17130 - A 4% determination of the Hubble constant from gravitational time delays with maximally flexible lens mass profile

Cycle: 30, 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) SL2SJ020524-093023	WFC3/UVIS	1	22-Jun-2023 14:00:23.0	yes
02	(2) SL2SJ021247-055552	WFC3/UVIS	1	22-Jun-2023 14:00:24.0	yes
03	(3) SL2SJ021411-040502	WFC3/UVIS	1	22-Jun-2023 14:00:25.0	yes
04	(4) SL2SJ021737-051329	WFC3/UVIS	1	22-Jun-2023 14:00:25.0	yes
05	(5) SL2SJ021801-080247	WFC3/UVIS	1	22-Jun-2023 14:00:25.0	yes
06	(6) SL2SJ021902-082934	WFC3/UVIS	1	22-Jun-2023 14:00:26.0	yes
07	(7) SL2SJ022046-094927	WFC3/UVIS	1	22-Jun-2023 14:00:26.0	yes
08	(8) SL2SJ022610-042011	WFC3/UVIS	1	22-Jun-2023 14:00:27.0	yes
09	(9) SL2SJ023251-040823	WFC3/UVIS	1	22-Jun-2023 14:00:27.0	yes
10	(10) SL2SJ023307-043838	WFC3/UVIS	1	22-Jun-2023 14:00:28.0	yes
23	(10) SL2SJ023307-043838	WFC3/UVIS	1	22-Jun-2023 14:00:28.0	yes
11	(11) SL2SJ084847-035103	WFC3/UVIS	1	22-Jun-2023 14:00:29.0	yes
12	(12) SL2SJ084909-041226	WFC3/UVIS	1	22-Jun-2023 14:00:29.0	yes
13	(13) SL2SJ085540-014730	WFC3/UVIS	1	22-Jun-2023 14:00:29.0	yes
14	(14) SL2SJ090407-005952	WFC3/UVIS	1	22-Jun-2023 14:00:30.0	yes
15	(15) SL2SJ095921+020638	WFC3/UVIS	1	22-Jun-2023 14:00:30.0	yes
65	(15) SL2SJ095921+020638	WFC3/UVIS	1	22-Jun-2023 14:00:31.0	yes
16	(16) SL2SJ135949+553550	WFC3/UVIS	1	22-Jun-2023 14:00:31.0	yes
17	(17) SL2SJ140454+520024	WFC3/UVIS	1	22-Jun-2023 14:00:32.0	yes
18	(18) SL2SJ140546+524311	WFC3/UVIS	1	22-Jun-2023 14:00:32.0	yes
19	(19) SL2SJ140650+522619	WFC3/UVIS	1	22-Jun-2023 14:00:33.0	yes
20	(20) SL2SJ220329+020518	WFC3/UVIS	1	22-Jun-2023 14:00:33.0	yes
21	(21) SL2SJ220506+014703	WFC3/UVIS	1	22-Jun-2023 14:00:33.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
22	(22) SL2SJ222148+011542	WFC3/UVIS	1	22-Jun-2023 14:00:34.0	yes

24 Total Orbits Used

ABSTRACT

Despite years of scrutiny, the measurement of H0 from SH0ES is still at 5-sigma tension with early-Universe probes. If the 8% difference is real it implies physics beyond LCDM. It is essential to develop independent methods with sufficient precision and accuracy to confirm or rule out the tension. A number of collaborations used gravitational time delays to measure H0 to 2% precision assuming that the mass density profiles of massive elliptical galaxies are described by a power-law or stars + Navarro Frenk White dark matter halos. However, if the assumption is relaxed under the mass sheet transformation, the precision of H0 from time delays drops to 8%.

We propose to obtain a 4% measurement of H0 (sufficient to distinguish SH0ES and Planck at 2-sigma) from time delays, by replacing mass profile assumptions with empirical information, obtained from a sample of 24 galaxy-galaxy lenses selected to match the deflectors of the time delay lenses in terms of redshift, velocity dispersion, and effective radius. While all other data are in place, deep and sharp imaging is missing: 10 systems lack HST images, while the archival HST snapshots are undithered and too shallow for 12 of them. We will obtain single-orbit F475X images with sufficient signal-to-noise ratio and sampling to meet our goal.

In addition, this proposal will serve as path finder for time delay cosmograpy in the era of the Euclid, Roman and Rubin Telescopes. Roman and Rubin will discover and image thousands of galaxy-galaxy lenses. Extracting and applying the information from galaxy-galaxy lenses will vastly accelerate the achievement of a 1% determination of H0 from gravitational time delays.

OBSERVING DESCRIPTION

The main goal of the proposed HST observations is to measure the local slope of the mass density profile, and in combination with available stellar kinematics from the ground determine, the parameter that quantifies departures from a pure power law in a way that is maximally degenerate with H0. This observable requires images with signal to noise ratio sufficient to determine the radial
distortion of the multiple images.

Filter F475X maximizes the information content of the blue multiply imaged background galaxies, due to its wide bandpass located blueward of the

4000\AA\ break of the red foreground deflector galaxy. Thus, signal of the blue arc is enhanced while shot noise from the red galaxy is suppressed. The archival snapshot images through filter F814W are sufficient to characterize the lens galaxy to the extent necessary for our analysis.

One full orbit in F475X with 4-point dithering strategy is needed to carry out the proposed measurement.

Visit

Proposal 17130, Visit 01, completed Thu Jun 22 18:00:34 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

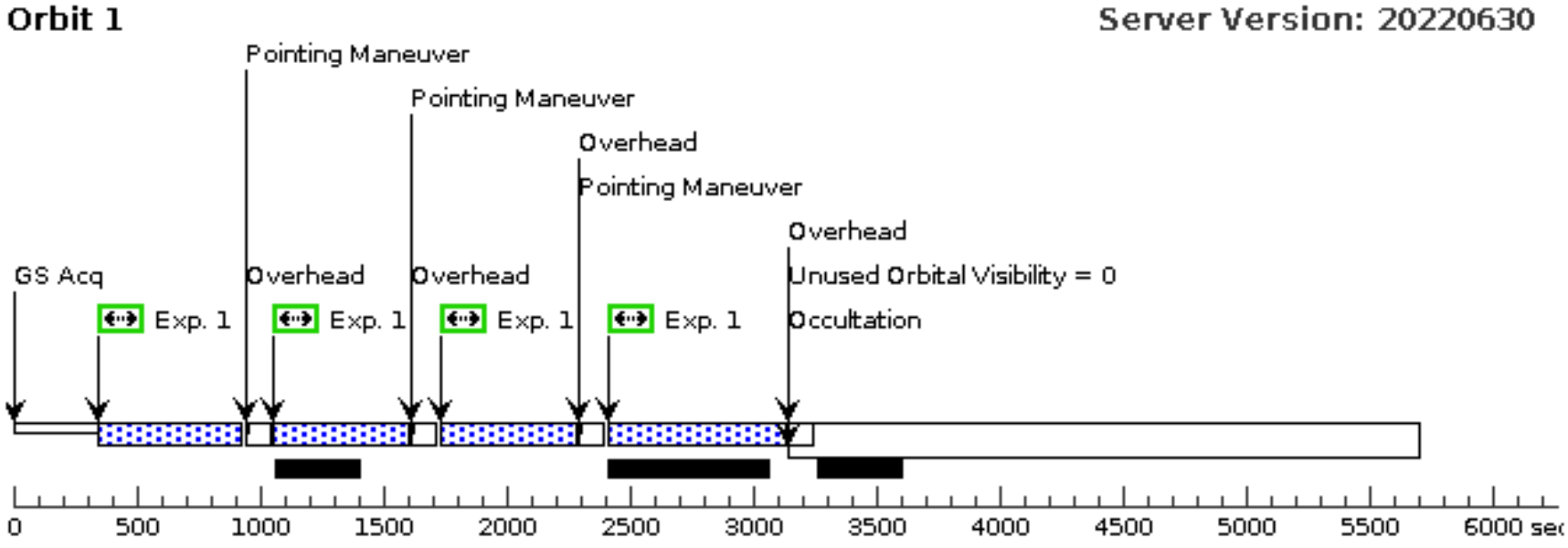
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SL2SJ020524-093023	RA: 02 05 24.6000 (31.3525000d) Dec: -09 30 23.30 (-9.50647d) Equinox: J2000		V=20.55	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SL2SJ020524-093023	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 01 (1)	550 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>720.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 02, completed Thu Jun 22 18:00:34 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

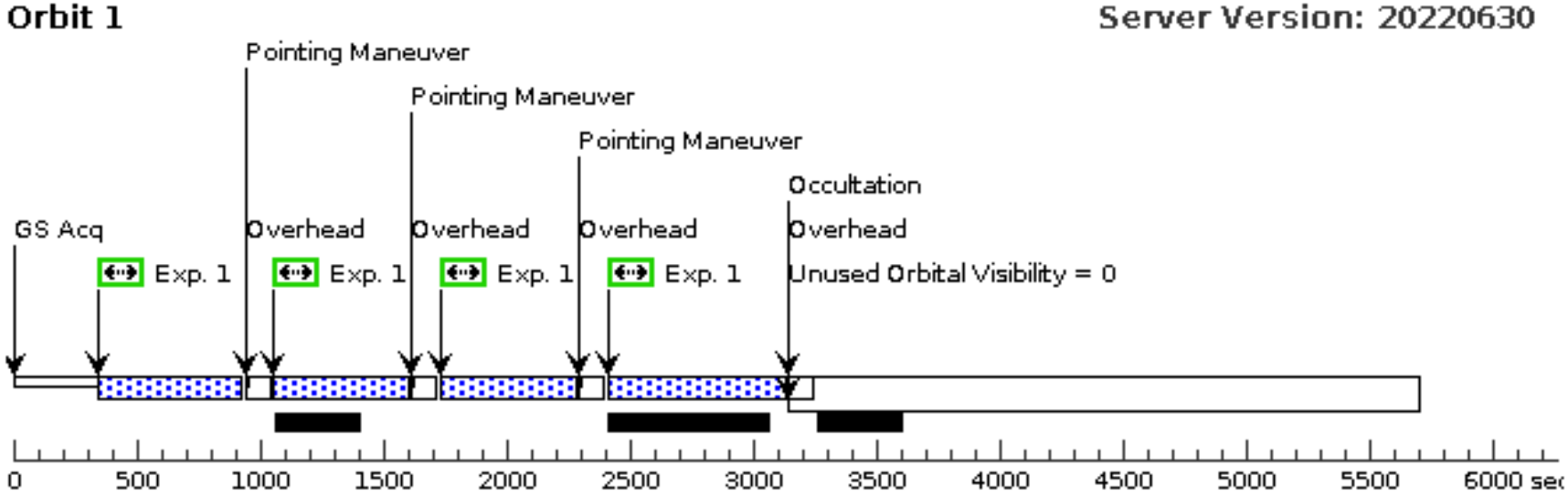
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SL2SJ021247-055552	RA: 02 12 47.8000 (33.1991667d) Dec: -05 55 52.20 (-5.93117d) Equinox: J2000		V=21.44	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) SL2SJ021247-055552	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 02 (1)	550 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>720.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 03, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

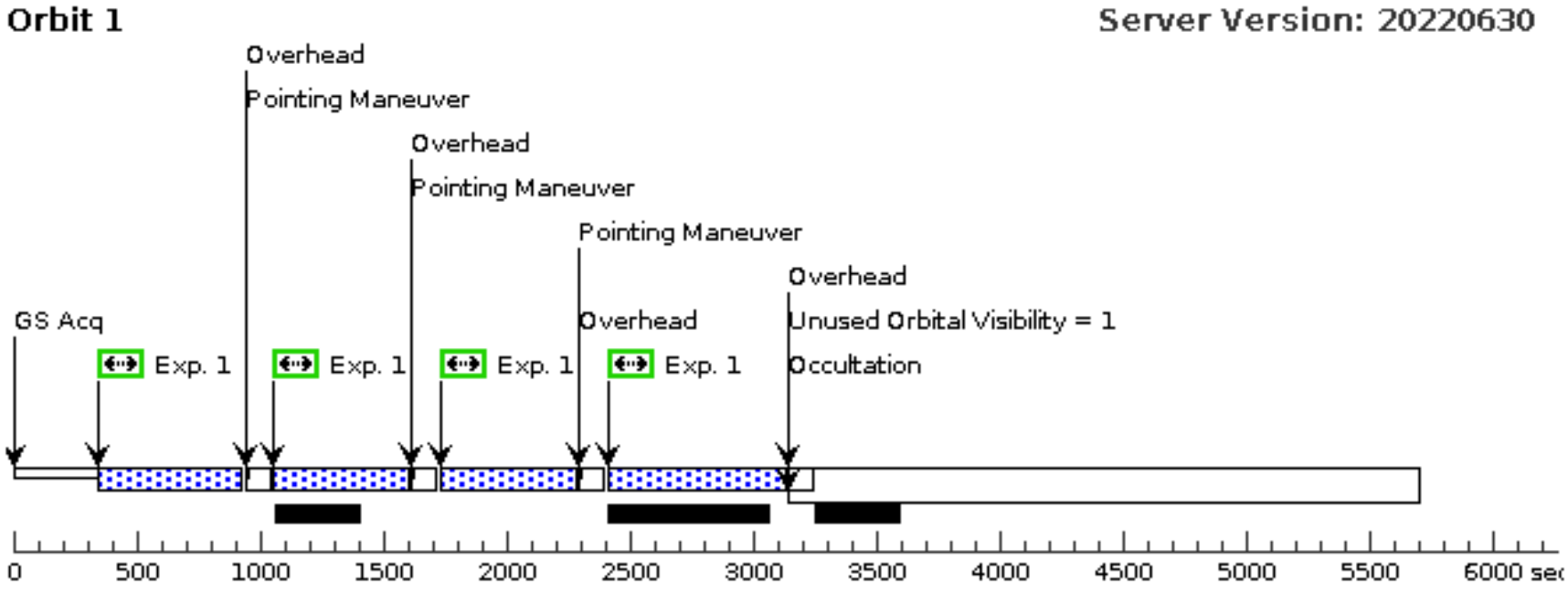
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SL2SJ021411-040502	RA: 02 14 11.2000 (33.5466667d) Dec: -04 05 2.80 (-4.08411d) Equinox: J2000		V=20.88	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) SL2SJ021411-040502	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 03 (1)	550 Secs (2366 Secs)	
								[==>549.0 Secs (Pattern 1)] *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 04, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

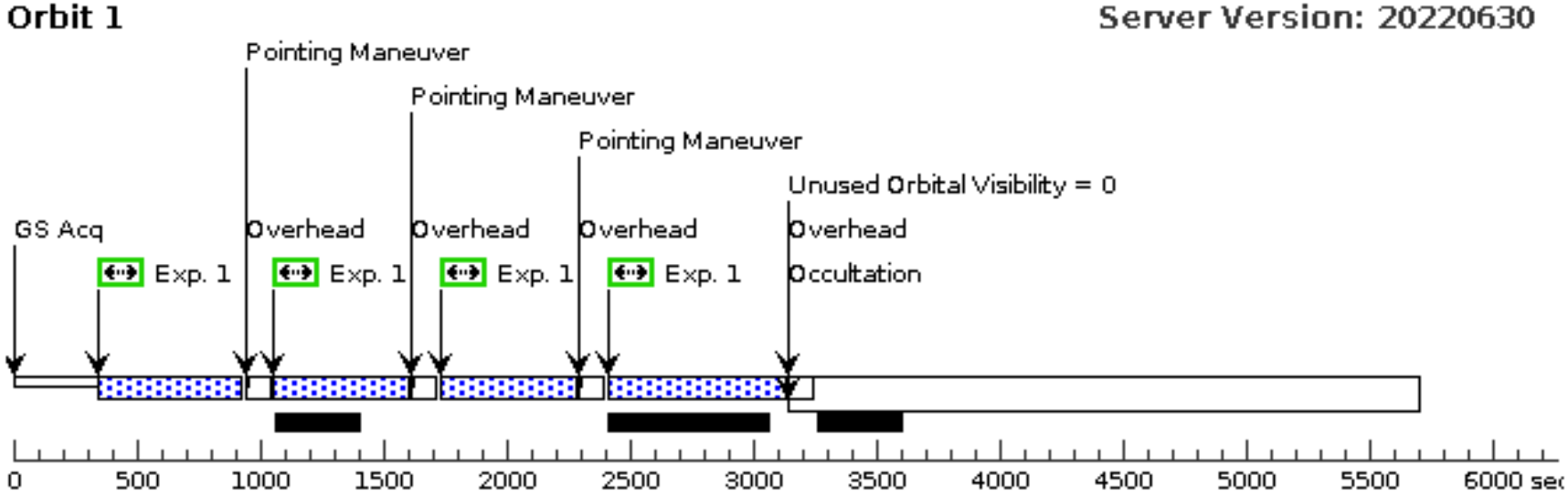
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SL2SJ021737-051329	RA: 02 17 37.2000 (34.4050000d) Dec: -05 13 29.40 (-5.22483d) Equinox: J2000		V=20.92	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) SL2SJ021737-051329	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 04 (1)	550 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>720.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 05, scheduled Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

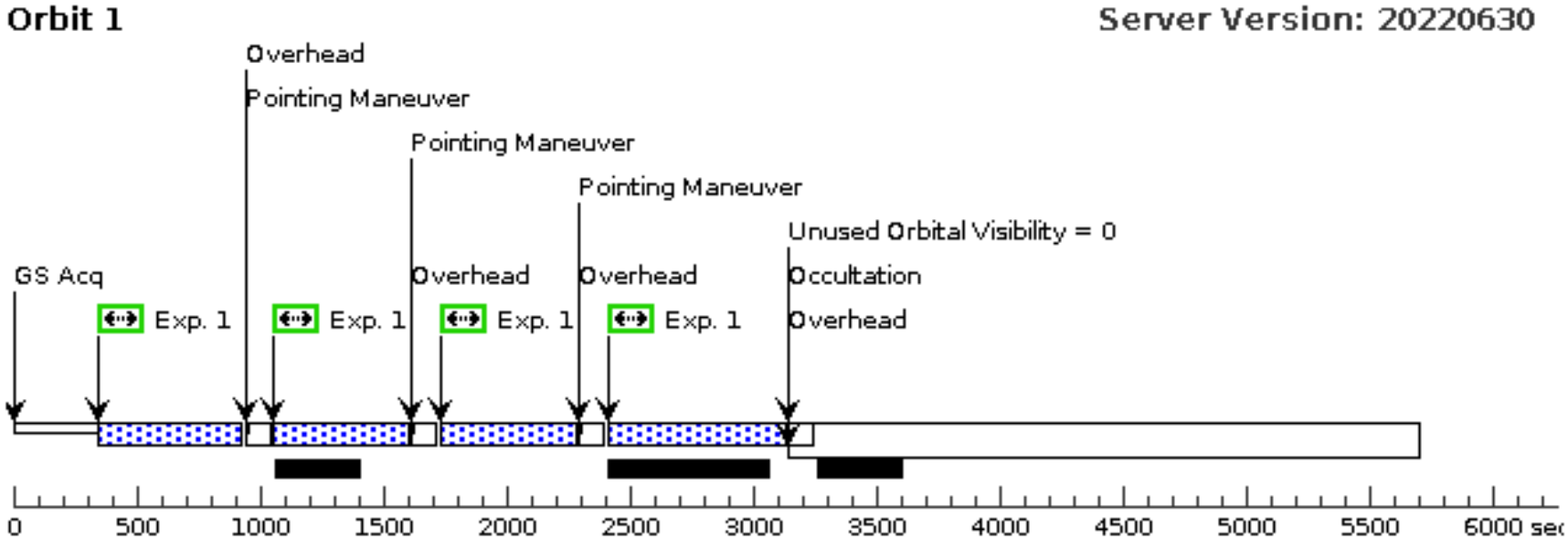
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SL2SJ021801-080247	RA: 02 18 1.3000 (34.5054167d) Dec: -08 02 47.50 (-8.04653d) Equinox: J2000		V=21.32	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) SL2SJ021801-080247	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 05 (1)	550 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>720.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 06, scheduled Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

