14275 - Tracing the CMB Cold Spot supervoid using HI gas clouds

Cycle: 23, 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) J0315-2143	COS/FUV COS/NUV	3	14-Jul-2015 21:28:03.0	yes
02	(2) J0321-1758	COS/FUV COS/NUV	4	14-Jul-2015 21:28:06.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(2) J0321-1758	COS/FUV COS/NUV	2	14-Jul-2015 21:28:09.0	yes
04	(3) J0317-1654	COS/FUV COS/NUV	3	14-Jul-2015 21:28:11.0	yes
05	(4) J0326-1646	COS/FUV COS/NUV	3	14-Jul-2015 21:28:13.0	yes

15 Total Orbits Used

ABSTRACT

The Cosmic Microwave Background (CMB) Cold Spot, a ~100 sq. deg. area with abnormally low temperatures, remains one of the greatest anomalies of the cosmic microwave sky. If primordial in origin, it represents a 3-4 sigma fluctuation in a LCDM cosmology. The alternative possibility is that it is caused by the Integrated Sachs-Wolfe (ISW) effect where a foreground supervoid imparts a net gravitational redshift to the CMB photons as they pass through. Recently such a supervoid has been claimed to be detected in the galaxy distribution at z~0.2, with a ~300/h Mpc diameter, representing a 2 sigma fluctuation in the LCDM model. Our prime aim is to test if the void is independently detected in the intergalactic medium traced by HI Lyman alpha absorption. Two quasar sightlines at ~10deg from the Cold Spot centre have already been serendipitously observed by COS and these show a tentative (~3 sigma) deficiency of Lyman-alpha absorption lines (Mackenzie et al 2015). In order to test further this potentially exciting detection of the Cold Spot supervoid in absorption we propose to use COS to observe 4 more quasars within a few degrees of the Cold Spot centre. If the HI underdensity reproduces at the same level then this could provide a >4 sigma detection of the supervoid. Such a result would not only be vital for a cosmological explanation of the Cold Spot anomaly but also revolutionise our view of how hydrogen gas clouds trace dark matter underdensities on the largest scales.

OBSERVING DESCRIPTION

We are going to observe 4 quasars with COS.

Visit

Proposal 14275, J0315-2143 G160M (01) Wed Jul 15 01:28:14 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Fixed Targets

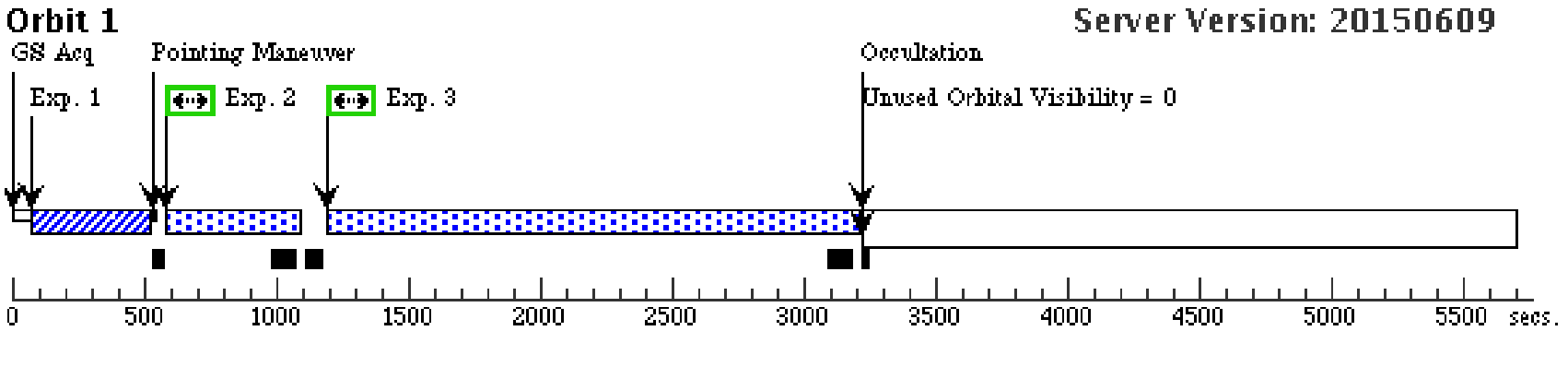
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	J0315-2143	RA: 03 15 19.2100 (48.8300417d) Dec: -21 43 29.70 (-21.72492d) Equinox: J2000	Redshift: 0.2811	V=16.44+/-0.2 GALEX FUV AB=17.89, GALEX NUV AB=17.31	Reference Frame: ICRS

