17499 - Dust Destruction in Supernova Remnant Shock Waves

Cycle: 31, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. John Charles Raymond (PI) (Contact)	**Smithsonian Institution Astrophysical Observatory**
Dr. Jonathan D. Slavin (CoI)	Smithsonian Institution Astrophysical Observatory

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) CLWEST-1	COS/FUV	1	06-Sep-2023 18:00:59.0	yes
02	(2) CLWEST-2	COS/FUV	1	06-Sep-2023 18:01:00.0	yes
03	(3) CLWEST-3	COS/FUV	1	06-Sep-2023 18:01:01.0	yes
04	(4) CLWEST-4	COS/FUV	1	06-Sep-2023 18:01:01.0	yes
05	(5) CLWEST-5	COS/FUV	1	06-Sep-2023 18:01:02.0	yes
06	(6) CLWEST-6	COS/FUV	1	06-Sep-2023 18:01:02.0	yes

6 Total Orbits Used

ABSTRACT

Supernova remnant shock waves dominate the destruction of interstellar dust, but the observational constraints on the destruction efficiency are poor. This is partly due to incomplete knowledge of the shock parameters and partly to inadequate observations, especially in the UV. We propose to obtain accurate fractions of the dust destroyed in 6 radiative shocks in the Cygnus Loop for which the shock wave parameters -- shock speed, preshock density and magnetic field -- are accurately known. We will use the COS UV spectra to measure the gas phase abundances of C, O and Si.

Oxygen is nearly undepleted in the preshock gas, while C and Si are locked up in grains until the grains are destroyed.

OBSERVING DESCRIPTION

We will obtain COS FUV spectra of 6 positions in the Cygnus Loop with the G140L grating. Each spectrum will be a 1 orbit exposure. There are no restrictions on roll angle. The emission is diffuse, so no peakup should be attempted.

Visit

Proposal 17499, CL-West-1 (01) Wed Sep 06 22:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

(CL-West-1 (01)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

(Exposure 1 (CL-West-1 (01))) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

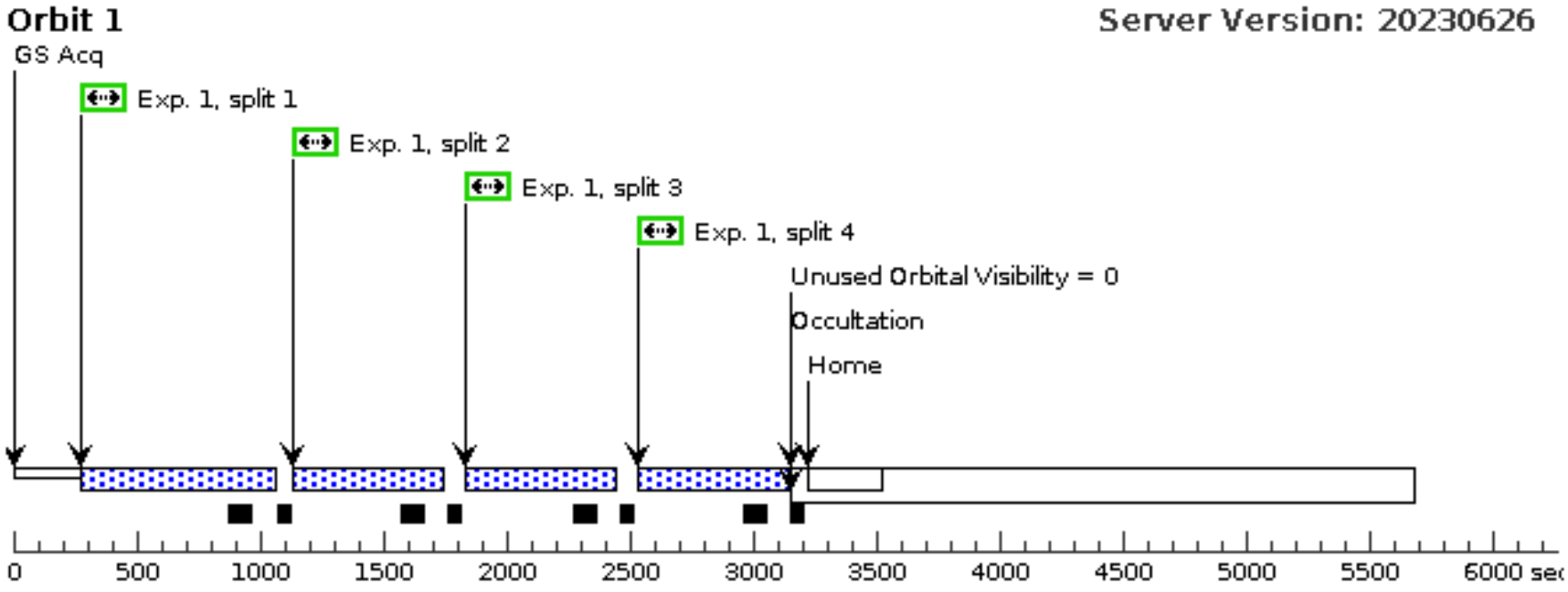
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	CLWEST-1	RA: 20 45 37.8309 (311.4076288d) Dec: +30 59 52.39 (30.99789d) Equinox: J2000		V=18+/-1	Reference Frame: ICRS

Comments:
Category=ISM
Description=[SHOCK FRONT]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1474508)	(1) CLWEST-1	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=400; FP-POS=ALL			500 Secs (2248 Secs) *[==>562.0 Secs (Split 1)]* *[==>562.0 Secs (Split 2)]* *[==>562.0 Secs (Split 3)]* *[==>562.0 Secs (Split 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17499, CL West - 2 (02) Wed Sep 06 22:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

(CL West - 2 (02)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

(CL West 2 (02.001)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

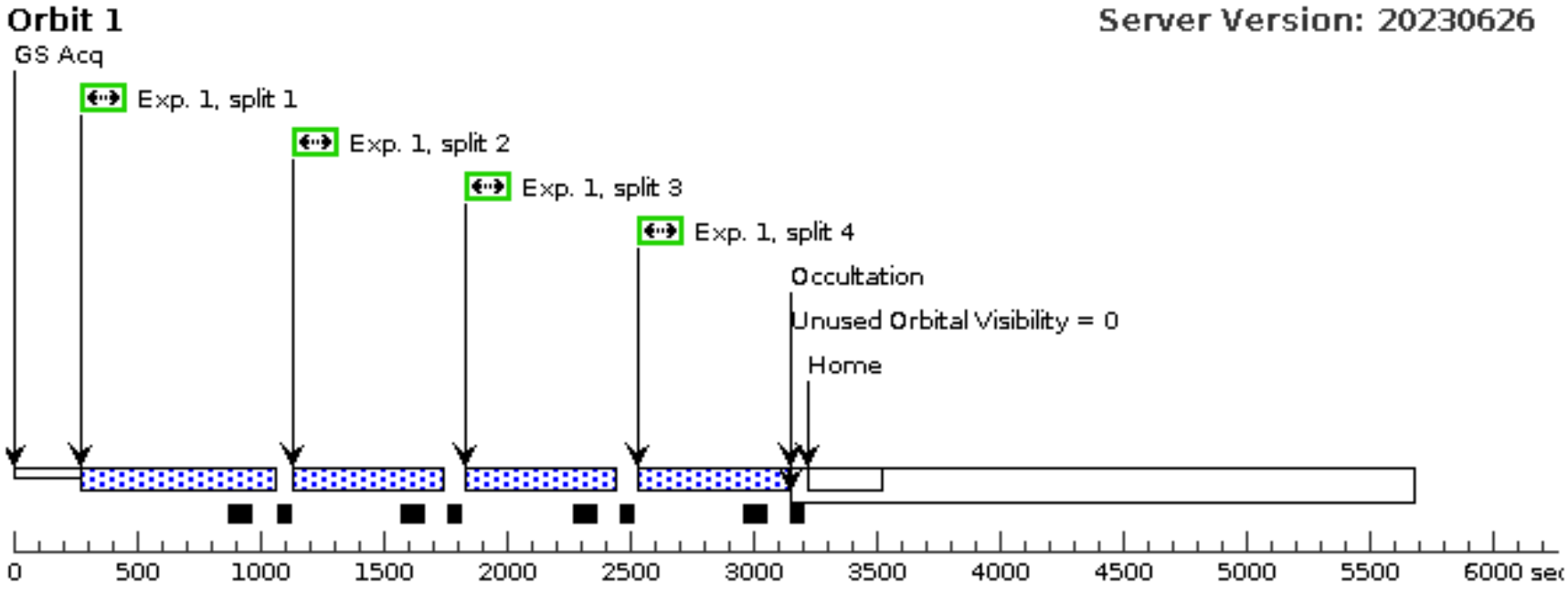
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	CLWEST-2	RA: 20 45 42.4328 (311.4268033d) Dec: +31 00 26.47 (31.00735d) Equinox: J2000		V=18+/-1	Reference Frame: ICRS

Comments:
Category=ISM
Description=[SHOCK FRONT]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CL West 2 (1474508)	(2) CLWEST-2	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=400; FP-POS=ALL			500 Secs (2248 Secs) *[==>562.0 Secs (Split 1)]* *[==>562.0 Secs (Split 2)]* *[==>562.0 Secs (Split 3)]* *[==>562.0 Secs (Split 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17499, CL West -3 (03) Wed Sep 06 22:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

(CL West -3 (03)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

(CL West - 3 (03.001)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

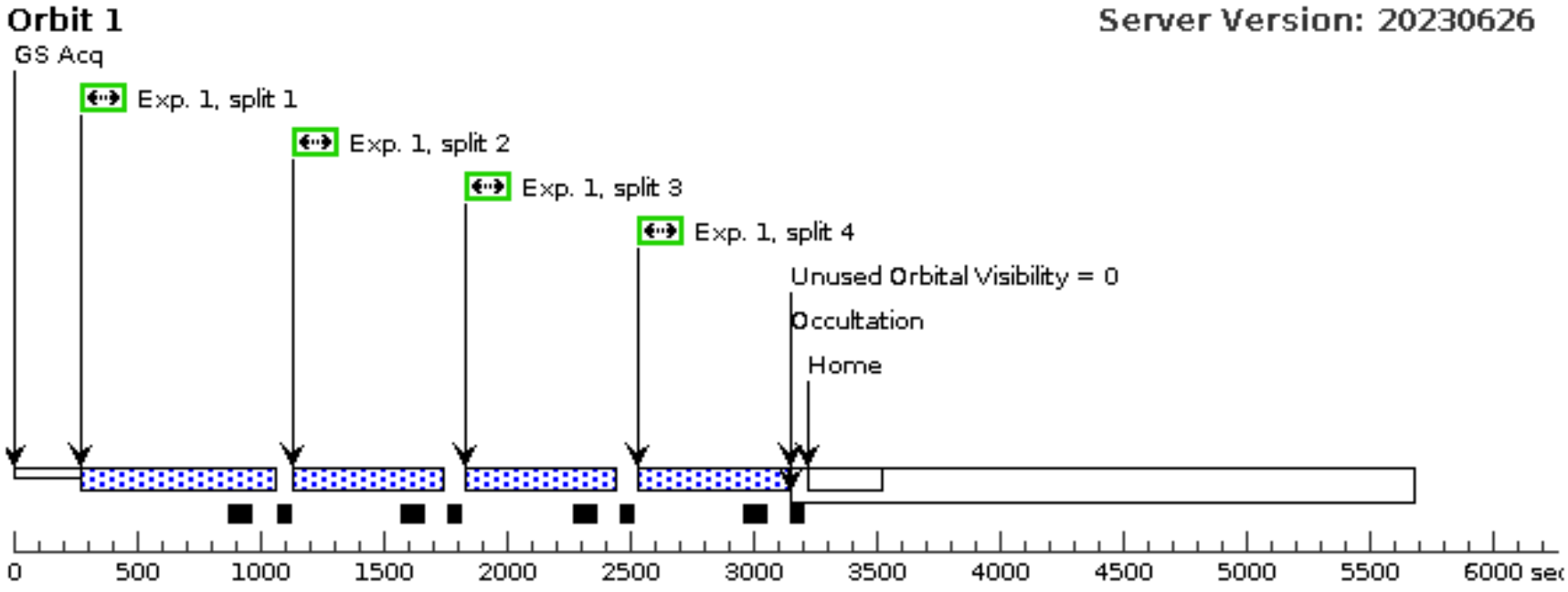
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	CLWEST-3	RA: 20 45 38.2023 (311.4091762d) Dec: +30 59 42.97 (30.99527d) Equinox: J2000		V=18+/-1	Reference Frame: ICRS

Comments:
Category=ISM
Description=[SHOCK FRONT]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CL West - 3 (1474508)	(3) CLWEST-3	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=400; FP-POS=ALL			500 Secs (2248 Secs) *[==>562.0 Secs (Split 1)]* *[==>562.0 Secs (Split 2)]* *[==>562.0 Secs (Split 3)]* *[==>562.0 Secs (Split 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17499, CL West - 4 (04) Wed Sep 06 22:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

(CL West - 4 (04)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

(CL West - 4 (04.001)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

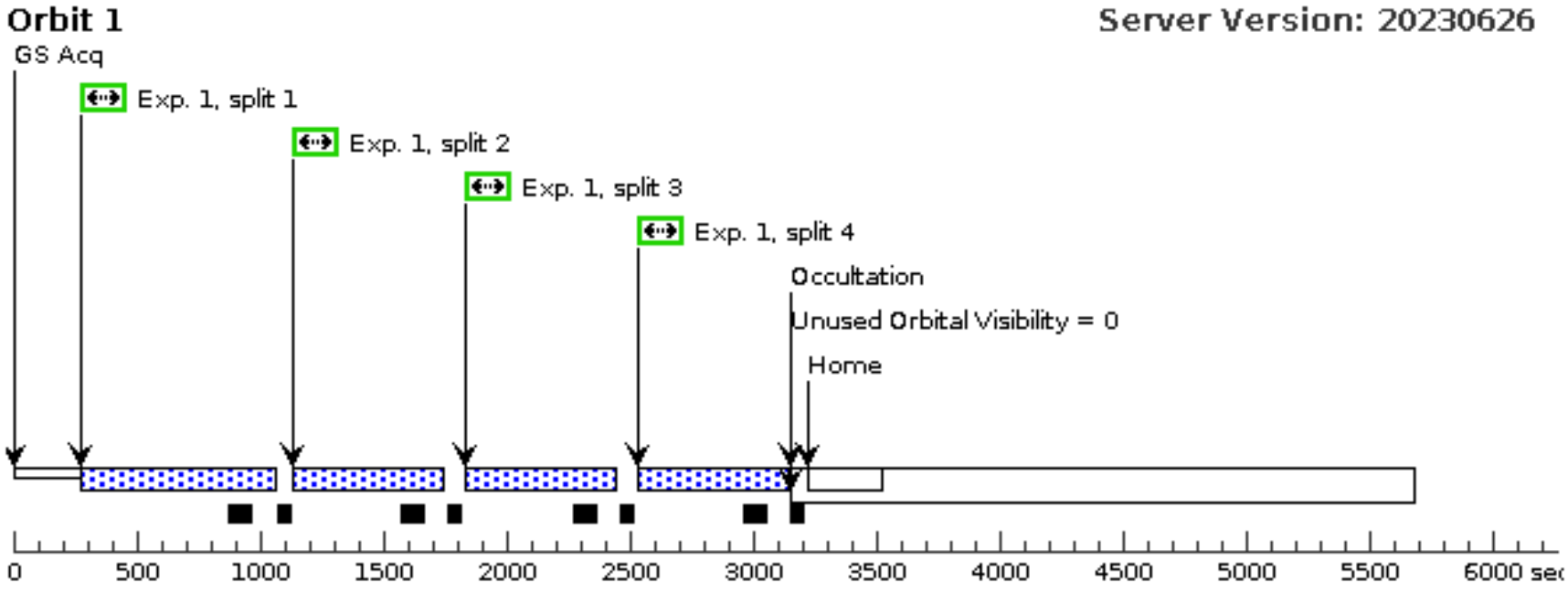
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	CLWEST-4	RA: 20 45 42.9308 (311.4288783d) Dec: +31 00 11.24 (31.00312d) Equinox: J2000		V=18+/-1	Reference Frame: ICRS

Comments:
Category=ISM
Description=[SHOCK FRONT]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CL West - 4 (1474508)	(4) CLWEST-4	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=400; FP-POS=ALL			500 Secs (2248 Secs) *[==>562.0 Secs (Split 1)]* *[==>562.0 Secs (Split 2)]* *[==>562.0 Secs (Split 3)]* *[==>562.0 Secs (Split 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17499, CL West - 5 (05) Wed Sep 06 22:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

(CL West - 5 (05)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

(CL West - 5 (05.001)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

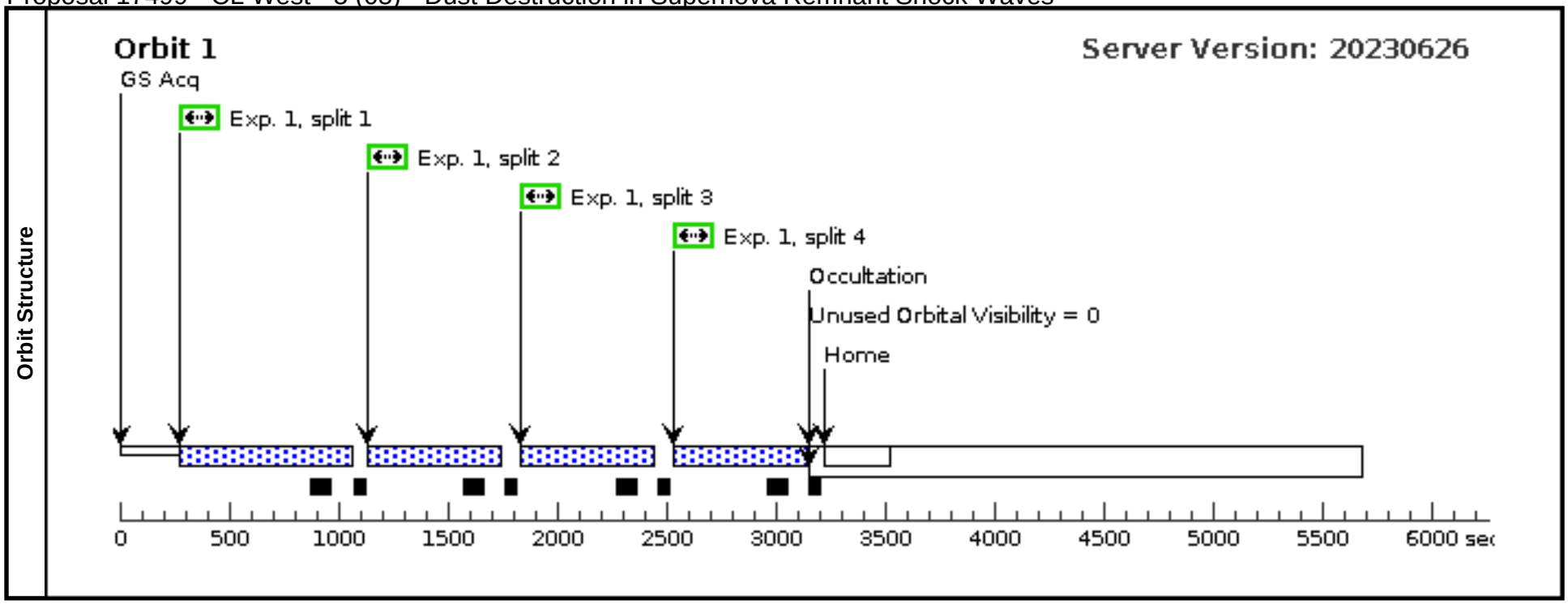
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	CLWEST-5	RA: 20 45 40.1793 (311.4174138d) Dec: +30 58 38.61 (30.97739d) Equinox: J2000		V=18+/-1	Reference Frame: ICRS

Comments:
Category=ISM
Description=[SHOCK FRONT]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CL West - 5 (1474508)	(5) CLWEST-5	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=400; FP-POS=ALL			500 Secs (2248 Secs) *[==>562.0 Secs (Split 1)]* *[==>562.0 Secs (Split 2)]* *[==>562.0 Secs (Split 3)]* *[==>562.0 Secs (Split 4)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20230626
GS Acq
Exp. 1, split 1
Exp. 1, split 2
Exp. 1, split 3
Exp. 1, split 4
Occultation
Unused Orbital Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17499, CL West - 6 (06) Wed Sep 06 22:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Diagnostics

(CL West - 6 (06)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

(CL West - 6 (06.001)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	CLWEST-6	RA: 20 45 40.6818 (311.4195075d) Dec: +30 58 24.54 (30.97348d) Equinox: J2000		V=18+/-1	Reference Frame: ICRS

Comments:
Category=ISM
Description=[SHOCK FRONT]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CL West - 6 (1474508)	(6) CLWEST-6	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=400; FP-POS=ALL			500 Secs (2248 Secs) *[==>562.0 Secs (Split 1)]* *[==>562.0 Secs (Split 2)]* *[==>562.0 Secs (Split 3)]* *[==>562.0 Secs (Split 4)]*	***[1]***

Orbit Structure