15646 - Massive Stellar Populations at Reionization-Era Metallicities with Ultra-Deep HST/COS Spectroscopy

Cycle: 26, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SB82	COS/FUV COS/NUV	5	30-Oct-2019 11:00:38.0	yes
02	(1) SB82	COS/FUV COS/NUV	5	30-Oct-2019 11:00:39.0	yes
03	(2) SB2	COS/FUV COS/NUV	5	30-Oct-2019 11:00:41.0	yes
04	(2) SB2	COS/FUV COS/NUV	5	30-Oct-2019 11:00:42.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
05	(3) HS1442+4250	COS/FUV COS/NUV	5	30-Oct-2019 11:00:43.0	yes
06	(3) HS1442+4250	COS/FUV COS/NUV	5	30-Oct-2019 11:00:44.0	yes
07	(4) J104457	COS/FUV COS/NUV	5	30-Oct-2019 11:00:45.0	yes
08	(4) J104457	COS/FUV COS/NUV	5	30-Oct-2019 11:00:46.0	yes
56	(3) HS1442+4250	COS/FUV COS/NUV	1	30-Oct-2019 11:00:47.0	yes

41 Total Orbits Used

ABSTRACT

The first glimpse of the spectral properties of z~7-10 galaxies has recently emerged. Deep UV spectra have revealed intense emission from nebular CIII] and CIV, implying a hard radiation field that is rarely seen at lower redshifts. Unfortunately, we are currently unprepared to interpret these features, owing to shortcomings in our understanding of the radiation field powered by low metallicity stellar populations. Recent work with HST/COS in the local universe has provided a way forward, unveiling four nearby metal poor galaxies with UV nebular line spectra approaching those seen at z>7. The discovery of these galaxies opens the door for the first comprehensive investigation of the low metallicity stellar populations that likely dominate at z>7. Here we propose to obtain ultra-deep (10 orbit) COS/G160M spectra capable of measuring stellar photospheric and wind absorption features in these four galaxies. The data will provide the first quantitative constraints on the metallicity of massive stars required to power the hard radiation fields implied by the nebular lines and will allow us to investigate whether the stellar metallicity (sensitive to iron) departs from the metallicity of the nebular gas (sensitive to oxygen) in the extreme UV line emitters. Using new spectral tools, we will simultaneously fit the stellar absorption features and nebular lines, providing a powerful stress test of population synthesis models at low metallicity. If this UV spectral database is not obtained while COS is still functioning, the interpretation of reionization era galaxy spectra will be severely jeopardized throughout the JWST era.

OBSERVING DESCRIPTION

We will obtain deep medium-resolution FUV COS spectroscopy for four metal-poor star-forming galaxies previously identified as high-ionization nebular line emitters with shallow UV spectroscopy. All four have already been observed with HST/COS, which also confirm each are dominated by easily-acquired compact star-forming regions bright in the UV (FUV<19). We will utilize the same acquisition strategy adopted previously: using an NUV ACQ/IMAGE exposure initially centered on the SDSS-derived ICRS coordinates of the bright knot. We adopt the Mirror A ACQ/IMAGE exposure times successfully used previously. The spectroscopic observations will be conducted in the G160M/1533 grism setting which covers the stellar photospheric and wind features we are targeting at the redshifts of the selected galaxies. Exposures will be taken in the TIME-TAG mode in all four focal positions for each object. Observations are split into two 5-orbit blocks per object for optimal scheduling, and each orbit is devoted to a single science exposure with buffer dumps occurring during occultation. ETC estimates indicate that the combined exposures will exceed an S/N of 15 per resolution element, sufficient to detect the faint stellar features we proposed to measure.

Visit

Proposal 15646, Visit 01, scheduling Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 01) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

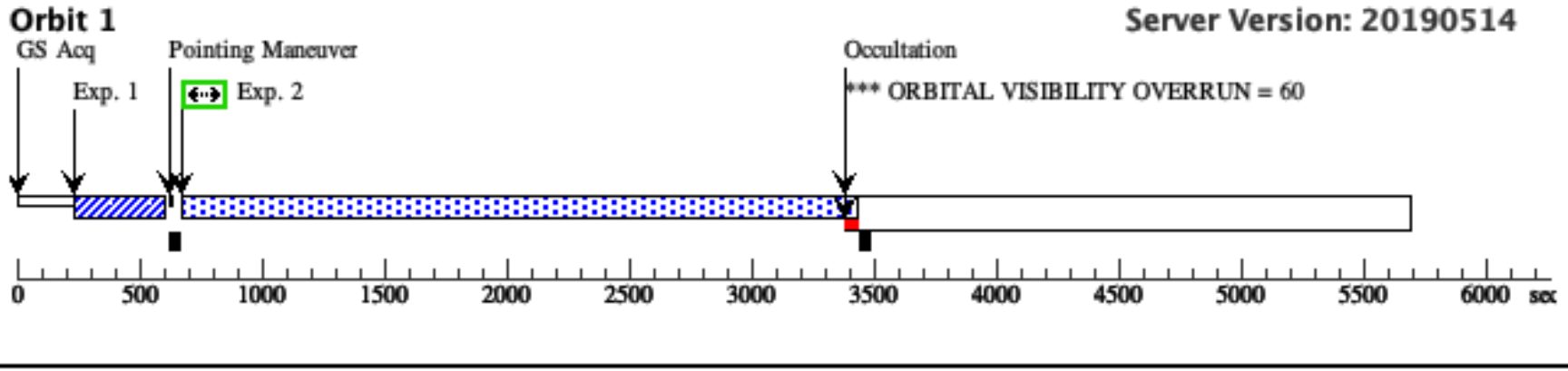
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SB82	RA: 11 55 28.3400 (178.8680833d) Dec: +57 39 51.97 (57.66444d) Equinox: J2000		V=17.3 FUV = 17.6	Reference Frame: ICRS

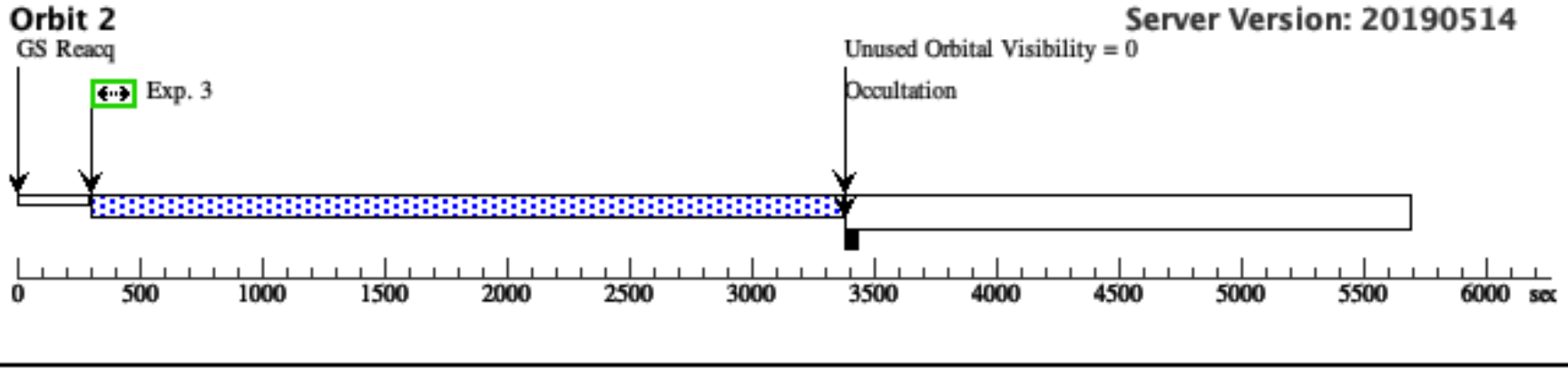
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

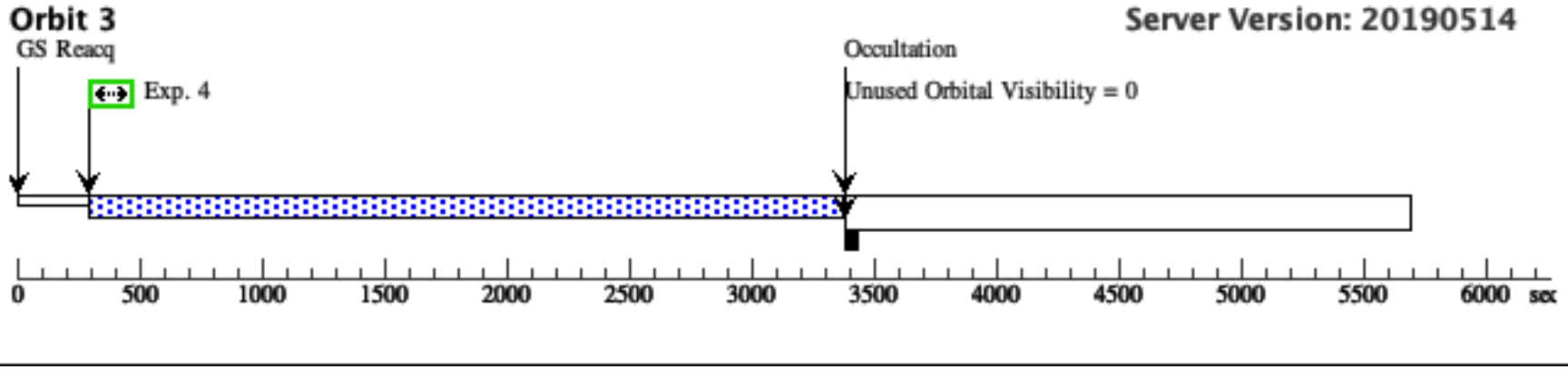
Exposures

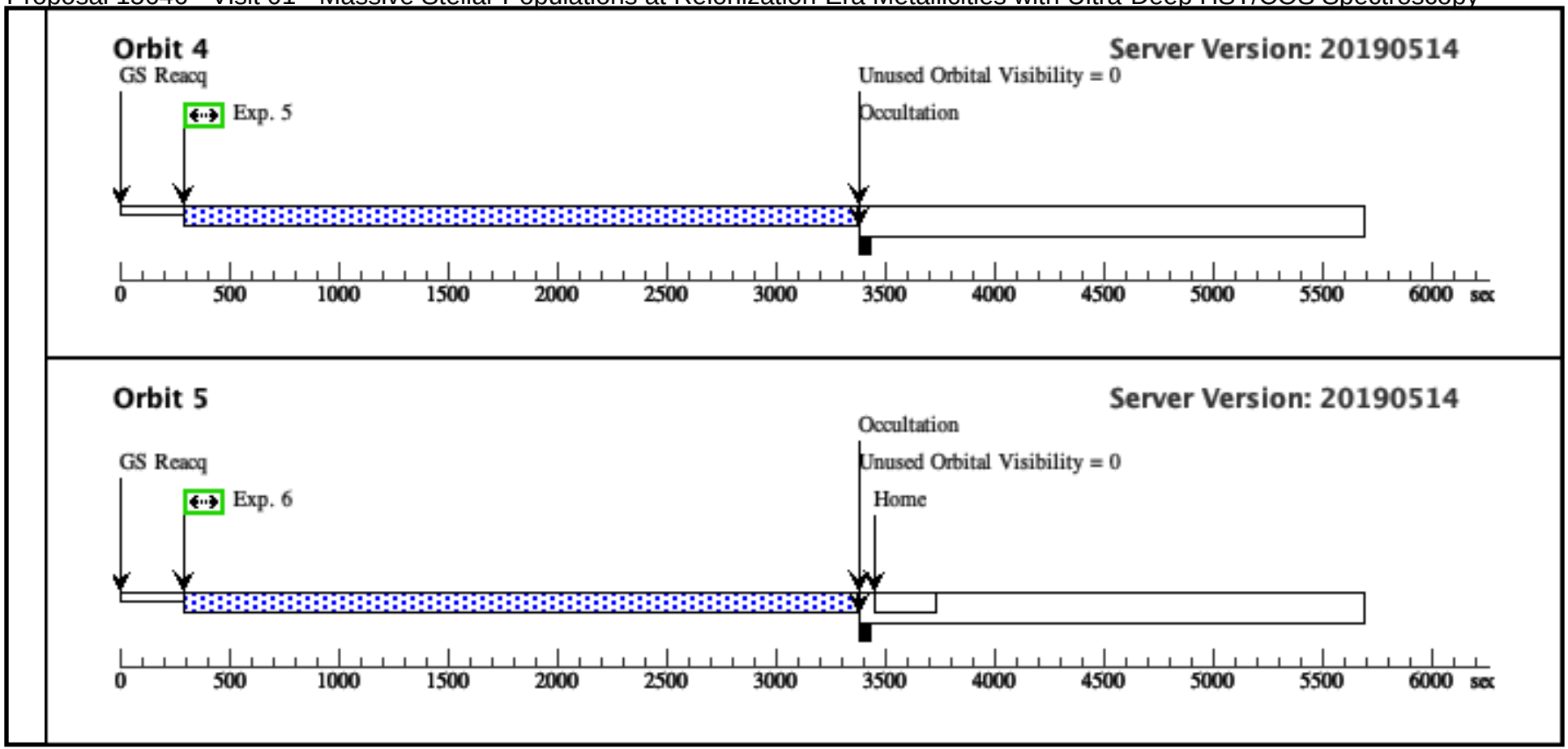
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.751429)	(1) SB82	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				78 Secs (78 Secs) *[==>]*	***[1]***
2	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=8.0e3			2200 Secs (2535 Secs) *[==>2535.0 Secs]*	***[1]***
3	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[2]***
4	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[3]***
5	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[4]***
6	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[5]***

Orbit Structure





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Visit

Proposal 15646, Visit 02, scheduling Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 02) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

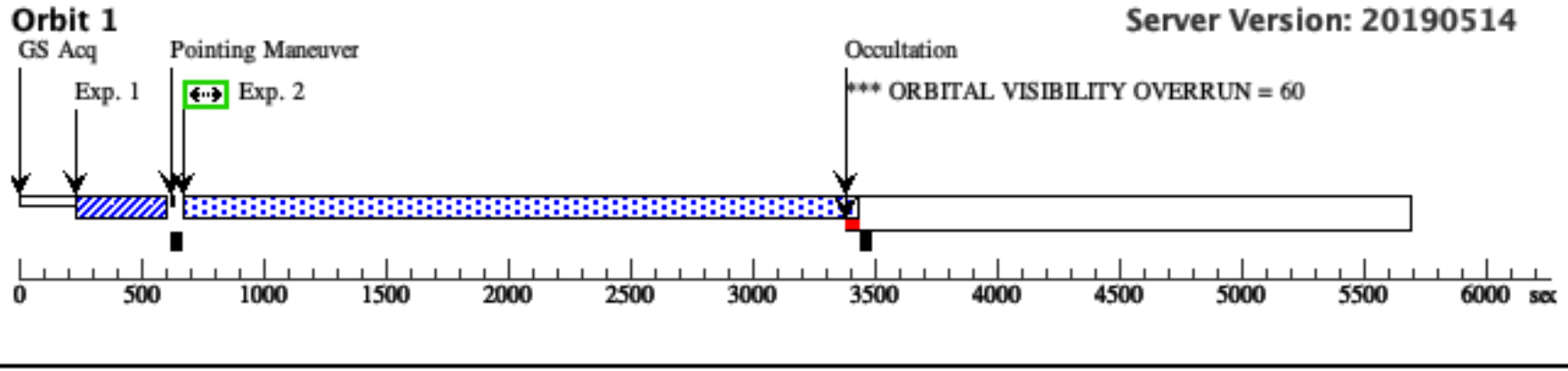
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SB82	RA: 11 55 28.3400 (178.8680833d) Dec: +57 39 51.97 (57.66444d) Equinox: J2000		V=17.3 FUV = 17.6	Reference Frame: ICRS

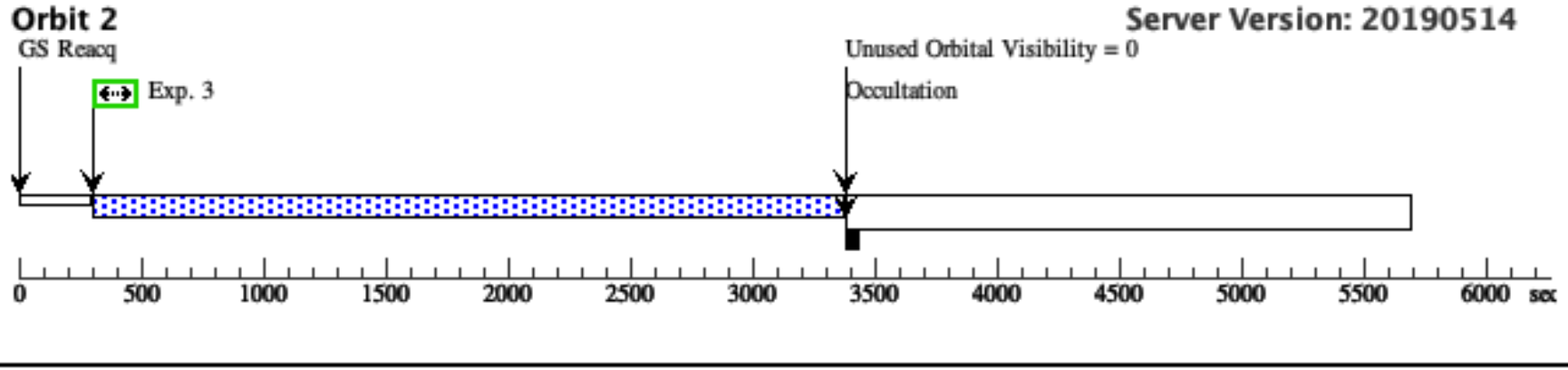
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

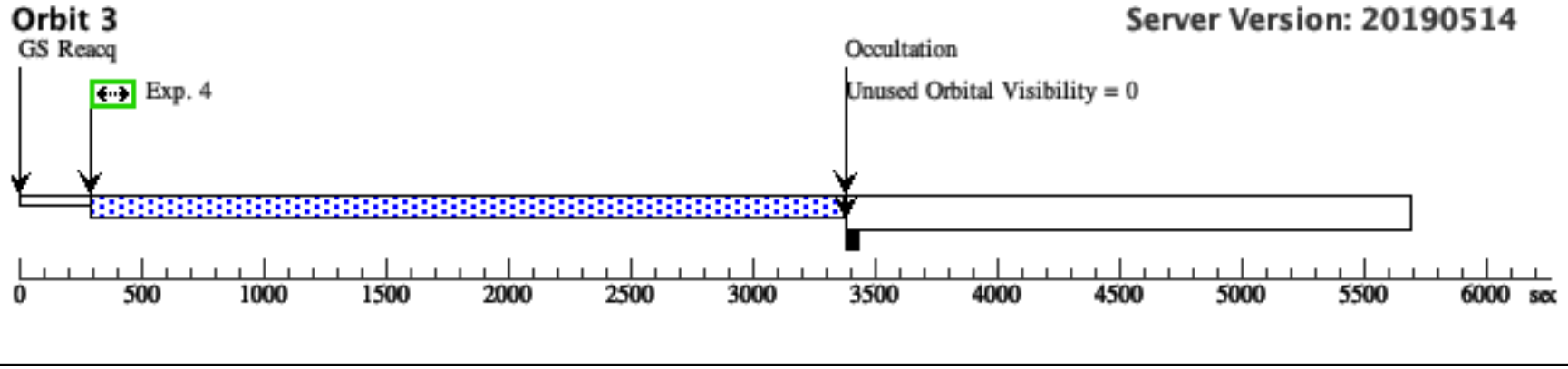
Exposures

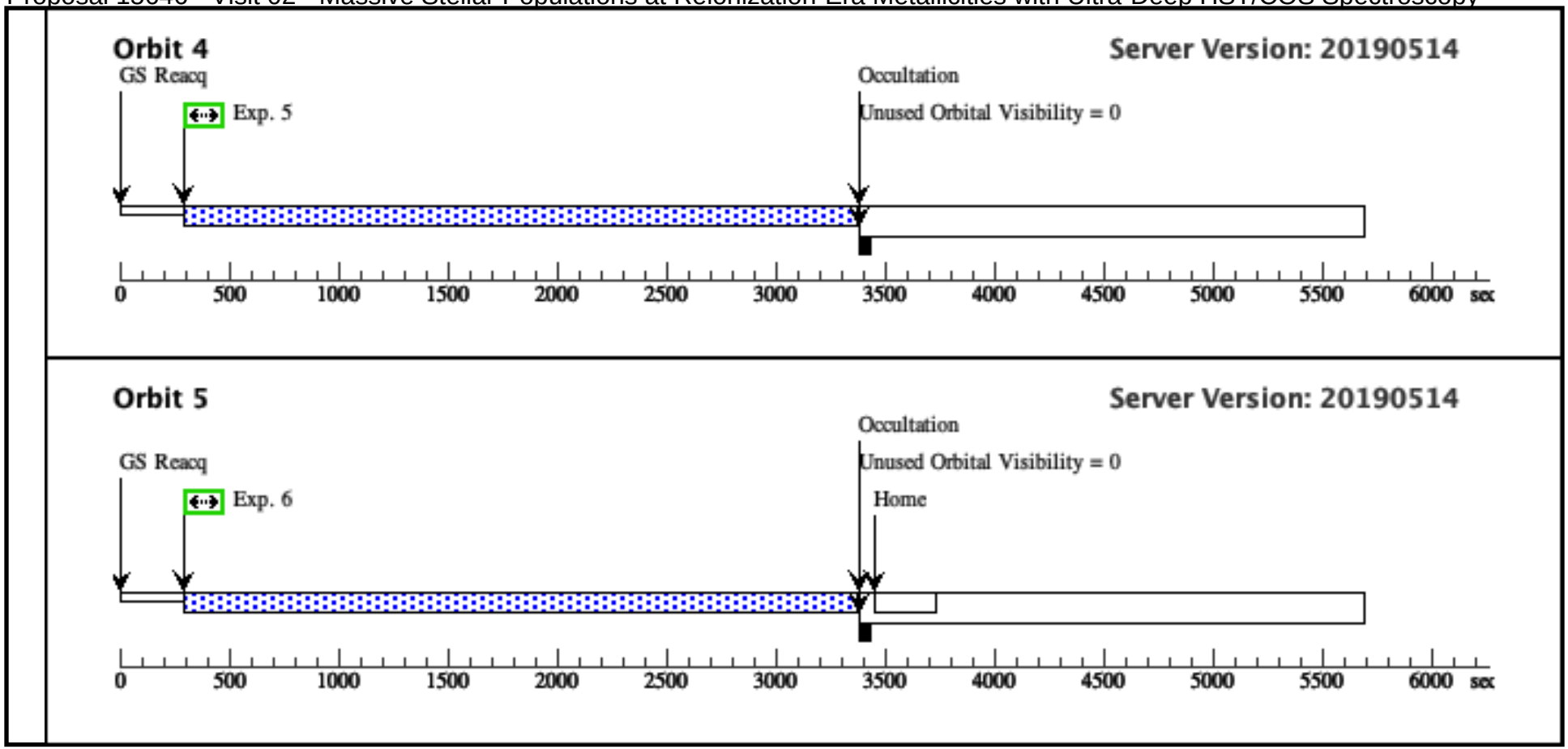
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.751429)	(1) SB82	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				78 Secs (78 Secs) *[==>]*	***[1]***
2	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=8.0e3			2200 Secs (2535 Secs) *[==>2535.0 Secs]*	***[1]***
3	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[2]***
4	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[3]***
5	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[4]***
6	(COS.sp.1301848)	(1) SB82	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=8.0e3			2800 Secs (3023 Secs) *[==>3023.0 Secs]*	***[5]***

Orbit Structure





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Visit

Proposal 15646, Visit 03, scheduling Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 03) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

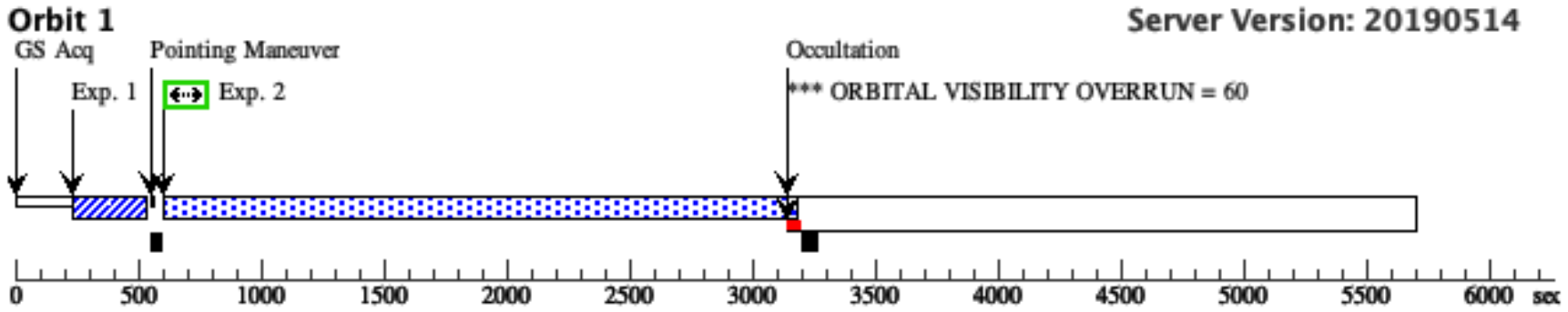
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SB2	RA: 09 44 1.8700 (146.0077917d) Dec: -00 38 32.18 (-.64227d) Equinox: J2000		V=16.7 FUV = 16.9	Reference Frame: ICRS

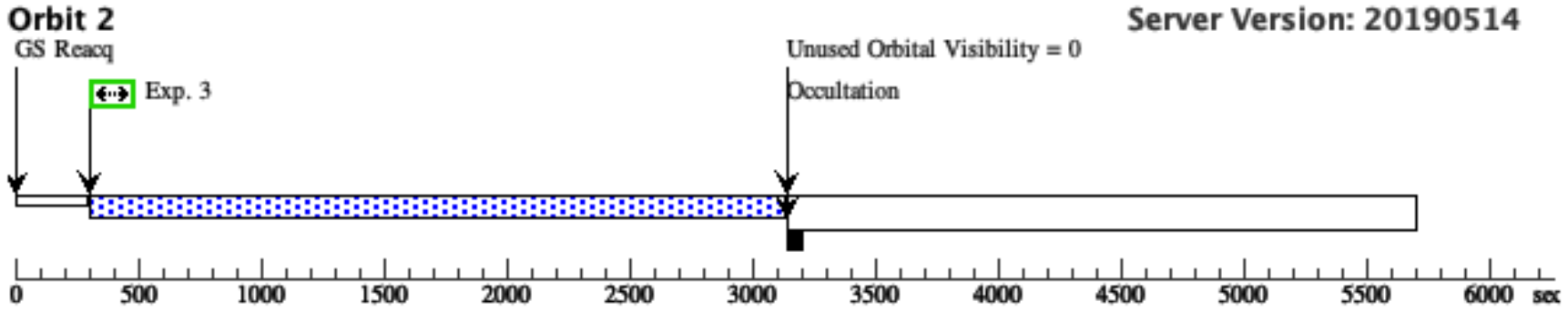
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

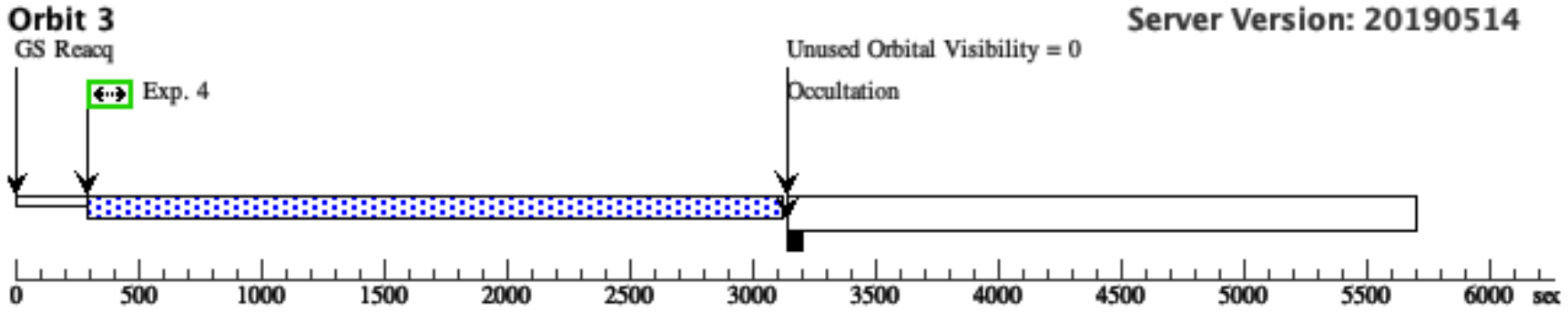
Exposures

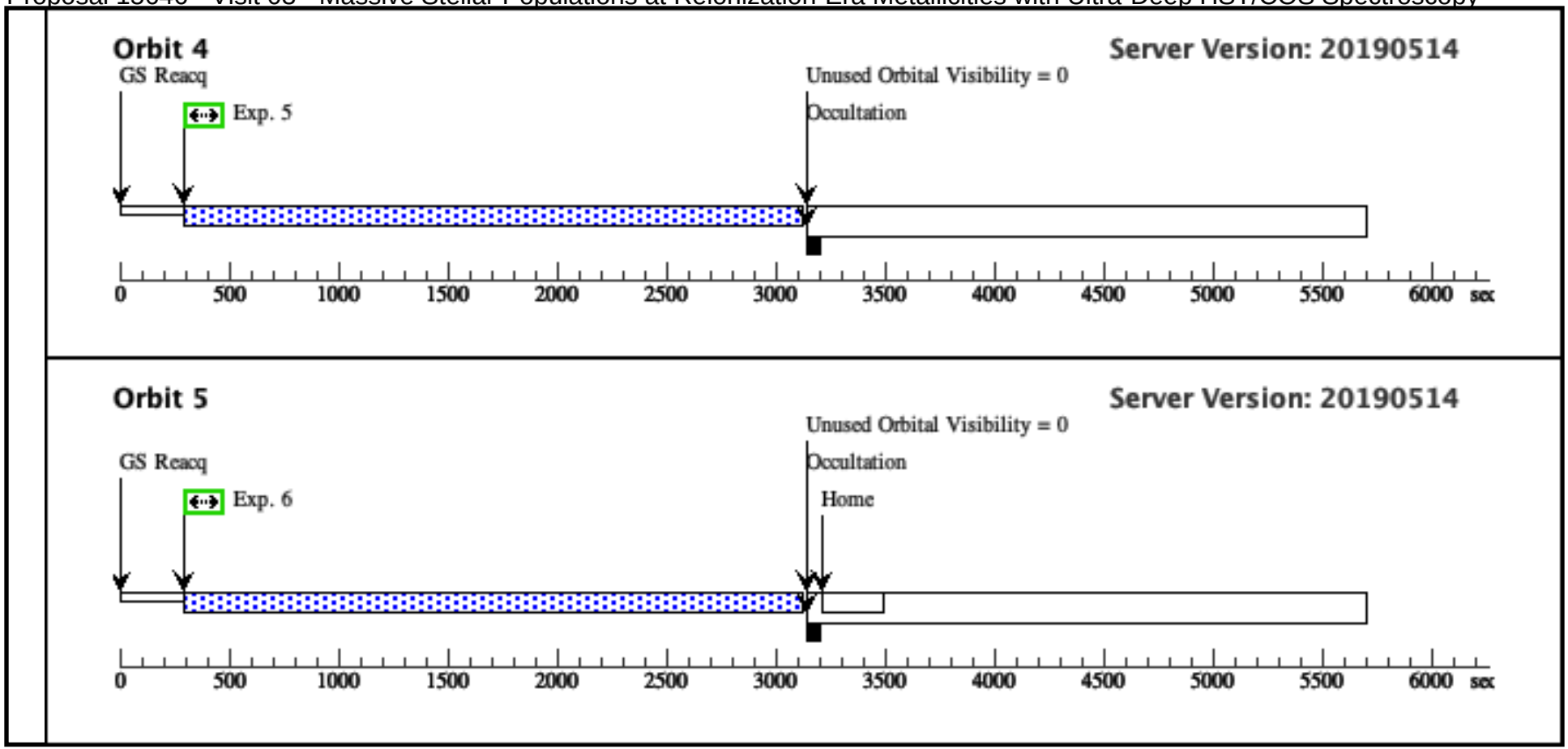
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.751 432)	(2) SB2	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				43 Secs (43 Secs) *[==>]*	***[1]***
2	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=5. 2e3			2200 Secs (2358 Secs) *[==>2358.0 Secs]*	***[1]***
3	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[2]***
4	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[3]***
5	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[4]***
6	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[5]***

Orbit Structure





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Visit

Proposal 15646, Visit 04, scheduling Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 04) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

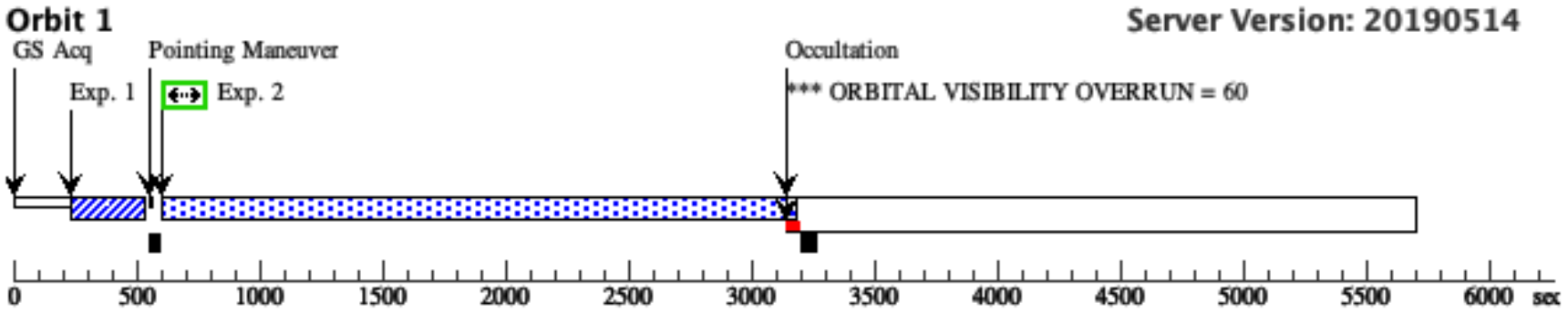
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SB2	RA: 09 44 1.8700 (146.0077917d) Dec: -00 38 32.18 (-.64227d) Equinox: J2000		V=16.7 FUV = 16.9	Reference Frame: ICRS

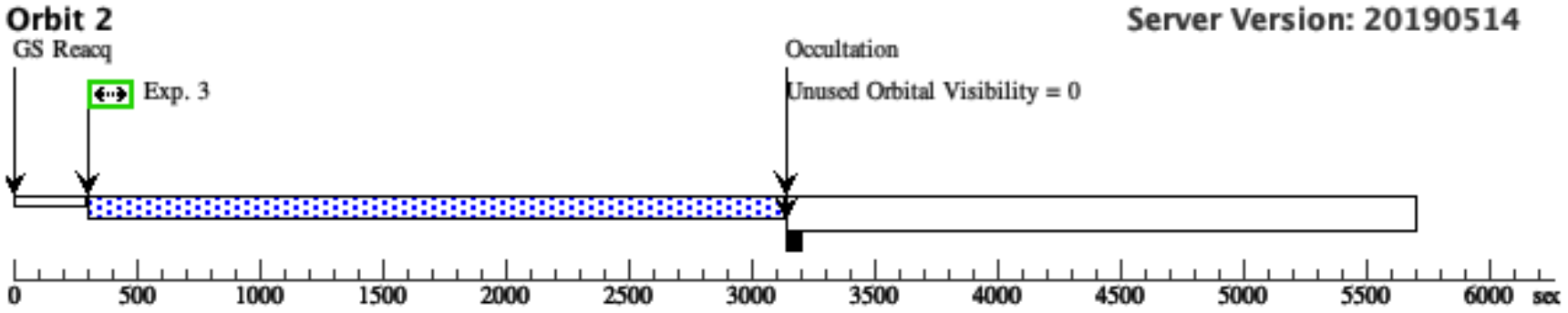
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

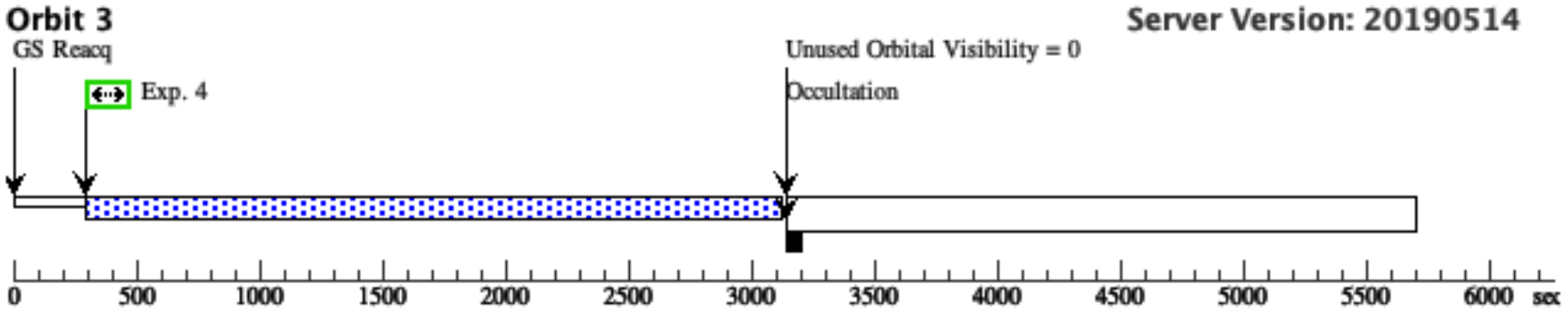
Exposures

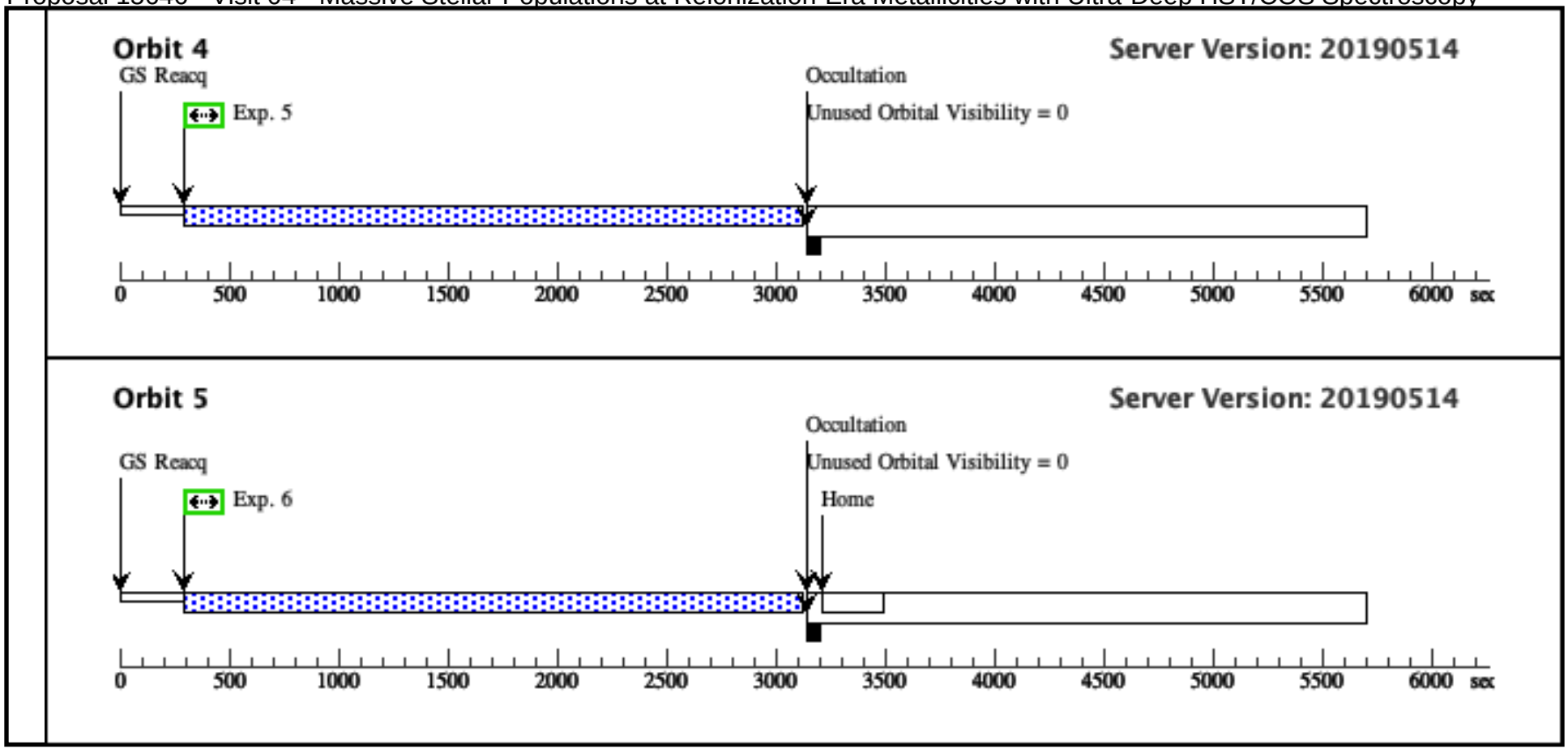
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.751 432)	(2) SB2	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				43 Secs (43 Secs) *[==>]*	***[1]***
2	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=5. 2e3			2200 Secs (2358 Secs) *[==>2358.0 Secs]*	***[1]***
3	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[2]***
4	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[3]***
5	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[4]***
6	(COS.sp.130 1852)	(2) SB2	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=5. 2e3			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[5]***

Orbit Structure





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Visit

Proposal 15646, Visit 05, completed Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 05) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

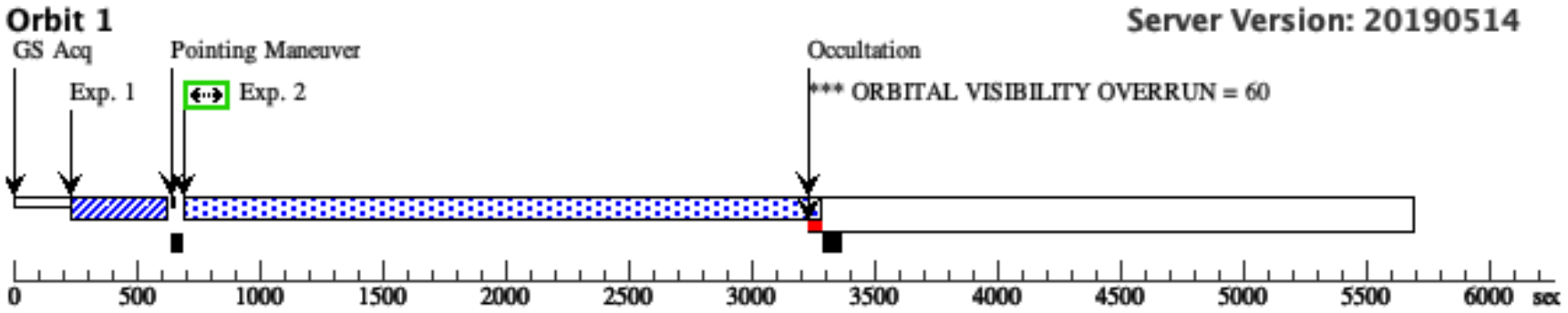
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HS1442+4250	RA: 14 44 11.4625 (221.0477604d) Dec: +42 37 35.57 (42.62655d) Equinox: J2000		V=16.3 FUV = 16.4	Reference Frame: ICRS

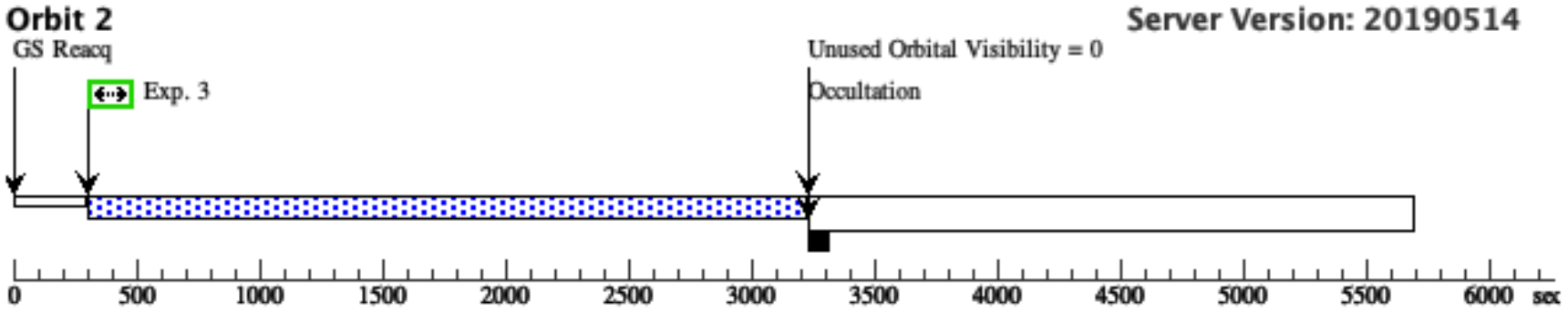
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

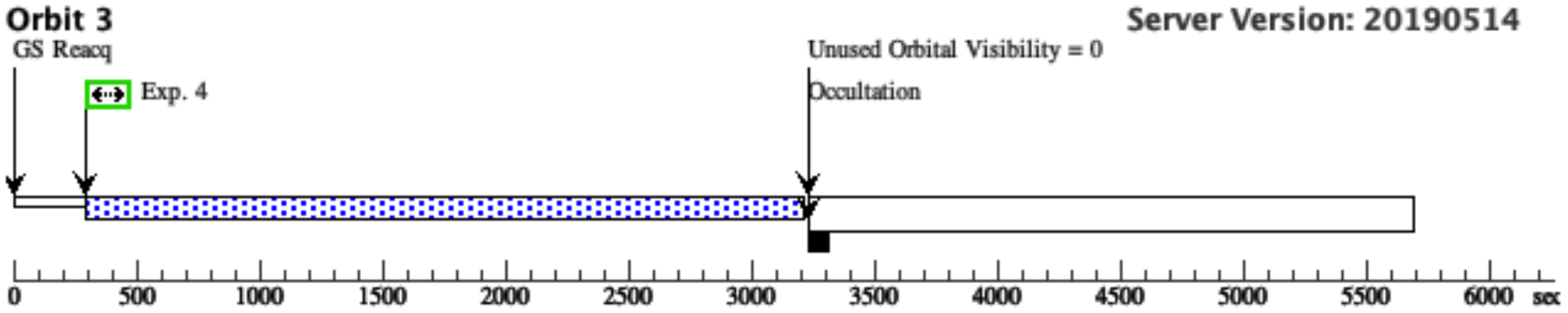
Exposures

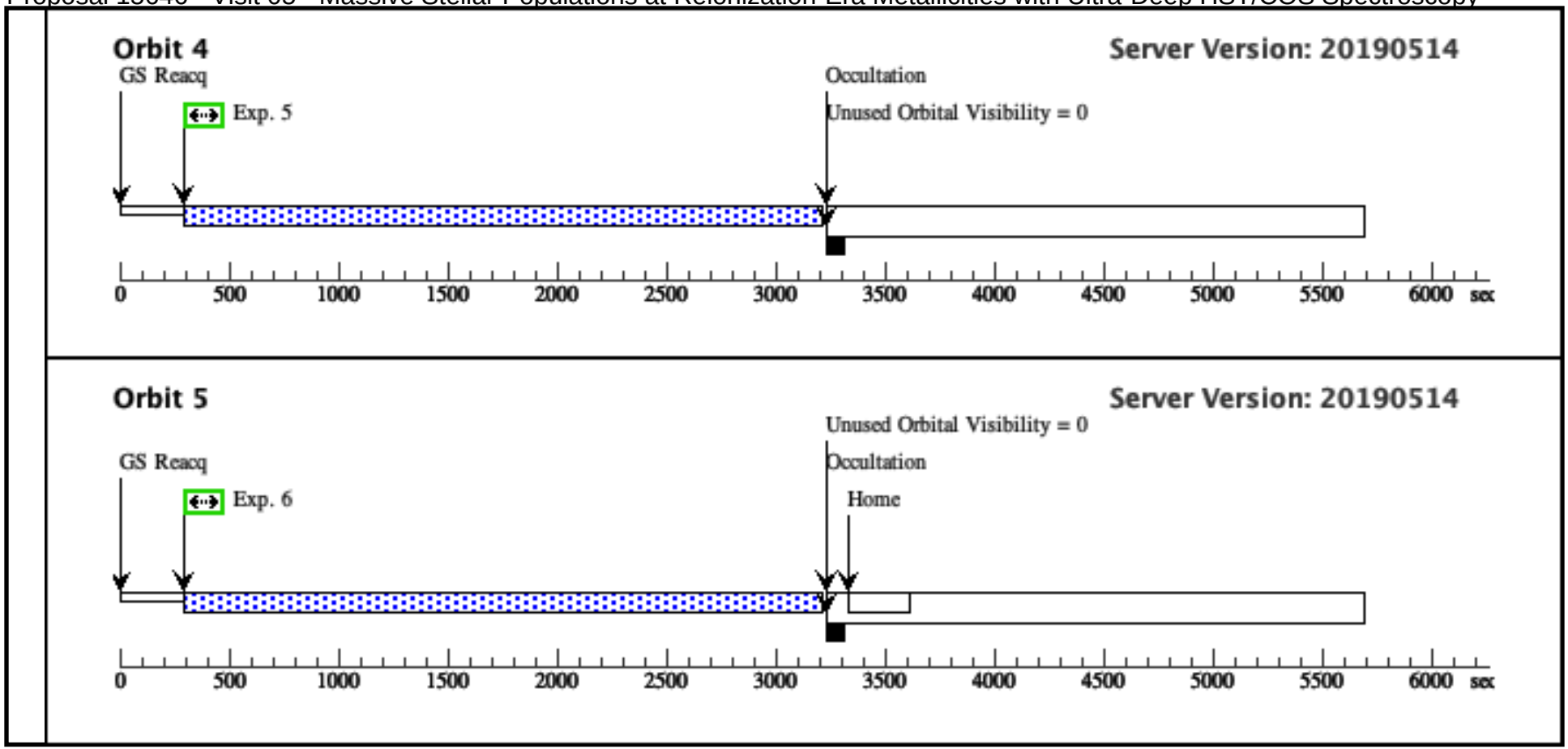
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.827908)	(3) HS1442+4250	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				88 Secs (88 Secs) *[==>]*	***[1]***
2	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=3.8e3			2200 Secs (2364 Secs) *[==>2364.0 Secs]*	***[1]***
3	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[2]***
4	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[3]***
5	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[4]***
6	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[5]***

Orbit Structure








Orbit 4
Server Version: 20190514
GS Reacq
Exp. 5
Occultation
Unused Orbital Visibility = 0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 5
Server Version: 20190514
Unused Orbital Visibility = 0
GS Reacq
Exp. 6
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15646, Visit 06, failed Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 06) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

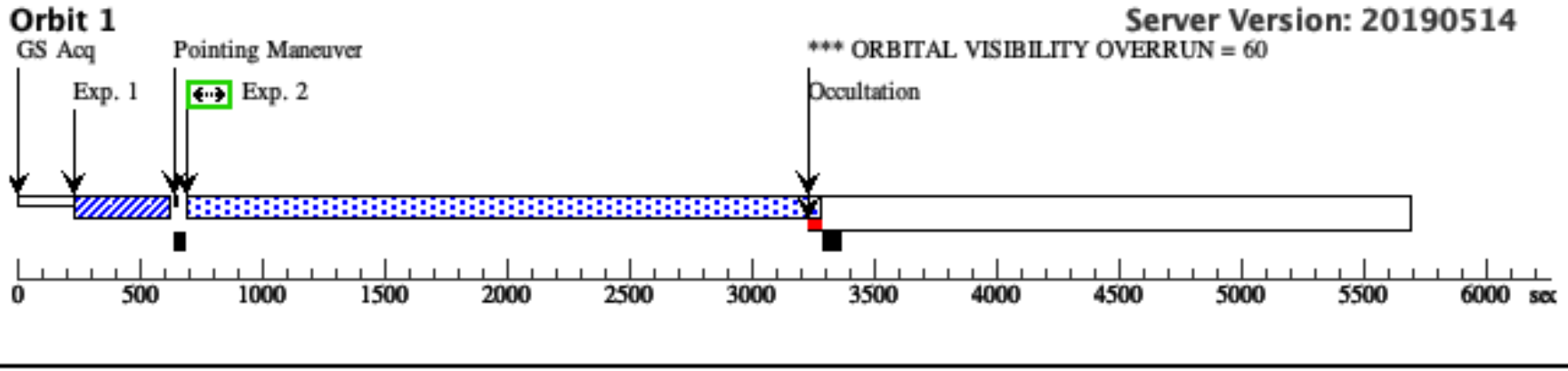
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HS1442+4250	RA: 14 44 11.4625 (221.0477604d) Dec: +42 37 35.57 (42.62655d) Equinox: J2000		V=16.3 FUV = 16.4	Reference Frame: ICRS

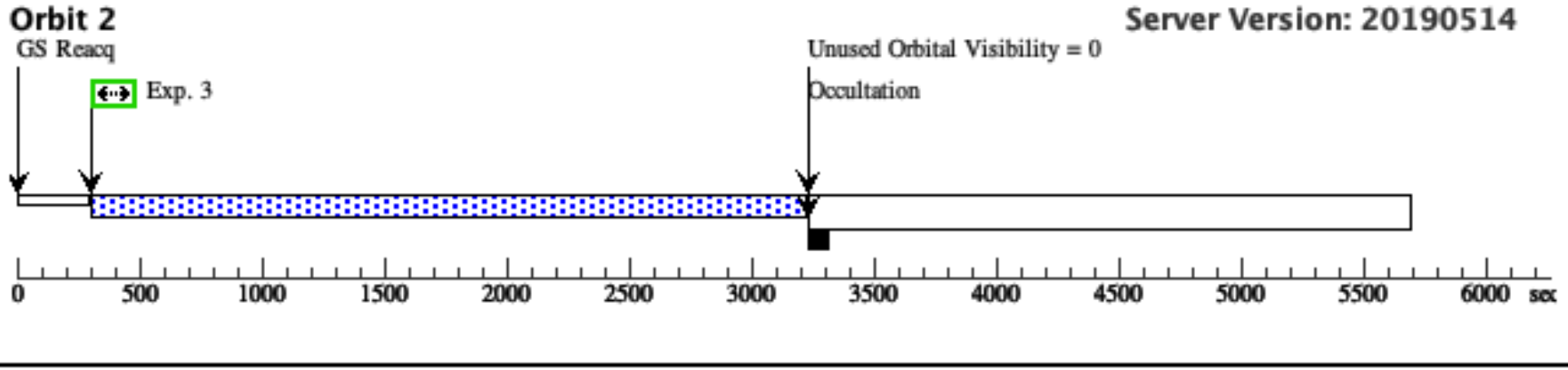
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

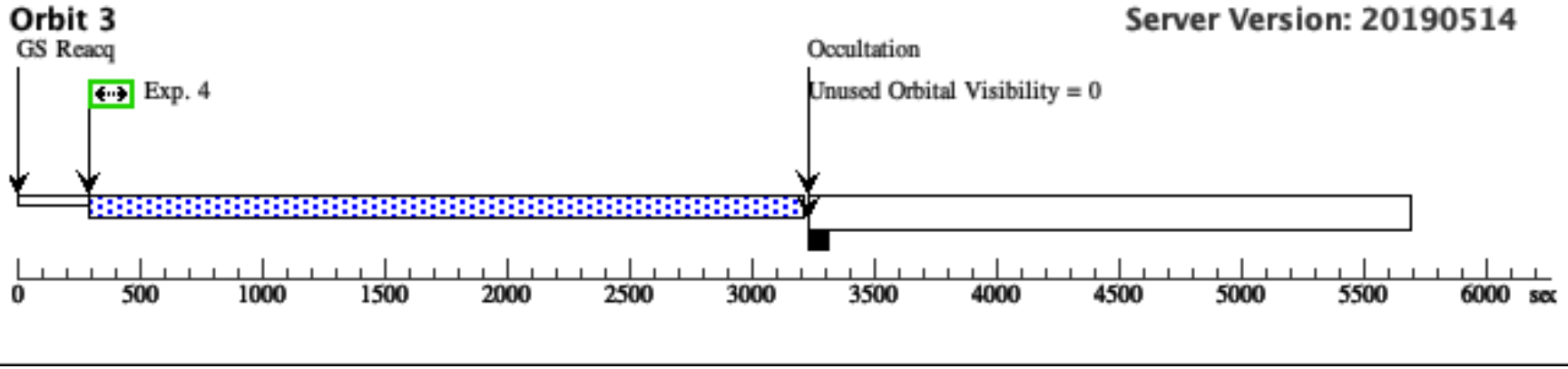
Exposures

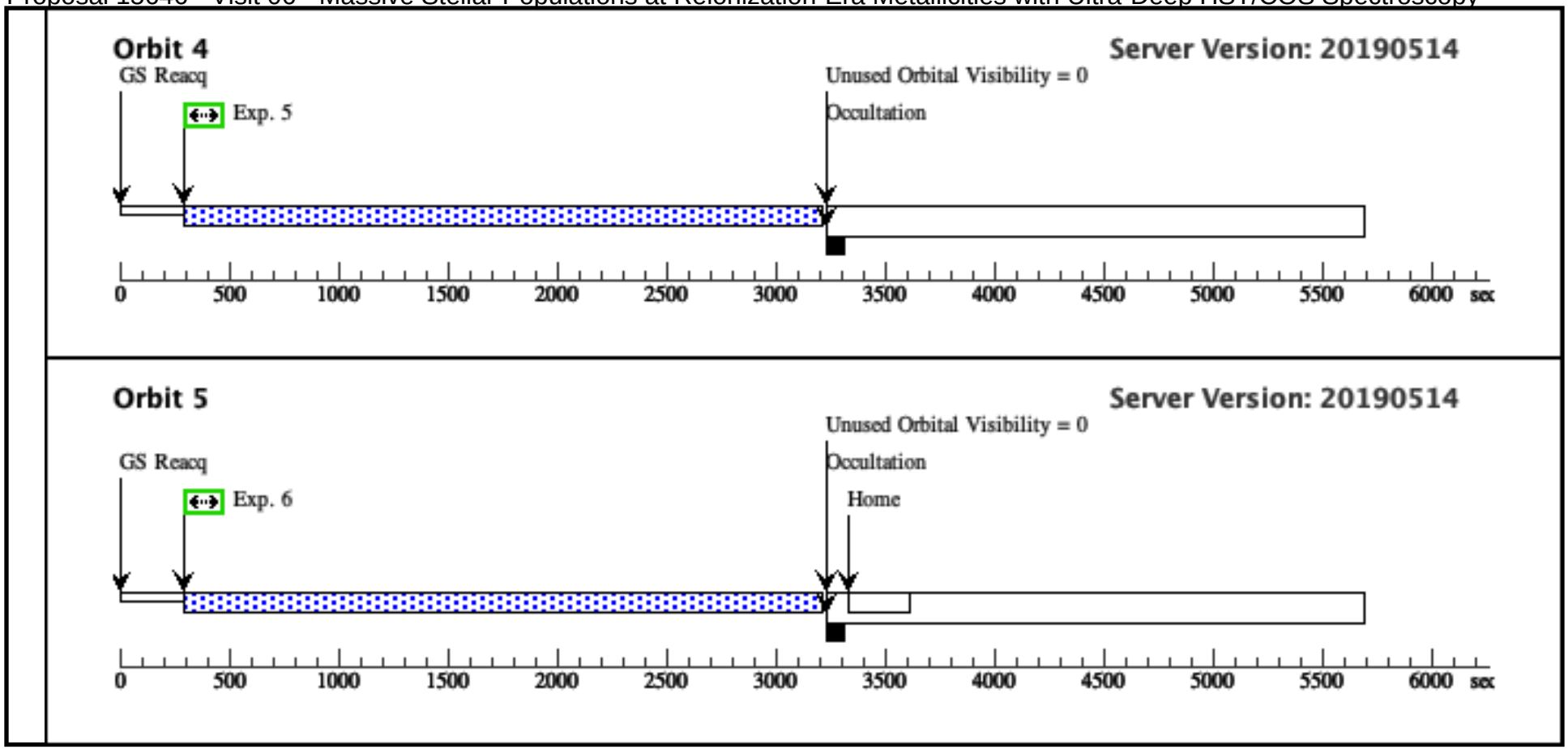
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.827908)	(3) HS1442+4250	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				88 Secs (88 Secs) *[==>]*	***[1]***
2	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=3.8e3			2200 Secs (2364 Secs) *[==>2364.0 Secs]*	***[1]***
3	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[2]***
4	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[3]***
5	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[4]***
6	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=3.8e3			2800 Secs (2872 Secs) *[==>2872.0 Secs]*	***[5]***

Orbit Structure








Orbit 4
Server Version: 20190514
GS Reacq
Exp. 5
Unused Orbital Visibility = 0
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 5
Server Version: 20190514
Unused Orbital Visibility = 0
GS Reacq
Occultation
Exp. 6
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15646, Visit 07, scheduling Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 07) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

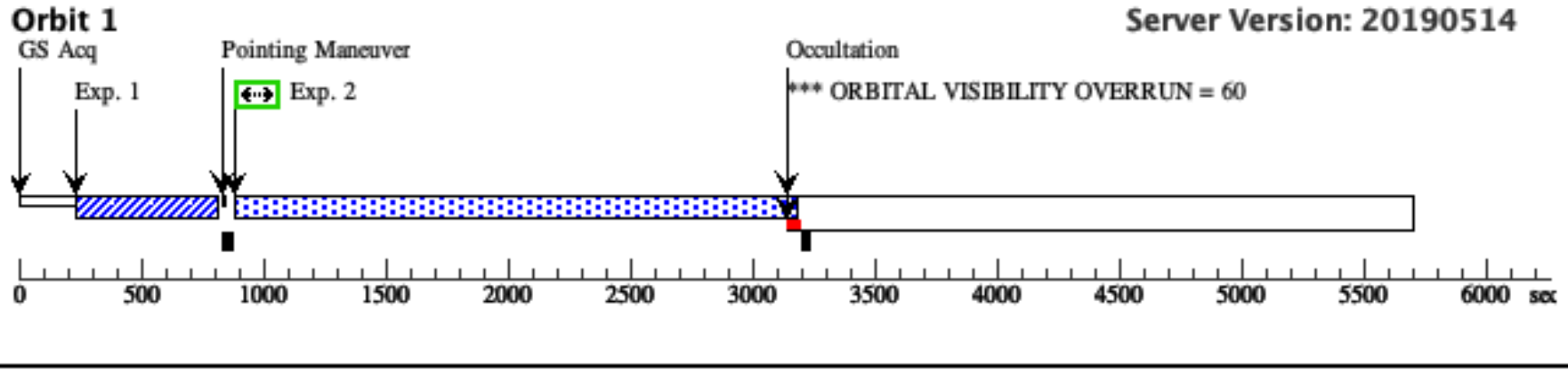
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	J104457	RA: 10 44 57.7900 (161.2407917d) Dec: +03 53 13.10 (3.88697d) Equinox: J2000		V=18.4 FUV = 18.3	Reference Frame: ICRS

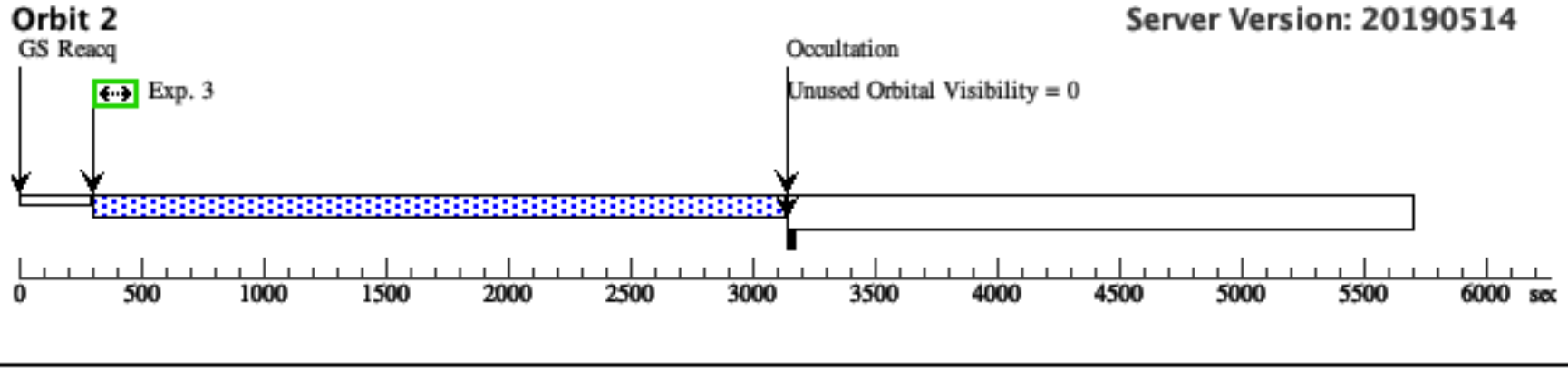
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

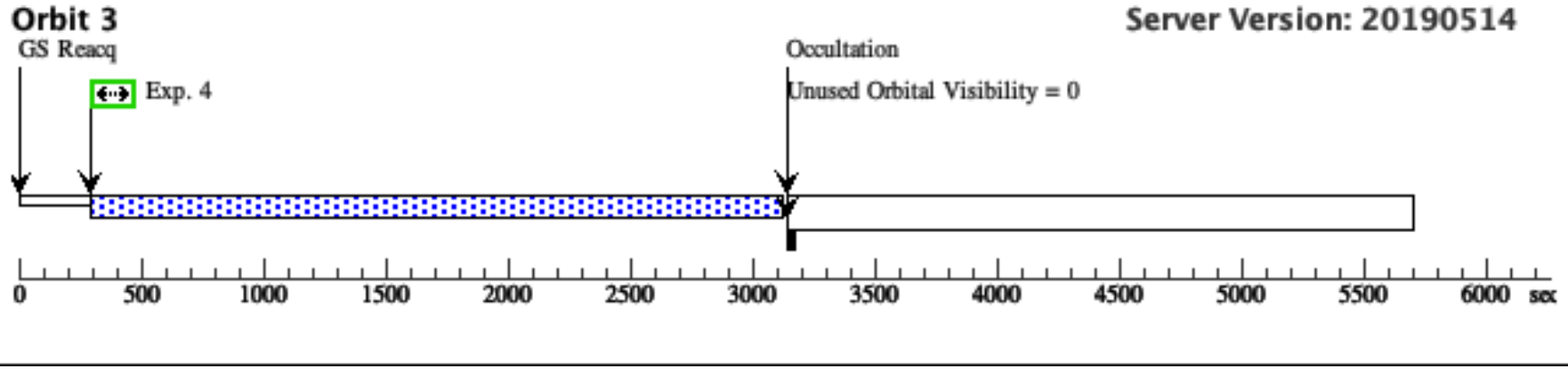
Exposures

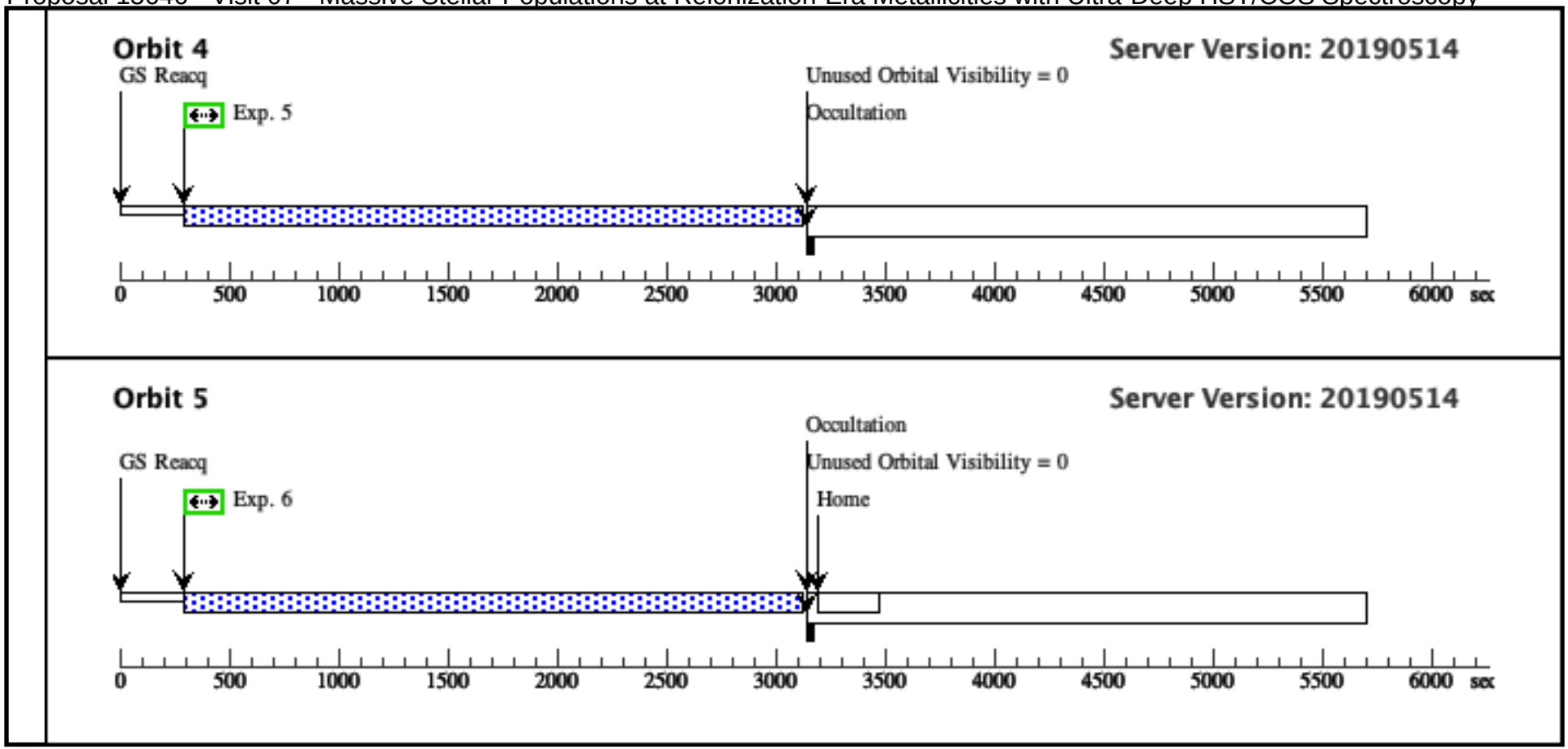
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1166419)	(4) J104457	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				183 Secs (183 Secs) *[==>]*	***[1]***
2	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=1.5e4			1500 Secs (2078 Secs) *[==>2078.0 Secs]*	***[1]***
3	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[2]***
4	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[3]***
5	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[4]***
6	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[5]***

Orbit Structure








Orbit 4
Server Version: 20190514
GS Reacq
Exp. 5
Unused Orbital Visibility = 0
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 5
Server Version: 20190514
Occultation
GS Reacq
Unused Orbital Visibility = 0
Exp. 6
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15646, Visit 08, scheduling Wed Oct 30 15:00:48 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 08) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

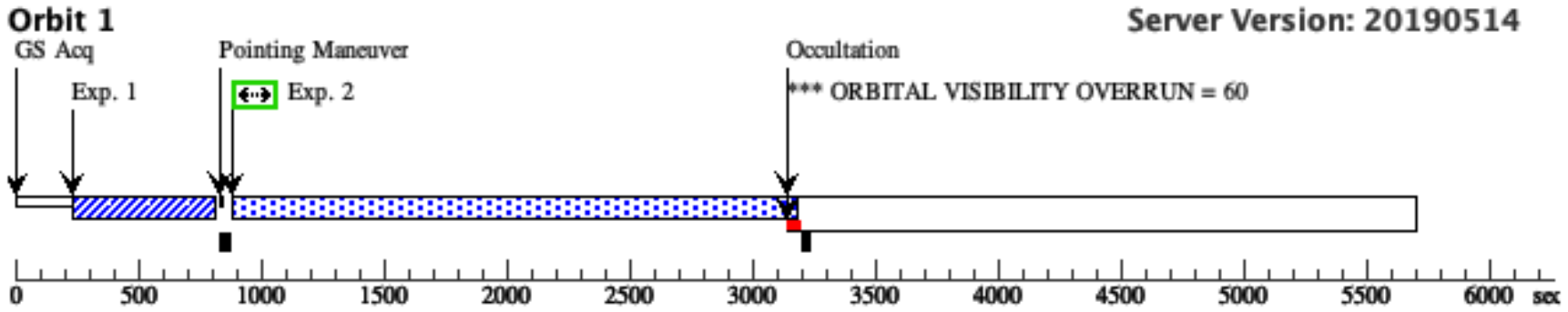
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	J104457	RA: 10 44 57.7900 (161.2407917d) Dec: +03 53 13.10 (3.88697d) Equinox: J2000		V=18.4 FUV = 18.3	Reference Frame: ICRS

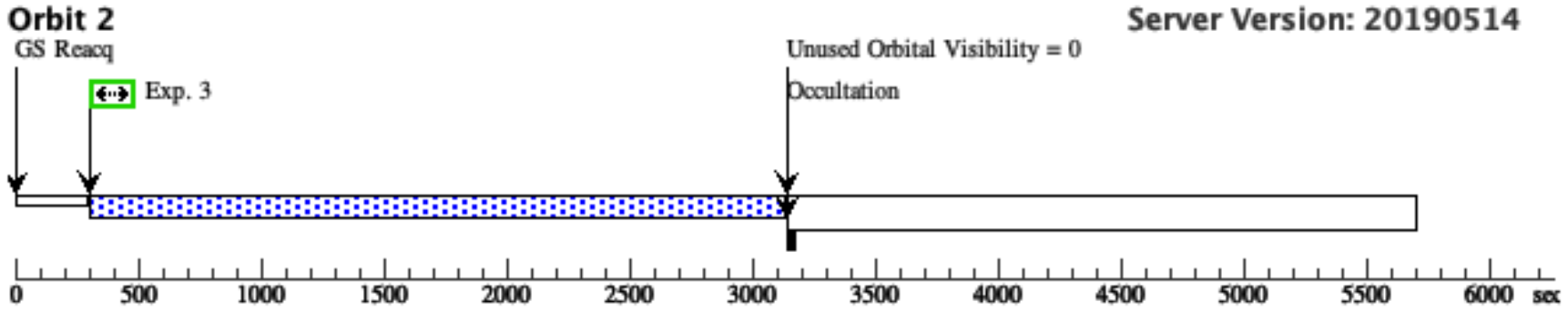
Comments:
Category=GALAXY
Description=[STAR FORMING REGION]
Extended=NO

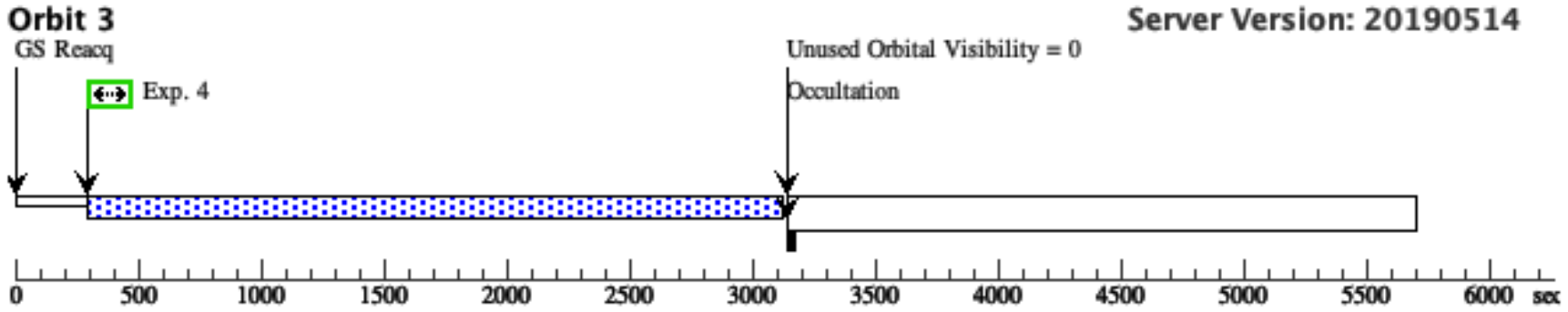
Exposures

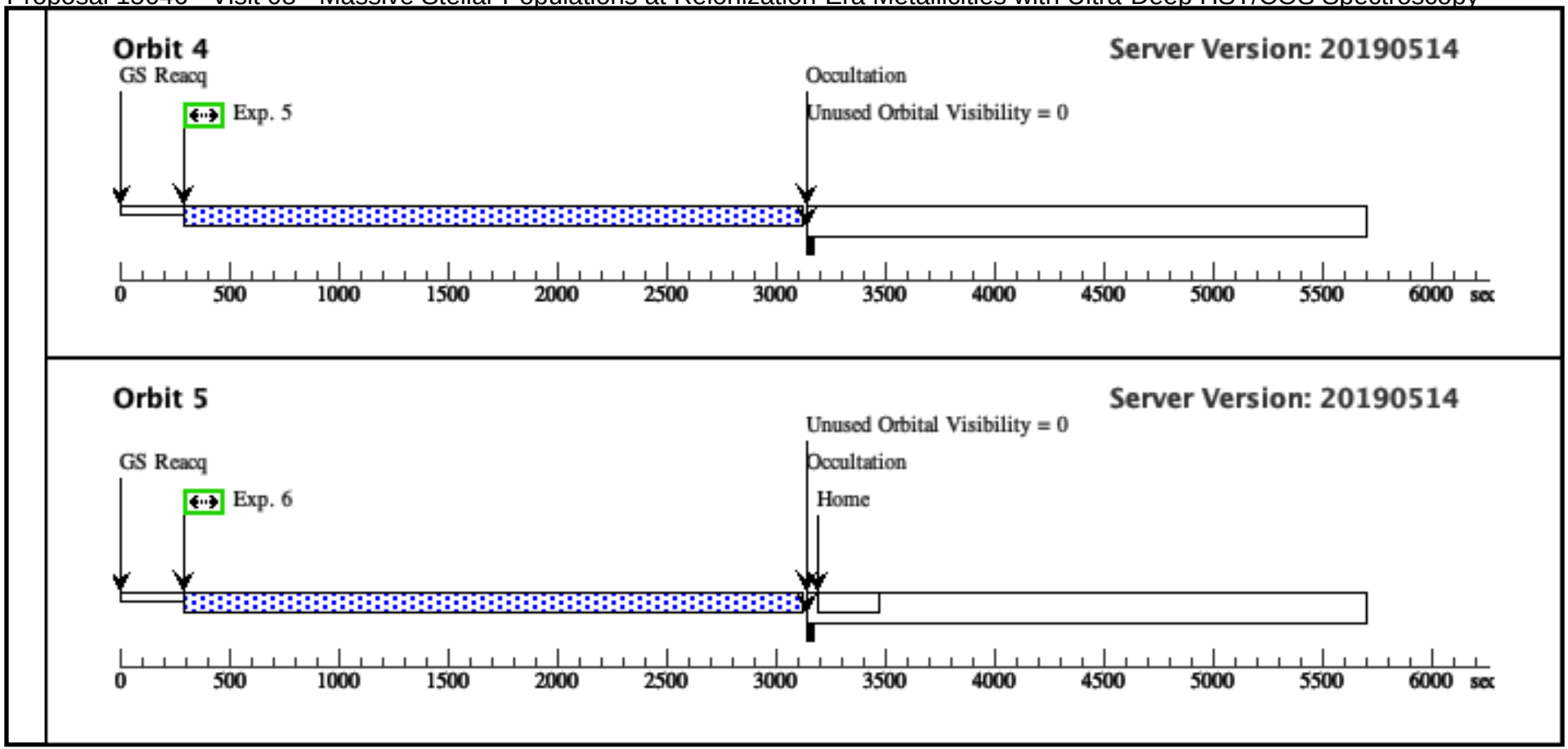
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1166419)	(4) J104457	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				183 Secs (183 Secs) *[==>]*	***[1]***
2	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=1.5e4			1500 Secs (2078 Secs) *[==>2078.0 Secs]*	***[1]***
3	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=1; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[2]***
4	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=2; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[3]***
5	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[4]***
6	(COS.sp.1301869)	(4) J104457	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=4; BUFFER-TIME=1.5e4			2800 Secs (2776 Secs) *[==>2776.0 Secs]*	***[5]***

Orbit Structure








Orbit 4
Server Version: 20190514
GS Reacq
Exp. 5
Occultation
Unused Orbital Visibility = 0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 5
Server Version: 20190514
Unused Orbital Visibility = 0
GS Reacq
Exp. 6
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15646, Visit 56 Wed Oct 30 15:00:49 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HS1442+4250	RA: 14 44 11.4625 (221.0477604d) Dec: +42 37 35.57 (42.62655d) Equinox: J2000		V=16.3 FUV = 16.4	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[STAR FORMING 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	(COS.ta.827908)	(3) HS1442+4250	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				88 Secs (88 Secs) *[==>]*	 ***[1]***
2	(COS.sp.1301862)	(3) HS1442+4250	COS/FUV, TIME-TAG, PSA	G160M 1533 A	FLASH=YES; FP-POS=3; BUFFER-TIME=3.8e3			2200 Secs (2304 Secs) *[==>2304.0 Secs]*	 ***[1]***

Orbit Structure