15966 - What lurks below the Lyman-Limit? Uncovering the unseen ionizing continuum of massive stars

Cycle: 27, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. John Chisholm (PI) (Contact)	**University of Texas at Austin**	**chisholm@austin.utexas.edu**
Dr. Jane R. Rigby (CoI)	NASA Goddard Space Flight Center	jane.r.rigby@nasa.gov
Dr. Jason X. Prochaska (CoI)	University of California - Santa Cruz	xavier@ucolick.org
Dr. Haakon Dahle (CoI) (ESA Member)	University of Oslo	hdahle@astro.uio.no
Dr. T. Emil Rivera-Thorsen (CoI) (ESA Member)	Stockholm University	trive@astro.su.se
Dr. Matthew Bayliss (CoI)	University of Cincinnati Main Campus	mbbayliss@gmail.com
Dr. Claus Leitherer (CoI)	Space Telescope Science Institute	leitherer@stsci.edu
Dr. J. J. Eldridge (CoI)	The University of Auckland	j.eldridge@auckland.ac.nz
Prof. Michael D. Gladders (CoI)	University of Chicago	gladders@oddjob.uchicago.edu
Prof. Anne Verhamme (CoI) (ESA Member)	University of Geneva, Department of Astronomy	anne.verhamme@unige.ch
Prof. Keren Sharon (CoI)	University of Michigan	kerens@umich.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SUNBURST-ARC	WFC3/UVIS	5	05-Oct-2021 13:00:16.0	yes
02	(1) SUNBURST-ARC	WFC3/UVIS	5	05-Oct-2021 13:00:18.0	yes
03	(1) SUNBURST-ARC	WFC3/UVIS	5	05-Oct-2021 13:00:19.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(1) SUNBURST-ARC	WFC3/UVIS	5	05-Oct-2021 13:00:20.0	yes
05	(1) SUNBURST-ARC	WFC3/UVIS	5	05-Oct-2021 13:00:21.0	yes
06	(1) SUNBURST-ARC	WFC3/UVIS	2	05-Oct-2021 13:00:21.0	yes
07	(1) SUNBURST-ARC	WFC3/UVIS	2	05-Oct-2021 13:00:22.0	yes

29 Total Orbits Used

ABSTRACT

It is a remarkable fact that the shape and strength of the ionizing continuum of the most massive stars has NEVER been spectroscopically mapped, at ANY redshift. Locally, the sparsity of such stars and the Hydrogen opacity precludes observations, and by the time redshift gives us access to these rest wavelengths in distant galaxies they are normally too faint, even for HST. Here we propose to acquire, for the first time, spectroscopy of the ionizing continuum in a star-forming galaxy down to a restframe of 560A (or photon energies of 24 eV) by observing THE brightest known gravitationally lensed galaxy, the Sunburst Arc. Our proposed observations - WFC3 grism spectroscopy - will directly probe the strength and spectral shape of the ionizing continuum in this galaxy. This will be the first-ever opportunity to directly compare the measured ionizing continuum against that inferred by the non-ionizing continuum and nebular emission lines. With this unprecedented observation, we will directly observe the strength and shape of the ionizing continuum, test whether the observed ionizing continuum is capable of producing the previously observed nebular emission lines, inform the next generation of theoretical models of stellar populations, and determine the impact of binary evolution on the production of ionizing photons. These observations will leave a lasting legacy for Hubble by mapping the unseen source of most extragalactic observations: the ionizing continuum of massive stars.

OBSERVING DESCRIPTION

Here we propose WFC3 UVIS G280 grism observations to obtain low-resolution spectra of the ionizing continuum from the Sunburst Arc, which as a bright gravitationally lensed redshift 2.4 galaxy.

To acheive this will break the 27 orbits up into 6 visits with a maximum of 5 orbits per visit.

We define the Sunburst-Arc RA/Dec as the coordinates of the brightest LyC emitting region and then place that region at the center of Chip 1 using

the POS TARG Y of -50 for each exposure. This is to boost the QE and flux calibration of the brightest LyC region.

Each visit will start with two undispersed 70s F300X images to set the location of the star-forming region. The proposed 140s of total integration time for the undispersed image is expected to produce a SNR of 5 for each visit. We have set the undispersed aperture of the F300X images to the G280-REF. We will use post-flash for the F300X images to achieve a background of 12e-.

We will then follow with 2700-3200s of integration using the G280 grating. We will not dither within a single visit, rather each visit follows the WFC3-UVIS-Dither-Box pattern, as outlined in the COS/WFC3 handbook.

We use previous HST IR G141 observations (HST PID: 15101) to set a strict orientation angle of 27.37. The F275W images (HST PID: 15418) suggest that the foreground cluster will be much fainter in the G280 grating than the IR G141, but we restrict the strong orientation constraints to ensure that redder wavelengths from the foreground cluster do not contaminate the traces of the Sunburst Arc.

Visit

Proposal 15966, Sunburst-LyC1 (01), completed Tue Oct 05 17:00:22 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Sunburst-LyC1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Undispersed (01.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

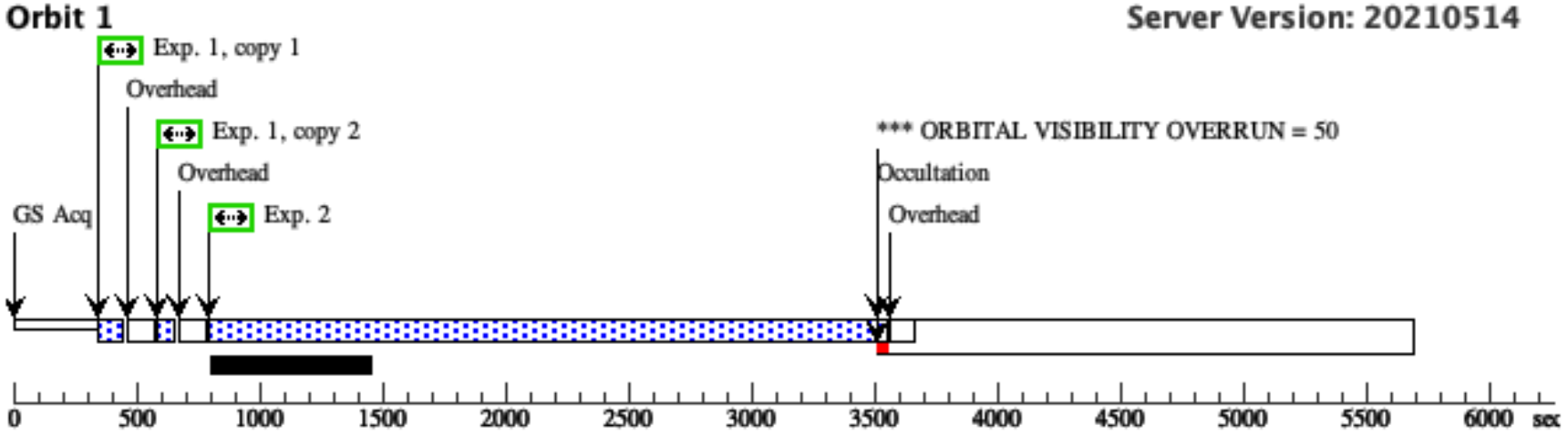
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

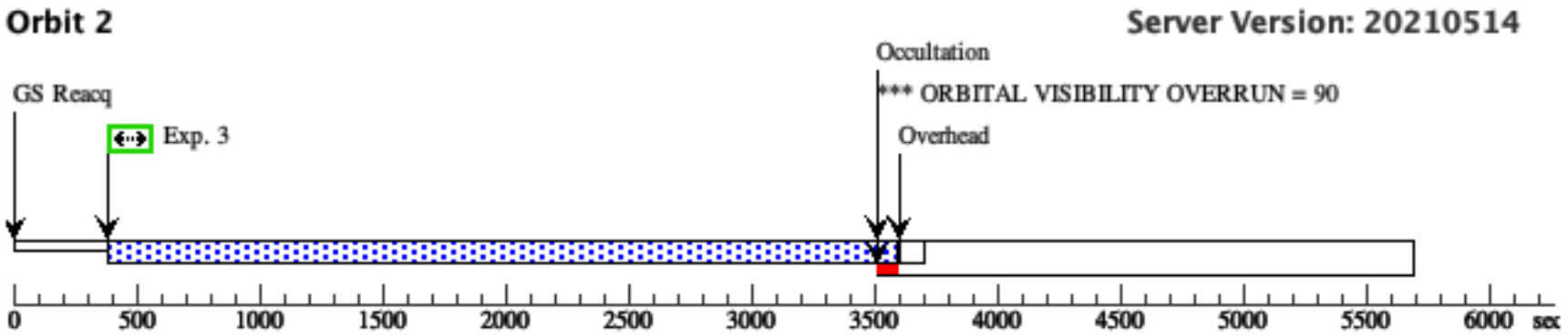
Comments:
Category=GALAXY
Description=[GRAVITATIONAL LENS, STARBURST]

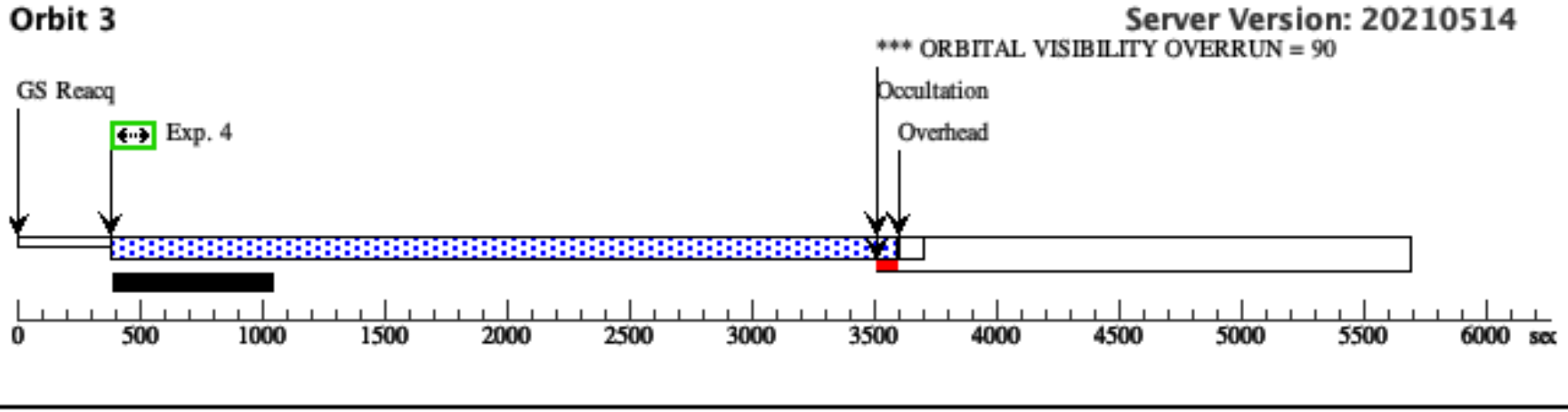
Exposures

#	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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG null,-50		70 Secs X 2 (140 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		2754 Secs (2754 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[3]***
5	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[4]***
6	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[5]***

Orbit Structure



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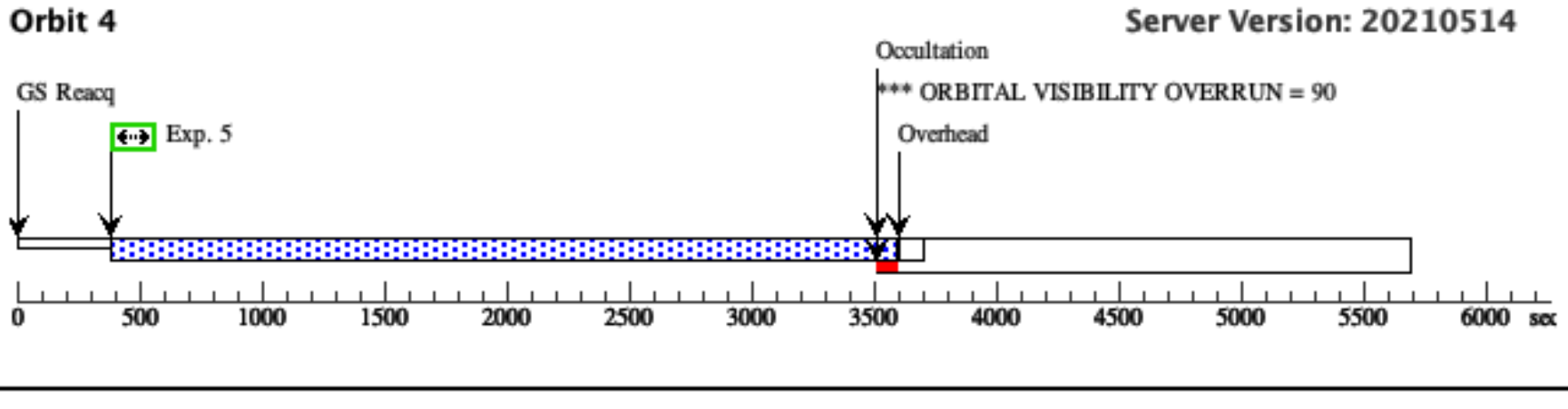
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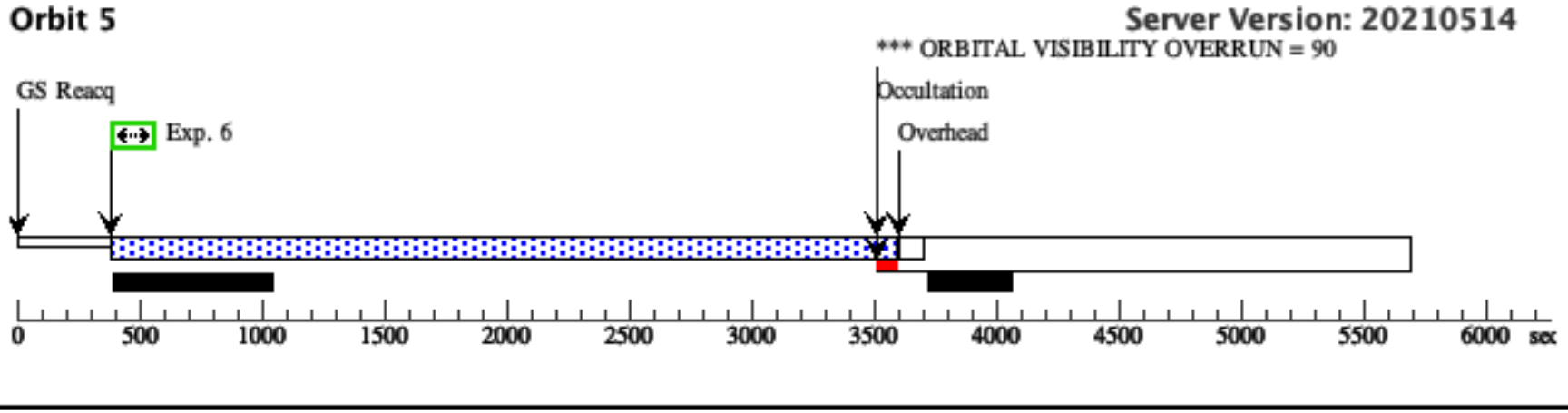
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Visit

Proposal 15966, Sunburst-LyC2 (02), completed Tue Oct 05 17:00:23 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Sunburst-LyC2 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC2 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC2 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC2 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC2 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Undispersed (02.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

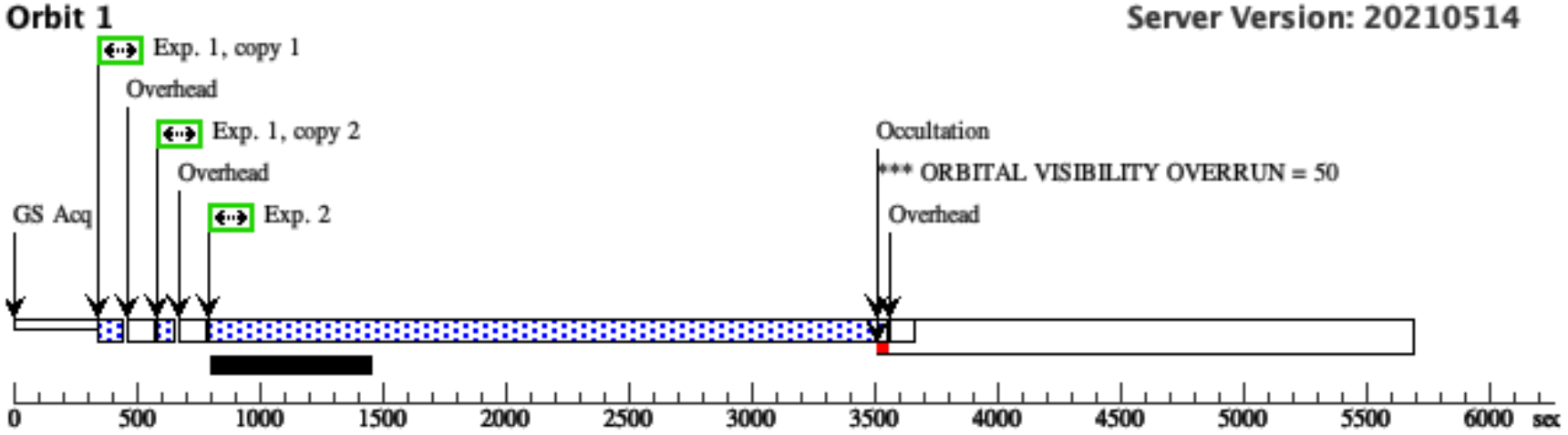
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

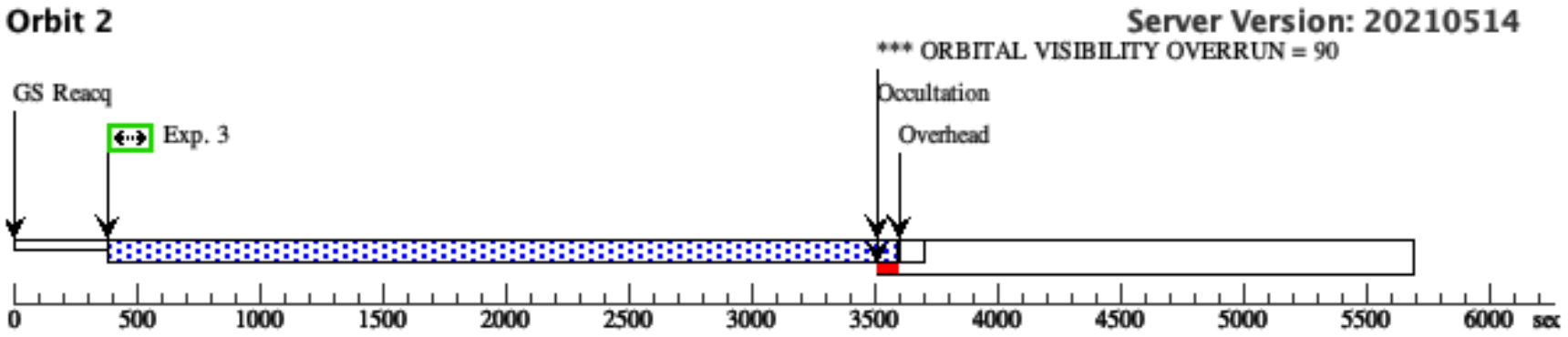
Comments:
Category=GALAXY
Description=[GRAVITATIONAL LENS, STARBURST]

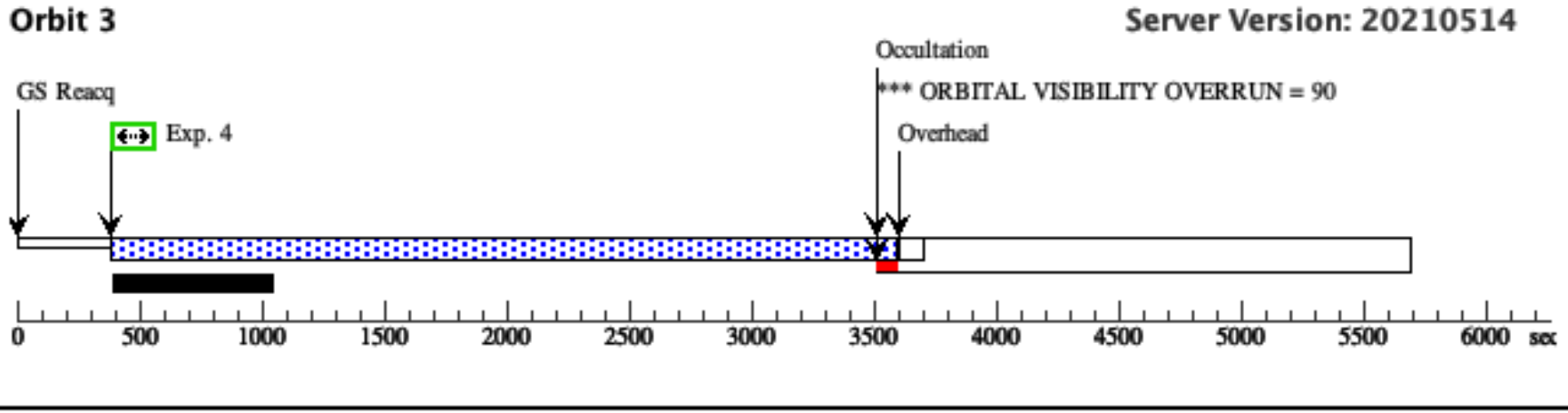
Exposures

#	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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG 0.158,-50.07		70 Secs X 2 (140 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG 0.158,-50.07		2754 Secs (2754 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG 0.158,-50.07		3209 Secs (3209 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG 0.158,-50.07		3209 Secs (3209 Secs) *[==>]*	***[3]***
5	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG 0.158,-50.07		3209 Secs (3209 Secs) *[==>]*	***[4]***
6	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG 0.158,-50.07		3209 Secs (3209 Secs) *[==>]*	***[5]***

Orbit Structure



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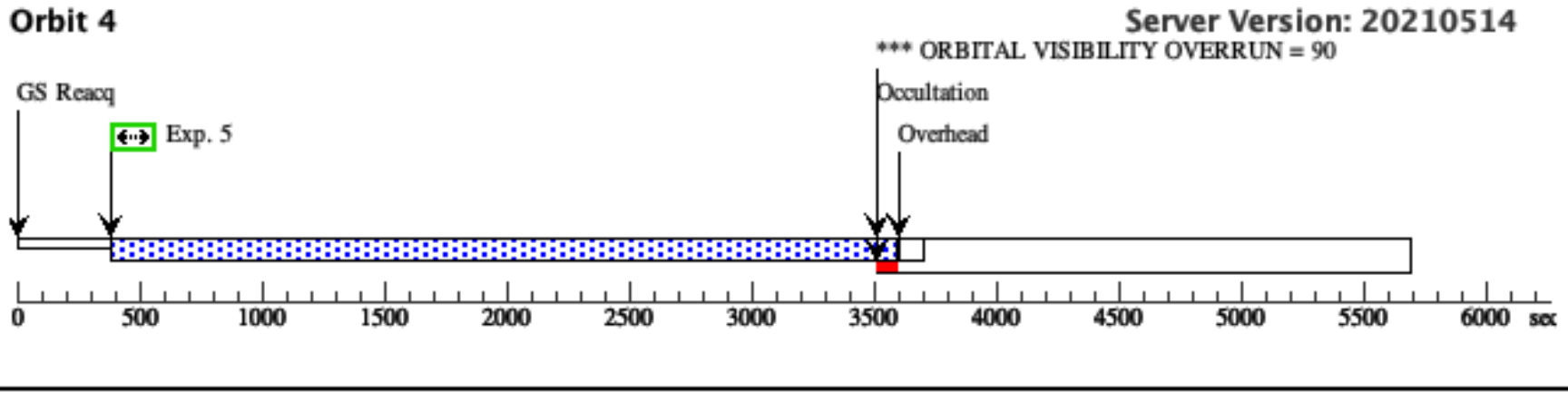
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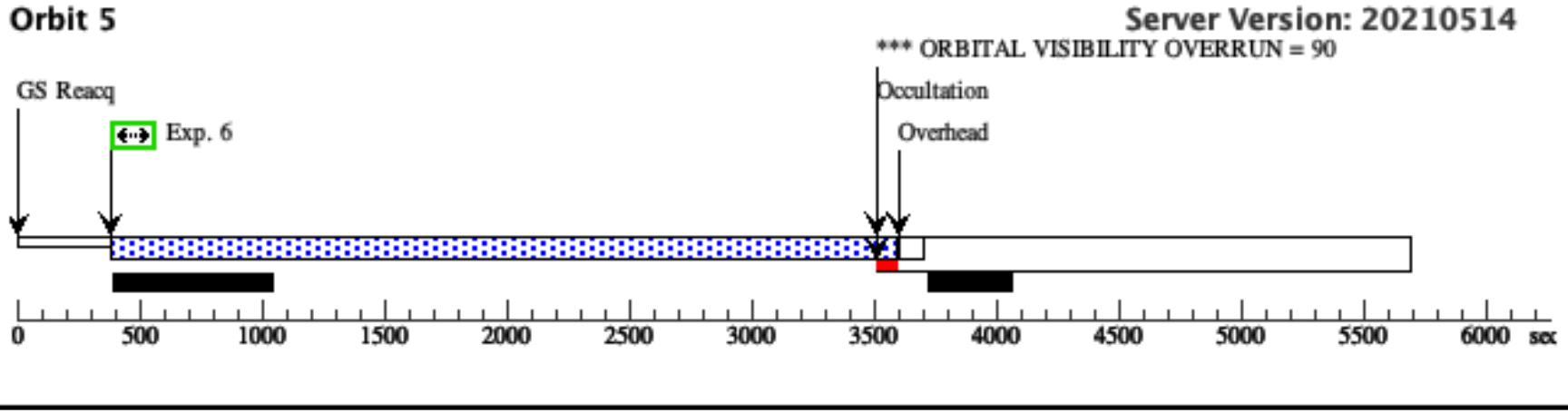
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Visit

Proposal 15966, Sunburst-LyC3 (03), failed Tue Oct 05 17:00:23 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Sunburst-LyC3 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC3 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC3 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC3 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC3 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Undispersed (03.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

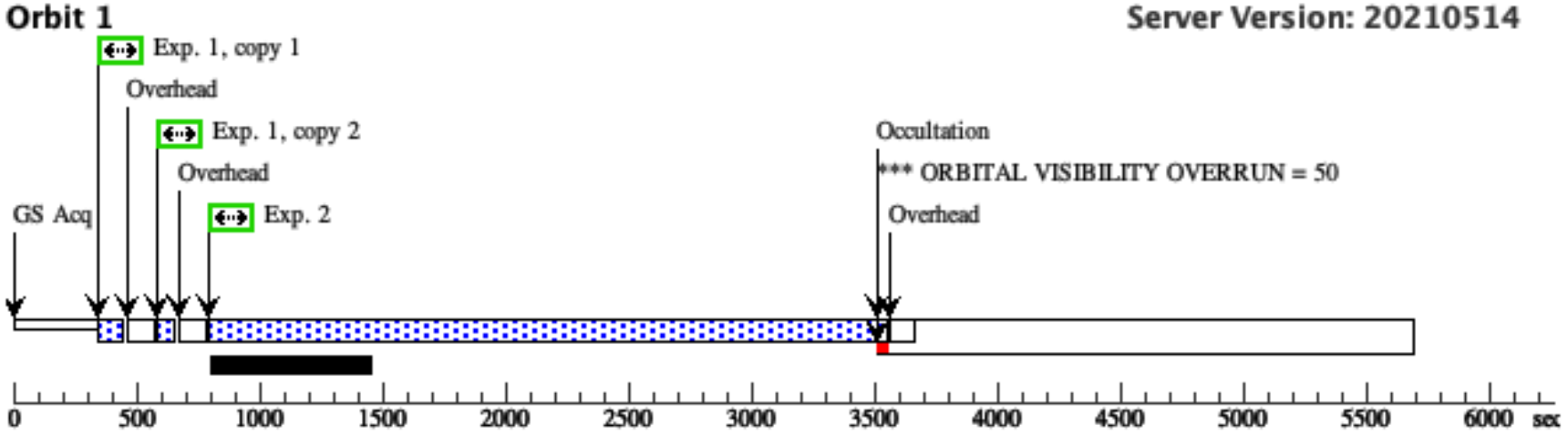
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

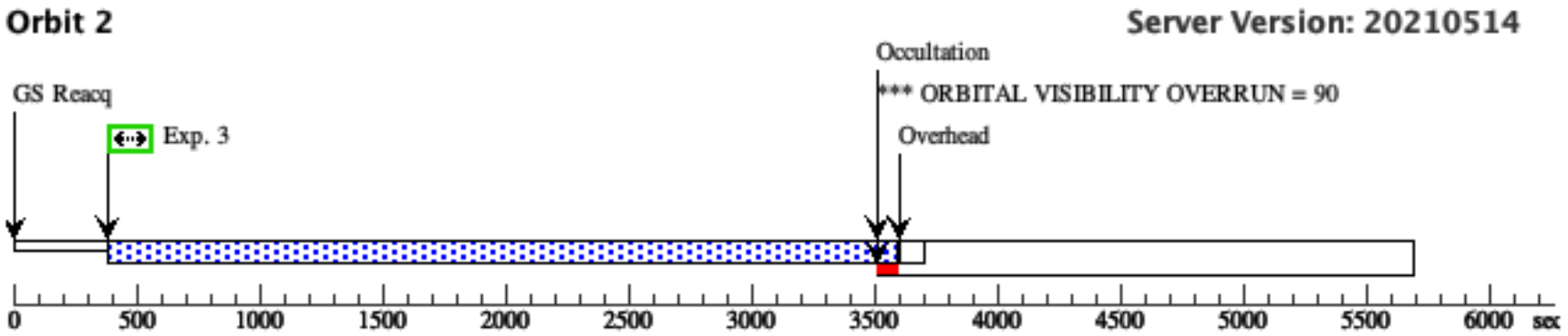
Comments:
Category=GALAXY
Description=[GRAVITATIONAL LENS, STARBURST]

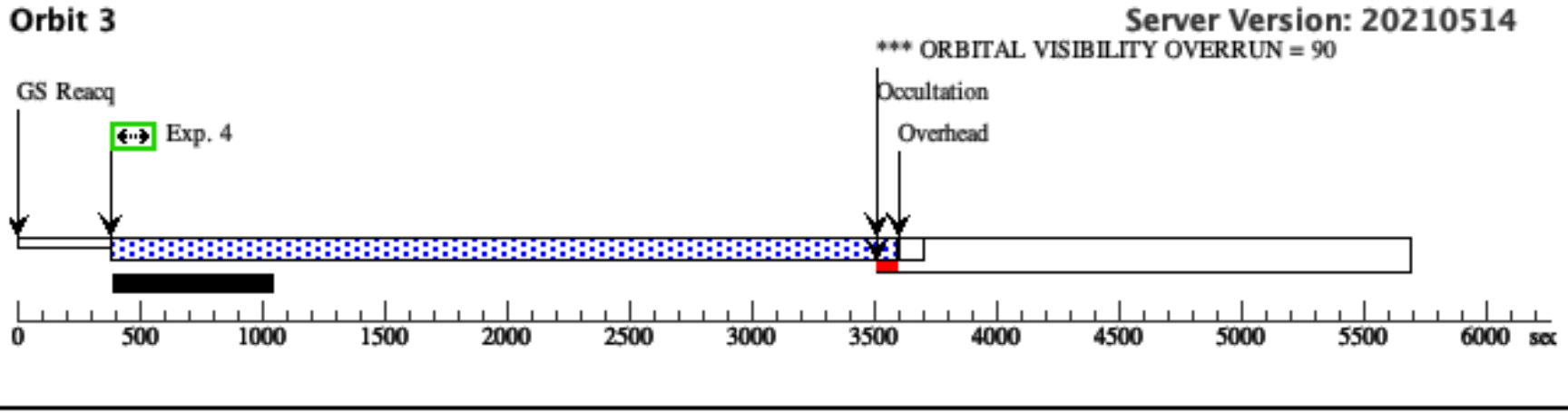
Exposures

#	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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG .099,-50 .165		70 Secs X 2 (140 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .099,-50 .165		2754 Secs (2754 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .099,-50 .165		3209 Secs (3209 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .099,-50 .165		3209 Secs (3209 Secs) *[==>]*	***[3]***
5	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .099,-50 .165		3209 Secs (3209 Secs) *[==>]*	***[4]***
6	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .099,-50 .165		3209 Secs (3209 Secs) *[==>]*	***[5]***

Orbit Structure



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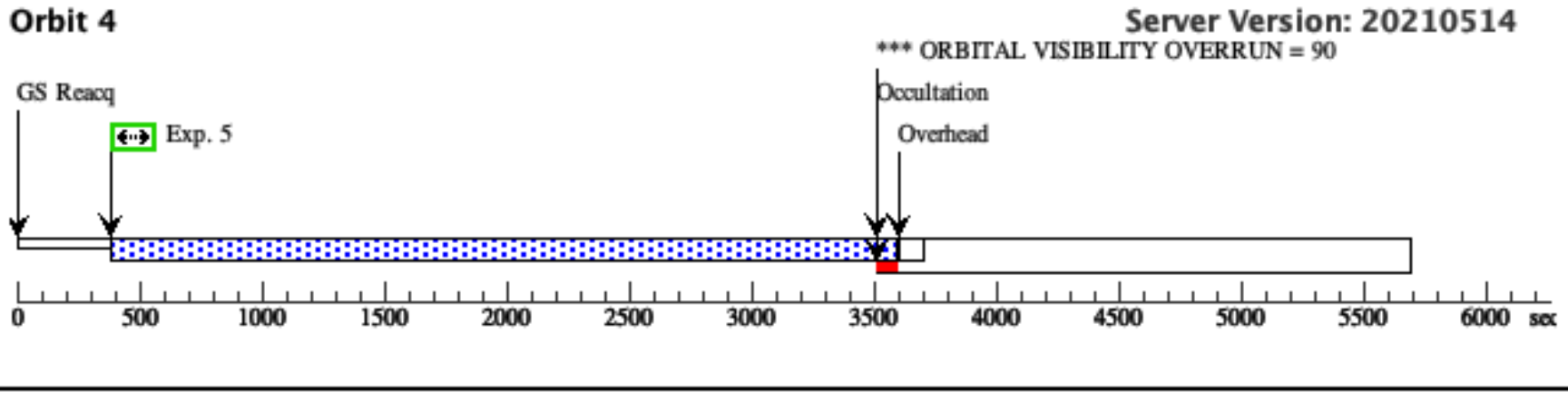
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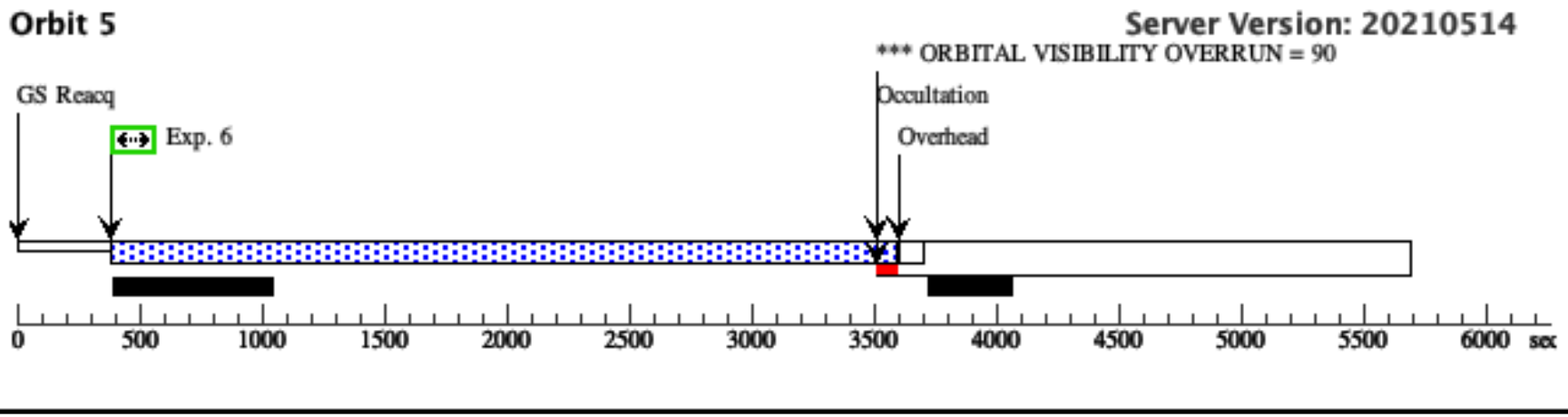
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Visit

Proposal 15966, Sunburst-LyC4 (04), completed Tue Oct 05 17:00:23 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Sunburst-LyC4 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC4 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC4 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC4 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC4 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Undispersed (04.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

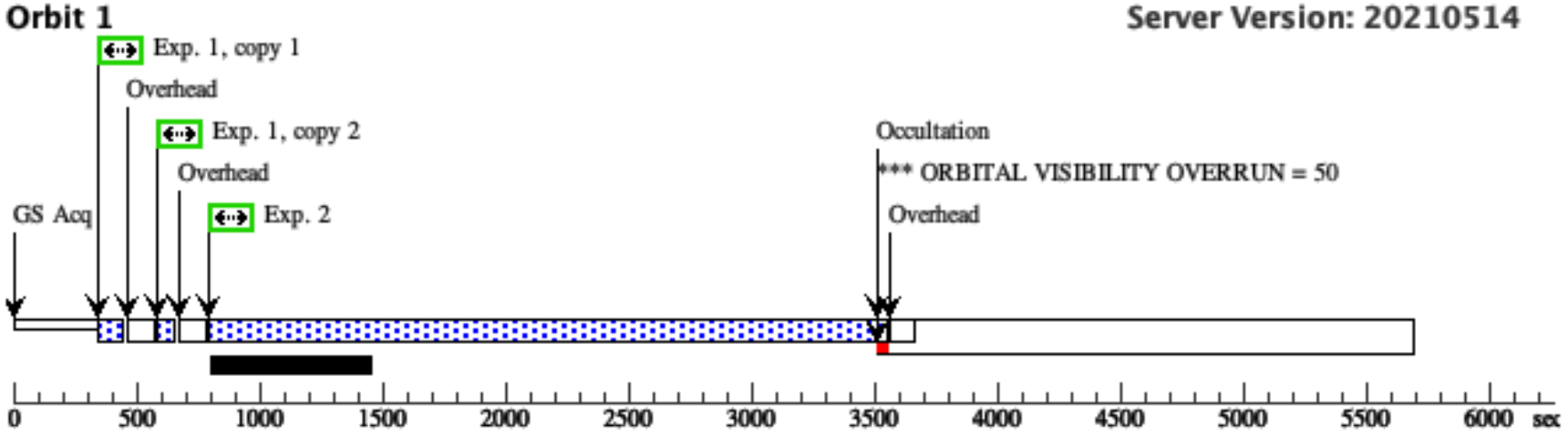
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

