13706 - Galactic Accretion Unveiled: A Unique Opportunity with COS and M33

Cycle: 22, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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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) M33-OB-2-4	COS/FUV	4	29-Dec-2015 21:00:38.0	yes
02	(2) M33-FUV-016	COS/FUV	4	29-Dec-2015 21:00:40.0	yes
03	(3) M33-FUV-350	COS/FUV	4	29-Dec-2015 21:00:42.0	yes
04	(4) M33-FUV-444	COS/FUV	4	29-Dec-2015 21:00:44.0	yes
08	(8) M33-OB-88-7	COS/FUV	4	29-Dec-2015 21:00:46.0	yes
06	(6) NGC592	COS/FUV	4	29-Dec-2015 21:00:48.0	yes
07	(7) NGC604	COS/FUV	4	29-Dec-2015 21:00:50.0	yes

28 Total Orbits Used

ABSTRACT

The flow of gas into and out of galactic disks is as crucial to the evolution of galaxies as it is difficult to observe. Observations of UV metal absorption lines towards a star at the center of M33 have already shown hints that this disk galaxy may be accreting through the cooling of hot gas at

the center of its halo. We develop a suite of accretion models, which show how further UV absorption line observations to M33 disk stars will distinguish between different accretion scenarios. We propose to use COS to observe 7 more stars at high spectral resolution to determine the radial scale and velocity structure of this inflow and further study the mechanisms that drive galactic accretion and winds.

OBSERVING DESCRIPTION

We are targeting O stars and Wolf-Rayet stars in the disk of M33 with two primary requirements: 1) They have FUSE spectra available in the archive, ensuring that their FUV flux will be high enough to achieve our required S/N (see below), and 2) They help discriminate amongst different accretion models. Criterion 1 limits us to 14 stars and criterion 2 winnows the group to our 7 targets in the star-forming disk of M33.

To achieve our primary goal of detecting the weak FUV absorption features in the wings of strong absorption features, we require a S/N of 15--20 over our wavelength range, and the highest spectral resolution of COS (G130M) with a central wavelength of 1291 angstroms. These requirements are to ensure an accurate measurement of this weak component and to avoid blending with the disk of M33 and the Milky Way. Our S/N requirements are determined primarily from our analysis of the COS G130M archival data for the sightline UIT-236, an O star in M33 studied by the COS GTO team. The total exposure time for the COS 130M observation of UIT-236 is 10,650 s, corresponding to 4 orbits in Cycle 18.

Because we selected all of our O star sightlines to have FUSE spectra with very similar UV continuum fluxes to that of UIT-236 (> 5.0 x 10^-15 ergs/s/cm^-2/angstrom at 1300 angstroms), we require similar exposure times. The Cycle 22 COS ETC tells us that we will require ~10,000 s exposure time for our targeted objects to reach a S/N of 15 - 20 over the full spectral range. The most stringent requirement setting the exposure time is that we cover the SiIV doublet (1393, 1402 angstroms) at the minimum S/N of 15. This calculation amounts to 4 orbits per target.

To make a more accurate assessment of the brightness of the sources, we use FUSE data taken at 1180 angstroms and extrapolate to 1300 angstroms. Unfortunately, these fields are crowded, and the FUSE FOV is much larger than the COS FOV. In the case of UIT-236, in the center of M33, this amounts to a factor of 7 decrease in observed brightness in the COS data. With this in mind we use the GALEX M33 image to assess the extent of crowding in the field by determining a ratio of expected COS flux to FUSE flux. We use this value and the FUSE measurement to extrapolate to the flux of source that we expect to be observed by COS. In our analysis we find expected fluxes at 1180 angstroms of:

M33_OB-2-4 2.72023e-14
M33_FUV-016 2.32667e-14

M33_FUV-350 6.27743e-15

M33_FUV-444 1.07750e-14

M33_OB-21-108 1.24190e-14

NGC592 6.08564e-15

NGC604 2.54475e-14

UIT-236 8.00000e-15

Visit

Proposal 13706, Visit 01, completed Wed Dec 30 02:00:51 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

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

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

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

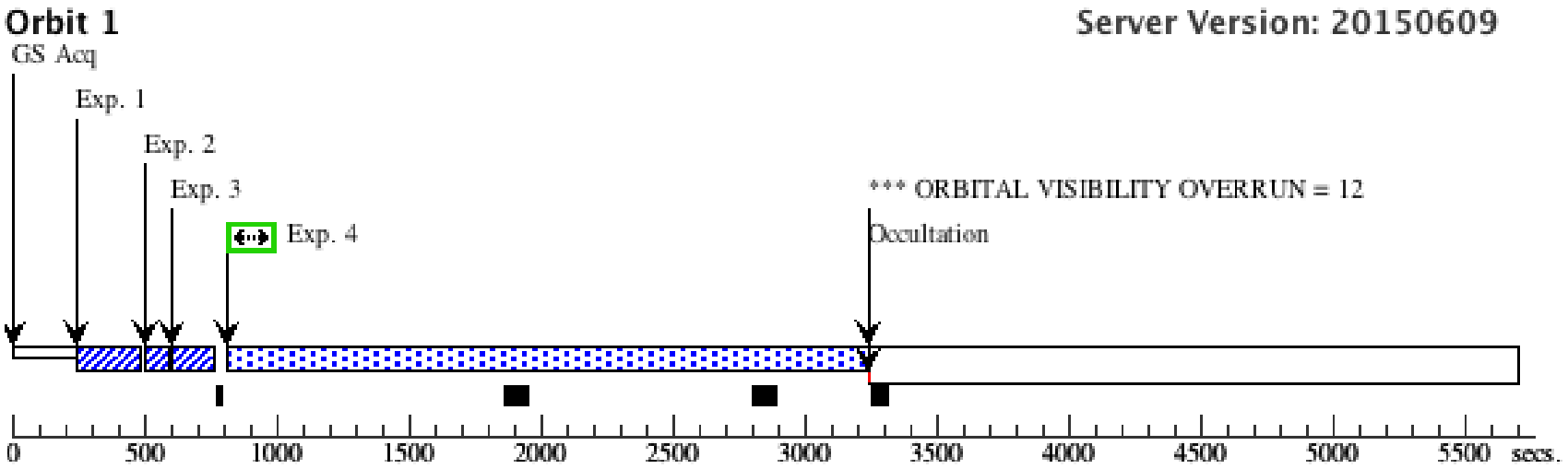
Fixed Targets

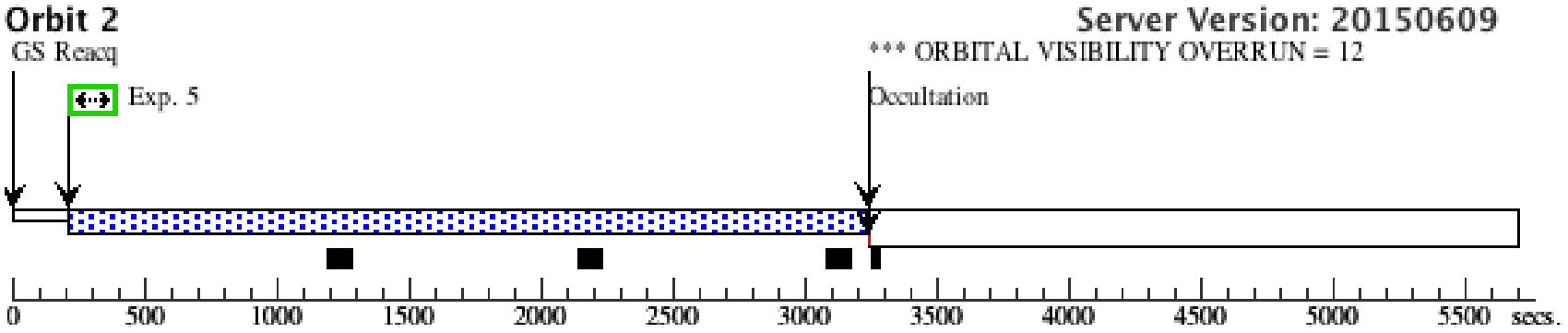
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M33-OB-2-4	RA: 01 33 58.6900 (23.4945417d) Dec: +30 35 25.79 (30.59050d) Equinox: J2000		V=16.5	Reference Frame: ICRS

