16645 - Spectral Imaging of O VI and Ly-alpha from a Giant Intragroup Filament

Cycle: 29, 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) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:33.0	yes
02	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:34.0	yes
03	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:35.0	yes
04	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:35.0	yes
05	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:36.0	yes
06	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:37.0	yes
07	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:38.0	yes
08	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:38.0	yes
09	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:39.0	yes
10	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:40.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
11	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:41.0	yes
12	(2) QSO-J1619+3342-FILAMENT	ACS/SBC	2	27-Jul-2021 15:00:41.0	yes

24 Total Orbits Used

ABSTRACT

Streams of gas in cosmological halos are critical to galaxy evolution, as they bring matter into halos (accretion) and carry matter out (outflows). In addition, "intergalactic transfer" from satellites and group members can be important for building up the gas mass of galaxies. We have discovered a giant (>100 kpc) [O II]-emitting nebula in the group environment of a z~0.5 QSO. The filament is devoid of starlight, showing instead knots of nebular emission in HST/ACS imaging; it is coincident in redshift with a partial Lyman-limit system having 1/20 solar metallicity in HST/COS spectroscopy. The filament may be an example of intragroup gas commonly identified via HI-selected absorption studies, representing either material stripped or shed from group members or accreting with new infall. We propose an ACS/SBC imaging campaign to study the spatial distribution and intensity of O VI and Ly-alpha emission from this filament, constructing a synthetic narrow band filter through difference imaging in two ACS longpass filters. Our proposed observations will allow us for the first time to understand how the warm/hot and cool phases of circumgalactic gas are related, provide a robust measure of the cooling rate of hot material in a gaseous halo, and give unique density and mass estimates in a filament. This filament is one of the few opportunities we have to image intergalactic gas prior to the next generation of UV telescopes and will be the only case for which we have both absorption and emission line data for the same species.

OBSERVING DESCRIPTION

Instrumental configuration: pseudo-filters to isolate emission lines

Following the technique pioneered by Hayes+ (2005, 2016) we aim to isolate diffuse emission in the O VI 1034 doublet and Ly-alpha 1215 from the z = 0.4708 filament associated with the QSO J1619+3342. The observed wavelengths of these lines will be 1520 Ang and 1797 Ang. We will observe the field in the F150LP and F165LP filters of the ACS/SBC, covering an area 210 x 185 kpc at z = 0.47, roughly the size of the panels in Fig. 1. We will isolate O VI using image subtraction in the two longpass filters to create a synthetic narrowband filter: F155NBsyn = F150LP - F165LP. This approach takes advantage of the shared red wings of the longpass filters (Fig. 2), which allow the accurate removal of continuum and redder line emission from the bluest filter used. This approach has successfully been demonstrated in several previous cycles through programs 13656, 14079, 15298, 15655, and 16231 in Cycles 22-28. Unlike many of these previous programs, we are imaging pure nebular emission with no continuum (based

on ACS/ WFC and deep ground-based broadband imaging); we may be able to use the F165LP filter to isolate Ly-alpha emission, as well (at least outside of galaxies).

Observing approach

We request that the visits are scheduled so that SBC has been switched off for at least 24 hours prior to reduce the dark current. For the same reason, we also request that each 2-orbit visit be spaced from the next visit by at least 24 hours, with the SBC turned off in between. The typical visibility of the O-tube is 53 minutes. In a 2-orbit visit, overheads total ~10.5 min and ~8 min in orbits 1 and 2. This leaves ~2.5 ks in each orbit for exposure. In each visit we will execute a square 4-point box dither pattern (with half-pixel shifts) to subsample the PSF.

To address potential large-scale gradients in the flatfielding, etc., each visit will be made on a 3x3 grid with points offset by 2.5 arcsec using the POS TARG functionality. The last three visits repeat the positions of the first three (although even these will not be exactly the same if the orientations are not identical). The pointing center of this pattern is offset from the QSO by (delta RA, delta Dec) = (+3.21, +1.83) arcsec [centered at (RA, Dec) = (16:19:16.8, 33:42:40.2)]. This ensures that different observatory orientations will all include the full extent of the filament within the SBC field of view.

Each visit obtains 1 orbit of exposure time in the F150LP and F165LP filters. The total exposure time in the two filters is the same when combining all 12 visits.

Visit

Proposal 16645, Grid_Point_1-1 (01) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

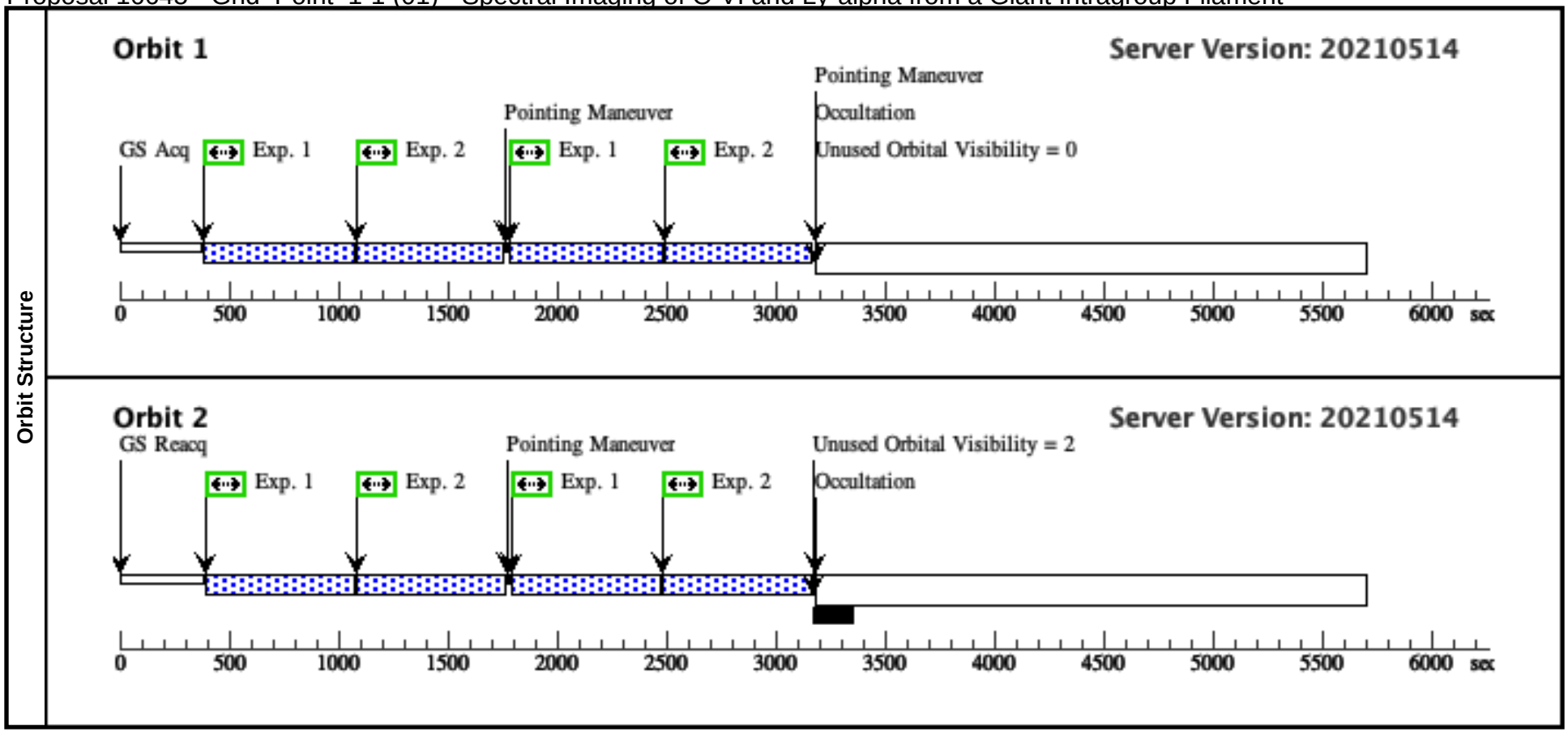
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 0,0	Pattern 3, Exps 1-2 in Grid_Point_1-1 (01) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG 0,0	Pattern 3, Exps 1-2 in Grid_Point_1-1 (01) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Pointing Maneuver
Occultation
Pointing Maneuver
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Unused Orbital Visibility = 0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16645, Grid_Point_2-1 (02) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

Fixed Targets

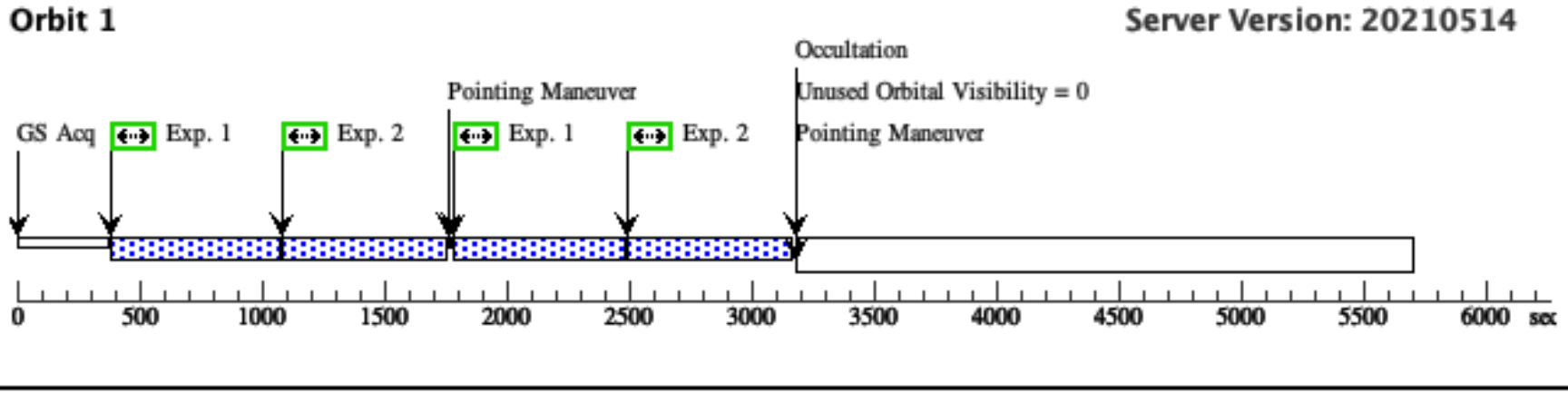
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

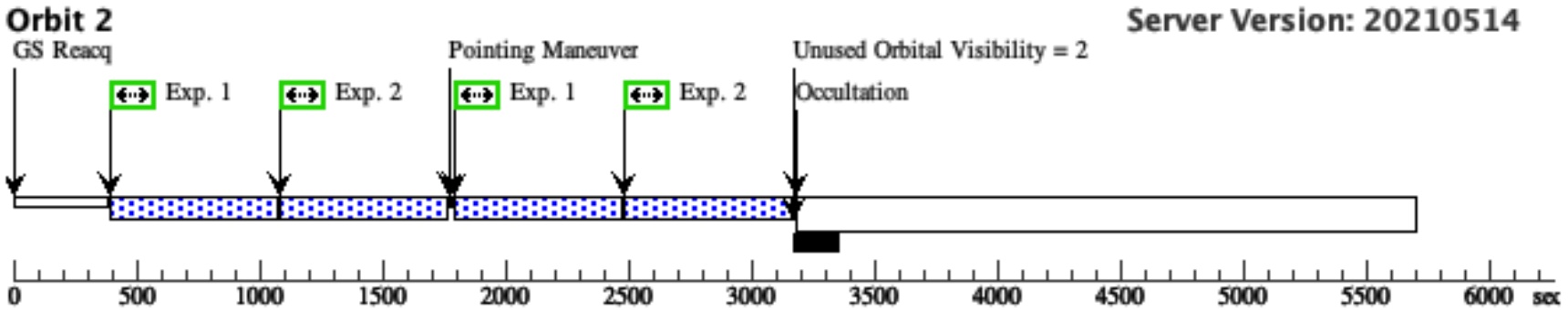
Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG -1.25,-2.13	Pattern 3, Exps 1-2 in Grid_Point_2-1 (02) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG -1.25,-2.13	Pattern 3, Exps 1-2 in Grid_Point_2-1 (02) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16645, Grid_Point_3-1 (03) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

Fixed Targets

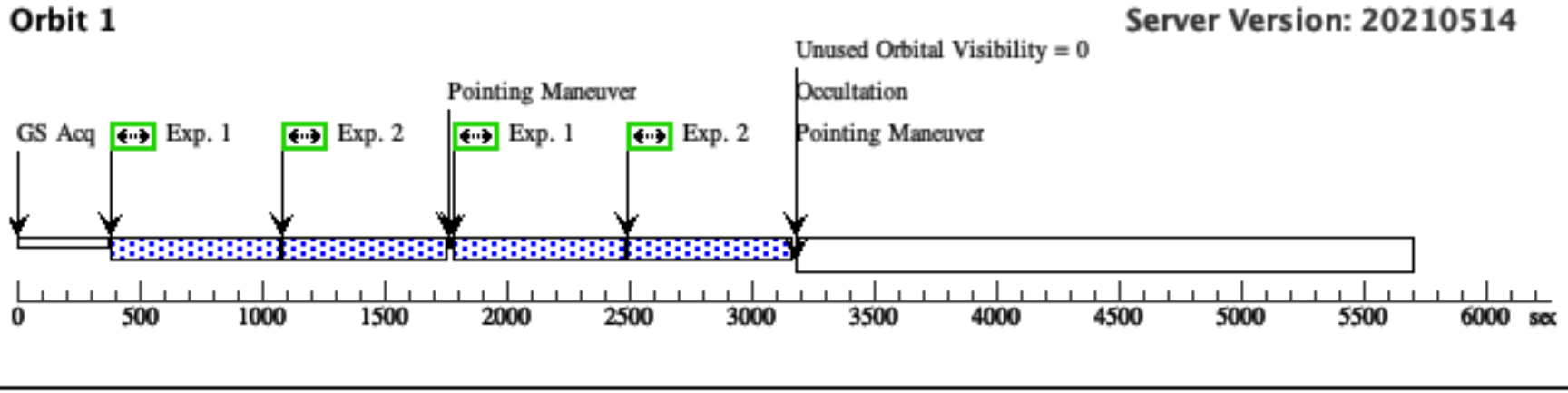
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

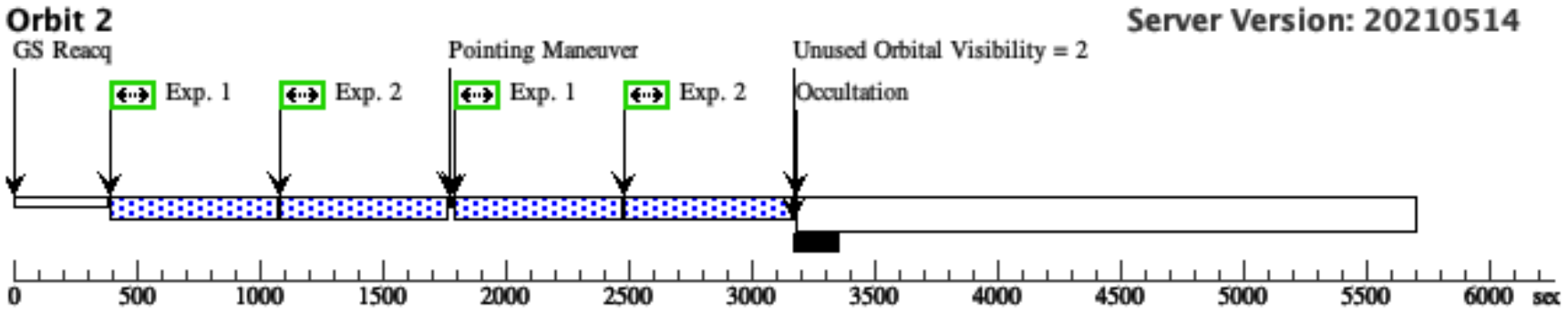
Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 1.25,2.13	Pattern 3, Exps 1-2 in Grid_Point_3-1 (03) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG 1.25,2.13	Pattern 3, Exps 1-2 in Grid_Point_3-1 (03) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16645, Grid_Point_4-1 (04) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

Fixed Targets

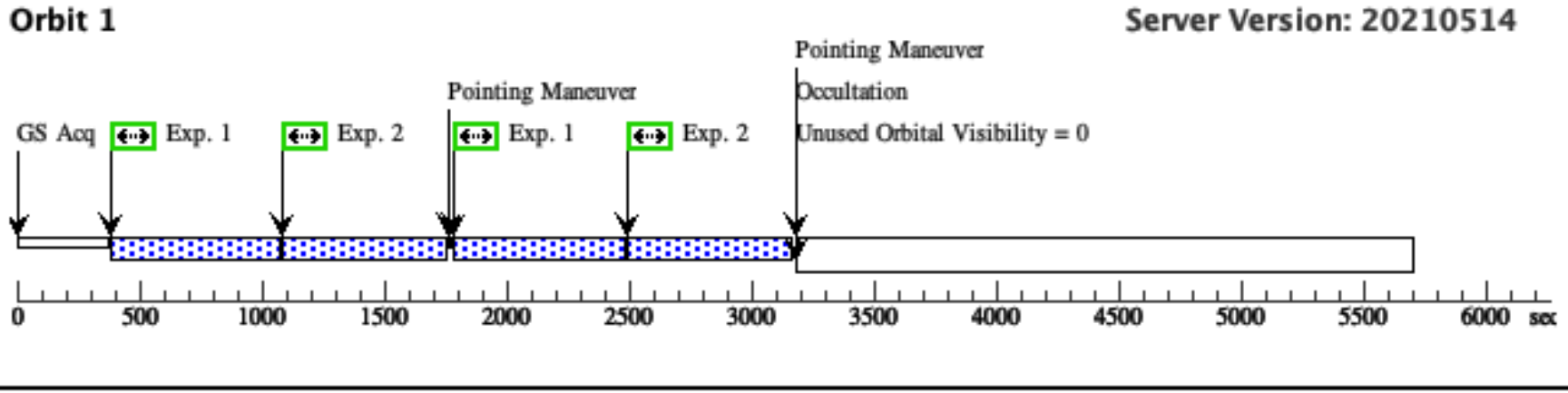
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

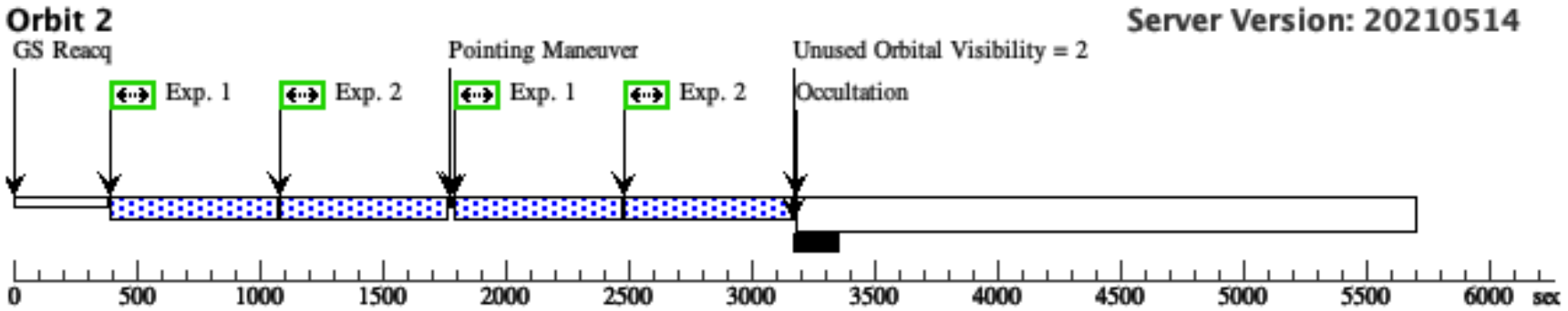
Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG -3.74,+0.30	Pattern 3, Exps 1-2 in Grid_Point_4-1 (04) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG -3.74,+0.30	Pattern 3, Exps 1-2 in Grid_Point_4-1 (04) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16645, Grid_Point_5-1 (05) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

Fixed Targets

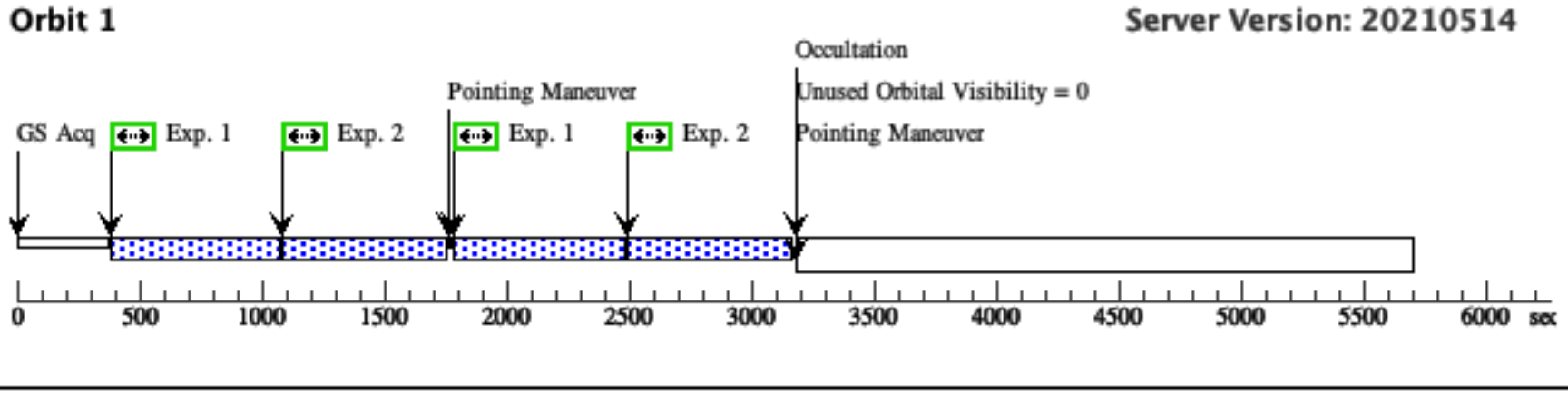
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

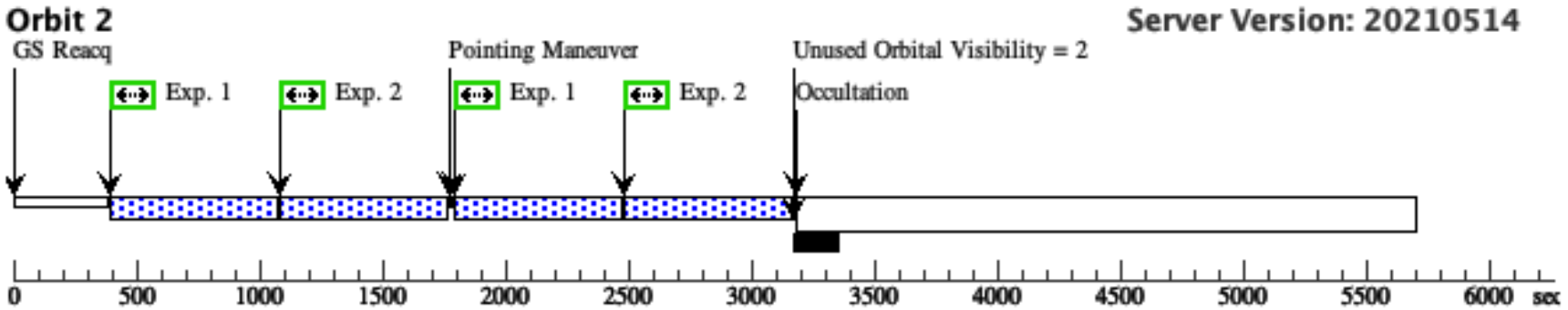
Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG +3.74,-0.30	Pattern 3, Exps 1-2 in Grid_Point_5-1 (05) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG +3.74,-0.30	Pattern 3, Exps 1-2 in Grid_Point_5-1 (05) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16645, Grid_Point_6-1 (06) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

Fixed Targets

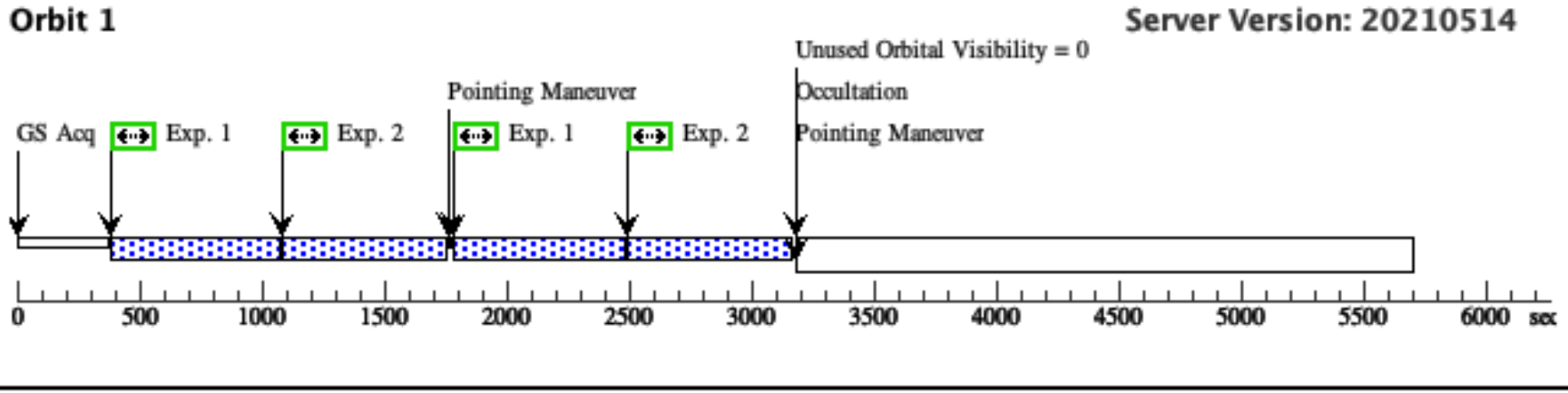
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