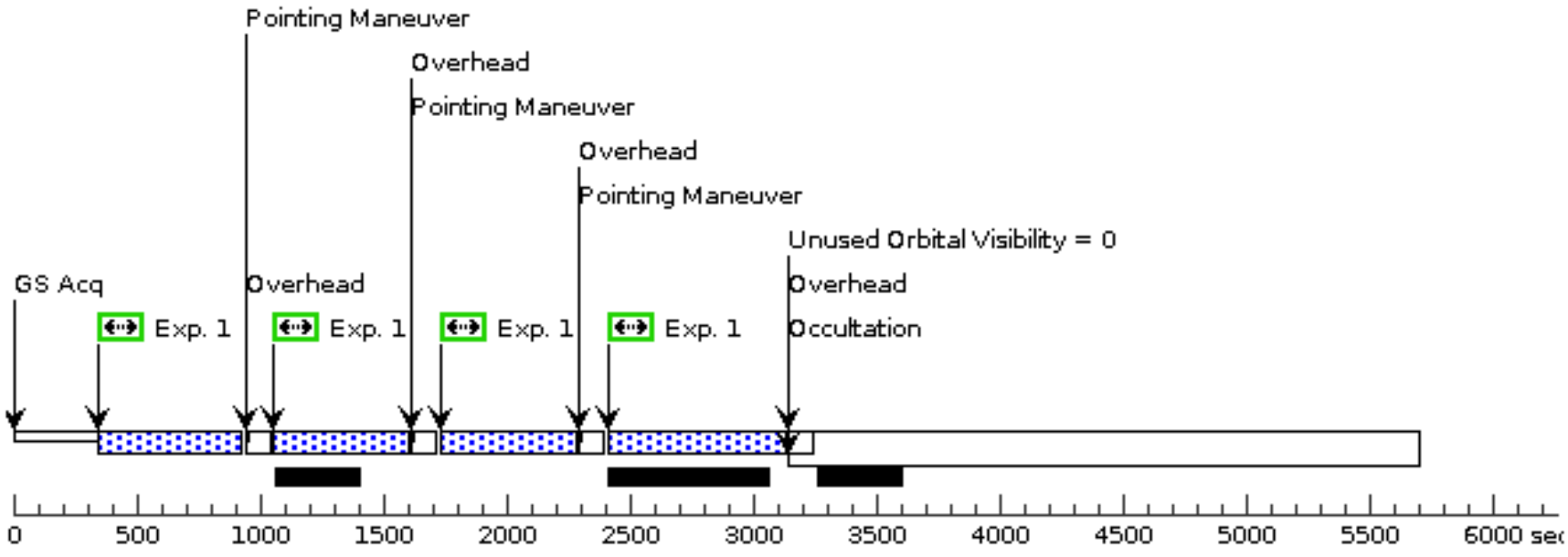
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	SL2SJ021902-082934	RA: 02 19 2.1000 (34.7587500d) Dec: -08 29 34.80 (-8.49300d) Equinox: J2000		V=19.7	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) SL2SJ021902-082934	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 06 (1)	550 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>720.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 07, completed

Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

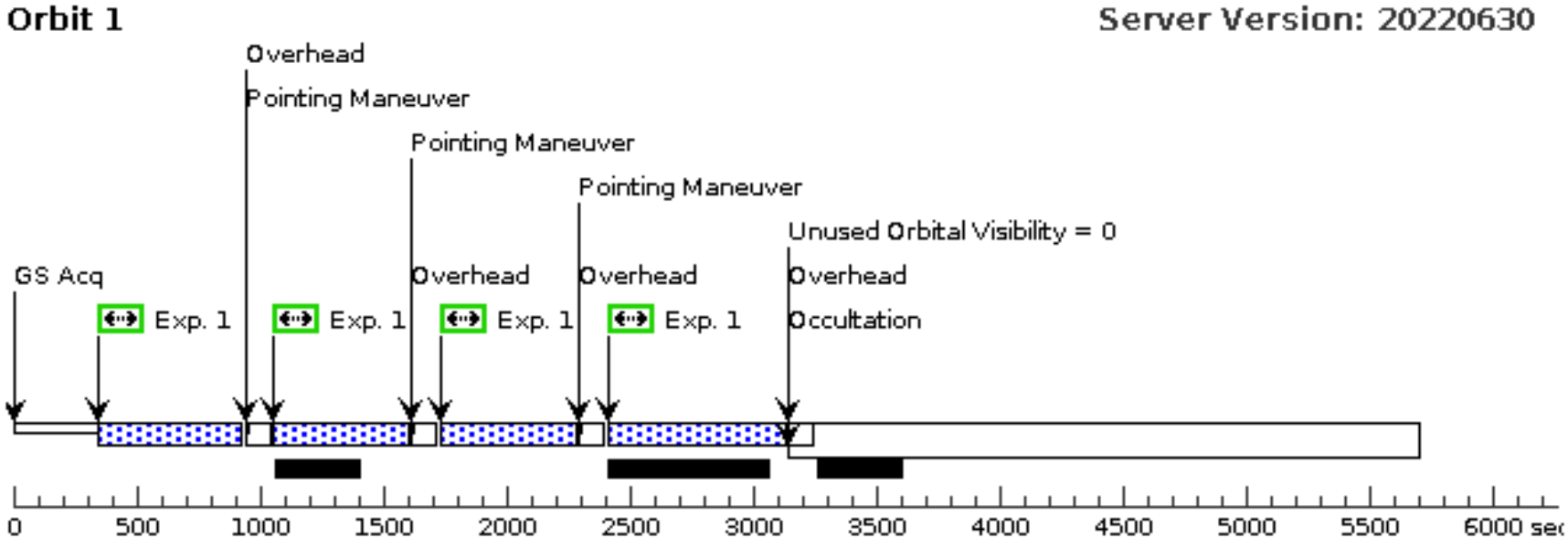
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SL2SJ022046-094927	RA: 02 20 46.1000 (35.1920833d) Dec: -09 49 27.90 (-9.82442d) Equinox: J2000		V=20.88	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) SL2SJ022046-094927	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 07 (1)	550 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>720.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 08, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

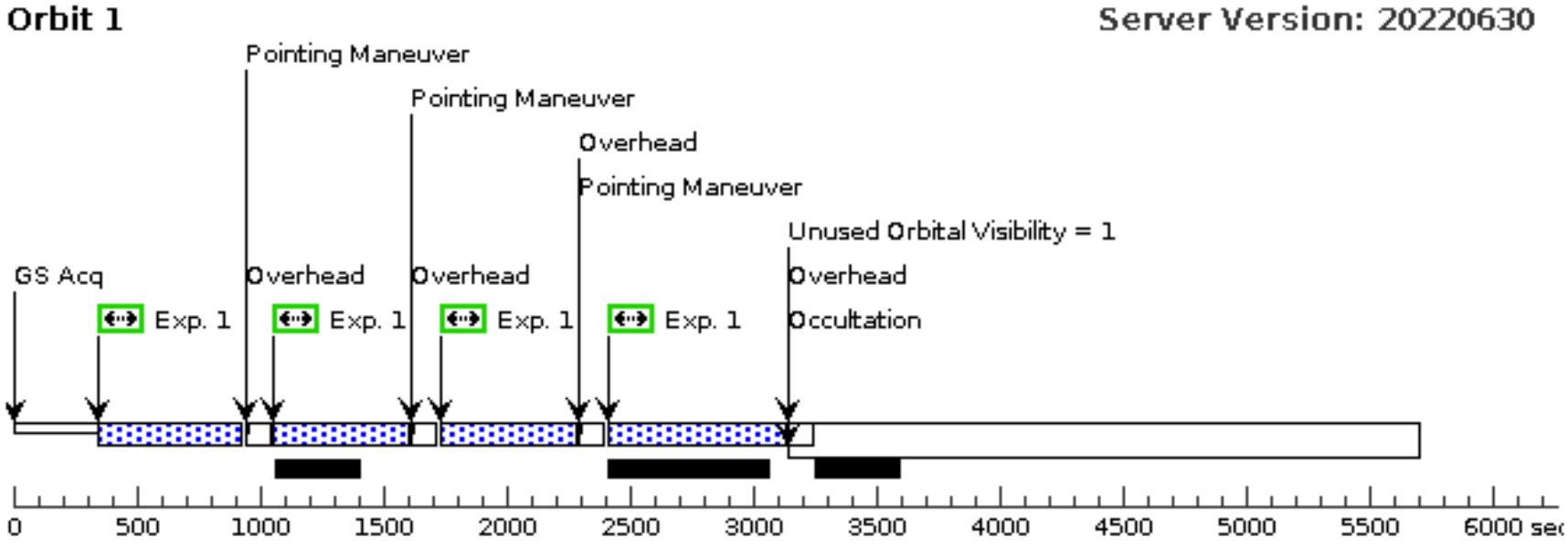
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SL2SJ022610-042011	RA: 02 26 10.7000 (36.5445833d) Dec: -04 20 11.60 (-4.33656d) Equinox: J2000		V=19.7	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(8) SL2SJ022610-042011	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 08 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 09, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

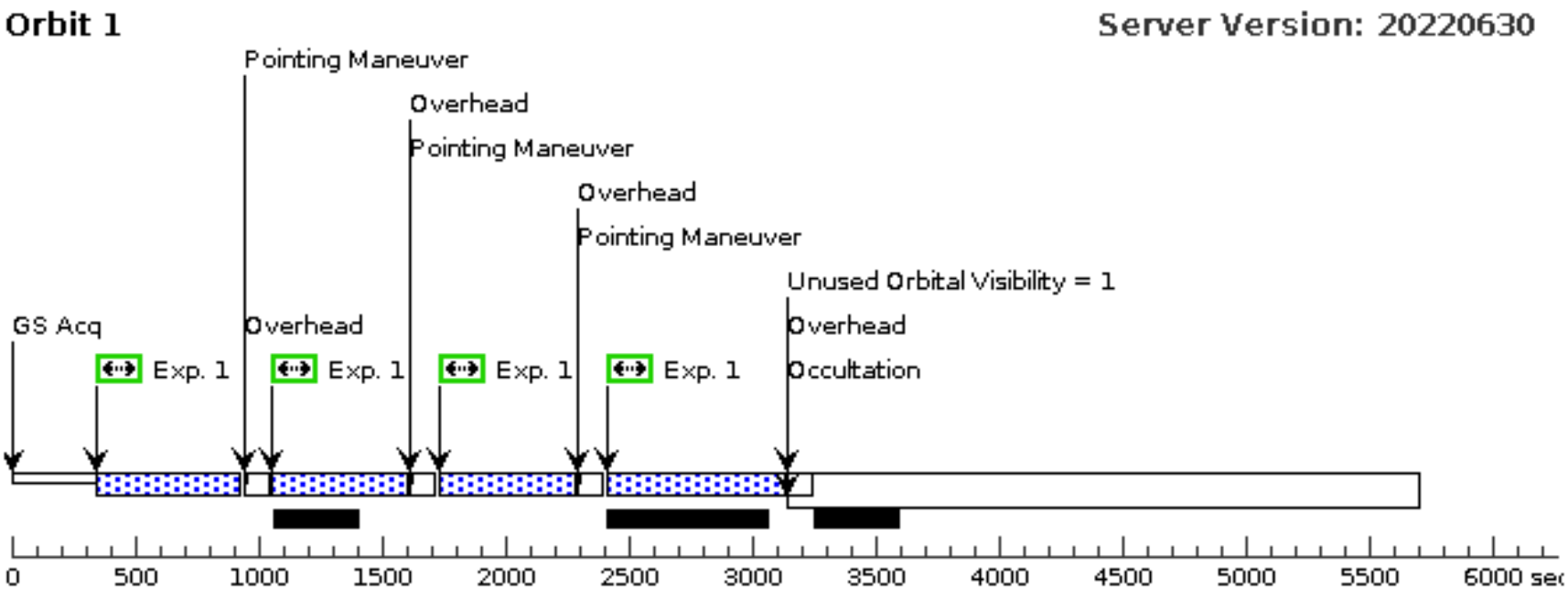
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SL2SJ023251-040823	RA: 02 32 51.6000 (38.2150000d) Dec: -04 08 23.80 (-4.13994d) Equinox: J2000		V=19.31	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(9) SL2SJ023251-040823	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 09 (1)	550 Secs (2366 Secs)	
								[==>549.0 Secs (Pattern 1)]	***[1]***
								[==>549.0 Secs (Pattern 2)]	
								[==>549.0 Secs (Pattern 3)]	
								[==>719.0 Secs (Pattern 4)]	

Orbit Structure



Visit

Proposal 17130, Visit 10, failed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
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Fixed Targets

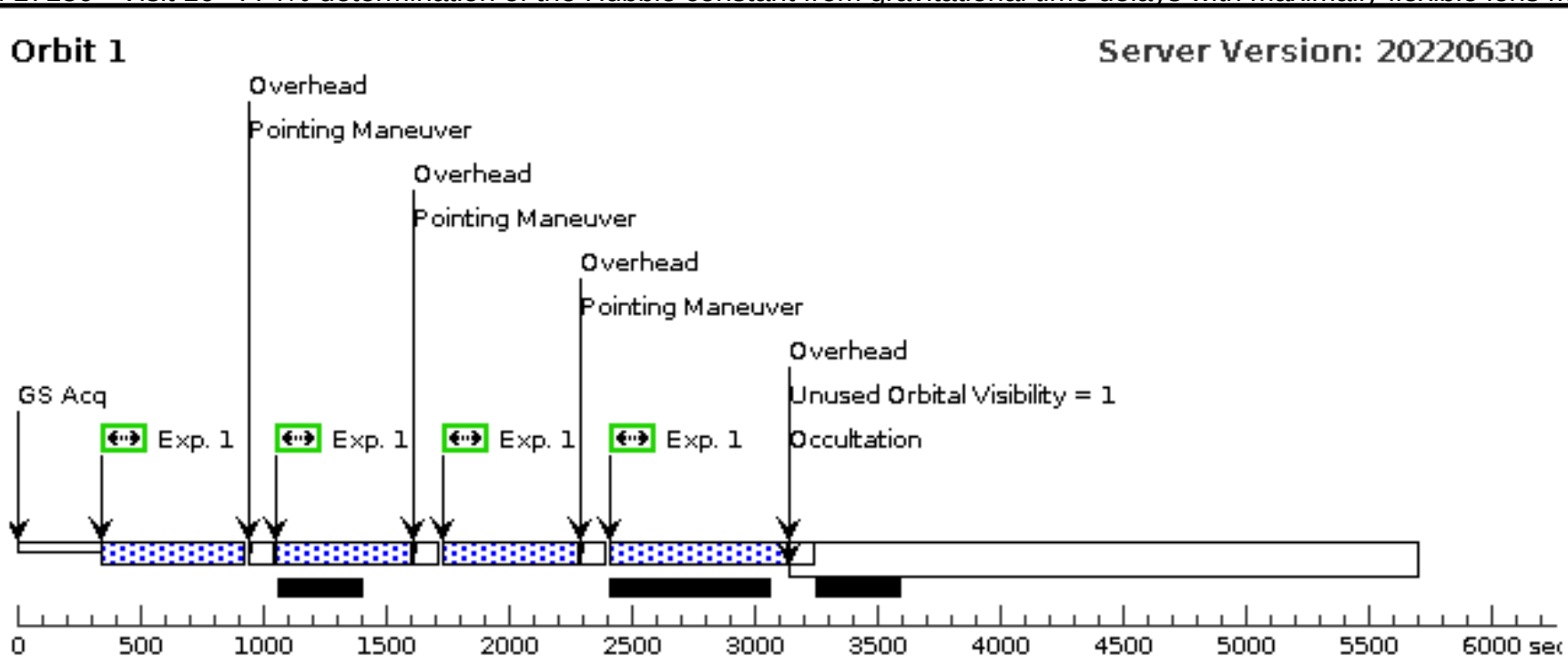
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SL2SJ023307-043838	RA: 02 33 7.1000 (38.2795833d) Dec: -04 38 38.30 (-4.64397d) Equinox: J2000		V=20.63	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(10) SL2SJ023307-043838	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 10 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 23, implementation Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Comments: Copy of 10, approved repeat as per HOPR

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

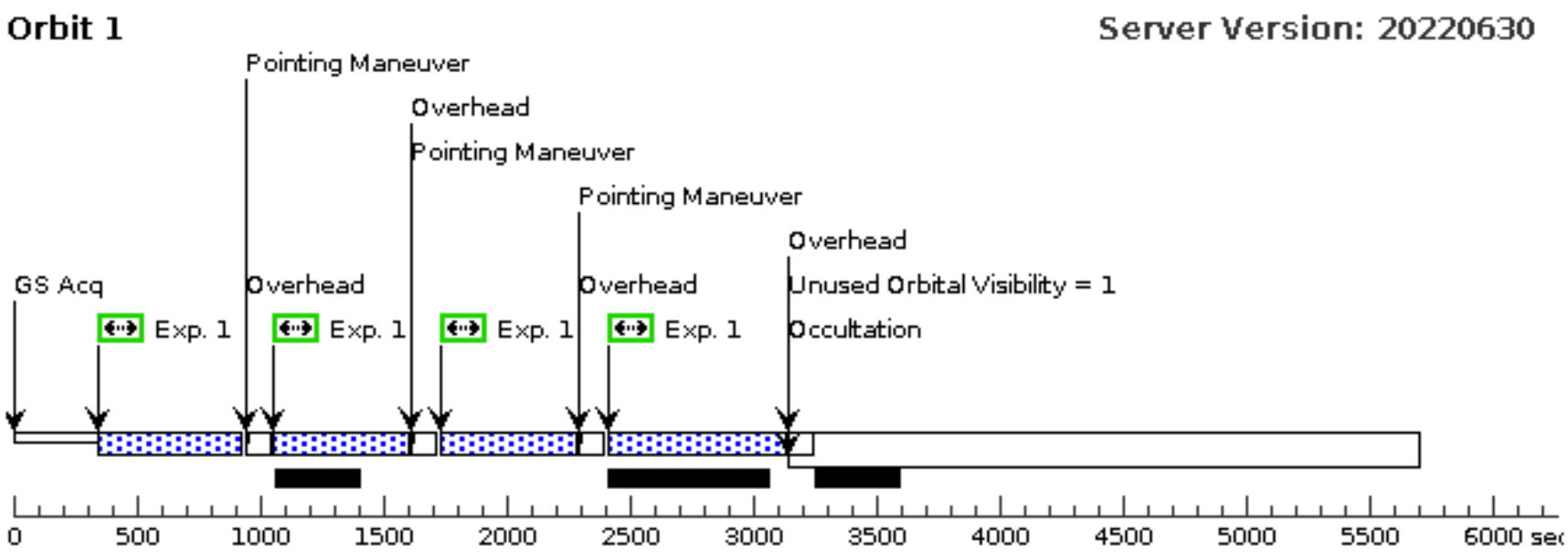
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SL2SJ023307-043838	RA: 02 33 7.1000 (38.2795833d) Dec: -04 38 38.30 (-4.64397d) Equinox: J2000		V=20.63	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(10) SL2SJ023307-043838	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 23 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 11, completed

Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

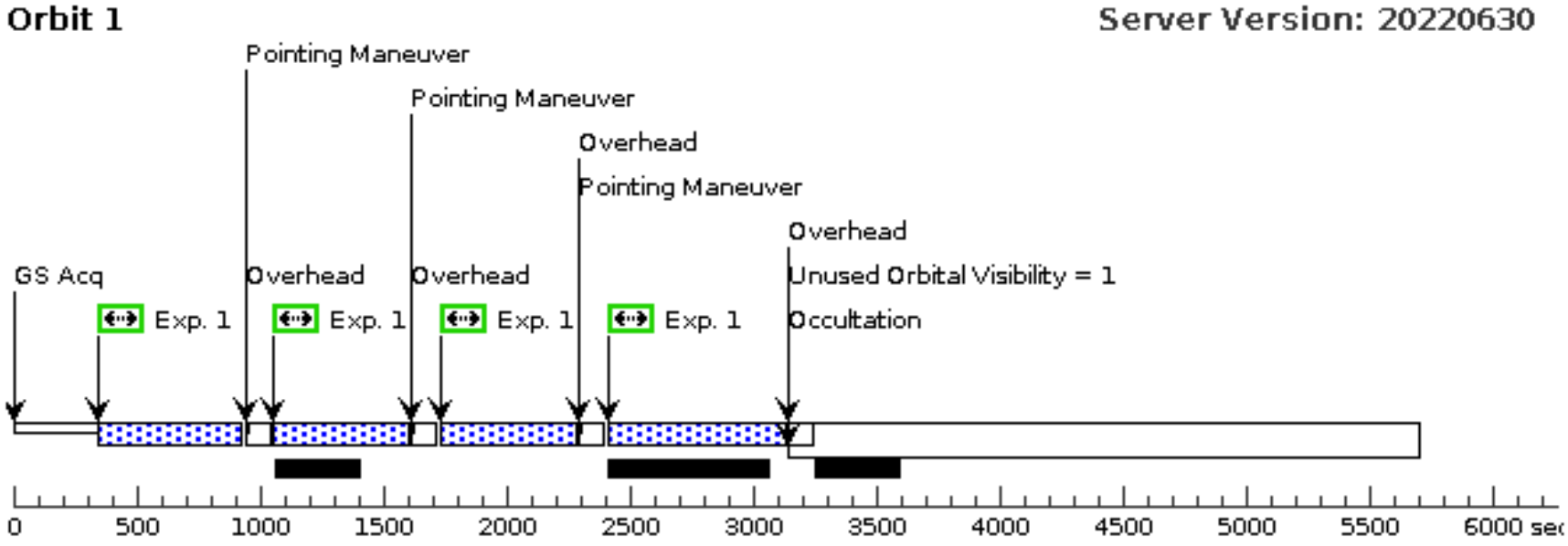
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(11)	SL2SJ084847-035103	RA: 08 48 47.2000 (132.1966667d) Dec: -03 51 3.80 (-3.85106d) Equinox: J2000		V=22.16	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(11) SL2SJ084847-035103	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 11 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 12, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

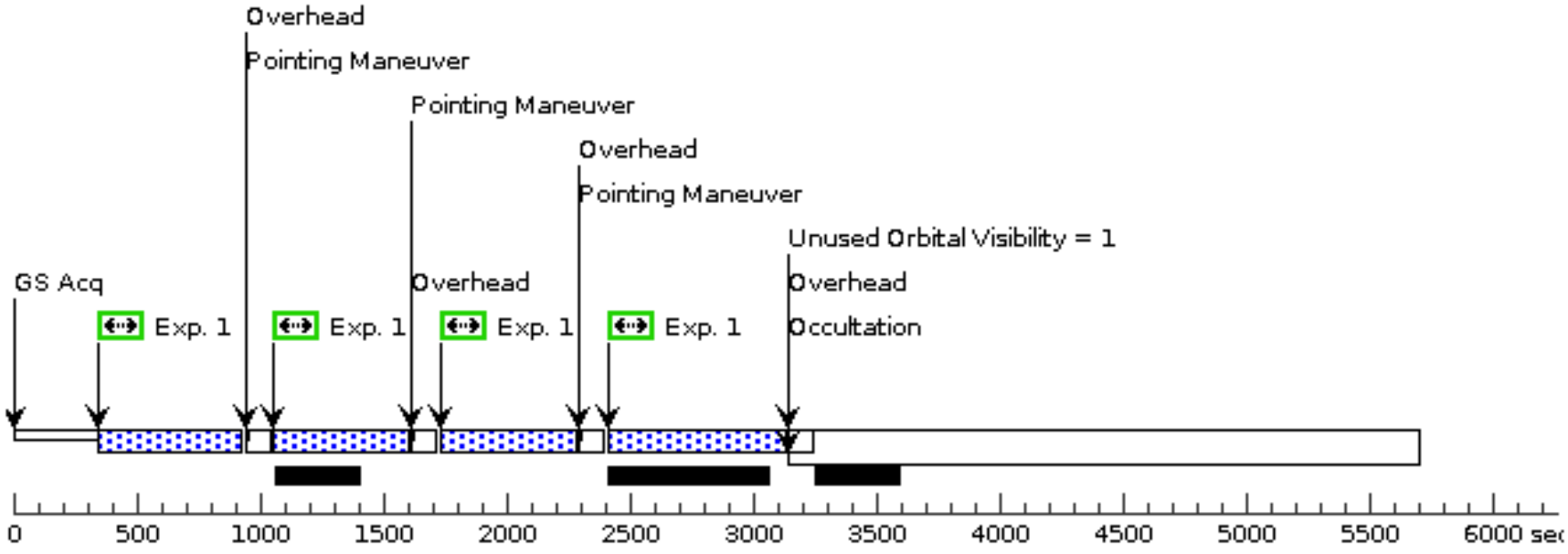
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(12)	SL2SJ084909-041226	RA: 08 49 9.5000 (132.2895833d) Dec: -04 12 26.70 (-4.20742d) Equinox: J2000		V=21.7	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(12) SL2SJ084909-041226	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 12 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 13, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

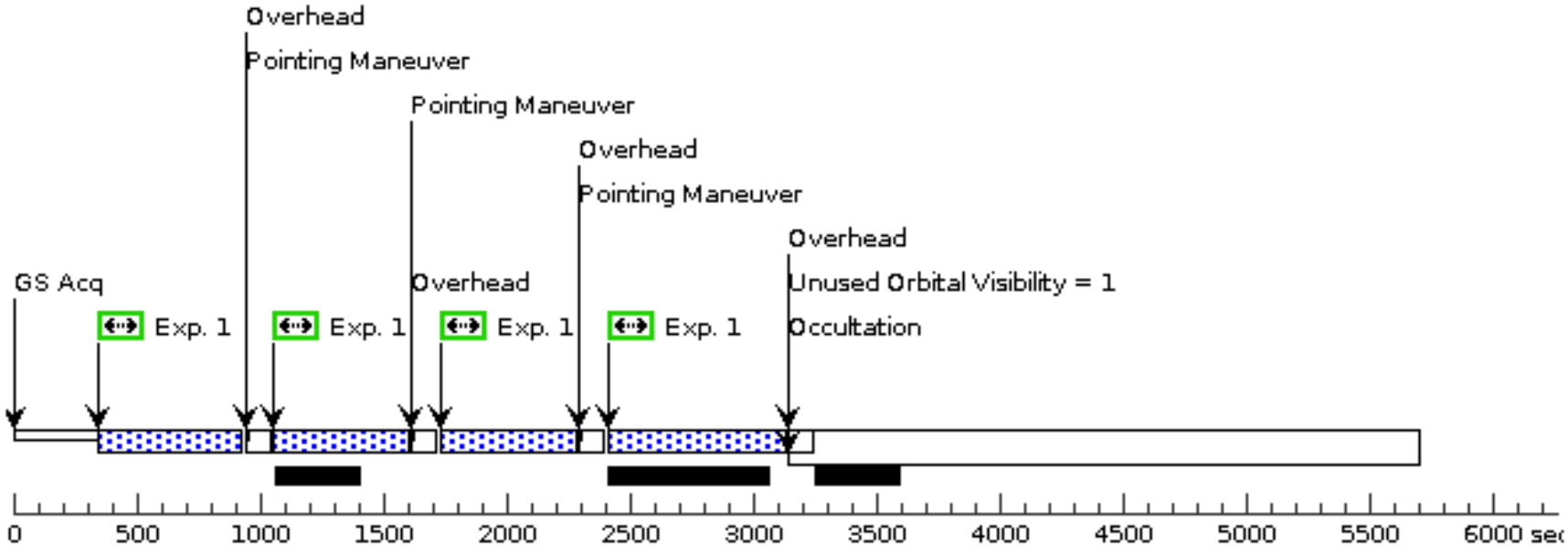
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(13)	SL2SJ085540-014730	RA: 08 55 40.1000 (133.9170833d) Dec: -01 47 30.40 (-1.79178d) Equinox: J2000		V=20.05	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(13) SL2SJ085540-014730	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 13 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 14, completed

Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

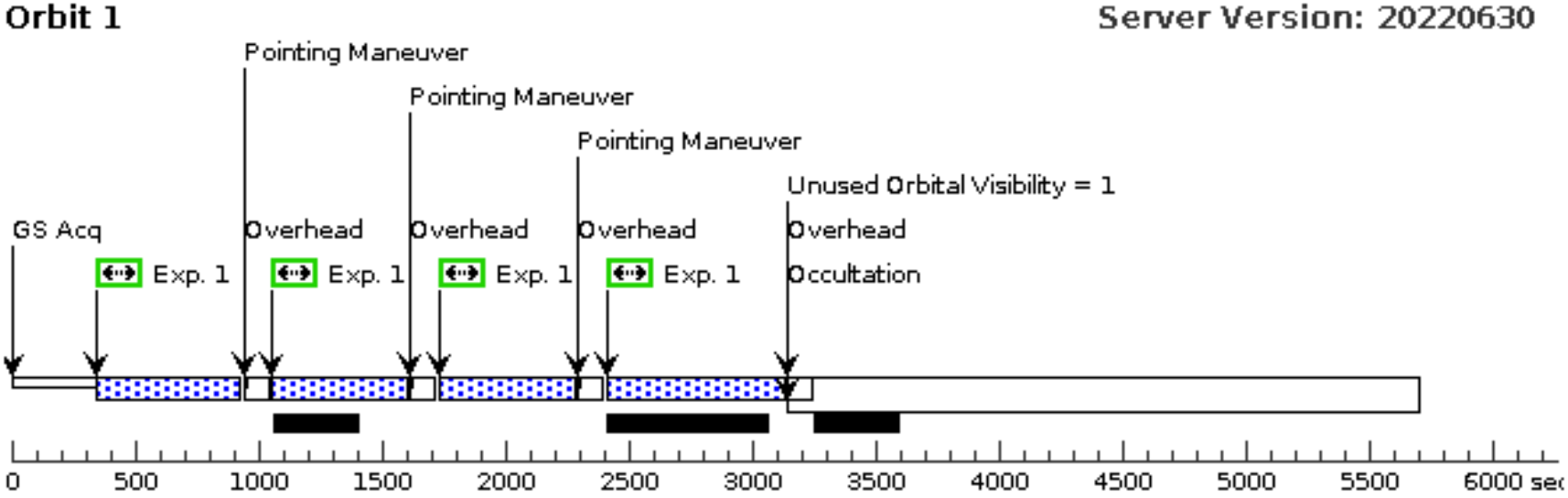
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(14)	SL2SJ090407-005952	RA: 09 04 7.9000 (136.0329167d) Dec: -00 59 52.80 (-.99800d) Equinox: J2000		V=20.57	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(14) SL2SJ090407-005952	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 14 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 15, failed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

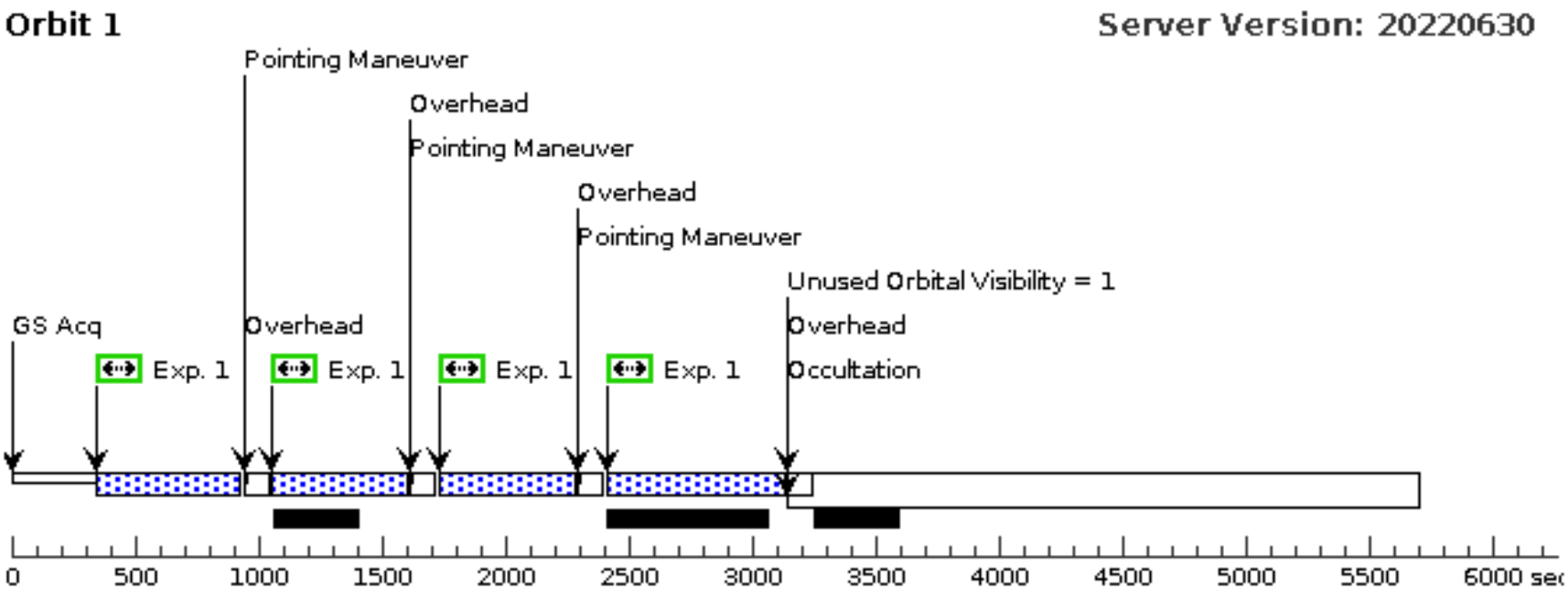
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(15)	SL2SJ095921+020638	RA: 09 59 21.8000 (149.8408333d) Dec: +02 06 38.40 (2.11067d) Equinox: J2000		V=21.23	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(15) SL2SJ095921+020638	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 15 (1)	550 Secs (2366 Secs)	
								[==>549.0 Secs (Pattern 1)]	***[1]***
								[==>549.0 Secs (Pattern 2)]	
								[==>549.0 Secs (Pattern 3)]	
								[==>719.0 Secs (Pattern 4)]	

Orbit Structure



Visit

Proposal 17130, Visit 65 Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Comments: HOPR repeat for visit 15

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

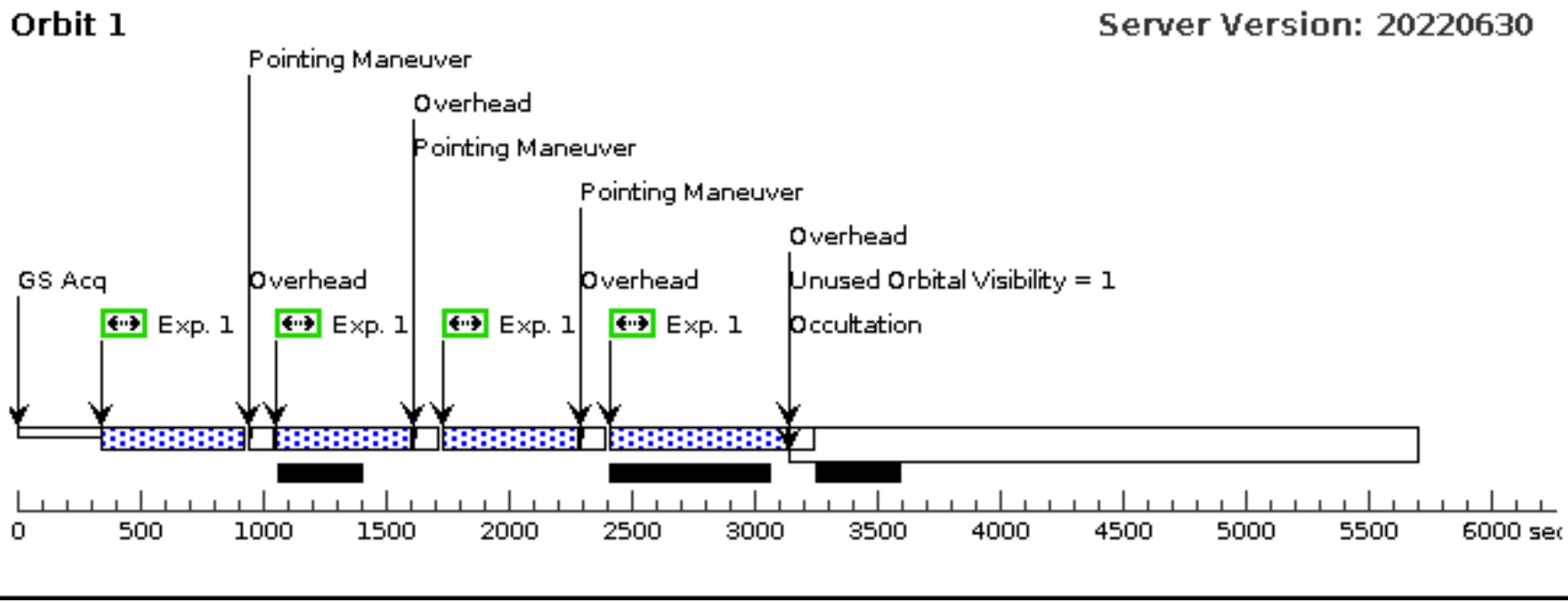
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(15)	SL2SJ095921+020638	RA: 09 59 21.8000 (149.8408333d) Dec: +02 06 38.40 (2.11067d) Equinox: J2000		V=21.23	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(15) SL2SJ095921+020638	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 65 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 16, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

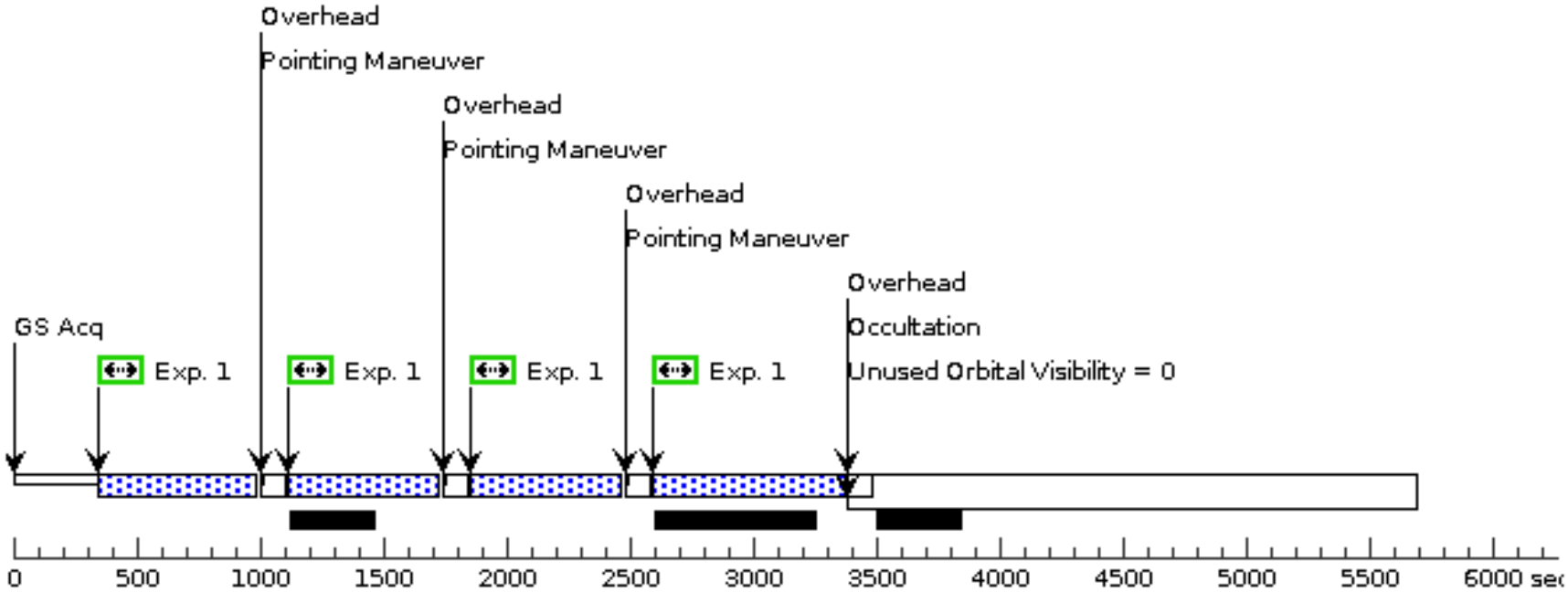
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(16)	SL2SJ135949+553550	RA: 13 59 49.6000 (209.9566667d) Dec: +55 35 50.40 (55.59733d) Equinox: J2000		V=21.9	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(16) SL2SJ135949+553550	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 16 (1)	550 Secs (2614 Secs) *[==>611.0 Secs (Pattern 1)]* *[==>611.0 Secs (Pattern 2)]* *[==>611.0 Secs (Pattern 3)]* *[==>781.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 17, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

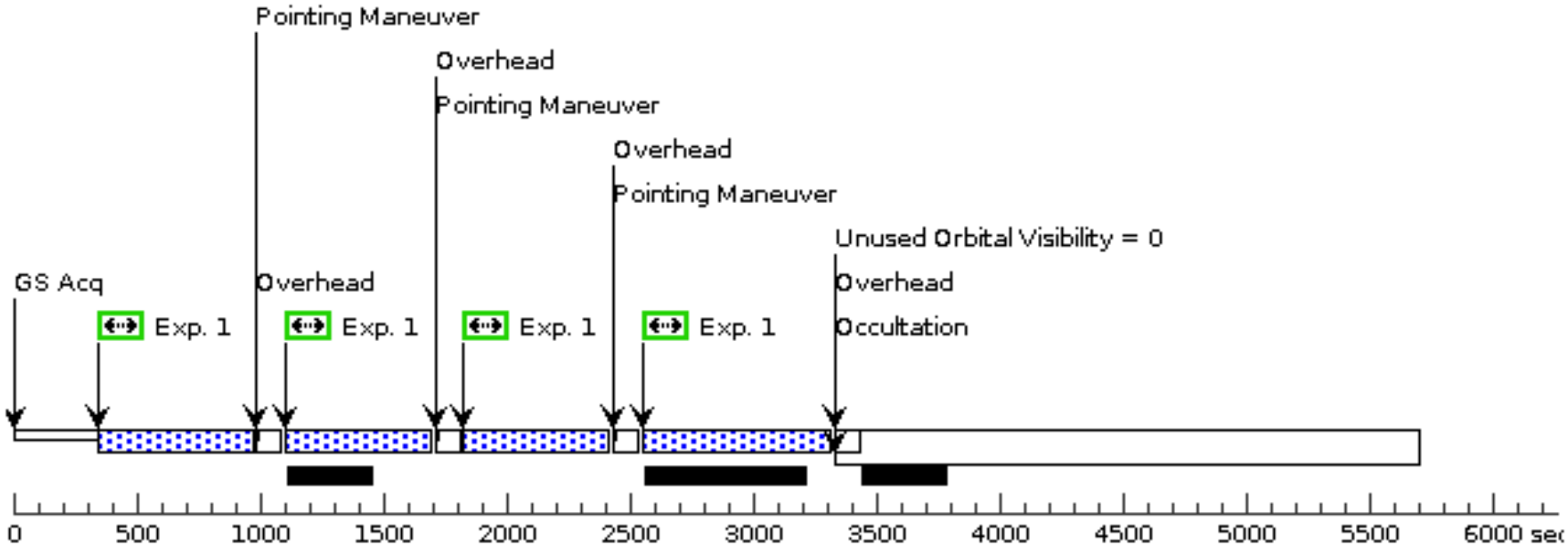
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(17)	SL2SJ140454+520024	RA: 14 04 54.4000 (211.2266667d) Dec: +52 00 24.60 (52.00683d) Equinox: J2000		V=18.56	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(17) SL2SJ140454+520024	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 17 (1)	550 Secs (2558 Secs) *[==>597.0 Secs (Pattern 1)]* *[==>597.0 Secs (Pattern 2)]* *[==>597.0 Secs (Pattern 3)]* *[==>767.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 18, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

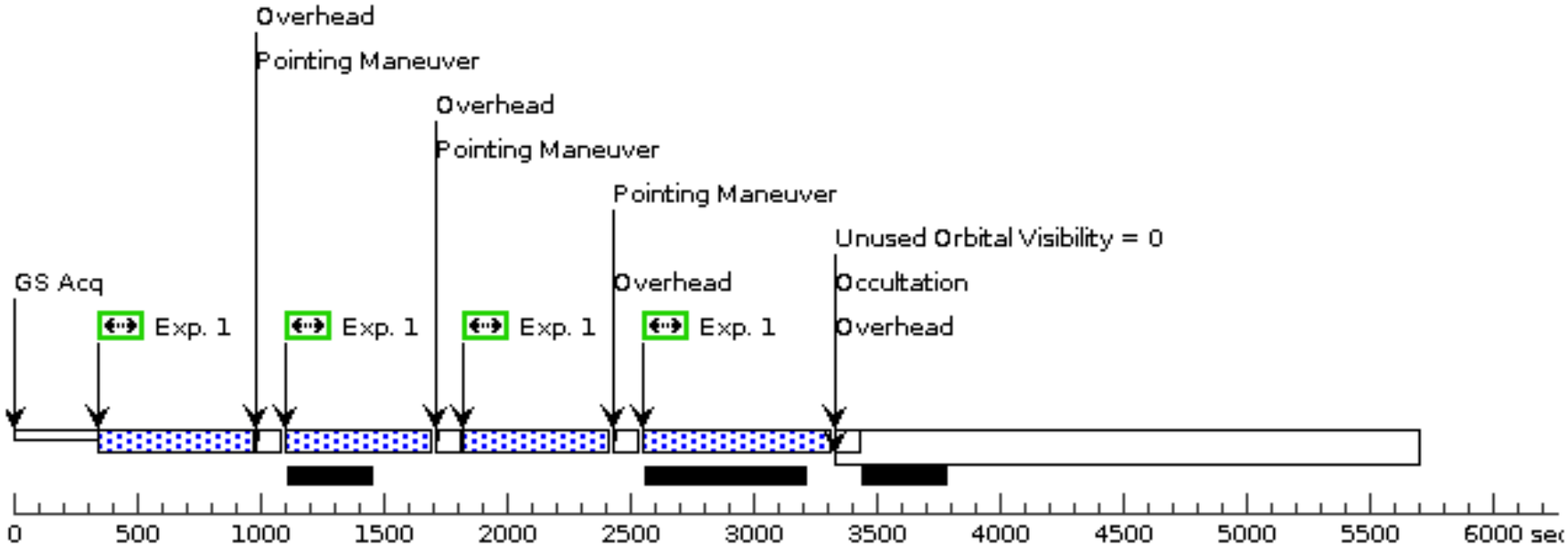
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(18)	SL2SJ140546+524311	RA: 14 05 46.2000 (211.4425000d) Dec: +52 43 11.20 (52.71978d) Equinox: J2000		V=20.1	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(18) SL2SJ140546+524311	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 18 (1)	550 Secs (2558 Secs)	
								[==>597.0 Secs (Pattern 1)]	***[1]***
								[==>597.0 Secs (Pattern 2)]	
								[==>597.0 Secs (Pattern 3)]	
								[==>767.0 Secs (Pattern 4)]	

Orbit Structure



Visit

Proposal 17130, Visit 19, scheduling Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