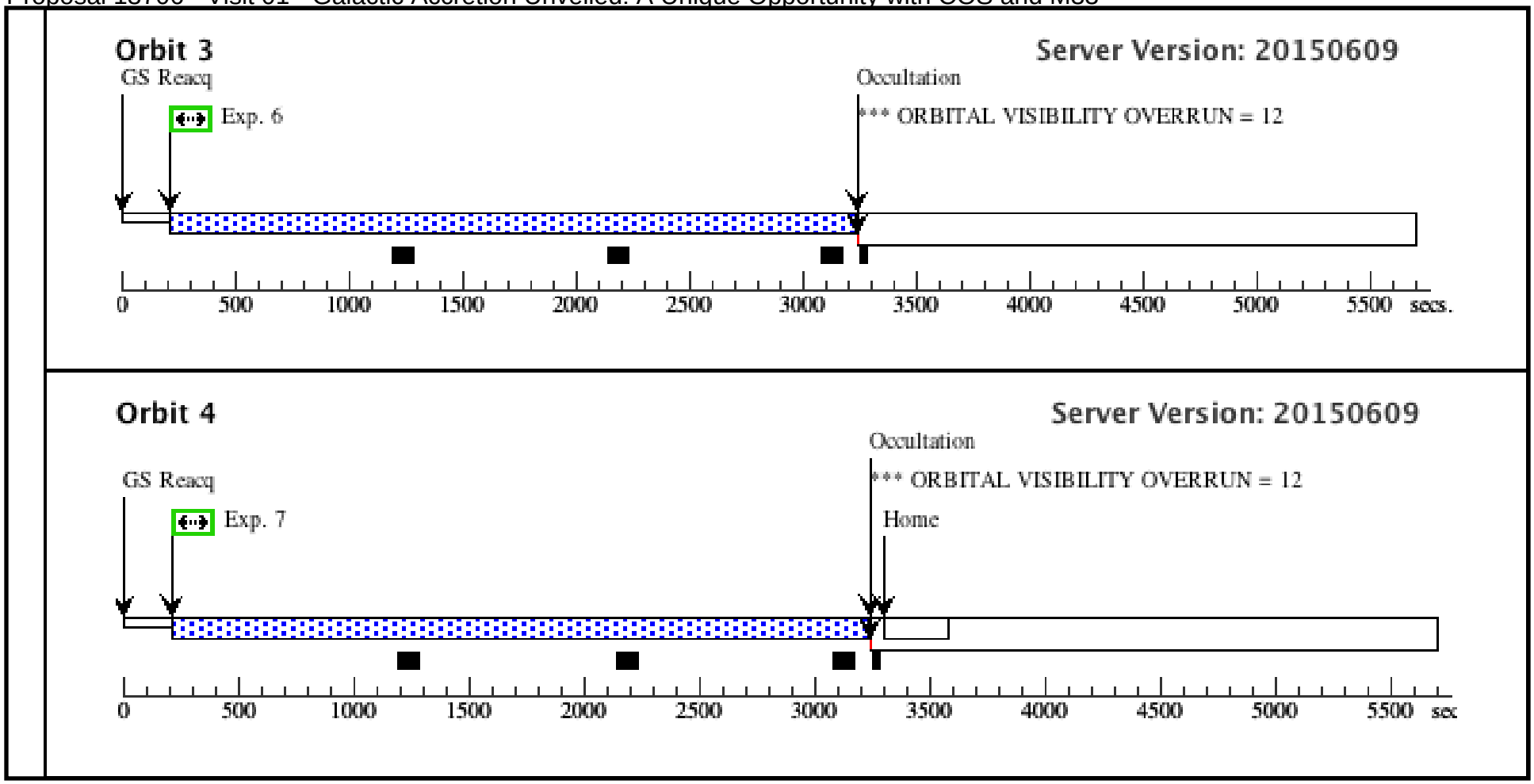
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626 285)	(1) M33-OB-2-4	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767			1.6 Secs (1.6 Secs) *[==>]*	*[1]*
2	(COS.sa.626 286)	(1) M33-OB-2-4	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				0.6 Secs (0.6 Secs) *[==>]*	*[1]*
3	(COS.sa.626 285)	(1) M33-OB-2-4	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=FLUX-WT-FLR; NUM-POS=5			1.6 Secs (1.6 Secs) *[==>]*	*[1]*
4	(COS.sp.626 305)	(1) M33-OB-2-4	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=942			2100 Secs (2308 Secs) *[==>2308.0 Secs]*	*[1]*
5	(COS.sp.626 305)	(1) M33-OB-2-4	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=942			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	*[2]*
6	(COS.sp.626 305)	(1) M33-OB-2-4	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=942			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	*[3]*
7	(COS.sp.626 305)	(1) M33-OB-2-4	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=942.0			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	*[4]*

Orbit Structure



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Visit

Proposal 13706, Visit 02, completed Wed Dec 30 02:00:51 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

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

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

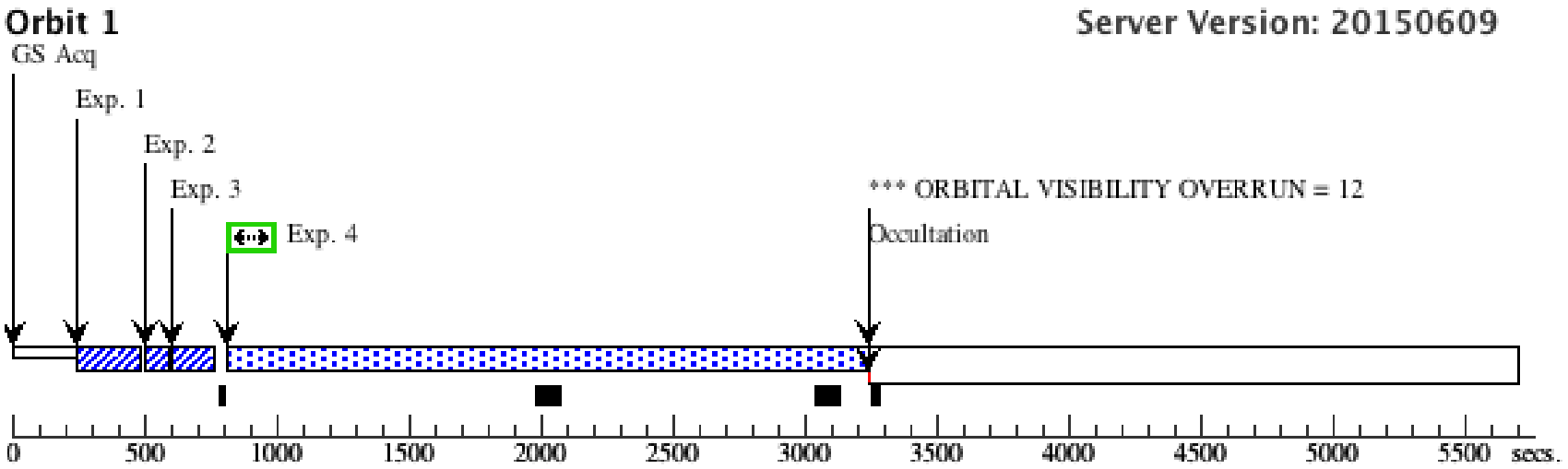
Fixed Targets

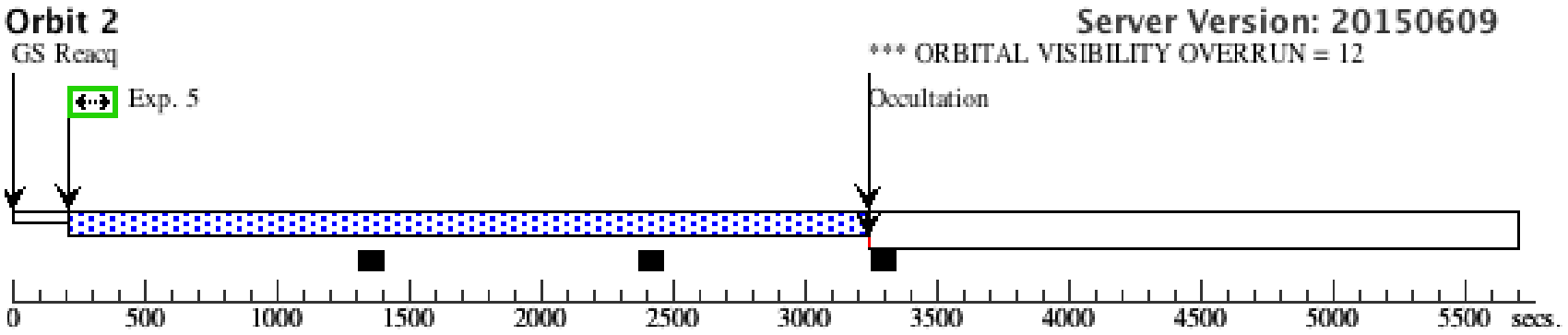
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	M33-FUV-016	RA: 01 32 37.7200 (23.1571667d) Dec: +30 40 5.60 (30.66822d) Equinox: J2000		V=17.4	Reference Frame: ICRS

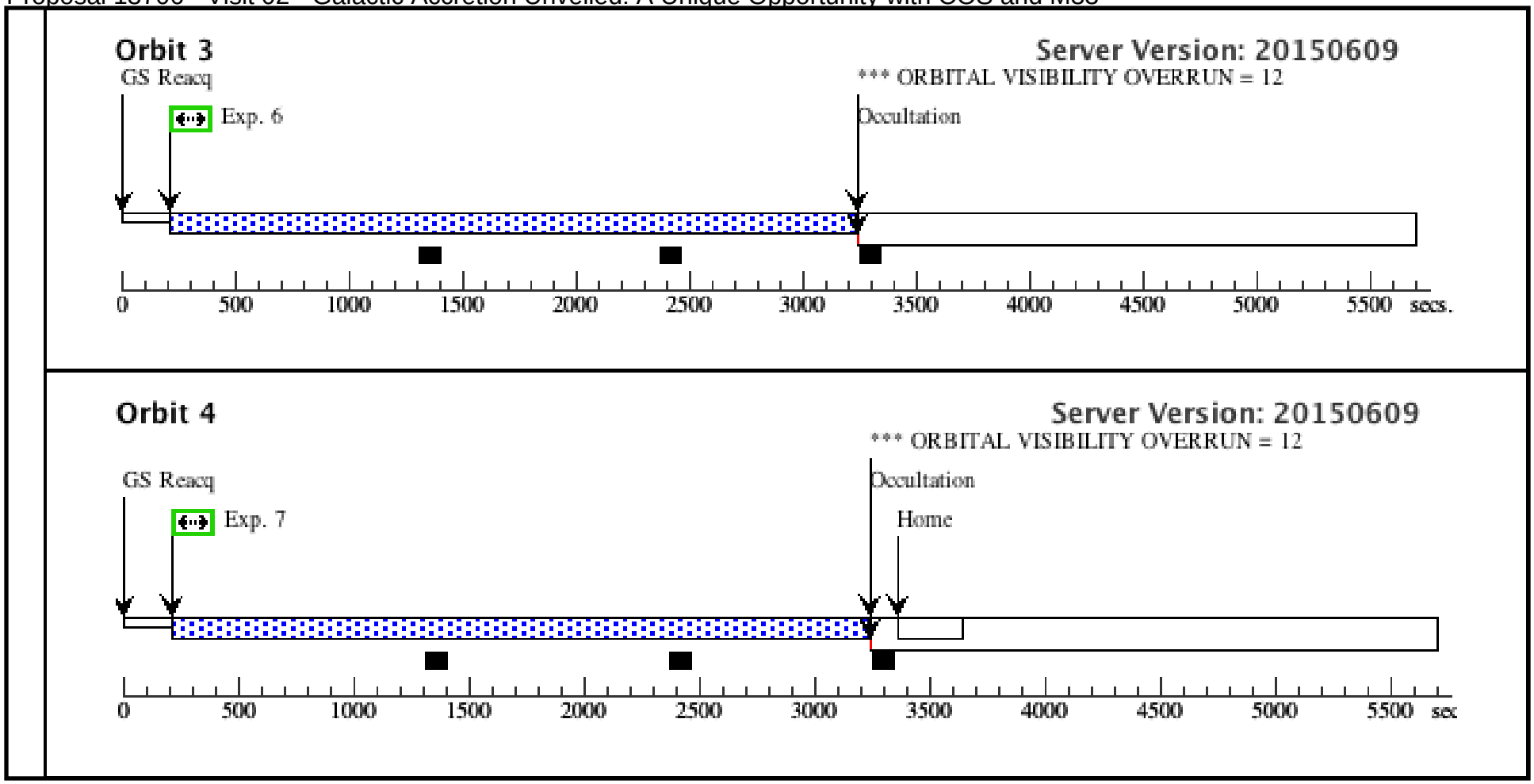
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626287)	(2) M33-FUV-016	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767			1.8 Secs (1.8 Secs) *[==>]*	***[1]***
2	(COS.sa.626288)	(2) M33-FUV-016	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				0.7 Secs (0.7 Secs) *[==>]*	***[1]***
3	(COS.sa.626287)	(2) M33-FUV-016	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=FLUX-WT-FLR; NUM-POS=5			1.8 Secs (1.8 Secs) *[==>]*	***[1]***
4	(COS.sp.626306)	(2) M33-FUV-016	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=1061			2100 Secs (2306 Secs) *[==>2306.0 Secs]*	***[1]***
5	(COS.sp.626306)	(2) M33-FUV-016	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=1061			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[2]***
6	(COS.sp.626306)	(2) M33-FUV-016	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=1061			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[3]***
7	(COS.sp.626306)	(2) M33-FUV-016	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=1061			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[4]***

Orbit Structure



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Visit

Proposal 13706, Visit 03, completed Wed Dec 30 02:00:52 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

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

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

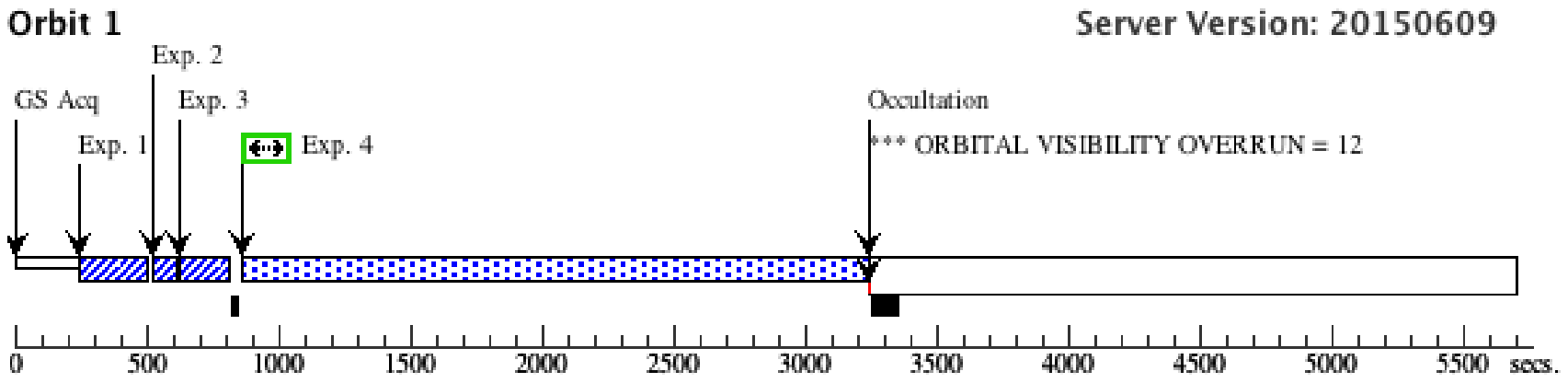
Fixed Targets

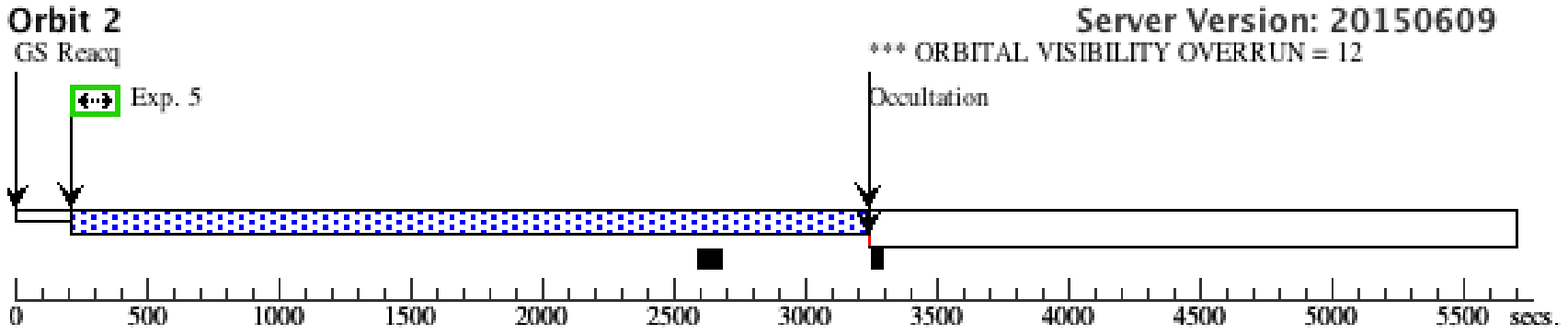
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	M33-FUV-350	RA: 01 33 55.8000 (23.4825000d) Dec: +30 45 29.00 (30.75806d) Equinox: J2000		V=17.9	Reference Frame: ICRS

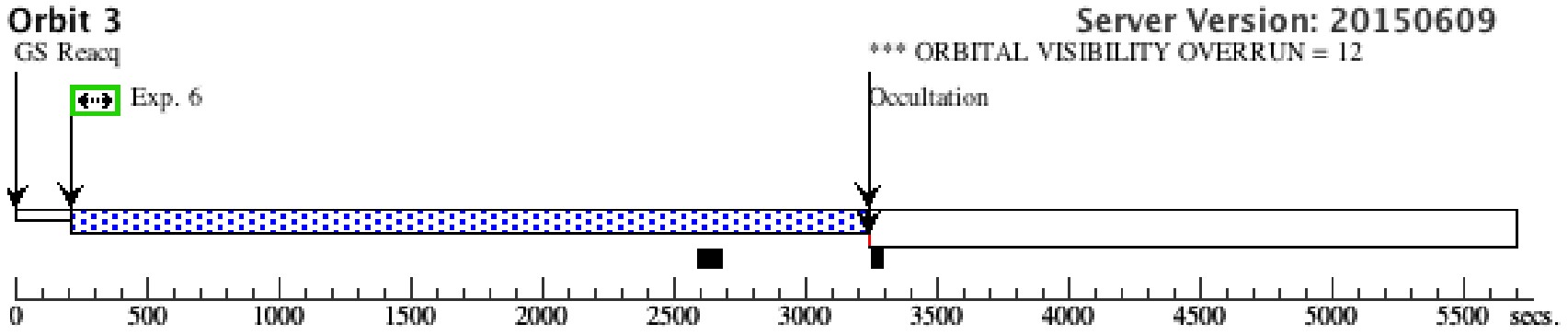
Exposures

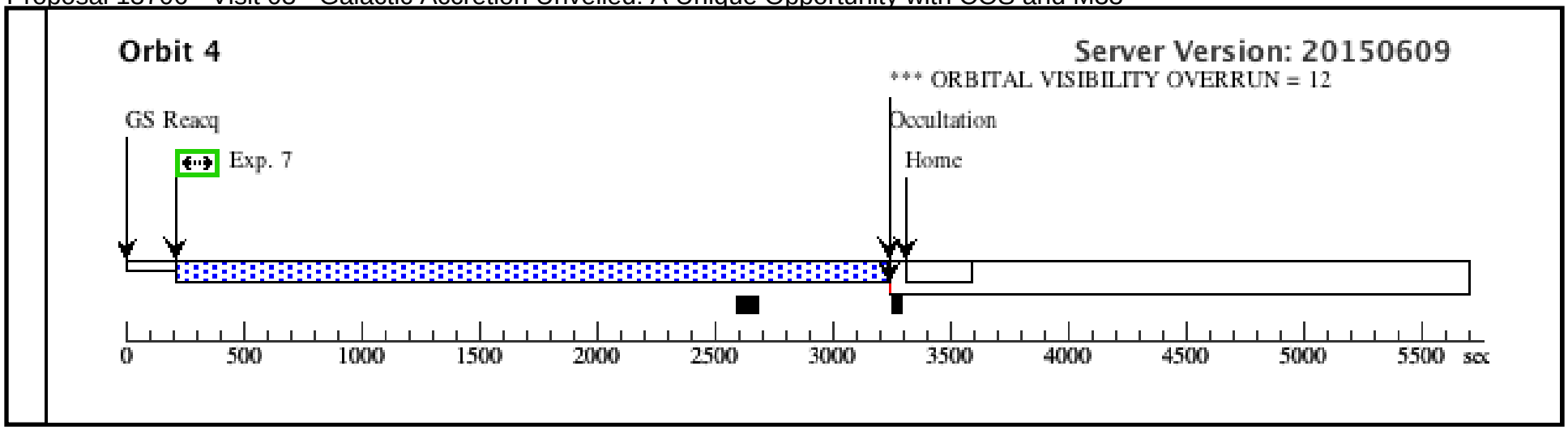
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626289)	(3) M33-FUV-350	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767			7 Secs (7 Secs) *[==>]*	***[1]***
2	(COS.sa.626290)	(3) M33-FUV-350	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				2.7 Secs (2.7 Secs) *[==>]*	***[1]***
3	(COS.sa.626289)	(3) M33-FUV-350	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; NUM-POS=5; CENTER=FLUX-WT-FLR			7 Secs (7 Secs) *[==>]*	***[1]***
4	(COS.sp.626307)	(3) M33-FUV-350	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=2336			2100 Secs (2258 Secs) *[==>2258.0 Secs]*	***[1]***
5	(COS.sp.626307)	(3) M33-FUV-350	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=2336			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[2]***
6	(COS.sp.626307)	(3) M33-FUV-350	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=2336			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[3]***
7	(COS.sp.626307)	(3) M33-FUV-350	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=2336			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[4]***

Orbit Structure





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Visit

Proposal 13706, Visit 04, completed Wed Dec 30 02:00:52 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

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

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

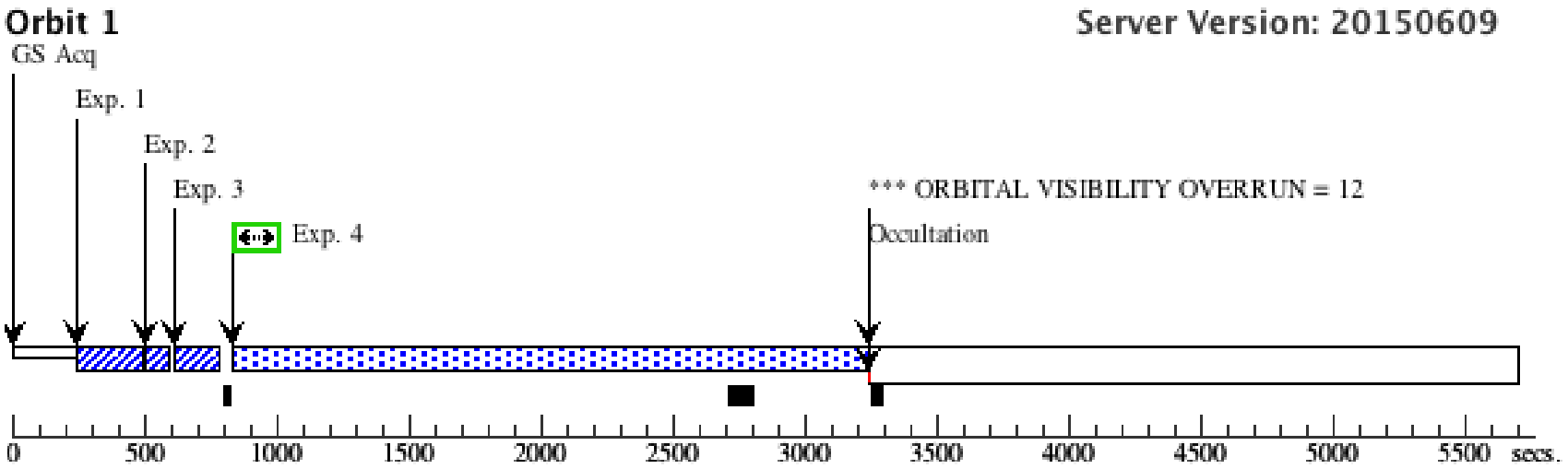
Fixed Targets

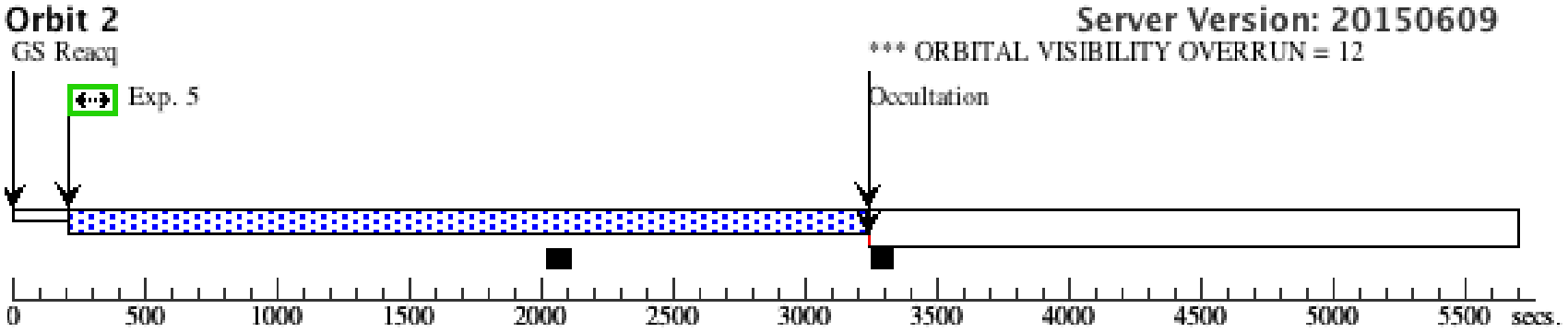
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	M33-FUV-444	RA: 01 34 9.9300 (23.5413750d) Dec: +30 39 10.60 (30.65294d) Equinox: J2000		V=17.8	Reference Frame: ICRS

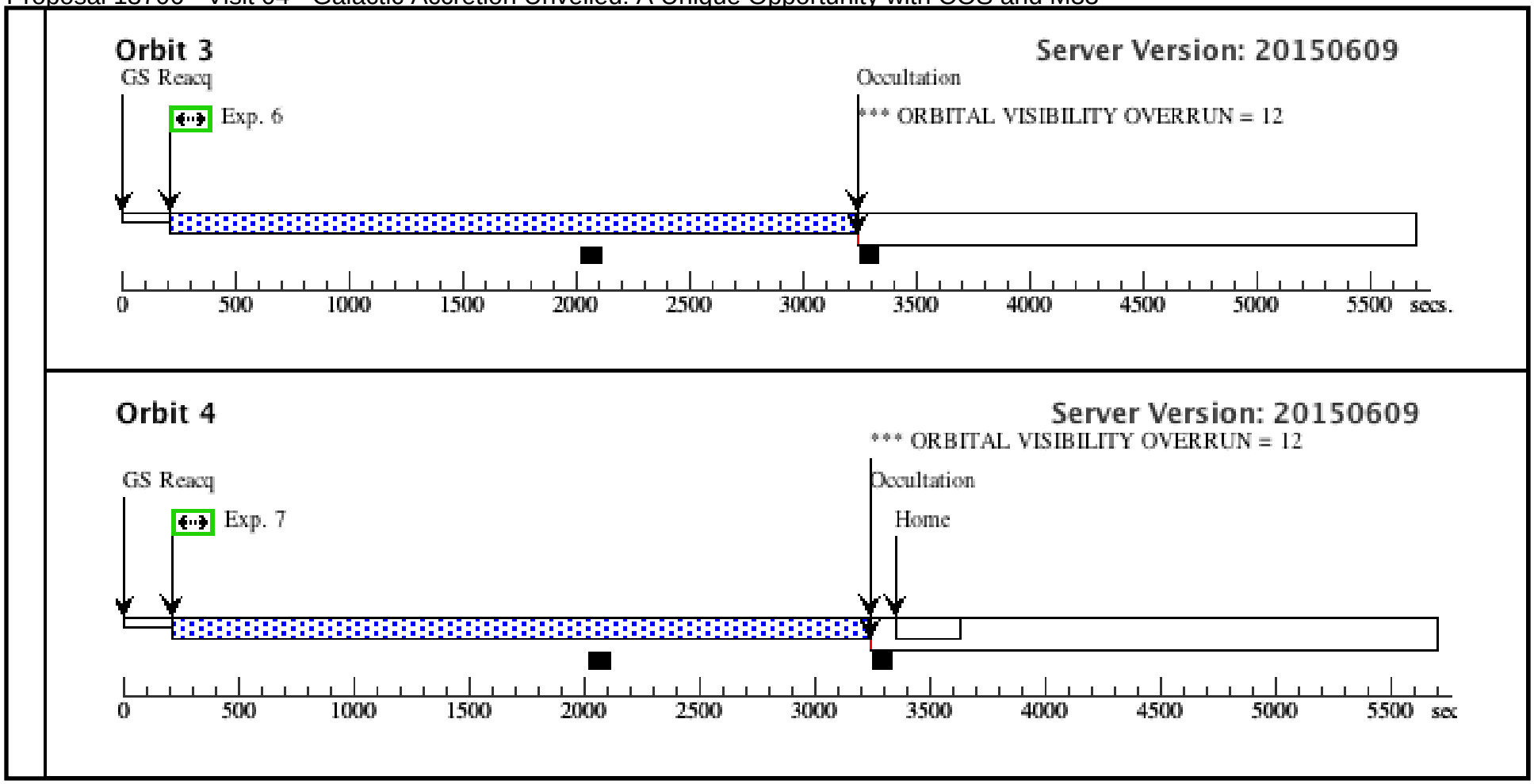
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626292)	(4) M33-FUV-444	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767			4.0 Secs (4 Secs) *[==>]*	***[1]***
2	(COS.sa.626294)	(4) M33-FUV-444	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				1.6 Secs (1.6 Secs) *[==>]*	***[1]***
3	(COS.sa.626292)	(4) M33-FUV-444	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; NUM-POS=5; CENTER=FLUX-WT-FLR			4.0 Secs (4 Secs) *[==>]*	***[1]***
4	(COS.sp.626308)	(4) M33-FUV-444	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=1772			2100 Secs (2286 Secs) *[==>2286.0 Secs]*	***[1]***
5	(COS.sp.626308)	(4) M33-FUV-444	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=1772			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[2]***
6	(COS.sp.626308)	(4) M33-FUV-444	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=1772			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[3]***
7	(COS.sp.626308)	(4) M33-FUV-444	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=1772			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[4]***

Orbit Structure



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Visit

Proposal 13706, Visit 08, implementation Wed Dec 30 02:00:52 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV

Special Requirements: (none)

Fixed Targets

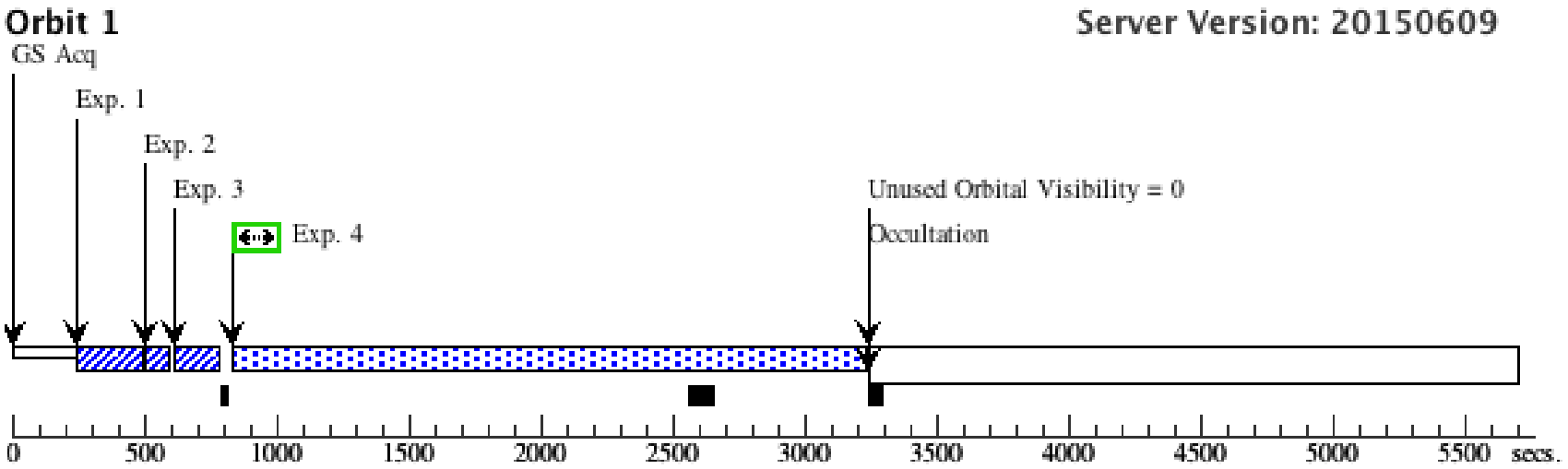
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	M33-OB-88-7	RA: 01 34 59.4000 (23.7475000d) Dec: +30 42 1.00 (30.70028d) Equinox: J2000		V=18.5	Reference Frame: ICRS

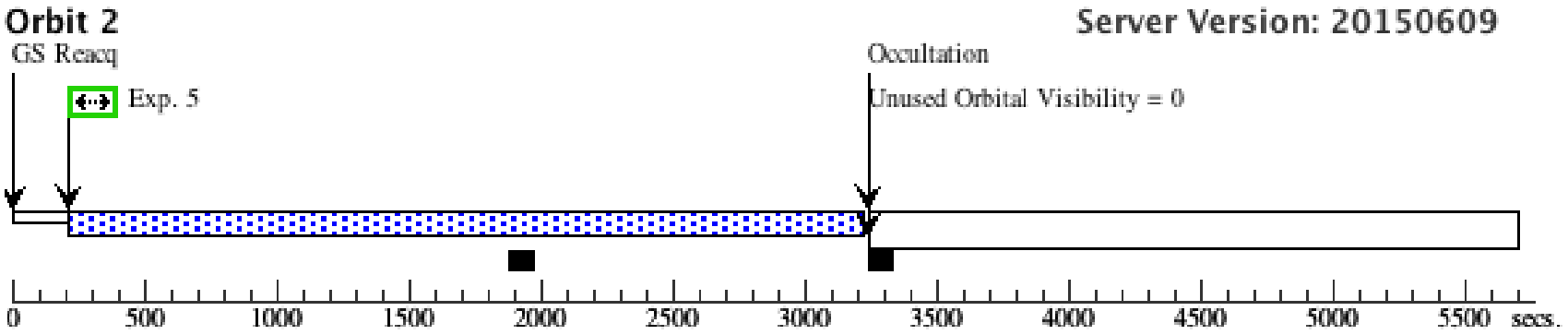
Comments: Extended=NO

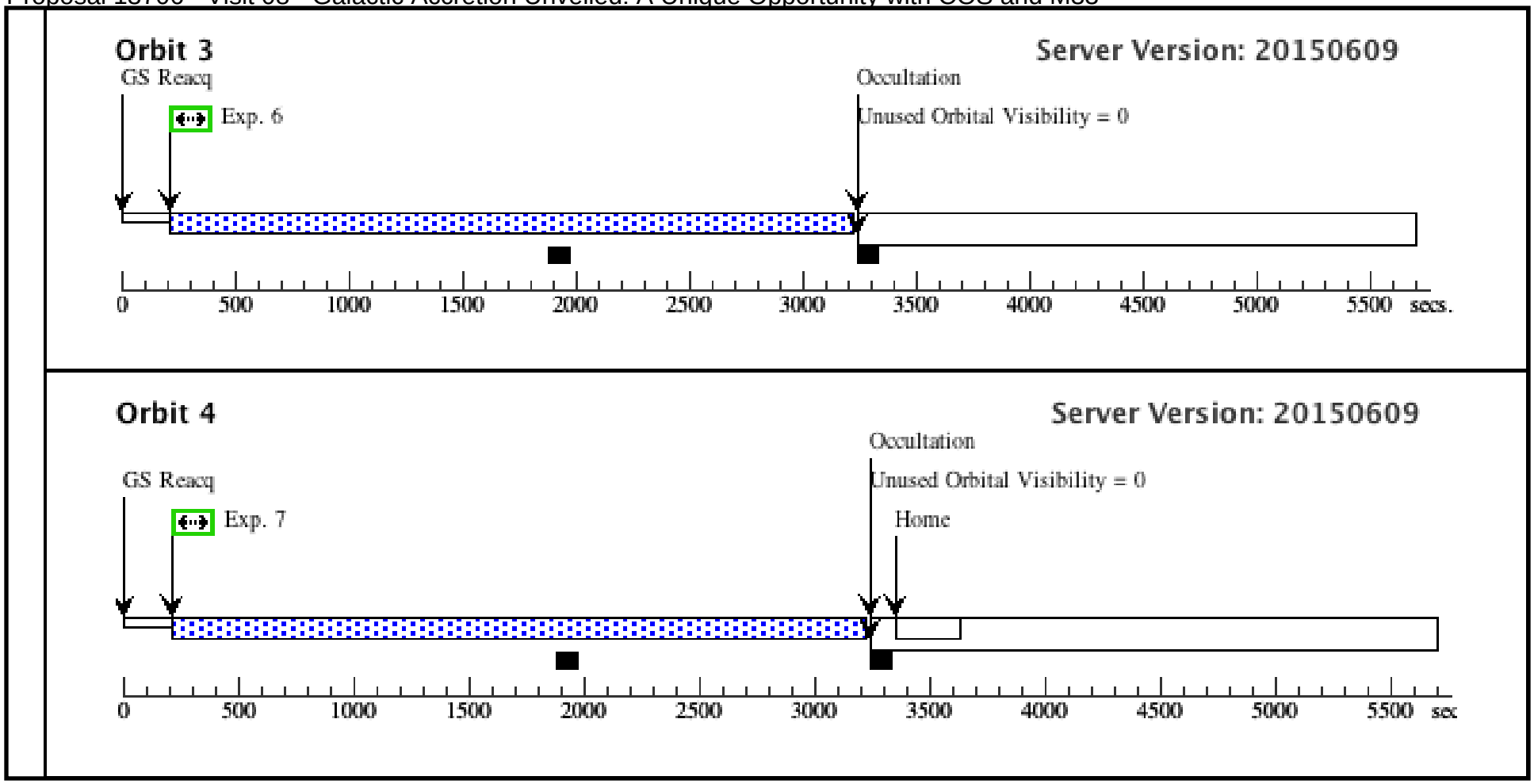
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626 296)	(8) M33-OB-88-7	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767	GS ACQ SCENARIO BASE1B3		3.5 Secs (3.5 Secs) *[==>]*	***[1]***
2	(COS.sa.626 298)	(8) M33-OB-88-7	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				1.3 Secs (1.3 Secs) *[==>]*	***[1]***
3	(COS.sa.626 296)	(8) M33-OB-88-7	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; NUM-POS=5; CENTER=FLUX-WT-FLR			3.5 Secs (3.5 Secs) *[==>]*	***[1]***
4	(COS.sp.626 309)	(8) M33-OB-88-7	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=1629			2100 Secs (2278 Secs) *[==>2278.0 Secs]*	***[1]***
5	(COS.sp.626 309)	(8) M33-OB-88-7	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=1629			2100 Secs (2959 Secs) *[==>2959.0 Secs]*	***[2]***
6	(COS.sp.626 309)	(8) M33-OB-88-7	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=1629			2100 Secs (2959 Secs) *[==>2959.0 Secs]*	***[3]***
7	(COS.sp.626 309)	(8) M33-OB-88-7	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=1629			2100 Secs (2959 Secs) *[==>2959.0 Secs]*	***[4]***

Orbit Structure






Orbit 3
Server Version: 20150609
GS Reacq
Exp. 6
Occultation
Unused Orbital Visibility = 0
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1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20150609
Occultation
GS Reacq
Unused Orbital Visibility = 0
Exp. 7
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13706, Visit 06, completed Wed Dec 30 02:00:52 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

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

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

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

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

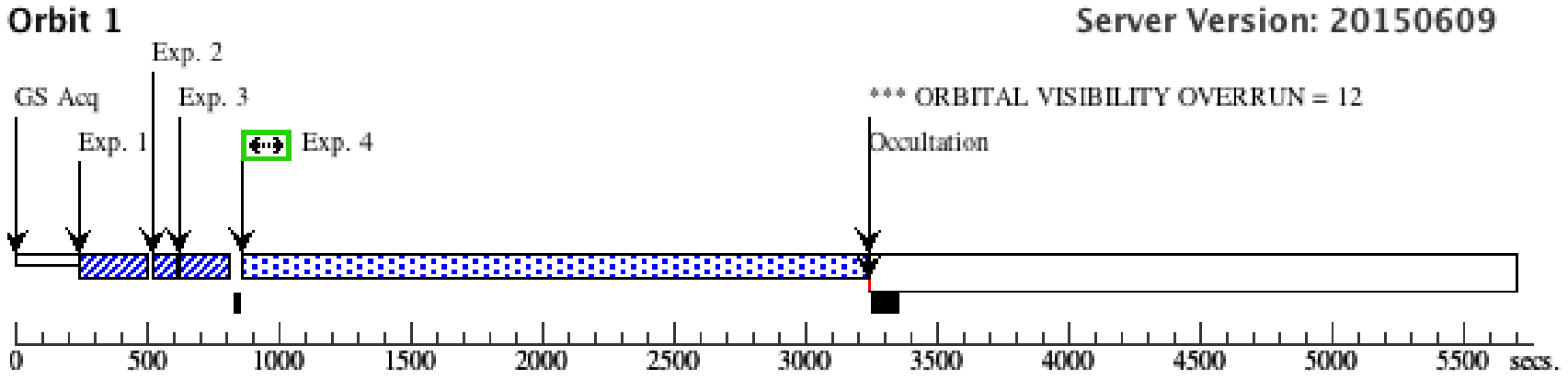
Fixed Targets

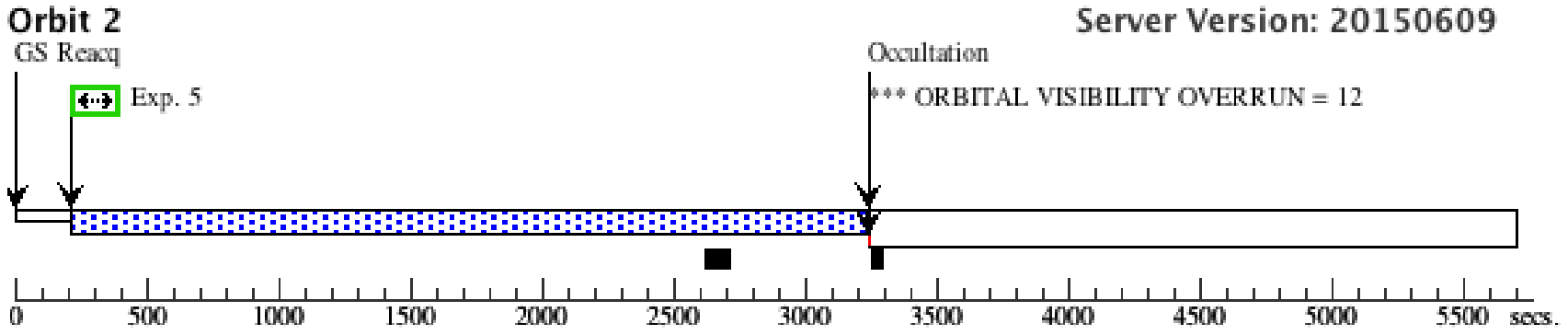
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	NGC592	RA: 01 33 11.8400 (23.2993333d) Dec: +30 38 53.54 (30.64821d) Equinox: J2000		V=17.7	Reference Frame: ICRS

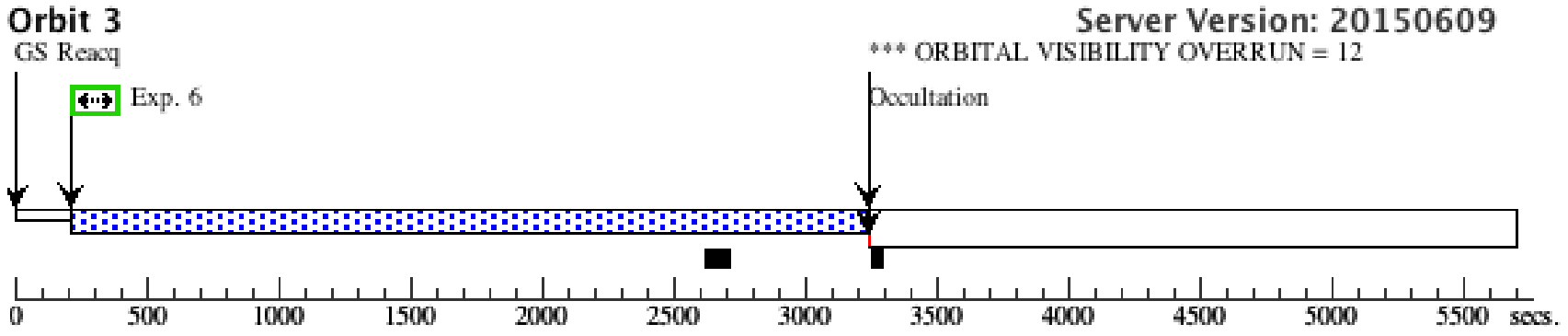
Exposures

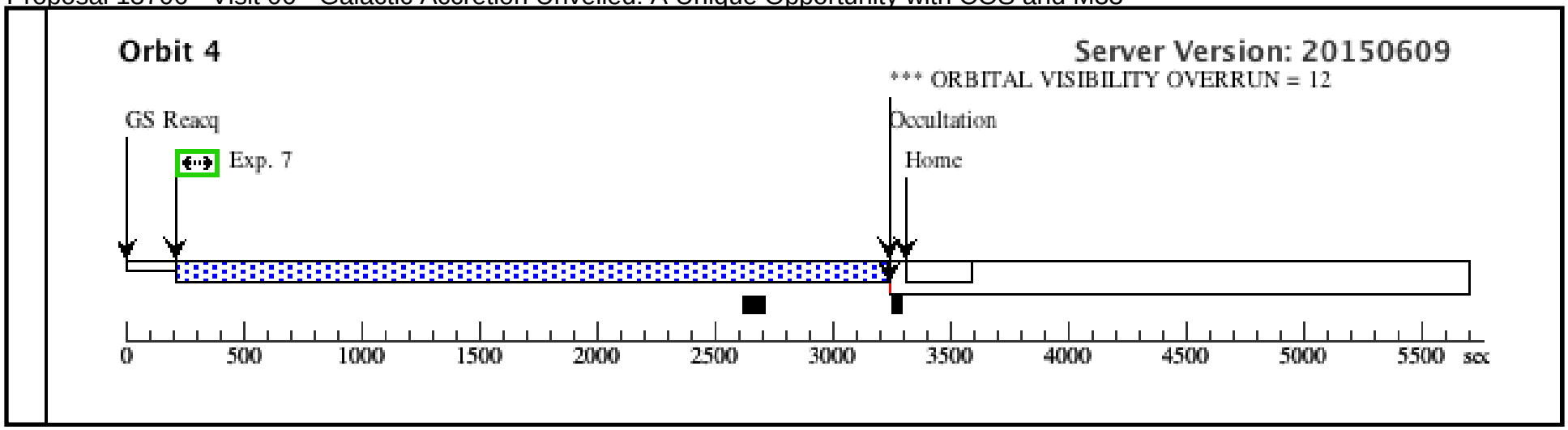
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626299)	(6) NGC592	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767	GS ACQ SCENARIO BASE1B3		7.3 Secs (7.3 Secs) *[==>]*	***[1]***
2	(COS.sa.626300)	(6) NGC592	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				2.8 Secs (2.8 Secs) *[==>]*	***[1]***
3	(COS.sa.626299)	(6) NGC592	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; NUM-POS=5; CENTER=FLUX-WT-FLR			7.3 Secs (7.3 Secs) *[==>]*	***[1]***
4	(COS.sp.626312)	(6) NGC592	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=2368			2100 Secs (2254 Secs) *[==>2254.0 Secs]*	***[1]***
5	(COS.sp.626312)	(6) NGC592	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=2368			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[2]***
6	(COS.sp.626312)	(6) NGC592	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=2368			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[3]***
7	(COS.sp.626312)	(6) NGC592	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=2368			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[4]***

Orbit Structure








Orbit 4
Server Version: 20150609
*** ORBITAL VISIBILITY OVERRUN = 12
GS Reacq
Exp. 7
Occultation
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1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13706, Visit 07, completed Wed Dec 30 02:00:52 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

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

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

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

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

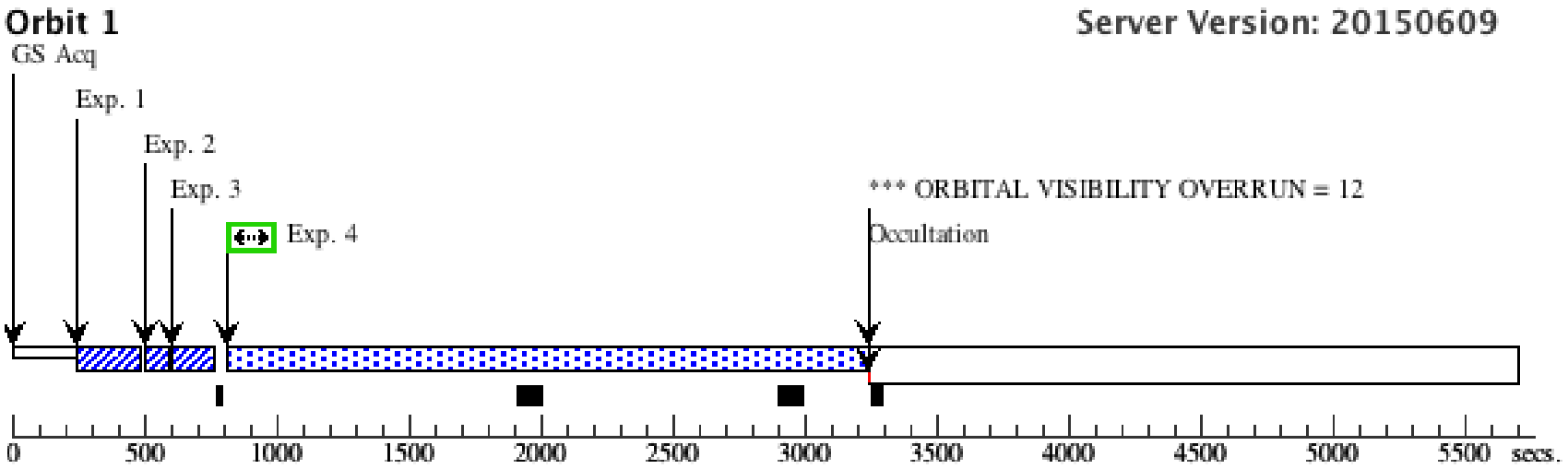
Fixed Targets

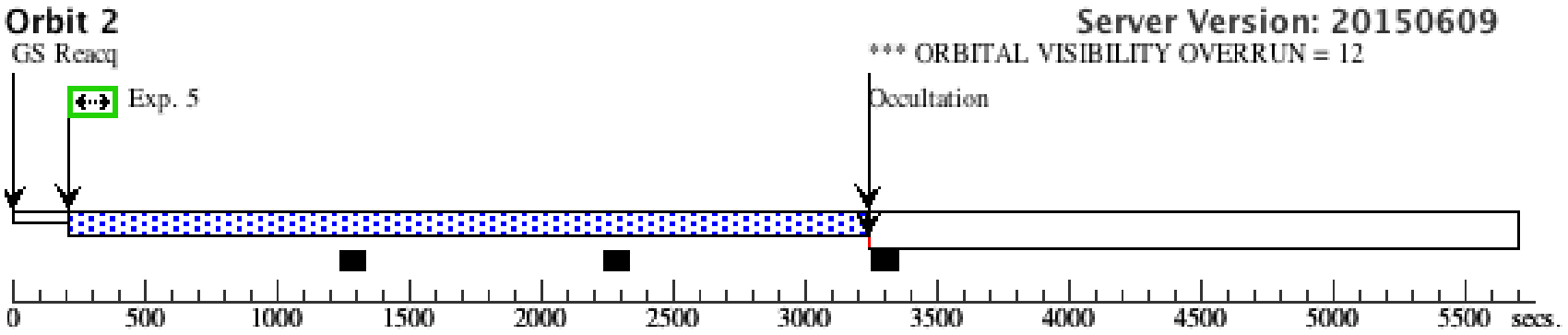
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	NGC604	RA: 01 34 32.4300 (23.6351250d) Dec: +30 46 59.23 (30.78312d) Equinox: J2000		V=17.2	Reference Frame: ICRS

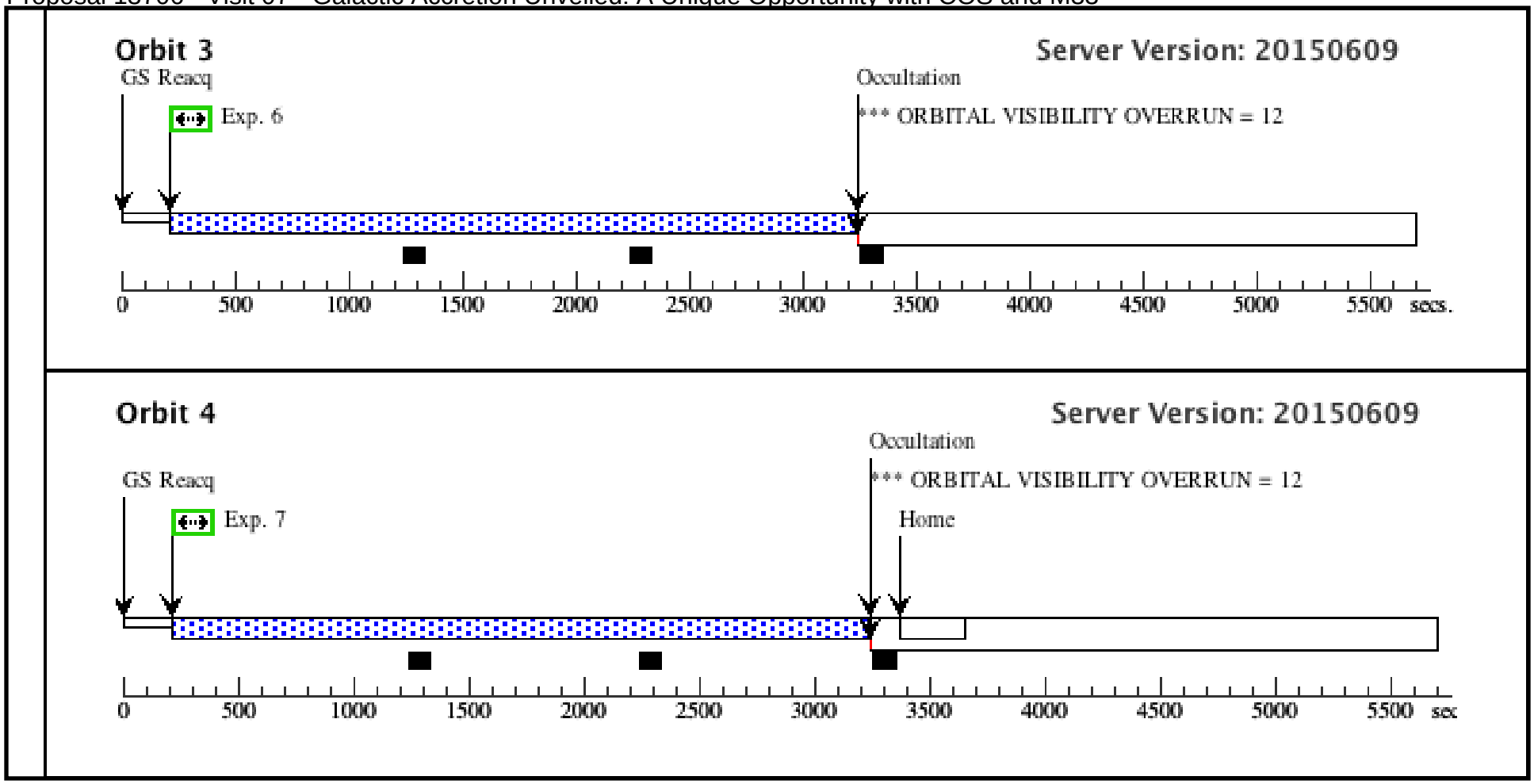
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.626 302)	(7) NGC604	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=2; STEP-SIZE=1.767			1.7 Secs (1.7 Secs) *[==>]*	***[1]***
2	(COS.sa.626 304)	(7) NGC604	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				0.7 Secs (0.7 Secs) *[==>]*	***[1]***
3	(COS.sa.626 302)	(7) NGC604	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=FLUX-WT-FLR; NUM-POS=5			1.7 Secs (1.7 Secs) *[==>]*	***[1]***
4	(COS.sp.626 313)	(7) NGC604	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; BUFFER-TIME=992			2100 Secs (2307 Secs) *[==>2307.0 Secs]*	***[1]***
5	(COS.sp.626 313)	(7) NGC604	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; BUFFER-TIME=992			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[2]***
6	(COS.sp.626 313)	(7) NGC604	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=992			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[3]***
7	(COS.sp.626 313)	(7) NGC604	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=992			2100 Secs (2971 Secs) *[==>2971.0 Secs]*	***[4]***

Orbit Structure






Orbit 3
Server Version: 20150609
GS Reacq
Exp. 6
Occultation
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1000
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3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20150609
Occultation
GS Reacq
*** ORBITAL VISIBILITY OVERRUN = 12
Exp. 7
Home
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500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec