



13715 - Imaging Spectroscopy of the Gamma-Ray Nova V959 Mon

Cycle: 22, Proposal Category: GO

(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) NOVA-V959-MON	WFC3/UVIS	1	30-May-2015 21:00:37.0	yes
02	(1) NOVA-V959-MON CCDFLAT	STIS/CCD	4	30-May-2015 21:00:42.0	yes
04	(1) NOVA-V959-MON	WFC3/UVIS	1	30-May-2015 21:00:46.0	yes
05	(1) NOVA-V959-MON	STIS/CCD	3	30-May-2015 21:00:49.0	yes

9 Total Orbits Used

ABSTRACT

The Fermi Gamma-Ray Space Telescope has recently revealed that most normal nova explosions probably emit gamma-rays. With energies of greater than 100 MeV, these unexpected gamma-rays do not emanate from radioactive nuclei. They must instead be the end product of particle acceleration in shocks. But what generates these pervasive shocks? To resolve this question, we propose a program of imaging spectroscopy of the

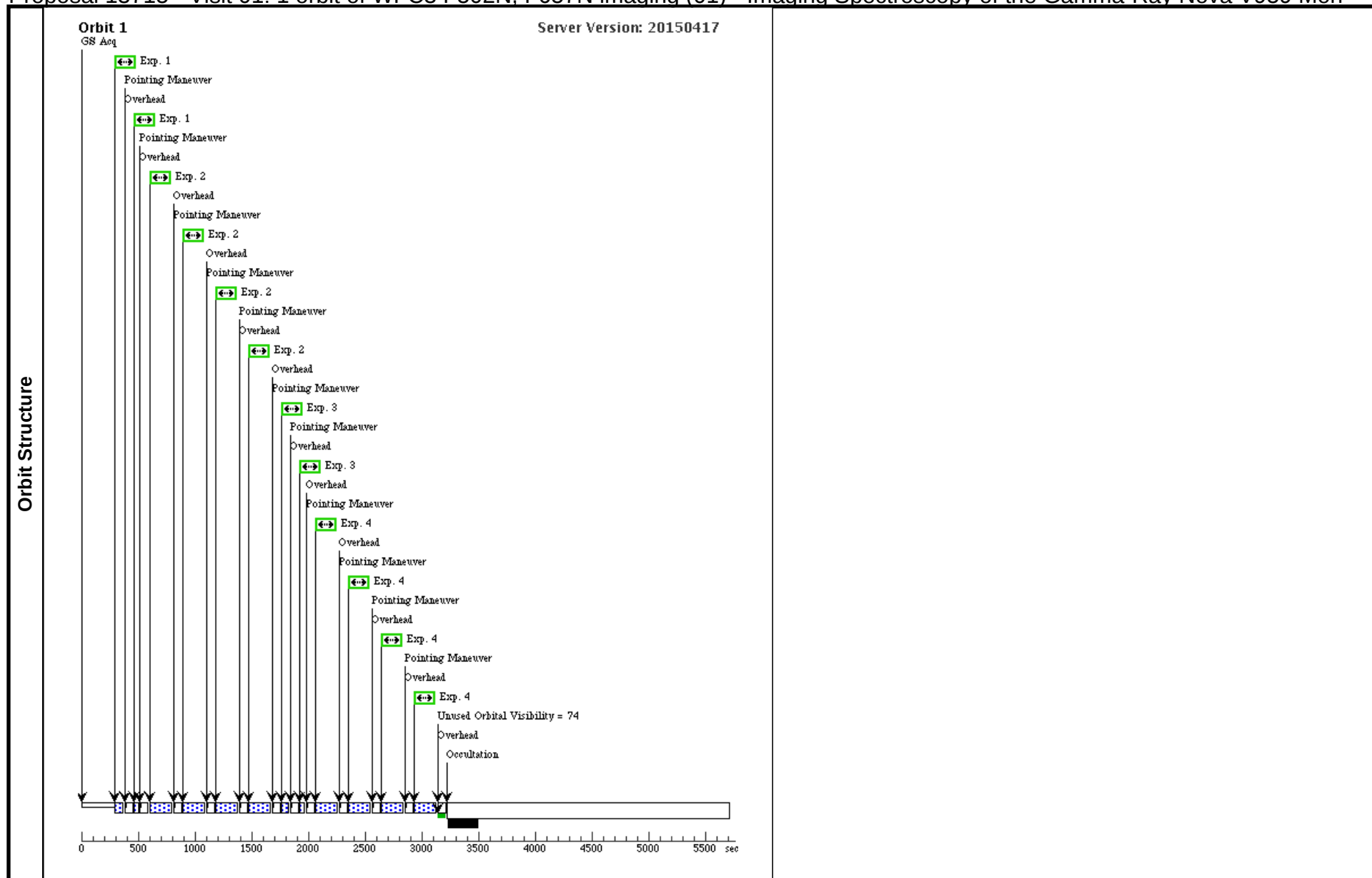
northern gamma-ray nova V959 Mon. Our proposed HST observations will provide the 3-D morphology and kinematic structure of the ejecta, and thereby show which portion of the ejecta drove shocks into which other component of the ejecta. V959 Mon is the perfect target for this research because it is the only one of four classical novae with well-characterized gamma-ray emission to be near enough and large enough to be spatially resolved with HST. Radio images confirm that the ejecta from V959 Mon contain resolvable substructures that will enable us to distinguish between models for the formation of shocks in novae. Uncovering the origin of gamma-ray emission from novae will not only solve the most exciting new puzzle in the field of nova studies, but also answer the long-standing question of how the envelope on a white dwarf is expelled during a nova event. Because the remnant around V959 Mon is less than 1 arcsec in diameter, however, and because of the need to resolve substructure within the remnant to distinguish between different models for the generation of shocks, HST is required for this research. Moreover, since V959 Mon is fading quickly and few other promising gamma-ray novae exist, this work is extremely time critical.

Proposal 13715 - Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01) - Imaging Spectroscopy of the Gamma-Ray Nova V959 Mon

Visit	Proposal 13715, Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01), completed Sun May 31 01:00:51 GMT 2015				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BEFORE 30-NOV-2014:00:00:00 <i>Comments: The purpose of Visit 01 is to take preliminary exploratory images of the expanding and fading remnant of Nova Mon 2012. This visit should be scheduled as soon as possible at the start of Cycle 22 in September or October, to provide intensity and orientation information for determining the optimal slit position angle and exposure time balance between G430L and G750L gratings in the STIS spectroscopic Visit 02 to follow. This imaging visit is for one orbit, for a total of ~860 seconds in F502N ([O III]) and ~860 seconds in F657N (Hα+ [N II]). An initial, short CR-SPLIT=2 exposure is included in each filter to ensure that the central point source (whose combined continuum+atomic line flux is uncertain) is not saturated nor CR-contaminated in at least one exposure. Flash levels set using the minimum ETC recommendation that did not trigger a warning flag.</i>				
Patterns	#	Primary Pattern		Secondary Pattern	Exposures
	(1)	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	(2), (4)
	(3)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=		Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false	(1), (3)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	NOVA-V959-MON	RA: 06 39 38.6000 (99.9108333d) Dec: +05 53 52.90 (5.89803d) Equinox: J2000		V=15.5+/-0.5 B=16.5+/-0.5
<i>Comments: Coordinates are taken from the UKIDSS source UGPS J063938.60+055352.9 identified as the likely progenitor star for Nova Mon 2012.</i>					

