17497 - UV CSM Interaction in the extremely nearby SN 2023ixf in M101

Cycle: 31, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
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Dr. Griffin Hosseinzadeh (CoI)	University of Arizona
Dr. Jennifer Andrews (CoI)	Gemini Observatory
Jeniveve Pearson (CoI)	University of Arizona
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Dr. Jacob Jencson (CoI)	The Johns Hopkins University
Mr. Yize Dong (CoI)	University of California - Davis
Dr. Michael Jon Lundquist (CoI)	California Association for Research in Astronomy (CARA)

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SN2023IXF	STIS/CCD STIS/FUV-MAMA	4	08-Dec-2023 12:02:55.0	yes
02	(1) SN2023IXF	STIS/CCD STIS/NUV-MAMA	3	08-Dec-2023 12:02:55.0	yes
03	(2) SN2023IXF-COS	COS/NUV	3	08-Dec-2023 12:02:56.0	yes

10 Total Orbits Used

ABSTRACT

The 2023 May 19 explosion of SN2023ixf in the nearby (~6.4 Mpc) spiral galaxy M101 has presented us with a once in an HST-lifetime chance to get a comprehensive NUV to NIR dataset of an interacting core collapse supernova. This non-disruptive ToO will be complementary to two already approved Cycle 30 proposals which have been triggered on this object. We will observe SN~2023ixf between 100 and 200 days after explosion to constrain any CSM interaction with CSM interaction. Late UV observations are the best way to constrain interaction for typical RSG mass loss rates. With only a handful of core-collapse supernovae observed in the ultraviolet with HST, and almost all within 3 weeks of explosion, this proposal fills a crucial gap in our knowledge of the evolution of core-collapse supernovae in the ultraviolet. This can only be done with HST, and only with a SN that is this close can we probe the UV far into time periods when the flux has normally faded significantly.

OBSERVING DESCRIPTION

This proposal will be triggered on SN 2023ixf a nearby SN discovered on 19 May 2023.

We will observe the SN with STIS FUV-MAMA G140L observation with the 52x0.2" slit and STIS NUV-MAMA G230L observation with the 52x0.2" slit.
The observations will be triggered beween October and November 2023 in the first window of observation.

The PCR 92628 for HST program 17497 has been appoved and this proposal can be triggered in cycle 30.

Visit

Proposal 17497, nebular (01), completed Fri Dec 08 17:02:57 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; BETWEEN 01-OCT-2023:00:00:00 AND 01-JAN-2024:00:00:00; TOO RESPONSE TIME 21.0D

Fixed Targets

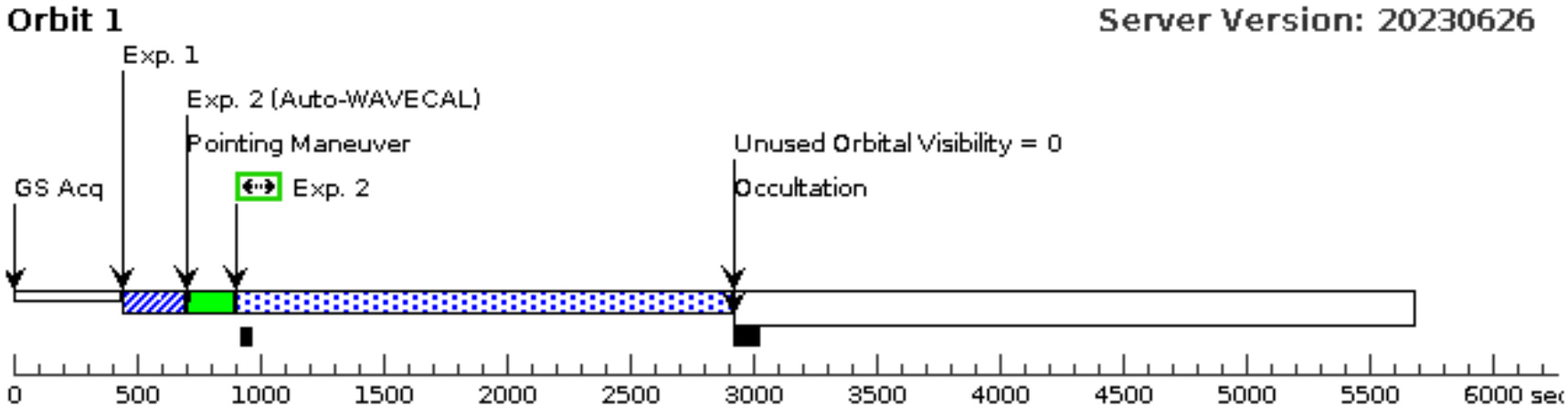
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2023IXF	RA: 14 03 38.5640 (210.9106833d) Dec: +54 18 42.00 (54.31167d) Equinox: J2000		V=19	Reference Frame: ICRS

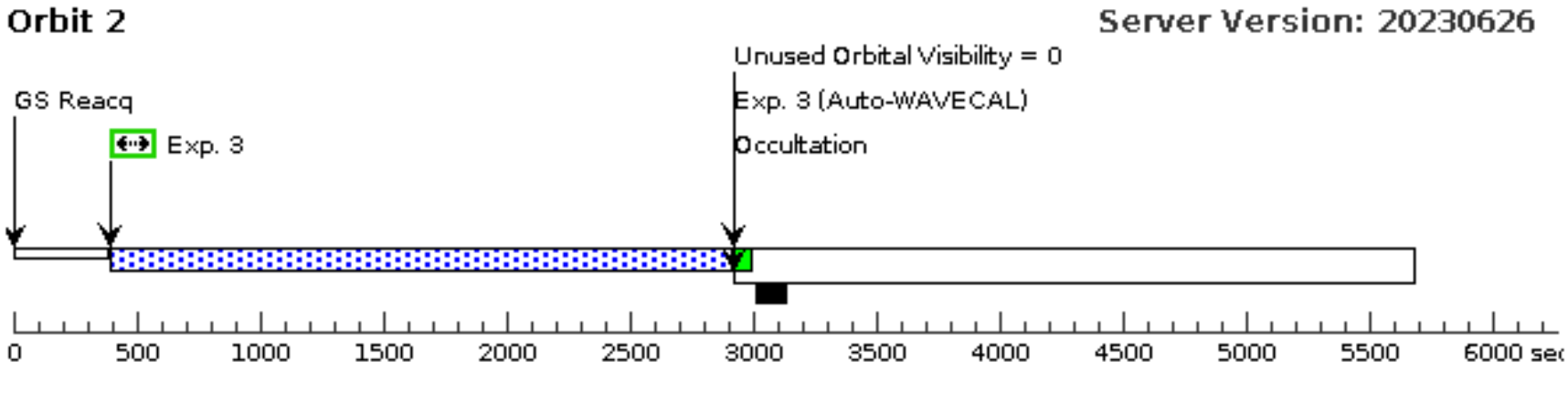
Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE II]

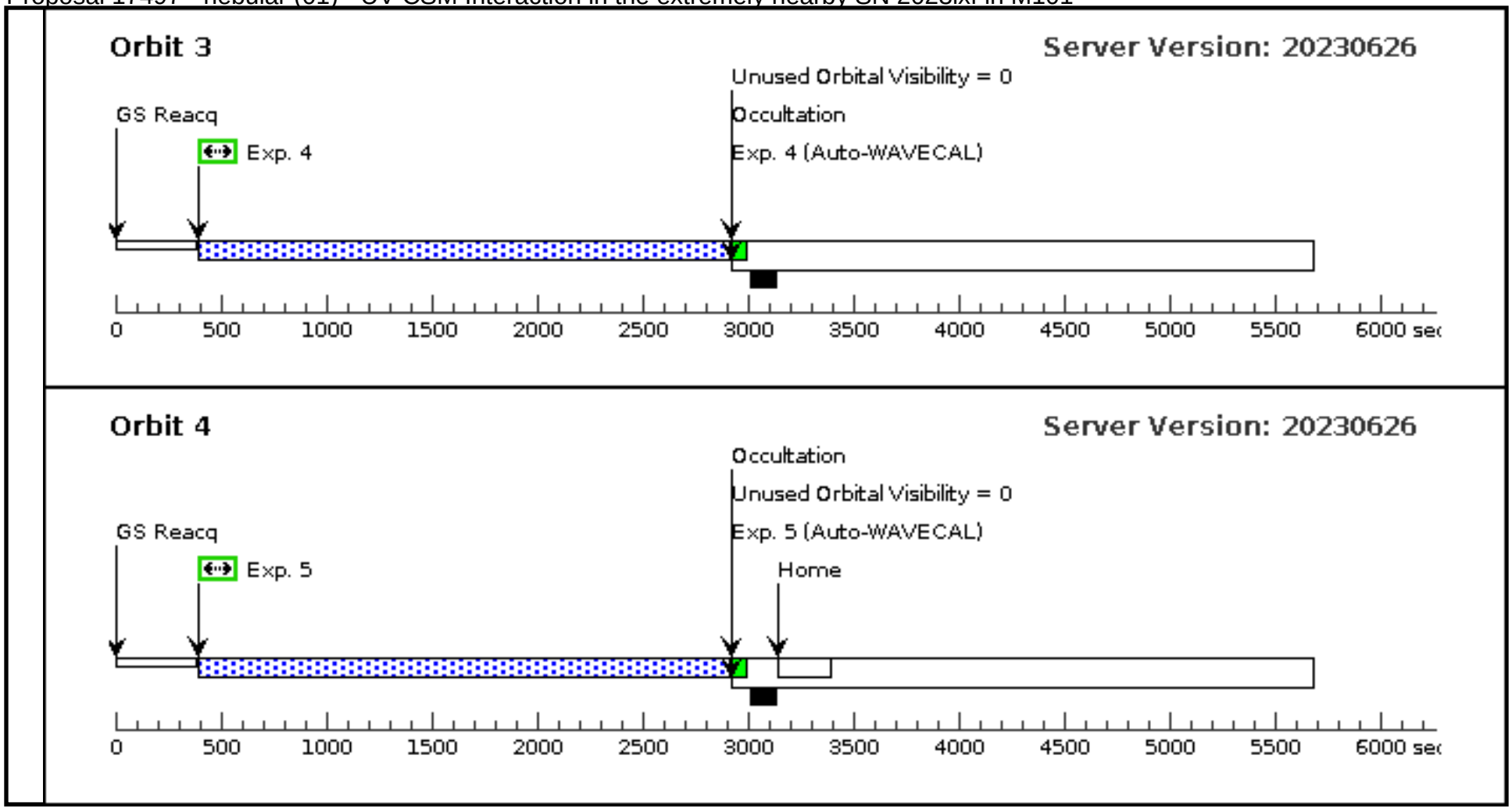
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TA (1889762)	(1) SN2023IXF	STIS/CCD, ACQ, F28X50LP	MIRROR				5 Secs (5 Secs) *[==>]*	 ***[1]***
2	G140L (1889763)	(1) SN2023IXF	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				3000 Secs (1994 Secs) *[==>1994.0 Secs]*	 ***[1]***
3	G140L (1889763)	(1) SN2023IXF	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				3000 Secs (2506 Secs) *[==>2506.0 Secs]*	 ***[2]***
4	G140L (1889763)	(1) SN2023IXF	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				3000 Secs (2506 Secs) *[==>2506.0 Secs]*	 ***[3]***
5	G140L (1889763)	(1) SN2023IXF	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				3000 Secs (2506 Secs) *[==>2506.0 Secs]*	 ***[4]***

Orbit Structure



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Exp. 4
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1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec
Orbit 4
Server Version: 20230626
Occultation
Unused Orbital Visibility = 0
Exp. 5 (Auto-WAVECAL)
GS Reacq
Exp. 5
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0
500
1000
1500
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2500
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3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17497, nebular (02), withdrawn Fri Dec 08 17:02:57 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; BETWEEN 01-OCT-2023:00:00:00 AND 01-JAN-2024:00:00:00; TOO RESPONSE TIME 21.0D

Fixed Targets

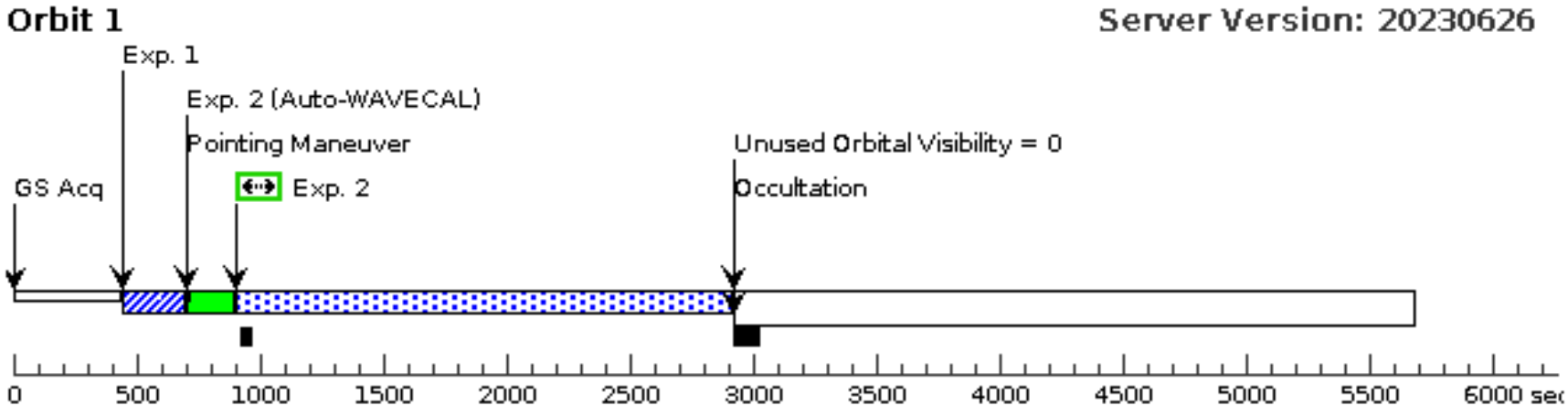
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2023IXF	RA: 14 03 38.5640 (210.9106833d) Dec: +54 18 42.00 (54.31167d) Equinox: J2000		V=19	Reference Frame: ICRS

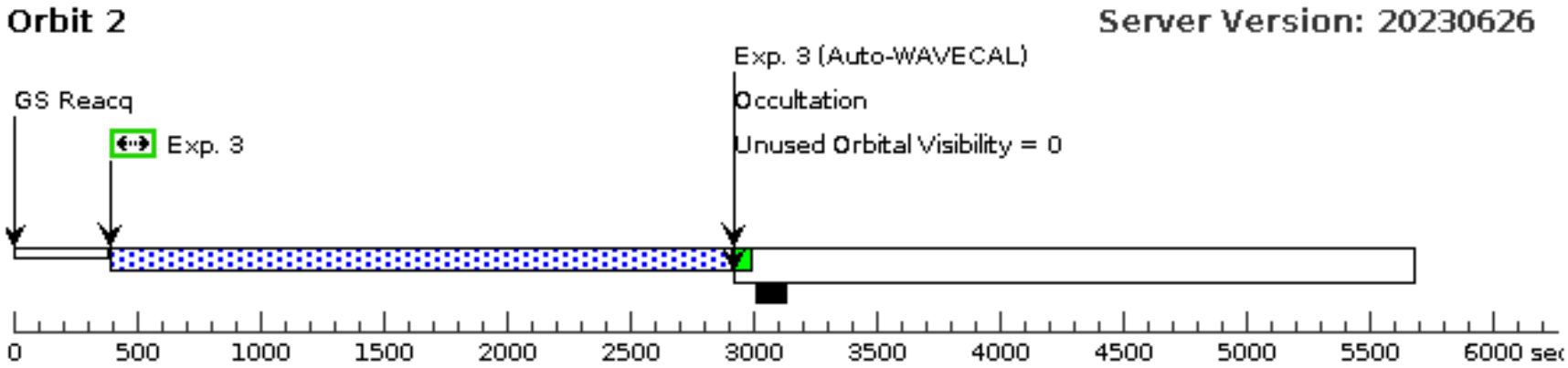
Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE II]

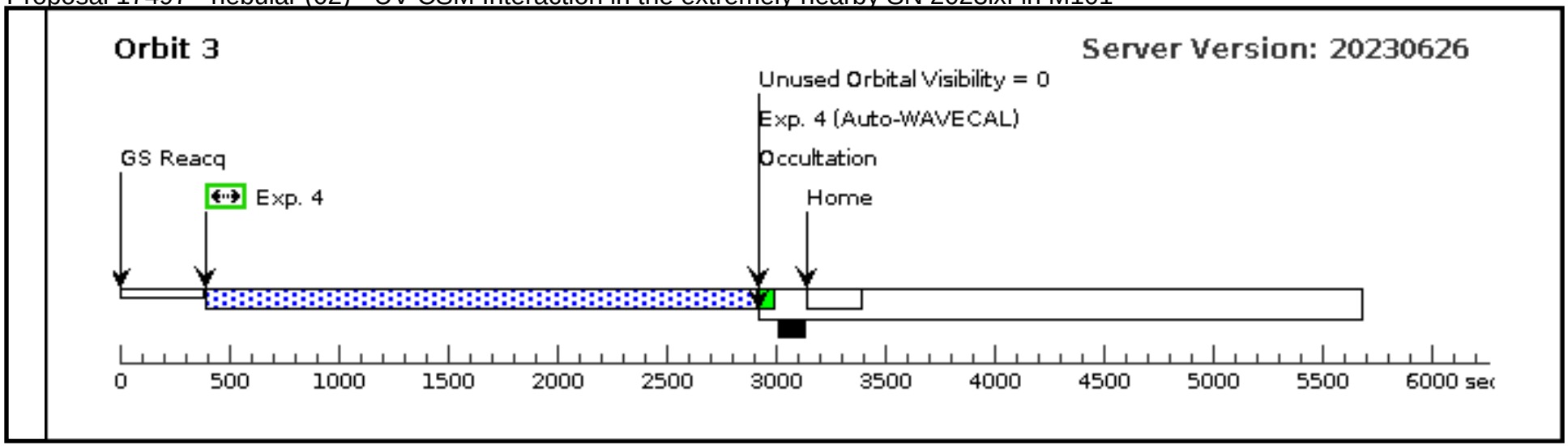
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TA (1889762)	(1) SN2023IXF	STIS/CCD, ACQ, F28X50LP	MIRROR				5 Secs (5 Secs) *[==>]*	***[1]***
2	G230L (1889798)	(1) SN2023IXF	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				3000 Secs (1994 Secs) *[==>1994.0 Secs]*	***[1]***
3	G230L (1889798)	(1) SN2023IXF	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				3000 Secs (2506 Secs) *[==>2506.0 Secs]*	***[2]***
4	G230L (1889798)	(1) SN2023IXF	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				3000 Secs (2506 Secs) *[==>2506.0 Secs]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20230626
Unused Orbital Visibility = 0
Exp. 4 (Auto-WAVECAL)
Occultation
GS Reacq
Exp. 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17497, nebular-COS-NUV (03), implementation Fri Dec 08 17:02:57 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: SCHED 100%; BETWEEN 01-OCT-2023:00:00:00 AND 01-JAN-2024:00:00:00; TOO RESPONSE TIME 21.0D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SN2023IXF-COS	RA: 14 03 38.5640 (210.9106833d) Dec: +54 18 42.00 (54.31167d) Equinox: J2000		V=19	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE II]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TA (COS.ta.1897960)	(2) SN2023IXF-COS	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				5 Secs (5 Secs) *[==>]*	*[1]*
2	G230L 2635 (1897970)	(2) SN2023IXF-COS	COS/NUV, TIME-TAG, PSA	G230L 2635 A	BUFFER-TIME=1142; FP-POS=3			1700 Secs (1700 Secs) *[==>]*	*[1]*
3	G230L 3000 (1898101)	(2) SN2023IXF-COS	COS/NUV, TIME-TAG, PSA	G230L 3000 A	BUFFER-TIME=1178; FP-POS=3			337 Secs (337 Secs) *[==>]*	*[1]*
4	G230L 2950 (1897973)	(2) SN2023IXF-COS	COS/NUV, TIME-TAG, PSA	G230L 2950 A	BUFFER-TIME=1164; FP-POS=3			1700 Secs (1700 Secs) *[==>]*	*[2]*
5	G230L 3000 (1898102)	(2) SN2023IXF-COS	COS/NUV, TIME-TAG, PSA	G230L 3000 A	BUFFER-TIME=1178; FP-POS=3			629 Secs (629 Secs) *[==>]*	*[2]*
6	G230L 3360 (1897978)	(2) SN2023IXF-COS	COS/NUV, TIME-TAG, PSA	G230L 3360 A	BUFFER-TIME=1183; FP-POS=3			1700 Secs (1700 Secs) *[==>]*	*[3]*
7	G230L 3000 (1898102)	(2) SN2023IXF-COS	COS/NUV, TIME-TAG, PSA	G230L 3000 A	BUFFER-TIME=1178; FP-POS=3			638 Secs (638 Secs) *[==>]*	*[3]*

Orbit Structure