17494 - Resolving the C/O Abundance Discrepancy with HST/COS

Cycle: 31, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Danielle Berg (PI) (Contact)	**University of Texas at Austin**
Dr. Evan D. Skillman (CoI)	University of Minnesota - Twin Cities
Dr. Richard W. Pogge (CoI)	The Ohio State University
Dr. Noah Sidney James Rogers (CoI)	Northwestern University
Dra. Karla Ziboney Arellano Cordova (CoI) (ESA Member)	University of Edinburgh, Institute for Astronomy

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) M33+208+567 (11) M33+208+567-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:18.0	yes
51	(1) M33+208+567 (11) M33+208+567-OFFSET	COS/FUV COS/NUV	1	29-Oct-2024 16:00:19.0	yes
02	(2) M33+333+745 (12) M33+333+745-OFFSET	COS/FUV COS/NUV	1	29-Oct-2024 16:00:20.0	yes
52	(2) M33+333+745 (12) M33+333+745-OFFSET	COS/FUV COS/NUV	1	29-Oct-2024 16:00:21.0	yes
03	(3) M33+209+473 (13) M33+209+473-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:22.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(4) M33-438+800 (14) M33-438+800-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:23.0	yes
05	(5) M33+553+448 (15) M33+553+448-OFFSET	COS/FUV COS/NUV	3	29-Oct-2024 16:00:24.0	yes
06	(6) M101-209+312 (16) M101-209+311-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:25.0	yes
56	(6) M101-209+312 (16) M101-209+311-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:27.0	yes
07	(7) M101-368-286 (17) M101-368-285-OFFSET	COS/FUV COS/NUV	3	29-Oct-2024 16:00:28.0	yes
08	(8) M101-392-270 (18) M101-392-270-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:29.0	yes
09	(9) M101+510+264 (19) M101+510+264-OFFSET	COS/FUV COS/NUV	2	29-Oct-2024 16:00:31.0	yes
10	(10) M101+668+174 (20) M101+668+174-OFFSET	COS/FUV COS/NUV	1	29-Oct-2024 16:00:32.0	yes

24 Total Orbits Used

ABSTRACT

While oxygen and nitrogen have been widely observed in spiral and dwarf galaxies, the study of the next most abundant element, carbon, resides in a state of relative infancy. This is due, in large part, to the lack of strong C emission lines in the optical regime, which has made carbon abundance measurements in HII regions, despite their clear astrophysical importance, relatively rare. To complicate matters futher, there exists an unresolved discrepancy (the abundance discrepancy factor; ADF) between the two methods of deriving accurate abundances: the collisionally-excited emission lines (CELs) method and the recombination emission lines (RLs) method. Because the optical RLs are intrinsically very faint, there is only a small collection of extragalactic HII regions for which O/H abundances from RLs and, subsequently, the O ADF can be determined, while little to no ADF studies of other elements exist.

Fortunately, HST provides the opportunity to observe the UV CIII] 1907,1909 and OIII] 1666 CELs. We request 20 orbits of COS G160M+G185M

spectra of 10 HII regions in M33 and M101 with optical C RL detections. We will measure the UV C and O CELs, determine robust C/O abundances and gradients, measure the ionizing massive star population properties, and, combined with the existing RLs, provide a novel pathway to accessing the ADF with C. Owing to their different nucelosynthetic pathways and emission sensitivies, we will be able to compare the O and C ADFs for these 10 regions relative to their gaseous and stellar properties and constrain the source of the ADF; this will be the first coherent UV+optical C+O ADF analysis of its kind.

OBSERVING DESCRIPTION

The observational goal of our program is to use the Cosmic Origins Spectrograph to obtain measurements of the O III] 1666 and C III] 1907,1909 emission lines in 10 H II regions in M101 and M33, spanning a large range in metallicity and disk radius.

Target Acquisition: We have excellent H-alpha narrow-band and R-band astrometry (Massey+07), allowing us to center our COS observations on the regions of highest surface brightness in H-alpha. However, due to the proximity of M101 and M33, the large H II regions fill the COS aperture, making centering on the nebular peak difficult. Instead, we will use the efficient target image acquisition method of a pointing offset from a nearby bright star. We used the Guide Star Catalog 2.3 and GAIA to select offset stars within 1' of the target H II regions.

COS Spectra:

We will use the G160M grating with the 1533 setting, allowing simultaneous coverage of all the necessary stellar features to constrain the the properties of the ionizing massive star population population and the O III] 1666 emission line. While some past programs targeting O III] 1666 in very nearby targets have suffered from contamination by the Milky Way Al II 1671 absorption feature, the high spectral resolution of G160M will ensure that the proposed O III] 1666 observations are cleanly separated. Additionally, we will use the G185M grating with the 2010 setting to cleanly center the C III] 1907,1909 in the highest- sensitivity portion of the NUV strips.

Visit

Proposal 17494, M33+208+567 (01), failed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M33+208+567 (01))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Same Guide Stars in M33+208+567 (01))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

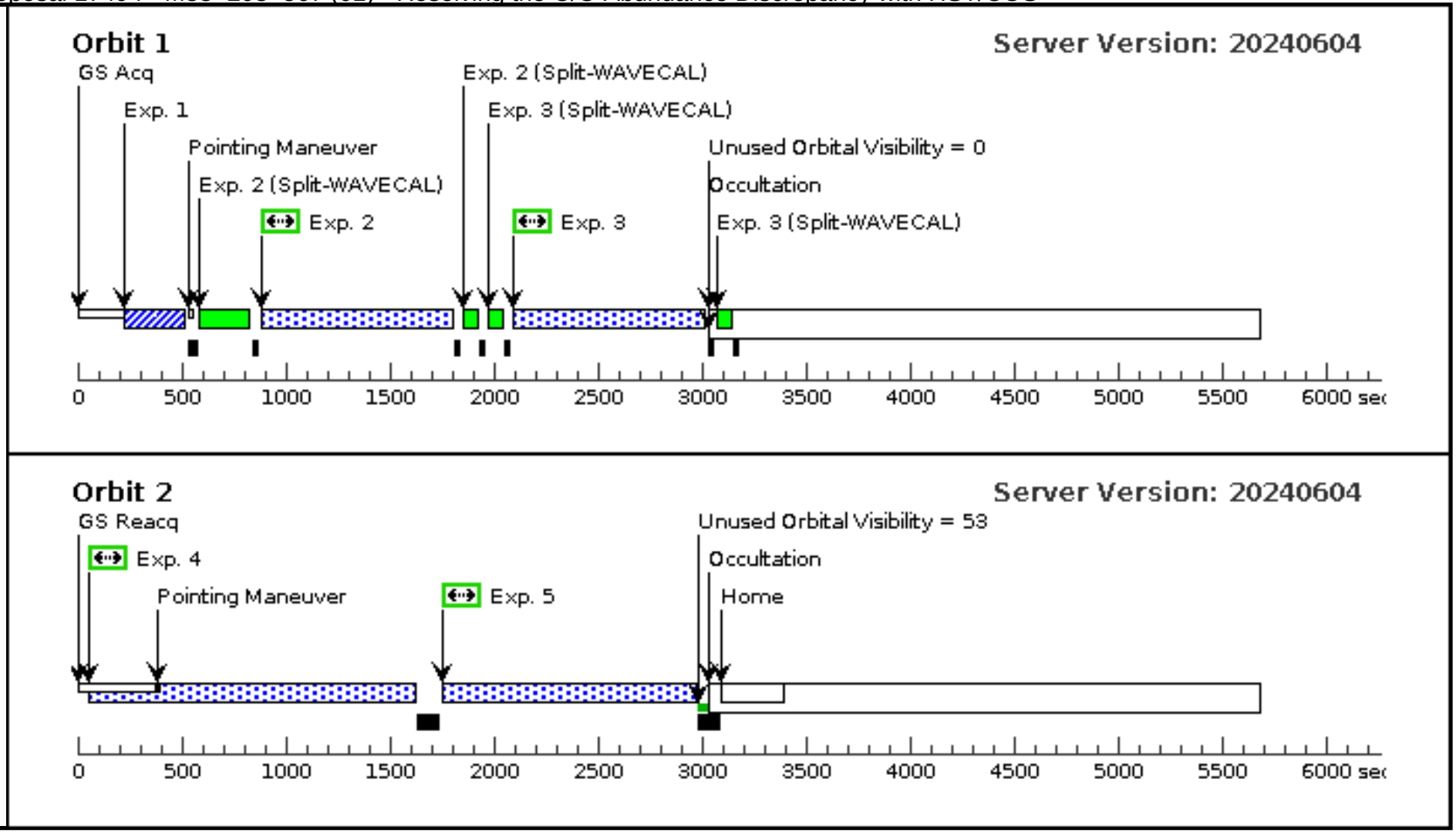
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M33+208+567	Offset from M33+208+567-OFFSET RA Offset: -0.23 Secs Dec Offset: 15.613 Arcsec		V=19.39 FUV/arcsec squared = 21.86	Offset Position (M33+208+567)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(11)	M33+208+567-OFFSET	RA: 01 34 6.9237 (23.5288487d) Dec: +30 48 41.38 (30.81149d) Equinox: J2000		V=19.5 F275W = 17.94	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891432)	(11) M33+208+567-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORA			Same Guide Stars in M33+208+567 (01)	40 Secs (40 Secs) *[==>]*	***[1]***
2	(1891080)	(1) M33+208+567	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+208+567 (01)	1000 Secs (873 Secs) *[==>873.0 Secs]*	***[1]***
3	(1891080)	(1) M33+208+567	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=4; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+208+567 (01)	1000 Secs (873 Secs) *[==>873.0 Secs]*	***[1]***
4	(1891082)	(1) M33+208+567	COS/NUV, TIME-TAG, PSA	G185M 2010 A	BUFFER-TIME=1200; FP-POS=3		Same Guide Stars in M33+208+567 (01)	1000 Secs (1200 Secs) *[==>1200.0 Secs]*	***[2]***
5	(1891082)	(1) M33+208+567	COS/NUV, TIME-TAG, PSA	G185M 2010 A	BUFFER-TIME=1200; FP-POS=4		Same Guide Stars in M33+208+567 (01)	1000 Secs (1200 Secs) *[==>1200.0 Secs]*	***[2]***

Orbit Structure



Visit

Proposal 17494, M33+208+567 (51), scheduling Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M33+208+567 (51))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Same Guide Stars in M33+208+567 (51))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

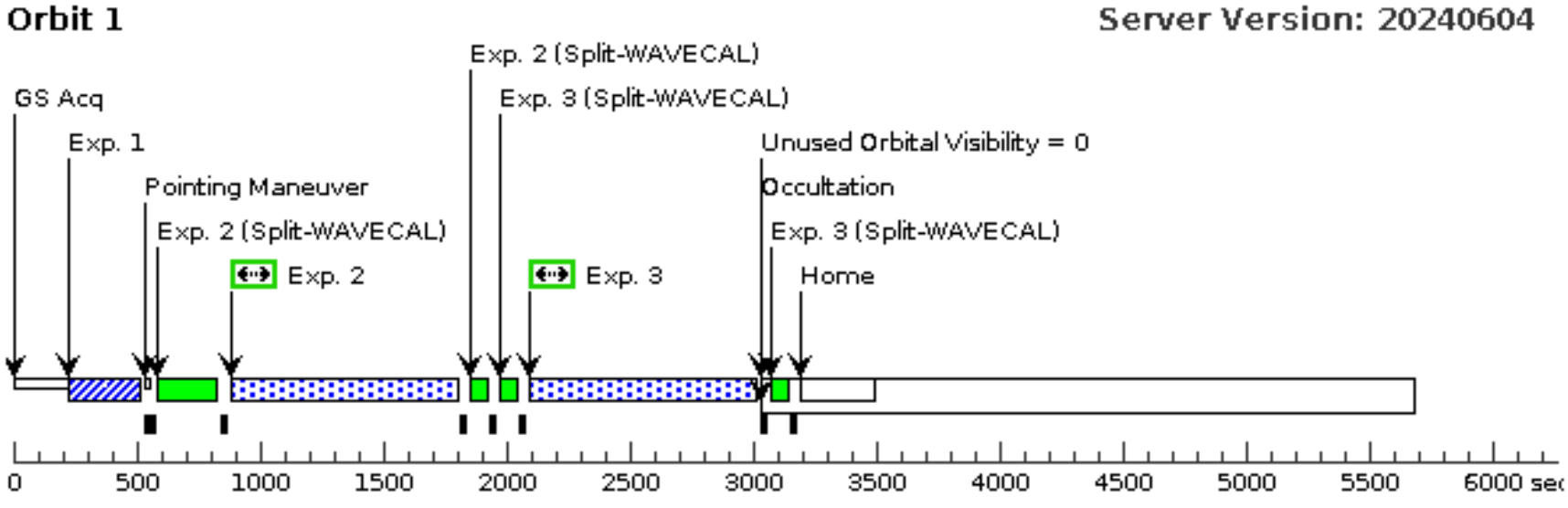
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M33+208+567	Offset from M33+208+567-OFFSET RA Offset: -0.23 Secs Dec Offset: 15.613 Arcsec		V=19.39 FUV/arcsec squared = 21.86	Offset Position (M33+208+567)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(11)	M33+208+567-OFFSET	RA: 01 34 6.9237 (23.5288487d) Dec: +30 48 41.38 (30.81149d) Equinox: J2000		V=19.5 F275W = 17.94	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891432)	(11) M33+208+567-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORA			Same Guide Stars in M33+208+567 (51)	40 Secs (40 Secs) *[==>]*	 ***[1]***
2	(1891080)	(1) M33+208+567	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+208+567 (51)	1000 Secs (873 Secs) *[==>873.0 Secs]*	 ***[1]***
3	(1891080)	(1) M33+208+567	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=4; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+208+567 (51)	1000 Secs (873 Secs) *[==>873.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 17494, M33+333+745 (02), failed

Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M33+333+745 (02))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Same Guide Stars in M33+333+745 (02))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

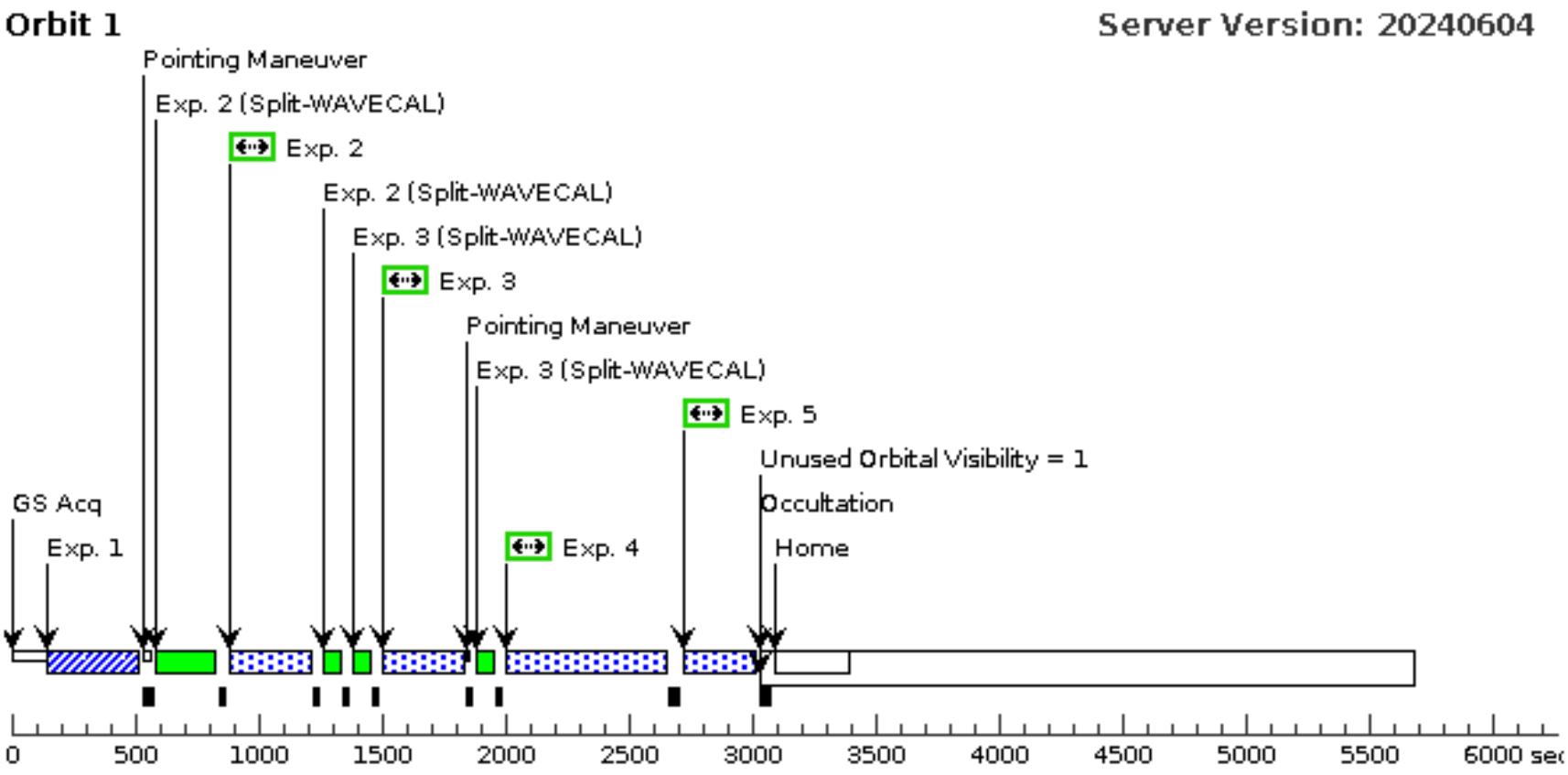
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	M33+333+745	Offset from M33+333+745-OFFSET RA Offset: -2.65 Secs Dec Offset: 16.709 Arcsec		V=19.00 FUV/arcsec squared = 20.36	Offset Position (M33+333+745)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(12)	M33+333+745-OFFSET	RA: 01 34 19.1139 (23.5796413d) Dec: +30 51 37.61 (30.86045d) Equinox: J2000		V=19.0	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891450)	(12) M33+333+745-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M33+333+745 (02)	40 Secs (40 Secs) *[==>]*	 ***[1]***
2	(1890649)	(2) M33+333+745	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+333+745 (02)	3000 Secs (278 Secs) *[==>278.0 Secs]*	 ***[1]***
3	(1890649)	(2) M33+333+745	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=4; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+333+745 (02)	3000 Secs (278 Secs) *[==>278.0 Secs]*	 ***[1]***
4	(1890616)	(2) M33+333+745	COS/NUV, TIME-TAG, PSA	G185M 2010 A	BUFFER-TIME=1100; FP-POS=3		Same Guide Stars in M33+333+745 (02)	500 Secs (278 Secs) *[==>278.0 Secs]*	 ***[1]***
5	(1890616)	(2) M33+333+745	COS/NUV, TIME-TAG, PSA	G185M 2010 A	BUFFER-TIME=1100; FP-POS=4		Same Guide Stars in M33+333+745 (02)	500 Secs (278 Secs) *[==>278.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 17494, M33+333+745 (52), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M33+333+745 (52))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Same Guide Stars in M33+333+745 (52))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

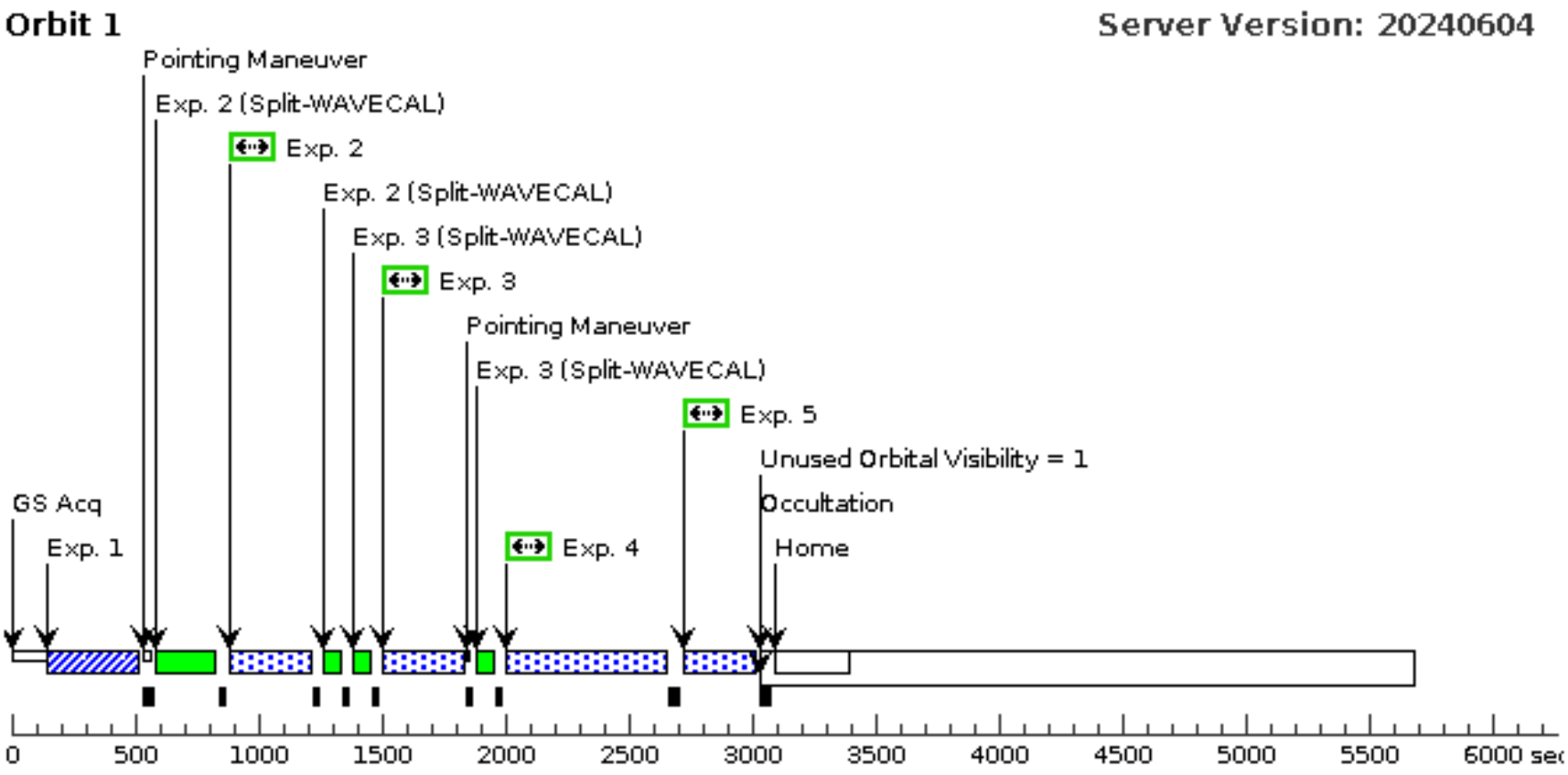
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	M33+333+745	Offset from M33+333+745-OFFSET RA Offset: -2.65 Secs Dec Offset: 16.709 Arcsec		V=19.00 FUV/arcsec squared = 20.36	Offset Position (M33+333+745)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(12)	M33+333+745-OFFSET	RA: 01 34 19.1139 (23.5796413d) Dec: +30 51 37.61 (30.86045d) Equinox: J2000		V=19.0	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891450)	(12) M33+333+745-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M33+333+745 (52)	40 Secs (40 Secs) *[==>]*	*[1]*
2	(1890649)	(2) M33+333+745	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+333+745 (52)	3000 Secs (278 Secs) *[==>278.0 Secs]*	*[1]*
3	(1890649)	(2) M33+333+745	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=4; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+333+745 (52)	3000 Secs (278 Secs) *[==>278.0 Secs]*	*[1]*
4	(1890616)	(2) M33+333+745	COS/NUV, TIME-TAG, PSA	G185M 2010 A	BUFFER-TIME=1100; FP-POS=3		Same Guide Stars in M33+333+745 (52)	500 Secs (278 Secs) *[==>278.0 Secs]*	*[1]*
5	(1890616)	(2) M33+333+745	COS/NUV, TIME-TAG, PSA	G185M 2010 A	BUFFER-TIME=1100; FP-POS=4		Same Guide Stars in M33+333+745 (52)	500 Secs (278 Secs) *[==>278.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 17494, M33+209+473 (03), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 4 (Same Guide Stars in M33+209+473 (03))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Same Guide Stars in M33+209+473 (03))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

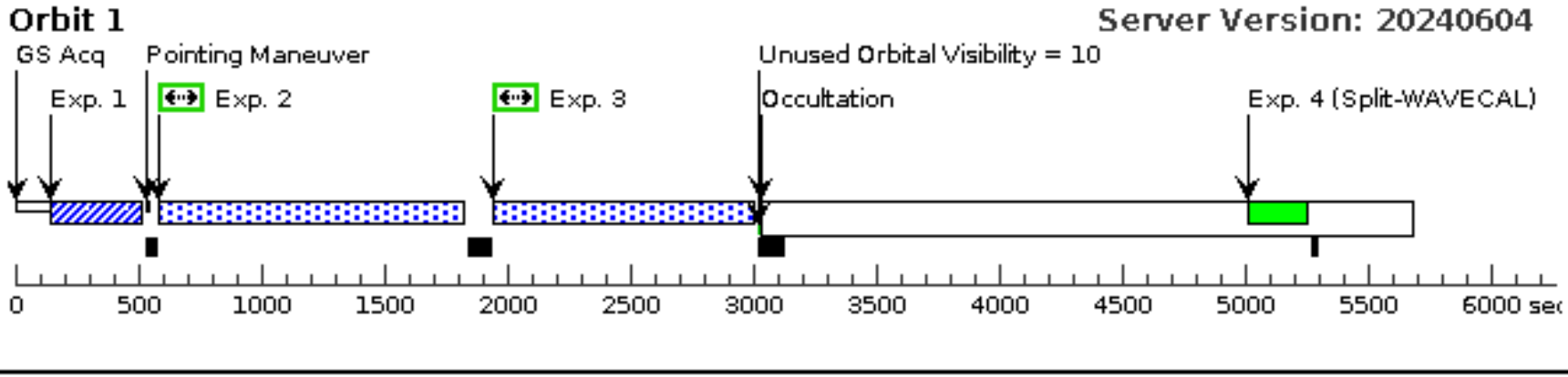
Fixed Targets

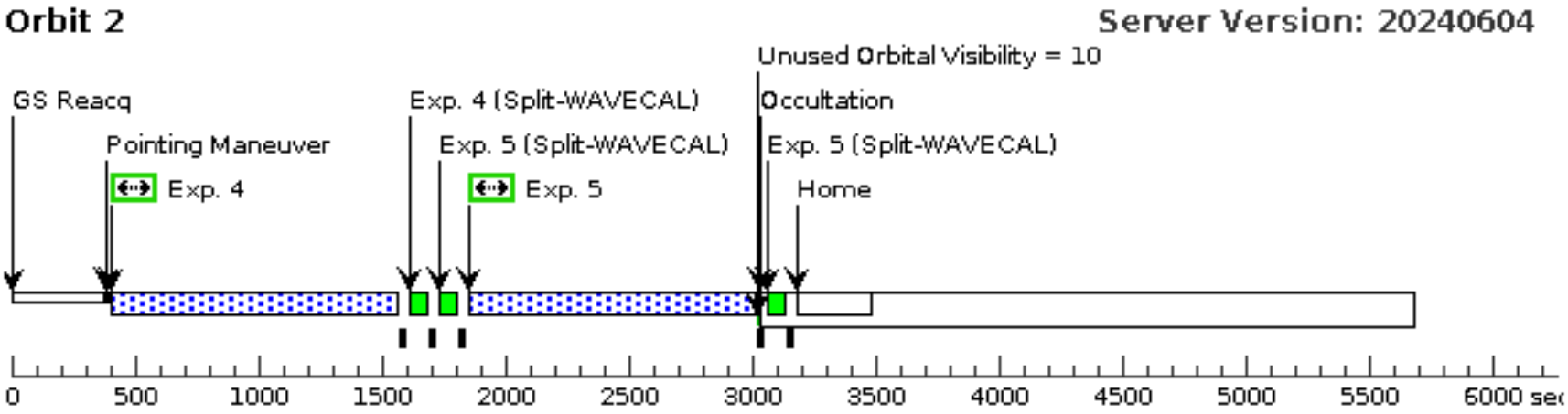
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	M33+209+473	Offset from M33+209+473-OFFSET RA Offset: 0.004 Secs Dec Offset: 0.182 Arcsec		V=17.69 FUV/arcsec squared = 20.29	Offset Position (M33+209+473)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(13)	M33+209+473-OFFSET	RA: 01 34 6.7938 (23.5283075d) Dec: +30 47 22.24 (30.78951d) Equinox: J2000		V=17.69 F275W = 16.48	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891443)	(13) M33+209+473-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M33+209+473 (03)	40 Secs (40 Secs) *[==>]*	***[1]***
2	(1890616)	(3) M33+209+473	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=3; BUFFER-TIME=1200		Same Guide Stars in M33+209+473 (03)	1000 Secs (1045 Secs) *[==>1045.0 Secs]*	***[1]***
3	(1890616)	(3) M33+209+473	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=4; BUFFER-TIME=1100		Same Guide Stars in M33+209+473 (03)	1000 Secs (1045 Secs) *[==>1045.0 Secs]*	***[1]***
4	(1890748)	(3) M33+209+473	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+209+473 (03)	3000 Secs (1108 Secs) *[==>1108.0 Secs]*	***[2]***
5	(1890748)	(3) M33+209+473	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=4; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+209+473 (03)	3000 Secs (1106 Secs) *[==>1106.0 Secs]*	***[2]***

