Proposal 16093 (STScI Edit Number: 1, Created: Wednesday, September 22, 2021 at 10:00:30 AM Eastern Standard Time) - Overview



16093 - ULLYSES LMC Early O/WN Stars - COS

Cycle: 27, Proposal Category: GO/DD (Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

V 151	10				
Visit	Targets used in Visit	Configurations used in Visit	Orbits Used		OP Current with Visit?
1C	(1) LMCE055-1	COS/FUV	3	22-Sep-2021 11:00:23.0	yes
AC	(1) LMCE055-1	COS/FUV	3	22-Sep-2021 11:00:25.0	yes
FC	(1) LMCE055-1	COS/FUV	3	22-Sep-2021 11:00:26.0	yes
2C	(2) VFTS-482	COS/FUV	2	22-Sep-2021 11:00:27.0	yes
3C	(3) W61-28-5	COS/FUV	3	22-Sep-2021 11:00:29.0	yes

14 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

Proposal 16093 (STScl Edit Number: 1, Created: Wednesday, September 22, 2021 at 10:00:30 AM Eastern Standard Time) - Overview 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/ULYSES.pdf.

	Proposal 16093, LMCE055-1-COS (1C), failed	Wed Sep 22 15:00:30 GMT 2021
	Diagnostic Status: No Diagnostics	
	Scientific Instruments: COS/FUV	
	Special Requirements: SCHED 100%; AFTER 01-MAY-2021:00:00; ON HOLD	
Visit	Comments: vstatus; 1C; LMCE055-1; P/COS approved for submission; P/AF 10/08/20 ; intrev: complete; P/CP 05/10/20 vcheck; Enter targ name & Inst. & Resp. Sci.; LMCE055-1; COS ; AF vcheck; FTC numbers entered in APT? Completed vcheck; Any screening violations?; None vcheck; S/N ETC calcs done & documented?; Yes vcheck; Field images checked & saved?; Yes - LMCE055-1_DSS.png and LMCE055-1_2MASS.png vcheck; Field images checked & saved?; Yes - LMCE055-1_DSS.png and LMCE055-1_2MASS.png vcheck; Fossible ACQ or Sci spoilers?; None vcheck; Fossible ACQ or Sci spoilers?; None vcheck; Field BOT clear?; Yes - 3 safe, 0 unknown vcheck; Visual BOT check for stars not in catalog?; Completed vcheck; Orbit packing finalized?; 3 orbits vcheck; Orbit packing finalized?; Done vcheck; Verify visit grouping correct; Not applicable vcheck; Is visit ready for int. review?; Yes Allocated COS orbits = 3 On Hold Comments: On Hold until the end of the proprietary period for GO-16299 COS G140L/800 observations of LMCe055-1. The GO-16299 observations executed on October the proprietary period ends on April 4, 2021. To allow a brief period to check the flux levels used to plan the ULLYSES observations, an AFTER = 01-MAY-2021 constraint has also	

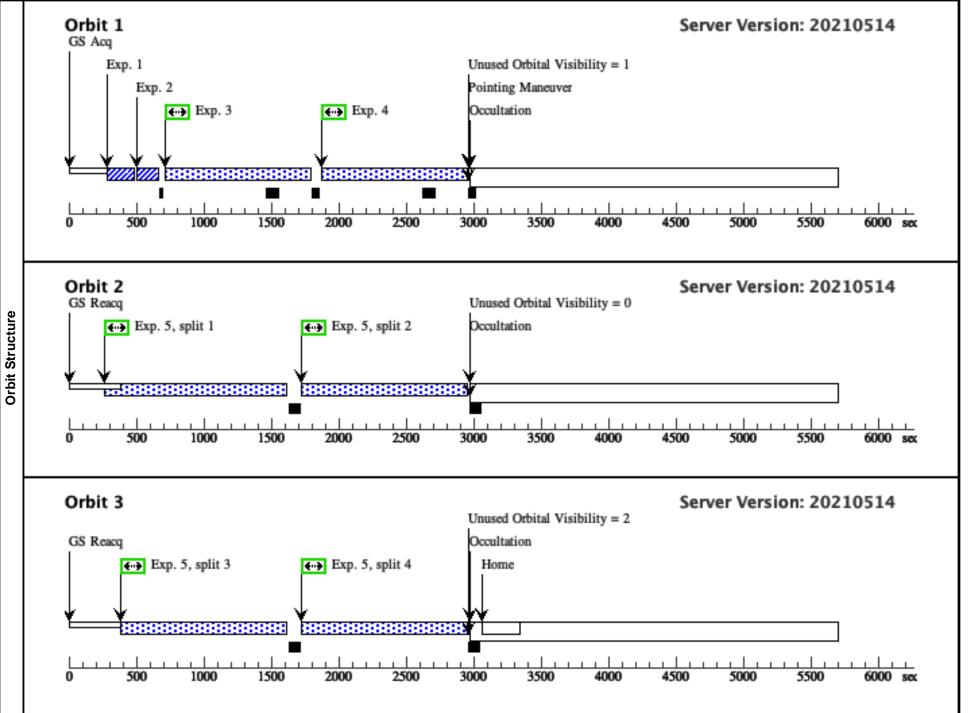
(1) LACE053-1 RA: 04 56 48.8107 (74.2034029d) V=16.15 Reference Frame: ICRS Alt Name2: MNR0215: Dec: -69 64 0.61 (-69 61128d) SpT=WN4045 (EB-V)=0.18; V LinkCE053-1 IMC0535-1; IMC055-1; IMC055-	#	Name	Target Coordinates	ES LMC Early O/VVN Stars - COS Targ. Coord. Corrections	Fluxes	Miscellaneous
Status: LMCE055-1 Equinox: J2000 =16.15. B = 16.05 B = 16.05 Comment:: LMC2055-1 JE Intro Control (Control): LMC2055-1 JE Intro Control:: LMC2055-1 JE JE Intro Control:: LMC2055-1 JE JE JE COSSGIGSMC1011:: Intro CHCEN-Winnode1-9, Z-0008, Tef=300000, Johnson V mag=16.150 vegamag) COSSGIGSMC1932:: Intro CHCEN-Winnode1-9, Z-0008, Tef=300000, Johnson V mag=16.150 vegamag) COSSGIGSMC1932:: Intro CHCEN-Winnode1-9, Z-0008, Tef=300000, Johnson V mag=16.150 vegamag) COSSGIGSMC1932:: Intro CHCEN-Winnode1-9, Z-0008, Tef=300000, Johnson V mag=16.150 vegamag) Corosting MMC1925:: ::::::::::::::::::::::::::::::::::::	(1)	LMCE055-1	RA: 04 56 48.8167 (74.2034029d)		V=16.15	Reference Frame: ICRS
Al Nume2: OGLE1.MC: B=16.05 BCL3354 Comment: LMC2055.1; LMCe055.1; LMCe055.1 Previous num: 2.MSUF630 mpuLMC.all.do1 fixed ser. NewCoords.pids.csv SMMAD internet: LMC2055.1; LMCe055.1; LMC2055.1 SMMAD internet: LMC2055.1; LMC2055.1; LMC2055.1 SMMAD internet: LMC2055.1; LMC205.1 SMMAD internet: LMC205.1; LMC205.1 COSGG150M(2101) : rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000), johnson V mag=16.150 vegamag) COSGG150M(2101) : rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000), johnson V mag=16.150 vegamag) STISE210M(2105) : rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000), johnson V mag=16.150 vegamag) STISE210M(2107) : rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000), johnson V mag=16.150 vegamag) STISE210M(2107) : rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000), johnson V mag=16.150 vegamag) STISE210M(2107) : rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000), johnson V mag=16.150 vegamag) Coordinates & P.M. apdated1': Pac-0003, Indiff=80000, johnson V mag=16.150 vegamag) Coordinates & P.M. apdated1': Sec-Gaia DR2 2015.5 coords - Mag Tcff=80000, johnson V mag=16.150 vegamag) STISE210M(2179): rmC(MFGEN-WMmodel=9, Z=0.008, Tcff=-80000, johnson V mag=16.150 vegamag) Coordinates &			Dec: -69 36 40.61 (-69.61128d)			3-V)=0.18; V
FECL 3548 Comments: IMCe055-1: IMCe055-1 Previous name : LMCe055-1: IMCe055-1: Imps://imbadu.strasbg.fr/simbadu/strasbg.fr/si			Equinox: J2000			
Previous name : LMCc005-11 Input file: LMC 2020Feb20Dimput LMC_all_dol_fixed_wr. New Coords_pids.csv SIMBAD link (IMM2015) LMCc055-11: https://simbad.w-strakbg/frambad/sim-dil/lent=[MNM2015]+LMCc055-1 & submit+id SpT = WN404 COS GF J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) COS GF J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) COS GF J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) COS GF J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) COS GF J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) COS GF J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) STISE-140M: CIAS : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) STISE J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) STISE J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) STISE J30M: CION : mCCMFGEN-WNmodel=9, Z=0008, Tef=80000), johnson V mag=16, 150 vegannag) Cacluation performed 2020-02-47118:09:14, v0.4 Cacluation performed 2020-02-4718:09:14, v0.4 Cacluation perform			-		B=16.05	
Adopted SED: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/LMCE055-1/LMCE055-1_adopted_sed.fits Of course, extrapolating the UV spectrum from optical photometry alone entails risks. Even so, the anticipated flux levels do not appear to pose any health & safety risks for the COS detectors. Category=EXT-STAR Description=[WOLF RAYET - WN]	Previous Input file. SIMBAD SpT = WI COS/G13 COS/G13 COS/G16 COS/G18 STIS/E14 STIS/E23 Coordina Calculati 	ts: LMCE055-1 : LMCe055-1 name : LMCe055-1 : LMC_2020Feb20/input/LM link ([MNM2015] LMCe055 N4/04 30M/c1096 : rn(CMFGEN-V 30M/c1091 : rn(CMFGEN-V 35M/c1921 : rn(CMFGEN-V 35M/c1953 : rn(CMFGEN-V 35M/c1953 : rn(CMFGEN-V 40M/c1425 : rn(CMFGEN-W 40M/c1978 : rn(CMFGEN-W 40M/c1978 : rn(CMFGEN-V 40M/c1978 : rn(CMFGEN-V 40M/c2707 : rn(CMFGEN-V 40M/	$IC_all_dol_fixed_wr_NewCoords_pia-1): https://simbad.u-strasbg.fr/simbad.u-strasbg.fr/simbad.vistasbg.fr/s$	ad/sim-id?Ident=[MNM2015]+LMCe055-1&submit=s johnson V mag=16.150 vegamag) johnson V mag=16.150 vegamag) johnson V mag=16.150 vegamag) johnson V mag=16.150 vegamag) johnson V mag=16.150 vegamag) ohnson V mag=16.150 vegamag) ohnson V mag=16.150 vegamag) ohnson V mag=16.150 vegamag) ohnson V mag=16.150 vegamag) AF 15/09/20; S/xx DD/MM/YY ECL-3548, GAIA DR2 4655168748370602880 SpType, which comes from 2017ApJ837122M set to 0 tars whose spectra are characterized by the emission-i e a detached or semi-detached member of an eclipsing because the system is very under-luminous and its light p may be the product of binary evolution, in which case neteresting test case for this hypothesis since it is known WN star. This interpretation is bolstered by the hybrid ut parameters, model atmospheres computed with CM. 75T), though (a) the flux of the "stripped" core must " model. For a comparison, see 55-1_stripped_vs_wn4.pdf dopted. This model does not account for the H and He he dominant source of UV light from the binary system ff = 70.795 kK, log g = 4.57, and a (comparatively sm alue was adjusted to improve modestly the fit with the of MCE055-1/LMCE055-1_adopted_sed_vs_UBV.png MCE055-1/LMCE055-1_adopted_sed_fits	line spectrum of a WN3 or V al be considered to be a simp binary system with a period t curve does not exhibit the e the WN spectrum comes fro to be a member of a binary id appearance of the spectru FGEN for "stripped" stars (be increased by an order of ell absorption features, which all mass-loss rate of logMd available UBV photometry, of	ble composite arising from a WR+O binary system. I of 2.159 days. Even so, Massey et al. ellipsoidal variations that are expected. om the very hot stellar core that remains after it is stripped y system. Alternately, these stars may represent a "missing m, which evidently results from mass-loss rates that are Gotberg et al. 2018A&A615A78G) are very similar in magnitude or more to match the flux from the WN4 ch are not as much of a concern in terms of detector health from the PoWR lmc-h40 grid (with "enhanced" hydrogen lot = -6.89 Msun/year. The model flux has been and is consistent with the value quoted by Massey et al.

Extended=NO

#	Label (ETC Run)	Target	_	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/PEAK	(1) LMCE05	5-1	COS/FUV, ACQ/PEAKXD, PSA	A G130M	CENTER=FLUX-W			1.1 Secs (1.1 Secs)	
	XD (COS.sa.146				1291 A	T;			[==>]	
	(COD.3a.140 0685)					NUM-POS=3;				[1]
						STEP-SIZE=1.3;				1-1
				6.89_Z0.50_lmcavg_ebmv_0.19_sec 27_mc/16093/LMCE055-1/LMCE(SEGMENT=BOTH				
				03 s per dwell point. Rounded up to						
BO	T: 3 safe, 0 unk	nown								
2	ACQ/PEAK		5-1	COS/FUV, ACQ/PEAKD, PSA	G130M	CENTER=FLUX-W			1.1 Secs (1.1 Secs)	
	D	. ,			1291 A	T-FLR;			[==>]	
	(COS.sa.146 0685)					NUM-POS=5;				
	,					STEP-SIZE=0.9;				[1]
						SEGMENT=BOTH				
				6.89_Z0.50_lmcavg_ebmv_0.19_sec c27_mc/16093/LMCE055-1/LMCE0		ts				
ΕT	C estimates an o	exposure time	of 1.05	03 s per dwell point. Rounded up t	o 1.1 s per dwell poin	nt.				
BO	T: 5 safe, 0 unk	nown							1	
3	G130M/129 1-3	(1) LMCE05	5-1	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=71			1030 Secs (1030 Secs)	_
	(COS.sp.146 0677)				1291 A	6; FP-POS=3			[==>]	[1]
				6.89_Z0.50_lmcavg_ebmv_0.19_sec 27_mc/16093/LMCE055-1/LMCE0		ts				
Ba.	seline exposure	time rounded	to 2720	-/- 0.5 A in 2,718.1280 s s (1360 s per FP-POS)						
1	ountrate (total, prightest pixel: (BUFFER-TIME	0.105 cts/s at	1216.27	(2193.7, Ī269.4) cts/s A 5 s						
Fir e te	al exptime decr reduce the nor	eased during 1inal exposure	orbit pa e time b	cking to 1030 s per FP-POS; 2060 y no more than 80%, the trade-off i.	s total. This reductio s acceptable in this co	on amounts to 76% of the asse. Estimated SNR at 115	exposure time requi 50 A = 26.1 per rese	red to achieve the ta el (COS.sp.1460691)	rget value of SNR=30. Although it violate.	s the manda
BO	T: 3 safe, 0 unk	nown			-					
4	G130M/129	(1) LMCE05	5-1	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=71			1030 Secs (1030 Secs)	
	1-4 (COS.sp.146				1291 A	6.0;			[==>]	
	0677)					FP-POS=4				[1]
Co ~	mments: SED P /box/ullyses_tec	oWR_70795_ h/ullyses_pro	4.57_m posals/o	6.89_Z0.50_lmcavg_ebmv_0.19_sec 27_mc/16093/LMCE055-1/LMCE0	l.fits)55-1_adopted_sed.fi	ts				
Ba.	seline exposure	time rounded brightest seg 0.105 cts/s at	to 2720 nent) = 1216.2 1	F/- 0.5 A in 2,718.1280 s s (1360 s per FP-POS) (2193.7, 1269.4) cts/s A s s						
Fir e to	al exptime decr reduce the nor	eased during 1inal exposure	orbit pa e time b	cking to 1030 s per FP-POS; 2060 y no more than 80%, the trade-off i.	s total. This reductions acceptable in this co	on amounts to 76% of the ase. Estimated SNR at 115	exposure time requi 50 A = 26.1 per rese	red to achieve the ta el (COS.sp.1460691)	rget value of SNR=30. Although it violate.	s the manda
BO	T: 3 safe, 0 unk	nown								

5	G160M/161 (1) LMCE055-1 1 (COS.sp.146 0681)	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=16 80.0; FP-POS=ALL	1175 Secs (4700 Secs) [==>(Split 1)] [==>(Split 2)]	[2]				
					[==>(Split 3)] [==>(Split 4)]	[3]				
Ε	Comments: SED PoWR_70795_4.57_m6.89_Z0.50_lmcavg_ebmv_0.19_sed.fits ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/LMCE055-1/LMCE055-1_adopted_sed.fits ETC estimates SNR = 30/resel at 1590 +/- 0.5 A in 5,128.2952 s									
	aseline exposure time rounded to 512 countrate (total, brightest segment) = brightest pixel: 0.011 cts/s at 1421.6 BUFFER-TIME = 2/3 * 2521 s = 16 inal exptime decreased during orbit p	= (935.6, 725.8) cts/s A 80 s	otal. Estimated SN	R at 1590 A = 28.7 per resel (COS.sp.1460690)						
В	OT: 3 safe, 0 unknown									

Proposal 16093 - LMCE055-1-COS (1C) - ULLYSES LMC Early O/WN Stars - COS



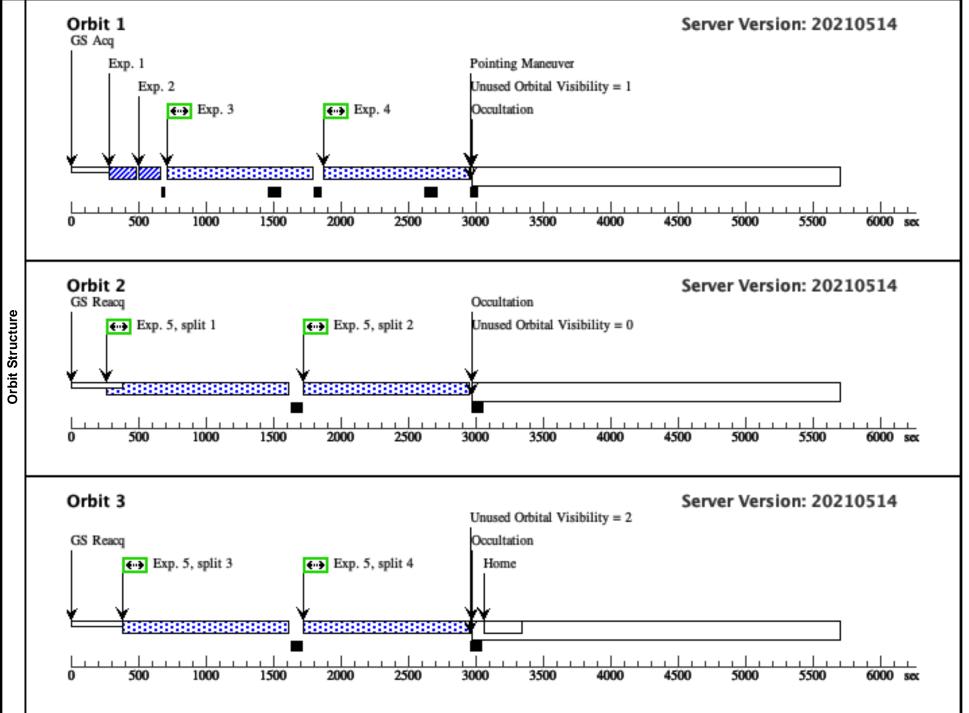
	Proposal 16093, LMCE055-1-COS (AC), completed	Wed Sep 22 15:00:30 GMT 2021
	Diagnostic Status: No Diagnostics	
	Scientific Instruments: COS/FUV	
	Special Requirements: SCHED 100%; AFTER 01-MAY-2021:00:00:00; ON HOLD	
Visit	Comments: vstatus; 1C; LMCE055-1; P/COS approved for submission; P/AF 10/08/20 ; intrev: complete; P/CP 05/10/20 vcheck; Enter targ name & Inst. & Resp. Sci.; LMCE055-1; COS ; AF vcheck; Any screening violations?; None vcheck; Any screening violations?; None vcheck; S/N ETC calcs done & documented?; Yes vcheck; Field images checked & saved?; Yes - LMCE055-1_DSS.png and LMCE055-1_2MASS.png vcheck; Field images checked & saved?; Yes - LMCE055-1_DSS.png and LMCE055-1_2MASS.png vcheck; Fossible ACQ or Sci spoilers?; None vcheck; Fossible ACQ or Sci spoilers?; None vcheck; Field BOT clear?; Yes - 3 safe, 0 unknown vcheck; Visual BOT check for stars not in catalog?; Completed vcheck; Orbit packing finalized?; 3 orbits vcheck; Orbit packing finalized?; Done vcheck; Verify visit grouping correct; Not applicable vcheck; Verify visit grouping correct; Not applicable vcheck; Is visit ready for int. review?; Yes Allocated COS orbits = 3 On Hold Comments: On Hold until the end of the proprietary period for GO-16299 COS G140L/800 observations of LMCe055-1. The GO-16299 observations executed on October the proprietary period ends on April 4, 2021. To allow a brief period to check the flux levels used to plan the ULLYSES observations, an AFTER = 01-MAY-2021 constraint has also	

	#	Name	Target Coordinates	LIVIC EARLY O/VVIN STARS - COS Targ. Coord. Corrections	Fluxes	Miscellaneous	
	(1)	LMCE055-1	RA: 04 56 48.8167 (74.2034029d)		V=16.15	Reference Frame: ICRS	
		Alt Name1: MNM2015- LMCE055-1 Alt Name2: OGLE-LMC- ECL-3548	Dec: -69 36 40.61 (-69.61128d) Equinox: J2000		SpT=WN4/O4; E(B-V)=0.18; V =16.15, B=16.05		
Fixed Target	Previous na Input file: SIMBAD lin SpT = WN4 COS/G1301 COS/G1301 COS/G1301 COS/G1851 STIS/E14010 STIS/E2301 STIS/E2301 Coordinate Calculation STIS/E2301 Coordinate Calculation STIS/E2301 Coordinate Calculation STIS/E2301 Coordinate Calculation STIS/E2301 Coordinate Calculation STIS/E2301 Coordinate Calculation STIS/E2301 Coordinate Calculation STIS/E2301 STIS/E2301 Coordinate Calculation STIS/E2301 STIS/E3301 S	nk ([MNM2015] LMCe055- //O4 M/c1096 : rn(CMFGEN-W M/c1291 : rn(CMFGEN-W M/c1921 : rn(CMFGEN-W M/c1921 : rn(CMFGEN-W M/c1933 : rn(CMFGEN-W M/c1978 : rn(CMFGEN-W M/c1978 : rn(CMFGEN-W M/c1978 : rn(CMFGEN-W M/c2707 : rn(CMFGEN-W M/c270 : rn(CMFGEN-W M/c270 : rn(CMFGEN-W M/c270 : rn(CMFGE	IC_all_do1_fixed_wr_NewCoords_pids.csv -1): https://simbad.u-strasbg.fr/simbad/sim-i VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson N(model=9, Z=0.008, Teff=80000, johnson N(model=9, Z=0.008, Teff=8000, johnson N(model=9, Z=0, Teff=8000, johnson N(model=9, Z=0.008, Teff=8000, johnson N(model=9, Z=0, teff=800, johnson N(model=9, Z=0, teff=8000, johnson N(model=9, Z=0, teff=80	n V mag=16.150 vegamag) n V mag=16.150 vegamag) n V mag=16.150 vegamag) n V mag=16.150 vegamag) n V mag=16.150 vegamag) V mag=16.150 vegamag) V mag=16.150 vegamag) V mag=16.150 vegamag) V mag=16.150 vegamag) Op/20; S/xx DD/MM/YY 548, GAIA DR2 4655168748370602880 , which comes from 2017ApJ837122M O hose spectra are characterized by the emission-line s B or O4 dwarf, so the spectrum cannot in general be tached or semi-detached member of an eclipsing bina e the system is very under-luminous and its light curv the the product of binary evolution, in which case the ing test case for this hypothesis since it is known to b ar. This interpretation is bolstered by the hybrid ap umeters, model atmospheres computed with CMFGE. though (a) the flux of the "stripped" core must be in el. For a comparison, see tripped_vs_wn4.pdf This model does not account for the H and HeII ab inant source of UV light from the binary system. The 1.795 kK, log g = 4.57, and a (comparatively small) r ts adjusted to improve modestly the fit with the avail 155-1/LMCE055-1_adopted_sed_vs_UBV.png	spectrum of a WN3 or WN4 star and considered to be a simple composit ry system with a period of 2.159 da we does not exhibit the ellipsoidal v WN spectrum comes from the very e a member of a binary system. Alt pearance of the spectrum, which ev N for "stripped" stars (Gotberg et a ccreased by an order of magnitude of ccreased by an order of magnitude of pesorption features, which are not as e adopted model comes from the Po nass-loss rate of logMdot = -6.89 M able UBV photometry, and is consi	te arising from a WR+O binary system. tys. Even so, Massey et al. aritations that are expected. hot stellar core that remains after it is stripped ernately, these stars may represent a "missing idently results from mass-loss rates that are al. 2018A&A615A78G) are very similar in or more to match the flux from the WN4 is much of a concern in terms of detector health WR Imc-h40 grid (with "enhanced" hydrogen Asun/year. The model flux has been stent with the value quoted by Massey et al.	

10

	#	Label (ETC Run)	Target		Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/PEAK	(1) LMCH	E055-1	COS/FUV, ACQ/PEAKX	KD, PSA	G130M	CENTER=FLUX-W			1.1 Secs (1.1 Secs)	
		XD (COS.sa.146					1291 A	T;			[==>]	
		0685)						NUM-POS=3;				[1]
								STEP-SIZE=1.3; SEGMENT=BOTH				
	Com ~/l	uments: SED F box/ullyses_te	oWR_7079 ch/ullyses_p	5_4.57_m proposals/	6.89_Z0.50_lmcavg_ebmv_0 c27_mc/16093/LMCE055-1/).19_sed.fit. /LMCE055-	s ·1_adopted_sed.fits	SLOWENT-DOTT				
	ETC	Cestimates an	exposure tii	me of 1.05	503 s per dwell point. Round	led up to 1.	1 s per dwell point.					
	BOT	T: 3 safe, 0 unl	nown									
	2	ACQ/PEAK	(1) LMCH	E055-1	COS/FUV, ACQ/PEAKD	D, PSA	G130M	CENTER=FLUX-W			1.1 Secs (1.1 Secs)	
		D (COS.sa.146					1291 A	T-FLR;			[==>]	
		0685)						NUM-POS=5;				[1]
								STEP-SIZE=0.9;				2-3
	C	CED I	- WD 7070	E 1 E7	6 90 70 50 1	$10 \rightarrow 10$	_	SEGMENT=BOTH				
	Com ~/l	box/ullyses_te	ch/ullyses_p	oroposals/	6.89_Z0.50_lmcavg_ebmv_0 c27_mc/16093/LMCE055-1/	LMCE055-	s ·1_adopted_sed.fits					
	ETC	Cestimates an	exposure tii	me of 1.05	503 s per dwell point. Round	led up to 1.	1 s per dwell point.					
	BOT	T: 5 safe, 0 unk	nown									
s	3	G130M/129	(1) LMCE	E055-1	COS/FUV, TIME-TAG, I	PSA	G130M	BUFFER-TIME=71			1030 Secs (1030 Secs)	
are.		1-3 (COS.sp.146					1291 A	6;			[==>]	[1]
SC		0677) ¹						FP-POS=3				[1]
Exposures					6.89_Z0.50_lmcavg_ebmv_0 c27_mc/16093/LMCE055-1/							
_	ETC	Cestimates SN	R = 30/rese	l at 1150 -	+/- 0.5 A in 2,718.1280 s							
	Base	eline exposure	time round	ed to 2720) s (1360 s per FP-POS)							
	br	rightest pixel: UFFER-TIME	0.105 cts/s	at 1216.2.								
	Fina	al exptime deci	reased duri	ng arhit n	ucking to 1030 s per FP-POS	5· 2060 s to	tal This reduction	amounts to 76% of the	exposure time require	ed to achieve the targe	value of SNR=30. Although it violates	the mandat
					y no more than 80%, the tra						value of strik=50. Minough it violates	ine manaai
	вот	T: 3 safe, 0 unk	nown									
	4	G130M/129		E055-1	COS/FUV, TIME-TAG, I	PSA	G130M	BUFFER-TIME=71			1030 Secs (1030 Secs)	
		1-4 (COS.sp.146					1291 A	6.0;			[==>]	
		(CO3.sp.140 0677)						FP-POS=4				[1]
					6.89_Z0.50_lmcavg_ebmv_0 c27_mc/16093/LMCE055-1/							·
	Base cc bi	eline exposure	time round brightest s 0.105 cts/s	ed to 2720 egment) = at 1216.2								
	Fina e to	ıl exptime deci reduce the noi	reased durii ninal expos	ng orbit pa sure time b	acking to 1030 s per FP-POS by no more than 80%, the trad	5; 2060 s to de-off is ac	tal. This reduction of ceptable in this case	amounts to 76% of the c Estimated SNR at 115	exposure time require 50 A = 26.1 per resel	ed to achieve the target (COS.sp.1460691)	value of SNR=30. Although it violates	the mandat
	BOT	T: 3 safe, 0 unk	nown									

5	G160M/161 (1) LMCE055-1	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=16	1175 Secs (4700 Secs)	
	l (COS.sp.146		1611 A	80.0;	[==>(Split 1)]	[2]
	0681)			FP-POS=ALL	[==>(Split 2)]	[2]
					[==>(Split 3)]	[2]
					[==>(Split 4)]	[3]
1	~/box/ullyses_tech/ullyses_proposals TC estimates SNR = 30/resel at 1590 aseline exposure time rounded to 512 countrate (total, brightest segment) brightest pixel: 0.011 cts/s at 1421. BUFFER-TIME = 2/3 * 2521 s = 10	28 s (1282 s per FP-POS) = (935.6, 725.8) cts/s 6 A 680 s	5-1_adopted_sed.fits	s R at 1590 A = 28.7 per resel (COS.sp.1460690)		



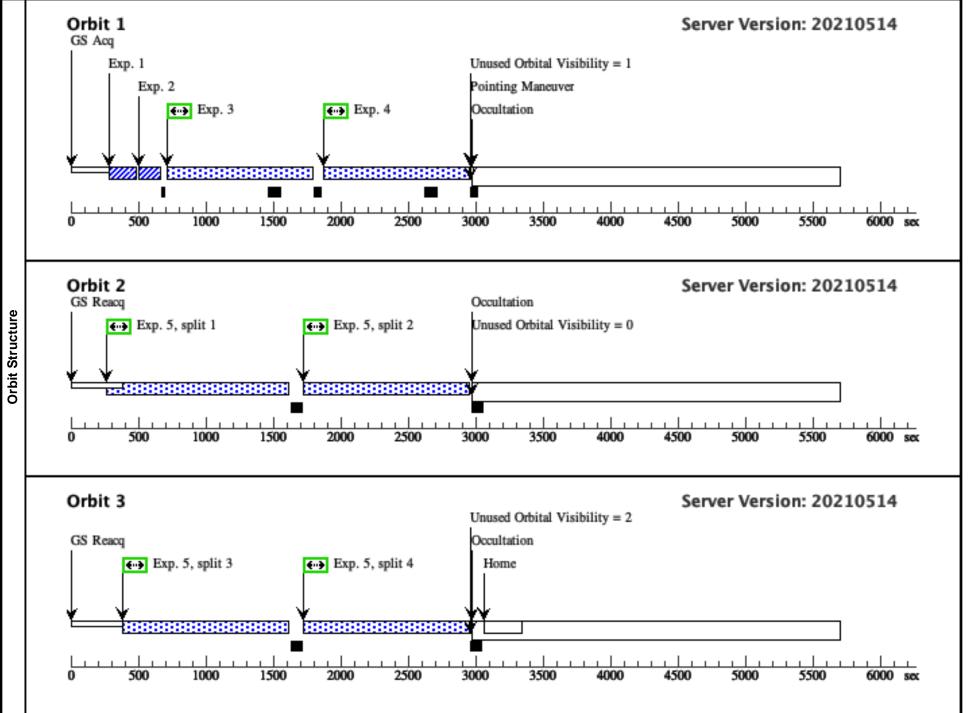
	Proposal 16093, LMCE055-1-COS (FC)	Wed Sep 22 15:00:30 GMT 2021
	Diagnostic Status: No Diagnostics	
	Scientific Instruments: COS/FUV	
	Special Requirements: SCHED 100%; AFTER 01-MAY-2021:00:00:00; ON HOLD	
Visit	Comments: vstatus; 1C; LMCE055-1; P/COS approved for submission; P/AF 10/08/20; intrev: complete; P/CP 05/10/20 vcheck; Enter targ name & Inst. & Resp. Sci.; LMCE055-1; COS; AF vcheck; ETC numbers entered in APT?; Completed vcheck; Any screening violations?; None vcheck; S/N ETC calcs done & documented?; Yes vcheck; Field images checked & saved?; Yes - LMCE055-1_DSS.png and LMCE055-1_2MASS.png vcheck; Field images checked & saved?; Yes - LMCE055-1_DSS.png and LMCE055-1_2MASS.png vcheck; Possible ACQ or Sci spoilers?; None vcheck; Field BOT clear?; Yes - 3 safe, 0 unknown vcheck; Field BOT clear?; Yes - 3 safe, 0 unknown vcheck; Orbit packing finalized?; 3 orbits vcheck; Orbit packing finalized?; Done vcheck; Verify visit grouping correct; Not applicable vcheck; Verify visit grouping correct; Not applicable vcheck; Verify visit grouping correct; Not applicable vcheck; Is visit ready for int. review?; Yes Allocated COS orbits = 3 On Hold Comments: On Hold until the end of the proprietary period for GO-16299 COS G140L/800 observations of LMCe055-1. The GO-16299 observations executed on October 3 the proprietary period ends on April 4, 2021. To allow a brief period to check the flux levels used to plan the ULLYSES observations, an AFTER = 01-MAY-2021 constraint has also	3, 2020. Presuming their success, been set.

	#	Name	Target Coordinates	LIVIC EARLY O/VVIN STARS - COS Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	LMCE055-1	RA: 04 56 48.8167 (74.2034029d)		V=16.15	Reference Frame: ICRS
		Alt Name1: MNM2015- LMCE055-1	Dec: -69 36 40.61 (-69.61128d) Equinox: J2000		SpT=WN4/O4; E(B-V)=0.18; V =16.15,	7
		Alt Name2: OGLE-LMC- ECL-3548			B=16.05	
Fixed Targets	Previous na Input file: I SIMBAD lin SpT = WN4 COS/G1301 COS/G1301 COS/G1301 COS/G1851 COS/G1851 STIS/E1400 STIS/E2300 Coordinate Calculation 	LMCE055-1 : LMCe055-1, tme : LMCe055-1 LMC_2020Feb20/input/LM the ([MNM2015] LMCe055- /04 M/c1096 : rn(CMFGEN-W M/c1091 : rn(CMFGEN-W M/c1921 : rn(CMFGEN-W M/c1923 : rn(CMFGEN-W M/c1938 : rn(CMFGEN-W M/c1978 : rn(CMFGEN	C_all_do1_fixed_wr_NewCoords_pids.csv -1): https://simbad.u-strasbg.fr/simbad/sim-i VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson VN(model=9, Z=0.008, Teff=80000), johnson N(model=9, Z=0.008, Teff=80000), johnson S(model=9, Z=0.008, Teff=80000), johnson N(model=9, Z=0.008, Teff=80000), johnson N(model=9, Z=0.008, Teff=80000), johnson N(model=9, Z=0.008, Teff=80000), johnson S(model=9, Z=0.008, Teff=80000), johnson N(model=9, Z=0.008, Teff=80000, johnson	n V mag=16.150 vegamag) n V mag=16.150 vegamag) n V mag=16.150 vegamag) n V mag=16.150 vegamag) n V mag=16.150 vegamag) V mag=16.150 vegamag) V mag=16.150 vegamag) V mag=16.150 vegamag) V mag=16.150 vegamag) 09/20; S/xx DD/MM/YY 548, GAIA DR2 4655168748370602880 , which comes from 2017ApJ837122M	pectrum of a WN3 or WN4 star and considered to be a simple composit, y system with a period of 2.159 day	e arising from a WR+O binary system. ys. Even so, Massey et al.
	of its outer of link" in the more akin to appearance module; and ~/box/ully For present	envelope during a Roche-lo normal evolutionary path to o O-stars and than the gene to models of WN4 stars cou d (b) the He II 1640 line is a yses_tech/ullyses_proposals	bb overflow event. LMCe055-1 is an interesti raversed by an O star as it becomes a WN sta eral WNE population. For similar input para mputed with POWR (2015A&A579A75T), about twice as strong in the "stripped" mode \$\langle c27_mc/16093/LMCE055-1/LMCE055-1_s. appropriate to a WN4 star has been adopted.	tripped_vs_wn4.pdf . This model does not account for the H and HeII ab	e a member of a binary system. Alte bearance of the spectrum, which even N for "stripped" stars (Gotberg et a creased by an order of magnitude of sorption features, which are not as	ernately, these stars may represent a "missing idently results from mass-loss rates that are l. 2018A&A615A78G) are very similar in or more to match the flux from the WN4 much of a concern in terms of detector health
	& safety as abundance extinguished (2017ApJ	the emission features. It al. of 0.40 by mass and metalli d by an LMC average extino 837122M) of E(B-V) = 0.1 lustrated: ~/box/ullyses_tec	so assumes that the WN4/O4 star is the domicity appropriate to the LMC) with Teff = 70. ction law with $E(B-V) = 0.19$. This value was 18.	inant source of UV light from the binary system. The .795 kK, log g = 4.57, and a (comparatively small) n is adjusted to improve modestly the fit with the availa !55-1/LMCE055-1_adopted_sed_vs_UBV.png	adopted model comes from the Po ass-loss rate of logMdot = -6.89 M	WR lmc-h40 grid (with "enhanced" hydrogen Isun/year. The model flux has been
	Category=1	EXT-STAR =[WOLF RAYET - WN]	um from optical photometry alone entails ris	sks. Even so, the anticipated flux levels do not appea	r to pose any health & safety risks	for the COS detectors.

