



17295 - ULLYSES Supplemental FUV Exposures for SMC O Stars - COS

Cycle: 29, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

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Proposal 17295 (STScI Edit Number: 1, Created: Tuesday, March 14, 2023 at 3:00:46 PM Eastern Standard Time) - Overview

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
1C	(1) NGC346-ELS-31	COS/FUV	2	14-Mar-2023 16:00:43.0	yes
2C	(2) AV296	COS/FUV	1	14-Mar-2023 16:00:44.0	yes
3C	(3) 2DFS-2553	COS/FUV COS/NUV	1	14-Mar-2023 16:00:45.0	yes
4C	(4) SK183	COS/FUV COS/NUV	1	14-Mar-2023 16:00:46.0	yes

5 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 $0.5 M_{\text{sun}}$. 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 Å

COS/G130M/c1291: 30 / six-pixel resel at 1150 Å

COS/G160M/c1611: 30 / six-pixel resel at 1590 Å

COS/G185M/c1953: 30 / three-pixel resel at 1860 Å

COS/G185M/c1986: 30 / three-pixel resel at 1980 Å

STIS/E140M/c1425: 20 / two-pixel resel at 1200 Å

STIS/E230M/c1978: 20 / two-pixel resel at 1800 Å

STIS/E230M/c2707: 20 / two-pixel resel at 2800 Å

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

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<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.

Proposal 17295, NGC346-ELS-31-COS (1C), implementation

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV
 Special Requirements: SCHED 100%

*Comments: vstatus; 1C; NGC346-ELS-31; P/COS approved for submission ; P/RS 23/10/20 ; intrev: completed ; P/CP 03/12/20
 vcheck; Enter targ name & Inst. & Resp. Sci.; NGC346-ELS-31 ; COS ; RS
 vcheck; ETC numbers entered in APT?; Yes
 vcheck; Any screening violations?; No
 vcheck; S/N ETC calcs done & documented?; N/A
 vcheck; Field images checked & saved?; Yes
 vcheck; Selected ACQ strategy?; COS G130M/1291 PSA 1.2 sec conservatively based on single detector ...
 There are two relatively bright stars in the field that would pose a safety issue for the PSA in the case of ACQ/IM with the BOA. Also the target is too bright for MIRROR_B/PSA ACQ/IM.
 vcheck; Possible ACQ or Sci spoilers?; No
 vcheck; Field BOT clear?; Yes
 vcheck; Visual BOT check for stars not in catalog?; OK
 vcheck; Orbit packing finalized?; Yes
 vcheck; Buffer times optimized?; Yes
 vcheck; Verify visit grouping correct; N/A
 vcheck; Is visit ready for int. review?; Yes
 Allocated COS orbits = 2*

10/3/23 ADDITIONAL NOTES (AF)
 Visit 1C is designed to increase the S/N of the COS G130M/1096 spectrum of NGC346-ELS-31 that was obtained by ULLYSES (PID, Visit) = (16372, 3C). Visit 1C was constructed directly from the previous visit. To start, the APT file for PID 16372 was retrieved from the database at STScI and the target information for NGC346-ELS-31 and the detailed implementation of Visit 3C were copied in their entirety. Orbits 3, 4, and 5 were deleted, leaving the initial NUV imaging target acquisition (Orbit 1) and 4 G130M/1096 sub-exposures (one for each FP-POS) in Orbits 1 and 2. The exposure and buffer times for FP-POS1 and FP-POS2 were adjusted to fill the time remaining in Orbit 1 after allowing for the target acquisition. Similarly, the exposure and buffer times for FP-POS3 and FP-POS4 were adjusted to fill Orbit 2 optimally. Although detailed ETC calculations were not performed, the combined data from Visits (16372, 3C) and (17295, 1C) are expected to produce S/N of ~18 per resel at 1080 Angstroms. Note that most of the information in the vstatus/vcheck checklist (see above) pertains to the original implementation of (16372, 3C), though the visit designation and orbital allocation have been updated for (17295, 1C). Since the target information, bright-object checking, and implementation details were thoroughly vetted for the original visit, the internal review was not repeated for the current "top up" visit.

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC346-ELS-31	RA: 00 59 54.0610 (14.9752542d)	Proper Motion RA: 0.867 mas/yr	V=15.02	Reference Frame: ICRS
	Alt Name1: NGC346-31	Dec: -72 04 31.42 (-72.07539d)	Proper Motion Dec: -1.111 mas/yr	SpT=O7 V; E(B-V)=0.01; B=14.8; V=15.0; F1160=1.53e-13; F1360=1.29e-13; F1700=8.89e-14	
	Alt Name2: NGC-346-031	Equinox: J2000	Epoch of Position: 2000		
<p><i>Comments: NGC346-ELS-31 : NGC 346-031, NGC346_31, Cl* NGC 346 ELS 031 Previous name : NGC 346-031 Input file: SMC_2020Feb20/input/SMC_all_do1_NewCoords_pids.csv SIMBAD link (Cl* NGC 346 ELS 031): https://simbad.u-strasbg.fr/simbad/sim-id?Ident=Cl*+NGC+346+ELS+031&submit=submit+id SpT = O7 V COS/G130M/c1096 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1160 +- 30.0A flux=1.5e-13 Flam) COS/G130M/c1291 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1360 +- 30.0A flux=1.3e-13 Flam) COS/G160M/c1611 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1700 +- 5.0A flux=8.9e-14 Flam) COS/G185M/c1921 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1700 +- 5.0A flux=8.9e-14 Flam) COS/G185M/c1953 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1700 +- 5.0A flux=8.9e-14 Flam) COS/G185M/c1986 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1700 +- 5.0A flux=8.9e-14 Flam) STIS/E140M/c1425 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1360 +- 30.0A flux=1.3e-13 Flam) STIS/E230M/c1978 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1700 +- 5.0A flux=8.9e-14 Flam) STIS/E230M/c2707 : rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1700 +- 5.0A flux=8.9e-14 Flam) Coordinate pedigree: Gaia v sin i = 18 Calculation performed 2020-02-24T17:58:42, v0.4</i></p> <hr/> <p><i>tstatus; NGC346-ELS-31; P/COS approved for submission ; S/ins not started; P/RS 23/10/20; S/xx DD/MM/YY tcheck; APT/SIMBAD target names: ; NGC346-ELS-31, '[M2002] SMC 47478' tcheck; Target info verification status?; OK ... spectral type is O8Vz in SIMBAD tcheck; Coordinates & P.M. updated?; Yes - GAIA DR2 tcheck; Adopted SED compared to Observations?; OK ... COS c1291 data exist, and changing E(B-V) to 0.05 provided a sufficient match to the FUV data Category=EXT-STAR Description=[MAIN SEQUENCE O] Extended=NO</i></p>					

