16035 - Exploring evolved planetary systems: three new gaseous debris discs

Cycle: 27, Proposal Category: GO

(UV Initiative, JWST Initative)

(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) WDJ052914.32-340108.11	COS/FUV COS/NUV	2	16-Jul-2020 13:00:53.0	yes
H1	(1) WDJ052914.32-340108.11	COS/FUV COS/NUV	1	16-Jul-2020 13:00:54.0	yes
H2	(1) WDJ052914.32-340108.11	COS/FUV COS/NUV	1	16-Jul-2020 13:00:54.0	yes
02	(1) WDJ052914.32-340108.11	COS/FUV COS/NUV	3	16-Jul-2020 13:00:55.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(2) WDJ213350.72+242805.93	COS/FUV COS/NUV	2	16-Jul-2020 13:00:56.0	yes
04	(2) WDJ213350.72+242805.93	COS/FUV COS/NUV	2	16-Jul-2020 13:00:57.0	yes
07	(3) WDJ221202.88-135239.96	COS/FUV COS/NUV	2	16-Jul-2020 13:00:58.0	yes
08	(3) WDJ221202.88-135239.96	COS/FUV COS/NUV	3	16-Jul-2020 13:00:59.0	yes

16 Total Orbits Used

ABSTRACT

It is now established that planets survive the evolution of their host star into a white dwarf. Planetary remnants around a number of these ancient stars are revealed by compact debris disks, formed from the tidal disruption of planetesimals, which are detectable as IR flux excess. Accretion from these disks results in metal pollution of the otherwise pristine H or He white dwarf atmospheres, and the analysis of adequate optical and UV spectroscopy of these systems allows to reconstruct the bulk composition of the disrupted planetesimals. Deeper insight into the properties of the parent bodies arises from mineralogical studies of the dusty disks, but requires sensitive IR spectroscopy - available currently only for one single system. The imminent launch of JWST will enable revolutionary IR spectroscopic studies, and now is the time to identify the best targets for these JWST observations.

White dwarf debris disks which contain copious amounts of metallic gas in addition to circumstellar dust are ideal targets, as they are actively undergoing planetesimal disruption events right now. However, these systems are extremely elusive, and so far, only three such systems were amenable to COS ultraviolet studies of their elemental abundances. We have identified three new gaseous debris disks, and request here COS spectroscopy to fully characterise the elemental abundances of the debris. With the atomic abundances in hand, these systems are prime targets for JWST IR spectroscopy, which will enable the detailed mineralogical modelling of the dusty debris. Combined, these observations will dramatically augment our knowledge of the composition and structure of rocky exo-planets.

OBSERVING DESCRIPTION

The goal of these observations is to obtain high signal-to-noise far-ultraviolet spectra of three white dwarfs which are accreting planetary debris from circumstellar debris disks. The planned COS spectroscopy will be used to measure the abundances of that material from the sharp photospheric metal lines.

We use the G130M grating with two central wavelengths to maximise the wavelength covered by these observations, and to achieve gap-less coverage. We make use of all permitted FP-POS positions, i.e. 3 & 4 for @1291A, and 1,2,3,4 @ 1222A. The @1291A and @1222A observations are split into two separate visits to facilitate the scheduling.

This program should not be affected in case that HST moves to a 2-gyro mode.

Visit

Proposal 16035, WDJ0529 @ 1291 (01), failed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: Only two FP-POS settings allowed for the 1291A central wavelength.

Diagnostics

(WDJ0529 @ 1291 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

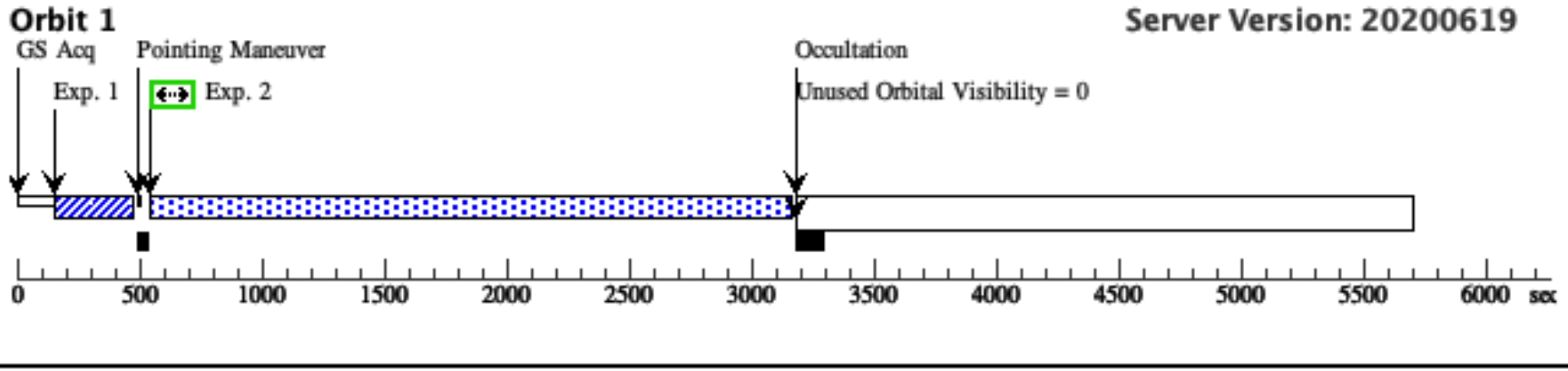
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WDJ052914.32-340108.11	RA: 05 29 14.3225 (82.3096771d) Dec: -34 01 8.62 (-34.01906d) Equinox: J2000	Proper Motion RA: -0.390 mas/yr Proper Motion Dec: -32.611 mas/yr Epoch of Position: 2015.5	V=17.5 GALEX FUV=16.7	Reference Frame: ICRS

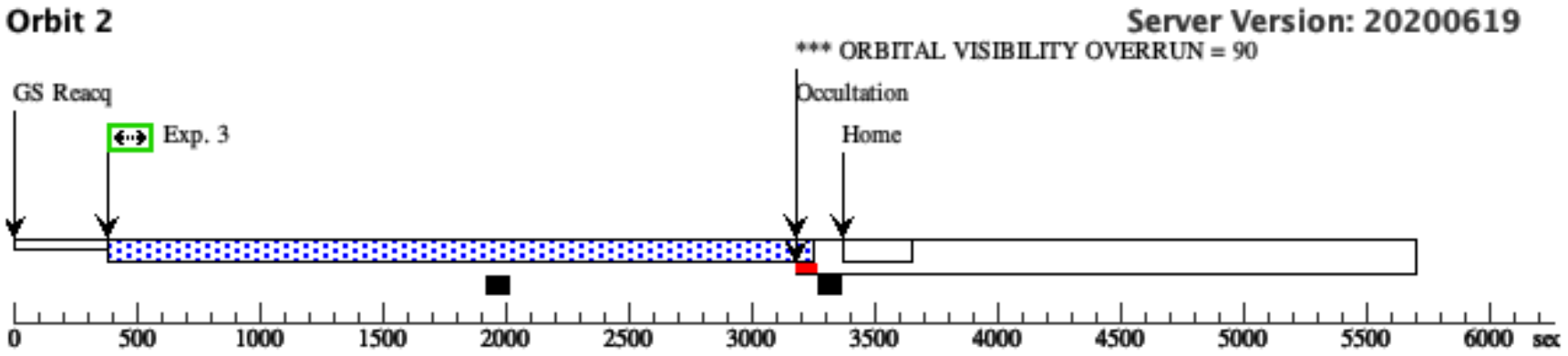
Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390782)	(1) WDJ052914.32-340108.11	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				12 Secs (12 Secs) *[==>]*	***[1]***
2	(COS.sp.1390783)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=2445; FP-POS=3			2451 Secs (2451 Secs) *[==>]*	***[1]***
3	(COS.sp.1390783)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1500; FP-POS=4			2814 Secs (2814 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16035, WDJ0529 @ 1291-HOPR (H1), completed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: This is a HOPR Repeat for exposure 03 of failed visit 01.

Only two FP-POS settings allowed for the 1291A central wavelength.

Fixed Targets

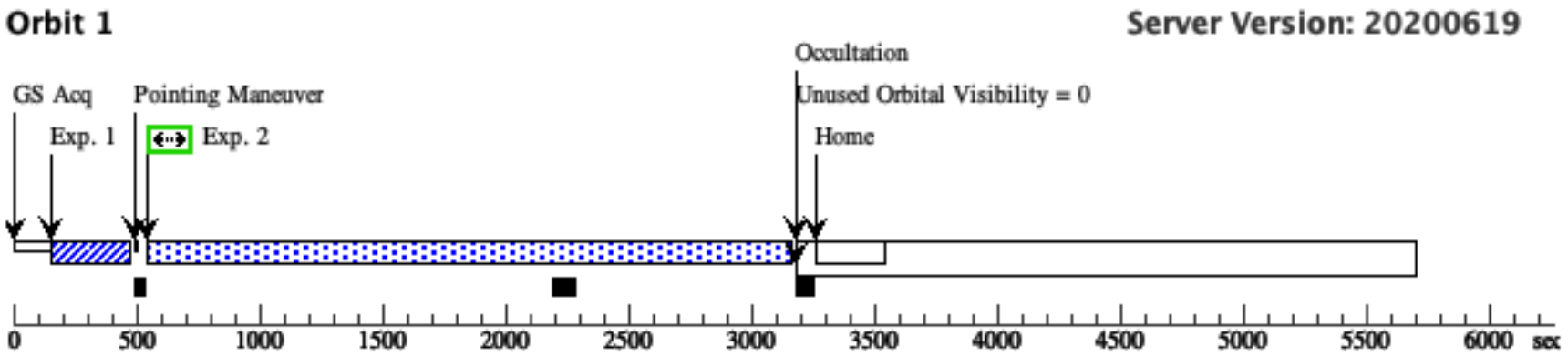
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WDJ052914.32-340108.11	RA: 05 29 14.3225 (82.3096771d) Dec: -34 01 8.62 (-34.01906d) Equinox: J2000	Proper Motion RA: -0.390 mas/yr Proper Motion Dec: -32.611 mas/yr Epoch of Position: 2015.5	V=17.5 GALEX FUV=16.7	Reference Frame: ICRS

Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390782)	(1) WDJ052914.32-340108.11	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				12 Secs (12 Secs) *[==>]*	*[1]*
2	(COS.sp.1390783)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1500; FP-POS=4			2451 Secs (2451 Secs) *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 16035, WDJ0529 @ 1291-HOPR (H2) Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: This is a HOPR Repeat for failed visit H1.

Only two FP-POS settings allowed for the 1291A central wavelength.

Fixed Targets

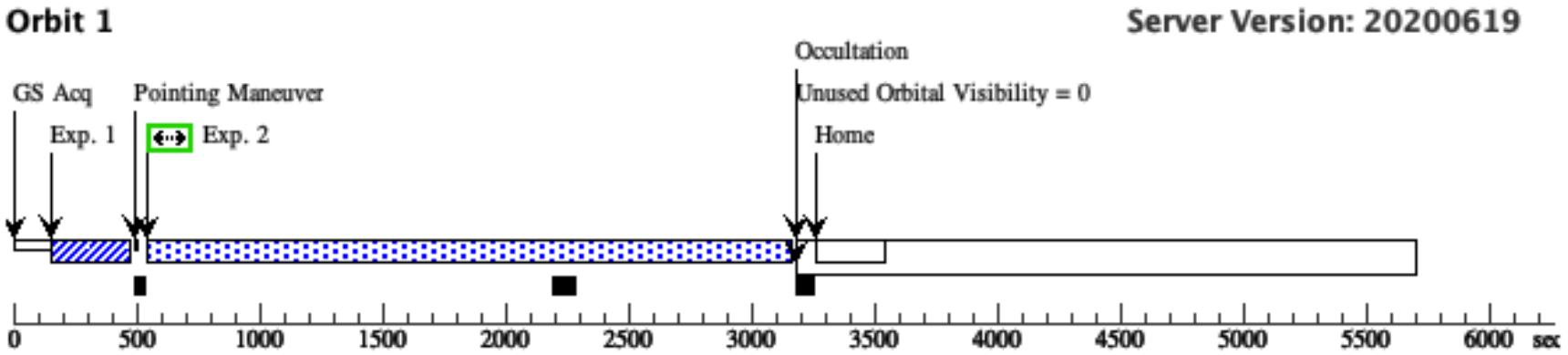
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WDJ052914.32-340108.11	RA: 05 29 14.3225 (82.3096771d) Dec: -34 01 8.62 (-34.01906d) Equinox: J2000	Proper Motion RA: -0.390 mas/yr Proper Motion Dec: -32.611 mas/yr Epoch of Position: 2015.5	V=17.5 GALEX FUV=16.7	Reference Frame: ICRS

Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390782)	(1) WDJ052914.32-340108.11	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				12 Secs (12 Secs) *[==>]*	*[1]*
2	(COS.sp.1390783)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1500; FP-POS=4			2451 Secs (2451 Secs) *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 16035, WDJ0529 @ 1222 (02), completed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(WDJ0529 @ 1222 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(WDJ0529 @ 1222 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

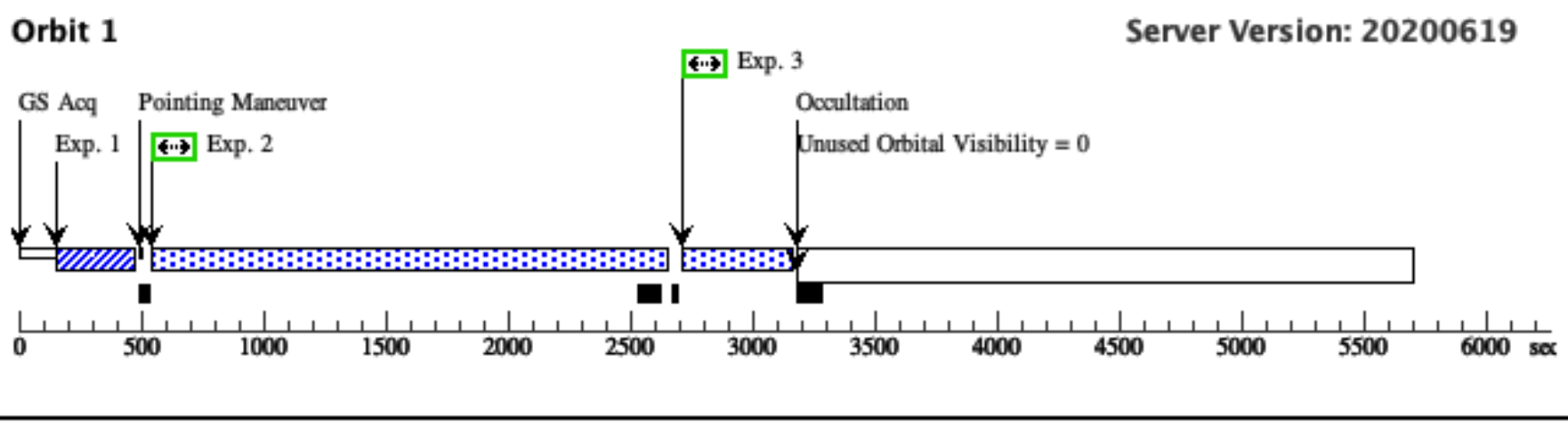
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WDJ052914.32-340108.11	RA: 05 29 14.3225 (82.3096771d) Dec: -34 01 8.62 (-34.01906d) Equinox: J2000	Proper Motion RA: -0.390 mas/yr Proper Motion Dec: -32.611 mas/yr Epoch of Position: 2015.5	V=17.5 GALEX FUV=16.7	Reference Frame: ICRS

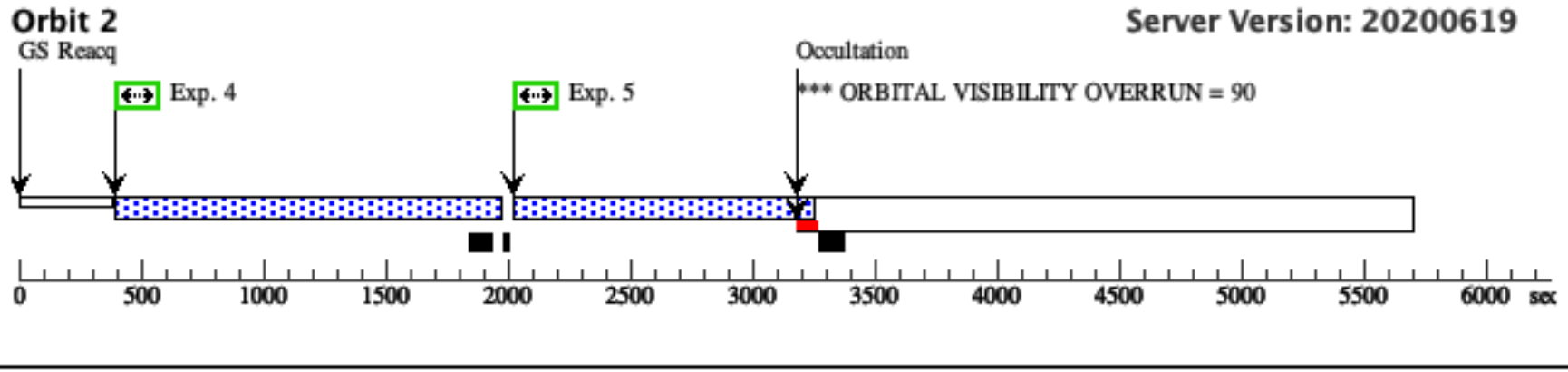
Comments:
Category=STAR
Description=[DA]
Extended=NO

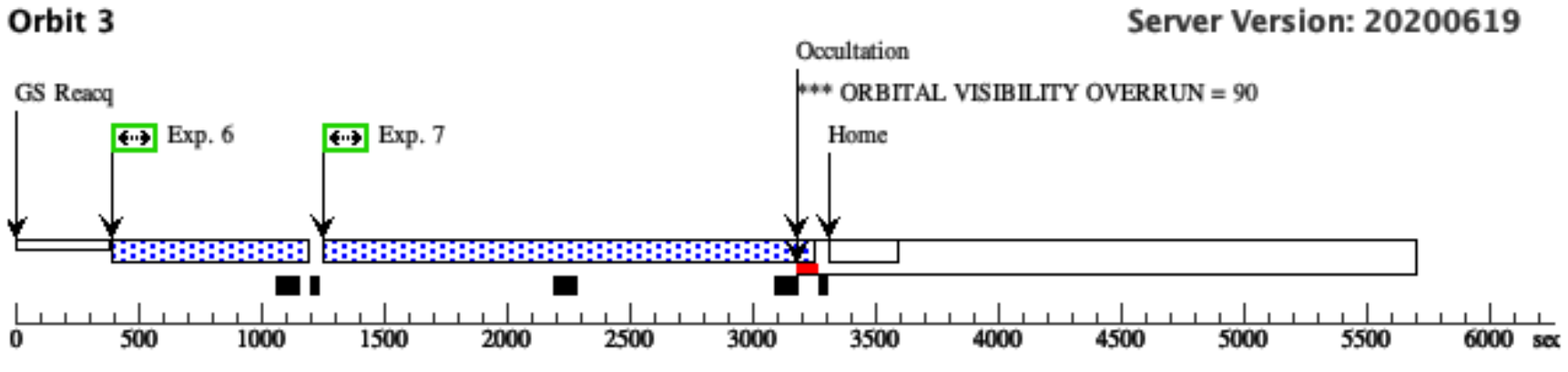
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390782)	(1) WDJ052914.32-340108.11	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				12 Secs (12 Secs) *[==>]*	***[1]***
2	(COS.sp.1390783)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1820; FP-POS=1			1930 Secs (1930 Secs) *[==>]*	***[1]***
3	(COS.sp.1390785)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=401; FP-POS=2			401 Secs (401 Secs) *[==>]*	***[1]***
4	(COS.sp.1390785)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1420; FP-POS=2			1530 Secs (1530 Secs) *[==>]*	***[2]***
5	(COS.sp.1390785)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1179; FP-POS=3			1179 Secs (1179 Secs) *[==>]*	***[2]***
6	(COS.sp.1390785)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=641; FP-POS=3			751 Secs (751 Secs) *[==>]*	***[3]***
7	(COS.sp.1390785)	(1) WDJ052914.32-340108.11	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=900; FP-POS=4			1948 Secs (1948 Secs) *[==>]*	***[3]***

Orbit Structure







Visit

Proposal 16035, WDJ2133 @ 1291 (03), completed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: Only two FP-POS settings allowed for the 1291A central wavelength.

Diagnostics

(WDJ2133 @ 1291 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

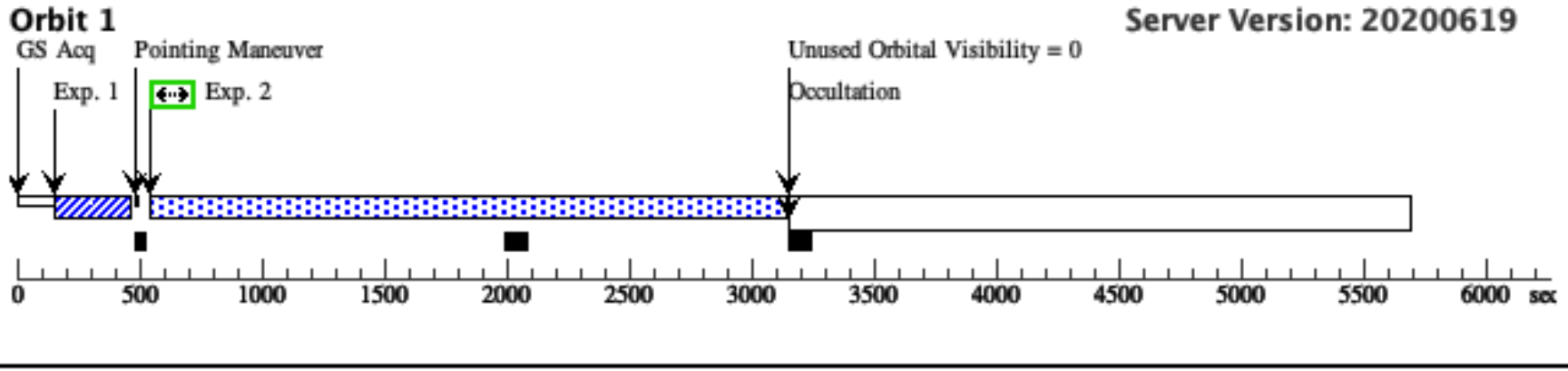
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	WDJ213350.72+242805.93	RA: 21 33 50.7127 (323.4613029d) Dec: +24 28 5.50 (24.46819d) Equinox: J2000	Proper Motion RA: -4.418 mas/yr Proper Motion Dec: -27.482 mas/yr Epoch of Position: 2015.5	V=17.4+/-0.1	Reference Frame: ICRS

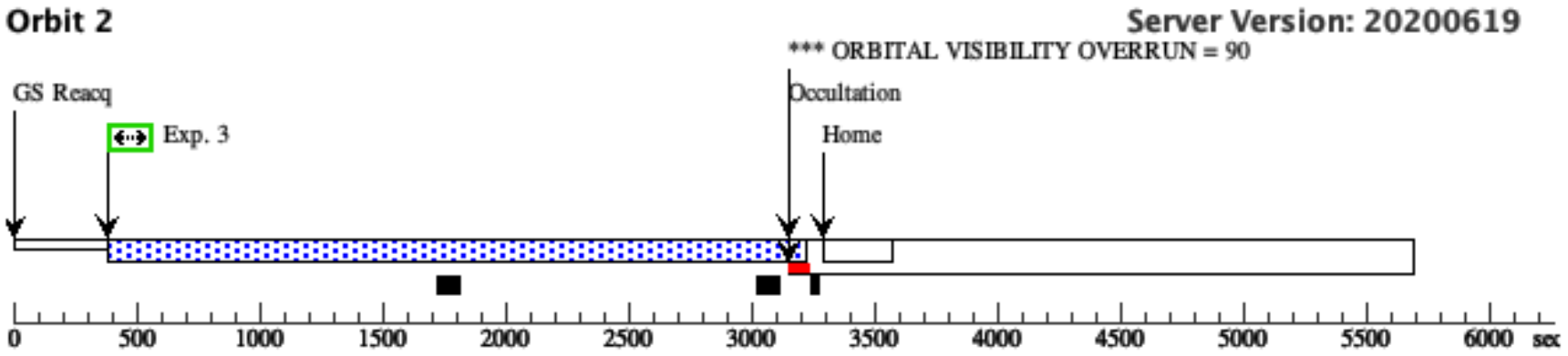
Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390794)	(2) WDJ213350.72+242805.93	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				10 Secs (10 Secs) *[==>]*	 ***[1]***
2	(COS.sp.1390796)	(2) WDJ213350.72+242805.93	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1300; FP-POS=3			2432 Secs (2432 Secs) *[==>]*	 ***[1]***
3	(COS.sp.1390796)	(2) WDJ213350.72+242805.93	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1300; FP-POS=4			2791 Secs (2791 Secs) *[==>]*	 ***[2]***

Orbit Structure





Visit

Proposal 16035, WDJ2133 @ 1222 (04), completed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(WDJ2133 @ 1222 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

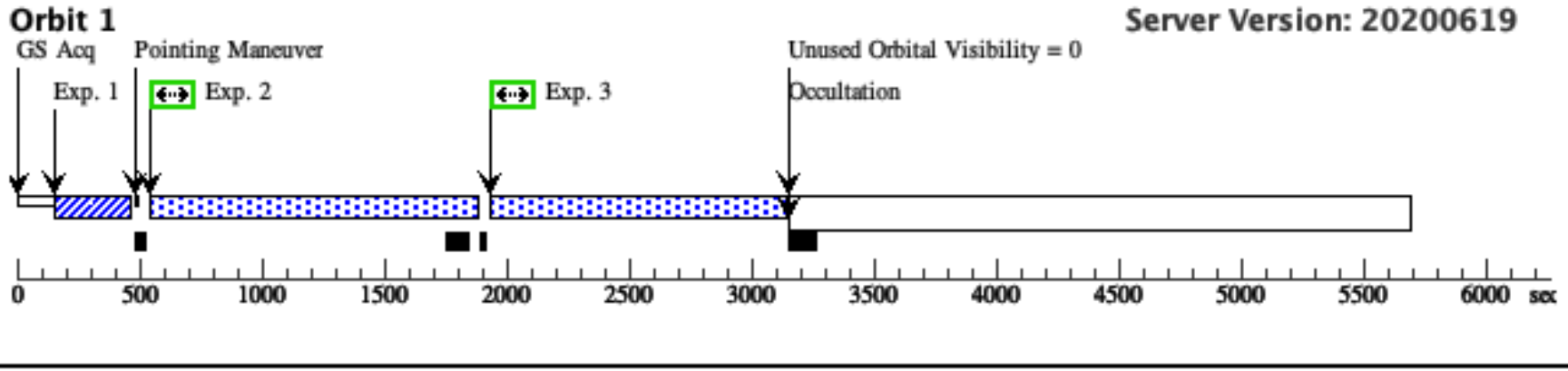
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	WDJ213350.72+242805.93	RA: 21 33 50.7127 (323.4613029d) Dec: +24 28 5.50 (24.46819d) Equinox: J2000	Proper Motion RA: -4.418 mas/yr Proper Motion Dec: -27.482 mas/yr Epoch of Position: 2015.5	V=17.4+/-0.1	Reference Frame: ICRS

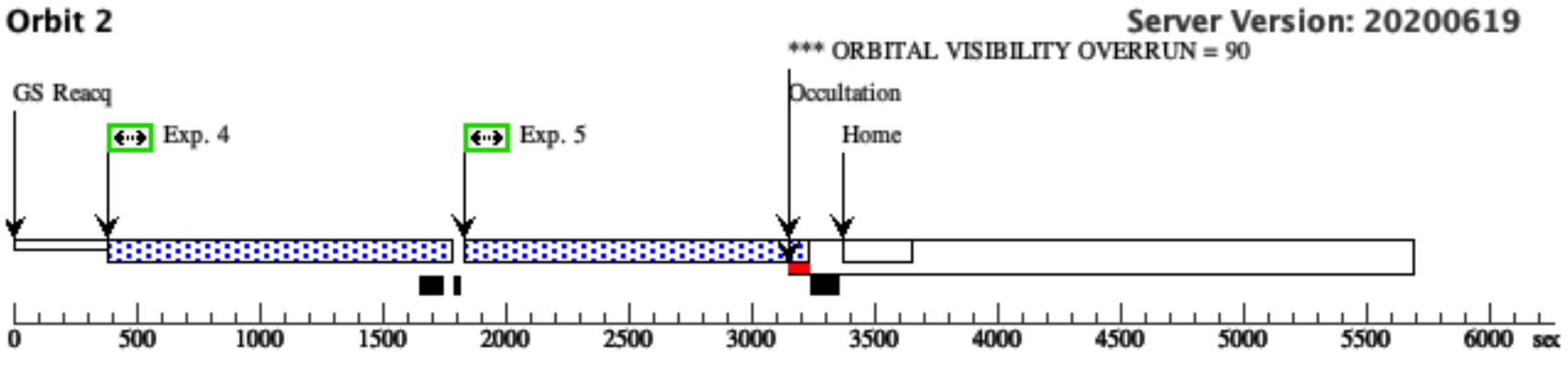
Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390794)	(2) WDJ213350.72+242805.93	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				10 Secs (10 Secs) *[==>]*	***[1]***
2	(COS.sp.1390795)	(2) WDJ213350.72+242805.93	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1046; FP-POS=1			1156 Secs (1156 Secs) *[==>]*	***[1]***
3	(COS.sp.1390795)	(2) WDJ213350.72+242805.93	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1100; FP-POS=2			1156 Secs (1156 Secs) *[==>]*	***[1]***
4	(COS.sp.1390795)	(2) WDJ213350.72+242805.93	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1233; FP-POS=3			1343 Secs (1343 Secs) *[==>]*	***[2]***
5	(COS.sp.1390795)	(2) WDJ213350.72+242805.93	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1300; FP-POS=4			1343 Secs (1343 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16035, WDJ2212 @ 1291 (07), completed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: Only two FP-POS settings allowed for the 1291A central wavelength.

Diagnostics

(WDJ2212 @ 1291 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

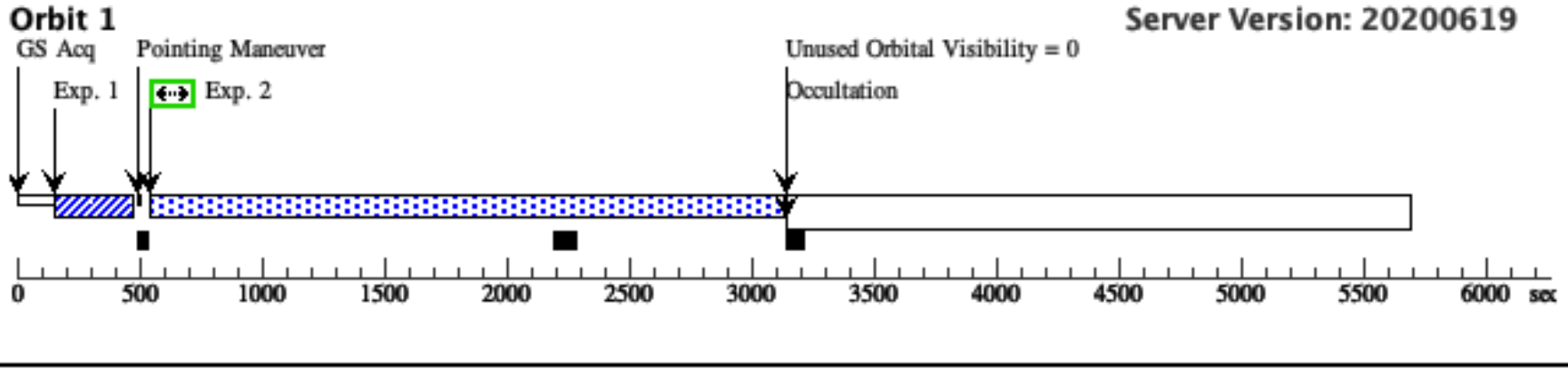
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	WDJ221202.88-135239.96	RA: 22 12 2.8452 (333.0118550d) Dec: -13 52 40.17 (-13.87782d) Equinox: J2000	Proper Motion RA: -28.661 mas/yr Proper Motion Dec: -13.044 mas/yr Epoch of Position: 2015.5	V=17.3+/-0.1 GALEX FUV=16.9	Reference Frame: ICRS

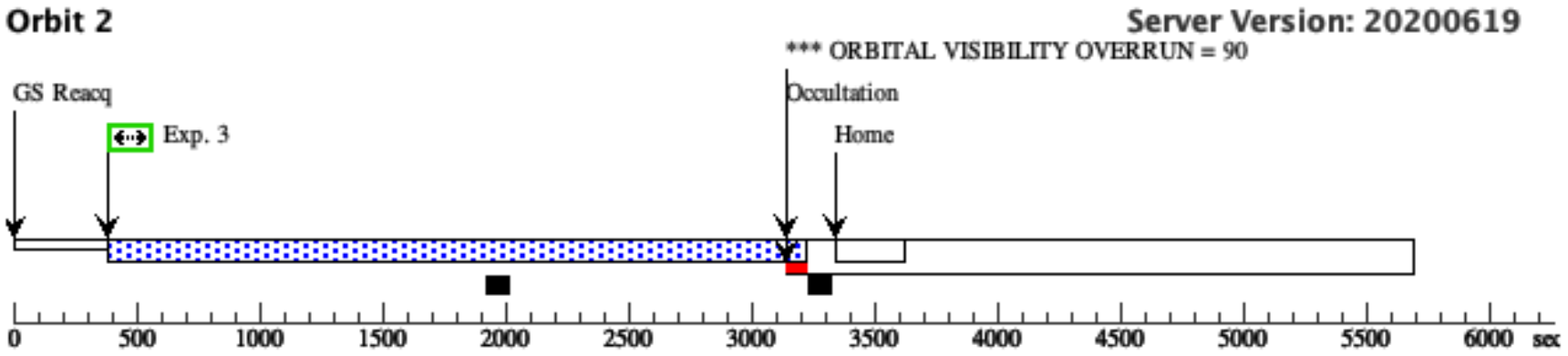
Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390797)	(3) WDJ221202.88-135239.96	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				12 Secs (12 Secs) *[==>]*	 ***[1]***
2	(COS.sp.1390798)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1500; FP-POS=3			2420 Secs (2420 Secs) *[==>]*	 ***[1]***
3	(COS.sp.1390798)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1500; FP-POS=4			2783 Secs (2783 Secs) *[==>]*	 ***[2]***

Orbit Structure





Visit

Proposal 16035, WDJ2212 @ 1222 (08), completed Thu Jul 16 17:01:00 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(WDJ2212 @ 1222 (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(WDJ2212 @ 1222 (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	WDJ221202.88-135239.96	RA: 22 12 2.8452 (333.0118550d) Dec: -13 52 40.17 (-13.87782d) Equinox: J2000	Proper Motion RA: -28.661 mas/yr Proper Motion Dec: -13.044 mas/yr Epoch of Position: 2015.5	V=17.3+/-0.1 GALEX FUV=16.9	Reference Frame: ICRS

Comments:
Category=STAR
Description=[DA]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1390797)	(3) WDJ221202.88-135239.96	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				12 Secs (12 Secs) *[==>]*	***[1]***
2	(COS.sp.1390799)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1940; FP-POS=1			2050 Secs (2050 Secs) *[==>]*	***[1]***
3	(COS.sp.1390799)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=2			250 Secs (250 Secs) *[==>]*	***[1]***
4	(COS.sp.1390799)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=1690; FP-POS=2			1800 Secs (1800 Secs) *[==>]*	***[2]***
5	(COS.sp.1390799)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=800; FP-POS=3			878 Secs (878 Secs) *[==>]*	***[2]***
6	(COS.sp.1390799)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=500; FP-POS=3			609 Secs (609 Secs) *[==>]*	***[3]***
7	(COS.sp.1390799)	(3) WDJ221202.88-135239.96	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=900; FP-POS=4			2059 Secs (2059 Secs) *[==>]*	***[3]***

Orbit Structure