14137 - Damped Lyman-alpha Systems in the Disks of Low-z SDSS Galaxies on Top of QSOs

Cycle: 23, 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	(2) Q0902+1414	COS/FUV COS/NUV	2	18-Feb-2016 21:02:15.0	yes
02	(3) Q1005+5302	COS/FUV COS/NUV	2	18-Feb-2016 21:02:16.0	yes
03	(4) Q1010-0100	COS/FUV COS/NUV	2	18-Feb-2016 21:02:18.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(5) Q1130+6026	COS/FUV COS/NUV	2	18-Feb-2016 21:02:19.0	yes
05	(6) Q1135+2414	COS/FUV COS/NUV	2	18-Feb-2016 21:02:20.0	yes
06	(7) Q1328+2159	COS/FUV COS/NUV	2	18-Feb-2016 21:02:22.0	yes
07	(9) Q1452+5443	COS/FUV COS/NUV	2	18-Feb-2016 21:02:23.0	yes
08	(10) Q1457+5321	COS/FUV COS/NUV	2	18-Feb-2016 21:02:24.0	yes
09	(12) Q1659+6202	COS/FUV COS/NUV	2	18-Feb-2016 21:02:25.0	yes
10	(13) Q2117+0026	COS/FUV COS/NUV	2	18-Feb-2016 21:02:27.0	yes

20 Total Orbits Used

ABSTRACT

Damped Lyman-alpha (DLA) and sub-DLA absorbers dominate the mass density of neutral gas in the Universe (log N(HI) > 20.3 and 19.0< log N(HI) < 20.3 respectively) and are easily detected in the spectra of background QSOs. Though they have been studied for decades, the relationship between DLAs, sub-DLAS, and the properties of their host galaxies remain an open question. This class of objects, being cold and neutral, have long been believed to be critical in the formation of galaxies and ideal staging grounds for new star formation. In fact, many studies suggest they may arise in galaxy disks or, due to their low metallicity nature, dwarf galaxies. The distinction is of great importance and requires the identification of as many host galaxies as possible, which is easiest at low-z due to the decrease in surface brightness with distance.

We present a sample of 10 FUV-bright QSOs probing the disks of foreground galaxies at z<0.14 from the SDSS. These galaxies have known star formation rates, E(B-V), and most importantly: imaging detections detailing their morphology and orientation relative to the QSO line of sight. We propose to use HST/COS to determine the neutral hydrogen column density of these galaxies in order to constrain the host environments of DLAs and sub-DLAs. We will use the spectra to determine metallicity gradients and HI covering fraction at z<0.14. Finally, we will determine correlations

between the HI absorption strength with the galaxy orientation and morphology that have been found in the literature for Mg II and Na I D.

OBSERVING DESCRIPTION

Since we are looking specically for sub-DLAs and DLAs (with 19.0<log NHI<20.3 and log NHI>20.3, respectively), a spectral resolution of Delta-lambda = 10A would be suffcient. At the wavelengths we are considering (~1350A), COS has a resolving power of approximately 1500 with the G140L grating, corresponding to a spectral resolution of Delta-lambda ~ 1A, which is more than suitable for our purposes.

We plan COS observations of 10 QSO sight lines that coincide with foreground galaxies in the SDSS. We have chosen our sample from our survey of 103 GOTOQs based on their FUV brightness (> 30 microJy in GALEX) and redshifts z < 2. We estimate using the COS ETC that we can reach a S/N~10 per resolution element in two orbits per QSO (4x1200s exposures) using the G140L_1105 grating. In our simulation, we have assumed a FOS-based QSO spectrum and FUV flux (> 30 microJy) from GALEX data. The emission redshifts of the QSO and the foreground galaxy are known from SDSS and our previous study of the GOTOQs (York+12; Straka+13,15). The QSOs we target are faint enough to avoid saturation during our exposures on COS.

TARGET ACQUISITION:

Each object will have target acquisition as follows:

COS ACQ/IMAGE - We use the ETC to determine the exposure time required to reach S/N~40. Because these QSOs have galaxies directly on top of them, the galaxies may be contributing UV flux to the GALEX flux measurements and magnitudes. Therefore, we conservatively estimate that the QSOs have half the flux reported by GALEX for the purposes of target acquisition in order to account for QSO variability and foreground galaxy contamination. We use the PSA and Mirror A for our settings. We assume a FOS-based QSO spectrum.

We also ran acquisition simulations at STScI in order to determine if the foreground galaxies would cause acquisition problems. The simulations came back with no problems centering on the QSOs.

EXPOSURE SETUP:

We will use the default FLASH = YES for all of our observations, which are taken in TIME-TAG PSA mode, in order to maximize science

integration times. In addition, we will use all 4 FP-POS settings, manually set across four exposures (2 exposures per orbit, 2 orbits). This will minimize fixed position noise and detector artifacts. The FP-POS settings are arranged in increasing order for each visit (1, 2, 3, and 4) to minimize overhead.

BRIGHT OBJECTS AND BUFFER TIMES:

We have checked the GALEX FUV and NUV images for foreground galaxy contribution to the flux and found no detection of the foreground galaxies for any of our targets. We have used the APT Bright Object Tracker to determine if there are any field objects that might pose a health or safety threat while using COS/FUV. We used the GALEX database for this search and found that all of our fields return safe.

We have used the ETC to determine the buffer time for each of our science frames. In each case, the ETC buffer time exceeds the science exposure time. Therefore, we take 2/3 of the ETC buffer time as our APT buffer time input for each science frame. The typical 2/3 ETC buffer time fore our sample is ~7000s.

OBSERVING FORMAT:
Our COS observations will proceed on average as follows (with some variability depending on target visibility):

First orbit: Guide star acquisition + ACQ/IMAGE + science (~20 minutes) + science overhead (5 minutes first exposure) + science (~20 minutes) + science overhead during occult (2 minutes subsequent exposure otherwise).

Second orbit: Guide star re-acquisition (~4 minutes) + science (~24 minutes) + science overhead (2 minutes) + science (~24 minutes) + science overhead (2 minutes) + occult.

Total science for 2 orbits : ~80 minutes
Total overhead for 2 orbits: ~20 minutes
Total orbits for 10 targets: 20 orbits

Visit

Proposal 14137, Q0902+1414 (01), scheduling Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

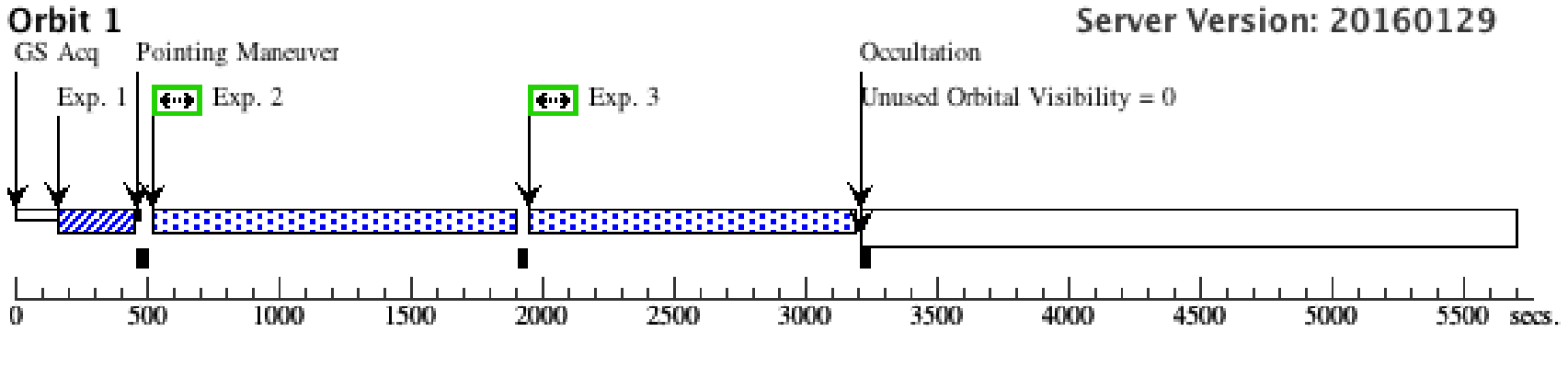
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	Q0902+1414	RA: 09 02 50.4700 (135.7102917d) Dec: +14 14 8.29 (14.23564d) Equinox: J2000	Redshift: 0.980	V=18.59 FUV=38microJy, NUV=102microJy	Reference Frame: ICRS

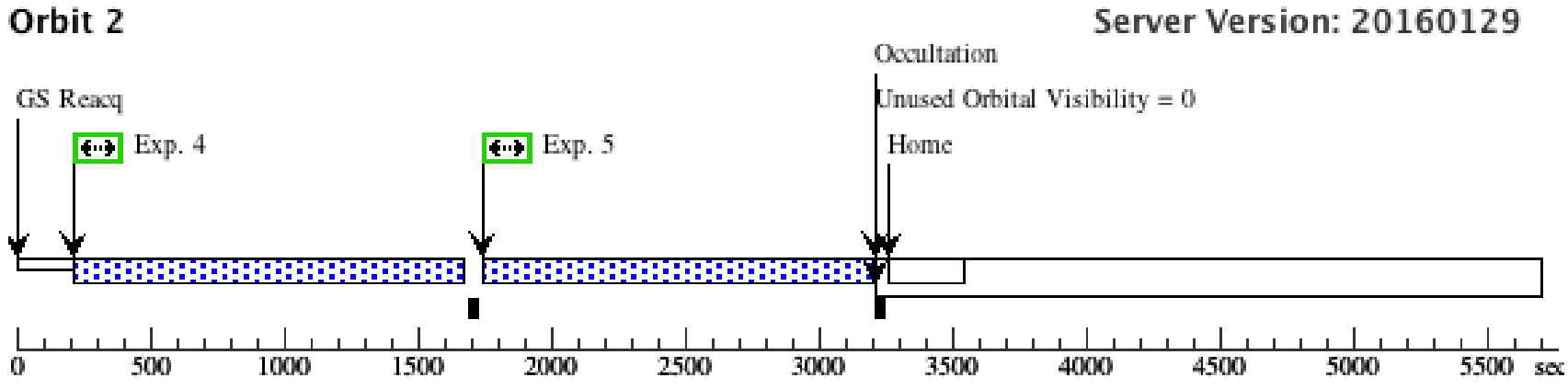
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q0902+1414 ACQ/IMAGE (COS.ta.717808)	(2) Q0902+1414	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	***[1]***
2	Q0902+1414 TIME-TAG (COS.sp.714935)	(2) Q0902+1414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	SEGMENT=A; BUFFER-TIME=7000; FP-POS=1; FLASH=YES			1192 Secs (1192 Secs) *[==>]*	***[1]***
3	Q0902+1414 TIME-TAG (COS.sp.714935)	(2) Q0902+1414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; FP-POS=2; SEGMENT=A	SAME POS AS 2		1192 Secs (1192 Secs) *[==>]*	***[1]***
4	Q0902+1414 TIME-TAG (COS.sp.714935)	(2) Q0902+1414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; FP-POS=3; SEGMENT=A	SAME POS AS 2		1410 Secs (1410 Secs) *[==>]*	***[2]***
5	Q0902+1414 TIME-TAG (COs.sp.714935)	(2) Q0902+1414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FP-POS=4; SEGMENT=A; FLASH=YES	SAME POS AS 2		1407 Secs (1407 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 14137, Q1005+5302 (02), implementation Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

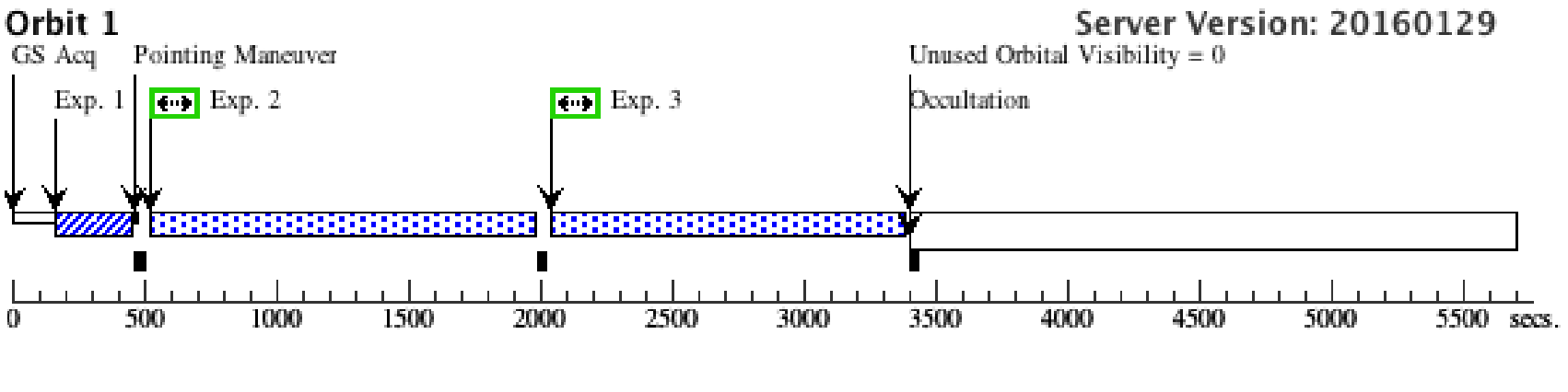
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	Q1005+5302	RA: 10 05 14.2100 (151.3092083d) Dec: +53 02 40.04 (53.04446d) Equinox: J2000	Redshift: 0.560	V=18.85 FUV=63microJy, NUV=115microJy	Reference Frame: ICRS

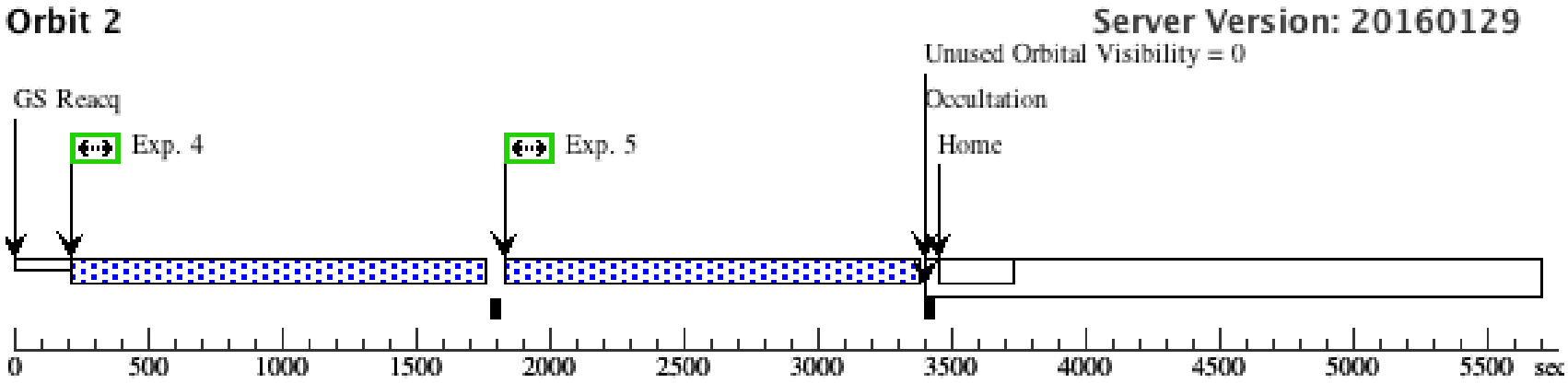
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1005+5302 ACQ/IMAGE (COS.ta.717809)	(3) Q1005+5302	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	*[1]*
2	Q1005+5302 TIME-TAG (COS.sp.732970)	(3) Q1005+5302	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9500; FLASH=YES; FP-POS=1; SEGMENT=BOTH			1287 Secs (1287 Secs) *[==>]*	*[1]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
3	Q1005+5302 TIME-TAG (COS.sp.732970)	(3) Q1005+5302	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9500; FLASH=YES; FP-POS=2; SEGMENT=BOTH	SAME POS AS 2		1290 Secs (1290 Secs) *[==>]*	*[1]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
4	Q1005+5302 TIME-TAG (COS.sp.732970)	(3) Q1005+5302	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9500; FP-POS=3; SEGMENT=BOTH; FLASH=YES	SAME POS AS 2		1501 Secs (1501 Secs) *[==>]*	*[2]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
5	Q1005+5302 TIME-TAG (COS.sp.732970)	(3) Q1005+5302	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9500; FP-POS=4; SEGMENT=BOTH; FLASH=YES	SAME POS AS 2		1501 Secs (1501 Secs) *[==>]*	*[2]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									

Orbit Structure





Visit

Proposal 14137, Q1010-0100 (03), scheduling Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

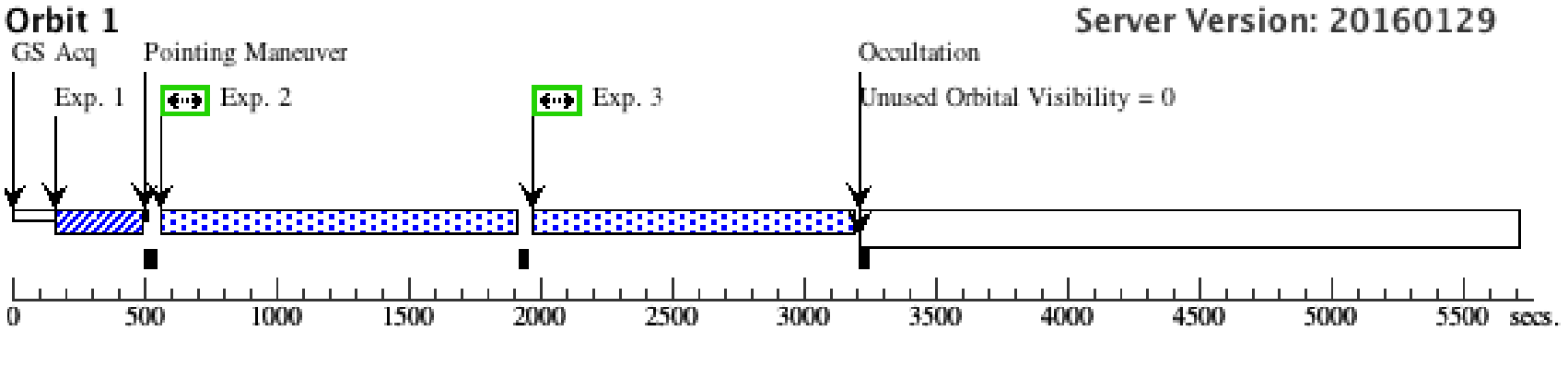
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	Q1010-0100	RA: 10 10 15.7400 (152.5655833d) Dec: -01 00 38.11 (-1.01059d) Equinox: J2000	Redshift: 0.230	V=19.67 FUV=53microJy, NUV=59microJy	Reference Frame: ICRS

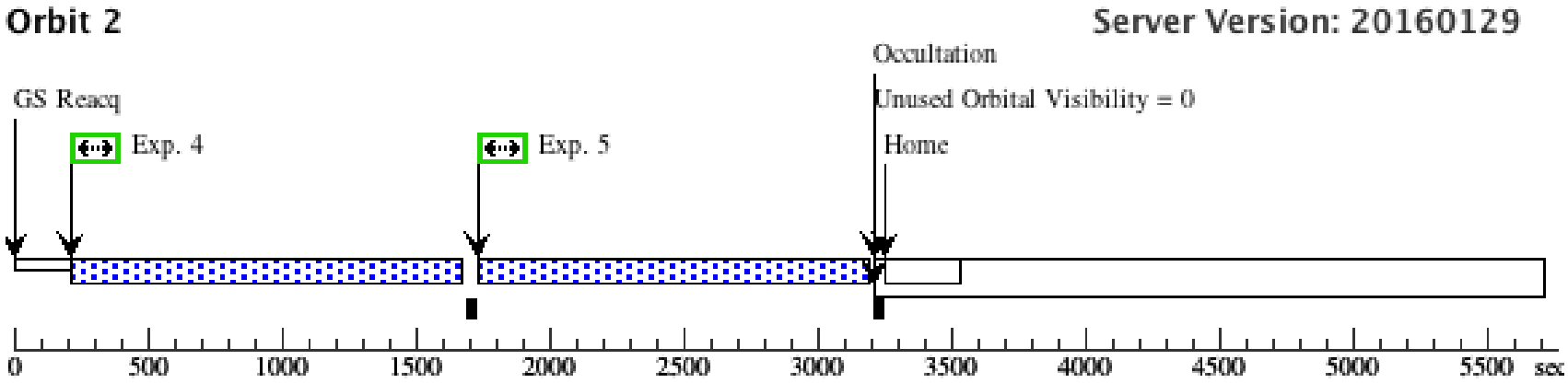
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1010-0100 ACQ/IMAGE (COS.ta.717807)	(4) Q1010-0100	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				50 Secs (50 Secs) *[==>]*	***[1]***
2	Q1010-0100 TIME-TAG (COS.sp.714982)	(4) Q1010-0100	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; SEGMENT=A; FP-POS=1			1168 Secs (1168 Secs) *[==>]*	***[1]***
3	Q1010-0100 TIME-TAG (COS.sp.714982)	(4) Q1010-0100	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FP-POS=2; SEGMENT=A; FLASH=YES			1168 Secs (1168 Secs) *[==>]*	***[1]***
4	Q1010-0100 TIME-TAG (COS.sp.714982)	(4) Q1010-0100	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; FP-POS=3; SEGMENT=A			1405 Secs (1405 Secs) *[==>]*	***[2]***
5	Q1010-0100 TIME-TAG (COS.sp.714982)	(4) Q1010-0100	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FP-POS=4; SEGMENT=A; FLASH=YES			1404 Secs (1404 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 14137, Q1130+6026 (04), scheduling Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

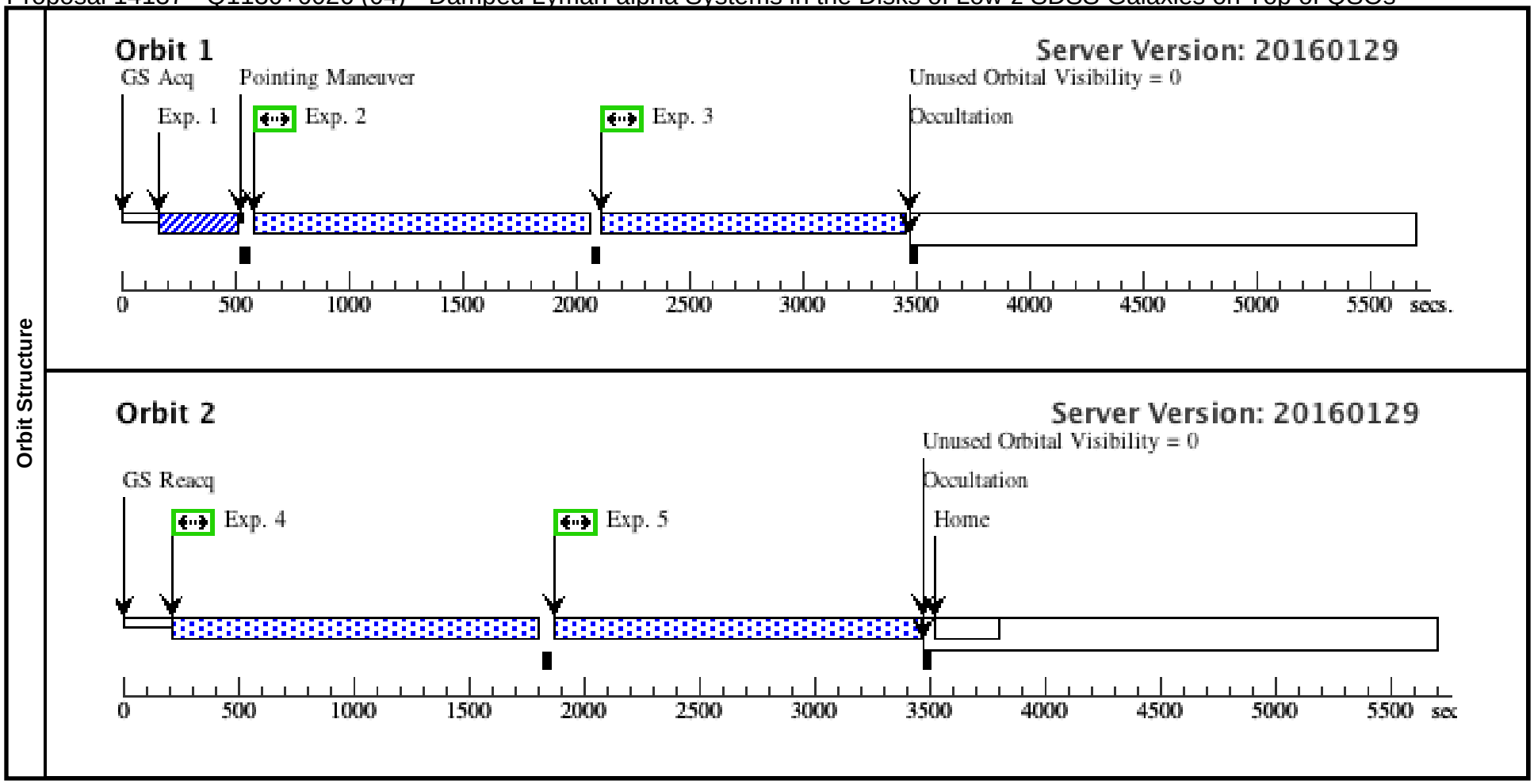
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	Q1130+6026	RA: 11 30 2.9900 (172.5124583d) Dec: +60 26 28.62 (60.44128d) Equinox: J2000	Redshift: 0.370	V=19.69 FUV=35microJy, NUV=36microJy	Reference Frame: ICRS

Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1130+6026 ACQ/IMAGE (COS.ta.717810)	(5) Q1130+6026	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				60 Secs (60 Secs) *[==>]*	***[1]***
2	Q1130+6026 TIME-TAG (COS.sp.714995)	(5) Q1130+6026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; FP-POS=1; SEGMENT=A			1292 Secs (1292 Secs) *[==>]*	***[1]***
3	Q1130+6026 TIME-TAG (COS.sp.714995)	(5) Q1130+6026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; SEGMENT=A; FP-POS=2			1292 Secs (1292 Secs) *[==>]*	***[1]***
4	Q1130+6026 TIME-TAG (COS.sp.714995)	(5) Q1130+6026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FP-POS=3; SEGMENT=A; FLASH=YES			1540 Secs (1540 Secs) *[==>]*	***[2]***
5	Q1130+6026 TIME-TAG (COS.sp.714995)	(5) Q1130+6026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7000; FLASH=YES; SEGMENT=A; FP-POS=4			1537 Secs (1537 Secs) *[==>]*	***[2]***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Exp. 2
Exp. 3
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Orbit 2
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Occultation
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Exp. 5
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sec

Visit

Proposal 14137, Q1135+2414 (05), scheduling Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

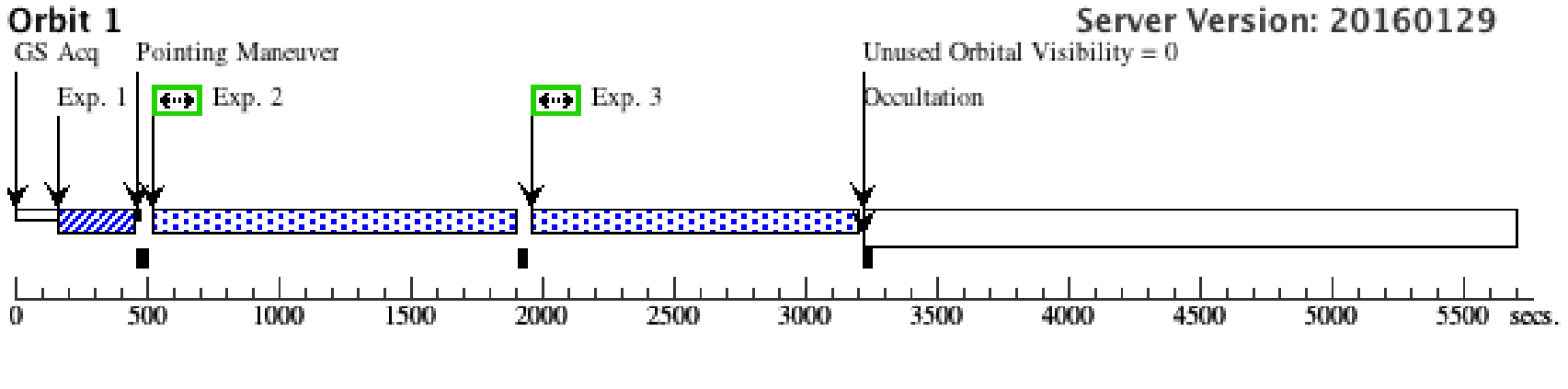
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	Q1135+2414	RA: 11 35 55.6600 (173.9819167d) Dec: +24 14 38.10 (24.24392d) Equinox: J2000	Redshift: 1.450	V=19.29 FUV=113microJy, NUV=155microJy	Reference Frame: ICRS

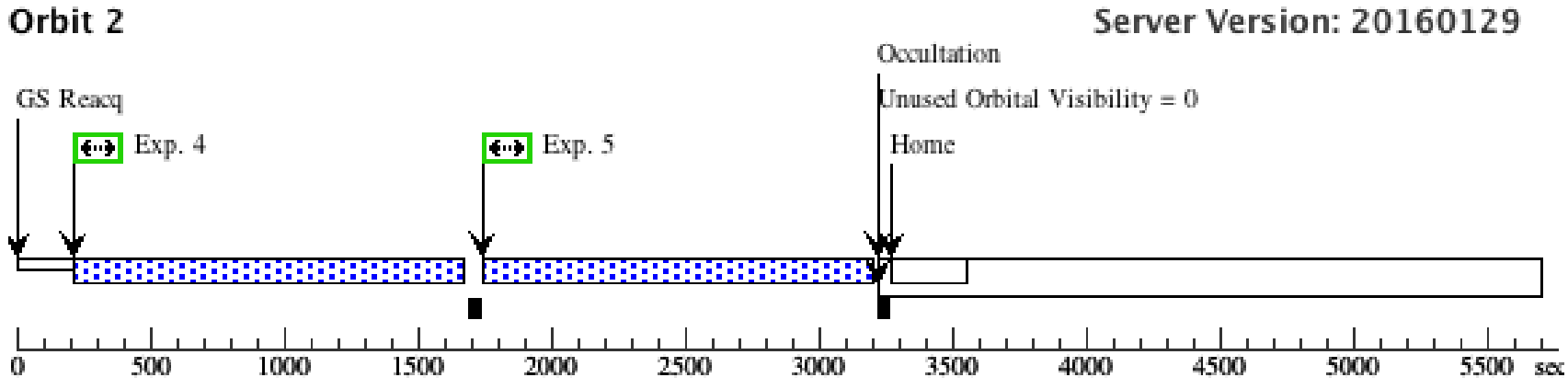
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1135+2414 ACQ/IMAGE (COS.ta.717190)	(6) Q1135+2414	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	*[1]*
2	Q1135+2414 TIME-TAG (COS.sp.715017)	(6) Q1135+2414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6200; FLASH=YES; SEGMENT=A; FP-POS=1			1200 Secs (1200 Secs) *[==>]*	*[1]*
3	Q1135+2414 TIME-TAG (COS.sp.715017)	(6) Q1135+2414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6200; FLASH=YES; FP-POS=2; SEGMENT=A			1188 Secs (1188 Secs) *[==>]*	*[1]*
4	Q1135+2414 TIME-TAG (COS.sp.715017)	(6) Q1135+2414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6200; FLASH=YES; FP-POS=3; SEGMENT=A			1406 Secs (1406 Secs) *[==>]*	*[2]*
5	Q1135+2414 TIME-TAG (COS.sp.715017)	(6) Q1135+2414	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6200; FP-POS=4; FLASH=YES; SEGMENT=A			1406 Secs (1406 Secs) *[==>]*	*[2]*

Orbit Structure





Visit

Proposal 14137, Q1328+2159 (06), implementation Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

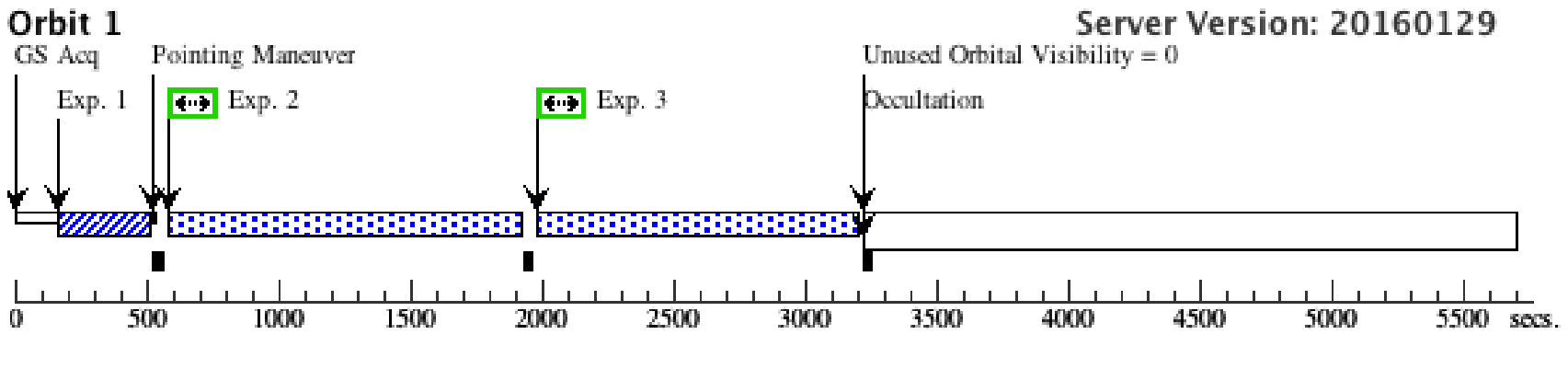
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	Q1328+2159	RA: 13 28 24.3300 (202.1013750d) Dec: +21 59 19.66 (21.98879d) Equinox: J2000	Redshift: 0.330	V=19.05 FUV=40microJy, NUV=46microJy	Reference Frame: ICRS

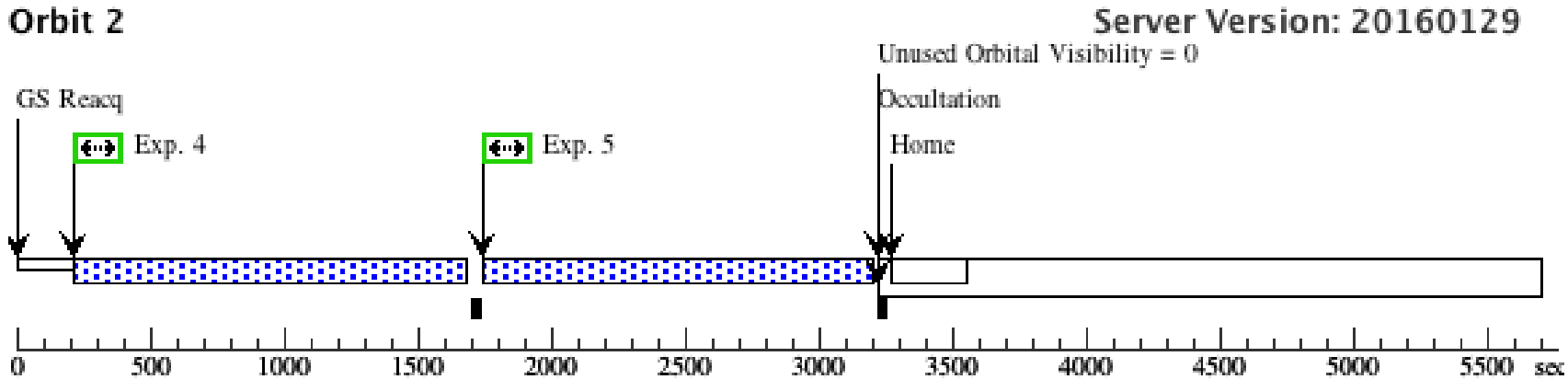
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1328+2159 ACQ/IMAGE (COS.ta.717812)	(7) Q1328+2159	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				60 Secs (60 Secs) *[==>]*	*[1]*
2	Q1328+2159 TIME-TAG (COS.sp.732972)	(7) Q1328+2159	COS/FUV, TIME-TAG, PSA	G140L 1280 A	SEGMENT=BOTH; BUFFER-TIME=10000; FP-POS=1; FLASH=YES			1165 Secs (1165 Secs) *[==>]*	*[1]*
	Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.								
3	Q1328+2159 TIME-TAG (COS.sp.732972)	(7) Q1328+2159	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=10000; FLASH=YES; FP-POS=2; SEGMENT=BOTH	SAME POS AS 2		1171 Secs (1171 Secs) *[==>]*	*[1]*
	Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.								
4	Q1328+2159TIME-TAG (COS.sp.732972)	(7) Q1328+2159	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=10000; FLASH=YES; FP-POS=3; SEGMENT=BOTH	SAME POS AS 2		1415 Secs (1415 Secs) *[==>]*	*[2]*
	Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.								
5	Q1328+2159 TIME-TAG (COS.sp.732972)	(7) Q1328+2159	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=10000; FP-POS=4; SEGMENT=BOTH; FLASH=YES	SAME POS AS 2		1406 Secs (1406 Secs) *[==>]*	*[2]*
	Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.								

Orbit Structure





Visit

Proposal 14137, Q1452+5443 (07), implementation Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

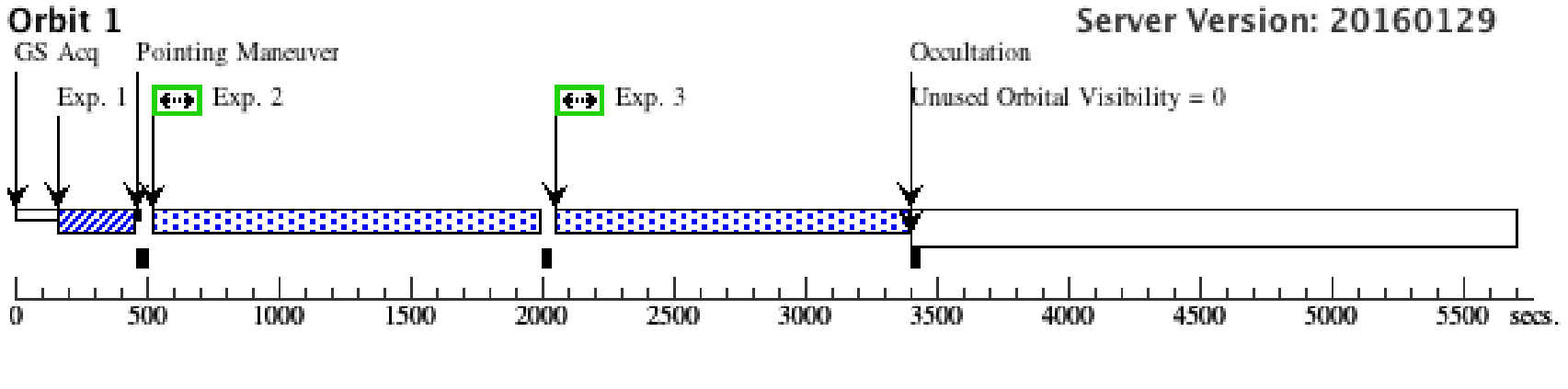
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	Q1452+5443	RA: 14 52 40.5300 (223.1688750d) Dec: +54 43 45.11 (54.72920d) Equinox: J2000	Redshift: 1.520	V=18.77 FUV=48microJy, NUV=82microJy	Reference Frame: ICRS

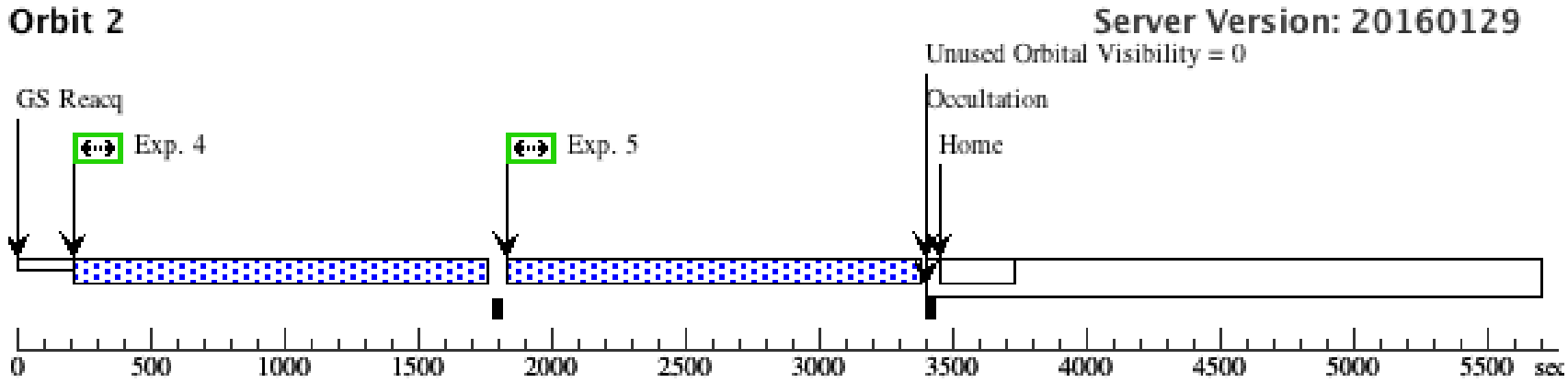
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1452+5443 ACQ/IMAGE (COS.ta.717813)	(9) Q1452+5443	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	*[1]*
2	Q1452+5443 TIME-TAG (COS.sp.732979)	(9) Q1452+5443	COS/FUV, TIME-TAG, PSA	G140L 1280 A	SEGMENT=BOTH; BUFFER-TIME=9700; FP-POS=1; FLASH=YES			1292 Secs (1292 Secs) *[==>]*	*[1]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
3	Q1452+5443 TIME-TAG (COS.sp.732979)	(9) Q1452+5443	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9700; FLASH=YES; FP-POS=2; SEGMENT=BOTH	SAME POS AS 2		1285 Secs (1285 Secs) *[==>]*	*[1]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
4	Q1452+5443 TIME-TAG (COS.sp.732979)	(9) Q1452+5443	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9700; FLASH=YES; FP-POS=3; SEGMENT=BOTH	SAME POS AS 2		1502 Secs (1502 Secs) *[==>]*	*[2]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
5	Q1452+5443 TIME-TAG (COS.sp.732979)	(9) Q1452+5443	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=9700; FP-POS=4; SEGMENT=BOTH; FLASH=YES	SAME POS AS 2		1500 Secs (1500 Secs) *[==>]*	*[2]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									

Orbit Structure





Visit

Proposal 14137, Q1457+5321 (08), scheduling Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

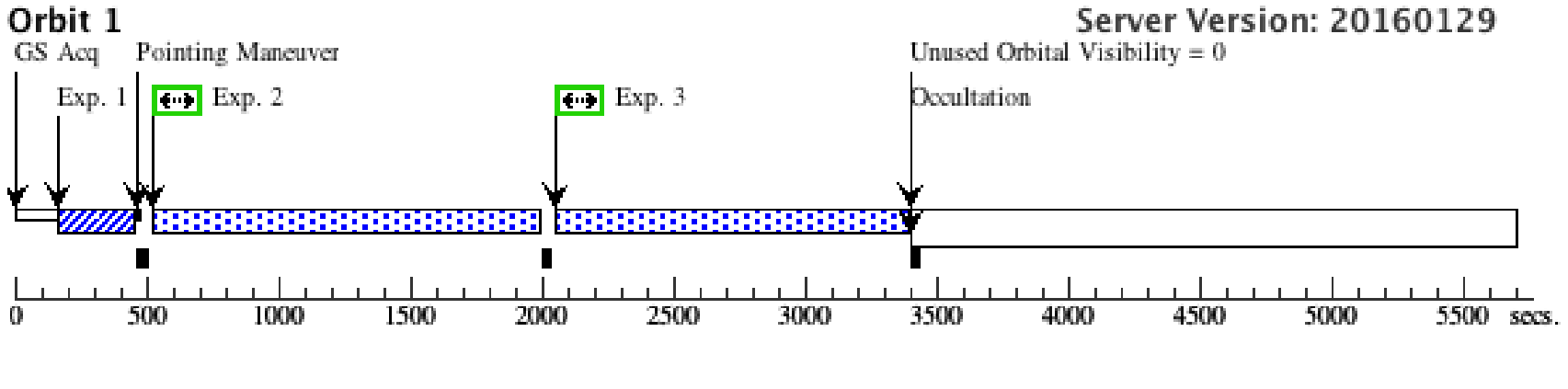
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	Q1457+5321	RA: 14 57 19.0000 (224.3291667d) Dec: +53 21 59.27 (53.36646d) Equinox: J2000	Redshift: 1.200	V=18.39 FUV=39microJy, NUV=99microJy	Reference Frame: ICRS

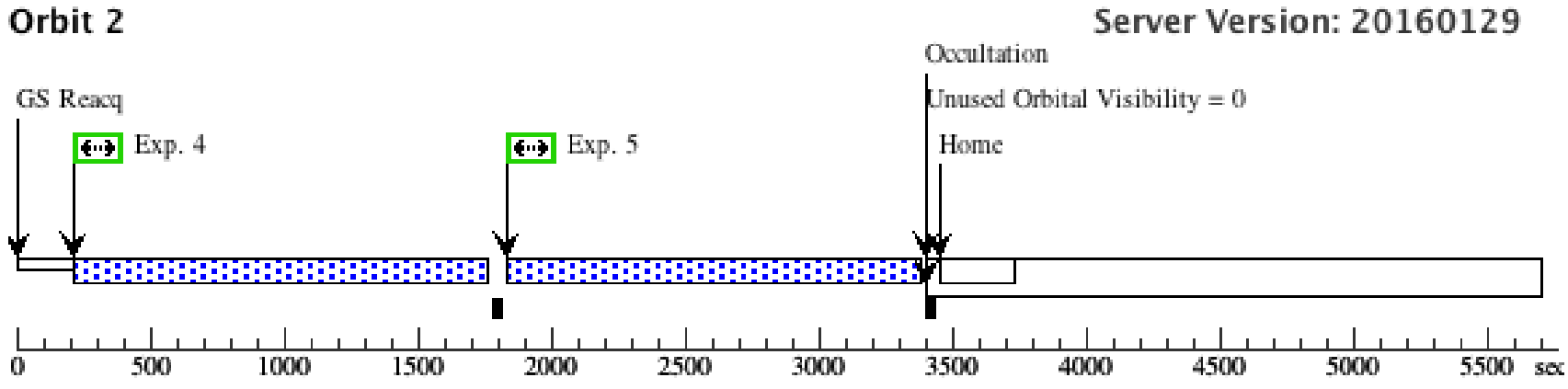
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1457+5321 ACQ/IMAGE (COS.ta.717814)	(10) Q1457+5321	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	***[1]***
2	Q1457+5321 TIME-TAG (COS.sp.715050)	(10) Q1457+5321	COS/FUV, TIME-TAG, PSA	G140L 1105 A	SEGMENT=A; BUFFER-TIME=7200; FP-POS=1; FLASH=YES			1285 Secs (1285 Secs) *[==>]*	***[1]***
3	Q1457+5321 TIME-TAG (COS.sp.715050)	(10) Q1457+5321	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7200; FLASH=YES; FP-POS=2; SEGMENT=A	SAME POS AS 2		1284 Secs (1284 Secs) *[==>]*	***[1]***
4	Q1457+5321 TIME-TAG (COS.sp.715050)	(10) Q1457+5321	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7200; FLASH=YES; FP-POS=3; SEGMENT=A	SAME POS AS 2		1502 Secs (1502 Secs) *[==>]*	***[2]***
5	Q1457+5321 TIME-TAG (COS.sp.715050)	(10) Q1457+5321	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=7200; FP-POS=4; SEGMENT=A; FLASH=YES	SAME POS AS 2		1500 Secs (1500 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 14137, Q1659+6202 (09), completed Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

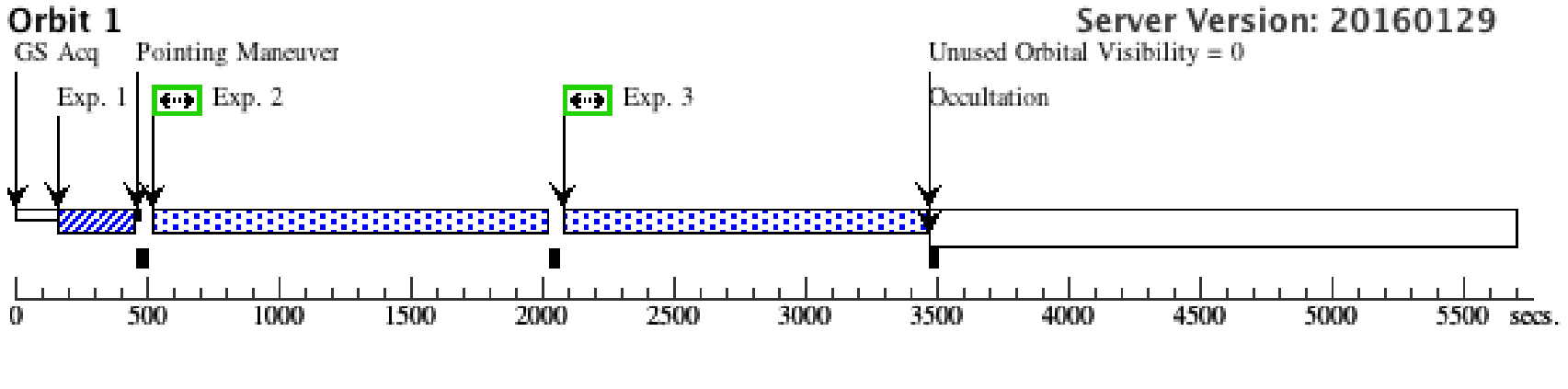
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(12)	Q1659+6202	RA: 16 59 58.9400 (254.9955833d) Dec: +62 02 18.14 (62.03837d) Equinox: J2000	Redshift: 0.230	V=17.87 FUV=119microJy, NUV=146microJy	Reference Frame: ICRS

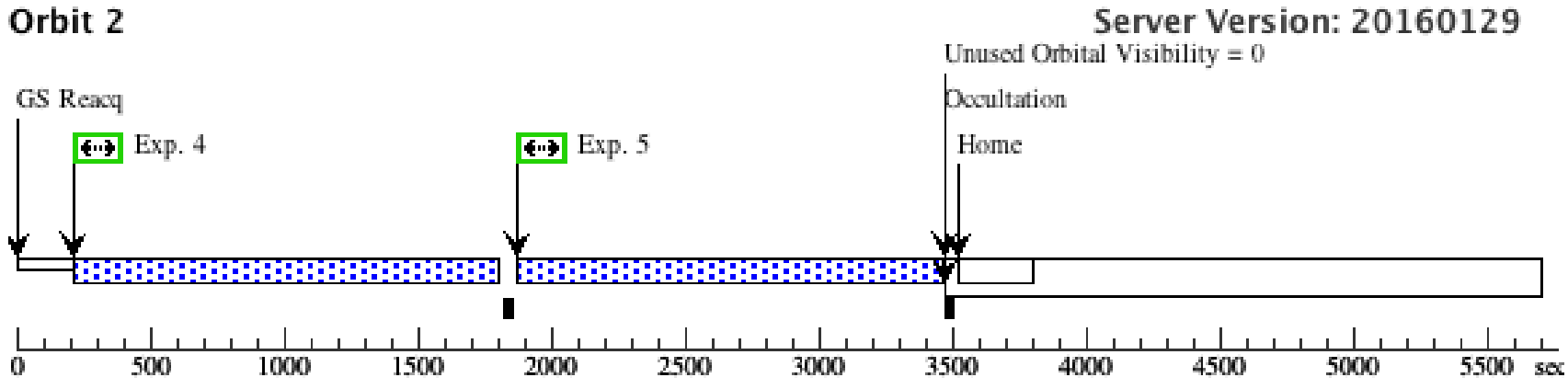
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q1659+6202 ACQ/IMAGE (COS.ta.717815)	(12) Q1659+6202	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	*[1]*
2	Q1659+6202 TIME-TAG (COS.sp.732984)	(12) Q1659+6202	COS/FUV, TIME-TAG, PSA	G140L 1280 A	SEGMENT=A; BUFFER-TIME=8700; FP-POS=1; FLASH=YES			1326 Secs (1326 Secs) *[==>]*	*[1]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
3	Q1659+6202 TIME-TAG (COS.sp.732984)	(12) Q1659+6202	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=8700; FLASH=YES; FP-POS=2; SEGMENT=A	SAME POS AS 2		1326 Secs (1326 Secs) *[==>]*	*[1]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
4	Q1659+6202 TIME-TAG (COS.sp.732984)	(12) Q1659+6202	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=8700; FLASH=YES; FP-POS=3; SEGMENT=A	SAME POS AS 2		1537 Secs (1537 Secs) *[==>]*	*[2]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									
5	Q1659+6202 TIME-TAG (COS.sp.732984)	(12) Q1659+6202	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=8700; FP-POS=4; SEGMENT=A; FLASH=YES	SAME POS AS 2		1540 Secs (1540 Secs) *[==>]*	*[2]*
Comments: The 1280 central wavelength will allow us to cover Ly-beta in addition to Ly-alpha.									

Orbit Structure





Visit

Proposal 14137, Q2117+0026 (10), scheduling Fri Feb 19 02:02:29 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: GALEX FUV flux halved for ETC in order to account for QSO variability and foreground galaxy contamination.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(13)	Q2117+0026	RA: 21 17 1.3100 (319.2554583d) Dec: -00 26 38.80 (-.44411d) Equinox: J2000	Redshift: 1.137	V=19.14 FUV=70microJy, NUV=120microJy	Reference Frame: ICRS

Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Q2117+0026 ACQ/IMAGE (COS.ta.717816)	(13) Q2117+0026	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				30 Secs (30 Secs) *[==>]*	***[1]***
2	Q2117+0026 TIME-TAG (COS.sp.715149)	(13) Q2117+0026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6700; FLASH=YES; FP-POS=1; SEGMENT=A			1195 Secs (1195 Secs) *[==>]*	***[1]***
3	Q2117+0026 TIME-TAG (COS.sp.715149)	(13) Q2117+0026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6700; FLASH=YES; FP-POS=2; SEGMENT=A	SAME POS AS 2		1181 Secs (1181 Secs) *[==>]*	***[1]***
4	Q2117+0026 TIME-TAG (COS.sp.715149)	(13) Q2117+0026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6700; FLASH=YES; FP-POS=3; SEGMENT=A	SAME POS AS 2		1404 Secs (1404 Secs) *[==>]*	***[2]***
5	Q2117+0026 TIME-TAG (COS.sp.715149)	(13) Q2117+0026	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=6700; FP-POS=4; FLASH=YES; SEGMENT=A	SAME POS AS 2		1405 Secs (1405 Secs) *[==>]*	***[2]***

Orbit Structure