12466 - The State of High Ionization Gas in 11 Intermediate Redshift Galaxies and Their Surroundings

Cycle: 19, Proposal Category: GO

(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) Q0454-2203	COS/FUV COS/NUV	1	02-Feb-2012 21:00:59.0	yes
02	(2) PG1206+459	COS/NUV	2	02-Feb-2012 21:01:05.0	yes
03	(3) Q1241+176	COS/FUV COS/NUV	6	02-Feb-2012 21:01:17.0	yes
04	(4) Q1248+401	COS/NUV	2	02-Feb-2012 21:01:24.0	yes

11 Total Orbits Used

ABSTRACT

Understanding the properties of the gas that lies in the environments of galaxies is essential for understanding their formation and evolution. This gas may include a variety of structures, such as infalling high-velocity clouds, tidal debris, material ejected in galactic winds, and gas stripped from dwarf galaxies. Near the Milky Way, OVI associated with HI high-velocity clouds (HVCs) has provided strong evidence for the presence of an extended and hot (~ 1 million K) corona. At high redshifts, strong and weak MgII absorbers have been hypothesized to serve as a proxy for detecting these high velocity clouds. Characterizing the properties of the OVI absorption associated with these MgII absorbers is therefore a highly effective tool to push the study of the galactic environment to higher redshifts. High resolution absorption line spectra, which allow us to determine velocities, metallicity, and ionization conditions, will allow us to carry out such study.

Previously, we used Cycle 9 STIS E230M near-UV spectra to locate and analyze the CIV associated with 11 MgII absorbers (both strong and weak) in galaxies at 0.4< z<1.0, and we conducted extensive photoionization modeling on these systems. Although model parameters were clear for the low ionization gas, there are ambiguities in the case of the high ionization phase. Here we propose to use the Cosmic Origins Spectrograph (COS) in the far-UV to obtain spectra covering OVI and other needed diagnostics (Lyman series, CIII), with sufficient S/N to discriminate between photoionization and collisional ionization for these systems. The high efficiency of COS will allow us to carry out these observations in 11 orbits.

OBSERVING DESCRIPTION

Our goal is to observe 4 QSOs/AGN with sufficiently high S/N ratios (S/N >~ 10 per resolution element) in order to detect various UV absorption in already confirme MgII absorption systems. For all the lines of sight we use the imaging acquisition exposures (SEARCH, IMAGE) with MIRROR B, and the grating G160M and/or G185M for the science exposures to cover O vi 1031, 1037 and as many other transitions as possible. The spectral resolution of these gratings is high enough to resolve these absorption profiles into multiple narrower components.

We use the 3 and 4 FP-SPLIT mode to reduce fixed pattern noise and avoid having important lines fall on grid wires. Also, we used the ETC on the HST/COS website to calculate the necessary exposure times to obtain spectra with, at least, S/N=10 per resolution element. UV fluxes are included as "Other Fluxes".

Visit

Proposal 12466, Visit 01, implementation Fri Feb 03 02:01:28 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Diagnostics

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

(Visit 01) Warning (Form): For the best data quality, it is strongly recommended that all four FP-POS positions be used when observing at a given COS CENWAVE setting.

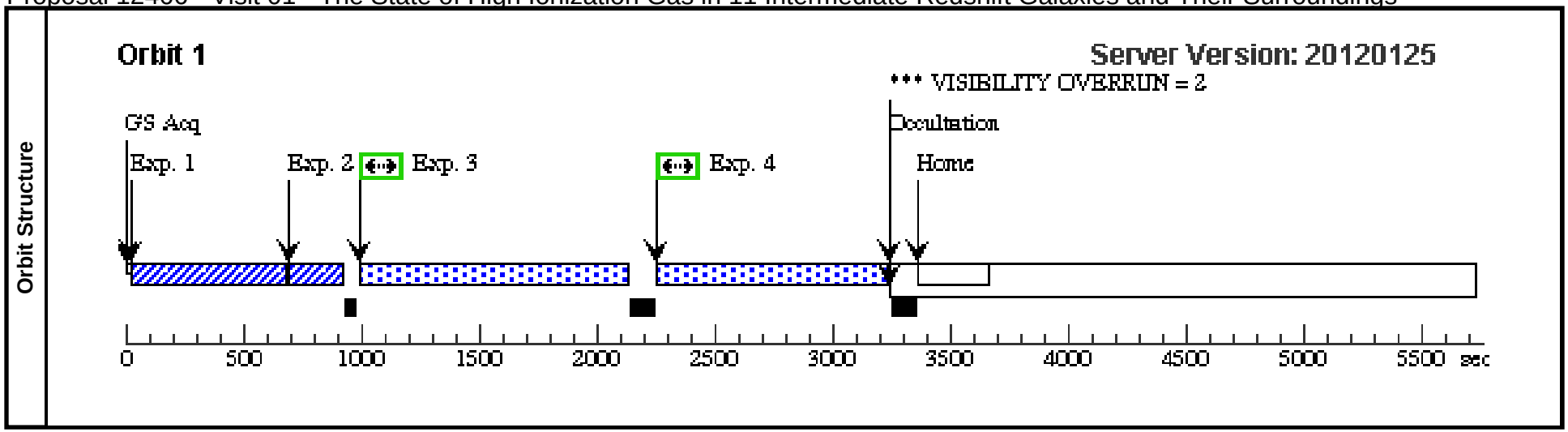
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	Q0454-2203	RA: 04 56 8.9300 (74.0372083d) Dec: -21 59 9.30 (-21.98592d) Equinox: J2000	Redshift: 0.533480	V=16.1 0.65E-14 ergs/s/cm2/A	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Q0454-220-ACQ/SEARCH (352636)	(1) Q0454-2203	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2; STEP-SIZE=1.767			50 Secs *[==>]*	***[1]***
	*Comments: Calculated for 0.5*F(1700)=0.325E-14 erg/cm2/s/A COS ETC result for S/N=40 (default setting) is 49.9 sec (id COS.ta.352636). Count rate entire detector: 887.266 c/sec.*								
2	Q0454-220-ACQ/IMAGE (352636)	(1) Q0454-2203	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				50 Secs *[==>]*	***[1]***
	*Comments: Calculated for 0.5*F(1700)=0.325E-14 erg/cm2/s/A COS ETC result for S/N=40 (default setting) is 49.9 sec (id COS.ta.352636). Count rate entire detector: 887.266 c/sec.*								
3	Q0454-220-orbit1(1577-3) (352640)	(1) Q0454-2203	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=924; FP-POS=3			924 Secs *[==>]*	***[1]***
	Comments: 2/3rds of buffer time at twice nominal flux is 4523 sec								
4	Q0454-220-orbit1(1577-4) (352640)	(1) Q0454-2203	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=925; FP-POS=4			925 Secs *[==>]*	***[1]***
	Comments: 2/3rds of buffer time at twice nominal flux is 4523 sec								


Orbit Structure
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Server Version: 20120125
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Exp. 2
Exp. 3
Exp. 4
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2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12466, Visit 02, implementation Fri Feb 03 02:01:29 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 02) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

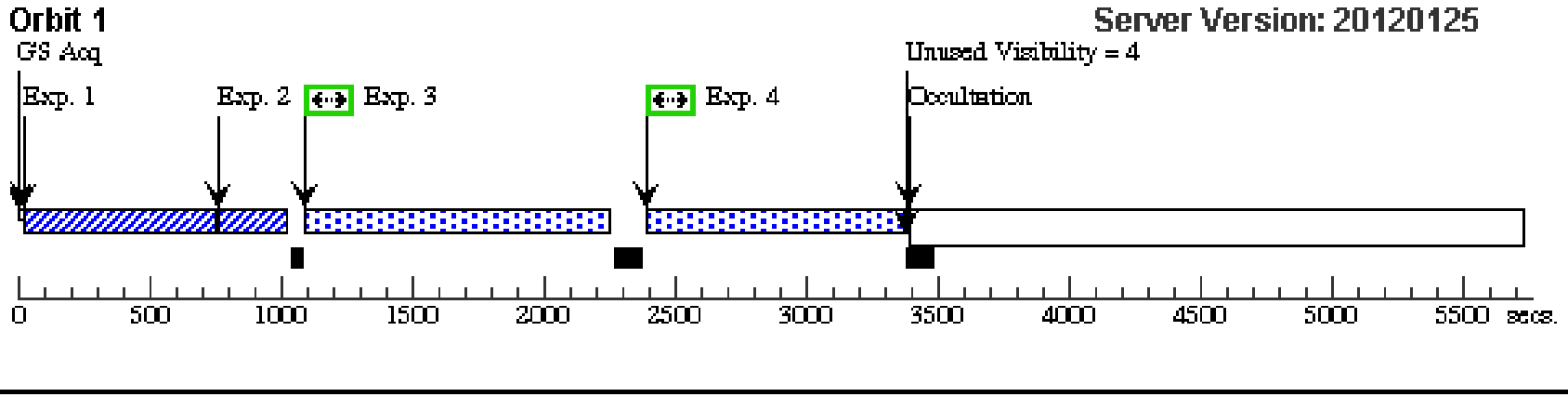
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	PG1206+459	RA: 12 08 58.0200 (182.2417500d) Dec: +45 40 35.20 (45.67644d) Equinox: J2000	Redshift: 1.162540	V=15.7 0.5E-14 ergs/s/cm2/A	Reference Frame: ICRS

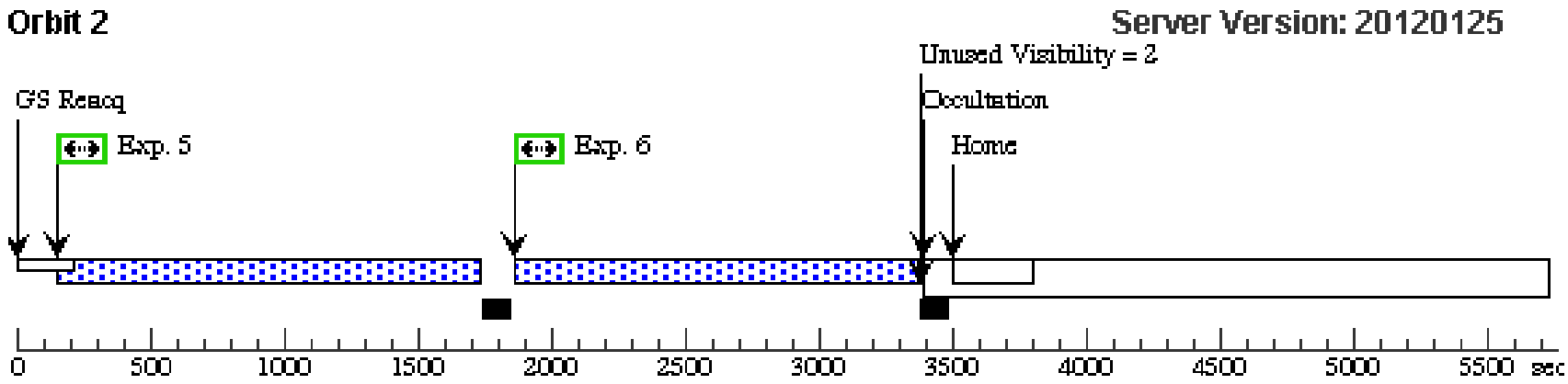
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	PG1206+459-ACQ/SEARCH (352643)	(2) PG1206+459	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2; STEP-SIZE=1.767			68 Secs *[==>]*	 ***[1]***
	*Comments: Calculated for 0.5*F(1700)=0.25E-14 erg/cm2/s/A COS ETC result for S/N=40 (default) is 67.7 sec (id COS.ta.352643). Count rate entire detector: 874.814 c/sec*								
2	PG1206+459-ACQ/IMAGE (35264)	(2) PG1206+459	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				68 Secs *[==>]*	 ***[1]***
	*Comments: Calculated for 0.5*F(1700)=0.25E-14 erg/cm2/s/A COS ETC result for S/N=40 (default) is 67.7 sec (id COS.ta.352643). Count rate entire detector: 874.814 c/sec*								
3	PG1206+459-orbit1(1900-3) (352645)	(2) PG1206+459	COS/NUV, TIME-TAG, PSA	G185M 1900 A	FP-POS=3; BUFFER-TIME=965			965 Secs *[==>]*	 ***[1]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1773 sec								
4	PG1206+459-orbit1(1900-4) (352645)	(2) PG1206+459	COS/NUV, TIME-TAG, PSA	G185M 1900 A	FP-POS=4; BUFFER-TIME=965			965 Secs *[==>]*	 ***[1]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1773 sec								
5	PG1206+459-orbit2(1900-3) (352645)	(2) PG1206+459	COS/NUV, TIME-TAG, PSA	G185M 1900 A	FP-POS=1; BUFFER-TIME=1497			1497 Secs *[==>]*	 ***[2]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1773 sec								
6	PG1206+459-orbit2(1900-4) (352645)	(2) PG1206+459	COS/NUV, TIME-TAG, PSA	G185M 1900 A	FP-POS=2; BUFFER-TIME=1497			1497 Secs *[==>]*	 ***[2]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1773 sec								

Orbit Structure





Visit

Proposal 12466, Visit 03, implementation Fri Feb 03 02:01:30 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Diagnostics

(Visit 03) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

(Visit 03) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	Q1241+176	RA: 12 44 10.8800 (191.0453333d) Dec: +17 21 4.70 (17.35131d) Equinox: J2000	Redshift: 1.27300	V=15.9 0.35E-14 ergs/s/cm2/A	Reference Frame: ICRS

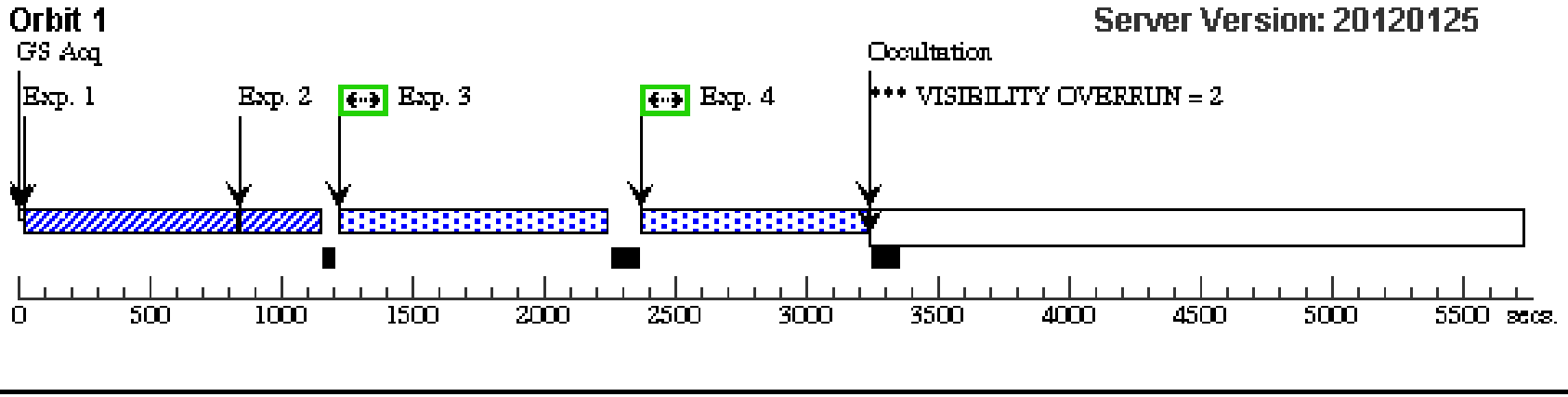
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

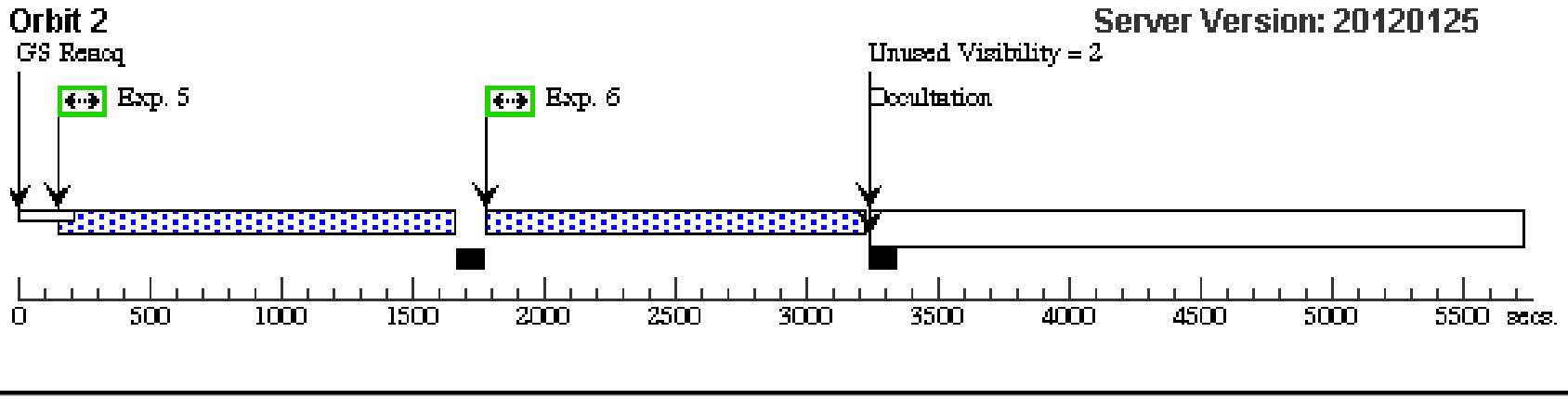
Exposures

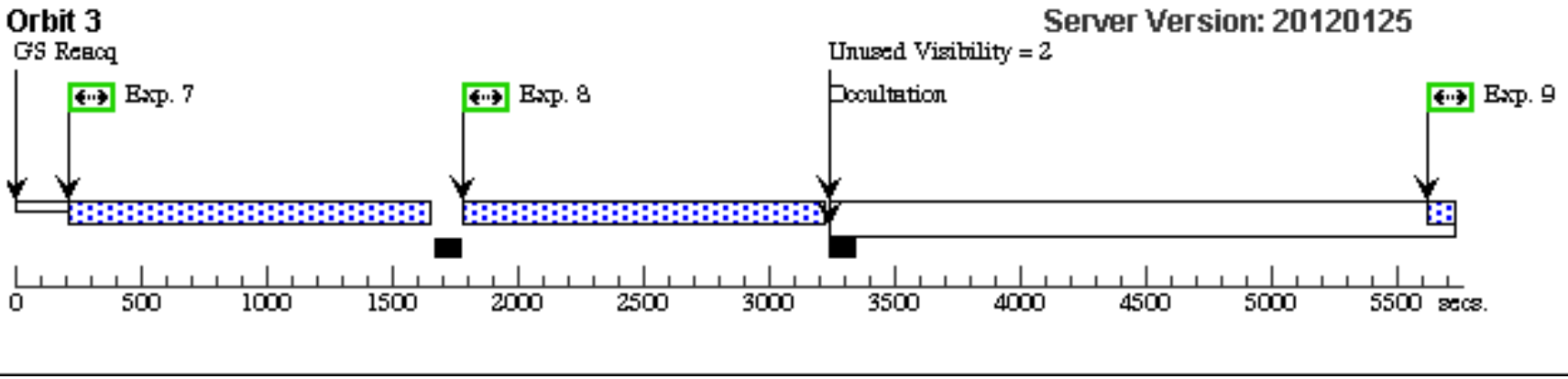
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Q1241+176-ACQ/SEARCH (352647)	(3) Q1241+176	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2; STEP-SIZE=1.767			89 Secs *[==>]*	*[1]*
	*Comments: Calculated for 0.5*F(1700)=0.175E-14 erg/cm2/s/A COS ETC result for S/N=40 is 88.0731 (id COS.ta.352647). Count rate entire detector: 866.702 c/sec*								
2	Q1241+176-ACQ/IMAGE (352647)	(3) Q1241+176	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				89 Secs *[==>]*	*[1]*
	*Comments: Calculated for 0.5*F(1700)=0.175E-14 erg/cm2/s/A COS ETC result for S/N=40 is 88.0731 (id COS.ta.352647). Count rate entire detector: 866.702 c/sec*								
3	Q1241+176-orbit1(1600-3) (352649)	(3) Q1241+176	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=8077; FP-POS=3			807 Secs *[==>]*	*[1]*
	Comments: 2/3rds of buffer time at twice nominal flux is 8737 sec								
4	Q1241+176-orbit1(1600-4) (352649)	(3) Q1241+176	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=8088; FP-POS=4			808 Secs *[==>]*	*[1]*
	Comments: 2/3rds of buffer time at twice nominal flux is 8737 sec								
5	Q1241+176-orbit2(1600-3) (352649)	(3) Q1241+176	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=1389; FP-POS=1			1389 Secs *[==>]*	*[2]*
	Comments: 2/3rds of buffer time at twice nominal flux is 8737 sec								
6	Q1241+176-orbit2(1600-4) (352649)	(3) Q1241+176	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=1389; FP-POS=2			1389 Secs *[==>]*	*[2]*
	Comments: 2/3rds of buffer time at twice nominal flux is 8737 sec								
7	Q1241+176-orbit3(1600-3) (352649)	(3) Q1241+176	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=1389; FP-POS=3			1389 Secs *[==>]*	*[3]*
	Comments: 2/3rds of buffer time at twice nominal flux is 8737 sec								
8	Q1241+176-orbit3(1600-4) (352649)	(3) Q1241+176	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=1389; FP-POS=4			1389 Secs *[==>]*	*[3]*
	Comments: 2/3rds of buffer time at twice nominal flux is 8737 sec								
9	Q1241+176-orbit4(1953-3) (352653)	(3) Q1241+176	COS/NUV, TIME-TAG, PSA	G185M 1953 A	FP-POS=1; BUFFER-TIME=1425			1425 Secs *[==>]*	*[3]*
	Comments: 2/3rds of buffer time at twice nominal flux is 1796 sec								
10	Q1241+176-orbit4(1953-4) (352653)	(3) Q1241+176	COS/NUV, TIME-TAG, PSA	G185M 1953 A	FP-POS=2; BUFFER-TIME=1425			1425 Secs *[==>]*	*[4]*
	Comments: 2/3rds of buffer time at twice nominal flux is 1796 sec								

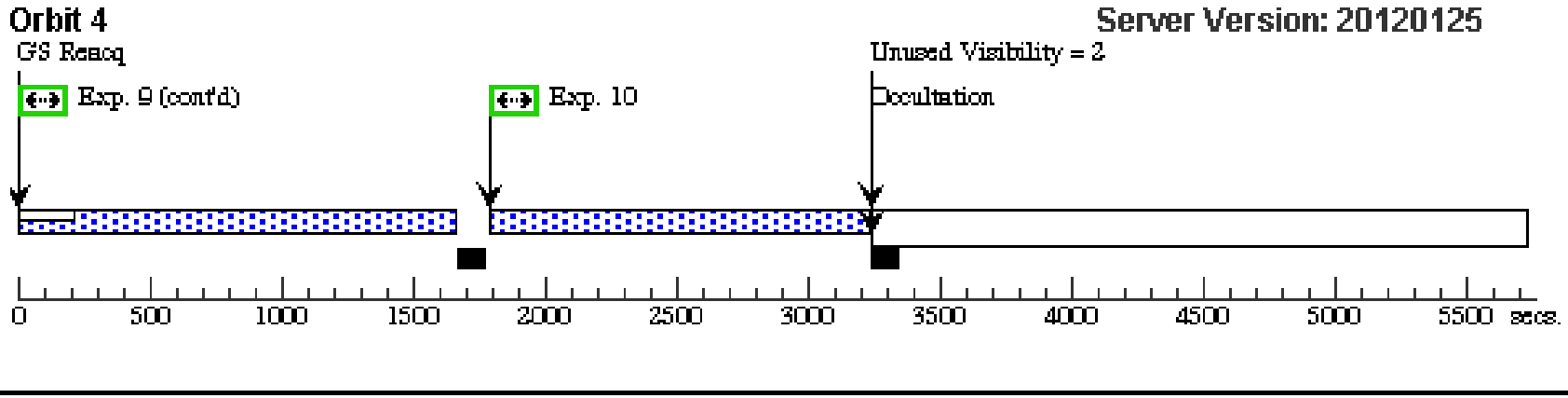
	11	Q1241+176-orbit5(1953-3) (352653)	(3) Q1241+176	COS/NUV, TIME-TAG, PSA	G185M 1953 A	FP-POS=3; BUFFER-TIME=1426	1426 Secs [==>]	[5]
	Comments: 2/3rds of buffer time at twice nominal flux is 1796 sec							
	12	Q1241+176-orbit5(1953-4) (352653)	(3) Q1241+176	COS/NUV, TIME-TAG, PSA	G185M 1953 A	FP-POS=4; BUFFER-TIME=1426	1426 Secs [==>]	[5]
	Comments: 2/3rds of buffer time at twice nominal flux is 1796 sec							
	13	Q1241+176-orbit6(1953-3) (352653)	(3) Q1241+176	COS/NUV, TIME-TAG, PSA	G185M 1953 A	FP-POS=1; BUFFER-TIME=1426	1426 Secs [==>]	[6]
	Comments: 2/3rds of buffer time at twice nominal flux is 1796 sec							
	14	Q1241+176-orbit6(1953-4) (352653)	(3) Q1241+176	COS/NUV, TIME-TAG, PSA	G185M 1953 A	FP-POS=2; BUFFER-TIME=1426	1426 Secs [==>]	[6]
	Comments: 2/3rds of buffer time at twice nominal flux is 1796 sec							

