15352 - Lyman alpha and ISM Tomography of Haro 11

Cycle: 25, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
10	(2) HARO11-KNOT-C (3) KNOT-C-NORTH (4) KNOT-C-SOUTH	COS/FUV COS/NUV	2	07-Nov-2019 12:01:45.0	yes
50	(2) HARO11-KNOT-C (3) KNOT-C-NORTH (4) KNOT-C-SOUTH	COS/FUV COS/NUV	2	07-Nov-2019 12:01:46.0	yes
51	(2) HARO11-KNOT-C (3) KNOT-C-NORTH	COS/FUV COS/NUV	1	07-Nov-2019 12:01:48.0	yes
07	(2) HARO11-KNOT-C (6) KNOT-A	COS/FUV COS/NUV	2	07-Nov-2019 12:01:49.0	yes
09	(2) HARO11-KNOT-C (5) KNOT-B	COS/FUV COS/NUV	2	07-Nov-2019 12:01:51.0	yes
04	(2) HARO11-KNOT-C WAVE	STIS/CCD	1	07-Nov-2019 12:01:52.0	yes
11	(2) HARO11-KNOT-C WAVE	STIS/CCD STIS/FUV-MAMA	2	07-Nov-2019 12:01:53.0	yes
12	(2) HARO11-KNOT-C WAVE	STIS/CCD	1	07-Nov-2019 12:01:55.0	yes
13	(2) HARO11-KNOT-C WAVE	STIS/CCD STIS/FUV-MAMA	2	07-Nov-2019 12:01:56.0	yes

15 Total Orbits Used

ABSTRACT

The compact starburst Haro11 is one of the nearest Lyman break analogs and the closest galaxy with a confirmed leakage of Lyman continuum photons. It is also one of the nearest Lyman alpha emitting galaxies known. Haro11 has three bright emission knots (A,B and C). Knot C has previously been observed with COS. We have used absorption lines in these spectra to determine the covering fraction and velocity structure of the neutral and ionized gas along the line of sight, finding la wide range of outflow velocities and covering fractions, indicating the presence of an

outflowing clumpy ISM. These are conditions that should be benign for the escape of Lyman continuum emission, but there are other observations suggesting that knot C may not be the cause of the Lyman continuum leakage: its ionization level is low, and there is no Lyman alpha at the systemic velocity which one would predict if Lyman continuum was escaping through a clumpy medium. We propose COS spectroscopy of the other two knots and two positions showing bright diffuse Lyman alpha emission. With multiple sightlines probing the ISM and Lyman alpha emission we can perform a spatially resolved tomographic study of the ISM and Lyman alpha emission in this key galaxy. By adding STIS spectroscopy, we propose to furthermore study these proceses at the finest scale offered by HST.

OBSERVING DESCRIPTION

This program consists of COS spectroscopy on knot A and B in Haro11 with G130M+G160M. Knot C has already this data in the archive. In addition, G130M spectroscopy will be obatined at one position north and one position south of knot C. For all COS visits, knot C is used for target acquisition, followed by offsets to the primary target.

In addition, STIS spectroscopy will be obtained at two slit positions. One that runs through knot C in approximately N-S direction, and one approximately orthogonal that runs through knot C and also includes knot B.

COS visits:
knot-A: Acquisition on knot C, offset, followed by NUV image, followed by G130/1223 (FP-POS=1 & 2), 1291 (FP-POS 3 & 4) and G160/1577(FP-POS=2 & 3),1611 (FP-POS 3 & 4).

knot-B: as for knot A

Knot-C-offset positions: Acquisition on knot C, offset to N position, observations with G130M/1223 (1 & 2), 1291 (FP-POS 3 & 4); offset to S position, followed by G130M/1223 (1 & 2), 1291 (FP-POS 3 & 4) observations.

The motivation for using two cenwaves with two FP-POS each is to maximise wavelength coverage (in order to capture all ISM absorption lines of interest).

STIS visits:
STIS-slit-1 and STIS-slit-2: acquisition on Knot-C followed by exposures in G430M (on 2 along-slit positions with 2 exposures each), G750M (on 2 along-slit positions with 2 exposures each), G130M
(4 exposures at different along slit positions as defined by POS-TARGs in the Y-direction).

All visits have individual orient constraints. For STIS the reason is obviously to achieve the correct
slit position angle. For COS we have chosen the ORIENT in order to optimise the dispersion direction. To achive this, we have added 45 deg to the desired PA of the dispersion direction, as specified in the phase2 proposal instructions.

Visit

Proposal 15352, COS-knotC-NSpositions-splitG130 (10), failed Thu Nov 07 17:01:56 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: ORIENT 305D TO 5 D; ORIENT 125D TO 185 D

Comments: orient constraint chosen to optimise dispersion direction

Diagnostics

(COS-knotC-NSpositions-splitG130 (10)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(COS-knotC-NSpositions-splitG130 (10)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(knotC-S-g130-1222 (10.002)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-S-g130-1222 (10.003)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-S-g130-1291 (10.004)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-S-g130-1291 (10.005)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1222 (10.006)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1222 (10.007)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1291 (10.008)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1291 (10.009)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d) Dec: -33 33 17.02 (-33.55473d) Equinox: J2000	Radial Velocity: 6126 km/sec	V=15.99+/-0.05 FUV=1.93E-14 erg/s/cm2	Reference Frame: ICRS

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

(3)	KNOT-C-NORTH	Offset from HARO11-KNOT-C RA Offset: 0.032 Secs Dec Offset: 2.0 Arcsec		V=18.6+/-0.2 FUV=6E-16 erg/s/cm2	Offset Position (KNOT-C-NORTH)

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).
Category=EXT-MEDIUM
Description=[EMISSION LINE NEBULA]
Extended=YES

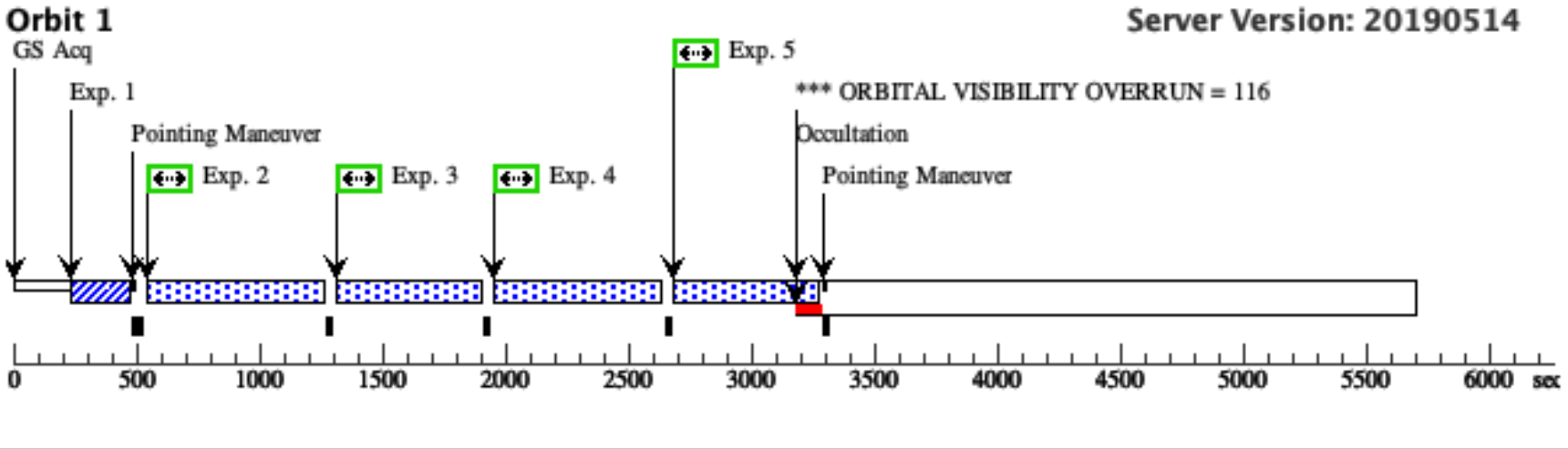
(4)	KNOT-C-SOUTH	Offset from HARO11-KNOT-C RA Offset: -0.032 Secs Dec Offset: -2.0 Arcsec		V=19.0+/-0.2 FUV=1E-15 erg/s/cm2	Offset Position (KNOT-C-SOUTH)

