16211 - A systematic study of auroral processes at Ganymede

Cycle: 28, 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) GANYMEDE-EAST-1	COS/FUV COS/NUV	2	03-Jun-2021 14:00:14.0	yes
02	(2) GANYMEDE-WEST-1	COS/FUV COS/NUV	2	03-Jun-2021 14:00:15.0	yes
03	(3) GANYMEDE-EAST-2	COS/FUV COS/NUV	2	03-Jun-2021 14:00:16.0	yes
04	(4) GANYMEDE-WEST-2	COS/FUV COS/NUV	2	03-Jun-2021 14:00:17.0	yes
05	(5) GANYMEDE-EAST-3	COS/FUV COS/NUV	2	03-Jun-2021 14:00:18.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
06	(6) GANYMEDE-WEST-3	COS/FUV COS/NUV	2	03-Jun-2021 14:00:19.0	yes

12 Total Orbits Used

ABSTRACT

Ganymede is the primary target of the upcoming JUICE mission, but many open questions currently exist about the unique magnetosphere-within-a-magnetosphere interaction between Ganymede and Jupiter. The ~10 degree offset between Jupiter's rotation and magnetic axes leads to a time-varying interaction between the magnetospheres of the two bodies, with Ganymede encountering the densest Jovian plasma at System III longitudes around 110 and 290 degrees. Previous observations of Ganymede's ultraviolet auroral emissions indicated that the orbital trailing and leading hemispheres respond differently to the changing plasma environment; the leading hemisphere emissions were found to be significantly more variable than the trailing emissions on a range of timescales. However, the two hemispheres were observed in different regions of System III longitude, and it is unclear if the difference in variability was real, or related to changes in the rate of reconnection with System III, as suggested by a recent analysis of radio observations. Our proposed program addresses this question by observing both hemispheres over a wide range of System III longitudes, including both plasma sheet crossings and regions of high and low radio emission probability, thereby conclusively determining whether the apparent disparate behavior of the two hemispheres is real. Our proposed observations, using COS G130M, will also provide the ability to test previous analysis of the expected O/O2 ratio in Ganymede's atmosphere, and will place constraints on S ions local to Ganymede. An improved understanding of the near-Ganymede environment will provide useful information in advance of the JUICE mission.

OBSERVING DESCRIPTION

The orbital leading and trailing hemispheres of Ganymede - visible at eastern and western elongation, respectively - will each be observed using the COS G130M grating with central wavelength setting 1291. We will use a total of 12 orbits (three 2-orbit visits per hemisphere) to observe the auroral emissions on both hemispheres while Ganymede's position relative to Jupiter's magnetic field changes, to study how the changing magnetic interaction affects the aurora on a range of timescales. We have selected times when Ganymede experiences different magnetic conditions by placing constraints on the CML of Jupiter as viewed by Ganymede in the target definitions. We have tried not to make the constraints too restrictive, but they may be expanded slightly more if necessary, as long as we sample a good range of different regions over the three visits per hemisphere. We have requested observations within +/- 8 weeks of Jupiter opposition to maximize Ganymede's angular size and therefore the signal-to-noise ratio in the observations, but if scheduling is a problem this constraint can also be relaxed (ideally only by a few more weeks).

The emissions we intend to measure fall on both segments of the detector. We have therefore only used FP-POS 3 and 4 in our observation plans, so that our observations comply with the current COS2025 policy.

We will use the same target acquisition strategy used in program 15868 for observations of Europa and Callisto (the first Callisto observations in that program have been acquired successfully). For ETC target acquisition runs, we used a surface brightness from JPL Horizons (5.5 Vmag/arcsec^2) and scaled it based on the difference between Ganymede's visible and NUV reflectance. Ganymede's visible albedo is ~43%, and its average albedo in the 240-320 nm range is ~ 8% (trailing hemisphere) to ~17% (leading hemisphere) [Nelson et al. 1987], so it is ~1 to 1.8 magnitudes dimmer in the NUV.

ETC runs for science acquisitions used an input spectrum extracted from previous observations of Ganymede using COS G130M (from program 14634). The expected count rate is well below the COS FUV limit at all wavelengths, including Lyman alpha.

If Hubble needs to operate in reduced-gyro mode during Cycle 28, we expect that the main impact on our program would be that the observations may be more spread out in time. This may degrade the signal-to-noise ratio in our observations (if we observe at times further from Jupiter opposition), and would add some uncertainty about whether our results may be influenced by long-term changes in the Jovian plasma conditions. However, we deliberately designed our visits to help us determine whether long-term variations may be occurring, by including some overlap in the magnetic longitudes targeted by the three visits per hemisphere. Since Juno is expected to continue operating at Jupiter for at least the next few years, we should also have some additional in situ infomation about the plasma conditions. We therefore don't expect the possible use of reduced-gyro mode to have a large effect on our science results.

Visit

Proposal 16211, Visit 01, implementation Thu Jun 03 18:00:20 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 24-JUN-2021:00:00:00 AND 14-OCT-2021:00:00:00

Diagnostics

(Exposure 2 (Visit 01)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Visit 01)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 4 (Visit 01)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Visit 01)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Solar System Targets

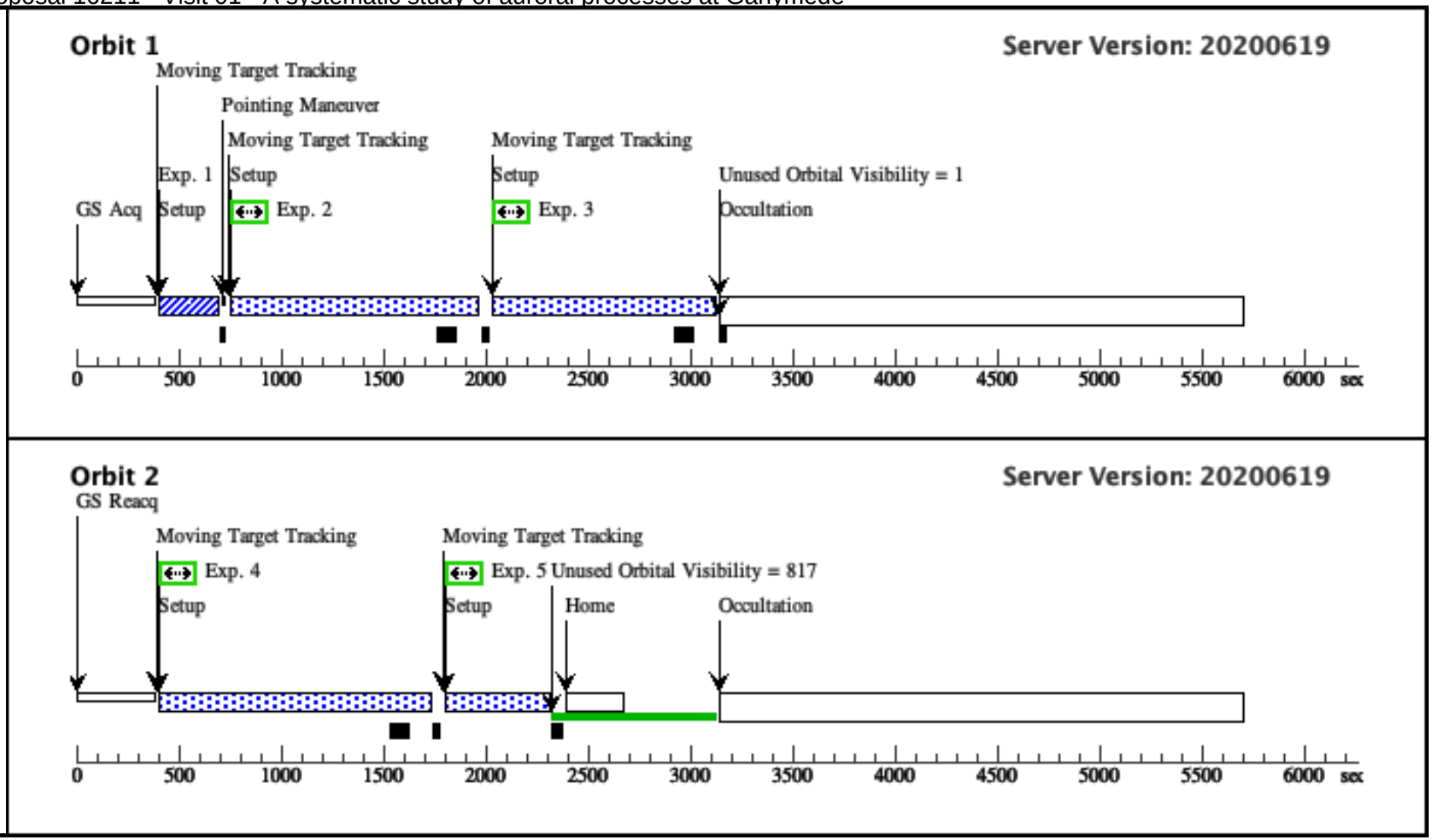
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	GANYMEDE-EAST-1	STD=JUPITER	STD=GANYMEDE		NOT OCC OF GANYMEDE-EAST-1 BY JUPITER FROM EARTH, SEP OF GANYMEDE-EAST-1 IO FROM EARTH GT 10", SEP OF GANYMEDE-EAST-1 EUROPA FROM EARTH GT 10", SEP OF GANYMEDE-EAST-1 CALLISTO FROM EARTH GT 10", OLG OF GANYMEDE-EAST-1 BETWEEN 75 105, CML OF JUPITER FROM GANYMEDE BETWEEN 110 260	EARTH

Comments: Description=SATELLITE GANYMEDE
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1451820)	(1) GANYMEDE-EAST-1	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2			3 Secs (3 Secs)	
								[==>]	***[1]***
Comments: ETC run uses target brightness of 6.5 Vmag/arcsec^2 (leading hemisphere brightness). SNR is >100.									
2	(COS.sp.1451826)	(1) GANYMEDE-EAST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=8500			950 Secs (1038 Secs)	
								[==>1038.0 Secs]	***[1]***
3	(COS.sp.1451826)	(1) GANYMEDE-EAST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs)	
								[==>1038.0 Secs]	***[1]***
4	(COS.sp.1451828)	(1) GANYMEDE-EAST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs)	
								[==>1276.0 Secs]	***[2]***
5	(COS.sp.1451828)	(1) GANYMEDE-EAST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (460 Secs)	
								[==>460 Secs]	***[2]***

Orbit Structure



Visit

Proposal 16211, Visit 02, implementation Thu Jun 03 18:00:20 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 24-JUN-2021:00:00:00 AND 14-OCT-2021:00:00:00

Diagnostics

(Exposure 2 (Visit 02)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Visit 02)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 4 (Visit 02)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Visit 02)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Solar System Targets

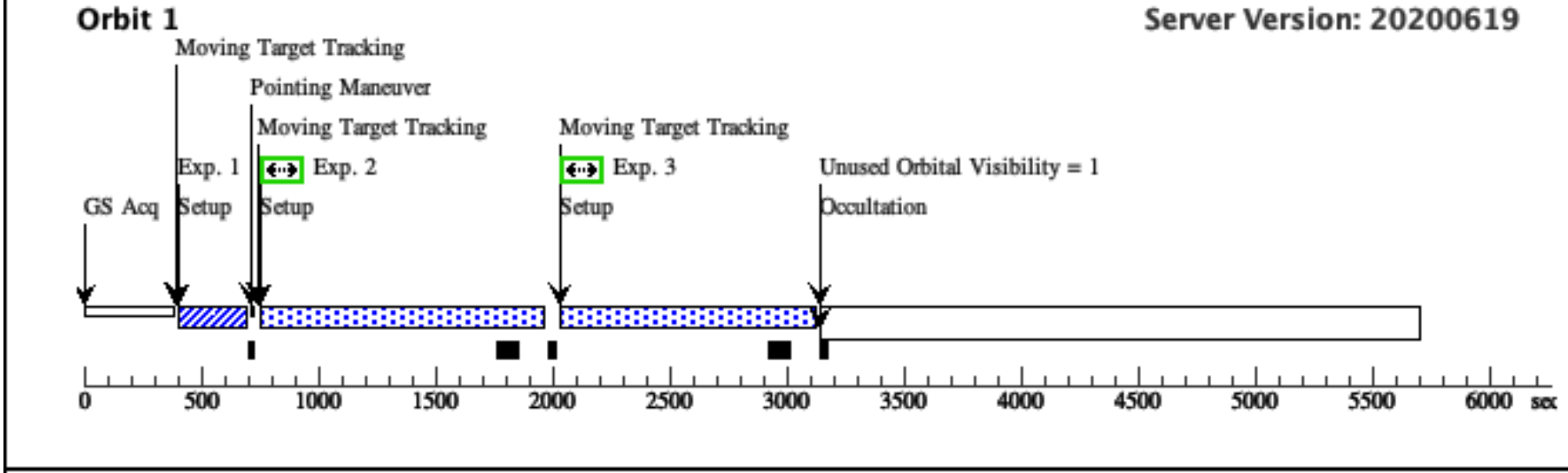
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	GANYMEDE-WEST-1	STD=JUPITER	STD=GANYMEDE		NOT OCC OF GANYMEDE-WEST-1 BY JUPITER FROM EARTH, SEP OF GANYMEDE-WEST-1 IO FROM EARTH GT 10", SEP OF GANYMEDE-WEST-1 EUROPA FROM EARTH GT 10", SEP OF GANYMEDE-WEST-1 CALLISTO FROM EARTH GT 10", OLG OF GANYMEDE-WEST-1 BETWEEN 255 285, CML OF JUPITER FROM GANYMEDE BETWEEN 290 80	EARTH

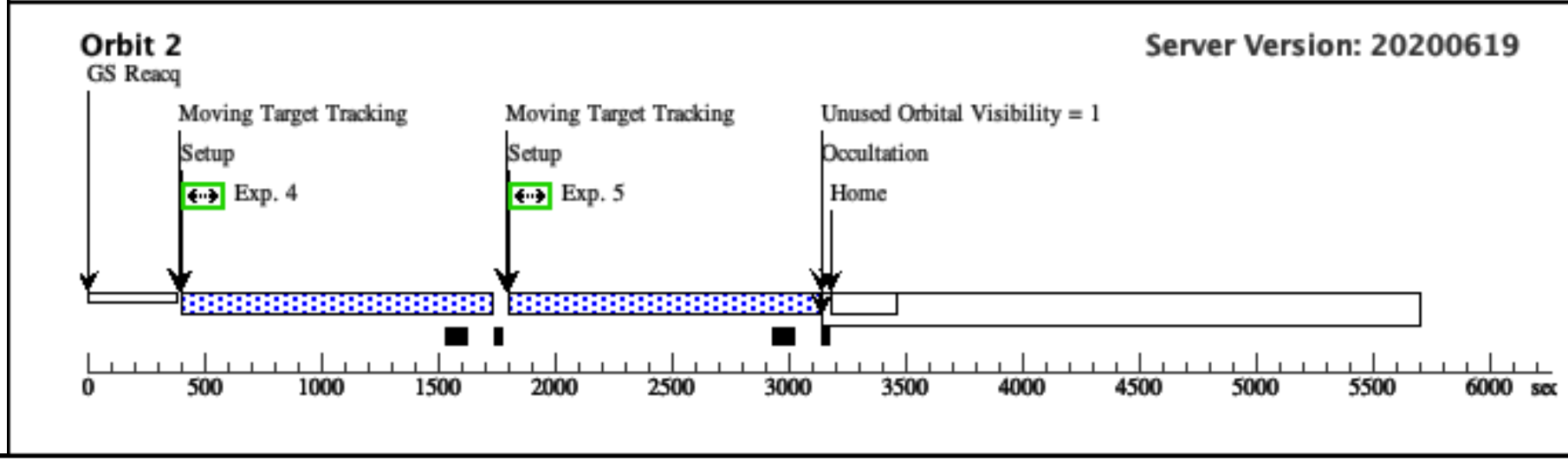
Comments: Description=SATELLITE GANYMEDE
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1451819)	(2) GANYMEDE-WEST-1	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2			3 Secs (3 Secs) *[==>]*	 ***[1]***
Comments: ETC run uses target brightness of 7.3 Vmag/arcsec^2 (trailing hemisphere brightness). SNR is >70.									
2	(COS.sp.1451826)	(2) GANYMEDE-WEST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs) *[==>1038.0 Secs]*	 ***[1]***
3	(COS.sp.1451826)	(2) GANYMEDE-WEST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs) *[==>1038.0 Secs]*	 ***[1]***
4	(COS.sp.1451828)	(2) GANYMEDE-WEST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs) *[==>1276.0 Secs]*	 ***[2]***
5	(COS.sp.1451828)	(2) GANYMEDE-WEST-1	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs) *[==>1276.0 Secs]*	 ***[2]***

Orbit Structure





Visit

Proposal 16211, Visit 03, implementation Thu Jun 03 18:00:20 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 24-JUN-2021:00:00:00 AND 14-OCT-2021:00:00:00

Diagnostics

(Exposure 2 (Visit 03)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Visit 03)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 4 (Visit 03)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Visit 03)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Solar System Targets

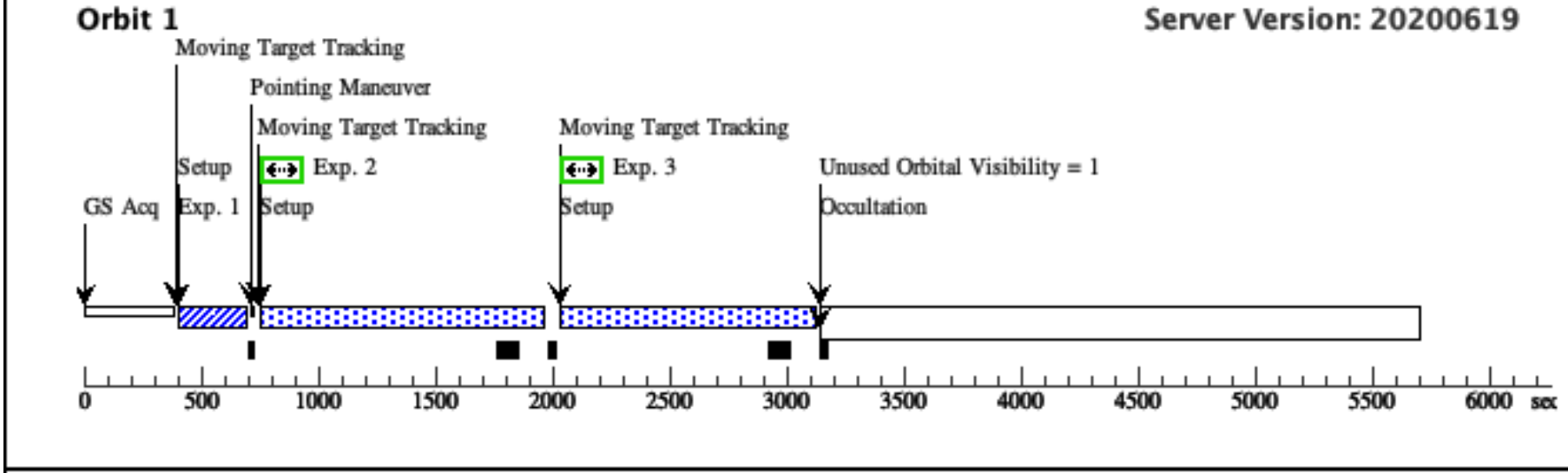
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	GANYMEDE-EAST-2	STD=JUPITER	STD=GANYMEDE		NOT OCC OF GANYMEDE-EAST-2 BY JUPITER FROM EARTH, SEP OF GANYMEDE-EAST-2 IO FROM EARTH GT 10", SEP OF GANYMEDE-EAST-2 EUROPA FROM EARTH GT 10", SEP OF GANYMEDE-EAST-2 CALLISTO FROM EARTH GT 10", OLG OF GANYMEDE-EAST-2 BETWEEN 75 105, CML OF JUPITER FROM GANYMEDE BETWEEN 305 95	EARTH

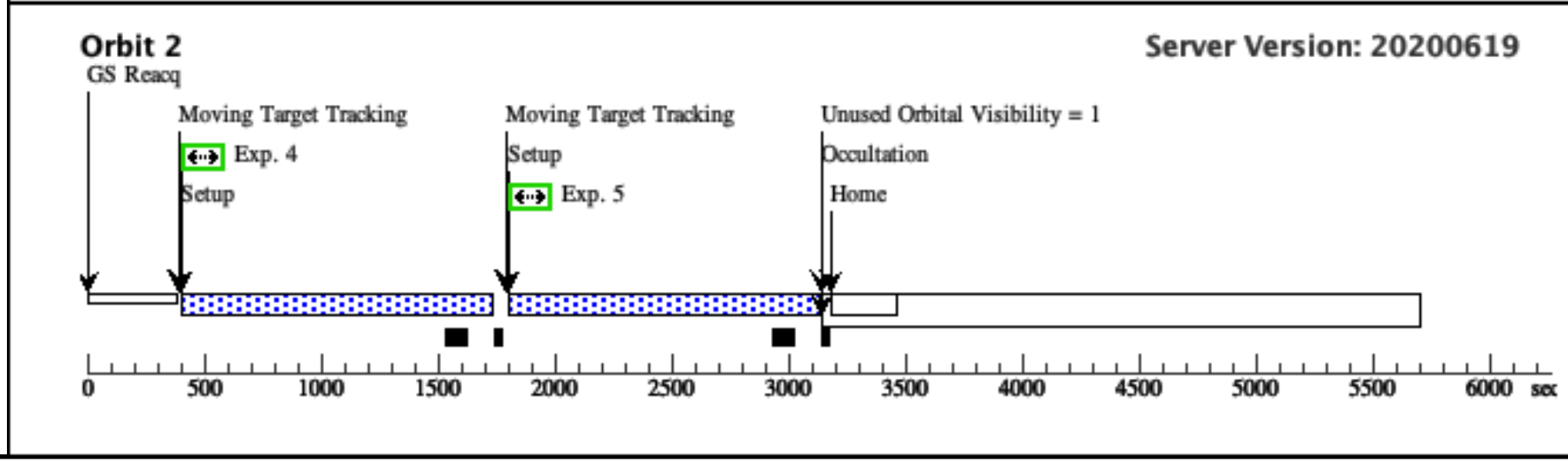
Comments: Description=SATELLITE GANYMEDE
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1451820)	(3) GANYMEDE-EAST-2	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2			3 Secs (3 Secs)	
								[==>]	***[1]***
Comments: ETC run uses target brightness of 6.5 Vmag/arcsec^2 (leading hemisphere brightness). SNR is >100.									
2	(COS.sp.1451826)	(3) GANYMEDE-EAST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs)	
								[==>1038.0 Secs]	***[1]***
3	(COS.sp.1451826)	(3) GANYMEDE-EAST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs)	
								[==>1038.0 Secs]	***[1]***
4	(COS.sp.1451828)	(3) GANYMEDE-EAST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs)	
								[==>1276.0 Secs]	***[2]***
5	(COS.sp.1451828)	(3) GANYMEDE-EAST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs)	
								[==>1276.0 Secs]	***[2]***

Orbit Structure





Visit

Proposal 16211, Visit 04, implementation Thu Jun 03 18:00:20 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 24-JUN-2021:00:00:00 AND 14-OCT-2021:00:00:00

Diagnostics

(Exposure 2 (Visit 04)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Visit 04)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 4 (Visit 04)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Visit 04)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Solar System Targets

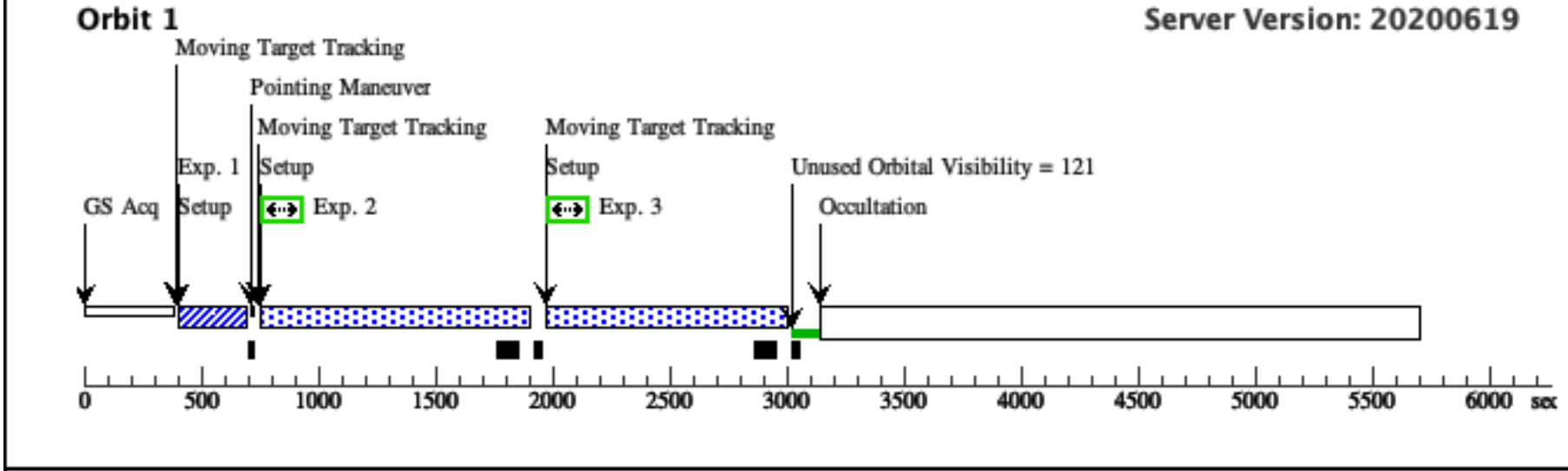
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	GANYMEDE-WEST-2	STD=JUPITER	STD=GANYMEDE		NOT OCC OF GANYMEDE-WEST-2 BY JUPITER FROM EARTH, SEP OF GANYMEDE-WEST-2 IO FROM EARTH GT 10", SEP OF GANYMEDE-WEST-2 EUROPA FROM EARTH GT 10", SEP OF GANYMEDE-WEST-2 CALLISTO FROM EARTH GT 10", OLG OF GANYMEDE-WEST-2 BETWEEN 255 285, CML OF JUPITER FROM GANYMEDE BETWEEN 125 275	EARTH

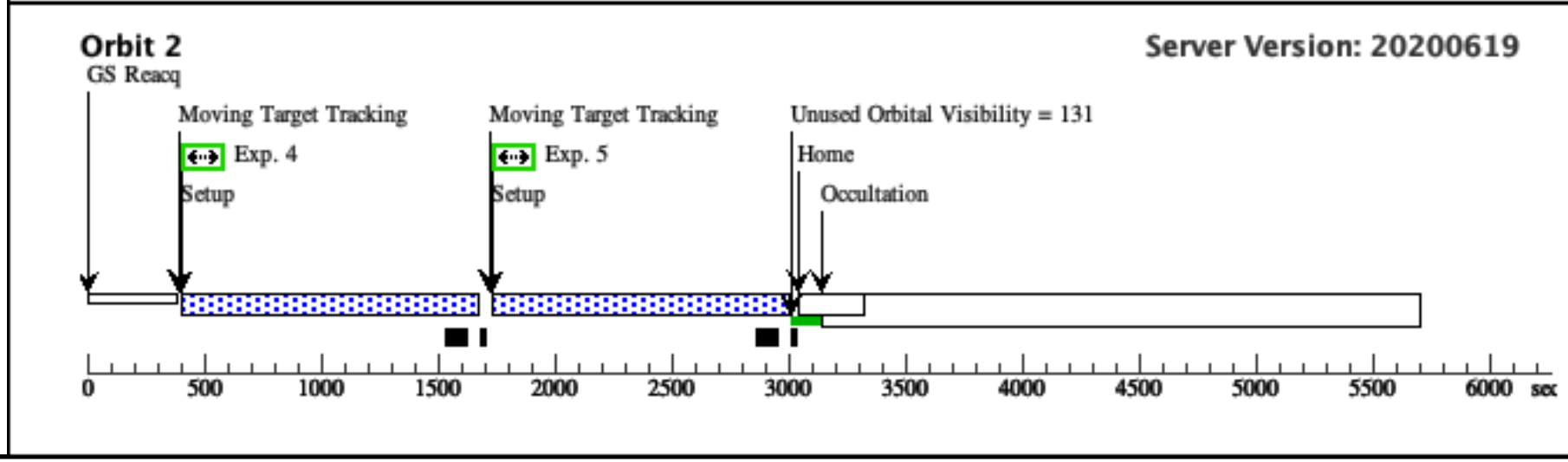
Comments: Description=SATELLITE GANYMEDE
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1451819)	(4) GANYMEDE-WEST-2	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2			3 Secs (3 Secs)	
								[==>]	***[1]***
Comments: ETC run uses target brightness of 7.3 Vmag/arcsec^2 (trailing hemisphere brightness). SNR is >70.									
2	(COS.sp.1451826)	(4) GANYMEDE-WEST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (978 Secs)	
								[==>978 Secs]	***[1]***
3	(COS.sp.1451826)	(4) GANYMEDE-WEST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (978 Secs)	
								[==>978 Secs]	***[1]***
4	(COS.sp.1451828)	(4) GANYMEDE-WEST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1100; FP-POS=4			1200 Secs (1216 Secs)	
								[==>1216 Secs]	***[2]***
5	(COS.sp.1451828)	(4) GANYMEDE-WEST-2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1100; FP-POS=4			1200 Secs (1216 Secs)	
								[==>1216 Secs]	***[2]***

Orbit Structure





Visit

Proposal 16211, Visit 05, implementation Thu Jun 03 18:00:20 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 24-JUN-2021:00:00:00 AND 14-OCT-2021:00:00:00

Diagnostics

(Exposure 2 (Visit 05)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Visit 05)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 4 (Visit 05)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Visit 05)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Solar System Targets

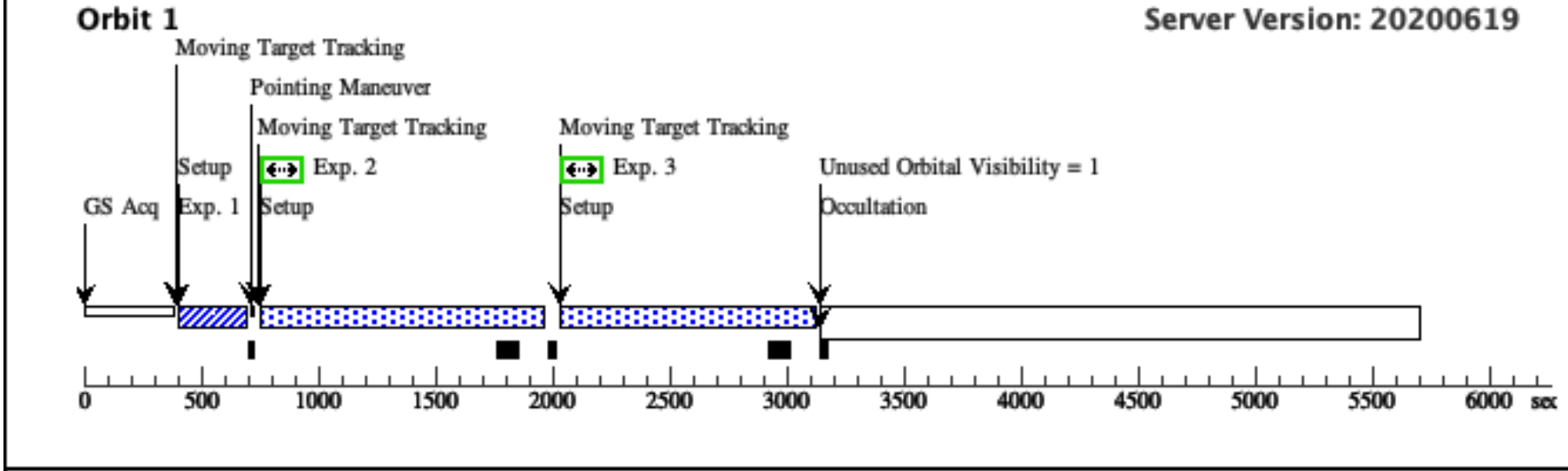
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(5)	GANYMEDE-EAST-3	STD=JUPITER	STD=GANYMEDE		NOT OCC OF GANYMEDE-EAST-3 BY JUPITER FROM EARTH, SEP OF GANYMEDE-EAST-3 IO FROM EARTH GT 10", SEP OF GANYMEDE-EAST-3 EUROPA FROM EARTH GT 10", SEP OF GANYMEDE-EAST-3 CALLISTO FROM EARTH GT 10", OLG OF GANYMEDE-EAST-3 BETWEEN 75 105, CML OF JUPITER FROM GANYMEDE BETWEEN 25 175	EARTH

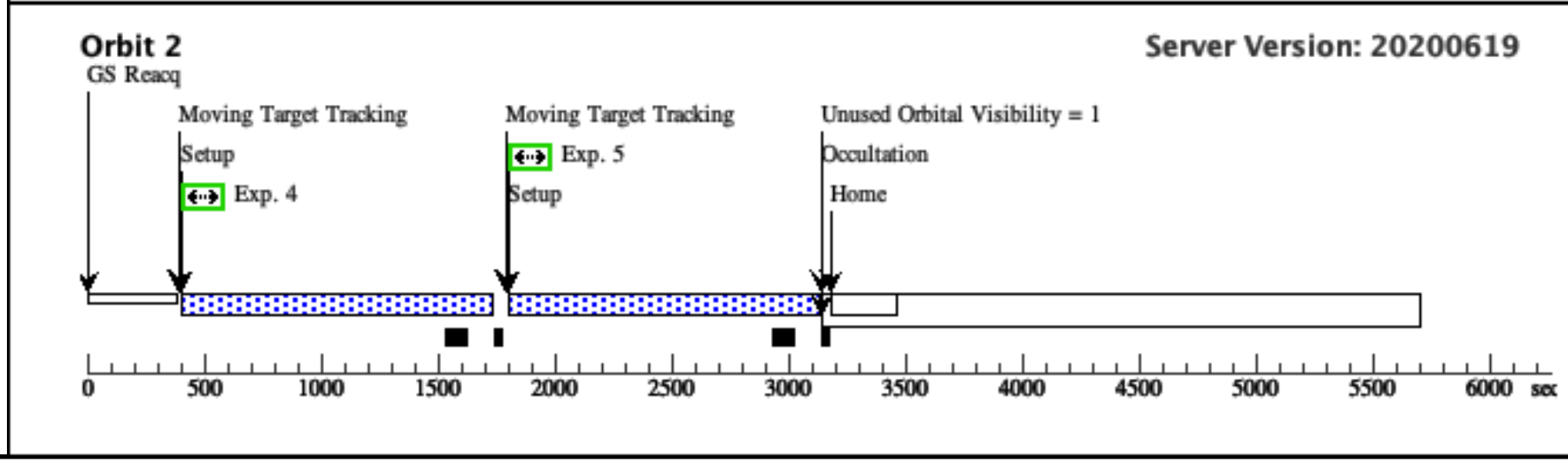
Comments: Description=SATELLITE GANYMEDE
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1451820)	(5) GANYMEDE-EAST-3	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2			3 Secs (3 Secs) *[==>]*	 ***[1]***
Comments: ETC run uses target brightness of 6.5 Vmag/arcsec^2 (leading hemisphere brightness). SNR is >100.									
2	(COS.sp.1451826)	(5) GANYMEDE-EAST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs) *[==>1038.0 Secs]*	 ***[1]***
3	(COS.sp.1451826)	(5) GANYMEDE-EAST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs) *[==>1038.0 Secs]*	 ***[1]***
4	(COS.sp.1451828)	(5) GANYMEDE-EAST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1100; FP-POS=4			1200 Secs (1276 Secs) *[==>1276.0 Secs]*	 ***[2]***
5	(COS.sp.1451828)	(5) GANYMEDE-EAST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1100; FP-POS=4			1200 Secs (1276 Secs) *[==>1276.0 Secs]*	 ***[2]***

Orbit Structure





Visit

Proposal 16211, Visit 06, implementation Thu Jun 03 18:00:20 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 24-JUN-2021:00:00:00 AND 14-OCT-2021:00:00:00

Diagnostics

(Exposure 2 (Visit 06)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 3 (Visit 06)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 4 (Visit 06)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(Exposure 5 (Visit 06)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(6)	GANYMEDE-WEST-3	STD=JUPITER	STD=GANYMEDE		NOT OCC OF GANYMEDE-WEST-3 BY JUPITER FROM EARTH, SEP OF GANYMEDE-WEST-3 IO FROM EARTH GT 10", SEP OF GANYMEDE-WEST-3 EUROPA FROM EARTH GT 10", SEP OF GANYMEDE-WEST-3 CALLISTO FROM EARTH GT 10", OLG OF GANYMEDE-WEST-3 BETWEEN 255 285, CML OF JUPITER FROM GANYMEDE BETWEEN 205 355	EARTH

Comments: Description=SATELLITE GANYMEDE
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1451819)	(6) GANYMEDE-WEST-3	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2			3 Secs (3 Secs)	
								[==>]	***[1]***
Comments: ETC run uses target brightness of 7.3 Vmag/arcsec^2 (trailing hemisphere brightness). SNR is >70.									
2	(COS.sp.1451826)	(6) GANYMEDE-WEST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs)	
								[==>1038.0 Secs]	***[1]***
3	(COS.sp.1451826)	(6) GANYMEDE-WEST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=8500; FP-POS=3			950 Secs (1038 Secs)	
								[==>1038.0 Secs]	***[1]***
4	(COS.sp.1451828)	(6) GANYMEDE-WEST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs)	
								[==>1276.0 Secs]	***[2]***
5	(COS.sp.1451828)	(6) GANYMEDE-WEST-3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=11000; FP-POS=4			1200 Secs (1276 Secs)	
								[==>1276.0 Secs]	***[2]***

Orbit Structure