16733 - Mapping the escape of Ly alpha and ionizing photons from an extreme emission-line lensed galaxy

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	(1) SDSSJ1723+3411	WFC3/UVIS	2	07-Jan-2022 17:00:37.0	yes
02	(1) SDSSJ1723+3411	WFC3/UVIS	3	07-Jan-2022 17:00:37.0	yes
03	(1) SDSSJ1723+3411	WFC3/UVIS	2	07-Jan-2022 17:00:38.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(1) SDSSJ1723+3411	WFC3/UVIS	3	07-Jan-2022 17:00:39.0	yes

10 Total Orbits Used

ABSTRACT

We propose 10 orbits of HST WFC3-UVIS G280 slitless grism spectroscopy of S1723, an extremely bright gravitationally lensed galaxy at redshift z=1.3293. The proposed observations will spatially map Lyman alpha, escaping ionizing radiation, and the non-ionizing UV spectral slope, on spatial scales never before obtained for an extreme emission line galaxy. Combining this new spectrum with a published HST-WFC3 G141 grism of Ha will produce maps of Lya escape fraction and ionizing photon escape fraction, to reveal how Lyman alpha and ionizing photons are able to escape. This target has the extremely strong rest-frame UV and optical emission lines that are a hallmark of galaxies at the epoch of reionization (z~7--8), but due to lensing magnification, can be studied at very high spatial resolution. The target has a wealth of published data including HST multiband imaging, a lens model, and MMT, Keck, Gemini, and HST spectra, and is an approved target for JWST imaging and spectroscopy with NIRCam, NIRSpec, and MIRI, with all data to go public as they are observed.

OBSERVING DESCRIPTION

This is 10 orbits of WFC3/UVIS grism spectroscopy, using the G280 grism, with just enough direct imaging in F300X to do the wavelength calibration.

We adapted the observing strategy from the similar program GO 15966. We split the 10 orbits into 3 visits (3 orbits, 3 orbits, 4 orbits) to improve schedulability.

As noted in Phase 1, we request an ORIENT special requirement to avoid bright contaminating sources, especially the brightest cluster galaxy, and to place the arc as perpedicular as possible to the dispersion direction (to minimize the extent to which the arc contaminates itself). We find that there is one unique ORIENT, as well as its +180 degree sister, that satisfies these contamination issues. We chose this ORIENT using Aladin.

As suggested by our Instrument Scientist, we use a postflash to set a minimum UVIS image total background of ~20 electrons/pix (actually 19.9).

Visit

Proposal 16733, S1723-rollA-1 (01), implementation Fri Jan 07 22:00:39 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 129D TO 129 D