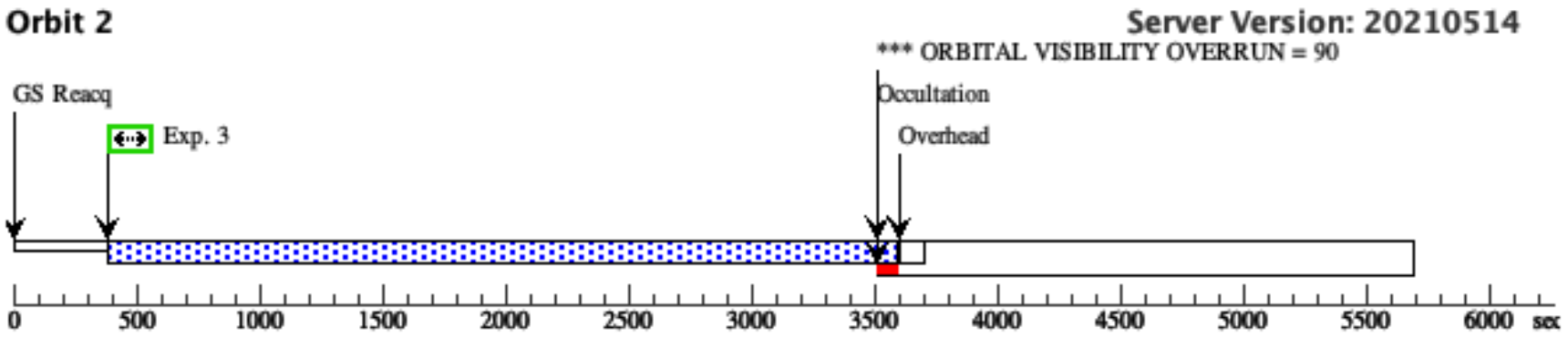
Comments:
Category=GALAXY
Description=[GRAVITATIONAL LENS, STARBURST]

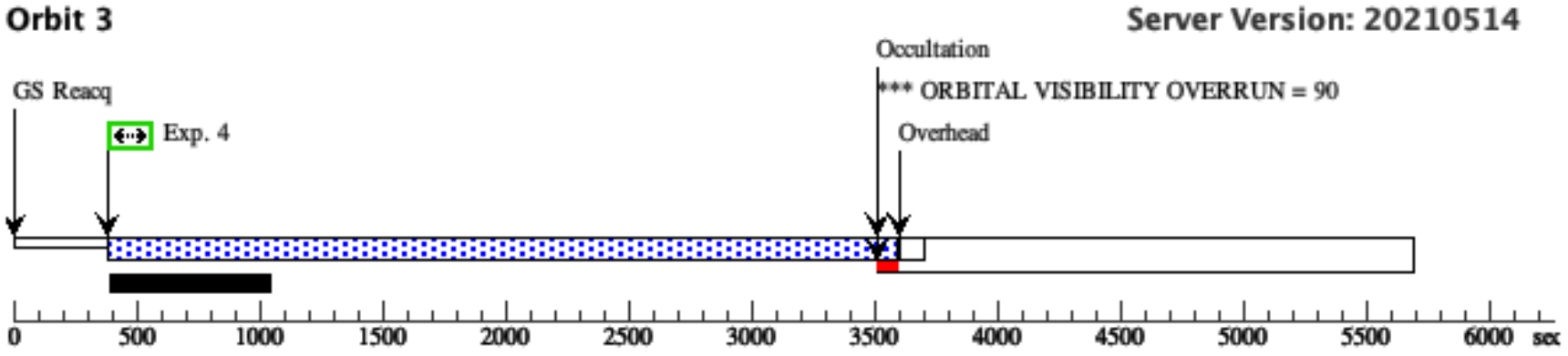
Exposures

#	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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG -.06,-50.095		70 Secs X 2 (140 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -.06,-50.095		2754 Secs (2754 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -.06,-50.095		3209 Secs (3209 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -.06,-50.095		3209 Secs (3209 Secs) *[==>]*	***[3]***
5	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.06,-50.095		3209 Secs (3209 Secs) *[==>]*	***[4]***
6	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG -0.06,-50.095		3209 Secs (3209 Secs) *[==>]*	***[5]***

Orbit Structure



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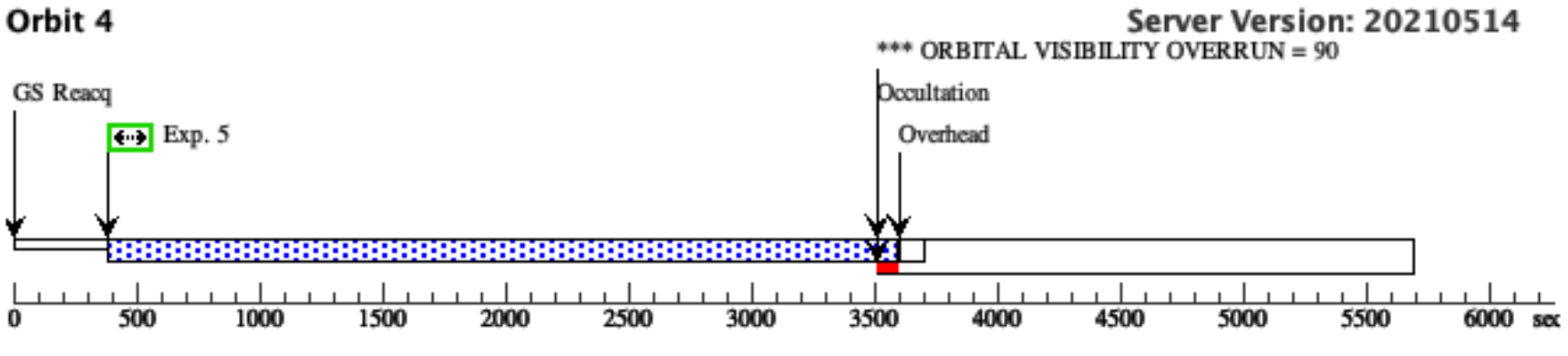
6000
sec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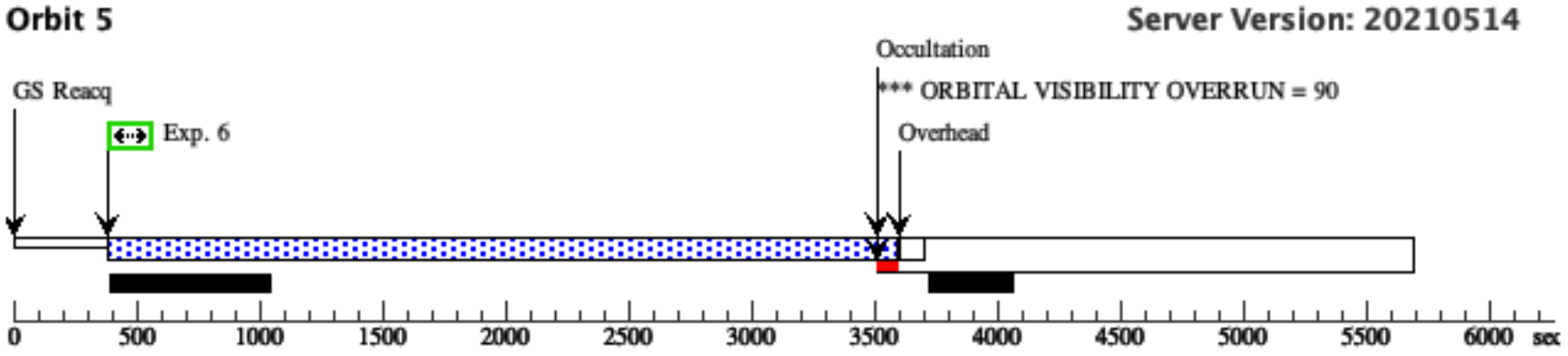
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Occultation
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Exp. 6
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1500
2000
2500
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3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15966, Sunburst-LyC5 (05), completed Tue Oct 05 17:00:23 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Sunburst-LyC5 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC5 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC5 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC5 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC5 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Undispersed (05.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

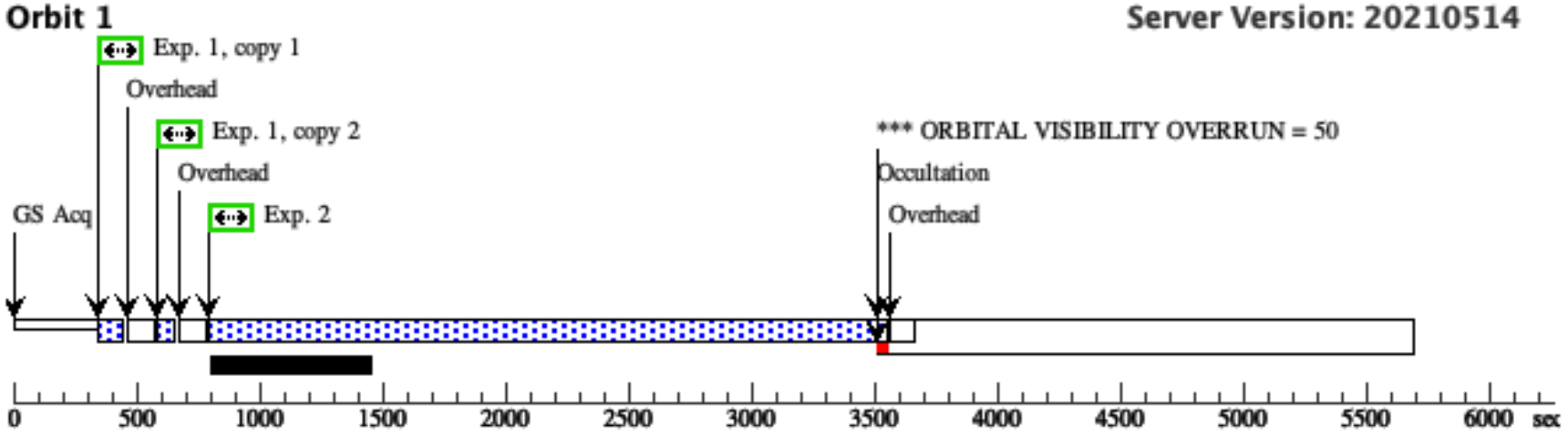
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

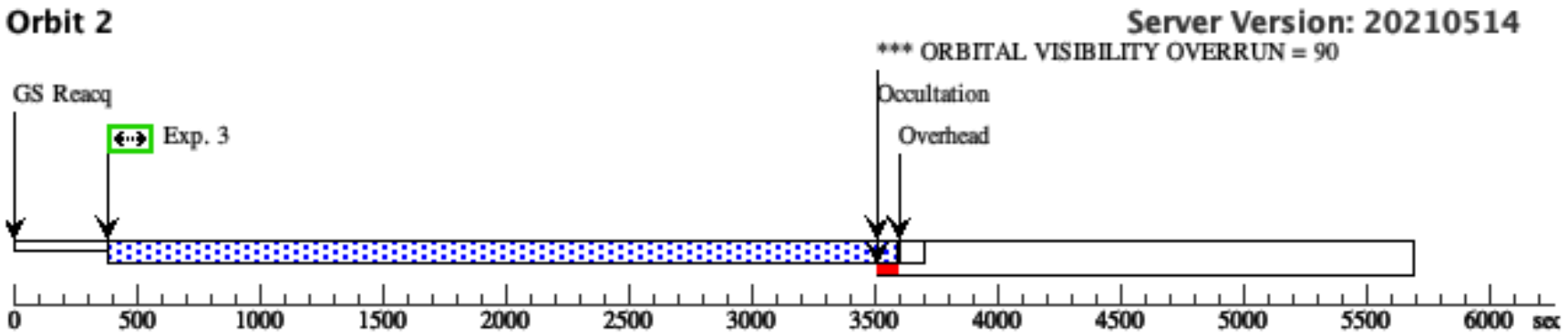
Comments:
Category=GALAXY
Description=[GRAVITATIONAL LENS, STARBURST]

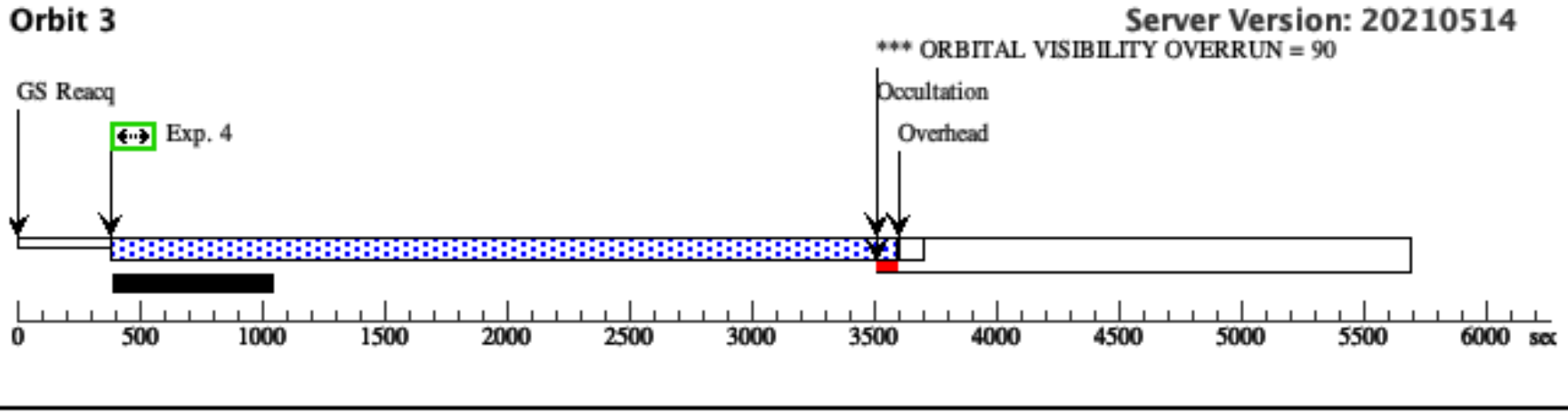
Exposures

#	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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG null,-50		70 Secs X 2 (140 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		2754 Secs (2754 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[2]***
4	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[3]***
5	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[4]***
6	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG null,-50		3209 Secs (3209 Secs) *[==>]*	***[5]***

Orbit Structure



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Occultation
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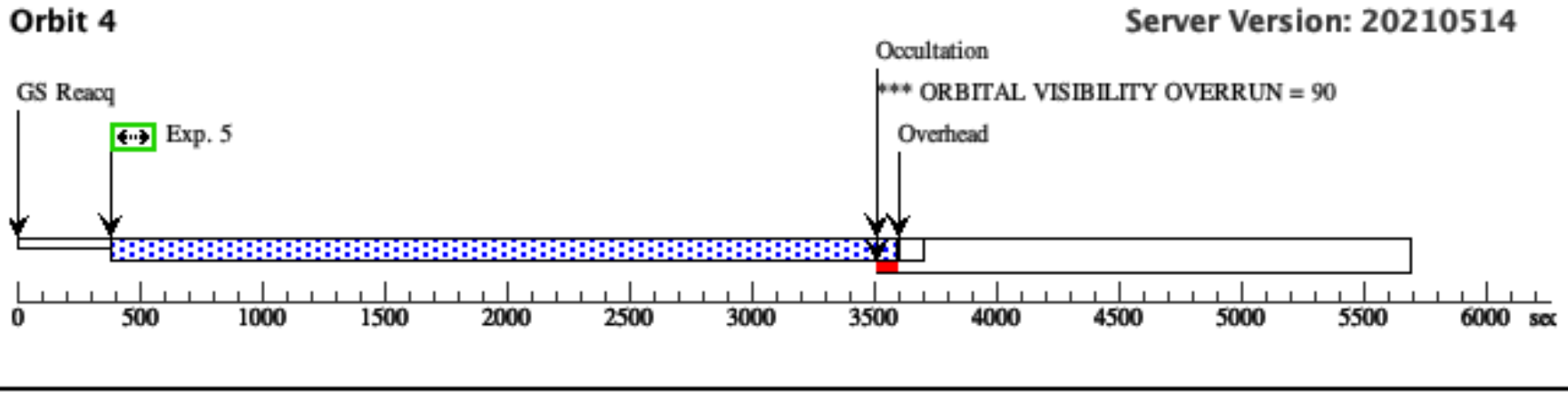
sec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Occultation
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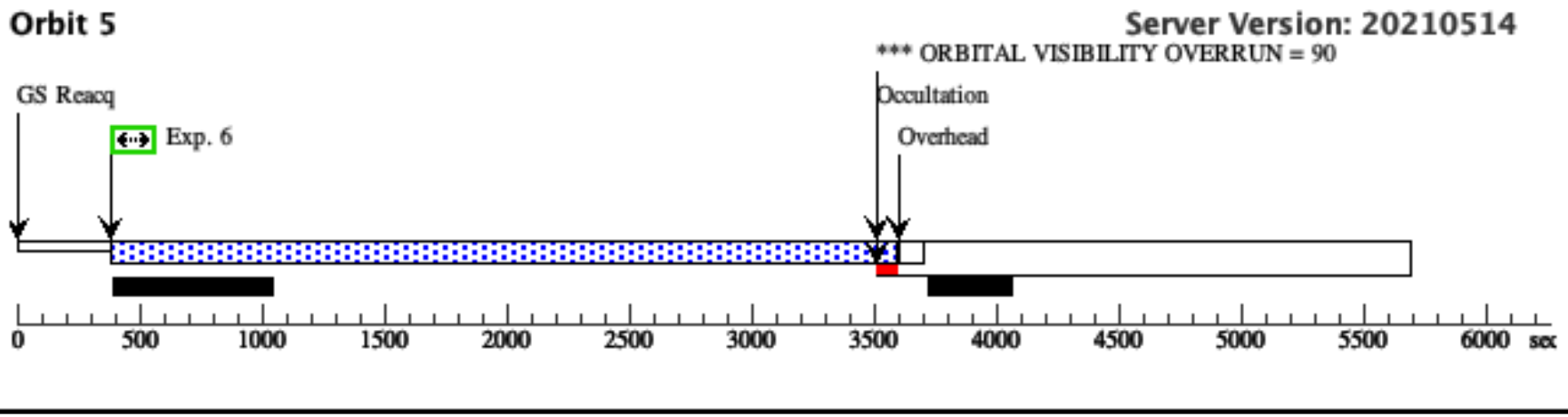
sec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Exp. 6
Occultation
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3500
4000
4500
5000
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6000
sec

Visit

Proposal 15966, Sunburst-LyC6 (06), completed Tue Oct 05 17:00:23 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Sunburst-LyC6 (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Sunburst-LyC6 (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Undispersed (06.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

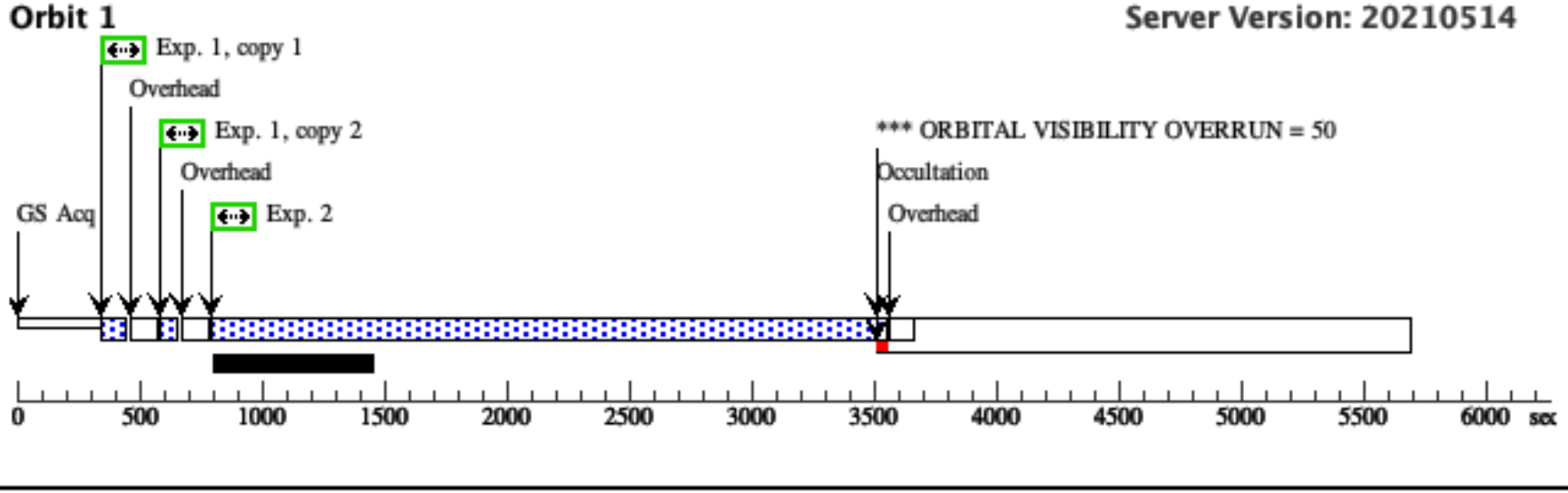
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

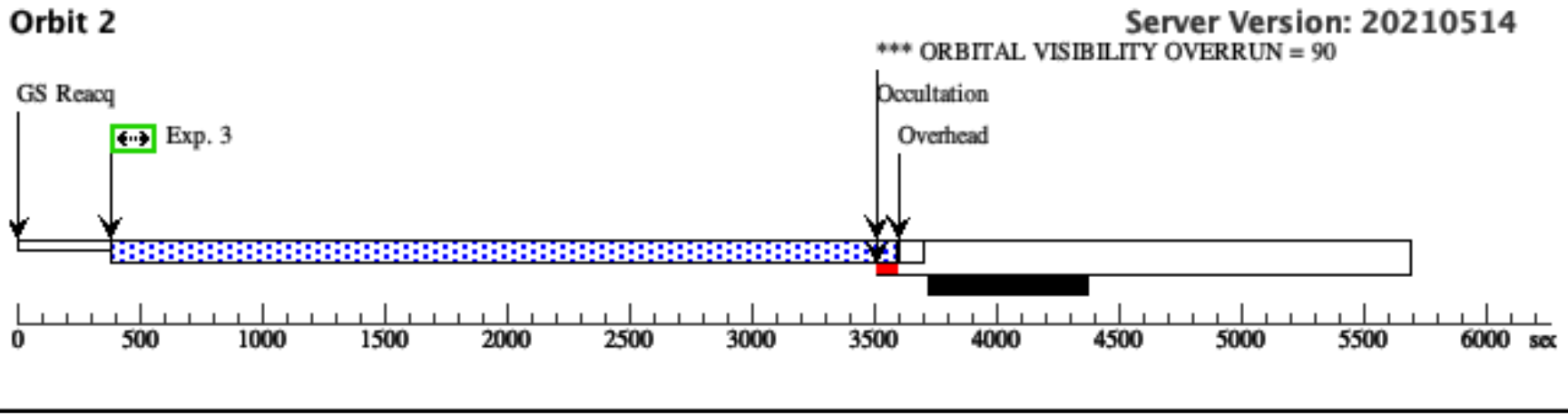
Comments:
Category=GALAXY
Description=[GRAVITATIONAL LENS, STARBURST]

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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG .158,-50.07		70 Secs X 2 (140 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .158,-50.07		2754 Secs (2754 Secs) *[==>]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .158,-50.07		3209 Secs (3209 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 15966, Sunburst-LyC6 (07) Tue Oct 05 17:00:23 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 8.25D TO 8.25 D

Comments: The orientation requirements are determined by building a model based upon an empirical estimate of the trace of bright objects from previous G280 observations of QSOs. We then applied that empirical trace to each target and each foreground object in the proposed field using previous F606W observations. We then calculated the number of foreground traces that intersect the blue portions of the brightest targets. We then stepped through each possible orientation angle by rotating the HST orientation by .01 degrees and calculated how many foreground objects intersected the faint EUV of the background galaxy. We confirmed that the predicted orientation angle matched that from the APT. We selected the only angle that was contamination free for the brightest targets.

Diagnostics

(Undispersed (07.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SUNBURST-ARC	RA: 15 49 59.6214 (237.4984225d) Dec: -78 11 13.66 (-78.18713d) Equinox: J2000		V=(?) R-band: 17.8	Reference Frame: ICRS

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

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) SUNBURST-ARC	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=11	POS TARG .158,-50 .07		70 Secs X 2 (106 Secs) *[==>53.0 Secs (Copy 1)]* *[==>53.0 Secs (Copy 2)]*	***[1]***
Comments: The proposed exposure time will acheive a SNR of at least 5 in the combined reference image.									
2	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .158,-50 .07		2754 Secs (2737 Secs) *[==>2737.0 Secs]*	***[1]***
3	Dispersed (WFC3UVIS.sp.1365845)	(1) SUNBURST-ARC	WFC3/UVIS, ACCUM, UVIS	G280		POS TARG .158,-50 .07		3209 Secs (3119 Secs) *[==>3119.0 Secs]*	***[2]***

Orbit Structure