16807 - ULLYSES SMC Late O Stars - STIS

Cycle: 29, Proposal Category: GO/DD

(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?*
1S	(1) AV238 WAVE	STIS/CCD STIS/FUV-MAMA	3	03-Oct-2022 13:00:37.0	yes
1T	(1) AV238 WAVE	STIS/CCD STIS/FUV-MAMA	3	03-Oct-2022 13:00:39.0	yes
2S	(2) AV506 WAVE	STIS/CCD STIS/FUV-MAMA	3	03-Oct-2022 13:00:40.0	yes
2T	(2) AV506 WAVE	STIS/CCD STIS/FUV-MAMA	2	03-Oct-2022 13:00:41.0	yes

11 Total Orbits Used

ABSTRACT

The Space Telescope Science Institute (STScI) Director has decided to devote up to 1000 orbits of Director's Discretionary time in observing Cycles 27-29 to a new Hubble Ultraviolet Legacy program focused on star formation and associated stellar physics. This new program, ULLYSES (UV Legacy Library of Young Stars as Essential Standards), will provide a UV spectroscopic reference sample of young (< 10 Myr) high- and low-mass stars. It will target over ~150 OB stars in the Magellanic Clouds and lower metallicity galaxies in the Local Group, and ~40 T Tauri stars and brown

dwarfs in the Milky Way. In addition, ULLYSES will monitor 4 typical T Tauri stars over different rotational phases through at least three rotation periods, and over timescales of months to years. The resulting library will provide template spectra of massive stars at metallicities substantially below the well studied, while the low mass sample will cover a wide range of ages, accretion rates, and masses, including objects down to well below 0.5 M_sun. The legacy of this large UV dataset on the first 10 Myr of stellar evolution will be enhanced by complementary datasets obtained by the scientific community. In addition to the core goals of the program related to stellar astrophysics of low and high mass stars, this data will also enable exciting science in the fields of ISM, CGM, jets, and exoplanets. ULLYSES will be modeled after the Frontier Fields program: all data obtained will be non-proprietary. The implementation team at STScI is developing high-level science data products and a sophisticated database and website for disseminating data from the ULLYSES program and ancillary datasets for the ULLYSES target sample from space and ground-based facilities.

OBSERVING DESCRIPTION

This proposal includes a subset of the massive ULLYSES stars being observed in the Magellanic clouds.

Depending on target brightness, the main FUV spectral range will generally use either the STIS E140M setting or the combination of the COS c1291 + c1611 settings. Sufficiently bright stars without good FUSE data in the archive will also be observed with the COS c1096 setting to provide coverage at shorter wavelengths. Where time permits, stars of type O9 or later will also be observed with STIS E230M/1978, while for supergiants of spectral type B5 or later E230M/2707 may also be included. Where possible, targets of a given spectral type were selected to span both a range in extinction and in rotation rates to support a variety of stellar and ISM studies.

Signal-to-noise requirements used to determine the desired exposures times were defined as follows:
COS/G130M/c1096: 20 / nine-pixel resel at 1080 A
COS/G130M/c1291: 30 / six-pixel resel at 1150 A
COS/G160M/c1611: 30 / six-pixel resel at 1590 A
COS/G185M/c1953: 30 / three-pixel resel at 1860 A
COS/G185M/c1986: 30 / three-pixel resel at 1980 A
STIS/E140M/c1425: 20 / two-pixel resel at 1200 A
STIS/E230M/c1978: 20 / two-pixel resel at 1800 A
STIS/E230M/c2707: 20 / two-pixel resel at 2800 A
The actual implemented exposure times may be adjusted to efficiently use HST orbits, but should always provide at least 80% of the desired time as defined by the above requirements.

Additional details about the scientific motivation and technical implementation strategy of the ULLYSES observations can be found at http://www.stsci.edu/stsci-research/research-topics-and-programs/ullyses. The ULLYSES program is based on the recommendations of a working group led by Sally Oey; the full text of that group's report can be found at http://www.stsci.edu/files/live/sites/www/files/home/stsci-research/research-topics-and-programs/ullyses/_documents/HSTUV-report-ULLYSES.pdf.

