15854 - A Comprehensive UV Study of the White Dwarf with A Disintegrating Asteroid

Cycle: 27, Proposal Category: GO

(UV Initiative)

(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) WD1145+0145	COS/NUV	3	03-Oct-2019 08:00:17.0	yes
02	(1) WD1145+0145	COS/NUV	3	03-Oct-2019 08:00:19.0	yes
03	(1) WD1145+0145	STIS/CCD STIS/NUV-MAMA	3	03-Oct-2019 08:00:21.0	yes

9 Total Orbits Used

ABSTRACT

WD 1145+017 is an exciting system that has a heavily polluted atmosphere, a dust disk, a gas disk, and transits from fragments of an actively disintegrating object. It is extremely active and full of surprises. Here, we propose to obtain a full UV spectrum of this system to determine the

chemical compositions of the material accreted onto WD 1145+017 as well as the composition and dynamical configuration of the gas disk. WD 1145+017 is the lynchpin to independently understand the tidal disruption of an asteroid-- crucial to our understanding of other polluted white dwarfs as well as the end stage of planetary systems.

OBSERVING DESCRIPTION

We propose to obtain a medium resolution NUV spectrum of WD 1145+017 that covers 1800 --- 3100 Angstrom.

We consulted the COS Instrument Handbook and STIS Instrument Handbook to find the optimal configuration for the proposal. To cover 1800 ~ 2300 Angstrom, COS is the only instrument that has enough sensitivity and spectral resolution for our program. We will use G185M (spectral resolution ~ 18,000) with a central wavelength of 1913 Angstrom, 1941 Angstrom, and 1971 Angstrom as well as G225M (spectral resolution ~ 22,000) with a central wavelength of 2186 Angstrom, 2217 Angstrom, and 2250 Angstrom. This will provide an almost complete coverage from 1800 to 2300 Angstrom. For 2300 Angstrom to 3100 Angstrom, we will use the STIS Echelle E230M (spectral resolution ~ 30,000) with a central wavelength of 2707 Angstrom.

To compute the required observing time, we used the exposure time calculator. A signal- to-noise ratio of at least 10 per pixel is required for our analysis. We require 1 orbit for each of the COS set-up and 3 orbits in total for STIS observations. A total of 9 orbits is required for this proposal.

Visit

Proposal 15854, G185M (01), implementation Thu Oct 03 12:00:21 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Fixed Targets

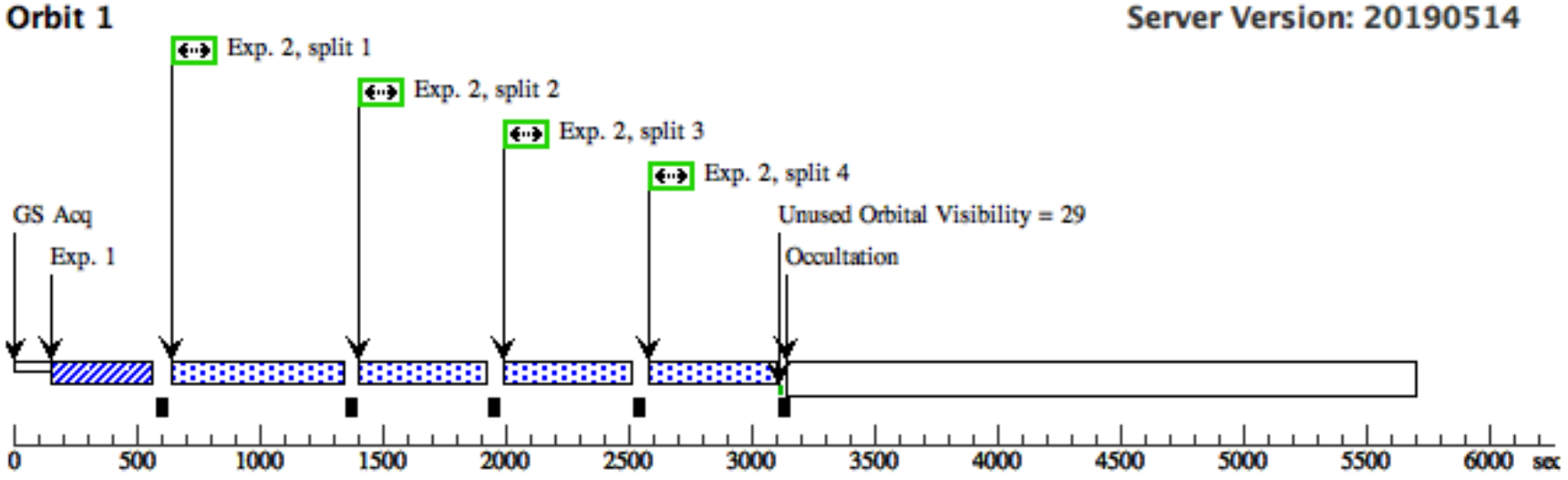
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD1145+0145	RA: 11 48 33.6270 (177.1401125d) Dec: +01 28 59.45 (1.48318d) Equinox: J2000	Proper Motion RA: -43.3 mas/yr Proper Motion Dec: -7 mas/yr Epoch of Position: 2000	V=17.3	Reference Frame: ICRS

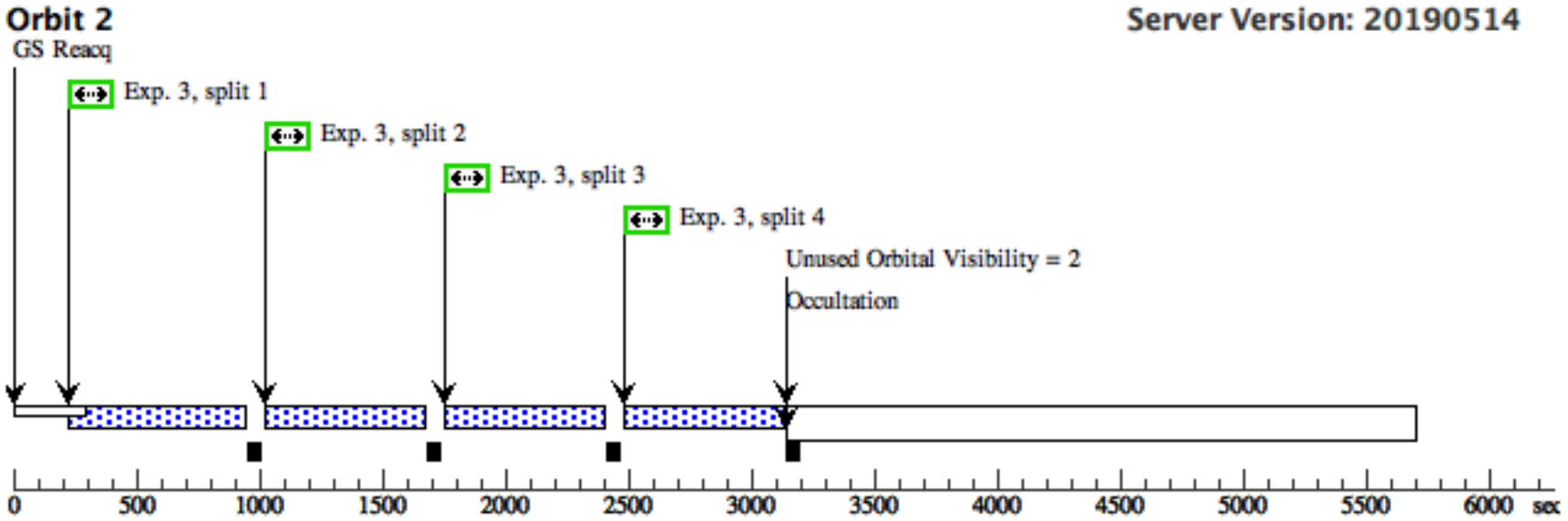
Comments:
Category=EXT-STAR
Description=[DB]
Extended=NO