Proposal 13715 - Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01) - Imaging Spectroscopy of the Gamma-Ray Nova V959 Mon

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Exp 01: Short 80 sec F502N image	(1) NOVA-V959-M ON	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F502N	FLASH=12		Pattern 3, Exps 1-1 in Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01) (3)	40 Secs (80 Secs) [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	Comments: Short, dithered F502N image to guarantee unsaturated core Post-flash = 12 e- based on ETC WFC3UVIS.im.622417									
	2	Exp 02: 780 second F502N integration (WFC3UVIS.im.622422)	(1) NOVA-V959-M ON	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F502N	FLASH=12		Pattern 1, Exps 2-2 in Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01) (1)	195 Secs (780 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	[1]
	Comments: Post-flash = 12 e- based on ETC WFC3UVIS.im.622422									
	3	Exp 03: Short 80 sec F657N image	(1) NOVA-V959-M ON	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F657N	FLASH=12		Pattern 3, Exps 3-3 in Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01) (3)	40 Secs (80 Secs) [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	Comments: Short, dithered F567N image to guarantee unsaturated core Post-flash = 12 e- based on ETC WFC3UVIS.im.622425									
4	Exp 04: 780 sec F657N exposure (WFC3UVIS.im.6224427)	(1) NOVA-V959-M ON	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F657N	FLASH=11		Pattern 1, Exps 4-4 in Visit 01: 1 orbit of WFC3 F502N, F657N imaging (01) (1)	195 Secs (780 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	[1]	
Comments: Post-flash = 11 e- based on ETC WFC3UVIS.im.622427										



Proposal 13715 - Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) - Imaging Spectroscopy of the Gamma-Ray Nova V959 ...

Sun May 31 01:00:52 GMT 2015

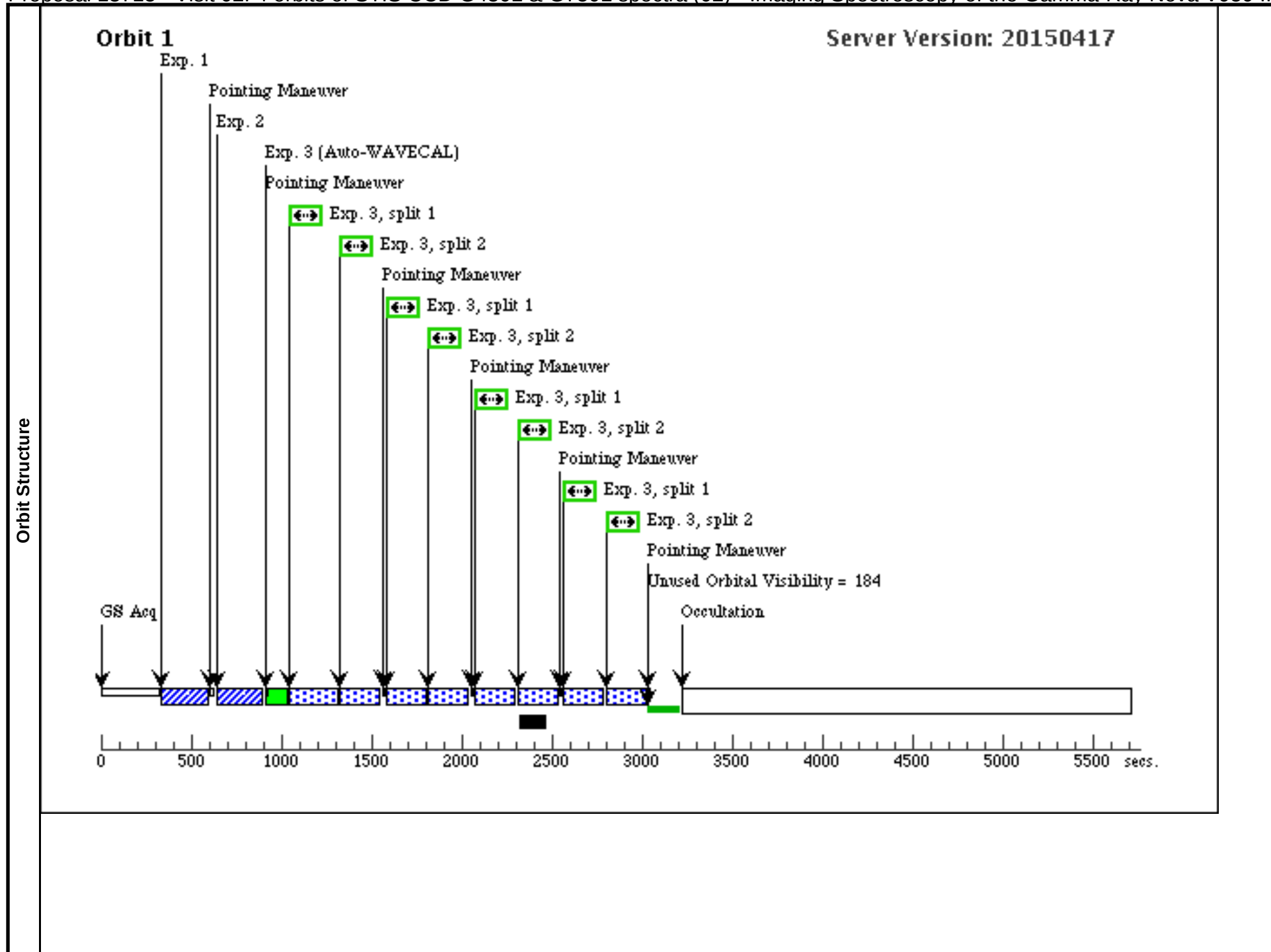
Visit	Proposal 13715, Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02), completed Diagnostic Status: No Diagnostics Scientific Instruments: STIS/CCD Special Requirements: ORIENT 310D TO 310 D Comments: VIST 02 COMMENT: UPDATED 2-DECEMBER-2014: We request that Visit 02 be activated IMMEDIATELY and scheduled as soon as is possible in December 2014. The purpose of Visit 02 is to take STIS CCD G430L and G750L spectra along the major axis of the surprisingly structured, expanding and fading remnant of Nova Mon 2012. Our WFC3 imaging in F502N and F657N from Visit 01 in late November 2014 has shown the remnant to be a beautifully complex, elongated, bipolar structure roughly 1.2" (E-W) and 0.8" (N-S), containing several pairs of arcs and knots of emission in its interior. As discussed in our original Phase II visit comments (included below), we thought it unlikely that the optimal slit PA for a follow up STIS visit would be required before January 2015, but it has surprisingly turned out otherwise. Most of the arcs and knots seen interior to the overall bipolar structure are symmetrically placed along the length of the major, roughly E-W axis of the remnant. Thus the optimal PA for the STIS 52x2 slit is either 85 or 265 deg E of N. These slit PAs translate to ORIENT requirements of 130 and 310, respectively. But the Visit Planner shows that the solar avoidance restriction eliminates any possibility of observing Nov V959 Mon at ORIENT=130 in summer of 2015. Thus we need to use ORIENT=310, which is available IMMEDIATELY, from 26-Nov-2014 through 24-Dec-2014. As our experience with the remnant of Nova T Pyx has shown, the nebular line emission can fade rapidly, so waiting a full year until the December 2015 observing window for ORIENT=310 is extremely counterproductive. We do sincerely apologize for the urgency, but we request that Visit 02 be activated as soon as possible within the current scheduling window. Based on the complex structures seen in the WFC3 F502N and F657N images, and how the arcs and knots in the latter are distributed somewhat orthogonally to the former, we also anticipate the benefit of taking STIS spectra aligned along the minor axis of the remnant as well. As such (and as discussed in our original Phase II comments below), based on the WFC3 results of Visit 01 we have opted to redistribute the orbit allocation between our original Visits 02 and 03. AT THIS TIME we will use FOUR orbits in Visit 02, leaving us four remaining orbits (from the original award of nine orbits) for further WFC3 imaging and STIS spectra at the PA of the minor axis in mid- to late January. The minor axis will require STIS slit PA = 355 deg E of N, equivalent to ORIENT=40. (The solar avoidance eliminates the ORIENT = 220 position from summer 2015). It is also possible that the results of major axis spectra taken here in Visit 02 will suggest that a better PA to avoid spatial-spectral confusion for the F657N structures will be closer to a 45 degree tilt to either axis (so at ORIENT=355 or 40); we will quickly review the Visit 02 spectra and adjust Visit 03 accordingly. To summarize the changes in this re-submission of Visit 02 from our original Phase II proposal, we are: 1) activating Visit 02 for immediate scheduling as soon as possible in December 2014; 2) removing the "on hold" conditional requirement and the "After Visit 01" timing requirement; 3) adding the ORIENT=310 visit orientation requirement; 4) reducing the visit from five to just FOUR orbits, two orbits each for STIS G430L and G750L spectra. ORIGINAL VISIT 02 COMMENTS BELOW: The purpose of Visit 02 is to take STIS CCD G430L and G750L spectra of the expanding and fading remnant of Nova Mon 2012. This visit will likely require a specific narrow range in roll angle to place the STIS slit at the optimum PA to match spatial structures seen in the WFC3 imaging of Visit 01. As such, determining this exact roll angle and the subsequent scheduling window will need to wait until the Visit 01 imaging is taken and quickly analyzed. Visit 02 will thus likely need to be scheduled in a few week window sometime within January to July 2015. The Visit 01 imaging will also help us determine the optimal exposure time balance between G430L and G750L gratings in this visit. Depending on line strengths seen in Visit 01, we may keep the fairly even balance of exposure time between the two gratings as initially structured here, or we might eliminate one grating in favor of the putting all of the exposure time in the other. This spectroscopic visit is for five orbits, with a default plan for a total of ~5950seconds in G430L and ~4560 seconds in G750L. At the start of the Phase II planning we are assuming that there will be several months between the first imaging Visit 01 and the time of the scheduling window for the optimal roll angle/slit PA for this spectroscopic Visit 02. As such, we will most likely require a second, deeper WFC3 imaging Visit 03 to be contemporaneous with Visit 02 here. In the event that the nebular features of the remnant are strong in the imaging Visit 01 and the optimal position angle allows for the spectroscopy Visit 02 to be scheduled quite promptly after Visit 01 (i.e. the imaging of Visit 01 is both contemporary and suitably deep for interpreting the spectra in Visit 02), we will consider moving some or all of the orbits allotted for Visit 03 into the spectroscopy Visit 02 here. But this 'ideal' timing seems relatively unlikely. At the time of this first submission of the Phase II plan, we anticipate needing to add a relatively narrow "Orient Range" visit orientation requirement to this spectroscopic Visit 02, to be specified after the imaging from Visit 01 taken early in Cycle 22 is obtained and quickly analyzed. Visits 02 and 03 will be grouped to be taken close in time to each other (ideally within 2 weeks).			
	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=STIS-ALONG-SLIT Purpose=DITHER Number Of Points=4 Point Spacing=0.5078 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides= Center Pattern=false	(3), (4), (5), (6)
	#	Name	Target Coordinates	Targ. Coord. Corrections
	(1)	NOVA-V959-MON	RA: 06 39 38.6000 (99.9108333d) Dec: +05 53 52.90 (5.89803d) Equinox: J2000	Fluxes V=15.5+/-0.5 B=16.5+/-0.5
	Comments: Coordinates are taken from the UKIDSS source UGPS J063938.60+055352.9 identified as the likely progenitor star for Nova Mon 2012.			
Fixed Targets	Miscellaneous Reference Frame: ICRS			

Proposal 13715 - Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) - Imaging Spectroscopy of the Gamma-Ray Nova V959 ...

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	NovaMon-A CQ (STIS.ta.622 498)	(1) NOVA-V959-M ON	STIS/CCD, ACQ, 50CCD	MIRROR	ACQTYPE=DIFFU SE; CHECKBOX=5; DIFFUSE-CENTER =FLUX-CENTROID			3 Secs (3 Secs) [==>]	[1]
	Comments: Acquisition imaging for Nova Mon 2012, which we expect to be a point source surrounded by small-scale (<0.5 arcsec) nebular structures of possibly similar intensity.									
	2	NovaMon-P EAK (STIS.ta.622 499)	(1) NOVA-V959-M ON	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				3 Secs (3 Secs) [==>]	[1]
	Comments: Peak-up imaging for Nova Mon 2012, which we expect to be a point source surrounded by small-scale (<0.5 arcsec) nebular structures of possibly similar intensity.									
	3	Orbit 1 G43 0L	(1) NOVA-V959-M ON	STIS/CCD, ACCUM, 52X2E1	G430L 4300 A	CR-SPLIT=2		Pattern 2, Exps 3-3 i n Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) (2)	378 Secs (1512 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	[1]
	4	Orbit 2 G43 0L	(1) NOVA-V959-M ON	STIS/CCD, ACCUM, 52X2E1	G430L 4300 A	CR-SPLIT=2		Pattern 2, Exps 4-4 i n Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) (2)	558 Secs (2232 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	[2]
	5	Orbit 3 G75 0L	(1) NOVA-V959-M ON	STIS/CCD, ACCUM, 52X2E1	G750L 7751 A	CR-SPLIT=2		Pattern 2, Exps 5-5 i n Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) (2)	578 Secs (2312 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	[3]

Proposal 13715 - Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) - Imaging Spectroscopy of the Gamma-Ray Nova V959 ...

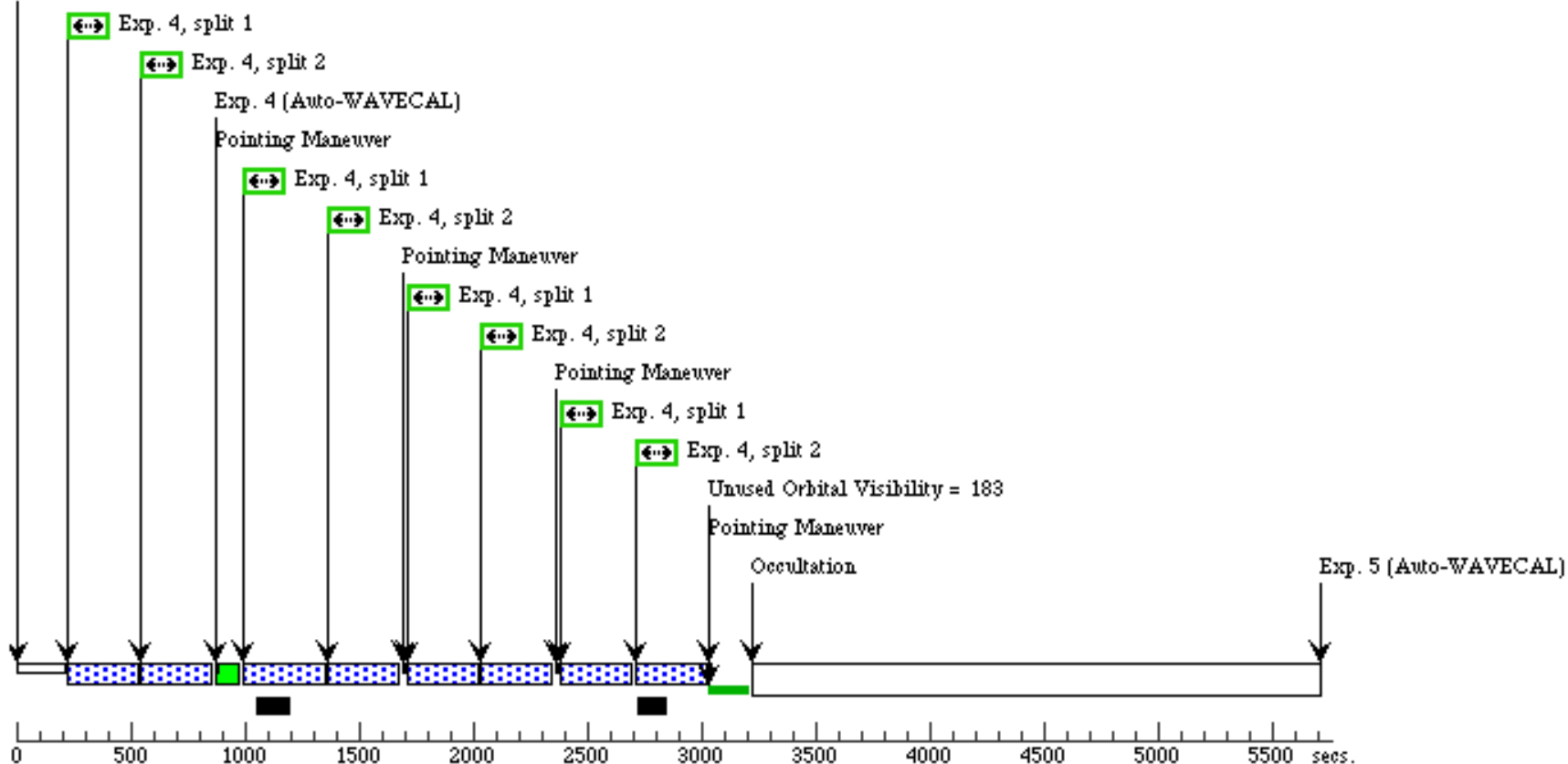
6	Orbit 4 G750L	(1) NOVA-V959-M ON	STIS/CCD, ACCUM, 52X2E1	G750L 7751 A	CR-SPLIT=2	Pattern 2, Exps 6-6 in Visit 02: 4 orbits of STIS CCD G430L & G750L spectra (02) (2)	550 Secs (2200 Secs)	[4]
							[==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	
7	Fringe Flat	CCDFLAT	STIS/CCD, ACCUM, 52X2	G750L 7751 A			[==>(Copy 1)]	[4]
							[==>(Copy 2)]	



Orbit 2

Server Version: 20150417

GS Reacq

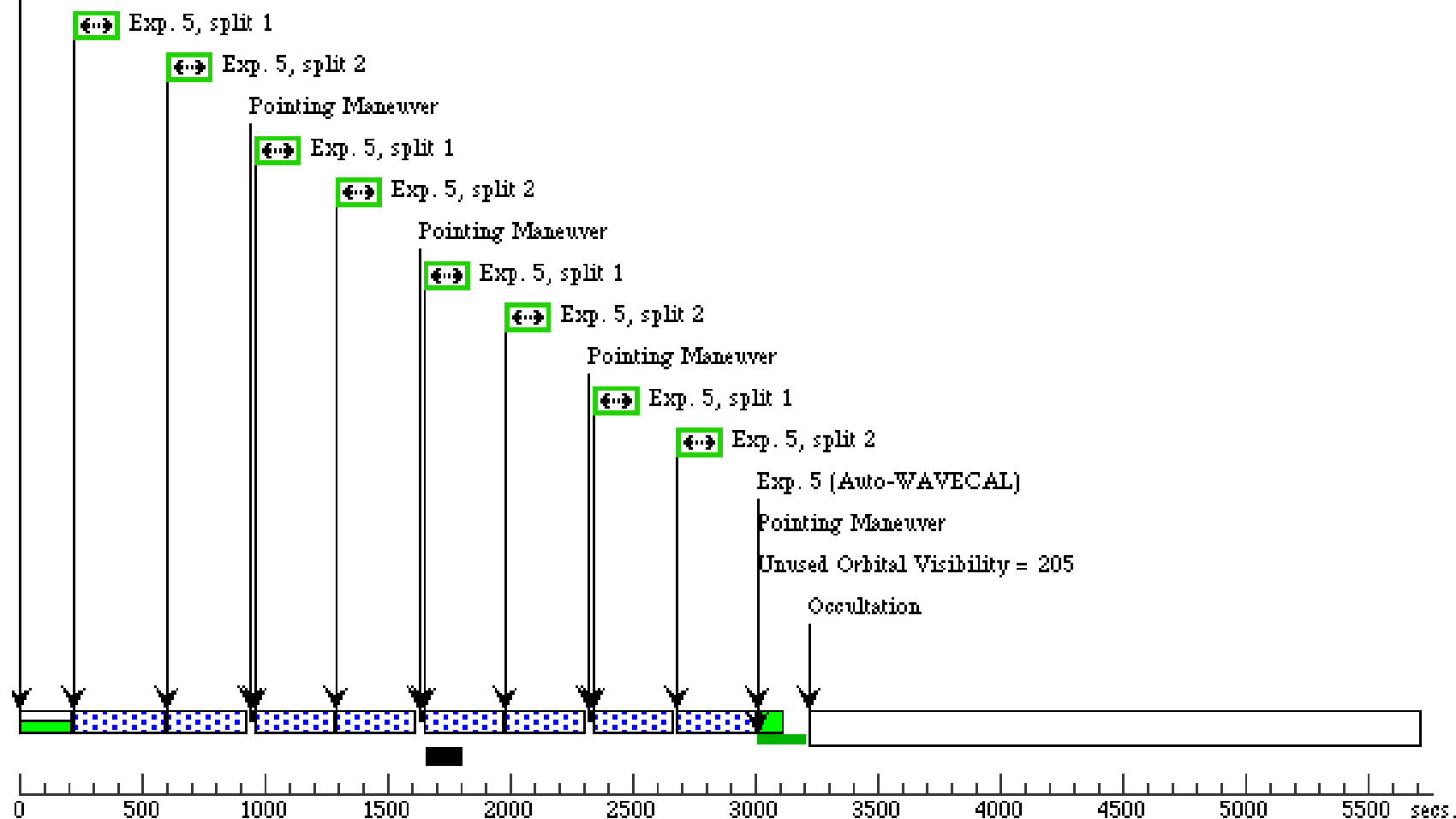


Orbit 3

Server Version: 20150417

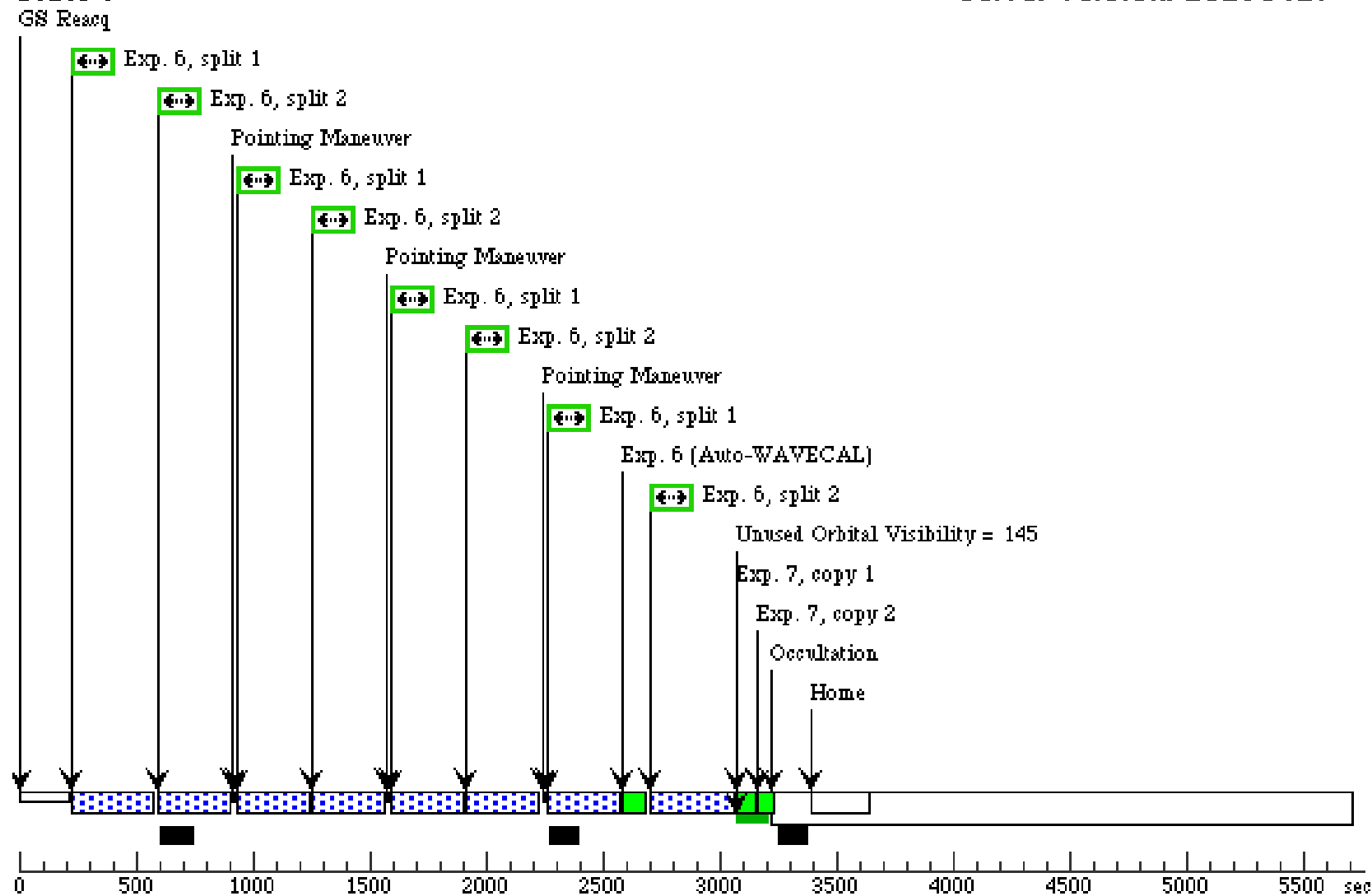
Exp. 5 (cont'd) (Auto-WAVECAL)

GS Reacq



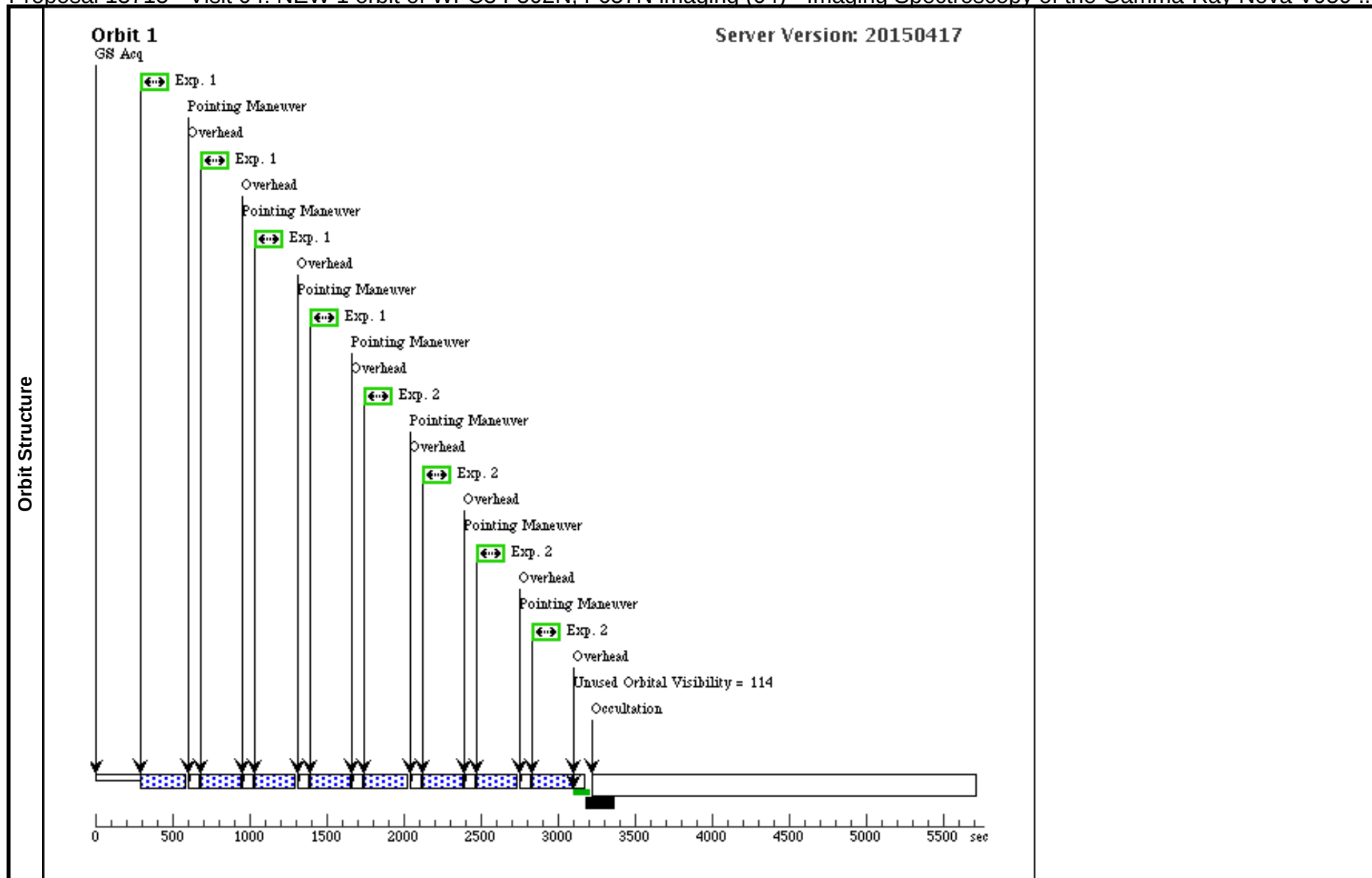
Orbit 4

Server Version: 20150417



Proposal 13715 - Visit 04: NEW 1 orbit of WFC3 F502N, F657N imaging (04) - Imaging Spectroscopy of the Gamma-Ray Nova V959 ...

Visit	Proposal 13715, Visit 04: NEW 1 orbit of WFC3 F502N, F657N imaging (04)						Sun May 31 01:00:52 GMT 2015				
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: WFC3/UVIS										
	Special Requirements: (none)										
Comments: VIST 04 COMMENT: UPDATED 29-MAY-2015: The purpose of this entirely new Visit 04 is to take a second epoch of images of the expanding remnant of Nova Mon 2012. This visit should be scheduled 21-31 days before the spectroscopic Visit 05, in order to provide contemporaneous intensity mapping, yet confirming orientation information for the STIS spectra in Visit 05 to promptly follow. This imaging visit is for one orbit, for a total of ~1050 seconds in F502N ([O III]) and ~1050 seconds in F657N (Halpha+[N II]). Note that use of the "auto-expand" function to maximally pack the orbit severely restricts the scheduling windows, so the requested exposure times are about as large as we can practically make them. Flash levels set using the minimum ETC recommendation that did not trigger a warning flag.											
Patterns	#	Primary Pattern				Secondary Pattern		Exposures			
	(1)	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)	NOVA-V959-MON	RA: 06 39 38.6000 (99.9108333d) Dec: +05 53 52.90 (5.89803d) Equinox: J2000				V=15.5+/-0.5 B=16.5+/-0.5		Reference Frame: ICRS		
	Comments: Coordinates are taken from the UKIDSS source UGPS J063938.60+055352.9 identified as the likely progenitor star for Nova Mon 2012.										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Exp 01: 780 second F502N integration (WFC3UVIS.im.622422)	(1) NOVA-V959-MON	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB		F502N	FLASH=12		Pattern 1, Exps 1-1 in Visit 04: NEW 1 orbit of WFC3 F502N, F657N imaging (04) (1)	262 Secs (1048 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]
	Comments: Post-flash = 12 e- based on ETC WFC3UVIS.im.622422										
	2	Exp 02: 780 sec F657N exposure (WFC3UVIS.im.6224427)	(1) NOVA-V959-MON	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB		F657N	FLASH=11		Pattern 1, Exps 2-2 in Visit 04: NEW 1 orbit of WFC3 F502N, F657N imaging (04) (1)	262 Secs (1048 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]
Comments: Post-flash = 11 e- based on ETC WFC3UVIS.im.622427											



Proposal 13715 - Visit 05: 3 orbits of STIS CCD G430L spectra (05) - Imaging Spectroscopy of the Gamma-Ray Nova V959 Mon

Sun May 31 01:00:53 GMT 2015

Proposal 13715, Visit 05: 3 orbits of STIS CCD G430L spectra (05)

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 310D TO 310 D; AFTER 04 BY 21 D TO 31 D

Comments: VIST 05 COMMENT: UPDATED 29-MAY-2015:

This Visit is closely patterned after the original Visit 03 (which has been eliminated) and closely follows the STIS G430L spectra of Visit 02 (executed in December 2014). Their original visit comments are included below.

The purpose of this newly-added Visit 05 is to use 3 orbits to take STIS CCD G430L spectra along the major axis of the structured, expanding and fading remnant of Nova Mon 2012. Our WFC3 imaging in F502N and F657N from Visit 01 in late November 2014 has shown the remnant to be a beautifully complex, elongated, bipolar structure roughly 1.2" (E-W) and 0.8" (N-S), containing several pairs of arcs and knots of emission in its interior. Our STIS spectra from Visit 02 in December 2014 showed a complex pattern of lobes, arcs and knots in a variety of atomic emission lines with a complex velocity pattern. Given the strength and complexity of these data, we feel the best use of the remaining orbits is to repeat the imaging and spectroscopy after one year, allowing for proper motion expansion to give us full 3D space velocities for these structures. To best isolate proper motion expansion from changes in intensity or radial velocity, we want to repeat the ORIENTAT=310 value of the STIS spectroscopy of Visit 02 in this newly-added Visit 05. Total exposure time will be ~6000 seconds in G430L. Note that use of the "auto-expand" function to maximally pack the orbit severely restricts the scheduling windows, so the requested exposure times are about as large as we can practically make them.

Most of the arcs and knots seen interior to the overall bipolar structure are symmetrically placed along the length of the major, roughly E-W axis of the remnant. Thus the optimal PA for the STIS 52x2 slit is either 85 or 265 deg E of N. These slit PAs translate to ORIENT requirements of 130 and 310, respectively. But the Visit Planner shows that the solar avoidance restriction eliminates any possibility of observing Nov V959 Mon at ORIENT=130 in summer of 2015. Thus we need to use ORIENT=310, which will be available from mid-November through mid-December 2015.

To summarize the changes in this re-submission of our Phase II proposal, we are:

- 1) deleting Visit 03 and re-distributing its four orbits into the new Visits 04 & 05;
- 2) adding new Visit 04 to take WFC3 imaging F502N and F657N to use for proper motion/expansion measurements in comparison to Visit 01 and to provide preliminary testing and contemporaneous spatial mapping for the STIS spectra in Visit 05 to follow---this visit should PRECEDE Visit 05 by 21--31 days;
- 3) adding new Visit 05 to take STIS G430L spectra identically matched to Visit 02 to track spectral evolution in the remnant---this visit should FOLLOW Visit 04 by 21--31 days and match the ORIENT=310 of Visit 02.

Earlier visit comments from the deleted Visit 03

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VIST 03 COMMENT: UPDATED 2-DECEMBER-2014:

We are continuing to keep Visit 03 "on hold" at this time, pending the results of the spectra in Visit 02. As such we have not edited the exposures here to reflect the additional orbit moved into this visit from Visit 02 (see below).

Based on our WFC3 imaging in F502N and F657N from Visit 01 in late November 2014, we have decided to execute the STIS spectroscopy in Visit 02 immediately in December 2014. We have also (as discussed in the original comments included below), decided to redistribute the orbital budget: we will use just FOUR orbits in Visit 02 and add an orbit to this visit. We anticipate using these final remaining four orbits (from our original allocation of nine orbits) to take three orbits of STIS spectra aligned along the minor axis of the remnant, or possibly some other optimal slit PA, along with one orbit of contemporaneous WFC3 imaging. We will quickly review the Visit 02 spectra in late December 2014 and adjust Visit 03 here accordingly. If we decide on both STIS spectra and WFC3 imaging, this visit will naturally need to be split into two coordinated, contemporaneous visits.

To summarize the changes in this re-submission of Visit 03 from our original Phase II proposal, we are:

- 1) adjusting the "on hold" conditional requirement and setting an "After Visit 02" timing requirement;
- We understand that the exposures and orbital budget are no longer correct, but we cannot make the needed changes until we have reviewed the spectral data from Visit 02.

ORIGINAL VISIT 02 COMMENTS:

The purpose of Visit 02 is to take STIS CCD G430L and G750L spectra of the expanding and fading remnant of Nova Mon 2012. This visit will likely require a specific narrow range in roll angle to place the STIS slit at the optimum PA to match spatial structures seen in the WFC3 imaging of Visit 01. As such, determining this exact roll angle and the subsequent scheduling window will need to wait until the Visit 01 imaging is taken and quickly analyzed. Visit 02 will thus likely need to be scheduled in a few week window sometime within January to July 2015. The Visit 01 imaging will also help us determine the optimal exposure time balance between G430L and G750L gratings in this visit. Depending on line strengths seen in Visit 01, we may keep the fairly even balance of exposure time between the two gratings as initially structured here, or we might eliminate one grating in favor of the putting all of the exposure time in the other. This spectroscopic visit is for five orbits, with a default plan for a total of ~5950seconds in G430L and ~4560 seconds in G750L.

At the start of the Phase II planning we are assuming that there will be several months between the first imaging Visit 01 and the time of the scheduling window for the optimal roll angle/slit PA for this spectroscopic Visit 02. As such, we will most likely require a second, deeper WFC3 imaging Visit 03 to be contemporaneous with Visit 02 here. In the event that the nebular features of the remnant are strong in the imaging Visit 01 and the optimal position angle allows for the spectroscopy Visit 02 to be scheduled quite promptly after Visit 01 (i.e. the imaging of Visit 01 is both contemporary and suitably deep for interpreting the spectra in Visit 02), we will consider moving some or all of the orbits allotted for Visit 03 into the spectroscopy Visit 02 here. But this 'ideal' timing seems relatively unlikely.

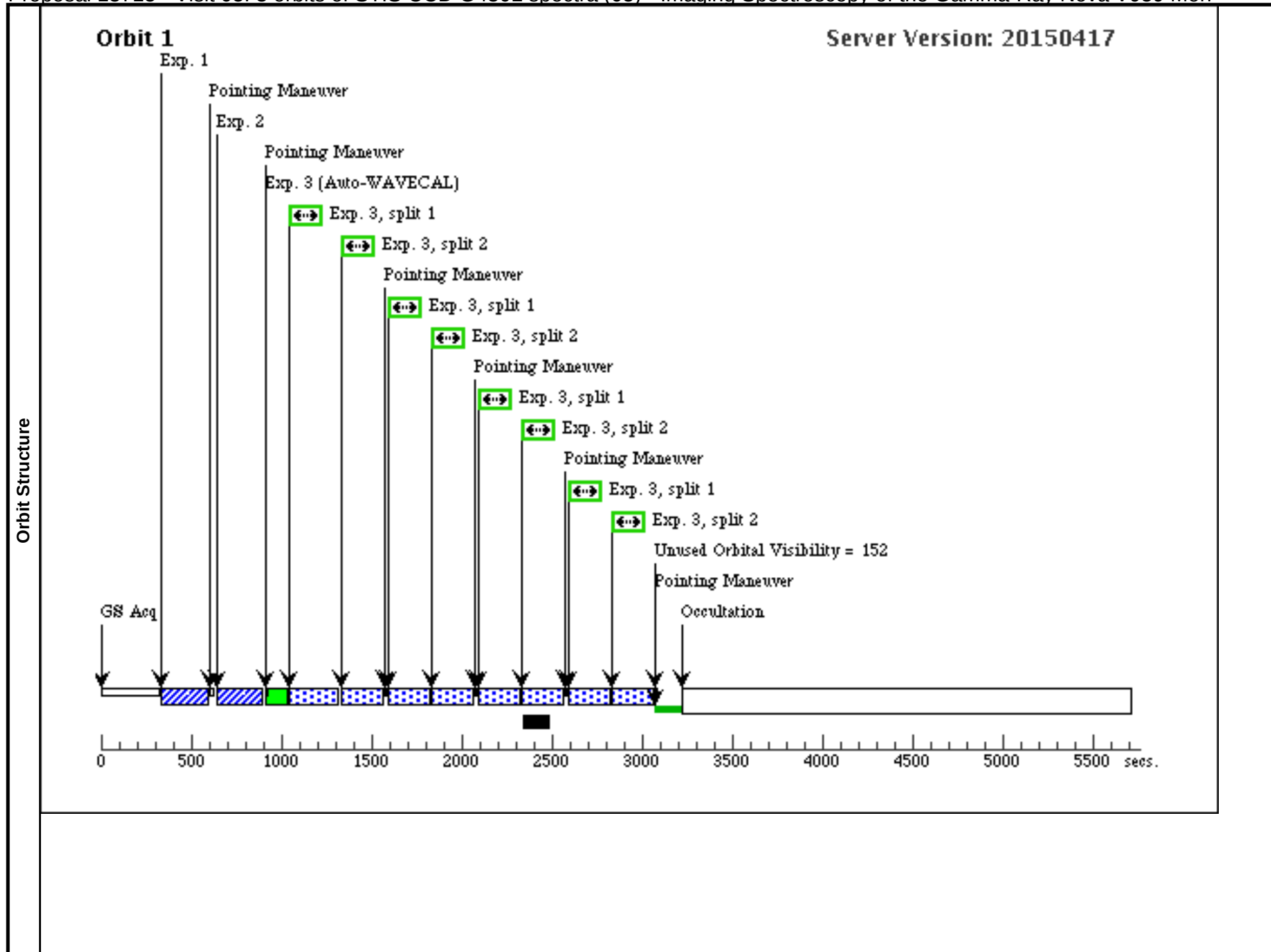
At the time of this first submission of the Phase II plan, we anticipate needing to add a relatively narrow "Orient Range" visit orientation requirement to this spectroscopic Visit 02, to be specified after the imaging from Visit 01 taken early in Cycle 22 is obtained and quickly analyzed. Visits 02 and 03 will be grouped to be taken close in time to each other (ideally within 2 weeks).

Visit

Patterns	#	Primary Pattern		Secondary Pattern	Exposures
		Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		
	(2)	Purpose=DITHER	Pattern Orientation=90.0		(3), (4), (5)
		Number Of Points=4	Angle Between Sides=		
		Point Spacing=0.5078	Center Pattern=false		
		Line Spacing=			

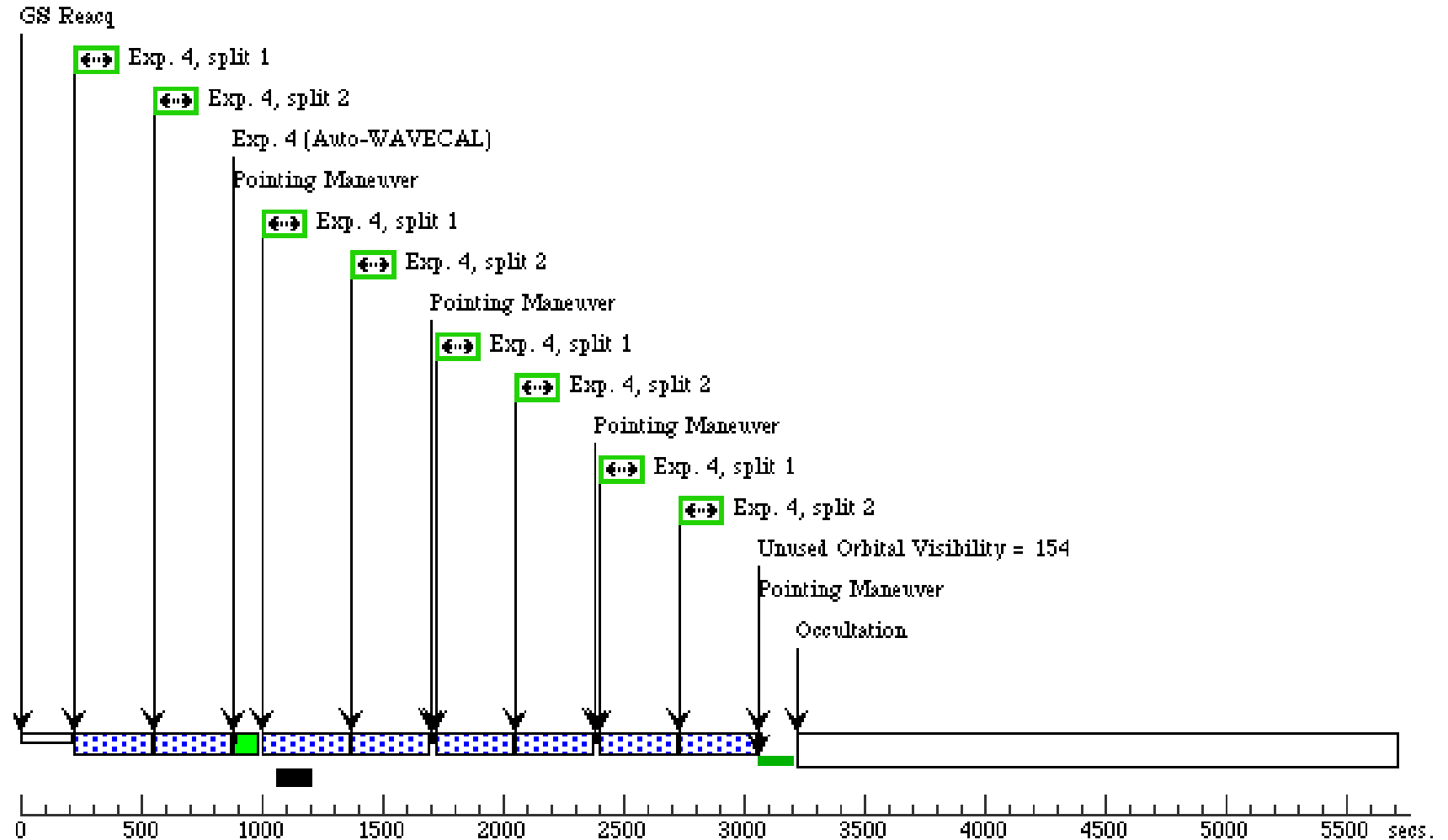
Proposal 13715 - Visit 05: 3 orbits of STIS CCD G430L spectra (05) - Imaging Spectroscopy of the Gamma-Ray Nova V959 Mon

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NOVA-V959-MON	RA: 06 39 38.6000 (99.9108333d) Dec: +05 53 52.90 (5.89803d) Equinox: J2000		V=15.5+/-0.5 B=16.5+/-0.5	Reference Frame: ICRS				
	Comments: Coordinates are taken from the UKIDSS source UGPS J063938.60+055352.9 identified as the likely progenitor star for Nova Mon 2012.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	NovaMon-A CQ (STIS.ta.622 498)	(1) NOVA-V959-MON	STIS/CCD, ACQ, 50CCD	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			3 Secs (3 Secs) [==>]	[1]
	Comments: Acquisition imaging for Nova Mon 2012, which we expect to be a point source surrounded by small-scale (<0.5 arcsec) nebular structures of possibly similar intensity.									
	2	NovaMon-P EAK (STIS.ta.622 499)	(1) NOVA-V959-MON	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				3 Secs (3 Secs) [==>]	[1]
	Comments: Peak-up imaging for Nova Mon 2012, which we expect to be a point source surrounded by small-scale (<0.5 arcsec) nebular structures of possibly similar intensity.									
	3	Orbit 1 G430L	(1) NOVA-V959-MON	STIS/CCD, ACCUM, 52X2E1	G430L 4300 A	CR-SPLIT=2		Pattern 2, Exps 3-3 in Visit 05: 3 orbits of STIS CCD G430L spectra (05) (2)	385 Secs (1540 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	[1]
	4	Orbit 2 G430L	(1) NOVA-V959-MON	STIS/CCD, ACCUM, 52X2E1	G430L 4300 A	CR-SPLIT=2		Pattern 2, Exps 4-4 in Visit 05: 3 orbits of STIS CCD G430L spectra (05) (2)	565 Secs (2260 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	[2]
	5	Orbit 3 G750L	(1) NOVA-V959-MON	STIS/CCD, ACCUM, 52X2E1	G430L 4300 A	CR-SPLIT=2		Pattern 2, Exps 5-5 in Visit 05: 3 orbits of STIS CCD G430L spectra (05) (2)	560 Secs (2240 Secs) [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)] [==>(Pattern 3, Split 1)] [==>(Pattern 3, Split 2)] [==>(Pattern 4, Split 1)] [==>(Pattern 4, Split 2)]	[3]



Orbit 2

Server Version: 20150417



Orbit 3

Server Version: 20150417

