



## 14806 - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

Cycle: 24, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

### 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>
0E	(2) ESO338-CLUSTER23 (4) ESO338-BA3 (5) ESO338-BA4 (7) ESO338-FA1 (11) ESO338-FA5	COS/FUV COS/NUV	4	29-Jul-2016 15:52:43.0	yes
0B	(2) ESO338-CLUSTER23 (5) ESO338-BA4 (6) ESO338-BA5 (10) ESO338-FA4 (12) ESO338-FA6 (14) ESO338-FA8	COS/FUV COS/NUV	4	29-Jul-2016 15:52:47.0	yes
0C	(2) ESO338-CLUSTER23 (3) ESO338-BA2 (5) ESO338-BA4 (8) ESO338-FA2 (9) ESO338-FA3 (13) ESO338-FA7	COS/FUV COS/NUV	4	29-Jul-2016 15:52:52.0	yes
0A	(2) ESO338-CLUSTER23	STIS/CCD STIS/FUV-MAMA	3	29-Jul-2016 15:52:54.0	yes
0D	(2) ESO338-CLUSTER23	STIS/CCD STIS/FUV-MAMA	3	29-Jul-2016 15:52:56.0	yes

18 Total Orbits Used

**ABSTRACT**

The Lyman alpha line is a widely used probe of the distant universe. However, being a resonant line it is prone to scattering on neutral hydrogen. Hence the radiative transport through galaxies sensitively depends on the structure, kinematics and dust content of the ISM, which in turn are strongly affected by feedback from massive star formation. Imaging observations have demonstrated that Lyman alpha emission from galaxies is dominated by a large scale diffuse component. Here we propose a multi aperture COS study of, ESO338-04, the nearest and brightest Lyman alpha

## Proposal 14806 (STScI Edit Number: 0, Created: Friday, July 29, 2016 2:52:57 PM EST) - Overview

galaxy. From this, we will deduce the Lyman alpha profile - in which the scattering history is imprinted - and how it varies across the galaxy, and for the first time probe the dominant diffuse component. Low ionisation metallic absorption lines will be used to study the neutral ISM kinematics along several sight lines and determine the outflow geometry. We will add two STIS slits from which we will study the Lyman alpha and H-beta profile on top of the brightest clusters at superb spatial and spectral resolution.

The result will be the first spatially resolved study combining neutral ISM kinematics and Lyman alpha profiles in a galaxy, from which we will build a realistic model of that accounts for the Lyman alpha emission from the entire galaxy. The data and results will have a strong legacy in the JWST and ELT era for interpreting Lyman alpha spectroscopy of high redshift sources when the UV window offered by HST has closed.

### **OBSERVING DESCRIPTION**

the observations are split in 5 visits: 3 COS visits of duration 4 orbits each, and 2 STSI visits of duration 3 orbits each. Each visit have different ORIENT constraints, selected for optimum dispersion direction (COS) or slit angle (STIS). The brightest central cluster (a.k.a. cluster #23) is used for acquisition in all visits.

For the COS visits, we obtain G130M spectra on multiple locations. For those containing bright continuum sources (bright apertures) we also obtain a short NUV image, to secure that the pointing is accurate. Each COS observation employs cenwave 1300 and 4 FP positions.

The STIS visits have orient angles selected so that the STIS slit covers bright star clusters. For CCD observations with G430M we use CR-SPLIT=2 and a pattern with 2 positions along the slit to get a total of 4 exposures. For G140M we take 3 positions offset along the slit using normal pos-targ commands. For G140L we obtain a single short exposure per visit.

Proposal 14806 - COS spec - orient 1 (0E) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

