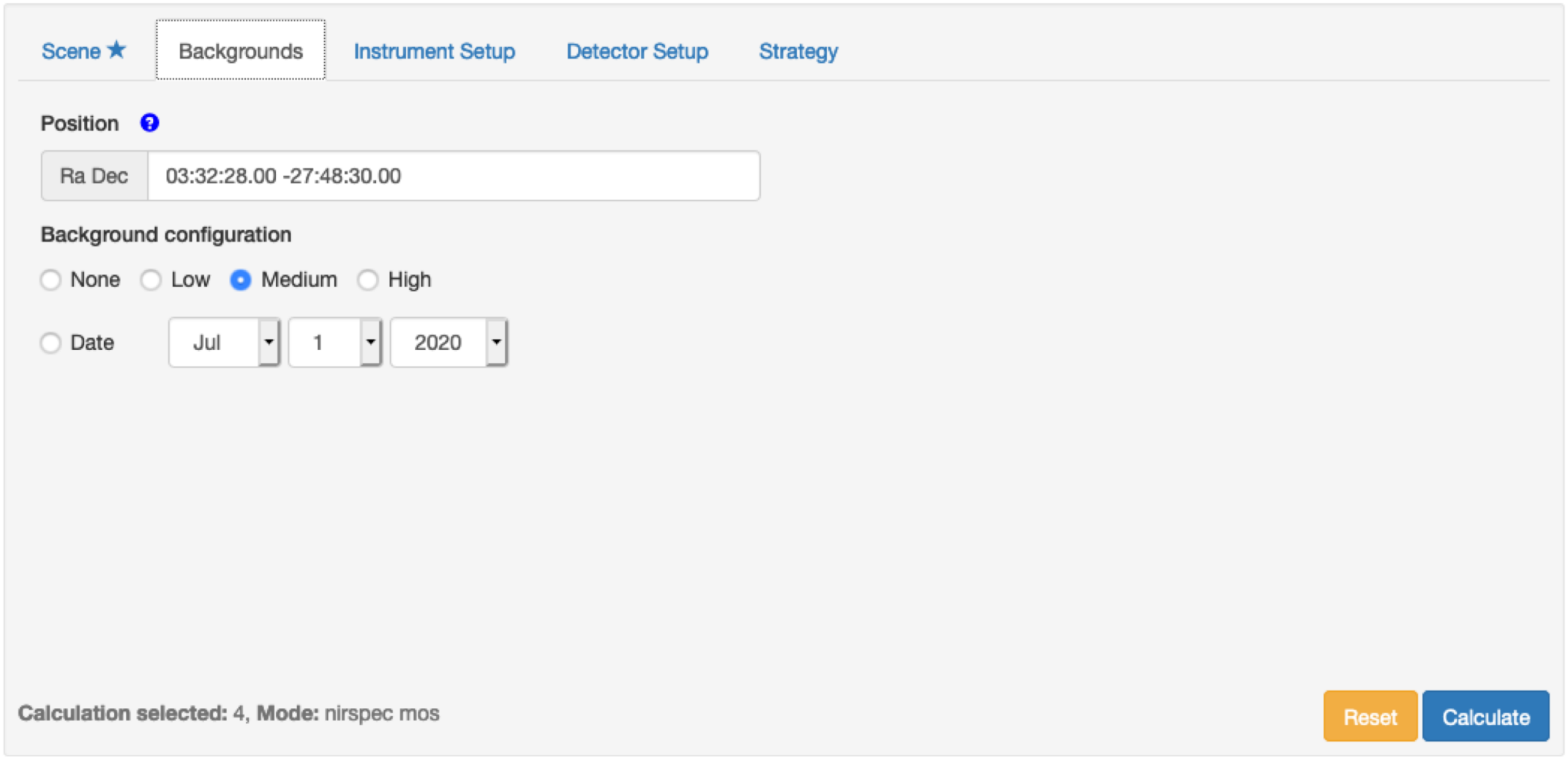
Same type of screen shots for computations 4, 3 and 2 (medium spectral resolution configurations F100LP/G140M, F170LP/G235M and F290LP/G395M).

Showing only one of them.

ETC Screenshots – emission line source scene



ETC Screenshots – Background



ETC Screenshots – Instrument Setup

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

NIRSpec Multi-Object Spectroscopy

Grating/Filter Pair

G395M/F290LP

Slitlet Shape

3 shutters (-1,0,1)

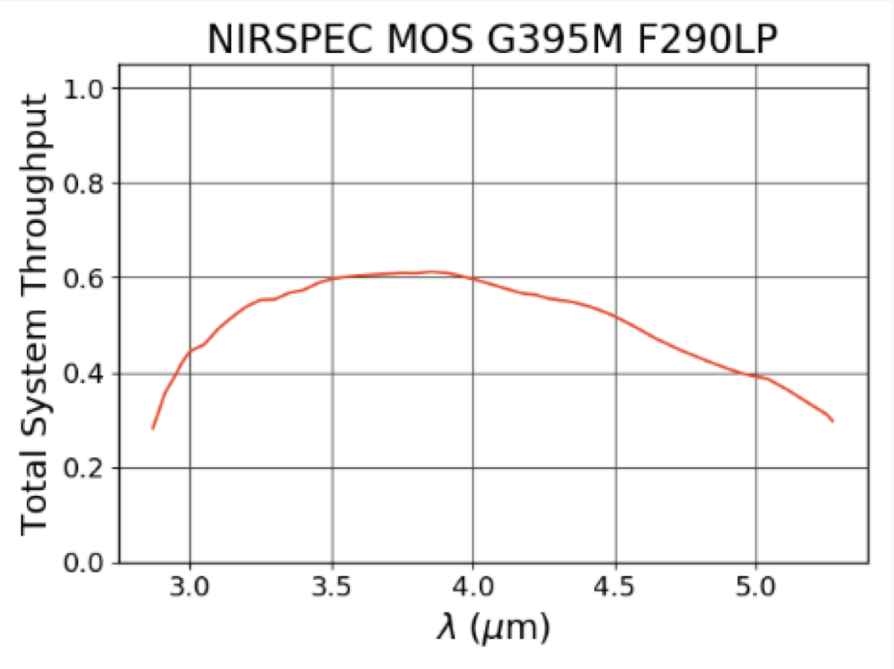
The source selected in the Strategy tab will be placed in shutter 0.

MSA Location

Quadrant 3 center

These relative directions are when looking through the MSA towards the sky.

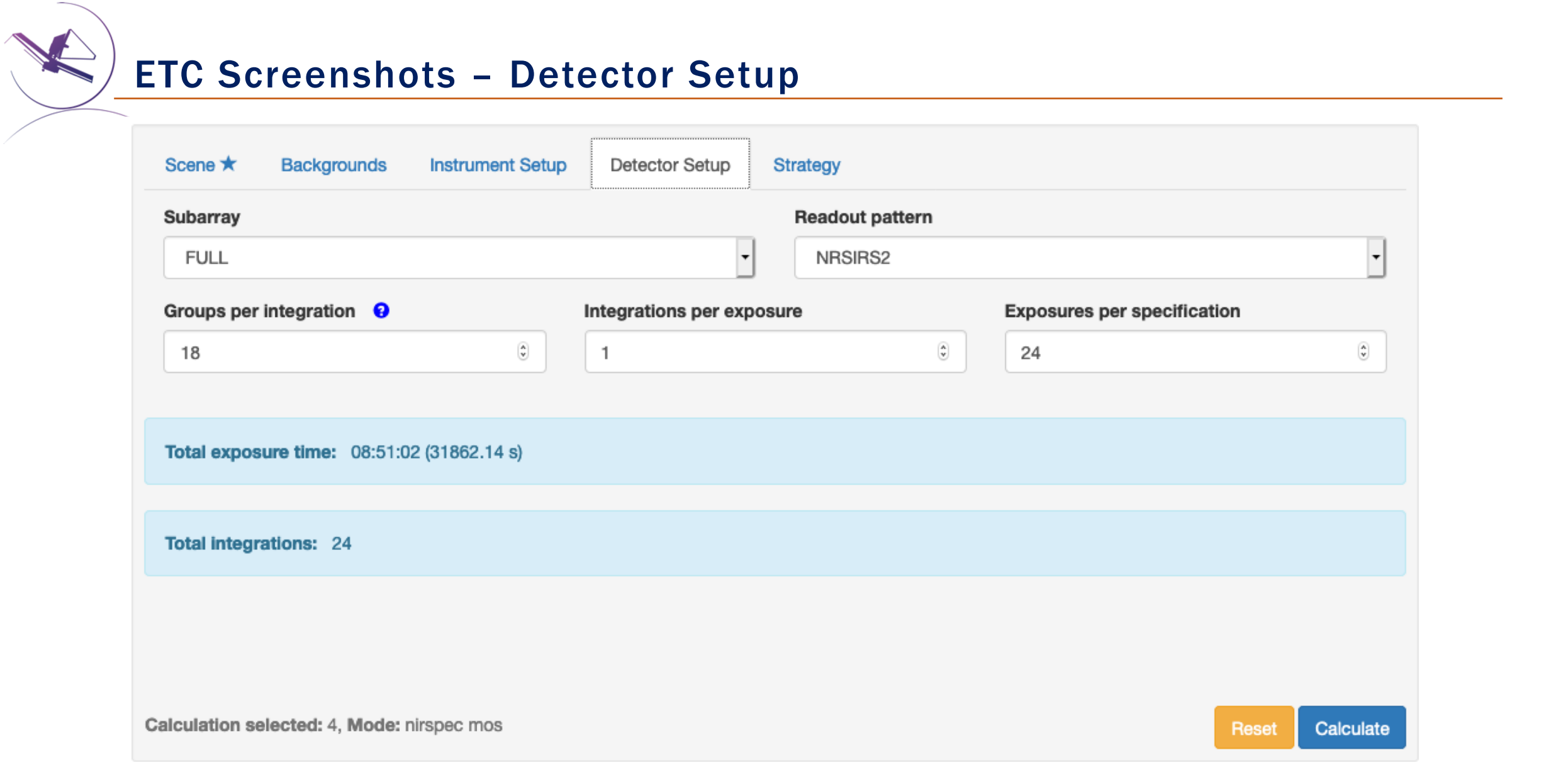
Wavelength range: (2.87 - 5.27)



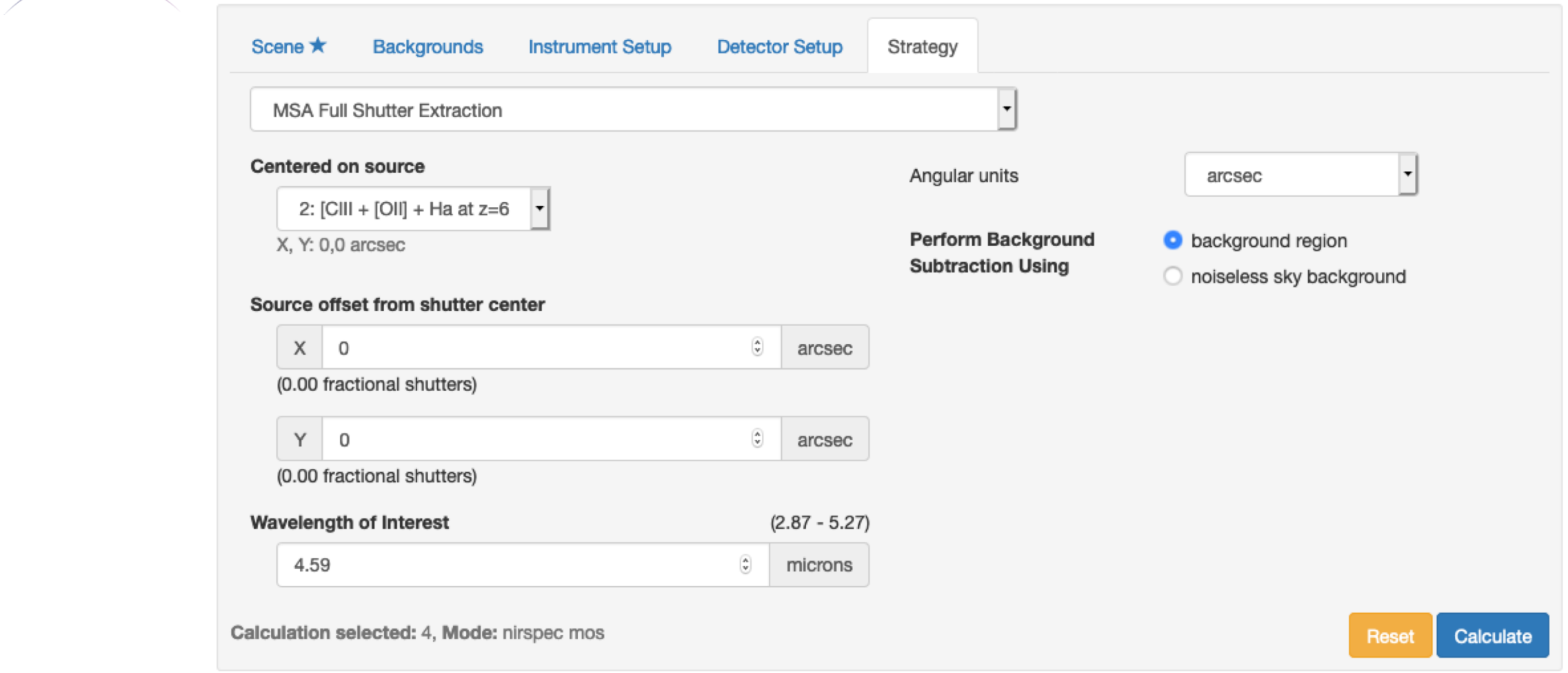
Calculation selected: 4, **Mode:** nirspec mos

Reset | Calculate

ETC Screenshots – Detector Setup



ETC Screenshots - Strategy



ETC Screenshots - Calculations

Calculations | Scenes and Sources | Upload Spectra | Caveats and Limitations

MIRI ▾ | NIRCam ▾ | NIRISS ▾ | NIRSpec ▾

ID ▲	✓	Mode -	λ -	Scn -	(s) -	SNR -	⚠
5	☐	nirspec target_acq	2.59	1	171.79	7.86	!
4	☐	nirspec mos	4.59	2	31862.14	11.92	✓
3	☑	nirspec mos	2.61	2	31862.14	11.21	✓
2	☑	nirspec mos	1.34	2	31862.14	17.90	✓
1	☑	nirspec mos	1.16	1	95586.41	12.79	✓
-	-	---	---	-	--.-	--.-	-

CLEAR/PRISM

ETC Screenshots – emission line source scene

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

Scene for Calculation

1: Point source - z=6 galaxy spectrum

★ Default scene is 2.

Sources in that Scene

1: z=6 compact dwarf

ID | Continuum | Renorm | Lines | Shape | Offset

Line name

My line

Add | Update | Remove

Lines applied after redshift and renormalization.

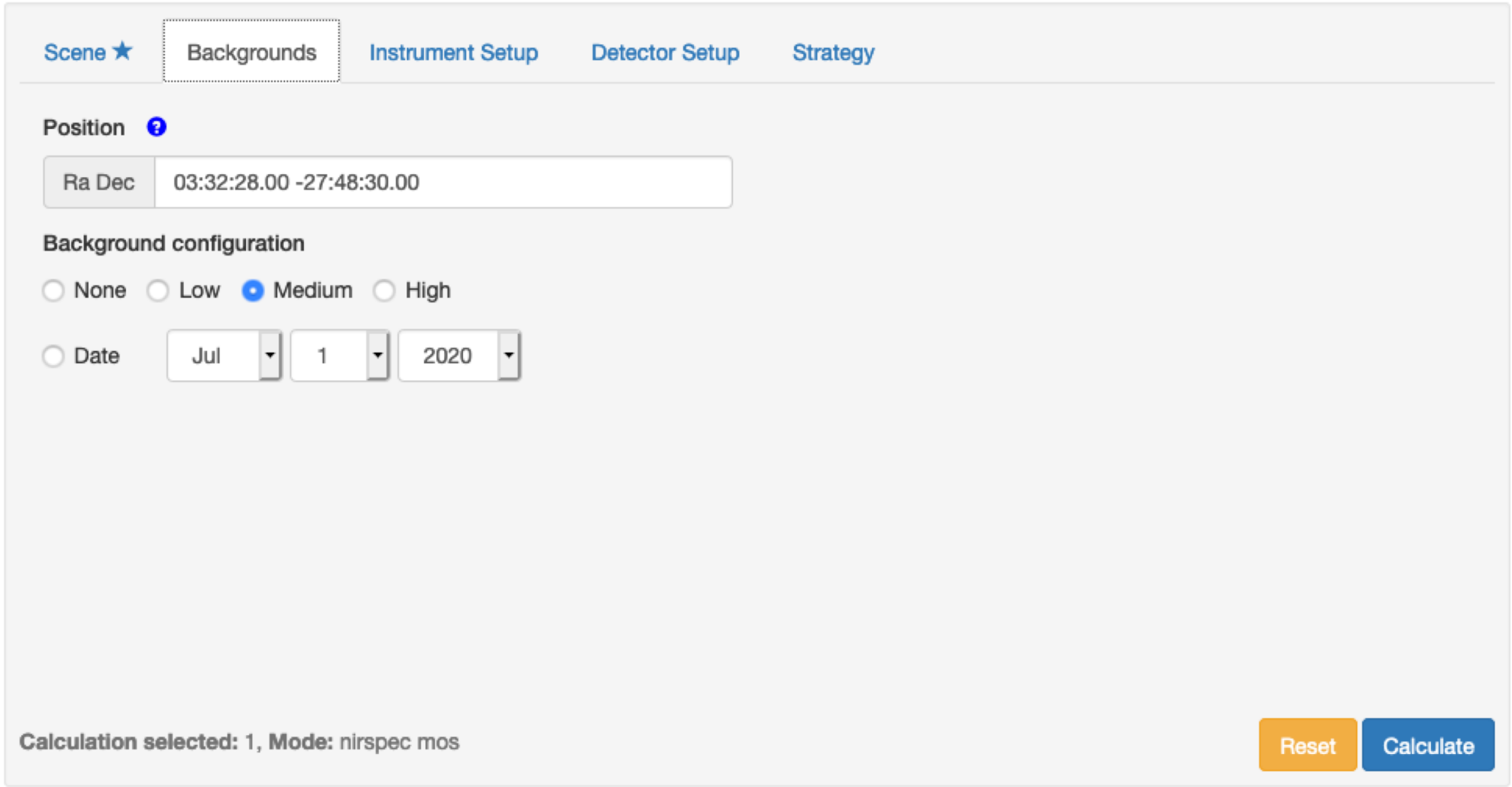
Line center		Line width		Line strength	
10	μm	10000	km/s	1e-12	erg/cm^2/s

Name	Center -	Width -	Strength -

Calculation selected: 1, **Mode:** nirspec mos

Reset | Calculate

ETC Screenshots - Background



ETC Screenshots – Instrument Setup

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

NIRSpec Multi-Object Spectroscopy

Grating/Filter Pair

Prism/CLEAR

Slitlet Shape

3 shutters (-1,0,1)

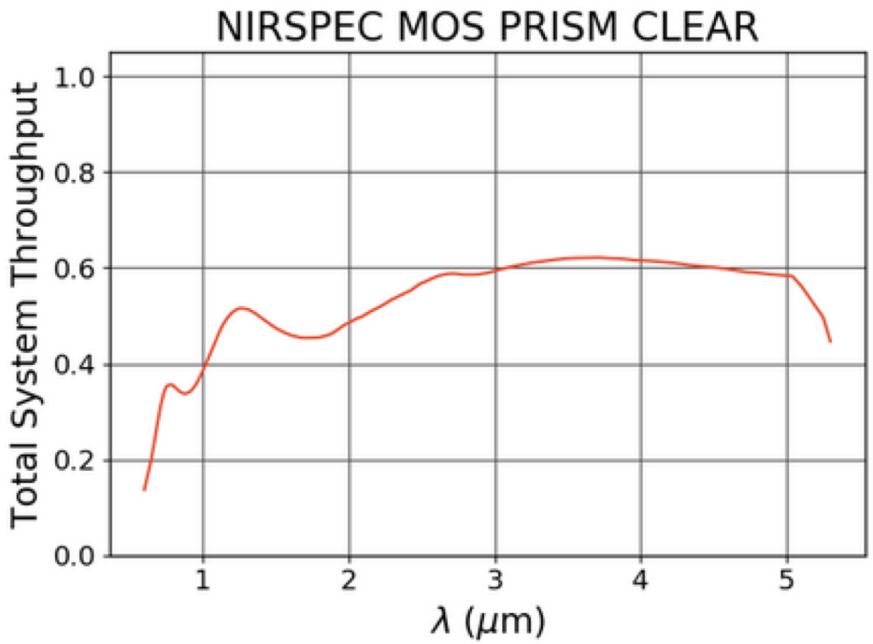
The source selected in the Strategy tab will be placed in shutter 0.

MSA Location

Quadrant 3 center

These relative directions are when looking through the MSA towards the sky.

Wavelength range: (0.6 - 5.3)



Calculation selected: 1, **Mode:** nirspec mos

Reset | Calculate

ETC Screenshots – Detector Setup

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

Subarray

FULL

Readout pattern

NRSIRS2

Groups per integration

18

Integrations per exposure

1

Exposures per specification

72

Total exposure time: 1d 02:33:06 (95586.41 s)

Total integrations: 72

Calculation selected: 1, **Mode:** nirspec mos

Reset | Calculate

ETC Screenshots - Strategy

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

MSA Full Shutter Extraction

Centered on source

1: z=6 compact dwarf

X, Y: 0,0 arcsec

Source offset from shutter center

X 0 arcsec

(0.00 fractional shutters)

Y 0 arcsec

(0.00 fractional shutters)

Wavelength of Interest (0.6 - 5.3)

1.15 microns

Angular units: arcsec

Perform Background Subtraction Using

- (•) background region
- ( ) noiseless sky background

Calculation selected: 1, **Mode:** nirspec mos

Reset | Calculate

ETC Screenshots - Calculations

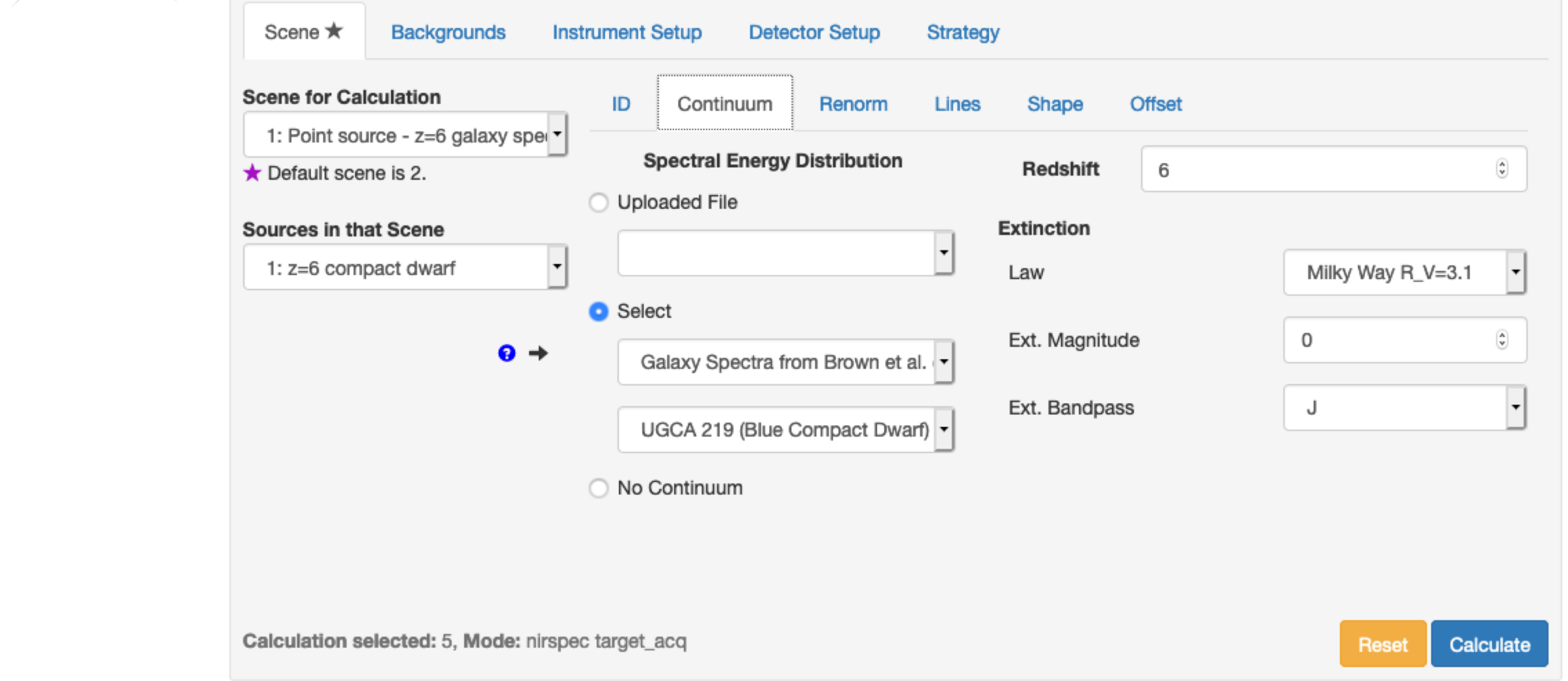
Calculations | Scenes and Sources | Upload Spectra | Caveats and Limitations

MIRI ▾ | NIRCam ▾ | NIRISS ▾ | NIRSpec ▾

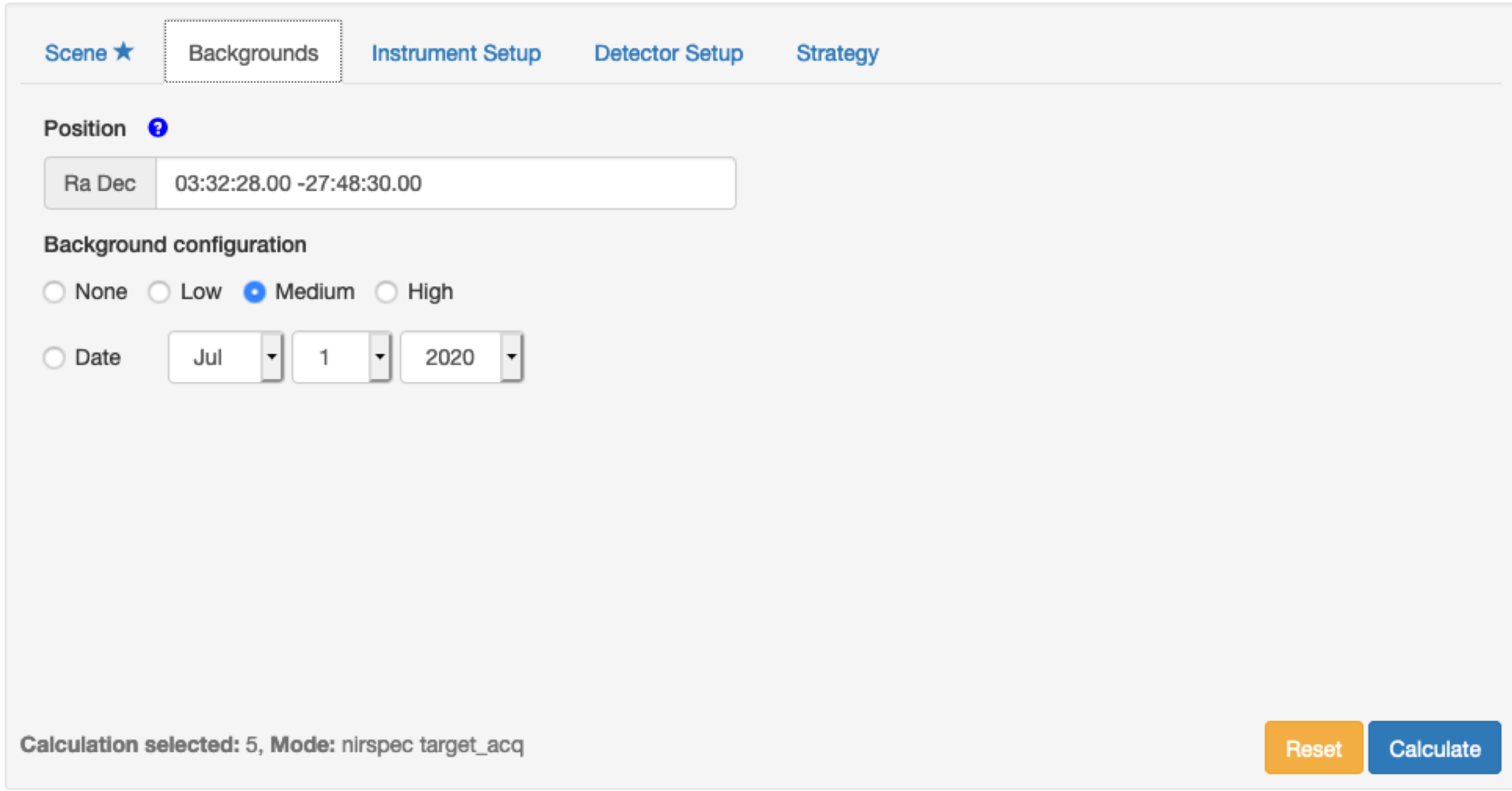
ID ▲		Mode -	λ -	Scn -	(s) -	SNR -	
5	☑	nirspec target_acq	2.59	1	171.79	7.86	!
4	☐	nirspec mos	4.59	2	31862.14	11.92	✓
3	☐	nirspec mos	2.61	2	31862.14	11.21	✓
2	☐	nirspec mos	1.34	2	31862.14	17.90	✓
1	☐	nirspec mos	1.16	1	95586.41	12.79	✓
-	-	---	---	-	--.-	--.-	-

MSA Target Acquisition

ETC Screenshots - Continuum source scene



ETC Screenshots - Background



ETC Screenshots – Instrument Setup

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

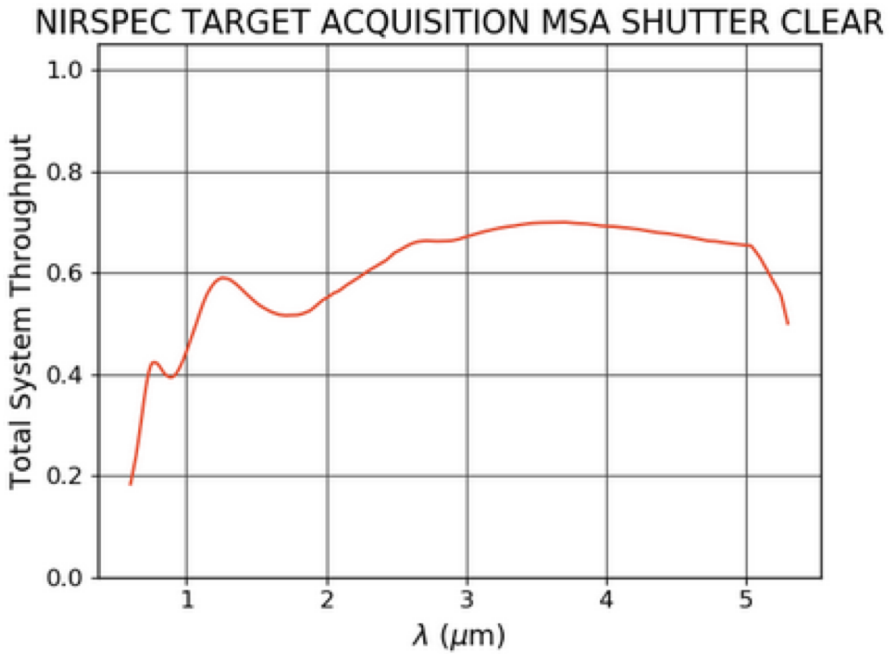
NIRSpec Target Aquisition

Acq Mode

MSATA (Single Object)

Filter

CLEAR



Calculation selected: 5, **Mode:** nirspec target_acq

Reset | Calculate

ETC Screenshots – Detector Setup

Scene ★ | Backgrounds | Instrument Setup | Detector Setup | Strategy

Subarray

FULL

Readout pattern

NRSRAPIDD6

Groups

3

Integrations

1

Exposures

1

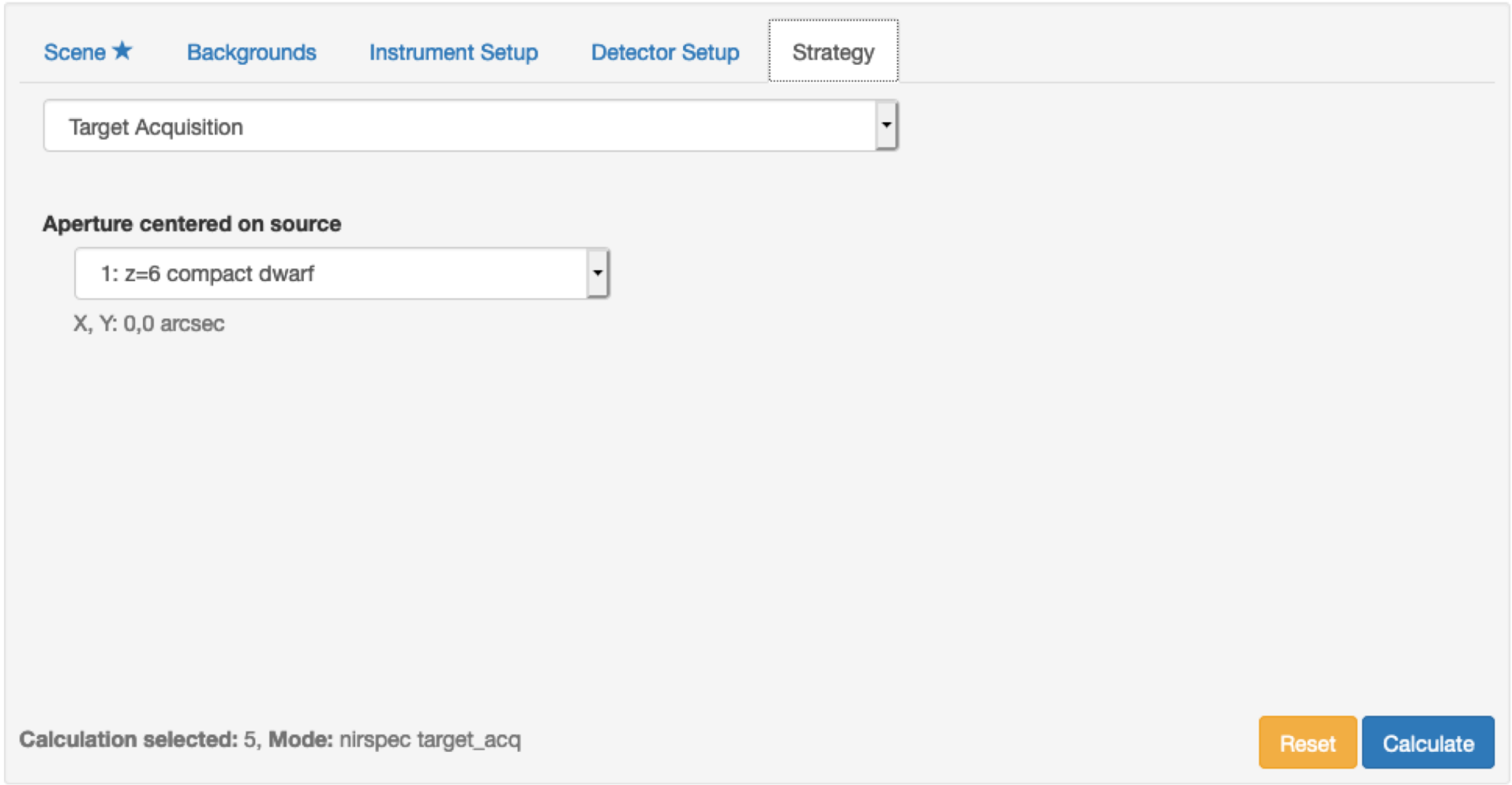
Total exposure time: 00:02:52 (171.79 s)

Total integrations: 1

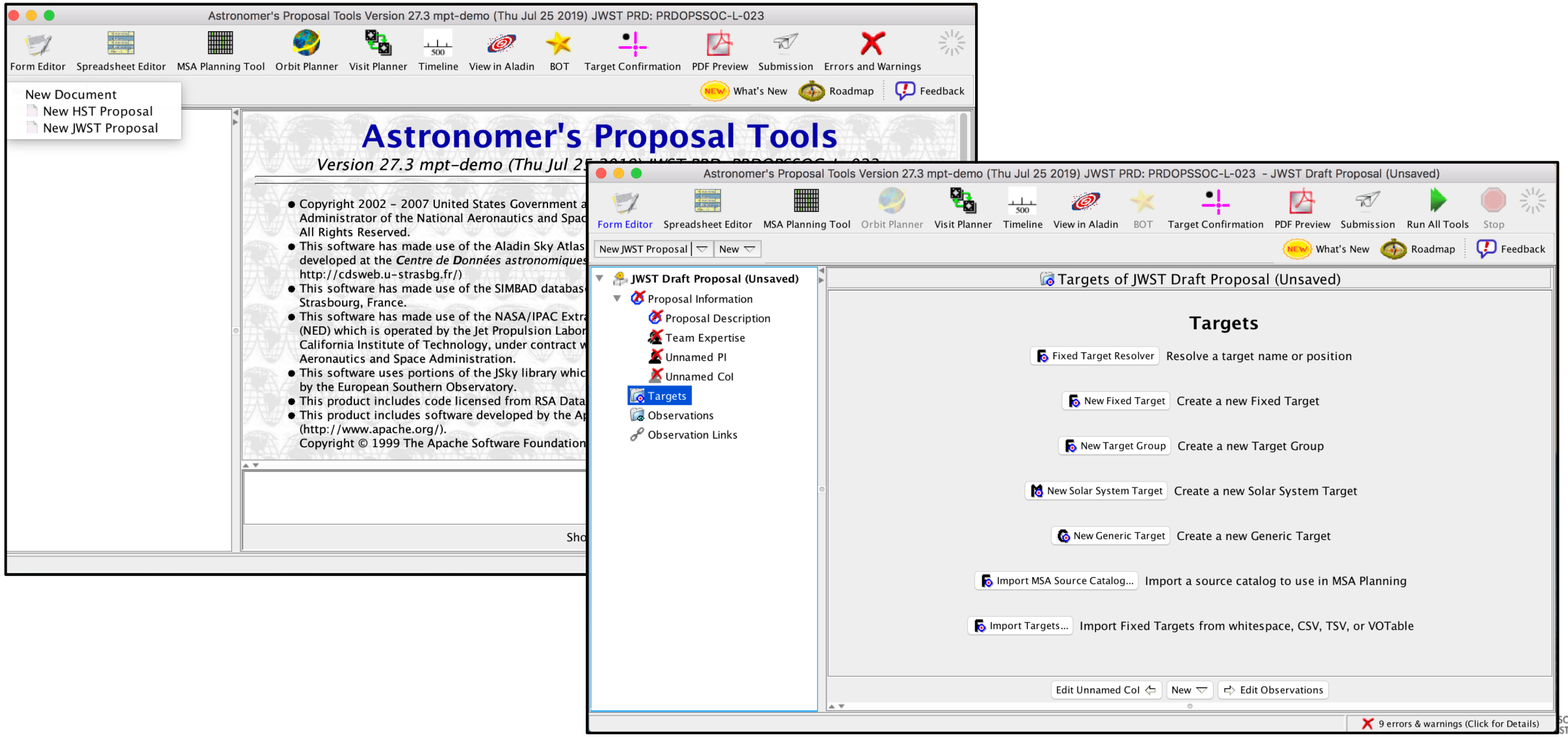
Calculation selected: 5, **Mode:** nirspec target_acq

Reset | Calculate

ETC Screenshots - Strategy



APT Screenshots – JWST Proposal and Catalog Target



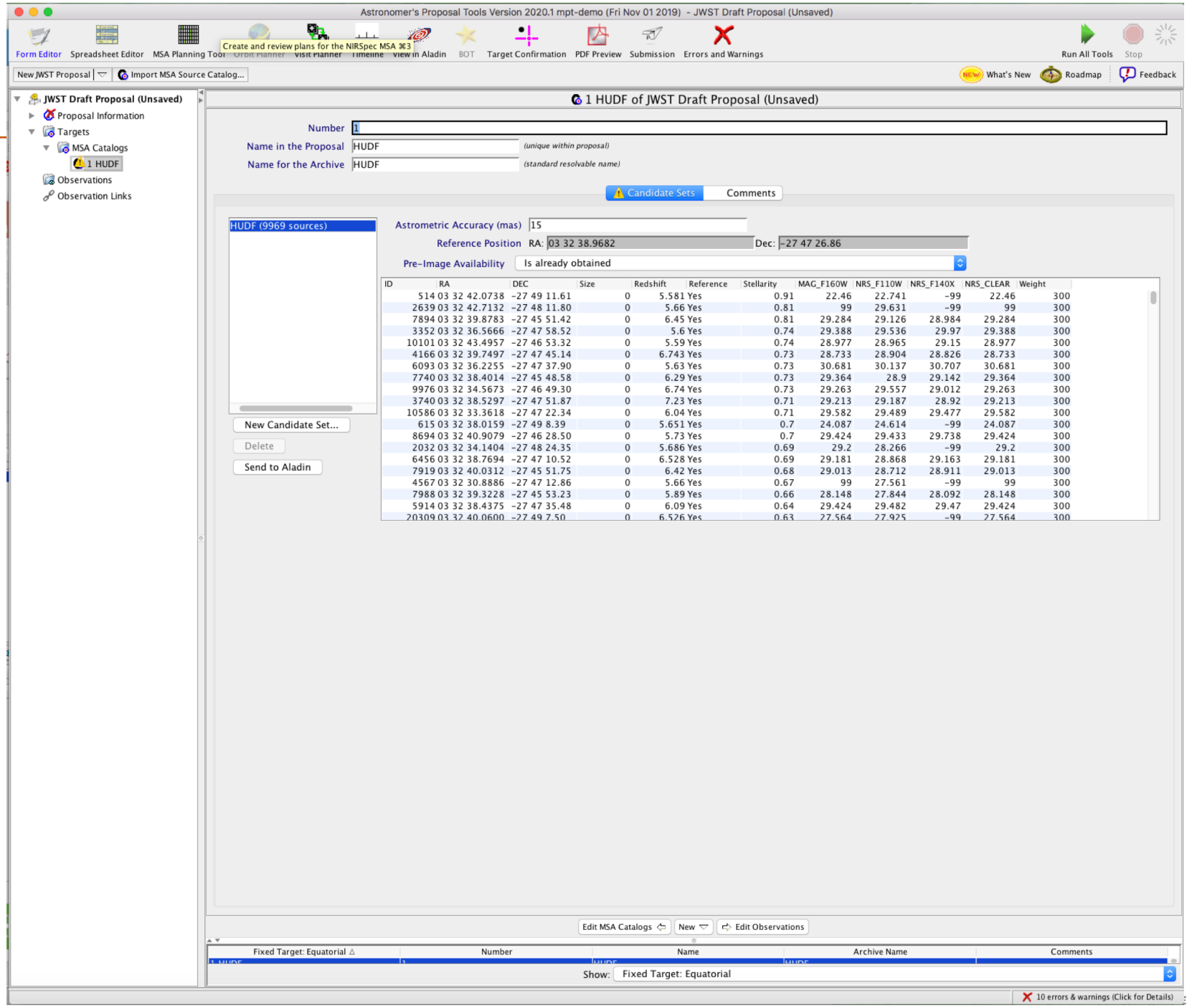
APT Screenshots - The structure of the observation

Table shows number of integrations or exposures needed for each

		CLEAR/PRISM	F100LP/G140M	F170LP/G235M	F290LP/G395M
Dither position #1	Nod position #1a	8	3	3	3
	Nod position #1b	8	3	3	3
	Nod position #1c	8	3	3	3
Dither position #2	Nod position #2a	8	3	3	3
	Nod position #2b	8	3	3	3
	Nod position #2c	8	3	3	3
Dither position #3	Nod position #3a	8	2	2	2
	Nod position #3b	8	2	2	2
	Nod position #3b	8	2	2	2

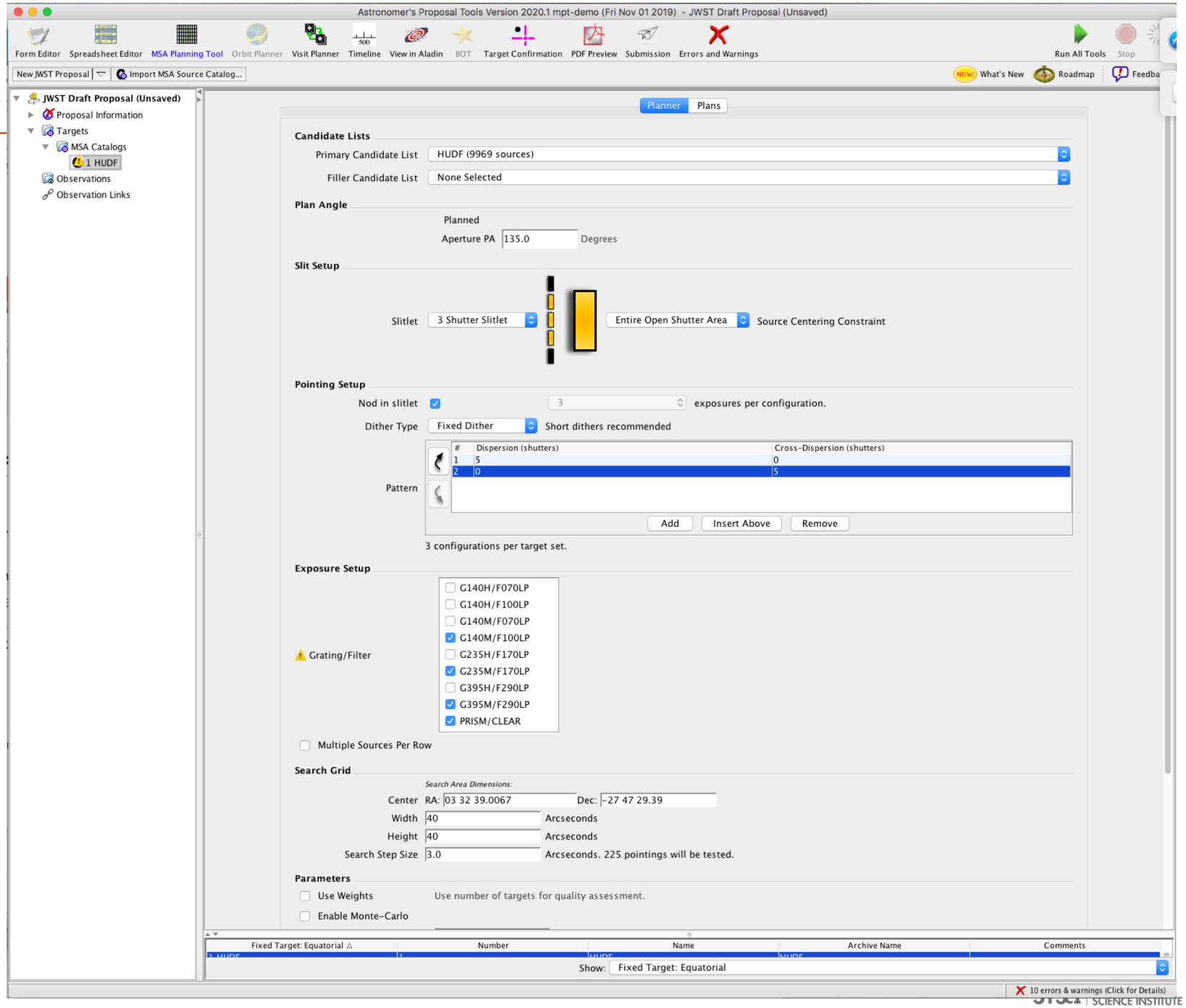
APT Screenshots

MSA Catalog Target Input for MPT

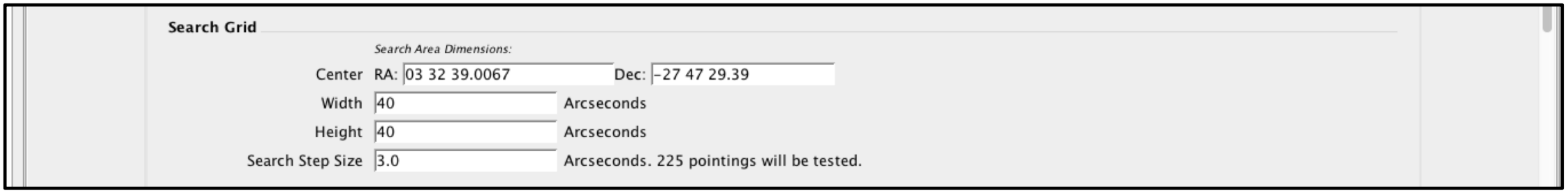


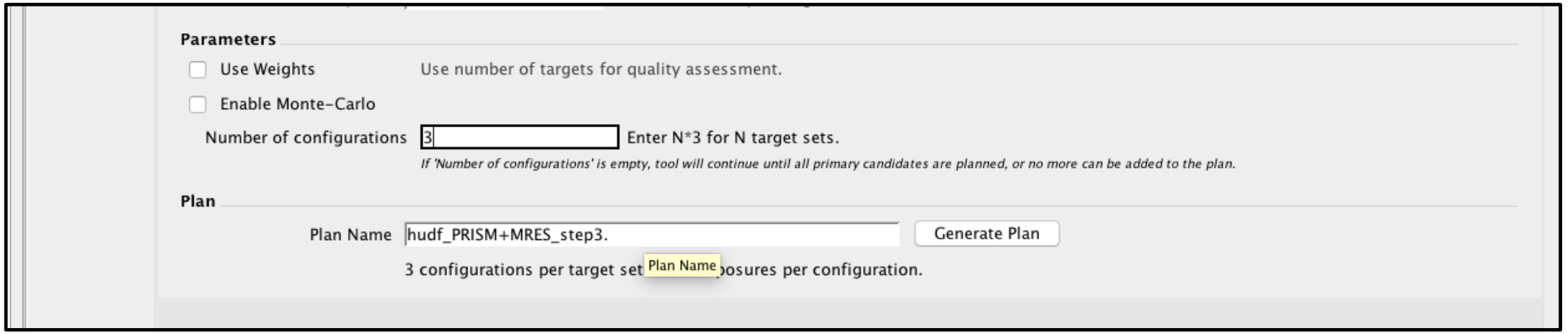
APT Screenshots

MSA Planning Tool
Planner

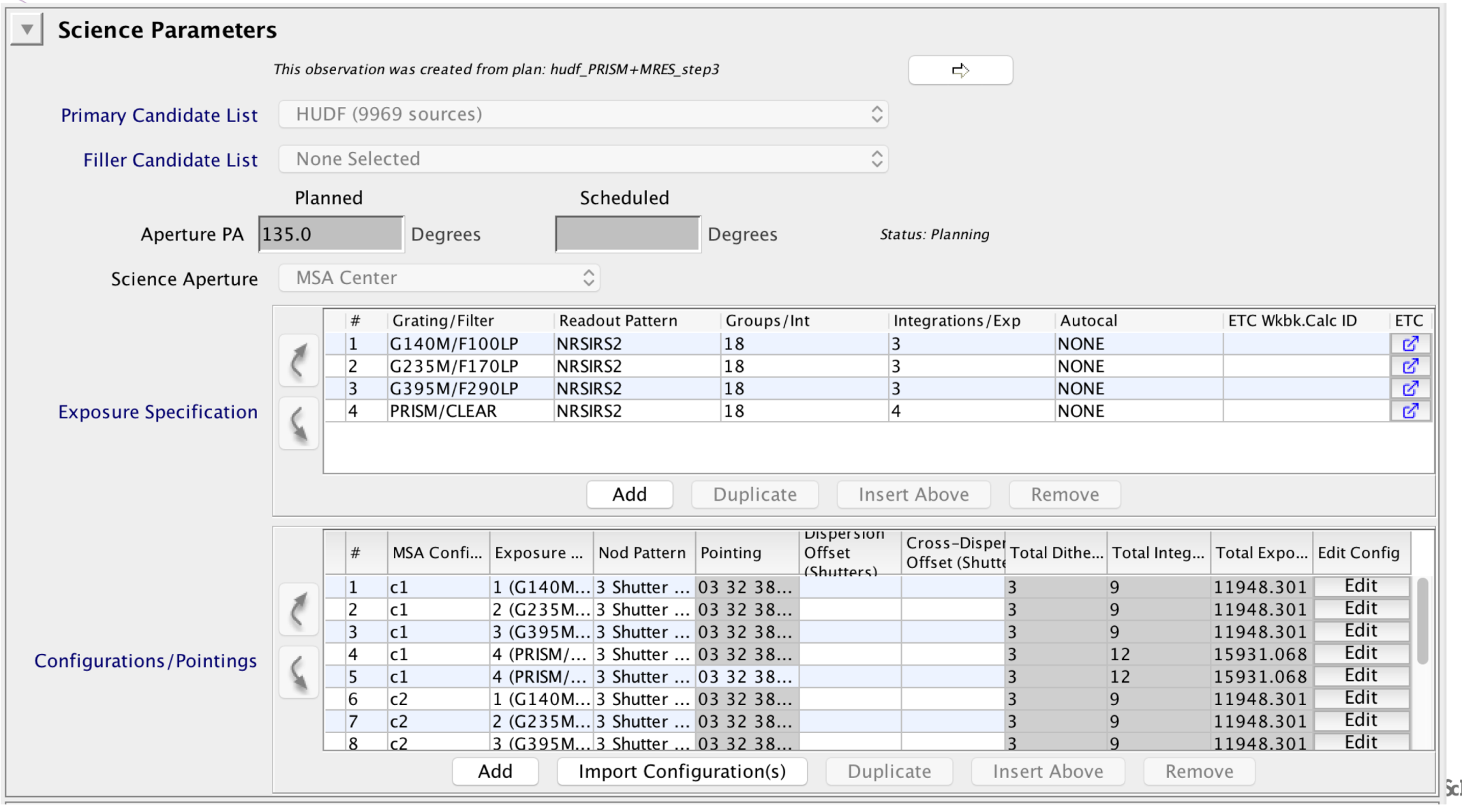


APT Screenshots – Planner parameters





APT Screenshots – Exposure specifications in the observation



Science Parameters

This observation was created from plan: hudf_PRISM+MRES_step3

Primary Candidate List: HUDF (9969 sources)

Filler Candidate List: None Selected

	Planned		Scheduled		
Aperture PA	135.0	Degrees		Degrees	*Status: Planning*

Science Aperture: MSA Center

Exposure Specification

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Autocal	ETC Wkbk.Calc ID	ETC
1	G140M/F100LP	NRSIRS2	18	3	NONE		
2	G235M/F170LP	NRSIRS2	18	3	NONE		
3	G395M/F290LP	NRSIRS2	18	3	NONE		
4	PRISM/CLEAR	NRSIRS2	18	4	NONE		

Add | Duplicate | Insert Above | Remove

Configurations/Pointings

#	MSA Confi...	Exposure ...	Nod Pattern	Pointing	Dispersion Offset (Shutters)	Cross-Disper Offset (Shutte	Total Dithe...	Total Integ...	Total Expo...	Edit Config
1	c1	1 (G140M...	3 Shutter ...	03 32 38...			3	9	11948.301	Edit
2	c1	2 (G235M...	3 Shutter ...	03 32 38...			3	9	11948.301	Edit
3	c1	3 (G395M...	3 Shutter ...	03 32 38...			3	9	11948.301	Edit
4	c1	4 (PRISM/...	3 Shutter ...	03 32 38...			3	12	15931.068	Edit
5	c1	4 (PRISM/...	3 Shutter ...	03 32 38...			3	12	15931.068	Edit
6	c2	1 (G140M...	3 Shutter ...	03 32 38...			3	9	11948.301	Edit
7	c2	2 (G235M...	3 Shutter ...	03 32 38...			3	9	11948.301	Edit
8	c2	3 (G395M...	3 Shutter ...	03 32 38...			3	9	11948.301	Edit

Add | Import Configuration(s) | Duplicate | Insert Above | Remove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