17305 - An X-ray through Radio Exo-Space Weather Campaign to Study the Infant Sun DS Tuc

Cycle: 30, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Prof. Kevin France (PI) (Contact)	**University of Colorado at Boulder**
Dr. Vladimir Airapetian (CoI)	American University

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:29.0	yes
Z1	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:30.0	yes
02	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:31.0	yes
Z2	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:32.0	yes
03	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:33.0	yes
Z3	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:33.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:34.0	yes
Z4	(1) DS-TUC-A	COS/FUV COS/NUV	3	15-Dec-2023 14:00:35.0	yes

24 Total Orbits Used

ABSTRACT

We propose to obtain COS spectra in support of an approved, international, multi-wavelength campaign to constrain the space weather conditions of the early proto-solar system. The focus of the proposed study is the magnetic activity of the young (45 Myr) Sun-like star, DS Tuc A. This nearby star thought to be an ideal proxy of the infant Sun at a near-zero-age main-sequence epoch, when the Earth's atmosphere transitioned from the primary to the secondary nitrogen and carbon dioxide rich atmosphere. Thus, the knowledge of the stellar ionizing radiation in the form of quiescent and flare X-ray and EUV emission, stellar wind and CME pressure that can affect the atmospheric escape and its chemistry is of critical importance for the study of early Venus, Earth and Mars environments. DS Tuc A, which is also exemplary for very young stars in its hosting of a transiting planet, is the subject of an approved ground-based, TESS, and NICER campaign that will occur in August 2023. We request director's discretionary time observations with COS to obtain simultaneous FUV spectra of this exemplar system to provide a physically consistent picture of the drivers and outputs of the magnetically driven stellar coronal and wind structures of infant suns. We will use these observations as inputs to a fully thermodynamic model of the corona-wind system of DS Tuc using the AWSoM code. AWSoM will output the missing EUV and stellar wind parameters that are required to predict the atmospheric evolution of terrestrial planets orbiting young suns.

OBSERVING DESCRIPTION

FUV Spectroscopy with COS:

The HST data will use COS with G130M, CENWAVE=1291 to record the emission lines of C III (117.5 nm), Si III (120.6 nm), N V (123.8nm), C I (132.9nm), C II (133.5 nm), Fe XXI (135.4nm), O V (137.1nm), O IV] (140.1nm), and Si IV (139.4, 140.3 nm). To resolve the physical processes relevant to chromospheric and coronal heating, we require R |*| 15,000. To constrain the stellar wind density of DS Tuc A, we require signal-to-noise ~8

per resolution element at the peak of the O IV] 140 nm line. We used archival spectra of the young G-type stars EK Dra and |*| Boo A [19,20] to compute S/N estimates for DS Tuc A. We assumed the flux of EK Dra, scaled by the distance to DS Tuc, and then divided by a factor of two to add margin for the slight stellar mass difference between the two stars.

Using the on-line STScI ETC, we estimate that 7,700 seconds (~three orbits) per visit will be sufficient for detection of S/N |*| 8 per resolution element in the peak of the densitysensitive O IV] features (COS.sp.1841043). This 3-orbit exposure time ensures high S/N in all of the other lines of interest: S/N between 10 and 20 in the peak of several C I lines and Fe XXI (COS.sp.1841045), S/N between 20 and 30 in N V (COS.sp.1841047) and S/N > 35 in Si III, C II, and Si IV (COS.sp.1841044). This high-fidelity spectrum will allow us to identify temporal variability and will provide robust line-fit measurements of thermal and non-thermal widths and line kinematics (Figure 2 below illustrates the line-profile measurements that will be conducted on these data; this example was constructed from archival observations of EK Dra, [20]).

The approved ground-based, TESS, and NICER programs will follow DS Tuc A over several rotation periods (DS Tuc A|*|s rotation period is 2.85 days) in August 2023. To explore the connection between time-variable phenomena (flares, CMEs) with magnetic surface topology and X-ray output, we request four epochs spread over two rotation periods; the four visits covering a stellar rotation period is a simplified version of the observing cadence adopted for the ULLYSES monitoring stars [21]. Breaking the total observing period into four visits also maximizes the chance of successful coordination with the ground-based observations; multi-wavelength observations of transient stellar phenomena is the crux of this proposal and the requested HST observing cadence has been tailored accordingly. Therefore, the total time request for this GO proposal is 3 orbits x 4 visits = 12 orbits.

Target Acquisition: We did a quantitative ETC target acquisition calculation using the

STScI online tools, we scaled a Kurucz G8 V atmosphere model to V-magnitude of V = 8.23, and we find that an exposure time of approximately 7.4s are required (COS.ta.1841052), using an imaging target acquisition in BOA+MIRRORA.

Instrument Safety: The same ETC calculations presented above (COS.sp.1841051) find no bright object violations using the COS G130M 1291 mode, therefore these observations present no risk to the instrument and are consistent with the COS 2025 observing guidelines.

Visit

Proposal 17305, Visit 01, failed Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; BETWEEN 14-NOV-2023:19:00:00 AND 17-NOV-2023:00:00:00

Diagnostics

(Visit 01) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

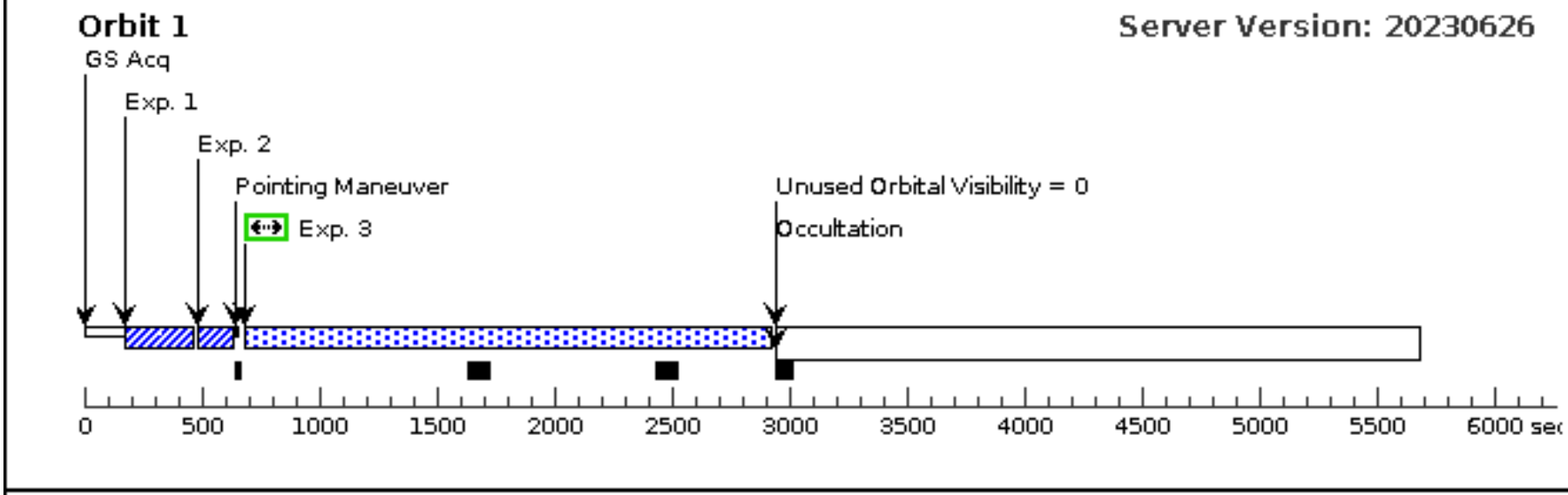
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

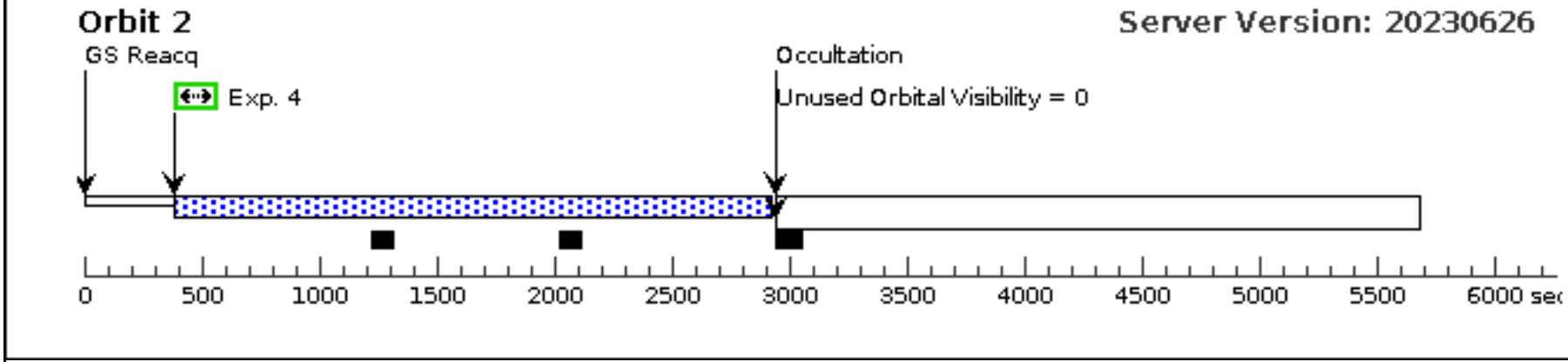
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

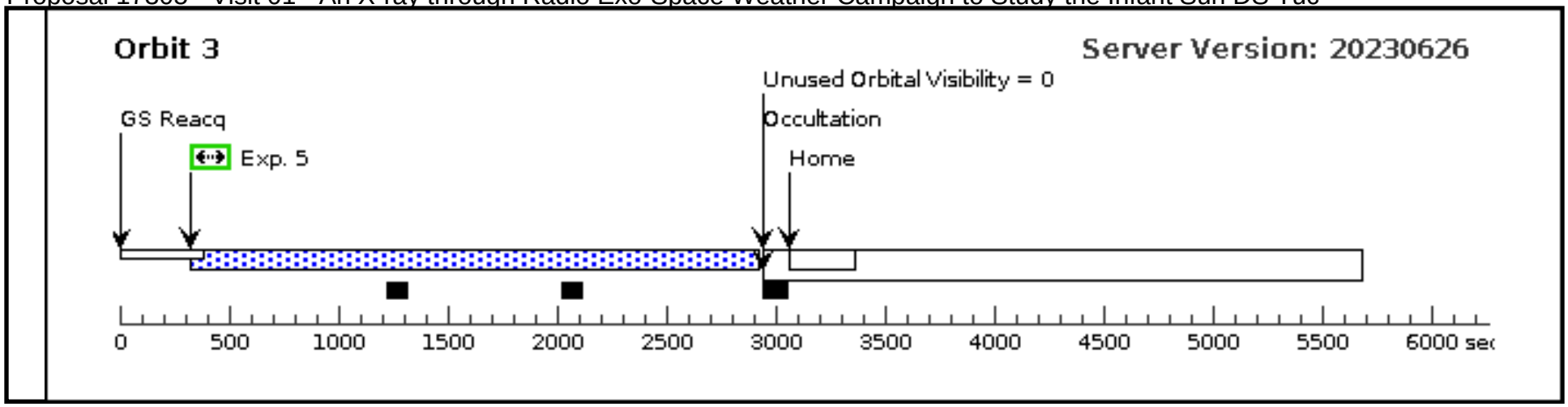
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD1 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD1 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v1_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2075 Secs (2075 Secs) *[==>]*	*[1]*
4	DS-Tuc_A-G130M_v1_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			2485 Secs (2485 Secs) *[==>]*	*[2]*
5	DS-Tuc_A-G130M_v1_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2485 Secs (2485 Secs) *[==>]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20230626
Unused Orbital Visibility = 0
GS Reacq
Occultation
Exp. 5
Home
0
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1000
1500
2000
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3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17305, Visit Z1 Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%

Diagnostics

(Visit Z1) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

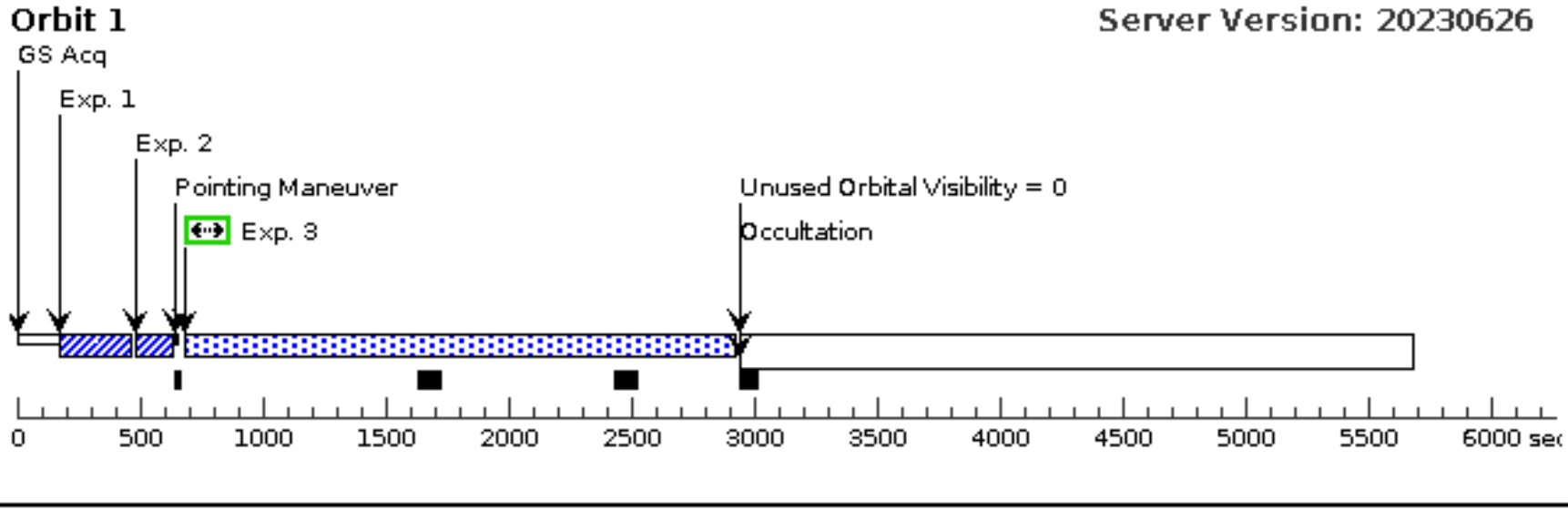
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

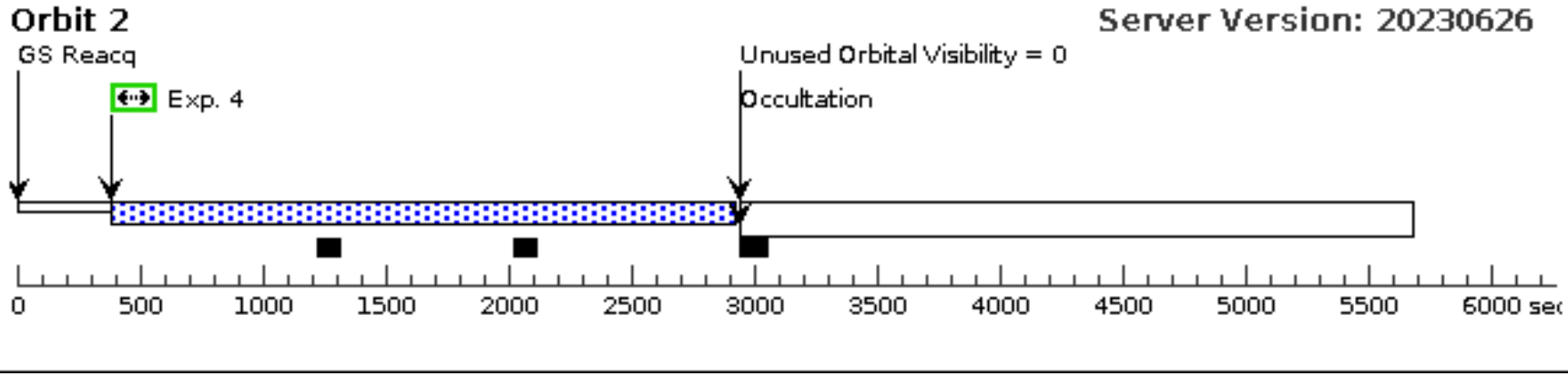
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

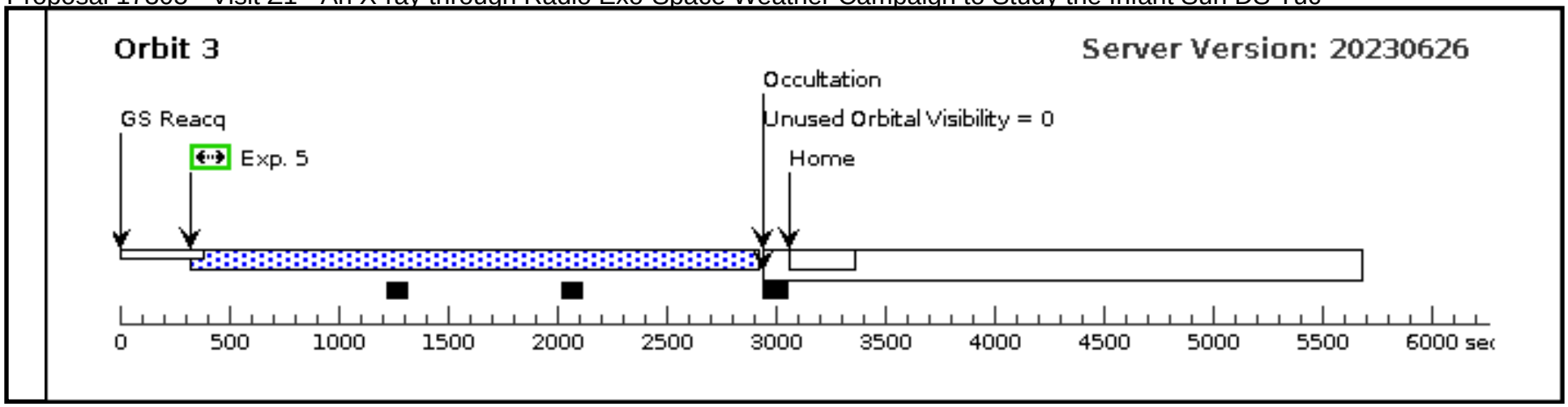
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD1 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD1 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v1_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2075 Secs (2075 Secs) *[==>]*	*[1]*
4	DS-Tuc_A-G130M_v1_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			2485 Secs (2485 Secs) *[==>]*	*[2]*
5	DS-Tuc_A-G130M_v1_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2485 Secs (2485 Secs) *[==>]*	*[3]*

Orbit Structure



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Server Version: 20230626
Occultation
GS Reacq
Unused Orbital Visibility = 0
Exp. 5
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3500
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4500
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5500
6000 sec

Visit

Proposal 17305, Visit 02, failed Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; AFTER 01 BY 12 H TO 60 H

Diagnostics

(Visit 02) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

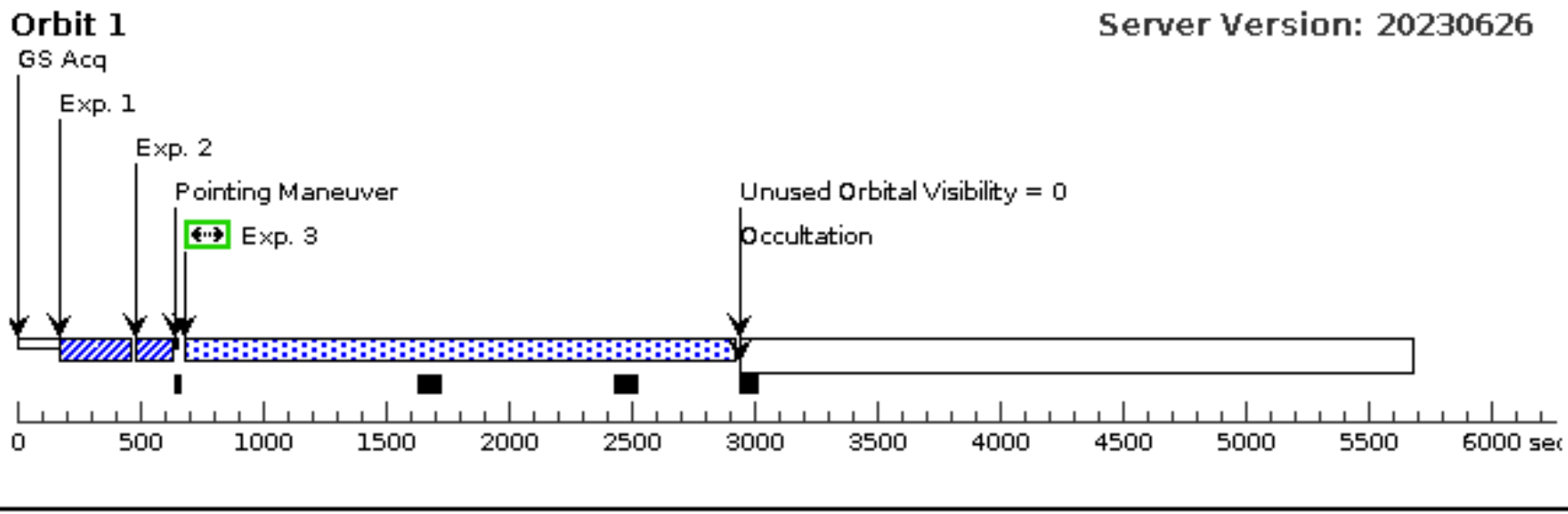
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

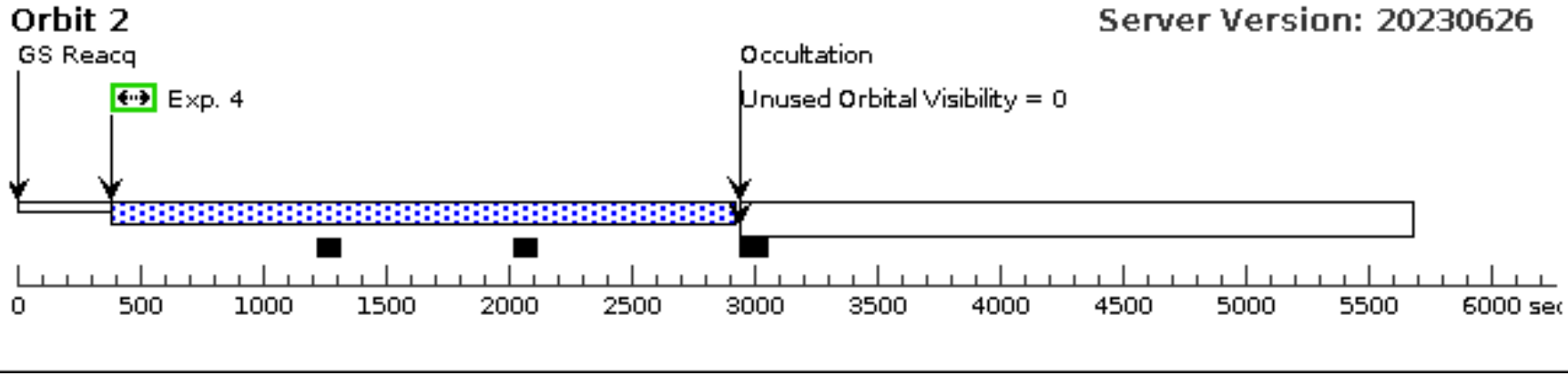
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

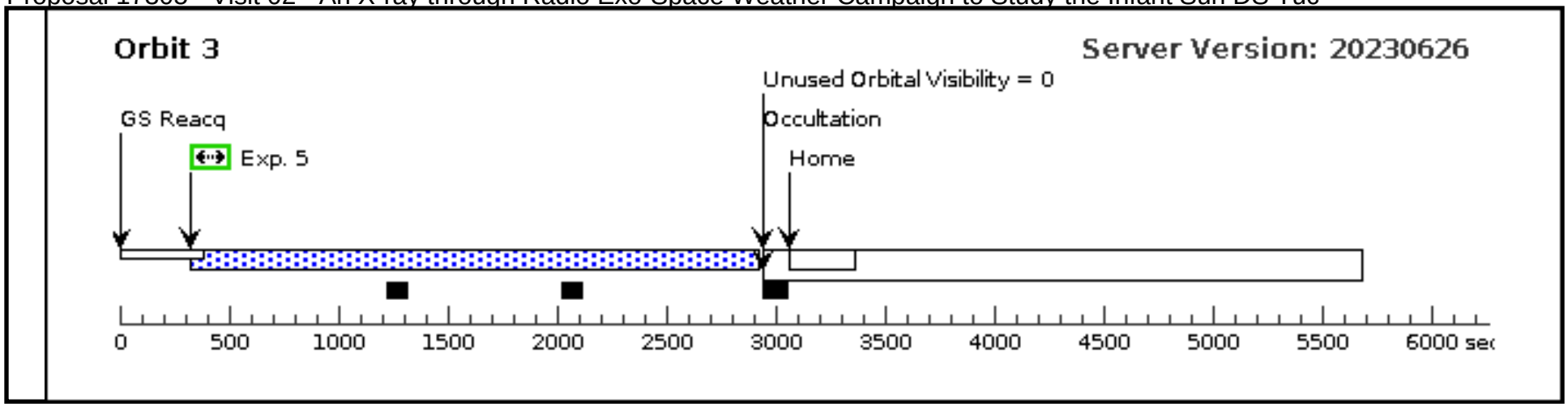
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD2 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD2 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v2_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2670 Secs (2075 Secs) *[==>2075.0 Secs]*	*[1]*
4	DS-Tuc_A-G130M_v2_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			3030 Secs (2485 Secs) *[==>2485.0 Secs]*	*[2]*
5	DS-Tuc_A-G130M_v2_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2310 Secs (2485 Secs) *[==>2485.0 Secs]*	*[3]*

Orbit Structure



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Unused Orbital Visibility = 0
GS Reacq
Occultation
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3500
4000
4500
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6000 sec

Visit

Proposal 17305, Visit Z2 Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; AFTER Z1 BY 12 H TO 60 H

Diagnostics

(Visit Z2) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

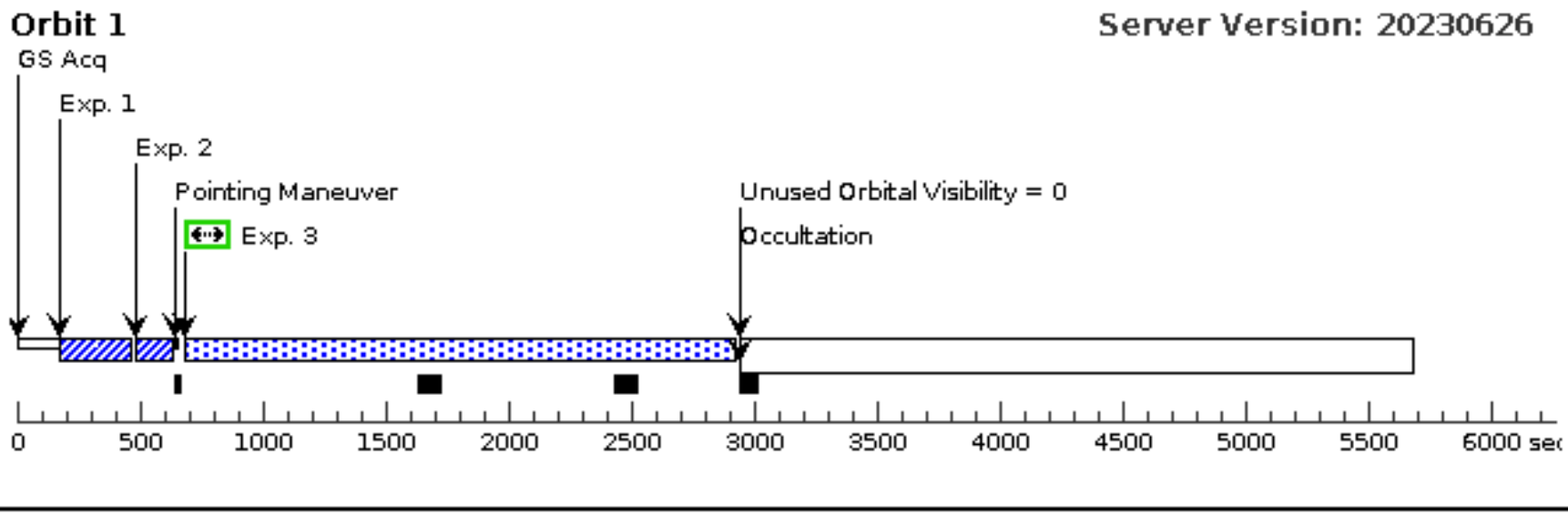
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

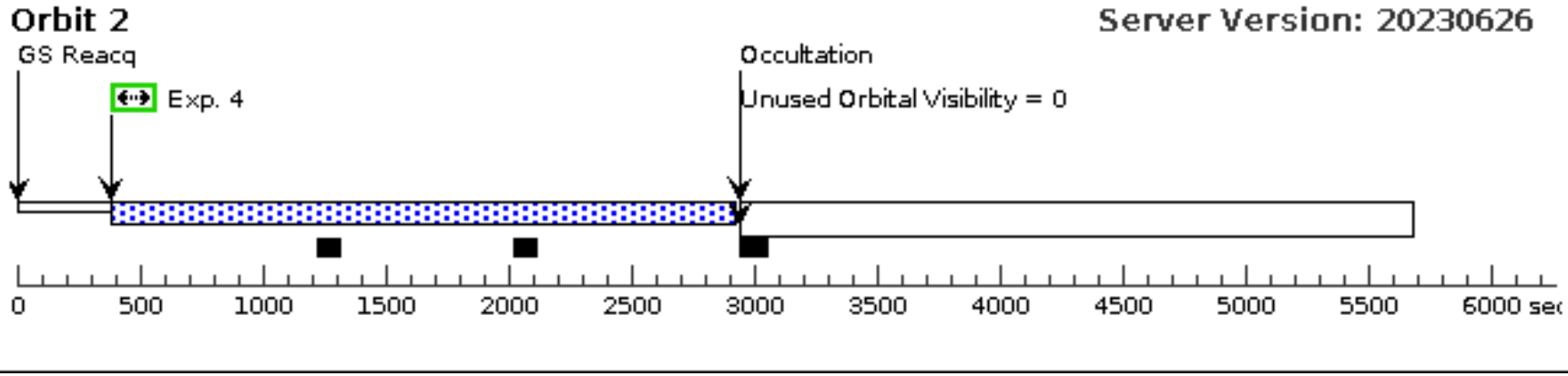
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

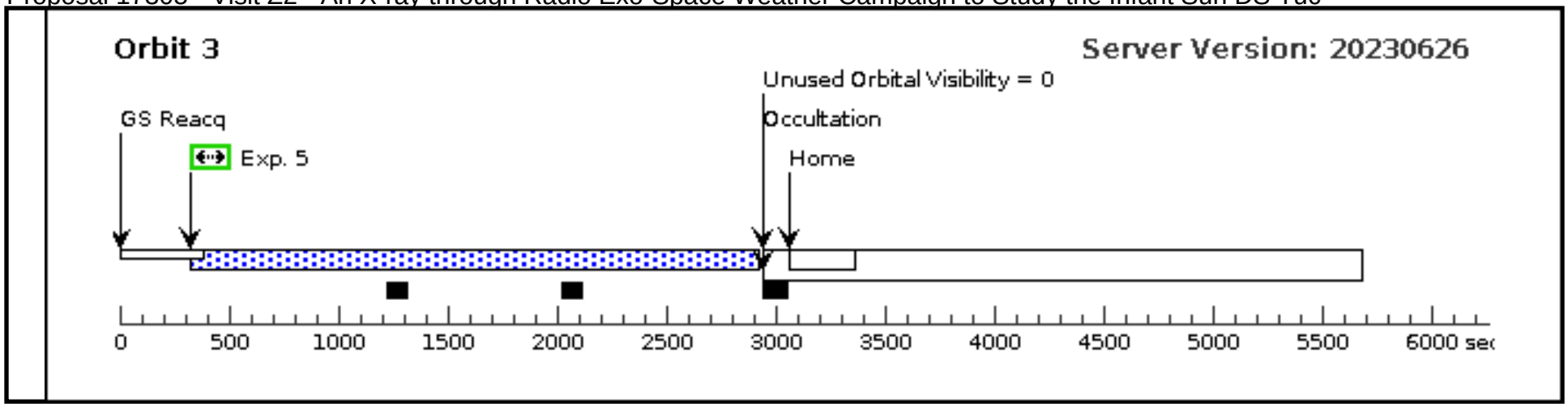
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD2 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD2 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v2_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2670 Secs (2075 Secs) *[==>2075.0 Secs]*	*[1]*
4	DS-Tuc_A-G130M_v2_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			3030 Secs (2485 Secs) *[==>2485.0 Secs]*	*[2]*
5	DS-Tuc_A-G130M_v2_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2310 Secs (2485 Secs) *[==>2485.0 Secs]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20230626
Unused Orbital Visibility = 0
GS Reacq
Occultation
Exp. 5
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6000 sec

Visit

Proposal 17305, Visit 03, failed Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; AFTER 02 BY 12 H TO 60 H

Diagnostics

(Visit 03) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

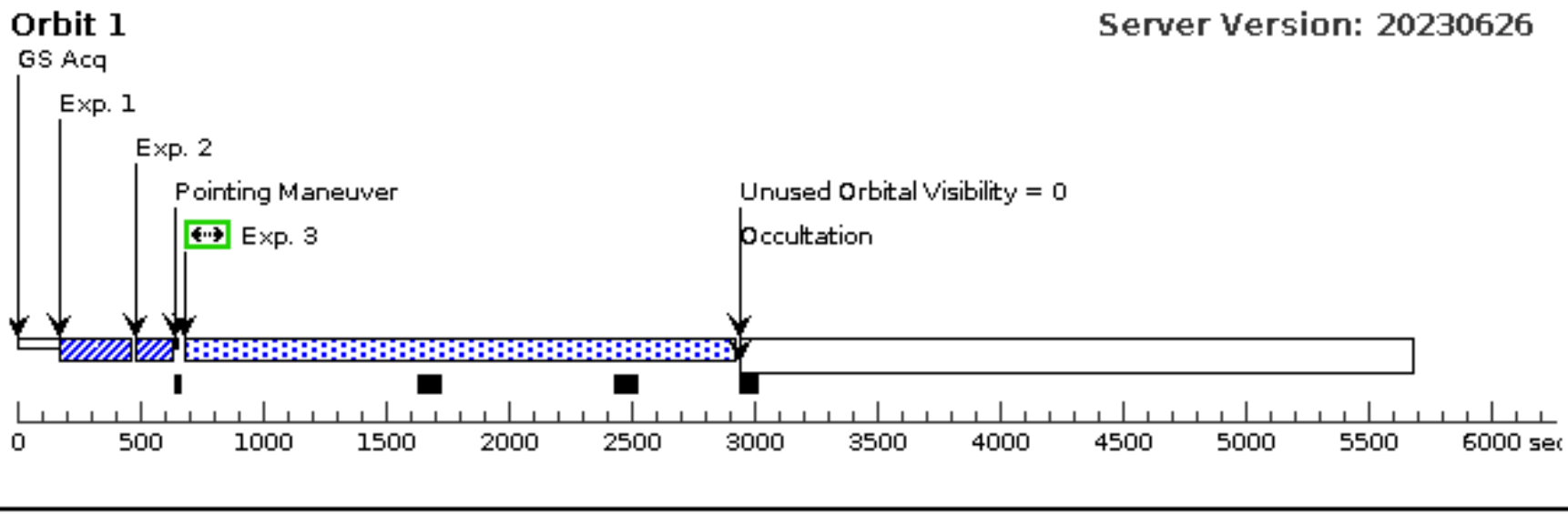
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

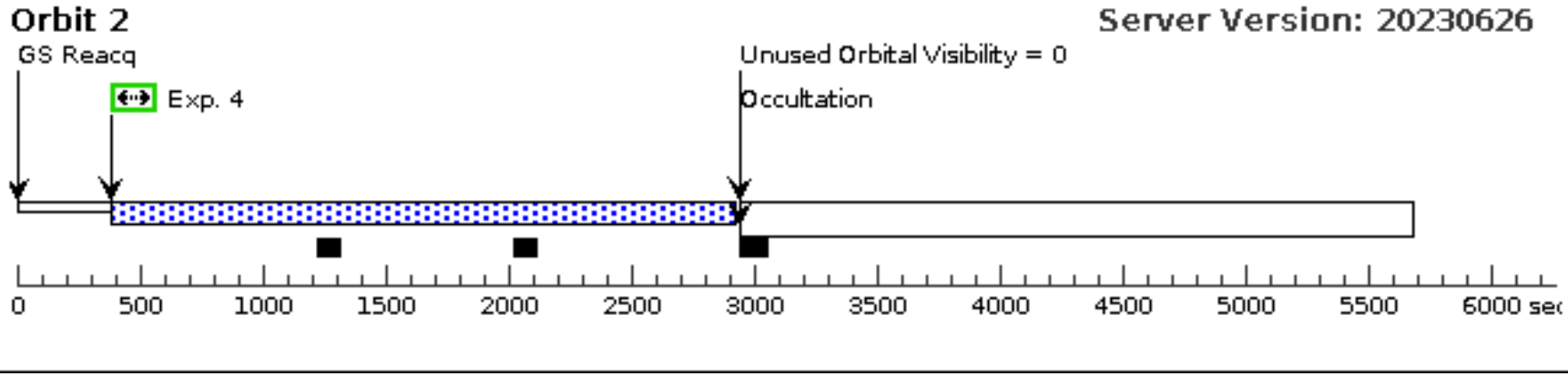
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

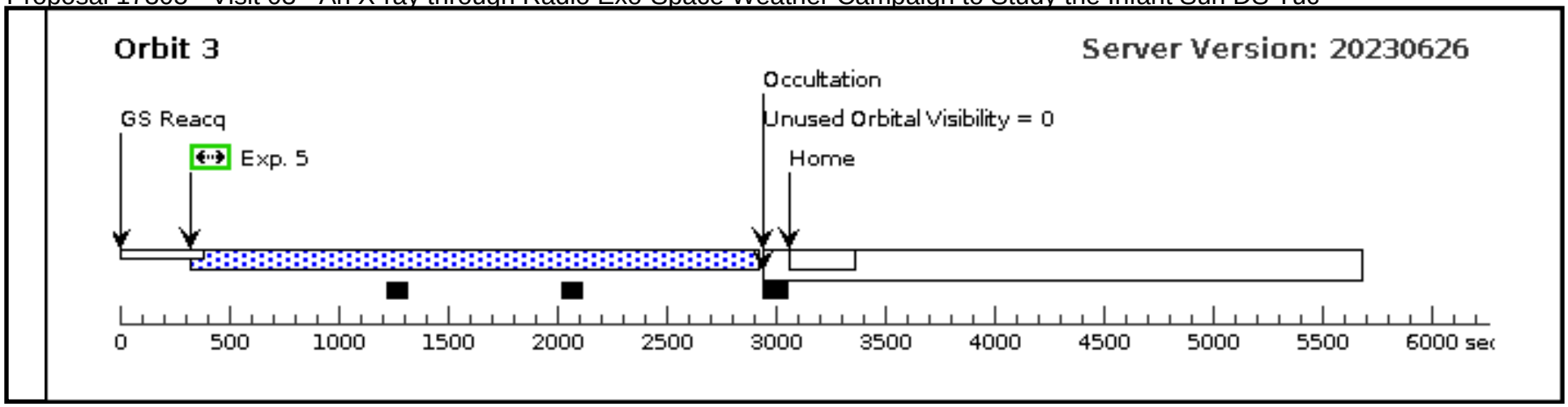
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD3 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD3 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v3_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2500 Secs (2075 Secs) *[==>2075.0 Secs]*	*[1]*
4	DS-Tuc_A-G130M_v3_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			2230 Secs (2485 Secs) *[==>2485.0 Secs]*	*[2]*
5	DS-Tuc_A-G130M_v3_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2310 Secs (2485 Secs) *[==>2485.0 Secs]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20230626
Occultation
GS Reacq
Unused Orbital Visibility = 0
Exp. 5
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17305, Visit Z3 Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; AFTER Z2 BY 12 H TO 60 H

Diagnostics

(Visit Z3) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

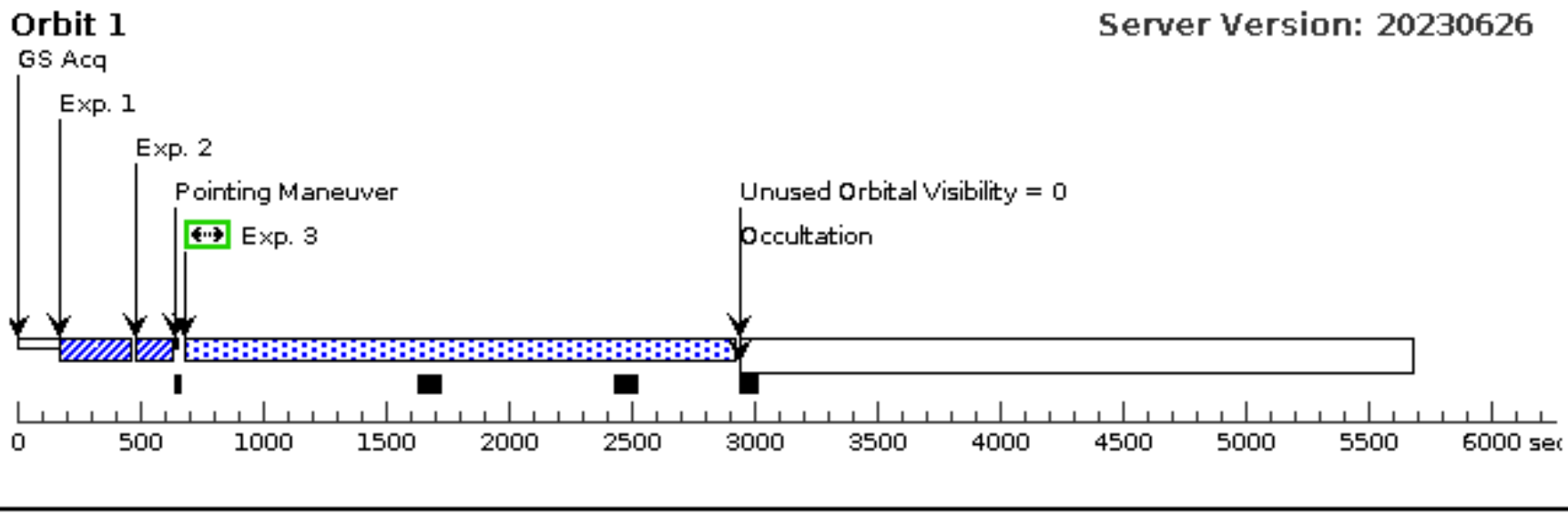
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

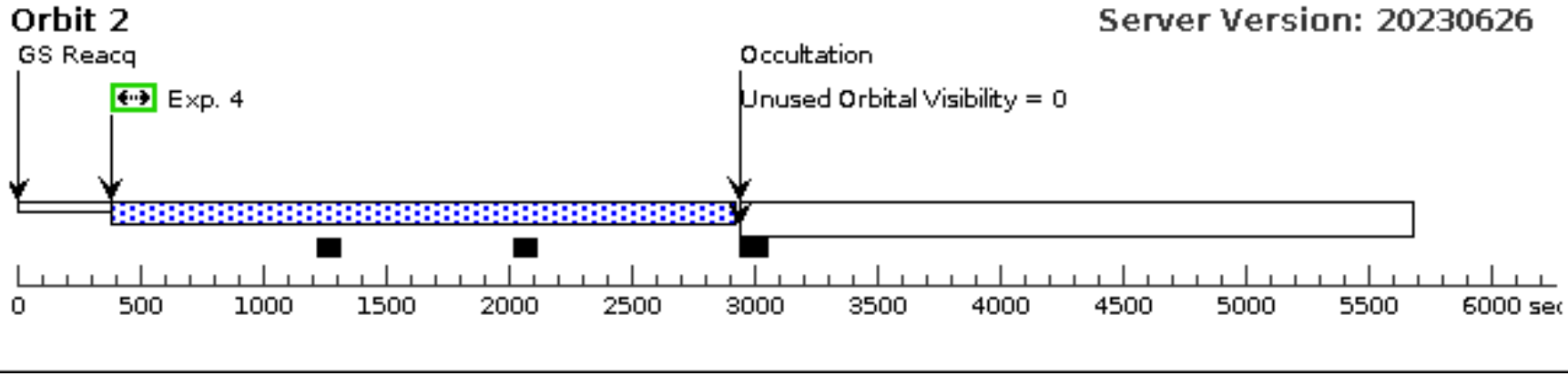
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

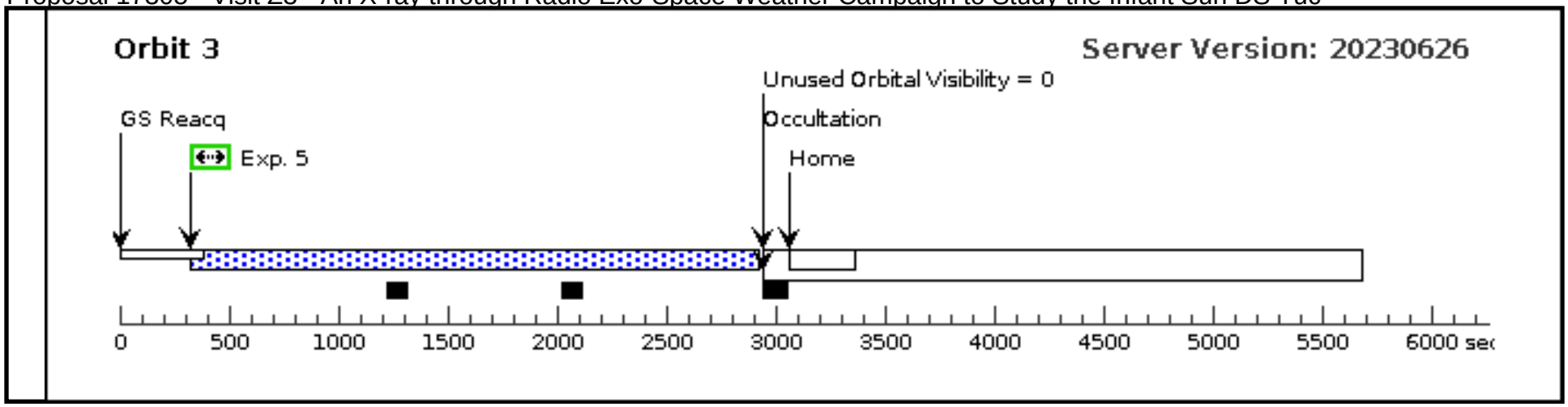
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD3 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD3 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v3_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2500 Secs (2075 Secs) *[==>2075.0 Secs]*	*[1]*
4	DS-Tuc_A-G130M_v3_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			2230 Secs (2485 Secs) *[==>2485.0 Secs]*	*[2]*
5	DS-Tuc_A-G130M_v3_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2310 Secs (2485 Secs) *[==>2485.0 Secs]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20230626
Unused Orbital Visibility = 0
GS Reacq
Occultation
Exp. 5
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17305, Visit 04, failed Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; AFTER 03 BY 12 H TO 60 H

Diagnostics

(Visit 04) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

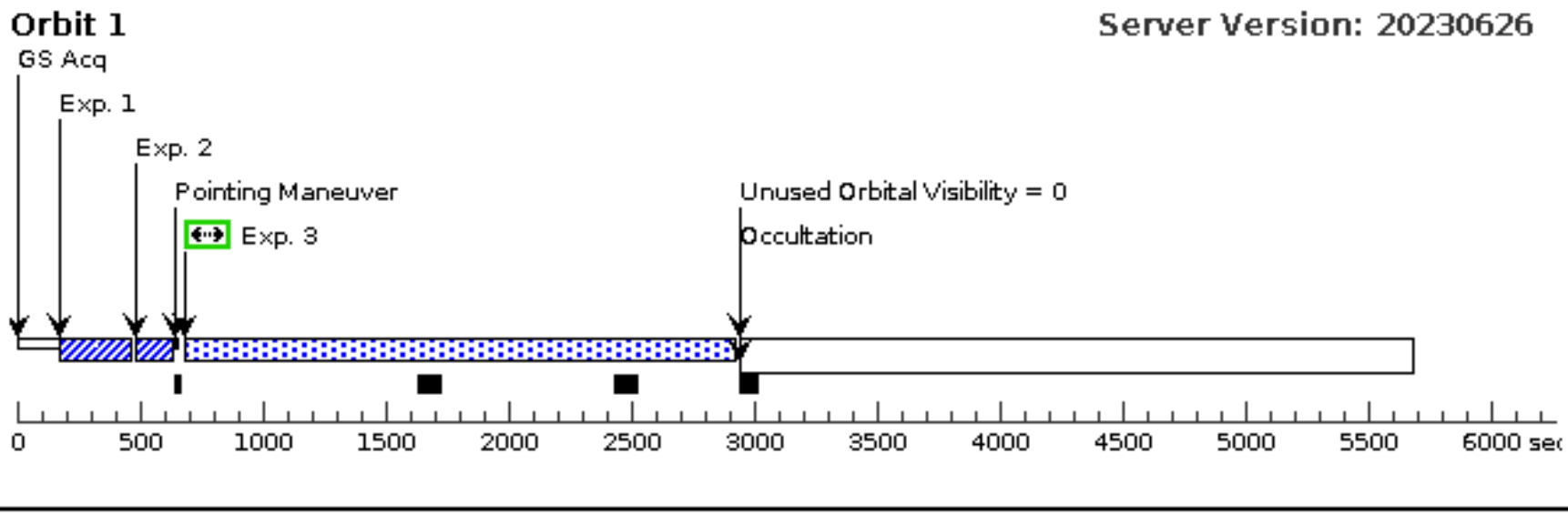
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

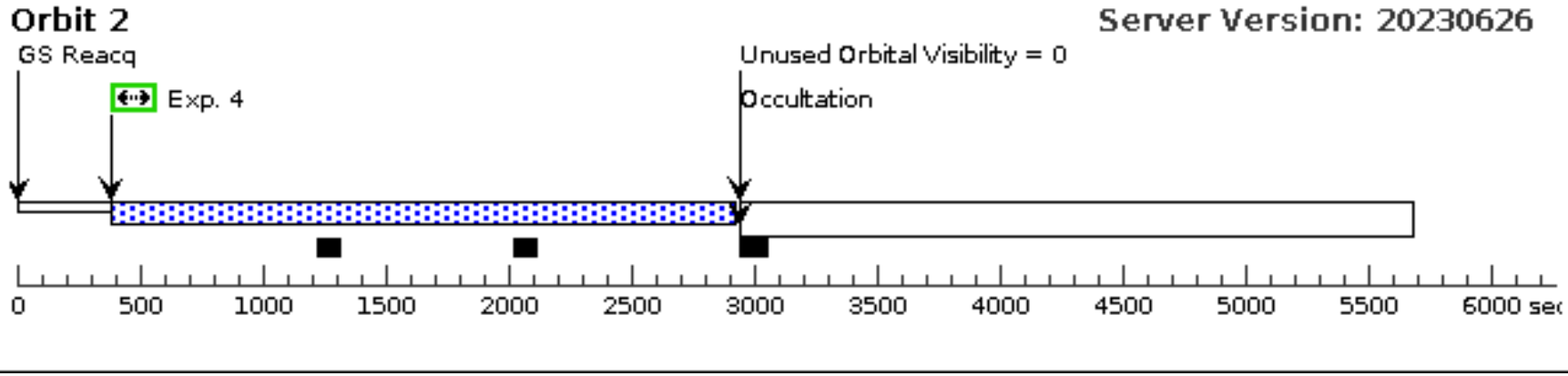
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

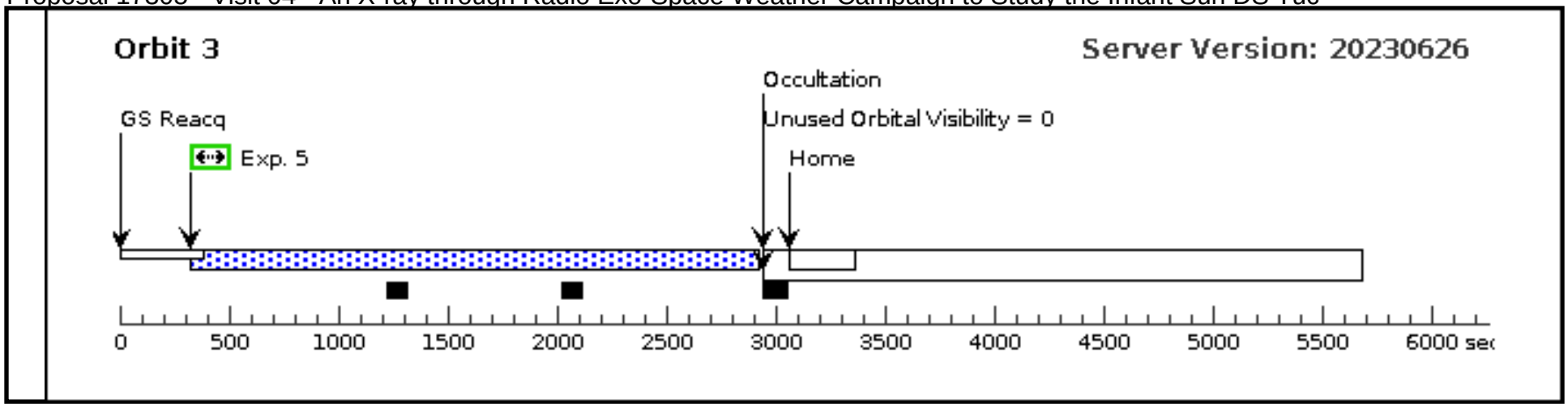
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD4 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD4 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v4_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			1955 Secs (2075 Secs) *[==>2075.0 Secs]*	*[1]*
4	DS-Tuc_A-G130M_v4_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			2320 Secs (2485 Secs) *[==>2485.0 Secs]*	*[2]*
5	DS-Tuc_A-G130M_v4_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2310 Secs (2485 Secs) *[==>2485.0 Secs]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20230626
Occultation
GS Reacq
Unused Orbital Visibility = 0
Exp. 5
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17305, Visit Z4 Fri Dec 15 19:00:36 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; AFTER Z3 BY 12 H TO 60 H

Diagnostics

(Visit Z4) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

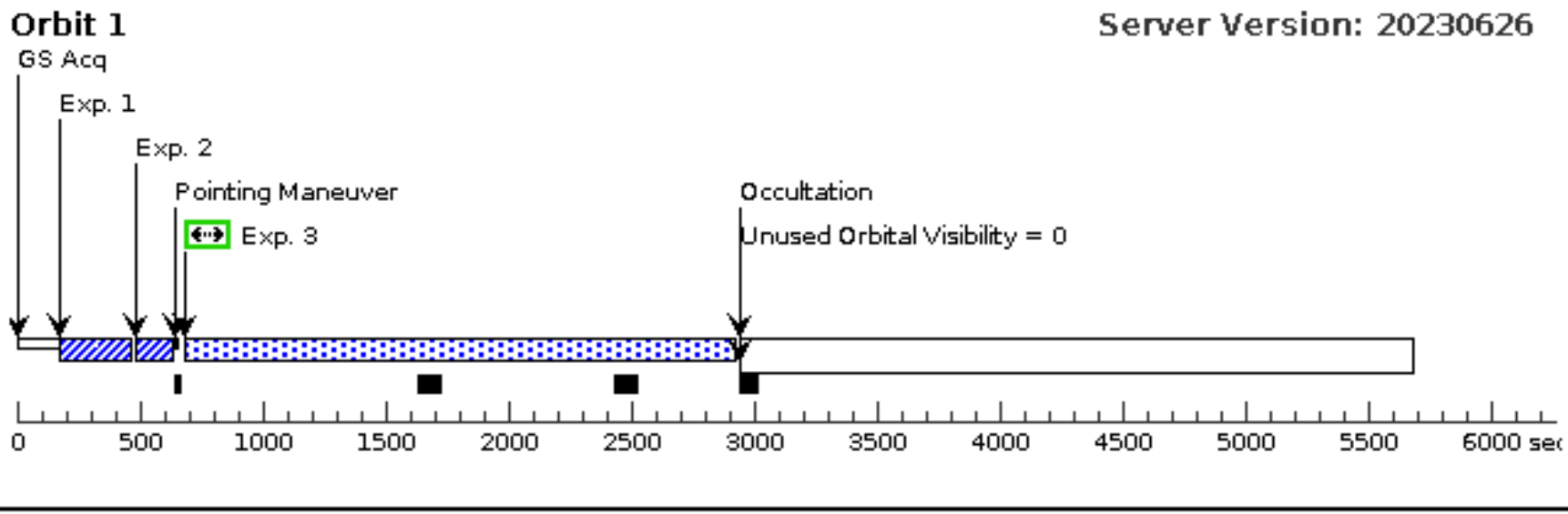
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DS-TUC-A	RA: 23 39 39.4808 (354.9145033d)	Proper Motion RA: 79.529 mas/yr	V=8.226	Reference Frame: ICRS
	Alt Name1: HD-222259A	Dec: -69 11 44.71 (-69.19575d)	Proper Motion Dec: -67.551 mas/yr		
		Equinox: J2000	Parallax: 0.0226367"		
			Epoch of Position: 2016.0		
			Radial Velocity: 7.785 km/sec		

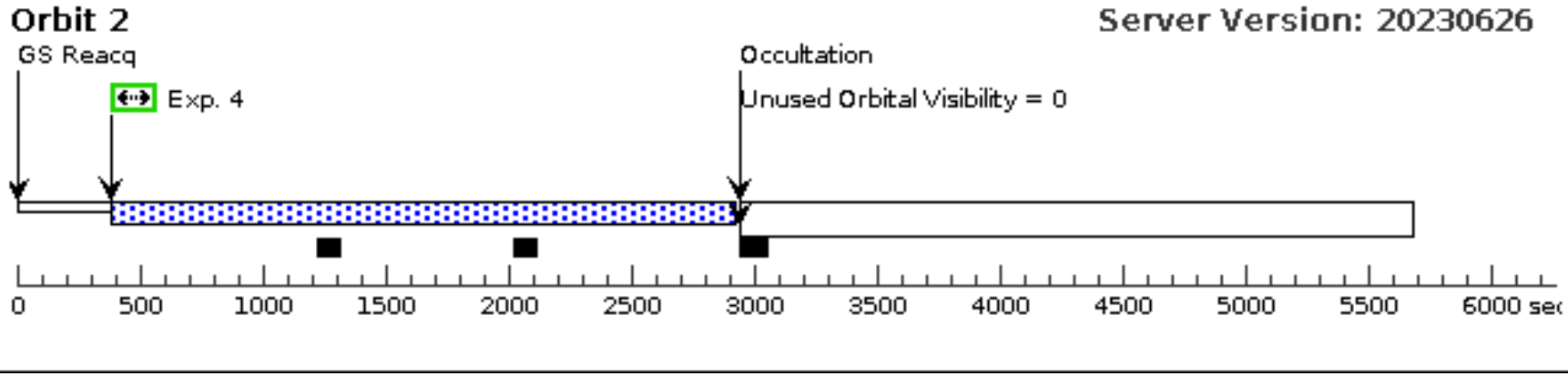
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

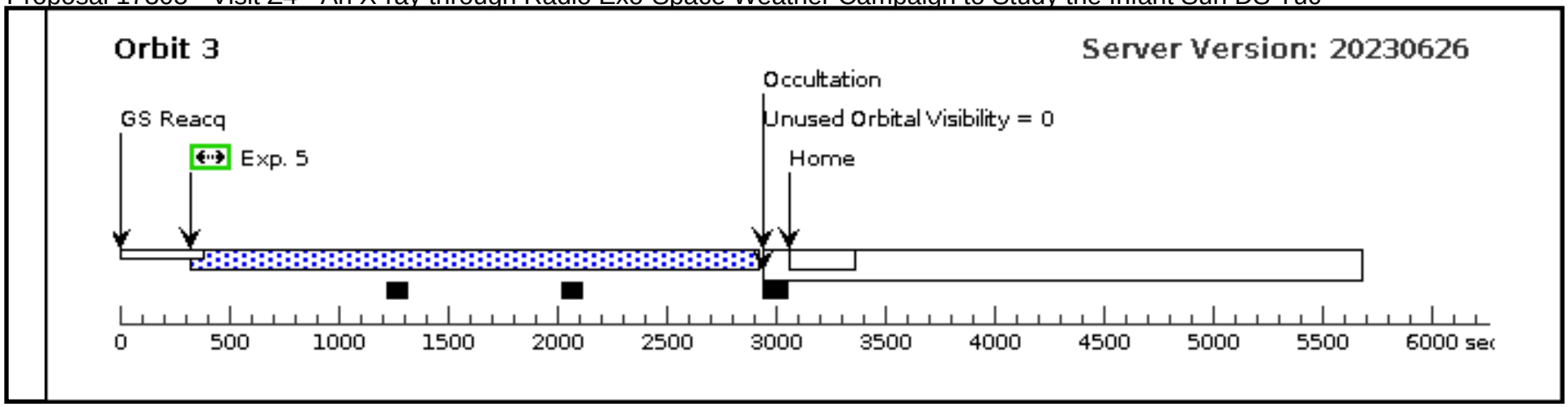
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DS-Tuc-A_PEAKXD4 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKXD, PSA	G230L 3000 A				1.0 Secs (1 Secs) *[==>]*	*[1]*
2	DS-Tuc-A_PEAKD4 (COS.sa.1847541)	(1) DS-TUC-A	COS/NUV, ACQ/PEAKD, PSA	G230L 3000 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-WT-FLR			1.0 Secs (1 Secs) *[==>]*	*[1]*
3	DS-Tuc_A-G130M_v4_1 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			1955 Secs (2075 Secs) *[==>2075.0 Secs]*	*[1]*
4	DS-Tuc_A-G130M_v4_2 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=4			2320 Secs (2485 Secs) *[==>2485.0 Secs]*	*[2]*
5	DS-Tuc_A-G130M_v4_3 (COS.sp.1841043)	(1) DS-TUC-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8000; FP-POS=3			2310 Secs (2485 Secs) *[==>2485.0 Secs]*	*[3]*

Orbit Structure






Orbit 3
Server Version: 20230626
Occultation
GS Reacq
Unused Orbital Visibility = 0
Exp. 5
Home
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500
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4500
5000
5500
6000 sec