Fixed Targets

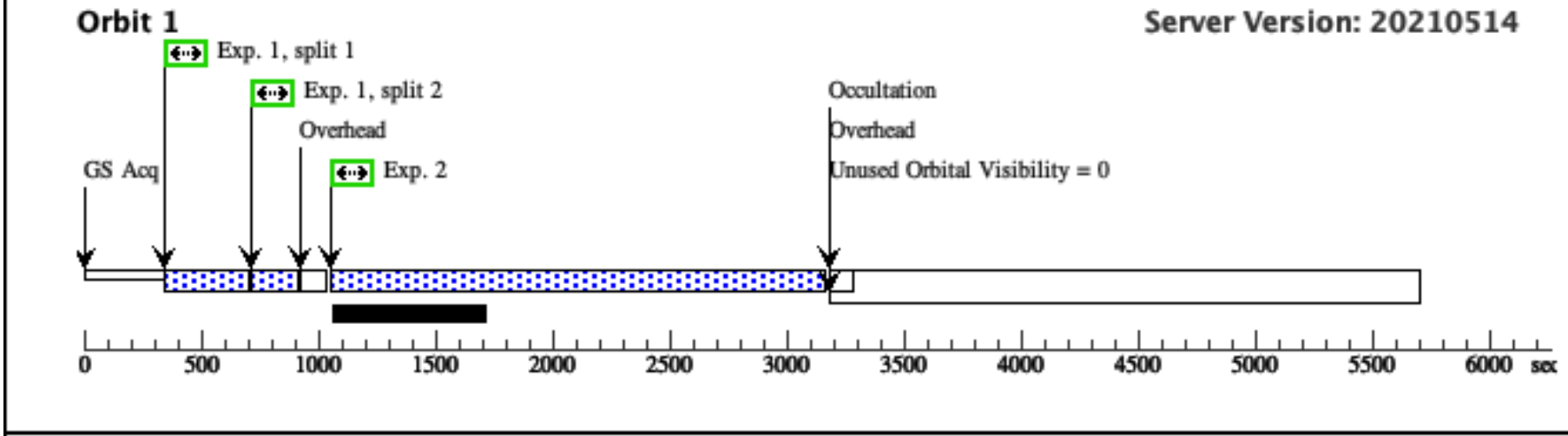
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SDSSJ1723+3411	RA: 17 23 36.4060 (260.9016917d) Dec: +34 11 54.69 (34.19852d) Equinox: J2000		V=20.5+/-0.1 From Florian et al. 2021: m_(1.6um)=20.1, m(1.4um)=20.2, m(1.1um)=20.2, m(1.05um)=19.9, m(0.775um)=20.5, m(0.390um)=20.6. All AB mags	Reference Frame: ICRS

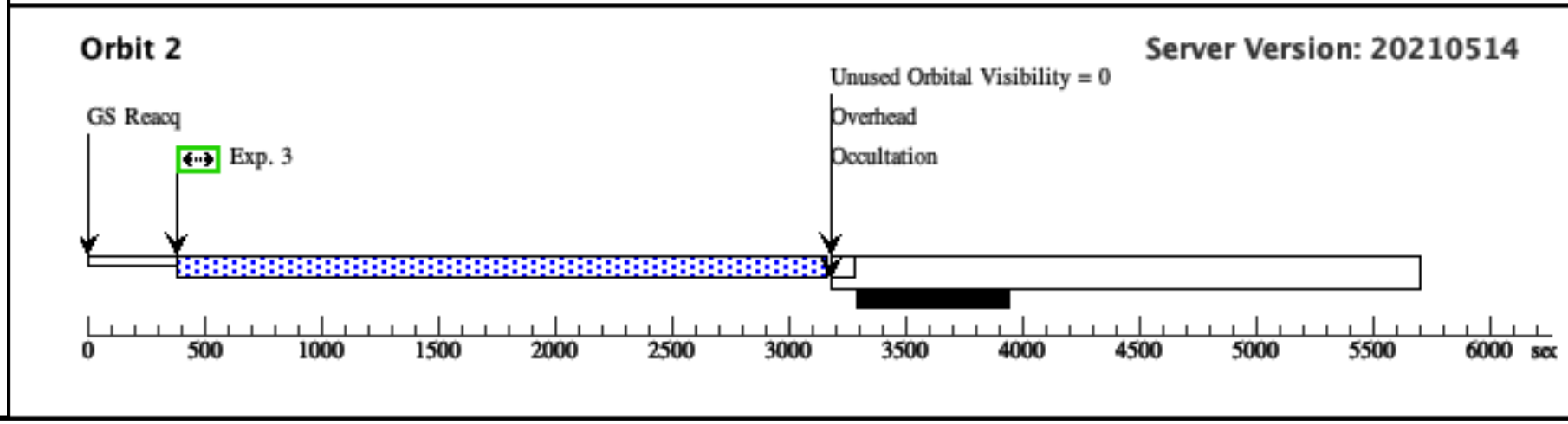
Comments:
Category=GALAXY
Description=[EMISSION LINE NEBULA, GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STAR FORMING REGION]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Undispersed (WFC3UVIS.im.1365826)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=19; CR-SPLIT=2	POS TARG null,-50		400 Secs (400 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		2105 Secs (2105 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		2780 Secs (2780 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16733, S1723-rollA-2 (02), implementation Fri Jan 07 22:00:39 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 129D TO 129 D

Fixed Targets

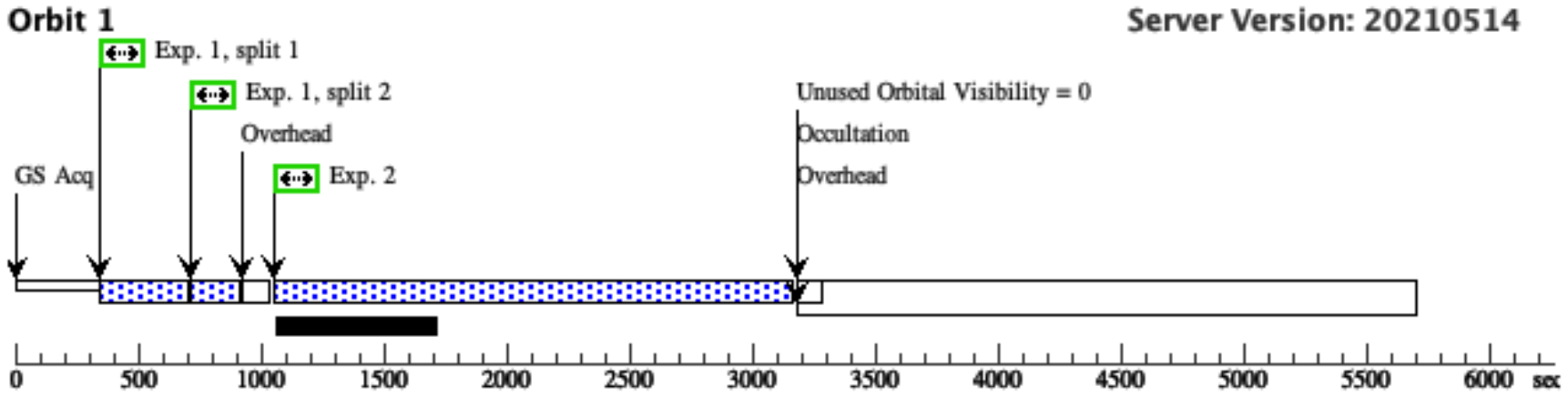
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SDSSJ1723+3411	RA: 17 23 36.4060 (260.9016917d) Dec: +34 11 54.69 (34.19852d) Equinox: J2000		V=20.5+/-0.1 From Florian et al. 2021: m_(1.6um)=20.1, m(1.4um)=20.2, m(1.1um)=20.2, m(1.05um)=19.9, m(0.775um)=20.5, m(0.390um)=20.6. All AB mags	Reference Frame: ICRS

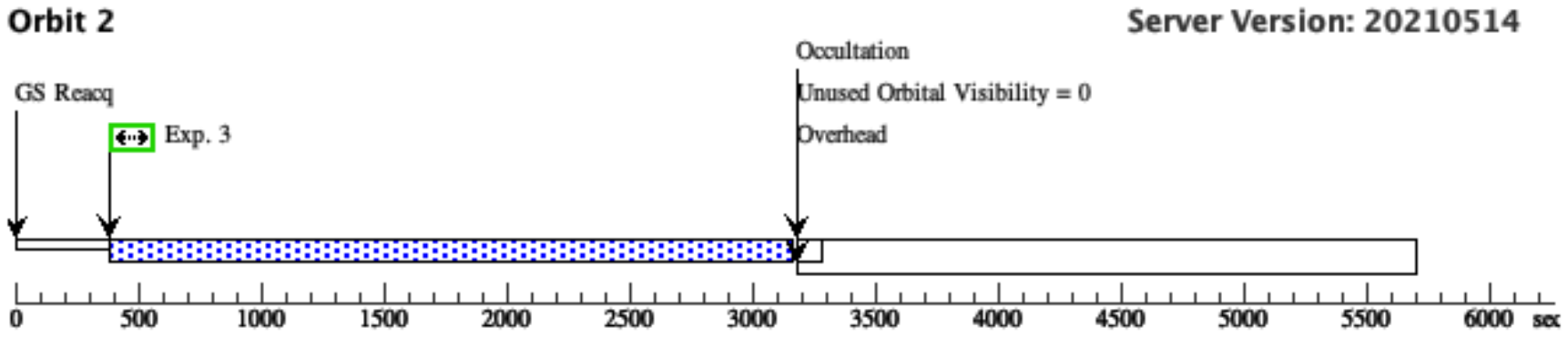
Comments:
Category=GALAXY
Description=[EMISSION LINE NEBULA, GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STAR FORMING REGION]

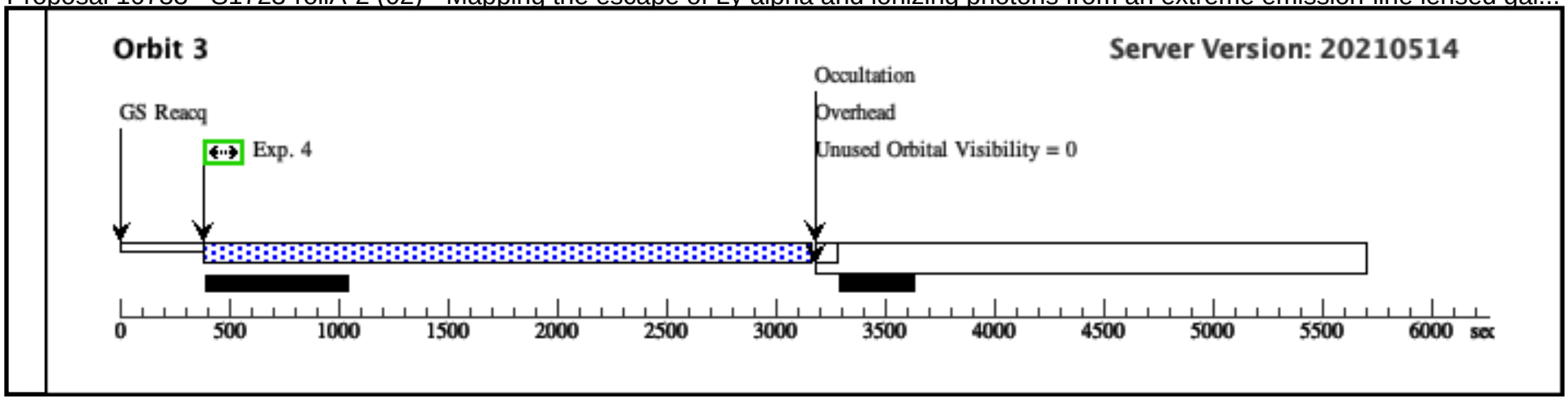
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Undispersed (WFC3UVIS.im.1365826)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=19; CR-SPLIT=2	POS TARG -0.092,-50.098		400 Secs (400 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.092,-50.098		2105 Secs (2105 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.092,-50.098		2780 Secs (2780 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.092,-50.098		2780 Secs (2780 Secs) *[==>]*	***[3]***

Orbit Structure



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5500
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sec

Visit

Proposal 16733, S1723-rollB-1 (03), implementation Fri Jan 07 22:00:39 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 309D TO 309 D

Fixed Targets

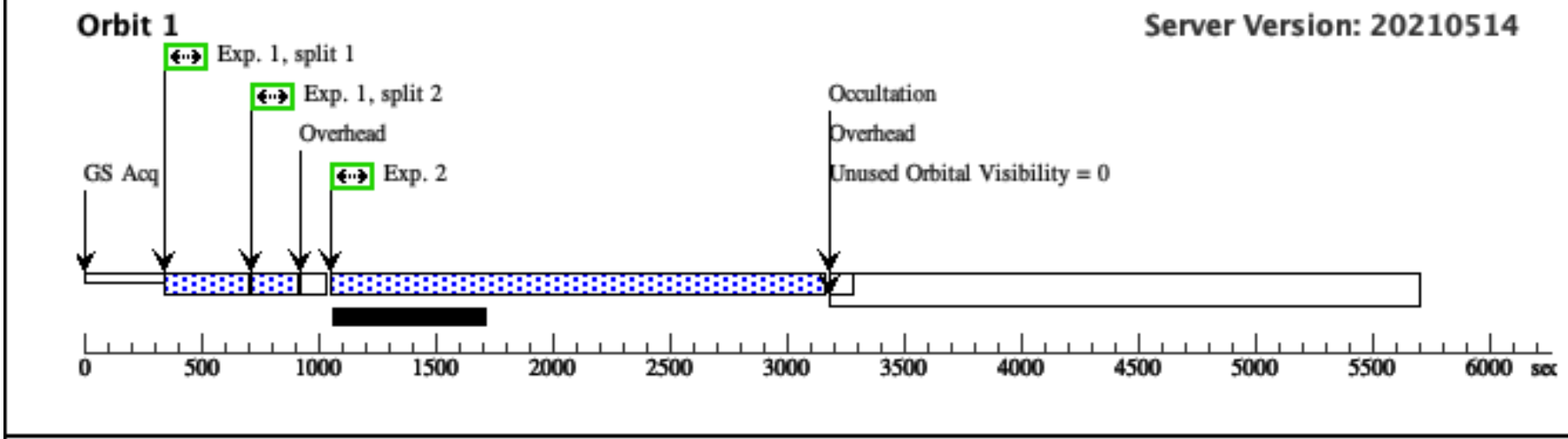
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SDSSJ1723+3411	RA: 17 23 36.4060 (260.9016917d) Dec: +34 11 54.69 (34.19852d) Equinox: J2000		V=20.5+/-0.1 From Florian et al. 2021: m_(1.6um)=20.1, m(1.4um)=20.2, m(1.1um)=20.2, m(1.05um)=19.9, m(0.775um)=20.5, m(0.390um)=20.6. All AB mags	Reference Frame: ICRS

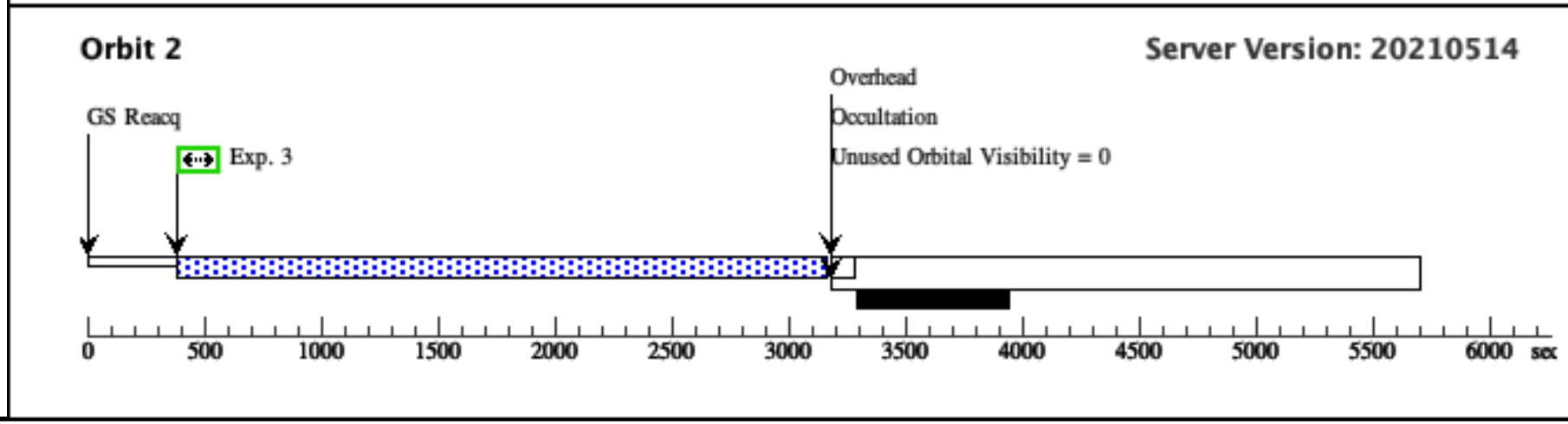
Comments:
Category=GALAXY
Description=[EMISSION LINE NEBULA, GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STAR FORMING REGION]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Undispersed (WFC3UVIS.im.1365826)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=19; CR-SPLIT=2	POS TARG null,-50		400 Secs (400 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		2105 Secs (2105 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		2780 Secs (2780 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16733, S1723-rollB-2 (04) Fri Jan 07 22:00:39 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 309D TO 309 D