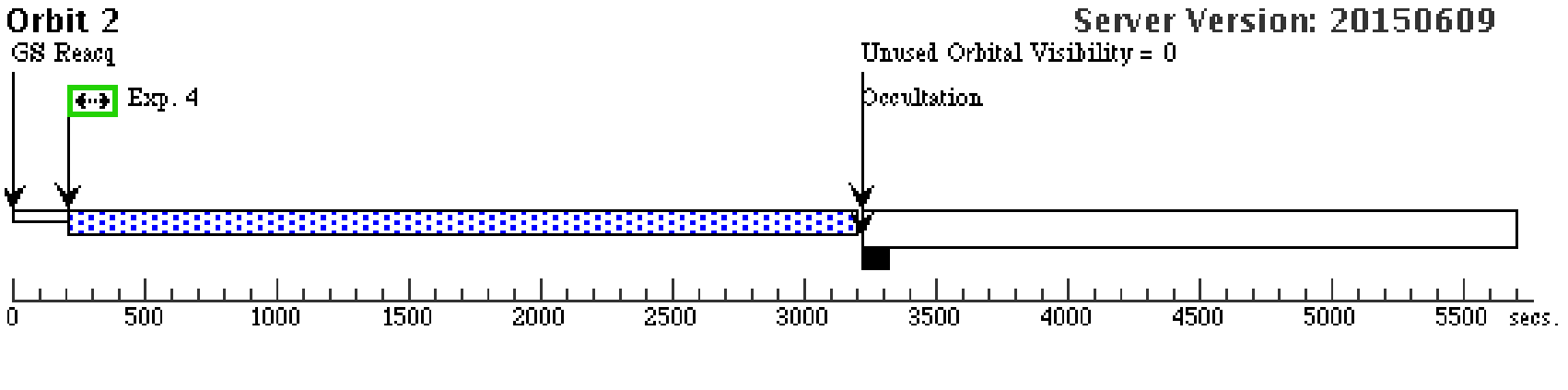
Comments: Extended=NO

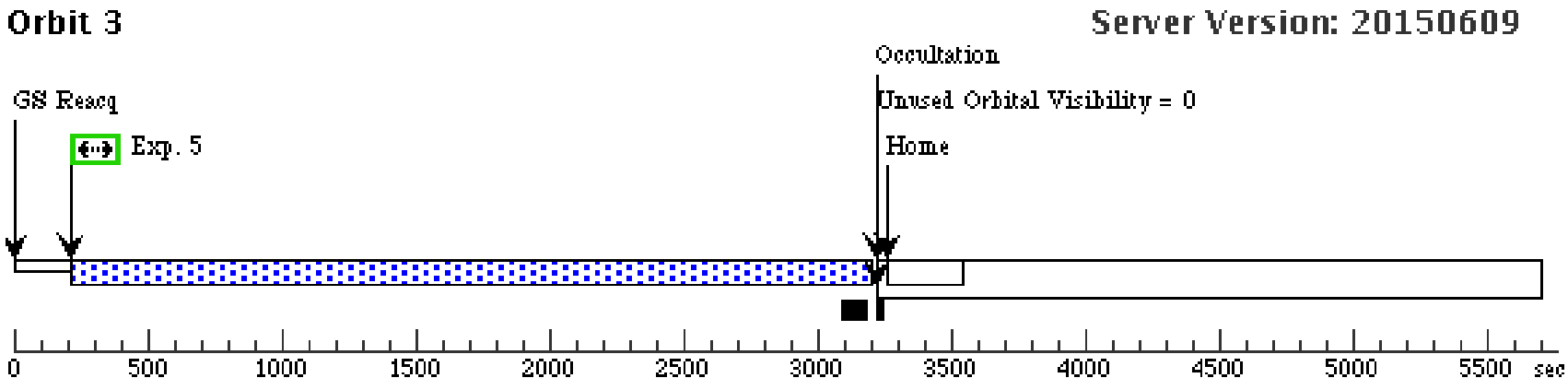
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (714998)	(1) J0315-2143	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				63 Secs (63 Secs) *[==>]*	*[1]*
2	G160M-1577-FP1 (715409)	(1) J0315-2143	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2000; FLASH=YES; FP-POS=1; SEGMENT=BOTH			300 Secs (300 Secs) *[==>]*	*[1]*
3	G160M-1577-FP2 (715409)	(1) J0315-2143	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=1863; FLASH=YES; FP-POS=2; SEGMENT=BOTH			1963 Secs (1963 Secs) *[==>]*	*[1]*
4	G160M-1577-FP3 (715409)	(1) J0315-2143	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2936; FLASH=YES; FP-POS=3; SEGMENT=BOTH			2936 Secs (2936 Secs) *[==>]*	*[2]*
5	G160M-1577-FP4 (715409)	(1) J0315-2143	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2836; FLASH=YES; FP-POS=4; SEGMENT=BOTH			2936 Secs (2936 Secs) *[==>]*	*[3]*

Orbit Structure







Visit

Proposal 14275, J0321-1758 G160M (02) Wed Jul 15 01:28:15 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Fixed Targets

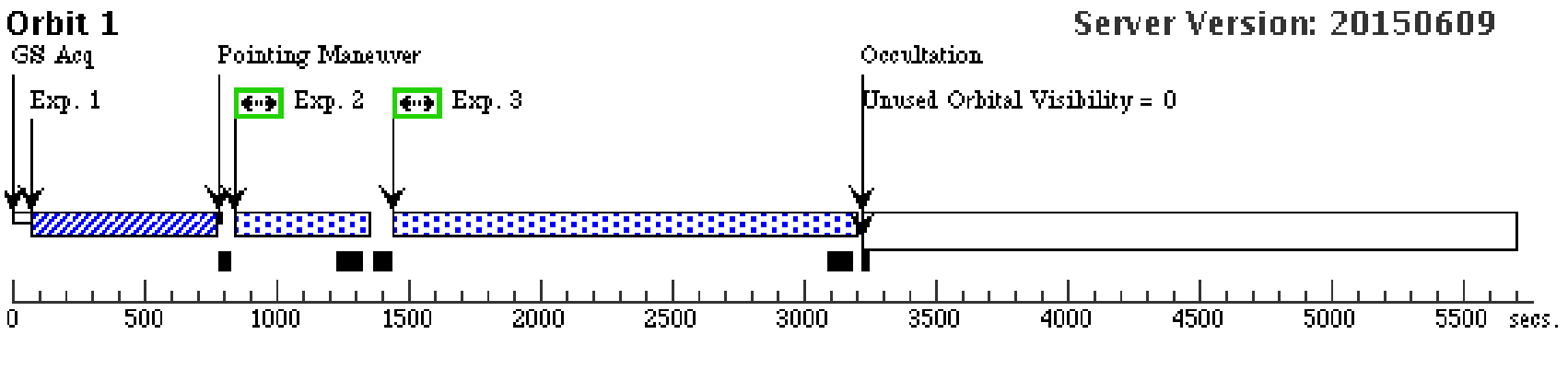
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	J0321-1758	RA: 03 21 54.3200 (50.4763333d) Dec: -17 58 51.50 (-17.98097d) Equinox: J2000	Redshift: 0.8528	V=16.68+/-0.2 GALEX FUV AB=18.25, GALEX NUV AB=17.49	Reference Frame: ICRS

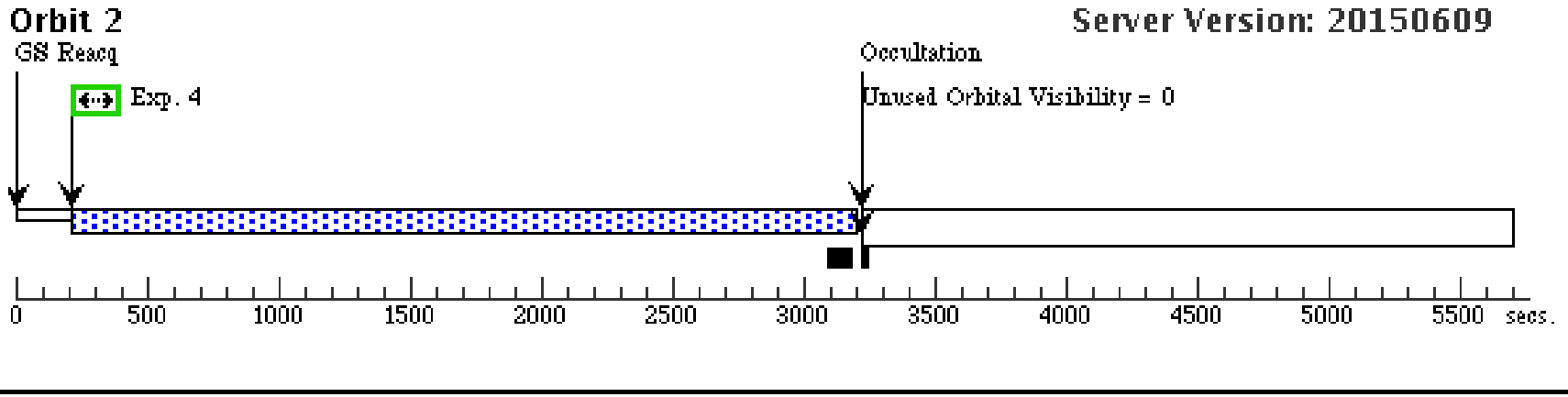
Comments: Extended=NO

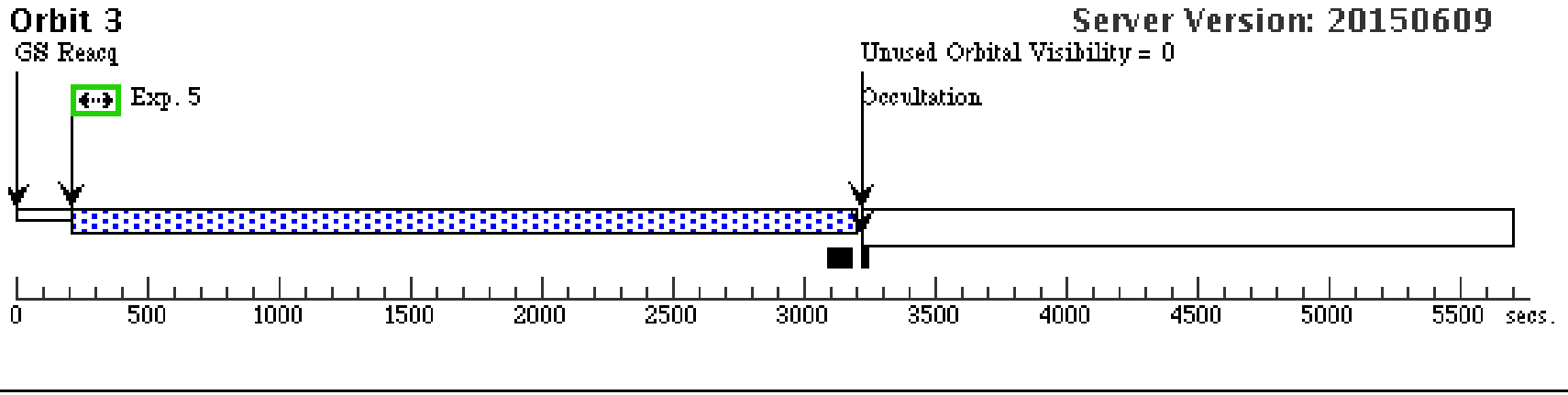
Exposures

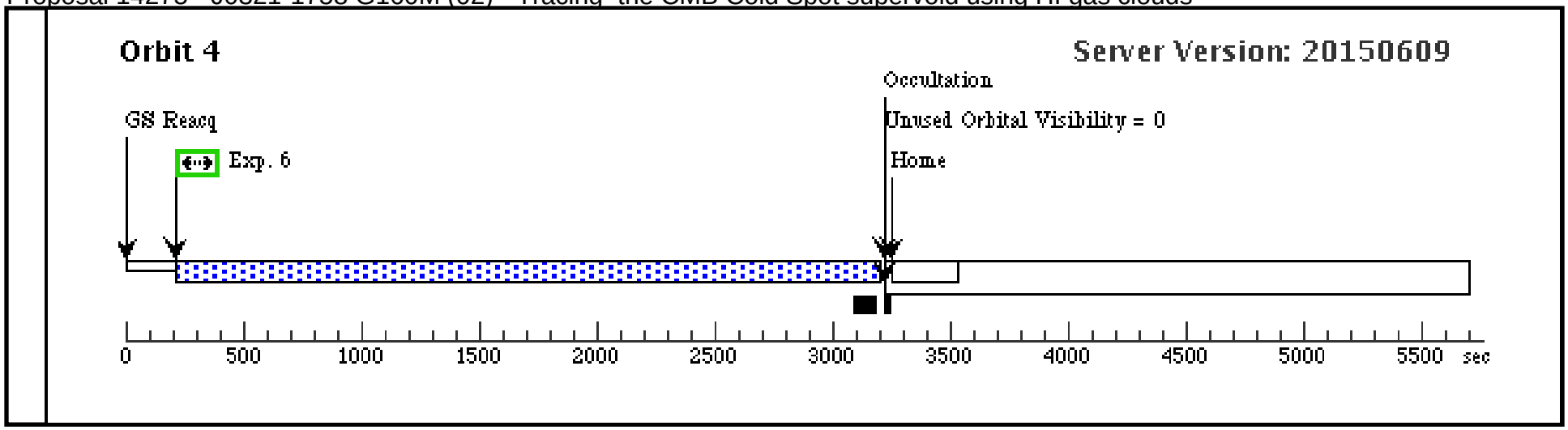
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (717459)	(2) J0321-1758	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				190 Secs (190 Secs) *[==>]*	*[1]*
2	G160M-1577-FP1 (715388)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2000; FLASH=YES; FP-POS=1; SEGMENT=BOTH			300 Secs (300 Secs) *[==>]*	*[1]*
3	G160M-1577-FP1 (715388)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=1611; FLASH=YES; FP-POS=1; SEGMENT=BOTH			1711 Secs (1711 Secs) *[==>]*	*[1]*
4	G160M-1577-FP2 (715388)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=2; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	*[2]*
