



12926 - Local Thermonuclear Runaways in Dwarf Novae?

Cycle: 20, Proposal Category: GO

(Availability Mode: AVAILABLE)

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) U-GEM	COS/FUV	3	11-Nov-2013 21:01:22.0	yes
02	(1) U-GEM	COS/FUV	1	11-Nov-2013 21:01:38.0	yes
03	(1) U-GEM	COS/FUV	1	11-Nov-2013 21:01:47.0	yes
04	(1) U-GEM	COS/FUV	1	11-Nov-2013 21:01:56.0	yes
05	(1) U-GEM	COS/FUV	1	11-Nov-2013 21:02:05.0	yes
06	(1) U-GEM	COS/FUV	1	11-Nov-2013 21:02:13.0	yes
4A	(1) U-GEM	S/C	1	11-Nov-2013 21:02:17.0	yes
4B	(2) TARGET1-SAFE-TARGET	COS/FUV	1	11-Nov-2013 21:02:23.0	yes

10 Total Orbits Used

ABSTRACT

We have no hope of understanding the structure and evolution of a class of astrophysical objects if we cannot identify the dominant energy source of those objects. The Disk Instability Model (DIM) postulates that Dwarf Nova (DN) outbursts are powered by runaway accretion from an accretion disk onto a White Dwarf (WD) in a red dwarf-WD mass transferring binary. Ominously, HST observations (e.g. Sion et al. 2001) of WD surface abundances hint at a significant shortcoming of the DIM. The data from the present proposal will be able to unequivocally demonstrate if the observed highly Carbon-depleted and Nitrogen-enhanced abundances on WD surfaces (NOT predicted by DIM) vary with binary orbital phase, or throughout a DN quiescence cycle, or from cycle to cycle. These same data will test if predicted (but never observed) Local Thermonuclear Runaways ("Nuclear-powered mini-novas") occur on the WDs of DN. Such events could trigger or even power DN, providing the long-sought physical mechanism of DN eruptions that DIM lacks. As a "free" bonus, the same data may also directly detect the diffusion of accreted metals in a WD atmosphere for the first time, or provide significant limits on the diffusion rate.

OBSERVING DESCRIPTION

The core goals of this proposal are 1) to detect and monitor abundance variations on the white dwarf of the dwarf nova U Gem during one quiescence cycle, and 2) to determine if the WD surface abundances vary from one quiescence cycle to the next. To achieve our goals we will need to acquire spectra taken at given intervals starting when the system recovers from outburst. This makes our proposal a Target of Opportunity (ToO), with 100% chance of occurring once every 4-6 months. We request observations at four epochs during one outburst cycle: roughly 2, 7, 20 and 60 days after outburst ends. The first observations should be taken as soon as possible after the system returns to quiescence, when the abundance pattern is most likely to have been altered due to the outburst activity. At the first epoch we request 3 HST orbits, which matches the orbital period of U Gem. This will enable us to definitively search for abundance variations ACROSS the surface of the WD, (as we see the WD from different angles), as hinted at by the work of Long et al (2006). At 7, 20 and 60 days after eruption we conservatively request only 1 HST orbit to determine if significant variations in abundances occur due to diffusion. Only if strongly phase-dependent variations are seen in the first 3 orbits will we request, in the future, 3-orbit visits at EVERY epoch. Finally, we request one more orbit at 7 days after the NEXT eruption, to compare the WD surface composition at similar times in different outburst cycles.

The orbital period of U Gem is 4.25 hr with a maximum orbital radial velocity of 107.1 ± 2.1 km/s. For an exposure time of 10 minutes, taken at orbital phase ± 0.3 or ± 0.7 , when the velocity shift of the spectral lines changes the fastest, the smearing of the spectral lines will only be ± 30 km/s, i.e. $0.13 \pm 0.01 \text{ \AA}$ at $1300 \pm 10 \text{ \AA}$. The rotational velocity of the WD will reduce the resolution to $100 \text{ km/s} \pm 1$ (R ± 3000). We chose the G140L grating to

Proposal 12926 (STScI Edit Number: 7, Created: Monday, November 11, 2013 9:02:31 PM EST) - Overview

obtain excellent spectral coverage (900 to 2200 Å) with COS, to observe a wide variety of CNO AND metal lines (see Godon et al 2006 for the detailed lists of ion lines we will use). The strongest-line producing ions we will monitor are: HeII, CI, CII, CIV,NI,NII,NIII,OIV,SiII, SiIII, SiIV,AIII,SI,SIV,SVI . The 2.5 arcsec aperture of COS is no problem as there are no stars brighter than 20th magnitude within 20 arcsec of U Gem.

Detailed line lists in Godon et al 2008 show that multiple ionization stages of each of C, N, O, P, Si, and S are available in this wavelength range...more than sufficient for our abundance analyses. (The 1155-1260 Å gap, including Lyman alpha, makes no difference to our analyses.)

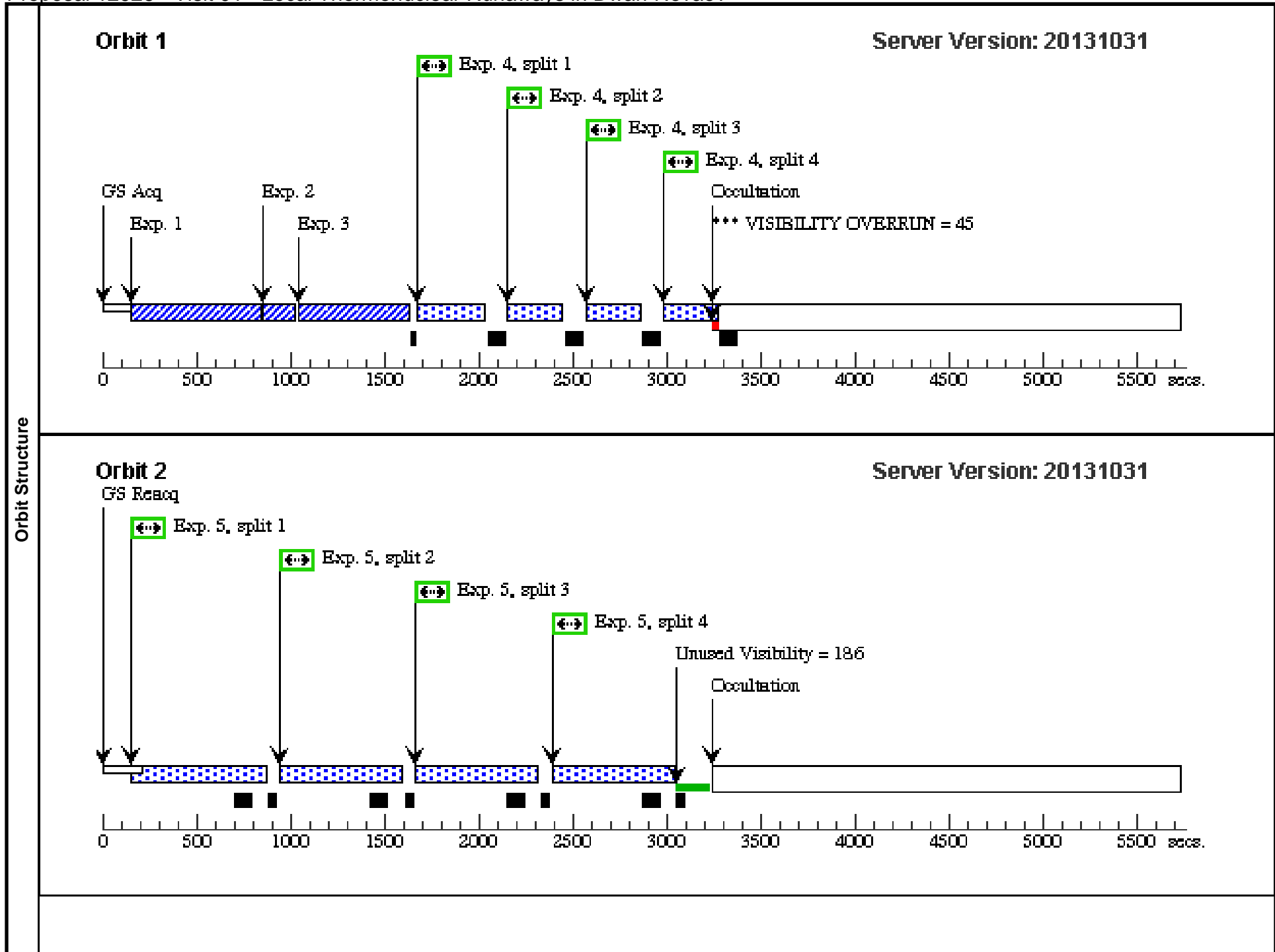
The minimum SNR needed to unambiguously distinguish abundance changes of a few times solar (see simulation in Fig. 2) is 35 (all previous observations only achieved $SNR < 15$ and could only demonstrate qualitatively that CNO abundances are non-solar). Given the orbital visibility time for U Gem of 53 min, 22 min overhead for the first orbit (6 min for guide star acquisition, 6 min for target acquisition, 8 min for the first exposure in orbit and 1x2 min for 2 additional exposures) we have 1860 s per orbit to expose. Using a mean of 4 calibrated FOS spectra (y11i0402t, y11i0403t, y11i0502t and y11i0503t) obtained during quiescence we determined the SNR achievable in the available observing time. For the G140L grating we used a Kurucz stellar atmosphere equivalent to an OV5 star, scaling it to a flux of $5e-14$ at 1700 Å, determined from the FOS spectra. We find that $SNR=35-40$ is easily achieved in 1 orbit with COS.

U Gem outbursts last approximately 10-20 days with a rise from minimum (≈ 14.5 mag) to maximum brightness (≈ 9 mag) lasting about 2 days, with a subsequent return to minimum $\approx 8-18$ days later. This means that STScI will be alerted at least two weeks prior to when the observations have to begin. In fact the continuous AAVSO monitoring of U Gem is so complete that we will be able to give STScI a heads up about 30 days before each anticipated eruption. We will take the first observation as soon as the system returns to quiescence. We will be able to give to STScI a precise date of when the observations should be taken one week in advance, once the onset of decline has started. We will work closely with STScI planners to minimize disruption to the HST schedule. By observing only up to 9 weeks after the return to quiescence, we ensure that our last observations will not occur during the next outburst, since the shortest time between any two U Gem outbursts is 100 days.

Proposal 12926 - Visit 01 - Local Thermonuclear Runaways in Dwarf Novae?

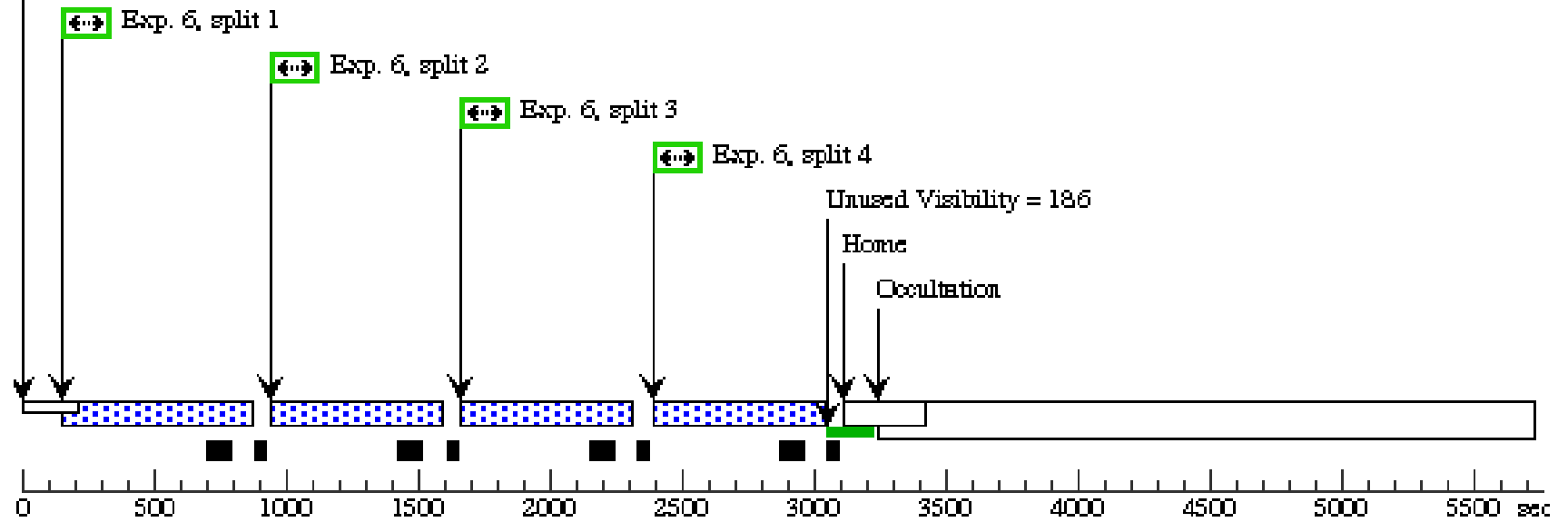
Tue Nov 12 02:02:32 GMT 2013

Visit	Proposal 12926, Visit 01, completed Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: (none)									
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Fixed Targets		#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(412280)	(1) U-GEM	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2			90.0 Secs (90 Secs) [==>]	[1]
	2	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A				90.0 Secs (90 Secs) [==>]	[1]
	3	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=0.05			90.0 Secs (90 Secs) [==>]	[1]
	4	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=ALL; BUFFER-TIME=30 0			240.0 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
	5	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=45 0; FP-POS=ALL			600.0 Secs (2400 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[2]
	6	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=45 0; FP-POS=ALL			600.0 Secs (2400 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[3]