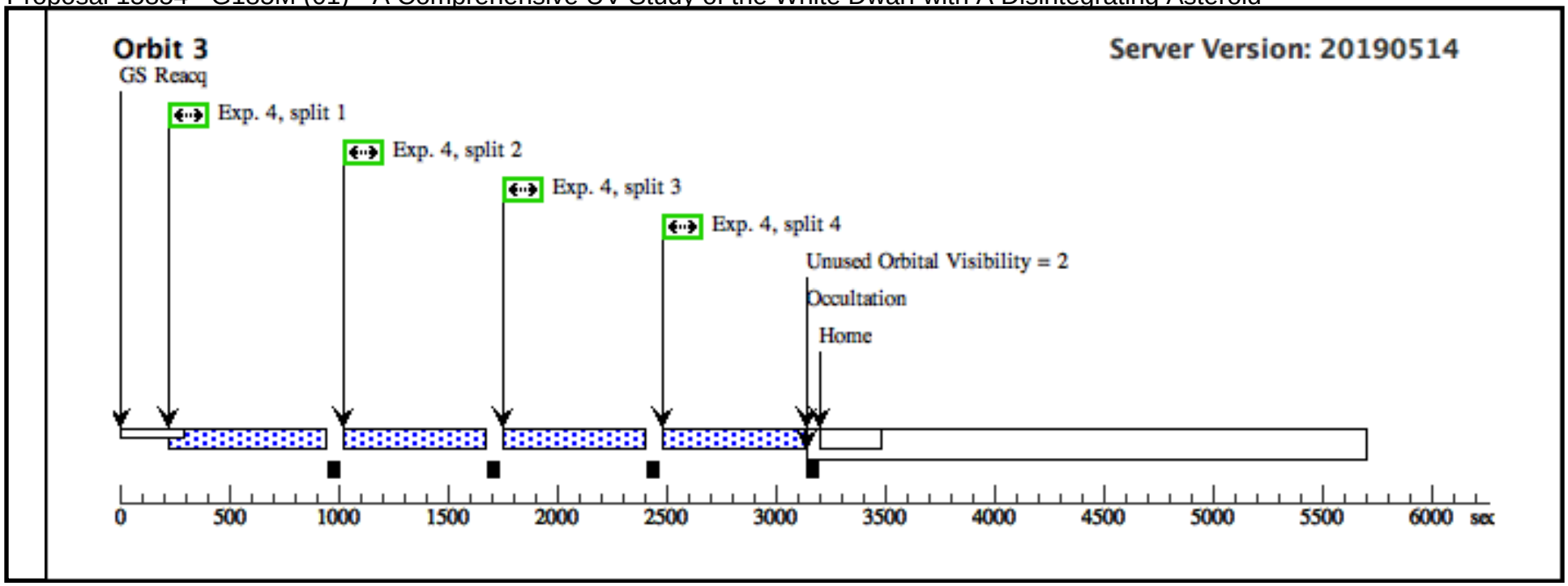
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAGE (COS.ta.1371603)	(1) WD1145+0145	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				60 Secs (60 Secs) *[==>]*	***[1]***
2	G185M_1913 (COS.sp.1371609)	(1) WD1145+0145	COS/NUV, TIME-TAG, PSA	G185M 1913 A	BUFFER-TIME=1500; FP-POS=ALL			510 Secs (2000 Secs) *[==>500.0 Secs (Split 1)]* *[==>500.0 Secs (Split 2)]* *[==>500.0 Secs (Split 3)]* *[==>500.0 Secs (Split 4)]*	***[1]***
3	G185M_1941 (COS.sp.1371610)	(1) WD1145+0145	COS/NUV, TIME-TAG, PSA	G185M 1941 A	BUFFER-TIME=1500; FP-POS=ALL			510 Secs (2520 Secs) *[==>630.0 Secs (Split 1)]* *[==>630.0 Secs (Split 2)]* *[==>630.0 Secs (Split 3)]* *[==>630.0 Secs (Split 4)]*	***[2]***
4	G185M_1971 (COS.sp.1371611)	(1) WD1145+0145	COS/NUV, TIME-TAG, PSA	G185M 1971 A	BUFFER-TIME=1500; FP-POS=ALL			510 Secs (2520 Secs) *[==>630.0 Secs (Split 1)]* *[==>630.0 Secs (Split 2)]* *[==>630.0 Secs (Split 3)]* *[==>630.0 Secs (Split 4)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20190514
GS Reacq
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Orbital Visibility = 2
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15854, G225M (02), implementation Thu Oct 03 12:00:22 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Fixed Targets

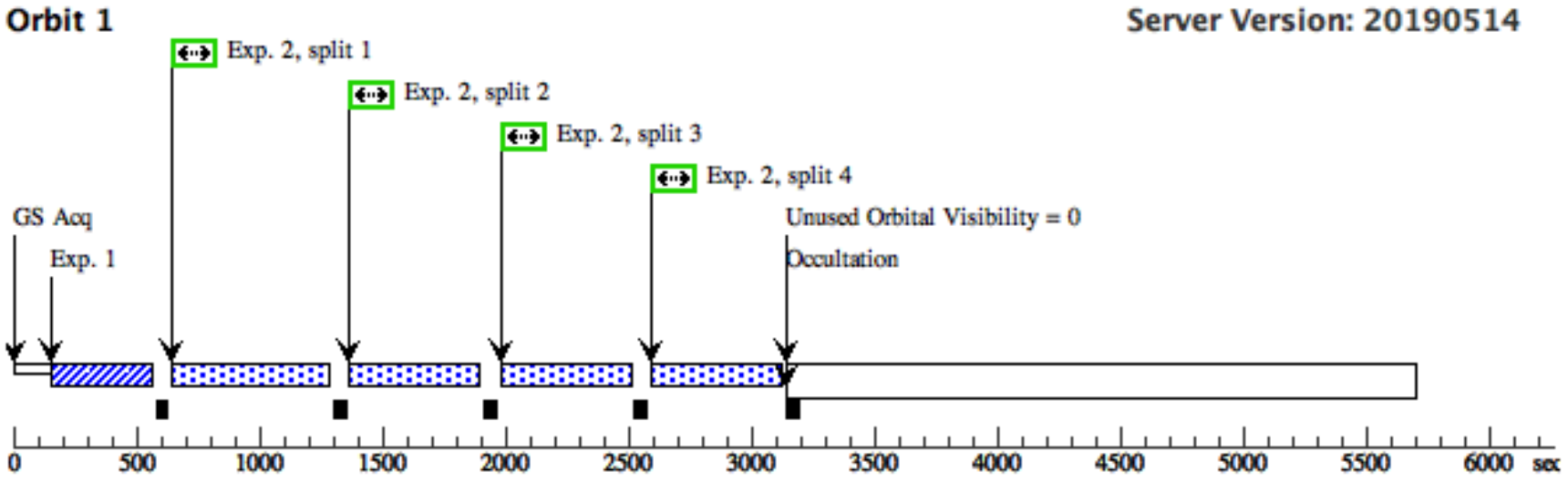
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD1145+0145	RA: 11 48 33.6270 (177.1401125d) Dec: +01 28 59.45 (1.48318d) Equinox: J2000	Proper Motion RA: -43.3 mas/yr Proper Motion Dec: -7 mas/yr Epoch of Position: 2000	V=17.3	Reference Frame: ICRS

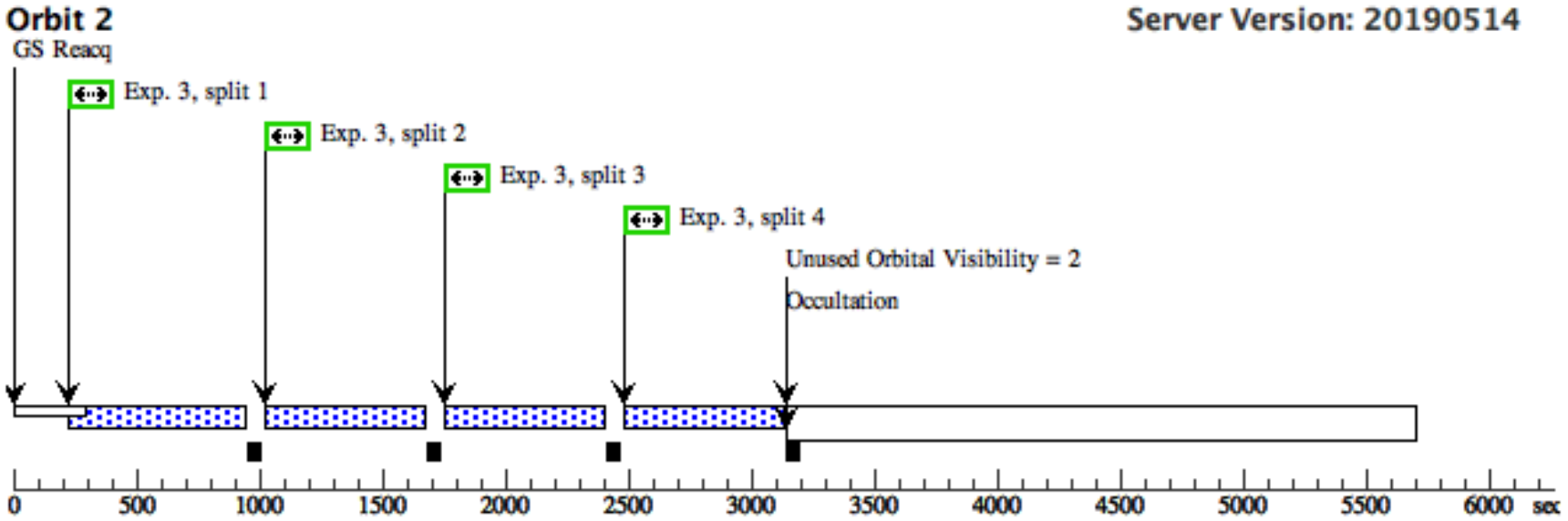
Comments:
Category=EXT-STAR
Description=[DB]
Extended=NO

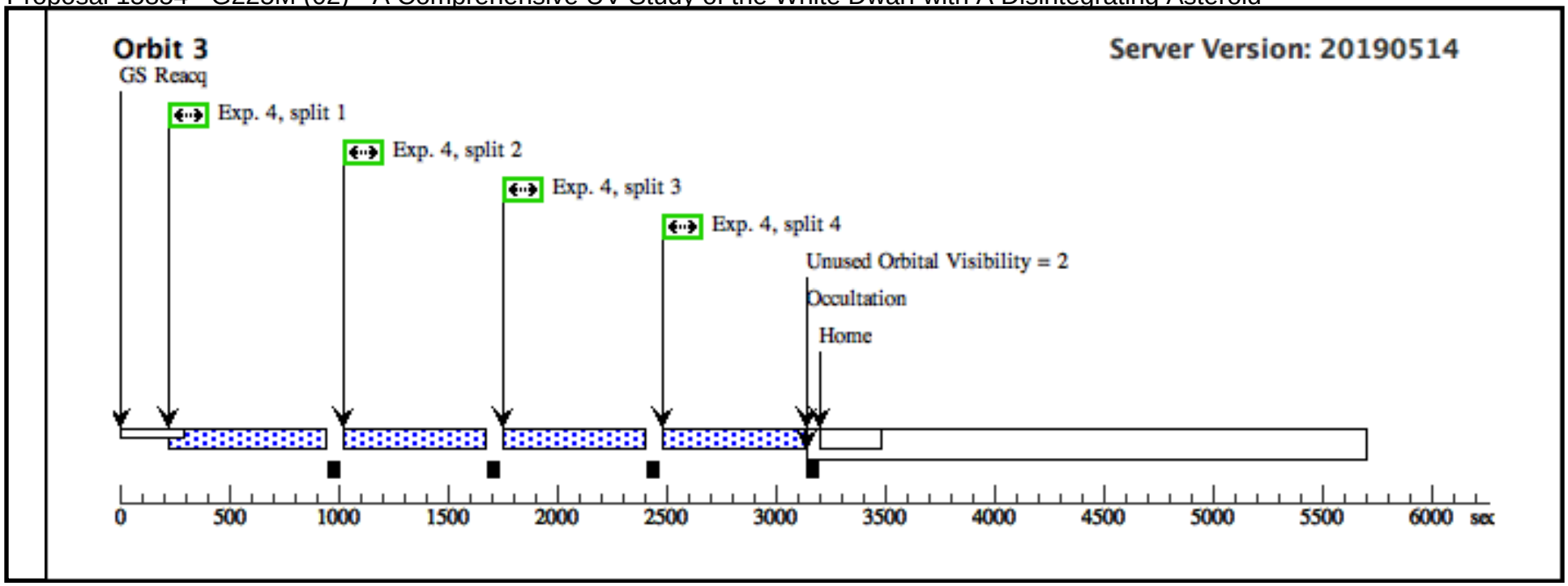
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAGE (COS.ta.1371603)	(1) WD1145+0145	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				60 Secs (60 Secs) *[==>]*	 ***[1]***
2	G225M_2186 (COS.sp.1371612)	(1) WD1145+0145	COS/NUV, TIME-TAG, PSA	G225M 2186 A	BUFFER-TIME=1500; FP-POS=ALL			510 Secs (2068 Secs) *[==>517.0 Secs (Split 1)]* *[==>517.0 Secs (Split 2)]* *[==>517.0 Secs (Split 3)]* *[==>517.0 Secs (Split 4)]*	 ***[1]***
3	G225M_2217 (COS.sp.1371613)	(1) WD1145+0145	COS/NUV, TIME-TAG, PSA	G225M 2217 A	BUFFER-TIME=1500; FP-POS=ALL			510 Secs (2520 Secs) *[==>630.0 Secs (Split 1)]* *[==>630.0 Secs (Split 2)]* *[==>630.0 Secs (Split 3)]* *[==>630.0 Secs (Split 4)]*	 ***[2]***
4	G225M_2250 (COS.sp.1371614)	(1) WD1145+0145	COS/NUV, TIME-TAG, PSA	G225M 2250 A	BUFFER-TIME=1500; FP-POS=ALL			510 Secs (2520 Secs) *[==>630.0 Secs (Split 1)]* *[==>630.0 Secs (Split 2)]* *[==>630.0 Secs (Split 3)]* *[==>630.0 Secs (Split 4)]*	 ***[3]***

Orbit Structure






Orbit 3
Server Version: 20190514
GS Reacq
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Orbital Visibility = 2
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15854, STIS NUV (03), implementation Thu Oct 03 12:00:22 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: (none)

Fixed Targets

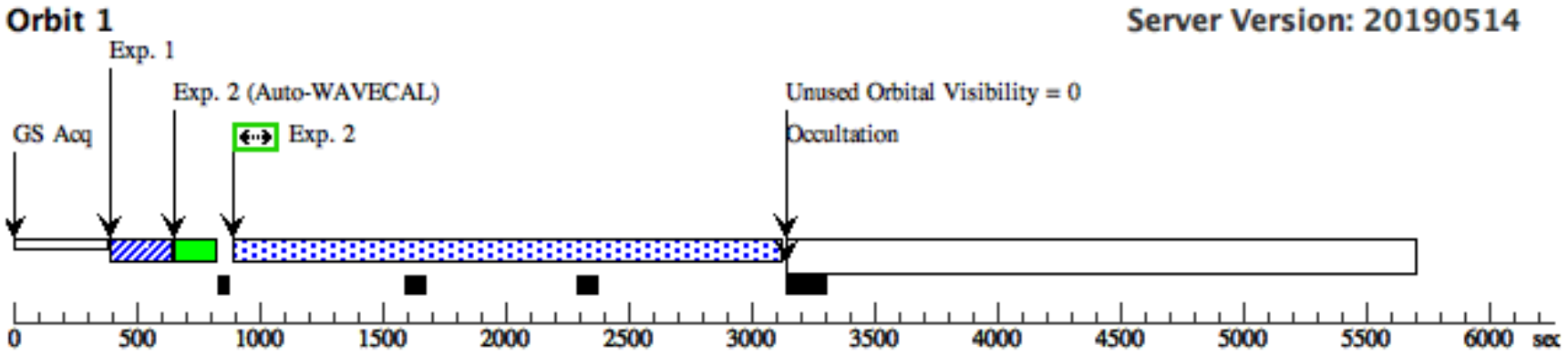
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD1145+0145	RA: 11 48 33.6270 (177.1401125d) Dec: +01 28 59.45 (1.48318d) Equinox: J2000	Proper Motion RA: -43.3 mas/yr Proper Motion Dec: -7 mas/yr Epoch of Position: 2000	V=17.3	Reference Frame: ICRS

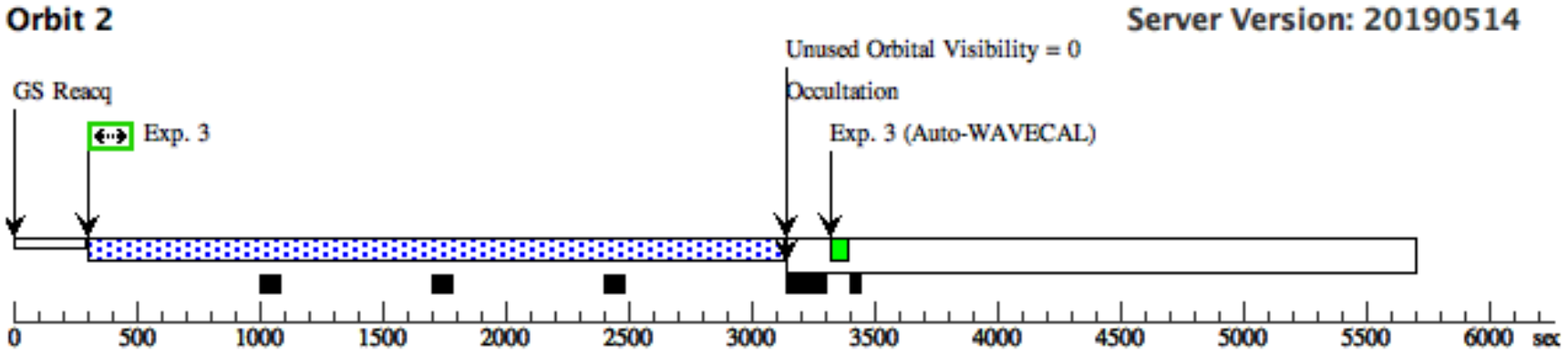
Comments:
Category=EXT-STAR
Description=[DB]
Extended=NO

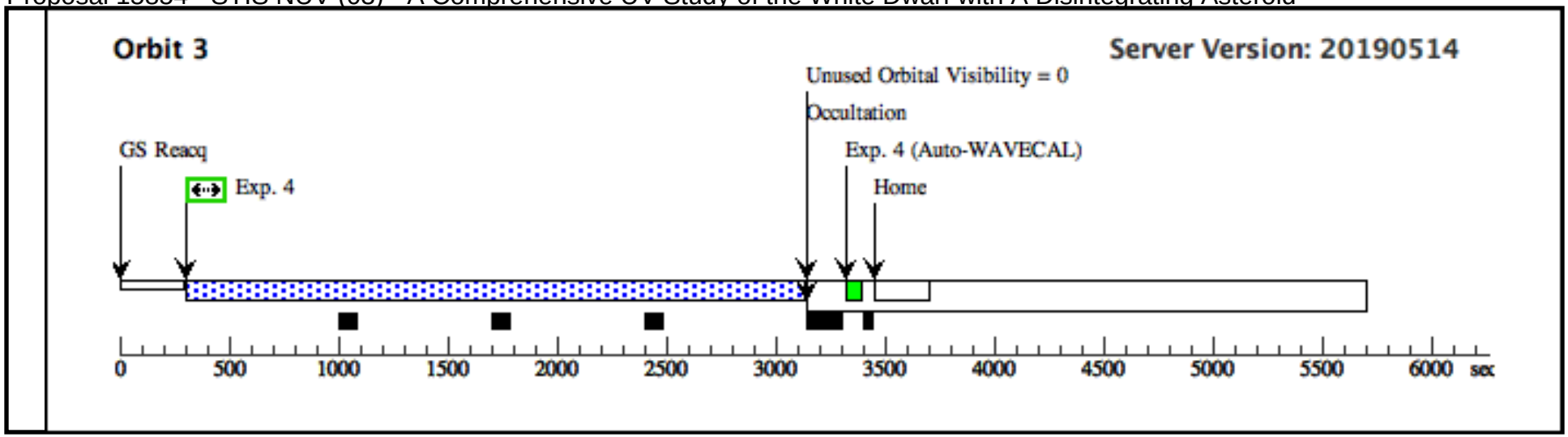
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.1372003)	(1) WD1145+0145	STIS/CCD, ACQ, F28X50LP	MIRROR				5 Secs (5 Secs) *[==>]*	*[1]*
2	E230M (STIS.sp.1371620)	(1) WD1145+0145	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230M 2707 A	BUFFER-TIME=700			2000 Secs (2218 Secs) *[==>2218.0 Secs]*	*[1]*
3	E230M (STIS.sp.1371620)	(1) WD1145+0145	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230M 2707 A	BUFFER-TIME=700			2000 Secs (2810 Secs) *[==>2810.0 Secs]*	*[2]*
4	E230M (STIS.sp.1371620)	(1) WD1145+0145	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230M 2707 A	BUFFER-TIME=700			2000 Secs (2810 Secs) *[==>2810.0 Secs]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20190514
Unused Orbital Visibility = 0
Occultation
GS Reacq
Exp. 4
Exp. 4 (Auto-WAVECAL)
Home
0
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4000
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5000
5500
6000
sec