

# 16495 - FUV Exploratory Spectral Resolution Program at LP6

Cycle: 28, Proposal Category: CAL/COS (Availability Mode: RESTRICTED)

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# **VISITS**

Visit	Targets used in Visit	Configurations used in Visit	Orbits Used		OP Current with Visit?
01	(1) AZV-80 NONE WAVE	COS COS/FUV COS/NUV	3	28-Jun-2021 10:00:50.0	yes
51	(1) AZV-80 NONE WAVE	COS COS/FUV COS/NUV	3	28-Jun-2021 10:00:58.0	yes

Visit	Targets used in Visit	Configurations used in Visit	Orbits Used		OP Current with Visit?
	(1) AZV-80 NONE WAVE	COS COS/FUV COS/NUV	3	28-Jun-2021 10:01:06.0	yes
03	(1) AZV-80 NONE WAVE	COS COS/FUV COS/NUV	3	28-Jun-2021 10:01:15.0	yes

12 Total Orbits Used

### **ABSTRACT**

This program is a program to measure the change in the spectral resolution for the G130M/1222 and G160M/1577 settings at 7", 9", 11" on the FUV detector as an exploratory program for Lifetime Position 6 (LP6). Knowledge of the COS line spread functions (LSFs) is critical for users to evaluate the feasibility and S/N requirements of their observations and to perform line profile fitting. It is not known what the spectral resolution is at and above 7", and we need to know how it changes as we move up the detector in order to optimize the placement of LP6 and future LPs.

To do so, we will acquire COS FUV G130M/1222 and G160M/1577 spectra of the SMC star AzV 80, using two FPPOS to optimize the S/N whilst keeping overheads (due to split-LP-wavecals) at a minimum. Once all FPPOS settings are combined, our observations will reach a S/N of 42/resel. We will test whether previous STIS E140M spectra of AzV 80 convolved with model COS LSFs at LP2 (the nearest calibrated lifetime position on the detector) can reproduce on-orbit observed COS FUV spectra of the numerous ISM lines toward AzV 80 at three different detector positions of +7", +9" and +11".

We will be able to measure the relative change in the spectral resolution, and unexpected larger variations in the COS LSFs larger than 15%.

For simplicity, we will use LP2 HV values of 173/175 (A/B) for all exposures.

This strategy is based on several earlier programs (LP4 resolution programs 14842 and 15366), which executed successfully.

Azv80 is used instead of the usual target for resolution programs (Azv75) because the visibility windows of Azv75 are too small. The depth of absorption features in Azv80 are comparable to those in Azv75.

### **OBSERVING DESCRIPTION**

We will acquire COS FUV G130M/1222 and G160M/1577 spectra of the SMC star AzV 80, using two FPPOS to optimize the S/N whilt minimizing overheads. Once all FPPOS settings are combined, our observations will reach a S/N of 42/resel. We will perform NUV imaging target acquisition with the BOA.

We will take observations at 3 cross-dispersion positions of 7", 9" and 11" (XD=+3.5 arcsec, XD=+5.5 arcsec and XD=+7.5 from LP2) encompassing the potential LP6 locations to support efforts to characterize the spectral resolution at 7" and above. We will use the LP2 HV values for all exposures for simplicity.

Wavecals concurrent with the science exposure cannot be taken at these positions on the detector due to a light leak from the FCA above +5.5", so wavecals are turned off (FLASH=NO and WAVECAL=NO). The aperture block is moved to LP2 to take wavecals before and after the science exposures.

All the exposures have LIFETIME-POSITION = LP2, aperture movements and focus values are relative to this LP.

Following PID 14935, make sure the focus is re-initialized before each FP-POS exposure. In orbit one (where we change FP-POS in the same orbit), because the FP-POS OSM movement would not allow enough time to move the focus between FP-POS exposures, we ordered the FP-POS in reverse, i.e., 3, 1, which has longer overheads and allows for enough time to move the focus between each exposure.

Exposure times -

Wavecals:

G130M/1222 - 52s

G160M/1577 - 12s

Exposure times from 11.5.4 of the Phase II instructions.

Science exposures:

G130M/1222 - S/N=42 at 1150A

G160M/1577 - S/N=42 at 1650A

To get S/N>42 for all important absorption lines.

Aperture positions -

We use XAPER to move the aperture from +3.5" (LP2) to another position.

 $XAPER = (LP6\_npos - LP2\_pos) * -21 steps/arcsecond.$ 

+7" example: XAPER = 7.0" - 3.5" \* -21 steps/arcsecond = -74.

In addition to using XAPER steps to command aperture movement, we will also use the QESIPARM XSTEPS special requirement to command to move the aperture to the correct location.

QESIPARM XSTEPS = XAPER(Current) - XAPER(Previous)

Step	XAPER	POSTARG	QESIPARM XSTEPS
LP2 (+3.5")	0	0"	NA
LP2 (+7.0")	-74	+3.52"	+74
LP2 (+9.0")	-116	+5.52"	+116
LP2 (+11.0"	) -158	+7.52"	+158

Focus values -

Focus will be set to the values obtained from PID 16491 analysis. Set to placeholder value for now, which is the estimated minimum value of the focus curve in PID 16491. Focus is being measured for G130M/1222 FUVB, focus is applicable to both segments. Focus is being measured for G160M/1600, focus offset to 1577 is known (340 steps).

OLD VALUES -

The focus relative to LP2 is -

Step G130M/1222 G160M/1577

LP2 (+3.5")	0	0
LP2 (+7.0")	+460	+534
LP2 (+9.0")	+860	+984
LP2 (+11.0")	+1360	+1484

Focus set to the values obtained from PID 16491 analysis. Focus measured for G130M/1222 FUVB, focus is applicable to both segments. Focus measured for G160M/1600 (both segments), focus offset to 1577 is known (-340 steps). The absolute focus for G160M/1600 at LP2 is +116, therefore the 1557 absolute focus at LP2 is +116-340 = -224.

## **NEW VALUES -**

The absolute focus values are -

Step	G130M/1222	G160M/1600	G160M/1577
LP2 (+3.5")	-810	+116	-224
LP2 (+7.0")	-951	+78	-262
LP2 (+9.0")	-851	+219	-121
LP2 (+11.0"	) -897	+267	-73

LP6\_npos focus step relative to LP2 = LP6\_npos estimated absolute focus - LP2 absolute focus

The focus relative to LP2 (what we put in APT) is -

Step	G130M/1222	G160M/1577
LP2 (+3.5")	0	0
LP2 (+7.0")	-141	-38
LP2 (+9.0")	-41	+103
LP2 (+11.0"	) -87	+151

# Scheduling -

All visits will need to execute after focus values from PID 16491 have been calculated.

Visit 01 of our program should be scheduled ~4 weeks after visits 01 and 04 of PID 16491.

Visit 02 of our program should be scheduled ~4 weeks after visits 02 and 05 of PID 16491.

Visit 03 of our program should be scheduled ~4 weeks after visits 03 and 06 of PID 16491.

This should give adequate time for the focus values to be derived and checked, implemented in this program, and for this program to be put back onto the schedule.

Program structure: 9 orbits

---- Marks non-interruptible sequences

Visit 01: 3 orbits

- 1. ACQ/IMAGE
- 2. ACQ/IMAGE (to guard against late GS acquisition)

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- 3. G130M/1222 Initialization exposure at LP2, FP-POS=3
- 4. Adjust focus value to +7" value
- 5. Take a wavecal at LP2, FP-POS=3
- 6. Move aperture block -74 steps from LP2 to 7"
- 7. G130M/1222 exposure at YPOSTARG = 3.52", FP-POS=3
- 8. Move aperture block back to default location
- 9. Take a wavecal at LP2, FP-POS=3

- 10. G130M/1222 Initialization exposure at LP2, FP-POS=1
- 11. Adjust focus value to +7" value
- 12. Take a wavecal at LP2, FP-POS=1
- 13. Move aperture block -74 steps from LP2 to 7"
- 14. G130M/1222 exposure at YPOSTARG = 3.52", FP-POS=1
- 15. Move aperture block back to default location

16. Take a wavecal at LP2, FP-POS=1

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- 17. G160M/1577 Initialization exposure at LP2, FP-POS=1
- 18. Adjust focus value to +7" value
- 19. Take a wavecal at LP2, FP-POS=1
- 20. Move aperture block -74 steps from LP2 to 7"
- 21. G160M/1577 exposure at YPOSTARG = 3.52", FP-POS=1
- 22. Move aperture block back to default location
- 23. Take a wavecal at LP2, FP-POS=1

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- 24. G130M/1222 Initialization exposure at LP2, FP-POS=1
- 25. Adjust focus value to +7" value
- 26. Take a wavecal at LP2, FP-POS=1
- 27. Move aperture block -74 steps from LP2 to 7"
- 28. G130M/1222 exposure at YPOSTARG = 3.52", FP-POS=1
- 29. Move aperture block back to default location
- 30. Take a wavecal at LP2, FP-POS=1

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- 31. G160M/1577 Initialization exposure at LP2, FP-POS=3
- 32. Adjust focus value to +7" value
- 33. Take a wavecal at LP2, FP-POS=3
- 34. Move aperture block -74 steps from LP2 to 7"
- 35. G160M/1577 exposure at YPOSTARG = 3.52", FP-POS=3
- 36. Move aperture block back to default location
- 37. Take a wavecal at LP2, FP-POS=3

- 38. G130M/1222 Initialization exposure at LP2, FP-POS=3
- 39. Adjust focus value to +7" value
- 40. Take a wavecal at LP2, FP-POS=3

- 41. Move aperture block -74 steps from LP2 to 7"
- 42. G130M/1222 exposure at YPOSTARG = 3.52", FP-POS=3
- 43. Move aperture block back to default location
- 44. Take a wavecal at LP2, FP-POS=3

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### Visit 02: 3 orbits

- 1. ACQ/IMAGE
- 2. ACQ/IMAGE (to guard against late GS acquisition)

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- 3. G130M/1222 Initialization exposure at LP2, FP-POS=3
- 4. Adjust focus value to +9" value
- 5. Take a wavecal at LP2, FP-POS=3
- 6. Move aperture block -116 steps from LP2 to 9"
- 7. G130M/1222 exposure at YPOSTARG = 5.52", FP-POS=3
- 8. Move aperture block back to default location
- 9. Take a wavecal at LP2, FP-POS=3

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- 10. G130M/1222 Initialization exposure at LP2, FP-POS=1
- 11. Adjust focus value to +9" value
- 12. Take a wavecal at LP2, FP-POS=1
- 13. Move aperture block -116 steps from LP2 to 9"
- 14. G130M/1222 exposure at YPOSTARG = 5.52", FP-POS=1
- 15. Move aperture block back to default location
- 16. Take a wavecal at LP2, FP-POS=1

- 17. G160M/1577 Initialization exposure at LP2, FP-POS=1
- 18. Adjust focus value to +9" value

- 19. Take a wavecal at LP2, FP-POS=1
- 20. Move aperture block -116 steps from LP2 to 9"
- 21. G160M/1577 exposure at YPOSTARG = 5.52", FP-POS=1
- 22. Move aperture block back to default location
- 23. Take a wavecal at LP2, FP-POS=1

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- 24. G130M/1222 Initialization exposure at LP2, FP-POS=1
- 25. Adjust focus value to +9" value
- 26. Take a wavecal at LP2, FP-POS=1
- 27. Move aperture block -116 steps from LP2 to 9"
- 28. G130M/1222 exposure at YPOSTARG = 5.52", FP-POS=1
- 29. Move aperture block back to default location
- 30. Take a wavecal at LP2, FP-POS=1

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- 31. G160M/1577 Initialization exposure at LP2, FP-POS=3
- 32. Adjust focus value to +9" value
- 33. Take a wavecal at LP2, FP-POS=3
- 34. Move aperture block -116 steps from LP2 to 9"
- 35. G160M/1577 exposure at YPOSTARG = 5.52", FP-POS=3
- 36. Move aperture block back to default location
- 37. Take a wavecal at LP2, FP-POS=3

- 38. G130M/1222 Initialization exposure at LP2, FP-POS=3
- 39. Adjust focus value to +9" value
- 40. Take a wavecal at LP2, FP-POS=3
- 41. Move aperture block -116 steps from LP2 to 9"
- 42. G130M/1222 exposure at YPOSTARG = 5.52", FP-POS=3
- 43. Move aperture block back to default location
- 44. Take a wavecal at LP2, FP-POS=3

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## Visit 03: 3 orbits

- 1. ACQ/IMAGE
- 2. ACQ/IMAGE (to guard against late GS acquisition)

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- 3. G130M/1222 Initialization exposure at LP2, FP-POS=3
- 4. Adjust focus value to +11" value
- 5. Take a wavecal at LP2, FP-POS=3
- 6. Move aperture block -158 steps from LP2 to 11"
- 7. G130M/1222 exposure at YPOSTARG = 7.52", FP-POS=3
- 8. Move aperture block back to default location
- 9. Take a wavecal at LP2, FP-POS=3

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- 10. G130M/1222 Initialization exposure at LP2, FP-POS=1
- 11. Adjust focus value to +11" value
- 12. Take a wavecal at LP2, FP-POS=1
- 13. Move aperture block -158 steps from LP2 to 11"
- 14. G130M/1222 exposure at YPOSTARG = 7.52", FP-POS=1
- 15. Move aperture block back to default location
- 16. Take a wavecal at LP2, FP-POS=1

- 17. G160M/1577 Initialization exposure at LP2, FP-POS=1
- 18. Adjust focus value to +11" value
- 19. Take a wavecal at LP2, FP-POS=1
- 20. Move aperture block -158 steps from LP2 to 11"
- 21. G160M/1577 exposure at YPOSTARG = 7.52", FP-POS=1

- 22. Move aperture block back to default location
- 23. Take a wavecal at LP2, FP-POS=1

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- 24. G130M/1222 Initialization exposure at LP2, FP-POS=1
- 25. Adjust focus value to +11" value
- 26. Take a wavecal at LP2, FP-POS=1
- 27. Move aperture block -158 steps from LP2 to 11"
- 28. G130M/1222 exposure at YPOSTARG = 7.52", FP-POS=1
- 29. Move aperture block back to default location
- 30. Take a wavecal at LP2, FP-POS=1

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- 31. G160M/1577 Initialization exposure at LP2, FP-POS=3
- 32. Adjust focus value to +11" value
- 33. Take a wavecal at LP2, FP-POS=3
- 34. Move aperture block -158 steps from LP2 to 11"
- 35. G160M/1577 exposure at YPOSTARG = 7.52", FP-POS=3
- 36. Move aperture block back to default location
- 37. Take a wavecal at LP2, FP-POS=3

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- 38. G130M/1222 Initialization exposure at LP2, FP-POS=3
- 39. Adjust focus value to +11" value
- 40. Take a wavecal at LP2, FP-POS=3
- 41. Move aperture block -158 steps from LP2 to 11"
- 42. G130M/1222 exposure at YPOSTARG = 7.52", FP-POS=3
- 43. Move aperture block back to default location
- 44. Take a wavecal at LP2, FP-POS=3

- 1. Turn off calibration for the COS/FUV exposures.
- 2. Disassociate all exposures.

SQL is required to perform these actions.

## Proposal 16495 - 7arcsec (01) - FUV Exploratory Spectral Resolution Program at LP6

Proposal 16495, 7arcsec (01), failed Mon Jun 28 14:01:16 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS, COS/FUV, COS/NUV

Special Requirements: SCHED 90%

Comments: - Bypass calibration for the COS/FUV exposures.

- Disassociate all exposures.

(7arcsec (01)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Diagnostics (7arcsec (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(7arcsec (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

#	Name	<b>Target Coordinates</b>	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AZV-80	RA: 00 50 43.8154 (12.6825642d)	Proper Motion RA: 0.114 mas/yr	V=13.32	Reference Frame: ICRS
		Dec: -72 47 41.57 (-72.79488d)	Proper Motion Dec: -1.453 mas/yr	B=13.19,	
		Equinox: J2000	Epoch of Position: 2015.5	1360A flux from STIS=3.3e-13 erg/s/cm^2/A	

Comments: Coordinates are from Gaia DR2.

Av 80 - O7 III - V=13.32, B=13.19, E(B-V)=0.13 (SMC), from ULLYSES.

SED derved from fitting to STIS E140M spectrum, E(B-V) modified from 0.14 to 0.13 to better fit existing data.

BOT GSC2 lists 3 unknown sources, but they are faint/invisible in the Swift W1 image. No GALEX imaging available. There are several fairly bright field objects which are not identified by the BOT, from Massey+02 these are >15" from the target, brightest have Vmags (Vega) of 16.85, 16.04, 16.36, 16.38. The target (which is safe) is the brightest object in the Swift W1 image, the fainter field objects are therefore safe for the science exposures. The field objects could affect the PSA during the NUV TA with the BOA but are safe based on their likely spectral types. From Massey +02 the B-V color of Av80 is -0.13, the colors of the field objects are all >0.34 and are therefore type later than A7. These are all safe, from Massey+02:

Field star which is brightest in the Swift W1 image and bluest within 20" - 15.08" away from Av80, RA=50 44.8100, Dec=-72 47 27.100. V=16.85, B-V=0.34 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.21. Zaritsky+02 has V=17.08. According to https://www.stsci.edu/~inr/intrins.html, http://www.pas.rochester.edu/~emamajek/EEM\_dwarf\_UBVIJHK\_colors\_Teff.txt this corresponds to spectral type A7, is safe COS.ta.1480381. XMM W1=17.35 (Page+14), is safe COS.ta.1480281.

Field star 15.35" away from target, RA=00 50 47.22, Dec=-72 47 39.2, V=16.04, B-V=0.63 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.50, this corresponds to spectral type F8, is safe COS.ta. 1480380. Field star 16.85" away from target, quite blue, RA=00 50 41.59, Dec=-72 47 55.2, V=16.36, B-V=0.39 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.26, this corresponds to spectral type A8, is safe COS.ta.1480383. XMM W1=18.40 Page+14) is safe COS.ta.1480395.

Field star 17.83" away from target, RA=00 50 41.56, Dec=-72 47 56.3, V=16.38, B-V=0.52 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.39, this corresponds to spectral type F3, is safe COS.ta.1480386.

There are numerous sources in Zaritsky+02 but these sources are very faint/invisible in the Swift W1 imaging, and should not pose an issue for the NUV TA.

Category=EXT-STAR

Description=[OF]

Extended=NO

Proposal 16495 - 7arcsec (01) - FUV Exploratory Spectral Resolution Program at LP6

	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	image_acq_	(1) AZV-80	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				5.3 Secs (5.3 Secs)	
	boa (COS.ta.147 4056)							[==>]	[1]
2	image_acq_	(1) AZV-80	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				5.3 Secs (5.3 Secs)	
	boa (COS.ta.147 4056)							[==>]	[1]
Con	nments: Repeat	ACQ/IMAGE to p	rotect against late GS acquisition.						
3		(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 3-9 Non-In t in 7arcsec (01)	· · · · · · · · · · · · · · · · · · ·	
	ze_aperture- position-foc			1222 A	0; FP-POS=3;		t iii /arcsec (01)	[==>]	
	us-HV-value				FLASH=NO;				
	(COS.sp.147				WAVECAL=NO;				[1]
	6390)				LIFETIME-POS=L				
					P2				
Con	nments: initiali	zes the G130M/122	22 observations to set aperture position,	HV value and focus	values to LP2 defaults b	efore we move the ape		1	PID 1649.
4	Adjust focus value for 12	NONE	COS, ALIGN/OSM		FOCUS=-141		Sequence 3-9 Non-In t in 7arcsec (01)	0.0 Secs (0 Secs)	
	22 LP6						t iii /arcsec (01)	[==>]	[1]
G13 G13	80M/1222	at LP2 is -810. is:	te obtained from PID 16491 analysis. = LP6_npos estimated absolute focus - L	P2 absolute focus =	= -951810 gives a focus	offset of -141 relative		,	
5	Wave_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;		Sequence 3-9 Non-In	· · · · · ·	
	FP3			1222 A	SEGMENT=BOTH: LIFETIME-POS=L P2	;	t in 7arcsec (01)	[==>]	[1]
Con	nments: Exposi L needed to by-	ure at LP2. Lamp e. pass calibration	xposure time from 11.5.4 of the Phase II	instructions.					
SQL					XAPER=-74;	QESIPARM XSTEP	Sequence 3-9 Non-In	0 Secs (0 Secs)	
6	Move Apert	NONE	COS, ALIGN/APER						
6		NONE	COS, ALIGN/APER		YAPER=0	S -74	t in 7arcsec (01)	[==>]	[1]
6 Con	Move Apert ure to +7 arc sec from LP 2	exposure we move	COS, ALIGN/APER  the aperture from $+3.5"$ (LP2) to $+7.0"$ . $+> XAPER = -74$ steps.		YAPER=0	S -74	t in /arcsec (01)	[==>]	[1]
Com So, (	Move Apert ure to +7 arc sec from LP 2 numents: In this (7.0-3.5)" * -21	exposure we move	the aperture from +3.5" (LP2) to +7.0". => XAPER= -74 steps.		YAPER=0	S -74	t in /arcsec (01)	[==>]	[1]
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2 numents: In this (7.0-3.5)" * -21 twersion is PER = 21 steps	exposure we move steps/arcsecond = per arcsec or 1 ste PS = XAPER(Curr	the aperture from +3.5" (LP2) to +7.0". => XAPER= -74 steps.			S -74	t in /arcsec (01)	[==>]	[1]
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2 numents: In this (7.0-3.5)" * -21 exercision is PER = 21 steps SIPARM XSTE 1222_FP3	exposure we move steps/arcsecond = per arcsec or 1 steps = XAPER(Curro (1) AZV-80	the aperture from $+3.5$ " (LP2) to $+7.0$ ". => XAPER = -74 steps. ep = 0.0476"		XSTEPS BUFFER-TIME=20	POS TARG 0.0,+3.5	Sequence 3-9 Non-In	498 Secs (498 Secs)	[1]
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2  numents: In this (7.0-3.5)" * -21  numers = 21 steps  SIPARM XSTE  1222 FP3 (COS.sp.147	exposure we move steps/arcsecond = per arcsec or 1 steps = XAPER(Curro (1) AZV-80	the aperture from $+3.5$ " (LP2) to $+7.0$ ". +> XAPER = -74 steps. +2p = 0.0476" +2p = 0.0476" +3.5" (LP2) to $+7.0$ " (LP2) to $+7.0$ ".	SPS = -74 - 0 = -74	XSTEPS  BUFFER-TIME=20 0;				[1]
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2 numents: In this (7.0-3.5)" * -21 exercision is PER = 21 steps SIPARM XSTE 1222_FP3	exposure we move steps/arcsecond = per arcsec or 1 steps = XAPER(Curro (1) AZV-80	the aperture from $+3.5$ " (LP2) to $+7.0$ ". +> XAPER = -74 steps. +2p = 0.0476" +2p = 0.0476" +3.5" (LP2) to $+7.0$ " (LP2) to $+7.0$ ".	<u>PS = -74 - 0 = -74</u> G130M	XSTEPS  BUFFER-TIME=20 0; FP-POS=3;	POS TARG 0.0,+3.5	Sequence 3-9 Non-In	498 Secs (498 Secs)	[1]
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2  numents: In this (7.0-3.5)" * -21  numers = 21 steps  SIPARM XSTE  1222 FP3 (COS.sp.147	exposure we move steps/arcsecond = per arcsec or 1 steps = XAPER(Curro (1) AZV-80	the aperture from $+3.5$ " (LP2) to $+7.0$ ". +> XAPER = -74 steps. +2p = 0.0476" +2p = 0.0476" +3.5" (LP2) to $+7.0$ " (LP2) to $+7.0$ ".	<u>PS = -74 - 0 = -74</u> G130M	XSTEPS  BUFFER-TIME=20 0; FP-POS=3; FLASH=NO;	POS TARG 0.0,+3.5	Sequence 3-9 Non-In	498 Secs (498 Secs)	[1]
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2  numents: In this (7.0-3.5)" * -21  numers = 21 steps  SIPARM XSTE  1222 FP3 (COS.sp.147	exposure we move steps/arcsecond = per arcsec or 1 steps = XAPER(Curro (1) AZV-80	the aperture from $+3.5$ " (LP2) to $+7.0$ ". +> XAPER = -74 steps. +2p = 0.0476" +2p = 0.0476" +3.5" (LP2) to $+7.0$ " (LP2) to $+7.0$ ".	<u>PS = -74 - 0 = -74</u> G130M	XSTEPS  BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO;	POS TARG 0.0,+3.5	Sequence 3-9 Non-In	498 Secs (498 Secs)	
Com So, ( Com XAF	Move Apert ure to +7 arc sec from LP 2  numents: In this (7.0-3.5)" * -21  numers = 21 steps  SIPARM XSTE  1222 FP3 (COS.sp.147	exposure we move steps/arcsecond = per arcsec or 1 steps = XAPER(Curro (1) AZV-80	the aperture from $+3.5$ " (LP2) to $+7.0$ ". +> XAPER = -74 steps. +2p = 0.0476" +2p = 0.0476" +3.5" (LP2) to $+7.0$ " (LP2) to $+7.0$ ".	<u>PS = -74 - 0 = -74</u> G130M	XSTEPS  BUFFER-TIME=20 0; FP-POS=3; FLASH=NO;	POS TARG 0.0,+3.5	Sequence 3-9 Non-In	498 Secs (498 Secs)	

