17903 - Rocky Worlds DDT: HST Observations of LTT 1445A

Cycle: 33, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Dr. Mercedes Lopez-Morales (CoI)	Space Telescope Science Institute
Dr. I. Neill Reid (CoI)	Space Telescope Science Institute

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) BD-17-588A	COS/FUV COS/NUV	4	13-Aug-2026 16:00:17.0	yes
02	(1) BD-17-588A	COS/FUV COS/NUV	4	13-Aug-2026 16:00:19.0	yes
03	(1) BD-17-588A	COS/FUV COS/NUV	4	13-Aug-2026 16:00:21.0	yes
04	(1) BD-17-588A CCDFLAT WAVE	STIS/CCD STIS/NUV-MAMA	1	13-Aug-2026 16:00:22.0	yes

13 Total Orbits Used

ABSTRACT

Rocky Worlds is a joint JWST and HST Director's Discretionary Program designed to implement the top recommendations from the Working Group on Strategic Exoplanet Initiatives with HST and JWST. The HST side of the Rocky Worlds DDT focuses on ultraviolet (UV) characterization of the nearby M-dwarf hosts of the rocky planets observed with JWST. We will use COS and STIS to measure the UV to blue-optical spectra of these stars, including UV flare monitoring and measuring the wings of the Ly-alpha profile where appropriate. With these observations we will constrain the high-energy output of these host M dwarfs in the UV, which can be applied to planetary models of atmospheric escape, as well as photochemistry if a planetary atmosphere is present. Complementary observations and analysis to fill in the rest of the M-dwarf panchromatic spectra, from the X-ray to the infrared, are encouraged.

Each M-dwarf planet host observed by HST in the Rocky Worlds DDT program has its own Program ID. The observations in this program will focus on LT 1445A, obtaining flare monitoring in G130M/1222 and adding STIS coverage of G230L and G750L to augment archival data of the star in GO 16701 and GO 16722 that include COS/G130M, STIS/G140M, COS/G160M, STIS/G230L, COS/G230L, and STIS/G430L.

NOTE: LTT 1445B was 5.09" to the west and 5.10" to the East in 2016 (Gaia DR3) just outside the 7" bright object radius, consisting of magnetically active M dwarfs of later type. These companions are not safe if they fall in the STIS long slit, and thus an ORIENT constraint is placed on the STIS Visit 4. In 2022 using WFC3/IR imaging, the closest star was separated by 7.06", implying that by 2026 it will still be ~7" away.

OBSERVING DESCRIPTION

HST observations of LTT 1445A. 12 orbits of flare monitoring using G130M/1222. We obtain NUV/Vis low resolution spectroscopy with STIS G230L and G750L and the 52x0.2 slit in order to construct an accurate stellar SED and leverage the Mg II 2800 emission lines to tie to archival observations. All UV observations are obtained in time-tag mode to allow for light curves to be generated in the case of a flare or serendipitous transit..

For all observations we used the LTT 1445A MUSCLES SED with constant resolution, and a custom HSLA combination of archival spectra for SNR calculations in the above modes. These observations mimic characterization of other M dwarfs from previous programs.

LTT1445BC was checked in case it flared during NUV STIS G230L since the 52x0.2 slit could intersect the BC component. It was determined to be unsafe so ORIENT constraints are present, following https://hst-docs.stsci.edu/stisihb/chapter-11-data-taking/11-4-fixing-orientation-on-the-sky, I calculated a +/-20 degree avoidance window assuming a PA of

Visit

Proposal 17903, Flare Monitoring A (01), implementation Thu Aug 13 20:00:22 GMT 2026

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; BETWEEN 01-SEP-2026:08:00:00 AND 30-SEP-2026:12:00:00

Comments: Flare monitoring of LTT 1445A

Fixed Targets

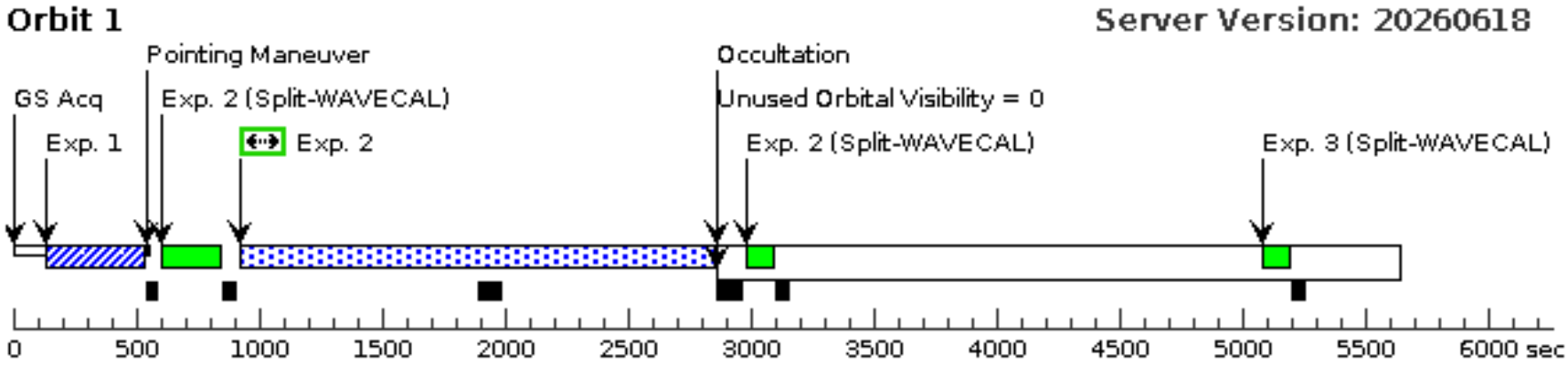
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BD-17-588A Alt Name1: LTT-1445A Alt Name2: HD-260665	RA: 03 01 50.9819 (45.4624246d) Dec: -16 35 40.32 (-16.59453d) Equinox: J2000	Proper Motion RA: -369.972 mas/yr Proper Motion Dec: -267.9309999848556 mas/yr Parallax: 0.14569220000000002" Epoch of Position: 2016 Radial Velocity: -5.74 km/sec	V=11.22	Reference Frame: ICRS

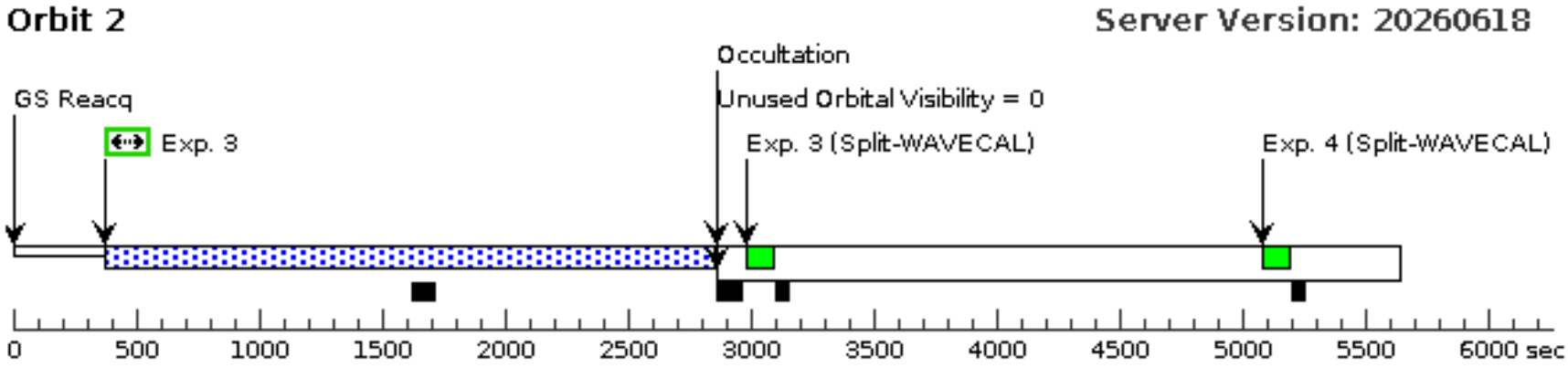
Comments: Gaia Coordinates used 11/6/2025
Category=EXT-STAR
Description=[EMISSION LINE STAR, EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]
Extended=NO

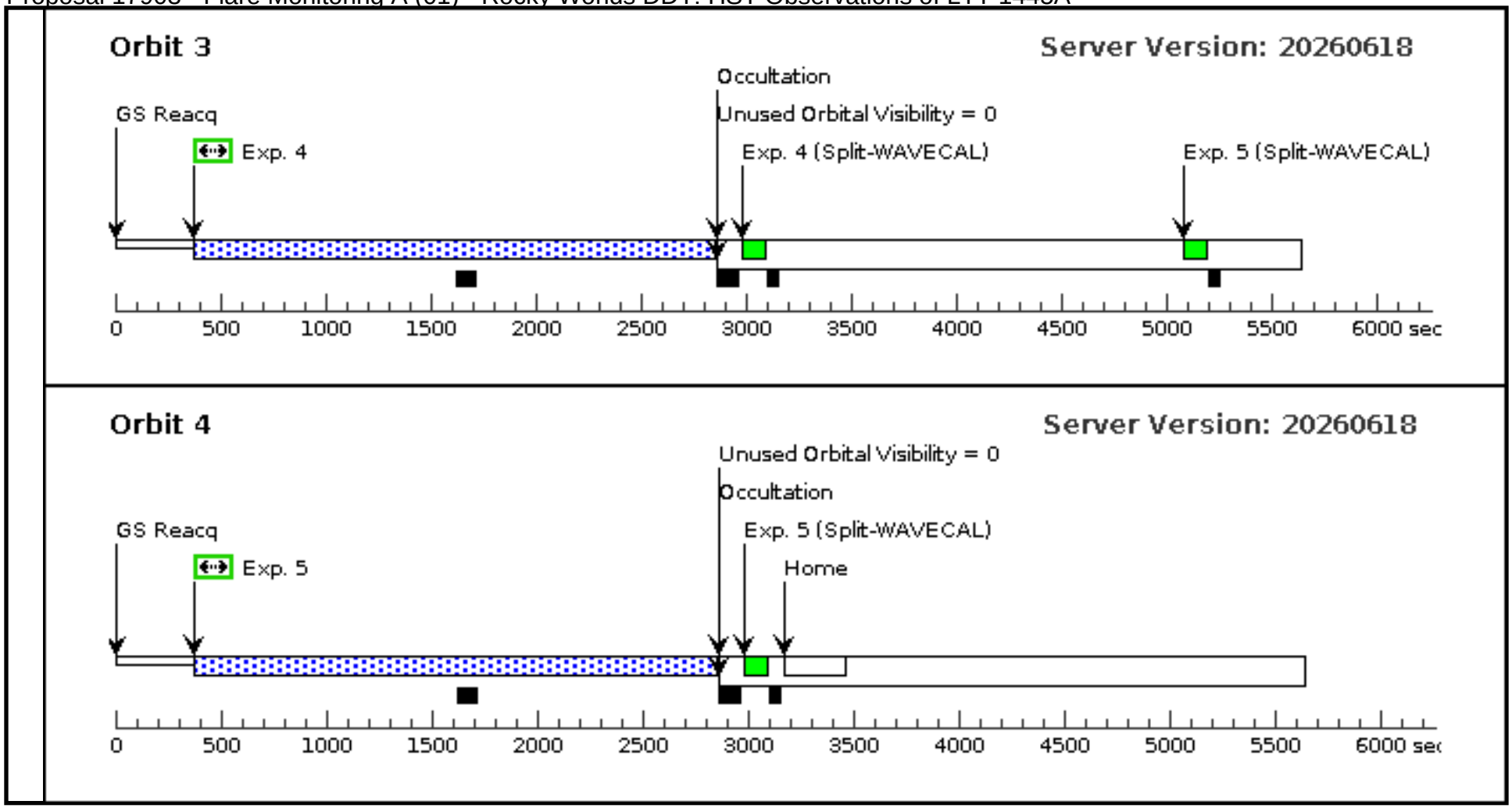
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.2227944)	(1) BD-17-588A	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				46 Secs (46 Secs) *[==>]*	***[1]***
Comments: Copied from 16722. Flaring clearance available in CS report for 16722									
2	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=939			1878 Secs (1878 Secs) *[==>]*	***[1]***
3	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[2]***
4	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[3]***
5	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=4; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[4]***

Orbit Structure



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GS Reacq
Exp. 4
Exp. 4 (Split-WAVECAL)
Exp. 5 (Split-WAVECAL)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec
Orbit 4
Server Version: 20260618
Unused Orbital Visibility = 0
Occultation
GS Reacq
Exp. 5 (Split-WAVECAL)
Exp. 5
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17903, Flare Monitoring B (02), implementation Thu Aug 13 20:00:22 GMT 2026

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; BETWEEN 01-SEP-2026:01:00:00 AND 30-SEP-2026:04:00:00

Comments: Flare monitoring of LTT 1445A

Fixed Targets

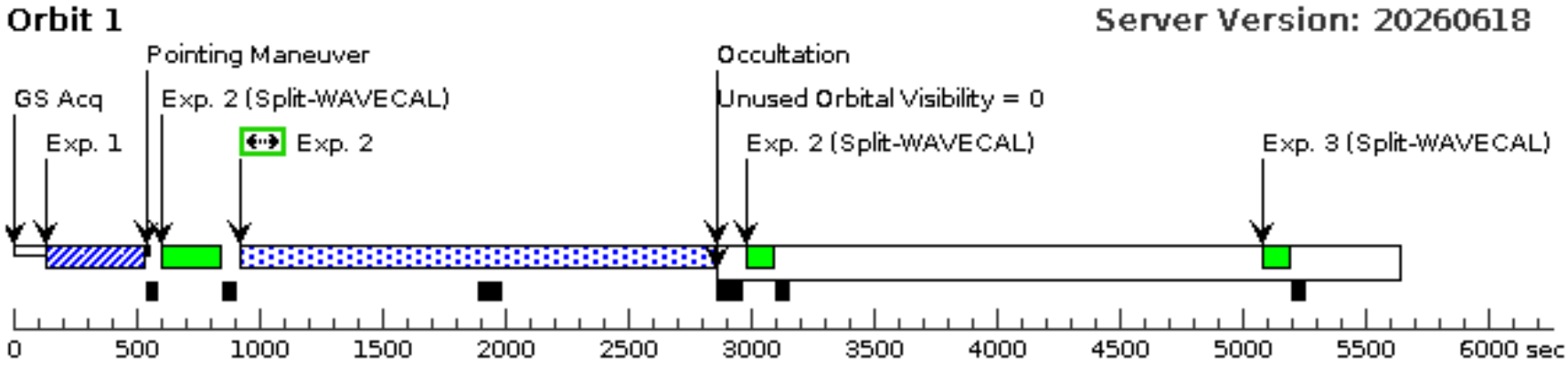
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BD-17-588A Alt Name1: LTT-1445A Alt Name2: HD-260665	RA: 03 01 50.9819 (45.4624246d) Dec: -16 35 40.32 (-16.59453d) Equinox: J2000	Proper Motion RA: -369.972 mas/yr Proper Motion Dec: -267.9309999848556 mas/yr Parallax: 0.14569220000000002" Epoch of Position: 2016 Radial Velocity: -5.74 km/sec	V=11.22	Reference Frame: ICRS

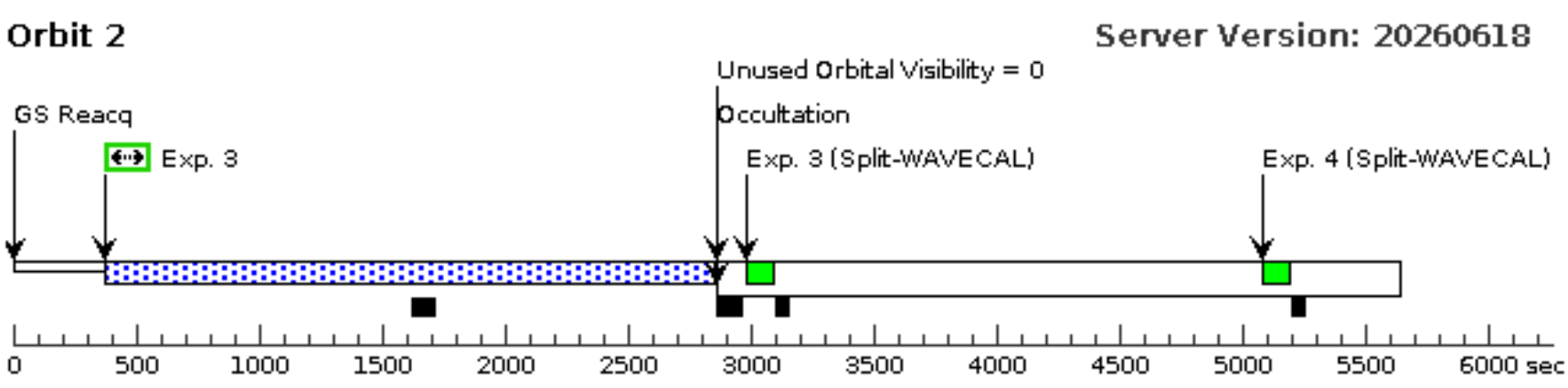
Comments: Gaia Coordinates used 11/6/2025
Category=EXT-STAR
Description=[EMISSION LINE STAR, EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]
Extended=NO

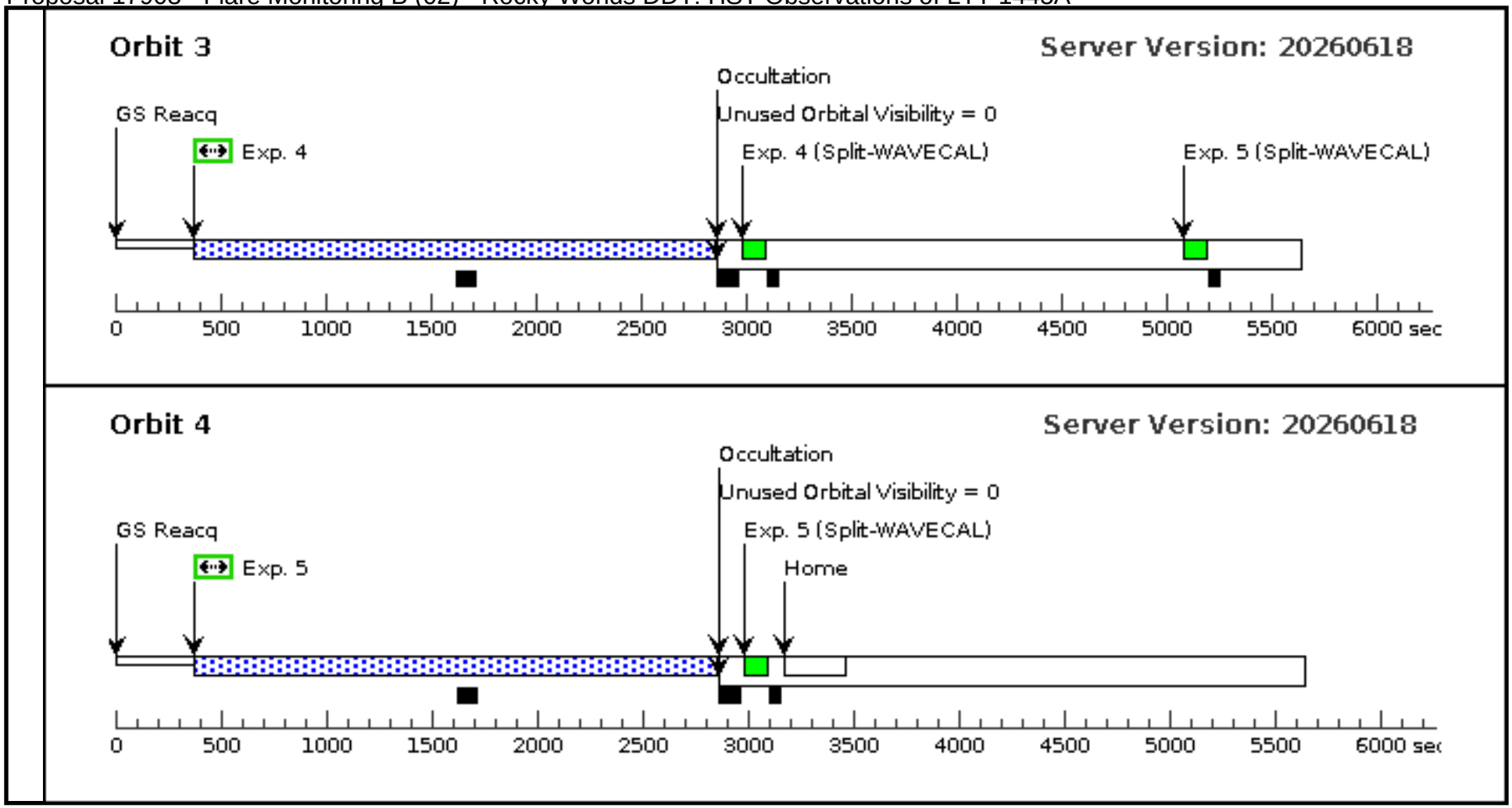
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.2227944)	(1) BD-17-588A	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				46 Secs (46 Secs) *[==>]*	***[1]***
Comments: Copied from 16722. Flaring clearance available in CS report for 16722									
2	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=939			1878 Secs (1878 Secs) *[==>]*	***[1]***
3	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[2]***
4	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[3]***
5	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=4; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[4]***

Orbit Structure






Orbit 3
Server Version: 20260618
Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 4
Exp. 4 (Split-WAVECAL)
Exp. 5 (Split-WAVECAL)
0
500
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1500
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3500
4000
4500
5000
5500
6000 sec
Orbit 4
Server Version: 20260618
Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 5
Exp. 5 (Split-WAVECAL)
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17903, Flare Monitoring C (03), implementation Thu Aug 13 20:00:23 GMT 2026

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; BETWEEN 04-SEP-2026:00:00:20 AND 04-SEP-2026:01:00:00

Comments: Flare monitoring of LTT 1445A

Fixed Targets

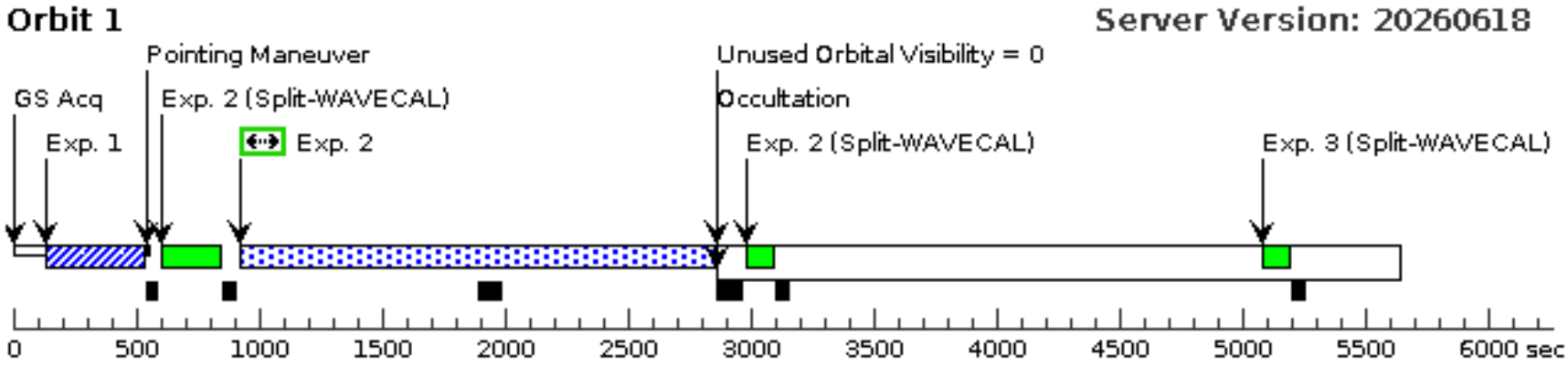
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BD-17-588A Alt Name1: LTT-1445A Alt Name2: HD-260665	RA: 03 01 50.9819 (45.4624246d) Dec: -16 35 40.32 (-16.59453d) Equinox: J2000	Proper Motion RA: -369.972 mas/yr Proper Motion Dec: -267.9309999848556 mas/yr Parallax: 0.14569220000000002" Epoch of Position: 2016 Radial Velocity: -5.74 km/sec	V=11.22	Reference Frame: ICRS

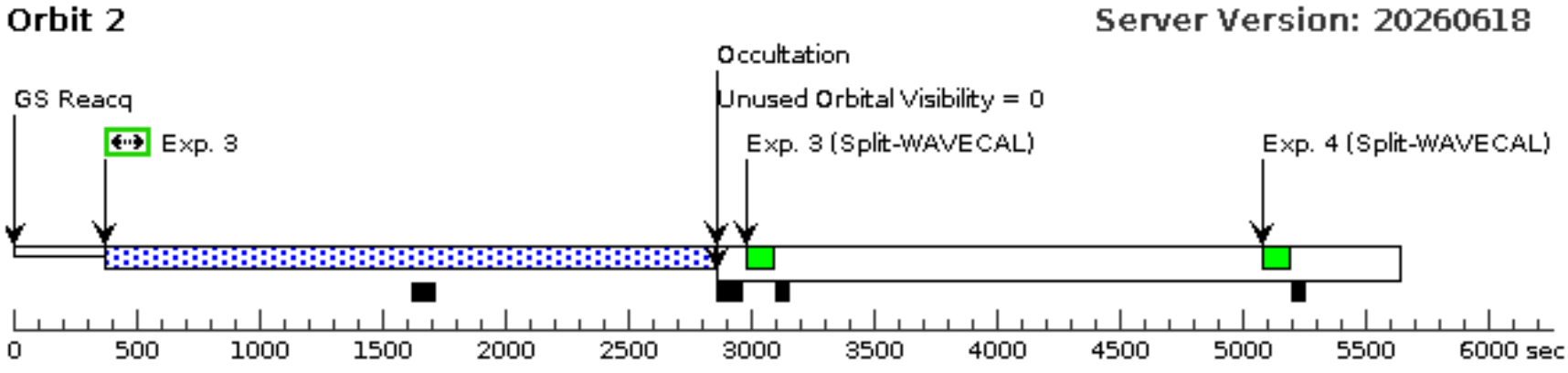
Comments: Gaia Coordinates used 11/6/2025
Category=EXT-STAR
Description=[EMISSION LINE STAR, EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]
Extended=NO

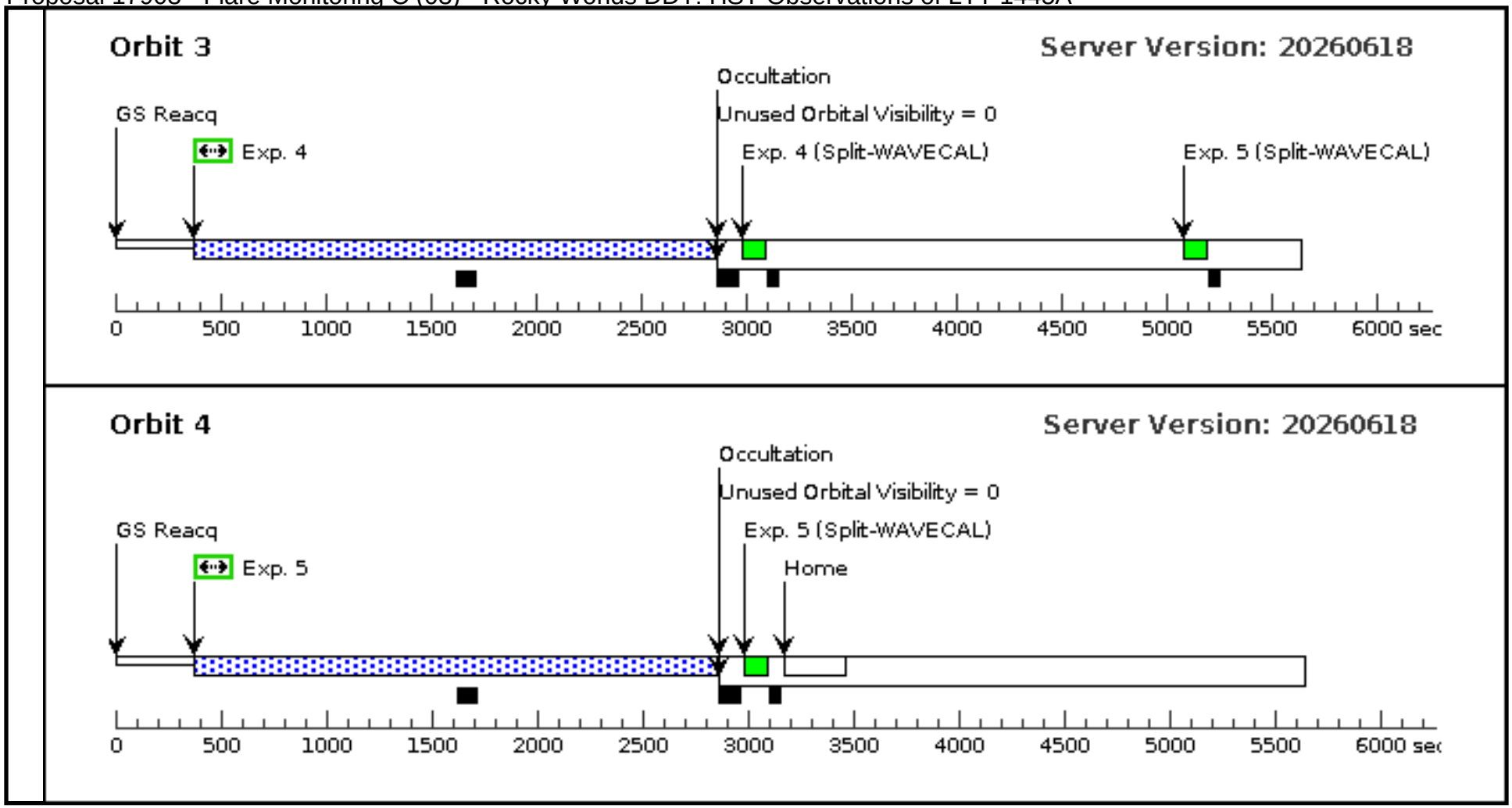
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.2227944)	(1) BD-17-588A	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				46 Secs (46 Secs) *[==>]*	***[1]***
Comments: Copied from 16722. Flaring clearance available in CS report for 16722									
2	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=939			1878 Secs (1878 Secs) *[==>]*	***[1]***
3	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[2]***
4	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[3]***
5	(COS.sp.2227949)	(1) BD-17-588A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=4; BUFFER-TIME=1213			2426 Secs (2426 Secs) *[==>]*	***[4]***

Orbit Structure



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Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 4
Exp. 4 (Split-WAVECAL)
Exp. 5 (Split-WAVECAL)
0
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5500
6000 sec
Orbit 4
Server Version: 20260618
Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 5
Exp. 5 (Split-WAVECAL)
Home
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3500
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5500
6000 sec

Visit

Proposal 17903, STIS-Coverage1 (04), completed Thu Aug 13 20:00:23 GMT 2026

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 80%; ORIENT 22D TO 162 D; ORIENT 202D TO 342 D

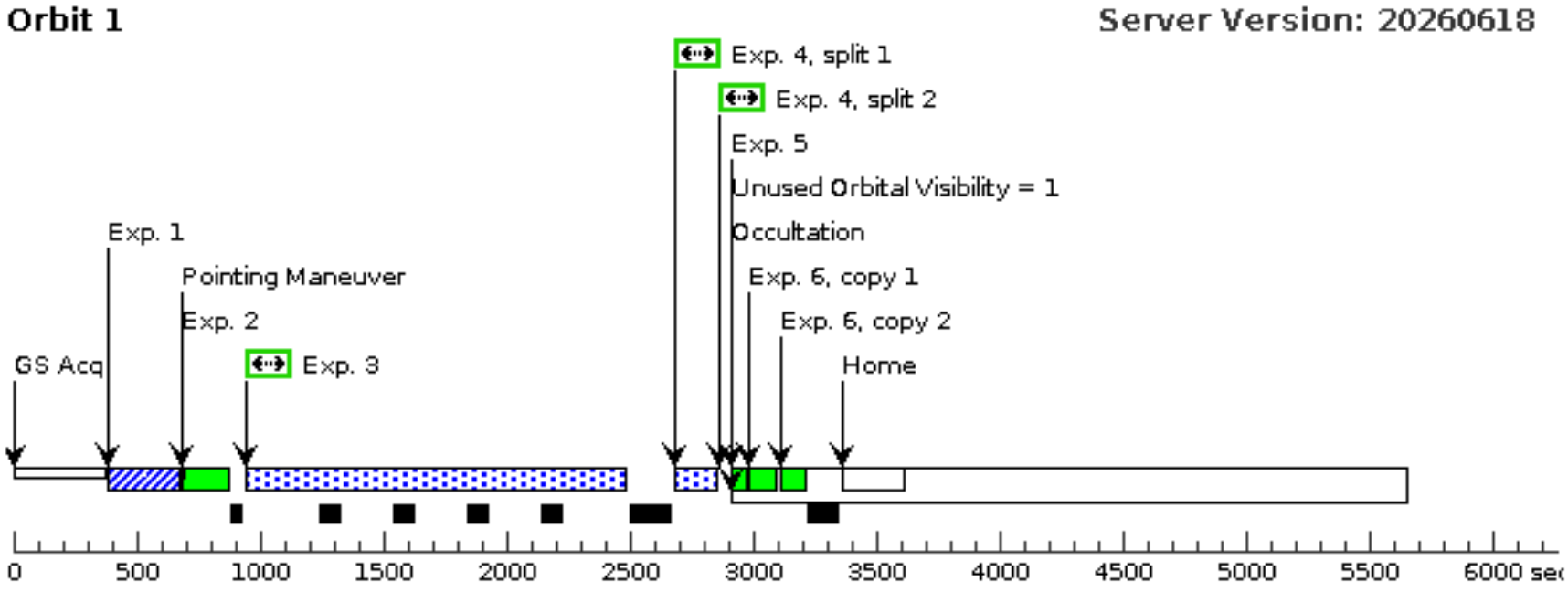
Comments: UV/Vis characterization

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BD-17-588A Alt Name1: LTT-1445A Alt Name2: HD-260665	RA: 03 01 50.9819 (45.4624246d) Dec: -16 35 40.32 (-16.59453d) Equinox: J2000	Proper Motion RA: -369.972 mas/yr Proper Motion Dec: -267.9309999848556 mas/yr Parallax: 0.14569220000000002" Epoch of Position: 2016 Radial Velocity: -5.74 km/sec	V=11.22	Reference Frame: ICRS

Comments: Gaia Coordinates used 11/6/2025
Category=EXT-STAR
Description=[EMISSION LINE STAR, EXTRA-SOLAR PLANETARY SYSTEM, M 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	Acquisition (STIS.ta.2252203)	(1) BD-17-588A	STIS/CCD, ACQ, F28X50OIII	MIRROR				5 Secs (5 Secs) *[==>]*	***[1]***
2	WAVECAL	WAVE	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				*[==>]*	***[1]***
3	G230L exp1 (STIS.sp.2221745)	(1) BD-17-588A	STIS/NUV-MAMA, TIME-TAG, 52X0.2	G230L 2376 A	BUFFER-TIME=300; WAVECAL=NO			1530 Secs (1530 Secs) *[==>]*	***[1]***
4	G750L (STIS.sp.2252201)	(1) BD-17-588A	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A	CR-SPLIT=2			5 Secs (5 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
5	WAVECAL -G750L	WAVE	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>]*	***[1]***
6	G750L FringeFlat	CCDFLAT	STIS/CCD, ACCUM, 0.3X0.09	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure