15151 - The Stellar Origins of Supernovae

Cycle: 25, 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) SN2018AOQ	WFC3/UVIS	1	02-Dec-2019 14:00:22.0	yes
02	(2) SN2018GJ	WFC3/UVIS	1	02-Dec-2019 14:00:24.0	yes
03	(3) SN2018ZD	WFC3/UVIS	1	02-Dec-2019 14:00:25.0	yes
04	(4) SN2018IVC	WFC3/UVIS	1	02-Dec-2019 14:00:26.0	yes
05	(5) AT2019QYL	WFC3/UVIS	1	02-Dec-2019 14:00:29.0	yes
06	(6) AT2019KRL	WFC3/UVIS	1	02-Dec-2019 14:00:32.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
07	(7) SNTOO7	WFC3/UVIS	1	02-Dec-2019 14:00:37.0	yes
08	(8) SNTOO8	WFC3/UVIS	1	02-Dec-2019 14:00:40.0	yes

8 Total Orbits Used

ABSTRACT

Supernovae (SNe) have a profound effect on galaxies and have been used as precise cosmological probes, resulting in the Nobel-distinguished discovery of the accelerating Universe. They are clearly very important events deserving of intense study. Yet, even with over 10000 classified SNe, we know relatively little about the stars which give rise to these powerful explosions. The main limitation has been the lack of spatial resolution in pre-SN imaging data. However, since 1999 our team has been at the vanguard of directly identifying SN progenitor stars in HST images. From this exciting line of study, the trends from 15 detections for Type II-Plateau SNe appear to be red supergiant progenitors of relatively low mass (8 to 17 Msun) -- although this upper mass limit still requires testing -- and warmer, envelope-stripped supergiant progenitors for 5 Type IIb SNe. Additionally, evidence is accumulating that some Type II-narrow SNe may arise from exploding stars in a luminous blue variable phase. However, the nature of the progenitors of Type Ib/c SNe, a subset of which are associated with gamma-ray bursts, still remains ambiguous. Furthermore, we continue in the embarrassing situation that we still do not yet know which progenitor systems explode as Type Ia SNe, which are being used for precision cosmology. In Cycles 16, 17, and 20 through 24 we have had great success with our approved ToO programs. As of this proposal deadline, we have already triggered on SN 2016jbu with our Cycle 24 program. We therefore propose to continue this project in Cycles 25 and 26, to determine the identities of the progenitors of 8 SNe within about 20 Mpc through ToO observations using WFC3/UVIS.

OBSERVING DESCRIPTION

We plan for eight (8) ToO triggers ***to be spread throughout both Cycles 25 and 26***. If we detect one or more candidate stellar objects within a 1-sigma positional uncertainty in ACS, WFPC2, or WFC3 pre-supernova archival image(s), we will request a trigger to pinpoint the location of the SN in the pre-SN images and attempt to confirm the progenitor candidate. Our plan is to image with WFC3/UVIS, to provide the highest possible spatial resolution. Our strategy, generally, is to acquire several short-exposure dithered images in V (F555W, 10-s) or I (F814W, 30-s), for the 6 core-collapse visits (which will likely best match with the available archival image data), and in U (F336W, 20-s) or B (F438W, 20-s) for the two nearby (<10 Mpc) SN Ia visits, since these SNe will likely be too bright in redder bands, but fade more rapidly in the blue. How the visits inevitably get used depends on what nearby SNe Nature provides us. We will be using the UVIS2 1Kx1K subarray near amplifier C. Since the exposures are quite short, we will also be using post-flash with 12 e- for each exposure, in order to mitigate against CTE losses. The initial Phase II observations are meant to

be representative of a typical trigger. Each of the 8 possible ToOs has an initial placeholder position of RA(J2000)=0, Dec(J2000)=0. We will likely request triggers when the SN is still fairly bright, depending on its age at discovery, but limit this, generally, to m >14 mag. We therefore may alter exposure times and bands, depending on the expected brightness of a given SN when it is scheduled and depending on the bands of the pre-SN images available for the SN site in the HST archive. This could also result in changes in the dither strategy for a given visit. The ToOs are not intended to be high-impact, and will be requested to occur after 2 to 3 weeks from discovery, so there should be no disruption of normal scheduling.

Proposal 15151 - Visit 01 - The Stellar Origins of Supernovae

Visit

Proposal 15151, Visit 01, completed Mon Dec 02 19:00:41 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2018AOQ	RA: 12 10 38.1700 (182.6590417d) Dec: +39 23 48.20 (39.39672d) Equinox: J2000		V=15.0+/-1.0	Reference Frame: ICRS

