



16431 - Focus Sweep Program for COS FUV Observations at LP5 and LP3

Cycle: 28, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) FEIGE-48 NONE	COS COS/FUV COS/NUV	3	01-Oct-2020 10:00:40.0	yes
02	(2) LIN-156 NONE	COS COS/FUV COS/NUV	5	01-Oct-2020 10:00:47.0	yes

8 Total Orbits Used

ABSTRACT

This program is designed to determine the best focus for the G130M/1291 setting at COS FUV Lifetime Position 5 (LP5) and for G140L/800 at COS FUV LP3. The focus sweeps are designed to determine the best focus position to within 30 steps, and will scan at 200 focus step increments from -1000 to +1000 relative to the predicted best focuses of +180 and -1747 for the G130M/1291 and G140L/800 settings, respectively, which were determined by extrapolation from adjacent LP2 and LP4 focuses. This strategy is based on several earlier programs (LENA2 program at LP3 - ID 13635; LP4 focus sweep exploratory program - ID 14527; New COS/FUV cenwave focus sweep program - ID 15451), which all executed successfully. We will adjust the focus in steps of 200, or 100 near the center of the range for our G140L observations, as is typical for focus sweeps.

Additionally, in addition to optimizing the spectral resolution of the G140L/800 setting, we will also optimize the cross-dispersion width at short wavelengths, since a low cross-dispersion width below 1100 Å is intended to be a unique benefit of this mode.

The targets for this program are Feige 48 and AzV 75, as in previous G130M and G140L focus sweeps such as PIDs 14527 and 14874. The exposure times at each step are defined to provide spectra with $S/N > 30$ in the G130M observations and to obtain sufficient S/N below 1100 Å in the G140L observations.

OBSERVING DESCRIPTION

This program performs a focus sweep at LP5 with G130M/1291 (Visit 01) and at LP3 with G140L/800 (FUVA only; Visit 02).

The G130M/1291 sweep at LP5 is designed as follows:

1. Perform an ACQ/IMAGE to acquire target Feige 48.
2. Initial exposure at relative focus offset set to 0, allowing for set up of the correct instrument mode for the focus sweep.
3. ALIGN/OSM exposure: Move the focus to -1000 steps from the preliminary G130M/1291 focus value ($f = 180$).
4. Take a spectrum with a minimum $S/N \sim 30$ using the FUVA detector only.

NOTE: FUVA and FUVB exposures must be done consecutively (not simultaneously) for health and safety (bright object) reasons.

5. Repeat steps 3 and 4, sweeping over focus values of -1000 to +1000, in increments of 200 steps.
6. Take a spectrum with a minimum $S/N \sim 30$ using the FUVB detector only.
7. ALIGN/OSM exposure: Move the focus to -800 steps from the preliminary G130M/1291 focus value ($f = 180$).

8. Repeat steps 6 and 7, sweeping over focus values of +1000 to -1000, in increments of 200 steps.
9. Re-set the focus offset to 0

The G140L/800 sweep at LP3 is designed as follows:

1. Perform an ACQ/SEARCH (to avoid past difficulties in acquiring this target) and two ACQ/IMAGEs (as a preventative measure against gyro 3 problems) to acquire target AzV 75. ORIENT constraints are set in order to keep bright field objects out of the PSA when the BOA is being used for acquisition.
2. Initialization exposure to set up the correct instrument mode for the focus sweep. Segment B is off by default for G140L/800 and will remain so for the rest of the exposures.
3. ALIGN/OSM exposure: Move the focus to -340 steps from the preliminary G140L/800 focus value ($f = -1747$)
4. Take a spectrum with adequate counts, as described below, between 900 and 1100A.
5. Repeat steps 3 and 4, sweeping over focus values of -340 to +1460 relative to G140L/800, in increments of 200 steps (apart from $+260 < f < +960$ when the increments are 100 in size).
6. Re-set the focus offset to 0.

The focus sweeps ranging ~2000 focus steps are designed to cover a broad-enough region to determine the focus-curve minimum. We sample more finely between $+260 < f < +960$ in the G140L observations as previous analysis indicates that the cross-dispersion width at the shortest wavelengths, an important consideration for this mode, will be minimized in this range.

The G140L/800 spectroscopic ETC calculation is for cenwave 1105 at the lowest available wavelength. The ETC shows a mild count-rate violation for G140L spectroscopy, but this star was used for the G140L focus sweep in Cycle 24 without incident. To determine the requisite exposure time at the wavelengths below 1100 A that will drive cenwave 800 science, we noted that program 12501 (PI McCandliss) obtained adequate counts for focusing at these wavelengths by exposing for 1056 s. Their target is 60% as bright as ours over the 900-1100 A range, and the sensitivity of this grating has declined by about 20% since the execution of that program. To obtain the same number of counts, we thus multiply $1056 \text{ s} * 0.6 * 1.2 = 760 \text{ s}$.

Buffer times are set to 111 s. Observations of AzV 75 at cenwave 1105 in focus sweep program 14874 yielded between 14,000 and 15,000 counts per second. This implies $1.55\text{e}6$ to $1.67\text{e}6$ counts in 111 s, or 66 to 71% of the $2.35\text{e}6$ counts that fill a buffer, which leaves an acceptable margin.

The SIAF to be used includes the following LP5 positions:

AP	V2	V3
-----	-----	-----
LFBOA5	236.5414	-233.6966
LFPSA5	236.5414	-233.6966
LAPTFBOA5	227.1672	-243.0708
LAPTFPSA5	245.9156	-224.3224

The FSW patchable constant table pcmech_ApMXDispPosition should use the following LP5 positions:

```
{ 13, 126 }, /* PSA_LP5 */  
{ -266, -153 }, /* BOA_LP5 */  
{ -266, -153 }, /* FCA_LP5 */  
{ 13, 126 }, /* WCA_LP5 */
```

The FSW patchable constant table pcmech_OSMTbl should use the following focus positions for the G130M/1291 and G140L/800 settings:

cenwave	LP1	LP2	LP3	LP4	LP5	LP6	LP7	LP8

1291	-170	-50	12	52	180	-170	-170	-170
800	-999	-999	-1747	-1487	-999	-999	-999	-999

The HV values for G130M/1291 at LP5 should be 167/175 for Segments A/B.

The SIAF for LP5 can be delivered by the 293 SMS (19 October 2020), therefore G130M observations in this program should execute after this date.

The HV values for G140L/800 at LP3 should be 173/175 for Segments A/B. This change is expected to occur on 05 October 2020, so G140L

Proposal 16431 (STScI Edit Number: 0, Created: Thursday, October 1, 2020 at 9:00:49 AM Eastern Standard Time) - Overview
observations in this program should execute after that date.

In order to meet the goal of moving to LP5 in October 2021, we would like this program to execute in October 2020.

----SPECIAL REQUESTS:-----

1. Please turn off calibration for the COS/FUV exposures.
2. Please disassociate all exposures. SQL is used to meet the above requests.

In case 1 qexposure.control_id is modified. In case 2 qassociation records are deleted. Please see G. Chapman/M. Reinhart.

Proposal 16431 - G130M 1291 focus (01) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

Thu Oct 01 14:00:49 GMT 2020

Visit	<p>Proposal 16431, G130M_1291_focus (01), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: COS, COS/FUV, COS/NUV</p> <p>Special Requirements: SCHED 90%</p> <p><i>Comments: ETCs calculate exposure times required to obtain S/N ~30. However, doing so creates an error similar to: "Segment countrate 18729 exceeds segment/stripe global count rate limit of 15000 counts per second for non-variable sources."</i></p> <p><i>Per Table 10.1 in the Instrument Handbook, the limiting count rate is reported as 15,000 counts/s per segment because the global count rate across BOTH detectors is 30,000 counts/s. Therefore, to alleviate this problem, we only observe with a single detector at a time, as a count rate not exceeding *30,000* counts/s is fine when only one detector is on.</i></p>												
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>FEIGE-48</td> <td>RA: 11 47 14.4421 (176.8101754d) Dec: +61 15 31.68 (61.25880d) Equinox: J2000</td> <td>Proper Motion RA: -0.0035937440813851103 sec of time/yr Proper Motion Dec: -0.007394999965981697 arcsec/yr Epoch of Position: 2015.5</td> <td>V=13.28</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table> <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i></p> <p>Category=EXT-STAR Description=[SDB] Extended=NO</p>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	FEIGE-48	RA: 11 47 14.4421 (176.8101754d) Dec: +61 15 31.68 (61.25880d) Equinox: J2000	Proper Motion RA: -0.0035937440813851103 sec of time/yr Proper Motion Dec: -0.007394999965981697 arcsec/yr Epoch of Position: 2015.5	V=13.28
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous								
(1)	FEIGE-48	RA: 11 47 14.4421 (176.8101754d) Dec: +61 15 31.68 (61.25880d) Equinox: J2000	Proper Motion RA: -0.0035937440813851103 sec of time/yr Proper Motion Dec: -0.007394999965981697 arcsec/yr Epoch of Position: 2015.5	V=13.28	Reference Frame: ICRS								

Proposal 16431 - G130M 1291 focus (01) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	ACQ/IMAG (1) FEIGE-48 E (COS.ta.607 556)	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				16 Secs (16 Secs) [==>]	[1]	
	<i>Comments: S/N=60</i>									
	2	1291_A_f-0 (1) FEIGE-48 (COS.sp.146 2296)	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5			260 Secs (260 Secs) [==>]	[1]	
	3	Move to -80 0	NONE	COS, ALIGN/OSM		FOCUS=-800		0 Secs (0 Secs) [==>]	[1]	
	4	1291_A_f-8 (1) FEIGE-48 00 (COS.sp.146 2296)	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5			260 Secs (260 Secs) [==>]	[1]	
	5	Move to -60 0	NONE	COS, ALIGN/OSM		FOCUS=-600		0 Secs (0 Secs) [==>]	[1]	
	6	1291_A_f-6 (1) FEIGE-48 00 (COS.sp.146 2296)	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5			260 Secs (260 Secs) [==>]	[1]	
	7	Move to -40 0	NONE	COS, ALIGN/OSM		FOCUS=-400		0 Secs (0 Secs) [==>]	[1]	
	8	1291_A_f-4 (1) FEIGE-48 00 (COS.sp.146 2296)	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5			260 Secs (260 Secs) [==>]	[1]	
	9	Move to -20 0	NONE	COS, ALIGN/OSM		FOCUS=-200		0 Secs (0 Secs) [==>]	[1]	
	10	1291_A_f-2 (1) FEIGE-48 00 (COS.sp.146 2296)	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5			260 Secs (260 Secs) [==>]	[1]	
11	Move to 0	NONE	COS, ALIGN/OSM		FOCUS=0		0 Secs (0 Secs) [==>]	[1]		

Proposal 16431 - G130M 1291 focus (01) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

12	1291_A_f-0 (COS.sp.146 2296)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5	POS TARG 0.0,0.0	260 Secs (260 Secs) [==>]	[2]
13	Move to +20 0	NONE	COS, ALIGN/OSM		FOCUS=+200		0 Secs (0 Secs) [==>]	[2]
14	1291_A_f+2 00 (COS.sp.146 2296)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5		260 Secs (260 Secs) [==>]	[2]
15	Move to +40 0	NONE	COS, ALIGN/OSM		FOCUS=+400		0 Secs (0 Secs) [==>]	[2]
16	1291_A_f+4 00 (COS.sp.146 2296)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5		260 Secs (260 Secs) [==>]	[2]
17	Move to +60 0	NONE	COS, ALIGN/OSM		FOCUS=+600		0 Secs (0 Secs) [==>]	[2]
18	1291_A_f+6 00 (COS.sp.146 2296)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5		260 Secs (260 Secs) [==>]	[2]
19	Move to +80 0	NONE	COS, ALIGN/OSM		FOCUS=+800		0 Secs (0 Secs) [==>]	[2]
20	1291_A_f+8 00 (COS.sp.146 2296)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5		260 Secs (260 Secs) [==>]	[2]
21	Move to +10 00	NONE	COS, ALIGN/OSM		FOCUS=+1000		0 Secs (0 Secs) [==>]	[2]
22	1291_A_f+1 000 (COS.sp.146 2296)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=A; BUFFER-TIME=13 0; LIFETIME-POS=L P5		260 Secs (260 Secs) [==>]	[2]
23	Move to +80 0	NONE	COS, ALIGN/OSM		FOCUS=+800		0 Secs (0 Secs) [==>]	[3]

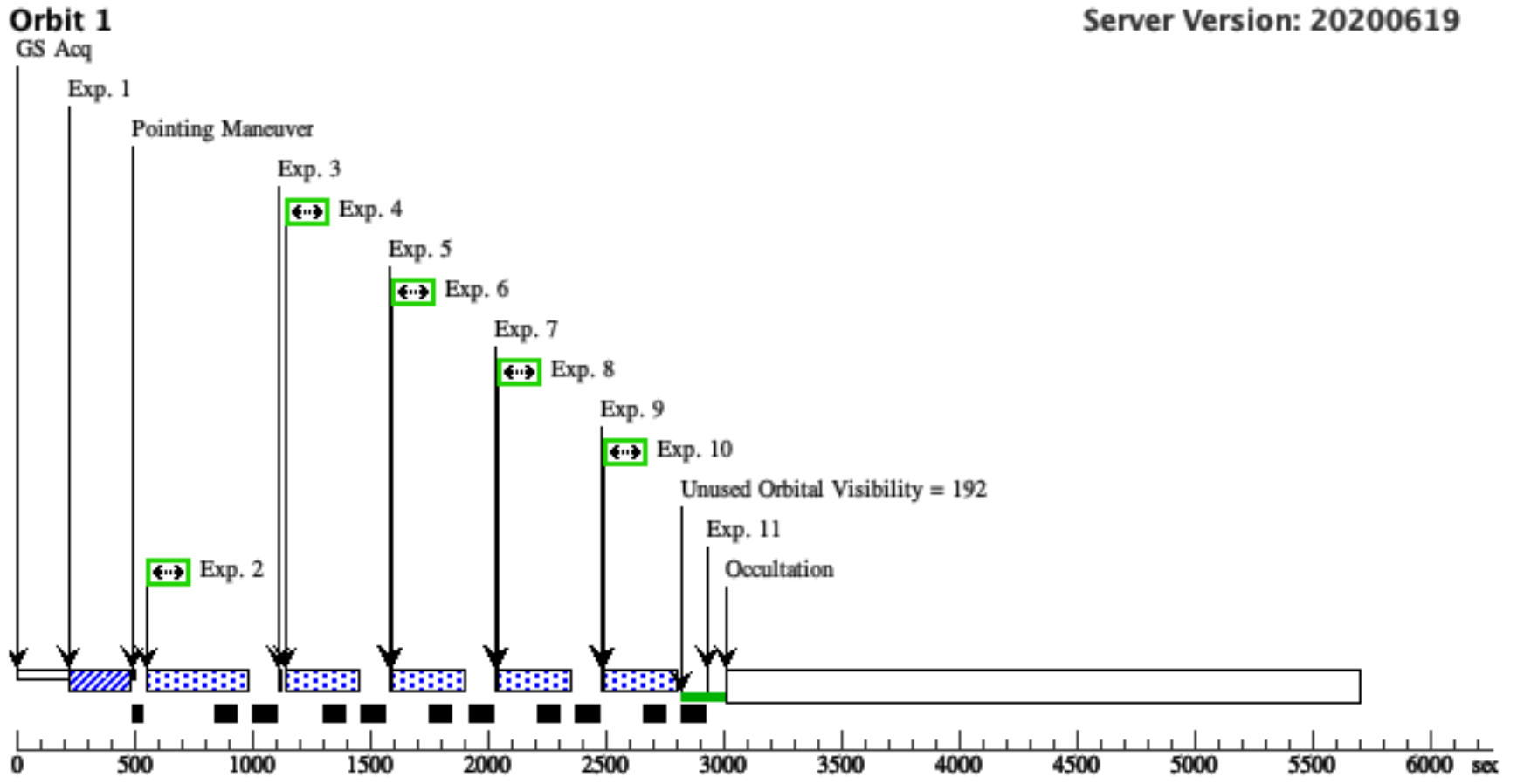
Proposal 16431 - G130M 1291 focus (01) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

24	1291_B_f+8 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
25	Move to +60 0	NONE	COS, ALIGN/OSM		FOCUS=+600	0 Secs (0 Secs) [==>]	[3]
26	1291_B_f+6 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
27	Move to +40 0	NONE	COS, ALIGN/OSM		FOCUS=+400	0 Secs (0 Secs) [==>]	[3]
28	1291_B_f+4 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
<i>Comments: S/N=39 at 1230A</i>							
29	Move to +20 0	NONE	COS, ALIGN/OSM		FOCUS=+200	0 Secs (0 Secs) [==>]	[3]
30	1291_B_f+2 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
31	Move to 0	NONE	COS, ALIGN/OSM		FOCUS=0	0 Secs (0 Secs) [==>]	[3]
32	1291_B_f-0 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
33	Move to -20 0	NONE	COS, ALIGN/OSM		FOCUS=-200	0 Secs (0 Secs) [==>]	[3]
34	1291_B_f-2 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
35	Move to -40 0	NONE	COS, ALIGN/OSM		FOCUS=-400	0 Secs (0 Secs) [==>]	[3]

Proposal 16431 - G130M 1291 focus (01) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

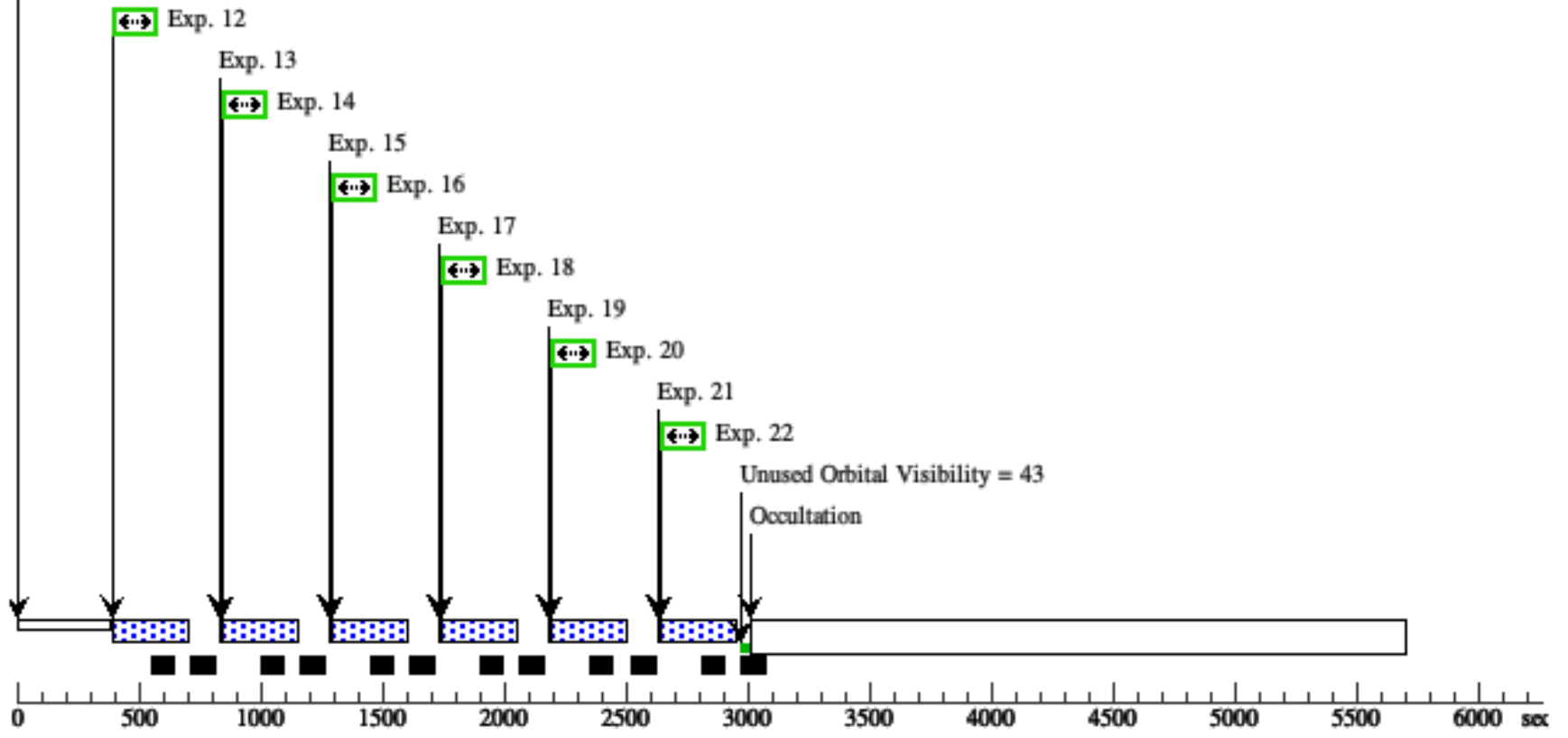
36	1291_B_f-4 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
37	Move to -60 0	NONE	COS, ALIGN/OSM		FOCUS=-600	0 Secs (0 Secs) [==>]	[3]
38	1291_B_f-6 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
<i>Comments: S/N=37 at 1230A</i>							
39	Move to -80 0	NONE	COS, ALIGN/OSM		FOCUS=-800	0 Secs (0 Secs) [==>]	[3]
40	1291_B_f-8 00 (COS.sp.146 2314)	(1) FEIGE-48	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; SEGMENT=B; BUFFER-TIME=11 1; LIFETIME-POS=L P5	110 Secs (110 Secs) [==>]	[3]
41	Move to 0	NONE	COS, ALIGN/OSM		FOCUS=0	0 Secs (0 Secs) [==>]	[3]

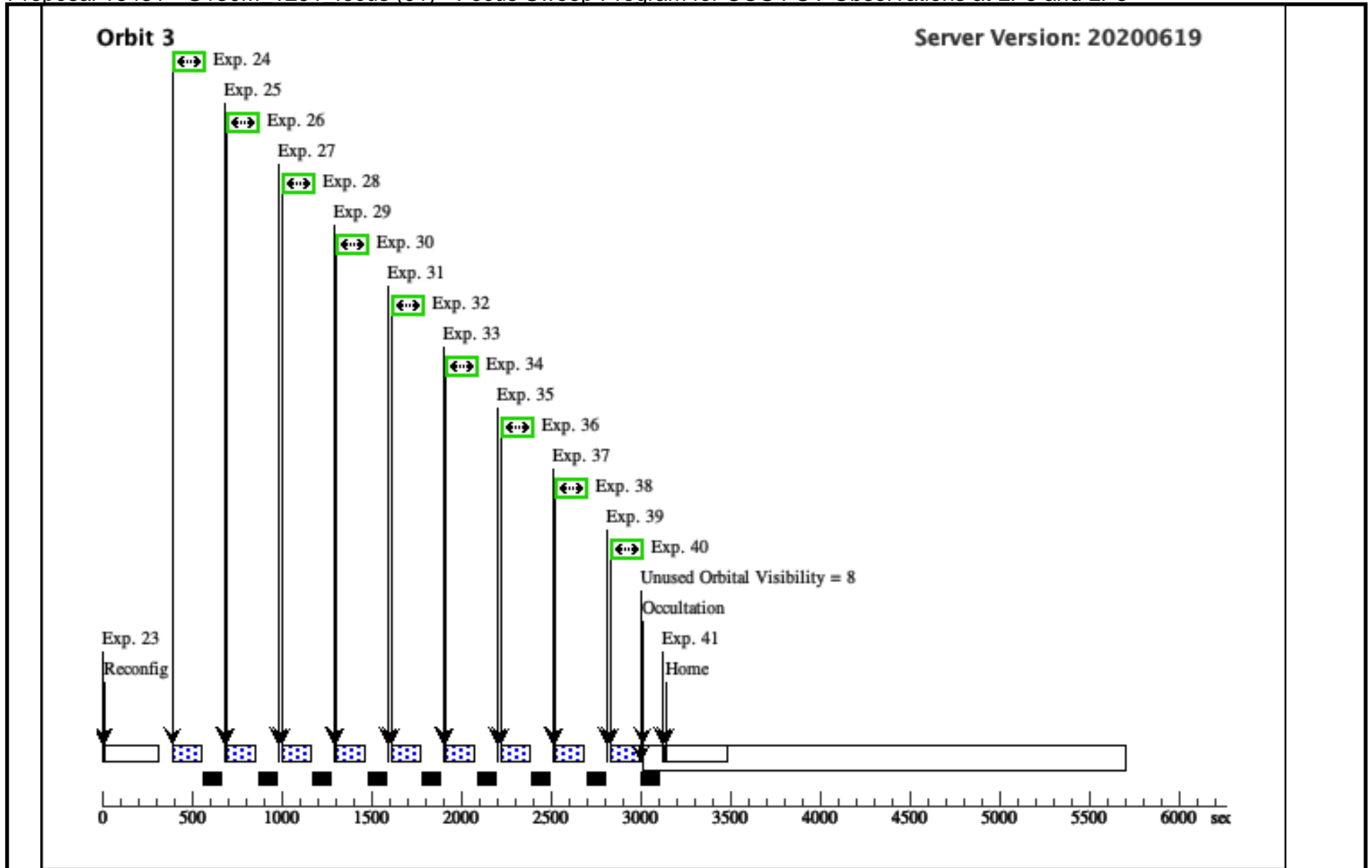
Orbit Structure



Orbit 2

GS Reacq





Proposal 16431 - G140L_800 focus (02) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

Visit	Proposal 16431, G140L_800_focus (02) Thu Oct 01 14:00:49 GMT 2020 Diagnostic Status: No Diagnostics Scientific Instruments: COS, COS/FUV, COS/NUV Special Requirements: SCHED 80%					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(2)		LIN-156	RA: 00 50 32.4076 (12.6350317d) Dec: -72 52 36.46 (-72.87679d) Equinox: J2000	Proper Motion RA: 1.428761918512278E-4 sec of time/yr Proper Motion Dec: - 0.001046999779161299 arcsec/yr Epoch of Position: 2015.5	V=12.756	Reference Frame: ICRS
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[MAIN SEQUENCE O] Extended=NO						

Proposal 16431 - G140L 800 focus (02) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	ACQ/SEAR CH (COS.ta.607 440)	(2) LIN-156	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2; STEP-SIZE=1.767; CENTER=FLUX-W T		7.3 Secs (7.3 Secs) [==>]	[1]	
	<i>Comments: Exposure time and ETC calculation taken from LENA2 (Program 13635)</i>									
	2	ACQ/IMAG E (COS.ta.607 440)	(2) LIN-156	COS/NUV, ACQ/IMAGE, BOA	MIRRORA			15 Secs (15 Secs) [==>]	[1]	
	<i>Comments: Exposure time and ETC calculation taken from LENA2 (Program 13635)</i>									
	3	ACQ/IMAG E (COS.ta.607 440)	(2) LIN-156	COS/NUV, ACQ/IMAGE, BOA	MIRRORA			15 Secs (15 Secs) [==>]	[1]	
	<i>Comments: Exposure time and ETC calculation taken from LENA2 (Program 13635)</i>									
	4	Initialize at LP3 (COS.sp.608 224)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	BUFFER-TIME=10 00; FP-POS=3; LIFETIME-POS=L P3; FLASH=NO; WAVECAL=NO		0.1 Secs (0.1 Secs) [==>]	[1]	
	<i>Comments: Initializing G140L/800 at nominal aperture and focus position.</i>									
	5	Move to -34 0	NONE		COS, ALIGN/OSM		FOCUS=-340		0 Secs (0 Secs) [==>]	[1]
	6	800_f-340 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3		760 Secs (760 Secs) [==>]	[1]	
	7	Move to -14 0	NONE		COS, ALIGN/OSM		FOCUS=-140		0 Secs (0 Secs) [==>]	[1]
8	800_f-140 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3		760 Secs (760 Secs) [==>]	[1]		
9	Move to +60 0	NONE		COS, ALIGN/OSM		FOCUS=+60		0 Secs (0 Secs) [==>]	[2]	
10	800_f+60 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3		760 Secs (760 Secs) [==>]	[2]		
11	Move to +26 0	NONE		COS, ALIGN/OSM		FOCUS=+260		0 Secs (0 Secs) [==>]	[2]	

Proposal 16431 - G140L 800 focus (02) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

12	800_f+260 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[2]
13	Move to +36 0	NONE	COS, ALIGN/OSM		FOCUS=+360	0 Secs (0 Secs) [==>]	[2]
14	800_f+360 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[2]
15	Move to +46 0	NONE	COS, ALIGN/OSM		FOCUS=-200	0 Secs (0 Secs) [==>]	[3]
16	800_f+460 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[3]
17	Move to +56 0	NONE	COS, ALIGN/OSM		FOCUS=+560	0 Secs (0 Secs) [==>]	[3]
18	800_f+560 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[3]
19	Move to +66 0	NONE	COS, ALIGN/OSM		FOCUS=+660	0 Secs (0 Secs) [==>]	[3]
<i>Comments: This is the absolute zero point at LP4 of f = -1087</i>							
20	800_f+660 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[3]
21	Move to +76 0	NONE	COS, ALIGN/OSM		FOCUS=+760	0 Secs (0 Secs) [==>]	[4]
22	800_f+760 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[4]
23	Move to +86 0	NONE	COS, ALIGN/OSM		FOCUS=+860	0 Secs (0 Secs) [==>]	[4]
24	800_f+860 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs) [==>]	[4]

Proposal 16431 - G140L 800 focus (02) - Focus Sweep Program for COS FUV Observations at LP5 and LP3

25	Move to +96 0	NONE	COS, ALIGN/OSM		FOCUS=+960	0 Secs (0 Secs)	
						[==>]	[4]
26	800_f+960 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs)	[4]
						[==>]	
27	Move to +10 60	NONE	COS, ALIGN/OSM		FOCUS=+1060	0 Secs (0 Secs)	
						[==>]	[5]
28	800_f+1060 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs)	[5]
						[==>]	
29	Move to +12 60	NONE	COS, ALIGN/OSM		FOCUS=+1260	0 Secs (0 Secs)	
						[==>]	[5]
30	800_f+1260 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs)	[5]
						[==>]	
31	Move to +14 60	NONE	COS, ALIGN/OSM		FOCUS=+1460	0 Secs (0 Secs)	
						[==>]	[5]
32	800_f+1460 (COS.sp.104 9092)	(2) LIN-156	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=3; BUFFER-TIME=11 1; LIFETIME-POS=L P3	760 Secs (760 Secs)	[5]
						[==>]	
33	Move to 0	NONE	COS, ALIGN/OSM		FOCUS=0	0 Secs (0 Secs)	
						[==>]	[5]