Visit

Proposal 16807, AV238-STIS (1S) Mon Oct 03 17:00:42 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; SEQ 1S,1T WITHIN 30 D

Comments: vstatus; 1S; AV238; P/STIS approved for submission; P/LS 09/08/22 ; intrev: complete ; P/AF 03/10/22
vcheck; Enter targ name & Inst. & Resp. Sci.; AV238 'AzV 238' ; STIS ; LS
vcheck; ETC numbers entered in APT?; completed
vcheck; Any screening violations?; None
vcheck; S/N ETC calcs done & documented?; Yes ...
ETC 1817966 and exp time of 14,700 s gives S/N of 20 at 1200 in S/N plot. Entering S/N of 20 at 1200 required gives exp time of 21,433 s. Used 14,700 as this fits into 6 orbits.
vcheck; Field images checked & saved?; Yes AV238-DSS-TA.png and AV238-2MASS-TA.png
vcheck; Selected ACQ strategy?; STIS F28X50LP 0.1 s
vcheck; Possible ACQ or Sci spoilers?; None
vcheck; Field BOT clear?; 1 safe star and Gaia_BOT has next brightest star to target with mag 16.52 if O5 V
vcheck; Visual BOT check for stars not in catalog?; OK
vcheck; Orbit packing finalized?; 3 orbits
vcheck; Buffer times optimized?; Done
vcheck; Verify visit grouping correct; GROUP VISITS 1 and 2 within 30 days
vcheck; Is visit ready for int. review?; Yes
Allocated STIS orbits = 6

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AV238 Alt Name1: M2002-47540 Alt Name2: AZV-238	RA: 00 59 55.5078 (14.9812825d) Dec: -72 13 37.78 (-72.22716d) Equinox: J2000	Proper Motion RA: 0 mas/yr Proper Motion Dec: 0 mas/yr Parallax: 0" Epoch of Position: 2000	V=13.64 SpT=O9.5 III; E(B-V)=0.09; U=12.49; B=13.47; V=13.64; F1160=5.440e-13; F1360=4.180e-13; F1700=2.630e-13; F2200=1.470e-13	Reference Frame: ICRS

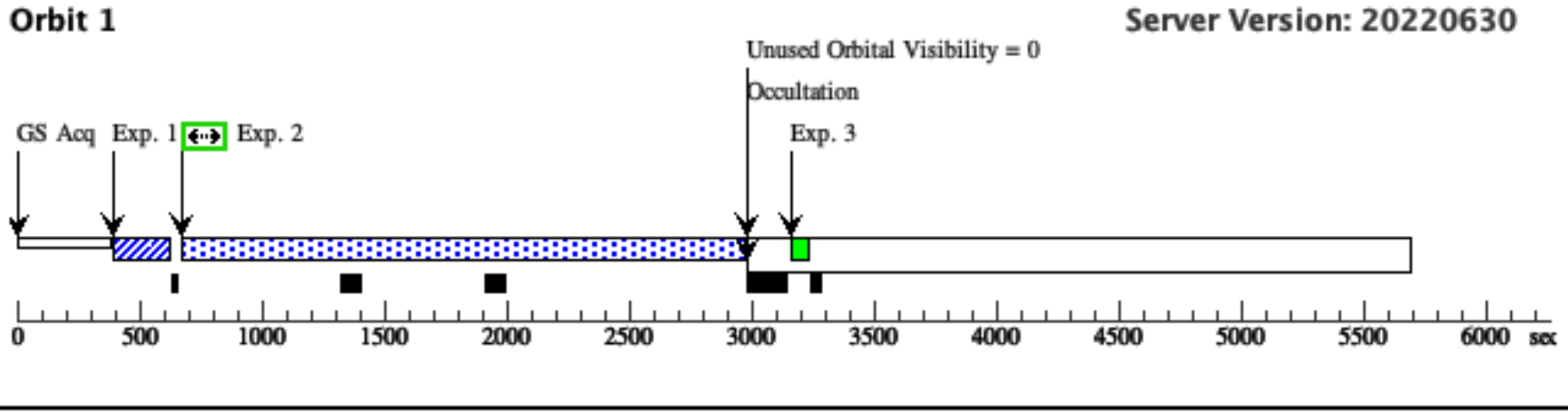
Comments: AV238 : M2002-47540, AzV 238
Previous name : AV 238
Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv
SpT = O9.5 III

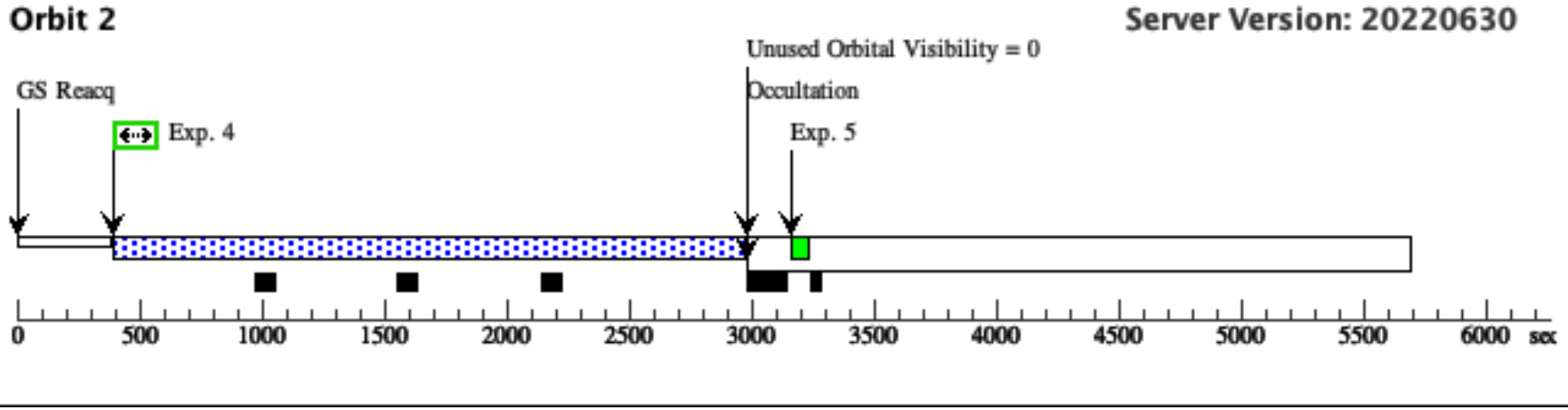
Coordinate pedigree: Gaia DR2
Calculation performed 2021-10-25T00:54:12, v0.9
---
tstatus; AV238; P/STIS approved for submission; S/ins not started; P/LS 03/08/22; S/xx DD/MM/YY
tcheck; APT/SIMBAD target names: ; AV238 'AzV 238'
tcheck; Target info verification status?; OK ...
SIMBAD lists SpT as O9 III and classifies it as a "Double or Multiple Star"...
Dufton+19 label it SB1 and give T_eff=33 800 and log g =3.75. Walborn+95 show FOS spectrum
tcheck; Coordinates & P.M. verified, epoch checked?; Yes - Gaia coords and PM set to zero
tcheck; Adopted SED compared to Observations?; 4 IUE spectra but 2 are of S85 - wrong target...
COS spectra 1800-2050 A and FOS FUV and NUV spectra fluxes agree very well. FUSE data weird shape and too high. But agrees with start of IUE and FOS spectra 1090-1190 A. Is SB1 component only seen at lambda < 1200 A? UBV photometry not a good match either and too low by 33%.
BUT SED agrees with the FUV observed fluxes so exposure time estimates will be correct.
Category=STAR
Description=[GIANT O]
Extended=NO

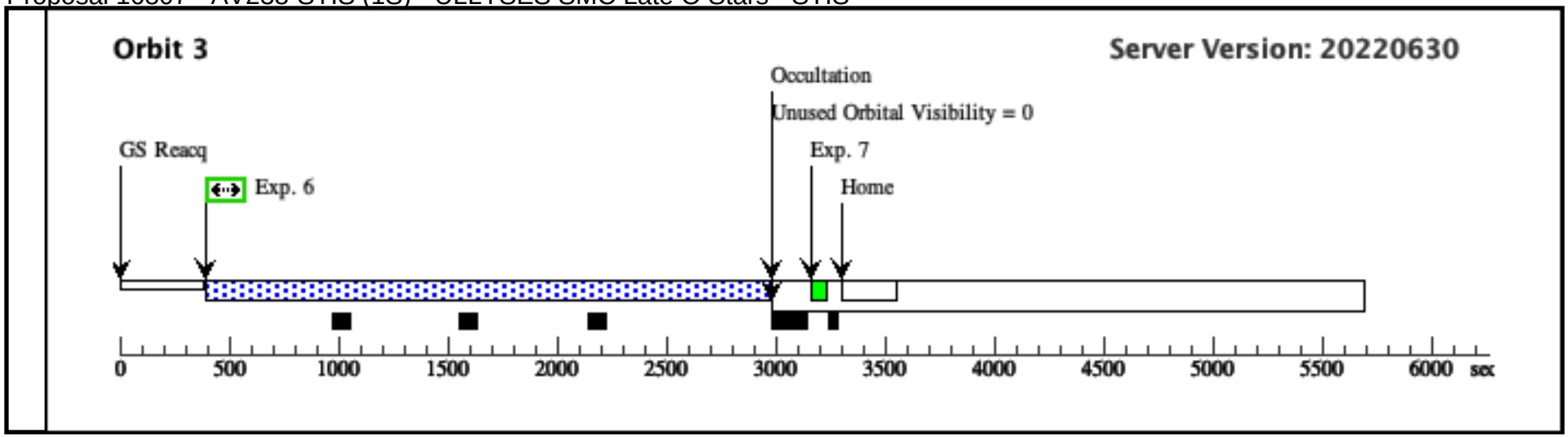
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (1825196)	(1) AV238	STIS/CCD, ACQ, F28X50LP	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***
2	E140M/1425 (1817966)	(1) AV238	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=582			14700 Secs (2215 Secs) *[==>2215 Secs]*	***[1]***
	Comments: rn(PoWR-OB-new(PoWR_31000_3.60_m7.02_Z0.14.fits, smc-ob-i 31-36, Z=0.140 solar, Teff=31000, log_lum=5.11, log_g=3.60, log_mdot=-7.02) (extinction smcbar=0.090), flux1360 +- 2.0A flux=4.2e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O9.5 III* *SED = AV238_STIS_E140M_c1425_sed.fits* *For exptime=14700 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 2287 cts/s/segment* *brightest pixel: 0.024 cts/s/pix at 1344.5 A* *Calculation performed 2022-08-09*								
3	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[1]***
4	E140M/1425 (1817966)	(1) AV238	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=582			14700 Secs (2567 Secs) *[==>2567 Secs]*	***[2]***
	Comments: rn(PoWR-OB-new(PoWR_31000_3.60_m7.02_Z0.14.fits, smc-ob-i 31-36, Z=0.140 solar, Teff=31000, log_lum=5.11, log_g=3.60, log_mdot=-7.02) (extinction smcbar=0.090), flux1360 +- 2.0A flux=4.2e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O9.5 III* *SED = AV238_STIS_E140M_c1425_sed.fits* *For exptime=14700 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 2287 cts/s/segment* *brightest pixel: 0.024 cts/s/pix at 1344.5 A* *Calculation performed 2022-08-09*								
5	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[2]***
6	E140M/1425 (1817966)	(1) AV238	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=582			14700 Secs (2567 Secs) *[==>2567 Secs]*	***[3]***
	Comments: rn(PoWR-OB-new(PoWR_31000_3.60_m7.02_Z0.14.fits, smc-ob-i 31-36, Z=0.140 solar, Teff=31000, log_lum=5.11, log_g=3.60, log_mdot=-7.02) (extinction smcbar=0.090), flux1360 +- 2.0A flux=4.2e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O9.5 III* *SED = AV238_STIS_E140M_c1425_sed.fits* *For exptime=21433 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 2287 cts/s/segment* *brightest pixel: 0.024 cts/s/pix at 1344.5 A* *Calculation performed 2022-08-09*								
7	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[3]***

Orbit Structure



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Exp. 6
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4000
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5500
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sec

Visit

Proposal 16807, AV238-STIS (1T) Mon Oct 03 17:00:42 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; SEQ 1S,1T WITHIN 30 D

Comments: vstatus; 1S; AV238; P/STIS approved for submission; P/LS 09/08/22 ; intrev: not complete ; P/AF 03/10/22
vcheck; Enter targ name & Inst. & Resp. Sci.; AV238 'AzV 238' ; STIS ; LS
vcheck; ETC numbers entered in APT?; completed
vcheck; Any screening violations?; None
vcheck; S/N ETC calcs done & documented?; Yes ...
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3	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[1]***
4	E140M/1425 (1817966)	(1) AV238	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=582			14700 Secs (2567 Secs) *[==>2567 Secs]*	***[2]***
	Comments: rn(PoWR-OB-new(PoWR_31000_3.60_m7.02_Z0.14.fits, smc-ob-i 31-36, Z=0.140 solar, Teff=31000, log_lum=5.11, log_g=3.60, log_mdot=-7.02) (extinction smcbar=0.090), flux1360 +- 2.0A flux=4.2e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O9.5 III* *SED = AV238_STIS_E140M_c1425_sed.fits* *For exptime=14700 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 2287 cts/s/segment* *brightest pixel: 0.024 cts/s/pix at 1344.5 A* *Calculation performed 2022-08-09*								
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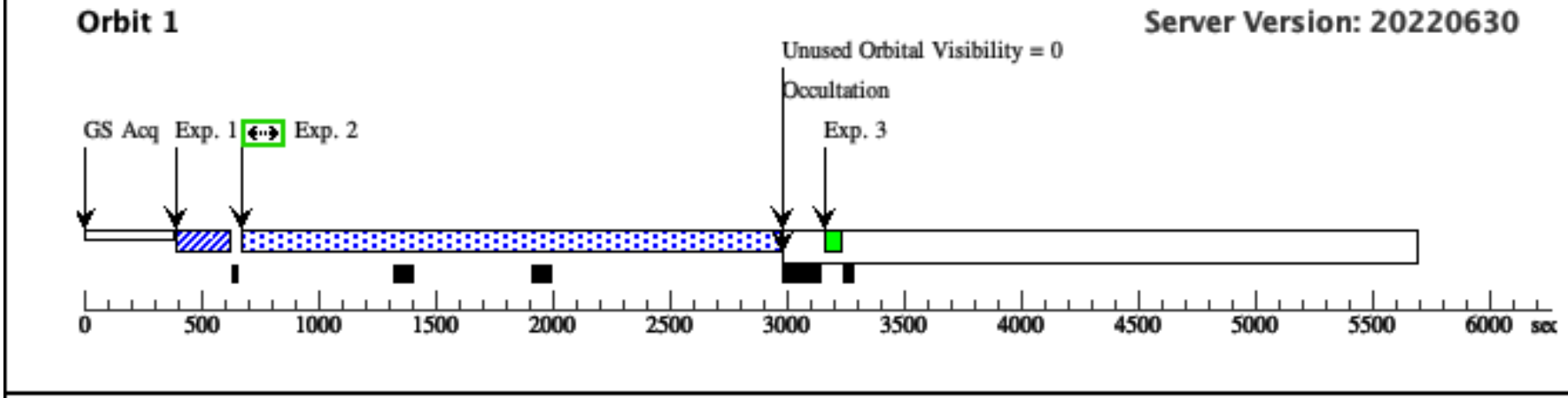
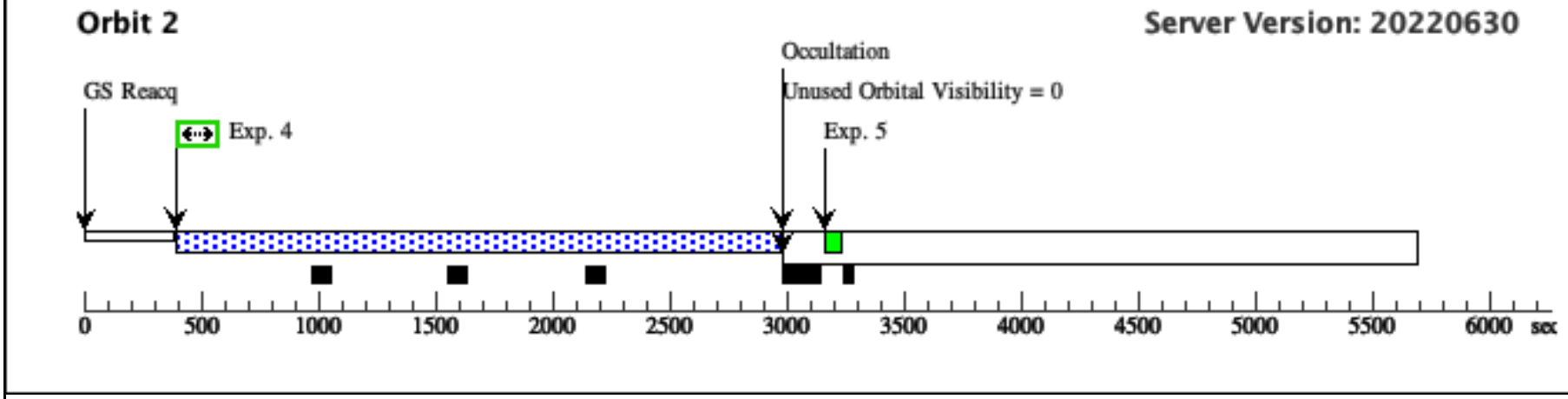
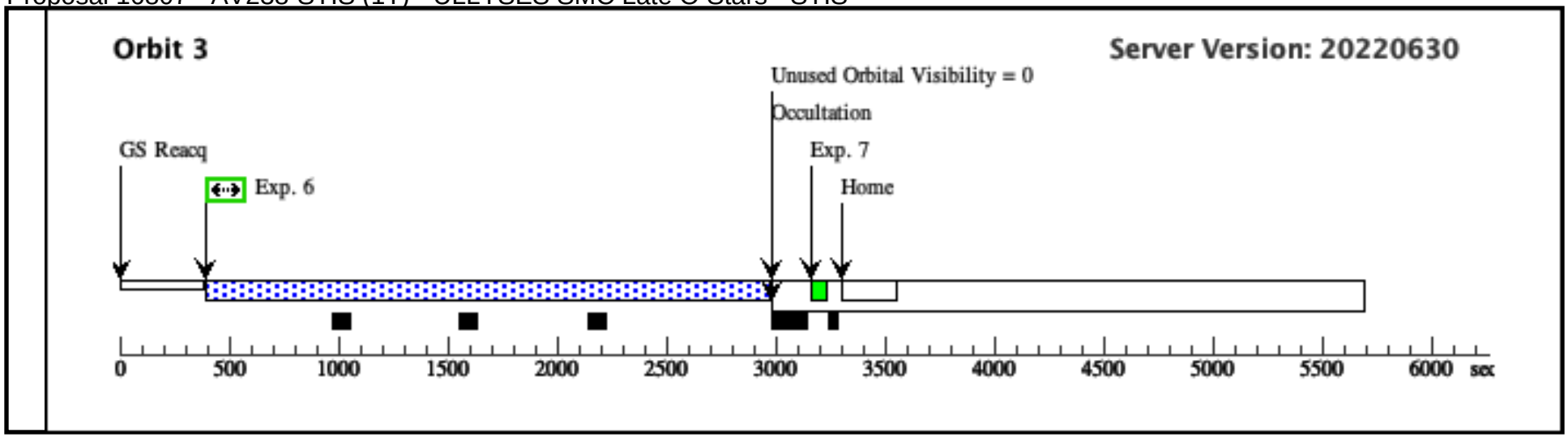
6	E140M/1425 (1817966)	(1) AV238	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=582			14700 Secs (2567 Secs) *[==>2567 Secs]*	***[3]***
	Comments: rn(PoWR-OB-new(PoWR_31000_3.60_m7.02_Z0.14.fits, smc-ob-i 31-36, Z=0.140 solar, Teff=31000, log_lum=5.11, log_g=3.60, log_mdot=-7.02) (extinction smcbar=0.090), flux1360 +- 2.0A flux=4.2e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O9.5 III* *SED = AV238_STIS_E140M_c1425_sed.fits* *For exptime=21433 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 2287 cts/s/segment* *brightest pixel: 0.024 cts/s/pix at 1344.5 A* *Calculation performed 2022-08-09*								
7	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[3]***

Orbit Structure



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GS Reacq
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5000
5500
6000
sec

Visit

Proposal 16807, AV506-STIS (2S) Mon Oct 03 17:00:42 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; SEQ 2S,2T WITHIN 30 D

Comments: vstatus; 2S; AV506; P/STIS approved for submission; P/LS 09/08/22 ; intrev: complete; P/AF 03/10/22
vcheck; Enter targ name & Inst. & Resp. Sci.; AV506 'SK169' ; STIS ; LS
vcheck; ETC numbers entered in APT?; DONE
vcheck; Any screening violations?; NONE
vcheck; S/N ETC calcs done & documented?; Yes - S/N=20 at 1200 for exp time of 12,130 s
vcheck; Field images checked & saved?; Done
vcheck; Selected ACQ strategy?; STIS F28X50LP 0.1 s
vcheck; Possible ACQ or Sci spoilers?; None
vcheck; Field BOT clear?; 1 safe star and Gaia_BOT has next brightest star to target with mag 16.39 if O5 V
vcheck; Visual BOT check for stars not in catalog?; OK
vcheck; Orbit packing finalized?; 3 orbits
vcheck; Buffer times optimized?; Done
vcheck; Verify visit grouping correct; GROUP VISITS 2S and 2T within 30 days
vcheck; Is visit ready for int. review?; Yes
Allocated STIS orbits = 5

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	AV506	RA: 01 22 11.2190 (20.5467458d)	Proper Motion RA: 0 mas/yr	V=13.53	Reference Frame: ICRS
	Alt Name1: SK169	Dec: -73 26 51.88 (-73.44774d)	Proper Motion Dec: 0 mas/yr	SpT=B0.5 II; E(B-V)=0.11; U=12.38; B=13.36; V=13.53; F1160=4.570e-13	
	Alt Name2: M2002-80545	Equinox: J2000	Parallax: 0"		
			Epoch of Position: 2000		

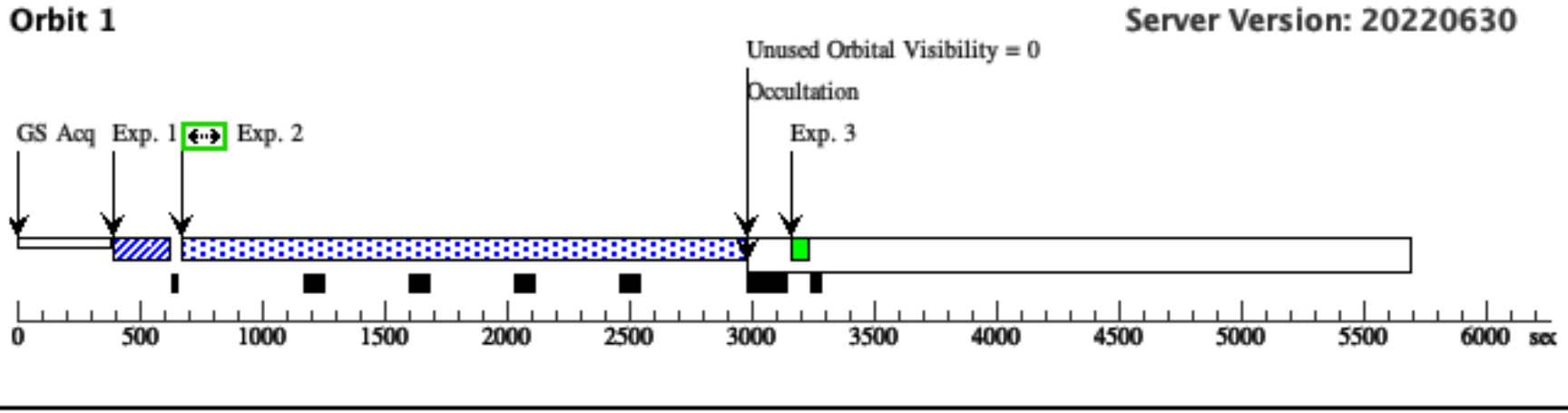
Comments: AV506 : SK169, M2002-80545, AzV 506
Previous name : [M2002]-80545
Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv
SpT = B0.5 II

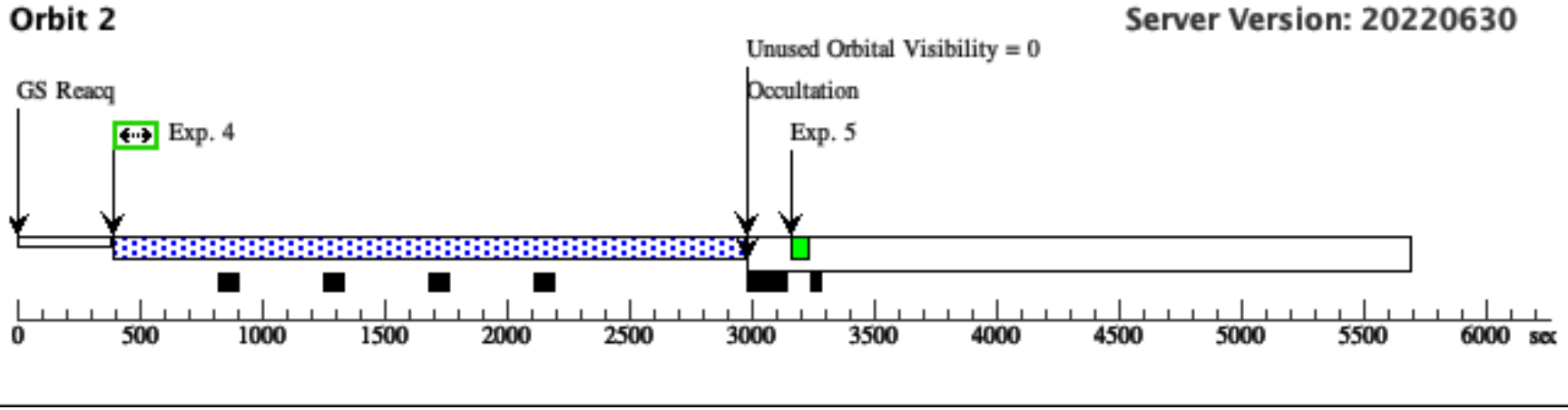
Coordinate pedigree: Gaia DR2
Calculation performed 2021-10-25T00:54:22, v0.9
---
tstatus; AV506; P/STIS approved for submission; S/ins not started; P/LS 03/08/22; S/xx DD/MM/YY
tcheck; APT/SIMBAD target names: ; AV506 'SK 169'
tcheck; Target info verification status?; OK ...
SpT given in SIMBAD as B0.5 III
tcheck; Coordinates & P.M. verified, epoch checked?; Yes - Gaia coords and PM set to zero
tcheck; Adopted SED compared to Observations?; FUSE and UBV only ...
FUSE agrees well because SED is normalized at 1160 A. UBV too faint by ~40%
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

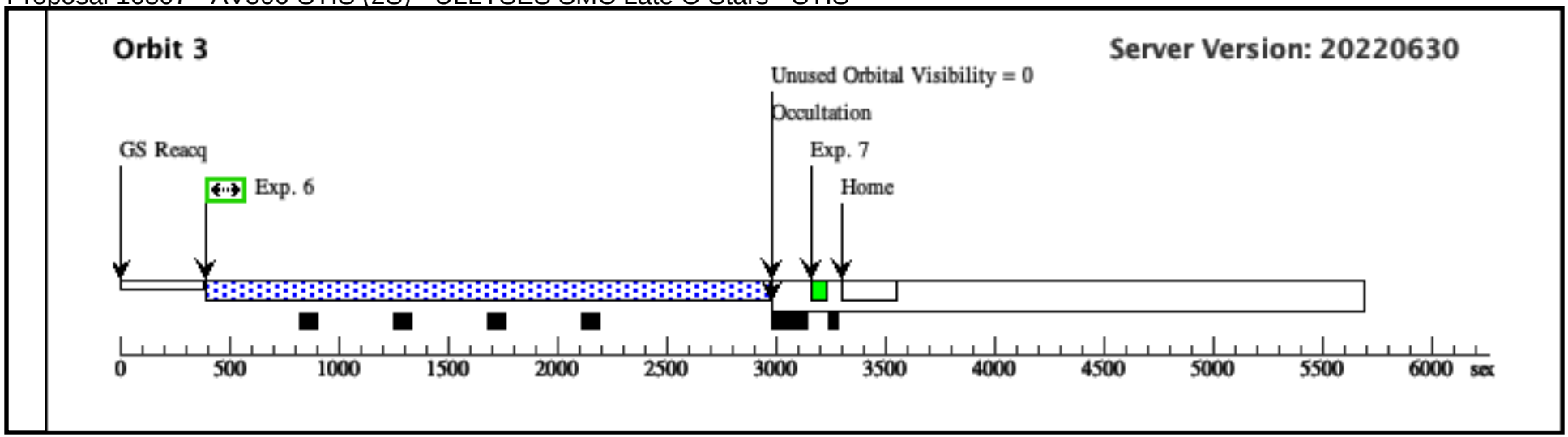
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (1817982)	(2) AV506	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	***[1]***
2	E140M/1425 (1817984)	(2) AV506	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=430			11274.5 Secs (2215 Secs) *[==>2215 Secs]*	***[1]***
	Comments: rn(PoWR-OB-new(PoWR_26000_3.40_m7.06_Z0.14.fits, smc-ob-i 26-34, Z=0.140 solar, Teff=26000, log_lum=4.90, log_g=3.40, log_mdot=-7.06) (extinction smcbar=0.110), flux1160 +- 2.0A flux=4.6e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: B0.5 II* *SED = AV506_STIS_E140M_c1425_sed.fits* *For exptime=11274.5 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 3104.2 cts/s/segment* *brightest pixel: 0.042 cts/s/pix at 1395.0 A* *Calculation performed 2021-10-25T00:54:30, v0.9*								
3	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[1]***
4	E140M/1425 (1817984)	(2) AV506	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=430			11274.5 Secs (2567 Secs) *[==>2567 Secs]*	***[2]***
	Comments: rn(PoWR-OB-new(PoWR_26000_3.40_m7.06_Z0.14.fits, smc-ob-i 26-34, Z=0.140 solar, Teff=26000, log_lum=4.90, log_g=3.40, log_mdot=-7.06) (extinction smcbar=0.110), flux1160 +- 2.0A flux=4.6e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: B0.5 II* *SED = AV506_STIS_E140M_c1425_sed.fits* *For exptime=11274.5 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 3104.2 cts/s/segment* *brightest pixel: 0.042 cts/s/pix at 1395.0 A* *Calculation performed 2021-10-25T00:54:30, v0.9*								
5	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[2]***
6	E140M/1425 (1817984)	(2) AV506	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=430			11274.5 Secs (2567 Secs) *[==>2567 Secs]*	***[3]***
	Comments: rn(PoWR-OB-new(PoWR_26000_3.40_m7.06_Z0.14.fits, smc-ob-i 26-34, Z=0.140 solar, Teff=26000, log_lum=4.90, log_g=3.40, log_mdot=-7.06) (extinction smcbar=0.110), flux1160 +- 2.0A flux=4.6e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: B0.5 II* *SED = AV506_STIS_E140M_c1425_sed.fits* *For exptime=11274.5 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 3104.2 cts/s/segment* *brightest pixel: 0.042 cts/s/pix at 1395.0 A* *Calculation performed 2021-10-25T00:54:30, v0.9*								
7	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20220630
Unused Orbital Visibility = 0
Occultation
GS Reacq
Exp. 6
Exp. 7
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16807, AV506-STIS (2T) Mon Oct 03 17:00:42 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; SEQ 2S,2T WITHIN 30 D

Comments: vstatus; 2S; AV506; P/STIS approved for submission; P/LS 09/08/22 ; intrev: complete ; P/AF 03/10/22
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vcheck; Visual BOT check for stars not in catalog?; OK
vcheck; Orbit packing finalized?; 2 orbits
vcheck; Buffer times optimized?; Done
vcheck; Verify visit grouping correct; GROUP VISITS 2S and 2T within 30 days
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3	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[1]***
4	E140M/1425 (1817984)	(2) AV506	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=430			11274.5 Secs (2567 Secs) *[==>2567 Secs]*	***[2]***
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5	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	***[2]***

Orbit Structure