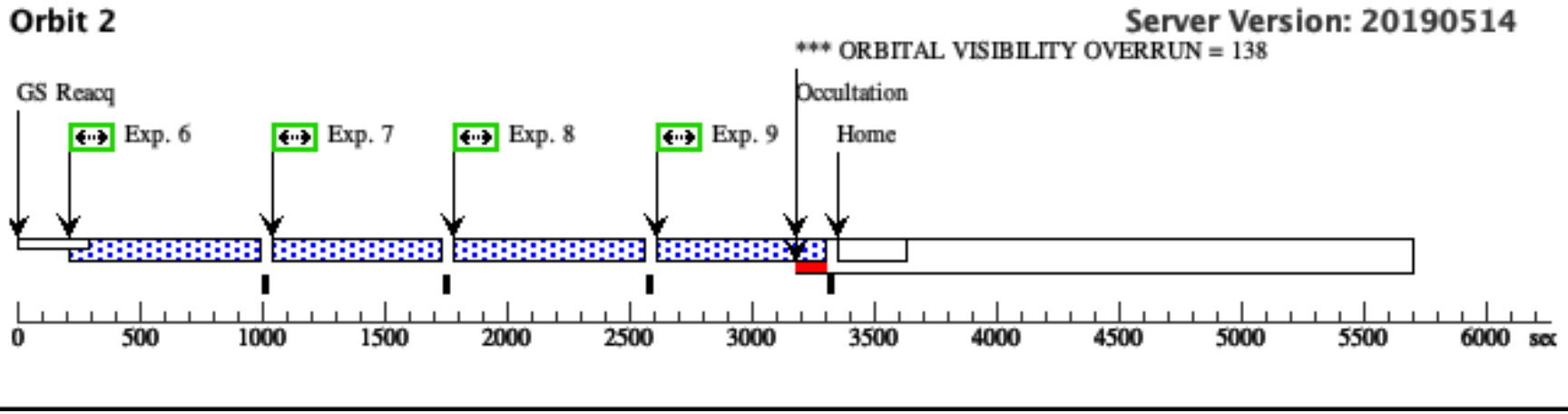
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).
Category=EXT-MEDIUM
Description=[EMISSION LINE NEBULA]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007750)	(2) HARO11-KNOT-C	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs) *[==>]*	***[1]***
Comments: ETC run assuming quasi-point source with total intensity scaled down accordingly. *Based on existing COS/NUV imaging with MIRROR B and ACS/SBC/F140LP imaging we estimate the peak pixel intensity to be a factor of 8.4 fainter than the ETC prediction for a true point source.*									
2	knotC-S-g130-1222 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=14000			536 Secs (536 Secs) *[==>]*	***[1]***
3	knotC-S-g130-1222 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=14000			537 Secs (537 Secs) *[==>]*	***[1]***
4	knotC-S-g130-1291 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=14000			540 Secs (540 Secs) *[==>]*	***[1]***
5	knotC-S-g130-1291 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=14000			540 Secs (540 Secs) *[==>]*	***[1]***
6	knotC-N-g130-1222 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=16000	POS TARG 0,0		636 Secs (636 Secs) *[==>]*	***[2]***
7	knotC-N-g130-1222 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=16000	POS TARG 0,0		636 Secs (636 Secs) *[==>]*	***[2]***
8	knotC-N-g130-1291 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=16000	POS TARG 0,0		638 Secs (638 Secs) *[==>]*	***[2]***
9	knotC-N-g130-1291 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=16000	POS TARG 0,0		639 Secs (639 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 15352, COS-knotC-NSpositions-splitG130 (50), failed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: ORIENT 305D TO 5 D; ORIENT 125D TO 185 D

Comments: orient constraint chosen to optimise dispersion direction
HOPR repeat of visit 10

Diagnostics

(COS-knotC-NSpositions-splitG130 (50)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(knotC-S-g130-1222 (50.002)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-S-g130-1222 (50.003)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-S-g130-1291 (50.004)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-S-g130-1291 (50.005)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1222 (50.006)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1222 (50.007)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1291 (50.008)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1291 (50.009)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d) Dec: -33 33 17.02 (-33.55473d) Equinox: J2000	Radial Velocity: 6126 km/sec	V=15.99+/-0.05 FUV=1.93E-14 erg/s/cm2	Reference Frame: ICRS

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

(3)	KNOT-C-NORTH	Offset from HARO11-KNOT-C RA Offset: 0.032 Secs Dec Offset: 2.0 Arcsec		V=18.6+/-0.2 FUV=6E-16 erg/s/cm2	Offset Position (KNOT-C-NORTH)

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
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Category=EXT-MEDIUM
Description=[EMISSION LINE NEBULA]
Extended=YES