15

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/PEAK	(1) LMCE055-1	COS/FUV, ACQ/PEAKXD, PSA	G130M	CENTER=FLUX-W			1.1 Secs (1.1 Secs)	
	XD (COS.sa.146			1291 A	T;			[==>]	
	0685)				NUM-POS=3;				[1]
					STEP-SIZE=1.3;				[1]
Ce	omments: SED F ~/box/ullyses_te	oWR_70795_4.57 ch/ullyses_proposi	7_m6.89_Z0.50_lmcavg_ebmv_0.19_sed.fi als/c27_mc/16093/LMCE055-1/LMCE053	ts 5-1_adopted_sed.fits	SEGMENT=BOTH				
E_{i}^{2}	TC estimates an	exposure time of	1.0503 s per dwell point. Rounded up to 1	.1 s per dwell point.					
Be	OT: 3 safe, 0 unl	nown							
2	· ·	(1) LMCE055-1	COS/FUV, ACQ/PEAKD, PSA	G130M	CENTER=FLUX-W			1.1 Secs (1.1 Secs)	
	D (COS.sa.146			1291 A	T-FLR;			[==>]	
	0685)				NUM-POS=5;				[1]
					STEP-SIZE=0.9;				[1]
					SEGMENT=BOTH				
Ce ·	omments: SED F ~/box/ullyses_te	oWR_70795_4.57 ch/ullyses_propos	7_m6.89_Z0.50_lmcavg_ebmv_0.19_sed.ft als/c27_mc/16093/LMCE055-1/LMCE053	ts 5-1_adopted_sed.fits	7				
E_{i}^{2}	TC estimates an	exposure time of	1.0503 s per dwell point. Rounded up to 1	.1 s per dwell point.					
Be	OT: 5 safe, 0 unl	nown							
n 3		(1) LMCE055-1	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=71			1030 Secs (1030 Secs)	
й =	1-3 (COS.sp.146			1291 A	6;			[==>]	[1]
	0677)				FP-POS=3				[1]
			'_m6.89_Z0.50_lmcavg_ebmv_0.19_sed.fi als/c27_mc/16093/LMCE055-1/LMCE055		1				
			50 +/- 0.5 A in 2,718.1280 s						
Ba	aseline exposure	time rounded to 2	$\begin{array}{l} 720 \ s \ (1360 \ s \ per \ FP-POS) \\ t) = (2193.7, \ 1269.4) \ cts/s \end{array}$						
	brightest pixel:	0.105 cts/s at 1210 $0 = 2/3 \times 1075 \text{ s} = 1000$	5.2 A						
			it packing to 1030 s per FP-POS; 2060 s t ne by no more than 80%, the trade-off is a					get value of SNR=30. Although it violates	the mandat
Be	OT: 3 safe, 0 unl	nown							
4		(1) LMCE055-1	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=71			1030 Secs (1030 Secs)	
	1-4 (COS.sp.146			1291 A	6.0;			[==>]	
	0677)				FP-POS=4				[1]
Ce	omments: SED F ~/box/ullyses_te	oWR_70795_4.57 ch/ullyses_propos	7_m6.89_Z0.50_lmcavg_ebmv_0.19_sed.fi als/c27_mc/16093/LMCE055-1/LMCE055	ts 5-1_adopted_sed.fits					
Ba	aseline exposure countrate (total brightest pixel:	time rounded to 2							
Fi e i	inal exptime deci to reduce the not	reased during orbi ninal exposure tin	it packing to 1030 s per FP-POS; 2060 s t te by no more than 80%, the trade-off is a	otal. This reduction cceptable in this cas	amounts to 76% of the see. Estimated SNR at 115	exposure time requir 50 A = 26.1 per reset	red to achieve the targ l (COS.sp.1460691)	get value of SNR=30. Although it violates	the mandat
Be	OT: 3 safe, 0 uni	nown							

5	G160M/161 (1) LMCE055-1	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=16	1175 Secs (4700 Secs)	
	l (COS.sp.146		1611 A	80.0;	[==>(Split 1)]	[2]
	0681)			FP-POS=ALL	[==>(Split 2)]	[2]
					[==>(Split 3)]	[2]
					[==>(Split 4)]	[3]
H H H	~/box/ullyses_tech/ullyses_proposals TC estimates SNR = 30/resel at 1590 aseline exposure time rounded to 512 countrate (total, brightest segment) brightest pixel: 0.011 cts/s at 1421.C BUFFER-TIME = 2/3 * 2521 s = 10	28 s (1282 s per FP-POS) = (935.6, 725.8) cts/s 6 A 680 s	5-1_adopted_sed.fits	s R at 1590 A = 28.7 per resel (COS.sp.1460690)		



			EINC Early O/WIN Stars - COS		
	Proposal 16093, VFTS-482-CO	S (2C), completed			Wed Sep 22 15:00:30 GMT 2021
	Diagnostic Status: No Diagnosti	cs			
	Scientific Instruments: COS/FUV				
	Special Requirements: SCHED 1	00%; ORIENT 120D TO 340 D			
Visit	vcheck; Enter targ name & Inst. o vcheck; ETC numbers entered in. vcheck; Any screening violations. vcheck; S/N ETC calcs done & do vcheck; Field images checked & s vcheck; Field images checked & s vcheck; Selected ACQ strategy?; vcheck; Possible ACQ or Sci spoi vcheck; Visual BOT clear?; Yes; s vcheck; Visual BOT check for sta	?; None cumented?; Completed caved?; Yes - VFTS-482_HTTP_f275w.png Dispersed 1291 lers?; No; see notes ee notes es not in catalog?; None; see notes 2 orbits - could not fit everything into 1 orb. Done ect; Not applicable	0/08/20 ; intrev: complete; P/CP 05/10/20 it without compromising SNR, so exp. times increa	sed by factors of (2, 2.3) for (G.	130M, G160M)
	# Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2) VFTS-482	RA: 05 38 40.2300 (84.6676250d)		V=12.85	Reference Frame: ICRS
	Alt Name1: MK-39	Dec: -69 05 59.76 (-69.09993d)		SpT=O2.5 If*/WN6;	
	Alt Name2: BAT99-	99 Equinox: J2000		40; U=12.12; B=12.9 ; F1160=2.20e-13; F -13; F1700=2.20e-13	1360=2.40e
Fixed Targets	SIMBAD link (CI* NGC 2070 MI SpT = 02.5 [f*/WN6 COS/G130M/c1096 : rn-max(W COS/G130M/c1291 : rn-max(W COS/G185M/c1921 : rn-max(W COS/G185M/c1921 : rn-max(W COS/G185M/c1935 : rn-max(W COS/G185M/c1986 : rn-max(W STIS/E140M/c1425 : rn-max(WN STIS/E230M/c2707 : rn-max(WN Coordinate pedigree: InputCatal Calculation performed 2020-02-2 tstatus; VFTS-482; P/COS appro tcheck; APT/SIMBAD target nam the cross-identification vFTS 482 tcheck; Target info verification st it has been replaced by (U, B, V) tcheck; Coordinates & P.M. upda tcheck; Adopted SED compared t Baseline fits were inadequate bec Hainich et al. (2014A&A565A to the existing STIS/G140L, STIS of the model from 15.3 Rsun to 19 the range determined from previo Baseline illustrated: ~/box/ullyss Adopted illustrated: ~/box/ullyss	M-Basic(03 I, Z=0.008, Teff=48978, log_lu, M-Basic(03 I, Z=0.008, Teff=48978, log_lu, M-Basic(03 I, Z=0.008, Teff=48978, log_lu, M-Basic(03 I, Z=0.008, Teff=48978, log_lu, M-Basic(03 I, Z=0.008, Teff=48978, log_lu, I-Basic(03 I, Z=0.008, Teff=48978, log_lu, I-Basic(03 I, I I-Basic(03 I, Z=0.008, Teff=48978, log_lu, I-Basic(03 I, I I-Basic(03 I, Z=0.008, Teff=48978, log_lu, I-Basic(03 I, I I-Basic(03 I, Z=0.008, Teff=48978, log_lu, I-Basic(16093/VF I-S=tech/ullyses_proposals/c27_mc/16093/VF	im-id?Ident=Cl*+NGC+2070+MEL+39&submit: m=6.16, log_g =3.88) (extinction $lmc30dor$ =0.380 m=6.16, log_g =3.88) (extinction $lmc30dor$ =0.380) m=6.16, log_g =3.88) (extinction $lmc30dor$ =0.380) n=6.16, log_g =3.880 (extinction $lmc30dor$ =0.380) n=6.16, log_g =3.880 (extinction log_g =3.80 n=7.80, log_g=3.80 (extinction $lmc30$), flux1160 +- 30.0A flux=2.2e-), flux1360 +- 30.0A flux=2.4e-), flux1700 +- 5.0A flux=2.2e-1), flux1700 +- 5.0A flux=2.2e-1), flux1700 +- 5.0A flux=2.2e-1 flux1700 +- 5.0A flux=2.2e-13 flux1700 +- 5.0A flux=2.2e-13 flux1700 +- 5.0A flux=2.2e-13 cause is SIMBAD confusing Mi was incorrect revious modeling efforts of Best Z0.50. Adjusted the reddening of 0.50, with flux increased by a far is degere of reddening is smalle	-13 Flam) 3 Flam) 3 Flam) 3 Flam) 13 Flam) 3 Flam) 3 Flam) 3 Flam)

Proposal 16093 - VFTS-482-COS (2C) - ULLYSES LMC Early O/WN Stars - COS Label (ETC Run) Target Config,Mode,Aperture Spectral Els. **Opt. Params.** Special Reqs. Exp. Time (Total)/[Actual Dur.] Orbit # Groups Exposures

1 ACQ/PEAK (2) VFTS-482	COS/FUV, ACQ/PEAKXD, PSA	G130M	CENTER=FLUX-W T;	0.3 Secs (0.3 Secs)	
1 ACQ/PEAK (2) VFTS-482 XD (COS.sa.145 4810)		1291 A	T; NUM-POS=3;	[==>]	
4810)			STEP-SIZE=1.3;		
			SEGMENT=BOTH		
					[1]

Comments: SED PoWR_42000_3.80_Z0.50_lmc30Dor_ebmv_0.33; includes an increase in model flux by a factor of 1.7 ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482_VFTS-482_adopted_sed.fits ETC estimates an exposure time of 0.2967 s per dwell point. Rounded up to 0.3 s per dwell point.

Notes on Bright Object Checking:

VFTS 482 is on the outskirts of the 30 Dor region. The BOT cannot identify any targets in the GSC II or Galex catalogs because the DSS and 2MASS images are saturated by the bright nebulosity. Instead, the capabili ties of the BOT have been reproduced by using the catalog and imaging products developed by the Hubble Tarantula Treasury Project (HTTP). See Sabbi et al. (2016ApJS..222...11S) and https://archive.stsci.edu/prep ds/30dor/ for details.

The HTTP catalog provides magnitudes in the VEGAMAG system for the WFC3 F275W filter, which is a more reliable estimator of the UV flux of an early-type star than the Johnson V-band. ETC calculations were r un for a range of m_f275w values to probe the count-rate limits for the COS G130M/1291 and G160M/1611 configurations. A model spectrum from the PoWR grid that corresponds to an unreddened O5 V star in the LMC - (Teff, logg, Z/Zsun) = (41 kK, 4.00, 0.50) - was used for these calculation. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.fits

The results of these calculations are summarized in the spreadsheet:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/Limiting_F275w_magnitudes_for_O5V.xlsx

They show that

1. An unreddened O5 V star with VEGAMAG m_f275w < 11.9 can be safely observed through the PSA with COS G130M/1291 and G160M/1611.

- 2. By assuming a throughput of 0.6% relative to the PSA (extrapolated from Fig. 3.2 in the COS IHB), the spectroscopic limit for the BOA is m_f275w < 6.4.
- 3. Since the extinction in the 30 Dor region is actually quite significant, these limits are very conservative.

For subsequent bright-object checking:

- Any star with m f275w > 11.9 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the PSA in the (G130M/1291, G160M/1611) configurations.
- Any star with $m_f 2752 > 6.4$ in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the BOA in the (G130M/1291, G160M/1611) configurations.
- Stars in the search region for the PSA that are brighter than $m_{f}275w = 11.9$ require explicit ETC calculations to verify their status.

FIRST:

Consider the circular region within 8 arcsec of the center of the PSA.

a) There are 24 sources in the HTTP catalog with m_f275w < 15.0, including VFTS 482.

See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.png

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.csv

Note that the numbers indicated on the image refer to the row in the csv table. There is no "1" because the first row in the csv file contains column names.

The brightest contaminant within the PSA is Star 18 = SABBI 053840.331-690559.65, which is 0.66 arcsec from VFTS 482. The magnitude difference at 2750 Angstroms implies that Star 18 has \sim 4% of the measured fl us of VFTS 482. If Star 18 were an unreddened OS V star - WHICH IT IS NOTI - it would contribute to the G130M/1291 count rate as follows:

Count	t Kate Segment A	Count Rate Segment B	EIC Calculation
Star 18	522.944	993.490	COS.sp.1458280
VFTS 482	3466.719	3639.238	COS.sp.1454809
TOTAL	3989.663	4632.728	*

These count rates are well below the limit of 15000 counts/s per segment. Consequently, contamination by Star 18 poses no threat to the health & safety of the COS detectors.

b) There are 2 sources in the HTTP catalog with m_f275w < 11.9, one of which is VFTS 482. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.csv

VFTS 482 has been shown to be safe by ETC calculation COS.sp.1454809

The other bright star is SABBI 053840.539-690557.18 = VFTS 1001 = Brey 75 = BAT99 100 = R134 = [P93] 786 = Cl* NGC 2070 SMB 013 = [HSH95] 4:

SpType = WN6h 1998ApJ...493..180M

 $V = 12.747 \ 1999A \& A \dots 341 \dots 98S$

 $B = 12.838 \ 1999A \& A \dots 341 \dots 98S$

 $U = 12.171 \ 1999A \& A \dots 341 \dots 98S$

It is 3.19 arcsec from VFTS 482, which corresponds to 2.55 times the radius of the PSA. The STEP_SIZE for FUV/ACQ PEAKXD is 1.3 arcsec = 1.04 times the radius of the PSA. With NUM_POS=3, there would be a t most a single step in the direction of VFTS 1001, which could therefore not appear in the PSA during a PEAKXD scan irrespective of the orientation. Similarly, the SAMS for a PEAKD maneuver with NUM_POS=5 and STEP_SIZE=0.9 will move the PSA 2*0.9 arcsec = 1.44 times the radius of the PSA in the direction of a nearby spoiler star. Consequently, it is unlikely that VFTS 1001 star will be encountered durin

Fits to model atmospheres have been published for VFTS 1001 by Bestenlehner et al. (2014A&A...570A..38B) and Hainich et al. (2014A&A...565A..27H). A PoWR model atmosphere for a WNL star with a depleted H content of 0.2 by mass and with other parameters parameters similar to those derived by Hainich et al. provides a good match to the available data: see ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001_adopted_sed_vs_FOS.png

The adopted SED

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001_adopted_sed.fits

corresponds to the file

g the target acquisition procedure.

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/seds/PoWR_44668_3.77_m4.49_Z0.50_lmc30Dor_ebmv_0.3_sed.fits.

ETC calculations with this input spectrum centered in the PSA give the following results with NO WARNINGS:
Configuration ETC Calculation Count Rate(SegA) CountRate(SegB) Total CountRate Brightest Pixel
G130M/1291 COS.sp.1458984 2988.915 3467.354 6456.269 0.319 ct/s @ 1216.11 A
G160M/1611 COS.sp.1458985 1027.378 2852.074 3879.452 0.063 ct/s @ 1420.48 A

Consequently, inadvertent exposure to this target poses no health & safety risk to the COS detectors.

SECOND:

Consider the annulus that the region of interest (ROI) associated with the BOA sweeps out for a range of PAs between 0 and 360 degrees. Like the PSA, this ROI is circular with a radius of 8 arcsec. Since the center o f the BOA is approximately 13 arcsec from the center of the PSA, the (inner, outer) radii that define the annulus are (5, 22) arcsec from the position of VFTS 482. Within this annulus, there are 3 sources in the HTTP c atalog with m_f275w < 11.9.

See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.csv

The brightest of these 3 sources has $m_f 275w = 9.728$, which is 3.3 magnitudes (a factor of 20.9 in flux) fainter than the BOA bright limit. There are NO individual stars brighter than the f275w bright limit for the BOA. However, for a range of PA's near 60 degrees, the BOA samples the central region of the R136 cluster. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_pa_60_to_60_m_F275w11.9_BOA.png

Consequently, it is conceivable that together with the flux from VFTS 482 in the PSA, the cumulative flux from multiple stars could contribute count rates that exceed the detector segment count-rate limits. This possibi lity can be eliminated by imposing a PA constraint on the visit: 120 degrees < PA < 340 degrees. The position of the BOA at these two extremes confirms that the core of the R136 cluster is avoided; see: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_pa_120_to_340_m_F275w11.9_BOA.png

CONCLUSION:

Within the specified PA restrictions, this analysis confirms that there are NO Health & Safety issues associated with the dispersed light acquisition or G130M and G160M observations of VFTS 482 through the PSA.

2 ACQ/PEAK (2) VFTS-482 D (COS.sa.145 4810)	COS/FUV, ACQ/PEAKD, PSA	G130M	CENTER=FLUX-W T-FLR;	0.3 Secs (0.3 Secs)	
D (COS sa 145		1291 A		[==>]	
4810)			NUM-POS=5;		
			STEP-SIZE=0.9;		
			SEGMENT=BOTH		
					[1]

Comments: SED PoWR_42000_3.80_Z0.50_lmc30Dor_ebmv_0.33; includes an increase in model flux by a factor of 1.7 ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482_VFTS-482_adopted_sed.fits ETC estimates an exposure time of 0.2967 s per dwell point. Rounded up to 0.3 s per dwell point.

Notes on Bright Object Checking:

VFTS 482 is on the outskirts of the 30 Dor region. The BOT cannot identify any targets in the GSC II or Galex catalogs because the DSS and 2MASS images are saturated by the bright nebulosity. Instead, the capabili ties of the BOT have been reproduced by using the catalog and imaging products developed by the Hubble Tarantula Treasury Project (HTTP). See Sabbi et al. (2016ApJS..222...11S) and https://archive.stsci.edu/prep ds/30dor/ for details.

The HTTP catalog provides magnitudes in the VEGAMAG system for the WFC3 F275W filter, which is a more reliable estimator of the UV flux of an early-type star than the Johnson V-band. ETC calculations were r un for a range of m_f275w values to probe the count-rate limits for the COS G130M/1291 and G160M/1611 configurations. A model spectrum from the PoWR grid that corresponds to an unreddened O5 V star in the LMC - (Teff, logg, Z/Zsun) = (41 kK, 4.00, 0.50) - was used for these calculation. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.fits

The results of these calculations are summarized in the spreadsheet:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/Limiting_F275w_magnitudes_for_O5V.xlsx

They show that

1. An unreddened O5 V star with VEGAMAG m_f275w < 11.9 can be safely observed through the PSA with COS G130M/1291 and G160M/1611.

- 2. By assuming a throughput of 0.6% relative to the PSA (extrapolated from Fig. 3.2 in the COS IHB), the spectroscopic limit for the BOA is m_f275w < 6.4.
- 3. Since the extinction in the 30 Dor region is actually quite significant, these limits are very conservative.

For subsequent bright-object checking:

- Any star with m f275w > 11.9 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the PSA in the (G130M/1291, G160M/1611) configurations.
- Any star with $m_f 2752 > 6.4$ in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the BOA in the (G130M/1291, G160M/1611) configurations.
- Stars in the search region for the PSA that are brighter than $m_{f}275w = 11.9$ require explicit ETC calculations to verify their status.

FIRST:

Consider the circular region within 8 arcsec of the center of the PSA.

a) There are 24 sources in the HTTP catalog with m_f275w < 15.0, including VFTS 482.

See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.png

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.csv

Note that the numbers indicated on the image refer to the row in the csv table. There is no "1" because the first row in the csv file contains column names.

The brightest contaminant within the PSA is Star 18 = SABBI 053840.331-690559.65, which is 0.66 arcsec from VFTS 482. The magnitude difference at 2750 Angstroms implies that Star 18 has ~4% of the measured fl ux of VFTS 482. If Star 18 were an unreddened 05 V star - WHICH IT IS NOT! - it would contribute to the G130M/1291 count rate as follows:

Count	Kale Segment A	Соит кате зедтет Б	EIC Calculation
Star 18	522.944	993.490	COS.sp.1458280
VFTS 482	3466.719	3639.238	COS.sp.1454809
TOTAL	3989.663	4632.728	*

These count rates are well below the limit of 15000 counts/s per segment. Consequently, contamination by Star 18 poses no threat to the health & safety of the COS detectors.

b) There are 2 sources in the HTTP catalog with m_f275w < 11.9, one of which is VFTS 482. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.csv

VFTS 482 has been shown to be safe by ETC calculation COS.sp.1454809

The other bright star is SABBI 053840.539-690557.18 = VFTS 1001 = Brey 75 = BAT99 100 = R134 = [P93] 786 = Cl* NGC 2070 SMB 013 = [HSH95] 4:

SpType = WN6h 1998ApJ...493..180M

 \vec{V} = 12.747 1999A&A...341...98S

 $B = 12.838 \ 1999A \& A \dots 341 \dots 98S$

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It is 3.19 arcsec from VFTS 482, which corresponds to 2.55 times the radius of the PSA. The STEP_SIZE for FUV/ACQ PEAKXD is 1.3 arcsec = 1.04 times the radius of the PSA. With NUM_POS=3, there would be a t most a single step in the direction of VFTS 1001, which could therefore not appear in the PSA during a PEAKXD scan irrespective of the orientation. Similarly, the SAMS for a PEAKD maneuver with NUM_POS=5 and STEP_SIZE=0.9 will move the PSA 2*0.9 arcsec = 1.44 times the radius of the PSA in the direction of a nearby spoiler star. Consequently, it is unlikely that VFTS 1001 star will be encountered durin

Fits to model atmospheres have been published for VFTS 1001 by Bestenlehner et al. (2014A&A...570A..38B) and Hainich et al. (2014A&A...565A..27H). A PoWR model atmosphere for a WNL star with a depleted H content of 0.2 by mass and with other parameters parameters similar to those derived by Hainich et al. provides a good match to the available data: see ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001_adopted_sed_vs_FOS.png

The adopted SED

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001_adopted_sed.fits

corresponds to the file

g the target acquisition procedure.

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/seds/PoWR_44668_3.77_m4.49_Z0.50_lmc30Dor_ebmv_0.3_sed.fits.

ETC calculations with this input spectrum centered in the PSA give the following results with NO WARNINGS:
Configuration ETC Calculation Count Rate(SegA) CountRate(SegB) Total CountRate Brightest Pixel
G130M/1291 COS.sp.1458984 2988.915 3467.354 6456.269 0.319 ct/s @ 1216.11 A
G160M/1611 COS.sp.1458985 1027.378 2852.074 3879.452 0.063 ct/s @ 1420.48 A

Consequently, inadvertent exposure to this target poses no health & safety risk to the COS detectors.

SECOND:

Consider the annulus that the region of interest (ROI) associated with the BOA sweeps out for a range of PAs between 0 and 360 degrees. Like the PSA, this ROI is circular with a radius of 8 arcsec. Since the center o f the BOA is approximately 13 arcsec from the center of the PSA, the (inner, outer) radii that define the annulus are (5, 22) arcsec from the position of VFTS 482. Within this annulus, there are 3 sources in the HTTP c atalog with m_f275w < 11.9.

See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.csv

The brightest of these 3 sources has $m_f 275w = 9.728$, which is 3.3 magnitudes (a factor of 20.9 in flux) fainter than the BOA bright limit. There are NO individual stars brighter than the f275w bright limit for the BOA. However, for a range of PA's near 60 degrees, the BOA samples the central region of the R136 cluster. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_pa_60_to_60_m_F275w11.9_BOA.png

Consequently, it is conceivable that together with the flux from VFTS 482 in the PSA, the cumulative flux from multiple stars could contribute count rates that exceed the detector segment count-rate limits. This possibi lity can be eliminated by imposing a PA constraint on the visit: 120 degrees < PA < 340 degrees. The position of the BOA at these two extremes confirms that the core of the R136 cluster is avoided; see: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_pa_120_to_340_m_F275w11.9_BOA.png

CONCLUSION:

Within the specified PA restrictions, this analysis confirms that there are NO Health & Safety issues associated with the dispersed light acquisition or G130M and G160M observations of VFTS 482 through the PSA.

3		COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=22 0.0;	102	20 Secs (1020 Secs)	
	G130M/129 (2) VFTS-482 1-3 (COS.sp.145 4809)		1291 A	0.0;		=>]	
	4809)			FP-POS=3			
							[1]

Comments: SED PoWR_42000_3.80_Z0.50_lmc30Dor_ebmv_0.33; includes an increase in model flux by a factor of 1.7 ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/VFTS-482_adopted_sed.fits ETC estimates SNR = 30/resel at 1150 +/- 0.5 A in 1,019.5160 s Baseline exposure time rounded to 1020 s (510 s per FP-POS) countrate (total, brightest segment) = (7105.9, 3639.2) cts/s brightest pixel: 0.137 cts/s at 1216.2 A BUFFER-TIME = 2/3 * 331 s = 220 s
Notes on Bright Object Checking:
VFTS 482 is on the outskirts of the 30 Dor region. The BOT cannot identify any targets in the GSC II or Galex catalogs because the DSS and 2MASS images are saturated by the bright nebulosity. Instead, the capabili ties of the BOT have been reproduced by using the catalog and imaging products developed by the Hubble Tarantula Treasury Project (HTTP). See Sabbi et al. (2016ApJS22211S) and https://archive.stsci.edu/prep ds/30dor/ for details.
The HTTP catalog provides magnitudes in the VEGAMAG system for the WFC3 F275W filter, which is a more reliable estimator of the UV flux of an early-type star than the Johnson V-band. ETC calculations were r un for a range of $m_f 275w$ values to probe the count-rate limits for the COS G130M/1291 and G160M/1611 configurations. A model spectrum from the PoWR grid that corresponds to an unreddened O5 V star in the LMC - (Teff, logg, Z/Zsun) = (41 kK, 4.00, 0.50) - was used for these calculation. See:
See. ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.fits
The results of these calculations are summarized in the spreadsheet: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/Limiting_F275w_magnitudes_for_O5V.xlsx
 They show that An unreddened O5 V star with VEGAMAG m_f275w < 11.9 can be safely observed through the PSA with COS G130M/1291 and G160M/1611. By assuming a throughput of 0.6% relative to the PSA (extrapolated from Fig. 3.2 in the COS IHB), the spectroscopic limit for the BOA is m_f275w < 6.4. Since the extinction in the 30 Dor region is actually quite significant, these limits are very conservative. For subsequent bright-object checking: Any star with m_f275w > 11.9 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the PSA in the (G130M/1291, G160M/1611) configurations. Any star with m_f2752 > 6.4 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the BOA in the (G130M/1291, G160M/1611) configurations. Stars in the search region for the PSA that are brighter than m_f275w = 11.9 require explicit ETC calculations to verify their status.
FIRST: Consider the circular region within 8 arcsec of the center of the PSA.
a) There are 24 sources in the HTTP catalog with m_f275w < 15.0, including VFTS 482.
See: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.csv
Note that the numbers indicated on the image refer to the row in the csv table. There is no "1" because the first row in the csv file contains column names.
The brightest contaminant within the PSA is Star 18 = SABBI 053840.331-690559.65, which is 0.66 arcsec from VFTS 482. If Star 18 were an unreddened O5 V star - WHICH IT IS NOT! - it would contribute to the G130M/1291 count rate as follows: Count Rate Segment A Count Rate Segment B ETC Calculation Star 18 522.944 993.490 VFTS 482 3466.719 3639.238 COS.sp.1454809 COS.sp.1454809
These count rates are well below the limit of 15000 counts/s per segment. Consequently, contamination by Star 18 poses no threat to the health & safety of the COS detectors.
b) There are 2 sources in the HTTP catalog with m_f275w < 11.9, one of which is VFTS 482. See: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.csv
VFTS 482 has been shown to be safe by ETC calculation COS.sp.1454809
The other bright star is SABBI 053840.539-690557.18 = VFTS 1001 = Brey 75 = BAT99 100 = R134 = [P93] 786 = Cl* NGC 2070 SMB 013 = [HSH95] 4: SpType = WN6h 1998ApJ493180M V = 12.747 1999A&A34198S B = 12.838 1999A&A34198S U = 12.171 1999A&A34198S

It is 3.19 arcsec from VFTS 482, which corresponds to 2.55 times the radius of the PSA. The STEP_SIZE for FUV/ACQ PEAKXD is 1.3 arcsec = 1.04 times the radius of the PSA. With NUM_POS=3, there would be a t most a single step in the direction of VFTS 1001, which could therefore not appear in the PSA during a PEAKXD scan irrespective of the orientation. Similarly, the SAMS for a PEAKD maneuver with NUM POS=5 and STEP SIZE=0.9 will move the PSA 2*0.9 arcsec = 1.8 arcsec = 1.44 times the radius of the PSA in the direction of a nearby spoiler star. Consequently, it is unlikely that VFTS 1001 star will be encountered durin g the target acquisition procedure. Fits to model atmospheres have been published for VFTS 1001 by Bestenlehner et al. (2014A&A...570A...38B) and Hainich et al. (2014A&A...565A..27H). A PoWR model atmosphere for a WNL star with a depleted H content of 0.2 by mass and with other parameters parameters similar to those derived by Hainich et al. provides a good match to the available data: see ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001 adopted sed vs FOS.png The adopted SED ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001_adopted_sed.fits corresponds to the file ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/VFTS1001/seds/PoWR 44668 3.77 m4.49 Z0.50 lmc30Dor ebmv 0.3 sed.fits. ETC calculations with this input spectrum centered in the PSA give the following results with NO WARNINGS: Configuration ETC Calculation Count Rate(SegA) CountRate(SegB) Total CountRate Brightest Pixel G130M/1291 COS.sp.1458984 6456.269 2988.915 3467.354 0.319 ct/s @ 1216.11 A G160M/1611 COS.sp.1458985 1027.378 2852.074 3879.452 0.063 ct/s @ 1420.48 A Consequently, inadvertent exposure to this target poses no health & safety risk to the COS detectors. SECOND: Consider the annulus that the region of interest (ROI) associated with the BOA sweeps out for a range of PAs between 0 and 360 degrees. Like the PSA, this ROI is circular with a radius of 8 arcsec. Since the center o f the BOA is approximately 13 arcsec from the center of the PSA, the (inner, outer) radii that define the annulus are (5, 22) arcsec from the position of VFTS 482. Within this annulus, there are 3 sources in the HTTP of atalog with $m_{f275w} < 11.9$. See: ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/BOA/HTTP VFTS482 r22.0arcsec m f275w11.9 BOA.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.csv The brightest of these 3 sources has m f275w = 9.728, which is 3.3 magnitudes (a factor of 20.9 in flux) fainter than the BOA bright limit. There are NO individual stars brighter than the f275w bright limit for the BO A. However, for a range of PA's near 60 degrees, the BOA samples the central region of the R136 cluster. See: ~/box/ullvses tech/ullvses proposals/c27 mc/16093/VFTS-482/mvBOT/BOA/HTTP VFTS482 r22.0arcsec pa 60 to 60 m F275w11.9 BOA.png Consequently, it is conceivable that together with the flux from VFTS 482 in the PSA, the cumulative flux from multiple stars could contribute count rates that exceed the detector segment count-rate limits. This possibi lity can be eliminated by imposing a PA constraint on the visit: 120 degrees < PA < 340 degrees. The position of the BOA at these two extremes confirms that the core of the R136 cluster is avoided; see: ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/BOA/HTTP VFTS482 r22.0arcsec pa 120 to 340 m F275w11.9 BOA.png CONCLUSION: Within the specified PA restrictions, this analysis confirms that there are NO Health & Safety issues associated with the dispersed light acquisition or G130M and G160M observations of VFTS 482 through the PSA.

4	G130M/129 (2) VFTS-482 1-4 (COS.sp.145 4809)	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=22 0.0;	1020 Secs (1020 Secs)	
	1-4 (COS sp 145		1291 A	0.0;	[==>]	
	4809)			FP-POS=4		
	,					
						[1]

Comments: SED PoWR 42000 3.80 Z0.50 lmc30Dor ebmv 0.33; includes an increase in model flux by a factor of 1.7 ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/VFTS-482_adopted_sed.fits ETC estimates SNR = 30/resel at 1150 +/- 0.5 A in 1,019.5160 s Baseline exposure time rounded to 1020 s (510 s per FP-POS) countrate (total, brightest segment) = (7105.9, 3639.2) cts/s brightest pixel: 0.137 cts/s at 1216.2 A BUFFER-TIME = 2/3 * 331 s = 220 sThe final exposure time was increased SUBSTANTIALLY during orbit-packing to 1020 s per FP-POS, or 2040 s in total.. ETC Calculation COS.sp.1460213 show that the expected SNR is 42.4 per resel @ 1150 +/-0 .5 A. Notes on Bright Object Checking: VFTS 482 is on the outskirts of the 30 Dor region. The BOT cannot identify any targets in the GSC II or Galex catalogs because the DSS and 2MASS images are saturated by the bright nebulosity. Instead, the capabili ties of the BOT have been reproduced by using the catalog and imaging products developed by the Hubble Tarantula Treasury Project (HTTP). See Sabbi et al. (2016ApJS..222...11S) and https://archive.stsci.edu/prep ds/30dor/ for details. The HTTP catalog provides magnitudes in the VEGAMAG system for the WFC3 F275W filter, which is a more reliable estimator of the UV flux of an early-type star than the Johnson V-band. ETC calculations were r un for a range of m_f275w values to probe the count-rate limits for the COS G130M/1291 and G160M/1611 configurations. A model spectrum from the PoWR grid that corresponds to an unreddened O5 V star in the LMC - (Teff, logg, Z/Zsun) = (41 kK, 4.00, 0.50) - was used for these calculation.See: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.fits The results of these calculations are summarized in the spreadsheet: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/Limiting_F275w_magnitudes_for_O5V.xlsx They show that 1. An unreddened O5 V star with VEGAMAG m f275w < 11.9 can be safely observed through the PSA with COS G130M/1291 and G160M/1611. 2. By assuming a throughput of 0.6% relative to the PSA (extrapolated from Fig. 3.2 in the COS IHB), the spectroscopic limit for the BOA is m f 275w < 6.4. 3. Since the extinction in the 30 Dor region is actually quite significant, these limits are very conservative. For subsequent bright-object checking: - Any star with m f275w > 11.9 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the PSA in the (G130M/1291, G160M/1611) configurations. - Any star with $m f^2 752 > 6.4$ in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the BOA in the (G130M/1291, G160M/1611) configurations. Stars in the search region for the PSA that are brighter than $m_{f}275w = 11.9$ require explicit ETC calculations to verify their status. FIRST: Consider the circular region within 8 arcsec of the center of the PSA. a) There are 24 sources in the HTTP catalog with m f275w < 15.0, including VFTS 482. See: ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/PSA/HTTP VFTS482 r8.0arcsec m f275w15.0.png ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/PSA/HTTP VFTS482 r8.0arcsec m f275w15.0.csv Note that the numbers indicated on the image refer to the row in the csv table. There is no "1" because the first row in the csv file contains column names. The brightest contaminant within the PSA is Star 18 = SABBI 053840.331-690559.65, which is 0.66 arcsec from VFTS 482. The magnitude difference at 2750 Angstroms implies that Star 18 has ~4% of the measured fl ux of VFTS 482. If Star 18 were an unreddened O5 V star - WHICH IT IS NOT! - it would contribute to the G130M/1291 count rate as follows: Count Rate Segment A Count Rate Segment B ETC Calculation 993.490 Star 18 522.944 COS.sp.1458280 VFTS 482 3466.719 3639.238 COS.sp.1454809 3989.663 4632.728 TOTAL These count rates are well below the limit of 15000 counts/s per segment. Consequently, contamination by Star 18 poses no threat to the health & safety of the COS detectors. b) There are 2 sources in the HTTP catalog with $m_{f}275w < 11.9$, one of which is VFTS 482. See. ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.csv VFTS 482 has been shown to be safe by ETC calculation COS.sp.1454809 The other bright star is SABBI 053840.539-690557.18 = VFTS 1001 = Brey 75 = BAT99 100 = R134 = [P93] 786 = Cl* NGC 2070 SMB 013 = [HSH95] 4:

 $U = 12.171 \ 1999A \& A \dots 341 \dots 98S$

It is 3.19 arcsec from VFTS 482, which corresponds to 2.55 times the radius of the PSA. The STEP_SIZE for FUV/ACQ PEAKXD is 1.3 arcsec = 1.04 times the radius of the PSA. With NUM_POS=3, there would be a t most a single step in the direction of VFTS 1001, which could therefore not appear in the PSA during a PEAKXD scan irrespective of the orientation. Similarly, the SAMS for a PEAKD manuver with NUM_POS=5 and STEP_SIZE=0.9 will move the PSA 2*0.9 arcsec = 1.8 arcsec = 1.44 times the radius of the PSA in the direction of a nearby spoiler star. Consequently, it is unlikely that VFTS 1001 star will be encountered durin g the target acquisition procedure.

Fits to model atmospheres have been published for VFTS 1001 by Bestenlehner et al. (2014A&A...570A..38B) and Hainich et al. (2014A&A...565A..27H). A PoWR model atmosphere for a WNL star with a depleted H content of 0.2 by mass and with other parameters similar to those derived by Hainich et al. provides a good match to the available data: see ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myB0T/VFTS1001/VFTS-1001_adopted_sed_vs_FOS.png

The adopted SED

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/VFTS1001/VFTS-1001_adopted_sed_fits

corresponds to the file

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myB0T/VFTS1001/seds/PoWR_44668_3.77_m4.49_Z0.50_lmc30Dor_ebmv_0.3_sed.fits.

ETC calculations with this input spectrum centered in the PSA give the following results with NO WARNINGS: Configuration ETC Calculation Count Rate(SegA) CountRate(SegB) Total CountRate Brightest Pixel G130M/1291 COS.sp.1458984 2988.915 3467.354 6456.269 0.319 ct/s @ 1216.11 A G160M/1611 COS.sp.1458985 1027.378 2852.074 3879.452 0.063 ct/s @ 1420.48 A

Consequently, inadvertent exposure to this target poses no health & safety risk to the COS detectors.

SECOND:

Consider the annulus that the region of interest (ROI) associated with the BOA sweeps out for a range of PAs between 0 and 360 degrees. Like the PSA, this ROI is circular with a radius of 8 arcsec. Since the center o f the BOA is approximately 13 arcsec from the center of the PSA, the (inner, outer) radii that define the annulus are (5, 22) arcsec from the position of VFTS 482. Within this annulus, there are 3 sources in the HTTP c atalog with m_f275w < 11.9.

See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_m_f275w11.9_BOA.csv

The brightest of these 3 sources has m_f275w = 9.728, which is 3.3 magnitudes (a factor of 20.9 in flux) fainter than the BOA bright limit. There are NO individual stars brighter than the f275w bright limit for the BOA. However, for a range of PA's near 60 degrees, the BOA samples the central region of the R136 cluster. See:

~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HŤTP_VFTS482_r22.0arcsec_pa_60_to_60_m_F275w11.9_BOA.png

Consequently, it is conceivable that together with the flux from VFTS 482 in the PSA, the cumulative flux from multiple stars could contribute count rates that exceed the detector segment count-rate limits. This possibi lity can be eliminated by imposing a PA constraint on the visit: 120 degrees < PA < 340 degrees. The position of the BOA at these two extremes confirms that the core of the R136 cluster is avoided; see: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTS482_r22.0arcsec_pa_120_to_340_m_F275w11.9_BOA.png

CONCLUSION:

Within the specified PA restrictions, this analysis confirms that there are NO Health & Safety issues associated with the dispersed light acquisition or G130M and G160M observations of VFTS 482 through the PSA.

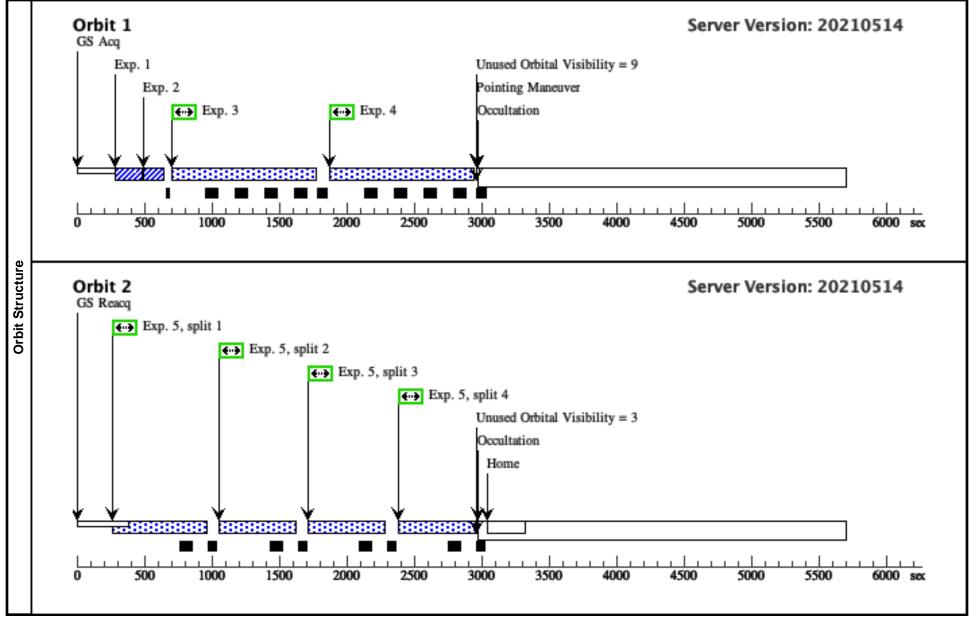
1	G160M/161 (2) VFTS-482 COS.sp.145 808)	1611 4	2.0	520 Secs (2080 Secs)	1
48	808)	1611 A	BUFFER-TIME=34 2.0;	[==>(Split 1)]	
			FP-POS=ALL	[==>(Split 2)]	
				[==>(Split 3)]	
				[==>(Split 4)]	
				[>(Spm+)]	
					12
					[2

Comments: SED PoWR_42000_3.80_Z0.50_lmc30Dor_ebmv_0.33; includes an increase in model flux by a factor of 1.7 ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/VFTS-482_adopted_sed.fits ETC estimates SNR = 30/resel at 1590 +/- 0.5 A in 901.7 s
Baseline exposure time rounded to 904 s (226 s per FP-POS) countrate (total, brightest segment) = (4591.6, 3450.2) cts/s brightest pixel: 0.055 cts/s at 1423.5 A BUFFER-TIME = 2/3 * 513 s = 342 s
The final exposure time was increased SUBSTANTIALLY during orbit-packing to 520 s per FP-POS, or 2080 s in total ETC Calculation COS.sp.1460212 show that the expected SNR is 45.6 per resel @ 1590 +/- 0.5 A.
Notes on Bright Object Checking:
VFTS 482 is on the outskirts of the 30 Dor region. The BOT cannot identify any targets in the GSC II or Galex catalogs because the DSS and 2MASS images are saturated by the bright nebulosity. Instead, the capabili ties of the BOT have been reproduced by using the catalog and imaging products developed by the Hubble Tarantula Treasury Project (HTTP). See Sabbi et al. (2016ApJS22211S) and https://archive.stsci.edu/prep ds/30dor/ for details.
The HTTP catalog provides magnitudes in the VEGAMAG system for the WFC3 F275W filter, which is a more reliable estimator of the UV flux of an early-type star than the Johnson V-band. ETC calculations were r un for a range of m_f275w values to probe the count-rate limits for the COS G130M/1291 and G160M/1611 configurations. A model spectrum from the PoWR grid that corresponds to an unreddened O5 V star in the LMC - (Teff, logg, Z/Zsun) = (41 kK, 4.00, 0.50) - was used for these calculation. See:
~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/PoWR_41000_4.00_Z0.50_lmc30Dor_ebmv_0.0_sed.fits
The results of these calculations are summarized in the spreadsheet: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/F275W_Limiting_Magnitudes/Limiting_F275w_magnitudes_for_O5V.xlsx
 They show that An unreddened O5 V star with VEGAMAG m_f275w < 11.9 can be safely observed through the PSA with COS G130M/1291 and G160M/1611. By assuming a throughput of 0.6% relative to the PSA (extrapolated from Fig. 3.2 in the COS IHB), the spectroscopic limit for the BOA is m_f275w < 6.4. Since the extinction in the 30 Dor region is actually quite significant, these limits are very conservative. For subsequent bright-object checking: Any star with m_f275w > 11.9 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the PSA in the (G130M/1291, G160M/1611) configurations. Any star with m_f2752 > 6.4 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the PSA in the (G130M/1291, G160M/1611) configurations. Any star with m_f2752 > 6.4 in the HTTP catalog is deemed to pose no threat to the health & safety of the COS detectors if observed through the BOA in the (G130M/1291, G160M/1611) configurations. Stars in the search region for the PSA that are brighter than m_f275w = 11.9 require explicit ETC calculations to verify their status.
FIRST: Consider the circular region within 8 arcsec of the center of the PSA.
a) There are 24 sources in the HTTP catalog with $m_f 275w < 15.0$, including VFTS 482.
See: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.png ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w15.0.csv
Note that the numbers indicated on the image refer to the row in the csv table. There is no "1" because the first row in the csv file contains column names.
The brightest contaminant within the PSA is Star 18 = SABBI 053840.331-690559.65, which is 0.66 arcsec from VFTS 482. The magnitude difference at 2750 Angstroms implies that Star 18 has ~4% of the measured fl ux of VFTS 482. If Star 18 were an unreddened O5 V star - WHICH IT IS NOT! - it would contribute to the G130M/1291 count rate as follows: Count Rate Segment A Count Rate Segment B ETC Calculation Star 18 522.944 993.490 COS.sp.1458280 VFTS 482 3466.719 3639.238 COS.sp.1454809 TOTAL 3989.663 4632.728
These count rates are well below the limit of 15000 counts/s per segment. Consequently, contamination by Star 18 poses no threat to the health & safety of the COS detectors.
b) There are 2 sources in the HTTP catalog with m_f275w < 11.9, one of which is VFTS 482. See: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.png
~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/PSA/HTTP_VFTS482_r8.0arcsec_m_f275w11.9.csv
VFTS 482 has been shown to be safe by ETC calculation COS.sp.1454809
The other bright star is SABBI 053840.539-690557.18 = VFTS 1001 = Brey 75 = BAT99 100 = $R134 = [P93]$ 786 = $Cl*NGC$ 2070 SMB 013 = [HSH95] 4: SpType = WN6h 1998ApJ493180M

V= 12.747 1999A & A ... 341 ... 98SВ = 12.838 1999A&A...341...98S U= 12.171 1999A&A...341...98S It is 3.19 arcsec from VFTS 482, which corresponds to 2.55 times the radius of the PSA. The STEP SIZE for FUV/ACO PEAKXD is 1.3 arcsec = 1.04 times the radius of the PSA. With NUM POS=3, there would be a t most a single step in the direction of VFTS 1001, which could therefore not appear in the PSA during a PEAKXD scan irrespective of the orientation. Similarly, the SAMS for a PEAKD maneuver with NUM POS=5 and STEP SIZE=0.9 will move the PSA 2*0.9 arcsec = 1.8 arcsec = 1.44 times the radius of the PSA in the direction of a nearby spoiler star. Consequently, it is unlikely that VFTS 1001 star will be encountered durin g the target acquisition procedure. Fits to model atmospheres have been published for VFTS 1001 by Bestenlehner et al. (2014A&A...570A...38B) and Hainich et al. (2014A&A...565A..27H). A PoWR model atmosphere for a WNL star with a depleted H content of 0.2 by mass and with other parameters parameters similar to those derived by Hainich et al. provides a good match to the available data: see ~/box/ullvses tech/ullvses proposals/c27 mc/16093/VFTS-482/mvBOT/VFTS1001/VFTS-1001 adopted sed vs FOS.png The adopted SED ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myB0T/VFTS1001/VFTS-1001 adopted sed.fits corresponds to the file ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/VFTS1001/seds/PoWR 44668 3.77 m4.49 Z0.50 lmc30Dor ebmv 0.3 sed.fits. ETC calculations with this input spectrum centered in the PSA give the following results with NO WARNINGS: Configuration ETC Calculation Count Rate(SegA) CountRate(SegB) Total CountRate Brightest Pixel G130M/1291 COS.sp.1458984 2988.915 3467.354 6456.269 0.319 ct/s @ 1216.11 A G160M/1611 COS.sp.1458985 3879.452 1027.378 2852.074 0.063 ct/s @ 1420.48 A Consequently, inadvertent exposure to this target poses no health & safety risk to the COS detectors. SECOND: Consider the annulus that the region of interest (ROI) associated with the BOA sweeps out for a range of PAs between 0 and 360 degrees. Like the PSA, this ROI is circular with a radius of 8 arcsec. Since the center o f the BOA is approximately 13 arcsec from the center of the PSA, the (inner, outer) radii that define the annulus are (5, 22) arcsec from the position of VFTS 482. Within this annulus, there are 3 sources in the HTTP c atalog with m f275w < 11.9. See: ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/BOA/HTTP VFTS482 r22.0arcsec m f275w11.9 BOA.png ~/box/ullyses tech/ullyses proposals/c27 mc/16093/VFTS-482/myBOT/BOA/HTTP VFTS482 r22.0arcsec m f275w11.9 BOA.csv The brightest of these 3 sources has m f275w = 9.728, which is 3.3 magnitudes (a factor of 20.9 in flux) fainter than the BOA bright limit. There are NO individual stars brighter than the f275w bright limit for the BO A. However, for a range of PA's near 60 degrees, the BOA samples the central region of the R136 cluster. See: ~/box/ullvses tech/ullvses proposals/c27 mc/16093/VFTS-482/mvBOT/BOA/HTTP VFTS482 r22.0arcsec pa 60 to 60 m F275w11.9 BOA.png Consequently, it is conceivable that together with the flux from VFTS 482 in the PSA, the cumulative flux from multiple stars could contribute count rates that exceed the detector segment count-rate limits. This possibi lity can be eliminated by imposing a PA constraint on the visit; 120 degrees < PA < 340 degrees. The position of the BOA at these two extremes confirms that the core of the R136 cluster is avoided; see: ~/box/ullyses_tech/ullyses_proposals/c27_mc/16093/VFTS-482/myBOT/BOA/HTTP_VFTŠ482_r22.0arcsec_pa_120_to_340_m_F275w11.9_BOA.png

CONCLUSION:

Within the specified PA restrictions, this analysis confirms that there are NO Health & Safety issues associated with the dispersed light acquisition or G130M and G160M observations of VFTS 482 through the PSA.



	Proposal 16093, W61-28-5-COS (3C), completed	Wed Sep 22 15:00:30 GMT 2021
	Diagnostic Status: Warning	
	Scientific Instruments: COS/FUV	
	Special Requirements: SCHED 100%	
Visit	Comments: vstatus; 3C; W61-28-5; P/COS approved for submission; P/AF 10/08/20; intrev: complete; P/CP 05/10/20 vcheck; Enter targ name & Inst. & Resp. Sci.; W61-28-5; COS; AF vcheck; ETC numbers entered in APT?; Completed vcheck; SIN ETC calcs done & documented?; Yes vcheck; S/N ETC calcs done & documented?; Yes vcheck; Sin ETC calcs done & documented?; Yes vcheck; Sin EtC calcs done & documented?; Yes vcheck; Field images checked & saved?; Yes - W61-28-5_DSS.png and W61-28-5_2MASS.png vcheck; Selected ACQ strategy?; Dispersed 1291 vcheck; Field BOT clear?; Yes vcheck; Field BOT clear?; Yes vcheck; Field BOT clear?; Yes vcheck; Visual BOT check for stars not in catalog?; No sources of concern - all have V > 17 in Zaritsky catalog vcheck; Buffer times optimized?; Jone vcheck; Verify visit grouping correct; Not applicable vcheck; Verify visit grouping correct; Not applicable vcheck; Is visit ready for int. review?; Yes Allocated COS orbits = 3	
nostics	(W61-28-5-COS (3C)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN	
Diagno		

	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	W61-28-5	RA: 05 34 28.4703 (83.6186263d)		V=13.92	Reference Frame: ICRS
		Alt Name1: 2MASS- J05342846-6943568	Dec: -69 43 56.83 (-69.73245d) Equinox: J2000		SpT=O4 V((f+)); E(B-V)=0.13; U=12.64; B=13.74; V=13.92; FI 160=5.15e-13; F1360=3.30e-13; F1700=2.69e-13	
Fixed Targets	Previous n Input file: SIMBAD li SpT = 04 COS/G130 COS/G130 COS/G185 COS/G185 COS/G185 STIS/E140 STIS/E230 STIS/E230 Coordinate v sin i = 12 Calculation STIS/E230 Coordinate v sin i = 12 Calculation tstatus; WC tcheck; AP tcheck; Co tcheck; Ad Baseline fi. the redden. equivalent reddening Baseline i Adopted S Category=	ink (W61 28-5): https://simu V((f+)) M/c1096 : rn-max(WM-Ba M/c1611 : rn-max(WM-Ba M/c1611 : rn-max(WM-Ba M/c1953 : rn-max(WM-Ba M/c1953 : rn-max(WM-Ba M/c1425 : rn-max(WM-Ba M/c1425 : rn-max(WM-Ba M/c1425 : rn-max(WM-Ba M/c1475 : rn-max(WM-Ba M/c1978 : rn-max(WM-Ba M/c1986 : rn-max(WM-Ba N/c1986	$IC_all_dol_fixed_wr_NewCoords_pids.csv$ bad.u-strasbg,fr/simbad/sim-id?Ident=W61 asic(04 V, Z=0.008, Teff=45709, log_lum= asic(04 V, Z=0.008, Teff=45709, log_lum= asic(04 V, Z=0.008, Teff=45709, log_lum= asic(04 V, Z=0.008, Teff=45709, log_lum= sic(04 V, Z=0.008, Teff=45709, log_lum= sic(04 V, Z=0.008, Teff=45709, log_lum= sic(04 V, Z=0.008, Teff=45709, log_lum= sic(04 V, Z=0.008, Teff=45709, log_lum=5 sic(04 V, Z=0, log_lum=5 sic(04 V, Z=0.	5.60, log_g=4.00) (extinction lmcavg=0.100), flux110 5.60, log_g=4.00) (extinction lmcavg=0.100), flux130 5.60, log_g=4.00) (extinction lmcavg=0.100), flux170 5.60, log_g=4.00) (extinction lmcavg=0.100), flux170 5.60, log_g=4.00) (extinction lmcavg=0.100), flux170 6.60, log_g=4.00, log_g=4.00, flux170 6.60, log_g=4.00, log_g=4.00 6.60, log_g=4.00, log_g=4.00 6.6	50 +- 30.0A flux=3.3e-13 Flam) 10 +- 5.0A flux=2.7e-13 Flam)	0_Z0.50, with flux reduced by 2/3 (which is

# La (E1	bel TC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
		(3) W61-28-5	COS/FUV, ACQ/PEAKXD, PSA	G130M	CENTER=FLUX-W	/		0.2 Secs (0.2 Secs)		
XD (COS.sa.145				1291 A	T;			[==>]		
480					NUM-POS=3;				[1]	
					STEP-SIZE=1.3; SEGMENT=BOTH	т				
Commen	nts: SED P	oWR 45000 4.00	Z0.50_lmcavg_ebmv_0.13; includes rea	uction in model flu		•			1	
~/box/ ETC esti	/ullyses_te mates an e	ch/ullyses_propose exposure time of 0	ıls/c27_mc/16093/W61-28-5/W61-28-5_ .15 s per dwell point. Rounded up to 0.2	adopted_sed.fits s per dwell point.						
ETC WARNING - Segment B count rate (8070 per s) exceeds segment limit of irregulary variable source - is benign because the source is not irregularly variable. BOT Check: 9 Safe. 3 Unknown										
PSA S	SOU90001:	47 05 34 28.4418	-69 43 58.28 probably Gaia DR2 465 -69 43 57.08 marked safe in graphica -69 43 57.41 ???	7273660375612544 I display????	4(G, BP-RP) = (18.67, 0)	0.76) Probably F9 V	Parallax = -0.23 m	as		
The sour by Aladii ~/box/	rce in the E n/BOT. Th /ullyses te	80A is safe. The tw here are no Gaia D ch/ullyses proposo		by the BOT. See WFC3 zoom.png	-	the target is single a	nd unblended, in sta	rk contrast to its appearance in the DSS im	age shown	
		(3) W61-28-5	COS/FUV, ACQ/PEAKD, PSA	G130M	CENTER=FLUX-W	J		0.2 Secs (0.2 Secs)		
D	-	(5) W01 20 5	COD/101, //CQ/12/11/2, 15/1	1291 A	T-FLR;			[==>]		
(CC 48(OS.sa.145				NUM-POS=5;					
					STEP-SIZE=0.9;				[1]	
					SEGMENT=BOTH	I				
ETC esti ETC WA BOT Che BOA	imates an e RNING - S eck: 10 Saj S0U91482	exposure time of 0. Segment B count ro fe, 3 Unknown 49 05 34 25.7043	uls/c27_mc/16093/W61-28-5/W61-28-5 15 s per dwell point. Rounded up to 0.2 tte (8070 per s) exceeds segment limit of -69 43 58.28 probably Gaia DR2 465 -69 43 57.08 marked safe in graphica	s per dwell point. irregulary variable 7273660375612544	0		0 5			
ETC esti ETC WA BOT Che BOA S PSA S PSA S The sour by Aladin ~/box/	imates an e RNING - S eck: 10 Say SOU91482 SOU900014 SOU911104 rce in the E n/BOT. Tl /ullyses_tes	exposure time of 0 Segment B count ra fe, 3 Unknown 49 05 34 25.7043 47 05 34 28.4418 41 05 34 28.5480 BOA is safe. The tw nere are no Gaia E ch/ullyses_proposo	15 s per dwell point. Rounded up to 0.2 tte (8070 per s) exceeds segment limit of -69 43 58.28 probably Gaia DR2 465 -69 43 57.08 marked safe in graphica -69 43 57.41 ??? to sources reported to be within the PSA R2 sources near the locations specified lls/c27_mc/16093/W61-28-5/W61-28-5_	s per dwell point. irregulary variable 7273660375612544 I display???? appear to be spurio by the BOT. See WFC3_zoom.png	4 (G, BP-RP) = (18.67, 100)	0.76) Probably F9 V	Parallax = -0.23 m		age shown	
ETC esti ETC WA BOT Che BOA PSA S PSA S The sour by Aladin ~/box/ ~/box/	imates an e RNING - S eck: 10 Say SOU91482 SOU90001- SOU91110- rce in the E n/BOT. Th /ullyses_tee /ullyses_tee	exposure time of 0 Segment B count ra (e, 3 Unknown 49 05 34 25.7043 47 05 34 28.4418 41 05 34 28.5480 BOA is safe. The tw here are no Gaia D ch/ullyses_propose ch/ullyses_propose	15 s per dwell point. Rounded up to 0.2 tte (8070 per s) exceeds segment limit of -69 43 58.28 probably Gaia DR2 465 -69 43 57.08 marked safe in graphica -69 43 57.41 ??? to sources reported to be within the PSA PR2 sources near the locations specified uls/c27_mc/16093/W61-28-5/W61-28-5_ uls/c27_mc/16093/W61-28-5/W61-28-5_	s per dwell point. irregulary variable 7273660375612544 I display???? appear to be spurio by the BOT. See WFC3_zoom.png	4 (G, BP-RP) = (18.67, 100)	0.76) Probably F9 V the target is single a	Parallax = -0.23 m	as rk contrast to its appearance in the DSS im	age shown	
ETC esti ETC WA BOT Che BOA / PSA S PSA S The sour by Aladin ~/box/ 3 G1 1-3	imates an e RNING - S sou91482 Sou90001- rce in the E n/BOT. Th /ullyses_teu /ullyses_teu 30M/129	exposure time of 0 Segment B count ra fe, 3 Unknown 49 05 34 25.7043 47 05 34 28.4418 41 05 34 28.5480 BOA is safe. The tw nere are no Gaia E ch/ullyses_proposo	15 s per dwell point. Rounded up to 0.2 tte (8070 per s) exceeds segment limit of -69 43 58.28 probably Gaia DR2 465 -69 43 57.08 marked safe in graphica -69 43 57.41 ??? to sources reported to be within the PSA R2 sources near the locations specified lls/c27_mc/16093/W61-28-5/W61-28-5_	s per dwell point. irregulary variable 7273660375612544 I display???? appear to be spurio by the BOT. See WFC3_zoom.png WFC3_GaiaDR2.pn	4 (G, BP-RP) = (18.67, 1 pus. On a WFC3 image,	0.76) Probably F9 V the target is single a	Parallax = -0.23 m	as rk contrast to its appearance in the DSS im 185 Secs (185 Secs)		
ETC esti. ETC WA BOT Che BOA S PSA S PSA S The sour by Aladii ~/box/ 3 G1 1-3 (CC 462	imates an e (RNING - S eck: 10 Say SOU91482 SOU9001- SOU91110- rce in the E n/BOT. T1 /ullyses_tec /ullyses_tec 30M/129 SOS.sp.145 29)	exposure time of 0 Segment B count ra fe, 3 Unknown 49 05 34 25.7043 47 05 34 28.4418 41 05 34 28.5480 60A is safe. The tw here are no Gaia E ch/ullyses_propose (3) W61-28-5	15 s per dwell point. Rounded up to 0.2 tte (8070 per s) exceeds segment limit of -69 43 58.28 probably Gaia DR2 465 -69 43 57.08 marked safe in graphica -69 43 57.41 ??? to sources reported to be within the PSA PR2 sources near the locations specified uls/c27_mc/16093/W61-28-5/W61-28-5_ uls/c27_mc/16093/W61-28-5/W61-28-5_	s per dwell point. irregulary variable 7273660375612544 l display???? appear to be spuric by the BOT. See WFC3_coom.png WFC3_GaiaDR2.pn G130M 1291 A	4 (G, BP-RP) = (18.67, 1 pus. On a WFC3 image, ng BUFFER-TIME=11 2; FP-POS=3	0.76) Probably F9 V the target is single a	Parallax = -0.23 m	as rk contrast to its appearance in the DSS im	age shown	

<u>upusai 10093 - Wut-20-3-C</u>			0/11101013 000		
	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=11	185 Secs (185 Secs)	
1-4 (COS.sp.145 4629)		1291 A	2.0; FP-POS=4	[==>]	[1]
Baseline exposure time rounded to 370 s (. countrate (total, brightest segment) = (1 brightest pixel: 0.20 cts/s at 1243.5 A BUFFER-TIME = 2/3 * 168 s = 112 s BOT Check: 9 Safe, 3 Unknown BOA S0U9148249 05 34 25.7043 -69 PSA S0U9000147 05 34 28.5480 -69	7_mc/16093/W61-28-5/W61-28-5 .5 A in 369.2 s 070 per s) exceeds segment limit of 185 s per FP-POS) 13962.3, 8051.0) cts/s 43 58.28 probably Gaia DR2 46 43 57.08 marked safe in graphic 43 57.41 ??? trccs reported to be within the PS/ ources near the locations specifiea 7_mc/16093/W61-28-5/W61-28-5	_adopted_sed.fits of irregulary variable 57273660375612544 cal display???? A appear to be spurion I by the BOT. See _WFC3_zoom.png	source - is benign because the source is not ir f(G, BP-RP) = (18.67, 0.76) Probably F9 V I us. On a WFC3 image, the target is single and		age shown
5 G160M/161 (3) W61-28-5	COS/FUV, TIME-TAG, PSA	G160M	BUFFER-TIME=25	188 Secs (752 Secs)	
1 (COS.sp.145 4631)		1611 A	2.0; FP-POS=ALL	[==>(Split 1)][==>(Split 2)][==>(Split 3)][==>(Split 4)]	[1]
PSA S0U9000147 05 34 28.4418 -69 PSA S0U9111041 05 34 28.5480 -69 Final exptime per FP-POS increased durin	43 57.08 marked safe in graphic 43 57.41 ??? 18 orbit packing to 188 s per FP-P trces reported to be within the PS/ ources near the locations specifiea 7_mc/16093/W61-28-5/W61-28-5	al display???? POS; 752 s total. A appear to be spurio l by the BOT. See _WFC3_zoom.png		Parallax = -0.23 mas d unblended, in stark contrast to its appearance in the DSS ima	age shown

6	G130M/109 (3) W61-28-5 6 (COS.sp.145 4801)	COS/FUV, TIME-TAG, PSA	G130M 1096 A	BUFFER-TIME=41 4.0; FP-POS=ALL	1170 Secs (4680 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[2]
E B F B T b	~/box/ullyses_tech/ullyses_proposa rC estimates SNR=20/resel at 1080 countrate (total, brightest segment) brightest pixel: 0.075 cts/s at 1216. BUFFER-TIME = 2/3 * 621 s = 41 nal exptime per FP-POS increased OT Check: 9 Safe, 3 Unknown BOA S0U9148249 05 34 25.7043 PSA S0U9000147 05 34 28.4418 PSA S0U9011041 05 34 28.5480 the source in the BOA is safe. The two ~/box/ullyses_tech/ullyses_proposa	68 s (992 s per FP-POS) = (3795.6, 3697.4) cts/s 2 A 4 s during orbit packing to 1170 s per FP- -69 43 58.28 probably Gaia DR2 46 -69 43 57.08 marked safe in graphic -69 43 57.41 ???	_adopted_sed.fits POS; 4680 s total. S 5727366037561254 val display???? A appear to be spuri l by the BOT. See _WFC3_zoom.png	SNR @ 1080 A = 21,7 per resel; see COS.sp.1455679. 4 (G, BP-RP) = (18.67, 0.76) Probably F9 V Parallax = -0 ous. On a WFC3 image, the target is single and unblended,		mage shown