<u>opc</u>	<u> osal 16495 - 7arcsec (0</u>	<u>i1) - FUV Exploratory Si</u>	<u>pectral Resc</u>	<u> Program</u>	<u>1 at LP6</u>			
8	Ap_move_L NONE P2	COS, ALIGN/APER		XAPER=0; YAPER=0		Sequence 3-9 Non-In t in 7arcsec (01)	0 Secs (0 Secs) [==>]	[1]
Co So,	nmments: In this exposure we move the (3.5-3.5)" * -21 steps/arcsecond => .	e aperture from +7.0" (LP6) to +3.5" ( XAPER= 0 steps	LP2). Observations		LP2.			
XA	nversion is .PER = 21 steps per arcsec or 1 step = 	= 0.0476"						
QE	ESIPARM XSTEPS = XAPER(Current)	t) - XAPER(Previous) cause of the TRANS rules, the "QESIPA	RM XSTEPS +74"	[(074) = +74] Specia	ıl Requirement is neces	ssary to move the apert	ure to the correct location.	
9	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;		Sequence 3-9 Non-In		
	FP3		1222 A	SEGMENT=BOTH; LIFETIME-POS=L P2		t in 7arcsec (01)	[==>]	[1]
	mments: Exposure at LP2 L needed to by-pass calibration							
10	_ ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 10-16 Non	0.1 Secs (0.1 Secs)	
	ze_aperture- position-foc		1222 A	0;		-Int in 7arcsec (01)	[==>]	
	us-HV-value			FP-POS=1;				
	s (COS.sp.147			FLASH=NO; WAVECAL=NO;				[1]
	6390)			LIFETIME-POS=L				
				P2				
Co	mments: initializes the G130M/1222 a	observations to set aperture position, F	IV value and focus v	values to LP2 defaults be	efore we move the aper	ture and change focus	values relevant for LP6 derived from P	ID 16491.
11		COS, ALIGN/OSM		FOCUS=-141		Sequence 10-16 Non	0.0 Secs (0 Secs)	
	value for 12 22 LP6					-Int in 7arcsec (01)	[==>]	[1]
G1 G1	omments: Adjust focus to the estimate of 130M/1222 focus at LP2 is -810. 130M/1222 at 7" is: 16_npos focus step relative to LP2 = L	obtained from PID 16491 analysis. P6_npos estimated absolute focus - LF	<sup>9</sup> 2 absolute focus =	-951810 gives a focus	offset of -141 relative l	LP2.		
12		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=1;		Sequence 10-16 Non	52 Secs (52 Secs)	
	FP1		1222 A	SEGMENT=BOTH;		-Int in 7arcsec (01)	[==>]	
				LIFETIME-POS=L P2				[1]
Co SO	mments: Exposure at LP2 L needed to by-pass calibration			12				
13	Move Apert NONE	COS, ALIGN/APER		XAPER=-74;	QESIPARM XSTEP	Sequence 10-16 Non	0 Secs (0 Secs)	
	ure to +7 arc sec from LP 2			YAPER=0	S -74	-Int in 7arcsec (01)	[==>]	[1]
Co So,	nmments: In this exposure we move the (7.0-3.5)" * -21 steps/arcsecond => .	e aperture from $+3.5$ " (LP2) to $+7.0$ ". XAPER= $-74$ steps.						
Co XA	onversion is .PER = 21 steps per arcsec or 1 step = 	= 0.0476"						
QE	ESIPARM XSTEPS = XAPER(Current	t) - XAPER(Previous), therefore XSTEI	PS = -74 - 0 = -74 X	STEPS				

		(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20	SAME POS AS 7	Sequence 10-16 Non	498 Secs (498 Secs)	
	(COS.sp.147 6390)			1222 A	0;		-Int in 7arcsec (01)	[==>]	
	0370)				FP-POS=1;				
					FLASH=NO;				[1
					LIFETIME-POS=L P2;				'-'
7			I W DOGTARG I G	1222 ED2	WAVECAL=NO				
			ıre by setting POS TARG value to: Same 1150A (wavelength of bluest window).	as 1222_FP3.					
5	Ap_move_L	NONE	COS, ALIGN/APER		XAPER=0;	OESIPARM XSTEP	Sequence 10-16 Non	0 Secs (0 Secs)	
	P2				YAPER=0	S 74	-Int in 7arcsec (01)	I==>1	/1
			e the aperture from +7.0" (LP6) to +3.5" => XAPER= 0 steps	" (LP2). Observati	ons are defined as being at	LP2.			
	version is ER = 21 steps	per arcsec or 1 st	tep = 0.0476"						
		-							
)ES (AP	IPARM XSTE ER is set to =	PS = XAPER(Cur. 0. *HOWEVER*.	rent) - XAPER(Previous) because of the TRANS rules, the "QESII	PARM XSTEPS +7	74" [(074) = +74] Specia	al Reauirement is neces	sary to move the aperti	ure to the correct location.	
	Wave_LP2_		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=1;		Sequence 10-16 Non		
	FP1			1222 A	SEGMENT=BOTH;		-Int in 7arcsec (01)	<i>[==&gt;1</i>	
					LIFETIME-POS=L				[1
					P2				
	ments: Exposi								
~		pass calibration	COC/ELIV TRAC TAC DCA	C160M	BUFFER-TIME=23		G 17.02 N	0.1.5 (0.1.5 )	
7	1577_initiali ze_aperture-	(1) AZV-80	COS/FUV, TIME-TAG, PSA	G160M	7;		Sequence 17-23 Non -Int in 7arcsec (01)		
	position-foc			1577 A	FP-POS=1;		` '	[==>]	
	us-HV-value s				FLASH=NO;				
	(COS.sp.151				WAVECAL=NO;				[2
	6692)				LIFETIME-POS=L				
					P2				
Com	ments: initiali	zes the G160M/15	77 observations to set aperture position,	HV value and foc	us values to LP2 defaults b	efore we move the aper	ture and change focus	values relevant for LP6 derive	d from PID 16
8	Adjust focus	NONE	COS, ALIGN/OSM		FOCUS=-38		Sequence 17-23 Non	0.0 Secs (0 Secs)	
	value for 15 77 LP6						-Int in 7arcsec (01)	[==>]	[2]
316 he	0M/1600 focu. absolute G160	s at LP2 is +116.7 0M/1577 focus at 7	ate obtained from PID 16491 analysis. The focus offset from cenwave 1600 to 1. 7" is -262. = LP6_npos estimated absolute focus	•	v		.P2.		
9	Wave_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1;		Sequence 17-23 Non	12 Secs (12 Secs)	
	FP1			1577 A	SEGMENT=BOTH;		-Int in 7arcsec (01)	[==>]	
					LIFETIME-POS=L				[2
	_				P2				
~	ments: Exposi	ure at LP2 pass calibration							
	needed to by-	pass canoranon							
	needed to by-								
	needed to by-								
	needed to by-								
	needed to by-								

sec from LP	COS, ALIGN/APER		XAPER=-74; YAPER=0	QESIPARM XSTEP S -74	Sequence 17-23 Non -Int in 7arcsec (01)	$0 \operatorname{Secs} (0 \operatorname{Secs})$ $I = = > I$	
2			TAI LK-0			[>]	[2]
Comments: In this exposure v So, (7.0-3.5)" * -21 steps/arc	we move the aperture from $+3.5"$ (LP2) to $+$ second $=> XAPER = -74$ steps.	7.0".					
Conversion is XAPER = 21 steps per arcsec	c or 1 step = 0.0476"						
QESIPARM XSTEPS = XAP	ER(Current) - XAPER(Previous), therefore 2	XSTEPS = -74 - 0 = -7	4 XSTEPS				
21 1577_FP1 (1) AZV- (COS.sp.151	80 COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23 7;	SAME POS AS 7	Sequence 17-23 Non -Int in 7arcsec (01)	1383.5 Secs (1383.5 Secs)	
6692)		1577 A	FP-POS=1;		int in varesce (01)	[==>]	
			FLASH=NO;				507
			WAVECAL=NO;				[2]
			LIFETIME-POS=L P2				
Comments: Adjusted target in This exposure time gives S/N:	n aperture by setting POS TARG value to: So =42 at 1650A.	ame as 1222_FP3	12				
22 Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;	QESIPARM XSTEP	Sequence 17-23 Non	0 Secs (0 Secs)	
PŽ			YAPER=0	S 74	-Int in 7arcsec (01)	[==>]	[2]
QESIPARM XSTEPS = XAPI XAPER is set to = 0. *HOWE 23 Wave_LP2_ WAVE	ER(Current) - XAPER(Previous) EVER*, because of the TRANS rules, the "QI COS/FUV, TIME-TAG, WCA		74" [(074) = +74] Special FP-POS=1;	ul Requirement is neces	sary to move the apertal Sequence 17-23 Non		
FP1 WAVE	COS/FUV, TIME-TAG, WCA	1577 A	SEGMENT=BOTH;		-Int in 7arcsec (01)	[==>]	
		1377 A	LIFETIME-POS=L P2			1>1	[2]
Comments: Exposure at LP2 SQL needed to by-pass calibi							
SQL needed to by-pass calibr 24 1222_initiali (1) AZV-	ration	G130M	BUFFER-TIME=20		Sequence 24-30 Non	` '	
SQL needed to by-pass calibr 24 1222_initiali (1) AZV- ze_aperture- position-foc	ration	G130M 1222 A	0;		Sequence 24-30 Non -Int in 7arcsec (01)	0.1 Secs (0.1 Secs) [==>]	
SQL needed to by-pass calibrates 24 1222_initiali (1) AZV- ze_aperture-	ration		0; FP-POS=1;			` '	
SQL needed to by-pass calibr 24 1222_initiali (1) AZV- ze_aperture- position-foc us-HV-value s (COS.sp.147	ration		0; FP-POS=1; FLASH=NO;			` '	[2]
SQL needed to by-pass calibr 24 1222_initiali (1) AZV- ze_aperture- position-foc us-HV-value s	ration		0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L			` '	
SQL needed to by-pass calibr 24 1222_initiali (1) AZV- ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)	80 COS/FUV, TIME-TAG, PSA	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2		-Int in 7arcsec (01)	[==>]	[2]
SQL needed to by-pass calibr  1222_initiali (1) AZV-ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the GI	action  80 COS/FUV, TIME-TAG, PSA  30M/1222 observations to set aperture positions	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b	efore we move the aper	-Int in 7arcsec (01) ture and change focus	[==>] values relevant for LP6 derived	[2]
SQL needed to by-pass calibr  1222_initiali (1) AZV- ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the GI 25 Adjust focus NONE value for 12	80 COS/FUV, TIME-TAG, PSA	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2	efore we move the aper	-Int in 7arcsec (01)	[==>] values relevant for LP6 derived	[2]
SQL needed to by-pass calibr  1222_initiali (1) AZV-ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the GI 25 Adjust focus value for 12 22 LP6	action  80 COS/FUV, TIME-TAG, PSA  30M/1222 observations to set aperture positions	1222 A tion, HV value and focu	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b	efore we move the aper	-Int in 7arcsec (01)  ture and change focus Sequence 24-30 Non	[==>]  values relevant for LP6 derived  0.0 Secs (0 Secs)	[2]
SQL needed to by-pass calibr  1222_initiali (1) AZV-ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the GI 25 Adjust focus NONE value for 12 22 LP6  Comments: Adjust focus to th G130M/1222 focus at LP2 is	action  80 COS/FUV, TIME-TAG, PSA  30M/1222 observations to set aperture positions COS, ALIGN/OSM  the estimate obtained from PID 16491 analys	1222 A tion, HV value and focu	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b	efore we move the aper	-Int in 7arcsec (01)  ture and change focus Sequence 24-30 Non	[==>]  values relevant for LP6 derived  0.0 Secs (0 Secs)	[2]
SQL needed to by-pass calibr  1222_initiali (1) AZV-ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the GI 25 Adjust focus NONE value for 12 22 LP6  Comments: Adjust focus to th G130M/1222 focus at LP2 is G130M/1222 at 7" is:	action  80 COS/FUV, TIME-TAG, PSA  30M/1222 observations to set aperture positions COS, ALIGN/OSM  the estimate obtained from PID 16491 analys	1222 A tion, HV value and focu	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b FOCUS=-141		-Int in 7arcsec (01)  ture and change focus Sequence 24-30 Non -Int in 7arcsec (01)	[==>]  values relevant for LP6 derived  0.0 Secs (0 Secs)	[2]

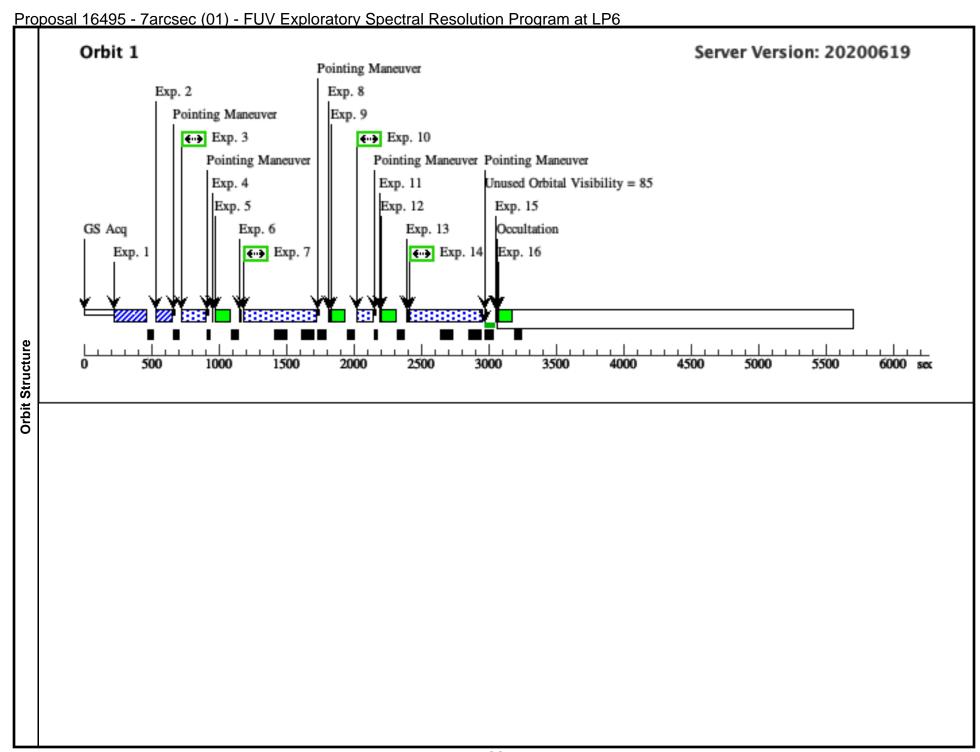
Proposal 16495 - 7arcsec (01) - FUV Exploratory Spectral Resolution Program at LP6 Sequence 24-30 Non Wave\_LP2\_ WAVE COS/FUV, TIME-TAG, WCA G130M FP-POS=1: 52 Secs (52 Secs) FP1 -Int in 7arcsec (01) 1222 A SEGMENT=BOTH; I = = > 1[2] LIFETIME-POS=L Comments: Exposure at LP2 SOL needed to by-pass calibration Move Apert NONE COS, ALIGN/APER XAPER=-74; QESIPARM XSTEP Sequence 24-30 Non | 0 Secs (0 Secs) ure to +7 arc S -74 -Int in 7arcsec (01) YAPER=0 I = = > 1sec from LP [2] Comments: In this exposure we move the aperture from +3.5" (LP2) to +7.0". So, (7.0-3.5)" \* -21 steps/arcsecond => XAPER = -74 steps. Conversion is XAPER = 21 steps per arcsec or 1 step = 0.0476" OESIPARM XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -74 - 0 = -74 XSTEPS 1222 FP1 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 SAME POS AS 7 Sequence 24-30 Non 152 Secs (152 Secs) (COS.sp.147 -Int in 7arcsec (01) 1222 A I = = > 16390) FP-POS=1; FLASH=NO; [2] LIFETIME-POS=L P2; WAVECAL=NO Comments: Adjusted target in aperture by setting POS TARG value to: Same as 1222 FP3. This exposure time gives S/N=42 at 1150A (wavelength of bluest window). 29 Ap\_move\_L NONE COS, ALIGN/APER XAPER=0; OESIPARM XSTEP Sequence 24-30 Non | 0 Secs (0 Secs) -Int in 7arcsec (01) S 74 YAPER=0 [2] f = = > 1Comments: In this exposure we move the aperture from +7.0'' (LP6) to +3.5'' (LP2). Observations are defined as being at LP2. So, (3.5-3.5)" \* -21 steps/arcsecond => XÂPER= 0 steps Conversion is XAPER = 21 steps per arcsec or 1 step = 0.0476"  $OESIPARM\ XSTEPS = XAPER(Current) - XAPER(Previous)$  $\bar{X}APER$  is set to =0. \*HOWEVER\*, because of the TRANS rules, the "QESIPARM XSTEPS +74" [(0 - -74) = +74] Special Requirement is necessary to move the aperture to the correct location. 30 Wave\_LP2\_ WAVE COS/FUV, TIME-TAG, WCA FP-POS=1: Sequence 24-30 Non | 52 Secs (52 Secs) G130M FP1 -Int in 7arcsec (01) 1222 A SEGMENT=BOTH: I = = > 1[2] LIFETIME-POS=L P2 Comments: Exposure at LP2 SOL needed to by-pass calibration 1577 initiali (1) AZV-80 COS/FUV, TIME-TAG, PSA G160M BUFFER-TIME=23 Sequence 31-37 Non 0.1 Secs (0.1 Secs) ze\_aperture--Int in 7arcsec (01) 1577 A I = = > 1position-foc FP-POS=3: us-HV-value FLASH=NO; [3] (COS.sp.151 WAVECAL=NO; 6692) LIFETIME-POS=L P2 Comments: initializes the G160M/1577 observations to set aperture position, HV value and focus values to LP2 defaults before we move the aperture and change focus values relevant for LP6 derived from PID 16491

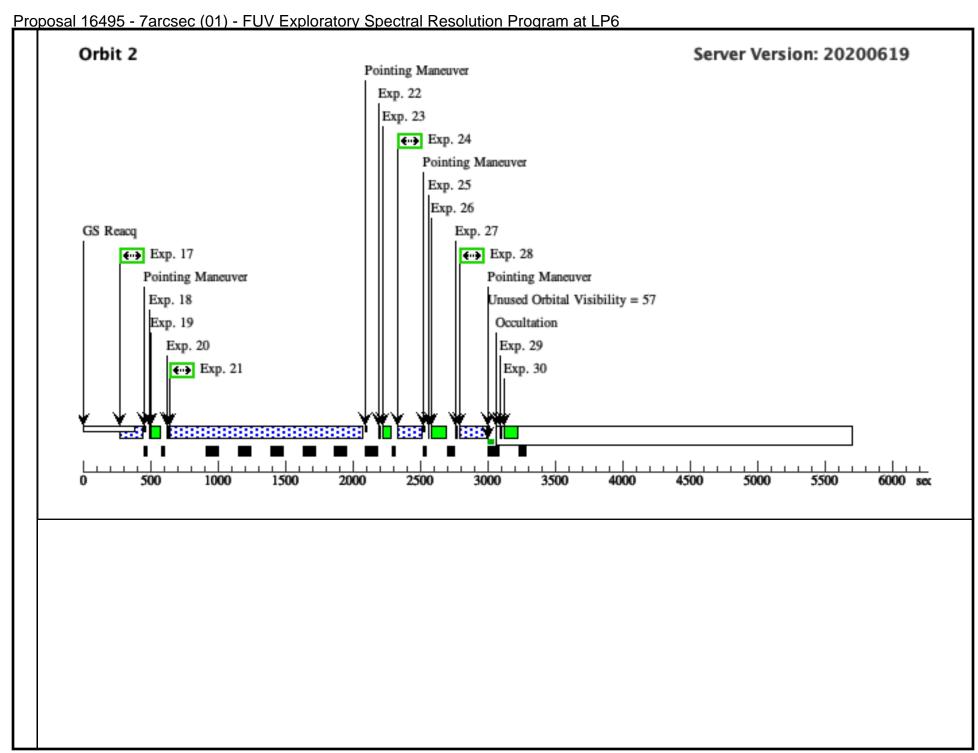
<u> 16495 - 7arcs</u>	<u>sec (01) - FUV Exploratory S</u>	<u>spectral Res</u>	<u>solution Progran</u>	n at LP6			
32 Adjust focus NONE	COS, ALIGN/OSM		FOCUS=-38			0.0 Secs (0 Secs)	
value for 15 77 LP6					-Int in 7arcsec (01)	[==>]	[3]
G160M/1600 focus at LP2 is + The absolute G160M/1577 foci	estimate obtained from PID 16491 analysis. 116. The focus offset from cenwave 1600 to 15 us at 7" is -262. o LP2 = LP6_npos estimated absolute focus - 1	1	J		P2		
33 Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=3;	s offset of 50 returive E	Sequence 31-37 Non	12 Secs (12 Secs)	
FP3	COB/10 V, TIME THO, WEST	1577 A	SEGMENT=BOTH;		-Int in 7arcsec (01)	[==>]	
			LIFETIME-POS=L P2				[3]
Comments: Exposure at LP2 SQL needed to by-pass calibrat	tion						
34 Move Apert NONE	COS, ALIGN/APER		XAPER=-74;		Sequence 31-37 Non	0 Secs (0 Secs)	
ure to +7 arc sec from LP 2			YAPER=0	S -74	-Int in 7arcsec (01)	[==>]	[3]
Comments: In this exposure we So, (7.0-3.5)" * -21 steps/arcse	move the aperture from $+3.5"$ (LP2) to $+7.0"$ cond => XAPER= $-74$ steps.						
Conversion is XAPER = 21 steps per arcsec o	or 1 step = 0.0476"						
QESIPARM XSTEPS = XAPER	R(Current) - XAPER(Previous), therefore XSTI	EPS = -74 - 0 = -74	4 XSTEPS				
35 1577_FP3 (1) AZV-80	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23	SAME POS AS 7	Sequence 31-37 Non	1383.5 Secs (1383.5 Secs)	
(COS.sp.151 6692)		1577 A	7;		-Int in 7arcsec (01)	[==>]	
***-/			FP-POS=3;				
			FLASH=NO;				[3]
			WAVECAL=NO; LIFETIME-POS=L				
			P2				
Comments: Adjusted target in a This exposure time gives S/N=4	aperture by setting POS TARG value to: Same	as 1222_FP3					
36 Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;	QESIPARM XSTEP	Sequence 31-37 Non	0 Secs (0 Secs)	
P2			YAPER=0	S 74	-Int in 7arcsec (01)	[==>]	[3]
Comments: In this exposure we So, (3.5-3.5)" * -21 steps/arcse	move the aperture from $+7.0"$ (LP6) to $+3.5"$ cond => XAPER= 0 steps	(LP2). Observation	ns are defined as being at	LP2.			
Conversion is XAPER = 21 steps per arcsec of	or 1 step = 0.0476"						
QESIPARM XSTEPS = XAPER XAPER is set to = 0. *HOWEV	R(Current) - XAPER(Previous) ER*, because of the TRANS rules, the "QESIF	ARM XSTEPS +74	!" [(074) = +74] Specie	al Requirement is neces	sary to move the apert	ure to the correct location.	
37 Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=3;		Sequence 31-37 Non	12 Secs (12 Secs)	
FP3		1577 A	SEGMENT=BOTH;	;	-Int in 7arcsec (01)	[==>]	
			LIFETIME-POS=L P2				[3]
Comments: Exposure at LP2 SQL needed to by-pass calibrat	tion						
SQL needed to by-pass cational	non						
1							

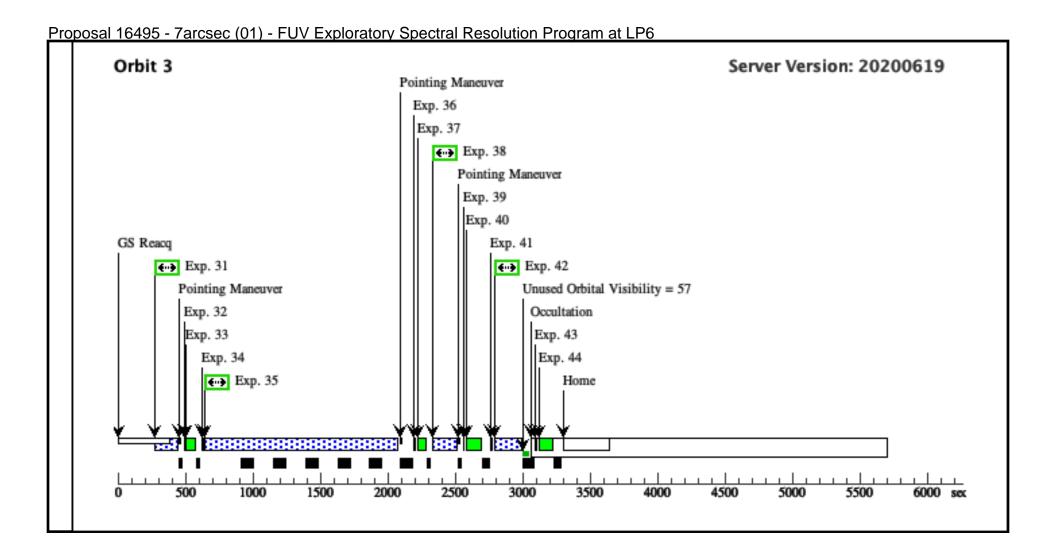
38	1222 initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 38-44 Non	0.1 Secs (0.1 Secs)	
	ze_aperture-	220,227, 220,2	1222 A	0;		-Int in 7arcsec (01)	[==>]	
	position-foc us-HV-value			FP-POS=3;				
	S (COS on 147			FLASH=NO;				[3]
	(COS.sp.147 6390)			WAVECAL=NO;				[5]
				LIFETIME-POS=L P2				
Com	ments: initializes the G130M/122.	2 observations to set aperture position,	HV value and focu		efore we move the aper	ture and change focus	values relevant for LP6 derived	l from PID 16491
39	Adjust focus NONE	COS, ALIGN/OSM	·	FOCUS=-141	,	Sequence 38-44 Non		
	value for 12 22 LP6					-Int in 7arcsec (01)	[==>]	[3]
Сот		te obtained from PID 16491 analysis.						
G13	OM/1222 focus at LP2 is -810. OM/1222 at 7" is:	• • • • • • • • • • • • • • • • • • •						
		LP6_npos estimated absolute focus - I	LP2 absolute focus	= -951810 gives a focus	offset of -141 relative	LP2.		
40	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;			52 Secs (52 Secs)	
	FP3		1222 A	SEGMENT=BOTH;		-Int in 7arcsec (01)	[==>]	
				LIFETIME-POS=L				[3]
Com	ments: Exposure at LP2			P2				
	needed to by-pass calibration							
41	Move Apert NONE ure to +7 arc	COS, ALIGN/APER		XAPER=-74;		Sequence 38-44 Non	` '	
	sec from LP			YAPER=0	S -74	-Inf in 7arcsec (01)	[==>]	[3]
Con XAP	7.0-3.5)" * -21 steps/arcsecond = version is ER = 21 steps per arcsec or 1 step	p = 0.0476"	EDG 74 0 7	4 MOTTE DG				
	$\frac{IPARM\ XSTEPS = XAPER(Curre}{1222\ FP3} $ (1) AZV-80	ent) - XAPER(Previous), therefore XST COS/FUV, TIME-TAG, PSA	EPS = -/4 - 0 = -/4 G130M	BUFFER-TIME=20	SAME DOS AS 7	Sequence 38-44 Non	152 Secs (152 Secs)	
42	(COS.sp.147	COS/FUV, TIME-TAG, PSA	1222 A	0;	SAME POS AS /	-Int in 7arcsec (01)	[==>]	
	6390)		1222 A	FP-POS=3;			[>]	
				FLASH=NO;				f27
				WAVECAL=NO;				[3]
				LIFETIME-POS=L				
Com	mante. A directed target in anorther	e by setting POS TARG value to: Same	as 1222 ED2	P2				
		e by setting FOS TAKG value to. Same 150A (wavelength of bluest window).	us 1222_FF3.					
43	Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;		Sequence 38-44 Non	0 Secs (0 Secs)	
	P2			YAPER=0	S 74	-Int in 7arcsec (01)	[==>]	[3]
Com So, (	ments: In this exposure we move t 3.5-3.5)" * -21 steps/arcsecond =	the aperture from $+7.0"$ (LP6) to $+3.5"$ > XAPER= 0 steps	' (LP2). Observatio	ns are defined as being at	LP2.			
	version is ER = 21 steps per arcsec or 1 step	p = 0.0476"						
	 IPARM XSTEPS = XAPER(Curre	ent) - XAPER(Previous)						
OF	H ANN ASIELS – AMFERICUTTE							
		ecause of the TRANS rules, the "QESIF	PARM XSTEPS +74	!" [(074) = +74] Specia	al Requirement is neces	sary to move the apert	ure to the correct location.	
		ecause of the TRANS rules, the "QESIF	PARM XSTEPS +74	!" [(074) = +74] Specie	ıl Requirement is neces	ssary to move the apert	ure to the correct location.	
		ecause of the TRANS rules, the "QESIF	PARM XSTEPS +74	''' [(074) = +74] Specia	ıl Requirement is neces	ssary to move the apert	ure to the correct location.	

Proposal 16495 - 7arcsec (01) - FUV Exploratory Spectral Resolution Program at LP6

	i Opo.	sai 10 <del>1</del> 33 - Laicsec (	OT 1 OV EXPIDIATORY	opeciiai i	Nesolution i Togram at Li o			
	44	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	Sequence 38-44 Non	52 Secs (52 Secs)	
		FP3		1222 A	SEGMENT=BOTH;	-Int in 7arcsec (01)	[==>]	
					LIFETIME-POS=L			[3]
ı					P2			
	Con	ments: Exposure at LP2						
L	SQL	needed to by-pass calibration						







### Proposal 16495 - 7arcsec (51) - FUV Exploratory Spectral Resolution Program at LP6

Proposal 16495, 7arcsec (51), scheduling

**Diagnostic Status: Warning** 

Scientific Instruments: COS, COS/FUV, COS/NUV

Special Requirements: SCHED 90%

Comments: - Bypass calibration for the COS/FUV exposures.

Disassociate all exposures.

Diagnostics

Repeat of visit 01 which was lost due to the June 13 NSSC-1 safing event.

(7arcsec (51)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

(7arcsec (51)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(7arcsec (51)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AZV-80	RA: 00 50 43.8154 (12.6825642d)	Proper Motion RA: 0.114 mas/yr	V=13.32	Reference Frame: ICRS
		Dec: -72 47 41.57 (-72.79488d)	Proper Motion Dec: -1.453 mas/yr	B=13.19,	
		Equinox: J2000	Epoch of Position: 2015.5	1360A flux from STIS=3.3e-13	

Mon Jun 28 14:01:17 GMT 2021

Comments: Coordinates are from Gaia DR2.

Av 80 - O7 III - V=13.32, B=13.19, E(B-V)=0.13 (SMC), from ULLYSES.

SED derved from fitting to STIS E140M spectrum, E(B-V) modified from 0.14 to 0.13 to better fit existing data.

BOT GSC2 lists 3 unknown sources, but they are faint/invisible in the Swift W1 image. No GALEX imaging available. There are several fairly bright field objects which are not identified by the BOT, from Massey+02 these are >15" from the target, brightest have Vmags (Vega) of 16.85, 16.04, 16.36, 16.38. The target (which is safe) is the brightest object in the Swift W1 image, the fainter field objects are therefore safe for the science exposures. The field objects could affect the PSA during the NUV TA with the BOA but are safe based on their likely spectral types. From Massey+02 the B-V color of Av80 is -0.13, the colors of the field objects are all >0.34 and are therefore type later than A7. These are all safe, from Massey+02:

Field star which is brightest in the Swift W1 image and bluest within 20" - 15.08" away from Av80, RA=50 44.8100, Dec=-72 47 27.100. V=16.85, B-V=0.34 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.21. Zaritsky+02 has V=17.08. According to https://www.stsci.edu/~inr/intrins.html, http://www.pas.rochester.edu/~emamajek/EEM\_dwarf\_UBVIJHK\_colors\_Teff.txt this corresponds to spectral type A7, is safe COS.ta.1480381. XMM W1=17.35 (Page+14), is safe COS.ta.1480281.

Field star 15.35" away from target, RA=00.50.47.22, Dec=-72.47.39.2, V=16.04, B-V=0.63 from Massey+02. If E(B-V)=0.13 then intrinsic B-V is 0.50, this corresponds to spectral type F8, is safe COS.ta.1480380. Field star 16.85" away from target, quite blue, RA=00.50.41.59, Dec=-72.47.55.2, V=16.36, B-V=0.39 from Massey+02. If E(B-V)=0.13 then intrinsic B-V is 0.26, this corresponds to spectral type A8, is safe COS.ta.1480383. XMM W=18.40.75 Page+14) is safe COS.ta.1480395.

Field star 17.83" away from target, RĂ=00 50 41.56, Dec=-72 47 56.3, V=16.38, B-V=0.52 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.39, this corresponds to spectral type F3, is safe COS.ta.1480386.

There are numerous sources in Zaritsky+02 but these sources are very faint/invisible in the Swift W1 imaging, and should not pose an issue for the NUV TA. Category=EXT-STAR

Description=[OF]

Extended=NO

Proposal 16495 - 7arcsec (51) - FUV Exploratory Spectral Resolution Program at LP6

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	image_acq_	(1) AZV-80	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				5.3 Secs (5.3 Secs)	
	boa (COS.ta.147 4056)							[==>]	[1]
2	image_acq_	(1) AZV-80	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				5.3 Secs (5.3 Secs)	
	boa (COS.ta.147 4056)							[==>]	[1]
Cor	nments: Repeat	ACQ/IMAGE to p	rotect against late GS acquisition.						
3	1222_initiali ze_aperture-	(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20 0;		Sequence 3-9 Non-In t in 7arcsec (51)		
	position-foc			1222 A	FP-POS=3;		em messes (e1)	[==>]	
	us-HV-value s				FLASH=NO;				
	(COS.sp.147 6390)				WAVECAL=NO;				[1]
	0390)				LIFETIME-POS=L				
_		4 612014/100	20 1		P2				DID 1640:
Cor 1	Adjust focus		22 observations to set aperture position, a COS. ALIGN/OSM	HV value and focus	FOCUS=-141	efore we move the ape	rture and change focus Sequence 3-9 Non-In		PID 16491
4	value for 12	NONE	COS, ALIGIVOSIVI		rocos=-141		t in 7arcsec (51)	[==>]	[1]
	22 LP6							[]	[1]
G1. G1.	30M/1222	at LP2 is -810. is:	te obtained from PID 16491 analysis. = LP6_npos estimated absolute focus - L	P2 absolute focus =	= -951810 gives a focus	offset of -141 relative	LP2.		
5	Wave_LP2_		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;		Sequence 3-9 Non-In	52 Secs (52 Secs)	
	FP3			1222 A	SEGMENT=BOTH;	;	t in 7arcsec (51)	[==>]	
					LIFETIME-POS=L P2				[1]
Cor SQ1	nments: Exposi L needed to by- <sub>l</sub>	ire at LP2. Lamp e. pass calibration	xposure time from 11.5.4 of the Phase II	instructions.					
6	Move Apert	NONE	COS, ALIGN/APER		XAPER=-74;	QESIPARM XSTEP	Sequence 3-9 Non-In	0 Secs (0 Secs)	
	ure to +7 arc sec from LP 2				YAPER=0	S -74	t in 7arcsec (51)	[==>]	[1]
Cor So,	nments: In this (7.0-3.5)" * -21	exposure we move   steps/arcsecond =	the aperture from $+3.5$ " (LP2) to $+7.0$ ". $=> XAPER = -74$ steps.						
Cor XA	nversion is PER = 21 steps	per arcsec or 1 ste	ep = 0.0476"						
QE.	SIPARM XSTE	$PS = XAPER(Curre}$	ent) - XAPER(Previous), therefore XSTE	PS = -74 - 0 = -74	XSTEPS				
7	1222_FP3	(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M			Sequence 3-9 Non-In	498 Secs (498 Secs)	
	(COS.sp.147 6390)			1222 A	0;	2	t in 7arcsec (51)	[==>]	
	,				FP-POS=3;				
					FLASH=NO;				[1]
					WAVECAL=NO;				
					LIFETIME-POS=L				
					P2				

	COS, ALIGN/APER		XAPER=0; YAPER=0	QESIPARM XSTEP S 74	Sequence 3-9 Non-In t in 7arcsec (51)	0 Secs (0 Secs) I = > I	[1]
Comments. In this armosum we man	the aperture from $+7.0"$ (LP6) to $+3.5"$	'(I D2) Obsamuati		1.02	,	[==>]	[1]
So, (3.5-3.5)" * -21 steps/arcsecond =	=> XAPER = 0  steps	(LF2). Observant	ons are aejinea as being ai	LF 2.			
Conversion is XAPER = 21 steps per arcsec or 1 ste	ep = 0.0476"						
 QESIPARM XSTEPS = XAPER(Curr. XAPER is set to = 0. *HOWEVER*, b	rent) - XAPER(Previous) because of the TRANS rules, the "QESII	PARM XSTEPS +7	74" [(074) = +74] Specia	al Requirement is neces	sary to move the apert	ure to the correct location.	
9 Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	•	Sequence 3-9 Non-In	52 Secs (52 Secs)	
FP3		1222 A	SEGMENT=BOTH; LIFETIME-POS=L P2	:	t in 7arcsec (51)	[==>]	[1]
Comments: Exposure at LP2 SQL needed to by-pass calibration							
10 1222_initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 10-16 Non	0.1 Secs (0.1 Secs)	
ze_aperture- position-foc		1222 A	0; FP-POS=1;		-Int in 7arcsec (51)	[==>]	
us-HV-value			FLASH=NO;				
(COS.sp.147			WAVECAL=NO;				[1]
6390)			LIFETIME-POS=L				
			P2				
	22 observations to set aperture position,	HV value and foc		efore we move the aper		T	ed from PID 16491.
11 Adjust focus NONE value for 12 22 LP6	COS, ALIGN/OSM		FOCUS=-141		Sequence 10-16 Non -Int in 7arcsec (51)	$0.0 \operatorname{Secs} (0 \operatorname{Secs})$ $I = > I$	[1]
	1 1 10 PVD 16401 1 1						•
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 =	= LP6_npos estimated absolute focus - LCOS/FILV_TIME_TAG_WCA			offset of -141 relative		52 Sacs (52 Sacs)	
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is:	•	G130M	FP-POS=1;		LP2. Sequence 10-16 Non -Int in 7arcsec (51)	52 Secs (52 Secs)	
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 = 12 Wave_LP2_ WAVE	= LP6_npos estimated absolute focus - 1				Sequence 10-16 Non	52 Secs (52 Secs) [==>]	[1]
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 = 12 Wave_LP2_ WAVE	= LP6_npos estimated absolute focus - 1	G130M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L		Sequence 10-16 Non	` '	[1]
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 = 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 13 Move Apert NONE	= LP6_npos estimated absolute focus - 1	G130M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L	QESIPARM XSTEP	Sequence 10-16 Non -Int in 7arcsec (51)	` '	[1]
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 =  12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration	= <u>LP6_npos estimated absolute focus - 1</u> COS/FUV, TIME-TAG, WCA	G130M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2		Sequence 10-16 Non -Int in 7arcsec (51)	[==>]	[1]
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 = 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 13 Move Apert NONE ure to +7 arc sec from LP 2	= LP6_npos estimated absolute focus - ACOS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +7.0"	G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 XAPER=-74;	QESIPARM XSTEP	Sequence 10-16 Non -Int in 7arcsec (51)	[==>]  0 Secs (0 Secs)	
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 =  12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration  13 Move Apert NONE ure to +7 arc sec from LP 2  Comments: In this exposure we move	COS, ALIGN/APER  the aperture from +3.5" (LP2) to +7.0" => XAPER = -74 steps.	G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 XAPER=-74;	QESIPARM XSTEP	Sequence 10-16 Non -Int in 7arcsec (51)	[==>]  0 Secs (0 Secs)	
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 =  12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration  13 Move Apert NONE ure to +7 arc sec from LP 2  Comments: In this exposure we move So, (7.0-3.5)" * -21 steps/arcsecond =  Conversion is XAPER = 21 steps per arcsec or 1 ste	COS, ALIGN/APER  the aperture from +3.5" (LP2) to +7.0" => XAPER = -74 steps.	G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  XAPER=-74; YAPER=0	QESIPARM XSTEP	Sequence 10-16 Non -Int in 7arcsec (51)	[==>]  0 Secs (0 Secs)	
G130M/1222 focus at LP2 is -810. G130M/1222 at 7" is: LP6_npos focus step relative to LP2 =  12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration  13 Move Apert NONE ure to +7 arc sec from LP 2  Comments: In this exposure we move So, (7.0-3.5)" * -21 steps/arcsecond =  Conversion is XAPER = 21 steps per arcsec or 1 ste	= $LP6\_npos$ estimated absolute focus - $LP6\_npos$ estimated absolute	G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  XAPER=-74; YAPER=0	QESIPARM XSTEP	Sequence 10-16 Non -Int in 7arcsec (51)	[==>]  0 Secs (0 Secs)	

14		(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20	SAME POS AS 7	Sequence 10-16 Non	498 Secs (498 Secs)	
	(COS.sp.147 6390)	1		1222 A	0;		-Int in 7arcsec (51)	[==>]	
	0070)				FP-POS=1;				
					FLASH=NO;				[1]
					LIFETIME-POS=L P2;				
					WAVECAL=NO				
Con	ments: Adjust	ed target in apertu	ure by setting POS TARG value to: Same	as 1222 FP3.					
This	exposure time	e gives S/N=42 at .	1150A (wavelength of bluest window).	<del>-</del>				T	
15	Ap_move_L P2	NONE	COS, ALIGN/APER		XAPER=0;	QESIPARM XSTEP S 74	Sequence 10-16 Non -Int in 7arcsec (51)	` ′	
	P2				YAPER=0	5 /4	-Int in /arcsec (51)	[==>]	[1]
			e the aperture from +7.0" (LP6) to +3.5" => XAPER= 0 steps	(LP2). Observati	ons are defined as being at	LP2.			
. ,	,	1 steps/arcsecona	-> AAI ER- 0 sieps						
Con X A F	version is PFR – 21 stens	s per arcsec or 1 st	ten = 0.0476"						
		-							
QES XAP	SIPARM XSTE PER is set to =	SPS = XAPER(Cur. 0. *HOWEVER*.	rent) - XAPER(Previous) because of the TRANS rules, the "QESIF	PARM XSTEPS +7	74" [(074) = +74] Specia	al Requirement is neces	sary to move the apert	ure to the correct location	
	Wave_LP2_		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=1;	at recent to reces	Sequence 10-16 Non		
	FP1			1222 A	SEGMENT=BOTH;		-Int in 7arcsec (51)	[==>1	
				12211	LIFETIME-POS=L				[1]
					P2				
	ments: Expos								
		pass calibration	COC/FLIM TIME TAC DOA	C1.60M	DUEEED TIME 22		G 17.02.N	0.1.0 (0.1.0 )	
17	1577_initiali ze_aperture-	(1) AZV-80	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23 7;		Sequence 17-23 Non -Int in 7arcsec (51)	` ′	
	position-foc			1577 A	FP-POS=1;		( )	[==>]	
	us-HV-value s	<b>?</b>			FLASH=NO;				
	(COS.sp.151				WAVECAL=NO;				[2]
	6692)				LIFETIME-POS=L				
					P2				
			77 observations to set aperture position,	HV value and foc	*	efore we move the aper		·	d from PID 164
18	Adjust focus value for 15	NONE	COS, ALIGN/OSM		FOCUS=-38		Sequence 17-23 Non -Int in 7arcsec (51)		
	77 LP6						-Int in /arcsec (51)	[==>]	[2]
Con	ments: Adjust	focus to the estim	ate obtained from PID 16491 analysis.						
G16	0M/1600 focu	s at LP2 is +116.7 0M/1577 focus at 7	The focus offset from cenwave 1600 to 15	577 is -340 steps. (	G160M/1557 focus at LP2 i	is -224.			
LP6	_npos focus st	ep relative to LP2	= LP6_npos estimated absolute focus - I	LP2 absolute focus	s = -262224 gives a focus	s offset of -38 relative L	.P2.		
19	Wave_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1;		Sequence 17-23 Non	12 Secs (12 Secs)	
	FP1			1577 A	SEGMENT=BOTH;		-Int in 7arcsec (51)	[==>]	
					LIFETIME-POS=L				[2]
					P2				
	ments: Expos								
SQL	neeaea to by-	pass calibration							

sec from LP	COS, ALIGN/APER		XAPER=-74; YAPER=0	QESIPARM XSTEP S -74	Sequence 17-23 Non -Int in 7arcsec (51)	0 Secs (0 Secs) [==>]	[21
2							[2]
Comments: In this exposure we move So, (7.0-3.5)" * -21 steps/arcsecond :	the aperture from $+3.5"$ (LP2) to $+7.0"$ => XAPER= -74 steps.	'.					
Conversion is (APER = 21 steps per arcsec or 1 st	ep = 0.0476"						
QESIPARM XSTEPS = XAPER(Curr	rent) - XAPER(Previous), therefore XST	EPS = -74 - 0 = -7	4 XSTEPS				
21 1577_FP1 (1) AZV-80 (COS.sp.151	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23 7;	SAME POS AS 7	Sequence 17-23 Non -Int in 7arcsec (51)	1383.5 Secs (1383.5 Secs)	
6692)		1577 A	FP-POS=1;		-Int in varesce (31)	[==>]	
			FLASH=NO;				
			WAVECAL=NO;				[2]
			LIFETIME-POS=L				
			P2				
Comments: Adjusted target in apertu This exposure time gives S/N=42 at 1	re by setting POS TARG value to: Same 1650A.	as 1222_FP3					
22 Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;	QESIPARM XSTEP	Sequence 17-23 Non	0 Secs (0 Secs)	
P2			YAPER=0	S 74	-Int in 7arcsec (51)	[==>]	[2]
	rent) - XAPER(Previous) because of the TRANS rules, the "QESII			ul Requirement is neces			
3 Wave_LP2_ WAVE FP1	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1;		Sequence 17-23 Non -Int in 7arcsec (51)		
		1577 A	SEGMENT=BOTH; LIFETIME-POS=L P2		m m / m esse (e 1)	[==>]	[2]
Comments: Exposure at LP2 SOL needed to by-pass calibration							
Comments: Exposure at LP2  QL needed to by-pass calibration  4 1222_initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 24-30 Non	0.1 Secs (0.1 Secs)	
GQL needed to by-pass calibration 4 1222_initiali (1) AZV-80 ze_aperture-	COS/FUV, TIME-TAG, PSA	G130M 1222 A	0;		Sequence 24-30 Non -Int in 7arcsec (51)	0.1 Secs (0.1 Secs) [==>]	
<i>IQL needed to by-pass calibration</i> 14 1222_initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA		0; FP-POS=1;			` '	
GQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture- position-foc us-HV-value s	COS/FUV, TIME-TAG, PSA		0; FP-POS=1; FLASH=NO;			` '	[2]
GQL needed to by-pass calibration  14 1222_initiali (1) AZV-80 ze_aperture- position-foc	COS/FUV, TIME-TAG, PSA		0; FP-POS=1; FLASH=NO; WAVECAL=NO;			` '	[2]
24 1222_initiali (1) AZV-80 25 ze_aperture- position-foc us-HV-value s (COS.sp.147	COS/FUV, TIME-TAG, PSA		0; FP-POS=1; FLASH=NO;			` '	[2]
EQL needed to by-pass calibration  14 1222_initiali (1) AZV-80  ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position,	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2	efore we move the aper	-Int in 7arcsec (51)	[==>]	
EQL needed to by-pass calibration  14 1222_initiali (1) AZV-80  ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/12.  25 Adjust focus NONE		1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2	efore we move the aper	-Int in 7arcsec (51)  ture and change focus Sequence 24-30 Non	[==>] values relevant for LP6 derived	
EQL needed to by-pass calibration  14 1222_initiali (1) AZV-80  ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/12.	22 observations to set aperture position,	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b	efore we move the aper	-Int in 7arcsec (51) ture and change focus	[==>] values relevant for LP6 derived	

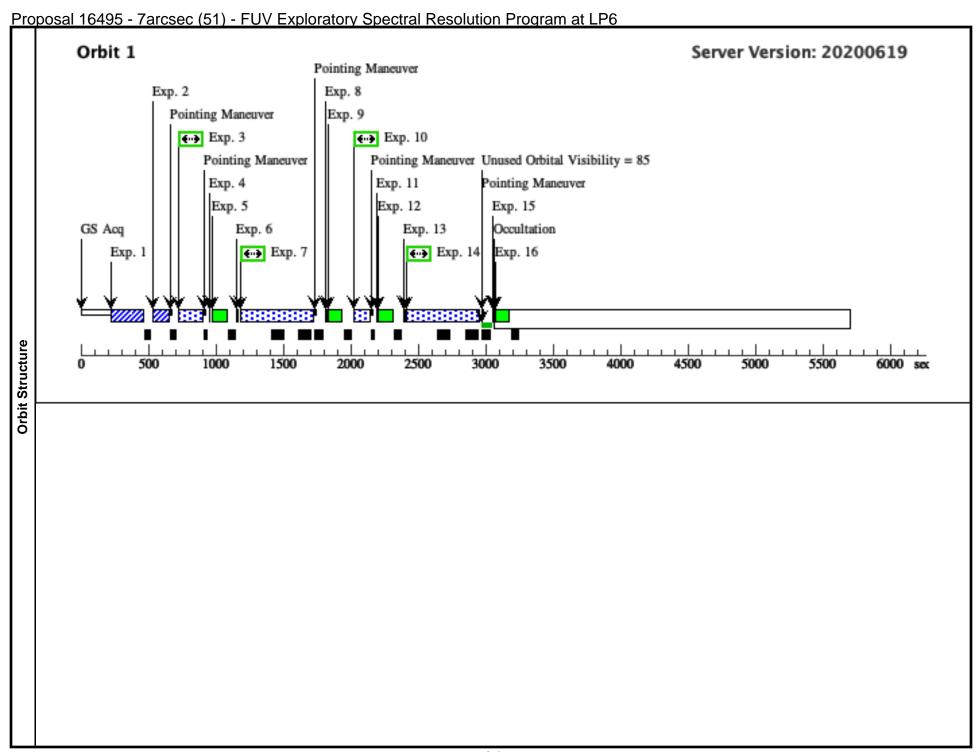
Proposal 16495 - 7arcsec (51) - FUV Exploratory Spectral Resolution Program at LP6 Sequence 24-30 Non Wave\_LP2\_ WAVE COS/FUV, TIME-TAG, WCA G130M FP-POS=1: 52 Secs (52 Secs) FP1 -Int in 7arcsec (51) 1222 A SEGMENT=BOTH; I = = > 1[2] LIFETIME-POS=L Comments: Exposure at LP2 SOL needed to by-pass calibration Move Apert NONE COS, ALIGN/APER XAPER=-74; QESIPARM XSTEP Sequence 24-30 Non | 0 Secs (0 Secs) ure to +7 arc S -74 -Int in 7arcsec (51) YAPER=0 I = = > 1sec from LP [2] Comments: In this exposure we move the aperture from +3.5" (LP2) to +7.0". So, (7.0-3.5)" \* -21 steps/arcsecond => XAPER = -74 steps. Conversion is XAPER = 21 steps per arcsec or 1 step = 0.0476" OESIPARM XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -74 - 0 = -74 XSTEPS 1222 FP1 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 SAME POS AS 7 Sequence 24-30 Non 152 Secs (152 Secs) (COS.sp.147 -Int in 7arcsec (51) 1222 A I = = > 16390) FP-POS=1; FLASH=NO; [2] LIFETIME-POS=L P2; WAVECAL=NO Comments: Adjusted target in aperture by setting POS TARG value to: Same as 1222 FP3. This exposure time gives S/N=42 at 1150A (wavelength of bluest window). 29 Ap\_move\_L NONE COS, ALIGN/APER XAPER=0; OESIPARM XSTEP Sequence 24-30 Non | 0 Secs (0 Secs) -Int in 7arcsec (51) S 74 YAPER=0 [2] f = = > 1Comments: In this exposure we move the aperture from +7.0'' (LP6) to +3.5'' (LP2). Observations are defined as being at LP2. So, (3.5-3.5)" \* -21 steps/arcsecond => XÂPER= 0 steps Conversion is XAPER = 21 steps per arcsec or 1 step = 0.0476"  $OESIPARM\ XSTEPS = XAPER(Current) - XAPER(Previous)$  $\bar{X}APER$  is set to =0. \*HOWEVER\*, because of the TRANS rules, the "QESIPARM XSTEPS +74" [(0 - -74) = +74] Special Requirement is necessary to move the aperture to the correct location. 30 Wave\_LP2\_ WAVE COS/FUV, TIME-TAG, WCA FP-POS=1: Sequence 24-30 Non 52 Secs (52 Secs) G130M FP1 -Int in 7arcsec (51) 1222 A SEGMENT=BOTH: I = = > 1[2] LIFETIME-POS=L P2 Comments: Exposure at LP2 SOL needed to by-pass calibration 1577 initiali (1) AZV-80 COS/FUV, TIME-TAG, PSA G160M BUFFER-TIME=23 Sequence 31-37 Non 0.1 Secs (0.1 Secs) ze\_aperture--Int in 7arcsec (51) 1577 A I = = > 1position-foc FP-POS=3: us-HV-value FLASH=NO; [3] (COS.sp.151 WAVECAL=NO; 6692) LIFETIME-POS=L P2 Comments: initializes the G160M/1577 observations to set aperture position, HV value and focus values to LP2 defaults before we move the aperture and change focus values relevant for LP6 derived from PID 16491

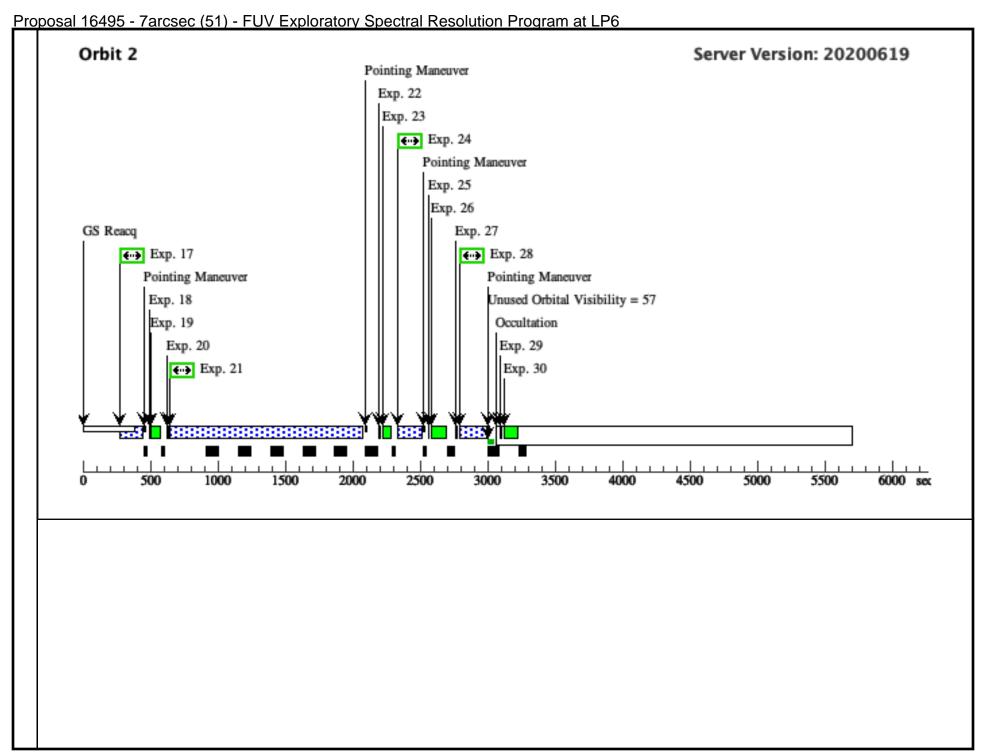
32	Adjust focus	NONE	COS, ALIGN/OSM		FOCUS=-38		Sequence 31-37 Non		
l	value for 15 77 LP6						-Int in 7arcsec (51)	[==>]	[3]
G160 The o	0M/1600 focus absolute G160	s at LP2 is +11 M/1577 focus	timate obtained from PID 16491 analysi.  6. The focus offset from cenwave 1600 to at 7" is -262. .P2 = LP6_npos estimated absolute focu:	o 1577 is -340 steps. G	v		D2		
	Wave_LP2_		COS/FUV, TIME-TAG, WCA	G160M	FP-POS=3;	is offset of -38 retailve L	Sequence 31-37 Non	12 Secs (12 Secs)	
<i>33</i>	FP3	WAVE	COS/TOV, TIME-TAG, WCA	1577 A	SEGMENT=BOTH:		-Int in 7arcsec (51)	[==>]	
				1377 A	LIFETIME-POS=L P2			1>1	[3]
	ments: Exposi needed to by-	ıre at LP2 pass calibratio	n						
34	Move Apert	NONE	COS, ALIGN/APER		XAPER=-74;		Sequence 31-37 Non	0 Secs (0 Secs)	
	ure to +7 arc sec from LP 2				YAPER=0	S -74	-Inf in 7arcsec (51)	[==>]	[3]
			nove the aperture from $+3.5$ " (LP2) to $+7$ and $=>$ XAPER= $-74$ steps.	7.0".					
	version is ER = 21 steps	per arcsec or	1 step = 0.0476"						
OES	IPARM XSTE	PS = XAPER(C)	Current) - XAPER(Previous), therefore X	STEPS = -74 - 0 = -74	4 XSTEPS				
	1577_FP3		COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23	SAME POS AS 7	Sequence 31-37 Non	1383.5 Secs (1383.5 Secs)	
	(COS.sp.151 6692)			1577 A	7;		-Int in 7arcsec (51)	[==>]	
	0092)				FP-POS=3;				
					FLASH=NO;				[3]
					WAVECAL=NO;				
					LIFETIME-POS=L P2				
Com This	ments: Adjusto exposure time	ed target in ape gives S/N=42	erture by setting POS TARG value to: Sa at 1650A.	me as 1222_FP3	12				
	Ap_move_L		COS, ALIGN/APER		XAPER=0;		Sequence 31-37 Non	0 Secs (0 Secs)	
	P2				YAPER=0	S 74	-Int in 7arcsec (51)	[==>]	[3]
			nove the aperture from $+7.0''$ (LP6) to $+3$ and $=>$ XAPER= 0 steps	3.5" (LP2). Observatio	ons are defined as being at	t LP2.			
XAP	version is ER = 21 steps	per arcsec or	1 step = 0.0476"						
QESI	IPARM XSTE		Current) - XAPER(Previous) R*, because of the TRANS rules, the "QE	SIPARM XSTEPS +74	4" [(074) = +74] Specia	ial Requirement is neces	sary to move the apert	ure to the correct location.	
37	Wave_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=3;		Sequence 31-37 Non	12 Secs (12 Secs)	
	FP3			1577 A	SEGMENT=BOTH:	;	-Int in 7arcsec (51)	[==>]	
					LIFETIME-POS=L P2				[3]
Com SQL	ments: Exposi needed to by-	ire at LP2 pass calibratio	n						

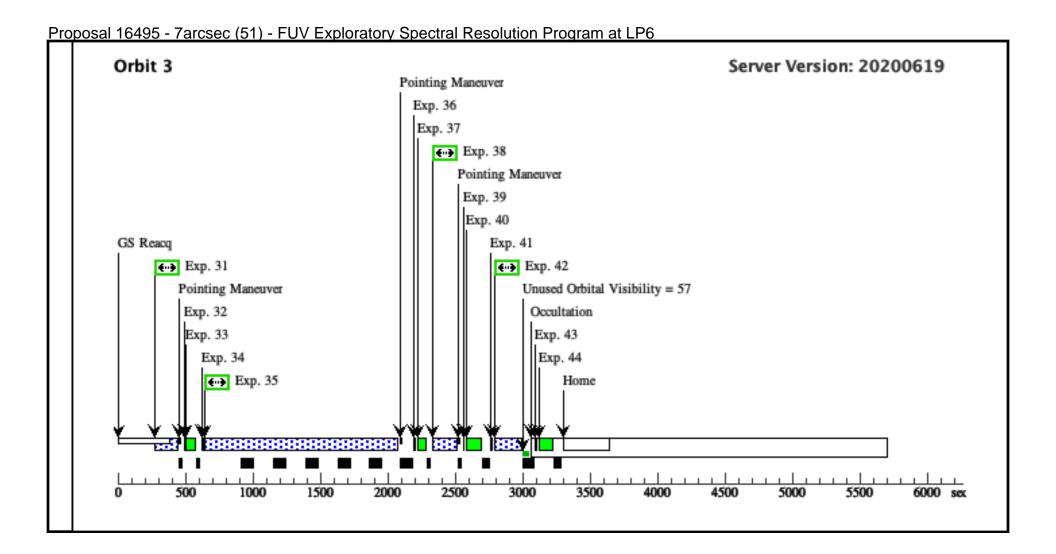
	1222_initiali (1) A	AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 38-44 Non		
	ze_aperture- position-foc			1222 A	0;		-Int in 7arcsec (51)	[==>]	
1	us-HV-value				FP-POS=3;				
	s (COS.sp.147				FLASH=NO;				[3]
	6390)				WAVECAL=NO;				
					LIFETIME-POS=L P2				
Com	ments: initializes th	he G130M/1222 o	bservations to set aperture position,	HV value and focu.	s values to LP2 defaults b	pefore we move the aper	ture and change focus	values relevant for LP6 derive	ed from PID 16491
39	Adjust focus NO		COS, ALIGN/OSM	J.	FOCUS=-141	, <u>, , , , , , , , , , , , , , , , , , </u>	Sequence 38-44 Non		
	value for 12 22 LP6						-Int in 7arcsec (51)	[==>]	[3]
Com		s to the estimate o	obtained from PID 16491 analysis.						[o]
G130	0M/1222 focus at L		oluinea from 1 1D 10491 analysis.						
	0M/1222 at 7" is:	lative to LP2 – Ll	P6_npos estimated absolute focus - I	I P2 absolute focus	– -951810 aives a focus	offset of -141 relative	IP?		
	Wave_LP2_ WA		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	ojjsei oj -141 reidiive i		52 Secs (52 Secs)	
40	FP3	IVE	COS/1 C V, TIME TAG, WEA	1222 A	SEGMENT=BOTH;		-Int in 7arcsec (51)	[==>]	
				1222 A	LIFETIME-POS=L	,		[>]	[3]
					P2				
	ments: Exposure at needed to by-pass o								
	Move Apert NO		COS, ALIGN/APER		XAPER=-74;	QESIPARM XSTEP	Sequence 38-44 Non	0 Secs (0 Secs)	
	ure to +7 arc sec from LP				YAPER=0	S -74	-Int in 7arcsec (51)	[==>]	[3]
So, (	7.0-3.5)" * -21 step.	sure we move ine os/arcsecond => X	aperture from $+3.5$ " (LP2) to $+7.0$ ' XAPER= $-74$ steps.	<b>'.</b>					
So, ( Conv XAP	7.0-3.5)" * -21 step. version is ER = 21 steps per a	os/arcsecond => X arcsec or 1 step =	XAPER= -74 steps.		North De				
So, ( Conv XAP  QES	7.0-3.5)" * -21 step. version is ER = 21 steps per a IPARM XSTEPS = _	os/arcsecond => X arcsec or 1 step = XAPER(Current)	XAPER= -74 steps 0.0476" - xAPER(Previous), therefore XST.	EPS = -74 - 0 = -74		SAME DOS AS 7	Saguanga 29 44 Non	152 Sags (152 Sags)	
So, ( Conv XAP <u>QES</u>	7.0-3.5)" * -21 step. persion is ER = 21 steps per a IPARM XSTEPS = 1222_FP3 (1) A	os/arcsecond => X arcsec or 1 step = XAPER(Current)	XAPER= -74 steps.	<i>EPS</i> = -74 - 0 = -74 G130M	XSTEPS  BUFFER-TIME=20 0;	SAME POS AS 7	Sequence 38-44 Non -Int in 7arcsec (51)	152 Secs (152 Secs)	
So, ( Conv XAP <u>QES</u>	7.0-3.5)" * -21 step. version is ER = 21 steps per a IPARM XSTEPS = _	os/arcsecond => X arcsec or 1 step = XAPER(Current)	XAPER= -74 steps 0.0476" - xAPER(Previous), therefore XST.	EPS = -74 - 0 = -74	BUFFER-TIME=20	SAME POS AS 7		152 Secs (152 Secs) [==>]	
So, ( Conv XAP <u>QES</u>	7.0-3.5)" * -21 step.  persion is  ER = 21 steps per a  IPARM XSTEPS = 1  1222_FP3 (1) A  (COS.sp.147	os/arcsecond => X arcsec or 1 step = XAPER(Current)	XAPER= -74 steps 0.0476" - xAPER(Previous), therefore XST.	<i>EPS</i> = -74 - 0 = -74 G130M	BUFFER-TIME=20 0;	SAME POS AS 7		` ′	
So, ( Conv XAP  QES	7.0-3.5)" * -21 step.  persion is  ER = 21 steps per a  IPARM XSTEPS = 1  1222_FP3 (1) A  (COS.sp.147	os/arcsecond => X arcsec or 1 step = XAPER(Current)	XAPER= -74 steps 0.0476" - xAPER(Previous), therefore XST.	<i>EPS</i> = -74 - 0 = -74 G130M	BUFFER-TIME=20 0; FP-POS=3;	SAME POS AS 7		` ′	[3]
So, ( Conv XAP <u>QES</u>	7.0-3.5)" * -21 step.  persion is  ER = 21 steps per a  IPARM XSTEPS = 1  1222_FP3 (1) A  (COS.sp.147	os/arcsecond => X arcsec or 1 step = XAPER(Current)	XAPER= -74 steps 0.0476" - xAPER(Previous), therefore XST.	<i>EPS</i> = -74 - 0 = -74 G130M	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO;	SAME POS AS 7		` ′	[3]
So, ( Conv XAP  QES  42	7.0-3.5)" * -21 step. persion is ER = 21 steps per a  IPARM XSTEPS =  1222_FP3 (1) 4  (COS.sp.147  6390)	os/arcsecond => X arcsec or 1 step = XAPER(Current) AZV-80	XAPER= -74 steps.  10.0476"  1- XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA	EPS = -74 - 0 = -74 G130M 1222 A	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO;	SAME POS AS 7		` ′	[3]
So, ( Conv XAP  QES  42	7.0-3.5)" * -21 step. version is ER = 21 steps per a IPARM XSTEPS = 1222_FP3 (1) A (COS.sp.147 6390)  ments: Adjusted tar	os/arcsecond => 3 arcsec or 1 step = XAPER(Current) AZV-80	XAPER= -74 steps.  - 0.0476"  - XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA	EPS = -74 - 0 = -74 G130M 1222 A	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L	SAME POS AS 7		` ′	[3]
So, ( Conv XAP  QES  42	7.0-3.5)" * -21 step. Persion is ER = 21 steps per a  IPARM XSTEPS =  1222_FP3 (1) A  (COS.sp.147  6390)  ments: Adjusted tar exposure time gives  Ap_move_L NOI	os/arcsecond => 3 arcsec or 1 step = XAPER(Current) AZV-80 arget in aperture by s S/N=42 at 1150	XAPER= -74 steps.  10.0476"  1- XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA	EPS = -74 - 0 = -74 G130M 1222 A	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L	QESIPARM XSTEP	-Int in 7arcsec (51)  Sequence 38-44 Non	[==>]	[3]
So, ( Conv XAP  QES  42  Com This	7.0-3.5)" * -21 step. version is ER = 21 steps per a IPARM XSTEPS = 1222_FP3 (1) A (COS.sp.147 6390)  ments: Adjusted tar exposure time gives	os/arcsecond => 3 arcsec or 1 step = XAPER(Current) AZV-80 arget in aperture by s S/N=42 at 1150	XAPER= -74 steps.  10.0476"  1- XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA  y setting POS TARG value to: Same A (wavelength of bluest window).	EPS = -74 - 0 = -74 G130M 1222 A	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2		-Int in 7arcsec (51)	[==>]	
So, ( Contact Son	7.0-3.5)" * -21 step.  persion is  ER = 21 steps per a  IPARM XSTEPS =  1222_FP3 (1) A  (COS.sp.147  6390)  ments: Adjusted tar  exposure time gives  Ap_move_L NOI  P2	os/arcsecond => 3 arcsec or 1 step = XAPER(Current) AZV-80 arget in aperture by s S/N=42 at 1150 NE	XAPER= -74 steps.  0.0476"  1- XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA  y setting POS TARG value to: Same (wavelength of bluest window).  COS, ALIGN/APER  aperture from +7.0" (LP6) to +3.5	EPS = -74 - 0 = -74 G130M 1222 A as 1222_FP3.	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 XAPER=0; YAPER=0	QESIPARM XSTEP S 74	-Int in 7arcsec (51)  Sequence 38-44 Non	[==>]  0 Secs (0 Secs)	[3]
So, ( Conv XAP  OES  42  Com This  43  Com So, ( Conv	7.0-3.5)" * -21 step. version is ER = 21 steps per a IPARM XSTEPS = . 1222_FP3 (1) A (COS.sp.147 6390)  ments: Adjusted tar exposure time gives Ap_move_L NOI P2	arcsecond => \( \) arcsec or 1 step =  XAPER(Current)  AZV-80  rget in aperture by s \( S/N = 42 \) at 1150  NE  ssure we move the ss/arcsecond => \( \)	XAPER= -74 steps.  6.0.0476"  1- XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA  by setting POS TARG value to: Same A (wavelength of bluest window).  COS, ALIGN/APER  aperture from +7.0" (LP6) to +3.5"  XAPER= 0 steps	EPS = -74 - 0 = -74 G130M 1222 A as 1222_FP3.	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 XAPER=0; YAPER=0	QESIPARM XSTEP S 74	-Int in 7arcsec (51)  Sequence 38-44 Non	[==>]  0 Secs (0 Secs)	
So, ( Contact Son	7.0-3.5)" * -21 step.  version is  ER = 21 steps per a  IPARM XSTEPS =  1222_FP3 (1) A  (COS.sp.147  6390)  ments: Adjusted tar  exposure time gives  Ap_move_L NOI P2  ments: In this expos  3.5-3.5)" * -21 step.  version is  ER = 21 steps per a	arcsec or 1 step =  XAPER(Current)  AZV-80  reget in aperture by s S/N=42 at 1150.  NE  usure we move the sylarcsecond => 3 arcsec or 1 step =	XAPER= -74 steps.  0.0476"  1-XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA  y setting POS TARG value to: Same (wavelength of bluest window).  COS, ALIGN/APER  aperture from +7.0" (LP6) to +3.5"  XAPER= 0 steps  1.0.0476"	EPS = -74 - 0 = -74 G130M 1222 A as 1222_FP3.	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 XAPER=0; YAPER=0	QESIPARM XSTEP S 74	-Int in 7arcsec (51)  Sequence 38-44 Non	[==>]  0 Secs (0 Secs)	
So, ( Conn XAP  QES  42  Com This  43  Com So, ( Com XAP  QES  QES	7.0-3.5)" * -21 step. Persion is ER = 21 steps per a IPARM XSTEPS = 1222_FP3 (1) A (COS.sp.147 6390)  ments: Adjusted tar exposure time gives Ap_move_L NOI P2  ments: In this expos 3.5-3.5)" * -21 step. Persion is IPARM XSTEPS = IPARM XSTEPS =	arcsec or 1 step =  XAPER(Current)  AZV-80  rget in aperture by s S/N=42 at 1150  NE  ssure we move the ps/arcsecond => 3  arcsec or 1 step =  XAPER(Current)	XAPER= -74 steps.  c. 0.0476"  c. XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA  y setting POS TARG value to: Same A (wavelength of bluest window).  COS, ALIGN/APER  aperture from +7.0" (LP6) to +3.5"  XAPER= 0 steps  c. 0.0476"  c. XAPER(Previous)	EPS = -74 - 0 = -74 G130M 1222 A  as 1222_FP3.	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEP S 74 LP2.	-Int in 7arcsec (51)  Sequence 38-44 Non -Int in 7arcsec (51)	[==>]  0 Secs (0 Secs) [==>]	
So, ( Conn XAP  QES  42  Com This  43  Com So, ( Com XAP  QES  QES	7.0-3.5)" * -21 step. Persion is ER = 21 steps per a IPARM XSTEPS = 1222_FP3 (1) A (COS.sp.147 6390)  ments: Adjusted tar exposure time gives Ap_move_L NOI P2  ments: In this expos 3.5-3.5)" * -21 step. Persion is IPARM XSTEPS = IPARM XSTEPS =	arcsec or 1 step =  XAPER(Current)  AZV-80  rget in aperture by s S/N=42 at 1150  NE  ssure we move the ps/arcsecond => 3  arcsec or 1 step =  XAPER(Current)	XAPER= -74 steps.  0.0476"  1-XAPER(Previous), therefore XST.  COS/FUV, TIME-TAG, PSA  y setting POS TARG value to: Same (wavelength of bluest window).  COS, ALIGN/APER  aperture from +7.0" (LP6) to +3.5"  XAPER= 0 steps  1.0.0476"	EPS = -74 - 0 = -74 G130M 1222 A  as 1222_FP3.	BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEP S 74 LP2.	-Int in 7arcsec (51)  Sequence 38-44 Non -Int in 7arcsec (51)	[==>]  0 Secs (0 Secs) [==>]	

Proposal 16495 - 7arcsec (51) - FUV Exploratory Spectral Resolution Program at LP6

	i Opo.	sai 10 <del>1</del> 33 - Laicsec i	ST/-1 OV Exploratory t	opeciiai i	Nesolution i rogram at Li o			
	44	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	Sequence 38-44 Non	52 Secs (52 Secs)	
		FP3		1222 A	SEGMENT=BOTH;	-Int in 7arcsec (51)	[==>]	
					LIFETIME-POS=L			[3]
					P2			
	Con	ments: Exposure at LP2						
L	SQL	needed to by-pass calibration						







## Proposal 16495 - 9arcsec (02) - FUV Exploratory Spectral Resolution Program at LP6

Proposal 16495, 9arcsec (02), scheduling Mon Jun 28 14:01:17 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS, COS/FUV, COS/NUV

Special Requirements: SCHED 90%

Comments: - Bypass calibration for the COS/FUV exposures.

- Disassociate all exposures.

(9arcsec (02)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Diagnostics (9arcsec (02)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(9arcsec (02)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

#	Name	<b>Target Coordinates</b>	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AZV-80	RA: 00 50 43.8154 (12.6825642d)	Proper Motion RA: 0.114 mas/yr	V=13.32	Reference Frame: ICRS
		Dec: -72 47 41.57 (-72.79488d)	Proper Motion Dec: -1.453 mas/yr	B=13.19,	
		Equinox: J2000	Epoch of Position: 2015.5	1360A flux from STIS=3.3e-13 erg/s/cm^2/A	

Comments: Coordinates are from Gaia DR2.

Av 80 - O7 III - V=13.32, B=13.19, E(B-V)=0.13 (SMC), from ULLYSES.

SED derved from fitting to STIS E140M spectrum, E(B-V) modified from 0.14 to 0.13 to better fit existing data.

BOT GSC2 lists 3 unknown sources, but they are faint/invisible in the Swift W1 image. No GALEX imaging available. There are several fairly bright field objects which are not identified by the BOT, from Massey+02 these are >15" from the target, brightest have Vmags (Vega) of 16.85, 16.04, 16.36, 16.38. The target (which is safe) is the brightest object in the Swift W1 image, the fainter field objects are therefore safe for the science exposures. The field objects could affect the PSA during the NUV TA with the BOA but are safe based on their likely spectral types. From Massey +02 the B-V color of Av80 is -0.13, the colors of the field objects are all >0.34 and are therefore type later than A7. These are all safe, from Massey+02:

Field star which is brightest in the Swift W1 image and bluest within 20" - 15.08" away from Av80, RA=50 44.8100, Dec=-72 47 27.100. V=16.85, B-V=0.34 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.21. Zaritsky+02 has V=17.08. According to https://www.stsci.edu/~inr/intrins.html, http://www.pas.rochester.edu/~emamajek/EEM\_dwarf\_UBVIJHK\_colors\_Teff.txt this corresponds to spectral type A7, is safe COS.ta.1480381. XMM W1=17.35 (Page+14), is safe COS.ta.1480281.

Field star 15.35" away from target, RA=00 50 47.22, Dec=-72 47 39.2, V=16.04, B-V=0.63 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.50, this corresponds to spectral type F8, is safe COS.ta. 1480380. Field star 16.85" away from target, quite blue, RA=00 50 41.59, Dec=72 47 55.2, V=16.36, B-V=0.39 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.26, this corresponds to spectral type A8, is safe COS.ta.1480383. XMM W1=18.40 Page+14) is safe COS.ta.1480395.

Field star 17.83" away from target, RA=00 50 41.56, Dec=-72 47 56.3, V=16.38, B-V=0.52 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.39, this corresponds to spectral type F3, is safe COS.ta.1480386.

There are numerous sources in Zaritsky+02 but these sources are very faint/invisible in the Swift W1 imaging, and should not pose an issue for the NUV TA.

Category=EXT-STAR

Description=[OF]

Extended=NO

Proposal 16495 - 9arcsec (02) - FUV Exploratory Spectral Resolution Program at LP6

S.ta.147  S.ta.1	(1) AZV-80  Zes the G130M/12  NONE  focus to the estimates at LP2 is -810. is:	COS/NUV, ACQ/IMAGE, BOA  COS/NUV, ACQ/IMAGE, BOA  corotect against late GS acquisition.  COS/FUV, TIME-TAG, PSA  22 observations to set aperture position  COS, ALIGN/OSM  atte obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -  COS/FUV, TIME-TAG, WCA		FOCUS=-41 = -851810 gives a focus	before we move the ape	Sequence 3-9 Non-In t in 9arcsec (02)	[==>] values relevant for LP6 derived from	[1] [1] [1] [1] [1]
ge_acq_ sta.147 sta.14	t ACQ/IMAGE to p (1) AZV-80  Zes the G130M/12  NONE  focus to the estima of the start LP2 is -810. Tis: ep relative to LP2	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	G130M 1222 A , HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 Social values to LP2 defaults b FOCUS=-41  = -851810 gives a focus	before we move the ape	t in 9arcsec (02)  erture and change focus  Sequence 3-9 Non-In t in 9arcsec (02)	5.3 Secs (5.3 Secs)  [==>]  0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived from 1.0.0 Secs (0 Secs)	[1]
S.ta.147 S. ta.147 S. ta.147 S. ta.147 S. ta.147 S. initiali perture- ion-foc V-value S.sp.147 S. initialis set for 12 P6 S. Adjust 222 focus 222 at 9" focus ste	t ACQ/IMAGE to p (1) AZV-80  Zes the G130M/12  NONE  focus to the estima of the state of the sta	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	G130M 1222 A , HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 Social values to LP2 defaults b FOCUS=-41  = -851810 gives a focus	before we move the ape	t in 9arcsec (02)  erture and change focus  Sequence 3-9 Non-In t in 9arcsec (02)	0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived from 1.0.0 Secs (0 Secs)	[1] PID 16491
Example 2: Repeat Example 2: Initialis Example 3: Repeat Example 4: Initialis Example 4: Initialis Example 5: Initialis Example 6: Adjust	(1) AZV-80  Example 2 (2) (2) (2) (3) (2) (3) (4) (4) (4) (4) (5) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	1222 A , HV value and focu LP2 absolute focus	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 Social values to LP2 defaults b FOCUS=-41  = -851810 gives a focus	before we move the ape	t in 9arcsec (02)  erture and change focus  Sequence 3-9 Non-In t in 9arcsec (02)	0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived from 1.0.0 Secs (0 Secs)	[1] PID 16491
e_initiali perture- ion-foc V-value S.sp.147 )) :: initiali sst focus e for 12 P6 :: Adjust 222 focus 222 at 9" focus ste	(1) AZV-80  Example 2 (2) (2) (2) (3) (2) (3) (4) (4) (4) (4) (5) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	1222 A , HV value and focu LP2 absolute focus	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 Social values to LP2 defaults b FOCUS=-41  = -851810 gives a focus	before we move the ape	t in 9arcsec (02)  erture and change focus  Sequence 3-9 Non-In t in 9arcsec (02)	values relevant for LP6 derived from 2 0.0 Secs (0 Secs)	PID 16491
perture- ion-foc [V-value S.sp.147 ])  :: initializ set focus e for 12 P6 :: Adjust j222 focus j222 at 9" focus ste	zes the G130M/12 NONE focus to the estima s at LP2 is -810. i is: ep relative to LP2	22 observations to set aperture position COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	1222 A , HV value and focu LP2 absolute focus	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 Social values to LP2 defaults b FOCUS=-41  = -851810 gives a focus	before we move the ape	t in 9arcsec (02)  erture and change focus  Sequence 3-9 Non-In t in 9arcsec (02)	values relevant for LP6 derived from 2 0.0 Secs (0 Secs)	PID 16491
ion-foc V-value S.sp.147 )) :: initializ sist focus e for 12 P6 :: Adjust 222 focus 222 at 9" focus ste	zes the G130M/12 NONE focus to the estima s at LP2 is -810. ' is: ep relative to LP2	COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	, HV value and focu LP2 absolute focus	FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b FOCUS=-41		erture and change focus Sequence 3-9 Non-In t in 9arcsec (02)	values relevant for LP6 derived from 2 0.0 Secs (0 Secs)	PID 16491
ist focus e for 12 P6 :: Adjust 222 focus 222 at 9" focus ste	zes the G130M/12 NONE focus to the estima s at LP2 is -810. ' is: ep relative to LP2	COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	LP2 absolute focus	WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b FOCUS=-41		Sequence 3-9 Non-In t in 9arcsec (02)	0.0 Secs (0 Secs)	PID 1649.
est focus e for 12 P6 est: Adjust 222 focus 222 at 9" focus ste	NONE  focus to the estima s at LP2 is -810. ' is: ep relative to LP2	COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	LP2 absolute focus	LIFETIME-POS=L P2 is values to LP2 defaults b FOCUS=-41 = -851810 gives a focus		Sequence 3-9 Non-In t in 9arcsec (02)	0.0 Secs (0 Secs)	
ust focus e for 12 P6 :: Adjust j 222 focus 222 at 9" focus ste	NONE  focus to the estima s at LP2 is -810. ' is: ep relative to LP2	COS, ALIGN/OSM  ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	LP2 absolute focus	FOCUS=-41 = -851810 gives a focus		Sequence 3-9 Non-In t in 9arcsec (02)	0.0 Secs (0 Secs)	
e for 12 P6 :: Adjust j 222 focus 222 at 9" focus ste	focus to the estime s at LP2 is -810. ' is: ep relative to LP2	nte obtained from PID 16491 analysis. = LP6_npos estimated absolute focus -		= -851810 gives a focus	s offset of -41 relative i	t in 9arcsec (02)	·	[1]
P6 :: Adjust ; 222 focus 222 at 9" focus ste	s at LP2 is -810. ' is: ep relative to LP2	= LP6_npos estimated absolute focus -			s offset of -41 relative i	` ,	[==>]	[1]
222 focus 222 at 9" focus ste	s at LP2 is -810. ' is: ep relative to LP2	= LP6_npos estimated absolute focus -			s offset of -41 relative i			1
e_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G130M				T	
				FP-POS=3;		Sequence 3-9 Non-In t in 9arcsec (02)	` '	
			1222 A	SEGMENT=BOTH LIFETIME-POS=L P2		t in 9arcsec (02)	[==>]	[1]
	ure at LP2 pass calibration							
e Apert		COS, ALIGN/APER		XAPER=-116;		Sequence 3-9 Non-In	0 Secs (0 Secs)	
o +9 arc from LP				YAPER=0	S -116	t in 9arcsec (02)	[==>]	[1]
		the aperture from $+3.5"$ (LP2) to $+9.0$ => XAPER= $-116$ steps.						
n is 21 steps	per arcsec or 1 st	ep = 0.0476"						
M XSTEI	PS = XAPER(Curi	rent) - XAPER(Previous), therefore XST	EPS = -116 - 0 = -1	116 XSTEPS				
		COS/FUV, TIME-TAG, PSA	G130M				498 Secs (498 Secs)	
S.sp.14/ ))			1222 A		2	t in 9arcsec (02)	[==>]	
,				· · · · · · · · · · · · · · · · · · ·				[1]
,								
,				P2				
:: Adjuste		in aperture by setting a POS TARG to X I 150A (wavelength of bluest window).	t=0.0  and  Y=+5.52  t	P2	YAPER=116/21 steps	).		
s S	_FP3 .sp.147	FP3 (1) AZV-80	FP3 (1) AZV-80 COS/FUV, TIME-TAG, PSA	FP3 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M	sp.147 1222 A 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L	EP3 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 POS TARG 0.0,+5.5 0; 2  FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L	FP3 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 POS TARG 0.0,+5.5 Sequence 3-9 Non-In 0; 2 t in 9arcsec (02)  FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L	FP3

8 Ap_move_L NONE P2	COS, ALIGN/APER		XAPER=0;	QESIPARM XSTEP S 116	Sequence 3-9 Non-In t in 9arcsec (02)	` ′	F17
Commonte. In this came course we are successful.	the aperture from +9.0" (LP6) to +3.5'	'(I D2) Obaamati	YAPER=0	. 1.02	,	[==>]	[1]
So, (3.5-3.5)" * -21 steps/arcsecond =	=> XAPER = 0  steps	(LF2). Observant	ons are aejinea as being ai	LF 2.			
Conversion is XAPER = 21 steps per arcsec or 1 ste	ep = 0.0476"						
 QESIPARM XSTEPS = XAPER(Curr XAPER is set to = 0. *HOWEVER*, l	rent) - XAPER(Previous) because of the TRANS rules, the "QESIF	PARM XSTEPS +1	16" [(0116) = +116] Sp	pecial Requirement is n	ecessary to move the a	perture to the correct locatio	n.
9 Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	•	Sequence 3-9 Non-In		
FP3		1222 A	SEGMENT=BOTH; LIFETIME-POS=L P2	;	t in 9arcsec (02)	[==>]	[1]
Comments: Exposure at LP2 SQL needed to by-pass calibration							
10 1222_initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20			0.1 Secs (0.1 Secs)	
ze_aperture- position-foc		1222 A	0; FP-POS=1;		-Int in 9arcsec (02)	[==>]	
us-HV-value s			FLASH=NO;				
(COS.sp.147			WAVECAL=NO;				[1]
6390)			LIFETIME-POS=L				
Commants: initializas the G130M/12	22 observations to set aperture position,	HV value and for	P2	refore we move the ana	ture and change focus	values relevant for LP6 deri	ved from PID 16401
Comments, initializes the G130M/122	22 observations to set aperture position,	nv vaiue ana joc	us vaiues io LF2 aejauiis o	ejore we move ine aper	ture ana change jocus	vaiues reievani jor LFO aeri	vea from F1D 10491
11 Adjust focus NONE	COS ALIGN/OSM		FOCUS=-41		Sequence 10-16 Non	0.0 Secs (0 Secs)	
11 Adjust focus NONE value for 12 22 LP6	COS, ALIGN/OSM		FOCUS=-41		Sequence 10-16 Non -Int in 9arcsec (02)	0.0 Secs (0 Secs) [==>]	[1]
value for 12 22 LP6 Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2 :	ate obtained from PID 16491 analysis. = LP6_npos estimated absolute focus - i		s = -851810 gives a focus	offset of -41 relative L	-Int in 9arcsec (02)	[==>]	[1]
value for 12 22 LP6 Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is:	nte obtained from PID 16491 analysis.	G130M	s = -851810 gives a focus FP-POS=1;	<i>u</i>	-Int in 9arcsec (02)	[==>] 52 Secs (52 Secs)	[1]
value for 12 22 LP6 Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2 : 12 Wave_LP2_ WAVE	ate obtained from PID 16491 analysis. = LP6_npos estimated absolute focus - i		s = -851810 gives a focus	<i>u</i>	-Int in 9arcsec (02)  P2.  Sequence 10-16 Non	[==>]	[1]
value for 12 22 LP6 Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2 : 12 Wave_LP2_ WAVE	ate obtained from PID 16491 analysis. = LP6_npos estimated absolute focus - i	G130M	s = -851810 gives a focus FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L	<i>u</i>	-Int in 9arcsec (02)  P2.  Sequence 10-16 Non	[==>] 52 Secs (52 Secs)	
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2:  12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration  13 Move Apert NONE	ate obtained from PID 16491 analysis. = LP6_npos estimated absolute focus - i	G130M	s = -851810 gives a focus FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L	QESIPARM XSTEP	-Int in 9arcsec (02)  P2. Sequence 10-16 Non -Int in 9arcsec (02)  Sequence 10-16 Non	[==>] 52 Secs (52 Secs)	
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2: 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration	ate obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus - i COS/FUV, TIME-TAG, WCA	G130M	s = -851810 gives a focus FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2	;	-Int in 9arcsec (02)  P2.  Sequence 10-16 Non -Int in 9arcsec (02)	[==>]  52 Secs (52 Secs) [==>]	
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2: 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 13 Move Apert NONE ure to +9 arc sec from LP 2	the obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus - 1  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +9.0'	G130M 1222 A	s = -851810 gives a focus  FP-POS=1;  SEGMENT=BOTH;  LIFETIME-POS=L P2  XAPER=-116;	QESIPARM XSTEP	-Int in 9arcsec (02)  P2. Sequence 10-16 Non -Int in 9arcsec (02)  Sequence 10-16 Non	[==>]  52 Secs (52 Secs) [==>]  0 Secs (0 Secs)	[1]
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2:  12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration  13 Move Apert NONE ure to +9 arc sec from LP 2  Comments: In this exposure we move	the obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus - 1 COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +9.0" => XAPER= -116 steps.	G130M 1222 A	s = -851810 gives a focus  FP-POS=1;  SEGMENT=BOTH;  LIFETIME-POS=L P2  XAPER=-116;	QESIPARM XSTEP	-Int in 9arcsec (02)  P2. Sequence 10-16 Non -Int in 9arcsec (02)  Sequence 10-16 Non	[==>]  52 Secs (52 Secs) [==>]  0 Secs (0 Secs)	[1]
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2: 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 13 Move Apert NONE ure to +9 arc sec from LP 2  Comments: In this exposure we move So, (9.0-3.5)" * -21 steps/arcsecond = Conversion is XAPER = 21 steps per arcsec or 1 ste	the obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus - 1 COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +9.0" => XAPER= -116 steps.	G130M 1222 A	s = -851810 gives a focus  FP-POS=1;  SEGMENT=BOTH;  LIFETIME-POS=L P2  XAPER=-116;  YAPER=0	QESIPARM XSTEP	-Int in 9arcsec (02)  P2. Sequence 10-16 Non -Int in 9arcsec (02)  Sequence 10-16 Non	[==>]  52 Secs (52 Secs) [==>]  0 Secs (0 Secs)	[1]
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2: 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 13 Move Apert NONE ure to +9 arc sec from LP 2  Comments: In this exposure we move So, (9.0-3.5)" * -21 steps/arcsecond = Conversion is XAPER = 21 steps per arcsec or 1 ste	the obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus - 1  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +9.0" => XAPER= -116 steps.  ep = 0.0476"	G130M 1222 A	s = -851810 gives a focus  FP-POS=1;  SEGMENT=BOTH;  LIFETIME-POS=L P2  XAPER=-116;  YAPER=0	QESIPARM XSTEP	-Int in 9arcsec (02)  P2. Sequence 10-16 Non -Int in 9arcsec (02)  Sequence 10-16 Non	[==>]  52 Secs (52 Secs) [==>]  0 Secs (0 Secs)	[1]
value for 12 22 LP6  Comments: Adjust focus to the estima G130M/1222 focus at LP2 is -810. G130M/1222 at 9" is: LP6_npos focus step relative to LP2: 12 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 13 Move Apert NONE ure to +9 arc sec from LP 2  Comments: In this exposure we move So, (9.0-3.5)" * -21 steps/arcsecond = Conversion is XAPER = 21 steps per arcsec or 1 ste	the obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus - 1  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +9.0" => XAPER= -116 steps.  ep = 0.0476"	G130M 1222 A	s = -851810 gives a focus  FP-POS=1;  SEGMENT=BOTH;  LIFETIME-POS=L P2  XAPER=-116;  YAPER=0	QESIPARM XSTEP	-Int in 9arcsec (02)  P2. Sequence 10-16 Non -Int in 9arcsec (02)  Sequence 10-16 Non	[==>]  52 Secs (52 Secs) [==>]  0 Secs (0 Secs)	[1]

po:	sal 16495	<u> - 9arcsec (</u>	02) - FUV Exploratory S	Spectral Re	solution Program	n at LP6			
14	1222_FP1 (COS.sp.147 6390)	(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2	SAME POS AS 7	Sequence 10-16 Non -Int in 9arcsec (02)	498 Secs (498 Secs) [==>]	[1]
			by setting POS TARG value to: Same 50A (wavelength of bluest window).	as 1222_FP3.					
	Ap_move_L P2		COS, ALIGN/APER		XAPER=0; YAPER=0	QESIPARM XSTEP S 116	Sequence 10-16 Non -Int in 9arcsec (02)	0 Secs (0 Secs) [==>]	[1]
		exposure we move the steps/arcsecond =>	he aperture from +9.0" (LP6) to +3.5" > XAPER= 0 steps	(LP2). Observati	ons are defined as being at	LP2.			
	eversion is PER = 21 steps	per arcsec or 1 step	o = 0.0476"						
QES XAF	SIPARM XSTEP PER is set to = 0	PS = XAPER(Currer ). *HOWEVER*, be	nt) - XAPER(Previous) ecause of the TRANS rules, the "QESIF	PARM XSTEPS + I	116'' [(0116) = +116] Spc	ecial Requirement is n	ecessary to move the a	perture to the correct location.	
	Wave_LP2_ FP1		COS/FUV, TIME-TAG, WCA	G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L	•	Sequence 10-16 Non -Int in 9arcsec (02)		[1]
	nments: Exposu L needed to by-p	re at LP2 pass calibration			P2				
17	1577_initiali ze_aperture- position-foc us-HV-value s (COS.sp.151 6692)	(1) AZV-80	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=23 7; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2		Sequence 17-23 Non -Int in 9arcsec (02)	0.1 Secs (0.1 Secs) [==>]	[2]
Con			7 observations to set aperture position,	HV value and foo	rus values to LP2 defaults be	efore we move the aper			d from PID 1649
18	Adjust focus value for 15 77 LP6	NONE	COS, ALIGN/OSM		FOCUS=+103		Sequence 17-23 Non -Int in 9arcsec (02)	0.0 Secs (0 Secs) [==>]	[2]
G16 The	60M/1600 focus absolute G160	at LP2 is +116. The M/1577 focus at 9" i	e obtained from PID 16491 analysis. e focus offset from cenwave 1600 to 15 is -121. LP6_npos estimated absolute focus - 1	1	y .	s -224.			
19	Wave_LP2_ FP1		COS/FUV, TIME-TAG, WCA	G160M 1577 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2		Sequence 17-23 Non -Int in 9arcsec (02)	12 Secs (12 Secs) [==>]	[2]
Con SQL	nments: Exposu L needed to by-p	re at LP2 pass calibration							ı

	ve Apert NONE to +9 arc from LP	COS, ALIGN/APER		XAPER=-116; YAPER=0	QESIPARM XSTEP S -116	Sequence 17-23 Non -Int in 9arcsec (02)	0 Secs (0 Secs) [==>]	[2]
2								[2]
Comments So, (9.0-3	ts: In this exposure we mov 3.5)" * -21 steps/arcsecond	e the aperture from $+3.5"$ (LP2) to $+9.0"$ => XAPER= -116 steps.	,					
Conversio XAPER =	on is = 21 steps per arcsec or 1 s	tep = 0.0476"						
QESIPAR	$RM \ XSTEPS = XAPER(Cur$	rent) - XAPER(Previous), therefore XST	EPS = -116 - 0 = -	116 XSTEPS				
	7_FP1 (1) AZV-80 OS.sp.151	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23 7;	SAME POS AS 7	Sequence 17-23 Non -Int in 9arcsec (02)	1383.5 Secs (1383.5 Secs)	
6692			1577 A	FP-POS=1;		The in Faresce (02)	[==>]	
				FLASH=NO;				
				WAVECAL=NO;				[2]
				LIFETIME-POS=L				
Commont	ts: Adjusted target in anerti	ure by setting POS TARG value to: Same	as 1222 FP3	P2				
	osure time gives S/N=42 at		us 1222_F1 5					
22 Ap_	_move_L NONE	COS, ALIGN/APER		XAPER=0;		Sequence 17-23 Non	0 Secs (0 Secs)	
PŽ				YAPER=0	S 116	-Int in 9arcsec (02)	[==>]	[2]
XAPER is	RM XSTEPS = XAPER(Cur s set to = 0. *HOWEVER*, ve_LP2_ WAVE	rent) - XAPER(Previous) because of the TRANS rules, the "QESII COS/FUV, TIME-TAG, WCA	PARM XSTEPS +1 G160M	$\frac{16'' [(0116) = +116] Sp}{FP-POS=1;}$	pecial Requirement is n	ecessary to move the ap Sequence 17-23 Non	perture to the correct location.  12 Secs (12 Secs)	
23 Way FP1		COS/FUV, TIME-TAG, WCA	G160M 1577 A	FP-POS=1; SEGMENT=BOTH;		-Int in 9arcsec (02)	[==>]	
			13// A	LIFETIME-POS=L P2			[==>]	[2]
_	ts: Exposure at LP2 led to by-pass calibration							
SQL need 24 1222	2_initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 24-30 Non	0.1 Secs (0.1 Secs)	
SQL need 24 1222 ze_a	2_initiali (1) AZV-80 aperture- ition-foc	COS/FUV, TIME-TAG, PSA	G130M 1222 A	0;		Sequence 24-30 Non -Int in 9arcsec (02)	0.1 Secs (0.1 Secs) [==>]	
SQL need 24 1222 ze_a posi	aperture-	COS/FUV, TIME-TAG, PSA		0; FP-POS=1;			` '	
24 1222 ze_a posi us-H	aperture- ition-foc	COS/FUV, TIME-TAG, PSA		0; FP-POS=1; FLASH=NO;			` '	[2]
24 1222 ze_a posi us-H s	aperture- ition-foc HV-value OS.sp.147	COS/FUV, TIME-TAG, PSA		0; FP-POS=1; FLASH=NO; WAVECAL=NO;			` '	[2]
24 1222 ze_a posi us-H s (CO	aperture- ition-foc HV-value OS.sp.147	COS/FUV, TIME-TAG, PSA		0; FP-POS=1; FLASH=NO;			` '	[2]
SQL need 24 1222 ze_a posi us-F s (CO 6390	aperture- ition-foc HV-value OS.sp.147	COS/FUV, TIME-TAG, PSA  222 observations to set aperture position,	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2	efore we move the aper	-Int in 9arcsec (02)	[==>]	
SQL need           24         122:           ze_z         posi           us-F         s           (CO         6390           Comment.         25           Adju	aperture- ition-foc HV-value OS.sp.147 O)  ts: initializes the G130M/12 tust focus NONE		1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2	efore we move the aper	-Int in 9arcsec (02)  ture and change focus Sequence 24-30 Non	[==>] values relevant for LP6 derived 0.0 Secs (0 Secs)	
SQL need           24         122:           ze_z         posi           us-F         s           (CO         6390           Comment.         25           Adju	aperture- ition-foc HV-value OS.sp.147 O)  ts: initializes the G130M/12 fust focus NONE are for 12	222 observations to set aperture position,	1222 A	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b	efore we move the aper	-Int in 9arcsec (02) ture and change focus	[==>] walues relevant for LP6 derived	
24 122:     ze_a posi us-F s (CO 6390  Comment: 25 Adju valu 22 I  Comment: G130M/II G130M/II	aperture- ition-foc HV-value OS.sp.147 (0)  ts: initializes the G130M/12 ust focus NONE ue for 12 LP6 ts: Adjust focus to the estim 1222 focus at LP2 is -810. 1222 at 9" is:	222 observations to set aperture position, COS, ALIGN/OSM ate obtained from PID 16491 analysis.	1222 A  HV value and foci	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b FOCUS=-41		-Int in 9arcsec (02)  ture and change focus Sequence 24-30 Non -Int in 9arcsec (02)	[==>] values relevant for LP6 derived 0.0 Secs (0 Secs)	l from PID 16491
24 122:     ze_a posi us-F s (CO 6390  Comment: 25 Adju valu 22 I  Comment: G130M/II G130M/II	aperture- ition-foc HV-value OS.sp.147 (0)  ts: initializes the G130M/12 ust focus NONE ue for 12 LP6 ts: Adjust focus to the estim 1222 focus at LP2 is -810. 1222 at 9" is:	222 observations to set aperture position, COS, ALIGN/OSM	1222 A  HV value and foci	0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b FOCUS=-41		-Int in 9arcsec (02)  ture and change focus Sequence 24-30 Non -Int in 9arcsec (02)	[==>] values relevant for LP6 derived 0.0 Secs (0 Secs)	l from PID 16491

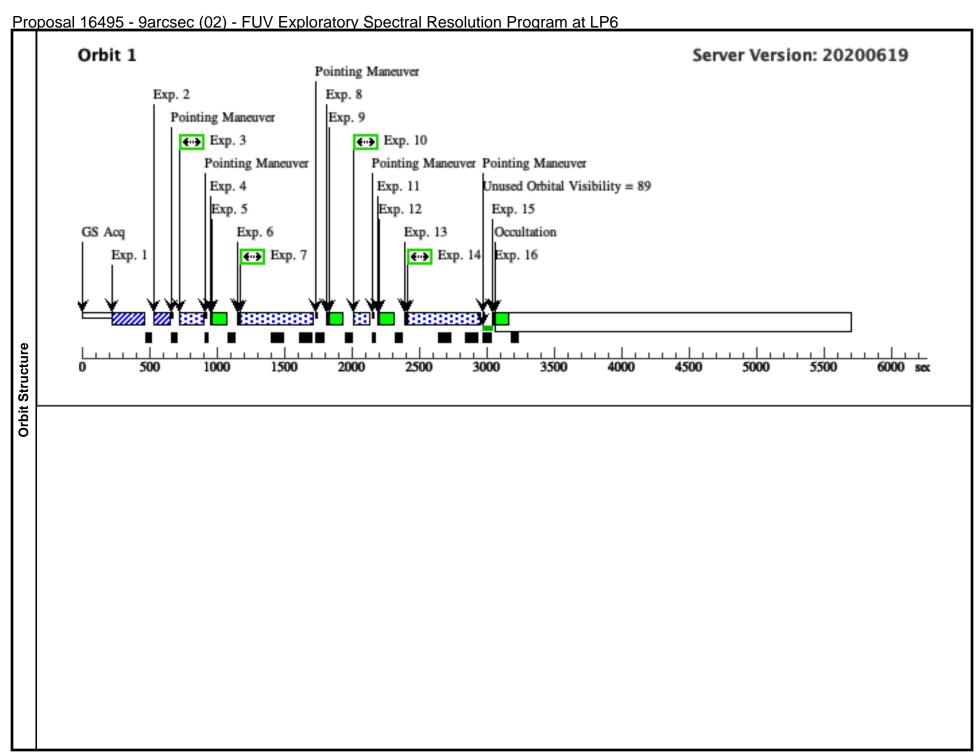
Wave_LP2_ FP1	WAVE	COS/FUV, TIME-TAG, WCA	G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2		Sequence 24-30 Non -Int in 9arcsec (02)	52 Secs (52 Secs) [==>]	[2]
ents: Exposi eeded to by-	ure at LP2 pass calibration							
re to +9 arc sec from LP		COS, ALIGN/APER		XAPER=-116; YAPER=0	QESIPARM XSTEP S -116	Sequence 24-30 Non -Int in 9arcsec (02)	0 Secs (0 Secs) [==>]	[2]
	per arcsec or 1 step	= 0.0476"						
PARM XSTE	PS = XAPER(Current	nt) - XAPER(Previous), therefore XST	EPS = -116 - 0 = -	116 XSTEPS				
		COS/FUV, TIME-TAG, PSA	G130M		SAME POS AS 7	Sequence 24-30 Non	152 Secs (152 Secs)	
COS.Sp.147 (390)			1222 A	FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L		-int in Paresec (02)	[==>]	[2
xposure time	e gives S/N=42 at 115	50A (wavelength of bluest window).	as 1222_FP3.					
An move I								
22 P2	NONE	COS, ALIGN/APER		XAPER=0; YAPER=0	QESIPARM XSTEP S 116	Sequence 24-30 Non -Int in 9arcsec (02)	$0 \operatorname{Secs} (0 \operatorname{Secs})$ $[==>]$	[2]
22 ents: In this 5-3.5)" * -21 rsion is		the aperture from +9.0" (LP6) to +3.5' > XAPER= 0 steps	(LP2). Observatio	YAPER=0	S 116	Sequence 24-30 Non -Int in 9arcsec (02)		[2]
P2 ents: In this 5-3.5)" * -21 rsion is R = 21 steps PARM XSTEI	exposure we move the I steps/arcsecond => per arcsec or I step PS = XAPER(Curren	the aperture from +9.0" (LP6) to +3.5' > XAPER= 0 steps = 0.0476" nt) - XAPER(Previous)	. ,	YAPER=0 ons are defined as being at	S 116 LP2.	-Int in 9arcsec (02)	[==>]	
P2 ents: In this 5-3.5)" * -21 rsion is R = 21 steps PARM XSTEI	exposure we move th I steps/arcsecond => per arcsec or I step PS = XAPER(Curren 0. *HOWEVER*, bet	the aperture from $+9.0"$ (LP6) to $+3.5'$ > XAPER= 0 steps = $=0.0476"$	. ,	YAPER=0 ons are defined as being at	S 116 LP2.	-Int in 9arcsec (02)  ecessary to move the ap  Sequence 24-30 Non	[==>] perture to the correct location.	
ents: In this 5-3.5)" * -21 rsion is R = 21 steps PARM XSTEI R is set to =	exposure we move th I steps/arcsecond => per arcsec or I step PS = XAPER(Curren 0. *HOWEVER*, bet	the aperture from +9.0" (LP6) to +3.5' > XAPER= 0 steps = 0.0476" at) - XAPER(Previous) cause of the TRANS rules, the "QESIF	PARM XSTEPS +1	YAPER=0  ons are defined as being at $16'' [(0116) = +116] Sp$	S 116  LP2.  vecial Requirement is n	-Int in 9arcsec (02)  ecessary to move the a	[==>] perture to the correct location.	
ents: In this 5-3.5)" * -21 rsion is R = 21 steps	exposure we move the l steps/arcsecond => steps/arcsec or 1 step PS = XAPER(Current of the lower	the aperture from +9.0" (LP6) to +3.5' > XAPER= 0 steps = 0.0476" at) - XAPER(Previous) cause of the TRANS rules, the "QESIF	PARM XSTEPS + 1 G130M	YAPER=0  ons are defined as being at a second secon	S 116  LP2.  vecial Requirement is n	-Int in 9arcsec (02)  ecessary to move the ap  Sequence 24-30 Non	[==>]  perture to the correct location.  52 Secs (52 Secs)	
ents: In this 5-3.5)" * -21 rsion is R = 21 steps	exposure we move the steps/arcsecond => steps/arcsecond => step arcsec or 1 step PS = XAPER(Currendo.*HOWEVER*, bedward bedwar	the aperture from +9.0" (LP6) to +3.5' > XAPER= 0 steps = 0.0476" at) - XAPER(Previous) cause of the TRANS rules, the "QESIF	PARM XSTEPS + 1 G130M	YAPER=0  ons are defined as being at a second secon	S 116  LP2.  vecial Requirement is n	-Int in 9arcsec (02)  ecessary to move the ap  Sequence 24-30 Non	[I==>] Description to the correct location. $[52  Secs  (52  Secs)]$ $[I==>]$	
	ents: Exposi eeded to by- Move Apert ire to +9 arc sec from LP ents: In this 0-3.5)" * -2. rsion is R = 21 steps PARM XSTE (222_FP1 COS.sp.147 (3390)	ents: Exposure at LP2 eeded to by-pass calibration  Move Apert NONE meet to +9 arc sec from LP 2 ents: In this exposure we move th 0-3.5)" * -21 steps/arcsecond => rsion is R = 21 steps per arcsec or 1 step PARM XSTEPS = XAPER(Current 1222_FP1 (1) AZV-80 COS.sp.147 6390)	ents: Exposure at LP2 eeded to by-pass calibration  Move Apert NONE COS, ALIGN/APER are to +9 arc sec from LP 2 ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0" 0-3.5)" * -21 steps/arcsecond => XAPER= -116 steps.  rsion is R = 21 steps per arcsec or 1 step = 0.0476" 2ARM XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTE 222_FP1 (1) AZV-80 COS/FUV, TIME-TAG, PSA COS.sp.147 6390)  ents: Adjusted target in aperture by setting POS TARG value to: Same exposure time gives S/N=42 at 1150A (wavelength of bluest window).	ents: Exposure at LP2 eeded to by-pass calibration  Move Apert NONE COS, ALIGN/APER are to +9 arc sec from LP 2 ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0". 0-3.5)" * -21 steps/arcsecond => XAPER= -116 steps.  rsion is $R = 21 \text{ steps per arcsec or } 1 \text{ step} = 0.0476"$ PARM XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -116 - 0 = -1222_FP1 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M COS.sp.147 1222 A  ents: Adjusted target in aperture by setting POS TARG value to: Same as 1222_FP3. Exposure time gives S/N=42 at 1150A (wavelength of bluest window).	ents: Exposure at LP2 eeded to by-pass calibration  Move Apert NONE COS, ALIGN/APER XAPER=-116; ure to +9 arc see from LP  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  ents: Aljusted target in aperture by setting POS TARG value to: Same as 1222_FP3.  ents: Adjusted target in aperture by setting POS TARG value to: Same as 1222_FP3.  exposure time gives S/N=42 at 1150A (wavelength of bluest window).	ents: Exposure at LP2 eeded to by-pass calibration  Move Apert NONE COS, ALIGN/APER XAPER=-116; YAPER=0 S-116  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0". 0-3.5)" *-21 steps/arcsecond => XAPER=-116 steps.  rsion is R = 21 steps per arcsec or 1 step = 0.0476"  PARM XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -116 - 0 = -116 XSTEPS  1222_FP1 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 SAME POS AS 7 O; 3990)  FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2  ents: Adjusted target in aperture by setting POS TARG value to: Same as 1222_FP3.  exposure time gives S/N=42 at 1150A (wavelength of bluest window).	ents: Exposure at LP2 events: NONE  COS, ALIGN/APER  NONE  COS, ALIGN/APER  XAPER=116; YAPER=0  S-116  S-116  Sequence 24-30 Non Int in 9arcsec (02)  ents: In this exposure we move the aperture from +3.5" (LP2) to +9.0".  0-3.5)" * -21 steps/arcsecond => XAPER= -116 steps.  rsion is  R = 21 steps per arcsec or 1 step = 0.0476"  PARM XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -116 - 0 = -116 XSTEPS  1222_FP1 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 SAME POS AS 7 OIN -Int in 9arcsec (02)  FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2  ents: Adjusted target in aperture by setting POS TARG value to: Same as 1222_FP3.  typosure time gives S/N=42 at 1150A (wavelength of bluest window).	

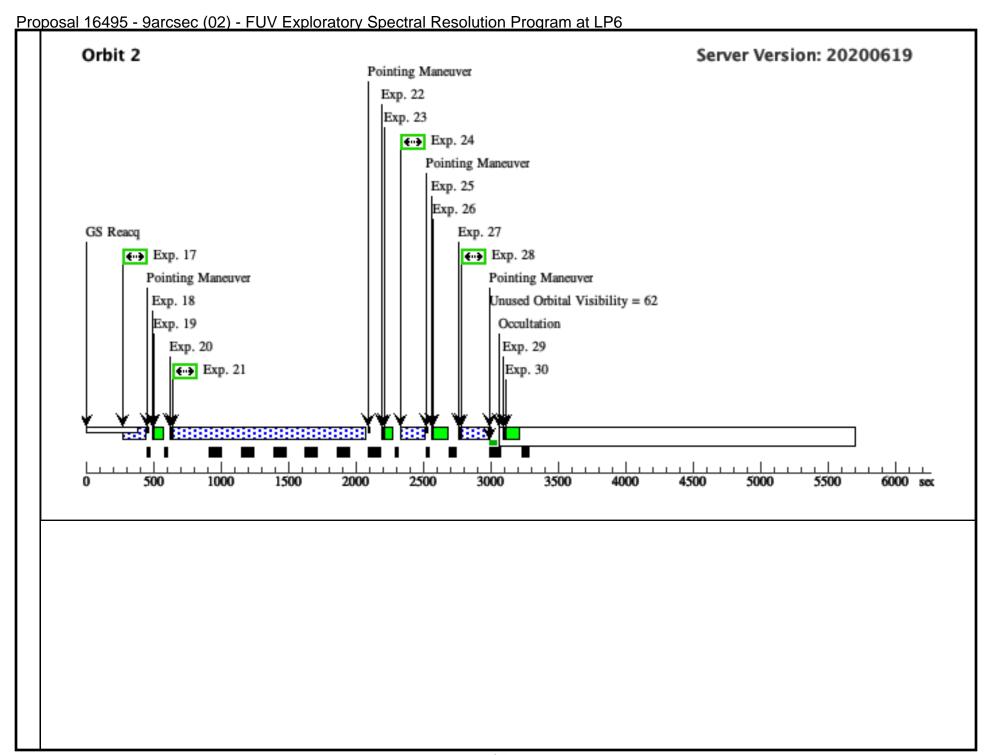
at LP2 is +116. Th M/1577 focus at 9" p relative to LP2 = WAVE  re at LP2 pass calibration NONE  exposure we move t steps/arcsecond =: per arcsec or 1 step	COS/FUV, TIME-TAG, WCA  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The aperture from +3.5" (LP2) to +9.0".  > XAPER= -116 steps.	P2 absolute focus G160M 1577 A	FP-POS=3; SEGMENT=BOTH; LIFETIME-POS=L P2  XAPER=-116; YAPER=0  BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	QESIPARM XSTEP S -116	Sequence 31-37 Non -Int in 9arcsec (02)  Sequence 31-37 Non -Int in 9arcsec (02)  Sequence 31-37 Non -Int in 9arcsec (02)	[==>]	[3]
at LP2 is +116. Th M/1577 focus at 9" p relative to LP2 = WAVE  re at LP2 pass calibration NONE  exposure we move to steps/arcsecond = 1 per arcsec or 1 step. PS = XAPER(Curre	the focus offset from cenwave 1600 to 15 is -121.  LP6_npos estimated absolute focus - L  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The aperture from +3.5" (LP2) to +9.0".  XAPER= -116 steps.  D = 0.0476"  mt) - XAPER(Previous), therefore XSTE	EPS = -116 - 0 = -	FP-POS=3; SEGMENT=BOTH; LIFETIME-POS=L P2  XAPER=-116; YAPER=0  BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	QESIPARM XSTEP S -116	-Int in 9arcsec (02)  Sequence 31-37 Non -Int in 9arcsec (02)  Sequence 31-37 Non	[==>]  0 Secs (0 Secs) [==>]  1383.5 Secs (1383.5 Secs)	[3]
re at LP2 pass calibration  NONE  exposure we move to steps/arcsecond = 1  per arcsec or 1 step PS = XAPER(Curre	COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  the aperture from +3.5" (LP2) to +9.0".  > XAPER= -116 steps.  p = 0.0476"  mt) - XAPER(Previous), therefore XSTE	G160M 1577 A EPS = -116 - 0 = - G160M	FP-POS=3; SEGMENT=BOTH; LIFETIME-POS=L P2  XAPER=-116; YAPER=0  MIGHTAL STEPS  BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	QESIPARM XSTEP S -116	-Int in 9arcsec (02)  Sequence 31-37 Non -Int in 9arcsec (02)  Sequence 31-37 Non	[==>]  0 Secs (0 Secs) [==>]  1383.5 Secs (1383.5 Secs)	[3]
re at LP2 pass calibration NONE  exposure we move to steps/arcsecond =: per arcsec or 1 step PS = XAPER(Curre	COS, ALIGN/APER  the aperture from $+3.5"$ (LP2) to $+9.0"$ . $> XAPER = -116$ steps. $p = 0.0476"$ $= 0.0476$	1577 A  EPS = -116 - 0 = - G160M	SEGMENT=BOTH; LIFETIME-POS=L P2  XAPER=-116; YAPER=0  MIGHTAL STEPS  BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	QESIPARM XSTEP S -116	-Int in 9arcsec (02)  Sequence 31-37 Non -Int in 9arcsec (02)  Sequence 31-37 Non	[==>]  0 Secs (0 Secs) [==>]  1383.5 Secs (1383.5 Secs)	[3]
pass calibration  NONE  exposure we move to steps/arcsecond =:  per arcsec or 1 steps  PS = XAPER(Curre	the aperture from +3.5" (LP2) to +9.0".  > XAPER= -116 steps.  p = 0.0476"  nt) - XAPER(Previous), therefore XSTE	<i>EPS</i> = -116 - 0 = - G160M	YAPER=0  -116 XSTEPS  BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	Š-116	-Int in 9arcsec (02)  Sequence 31-37 Non	[==>]  1383.5 Secs (1383.5 Secs)	
exposure we move t steps/arcsecond =: per arcsec or 1 step PS = XAPER(Curre	the aperture from +3.5" (LP2) to +9.0".  > XAPER= -116 steps.  p = 0.0476"  nt) - XAPER(Previous), therefore XSTE	<i>EPS</i> = -116 - 0 = - G160M	YAPER=0  -116 XSTEPS  BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	Š-116	-Int in 9arcsec (02)  Sequence 31-37 Non	[==>]  1383.5 Secs (1383.5 Secs)	
steps/arcsecond =: per arcsec or 1 step PS = XAPER(Curre	> XAPER= -116 steps. p = 0.0476" nt) - XAPER(Previous), therefore XSTE	<i>EPS</i> = -116 - 0 = - G160M	BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;		Sequence 31-37 Non	1383.5 Secs (1383.5 Secs)	
steps/arcsecond =: per arcsec or 1 step PS = XAPER(Curre	> XAPER= -116 steps. p = 0.0476" nt) - XAPER(Previous), therefore XSTE	<i>EPS</i> = -116 - 0 = - G160M	BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	SAME POS AS 7		` · · · · · · · · · · · · · · · · · · ·	
PS = XAPER(Curre)	nt) - XAPER(Previous), therefore XSTE	G160M	BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	SAME POS AS 7		` · · · · · · · · · · · · · · · · · · ·	
•	· · · · · · · · · · · · · · · · · · ·	G160M	BUFFER-TIME=23 7; FP-POS=3; FLASH=NO;	SAME POS AS 7		` · · · · · · · · · · · · · · · · · · ·	
		1577 A	FP-POS=3; FLASH=NO;		-Int in 9arcsec (02)	[==>]	
			FLASH=NO;				
			*				
							[3
			WAVECAL=NO;				
			LIFETIME-POS=L P2				
		as 1222_FP3					
NONE	COS, ALIGN/APER		XAPER=0;		Sequence 31-37 Non	0 Secs (0 Secs)	
			YAPER=0	5 110	-IIII III 9arcsec (02)	[==>]	[3]
steps/arcsecond = 2	> XÂPER= 0 steps	(LP2). Observatio	ons are defined as being at	LP2.			
0. *HOWEVER*, be	ecause of the TRANS rules, the "QESIP.			pecial Requirement is n			
WAVE	COS/FUV, TIME-TAG, WCA		· · · · · · · · · · · · · · · · · · ·				
		15// A	SEGMENT=BOTH; LIFETIME-POS=L P2			[==>]	[3]
re at LP2 pass calibration							
2	gives S/N=42 at 16 NONE  exposure we move to steps/arcsecond = toer arcsec or 1 steps/S = XAPER(Curred). *HOWEVER*, but the bu	gives S/N=42 at 1650A.  NONE  COS, ALIGN/APER  exposure we move the aperture from +9.0" (LP6) to +3.5" steps/arcsecond => XAPER= 0 steps  per arcsec or 1 step = 0.0476"  S = XAPER(Current) - XAPER(Previous)  N *HOWEVER*, because of the TRANS rules, the "QESIPMAVE"  COS/FUV, TIME-TAG, WCA	NONE COS, ALIGN/APER  exposure we move the aperture from +9.0" (LP6) to +3.5" (LP2). Observation is steps/arcsecond => XAPER= 0 steps  over arcsec or 1 step = 0.0476"  SS = XAPER(Current) - XAPER(Previous)  O *HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS + ID WAVE COS/FUV, TIME-TAG, WCA G160M 1577 A  The at LP2	RONE COS, ALIGN/APER XAPER=0; YAPER=0 Exposure we move the aperture from +9.0" (LP6) to +3.5" (LP2). Observations are defined as being at steps/arcsecond => XAPER= 0 steps  SE = XAPER(Current) - XAPER(Previous) D. *HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS +116" [(0116) = +116] Sp.  WAVE COS/FUV, TIME-TAG, WCA G160M FP-POS=3; 1577 A SEGMENT=BOTH: LIFETIME-POS=L P2	NONE COS, ALIGN/APER XAPER=0; QESIPARM XSTEP YAPER=0 \$ 116  exposure we move the aperture from +9.0" (LP6) to +3.5" (LP2). Observations are defined as being at LP2.  steps/arcsecond => XAPER= 0 steps  per arcsec or 1 step = 0.0476"  IS = XAPER(Current) - XAPER(Previous)	NONE COS, ALIGN/APER XAPER=0; QESIPARM XSTEP Sequence 31-37 Non-Int in 9arcsec (02)  exposure we move the aperture from +9.0" (LP6) to +3.5" (LP2). Observations are defined as being at LP2.  steps/arcsecond => XAPER= 0 steps  Deer arcsec or 1 step = 0.0476"  SS = XAPER(Current) - XAPER(Previous)  D. *HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS +116" [(0116) = +116] Special Requirement is necessary to move the aperture from +9.0" (LIFETIME-POS=L P2)  The at LP2	NONE COS, ALIGN/APER XAPER=0; QESIPARM XSTEP Sequence 31-37 Non-Int in 9arcsec (02) $0 = 1 = 10 = 10 = 10 = 10 = 10 = 10 = $

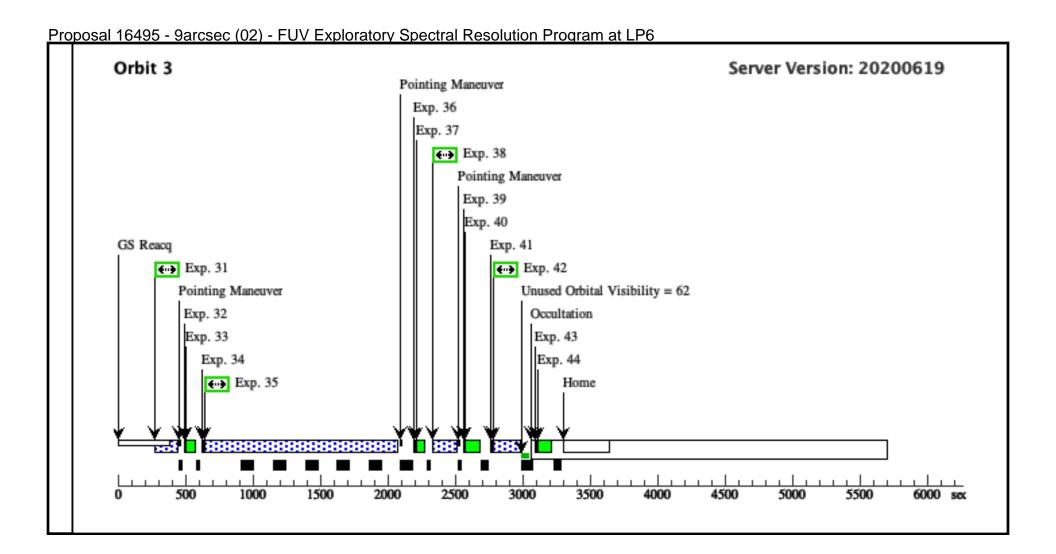
38	1222 initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 38-44 Non	0.1 Secs (0.1 Secs)	
	ze_aperture-		1222 A	0;		-Int in 9arcsec (02)	[==>]	
	position-foc us-HV-value			FP-POS=3;				
	S (COS on 147			FLASH=NO;				[3]
	(COS.sp.147 6390)			WAVECAL=NO;				[3]
	,			LIFETIME-POS=L P2				
Com	ments: initializes the G130M/122.	2 observations to set aperture position,	HV value and focu		efore we move the aper	ture and change focus	values relevant for LP6 derived	d from PID 16491
39	Adjust focus NONE	COS, ALIGN/OSM		FOCUS=-41	1	Sequence 38-44 Non		
	value for 12 22 LP6					-Int in 9arcsec (02)	[==>]	[3]
G13 G13	0M/1222 focus at LP2 is -810. 0M/1222 at 9" is:	e obtained from PID 16491 analysis.  LP6_npos estimated absolute focus - 1	I P2 absolute focus	– .851810 aivas a focus	offset of Al relative I	P2		
	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	ojjsei oj -41 reiditve Li		52 Secs (52 Secs)	
	FP3	200/10 1, 111/12 1110, 11 611	1222 A	SEGMENT=BOTH;		-Int in 9arcsec (02)	[==>]	
			12211	LIFETIME-POS=L P2				[3]
	ments: Exposure at LP2 needed to by-pass calibration			12				ļ .
	Move Apert NONE	COS, ALIGN/APER		XAPER=-116;	QESIPARM XSTEP	Sequence 38-44 Non	0 Secs (0 Secs)	
	ure to +9 arc sec from LP 2			YAPER=0	S-116	-Int in 9arcsec (02)	[==>]	[3]
XAP	version is ER = 21 steps per arcsec or 1 step		EDC - 116 0 - 1	116 VCTEDC				
	$\frac{IPARM XSTEPS = XAPER(Curre}{1222 \text{ FP3}} $ (1) AZV-80	nt) - XAPER(Previous), therefore XST. COS/FUV, TIME-TAG, PSA	EPS = -110 - 0 = -1 G130M	BUFFER-TIME=20	SAME POS AS 7	Sequence 38-44 Non	152 Secs (152 Secs)	
42	(COS.sp.147	COS/TOV, TIME-TAG, TSA	1222 A	0;	SAME 1 OS AS /	-Int in 9arcsec (02)	[==>]	
	6390)		1222 A	FP-POS=3;			[>]	
				FLASH=NO;				121
				WAVECAL=NO;				[3]
				LIFETIME-POS=L P2				
		e by setting POS TARG value to: Same 50A (wavelength of bluest window).	as 1222_FP3.					,
43	Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;		Sequence 38-44 Non	0 Secs (0 Secs)	
	P2			YAPER=0	S 116	-Int in 9arcsec (02)	[==>]	[3]
	ments: In this exposure we move t 3.5-3.5)" * -21 steps/arcsecond =	the aperture from +9.0" (LP6) to +3.5" > XAPER= 0 steps	'(LP2). Observation	ns are defined as being at	LP2.			
Com So, (	,							
So, (	version is ER = 21 steps per arcsec or 1 step	p = 0.0476"						
So, ( Conv XAP QES	version is  ER = 21 steps per arcsec or 1 step	nt) - XAPER(Previous)						
So, ( Conv XAP QES	version is  ER = 21 steps per arcsec or 1 step		PARM XSTEPS +11	6" [(0116) = +116] Sp	pecial Requirement is n	ecessary to move the ap	perture to the correct location.	
So, ( Conv XAP QES	version is  ER = 21 steps per arcsec or 1 step	nt) - XAPER(Previous)	PARM XSTEPS +11	6" [(0116] = +116] Sp	pecial Requirement is n	ecessary to move the a	perture to the correct location.	

Proposal 16495 - 9arcsec (02) - FUV Exploratory Spectral Resolution Program at LP6

<u> </u>	<del>opo.</del>	sai iotos saicoco	(OZ) I OV EXPIDIATORY	Opcoliai	resolution i regiani at Li e			
	44	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	Sequence 38-44 Non	52 Secs (52 Secs)	
		FP3		1222 A	SEGMENT=BOTH;	-Int in 9arcsec (02)	[==>]	
					LIFETIME-POS=L			[3]
1					P2			
1		nments: Exposure at LP2						
	SQL	needed to by-pass calibration						







Proposal 16495, 11arcsec (03), implementation

Mon Jun 28 14:01:17 GMT 2021

Diagnostic Status: Warning

Diagnostics

Scientific Instruments: COS, COS/FUV, COS/NUV

Special Requirements: SCHED 90%

Comments: - Bypass calibration for the COS/FUV exposures.

- Disassociate all exposures.

(11arcsec (03)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

(11arcsec (03)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(11arcsec (03)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AZV-80	RA: 00 50 43.8154 (12.6825642d)	Proper Motion RA: 0.114 mas/yr	V=13.32	Reference Frame: ICRS
		Dec: -72 47 41.57 (-72.79488d)	Proper Motion Dec: -1.453 mas/yr	B=13.19,	
		Equinox: J2000	Epoch of Position: 2015.5	1360A flux from STIS=3.3e-13 erg/s/cm^2/A	

Comments: Coordinates are from Gaia DR2.

Av 80 - O7 III - V=13.32, B=13.19, E(B-V)=0.13 (SMC), from ULLYSES.

SED derved from fitting to STIS E140M spectrum, E(B-V) modified from 0.14 to 0.13 to better fit existing data.

BOT GSC2 lists 3 unknown sources, but they are faint/invisible in the Swift W1 image. No GALEX imaging available. There are several fairly bright field objects which are not identified by the BOT, from Massey+02 these are >15" from the target, brightest have Vmags (Vega) of 16.85, 16.04, 16.36, 16.38. The target (which is safe) is the brightest object in the Swift W1 image, the fainter field objects are therefore safe for the science exposures. The field objects could affect the PSA during the NUV TA with the BOA but are safe based on their likely spectral types. From Massey+02 the B-V color of Av80 is -0.13, the colors of the field objects are all >0.34 and are therefore type later than A7. These are all safe, from Massey+02:

Field star which is brightest in the Swift W1 image and bluest within 20" - 15.08" away from Av80, RA=50 44.8100, Dec=-72 47 27.100. V=16.85, B-V=0.34 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.21. Zaritsky+02 has V=17.08. According to https://www.stsci.edu/~inr/intrins.html, http://www.pas.rochester.edu/~emamajek/EEM\_dwarf\_UBVIJHK\_colors\_Teff.txt this corresponds to spectral type A7, is safe COS.ta.1480381. XMM W1=17.35 (Page+14), is safe COS.ta.1480281.

Field star 15.35" away from target, RA=00.50.47.22, Dec=-72.47.39.2, V=16.04, B-V=0.63 from Massey+02. If E(B-V)=0.13 then intrinsic B-V is 0.50, this corresponds to spectral type F8, is safe COS.ta.1480380. Field star 16.85" away from target, quite blue, RA=00.50.41.59, Dec=-72.47.55.2, V=16.36, B-V=0.39 from Massey+02. If E(B-V)=0.13 then intrinsic B-V is 0.26, this corresponds to spectral type A8, is safe COS.ta.1480383. XMM W=18.40.75 Page+14) is safe COS.ta.1480395.

Field star 17.83" away from target, RÅ=00 50 41.56, Dec=-72 47 56.3, V=16.38, B-V=0.52 from Massey+02. If E(B-V) = 0.13 then intrinsic B-V is 0.39, this corresponds to spectral type F3, is safe COS.ta.1480386.

There are numerous sources in Zaritsky+02 but these sources are very faint/invisible in the Swift W1 imaging, and should not pose an issue for the NUV TA.

Category=EXT-STAR

Description=[OF]

Extended=NO

Proposal 16495 - 11arcsec (03) - FUV Exploratory Spectral Resolution Program at LP6

S.ta.147 ) e_acq_ S.ta.147 ) : Repeatinitiali perture- ion-foc V-value S.sp.147 ) : initializ st foc us t foc us 22 foc us 22 foc us 22 at 11 foc us ste	(1) AZV-80  Zes the G130M/122  NONE  focus to the estimal at LP2 is -810. " is:	COS/NUV, ACQ/IMAGE, BOA  COS/NUV, ACQ/IMAGE, BOA  rotect against late GS acquisition.  COS/FUV, TIME-TAG, PSA  22 observations to set aperture position  COS, ALIGN/OSM  te obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus		BUFFER-TIME=20 0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b FOCUS=-87	refore we move the ape	Sequence 3-9 Non-In t in 11arcsec (03)  rture and change focus  Sequence 3-9 Non-In t in 11arcsec (03)	[==>] values relevant for LP6 derived from t	[1] [1] [1] [1]
e_acq_ S.ta.147  : Repeat _initiali perture- ion-foc V-value S.sp.147  : initializ st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	ACQ/IMAGE to p (1) AZV-80  Zes the G130M/122  NONE  focus to the estimal at LP2 is -810. " is: pp relative to LP2:	rotect against late GS acquisition.  COS/FUV, TIME-TAG, PSA  22 observations to set aperture position  COS, ALIGN/OSM  te obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus	G130M 1222 A 1, HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b	vefore we move the ape	t in 11arcsec (03)  rture and change focus  Sequence 3-9 Non-In	5.3 Secs (5.3 Secs) [==>]  0.1 Secs (0.1 Secs) [==>]  values relevant for LP6 derived from 1 0.0 Secs (0 Secs)	[1]
S.ta.147 ): Repeat _initiali perture- ion-foc V-value S.sp.147 ) : initializ st focus p for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	ACQ/IMAGE to p (1) AZV-80  Zes the G130M/122  NONE  focus to the estimal at LP2 is -810. " is: pp relative to LP2:	rotect against late GS acquisition.  COS/FUV, TIME-TAG, PSA  22 observations to set aperture position  COS, ALIGN/OSM  te obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus	G130M 1222 A 1, HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b	refore we move the ape	t in 11arcsec (03)  rture and change focus  Sequence 3-9 Non-In	[==>]  0.1 Secs (0.1 Secs) [==>]  values relevant for LP6 derived from 1 0.0 Secs (0 Secs)	[1]
: Repeat _initiali perture- ion-foc V-value S.sp.147 ) : initializ st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	(1) AZV-80  zes the G130M/122  NONE  focus to the estima at LP2 is -810. " is: pp relative to LP2 :	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position COS, ALIGN/OSM  te obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus	1222 A  1, HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b	refore we move the aper	t in 11arcsec (03)  rture and change focus  Sequence 3-9 Non-In	0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived from 1  0.0 Secs (0 Secs)	[1] PID 1649
initiali perture- ion-foc V-value 3.sp.147 ) : initializ st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	(1) AZV-80  zes the G130M/122  NONE  focus to the estima at LP2 is -810. " is: pp relative to LP2 :	COS/FUV, TIME-TAG, PSA  22 observations to set aperture position COS, ALIGN/OSM  te obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus	1222 A  1, HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b	refore we move the ape	t in 11arcsec (03)  rture and change focus  Sequence 3-9 Non-In	[==>] values relevant for LP6 derived from 1 0.0 Secs (0 Secs)	PID 16491
certure- ion-foc V-value S.sp.147 ) : initializ st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	zes the G130M/122 NONE focus to the estima at LP2 is -810. " is: prelative to LP2 :	22 observations to set aperture position COS, ALIGN/OSM te obtained from PID 16491 analysis. = LP6_npos estimated absolute focus	1222 A  1, HV value and focu	0; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b	refore we move the aper	t in 11arcsec (03)  rture and change focus  Sequence 3-9 Non-In	[==>] values relevant for LP6 derived from 1 0.0 Secs (0 Secs)	PID 1649.
ion-foc V-value S.sp.147 ) : initializ st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	NONE  focus to the estima at LP2 is -810. " is: p relative to LP2 :	COS, ALIGN/OSM  te obtained from PID 16491 analysis.  LP6_npos estimated absolute focus	n, HV value and focu	FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 s values to LP2 defaults b	refore we move the ape	rture and change focus Sequence 3-9 Non-In	values relevant for LP6 derived from 1 0.0 Secs (0 Secs)	PID 1649.
: initializ st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	NONE  focus to the estima at LP2 is -810. " is: p relative to LP2 :	COS, ALIGN/OSM  te obtained from PID 16491 analysis.  LP6_npos estimated absolute focus		LIFETIME-POS=L P2 s values to LP2 defaults b	nefore we move the ape	Sequence 3-9 Non-In	0.0 Secs (0 Secs)	PID 1649
st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	NONE  focus to the estima at LP2 is -810. " is: p relative to LP2 :	COS, ALIGN/OSM  te obtained from PID 16491 analysis.  LP6_npos estimated absolute focus		s values to LP2 defaults b	refore we move the aper	Sequence 3-9 Non-In	0.0 Secs (0 Secs)	
st focus e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	NONE  focus to the estima at LP2 is -810. " is: p relative to LP2 :	COS, ALIGN/OSM  te obtained from PID 16491 analysis.  LP6_npos estimated absolute focus			egore we move me ape	Sequence 3-9 Non-In	0.0 Secs (0 Secs)	
e for 12 P6 : Adjust j 22 focus 22 at 11 focus ste	focus to the estima : at LP2 is -810. " is: p relative to LP2 :	te obtained from PID 16491 analysis. = LP6_npos estimated absolute focus -	IP2 absolute focus	1000507		t in 11arcsec (03)		[1]
: Adjust j 22 focus 22 at 11 focus ste	at LP2 is -810. " is: p relative to LP2 =	ELP6_npos estimated absolute focus -	IP2 absolute focus				[]	[1]
22 focus 22 at 11 focus ste	at LP2 is -810. " is: p relative to LP2 =	ELP6_npos estimated absolute focus -	IP2 absolute form					-
e_LP2_	WAVE	COC/PINA TRACTOR CO.	Li 2 aosoinie jocus		offset of -87 relative L			T
		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;		Sequence 3-9 Non-In t in 11arcsec (03)		1
			1222 A	SEGMENT=BOTH; LIFETIME-POS=L P2	;	t in Tracsec (03)	[==>]	[1]
	ire at LP2 pass calibration							
e Apert	NONE	COS, ALIGN/APER		XAPER=-158;		Sequence 3-9 Non-In	0 Secs (0 Secs)	
o +Î1 ar from L				YAPER=0	S -158	t in 11arcsec (03)	[==>]	[1]
		the aperture from $+3.5$ " (LP2) to $+11$ => $XAPER = -158$ steps.	.0".					
n is 21 steps	per arcsec or 1 ste	p = 0.0476"						
M XSTEI	PS = XAPER(Curr	ent) - XAPER(Previous), therefore XS	TEPS = -158 - 0 = -1	58 XSTEPS				
		COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20			498 Secs (498 Secs)	
s.sp.147			1222 A		۷	t in Traicsec (05)	[==>]	
				WAVECAL=NO;				[1]
				LIFETIME-POS=L				
<u>И</u>	<i>XSTEI</i> FP3 sp.147	XSTEPS = XAPER(Curre FP3 (1) AZV-80 sp.147	FP3 (1) AZV-80 COS/FUV, TIME-TAG, PSA sp.147	XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -158 - 0 = -158 - 0 = -168	XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -158 - 0 = -158 XSTEPS   TSTEPS   TSTE	XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -158 - 0 = -158 XSTEPS   STEPS	XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -158 - 0 = -158 XSTEPS  FP3 (1) AZV-80 COS/FUV, TIME-TAG, PSA G130M BUFFER-TIME=20 POS TARG 0.0,+7.5 Sequence 3-9 Non-In t in 11arcsec (03)  FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L	XSTEPS = XAPER(Current) - XAPER(Previous), therefore XSTEPS = -158 - 0 = -158 XSTEPS   STEPS

opc	<u> osal 16495 - 11arcsec (</u>	<u> (03) - FUV Exploratory</u>	Spectral Re	solution Progra	<u>ım at LP6</u>			
8	Ap_move_L NONE P2	COS, ALIGN/APER		XAPER=0; YAPER=0		Sequence 3-9 Non-In t in 11arcsec (03)	0 Secs (0 Secs) [==>]	[1]
Co So,	nmments: In this exposure we move the (3.5-3.5)" * -21 steps/arcsecond =>	e aperture from +11.0" (LP6) to +3.5' XAPER= 0 steps	" (LP2). Observation		et LP2.			
XA	onversion is PER = 21 steps per arcsec or 1 step =	= 0.0476"						
QE	 ESIPARM XSTEPS = XAPER(Current PER is set to = 0. *HOWEVER*, because	t) - XAPER(Previous) cause of the TRANS rules, the "QESIPA	ARM XSTEPS +158	3" [(0158) = +158] Sp	pecial Requirement is n	ecessary to move the a <sub>l</sub>	perture to the correct location.	
9	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;		Sequence 3-9 Non-In		
	FP3		1222 A	SEGMENT=BOTH; LIFETIME-POS=L P2		t in 11arcsec (03)	[==>]	[1]
	mments: Exposure at LP2 L needed to by-pass calibration							
10	_ ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 10-16 Non	0.1 Secs (0.1 Secs)	
	ze_aperture- position-foc		1222 A	0;		-Int in 11arcsec (03)	[==>]	
	us-HV-value			FP-POS=1;				
	s (COS.sp.147			FLASH=NO; WAVECAL=NO;				[1]
	6390)			LIFETIME-POS=L			!	
				P2				
Co			HV value and focus		efore we move the aper		values relevant for LP6 derived from P	PID 16491.
11	Adjust focus NONE value for 12	COS, ALIGN/OSM		FOCUS=-87		Sequence 10-16 Non -Int in 11arcsec (03)		
	22 LP6					-IIII III Traicsec (03)	[==>]	[1]
<i>G1</i> <i>G1</i>	omments: Adjust focus to the estimate of 130M/1222 focus at LP2 is -810. 130M/1222 at 11" is: 16_npos focus step relative to LP2 = L	obtained from PID 16491 analysis. LP6_npos estimated absolute focus - L	.P2 absolute focus =	897810 gives a focus	offset of -87 relative L	P2.		
12		COS/FUV, TIME-TAG, WCA	G130M	FP-POS=1;			52 Secs (52 Secs)	
	FP1		1222 A	SEGMENT=BOTH;		-Int in 11arcsec (03)	[==>]	
				LIFETIME-POS=L P2			!	[1]
Co SO	mments: Exposure at LP2 L needed to by-pass calibration			12				
13	Move Apert NONE	COS, ALIGN/APER		XAPER=-158;		Sequence 10-16 Non	0 Secs (0 Secs)	
	ure to +Î1 ar csec from L P2			YAPER=0	S -158	-Inf in 11arcsec (03)	[==>]	[1]
Co So,	nmments: In this exposure we move the (11.0-3.5)" * -21 steps/arcsecond =>	e aperture from +3.5" (LP2) to +11.0' > XAPER= -158 steps.	<i>"</i> .					
Co XA	onversion is PER = 21 steps per arcsec or 1 step =	= 0.0476"						
QE	ESIPARM XSTEPS = XAPER(Current	t) - XAPER(Previous), therefore XSTE	PS = -158 - 0 = -15	i8 XSTEPS				

14		(1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Caguanga 10 16 M	409 Sags (409 Sags)	
14	(COS.sp.147	(1) AZV-80	COS/FUV, TIME-TAG, PSA		BUFFER-TIME=20 0;	SAME POS AS /	Sequence 10-16 Non -Int in 11arcsec (03)		
	6390)			1222 A	FP-POS=1;		in in Tracesee (65)	[==>]	
					FLASH=NO;				[1]
					WAVECAL=NO;				
					LIFETIME-POS=L P2				
~			I DOGGLAG	1000 ED2	P2				
			re by setting POS TARG value to: Same 150A (wavelength of bluest window).	as 1222_FP3.					
15	Ap_move_L	NONE	COS, ALIGN/APER		XAPER=0;	OESIPARM XSTEP	Sequence 10-16 Non	0 Secs (0 Secs)	
	P2				YAPER=0	S 158	-Int in 11arcsec (03)	[==>1	[1]
Co	mmønts: In this	ernosure we move	the aperture from $+11.0"$ (LP6) to $+3.5$	" (LP2) Observa		at I P?		[[ ' ]	[-]
			=> XAPER= 0 steps	(Li 2). Observa	ations are acjuica as being a	n El Z.			
Co	nversion is								
		s per arcsec or 1 ste	ep = 0.0476"						
QE XA.	SIPARM XSIE PER is set to =	PS = XAPEK(Curr 0. *HOWEVER*. l	ent) - XAPER(Previous) pecause of the TRANS rules, the "QESIF	PARM XSTEPS +	158'' I(0158) = +1581 Sp	pecial Reauirement is n	ecessary to move the a	perture to the correct location.	
16			COS/FUV. TIME-TAG. WCA	G130M	FP-POS=1;	•	Sequence 10-16 Non		
	FP1	2		1222 A	SEGMENT=BOTH;		-Int in 11arcsec (03)	[==>]	
				1222 11	LIFETIME-POS=L				[1]
					P2				'
Coi	mments: Expos	ure at LP2							•
		pass calibration							
17	1577_initiali (1) AZV-80 ze_aperture- position-foc us-HV-value		COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=23		Sequence 17-23 Non	0.1 Secs (0.1 Secs)	
					7;		-Int in 11arcsec (03)	[==>]	
				FP-POS=1;					
	S (COS 151				FLASH=NO;				[2]
	(COS.sp.151 6692)			WAVECAL=NO;				[2]	
	0072)	0072)			LIFETIME-POS=L				
					P2				
Coi	mments: initiali	izes the G160M/157	77 observations to set aperture position,	HV value and foo	cus values to LP2 defaults b	efore we move the ape		T	d from PID 164
18	Adjust focus	NONE	COS, ALIGN/OSM		FOCUS=+151		Sequence 17-23 Non	0.0 Secs (0 Secs)	
	value for 15 77 LP6						-Int in 11arcsec (03)	[==>]	[2]
Co		focus to the estima	te obtained from PID 16491 analysis.						
G1	60M/1600 focu	s at LP2 is +116. T	he focus offset from cenwave 1600 to 15	577 is -340 steps.	G160M/1557 focus at LP2 i	is -224.			
		OM/1577 focus at 1		D2 abaaluta faar	72 224 sives a feeta	offert of 151 volations	1.02		
			= LP6_npos estimated absolute focus - I			ojjsei oj +151 relative		12 5 (12 5	
19	Wave_LP2_ FP1	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1;		Sequence 17-23 Non -Int in 11arcsec (03)	` ,	
				1577 A	SEGMENT=BOTH;		-int in Traicisce (03)	[==>]	523
					LIFETIME-POS=L P2				[2]
C	. =	. 1.00			ΓΔ				
SO	mments: Exposi Lneeded to by-	ure at LP2 pass calibration							
JQ.	L'heeded to by	pass canoranon							

ure to +11 ar csec from L	COS, ALIGN/APER		XAPER=-158; YAPER=0	QESIPARM XSTEP S -158	Sequence 17-23 Non-Int in 11arcsec (03)	0 Secs (0 Secs) [==>]	[2]
P2							[2]
Comments: In this exposure we mo So, (11.0-3.5)" * -21 steps/arcseco	ove the aperture from $+3.5$ " (LP2) to $+11.6$ and $=> XAPER = -158$ steps.	9".					
Conversion is XAPER = 21 steps per arcsec or 1	<i>step</i> = 0.0476"						
$QESIPARM\ XSTEPS = XAPER(C$	urrent) - XAPER(Previous), therefore XST	EPS = -158 - 0 = -	-158 XSTEPS			_	
21 1577_FP1 (1) AZV-80 (COS.sp.151	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23 7;	SAME POS AS 7	Sequence 17-23 Non -Int in 11arcsec (03)	1383.5 Secs (1383.5 Secs)	
6692)		1577 A	FP-POS=1;		Int in 11uicocc (05)	[==>]	
			FLASH=NO;				527
			WAVECAL=NO;				[2]
			LIFETIME-POS=L P2				
Comments: Adjusted target in ape This exposure time gives S/N=42 c	rture by setting POS TARG value to: Same	as 1222_FP3.	1 2				I
22 Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;	OESIPARM XSTEP	Sequence 17-23 Non	0 Secs (0 Secs)	
P2			YAPER=0	S 158	-Int in 11arcsec (03)	[==>]	[2]
XAPER = 21 steps per arcsec or 1  QESIPARM XSTEPS = XAPER(C	urrent) - XAPER(Previous)						
	*, because of the TRANS rules, the "QESII			pecial Requirement is n			
	*, because of the TRANS rules, the "QESII COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1;	•	Sequence 17-23 Non-Int in 11arcsec (03)	12 Secs (12 Secs)	
23 Wave_LP2_ WAVE	*			•	Sequence 17-23 Non		[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L	•	Sequence 17-23 Non	12 Secs (12 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 BUFFER-TIME=20	•	Sequence 17-23 Non -Int in 11arcsec (03)	12 Secs (12 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration	COS/FUV, TIME-TAG, WCA	G160M 1577 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 BUFFER-TIME=20 0;	•	Sequence 17-23 Non -Int in 11arcsec (03)	12 Secs (12 Secs) [==>]	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture-	COS/FUV, TIME-TAG, WCA	G160M 1577 A G130M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 BUFFER-TIME=20 0; FP-POS=1;	•	Sequence 17-23 Non -Int in 11arcsec (03)	12 Secs (12 Secs) <i>I</i> ==> <i>I</i> 0.1 Secs (0.1 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture- position-foc us-HV-value s (COS.sp.147	COS/FUV, TIME-TAG, WCA	G160M 1577 A G130M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 BUFFER-TIME=20 0; FP-POS=1; FLASH=NO;	•	Sequence 17-23 Non -Int in 11arcsec (03)	12 Secs (12 Secs) <i>I</i> ==> <i>I</i> 0.1 Secs (0.1 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture- position-foc us-HV-value s	COS/FUV, TIME-TAG, WCA	G160M 1577 A G130M	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2 BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO;	•	Sequence 17-23 Non -Int in 11arcsec (03)	12 Secs (12 Secs) <i>I</i> ==> <i>I</i> 0.1 Secs (0.1 Secs)	
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)	COS/FUV, TIME-TAG, WCA COS/FUV, TIME-TAG, PSA	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2		Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs)  [==>]  0.1 Secs (0.1 Secs)  [==>]	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/	COS/FUV, TIME-TAG, WCA  COS/FUV, TIME-TAG, PSA  1222 observations to set aperture position,	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b		Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs) $[l==>]$ 0.1 Secs (0.1 Secs) $[l==>]$ values relevant for LP6 derived	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiali (1) AZV-80 ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/ 25 Adjust focus NONE value for 12	COS/FUV, TIME-TAG, WCA COS/FUV, TIME-TAG, PSA	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2		Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs)  [==>]  0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived 0.0 Secs (0 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2 SQL needed to by-pass calibration 24 1222_initiality (1) AZV-80 ze_aperture- position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/ 25 Adjust focus NONE value for 12 22 LP6	COS/FUV, TIME-TAG, WCA  COS/FUV, TIME-TAG, PSA  COS/FUV, TIME-TAG, PSA  1222 observations to set aperture position, COS, ALIGN/OSM	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b		Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs) $[l==>]$ 0.1 Secs (0.1 Secs) $[l==>]$ values relevant for LP6 derived	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2  SQL needed to by-pass calibration  24 1222_initiali (1) AZV-80     ze_aperture-position-foc     us-HV-value     s (COS.sp.147     6390)  Comments: initializes the G130M/  25 Adjust focus NONE     value for 12     22 LP6  Comments: Adjust focus to the esti     G130M/1222 focus at LP2 is -810.	COS/FUV, TIME-TAG, WCA  COS/FUV, TIME-TAG, PSA  1222 observations to set aperture position, COS, ALIGN/OSM  mate obtained from PID 16491 analysis.	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b		Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs)  [==>]  0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived 0.0 Secs (0 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2  SQL needed to by-pass calibration  24 1222_initiali (1) AZV-80  ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/  25 Adjust focus NONE value for 12 22 LP6  Comments: Adjust focus to the est G130M/1222 focus at LP2 is -810. G130M/1222 at 11" is:	COS/FUV, TIME-TAG, WCA  COS/FUV, TIME-TAG, PSA  1222 observations to set aperture position, COS, ALIGN/OSM  mate obtained from PID 16491 analysis.	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b FOCUS=-87	efore we move the aper	Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs)  [==>]  0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived 0.0 Secs (0 Secs)	[2]
23 Wave_LP2_ WAVE FP1  Comments: Exposure at LP2  SQL needed to by-pass calibration  24 1222_initiali (1) AZV-80  ze_aperture-position-foc us-HV-value s (COS.sp.147 6390)  Comments: initializes the G130M/  25 Adjust focus NONE value for 12 22 LP6  Comments: Adjust focus to the est G130M/1222 focus at LP2 is -810. G130M/1222 at 11" is:	COS/FUV, TIME-TAG, WCA  COS/FUV, TIME-TAG, PSA  1222 observations to set aperture position, COS, ALIGN/OSM  mate obtained from PID 16491 analysis.	G160M 1577 A G130M 1222 A	FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=L P2  BUFFER-TIME=20 0; FP-POS=1; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2 us values to LP2 defaults b FOCUS=-87	efore we move the aper	Sequence 17-23 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)  Sequence 24-30 Non -Int in 11arcsec (03)	12 Secs (12 Secs)  [==>]  0.1 Secs (0.1 Secs)  [==>]  values relevant for LP6 derived 0.0 Secs (0 Secs)	[2]

ure we move the apens/arcsecond => $XA$ $C$ $C$ $C$ $C$ $C$ $C$ $C$ $C$ $C$	-		BUFFER-TIME=20 0;	S -158	Sequence 24-30 Non -Int in 11arcsec (03)	[==>]	[2]
NE Continuous Continu	erture from +3.5" (LP2) to +11.0 PER= -158 steps. 0476" SAPER(Previous), therefore XSTI	EPS = -158 - 0 = -1 G130M	YAPER=0  #58 XSTEPS  BUFFER-TIME=20 0;	S -158	-Int in 11arcsec (03)	[==>]	[2]
$cos/arcsecond => \dot{X}A$ $cosecor1 step = 0.0$ $cosecor1 step = 0.0$	PER= -158 steps. )476"  APER(Previous), therefore XSTI	EPS = -158 - 0 = -1 G130M	BUFFER-TIME=20 0;	SAME POS AS 7	Sequence 24-30 Non		
XAPER(Current) - X	APER(Previous), therefore XSTI	G130M	BUFFER-TIME=20 0;	SAME POS AS 7	Sequence 24-30 Non		
	, , , , , ,	G130M	BUFFER-TIME=20 0;	SAME POS AS 7	Sequence 24-30 Non		
AZV-80 CO	OS/FUV, TIME-TAG, PSA		0;	SAME POS AS 7	Sequence 24-30 Non		
		1222 A			J. 11 (02)	152 Secs (152 Secs)	
			FP-POS=1; FLASH=NO;		-Int in 11arcsec (03)	[==>]	
			WAVECAL=NO;				[2
			LIFETIME-POS=L P2				
get in aperture by se S/N=42 at 1150A (v	tting POS TARG value to: Same wavelength of bluest window).	as 1222_FP3.					
	COS, ALIGN/APER	XAPER=0; QES YAPER=0 S 158			0 Secs (0 Secs)		
					-Int in 11arcsec (03)	[==>]	[2
ure we move the ape s/arcsecond => XAF	rture from +11.0" (LP6) to +3.5 PER= 0 steps	5" (LP2). Observati	ons are defined as being at	t LP2.			
rcsec or 1 step = 0.0	)476"						
		PARM XSTEPS +15	58''[(0158) = +158] Specifical Specific (1997)	ecial Requirement is no	ecessary to move the ap	perture to the correct location.	
VE C	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=1;	Sequence 24-30 Non	52 Secs (52 Secs)		
		1222 A	SEGMENT=BOTH;		-Int in 11arcsec (03)	[==>]	12
			LIFETIME-POS=L P2				[2
LP2 alibration							
	OS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=23		Sequence 31-37 Non	0.1 Secs (0.1 Secs)	
		1577 A	7; FP-POS=3;		-Int in 11arcsec (03)	[==>]	
			WAVECAL=NO; LIFETIME-POS=L				[3
e G160M/1577 obse	rvations to set aperture position,	HV value and focu		efore we move the aper	ture and change focus	values relevant for LP6 derived	l from PID 16
	ure we move the ape Varcsecond => XAP  rcsec or 1 step = 0.0  XAPER(Current) - X.  OWEVER*, because  VE CO  LP2  alibration  XZV-80 CO	ure we move the aperture from +11.0" (LP6) to +3.5  Varcsecond => XAPER= 0 steps  rcsec or 1 step = 0.0476"  XAPER(Current) - XAPER(Previous)  OWEVER*, because of the TRANS rules, the "QESIFIVE COS/FUV, TIME-TAG, WCA  LP2  alibration  XZV-80 COS/FUV, TIME-TAG, PSA	ure we move the aperture from +11.0" (LP6) to +3.5" (LP2). Observational contents of the steps  resection of the steps of the steps of the TRANS rules, the "QESIPARM XSTEPS +15" (VE COS/FUV, TIME-TAG, WCA G130M 1222 A STEPS +15"). The step of the	YAPER=0  ure we move the aperture from +11.0" (LP6) to +3.5" (LP2). Observations are defined as being at warcsecond => XAPER= 0 steps  Tracec or 1 step = 0.0476"  XAPER(Current) - XAPER(Previous)  OWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS +158" [(0158) = +158] Sp.  VE COS/FUV, TIME-TAG, WCA G130M FP-POS=1;  LIFETIME-POS=L  P2  LP2  alibration  XZV-80 COS/FUV, TIME-TAG, PSA G160M BUFFER-TIME=23  1577 A  FP-POS=3;  FLASH=NO;  WAVECAL=NO;  LIFETIME-POS=L  P2	YAPER=0 S 158  ure we move the aperture from +11.0" (LP6) to +3.5" (LP2). Observations are defined as being at LP2.  varcsecond => XAPER= 0 steps  XAPER(Current) - XAPER(Previous)  OWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS +158" [(0158) = +158] Special Requirement is not be seen to see the transfer of the transfe	YAPER=0 \$ 158 -Int in 11arcsec (03)  we we move the aperture from +11.0" (LP6) to +3.5" (LP2). Observations are defined as being at LP2.  warcsecond => XAPER= 0 steps  rcsec or 1 step = 0.0476"  KAPER(Current) - XAPER(Previous) OWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS +158" [(0158) = +158] Special Requirement is necessary to move the aperture from +11.0" (LP2)  WE COS/FUV, TIME-TAG, WCA G130M FP-POS=1; Sequence 24-30 Non 1222 A SEGMENT=BOTH; LIFETIME-POS=L P2  LP2 alibration  LIFETIME-POS=1 FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=L P2  LIFETIME-POS=L P2  WAVECAL=NO; LIFETIME-POS=L P2  LIFETIME-POS=L P2  LIFETIME-POS=L P2  LIFETIME-POS=L P3  LIFETIME-POS=L P4  LIFETIME-POS=L P4  LIFETIME-POS=L P5  LIFETIME-POS=L P5  LIFETIME-POS=L P6  LIFETIME-POS=L P6  LIFETIME-POS=L P6  LIFETIME-POS=L P7  LIFETIME-POS=L P8  LIFETIME-POS=L P9  LIF	YAPER=0 \$ \$ 158

	value for 15						-Int in 11arcsec (03)		
	77 LP6	1.3						[==>]	[3]
G1601 The al	M/1600 focu bsolute G160	s at LP2 is +116 M/1577 focus at	mate obtained from PID 16491 analysis. i. The focus offset from cenwave 1600 to 15 t 11" is -73. 22 = LP6_npos estimated absolute focus - 1	•			LP2.		
	Wave_LP2_		COS/FUV, TIME-TAG, WCA	G160M	FP-POS=3;	syjuan of the remarks	Sequence 31-37 Non	12 Secs (12 Secs)	
	FP3	AZ_ WITTE	COS/1 C V, TIME THE, WEST	1577 A	SEGMENT=BOTH;		-Int in 11arcsec (03)	[==>]	
				137711	LIFETIME-POS=L P2			[]	[3]
	nents: Expos needed to by-	ure at LP2 pass calibration							
	Move Apert		COS, ALIGN/APER		XAPER=-158;		Sequence 31-37 Non	0 Secs (0 Secs)	
(	ure to +11 ar csec from L P2				YAPER=0	S -158	-Int in 11arcsec (03)	[==>]	[3]
Comm So, (3.	nents: In this .5-11.0)" * 2	exposure we mo 1 steps/arcsecon	we the aperture from $+3.5$ " (LP2) to $+11.0$ and $=>$ XAPER= $-158$ steps.	<b>".</b>					
	ersion is R = 21 steps	per arcsec or 1	step = 0.0476"						
		,	urrent) - XAPER(Previous), therefore XSTI	EPS = -158 - 0 = -158				T	
	1577_FP3 (1) AZV-80 (COS.sp.151 6692)		COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=23	SAME POS AS 7	Sequence 31-37 Non -Int in 11arcsec (03)	1383.5 Secs (1383.5 Secs)	
					7; ED DOG_2.			[==>]	
					FP-POS=3;				
					FLASH=NO;				[3]
					WAVECAL=NO;				
				LIFETIME-POS=L P2					
		ed target in aper gives S/N=42 a	ture by setting POS TARG value to: Same t 1650A.	as 1222_FP3					•
36	Ap_move_L P2	NONE	COS, ALIGN/APER		XAPER=0;		Sequence 31-37 Non	0 Secs (0 Secs)	
J	P2				YAPER=0	S 158	-Int in 11arcsec (03)	[==>]	[3]
			we the aperture from $+11.0"$ (LP6) to $+3.5$ d => XAPER= 0 steps	" (LP2). Observati	ions are defined as being a	t LP2.			
KAPE	ersion is R = 21 steps	per arcsec or 1	step = 0.0476"						
XAPE	R is set to =	0. *HOWEVER	urrent) - XAPER(Previous) *, because of the TRANS rules, the "QESIP			ecial Requirement is n			
	Wave_LP2_ FP3	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FP-POS=3;		Sequence 31-37 Non	` '	
	rr 3			1577 A	SEGMENT=BOTH;		-Int in 11arcsec (03)	[==>]	
					LIFETIME-POS=L P2				[3]
SQL n	nents: Expos needed to by-	ure at LP2 pass calibration							

38	1222_initiali (1) AZV-80	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=20		Sequence 38-44 Non	0.1 Secs (0.1 Secs)	
	ze_aperture- position-foc		1222 A	0;		-Int in 11arcsec (03)	[==>]	
l	us-HV-value			FP-POS=3;				
	s (COS.sp.147			FLASH=NO;				[3]
l	6390)			WAVECAL=NO;				
i				LIFETIME-POS=L P2				
Con	ments: initializes the G130M/12	22 observations to set aperture position	, HV value and focu	s values to LP2 defaults b	efore we move the aper	ture and change focus	values relevant for LP6 derived	d from PID 16491
39	Adjust focus NONE	COS, ALIGN/OSM		FOCUS=-87		Sequence 38-44 Non	0.0 Secs (0 Secs)	
	value for 12 22 LP6					-Int in 11arcsec (03)	[==>]	[3]
G13 G13	0M/1222 focus at LP2 is -810. 0M/1222 at 11" is:	tte obtained from PID 16491 analysis.  = LP6_npos estimated absolute focus -	I.P2 absolute focus	= -897810 gives a facus	offset of -87 relative I	P?		
	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	ojjset oj or retaitre E	Sequence 38-44 Non	52 Secs (52 Secs)	
	FP3		1222 A	SEGMENT=BOTH;			[==>]	
			1222 11	LIFETIME-POS=L P2				[3]
	ments: Exposure at LP2 needed to by-pass calibration							l
	Move Apert NONE	COS, ALIGN/APER		XAPER=-158;	QESIPARM XSTEP	Sequence 38-44 Non	0 Secs (0 Secs)	
	ure to +Î1 ar csec from L P2			YAPER=0	S -158	-Int in 11arcsec (03)	[==>]	[3]
Con XAF	3.5-11.0)" * 21 steps/arcsecond version is ER = 21 steps per arcsec or 1 ste	ep = 0.0476"	ETDG 150 0 1	50 VOTENO				
	$\frac{IPARM\ XSTEPS = XAPER(Curr}{1222\ FP3}$ (1) AZV-80	rent) - XAPER(Previous), therefore XST COS/FUV, TIME-TAG, PSA	EPS = -158 - 0 = 1. G130M	BUFFER-TIME=20	SAME DOS AS 7	Sequence 38-44 Non	152 Secs (152 Secs)	
42	(COS.sp.147	COS/FUV, HIME-TAG, PSA	1222 A	0;	SAME POS AS /	-Int in 11arcsec (03)	[==>]	
	6390)		1222 A	FP-POS=3;			[>]	
				FLASH=NO;				
				WAVECAL=NO;				[3]
				LIFETIME-POS=L P2				
		re by setting POS TARG value to: Same 150A (wavelength of bluest window).	as 1222_FP3.					<u>'</u>
43	Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;		Sequence 38-44 Non	0 Secs (0 Secs)	
	P2			YAPER=0	S 158	-Int in 11arcsec (03)	[==>]	[3]
	ments: In this exposure we move 3.5-3.5)" * -21 steps/arcsecond =	the aperture from $+11.0"$ (LP6) to $+3$ => XAPER= 0 steps	5" (LP2). Observati	ons are defined as being a	at LP2.			
Con So, (								
So, (	version is ER = 21 steps per arcsec or 1 ste	ep = 0.0476"						
So, ( Con XAP	ER = 21 steps per arcsec or 1 ste	•						
So, ( Con XAP QES	ER = 21 steps per arcsec or 1 ste  IPARM XSTEPS = XAPER(Curr	•	PARM XSTEPS +15	$58''[(0158) = +158] S_F$	pecial Requirement is n	ecessary to move the ap	perture to the correct location.	
So, ( Con XAP QES	ER = 21 steps per arcsec or 1 ste  IPARM XSTEPS = XAPER(Curr	rent) - XAPER(Previous)	PARM XSTEPS +15	58" [(0158) = +158] Sp	pecial Requirement is n	ecessary to move the ap	perture to the correct location.	

Proposal 16495 - 11arcsec (03) - FUV Exploratory Spectral Resolution Program at LP6

1 1	JPU	<u>sai 10<del>1</del>33 - 11ai0360</u>	(03) - 1 OV Exploratory	Opectial i	Nesolution i Togram at Li o			
	44	Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G130M	FP-POS=3;	Sequence 38-44 Non		
		FP3		1222 A	SEGMENT=BOTH;	-Int in 11arcsec (03)	[==>]	
					LIFETIME-POS=L P2			[3]
		ments: Exposure at LP2 needed to by-pass calibration						