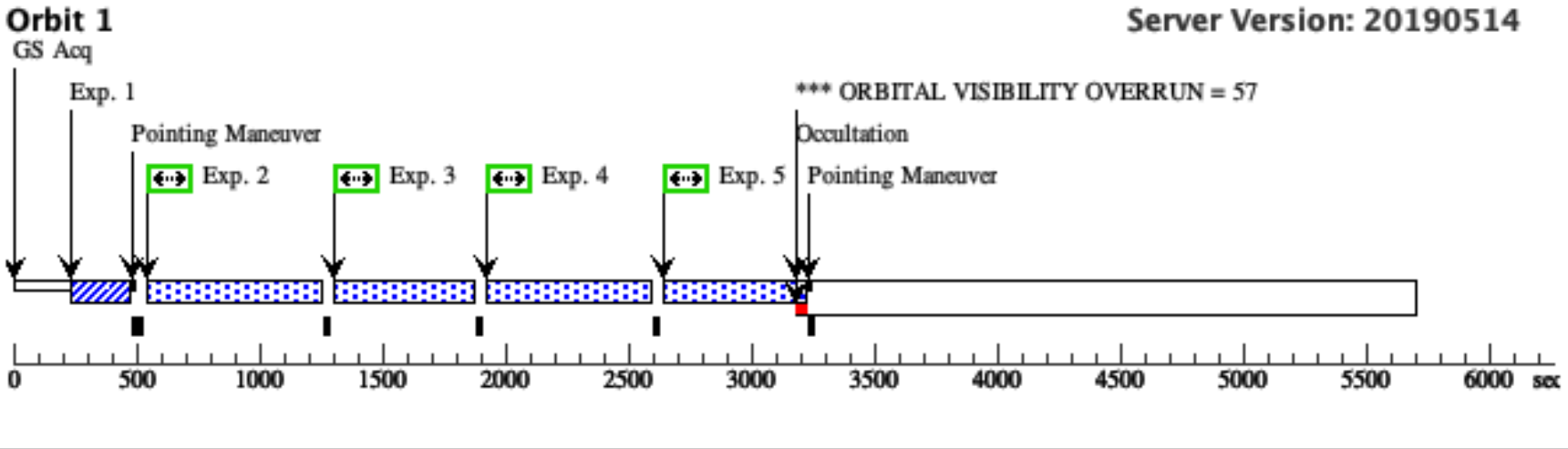
(4)	KNOT-C-SOUTH	Offset from HARO11-KNOT-C RA Offset: -0.032 Secs Dec Offset: -2.0 Arcsec		V=19.0+/-0.2 FUV=1E-15 erg/s/cm2	Offset Position (KNOT-C-SOUTH)