Fri Jul 29 19:52:57 GMT 2016

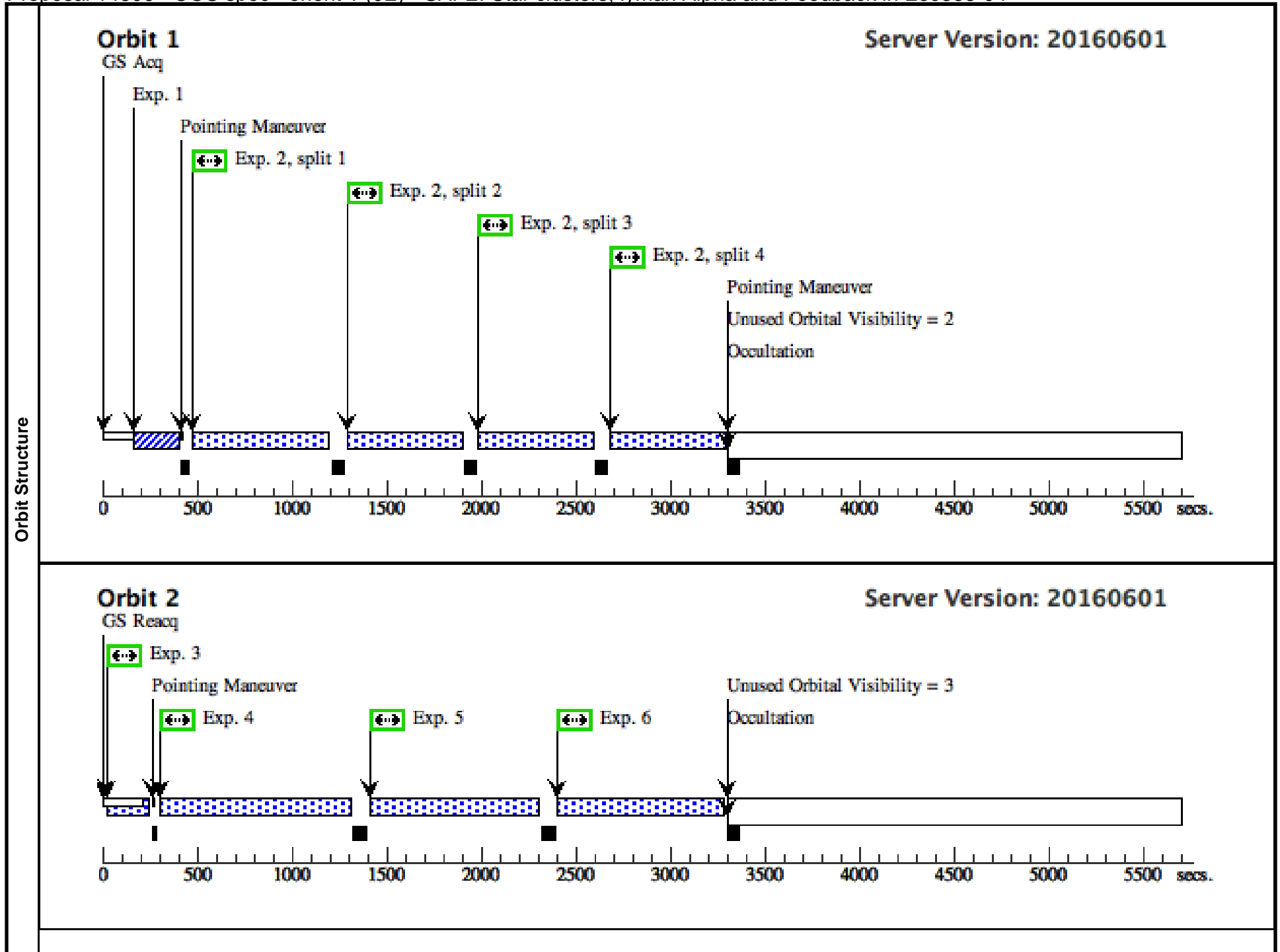
Visit	<b>Proposal 14806, COS spec - orient 1 (0E), implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: COS/FUV, COS/NUV Special Requirements: ORIENT 0D TO 30 D; ORIENT 180D TO 210 D																																																																						
Diagnostics	(COS spec - orient 1 (0E)) Warning (Form): If the target coordinates are not known to 0.4" (or better), an ACQ/SEARCH should precede the ACQ/IMAGE. (COS spec - orient 1 (0E)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS (COS spec - orient 1 (0E)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS (FA1 spec (0E.013)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details. (FA5 spec (0E.014)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.																																																																						
Fixed Targets	<table border="1"> <thead> <tr> <th data-bbox="142 393 247 418">#</th> <th data-bbox="247 393 478 418">Name</th> <th data-bbox="478 393 907 418">Target Coordinates</th> <th data-bbox="907 393 1318 418">Targ. Coord. Corrections</th> <th data-bbox="1318 393 1612 418">Fluxes</th> <th data-bbox="1612 393 1999 418">Miscellaneous</th> </tr> </thead> <tbody> <tr> <td data-bbox="142 425 247 451">(2)</td> <td data-bbox="247 425 478 451">ESO338-CLUSTER23</td> <td data-bbox="478 425 907 516">                     RA: 19 27 58.3896 (291.9932900d)                      Dec: -41 34 30.81 (-41.57522d)                      Equinox: J2000                 </td> <td data-bbox="907 425 1318 516">                     Proper Motion RA: 0                      Proper Motion Dec: 0                      Radial Velocity: 2859.7 km/sec                 </td> <td data-bbox="1318 425 1612 483">                     V=17.59+/-0.05                      mag_1500_AB = 16.7                 </td> <td data-bbox="1612 425 1999 451">Reference Frame: ICRS</td> </tr> <tr> <td colspan="6" data-bbox="142 522 1999 630"> <i>Comments: Brightest central star cluster in ESO 388-04 = Bright Aperture (B)</i>  <i>The coordinates have been determined in an ACS/WFC/F550W image that has been matched to 2MASS and the uncertainties in position quoted above is the resulting RMS from this match, using 21 stars. We have checked these stars for proper motion and the RMS of the proper motions over the 10 year time difference between 2MASS and the ACS image is approx 0.2 arcsec, hence smaller than the position uncertainty, but making a significant contribution to the total error budget. Hence we feel confident that a ACQ/IMA is adequate.</i>                      Extended=NO                 </td> </tr> <tr> <td data-bbox="142 636 247 662">(4)</td> <td data-bbox="247 636 478 662">ESO338-BA3</td> <td data-bbox="478 636 907 727">                     RA: 19 27 58.2620 (291.9927583d)                      Dec: -41 34 31.89 (-41.57553d)                      Equinox: J2000                 </td> <td data-bbox="907 636 1318 727">                     Proper Motion RA: 0                      Proper Motion Dec: 0                      Radial Velocity: 2860 km/sec                 </td> <td data-bbox="1318 636 1612 695">                     V=18.2+/-0.1                      mag_1500_AB = 17.8                 </td> <td data-bbox="1612 636 1999 662">Reference Frame: ICRS</td> </tr> <tr> <td colspan="6" data-bbox="142 734 1999 776"> <i>Comments: Bright aperture 3 (BA3)</i>                      Extended=NO                 </td> </tr> <tr> <td data-bbox="142 782 247 808">(5)</td> <td data-bbox="247 782 478 808">ESO338-BA4</td> <td data-bbox="478 782 907 873">                     RA: 19 27 58.0872 (291.9920300d)                      Dec: -41 34 31.20 (-41.57533d)                      Equinox: J2000                 </td> <td data-bbox="907 782 1318 873">                     Proper Motion RA: 0                      Proper Motion Dec: 0                      Radial Velocity: 2860 km/sec                 </td> <td data-bbox="1318 782 1612 841">                     V=19.0+/-0.1                      mag_1500_AB = 18.3                 </td> <td data-bbox="1612 782 1999 808">Reference Frame: ICRS</td> </tr> <tr> <td colspan="6" data-bbox="142 880 1999 922"> <i>Comments: Bright aperture 4 (BA4)</i>                      Extended=NO                 </td> </tr> <tr> <td data-bbox="142 928 247 954">(7)</td> <td data-bbox="247 928 478 954">ESO338-FA1</td> <td data-bbox="478 928 907 1019">                     RA: 19 27 57.6872 (291.9903633d)                      Dec: -41 34 35.15 (-41.57643d)                      Equinox: J2000                 </td> <td data-bbox="907 928 1318 1019">                     Proper Motion RA: 0                      Proper Motion Dec: 0                      Radial Velocity: 2860 km/sec                 </td> <td data-bbox="1318 928 1612 987">                     V=18.6+/-0.1                      mag_1500_AB = 19.8                 </td> <td data-bbox="1612 928 1999 954">Reference Frame: ICRS</td> </tr> <tr> <td colspan="6" data-bbox="142 1026 1999 1068"> <i>Comments: Faint Aperture 1 (FA1) - Diffuse region</i>                      Extended=YES                 </td> </tr> <tr> <td data-bbox="142 1075 247 1101">(11)</td> <td data-bbox="247 1075 478 1101">ESO338-FA5</td> <td data-bbox="478 1075 907 1166">                     RA: 19 27 58.4900 (291.9937083d)                      Dec: -41 34 28.60 (-41.57461d)                      Equinox: J2000                 </td> <td data-bbox="907 1075 1318 1166">                     Proper Motion RA: 0                      Proper Motion Dec: 0                      Radial Velocity: 2860 km/sec                 </td> <td data-bbox="1318 1075 1612 1133">                     V=18.1+/-0.1                      mag_1500_AB = 18.2                 </td> <td data-bbox="1612 1075 1999 1101">Reference Frame: ICRS</td> </tr> <tr> <td colspan="6" data-bbox="142 1172 1999 1214"> <i>Comments: Faint Aperture 5 (FA5) - Diffuse region</i>                      Extended=YES                 </td> </tr> </tbody> </table>					#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(2)	ESO338-CLUSTER23	RA: 19 27 58.3896 (291.9932900d) Dec: -41 34 30.81 (-41.57522d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2859.7 km/sec	V=17.59+/-0.05 mag_1500_AB = 16.7	Reference Frame: ICRS	<i>Comments: Brightest central star cluster in ESO 388-04 = Bright Aperture (B)</i> <i>The coordinates have been determined in an ACS/WFC/F550W image that has been matched to 2MASS and the uncertainties in position quoted above is the resulting RMS from this match, using 21 stars. We have checked these stars for proper motion and the RMS of the proper motions over the 10 year time difference between 2MASS and the ACS image is approx 0.2 arcsec, hence smaller than the position uncertainty, but making a significant contribution to the total error budget. Hence we feel confident that a ACQ/IMA is adequate.</i> Extended=NO						(4)	ESO338-BA3	RA: 19 27 58.2620 (291.9927583d) Dec: -41 34 31.89 (-41.57553d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.2+/-0.1 mag_1500_AB = 17.8	Reference Frame: ICRS	<i>Comments: Bright aperture 3 (BA3)</i> Extended=NO						(5)	ESO338-BA4	RA: 19 27 58.0872 (291.9920300d) Dec: -41 34 31.20 (-41.57533d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=19.0+/-0.1 mag_1500_AB = 18.3	Reference Frame: ICRS	<i>Comments: Bright aperture 4 (BA4)</i> Extended=NO						(7)	ESO338-FA1	RA: 19 27 57.6872 (291.9903633d) Dec: -41 34 35.15 (-41.57643d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.6+/-0.1 mag_1500_AB = 19.8	Reference Frame: ICRS	<i>Comments: Faint Aperture 1 (FA1) - Diffuse region</i> Extended=YES						(11)	ESO338-FA5	RA: 19 27 58.4900 (291.9937083d) Dec: -41 34 28.60 (-41.57461d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.1+/-0.1 mag_1500_AB = 18.2	Reference Frame: ICRS	<i>Comments: Faint Aperture 5 (FA5) - Diffuse region</i> Extended=YES					
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																																																																		
(2)	ESO338-CLUSTER23	RA: 19 27 58.3896 (291.9932900d) Dec: -41 34 30.81 (-41.57522d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2859.7 km/sec	V=17.59+/-0.05 mag_1500_AB = 16.7	Reference Frame: ICRS																																																																		
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<i>Comments: Bright aperture 3 (BA3)</i> Extended=NO																																																																							
(5)	ESO338-BA4	RA: 19 27 58.0872 (291.9920300d) Dec: -41 34 31.20 (-41.57533d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=19.0+/-0.1 mag_1500_AB = 18.3	Reference Frame: ICRS																																																																		
<i>Comments: Bright aperture 4 (BA4)</i> Extended=NO																																																																							
(7)	ESO338-FA1	RA: 19 27 57.6872 (291.9903633d) Dec: -41 34 35.15 (-41.57643d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.6+/-0.1 mag_1500_AB = 19.8	Reference Frame: ICRS																																																																		
<i>Comments: Faint Aperture 1 (FA1) - Diffuse region</i> Extended=YES																																																																							
(11)	ESO338-FA5	RA: 19 27 58.4900 (291.9937083d) Dec: -41 34 28.60 (-41.57461d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.1+/-0.1 mag_1500_AB = 18.2	Reference Frame: ICRS																																																																		
<i>Comments: Faint Aperture 5 (FA5) - Diffuse region</i> Extended=YES																																																																							