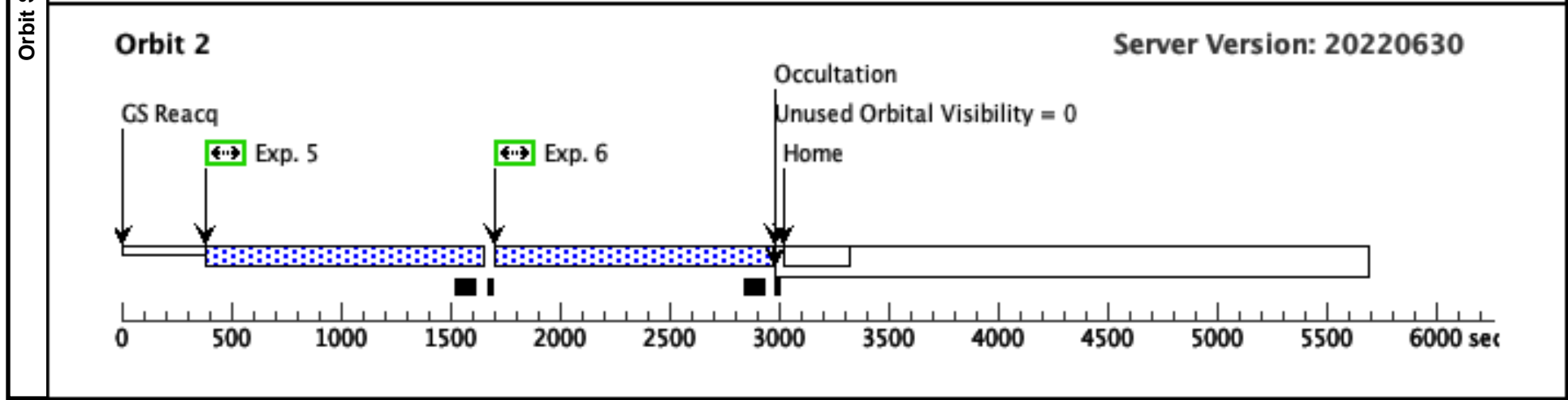
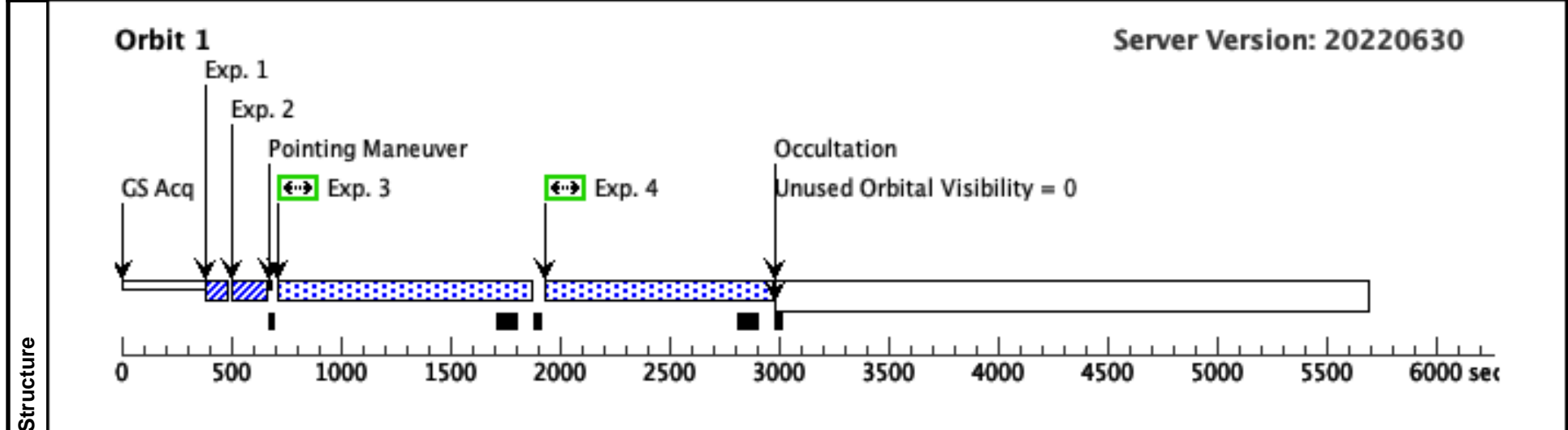
Proposal 17295 - NGC346-ELS-31-COS (1C) - ULLYSES Supplemental FUV Exposures for SMC O Stars - COS