Fixed Targets

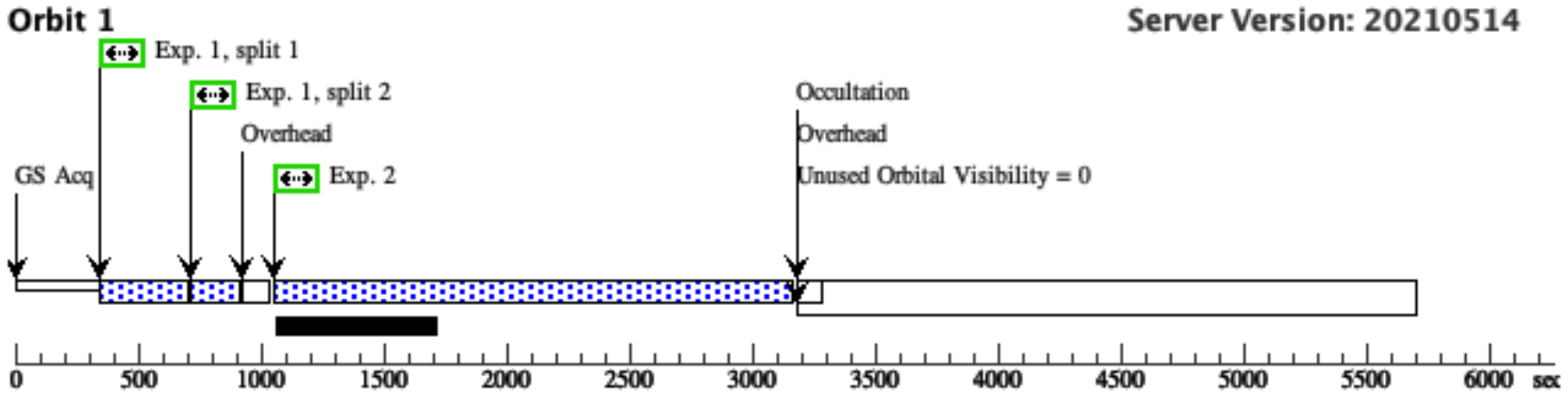
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SDSSJ1723+3411	RA: 17 23 36.4060 (260.9016917d) Dec: +34 11 54.69 (34.19852d) Equinox: J2000		V=20.5+/-0.1 From Florian et al. 2021: m_(1.6um)=20.1, m(1.4um)=20.2, m(1.1um)=20.2, m(1.05um)=19.9, m(0.775um)=20.5, m(0.390um)=20.6. All AB mags	Reference Frame: ICRS

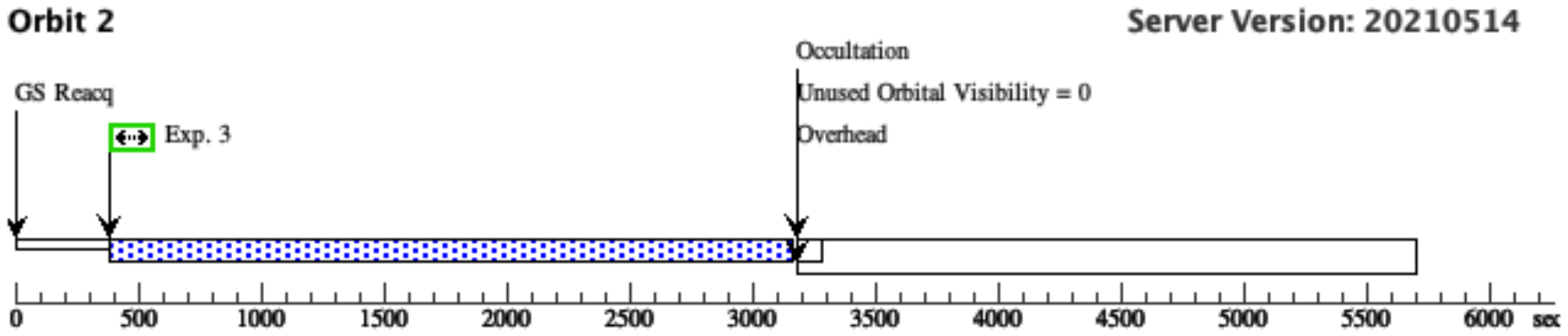
Comments:
Category=GALAXY
Description=[EMISSION LINE NEBULA, GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STAR FORMING REGION]

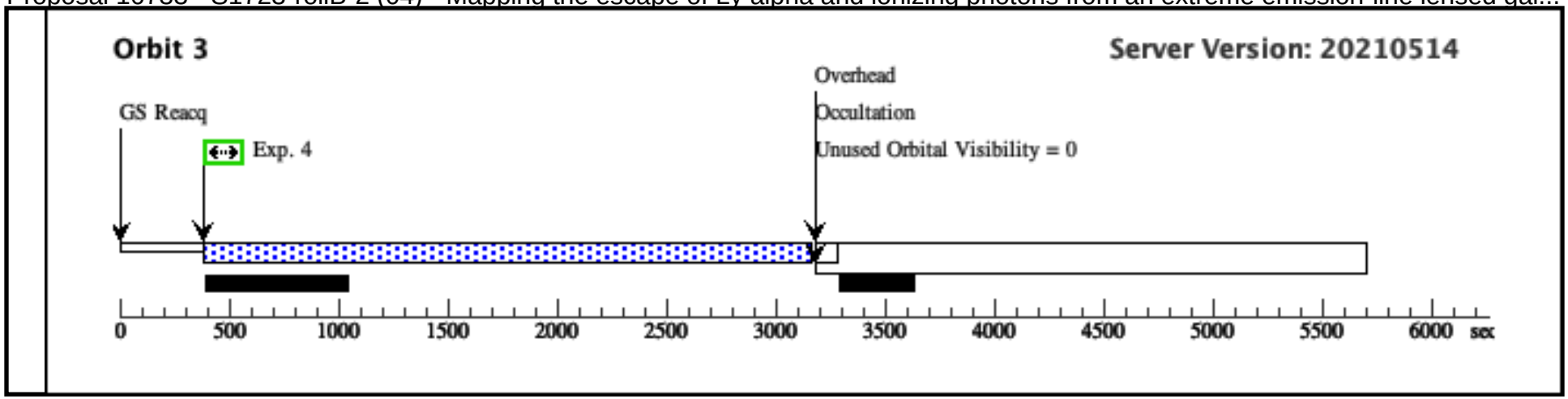
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Undispersed (WFC3UVIS.im.1365826)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=19; CR-SPLIT=2	POS TARG -0.092,-50.098		400 Secs (400 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.092,-50.098		2105 Secs (2105 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.092,-50.098		2780 Secs (2780 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SDSSJ1723+3411	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.092,-50.098		2780 Secs (2780 Secs) *[==>]*	***[3]***

Orbit Structure



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