16821 - ULLYSES LMC O6 Bright Giants - STIS

Cycle: 29, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
1S	(1) SK-66D100 WAVE	STIS/CCD STIS/FUV-MAMA	2	18-Apr-2022 16:00:15.0	yes

2 Total Orbits Used

ABSTRACT

The Space Telescope Science Institute (STScI) Director has decided to devote up to 1000 orbits of Director's Discretionary time in observing Cycles 27-29 to a new Hubble Ultraviolet Legacy program focused on star formation and associated stellar physics. This new program, ULLYSES (UV Legacy Library of Young Stars as Essential Standards), will provide a UV spectroscopic reference sample of young (< 10 Myr) high- and low-mass stars. It will target over ~150 OB stars in the Magellanic Clouds and lower metallicity galaxies in the Local Group, and ~40 T Tauri stars and brown dwarfs in the Milky Way. In addition, ULLYSES will monitor 4 typical T Tauri stars over different rotational phases through at least three rotation periods, and over timescales of months to years. The resulting library will provide template spectra of massive stars at metallicities substantially below the well studied, while the low mass sample will cover a wide range of ages, accretion rates, and masses, including objects down to well below 0.5 M_sun. The legacy of this large UV dataset on the first 10 Myr of stellar evolution will be enhanced by complementary datasets obtained by the scientific community. In addition to the core goals of the program related to stellar astrophysics of low and high mass stars, this data will also enable exciting science in the fields of ISM, CGM, jets, and exoplanets. ULLYSES will be modeled after the Frontier Fields program: all data obtained will be non-proprietary. The implementation team at STScI is developing high-level science data products and a sophisticated database and website for

disseminating data from the ULLYSES program and ancillary datasets for the ULLYSES target sample from space and ground-based facilities.

OBSERVING DESCRIPTION

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

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

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

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

Visit

Proposal 16821, SK-66D100-STIS (1S) Mon Apr 18 20:00:16 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%

Comments: vstatus; 1S; SK-66D100; P/STIS approved for submission; P/LS 28/01/22 ; intrev: complete ; P/JRD 18/04/22
vcheck; Enter targ name & Inst. & Resp. Sci.; SK -66 100 'SK -66 100'; STIS; LS
vcheck; ETC numbers entered in APT?; completed
vcheck; Any screening violations?; None
vcheck; S/N ETC calcs done & documented?; Yes ...
SED gives exposure time of 7948 s for S/N of 20 but S/N plot shows S/N=25. Exposure time used in APT is 5180 s and this gives a S/N of 20 in S/N plot
vcheck; Field images checked & saved?; Yes SK-66D100_DSS.png and SK-66D100_2MASS.png
vcheck; Selected ACQ strategy?; STIS F28X50LP 2.1 s (same as 16230 - ACQ image looks good)
vcheck; Possible ACQ or Sci spoilers?; None
vcheck; Field BOT clear?; Yes
vcheck; Visual BOT check for stars not in catalog?; Yes
vcheck; Orbit packing finalized?; 2 orbits, total exp is 4736 s
vcheck; Buffer times optimized?; Yes
vcheck; Verify visit grouping correct; Yes
vcheck; Is visit ready for int. review?; Yes
Allocated STIS orbits = 2

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SK-66D100 Alt Name1: SK-66-100	RA: 05 27 45.4515 (81.9393812d) Dec: -66 55 15.29 (-66.92091d) Equinox: J2000	Proper Motion RA: 1.591415102161044 mas/yr Proper Motion Dec: 0.5705268658050937 mas/yr Parallax: 0" Epoch of Position: 2015.5	V=13.26 SpT=O6 II(f); E(B-V)=0.06; U=11.99; B=13.05; V=13.26; F1160=1.150e-12; F1360=7.030e-13; F1700=4.730e-13; F2200=2.450e-13	Reference Frame: ICRS

Comments: SK-66D100 : SK -66 100
Previous name : SK-66 100
Input file: ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv
SpT = O6 II(f)

Coordinate pedigree: Gaia DR2
Calculation performed 2021-10-25T01:00:04, v0.9
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tstatus; SK-66D100; P/STIS approved for submission; S/ins not started; P/LS 25/02/22; S/xx DD/MM/YY
tcheck; APT/SIMBAD target names: ; SK -66 100 'SK -66 100'...
aka 2MASS J05274546-6655152, Gaia DR2 ID 4660223379469868416
tcheck; Target info verification status?; OK...
SIMBAD gives SpT as O6II(f) and this is used in recent papers
tcheck; Coordinates & P.M. verified, epoch checked?; yes - used PMs given in SNAP 16230 for epoch 2015.5. Coords are same.
tcheck; Adopted SED compared to Observations?; OK - FUSE match is good but STIS/G230LB and G430L and UBV are 30% brighter than SED
Category=STAR
Description=[SUPERGIANT O, OF]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.1687276)	(1) SK-66D100	STIS/CCD, ACQ, F28X50LP	MIRROR				2.1 Secs (2.1 Secs) *[==>]*	*[1]*
2	E140M/1425 (1687230)	(1) SK-66D100	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=300			5180.2 Secs (2188 Secs) *[==>2188.0 Secs]*	*[1]*
	Comments: rn(PoWR-OB-new(PoWR_39000_3.80_m7.00_Z0.50.fits, lmc-ob-i 39-38, Z=0.500 solar, Teff=39000, log_lum=5.54, log_g=3.80, log_mdot=-7.00) (extinction lmcavg=0.060), flux1360 +- 2.0A flux=7e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O6 II(f)* *SED = SK-66D100_STIS_E140M_c1425_sed.fits* *For exptime=5180.2 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 4149.2 cts/s/segment* *brightest pixel: 0.057 cts/s/pix at 1243.5 A* *Calculation performed 2021-10-25T01:00:12, v0.9*								
3	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	*[1]*
4	E140M/1425 (1687230)	(1) SK-66D100	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	WAVECAL=NO; BUFFER-TIME=300			5180.2 Secs (2548 Secs) *[==>2548.0 Secs]*	*[2]*
	Comments: rn(PoWR-OB-new(PoWR_39000_3.80_m7.00_Z0.50.fits, lmc-ob-i 39-38, Z=0.500 solar, Teff=39000, log_lum=5.54, log_g=3.80, log_mdot=-7.00) (extinction lmcavg=0.060), flux1360 +- 2.0A flux=7e-13 Flam); stis,fuvmama,e140m,c1425,0.2x0.2,mjd#59670 *From file ULLYSES_Cycle29_MassiveStar_ProgramInput_v5.csv* *Spectral type: O6 II(f)* *SED = SK-66D100_STIS_E140M_c1425_sed.fits* *For exptime=5180.2 s, spectral region:* *1200.0 +- 0.5 A achieves SNR=20.0/resel* *global countrate (brightest segment): 4149.2 cts/s/segment* *brightest pixel: 0.057 cts/s/pix at 1243.5 A* *Calculation performed 2021-10-25T01:00:12, v0.9*								
5	E140M/1425 WAVECAL	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				*[==>]*	*[2]*

Orbit Structure