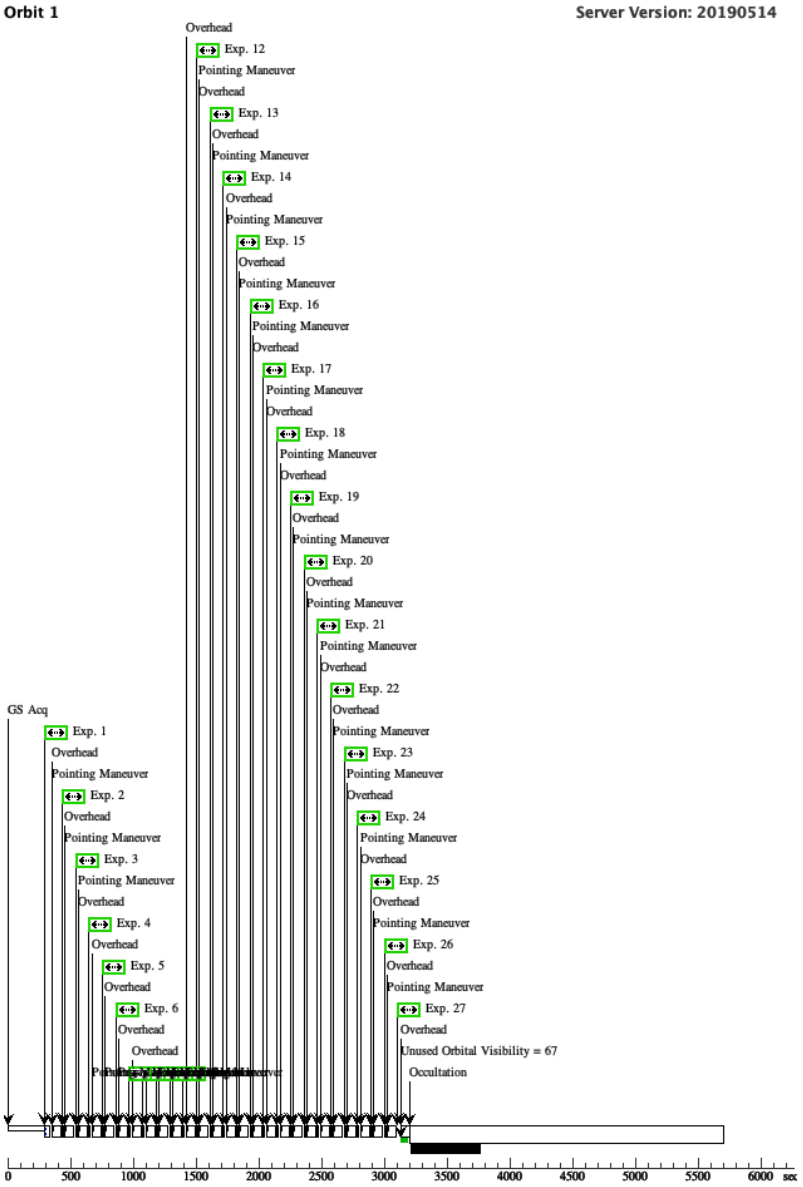
Comments:
Category=EXT-STAR
Description=[SUPERNOVA, SUPERNOVA TYPE II]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0,0		10 Secs (10 Secs)	
								[==>]	***[1]***
2		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
3		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
4		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
5		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.26644		10 Secs (10 Secs)	
								[==>]	***[1]***
6		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.25267, 0.44152		10 Secs (10 Secs)	
								[==>]	***[1]***
7		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.34603, 0.06265		10 Secs (10 Secs)	
								[==>]	***[1]***
8		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.38555, 0.19801		10 Secs (10 Secs)	
								[==>]	***[1]***
9		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.42549, 0.41309		10 Secs (10 Secs)	
								[==>]	***[1]***
10		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.65000, 0.00000		10 Secs (10 Secs)	
								[==>]	***[1]***
11		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.69392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
12		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.72988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
13		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.78293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
14		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.86273, 0.22644		10 Secs (10 Secs)	
								[==>]	***[1]***
15		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.90267, 0.44152		10 Secs (10 Secs)	
								[==>]	***[1]***
16		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.99603, 0.06265		10 Secs (10 Secs)	
								[==>]	***[1]***
17		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 1.03555, 0.19801		10 Secs (10 Secs)	
								[==>]	***[1]***
18		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 1.07549, 0.41309		10 Secs (10 Secs)	
								[==>]	***[1]***
19		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.00000, 0.65000		10 Secs (10 Secs)	
								[==>]	***[1]***
20		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.82548		10 Secs (10 Secs)	
								[==>]	***[1]***
21		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 1.04030		10 Secs (10 Secs)	
								[==>]	***[1]***
22		(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.73843		10 Secs (10 Secs)	
								[==>]	***[1]***

	23	(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.87644	10 Secs (10 Secs) *[==>]*	 ***[1]***
	24	(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.25267, 1.09152	10 Secs (10 Secs) *[==>]*	 ***[1]***
	25	(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.34603, 0.71265	10 Secs (10 Secs) *[==>]*	 ***[1]***
	26	(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.38555, 0.84801	10 Secs (10 Secs) *[==>]*	 ***[1]***
	27	(1) SN2018AOQ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.42549, 1.06309	10 Secs (10 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 15151, Visit 02, completed Mon Dec 02 19:00:41 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-2)

Fixed Targets

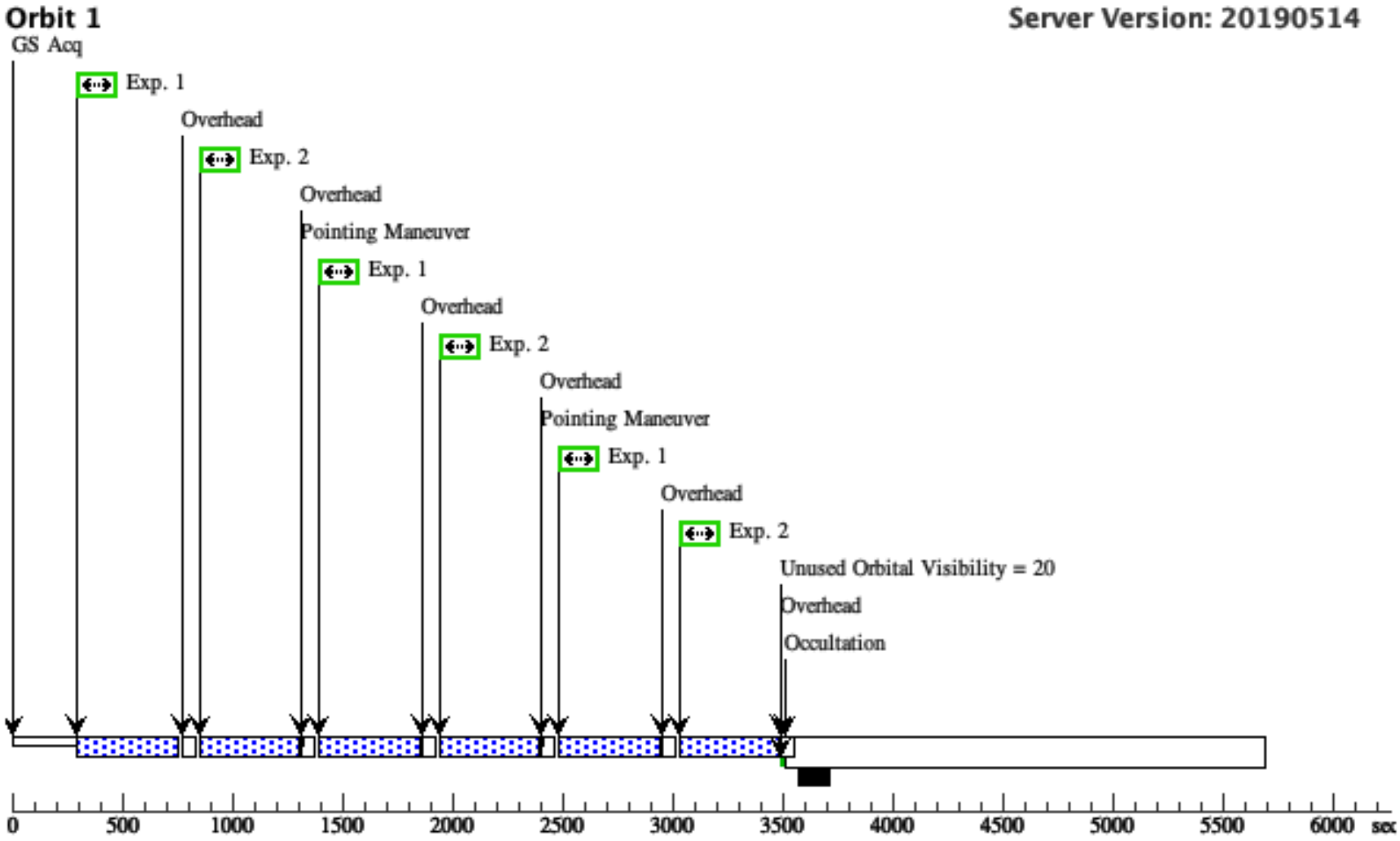
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SN2018GJ	RA: 16 32 2.4000 (248.0100000d) Dec: +78 12 41.10 (78.21142d) Equinox: J2000		V=20.0+/-1.0	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA, SUPERNOVA TYPE II]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) SN2018GJ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F625W			Pattern 1, Exps 1-2 in Visit 02 (1)	435 Secs (1305 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(2) SN2018GJ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=2		Pattern 1, Exps 1-2 in Visit 02 (1)	435 Secs (1305 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 15151, Visit 03, completed Mon Dec 02 19:00:41 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-2)

Fixed Targets

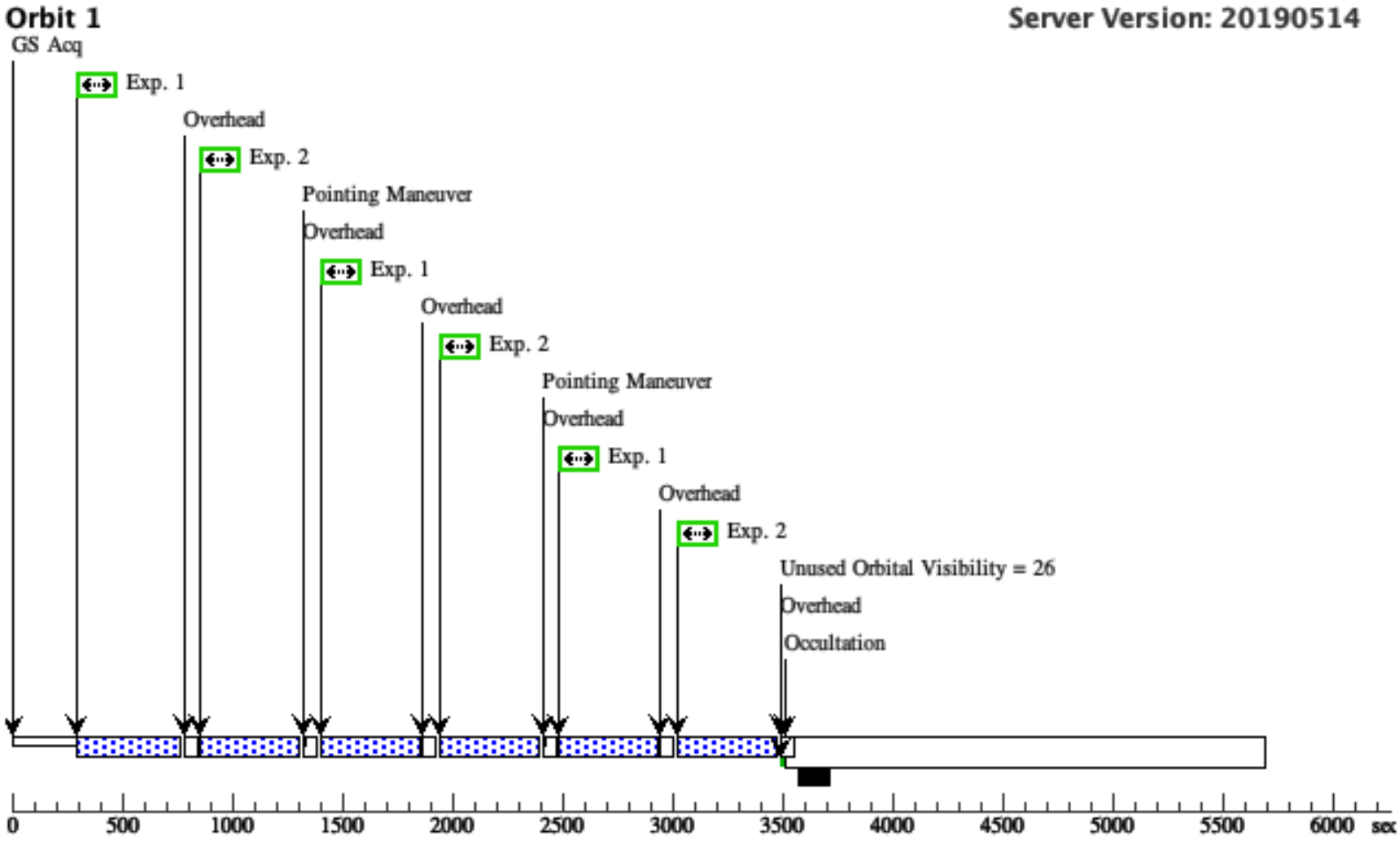
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2018ZD	RA: 06 18 3.1800 (94.5132500d) Dec: +78 22 0.90 (78.36692d) Equinox: J2000		V=20.0+/-1.0	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA, SUPERNOVA TYPE IB]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) SN2018ZD	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=2		Pattern 1, Exps 1-2 in Visit 03 (1)	440 Secs (1320 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(3) SN2018ZD	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=2		Pattern 1, Exps 1-2 in Visit 03 (1)	440 Secs (1320 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 15151, Visit 04, completed Mon Dec 02 19:00:41 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

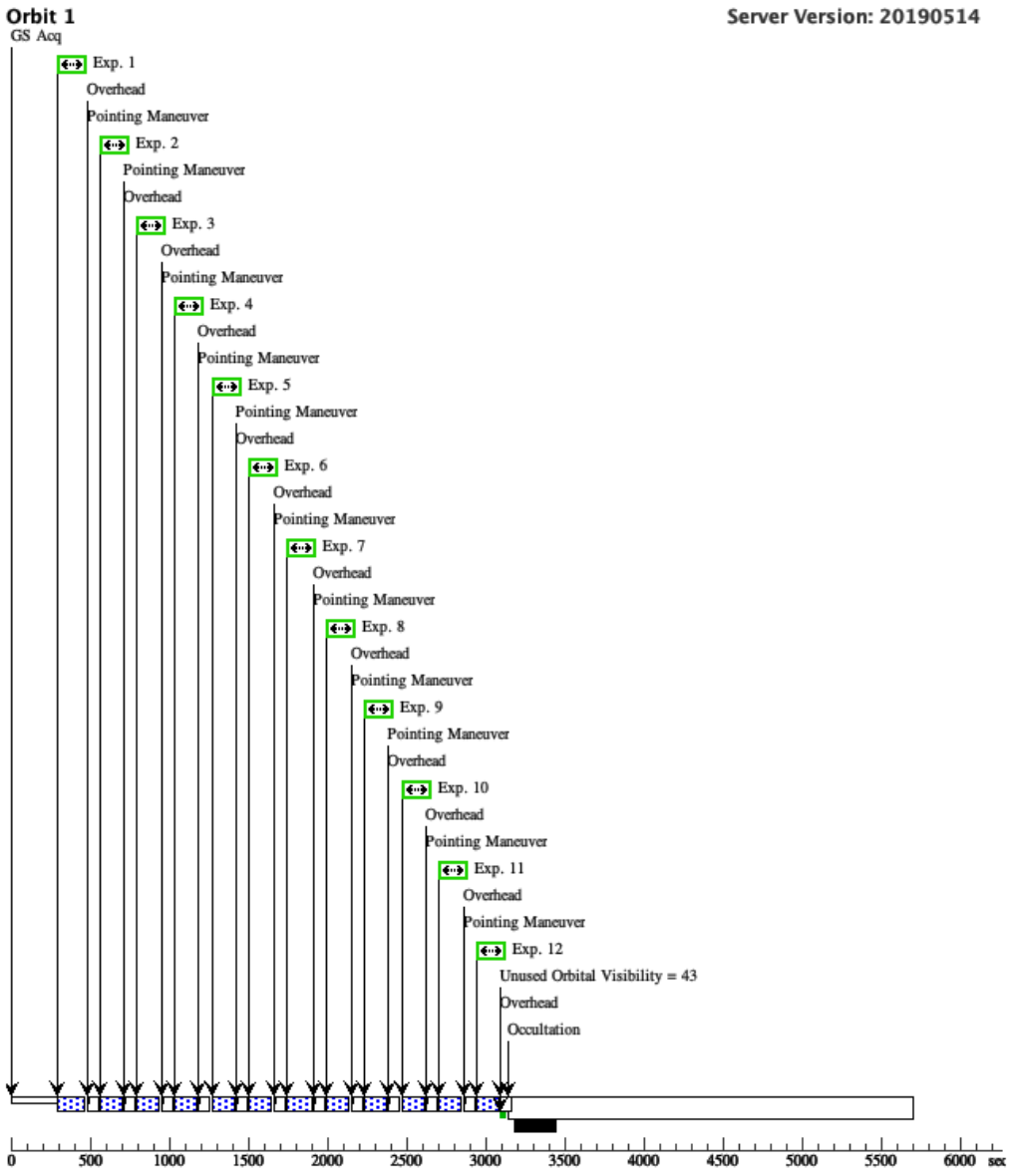
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN2018IVC	RA: 02 42 41.2900 (40.6720417d) Dec: -00 00 31.71 (-.00881d) Equinox: J2000		V=20.0+/-1.0	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA, SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=8	POS TARG 0,0		140 Secs (140 Secs) *[==>]*	 ***[1]***
2		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=8	POS TARG 0.04392, 0.17548		140 Secs (140 Secs) *[==>]*	 ***[1]***
3		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=8	POS TARG 0.07988, 0.39030		140 Secs (140 Secs) *[==>]*	 ***[1]***
4		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=8	POS TARG 0.13293, 0.08843		140 Secs (140 Secs) *[==>]*	 ***[1]***
5		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=8	POS TARG 0.21273, 0.26644		140 Secs (140 Secs) *[==>]*	 ***[1]***
6		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=8	POS TARG 0.25267, 0.44152		140 Secs (140 Secs) *[==>]*	 ***[1]***
7		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=11	POS TARG 0,0		140 Secs (140 Secs) *[==>]*	 ***[1]***
8		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=11	POS TARG 0.04392, 0.17548		140 Secs (140 Secs) *[==>]*	 ***[1]***
9		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=11	POS TARG 0.07988, 0.39030		140 Secs (140 Secs) *[==>]*	 ***[1]***
10		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=11	POS TARG 0.13293, 0.08843		140 Secs (140 Secs) *[==>]*	 ***[1]***
11		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=11	POS TARG 0.21273, 0.26644		140 Secs (140 Secs) *[==>]*	 ***[1]***
12		(4) SN2018IVC	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=11	POS TARG 0.25267, 0.44152		140 Secs (140 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 15151, Visit 05, implementation Mon Dec 02 19:00:42 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	AT2019QYL	RA: 00 54 57.6600 (13.7402500d) Dec: -37 38 40.03 (-37.64445d) Equinox: J2000		V=21.0+/-1.0	Reference Frame: ICRS

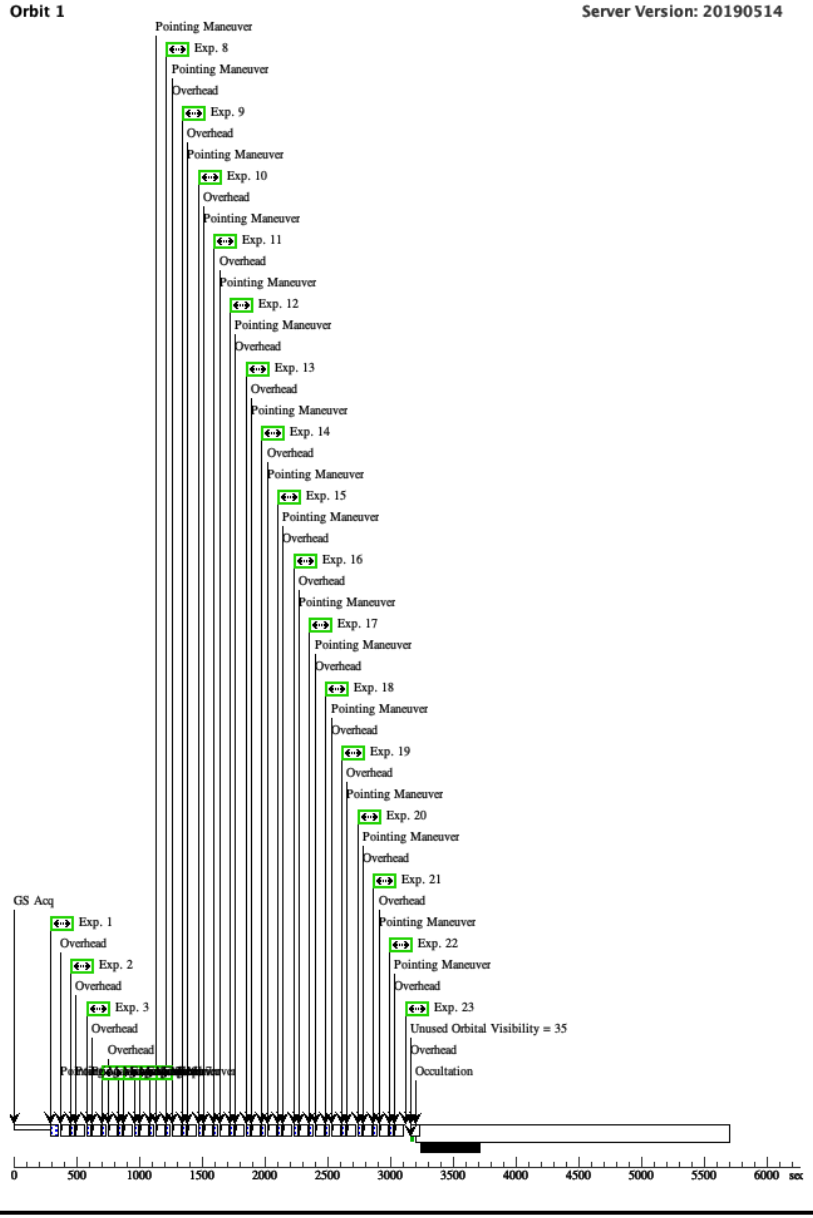
Comments:
Category=EXT-STAR
Description=[ETA CARINAE STAR, LUMINOUS BLUE VARIABLE]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0,0; GS ACQ SCENARIO BASE1B3		30 Secs (30 Secs) *[==>]*	*[1]*
2		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.17548		30 Secs (30 Secs) *[==>]*	*[1]*
3		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 0.39030		30 Secs (30 Secs) *[==>]*	*[1]*
4		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.08843		30 Secs (30 Secs) *[==>]*	*[1]*
5		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.26644		30 Secs (30 Secs) *[==>]*	*[1]*
6		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.25267, 0.44152		30 Secs (30 Secs) *[==>]*	*[1]*
7		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.34603, 0.06265		30 Secs (30 Secs) *[==>]*	*[1]*
8		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.38555, 0.19801		30 Secs (30 Secs) *[==>]*	*[1]*
9		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.42549, 0.41309		30 Secs (30 Secs) *[==>]*	*[1]*
10		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.65000, 0.00000		30 Secs (30 Secs) *[==>]*	*[1]*
11		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.69392, 0.17548		30 Secs (30 Secs) *[==>]*	*[1]*
12		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.72988, 0.39030		30 Secs (30 Secs) *[==>]*	*[1]*
13		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.78293, 0.08843		30 Secs (30 Secs) *[==>]*	*[1]*
14		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.86273, 0.22644		30 Secs (30 Secs) *[==>]*	*[1]*
15		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.90267, 0.44152		30 Secs (30 Secs) *[==>]*	*[1]*
16		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.99603, 0.06265		30 Secs (30 Secs) *[==>]*	*[1]*
17		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 1.03555, 0.19801		30 Secs (30 Secs) *[==>]*	*[1]*
18		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 1.07549, 0.41309		30 Secs (30 Secs) *[==>]*	*[1]*
19		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.00000, 0.65000		30 Secs (30 Secs) *[==>]*	*[1]*
20		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.82548		30 Secs (30 Secs) *[==>]*	*[1]*
21		(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 1.04030		30 Secs (30 Secs) *[==>]*	*[1]*

	22	(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.73843	30 Secs (30 Secs) *[==>]*	 ***[1]***
	23	(5) AT2019QYL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.87644	30 Secs (30 Secs) *[==>]*	 ***[1]***

Orbit Structure



Proposal 15151 - Visit 06 - The Stellar Origins of Supernovae

Visit

Proposal 15151, Visit 06, completed Mon Dec 02 19:00:42 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	AT2019KRL	RA: 01 36 49.6510 (24.2068792d) Dec: +15 46 46.21 (15.77950d) Equinox: J2000		V=21.5+/-1.0	Reference Frame: ICRS

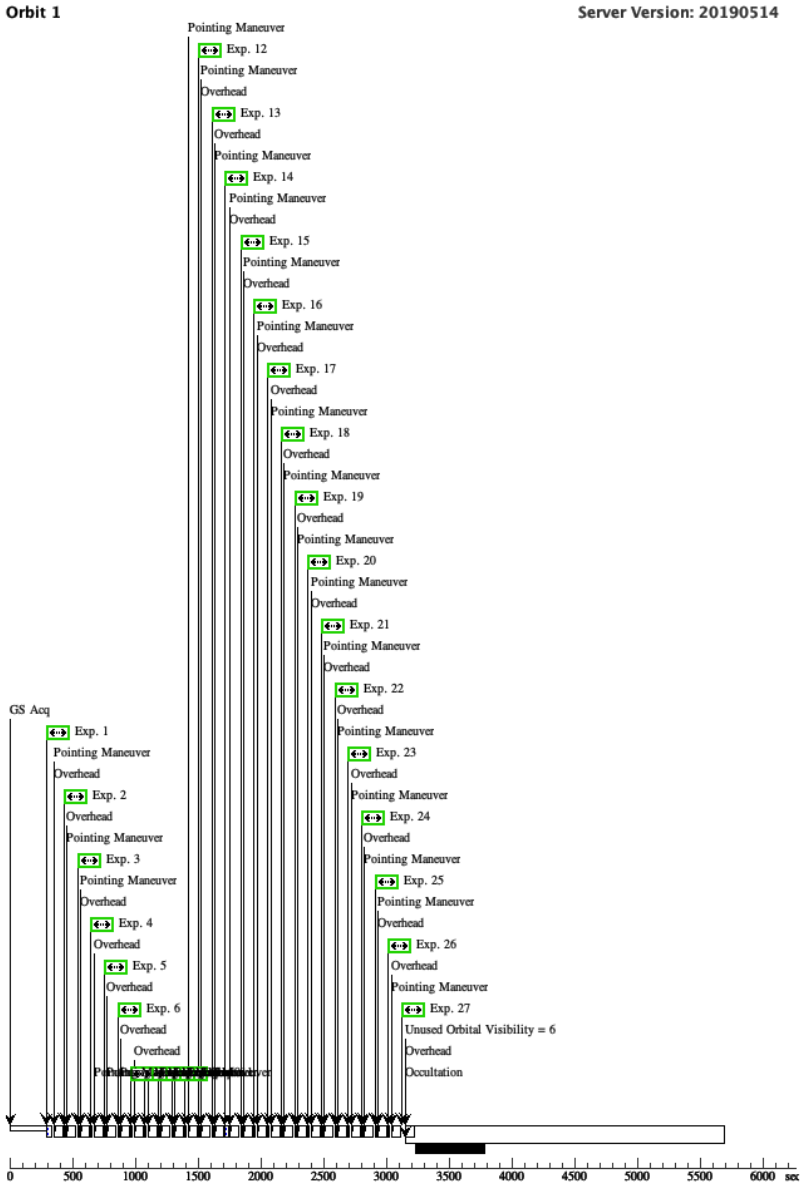
Comments:
Category=EXT-STAR
Description=[ETA CARINAE STAR, LUMINOUS BLUE VARIABLE]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0,0		10 Secs (10 Secs)	
								[==>]	***[1]***
2		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
3		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
4		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
5		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.26644		10 Secs (10 Secs)	
								[==>]	***[1]***
6		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.25267, 0.44152		10 Secs (10 Secs)	
								[==>]	***[1]***
7		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.34603, 0.06265		10 Secs (10 Secs)	
								[==>]	***[1]***
8		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.38555, 0.19801		10 Secs (10 Secs)	
								[==>]	***[1]***
9		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.42549, 0.41309		10 Secs (10 Secs)	
								[==>]	***[1]***
10		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.65000, 0.00000		10 Secs (10 Secs)	
								[==>]	***[1]***
11		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.69392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
12		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.72988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
13		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.78293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
14		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0,0		10 Secs (10 Secs)	
								[==>]	***[1]***
15		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.04392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
16		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.07988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
17		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.13293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
18		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.21273, 0.26644		10 Secs (10 Secs)	
								[==>]	***[1]***
19		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.25267, 0.44152		10 Secs (10 Secs)	
								[==>]	***[1]***
20		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.34603, 0.06265		10 Secs (10 Secs)	
								[==>]	***[1]***
21		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.38555, 0.19801		10 Secs (10 Secs)	
								[==>]	***[1]***
22		(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.42549, 0.41309		10 Secs (10 Secs)	
								[==>]	***[1]***

	23	(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.65000, 0.00000	10 Secs (10 Secs) *[==>]*	 ***[1]***
	24	(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.69392, 0.17548	10 Secs (10 Secs) *[==>]*	 ***[1]***
	25	(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.72988, 0.39030	10 Secs (10 Secs) *[==>]*	 ***[1]***
	26	(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.78293, 0.08843	10 Secs (10 Secs) *[==>]*	 ***[1]***
	27	(6) AT2019KRL	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=12	POS TARG 0.86273, 0.22644	10 Secs (10 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 15151, Visit 07, withdrawn Mon Dec 02 19:00:42 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ON HOLD

On Hold Comments: Pending ToO activation.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SNTOO7	RA: 00 00 0.0000 (.0000000d) Dec: +00 00 0.00 (.00000d) Equinox: J2000		V=14.0+/-1.0	Reference Frame: ICRS

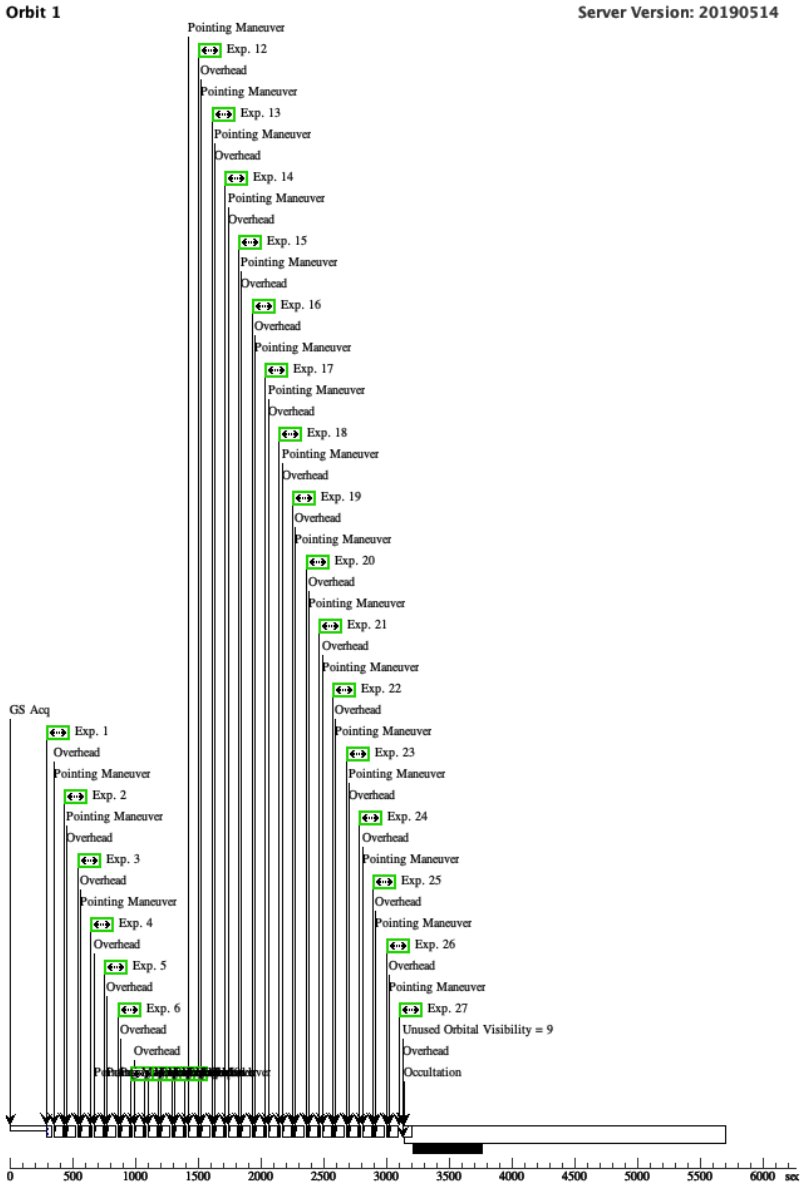
Comments:
Category=EXT-STAR
Description=[SUPERNOVA, SUPERNOVA TYPE IB]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0,0		10 Secs (10 Secs)	
								[==>]	***[1]***
2		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
3		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
4		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
5		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.26644		10 Secs (10 Secs)	
								[==>]	***[1]***
6		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.25267, 0.44152		10 Secs (10 Secs)	
								[==>]	***[1]***
7		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.34603, 0.06265		10 Secs (10 Secs)	
								[==>]	***[1]***
8		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.38555, 0.19801		10 Secs (10 Secs)	
								[==>]	***[1]***
9		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.42549, 0.41309		10 Secs (10 Secs)	
								[==>]	***[1]***
10		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.65000, 0.00000		10 Secs (10 Secs)	
								[==>]	***[1]***
11		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.69392, 0.17548		10 Secs (10 Secs)	
								[==>]	***[1]***
12		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.72988, 0.39030		10 Secs (10 Secs)	
								[==>]	***[1]***
13		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.78293, 0.08843		10 Secs (10 Secs)	
								[==>]	***[1]***
14		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.86273, 0.22644		10 Secs (10 Secs)	
								[==>]	***[1]***
15		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.90267, 0.44152		10 Secs (10 Secs)	
								[==>]	***[1]***
16		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.99603, 0.06265		10 Secs (10 Secs)	
								[==>]	***[1]***
17		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 1.03555, 0.19801		10 Secs (10 Secs)	
								[==>]	***[1]***
18		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 1.07549, 0.41309		10 Secs (10 Secs)	
								[==>]	***[1]***
19		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.00000, 0.65000		10 Secs (10 Secs)	
								[==>]	***[1]***
20		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.04392, 0.82548		10 Secs (10 Secs)	
								[==>]	***[1]***
21		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.07988, 1.04030		10 Secs (10 Secs)	
								[==>]	***[1]***
22		(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.13293, 0.73843		10 Secs (10 Secs)	
								[==>]	***[1]***

	23	(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.21273, 0.87644	10 Secs (10 Secs) *[==>]*	 ***[1]***
	24	(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.25267, 1.09152	10 Secs (10 Secs) *[==>]*	 ***[1]***
	25	(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.34603, 0.71265	10 Secs (10 Secs) *[==>]*	 ***[1]***
	26	(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.38555, 0.84801	10 Secs (10 Secs) *[==>]*	 ***[1]***
	27	(7) SNTOO7	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=12	POS TARG 0.42549, 1.06309	10 Secs (10 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 15151, Visit 08, withdrawn Mon Dec 02 19:00:42 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: ON HOLD

On Hold Comments: Pending ToO activation.

Diagnostics

(Visit 08) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SNTOO8	RA: 00 00 0.0000 (.0000000d) Dec: +00 00 0.00 (.00000d) Equinox: J2000		V=14.0+/-1.0	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA, SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0,0		20 Secs (20 Secs)	
								[==>]	***[1]***
2		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.04392, 0.17548		20 Secs (20 Secs)	
								[==>]	***[1]***
3		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.07988, 0.39030		20 Secs (20 Secs)	
								[==>]	***[1]***
4		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.13293, 0.08843		20 Secs (20 Secs)	
								[==>]	***[1]***
5		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.21273, 0.26644		20 Secs (20 Secs)	
								[==>]	***[1]***
6		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.25267, 0.44152		20 Secs (20 Secs)	
								[==>]	***[1]***
7		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.34603, 0.06265		20 Secs (20 Secs)	
								[==>]	***[1]***
8		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.38555, 0.19801		20 Secs (20 Secs)	
								[==>]	***[1]***
9		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.42549, 0.41309		20 Secs (20 Secs)	
								[==>]	***[1]***
10		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.65000, 0.00000		20 Secs (20 Secs)	
								[==>]	***[1]***
11		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.69392, 0.17548		20 Secs (20 Secs)	
								[==>]	***[1]***
12		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.72988, 0.39030		20 Secs (20 Secs)	
								[==>]	***[1]***
13		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.78293, 0.08843		20 Secs (20 Secs)	
								[==>]	***[1]***
14		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.86273, 0.22644		20 Secs (20 Secs)	
								[==>]	***[1]***
15		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.90267, 0.44152		20 Secs (20 Secs)	
								[==>]	***[1]***
16		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.99603, 0.06265		20 Secs (20 Secs)	
								[==>]	***[1]***
17		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 1.03555, 0.19801		20 Secs (20 Secs)	
								[==>]	***[1]***
18		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 1.07549, 0.41309		20 Secs (20 Secs)	
								[==>]	***[1]***
19		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.00000, 0.65000		20 Secs (20 Secs)	
								[==>]	***[1]***
20		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.04392, 0.82548		20 Secs (20 Secs)	
								[==>]	***[1]***
21		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.07988, 1.04030		20 Secs (20 Secs)	
								[==>]	***[1]***
22		(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.13293, 0.73843		20 Secs (20 Secs)	
								[==>]	***[1]***

	23	(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.21273, 0.87644	20 Secs (20 Secs) *[==>]*	 ***[1]***
	24	(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.25267, 1.09152	20 Secs (20 Secs) *[==>]*	 ***[1]***
	25	(8) SNTOO8	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F438W	FLASH=12	POS TARG 0.34603, 0.71265	20 Secs (20 Secs) *[==>]*	 ***[1]***

Orbit Structure