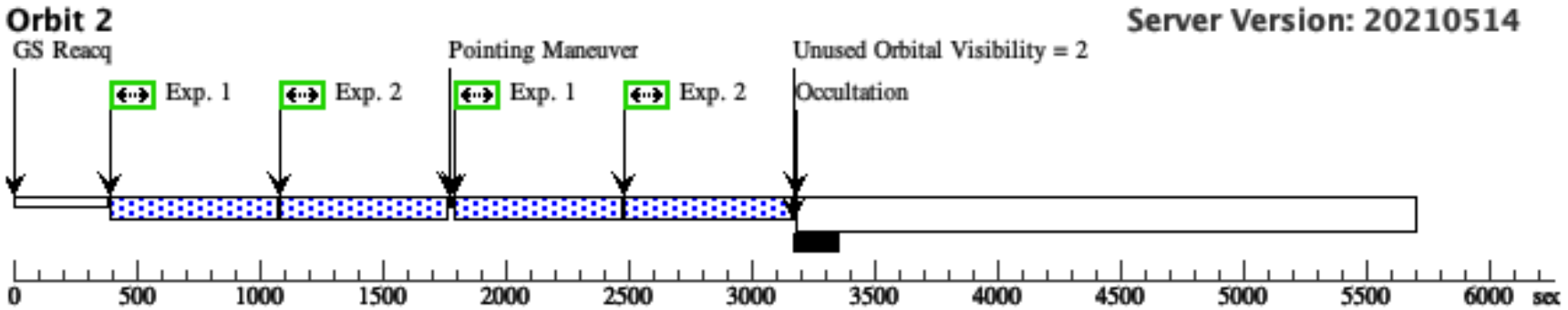
Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG -2.49,-0.91	Pattern 3, Exps 1-2 in Grid_Point_6-1 (06) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG -2.49,-0.91	Pattern 3, Exps 1-2 in Grid_Point_6-1 (06) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16645, Grid_Point_7-1 (07) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

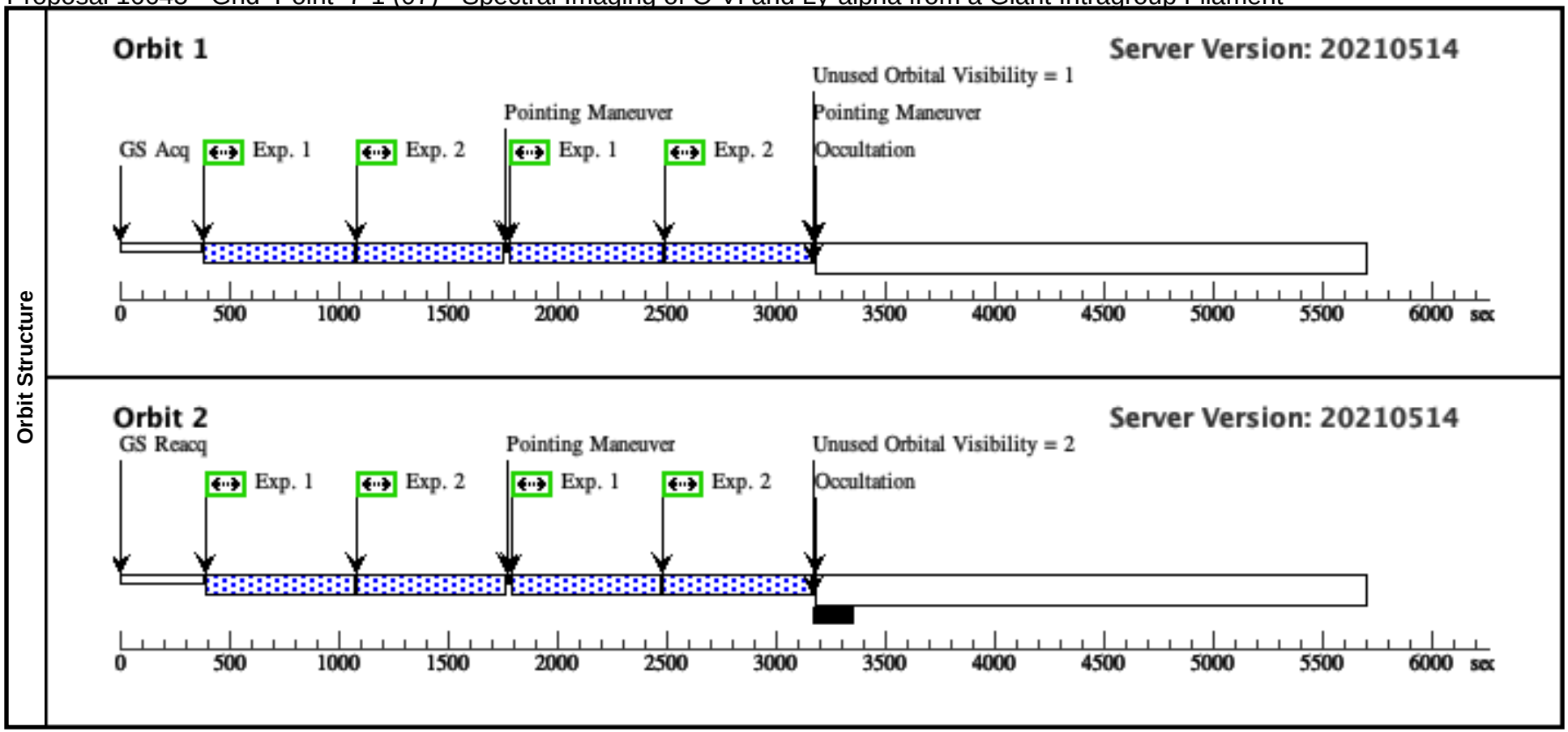
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG +2.49,+0.91	Pattern 3, Exps 1-2 in Grid_Point_7-1 (07) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 2.490,0.91	Pattern 3, Exps 1-2 in Grid_Point_7-1 (07) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Unused Orbital Visibility = 1
Pointing Maneuver
Pointing Maneuver
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16645, Grid_Point_8-1 (08) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

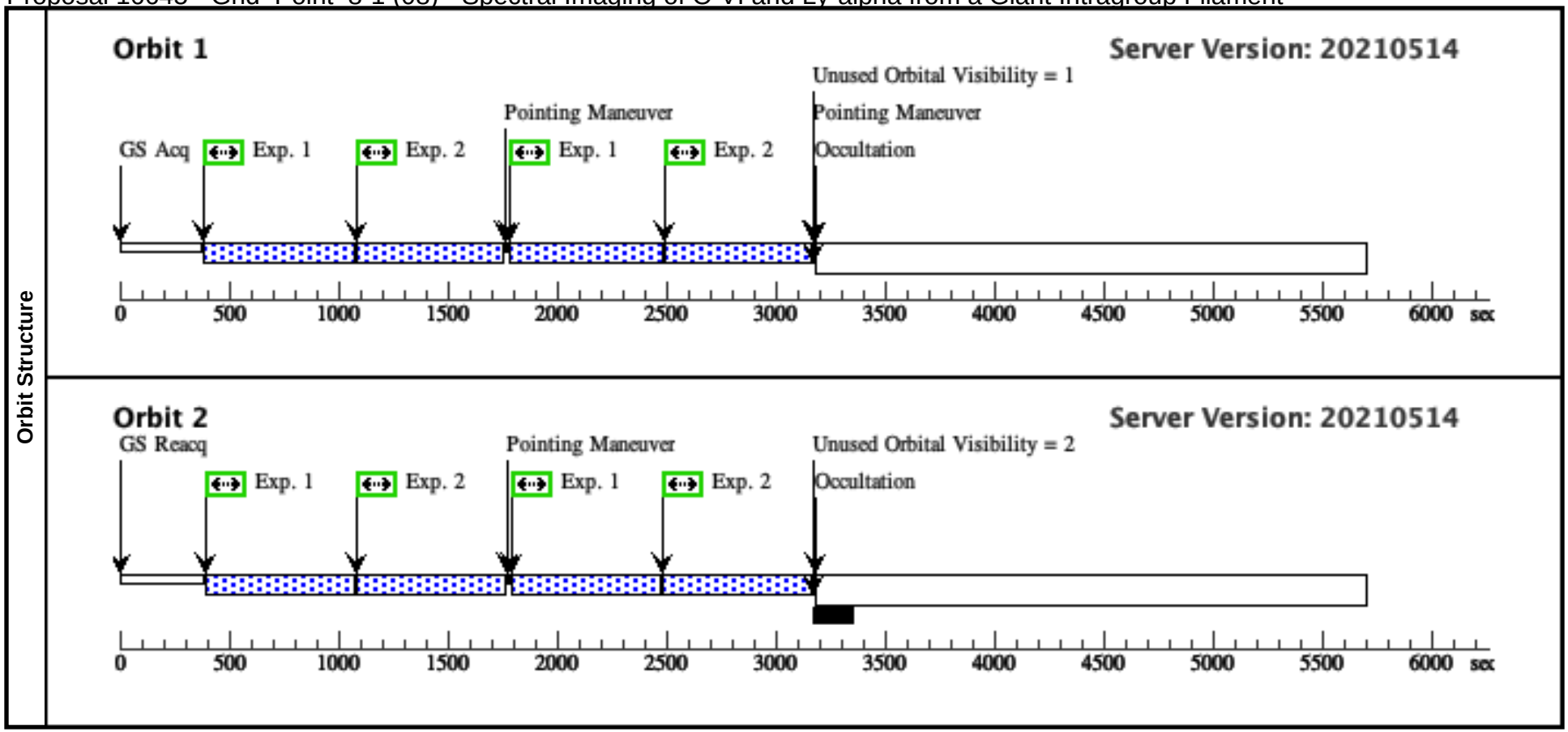
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG +1.25,-1.22	Pattern 3, Exps 1-2 in Grid_Point_8-1 (08) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG +1.25,-1.22	Pattern 3, Exps 1-2 in Grid_Point_8-1 (08) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Unused Orbital Visibility = 1
Pointing Maneuver
Pointing Maneuver
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16645, Grid_Point_9-1 (09) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

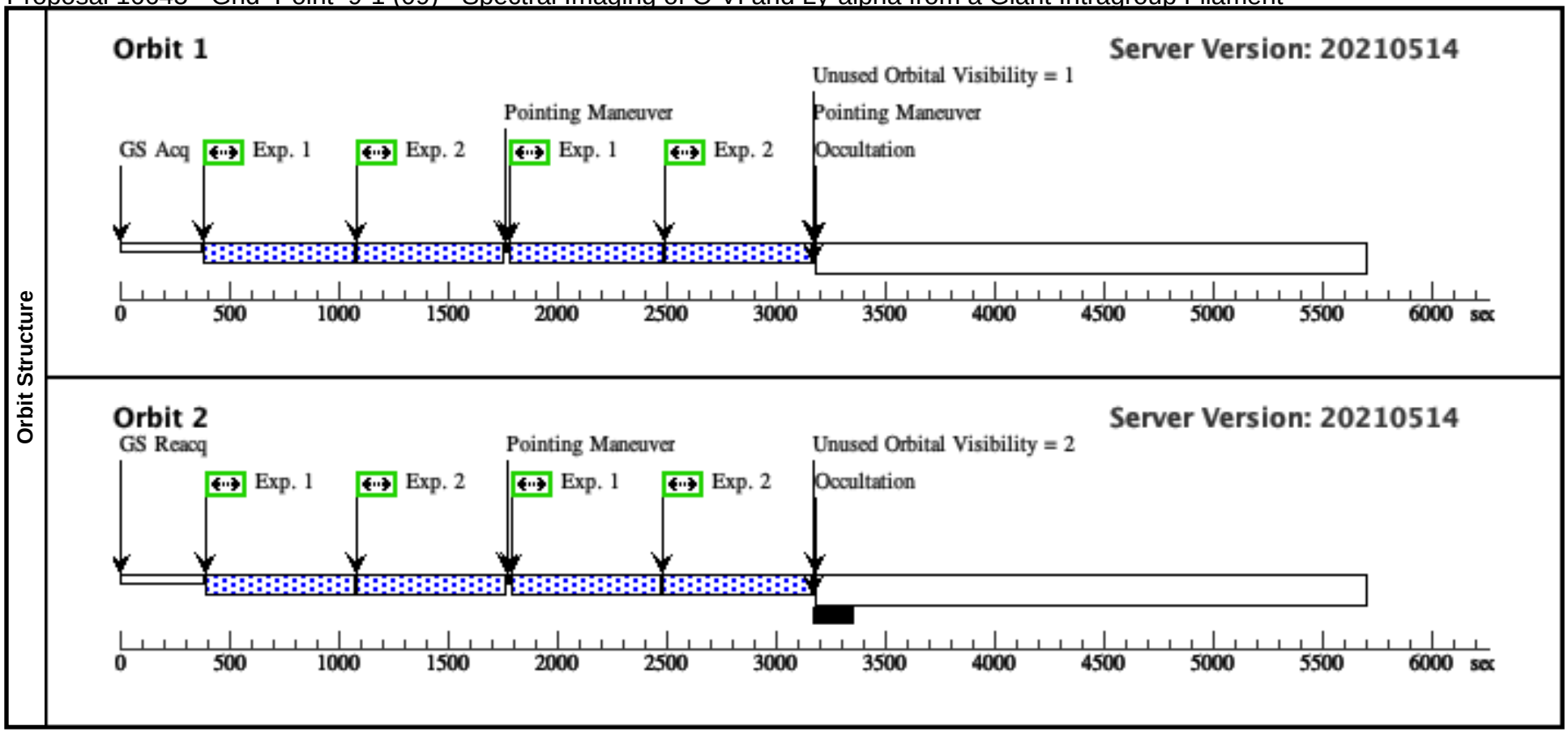
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG -1.25,+1.22	Pattern 3, Exps 1-2 in Grid_Point_9-1 (09) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG -1.25,+1.22	Pattern 3, Exps 1-2 in Grid_Point_9-1 (09) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Unused Orbital Visibility = 1
Pointing Maneuver
Pointing Maneuver
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16645, Grid_Point_1-2 (10) Tue Jul 27 19:00:42 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

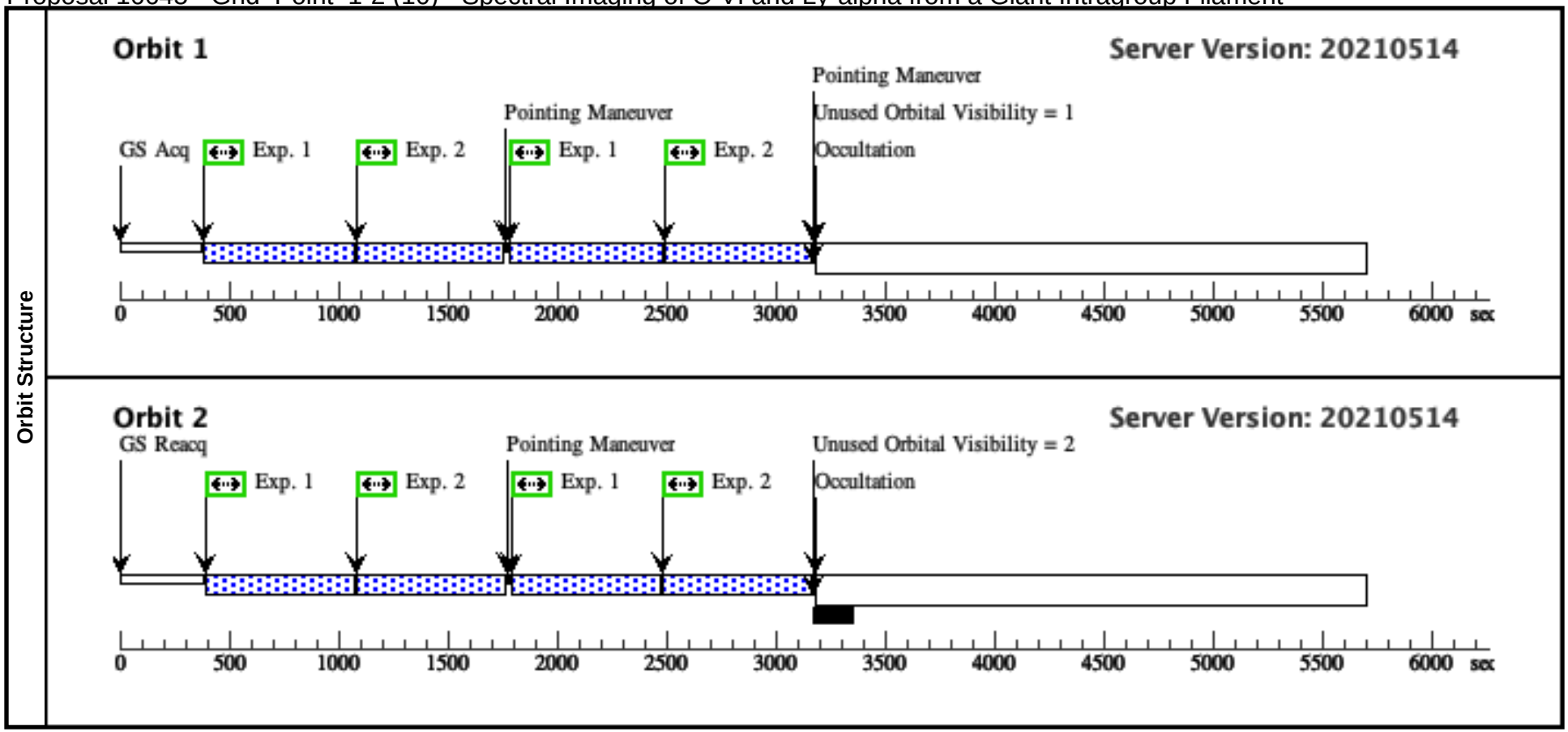
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG 0,0	Pattern 3, Exps 1-2 in Grid_Point_1-2 (10) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 0,0	Pattern 3, Exps 1-2 in Grid_Point_1-2 (10) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Pointing Maneuver
Pointing Maneuver
Unused Orbital Visibility = 1
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16645, Grid_Point_2-2 (11) Tue Jul 27 19:00:43 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

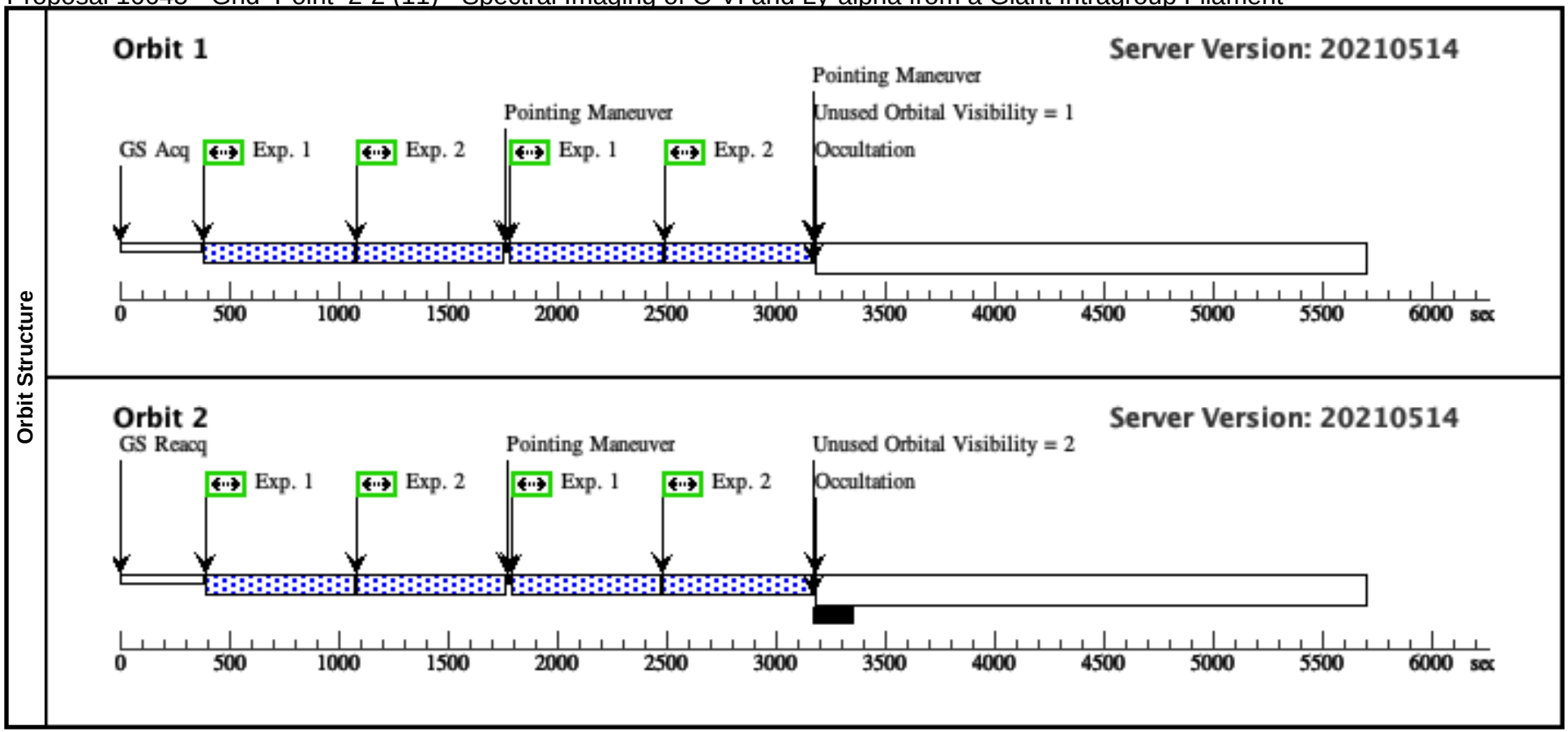
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG -1.25,-2.13	Pattern 3, Exps 1-2 in Grid_Point_2-2 (11) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG -1.25,-2.13	Pattern 3, Exps 1-2 in Grid_Point_2-2 (11) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Pointing Maneuver
Pointing Maneuver
Unused Orbital Visibility = 1
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16645, Grid_Point_3-2 (12) Tue Jul 27 19:00:43 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Comments: To minimize the dark current, please schedule after the SBC has been switched off for 24 hours. Similarly, consecutive visits should be spaced by at least 24 hours, with the SBC switched off in between.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=BOX	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=20.151333		
	Number Of Points=4	Angle Between Sides=64.478514		
	Point Spacing=0.894773	Center Pattern=false		
	Line Spacing=0.587116			

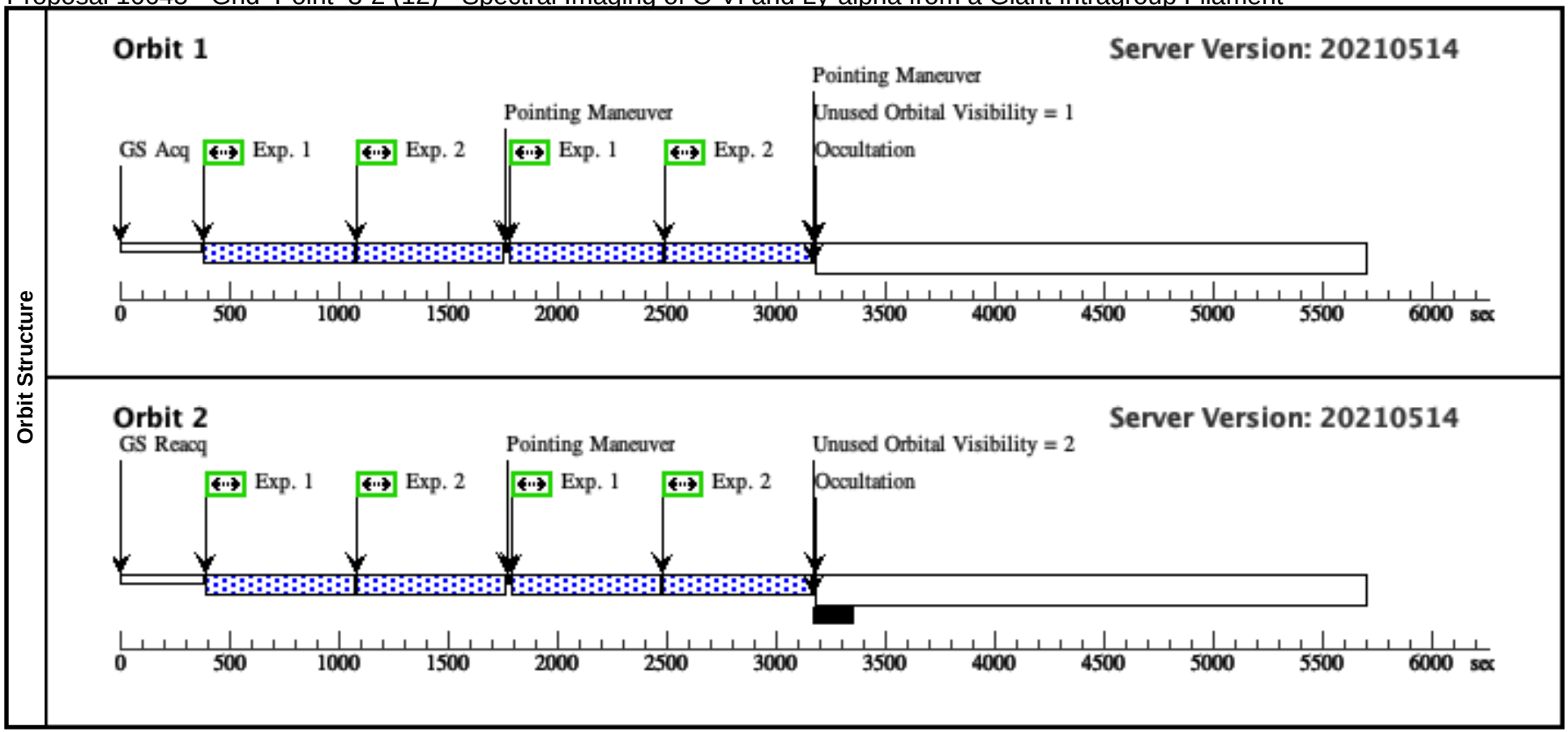
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	QSO-J1619+3342-FILAMENT	RA: 16 19 16.8000 (244.8200000d) Dec: +33 42 40.20 (33.71117d) Equinox: J2000	Proper Motion RA: 7.613544036777437E-6 sec of time/yr Proper Motion Dec: -4.8999959290085826E-5 arcsec/yr Epoch of Position: 2015.5	V=17.26	Reference Frame: SIMBAD

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[EMISSION LINE NEBULA, LYMAN ALPHA CLOUD, QSO]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.1527026)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F150LP		POS TARG +1.25,+2.13	Pattern 3, Exps 1-2 in Grid_Point_3-2 (12) (3)	620 Secs (2526 Secs)	
								[==>(Pattern 1)] *[==>648.0 Secs (Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***
2	(ACS.im.1527024)	(2) QSO-J1619+3342-FILAMENT	ACS/SBC, ACCUM, SBC	F165LP		POS TARG +1.25,+2.13	Pattern 3, Exps 1-2 in Grid_Point_3-2 (12) (3)	620 Secs (2498 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>629.0 Secs (Pattern 3)] *[==>629.0 Secs (Pattern 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20210514
Pointing Maneuver
Pointing Maneuver
Unused Orbital Visibility = 1
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 2
Server Version: 20210514
GS Reacq
Pointing Maneuver
Unused Orbital Visibility = 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec