16467 - COS FUV Spectral Resolution at LP5

Cycle: 28, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(3) AV75	COS/FUV COS/NUV	2	18-Dec-2020 09:00:39.0	yes

2 Total Orbits Used

ABSTRACT

Knowledge of the COS Line Spread Function (LSF) is critical for users who wish to perform detailed line fitting studies as well as estimate signal-to-noise requirements. The exact shape of the LSF, and therefore the achievable overall spectral resolution, is a function of the overall optical path to a given lifetime position (LP). Here we determine the LSF and spectral resolution at LP5 for settings G130M/1291 and G130M/1327, which encompass the range of cenwaves moving to LP5. We observe the SMC blue super giant AV 75, whose spectra has both narrow interstellar absorption lines and complex broader convolved lines. We will test whether previous STIS E140M spectra of AV 75 convolved with model LP5 COS LSFs can reproduce the observed COS FUV spectra of numerous lines, thus validating the model spectra LSFs. We expect achieving a SN of

about 60 for cenwave 1327 but possibly lower for 1291, where the COS2025 policy prevents use of all four FP-POS, thus preventing mitigation of fixed pattern noise. We also take one exposure with cenwave G140L/800 at LP3 to 1) check the LP4 wavelength calibration accuracy at this mode and 2) use for a new derivation of the wavelength solution if needed. The 1291/FUVB data will also be used for the wavelength calibration derivation at LP5.

OBSERVING DESCRIPTION

The observability windows for this program are constrained by ORIENT constraints due to a crowded field. There is a short window in March 2021 and then a longer one in July and August. Please try to schedule March first and consider July and August a backup in case March fails or is not schedulable.

This program observes target AV 75 using cenwaves G130M/1291, G130M/1327, and G140L/800.

Cenwave 1291 is restricted by COS2025 so that only FP-POS 3 and 4 can be used in segment B. We observe both segments with FP-POS 3 and 4 and then turn off Segment B and observe segment A with FP-POS 1 and 2.

Cenwave 1327 is observed in all FP-POS, restricted to segment A due to COS2025.

Cenwave 800 is observed in FP-POS 3 only, and as usual c800 is only observed in segment A.

This crowded field has had troublesome acquisitions before, thus the ACQ/SEARCH even though coordinates are well known. A bad guide star is suspected, but the ACQ/SEARCH has solved the problem for this recurrent calibration target. We then perform two ACQ/IMAGEs using the BOA because the data will also be used for wavelength calibration, which requires exquisite centering.

Visit

Proposal 16467, AV75-LP5-resolution (01), implementation Fri Dec 18 14:00:40 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; ORIENT 280D TO 60 D; ORIENT 160D TO 165 D; BETWEEN 08-MAR-2021:00:00:00 AND 10-AUG-2021:00:00:00

Comments: The observability windows for this program are constrained by ORIENT constraints due to a crowded field. There is a short window in March 2021 and then a longer one in July and August. Please try to schedule March first and consider July and August a backup in case March fails or is not schedulable.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	AV75	RA: 00 50 32.3900 (12.6349583d) Dec: -72 52 36.48 (-72.87680d) Equinox: J2000		V=12.79	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[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/SEARCH (1003400)	(3) AV75	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2; STEP-SIZE=1.767; CENTER=FLUX-WT			6 Secs (6 Secs) *[==>]*	*[1]*
2	image_acq_boa (1003400)	(3) AV75	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				12 Secs (12 Secs) *[==>]*	*[1]*
3	image_acq_boa (1003400)	(3) AV75	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				12 Secs (12 Secs) *[==>]*	*[1]*
4	1291_1_FP3 (COS.sp.1469019)	(3) AV75	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; LIFETIME-POS=LP5; BUFFER-TIME=100			200 Secs (200 Secs) *[==>]*	*[1]*
5	1291_2_FP4 (COS.sp.1469019)	(3) AV75	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; LIFETIME-POS=LP5; BUFFER-TIME=100			200 Secs (200 Secs) *[==>]*	*[1]*
6	800_3_FP3_LP3 (COS.sp.1472774)	(3) AV75	COS/FUV, TIME-TAG, PSA	G140L 800 A	BUFFER-TIME=111; LIFETIME-POS=LP3; FP-POS=3			587 Secs (587 Secs) *[==>]*	*[1]*
7	1291_4_FP1 (COS.sp.1469019)	(3) AV75	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=1; LIFETIME-POS=LP5; BUFFER-TIME=100; SEGMENT=A			200 Secs (200 Secs) *[==>]*	*[2]*
8	1291_5_FP2 (COS.sp.1469019)	(3) AV75	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=2; LIFETIME-POS=LP5; BUFFER-TIME=100; SEGMENT=A			200 Secs (200 Secs) *[==>]*	*[2]*
9	1327_6_FP_ALL (COS.sp.1469024)	(3) AV75	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=96; LIFETIME-POS=LP5; FP-POS=ALL; SEGMENT=A			192 Secs (768 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	*[2]*

Orbit Structure