5	G160M-1577-FP3 (715388)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=3; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	*[3]*
6	G160M-1577-FP4 (715388)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=4; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	*[4]*

Orbit Structure





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Visit

Proposal 14275, J0321-1758 G130M (03) Wed Jul 15 01:28:15 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Fixed Targets

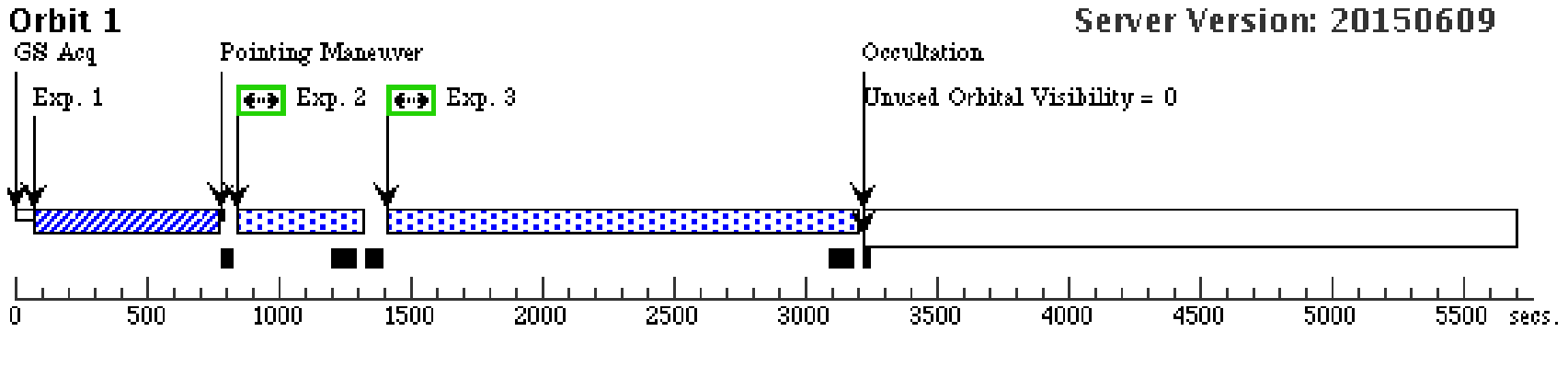
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	J0321-1758	RA: 03 21 54.3200 (50.4763333d) Dec: -17 58 51.50 (-17.98097d) Equinox: J2000	Redshift: 0.8528	V=16.68+/-0.2 GALEX FUV AB=18.25, GALEX NUV AB=17.49	Reference Frame: ICRS

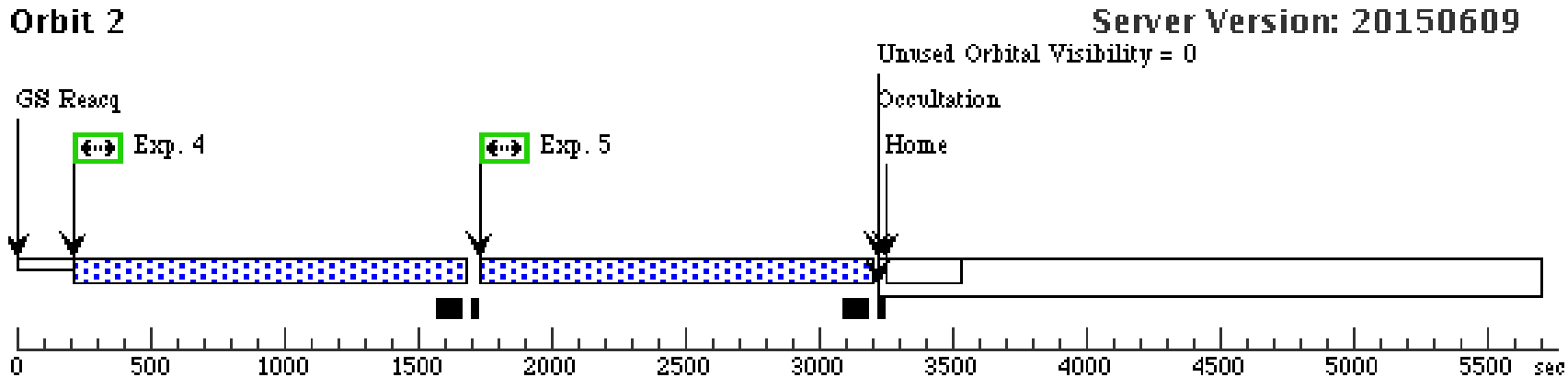
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (717459)	(2) J0321-1758	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				190 Secs (190 Secs) *[==>]*	*[1]*
2	G130M-1327-FP1 (717637)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=2000; FLASH=YES; FP-POS=1; SEGMENT=BOTH			300 Secs (300 Secs) *[==>]*	*[1]*
3	G130M-1327-FP2 (717637)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=1642; FLASH=YES; FP-POS=2; SEGMENT=BOTH			1742 Secs (1742 Secs) *[==>]*	*[1]*
4	G130M-1327-FP3 (717637)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=1315; FLASH=YES; FP-POS=3; SEGMENT=BOTH			1415 Secs (1415 Secs) *[==>]*	*[2]*
5	G130M-1327-FP4 (717637)	(2) J0321-1758	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=1315; FLASH=YES; FP-POS=4; SEGMENT=BOTH			1415 Secs (1415 Secs) *[==>]*	*[2]*

Orbit Structure





Visit

Proposal 14275, J0317-1654 G160M (04) Wed Jul 15 01:28:16 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Fixed Targets

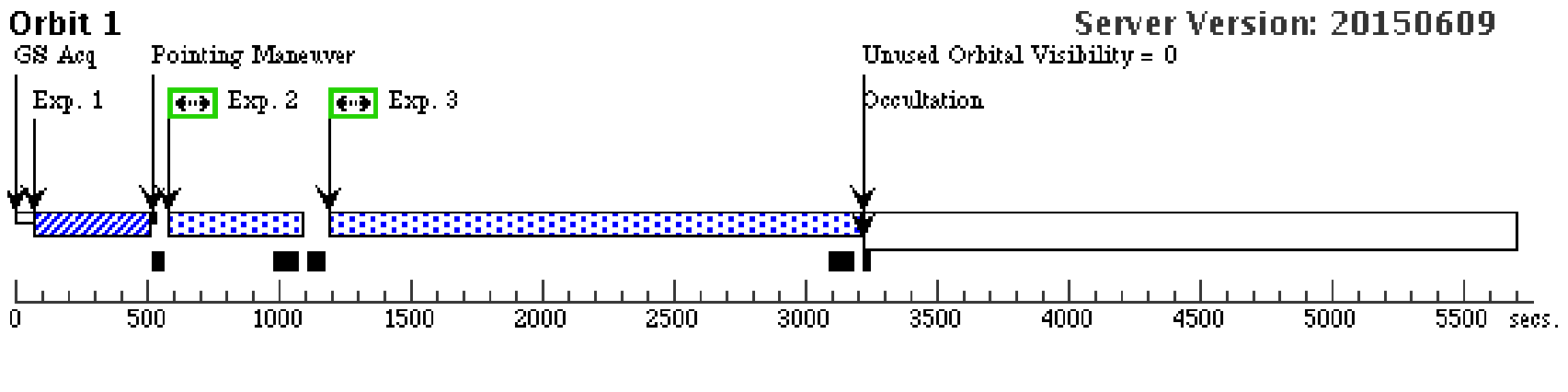
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	J0317-1654	RA: 03 17 59.6900 (49.4987083d) Dec: -16 54 52.20 (-16.91450d) Equinox: J2000	Redshift: 0.3505	V=16.55+/-0.2 GALEX FUV AB=17.99, GALEX NUV AB=17.47	Reference Frame: ICRS

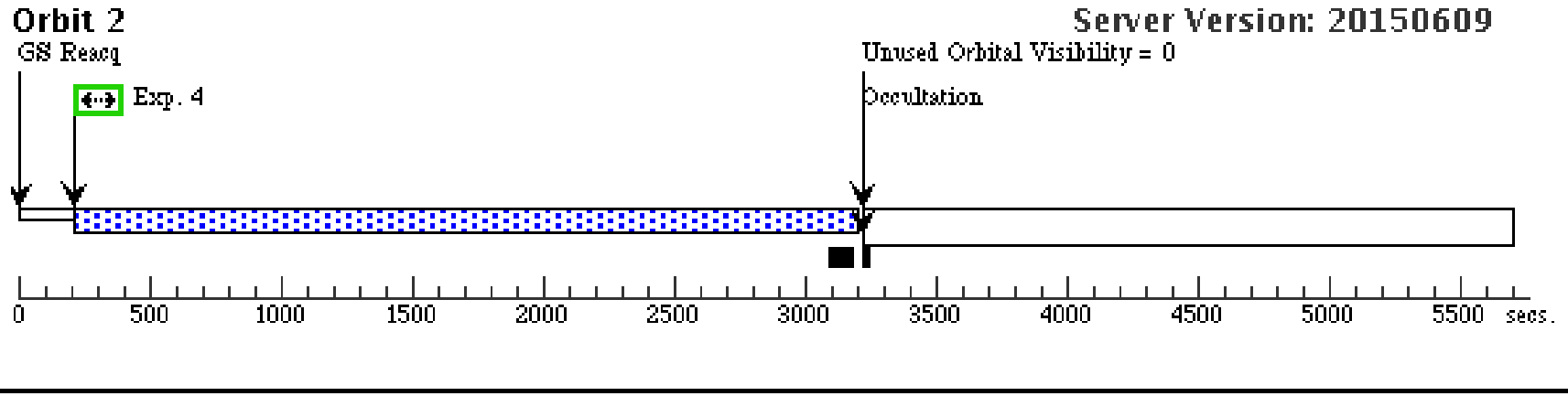
Comments: Extended=NO

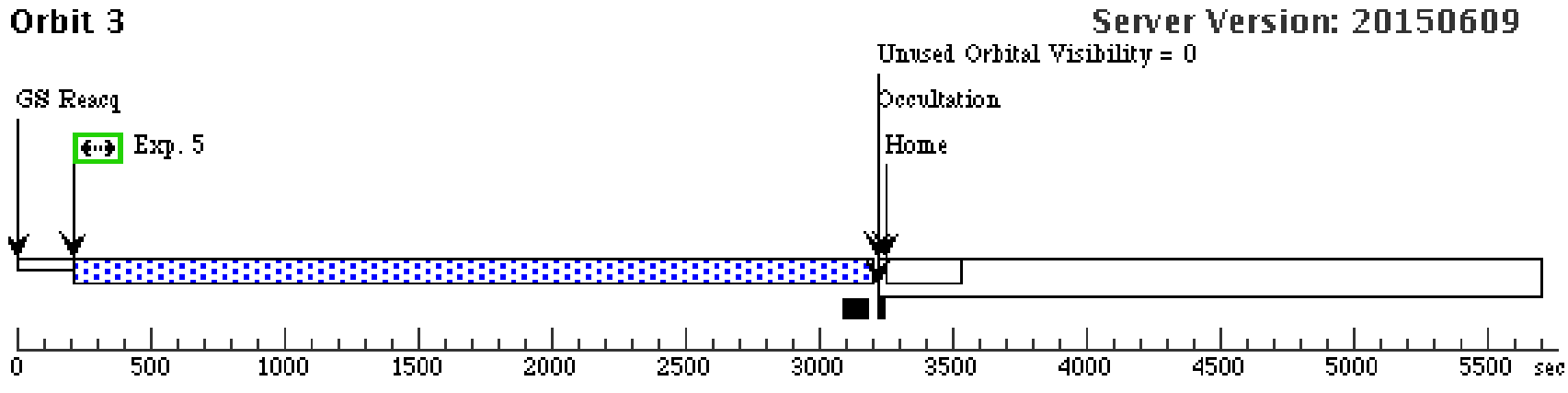
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (717476)	(3) J0317-1654	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				62 Secs (62 Secs) *[==>]*	***[1]***
2	G160M-1577-FP1 (715389)	(3) J0317-1654	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=200; FLASH=YES; FP-POS=1; SEGMENT=BOTH			300 Secs (300 Secs) *[==>]*	***[1]***
3	G160M-1577-FP2 (715389)	(3) J0317-1654	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=1864; FLASH=YES; FP-POS=2; SEGMENT=BOTH			1964 Secs (1964 Secs) *[==>]*	***[1]***
4	G160M-1577-FP3 (715389)	(3) J0317-1654	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=3; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	***[2]***
5	G160M-1577-FP4 (715389)	(3) J0317-1654	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=4; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	***[3]***

Orbit Structure







Visit

Proposal 14275, J0326-1646 G160M (05) Wed Jul 15 01:28:16 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	J0326-1646	RA: 03 25 41.0800 (51.4211667d) Dec: -16 46 17.00 (-16.77139d) Equinox: J2000	Redshift: 0.2910	V=16.7+/-0.2 GALEX FUV AB=17.82, GALEX NUV AB=17.44	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	ACQ (717479)	(4) J0326-1646	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				64 Secs (64 Secs) *[==>]*	*[1]*
2	G160M-1577-FP1 (715406)	(4) J0326-1646	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2000; FLASH=YES; FP-POS=1; SEGMENT=BOTH			300 Secs (300 Secs) *[==>]*	*[1]*
3	G160M-1577-FP2 (715406)	(4) J0326-1646	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=1860; FLASH=YES; FP-POS=2; SEGMENT=BOTH			1960 Secs (1960 Secs) *[==>]*	*[1]*
4	G160M-1577-FP3 (715406)	(4) J0326-1646	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=3; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	*[2]*
5	G160M-1577-FP4 (715406)	(4) J0326-1646	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2835; FLASH=YES; FP-POS=4; SEGMENT=BOTH			2935 Secs (2935 Secs) *[==>]*	*[3]*

Orbit Structure