Orbit Structure





Visit

Proposal 17494, M33-438+800 (04), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 4 (Same Guide Stars in M33-438+800 (04))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Same Guide Stars in M33-438+800 (04))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

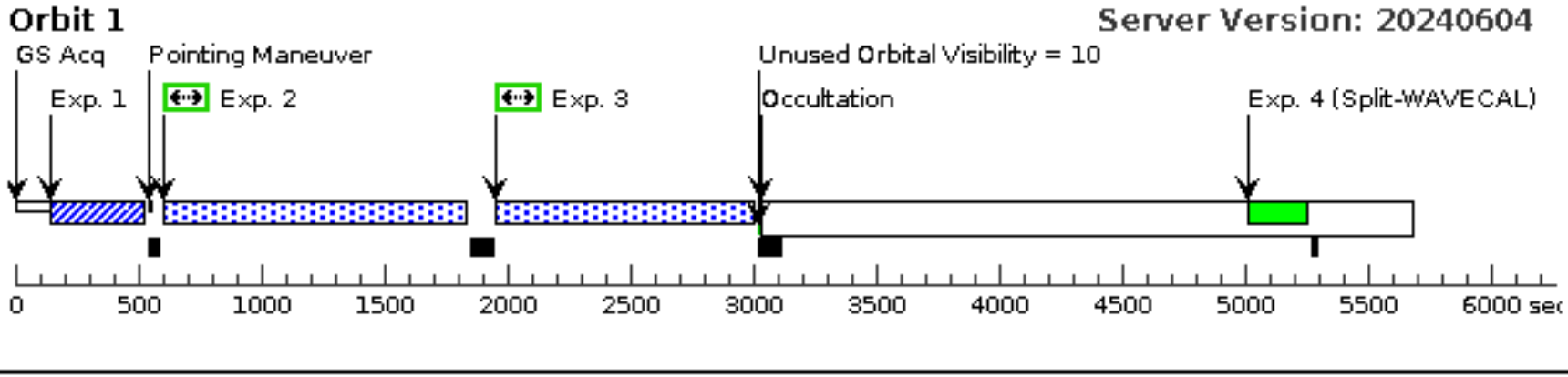
Fixed Targets

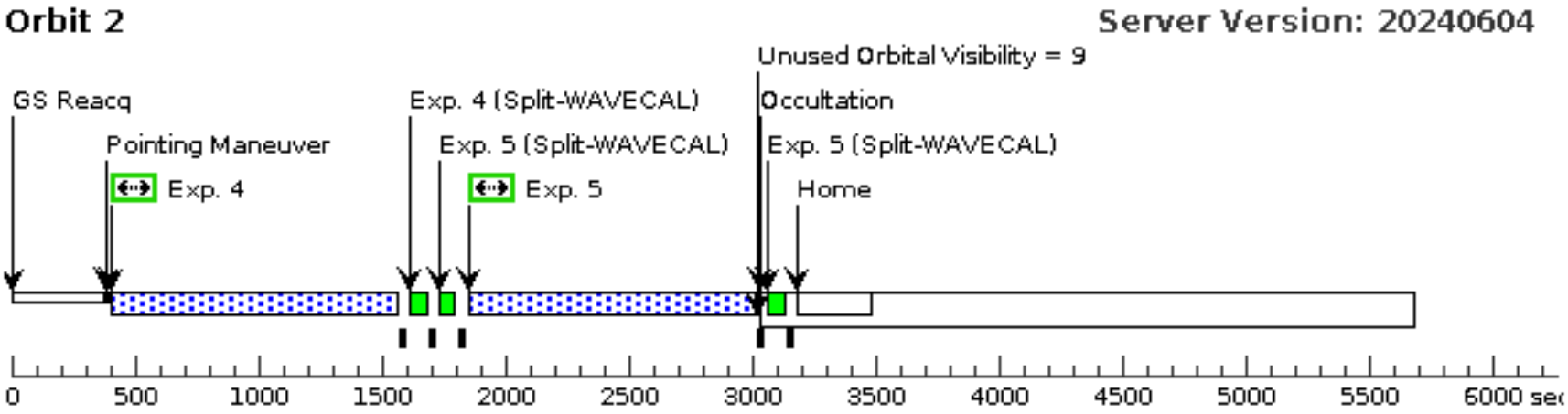
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	M33-438+800	Offset from M33-438+800-OFFSET RA Offset: 0.384 Secs Dec Offset: 4.128 Arcsec		V=17.72 FUV/arcsec squared = 20.94	Offset Position (M33-438+800)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(14)	M33-438+800-OFFSET	RA: 01 33 16.1728 (23.3173867d) Dec: +30 52 45.57 (30.87933d) Equinox: J2000		V=17.72 F275W = 16.67	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891440)	(14) M33-438+800-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M33-438+800 (04)	47 Secs (47 Secs) *[==>]*	 ***[1]***
2	(1890641)	(4) M33-438+800	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=3; BUFFER-TIME=1200		Same Guide Stars in M33-438+800 (04)	1000 Secs (1038 Secs) *[==>1038.0 Secs]*	 ***[1]***
3	(1890616)	(4) M33-438+800	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=4; BUFFER-TIME=1200		Same Guide Stars in M33-438+800 (04)	1000 Secs (1038 Secs) *[==>1038.0 Secs]*	 ***[1]***
4	(1890752)	(4) M33-438+800	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33-438+800 (04)	3000 Secs (1109 Secs) *[==>1109.0 Secs]*	 ***[2]***
5	(1890752)	(4) M33-438+800	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33-438+800 (04)	3000 Secs (1109 Secs) *[==>1109.0 Secs]*	 ***[2]***

Orbit Structure





Visit

Proposal 17494, M33+553+448 (05), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M33+553+448 (05))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Same Guide Stars in M33+553+448 (05))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

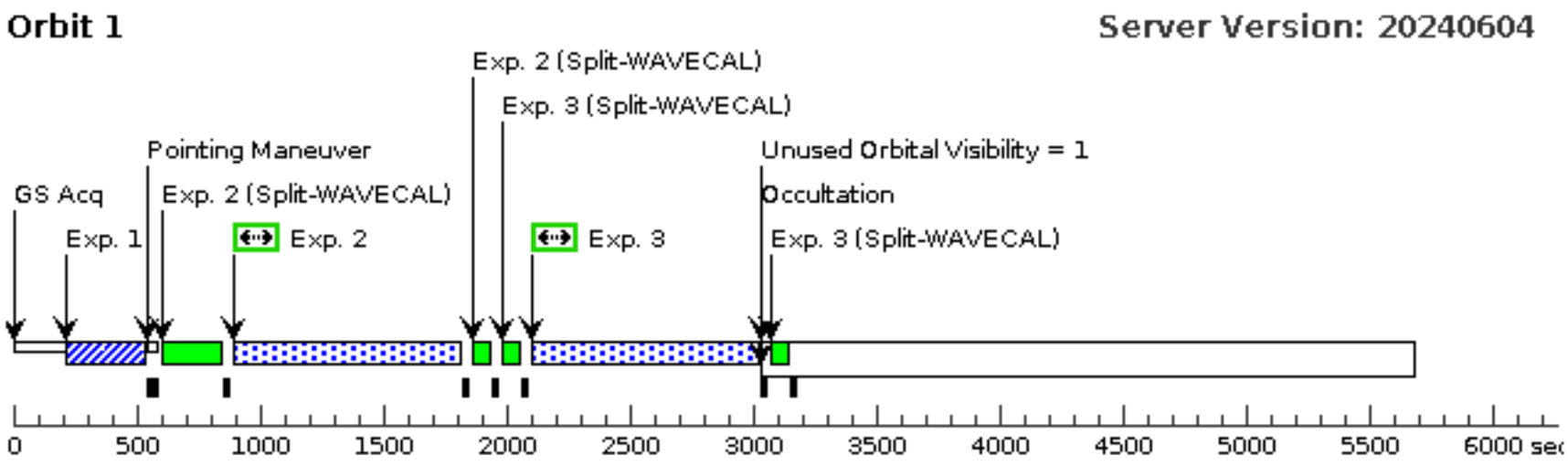
Fixed Targets

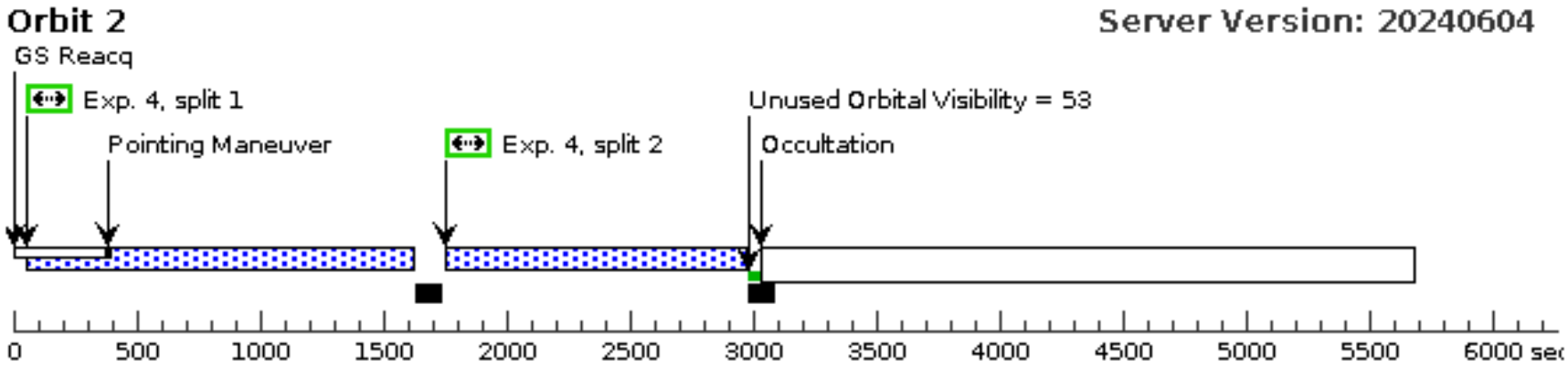
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	M33+553+448	Offset from M33+553+448-OFFSET RA Offset: -3.47 Secs Dec Offset: 35.48 Arcsec		V=13.43 FUV/arcsec squared = 18.24	Offset Position (M33+553+448)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(15)	M33+553+448-OFFSET	RA: 01 34 36.9387 (23.6539113d) Dec: +30 46 21.77 (30.77271d) Equinox: J2000		V=13.43 F275W = 13.16	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

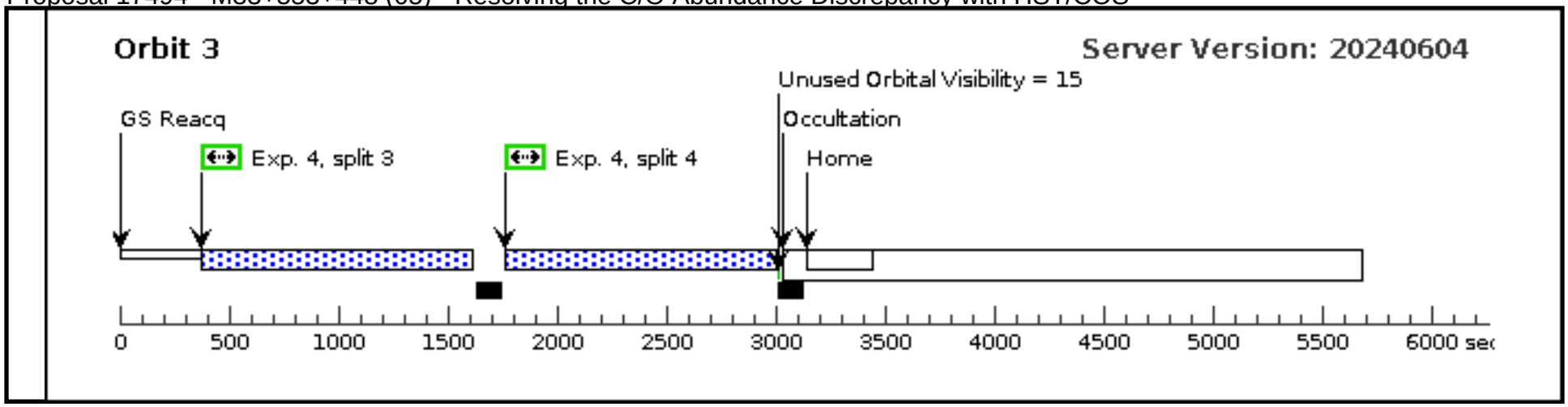
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1891447)	(15) M33+553+448-OFFSET	COS/NUV, ACQ/IMAGE, BOA	MIRRORA			Same Guide Stars in M33+553+448 (05)	47 Secs (47 Secs) *[==>]*	 ***[1]***
2	(1890644)	(5) M33+553+448	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=3; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+553+448 (05)	3000 Secs (865 Secs) *[==>865.0 Secs]*	 ***[1]***
3	(1890644)	(5) M33+553+448	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=4; BUFFER-TIME=10000	EXP PCS MODE FINE	Same Guide Stars in M33+553+448 (05)	3000 Secs (865 Secs) *[==>865.0 Secs]*	 ***[1]***
4	(1890643)	(5) M33+553+448	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=ALL; BUFFER-TIME=1200		Same Guide Stars in M33+553+448 (05)	3500 Secs (4858 Secs) *[==>1200.0 Secs (Split 1)]* *[==>1200.0 Secs (Split 2)]* *[==>1229.0 Secs (Split 3)]* *[==>1229.0 Secs (Split 4)]*	 ***[2]*** ***[3]***

Orbit Structure






Orbit 3
Server Version: 20240604
Unused Orbital Visibility = 15
GS Reacq
Occultation
Exp. 4, split 3
Exp. 4, split 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17494, M101-209+312 (06), failed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(M101-209+312 (06)) Warning (Orbit Planner): MERGING RULE VIOLATED DURING AUTOMATIC MERGING

(M101-209+312 (06)) Warning (Orbit Planner): MERGING RULE VIOLATED DURING AUTOMATIC MERGING

(Exposure 2 (Same Obset in M101-209+312 (06))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

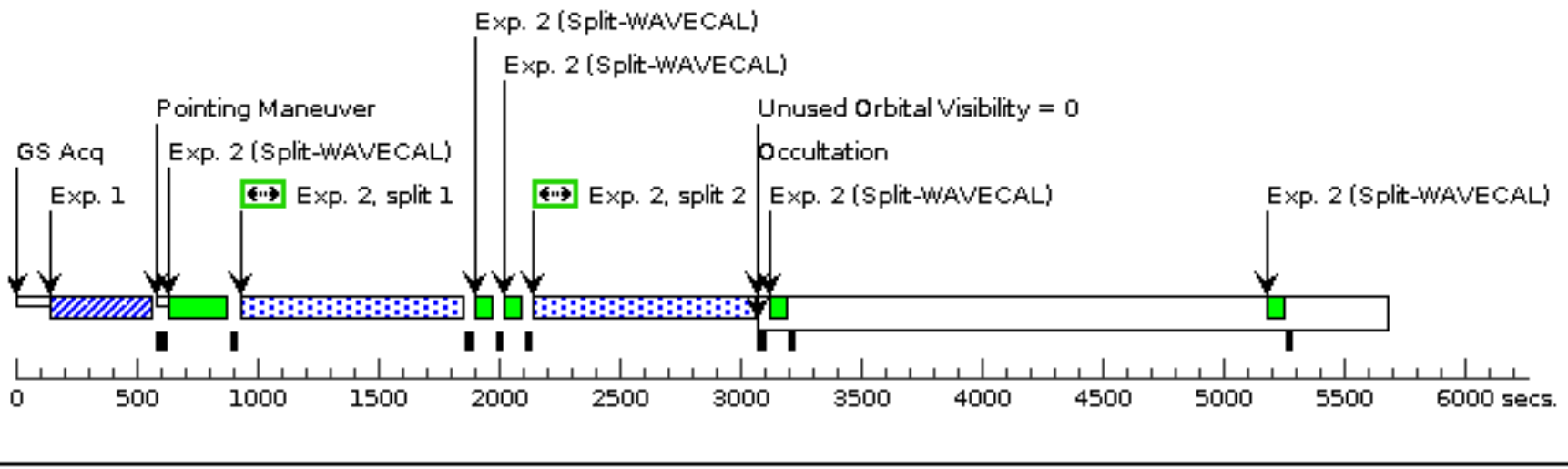
Fixed Targets

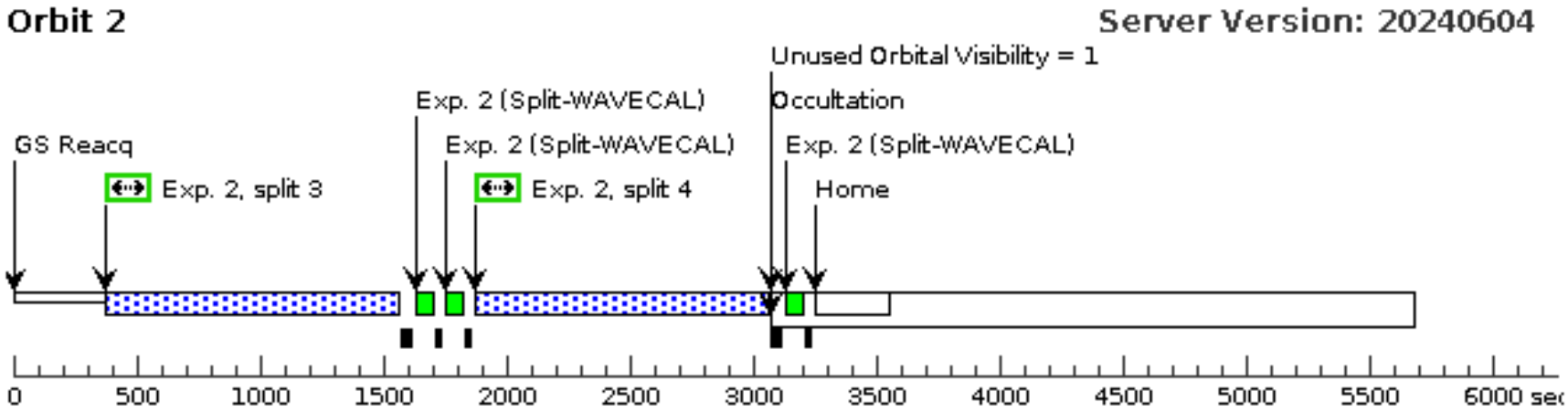
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	M101-209+312	Offset from M101-209+311-OFFSET RA Offset: 7.049 Secs Dec Offset: -119.974 Arcsec		V=7.77 FUV/arcsec squared = 21.070	Offset Position (M101-209+312)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(16)	M101-209+311-OFFSET	RA: 14 02 54.1150 (210.7254792d) Dec: +54 16 29.13 (54.27476d) Equinox: J2000		V=13.6 NUV=17.64	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1006906)	(16) M101-209+311-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Obset in M101-209+312 (06)	65 Secs (65 Secs)	
								[==>]	***[1]***
2	(934460)	(6) M101-209+312	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=ALL; BUFFER-TIME=5000	EXP PCS MODE FINE	Same Obset in M101-209+312 (06)	3000 Secs (4006 Secs)	
								[==>865.0 Secs (Split 1)] *[==>865.0 Secs (Split 2)]*	***[1]***
								[==>1138.0 Secs (Split 3)] *[==>1138.0 Secs (Split 4)]*	***[2]***

Orbit Structure





Visit

Proposal 17494, M101-209+312 (56) Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(M101-209+312 (56)) Warning (Orbit Planner): MERGING RULE VIOLATED DURING AUTOMATIC MERGING

(M101-209+312 (56)) Warning (Orbit Planner): MERGING RULE VIOLATED DURING AUTOMATIC MERGING

(Exposure 2 (Same Obset in M101-209+312 (56))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

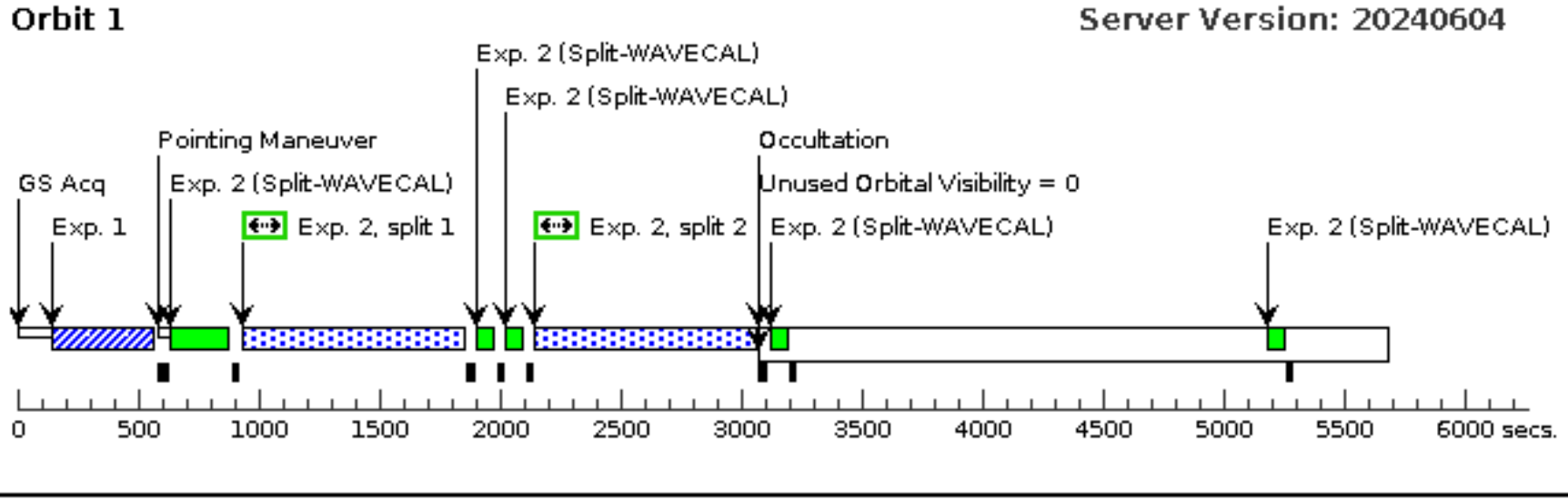
Fixed Targets

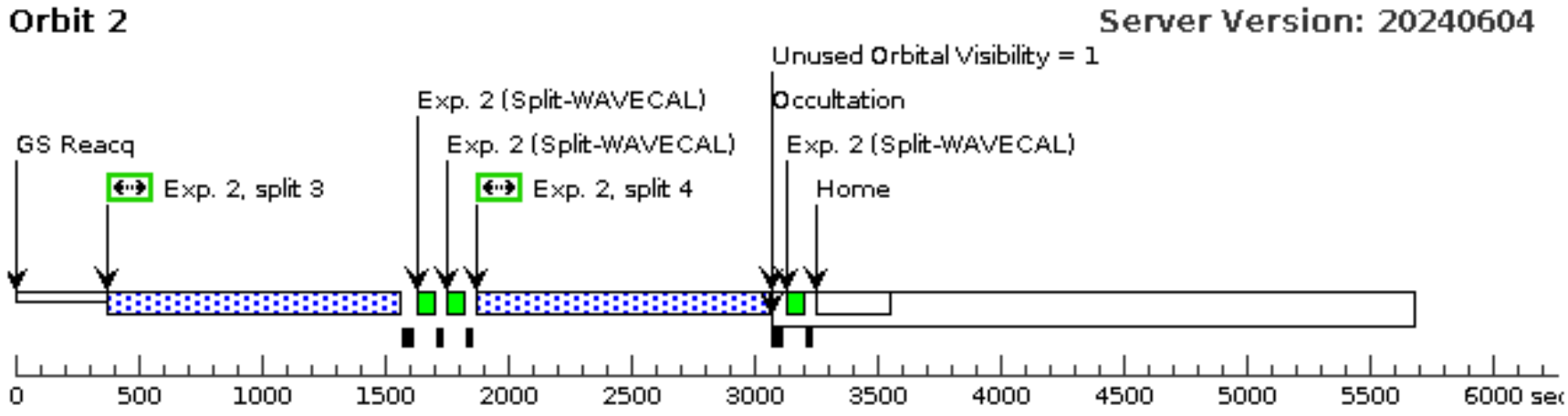
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	M101-209+312	Offset from M101-209+311-OFFSET RA Offset: 7.049 Secs Dec Offset: -119.974 Arcsec		V=7.77 FUV/arcsec squared = 21.070	Offset Position (M101-209+312)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(16)	M101-209+311-OFFSET	RA: 14 02 54.1150 (210.7254792d) Dec: +54 16 29.13 (54.27476d) Equinox: J2000		V=13.6 NUV=17.64	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1006906)	(16) M101-209+311-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Obset in M101-209+312 (56)	65 Secs (65 Secs)	
								[==>]	***[1]***
2	(934460)	(6) M101-209+312	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=ALL; BUFFER-TIME=5000	EXP PCS MODE FINE	Same Obset in M101-209+312 (56)	3000 Secs (4006 Secs)	
								[==>865.0 Secs (Split 1)] *[==>865.0 Secs (Split 2)]*	***[1]***
								[==>1138.0 Secs (Split 3)] *[==>1138.0 Secs (Split 4)]*	***[2]***

Orbit Structure





Visit

Proposal 17494, M101-368-286 (07), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M101-368-286 (07))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

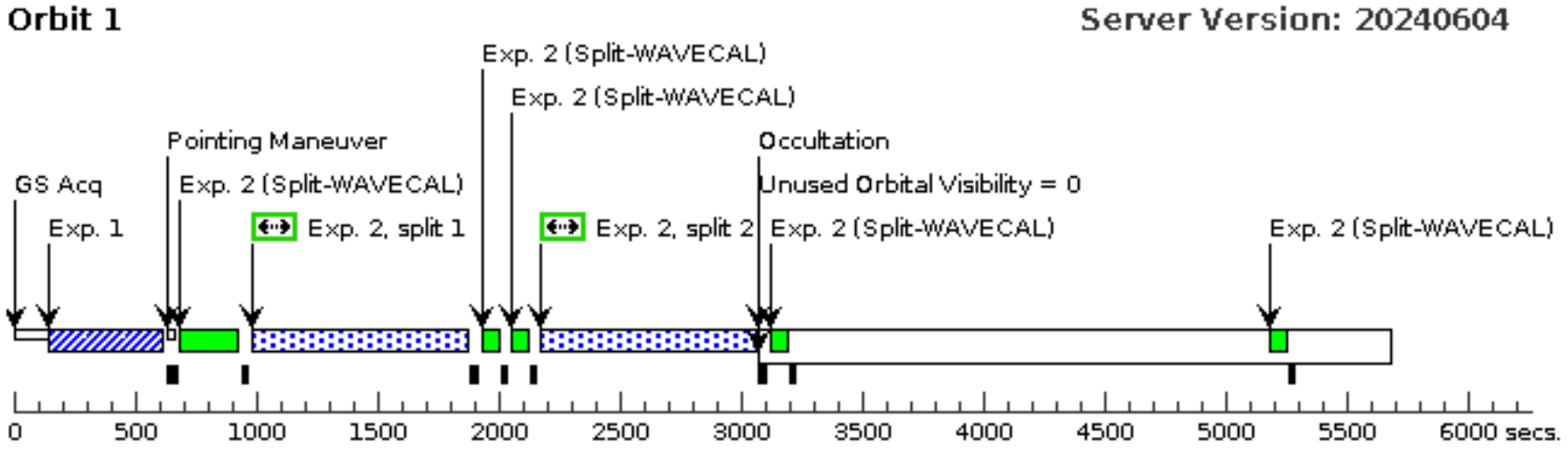
Fixed Targets

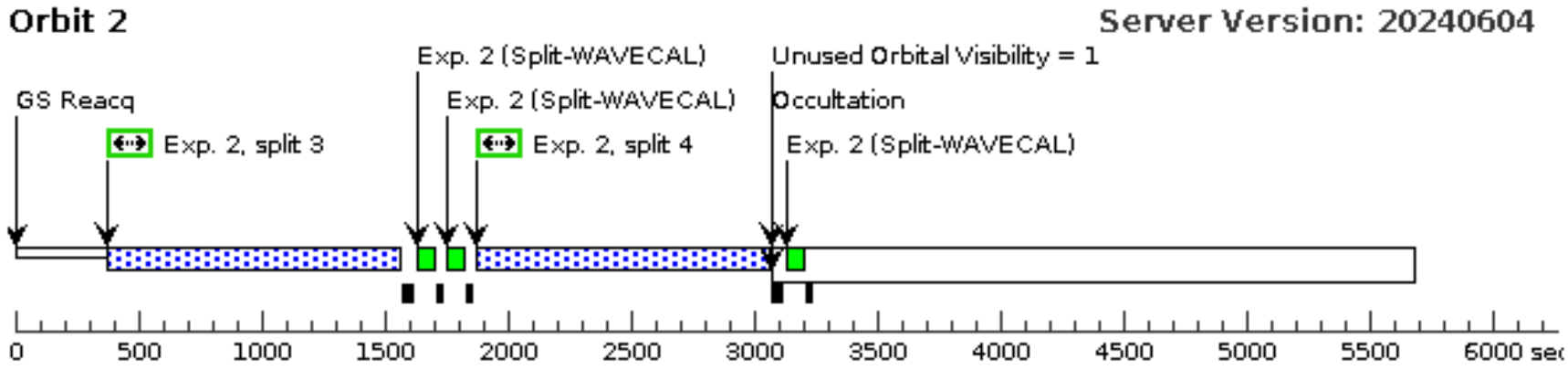
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	M101-368-286	Offset from M101-368-285-OFFSET RA Offset: 1.03 Secs Dec Offset: -45.776 Arcsec		V=7.77 FUV/arcsec squared = 21.816	Offset Position (M101-368-286)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(17)	M101-368-285-OFFSET	RA: 14 02 29.5710 (210.6232125d) Dec: +54 16 55.49 (54.28208d) Equinox: J2000		V=7.77 U=15.26	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

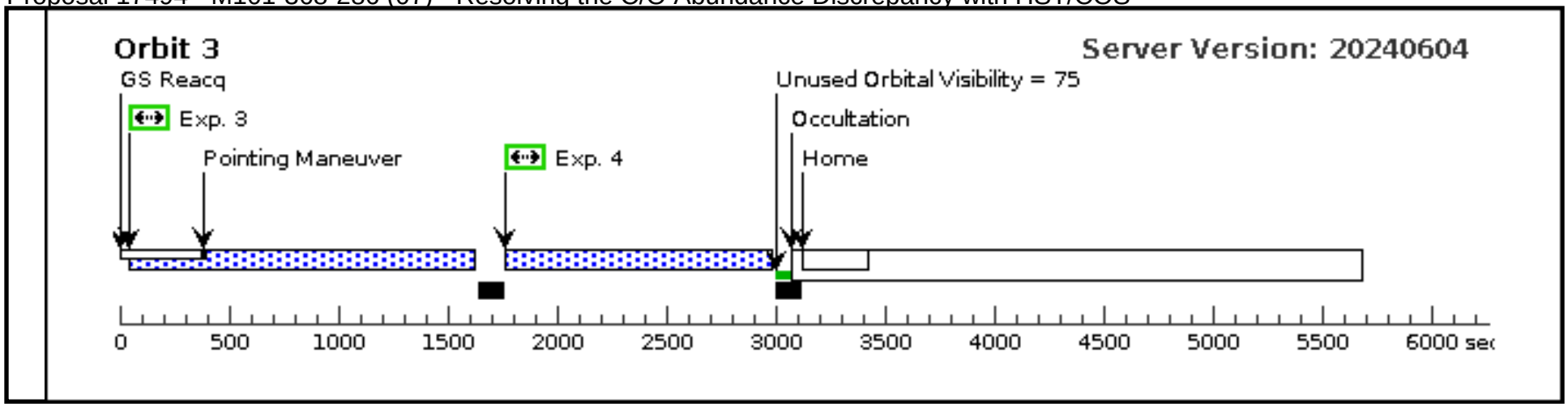
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1006921)	(17) M101-368-285-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M101-368-286 (07)	90 Secs (90 Secs) *[==>]*	***[1]***
2	(1890649)	(7) M101-368-286	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=ALL; BUFFER-TIME=5000	EXP PCS MODE FINE	Same Guide Stars in M101-368-286 (07)	3000 Secs (3956 Secs) *[==>840.0 Secs (Split 1)]* *[==>840.0 Secs (Split 2)]* *[==>1138.0 Secs (Split 3)]* *[==>1138.0 Secs (Split 4)]*	***[1]*** ***[2]***
3	(1901406)	(7) M101-368-286	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=3; BUFFER-TIME=1200		Same Guide Stars in M101-368-286 (07)	2000 Secs (1206 Secs) *[==>1206.0 Secs]*	***[3]***
4	(1901406)	(7) M101-368-286	COS/NUV, TIME-TAG, PSA	G185M 2010 A	FP-POS=4; BUFFER-TIME=1200		Same Guide Stars in M101-368-286 (07)	2000 Secs (1206 Secs) *[==>1206.0 Secs]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20240604
GS Reacq
Exp. 3
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 75
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17494, M101-392-270 (08), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M101-392-270 (08))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

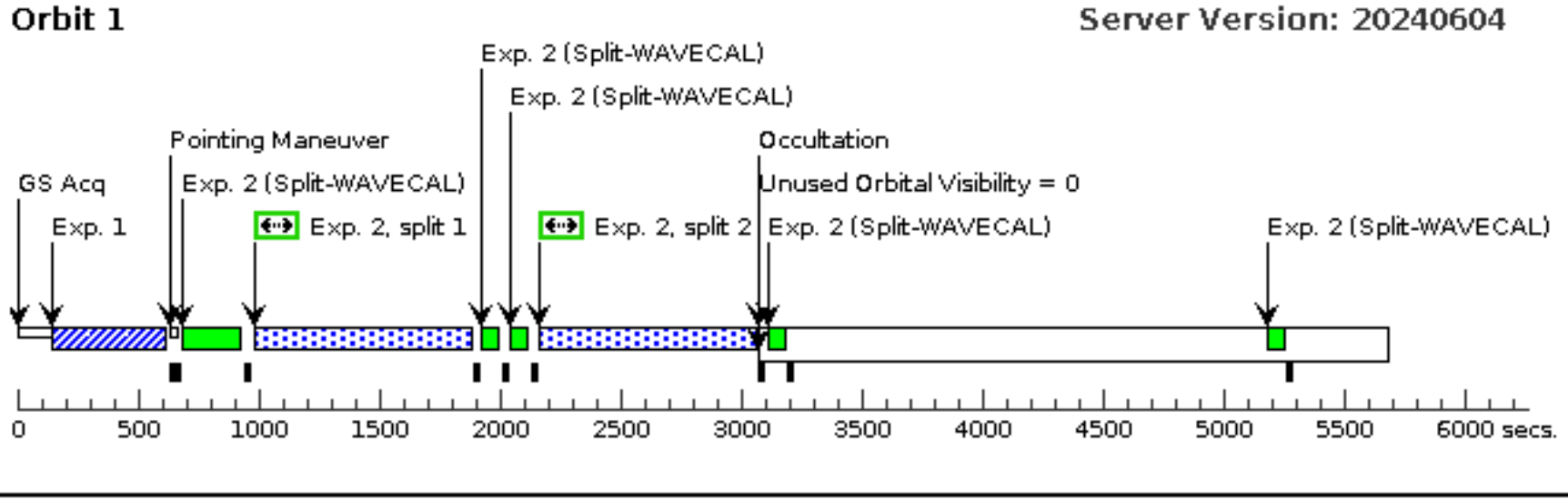
Fixed Targets

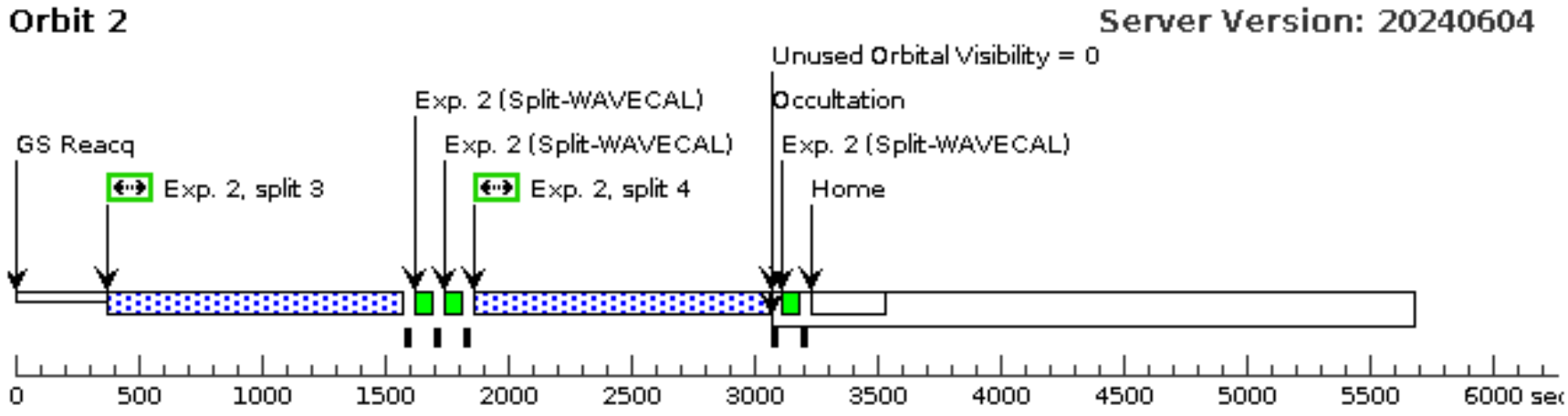
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	M101-392-270	Offset from M101-392-270-OFFSET RA Offset: -1.351 Secs Dec Offset: -29.094 Arcsec		V=7.77 FUV/arcsec squared = 21.250	Offset Position (M101-392-270)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(18)	M101-392-270-OFFSET	RA: 14 02 29.5710 (210.6232125d) Dec: +54 16 55.49 (54.28208d) Equinox: J2000		V=7.77 U=15.26	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1006921)	(18) M101-392-270-OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M101-392-270 (08)	90 Secs (90 Secs)	
								[==>]	***[1]***
2	(1890748)	(8) M101-392-270	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=ALL; BUFFER-TIME=15000	EXP PCS MODE FINE	Same Guide Stars in M101-392-270 (08)	3000 Secs (3986 Secs)	
								[==>845.0 Secs (Split 1)] *[==>845.0 Secs (Split 2)]*	***[1]***
								[==>1148.0 Secs (Split 3)] *[==>1148.0 Secs (Split 4)]*	***[2]***

Orbit Structure





Visit

Proposal 17494, M101+510+264 (09), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(M101+510+264 (09)) Warning (Orbit Planner): MERGING RULE VIOLATED DURING AUTOMATIC MERGING

(M101+510+264 (09)) Warning (Orbit Planner): MERGING RULE VIOLATED DURING AUTOMATIC MERGING

(Exposure 2 (Same Guide Stars in M101+510+264 (09))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

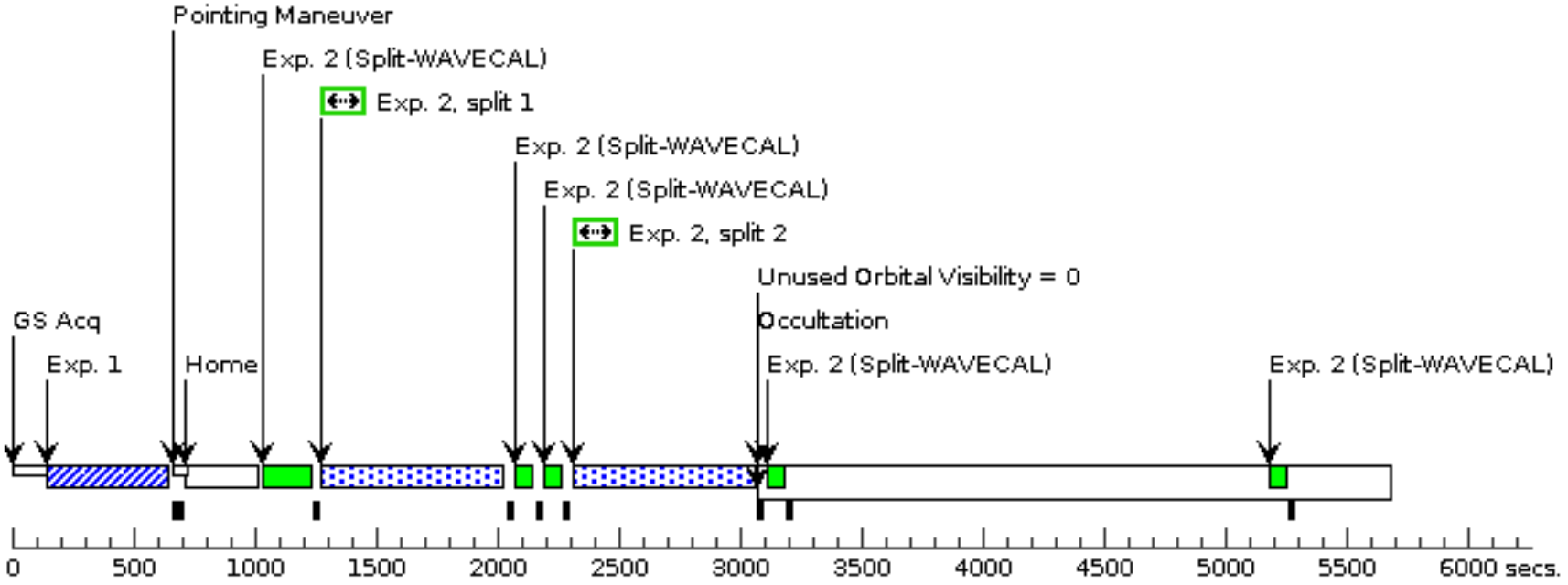
Fixed Targets

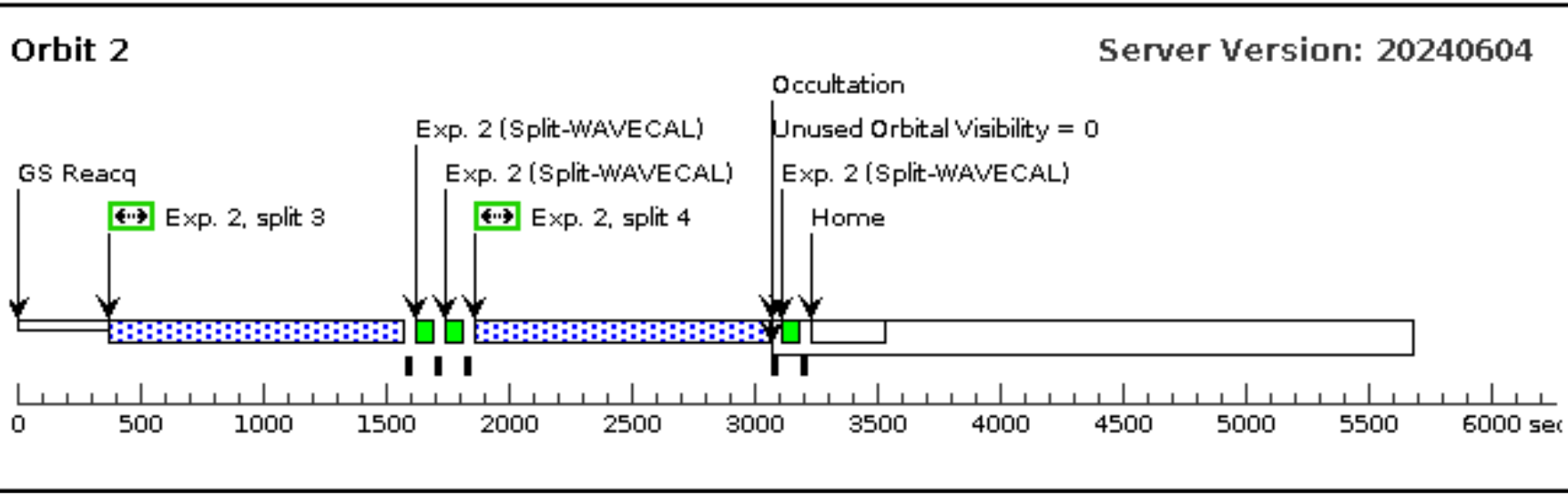
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	M101+510+264	Offset from M101+510+264-OFFSET RA Offset: -9.213 Secs Dec Offset: 113.605 Arcsec		V=7.77 FUV/arcsec squared = 21.673	Offset Position (M101+510+264)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(19)	M101+510+264-OFFSET	RA: 14 04 20.4240 (211.0851000d) Dec: +54 23 24.55 (54.39015d) Equinox: J2000		V=13.85 NUV=17.85	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1006924)	(19) M101+510+264 -OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M101+510+264 (09)	105 Secs (105 Secs) *[==>]*	 ***[1]***
2	(1890752)	(9) M101+510+264	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=ALL; BUFFER-TIME=15000	EXP PCS MODE FINE	Same Guide Stars in M101+510+264 (09)	3000 Secs (3688 Secs) *[==>696.0 Secs (Split 1)]* *[==>696.0 Secs (Split 2)]* *[==>1148.0 Secs (Split 3)]* *[==>1148.0 Secs (Split 4)]*	 ***[1]*** ***[2]***

Orbit Structure





Visit

Proposal 17494, M101+668+174 (10), completed Tue Oct 29 20:00:33 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Same Guide Stars in M101+668+174 (10))) 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
(10)	M101+668+174	Offset from M101+668+174-OFFSET RA Offset: 8.982 Secs Dec Offset: 22.595 Arcsec		V=7.77 FUV/arcsec squared = 20.224	Offset Position (M101+668+174)
Comments: *Category=ISM* *Description=[HII REGION]* *Extended=YES*					
(20)	M101+668+174-OFFSET	RA: 14 04 20.4240 (211.0851000d) Dec: +54 23 24.55 (54.39015d) Equinox: J2000		V=13.85 NUV=17.85	Reference Frame: ICRS
Comments: *Category=EXT-MEDIUM* *Description=[HII REGION]* *Extended=NO*					

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1006924)	(20) M101+668+174 -OFFSET	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Same Guide Stars in M101+668+174 (10)	105 Secs (105 Secs) *[==>]*	 ***[1]***
2	(1890754)	(10) M101+668+174	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FP-POS=ALL; BUFFER-TIME=14 000	EXP PCS MODE FI NE	Same Guide Stars in M101+668+174 (10)	3000 Secs (976 Secs) *[==>244.0 Secs (Split 1)]* *[==>244.0 Secs (Split 2)]* *[==>244.0 Secs (Split 3)]* *[==>244.0 Secs (Split 4)]*	 ***[1]***

Orbit Structure