Proposal 14806 - COS spec - orient 1 (0E) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	Acquisition on #23 (825254)	(2) ESO338-CLUST ER23	COS/NUV, ACQ/IMAGE, PSA	MIRRORA			7 Secs (7 Secs) [==>]	[1]	
	<i>Comments: The brightness of the acquisition source has been measured directly from ACS/F140LP and WFPC2/F336W images. It takes into account the slight extension of the source (FWHM=0.065" as measured from several passbands in WFPC2/PC images) which in effect reduces the peak pixel intensity with COS/NUV to 59% of that for a pure point source.</i>									
	2	23 spec (825352)	(2) ESO338-CLUST ER23	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=1200; FP-POS=ALL			554 Secs (2216 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
	<i>Comments: Buffer time accounts for total flux in aperture (cluster 23 + background)</i>									
	3	BA3 NUV image (826642)	(4) ESO338-BA3	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=300			20 Secs (20 Secs) [==>]	[2]
	4	BA3 spec F P1 (826644)	(4) ESO338-BA3	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=1500; FP-POS=1			840 Secs (840 Secs) [==>]	[2]
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
	5	BA3 spec F P2 (826644)	(4) ESO338-BA3	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=1500; FP-POS=2			840 Secs (840 Secs) [==>]	[2]
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
	6	BA3 spec F P3 (826644)	(4) ESO338-BA3	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=1500; FP-POS=3			830 Secs (830 Secs) [==>]	[2]
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
7	BA3 spec F P4 (826644)	(4) ESO338-BA3	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=1500; FP-POS=4			450 Secs (450 Secs) [==>]	[3]	
<i>Comments: Buffer time accounts for total flux in aperture</i>										
8	BA4 NUV image (826680)	(5) ESO338-BA4	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=300			40 Secs (40 Secs) [==>]	[3]	
9	BA4 spec 1 (826677)	(5) ESO338-BA4	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2000; FP-POS=1			430 Secs (430 Secs) [==>]	[3]	
<i>Comments: Buffer time accounts for total flux in aperture</i>										
10	BA4 spec 2 (826677)	(5) ESO338-BA4	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2000; FP-POS=2			415 Secs (415 Secs) [==>]	[3]	
<i>Comments: Buffer time accounts for total flux in aperture</i>										
11	BA4 spec 3 (826677)	(5) ESO338-BA4	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2000; FP-POS=3			415 Secs (415 Secs) [==>]	[3]	
<i>Comments: Buffer time accounts for total flux in aperture</i>										

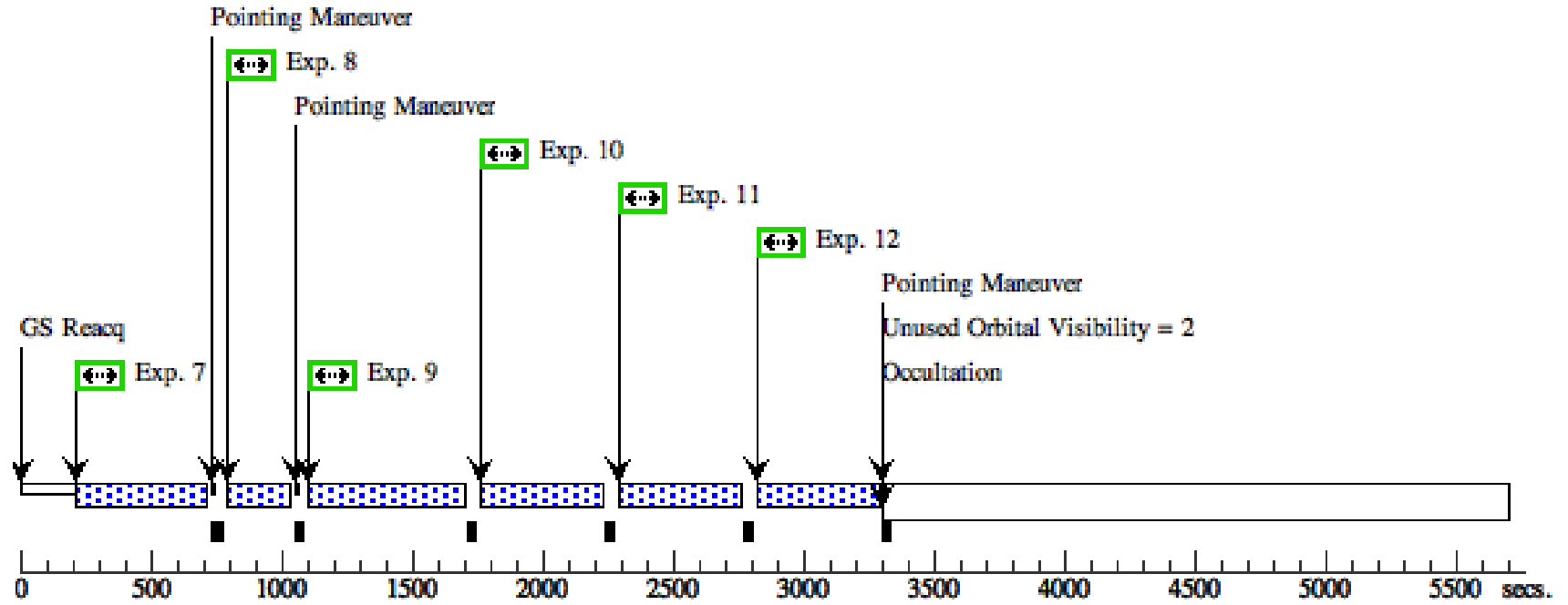
Proposal 14806 - COS spec - orient 1 (0E) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

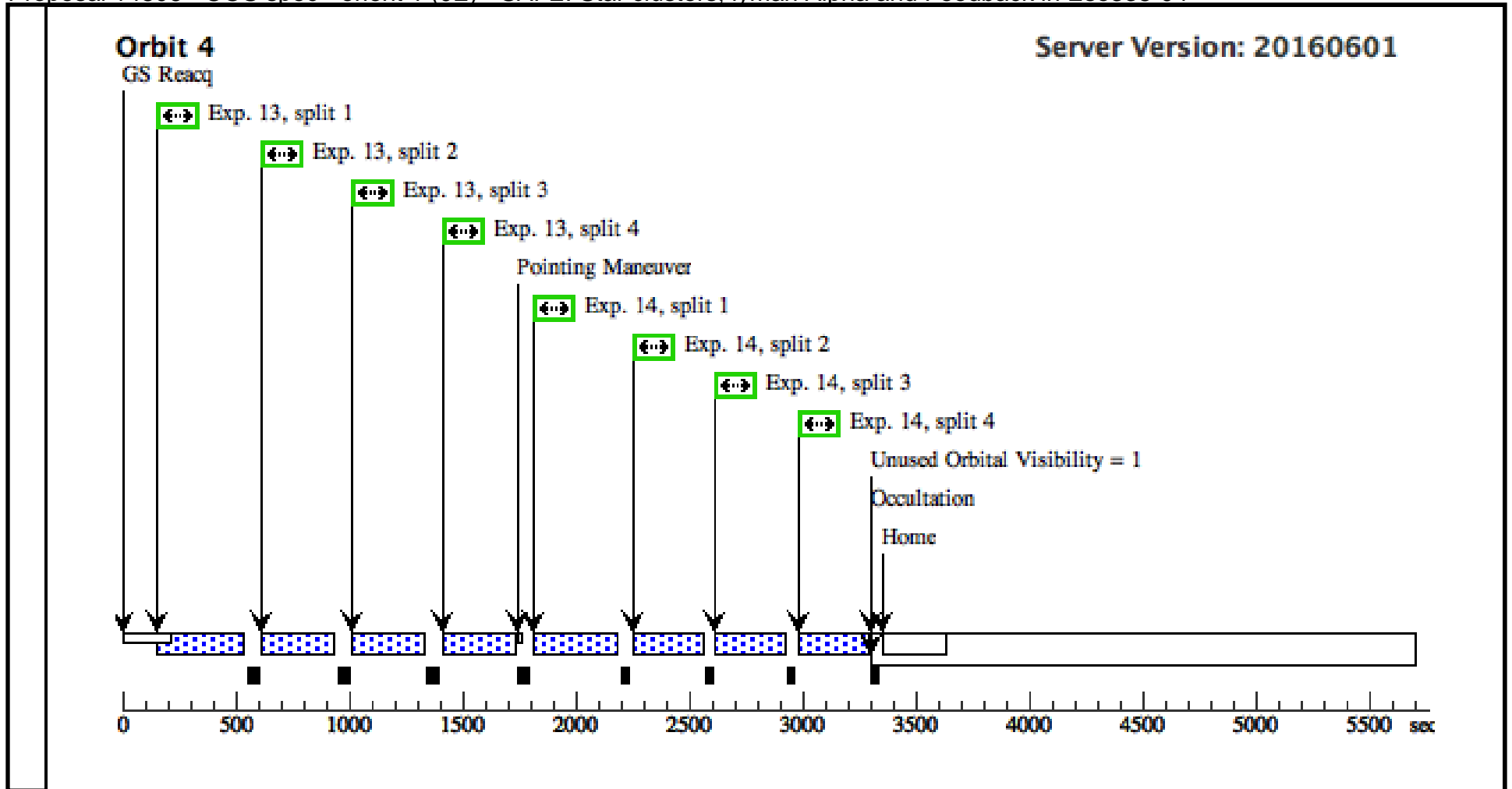
12	BA4 spec 4 (826677)	(5) ESO338-BA4	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=20 00; FP-POS=4	415 Secs (415 Secs) [==>]	[3]
<i>Comments: Buffer time accounts for total flux in aperture</i>							
13	FA1 spec (826688)	(7) ESO338-FA1	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=60 0; FP-POS=ALL	265 Secs (1060 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[4]
<i>Comments: Buffer time accounts for total flux in aperture</i>							
14	FA5 spec (826692)	(11) ESO338-FA5	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=18 00; FP-POS=ALL	253 Secs (1012 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[4]
<i>Comments: Buffer time accounts for total flux in aperture</i>							



### Orbit 3

Server Version: 20160601





<b>Visit</b>	<b>Proposal 14806, COS spec - orient 2 (0B), implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: COS/FUV, COS/NUV Special Requirements: ORIENT 85D TO 115 D; ORIENT 265D TO 295 D
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<b>Diagnostics</b>	(COS spec - orient 2 (0B)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS
	(COS spec - orient 2 (0B)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS
	(COS spec - orient 2 (0B)) Warning (Form): If the target coordinates are not known to 0.4" (or better), an ACQ/SEARCH should precede the ACQ/IMAGE.
	(COS spec - orient 2 (0B)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS
	(FA4 spec (0B.008)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.
	(FA6 spec (0B.009)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.
	(FA8 spec FP1 (0B.010)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.
	(FA8 spec FP2 (0B.011)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.
	(FA8 spec FP3 (0B.012)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

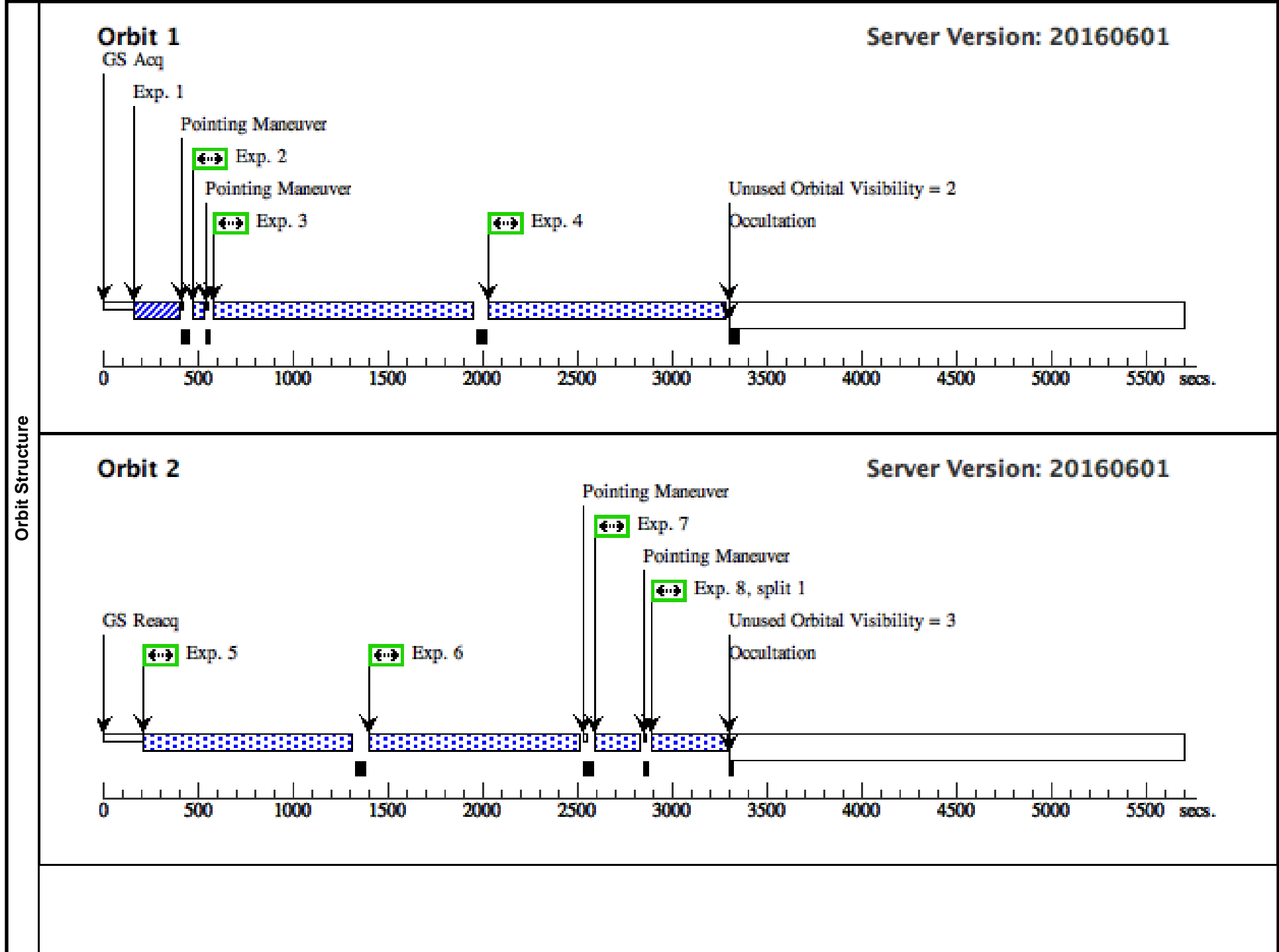
<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	
	(2)	ESO338-CLUSTER23	RA: 19 27 58.3896 (291.9932900d) Dec: -41 34 30.81 (-41.57522d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2859.7 km/sec	V=17.59+/-0.05 mag_1500_AB = 16.7	Reference Frame: ICRS	
	<i>Comments: Brightest central star cluster in ESO 388-04 = Bright Aperture (B)</i> <i>The coordinates have been determined in an ACS/WFC/F550W image that has been matched to 2MASS and the uncertainties in position quoted above is the resulting RMS from this match, using 21 stars. We have checked these stars for proper motion and the RMS of the proper motions over the 10 year time difference between 2MASS and the ACS image is approx 0.2 arcsec, hence smaller than the position uncertainty, but making a significant contribution to the total error budget. Hence we feel confident that a ACQ/IMA is adequate.</i> <i>Extended=NO</i>						
	(5)	ESO338-BA4	RA: 19 27 58.0872 (291.9920300d) Dec: -41 34 31.20 (-41.57533d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=19.0+/-0.1 mag_1500_AB = 18.3	Reference Frame: ICRS	
	<i>Comments: Bright aperture 4 (BA4)</i> <i>Extended=NO</i>						
	(6)	ESO338-BA5	RA: 19 27 57.8948 (291.9912283d) Dec: -41 34 31.22 (-41.57534d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=19.0+/-0.1 mag_1500_AB = 18.9	Reference Frame: ICRS	
	<i>Comments: Bright aperture 5 (BA5)</i> <i>Extended=NO</i>						
	(10)	ESO338-FA4	RA: 19 27 58.6300 (291.9942917d) Dec: -41 34 30.83 (-41.57523d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=17.7+/-0.1 mag_1500_AB = 18.2	Reference Frame: ICRS	
	<i>Comments: Faint Aperture 4 (FA4) - Diffuse region</i> <i>Extended=YES</i>						
	(12)	ESO338-FA6	RA: 19 27 58.2600 (291.9927500d) Dec: -41 34 28.49 (-41.57458d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.6+/-0.1 mag_1500_AB = 19.8	Reference Frame: ICRS	
<i>Comments: Faint Aperture 6 (FA6) - Diffuse region</i> <i>Extended=YES</i>							
(14)	ESO338-FA8	RA: 19 27 58.0100 (291.9917083d) Dec: -41 34 28.43 (-41.57456d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=19.5+/-0.1 mag_1500_AB = 20.2	Reference Frame: ICRS		
<i>Comments: Faint Aperture 8 (FA8) - Diffuse region</i> <i>Extended=YES</i>							

Proposal 14806 - COS spec - orient 2 (0B) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	Acquisition on #23 (825254)	(2) ESO338-CLUST ER23	COS/NUV, ACQ/IMAGE, PSA	MIRRORA			7 Secs (7 Secs) [==>]	[1]	
	2	BA5 NUV image (826701)	(6) ESO338-BA5	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=600		50 Secs (50 Secs) [==>]	[1]	
	3	BA5 spec F P1 (826704)	(6) ESO338-BA5	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=3000; FP-POS=1		1200 Secs (1200 Secs) [==>]	[1]	
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
	4	BA5 spec F P2 (826704)	(6) ESO338-BA5	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=3000; FP-POS=2		1200 Secs (1200 Secs) [==>]	[1]	
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
	5	BA5 spec F P3 (826704)	(6) ESO338-BA5	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=3000; FP-POS=3		1050 Secs (1050 Secs) [==>]	[2]	
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
	6	BA5 spec F P4 (826704)	(6) ESO338-BA5	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=3000; FP-POS=4		1060 Secs (1060 Secs) [==>]	[2]	
	<i>Comments: Buffer time accounts for total flux in aperture</i>									
	7	FA4 NUV image (826711)	(10) ESO338-FA4	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=1400		40 Secs (40 Secs) [==>]	[2]	
8	FA4 spec (826713)	(10) ESO338-FA4	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2200; FP-POS=ALL		225 Secs (900 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[2]  [3]		
<i>Comments: Buffer time accounts for total flux in aperture</i>										
9	FA6 spec (826715)	(12) ESO338-FA6	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=4500; FP-POS=ALL		300 Secs (1200 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[3]		
<i>Comments: Buffer time accounts for total flux in aperture</i>										
10	FA8 spec FP 1 (826716)	(14) ESO338-FA8	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=4500; FP-POS=1		275 Secs (275 Secs) [==>]	[3]		
<i>Comments: Buffer time accounts for total flux in aperture</i>										
11	FA8 spec FP 2 (826716)	(14) ESO338-FA8	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=4500; FP-POS=2		300 Secs (300 Secs) [==>]	[4]		
<i>Comments: Buffer time accounts for total flux in aperture</i>										

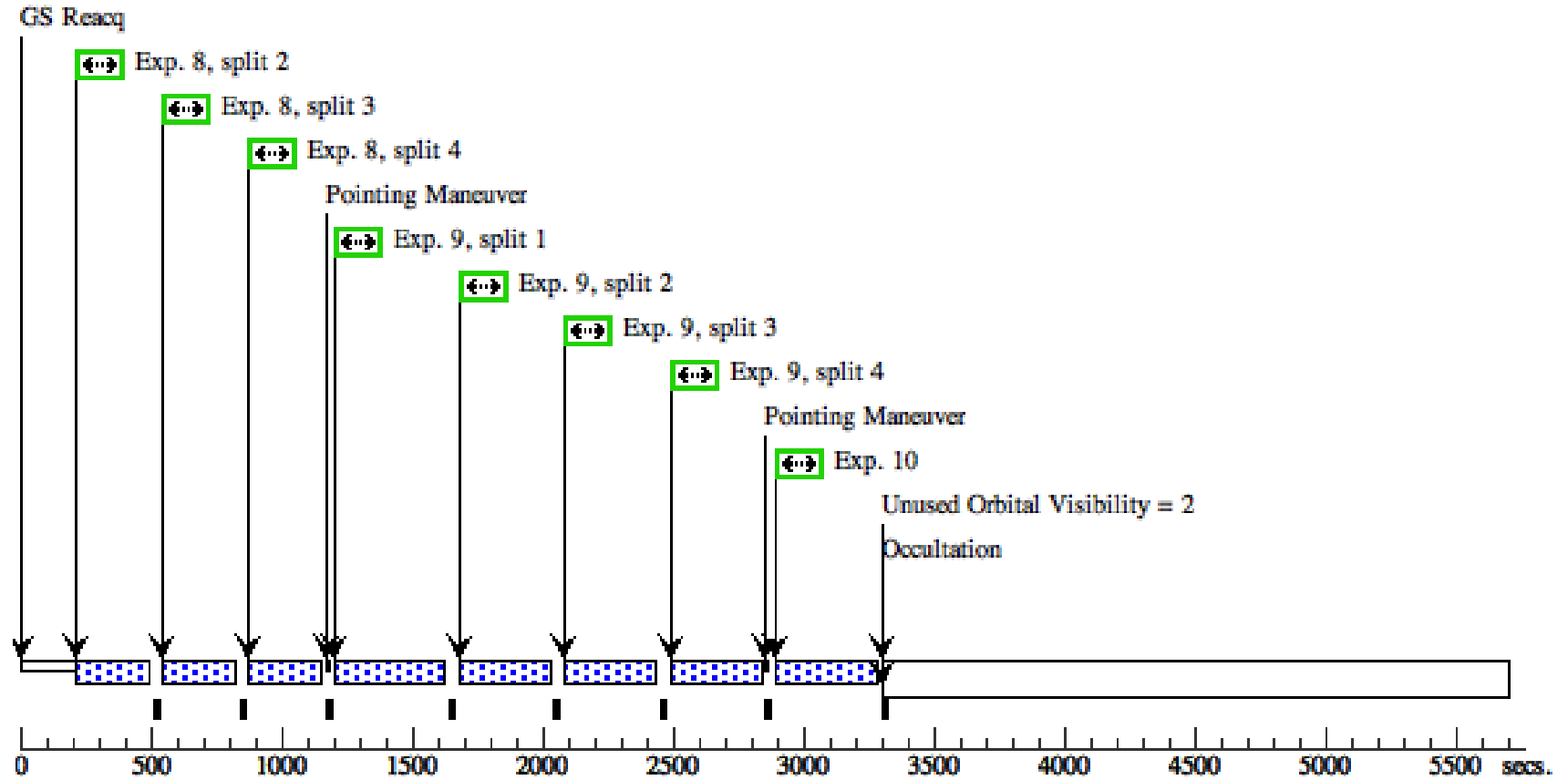
Proposal 14806 - COS spec - orient 2 (0B) - SAFE: Star clusters, lyman Alpha and Feedback in Eso338-04

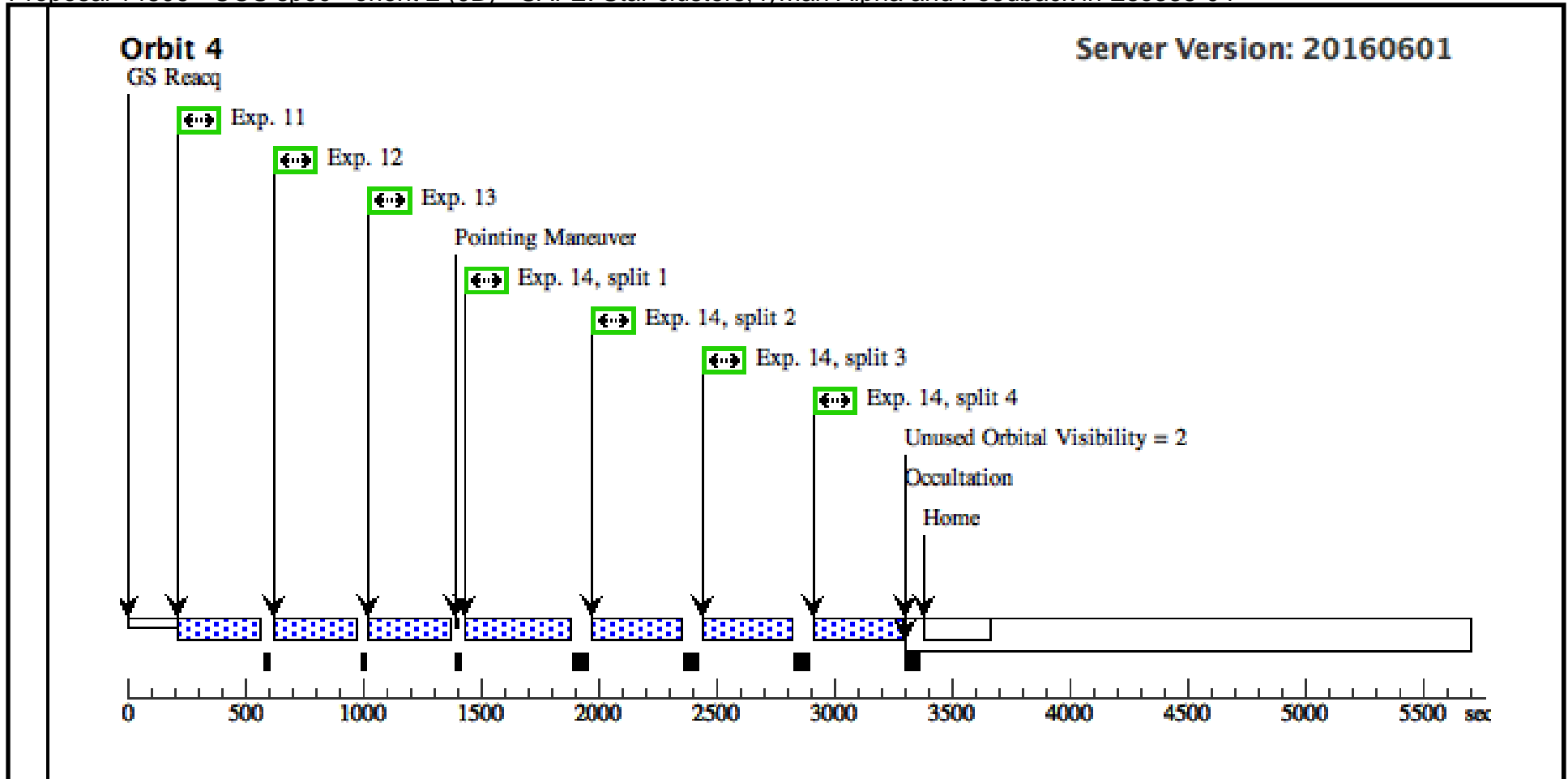
12	FA8 spec FP (14) ESO338-FA8 3 (826716)	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=45 00; FP-POS=3	300 Secs (300 Secs) [==>]	[4]
<i>Comments: Buffer time accounts for total flux in aperture</i>						
13	FA8 spec FP (14) ESO338-FA8 4 (826716)	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=45 00; FP-POS=4	300 Secs (300 Secs) [==>]	[4]
<i>Comments: Buffer time accounts for total flux in aperture</i>						
14	BA4 spec (5) ESO338-BA4 (826677)	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=60 0; FP-POS=ALL	327 Secs (1308 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[4]
<i>Comments: Buffer time accounts for total flux in aperture</i>						



**Orbit 3**

Server Version: 20160601





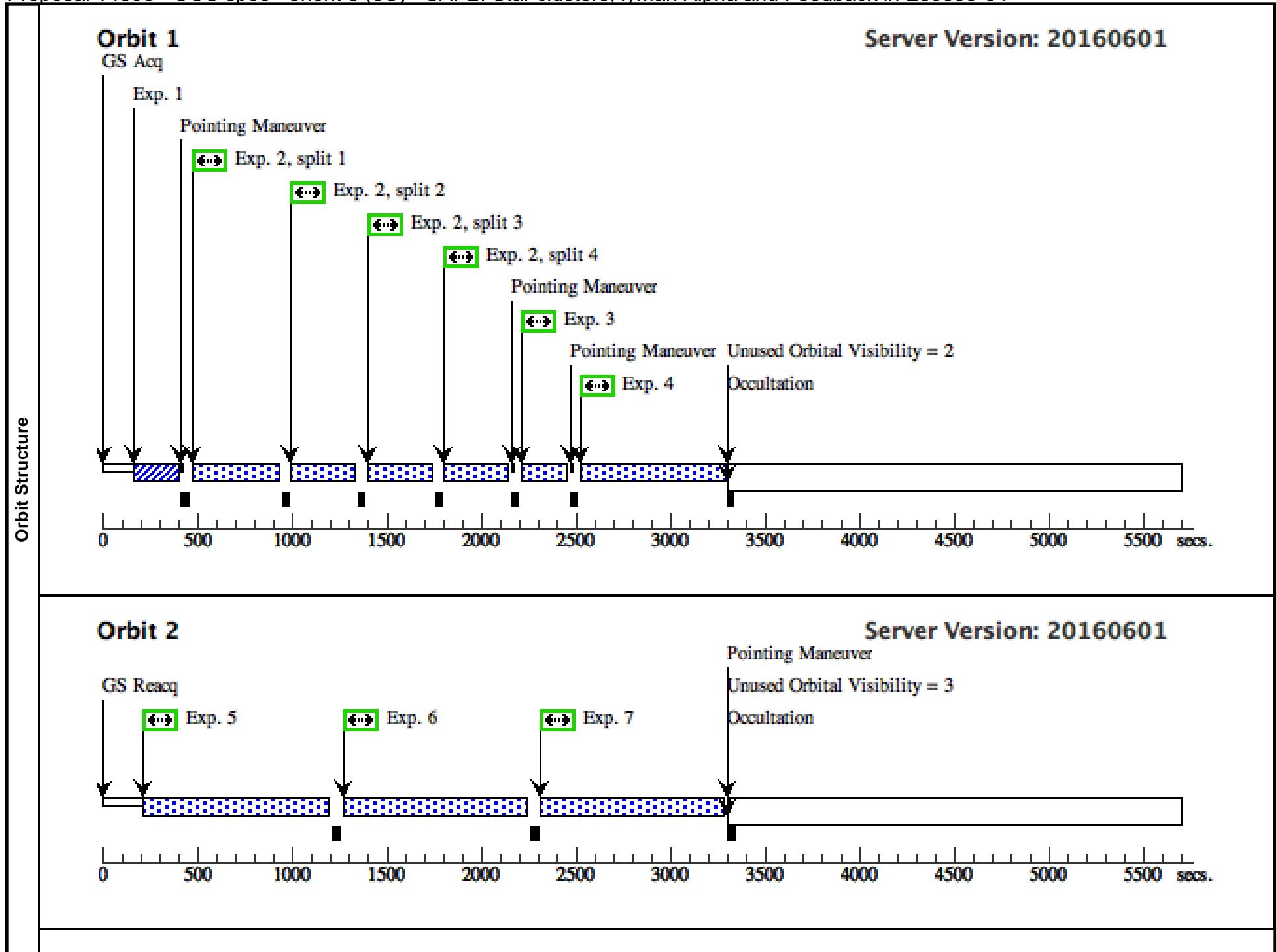
Proposal 14806 - COS spec - orient 3 (0C) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

Fri Jul 29 19:52:58 GMT 2016

Visit	<b>Proposal 14806, COS spec - orient 3 (0C), implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: COS/FUV, COS/NUV Special Requirements: ORIENT 130D TO 160 D; ORIENT 310D TO 340 D						
Diagnostics	(COS spec - orient 3 (0C)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS (COS spec - orient 3 (0C)) Warning (Form): If the target coordinates are not known to 0.4" (or better), an ACQ/SEARCH should precede the ACQ/IMAGE. (COS spec - orient 3 (0C)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS (COS spec - orient 3 (0C)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS (FA3 spec (0C.008)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details. (FA2 spec (0C.009)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details. (FA7 spec (0C.010)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	
	(2)	ESO338-CLUSTER23	RA: 19 27 58.3896 (291.9932900d) Dec: -41 34 30.81 (-41.57522d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2859.7 km/sec	V=17.59+/-0.05 mag_1500_AB = 16.7	Reference Frame: ICRS	
	<i>Comments: Brightest central star cluster in ESO 388-04 = Bright Aperture (B)                      The coordinates have been determined in an ACS/WFC/F550W image that has been matched to 2MASS and the uncertainties in position quoted above is the resulting RMS from this match, using 21 stars. We have checked these stars for proper motion and the RMS of the proper motions over the 10 year time difference between 2MASS and the ACS image is approx 0.2 arcsec, hence smaller than the position uncertainty, but making a significant contribution to the total error budget. Hence we feel confident that a ACQ/IMA is adequate.                      Extended=NO</i>						
	(3)	ESO338-BA2	RA: 19 27 58.5048 (291.9937700d) Dec: -41 34 33.29 (-41.57591d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=20.0+/-0.1 mag_1500_AB = 18.7	Reference Frame: ICRS	
	<i>Comments: Bright Aperture 2 = BA2                      Extended=NO</i>						
	(5)	ESO338-BA4	RA: 19 27 58.0872 (291.9920300d) Dec: -41 34 31.20 (-41.57533d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=19.0+/-0.1 mag_1500_AB = 18.3	Reference Frame: ICRS	
	<i>Comments: Bright aperture 4 (BA4)                      Extended=NO</i>						
(8)	ESO338-FA2	RA: 19 27 58.1200 (291.9921667d) Dec: -41 34 33.78 (-41.57605d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.2+/-0.1 mag_1500_AB = 19.5	Reference Frame: ICRS		
<i>Comments: Faint Aperture 2 (FA2) - Diffuse region                      Extended=YES</i>							
(9)	ESO338-FA3	RA: 19 27 58.3200 (291.9930000d) Dec: -41 34 34.12 (-41.57614d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=18.9+/-0.1 mag_1500_AB = 20.4	Reference Frame: ICRS		
<i>Comments: Faint Aperture 3 (FA3) - Diffuse region                      Extended=YES</i>							
(13)	ESO338-FA7	RA: 19 27 58.4100 (291.9933750d) Dec: -41 34 26.47 (-41.57402d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2860 km/sec	V=20.0+/-0.1 mag_1500_AB = 21.1	Reference Frame: ICRS		
<i>Comments: Faint Aperture 7 (FA7) - Diffuse region                      Extended=YES</i>							

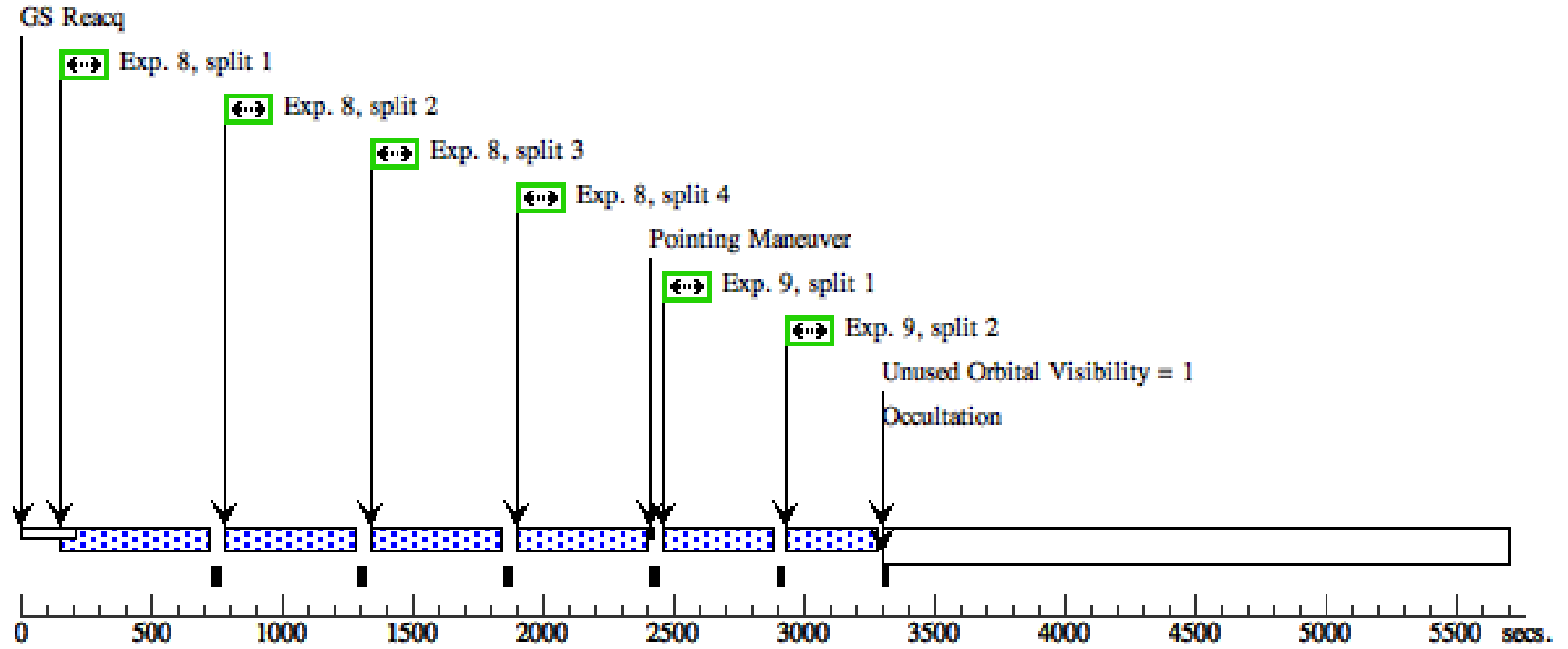
Proposal 14806 - COS spec - orient 3 (0C) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

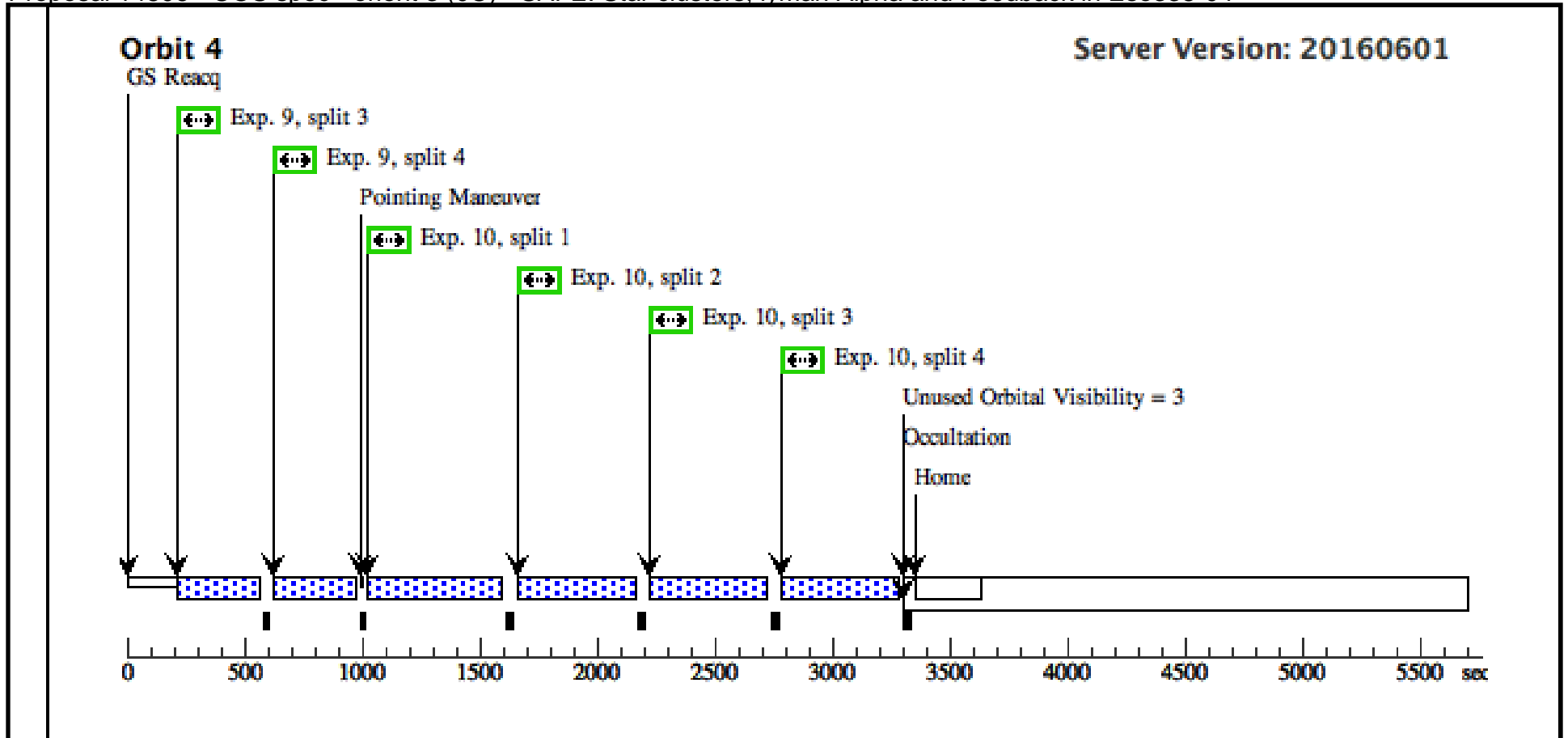
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
Exposures	1	Acquisition on #23 (825254)	(2) ESO338-CLUSTER23	COS/NUV, ACQ/IMAGE, PSA	MIRRORA			7 Secs (7 Secs) [==>]	[1]
	2	BA4 Spec (826677)	(5) ESO338-BA4	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2000; FP-POS=ALL		290 Secs (1160 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
	<i>Comments: Buffer time accounts for total flux in aperture (cluster 23 + background)</i>								
	3	BA2 NUV image (826723)	(3) ESO338-BA2	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=300		40 Secs (40 Secs) [==>]	[1]
	4	BA2 spec F P1 (826725)	(3) ESO338-BA2	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2800; FP-POS=1		600 Secs (600 Secs) [==>]	[1]
	<i>Comments: Buffer time accounts for total flux in aperture</i>								
	5	BA2 spec F P2 (826725)	(3) ESO338-BA2	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2800; FP-POS=2		930 Secs (930 Secs) [==>]	[2]
	<i>Comments: Buffer time accounts for total flux in aperture</i>								
	6	BA2 spec F P3 (826725)	(3) ESO338-BA2	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2800; FP-POS=3		920 Secs (920 Secs) [==>]	[2]
	<i>Comments: Buffer time accounts for total flux in aperture</i>								
7	BA2 spec F P4 (826725)	(3) ESO338-BA2	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=2800; FP-POS=4		920 Secs (920 Secs) [==>]	[2]	
<i>Comments: Buffer time accounts for total flux in aperture</i>									
8	FA3 spec (827353)	(9) ESO338-FA3	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=4000; FP-POS=ALL		447 Secs (1788 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[3]	
<i>Comments: Buffer time accounts for total flux in aperture</i>									
9	FA2 spec (827356)	(8) ESO338-FA2	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=4000; FP-POS=ALL		300 Secs (1200 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[3] [4]	
<i>Comments: Buffer time accounts for total flux in aperture</i>									
10	FA7 spec (827354)	(13) ESO338-FA7	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=4000; FP-POS=ALL		449 Secs (1796 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[4]	
<i>Comments: Buffer time accounts for total flux in aperture</i>									



### Orbit 3

Server Version: 20160601

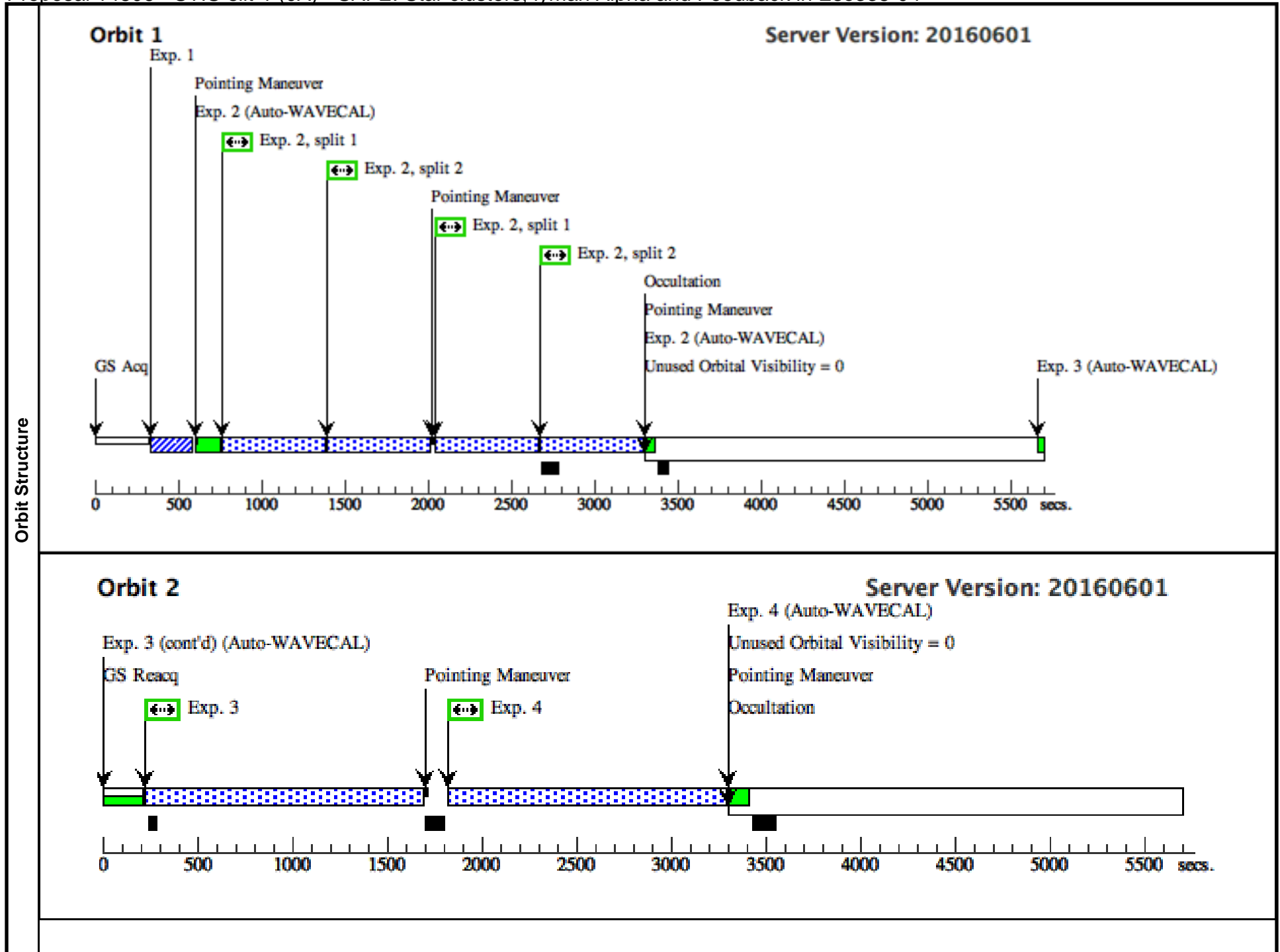


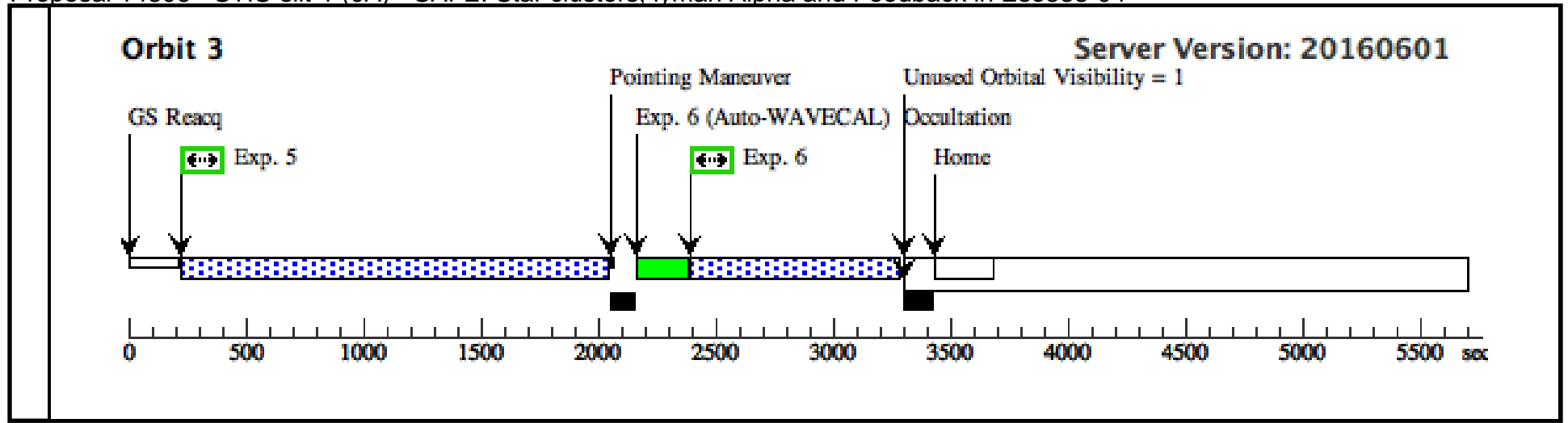


Proposal 14806 - STIS-slit-1 (0A) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

Fri Jul 29 19:52:58 GMT 2016

Visit	<b>Proposal 14806, STIS-slit-1 (0A), implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: ORIENT 197.5D TO 199 D; ORIENT 17.5D TO 19 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=STIS-ALONG-SLIT Purpose=DITHER Number Of Points=2 Point Spacing=0.5070 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides= Center Pattern=false		(2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	ESO338-CLUSTER23	RA: 19 27 58.3896 (291.9932900d) Dec: -41 34 30.81 (-41.57522d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2859.7 km/sec	V=17.59+/-0.05 mag_1500_AB = 16.7	Reference Frame: ICRS				
<i>Comments: Brightest central star cluster in ESO 388-04 = Bright Aperture (B)                      The coordinates have been determined in an ACS/WFC/F550W image that has been matched to 2MASS and the uncertainties in position quoted above is the resulting RMS from this match, using 21 stars. We have checked these stars for proper motion and the RMS of the proper motions over the 10 year time difference between 2MASS and the ACS image is approx 0.2 arcsec, hence smaller than the position uncertainty, but making a significant contribution to the total error budget. Hence we feel confident that a ACQ/IMA is adequate.                      Extended=NO</i>										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Acquisition on #23 (827229)	(2) ESO338-CLUST ER23	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			4.5 Secs (4.5 Secs) [==>]	[1]
	2	G430M slit 1	(2) ESO338-CLUST ER23	STIS/CCD, ACCUM, 52X0.2	G430M 4961 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in STIS-slit-1 (0A) (1)	1168 Secs (2336 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)]	[1]
	3	G140M exp 1 (827272)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				1456 Secs (1456 Secs) [==>]	[2]
	4	G140M exp 2 (827272)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG 0,0.25		1456 Secs (1456 Secs) [==>]	[2]
	5	G140M exp 3 (827272)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,-0.25		1800 Secs (1800 Secs) [==>]	[3]
	6	G140L (827324)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				880 Secs (880 Secs) [==>]	[3]





Proposal 14806 - STIS-slit-2 (0D) - SAFE: Star clusters, Lyman Alpha and Feedback in Eso338-04

Fri Jul 29 19:52:58 GMT 2016

Visit	<b>Proposal 14806, STIS-slit-2 (0D), implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: ORIENT 101D TO 102.5 D; ORIENT 281D TO 282.5 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=STIS-ALONG-SLIT Purpose=DITHER Number Of Points=2 Point Spacing=0.5070 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides= Center Pattern=false		(2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	ESO338-CLUSTER23	RA: 19 27 58.3896 (291.9932900d) Dec: -41 34 30.81 (-41.57522d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Radial Velocity: 2859.7 km/sec	V=17.59+/-0.05 mag_1500_AB = 16.7	Reference Frame: ICRS				
<i>Comments: Brightest central star cluster in ESO 388-04 = Bright Aperture (B)                      The coordinates have been determined in an ACS/WFC/F550W image that has been matched to 2MASS and the uncertainties in position quoted above is the resulting RMS from this match, using 21 stars. We have checked these stars for proper motion and the RMS of the proper motions over the 10 year time difference between 2MASS and the ACS image is approx 0.2 arcsec, hence smaller than the position uncertainty, but making a significant contribution to the total error budget. Hence we feel confident that a ACQ/IMA is adequate.                      Extended=NO</i>										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Acquisition on #23 (827229)	(2) ESO338-CLUST ER23	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			4.5 Secs (4.5 Secs) [==>]	[1]
	2	G430M slit 1	(2) ESO338-CLUST ER23	STIS/CCD, ACCUM, 52X0.2	G430M 4961 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in STIS-slit-2 (0D) (1)	1168 Secs (2336 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)]	[1]
	3	G140M exp 1 (827272)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				1456 Secs (1456 Secs) [==>]	[2]
	4	G140M exp 2 (827272)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG 0,0.25		1456 Secs (1456 Secs) [==>]	[2]
	5	G140M exp 3 (827272)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,-0.25		1800 Secs (1800 Secs) [==>]	[3]
	6	G140L (827324)	(2) ESO338-CLUST ER23	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				880 Secs (880 Secs) [==>]	[3]