Orbit Structure





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Exp. 10
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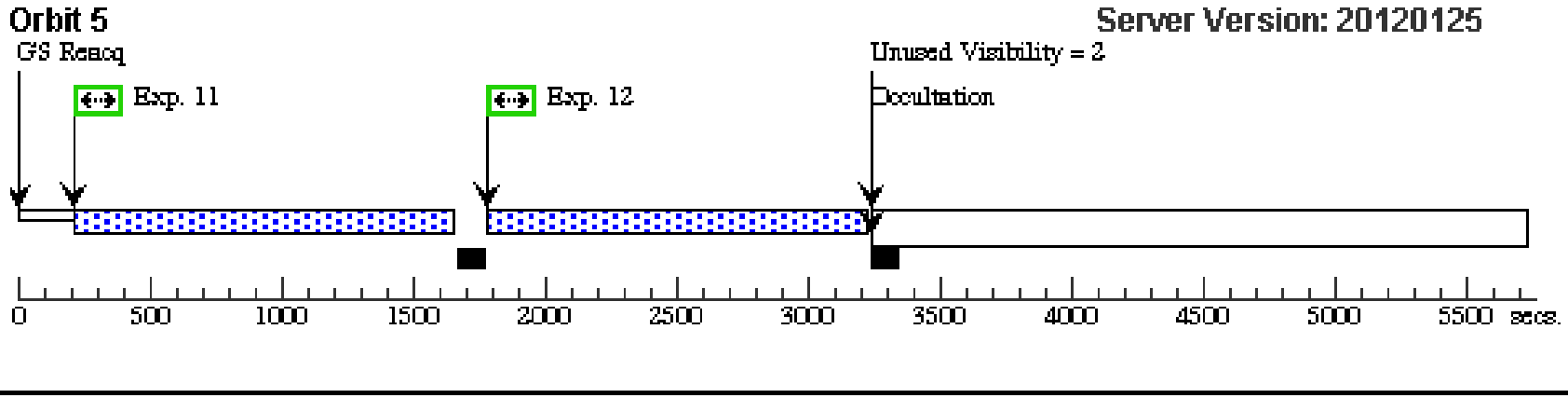
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 5
Server Version: 20120125
GS Reacq
Exp. 11
Exp. 12
Unused Visibility = 2
Occultation
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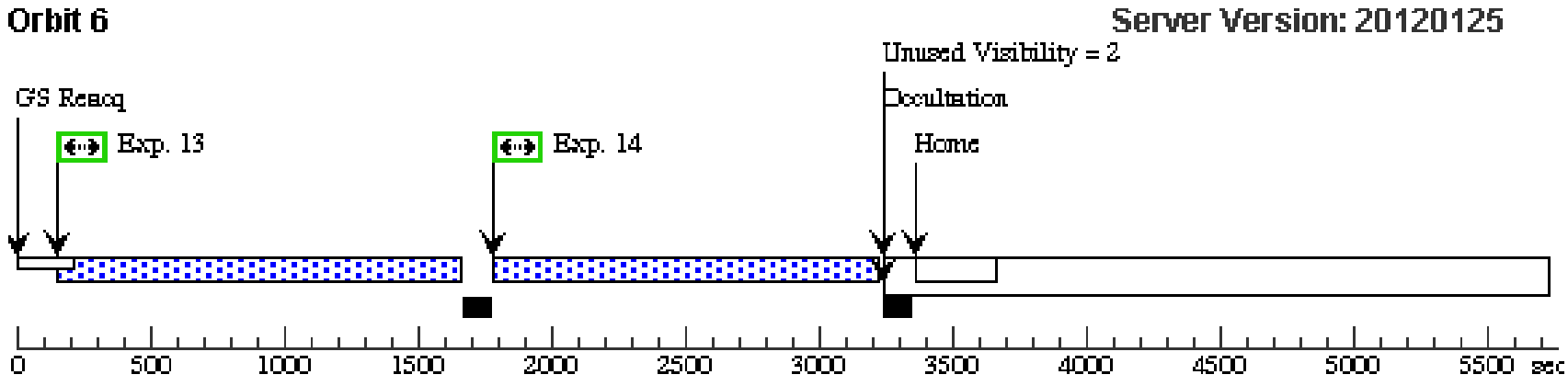
secs.


Orbit 6
Server Version: 20120125
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GS Reacq
Exp. 13
Exp. 14
Occultation
Home
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1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12466, Visit 04, implementation Fri Feb 03 02:01:31 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV

Special Requirements: (none)

Diagnostics

(Visit 04) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	Q1248+401	RA: 12 50 48.2700 (192.7011250d) Dec: +39 51 39.70 (39.86103d) Equinox: J2000	Redshift: 1.032790	V=16.3 0.4E-14 ergs/s/cm2/A	Reference Frame: ICRS

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Q1248+401-ACQ/SEARCH (352654)	(4) Q1248+401	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2; STEP-SIZE=1.767			74 Secs *[==>]*	***[1]***
	*Comments: Calculated for 0.5*F(1700)=0.2E-14 erg/cm2/s/A COS ETC result for S/N=40 (default) is 73.5 sec (id COS.ta.352654). Count rate entire detector: 872.019 c/sec*								
2	Q1248+401-ACQ/IMAGE (352654)	(4) Q1248+401	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				74 Secs *[==>]*	***[1]***
	*Comments: Calculated for 0.5*F(1700)=0.2E-14 erg/cm2/s/A COS ETC result for S/N=40 (default) is 73.5 sec (id COS.ta.352654). Count rate entire detector: 872.019 c/sec*								
3	Q1248+401-orbit1(1921-3) (352655)	(4) Q1248+401	COS/NUV, TIME-TAG, PSA	G185M 1921 A	FP-POS=3; BUFFER-TIME=902			902 Secs *[==>]*	***[1]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1775 sec								
4	Q1248+401-orbit1(1921-4) (352655)	(4) Q1248+401	COS/NUV, TIME-TAG, PSA	G185M 1921 A	FP-POS=4; BUFFER-TIME=902			902 Secs *[==>]*	***[1]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1775 sec								
5	Q1248+401-orbit2(1921-3) (352655)	(4) Q1248+401	COS/NUV, TIME-TAG, PSA	G185M 1921 A	FP-POS=1; BUFFER-TIME=1452			1452 Secs *[==>]*	***[2]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1775 sec								
6	Q1248+401-orbit2(1921-4) (352655)	(4) Q1248+401	COS/NUV, TIME-TAG, PSA	G185M 1921 A	FP-POS=2; BUFFER-TIME=1452			1452 Secs *[==>]*	***[2]***
	Comments: 2/3rds of buffer time at twice nominal flux is 1775 sec								

Orbit Structure