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	ACQ/PEAK XD (COS.sa.147 0927)	(1) NGC346-ELS-31 COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	CENTER=FLUX-W T; NUM-POS=3; STEP-SIZE=1.3; SEGMENT=BOTH			1.2 Secs (1.2 Secs) [==>]	[1]	
	2	ACQ/PEAK D (COS.sa.147 0927)	(1) NGC346-ELS-31 COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	CENTER=FLUX-W T-FLR; NUM-POS=5; STEP-SIZE=0.9; SEGMENT=BOTH			1.2 Secs (1.2 Secs) [==>]	[1]	
	3	G130M/109 6 (COS.sp.147 0928)	(1) NGC346-ELS-31 COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=85 0; FP-POS=1			990 Secs (990 Secs) [==>]	[1]	
	<p><i>Comments: rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1160 +- 30.0A flux=1.5e-13 Flam); cos,fuv,g130m,c1096,psa,mjd#59305; fp-pos=None, segment=None)</i> <i>From file SMC_2020Feb20/input/SMC_all_do1_NewCoords_pids.csv</i> <i>Spectral type: O7 V --> O7 V</i> <i>SED = NGC346-ELS-31_COS_G130M_c1096_sed.fits</i> <i>For exptime=10629.0 s, spectral region:</i> <i>1080.0 +- 0.5 A achieves SNR=20.0/resel</i> <i>global countrate (brightest segment): 1309.1 cts/s/segment</i> <i>brightest pixel: 0.019 cts/s/pix at 1205.0 A</i> <i>Calculation performed 2020-02-24T17:58:50, v0.4</i></p>									
	4	G130M/109 6 (COS.sp.147 0928)	(1) NGC346-ELS-31 COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=85 0; FP-POS=2			990 Secs (990 Secs) [==>]	[1]	
<p><i>Comments: rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1160 +- 30.0A flux=1.5e-13 Flam); cos,fuv,g130m,c1096,psa,mjd#59305; fp-pos=None, segment=None)</i> <i>From file SMC_2020Feb20/input/SMC_all_do1_NewCoords_pids.csv</i> <i>Spectral type: O7 V --> O7 V</i> <i>SED = NGC346-ELS-31_COS_G130M_c1096_sed.fits</i> <i>For exptime=10629.0 s, spectral region:</i> <i>1080.0 +- 0.5 A achieves SNR=20.0/resel</i> <i>global countrate (brightest segment): 1309.1 cts/s/segment</i> <i>brightest pixel: 0.019 cts/s/pix at 1205.0 A</i> <i>Calculation performed 2020-02-24T17:58:50, v0.4</i></p>										
5	G130M/109 6 (COS.sp.147 0928)	(1) NGC346-ELS-31 COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=10 99; FP-POS=3			1214 Secs (1214 Secs) [==>]	[2]		
<p><i>Comments: rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1160 +- 30.0A flux=1.5e-13 Flam); cos,fuv,g130m,c1096,psa,mjd#59305; fp-pos=None, segment=None)</i> <i>From file SMC_2020Feb20/input/SMC_all_do1_NewCoords_pids.csv</i> <i>Spectral type: O7 V --> O7 V</i> <i>SED = NGC346-ELS-31_COS_G130M_c1096_sed.fits</i> <i>For exptime=10629.0 s, spectral region:</i> <i>1080.0 +- 0.5 A achieves SNR=20.0/resel</i> <i>global countrate (brightest segment): 1309.1 cts/s/segment</i> <i>brightest pixel: 0.019 cts/s/pix at 1205.0 A</i> <i>Calculation performed 2020-02-24T17:58:50, v0.4</i></p>										

Proposal 17295 - NGC346-ELS-31-COS (1C) - ULLYSES Supplemental FUV Exposures for SMC O Stars - COS

6	G130M/109 (1)NGC346-ELS-31 COS/FUV, TIME-TAG, PSA 6 (COS.sp.147 0928)	G130M 1096 A	BUFFER-TIME=10 99; FP-POS=4	1214 Secs (1214 Secs) [==>]	[2]
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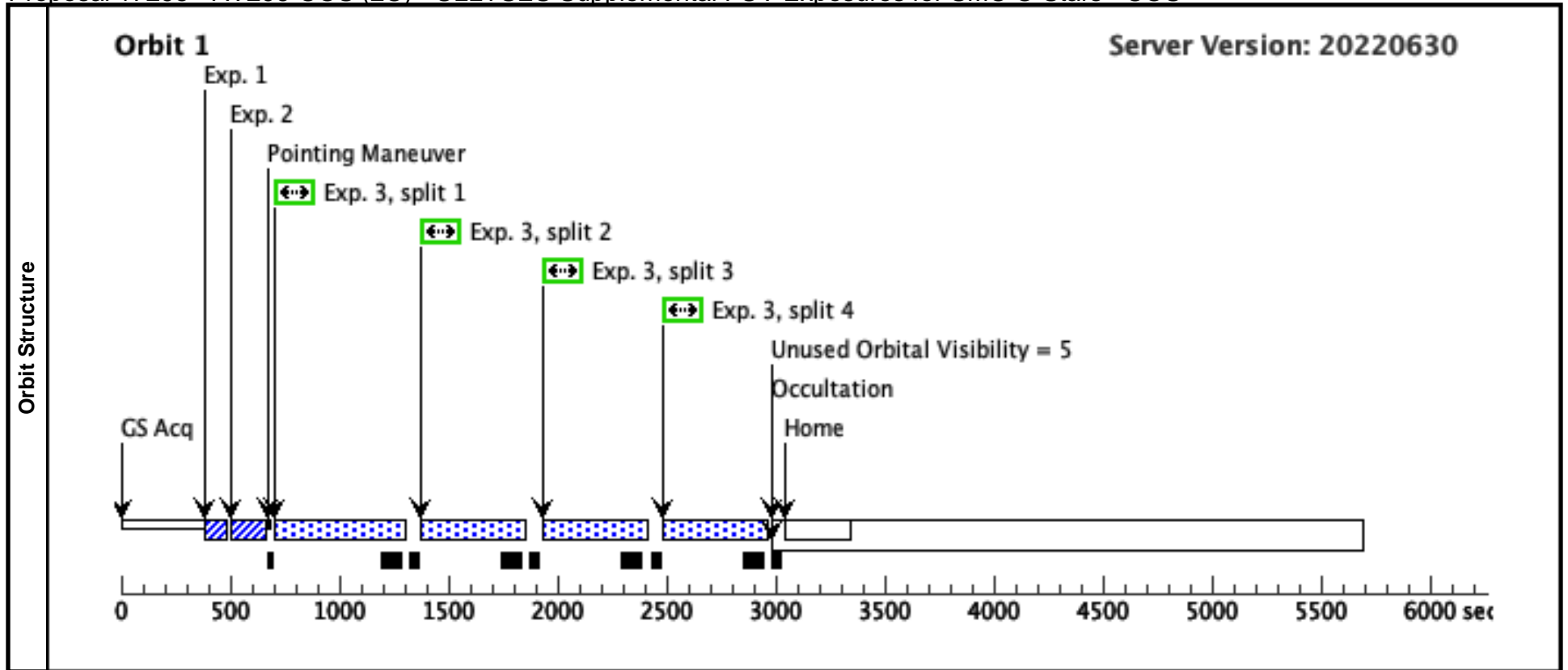
Comments: *rn-max(WM-Basic(O7 V, Z=0.004, Teff=39811, log_lum=5.42, log_g=4.00) (extinction smcbar=0.010), flux1160 +/- 30.0A flux=1.5e-13 Flam); cos.fuv,g130m,c1096,psa,mjd#59305; fp-pos=None, segment=None*
 From file *SMC_2020Feb20/input/SMC_all_do1_NewCoords_pids.csv*
 Spectral type: *O7 V --> O7 V*
 SED = *NGC346-ELS-31_COS_G130M_c1096_sed.fits*
 For exptime=10629.0 s, spectral region:
 1080.0 +/- 0.5 A achieves SNR=20.0/resel
 global countrate (brightest segment): 1309.1 cts/s/segment
 brightest pixel: 0.019 cts/s/pix at 1205.0 A
 Calculation performed 2020-02-24T17:58:50, v0.4



Visit	<p>Proposal 17295, AV296-COS (2C), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: COS/FUV</p> <p>Special Requirements: SCHED 100%</p> <p><i>Comments: vstatus; 2C; AV296; P/COS approved for submission; P/RS 25/12/21 ; intrev: complete ; P/JRD 11/05/22</i></p> <p><i>vcheck; Enter targ name & Inst. & Resp. Sci.; AV296 ; COS ; RS</i></p> <p><i>vcheck; ETC numbers entered in APT?; yes</i></p> <p><i>vcheck; Any screening violations?; no</i></p> <p><i>vcheck; S/N ETC calcs done & documented?; yes</i></p> <p><i>vcheck; Field images checked & saved?; yes</i></p> <p><i>vcheck; Selected ACQ strategy?; yes spectroscopic acq G130M/1291</i></p> <p><i>vcheck; Possible ACQ or Sci spoilers?; no</i></p> <p><i>vcheck; Field BOT clear?; yes ...</i></p> <p><i>stars with V=17.65 and 17.68 in Zaritsky catalog that make imaging ACQ problematic otherwise okay, GSCII warning due to O5V assumption</i></p> <p><i>vcheck; Visual BOT check for stars not in catalog?; yes ok</i></p> <p><i>vcheck; Orbit packing finalized?; yes</i></p> <p><i>vcheck; Buffer times optimized?; yes</i></p> <p><i>vcheck; Verify visit grouping correct; N/A</i></p> <p><i>vcheck; Is visit ready for int. review?; yes</i></p> <p>Allocated COS orbits = 1</p> <p>10/3/23 ADDITIONAL NOTES (AF)</p> <p>Visit 2C is designed to increase the S/N of the COS G130M/1096 spectrum of AV296 that was obtained by ULLYSES (PID, Visit) = (16802, 1C). Visit 2C was constructed directly from the previous Visit 1C by (a) retrieving the APT file for PID 16802 from the database at STScI; and (b) copying the target information for AV296 and the detailed implementation of Visit 1C. The second orbit of Visit 1C was deleted, and the exposure and buffer times for FP-POS=ALL were adjusted to fill the single orbit allocated to new visit 2C after allowing for the target acquisition. Although detailed ETC calculations were not performed, the combined data from Visits (16802, 1C) and (17295, 2C) are expected to produce S/N of ~18 per resel at 1080 Angstroms. Note that most of the information in the vstatus/vcheck checklist (see above) pertains to the original implementation of (16802, 1C), though the visit designation and orbital allocation have been updated for (17295, 2C). Since the target information, bright-object checking, and implementation details were thoroughly vetted for the original visit, the internal review was not repeated for the current "top up" visit.</p>																														
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(2)</td> <td>AV296</td> <td>RA: 01 02 8.6474 (15.5360308d)</td> <td>Proper Motion RA: 0.948 mas/yr</td> <td>V=14.26</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td></td> <td>Alt Name1: M2002-52948</td> <td>Dec: -72 13 20.02 (-72.22223d)</td> <td>Proper Motion Dec: -0.956 mas/yr</td> <td>SpT=O7.5 V((f)); E(B-V)=0.09;</td> <td>U=13.05; B=14.07; V=14.26; F1</td> </tr> <tr> <td></td> <td>Alt Name2: AZV-296</td> <td>Equinox: J2000</td> <td>Parallax: 0"</td> <td>160=3.600e-13; F1360=2.570e-1</td> <td>3; F1700=1.640e-13</td> </tr> <tr> <td></td> <td colspan="5"> <p>Epoch of Position: 2000</p> <p><i>Comments: AV296 : M2002-52948, AzV 296</i></p> <p><i>Previous name : AV 296</i></p> <p><i>Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv</i></p> <p><i>SpT = O7.5 V((f))</i></p> <p><i>COS/G130M/c1096 : rn(PoWR-OB-new(PoWR_35000_3.60_m6.82_ZO.14.fits, smc-ob-i 35-36, Z=0.140 solar, Teff=35000, log_lum=5.50, log_g=3.60, log_mdodot=-6.82) (extinction smcbar=0.090), flux1160 +- 2.0A flux=3.6e-13 Flam)</i></p> <p><i>Coordinate pedigree: Gaia DR2</i></p> <p><i>Calculation performed 2021-10-25T00:53:19, v0.9</i></p> <p>-----</p> <p><i>tstatus: AV296; P/COS approved for submission; S/ins not started; P/RS 23/12/21; S/xx DD/MM/YY</i></p> <p><i>tcheck; APT/SIMBAD target names: ; AV296 'AzV 296'</i></p> <p><i>tcheck; Target info verification status?; OK</i></p> <p><i>tcheck; Coordinates & P.M. verified, epoch checked?; OK</i></p> <p><i>tcheck; Adopted SED compared to Observations?; POWR model SED, AV296_COS_G130M_c1096_sed.fits matches at 1150A ...</i></p> <p><i>but is about 19% higher than STIS and IUE spectra at longer wavelength ...</i></p> <p><i>A new POWR model SED with E(B-V)=0.06 normalized to flux density of 3e-13 at 1160A (AV296_new_ext0pt06_scl3e-13_sed.fits) was used</i></p> <p>Category=STAR</p> <p>Description=[MAIN SEQUENCE O, OF]</p> <p>Extended=NO</p> </td> </tr> </tbody> </table>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(2)	AV296	RA: 01 02 8.6474 (15.5360308d)	Proper Motion RA: 0.948 mas/yr	V=14.26	Reference Frame: ICRS		Alt Name1: M2002-52948	Dec: -72 13 20.02 (-72.22223d)	Proper Motion Dec: -0.956 mas/yr	SpT=O7.5 V((f)); E(B-V)=0.09;	U=13.05; B=14.07; V=14.26; F1		Alt Name2: AZV-296	Equinox: J2000	Parallax: 0"	160=3.600e-13; F1360=2.570e-1	3; F1700=1.640e-13		<p>Epoch of Position: 2000</p> <p><i>Comments: AV296 : M2002-52948, AzV 296</i></p> <p><i>Previous name : AV 296</i></p> <p><i>Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv</i></p> <p><i>SpT = O7.5 V((f))</i></p> <p><i>COS/G130M/c1096 : rn(PoWR-OB-new(PoWR_35000_3.60_m6.82_ZO.14.fits, smc-ob-i 35-36, Z=0.140 solar, Teff=35000, log_lum=5.50, log_g=3.60, log_mdodot=-6.82) (extinction smcbar=0.090), flux1160 +- 2.0A flux=3.6e-13 Flam)</i></p> <p><i>Coordinate pedigree: Gaia DR2</i></p> <p><i>Calculation performed 2021-10-25T00:53:19, v0.9</i></p> <p>-----</p> <p><i>tstatus: AV296; P/COS approved for submission; S/ins not started; P/RS 23/12/21; S/xx DD/MM/YY</i></p> <p><i>tcheck; APT/SIMBAD target names: ; AV296 'AzV 296'</i></p> <p><i>tcheck; Target info verification status?; OK</i></p> <p><i>tcheck; Coordinates & P.M. verified, epoch checked?; OK</i></p> <p><i>tcheck; Adopted SED compared to Observations?; POWR model SED, AV296_COS_G130M_c1096_sed.fits matches at 1150A ...</i></p> <p><i>but is about 19% higher than STIS and IUE spectra at longer wavelength ...</i></p> <p><i>A new POWR model SED with E(B-V)=0.06 normalized to flux density of 3e-13 at 1160A (AV296_new_ext0pt06_scl3e-13_sed.fits) was used</i></p> <p>Category=STAR</p> <p>Description=[MAIN SEQUENCE O, OF]</p> <p>Extended=NO</p>			
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	<p>Epoch of Position: 2000</p> <p><i>Comments: AV296 : M2002-52948, AzV 296</i></p> <p><i>Previous name : AV 296</i></p> <p><i>Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv</i></p> <p><i>SpT = O7.5 V((f))</i></p> <p><i>COS/G130M/c1096 : rn(PoWR-OB-new(PoWR_35000_3.60_m6.82_ZO.14.fits, smc-ob-i 35-36, Z=0.140 solar, Teff=35000, log_lum=5.50, log_g=3.60, log_mdodot=-6.82) (extinction smcbar=0.090), flux1160 +- 2.0A flux=3.6e-13 Flam)</i></p> <p><i>Coordinate pedigree: Gaia DR2</i></p> <p><i>Calculation performed 2021-10-25T00:53:19, v0.9</i></p> <p>-----</p> <p><i>tstatus: AV296; P/COS approved for submission; S/ins not started; P/RS 23/12/21; S/xx DD/MM/YY</i></p> <p><i>tcheck; APT/SIMBAD target names: ; AV296 'AzV 296'</i></p> <p><i>tcheck; Target info verification status?; OK</i></p> <p><i>tcheck; Coordinates & P.M. verified, epoch checked?; OK</i></p> <p><i>tcheck; Adopted SED compared to Observations?; POWR model SED, AV296_COS_G130M_c1096_sed.fits matches at 1150A ...</i></p> <p><i>but is about 19% higher than STIS and IUE spectra at longer wavelength ...</i></p> <p><i>A new POWR model SED with E(B-V)=0.06 normalized to flux density of 3e-13 at 1160A (AV296_new_ext0pt06_scl3e-13_sed.fits) was used</i></p> <p>Category=STAR</p> <p>Description=[MAIN SEQUENCE O, OF]</p> <p>Extended=NO</p>																														

Proposal 17295 - AV296-COS (2C) - ULLYSES Supplemental FUV Exposures for SMC O Stars - COS

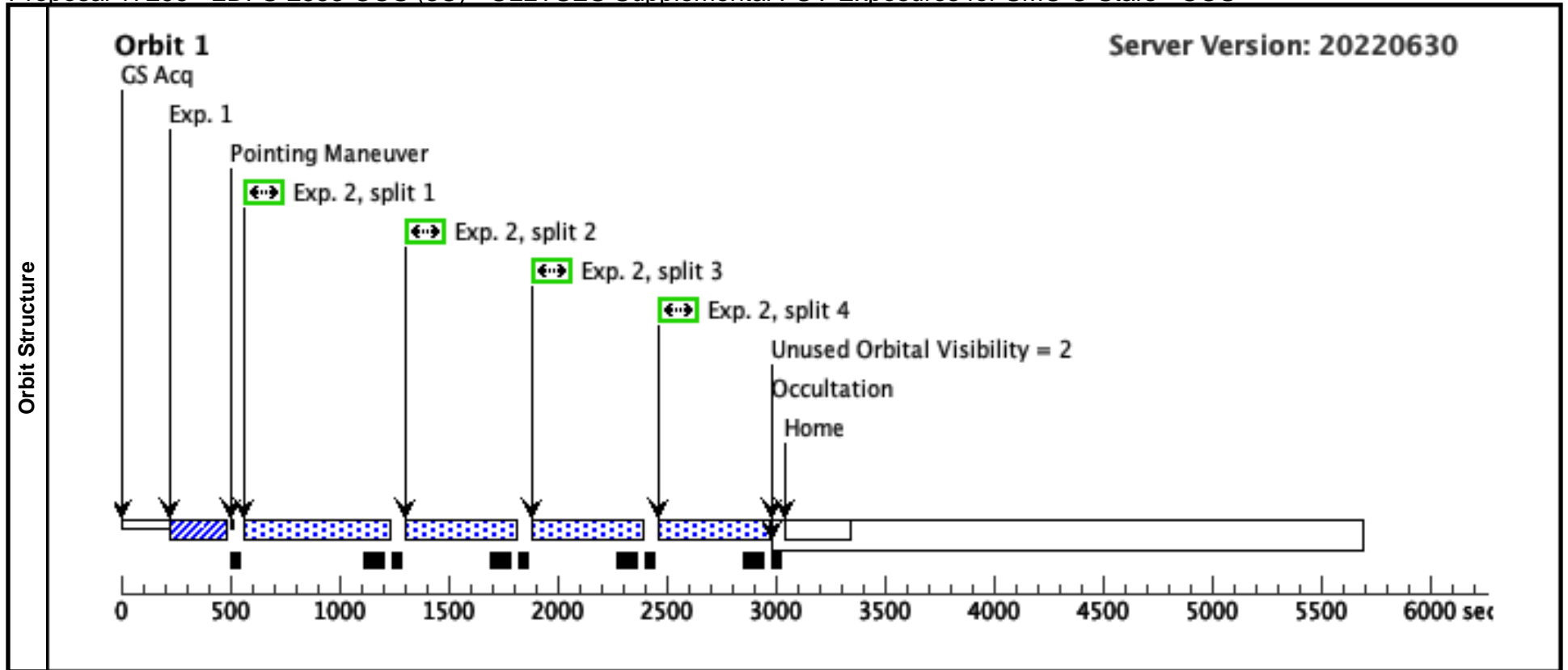
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
Exposures	1	FUV PEAK (2) AV296 XD (COS.sa.174 6058)	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	NUM-POS=3; STEP-SIZE=1.3; CENTER=FLUX-W T			1 Secs (1 Secs) [==>]	[1]
	<i>Comments: Exposure time based on scaled SED; original SED used to clear BOT.</i>								
	2	FUV PEAK (2) AV296 D (COS.sa.174 6058)	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	NUM-POS=5; STEP-SIZE=0.9; CENTER=FLUX-W T-FLR			1 Secs (1 Secs) [==>]	[1]
<i>Comments: Exposure time based on scaled SED; original SED used to clear BOT.</i>									
3	G130M/109 (2) AV296 6 (COS.sp.174 6059)	COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=33 0; FP-POS=ALL			430 Secs (1720 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
<p><i>Comments: rn(PoWR-OB-new(PoWR_35000_3.60_m6.82_Z0.14.fits, smc-ob-i 35-36, Z=0.140 solar, Teff=35000, log_lum=5.50, log_g=3.60, log_mdodot=-6.82) (extinction smcbar=0.090), flux1160 +- 2.0A flux=3.6e-13 Flam); cos.fuv.g130m.c1096.psa.mjd#59670; fp-pos=None, segment=None)</i> <i>From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv</i> <i>Spectral type: O7.5 V(f)</i> <i>SED = AV296_COS_G130M_c1096_sed.fits</i> <i>For exptime=5518.8 s, spectral region:</i> <i>1080.0 +- 0.5 A achieves SNR=20.0/resel</i> <i>global countrate (brightest segment): 4130.2 cts/s/segment</i> <i>brightest pixel: 0.081 cts/s/pix at 1227.0 A</i> <i>Calculation performed 2021-10-25T00:53:26, v0.9</i></p>									



Visit	<p>Proposal 17295, 2DFS-2553-COS (3C), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: COS/FUV, COS/NUV</p> <p>Special Requirements: SCHED 100%</p> <p><i>Comments: vstatus; 3C; 2DFS-2553; P/COS approved for submission; P/RP 22/03/22 ; intrev: complete ; P/AF 22/03/22</i></p> <p><i>vcheck; Enter targ name & Inst. & Resp. Sci.; 2DFS-2553 ; COS ; RP</i></p> <p><i>vcheck; ETC numbers entered in APT?; Yes</i></p> <p><i>vcheck; Any screening violations?; No</i></p> <p><i>vcheck; S/N ETC calcs done & documented?; Yes</i></p> <p><i>vcheck; Field images checked & saved?; Yes</i></p> <p><i>vcheck; Selected ACQ strategy?; Yes ... BOA/MIRRORA</i></p> <p><i>vcheck; Possible ACQ or Sci spoilers?; No</i></p> <p><i>vcheck; Field BOT clear?; No ... ACQ has 3 flags, but all should be safe based on their Fpg values ...</i></p> <p><i>Additionally, we checked the Gaia colors when available. We believe the associated Gaia names to be:</i></p> <ul style="list-style-type: none"> - Gaia EDR3 4687154675500285568 which is consistent with a G1 V star - Gaia EDR3 4687154606780812416 which is consistent with an A0 V - A2 V star - Gaia EDR3 4687154679787022976 which was too faint to have enough color information <p><i>Finally, all 3 stars have comparatively large proper motions and/or parallaxes, which indicates that they are faint foreground objects.</i></p> <p><i>vcheck; Visual BOT check for stars not in catalog?; Yes</i></p> <p><i>vcheck; Orbit packing finalized?; Yes</i></p> <p><i>vcheck; Buffer times optimized?; Yes</i></p> <p><i>vcheck; Verify visit grouping correct; N/A</i></p> <p><i>vcheck; Is visit ready for int. review?; Yes</i></p> <p>Allocated COS orbits = 1</p> <p>10/3/23 ADDITIONAL NOTES (AF)</p> <p><i>Visit 3C is designed to increase the S/N of the COS G130M/1096 spectrum of 2DFS-2553 that was obtained by ULLYSES (PID, Visit) = (16803, 1C) and (16803, 1D). Visit 3C was constructed directly from the previous Visit 1C by (a) retrieving the APT file for PID 16803 from the database at STScI; and (b) copying the target information for 2DFS-2553 and the detailed implementation of Visit 1C. The second and third orbits of Visit 1C were deleted, and the exposure and buffer times for FP-POS=ALL were adjusted to fill the single orbit allocated to new visit 3C after allowing for the target acquisition. Although detailed ETC calculations were not performed, the combined data from Visits (16803, 1C), (16803, 1D) and (17295, 3C) are expected to produce S/N of ~18 per resel at 1080 Angstroms. Note that most of the information in the vstatus/vcheck checklist (see above) pertains to the original implementation of (16803, 1C), though the visit designation and orbital allocation have been updated for (17295, 3C). Since the target information, bright-object checking, and implementation details were thoroughly vetted for the original visit, the internal review was not repeated for the current "top up" visit.</i></p>																																							
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Proposal 17295 - 2DFS-2553-COS (3C) - ULLYSES Supplemental FUV Exposures for SMC O Stars - COS

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/Image (COS.ta.172 3922)	(3) 2DFS-2553	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				20.0 Secs (20 Secs)	
								[==>]	[1]
<i>Comments: Expected S/N ~ 32 with updated model</i>									
2	G130M/109 6-1 (COS.sp.173 4654)	(3) 2DFS-2553	COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=35 7; FP-POS=ALL			457 Secs (1828 Secs)	
								[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
<p><i>Comments: rn(PoWR-OB-new(PoWR_37000_3.60_m6.70_Z0.14.fits, smc-ob-i 37-36, Z=0.140 solar, Teff=37000, log_lum=5.70, log_g=3.60, log_mdod=-6.70) (extinction smcbar=0.140), flux1160 +- 2.0A flux=1.8e-13 Flam); cos.fuv.g130m.c1096.psa.mjd#59670; fp-pos=None, segment=None)</i> <i>From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv</i> <i>Spectral type: O6.5 III((f))e_2</i> <i>SED = 2DFS-2553_COS_G130M_c1096_sed.fits</i> <i>For exptime=12790.5 s, spectral region:</i> <i>1080.0 +- 0.5 A achieves SNR=20.0/resel</i> <i>global countrate (brightest segment): 2233.7 cts/s/segment</i> <i>brightest pixel: 0.044 cts/s/pix at 1227.0 A</i> <i>Calculation performed 2021-10-25T00:53:50, v0.9</i></p> <p>-----</p> <p><i>An updated model from the one above was used to more closely fit the observed STIS data for the ETC run for these observations. The O6 II model was used rather than the O6.5 II model, and the extinction also decreased to 0.07. These changes match the observed STIS data and U, B, V photometry much better.</i></p>									



Proposal 17295, SK183-COS (4C), implementation

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%

Comments: vstatus; 4C; SK183; P/COS approved for submission; P/RS 18/02/22 ; intrev: complete ; P/AF 24/02/22 vcheck; Enter targ name & Inst. & Resp. Sci.; SK183 ; COS ; RS vcheck; ETC numbers entered in APT?; yes vcheck; Any screening violations?; no ... warning for variable sources which is not relevant here vcheck; S/N ETC calcs done & documented?; yes vcheck; Field images checked & saved?; yes vcheck; Selected ACQ strategy?; yes ... NUV Imaging ACQ MIRROR A BOA the exposure time was calculated for the normalized spectrum and with S/N increased to 45 in order to ensure sufficient time for acquisition vcheck; Possible ACQ or Sci spoilers?; no vcheck; Field BOT clear?; yes ... GALEX throws warning for BOA in the science exposure but that is due to extended diffuse gas from nearby cluster of stars while O5V is assumed vcheck; Visual BOT check for stars not in catalog?; ok ... two bright stars beyond the PSA radius for BOA acquisition are B1.5IV and B2V (Ramchandran et al 2019) with V=15.41 and 15.85 (Massey et al 2002) vcheck; Orbit packing finalized?; yes vcheck; Buffer times optimized?; yes vcheck; Verify visit grouping correct; N/A vcheck; Is visit ready for int. review?; yes Allocated COS orbits = 1

10/3/23 ADDITIONAL NOTES (AF)
 Visit 4C is designed to increase the S/N of the COS G130M/1096 spectrum of SK183 that was obtained by ULLYSES (PID, Visit) = (16808, 1C). Target information for SK183 and the detailed implementation of the original visit were copied without modification from the Phase II proposal for PID 16808, which was retrieved from the database at STScI. Note that most of the information in the vstatus/vcheck checklist (see above) pertains to the original implementation of (16808, 1C), though the visit designation and orbital allocation have been updated for (17295, 4C). Since the target information, bright-object checking, and implementation details were thoroughly vetted for the original visit, the internal review was not repeated for the current "top up" visit.

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SK183 Alt Name1: SMCSGS-FS-231	RA: 01 29 24.5483 (22.3522846d) Dec: -73 33 16.34 (-73.55454d) Equinox: J2000	Proper Motion RA: 0.896 mas/yr Proper Motion Dec: -1.351 mas/yr Parallax: 0" Epoch of Position: 2000	V=13.82 SpT=O3 V((f*));z; E(B-V)=0.05; U=12.51; B=13.59; V=13.82; F1 160=1.030e-12; F1360=5.720e-1 3; F1700=3.650e-13	Reference Frame: ICRS
<p><i>Comments: SK183 : SMCSGS-FS-231, SK 183 Previous name : [SMCSGS-FS]-231 Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv SpT = O3 V((f*));z; Note: Some exptime deducted due to outside program(s). COS/G130M/c1096 : rn(PoWR-OB-new(PoWR_46000_4.00_m6.74_Z0.14.fits, smc-ob-i 46-40, Z=0.140 solar, Teff=46000, log_lum=5.78, log_g=4.00, log_mdot=-6.74) (extinction smcbar=0.050), flux1160 +- 2.0A flux=1e-12 Flam) Coordinate pedigree: Gaia DR2 Calculation performed 2021-10-25T00:54:31, v0.9</i></p> <p>-----</p> <p><i>tstatus; SK183; P/COS ready for internal review; S/ins not started; P/RS 18/02/22; S/xx DD/MM/YY tcheck; APT/SIMBAD target names: ; SK183 'SK 183' tcheck; Target info verification status?; ok tcheck; Coordinates & P.M. verified, epoch checked?; yes tcheck; Adopted SED compared to Observations?; yes ... one IUE SWP observation closely matches PoWR SED SK183_COS_G130M_c1096_sed.fits but STIS and two other SWP observations match each other but are about 20% lower than the model SED ... therefore we scale the original SED by 0.8 which we name SK183_new_c1096_scaleflux_0pt8_sed.fits and use that for confirming signal to noise ... The original model was used for BOT clearance (cos.sp.1682711). Category=STAR Description=[MAIN SEQUENCE O, OF] Extended=NO</i></p>					

Proposal 17295 - SK183-COS (4C) - ULLYSES Supplemental FUV Exposures for SMC O Stars - COS

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/Image (COS.ta.171 7345)	(4) SK183	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				10.0 Secs (10 Secs) [==>]	[1]
<i>Comments: Exposure time calculated for S/N=45 in case target is slightly fainter than expected.</i>									
2	G130M/1096 (COS.sp.171 7346)	(4) SK183	COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=16 2; FP-POS=ALL			434 Secs (1736 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
<p><i>Comments: rn(PoWR-OB-new(PoWR_46000_4.00_m6.74_Z0.14.fits, smc-ob-i 46-40, Z=0.140 solar, Teff=46000, log_lum=5.78, log_g=4.00, log_mdodot=-6.74) (extinction smcbar=0.050), flux1160 +- 2.0A flux=1e-12 Flam); cos.fuv.g130m.c1096.psa.mjd#59670; fp-pos=None, segment=None)</i></p> <p><i>From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv</i></p> <p><i>Spectral type: O3 V((f*))z</i></p> <p><i>SED = SK183_COS_G130M_c1096_sed.fits</i></p> <p><i>For exptime=1708.8 s, spectral region:</i></p> <p><i>1080.0 +- 0.5 A achieves SNR=20.0/resel</i></p> <p><i>global countrate (brightest segment): 10975.8 cts/s/segment</i></p> <p><i>brightest pixel: 0.208 cts/s/pix at 1225.5 A</i></p> <p><i>Calculation performed 2021-10-25T00:54:37, v0.9</i></p>									

