



16165 - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

Cycle: 28, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) SN-2012FH	WFC3/UVIS	3	25-Jan-2021 12:00:33.0	yes
02	(2) SN-2016COI	WFC3/UVIS	1	25-Jan-2021 12:00:34.0	yes
03	(3) SN-2017GAX	WFC3/UVIS	1	25-Jan-2021 12:00:35.0	yes
04	(4) SN-2013GE	WFC3/UVIS	2	25-Jan-2021 12:00:35.0	yes
05	(4) SN-2013GE	WFC3/UVIS	3	25-Jan-2021 12:00:36.0	yes
06	(4) SN-2013GE	WFC3/UVIS	2	25-Jan-2021 12:00:37.0	yes
07	(4) SN-2013GE	WFC3/UVIS	2	25-Jan-2021 12:00:37.0	yes
Z1	(1) SN-2012FH	WFC3/UVIS	3	25-Jan-2021 12:00:38.0	yes

17 Total Orbits Used

ABSTRACT

We propose optical+UV observations at the sites of nearby stripped-envelope supernovae (SNe) to search for expected surviving binary companions from the progenitor systems. Directly measuring the photometry (or deep upper limits) of SN companions provides a critical constraint on the underlying physics in binary evolution models, which in turn has far-reaching implications in all of astrophysics. While a number of binary star models exist, the detailed physics remain unconstrained (e.g., winds, rotation, metallicity, nuclear burning instabilities). Current models predict that the majority of stripped-envelope SNe (i.e., IIb, Ib, and Ic) have a close binary companion, but the expected endpoints for these companions vary based on the physics of the binary interaction and evolution. An unbiased, comprehensive, statistically complete sample of direct companion observations is necessary to measure the actual binary fraction and stellar type. To date, however, only several candidate detections exist. Our program will build a meaningful sample by providing robust detections (or deep upper limits) of the most viable candidates out to a reasonable detection limit (~20 Mpc). NUV (F275W/F336W) imaging offers an optimum detection strategy for the expected hot, blue stellar companions, while optical imaging can rule out shock interaction contributions and probe less likely, but possible, cooler star companions. Given HST's time horizon, the degrading UV response on WFC3, and the requisite waiting period to allow the SN to fade before conducting a companion search, now is the time to take full advantage of HST's unique UV capabilities.

OBSERVING DESCRIPTION

WFC3:

- Use entire array to acquire fiducial stars for alignment purposes
- Use 512_UVIS2_CTE aperture to minimize photon transfer losses for 12fh and 13ge only
- When scheduled, please have CS contact PI to finalize pos_tag based on final orientation

- EXPTIME (actual):
 - SN 2012fh (3 orbits)
 - F275W (5246 s)
 - F336W (2364 s)
 - SN 2016coi (1 orbit)
 - F555W (2381 s)
 - SN 2017gax (1 orbit)
 - F555W (2614 s)
 - SN 2013ge (9 orbits)
 - F275W (13803 s)
 - F336W (8082 s)
 - F438W (1000 s)
 - F555W (700 s)
- FLASH = varies with aim of minimizing photon transfer losses and read noise
 - To be safe
- 4 pt WFC3-UVIS-DITHER-Box
 - Provides optimal 4-step sampling of the PSF; produces spacings of >1 column for removal of hot columns
 - remove CR and hot pixels

Scheduling constraints for 16coi and 17gax

Although we did not specifically mention scheduling constraints in the original proposal, the goal of observing 16coi and 17gax is to observe the SN position (astrometry) before it fades. We estimated a flux based on a decline rate somewhere towards the middle of Cycle 28. Therefore, scheduling

these targets earlier in the cycle is a huge benefit since the late time decay of such SNe remains somewhat uncertain. We therefore request the added scheduling constraints for 16coi and 17gax (only one orbit each).

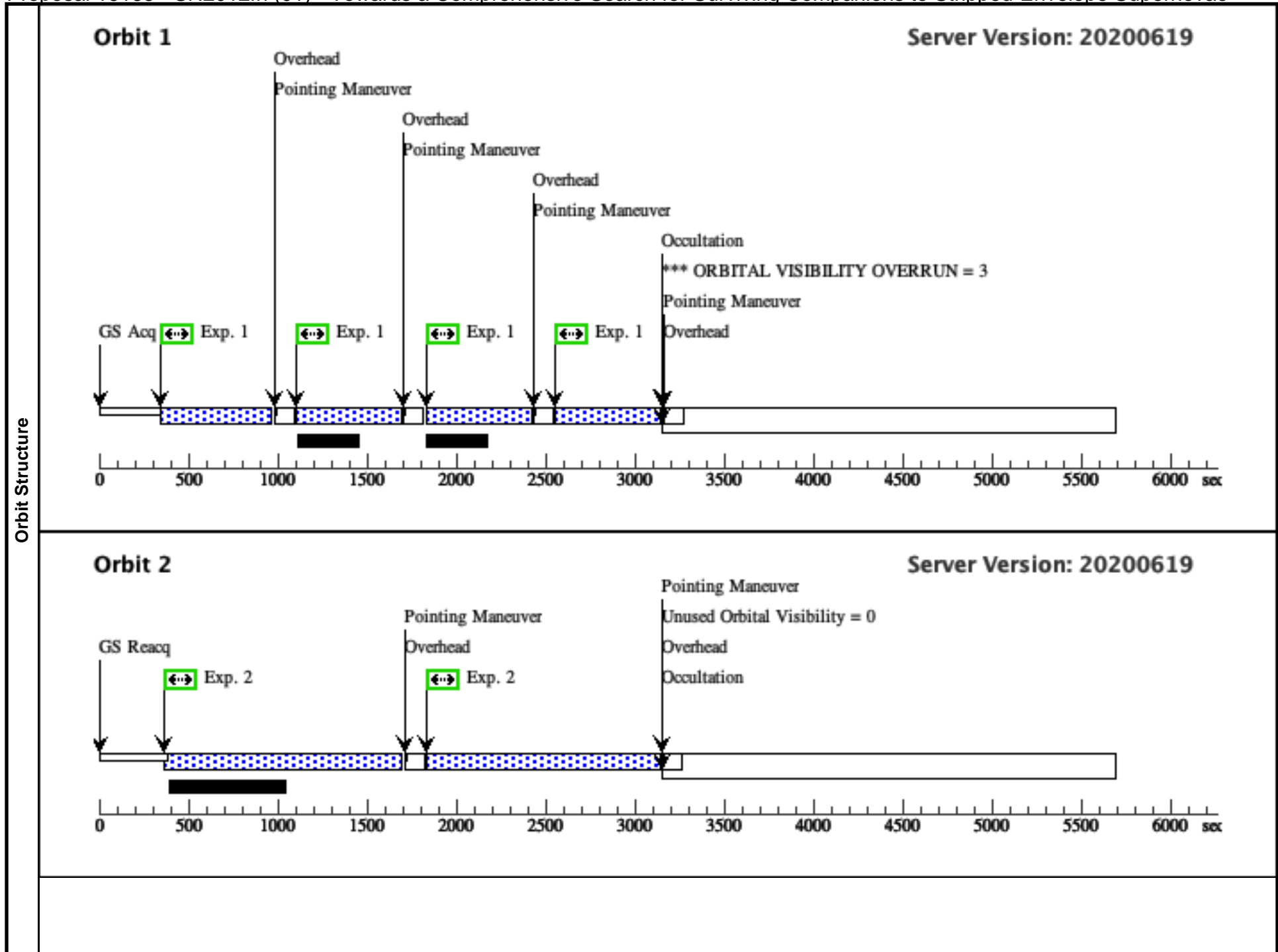
Impact of Gyros

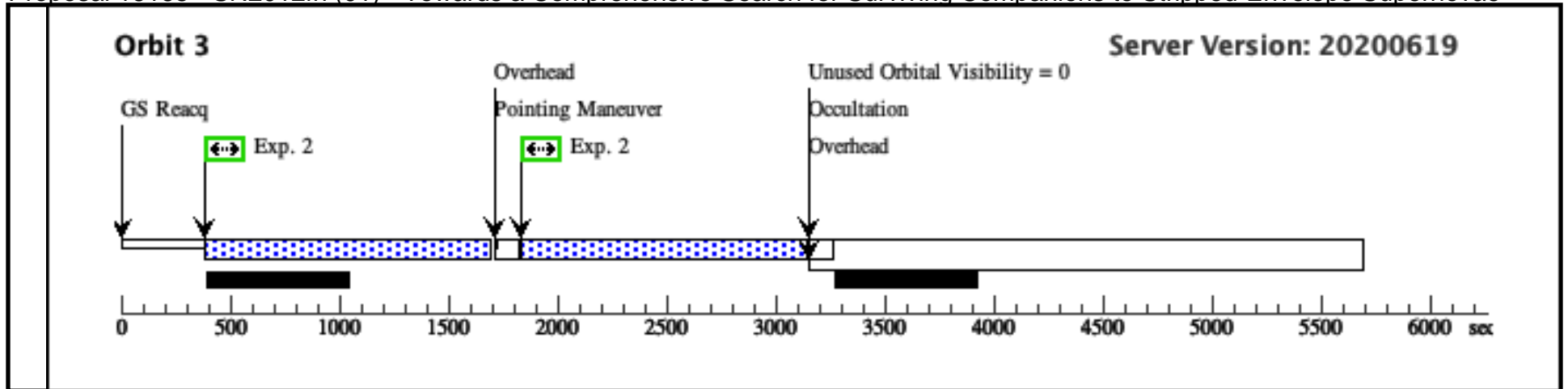
We have considered the impact of reduced gyro operations on our program. The only problematic observation is SN 2013ge, which has 9 orbits requested. We were able to successfully reduce this target to 4 visits, each with 2-3 orbits per visit. The only condition is that all filters must be obtained in the same orientation for several reasons, including time variability and optimized sampling and reductions. Therefore, we have added this constraint.

Proposal 16165 - SN2012fh (01) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

Mon Jan 25 17:00:39 GMT 2021

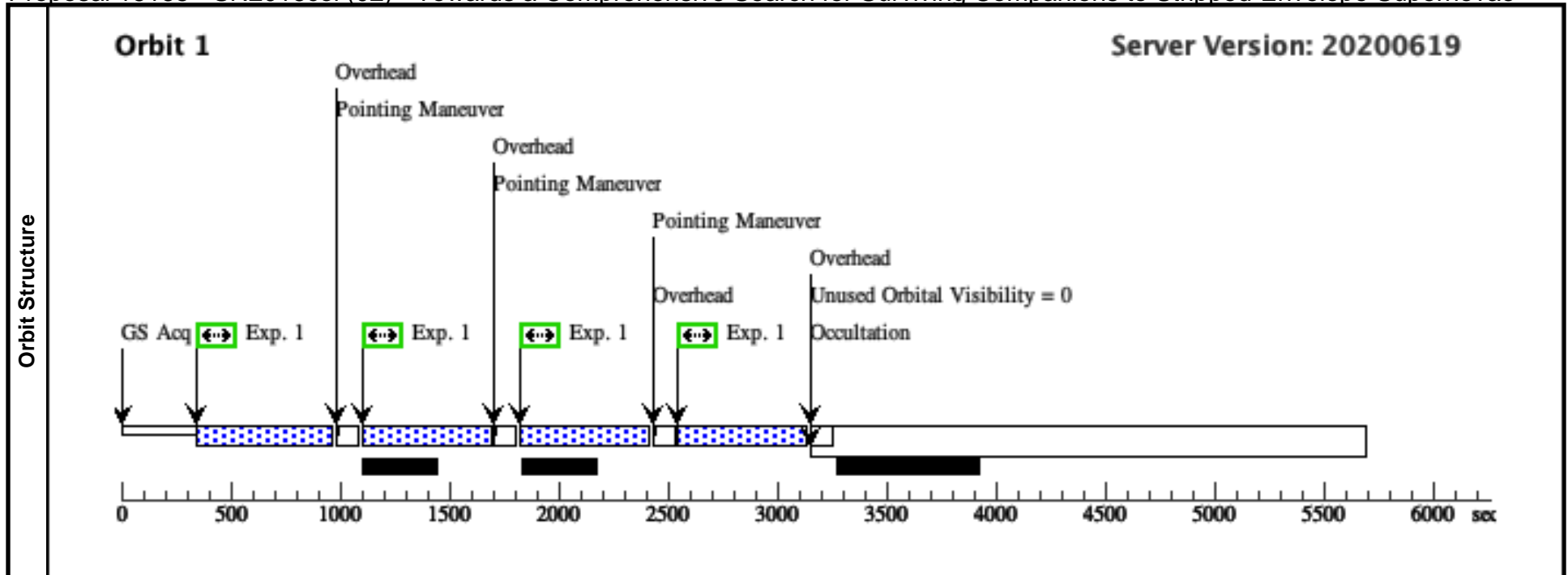
Visit	Proposal 16165, SN2012fh (01), failed Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: (none)										
	(SN2012fh (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
Diagnosics											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(3)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112				Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false				(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	SN-2012FH	RA: 10 43 34.0490 (160.8918708d) Dec: +24 53 29.00 (24.89139d) Equinox: J2000				V=25.0		Reference Frame: SIMBAD		
Comments: Category=EXT-STAR Description=[SUPERNOVA TYPE IB]											
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	F336W	(1) SN-2012FH	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F336W	FLASH=10		Pattern 3, Exps 1-1 in SN2012fh (01) (3)	591 Secs (2364 Secs)		
										[==>(Pattern 1)]	[1]
										[==>(Pattern 2)]	
									[==>(Pattern 3)]		
									[==>(Pattern 4)]		
2	F275W (WFC3UVI S.im.144875 9)	(1) SN-2012FH	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=8		Pattern 3, Exps 2-2 in SN2012fh (01) (3)	1250 Secs (5246 Secs)			
									[==>1312.0 Secs (Pattern 1)]	[2]	
									[==>1311.0 Secs (Pattern 2)]		
									[==>1312.0 Secs (Pattern 3)]		
									[==>1311.0 Secs (Pattern 4)]	[3]	





Proposal 16165 - SN2016coi (02) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

Visit	Proposal 16165, SN2016coi (02), completed Mon Jan 25 17:00:39 GMT 2021 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
Patterns	#	Primary Pattern	Secondary Pattern	Exposures						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	(3)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false	(1)						
	(2)	SN-2016COI	RA: 21 59 4.1000 (329.7670833d) Dec: +18 11 10.70 (18.18631d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD				
	1	F555W	(2) SN-2016COI	WFC3/UVIS, ACCUM, UVIS2	F555W			Pattern 3, Exps 1-1 i n SN2016coi (02) (3)	700 Secs (2381 Secs) [=>595.0 Secs (Pattern 1)] [=>595.0 Secs (Pattern 2)] [=>595.0 Secs (Pattern 3)] [=>596.0 Secs (Pattern 4)]	[1]



Proposal 16165 - SN2017gax (03) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

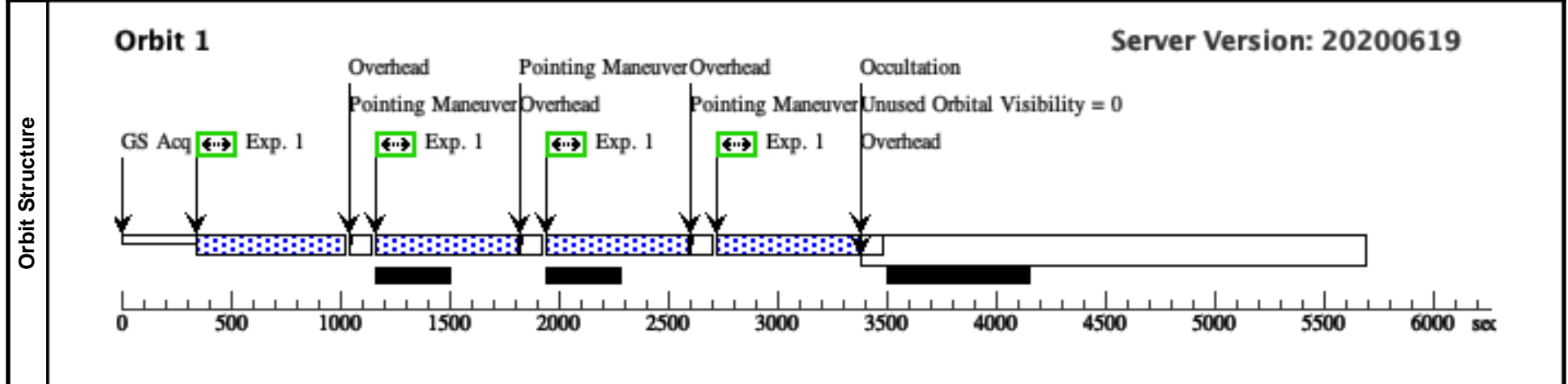
Mon Jan 25 17:00:39 GMT 2021

Visit	Proposal 16165, SN2017gax (03), completed		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: WFC3/UVIS		
	Special Requirements: (none)		

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

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	SN-2017GAX	RA: 04 45 49.5000 (71.4562500d) Dec: -59 14 42.50 (-59.24514d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=EXT-STAR Description=[SUPERNOVA TYPE IB]						

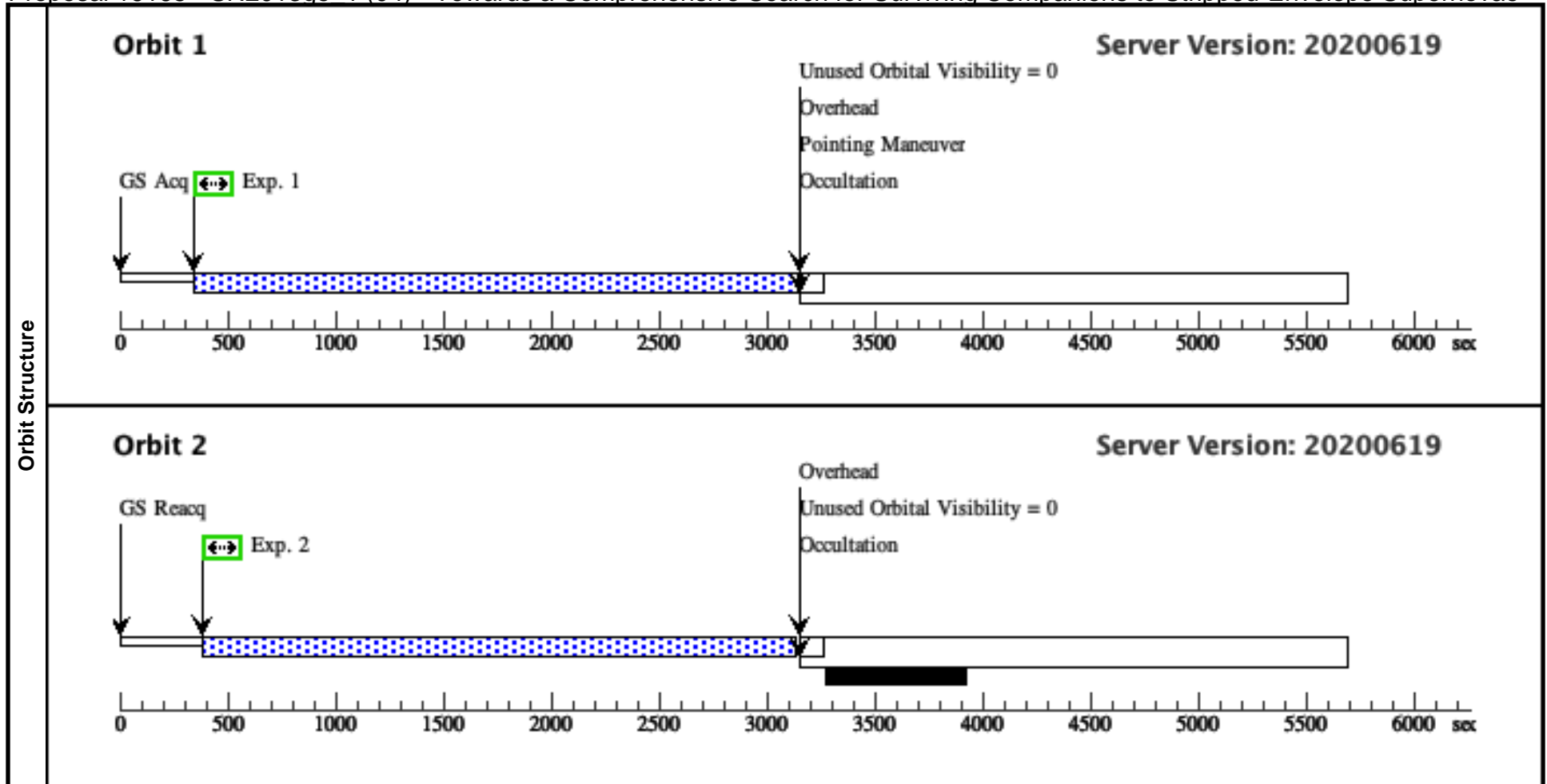
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F555W	(3) SN-2017GAX	WFC3/UVIS, ACCUM, UVIS2	F555W			Pattern 3, Exps 1-1 in SN2017gax (03) (3)	700 Secs (2614 Secs) [==>653.0 Secs (Pattern 1)] [==>654.0 Secs (Pattern 2)] [==>653.0 Secs (Pattern 3)] [==>654.0 Secs (Pattern 4)]	[1]



Proposal 16165 - SN2013ge 1 (04) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

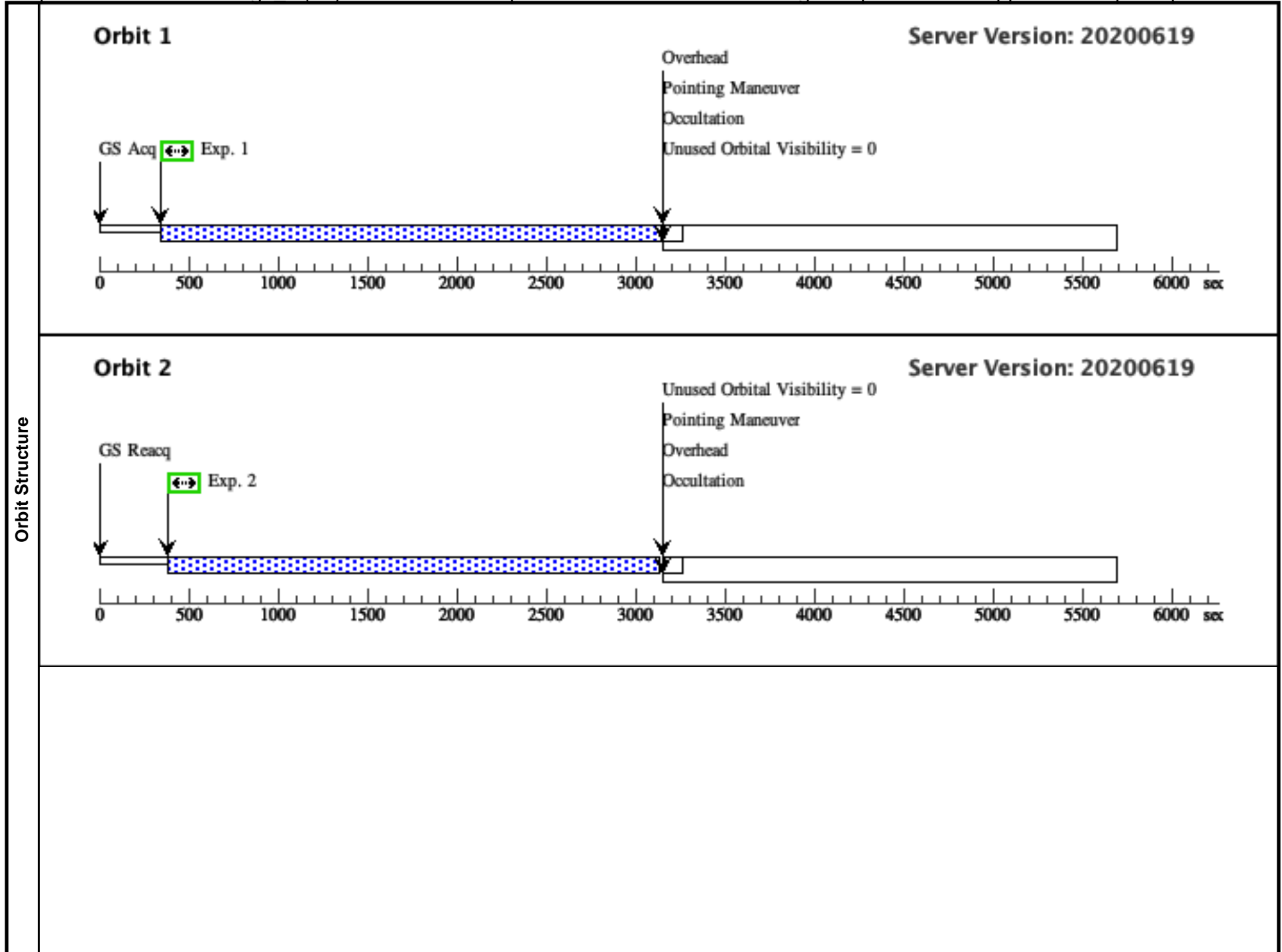
Mon Jan 25 17:00:39 GMT 2021

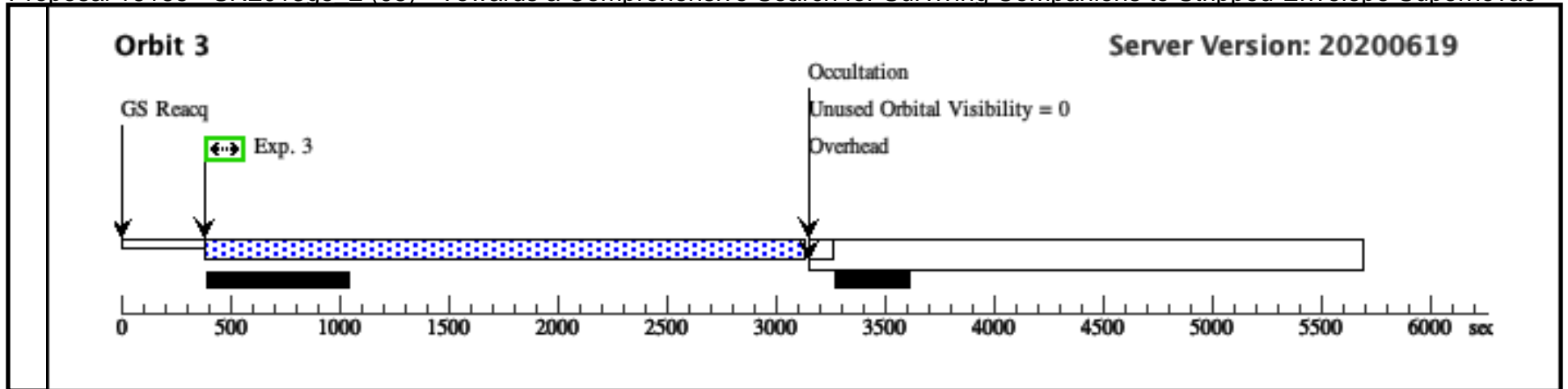
Visit	Proposal 16165, SN2013ge_1 (04), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD			
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=EXT-STAR Description=[SUPERNOVA TYPE IB]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F275W (WFC3UVI S.im.144876 9)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=5	POS TARG 0,0		2500 Secs (2766 Secs) [=>2766.0 Secs]	[1]
2	F275W (WFC3UVI S.im.144876 9)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=5	POS TARG 0.1719,0 .1837		2500 Secs (2757 Secs) [=>2757.0 Secs]	[2]	



Proposal 16165 - SN2013ge 2 (05) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

Visit	Proposal 16165, SN2013ge_2 (05), completed Mon Jan 25 17:00:39 GMT 2021 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 04; AFTER 04 BY 0 D TO 5 D																											
	Fixed Targets	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(4)</td> <td>SN-2013GE</td> <td>RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000</td> <td></td> <td>V=25.0</td> <td>Reference Frame: SIMBAD</td> </tr> <tr> <td colspan="6"> <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=EXT-STAR Description=[SUPERNOVA TYPE IB]</i> </td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=EXT-STAR Description=[SUPERNOVA TYPE IB]</i>				
#		Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																						
(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD																							
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=EXT-STAR Description=[SUPERNOVA TYPE IB]</i>																												
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit																		
	1	F275W (WFC3UVI S.im.144876 9)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=5	POS TARG 0.3437,0 .3674	2500 Secs (2766 Secs) [=>2766.0 Secs]		[1]																		
	2	F275W (WFC3UVI S.im.144876 9)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=5	POS TARG 0.4760,0 .5286	2500 Secs (2757 Secs) [=>2757.0 Secs]		[2]																		
	3	F275W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=5	POS TARG 0.6544,0 .6796	2500 Secs (2757 Secs) [=>2757.0 Secs]		[3]																		

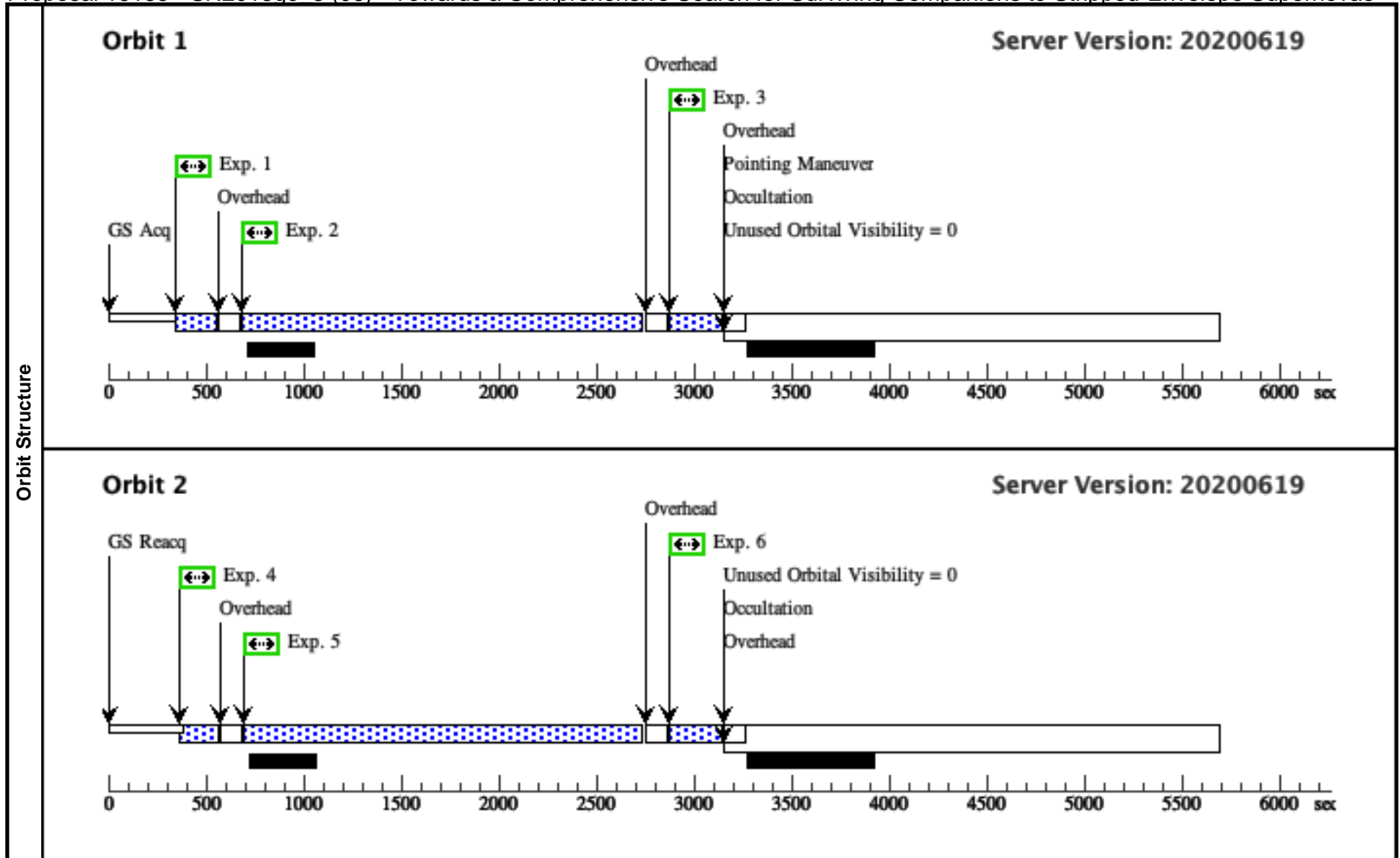




Proposal 16165 - SN2013ge 3 (06) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

Mon Jan 25 17:00:39 GMT 2021

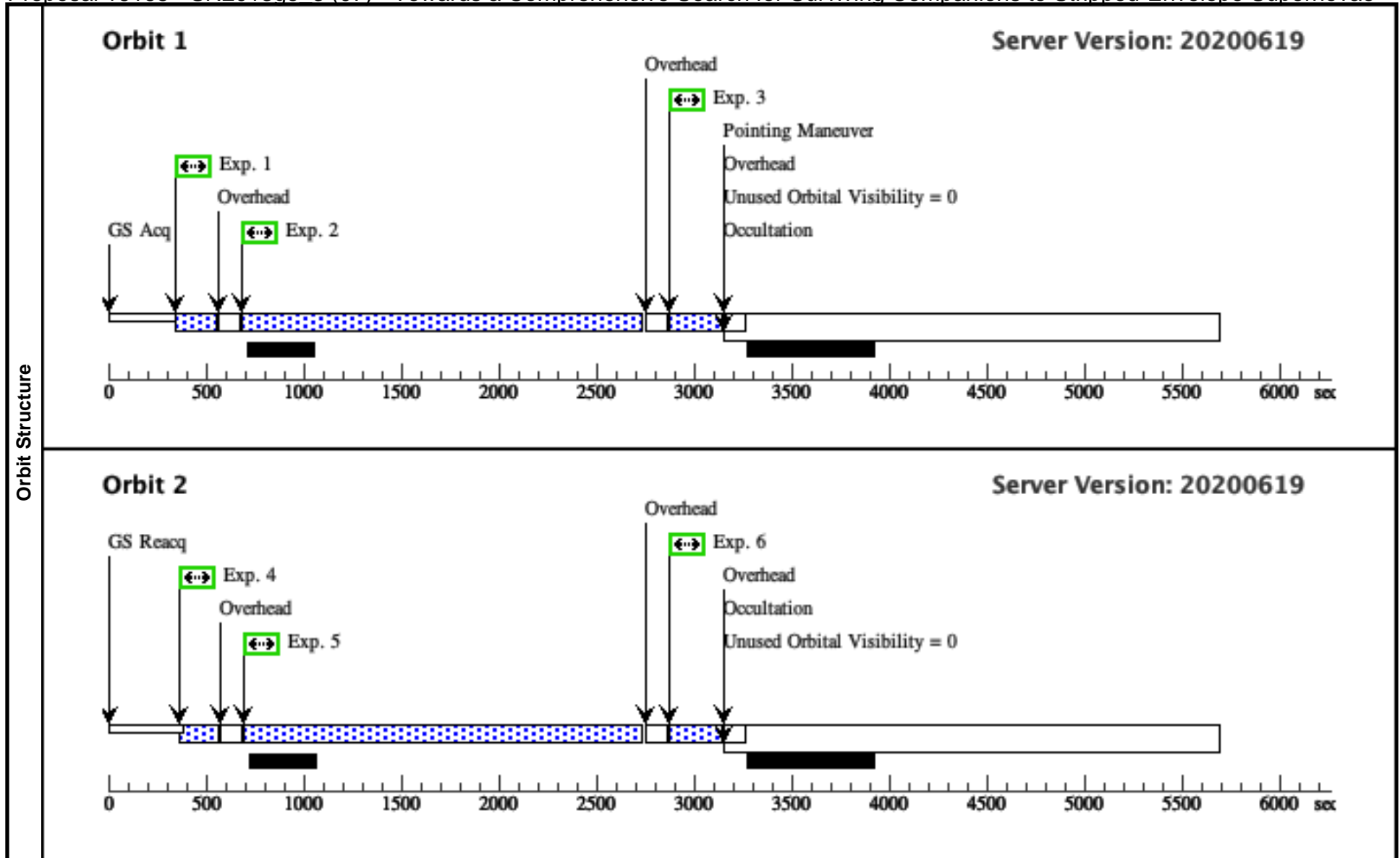
Visit	Proposal 16165, SN2013ge_3 (06), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: GROUP 06.04 WITHIN 1D																											
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(4)</td> <td>SN-2013GE</td> <td>RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000</td> <td></td> <td>V=25.0</td> <td>Reference Frame: SIMBAD</td> </tr> <tr> <td colspan="6"> <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>Category=EXT-STAR</i> <i>Description=[SUPERNOVA TYPE IB]</i> </td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>Category=EXT-STAR</i> <i>Description=[SUPERNOVA TYPE IB]</i>				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																							
(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD																							
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>Category=EXT-STAR</i> <i>Description=[SUPERNOVA TYPE IB]</i>																												
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit																		
	1	F555W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F555W	FLASH=7	POS TARG 0,0		300 Secs (175 Secs) [=>175 Secs]	[1]																		
	2	F336W (WFC3UVI S.im.145235 2)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F336W	FLASH=6	SAME POS AS 1		2500 Secs (2027 Secs) [=>2027.0 Secs]	[1]																		
	3	F438W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F438W	FLASH=9	SAME POS AS 1		300 Secs (250 Secs) [=>250.0 Secs]	[1]																		
	4	F555W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F555W	FLASH=7	POS TARG 0.1785,0 .1908		300 Secs (175 Secs) [=>175 Secs]	[2]																		
	5	F336W (WFC3UVI S.im.144878 0)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F336W	FLASH=6	SAME POS AS 4		2500 Secs (2018 Secs) [=>2018.0 Secs]	[2]																		
	6	F438W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F438W	FLASH=9	SAME POS AS 4		300 Secs (250 Secs) [=>250.0 Secs]	[2]																		



Proposal 16165 - SN2013ge 3 (07) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supernovae

Mon Jan 25 17:00:39 GMT 2021

Visit	Proposal 16165, SN2013ge_3 (07), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 06; AFTER 06 BY 0 D TO 5 D; GROUP 07,04 WITHIN 1D																											
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(4)</td> <td>SN-2013GE</td> <td>RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000</td> <td></td> <td>V=25.0</td> <td>Reference Frame: SIMBAD</td> </tr> <tr> <td colspan="6"> <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>Category=EXT-STAR</i> <i>Description=[SUPERNOVA TYPE IB]</i> </td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>Category=EXT-STAR</i> <i>Description=[SUPERNOVA TYPE IB]</i>				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																							
(4)	SN-2013GE	RA: 10 34 48.4610 (158.7019208d) Dec: +21 39 41.90 (21.66164d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD																							
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>Category=EXT-STAR</i> <i>Description=[SUPERNOVA TYPE IB]</i>																												
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit																		
	1	F555W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F555W	FLASH=7	POS TARG 0.3173,0.3591		300 Secs (175 Secs) [=>175 Secs]	[1]																		
	2	F336W (WFC3UVI S.im.144878 0)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F336W	FLASH=6	SAME POS AS 1		2500 Secs (2027 Secs) [=>2027.0 Secs]	[1]																		
	3	F438W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F438W	FLASH=9	SAME POS AS 1		300 Secs (250 Secs) [=>250 Secs]	[1]																		
	4	F555W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F555W	FLASH=7	POS TARG 0.4958,0.5101		300 Secs (175 Secs) [=>175 Secs]	[2]																		
	5	F336W (WFC3UVI S.im.144878 0)	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F336W	FLASH=6	SAME POS AS 4		2500 Secs (2018 Secs) [=>2018.0 Secs]	[2]																		
	6	F438W	(4) SN-2013GE	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F438W	FLASH=9	SAME POS AS 4		300 Secs (250 Secs) [=>250 Secs]	[2]																		



Proposal 16165 - SN2012fh_HOPR (Z1) - Towards a Comprehensive Search for Surviving Companions to Stripped-Envelope Supern...

Mon Jan 25 17:00:40 GMT 2021

Visit	Proposal 16165, SN2012fh_HOPR (Z1), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: (none) <i>Comments: Visit 01 HOPR</i>									
	(SN2012fh_HOPR (Z1)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
Diagnosics										
Patterns	#	Primary Pattern	Secondary Pattern			Exposures				
	(3)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false			(1), (2)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	SN-2012FH	RA: 10 43 34.0490 (160.8918708d) Dec: +24 53 29.00 (24.89139d) Equinox: J2000		V=25.0	Reference Frame: SIMBAD				
<i>Comments: Category=EXT-STAR Description=[SUPERNOVA TYPE IB]</i>										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F336W	(1) SN-2012FH	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F336W	FLASH=10	GS ACQ SCENARIO BASE1BE	Pattern 3, Exps 1-1 in SN2012fh_HOPR (Z1) (3)	591 Secs (2364 Secs)	
	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]									[1]
	2	F275W (WFC3UVIS.im.1448759)	(1) SN-2012FH	WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F275W	FLASH=8			Pattern 3, Exps 2-2 in SN2012fh_HOPR (Z1) (3)	1250 Secs (5246 Secs)
[==>1312.0 Secs (Pattern 1)] [==>1311.0 Secs (Pattern 2)] [==>1312.0 Secs (Pattern 3)] [==>1311.0 Secs (Pattern 4)]									[2] [3]	