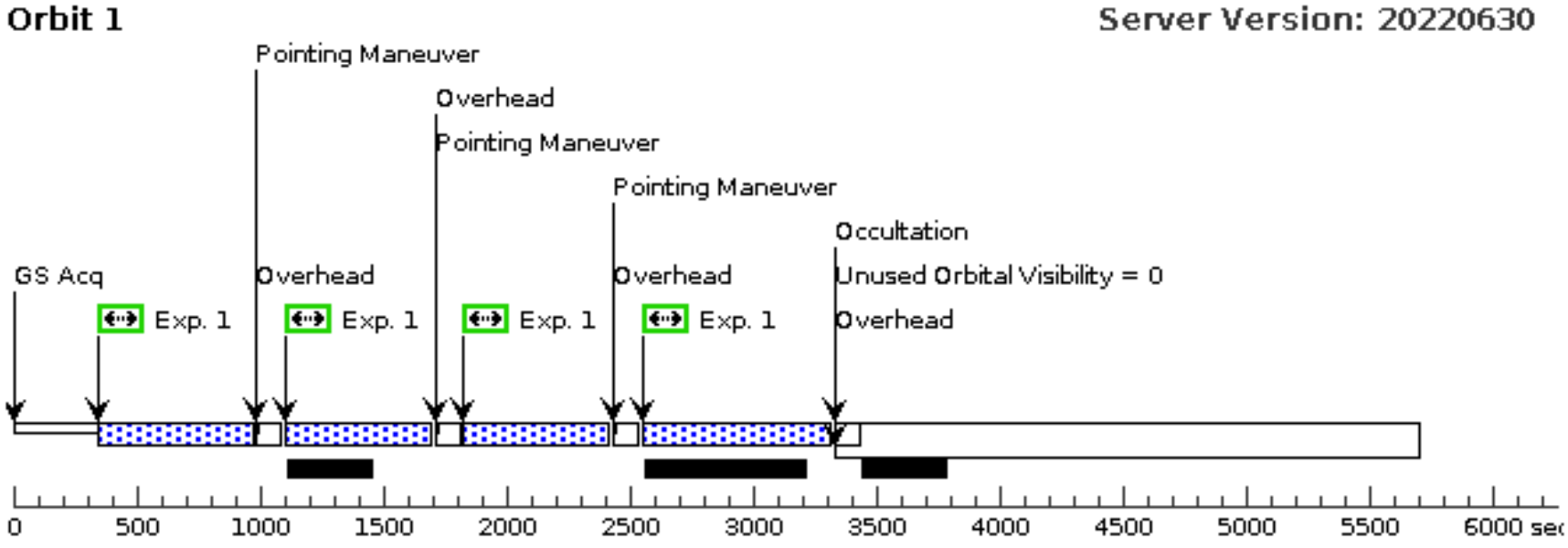
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(19)	SL2SJ140650+522619	RA: 14 06 50.3000 (211.7095833d) Dec: +52 26 19.10 (52.43864d) Equinox: J2000		V=21.31	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(19) SL2SJ140650+522619	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 19 (1)	550 Secs (2558 Secs) *[==>597.0 Secs (Pattern 1)]* *[==>597.0 Secs (Pattern 2)]* *[==>597.0 Secs (Pattern 3)]* *[==>767.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17130, Visit 20, completed

Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

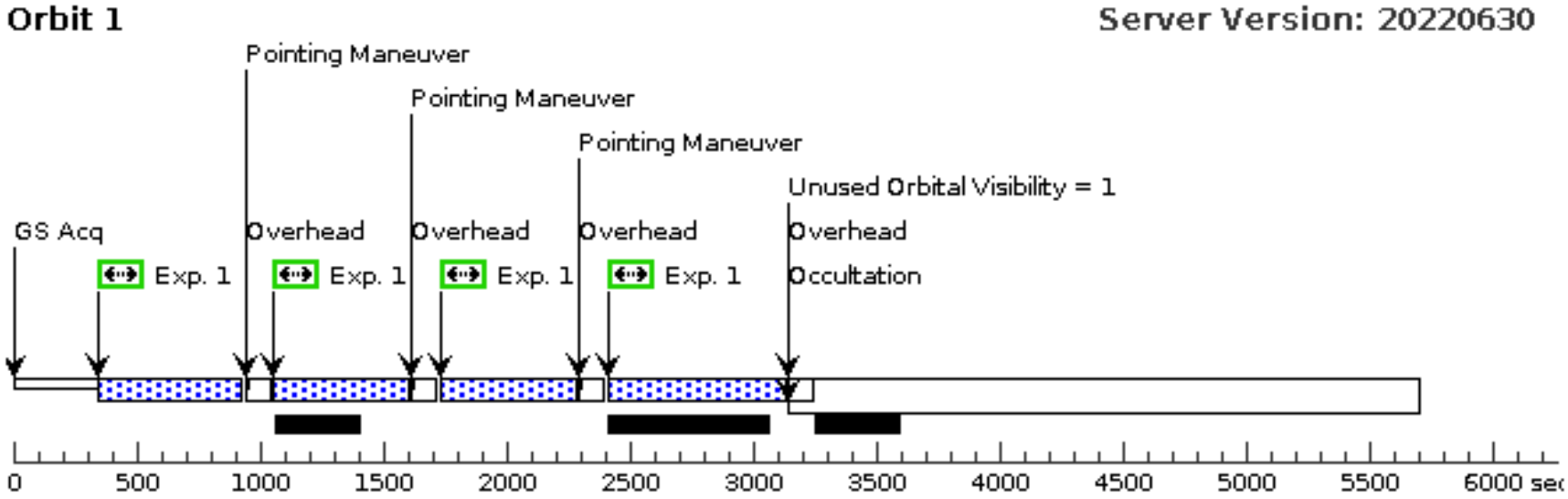
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(20)	SL2SJ220329+020518	RA: 22 03 29.0000 (330.8708333d) Dec: +02 05 18.90 (2.08858d) Equinox: J2000		V=19.8	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(20) SL2SJ220329+020518	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 20 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17130, Visit 21, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX	Coordinate Frame=POS-TARG		(1)
	Purpose=DITHER	Pattern Orientation=23.884		
	Number Of Points=4	Angle Between Sides=81.785		
	Point Spacing=0.173	Center Pattern=false		
	Line Spacing=0.112			

Fixed Targets

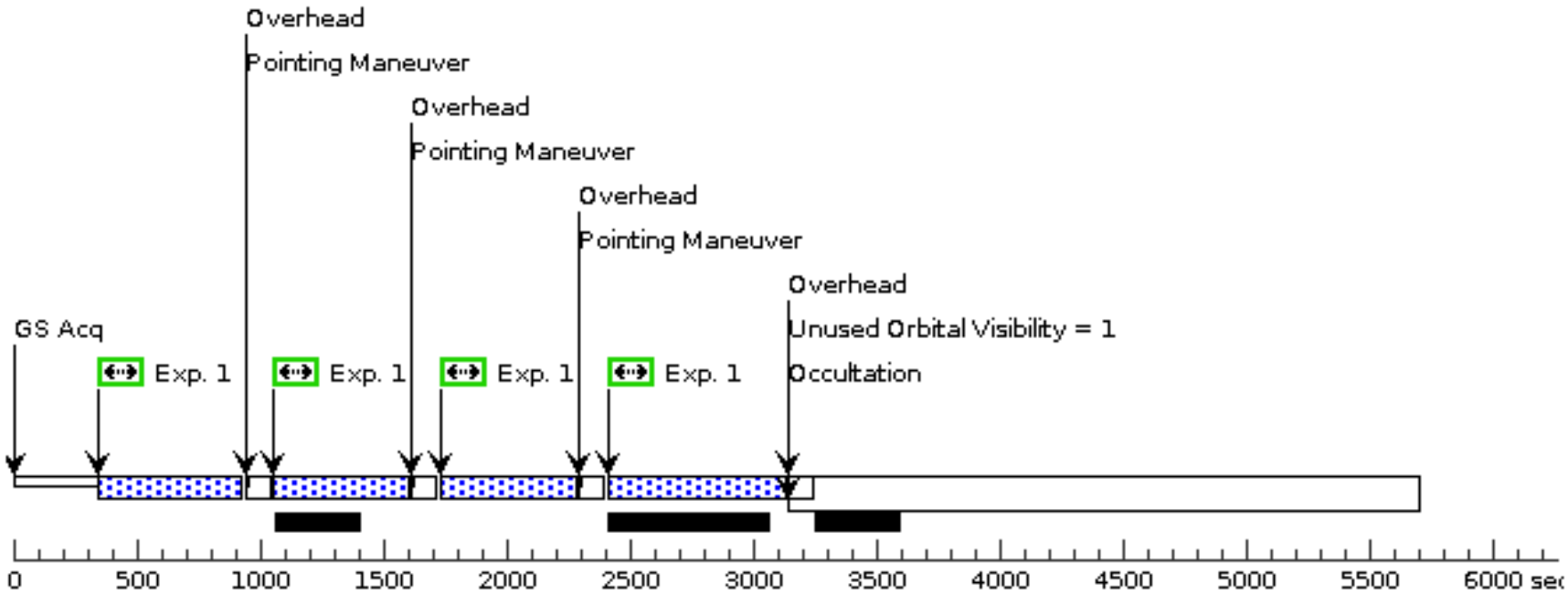
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(21)	SL2SJ220506+014703	RA: 22 05 6.9000 (331.2787500d) Dec: +01 47 3.90 (1.78442d) Equinox: J2000		V=20.09	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(21) SL2SJ220506+014703	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 21 (1)	550 Secs (2366 Secs)	
								[==>549.0 Secs (Pattern 1)]	***[1]***
								[==>549.0 Secs (Pattern 2)]	
								[==>549.0 Secs (Pattern 3)]	
								[==>719.0 Secs (Pattern 4)]	

Orbit Structure



Visit

Proposal 17130, Visit 22, completed Thu Jun 22 18:00:35 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(22)	SL2SJ222148+011542	RA: 22 21 48.8000 (335.4533333d) Dec: +01 15 42.70 (1.26186d) Equinox: J2000		V=18.83	Reference Frame: SDSS

Comments:
Category=GALAXY
Description=[ELLIPTICAL, GRAVITATIONAL LENS]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(22) SL2SJ222148+011542	WFC3/UVIS, ACCUM, UVIS1	F475X			Pattern 1, Exps 1-1 in Visit 22 (1)	550 Secs (2366 Secs) *[==>549.0 Secs (Pattern 1)]* *[==>549.0 Secs (Pattern 2)]* *[==>549.0 Secs (Pattern 3)]* *[==>719.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure