



12080 - COS G140L Optics Alignment and Focus

Cycle: 17, 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) AZV18 NONE	COS COS/FUV COS/NUV	5	14-Sep-2010 21:13:04.0	yes

5 Total Orbits Used

ABSTRACT

A G140L focus sweep will be performed using the B2Ia star AZV18 in the Small Magellanic Cloud. A sequence of time-tag spectra will be acquired through the PSA aperture (CENWAVE=1105 A), at a range of focus settings. There will be 17 focus settings sampled, ranging from -800 to +800 in 100-step intervals centered on the nominal absolute focus for G140L/1105 (currently = -370) . The corresponding range in absolute focus probed in this sweep will be -1170 to +430. The optimum focus will be determined by cross-correlating prominent absorption features in the spectra with a template high resolution STIS E140M spectrum, then choosing the focus

setting yielding the narrowest cross-correlation profile from the sequence. This is similar to the focusing procedure used for the G140L grating during SMOV (PID 11484, Visit 3), except that the new focus sweep will extend to more extreme focus positions around 0 (+/-800 instead of +/-600). The inclusion of additional focus positions is necessary because the G140L focus curve from SMOV (cross-correlation FWHM vs. focus position) is broad and shallow, making it difficult to measure the minimum in the curve. After obtaining an exposure at the most extreme positive focus position (+800), the focus is returned to its nominal position (0). A final spectrum is then acquired at that position, for repeatability comparison with the earlier FOCUS=0 spectrum. After the data are analyzed, a patchable constant SMS update of OSM1 focus for the G140L grating will be uplinked.

OBSERVING DESCRIPTION

This is a program designed to produce data suitable for determining the optimal OSM focus setting for the FUV channel + G140L grating combination. The B star AZV 18 is first acquired via an imaging target acquisition with MIRRORA + BOA. It is then observed over a range of OSM1 focus settings from -800 to +800 around the nominal focus, at a central wavelength of 1105 Å. The tagflashes are specified to occur at 100 second intervals for a duration of 10 s each, to get a good characterization of any OSM drifts during the exposure. All exposures are for 700 seconds save for the most extreme focus settings (+/-800), where they are set to 600 seconds.

Visit	<p>Proposal 12080, Visit 01, scheduling</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: COS, COS/NUV, COS/FUV</p> <p>Special Requirements: (none)</p> <p><i>Comments: Visit 01 performs the focus sweep for grating G140L with the primary target for G140L. This uses the same layout as the initial version of this proposal except that a G140L/1105 exposure was inserted after the target acq, before the focus move starts. This insures that focus space probed is from -370-800 to -370+800 and is still within the 5 orbit allocation.</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>AZV18</td> <td>RA: 00 47 12.1700 (11.8007083d)</td> <td>Proper Motion RA: -0.0003s/yr</td> <td>V=12.48</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td></td> <td>Alt Name1: SK13</td> <td>Dec: -73 06 32.68 (-73.10908d)</td> <td>Proper Motion Dec: -0.0035"/yr</td> <td>(B-V)=+0.03</td> <td></td> </tr> <tr> <td></td> <td></td> <td>Equinox: J2000</td> <td>Epoch of Position: 2000</td> <td></td> <td></td> </tr> </tbody> </table> <p><i>Comments: Spectral type B2Ia, Small Magellanic Cloud.</i></p>						#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	AZV18	RA: 00 47 12.1700 (11.8007083d)	Proper Motion RA: -0.0003s/yr	V=12.48	Reference Frame: ICRS		Alt Name1: SK13	Dec: -73 06 32.68 (-73.10908d)	Proper Motion Dec: -0.0035"/yr	(B-V)=+0.03				Equinox: J2000	Epoch of Position: 2000	
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(1) AZV18	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=3; STEP-SIZE=1.767				30 Secs [==>]	[1]
<i>Comments: NUV BOA + MIRROA target acquisition. S/N=60 in 30 s, 193 cts/s entire detector, 17 cts/s brightest pixel (COS.A286584)</i>									
2	(1) AZV18	COS/NUV, ACQ/IMAGE, BOA	MIRRORA					30 Secs [==>]	[1]
3	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=15 0; FLASH=S0100D01 0				150 Secs [==>]	[1]
<i>Comments: Dummy exposure to get the OSM1 to set to the default absolute focus of G140L/1105 (= -370). This makes FOCUS=0 for this exposure (all foci are measured relative to the absolute default).</i>									
4	NONE	COS, ALIGN/OSM		FOCUS=-800				0.0 Secs [==>]	[1]
<i>Comments: Begin focus sweep by moving to -extremum (-800; this corresponds to an absolute focus of -1170); this is the first of 17 focus sweep images using a focus offset (delta=100).</i>									
5	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0				600 Secs [==>]	[1]
<i>Comments: 1 of 17 focus-sweep exposures; uses negative extremum focus (-800) S/N=65 @1300 A, 4100 cts/s global, 0.16 cts/s local, buffertime=570 s (COS.A228779) Flashes set to occur at 100 s intervals for a duration of 10s each.</i>									
6	NONE	COS, ALIGN/OSM		FOCUS=-700				0.0 Secs [==>]	[1]
<i>Comments: move to absolute focus of -370 + (-700) = -1070.</i>									
7	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0				700 Secs [==>]	[1]
<i>Comments: focus=-700</i>									
8	NONE	COS, ALIGN/OSM		FOCUS=-600				0.0 Secs [==>]	[1]
<i>Comments: move to absolute focus of -370 + (-600) = -970.</i>									
9	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0				700 Secs [==>]	[2]
<i>Comments: focus=-600</i>									
10	NONE	COS, ALIGN/OSM		FOCUS=-500				0.0 Secs [==>]	[2]
<i>Comments: move to absolute focus of -370 + (-500) = -870.</i>									
11	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0				700 Secs [==>]	[2]
<i>Comments: focus = -500</i>									

Exposures

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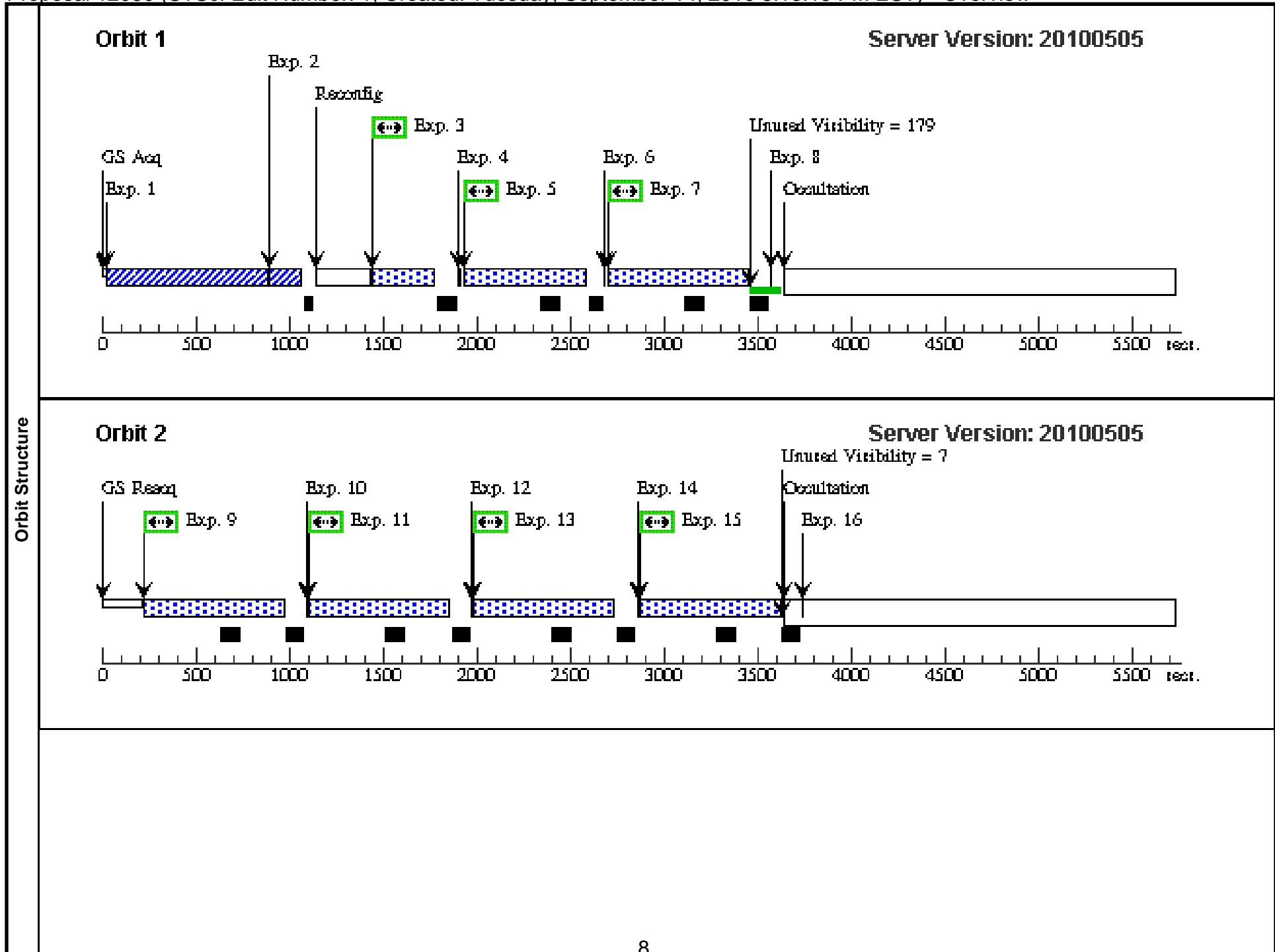
12	NONE	COS, ALIGN/OSM		FOCUS=-400	0.0 Secs	
					[==>]	[2]
<i>Comments: move to absolute focus of -370 + (-400) = -770.</i>						
13	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[2]
<i>Comments: focus=-400</i>						
14	NONE	COS, ALIGN/OSM		FOCUS=-300	0.0 Secs	
					[==>]	[2]
<i>Comments: move to absolute focus of -370 + (-300) = -670.</i>						
15	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[2]
<i>Comments: focus=-300</i>						
16	NONE	COS, ALIGN/OSM		FOCUS=-200	0.0 Secs	
					[==>]	[2]
<i>Comments: move to absolute focus of -370 + (-200) = -570.</i>						
17	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[3]
<i>Comments: focus=-200</i>						
18	NONE	COS, ALIGN/OSM		FOCUS=-100	0.0 Secs	
					[==>]	[3]
<i>Comments: move to absolute focus of -370 + (-100) = -470.</i>						
19	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[3]
<i>Comments: focus=-100</i>						
20	NONE	COS, ALIGN/OSM		FOCUS=0	0.0 Secs	
					[==>]	[3]
<i>Comments: move to absolute focus of -370 + (0) = -370.</i>						
21	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[3]
<i>Comments: focus=0</i>						
22	NONE	COS, ALIGN/OSM		FOCUS=+100	0.0 Secs	
					[==>]	[3]
<i>Comments: move to absolute focus of -370 + (+100) = -270.</i>						
23	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[3]
<i>Comments: focus=+100</i>						

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24	NONE	COS, ALIGN/OSM		FOCUS=+200	0.0 Secs	
					[==>]	[3]
<i>Comments: move to absolute focus of -370 + (+200) = -170.</i>						
25	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[4]
<i>Comments: focus=+200</i>						
26	NONE	COS, ALIGN/OSM		FOCUS=+300	0.0 Secs	
					[==>]	[4]
<i>Comments: move to absolute focus of -370 + (+300) = -70.</i>						
27	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[4]
<i>Comments: focus=+300</i>						
28	NONE	COS, ALIGN/OSM		FOCUS=+400	0.0 Secs	
					[==>]	[4]
<i>Comments: move to absolute focus of -370 + (+400) = +30.</i>						
29	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[4]
<i>Comments: focus=+400</i>						
30	NONE	COS, ALIGN/OSM		FOCUS=+500	0.0 Secs	
					[==>]	[4]
<i>Comments: move to absolute focus of -370 + (+500) = +130.</i>						
31	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[4]
<i>Comments: focus=+500</i>						
32	NONE	COS, ALIGN/OSM		FOCUS=+600	0.0 Secs	
					[==>]	[4]
<i>Comments: move to absolute focus of -370 + (+600) = +230.</i>						
33	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[5]
<i>Comments: focus=+600</i>						
34	NONE	COS, ALIGN/OSM		FOCUS=+700	0.0 Secs	
					[==>]	[5]
<i>Comments: move to absolute focus of -370 + (+700) = +330.</i>						
35	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[5]
<i>Comments: focus=+700</i>						

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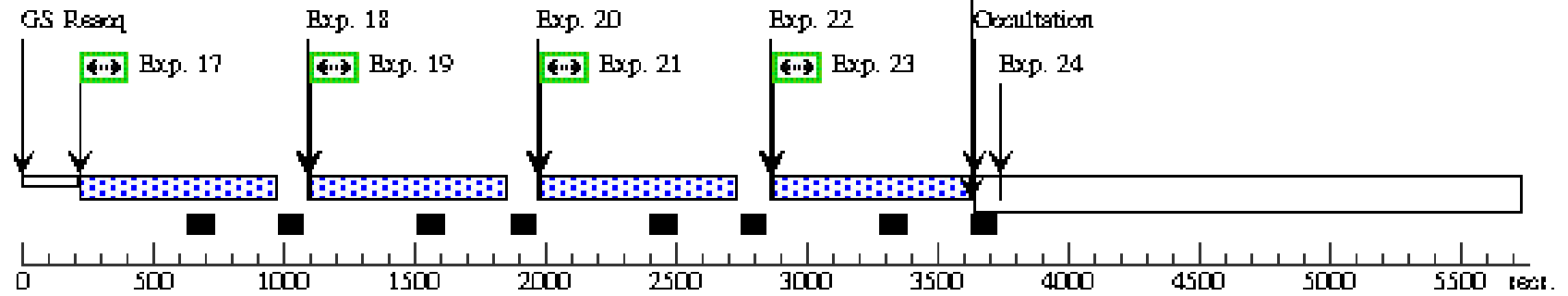
36	NONE	COS, ALIGN/OSM		FOCUS=+800	0.0 Secs	
					[==>]	[5]
<i>Comments: move to absolute focus of -370 + (+800) = +430.</i>						
37	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	600 Secs	
					[==>]	[5]
<i>Comments: focus=+800</i>						
38	NONE	COS, ALIGN/OSM		FOCUS=0	0.0 Secs	
					[==>]	[5]
<i>Comments: Post-focus sweep return to nominal focus = 0 corresponding to absolute focus -370 + 0 = -370</i>						
39	(1) AZV18	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=38 0; FLASH=S0100D01 0	700 Secs	
					[==>]	[5]
<i>Comments: focus=0</i>						



Orbit 3

Server Version: 20100505

Unused Visibility = 7



Orbit 4

Server Version: 20100505

Unused Visibility = 7