Orbit 3

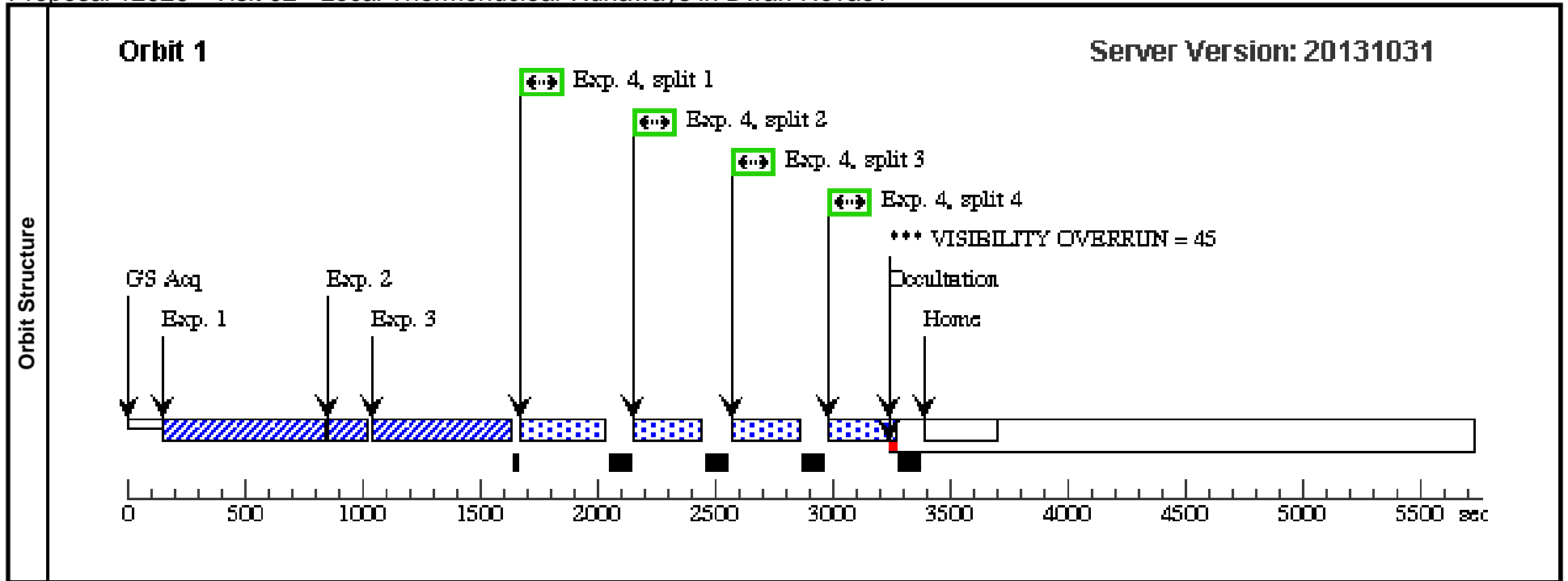
GS Req



Proposal 12926 - Visit 02 - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:35 GMT 2013

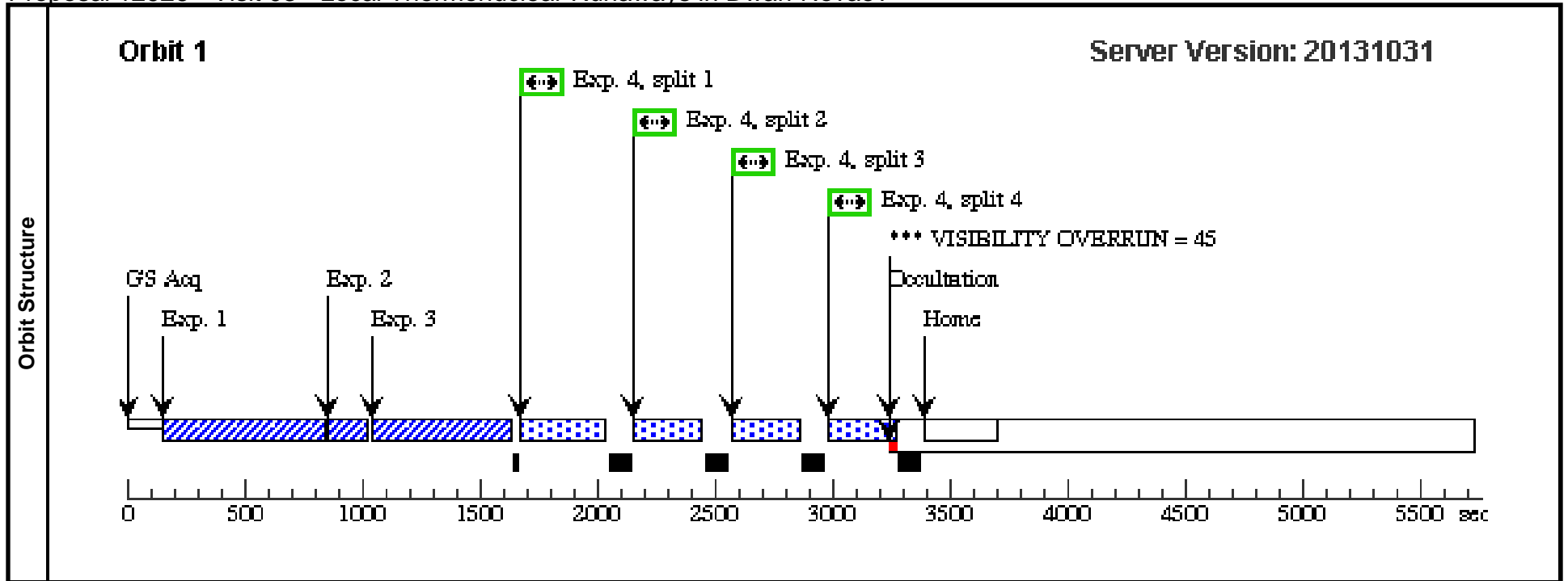
Visit	Proposal 12926, Visit 02, completed Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: AFTER 01 BY 5 D TO 6 D									
	(Visit 02) Warning (Orbit Planner): VISIBILITY OVERRUN									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(412280)	(1) U-GEM	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2			90.0 Secs (90 Secs) [==>]	[1]
	2	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A				90.0 Secs (90 Secs) [==>]	[1]
	3	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=0.05			90.0 Secs (90 Secs) [==>]	[1]
	4	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=30 0; FP-POS=ALL			240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]



Proposal 12926 - Visit 03 - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:36 GMT 2013

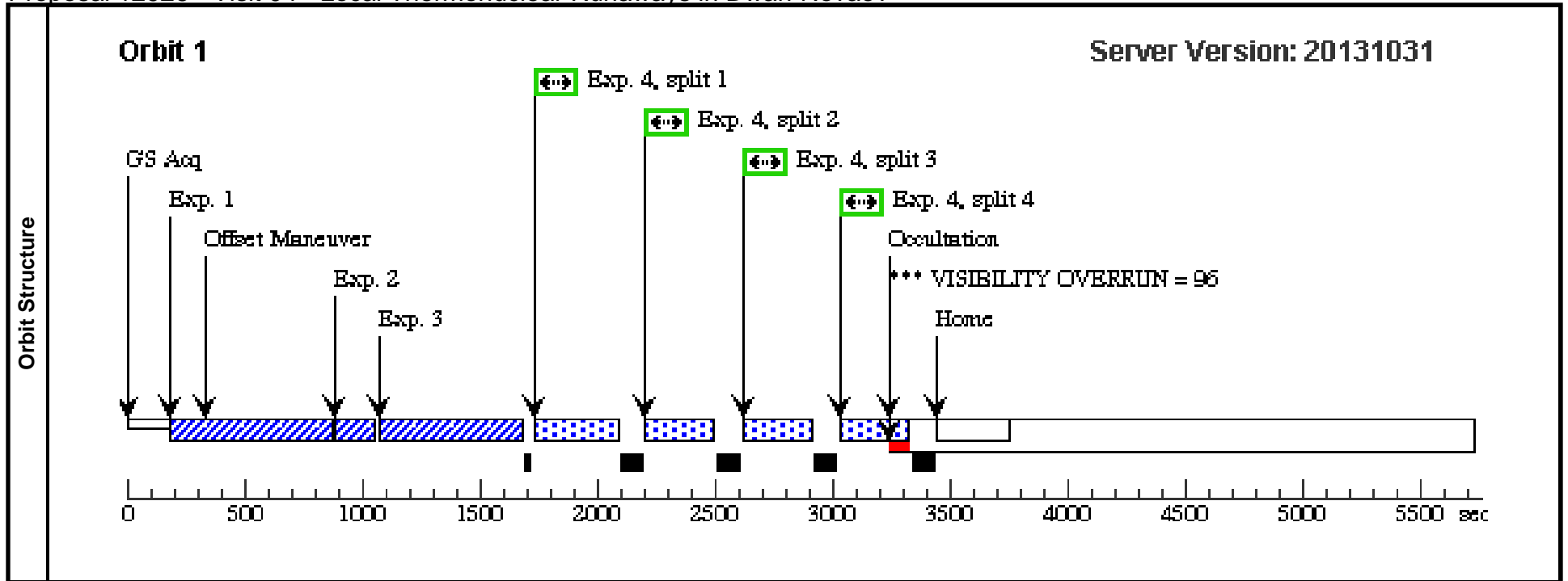
Visit	Proposal 12926, Visit 03, withdrawn Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: AFTER 01 BY 18 D TO 19 D									
	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN									
Diagnostics										
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(412280)	(1) U-GEM	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2			90.0 Secs (90 Secs) [==>]	[1]
	2	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A				90.0 Secs (90 Secs) [==>]	[1]
	3	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=0.05			90.0 Secs (90 Secs) [==>]	[1]
	4	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=30 0; FP-POS=ALL			240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]



Proposal 12926 - Visit 04 - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:37 GMT 2013

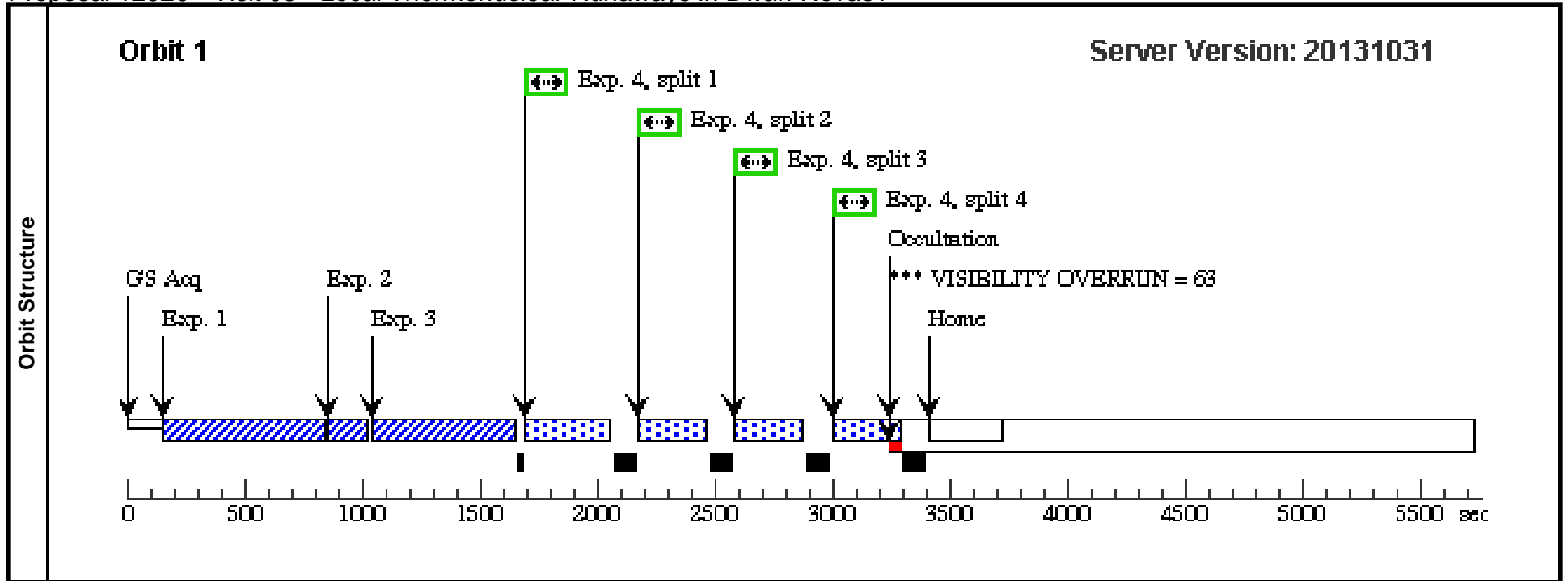
Visit	Proposal 12926, Visit 04, completed Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: ORIENT 200D TO 80 D; BETWEEN 2013.029:11:30:37 AND 2013.032:11:30:39									
	(Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN									
Diagnosics										
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(412280)	(1) U-GEM	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2	USE OFFSET V04S AF; GS ACQ SCENARI O BASE1B3		90.0 Secs (90 Secs) [==>]	[1]
	2	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A		USE OFFSET V04S AF		90.0 Secs (90 Secs) [==>]	[1]
	3	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=1.3	USE OFFSET V04S AF		90.0 Secs (90 Secs) [==>]	[1]
	4	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=30 0; FP-POS=ALL	USE OFFSET V04S AF		240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]



Proposal 12926 - Visit 05 - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:37 GMT 2013

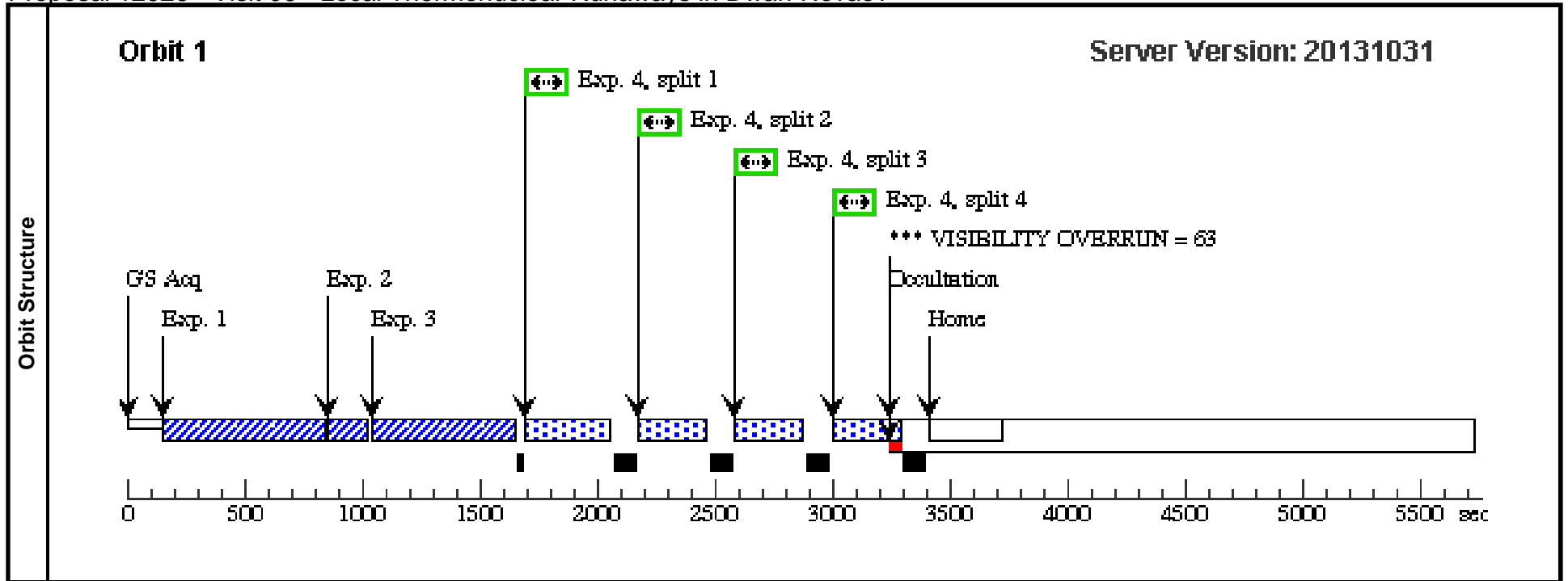
Visit	Proposal 12926, Visit 05, implementation Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: ORIENT 259D TO 300 D; BETWEEN 02-DEC-2013 AND 09-DEC-2013:00:00:00									
	(Visit 05) Warning (Orbit Planner): VISIBILITY OVERRUN									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(412280)	(1) U-GEM	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2			90.0 Secs (90 Secs) [==>]	[1]
	2	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A				90.0 Secs (90 Secs) [==>]	[1]
	3	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=1.3			90.0 Secs (90 Secs) [==>]	[1]
	4	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=30 0; FP-POS=ALL			240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]



Proposal 12926 - Visit 06 - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:38 GMT 2013

Visit	Proposal 12926, Visit 06, completed Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: (none) <i>Comments: This visit replaces visit 03.</i>									
	(Visit 06) Warning (Orbit Planner): VISIBILITY OVERRUN									
Diagnostics										
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(412280)	(1) U-GEM	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2			90.0 Secs (90 Secs) [==>]	[1]
	2	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A				90.0 Secs (90 Secs) [==>]	[1]
	3	(412280)	(1) U-GEM	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=1.3			90.0 Secs (90 Secs) [==>]	[1]
	4	(412293)	(1) U-GEM	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=30 0; FP-POS=ALL			240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]



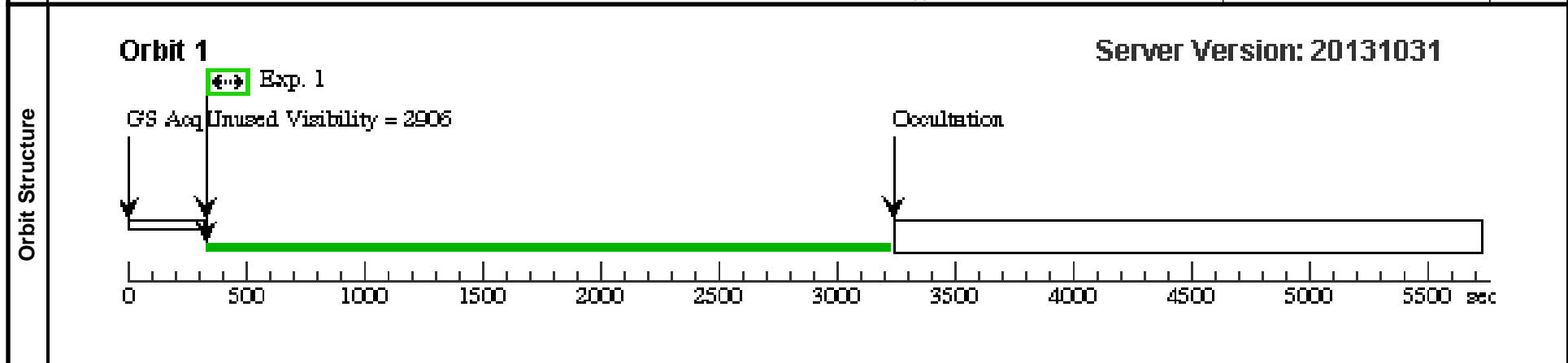
Proposal 12926 - Visit 4A - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:39 GMT 2013

Visit	Proposal 12926, Visit 4A, completed Diagnostic Status: No Diagnostics Scientific Instruments: S/C Special Requirements: ORIENT 200D TO 80 D Comments: This visit allocates and sets up the safe position offset slow for visit 04 which will use that slow.				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) U-GEM	S/C, DATA, V1				POS TARG 235.081, -234.940; SAVE OFFSET V04 SAF; SPEC COM INSTR ECSLOTSET; GS ACQ SCENARI O BASE1B3; QESIPARM ANGL E 1.6; QESIPARM DIST 9. 062		5 Secs (5 Secs) [==>]



Proposal 12926 - Visit 4B - Local Thermonuclear Runaways in Dwarf Novae?

Tue Nov 12 02:02:39 GMT 2013

Visit	Proposal 12926, Visit 4B, withdrawn Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: ORIENT 200D TO 80 D; BETWEEN 2013.029:11:30:37 AND 2013.032:11:30:39 <i>Comments: This visit is for BOP checking the "safe" target only and should not execute onboard HST.</i>																																																											
	Diagnosics (Visit 4B) Warning (Orbit Planner): NO PLATE ID SPECIFIED FOR FIXED TARGET (Visit 4B) Warning (Orbit Planner): NO PLATE ID SPECIFIED FOR FIXED TARGET (Visit 4B) Warning (Orbit Planner): NO PLATE ID SPECIFIED FOR FIXED TARGET (Visit 4B) Warning (Orbit Planner): NO PLATE ID SPECIFIED FOR FIXED TARGET (Visit 4B) Warning (Orbit Planner): VISIBILITY OVERRUN																																																											
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>(1)</td> <td>U-GEM</td> <td>RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000</td> <td></td> <td>V=14.2</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td>(2)</td> <td>TARGET1-SAFE-TARGET</td> <td>Offset from U-GEM RA Offset: 0.01 Secs Dec Offset: 9.058 Arcsec</td> <td></td> <td>V=20</td> <td>Offset Position (TARGET1-SAFE-TARGET)</td> </tr> </tbody> </table> <i>Comments: This target is a blank piece of sky which is the bright object safe pointing and is 9.062 arcseconds away at a PA 1.6 degrees from Target #1.</i>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS	(2)	TARGET1-SAFE-TARGET	Offset from U-GEM RA Offset: 0.01 Secs Dec Offset: 9.058 Arcsec		V=20	Offset Position (TARGET1-SAFE-TARGET)																																
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(1)	U-GEM	RA: 07 55 5.2400 (118.7718333d) Dec: +22 00 5.10 (22.00142d) Equinox: J2000		V=14.2	Reference Frame: ICRS																																																							
(2)	TARGET1-SAFE-TARGET	Offset from U-GEM RA Offset: 0.01 Secs Dec Offset: 9.058 Arcsec		V=20	Offset Position (TARGET1-SAFE-TARGET)																																																							
Exposures	<table border="1"> <thead> <tr> <th>#</th> <th>Label (ETC Run)</th> <th>Target</th> <th>Config,Mode,Aperture</th> <th>Spectral Els.</th> <th>Opt. Params.</th> <th>Special Reqs.</th> <th>Groups</th> <th>Exp. Time (Total)/[Actual Dur.]</th> <th>Orbit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(412280)</td> <td>(2) TARGET1-SAFE-TARGET</td> <td>COS/FUV, ACQ/SEARCH, PSA</td> <td>G140L 1280 A</td> <td>SCAN-SIZE=2</td> <td>GS ACQ SCENARI O BASE1B3</td> <td></td> <td>90.0 Secs (90 Secs) [==>]</td> <td>[1]</td> </tr> <tr> <td>2</td> <td>(412280)</td> <td>(2) TARGET1-SAFE-TARGET</td> <td>COS/FUV, ACQ/PEAKXD, PSA</td> <td>G140L 1280 A</td> <td></td> <td></td> <td></td> <td>90.0 Secs (90 Secs) [==>]</td> <td>[1]</td> </tr> <tr> <td>3</td> <td>(412280)</td> <td>(2) TARGET1-SAFE-TARGET</td> <td>COS/FUV, ACQ/PEAKD, PSA</td> <td>G140L 1280 A</td> <td>STEP-SIZE=1.3</td> <td></td> <td></td> <td>90.0 Secs (90 Secs) [==>]</td> <td>[1]</td> </tr> <tr> <td>4</td> <td>(412293)</td> <td>(2) TARGET1-SAFE-TARGET</td> <td>COS/FUV, TIME-TAG, PSA</td> <td>G140L 1280 A</td> <td>BUFFER-TIME=30 0; FP-POS=ALL</td> <td></td> <td></td> <td>240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]</td> <td>[1]</td> </tr> </tbody> </table>										#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	1	(412280)	(2) TARGET1-SAFE-TARGET	COS/FUV, ACQ/SEARCH, PSA	G140L 1280 A	SCAN-SIZE=2	GS ACQ SCENARI O BASE1B3		90.0 Secs (90 Secs) [==>]	[1]	2	(412280)	(2) TARGET1-SAFE-TARGET	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A				90.0 Secs (90 Secs) [==>]	[1]	3	(412280)	(2) TARGET1-SAFE-TARGET	COS/FUV, ACQ/PEAKD, PSA	G140L 1280 A	STEP-SIZE=1.3			90.0 Secs (90 Secs) [==>]	[1]	4	(412293)	(2) TARGET1-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=30 0; FP-POS=ALL			240 Secs (960 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
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