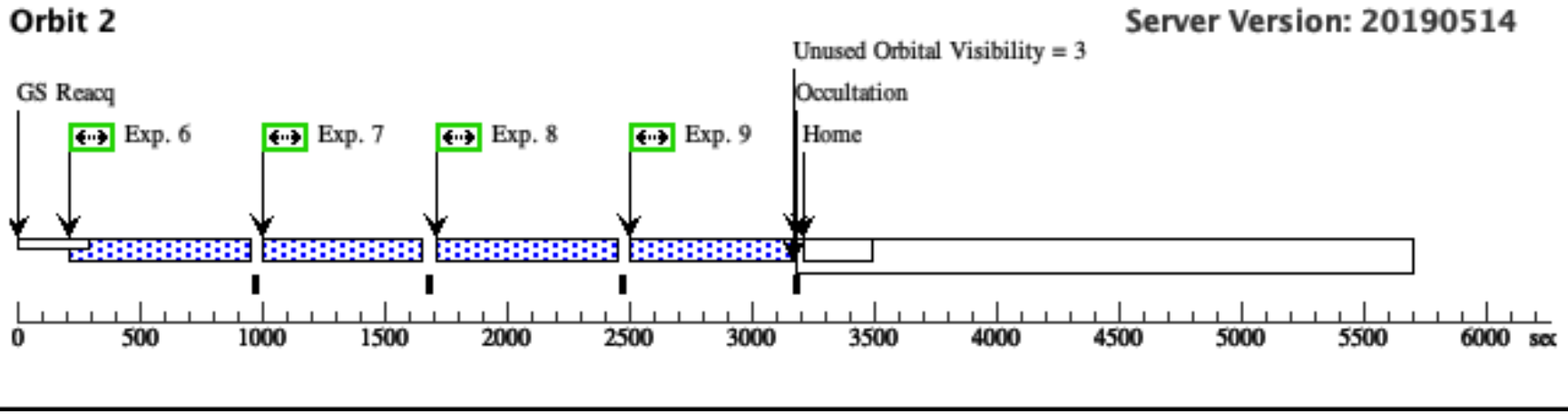
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).
Category=EXT-MEDIUM
Description=[EMISSION LINE NEBULA]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007750)	(2) HARO11-KNOT-C	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs)	
								[==>]	***[1]***
Comments: ETC run assuming quasi-point source with total intensity scaled down accordingly. *Based on existing COS/NUV imaging with MIRROR B and ACS/SBC/F140LP imaging we estimate the peak pixel intensity to be a factor of 8.4 fainter than the ETC prediction for a true point source.*									
2	knotC-S-g130-1222 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=14000			522 Secs (522 Secs)	
								[==>]	***[1]***
3	knotC-S-g130-1222 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=14000			522 Secs (522 Secs)	
								[==>]	***[1]***
4	knotC-S-g130-1291 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=14000			525 Secs (525 Secs)	
								[==>]	***[1]***
5	knotC-S-g130-1291 (1007758)	(4) KNOT-C-SOUTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=14000			525 Secs (525 Secs)	
								[==>]	***[1]***
6	knotC-N-g130-1222 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=16000	POS TARG 0,0		601 Secs (601 Secs)	
								[==>]	***[2]***
7	knotC-N-g130-1222 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=16000	POS TARG 0,0		601 Secs (601 Secs)	
								[==>]	***[2]***
8	knotC-N-g130-1291 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=16000	POS TARG 0,0		603 Secs (603 Secs)	
								[==>]	***[2]***
9	knotC-N-g130-1291 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=16000	POS TARG 0,0		603 Secs (603 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 15352, repeat-COS-knotC-Npositions-splitG130 (51) Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: ORIENT 305D TO 5 D; ORIENT 125D TO 185 D

Comments: orient constraint chosen to optimise dispersion direction
HOPR repeat of second orbit of visit 50 due to guide star failure

Diagnostics

(knotC-N-g130-1222 (51.002)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(knotC-N-g130-1222 (51.003)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

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Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	KNOT-C-NORTH	Offset from HARO11-KNOT-C RA Offset: 0.032 Secs Dec Offset: 2.0 Arcsec		V=18.6+/-0.2 FUV=6E-16 erg/s/cm2	Offset Position (KNOT-C-NORTH)

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
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Description=[EMISSION LINE NEBULA]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
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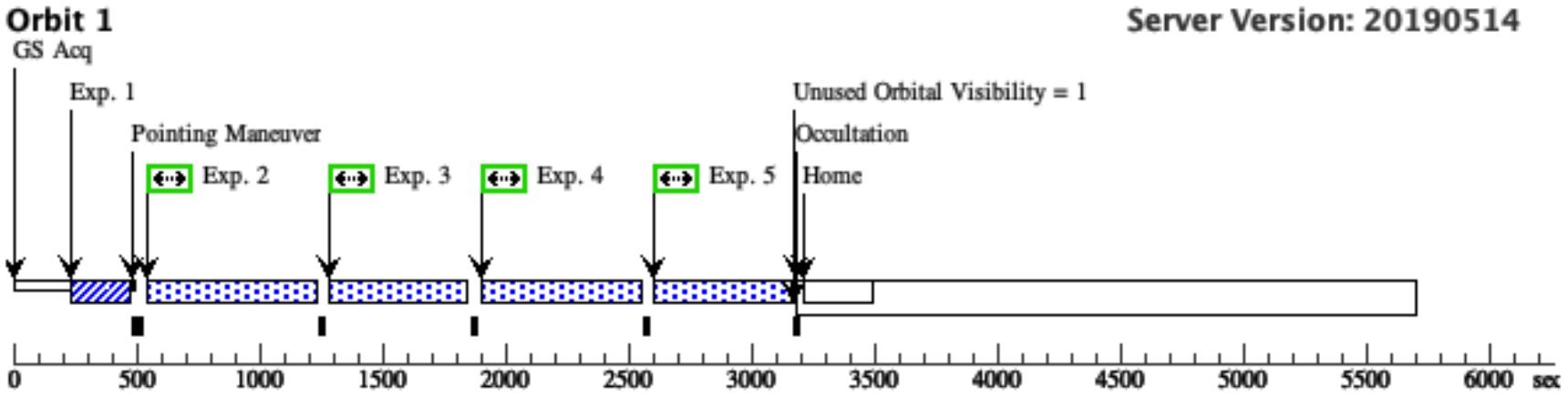
	Comments: ETC run assuming quasi-point source with total intensity scaled down accordingly. *Based on existing COS/NUV imaging with MIRROR B and ACS/SBC/F140LP imaging we estimate the peak pixel intensity to be a factor of 8.4 fainter than the ETC prediction for a true point source.*								
2	knotC-N-g130-1222 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=16000	POS TARG 0,0		509 Secs (509 Secs) *[==>]*	*[1]*
3	knotC-N-g130-1222 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=16000	POS TARG 0,0		509 Secs (509 Secs) *[==>]*	*[1]*
4	knotC-N-g130-1291 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=16000	POS TARG 0,0		509 Secs (509 Secs) *[==>]*	*[1]*
5	knotC-N-g130-1291 (1007762)	(3) KNOT-C-NORTH	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=16000	POS TARG 0,0		509 Secs (509 Secs) *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 15352, COS-knotA-splitG130andG160 (07), completed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: ORIENT 25D TO 45 D; ORIENT 205D TO 225 D

Comments: orient constraint chosen to optimise dispersion direction

Diagnostics

(COS-knotA-splitG130andG160 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(COS-knotA-splitG130andG160 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(g130-1222 (07.003)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g130-1222 (07.004)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g130-1291 (07.005)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g130-1291 (07.006)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(G160M exp 1 (07.007)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(G160M exp 2 (07.008)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(G160M exp 3 (07.009)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(G160M exp 4 (07.010)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d) Dec: -33 33 17.02 (-33.55473d) Equinox: J2000	Radial Velocity: 6126 km/sec	V=15.99+/-0.05 FUV=1.93E-14 erg/s/cm2	Reference Frame: ICRS

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

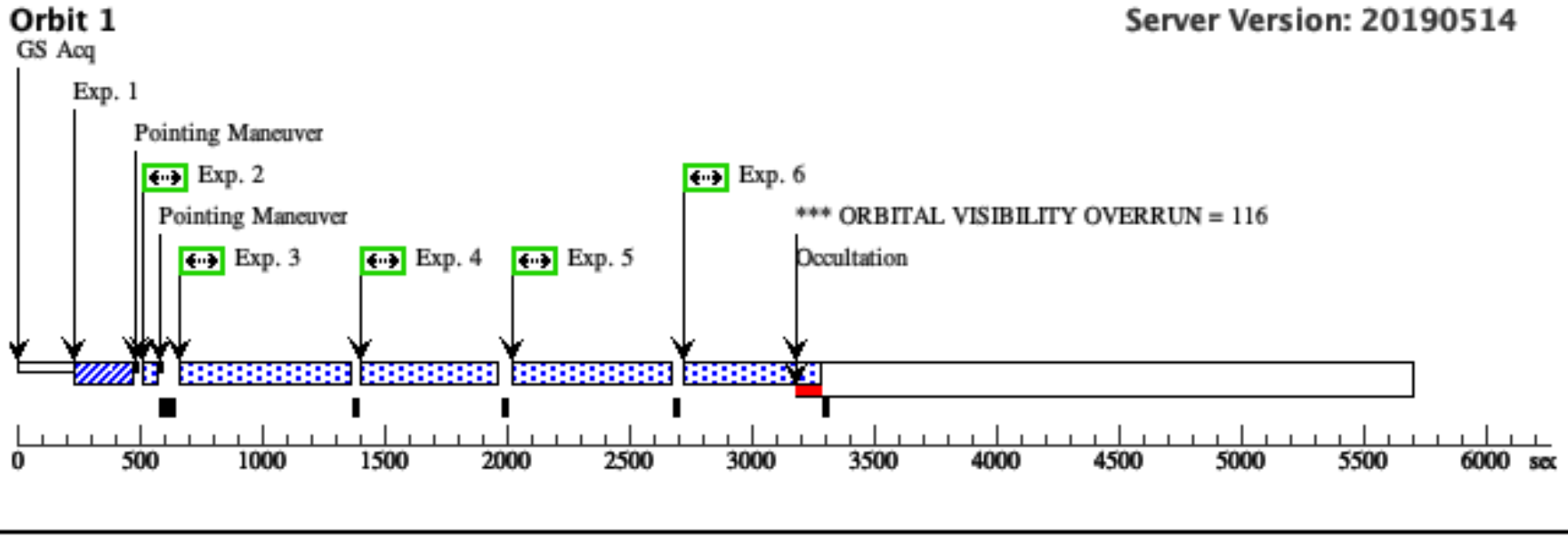
(6)	KNOT-A	Offset from HARO11-KNOT-C RA Offset: -0.342 Secs Dec Offset: -2.76 Arcsec		V=16.84+/-0.05 FUV=1.1E-14 erg/s/cm2	Offset Position (KNOT-A)

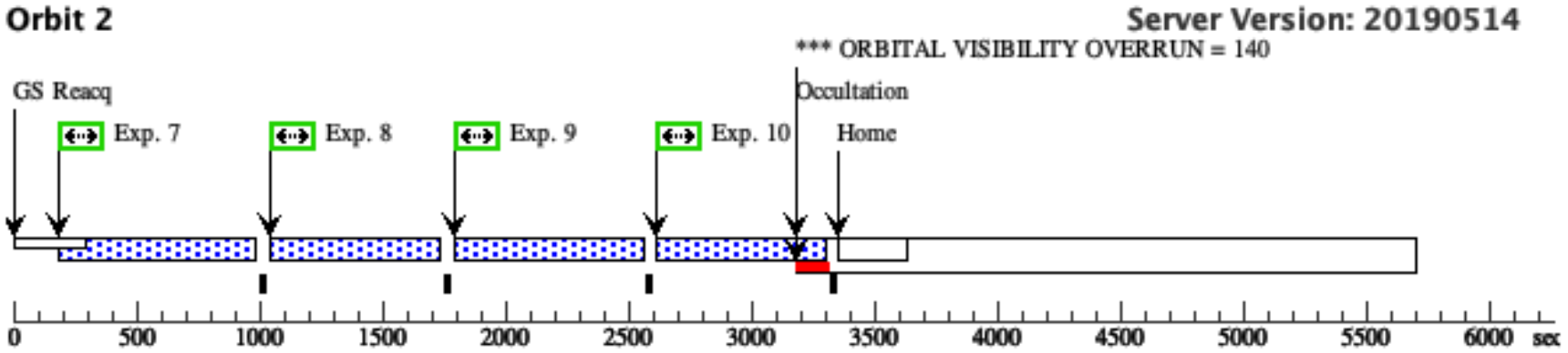
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).
Category=EXT-CLUSTER
Description=[EMISSION LINE NEBULA, MULTIPLE NUCLEI, NUCLEUS, STAR FORMING REGION]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007750)	(2) HARO11-KNOT-C	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs) *[==>]*	 ***[1]***
Comments: ETC run assuming quasi-point source with total intensity scaled down accordingly. *Based on existing COS/NUV imaging with MIRROR B and ACS/SBC/F140LP imaging we estimate the peak pixel intensity to be a factor of 8.4 fainter than the ETC prediction for a true point source.*									
2	NUV-image (1007779)	(6) KNOT-A	COS/NUV, ACCUM, PSA	MIRRORA				51 Secs (51 Secs) *[==>]*	 ***[1]***
3	g130-1222 (1007762)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=15000			512 Secs (512 Secs) *[==>]*	 ***[1]***
4	g130-1222 (1007762)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=15000			512 Secs (512 Secs) *[==>]*	 ***[1]***
5	g130-1291 (1007762)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=15000			505 Secs (505 Secs) *[==>]*	 ***[1]***
6	g130-1291 (1007762)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=15000			505 Secs (505 Secs) *[==>]*	 ***[1]***
7	G160M exp 1 (1007771)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FP-POS=2; BUFFER-TIME=15000			640 Secs (640 Secs) *[==>]*	 ***[2]***
8	G160M exp 2 (1007771)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FP-POS=3; BUFFER-TIME=15000			640 Secs (640 Secs) *[==>]*	 ***[2]***
9	G160M exp 3 (1007771)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G160M 1611 A	FP-POS=3; BUFFER-TIME=15000			639 Secs (639 Secs) *[==>]*	 ***[2]***
10	G160M exp 4 (1007771)	(6) KNOT-A	COS/FUV, TIME-TAG, PSA	G160M 1611 A	FP-POS=4; BUFFER-TIME=15000			639 Secs (639 Secs) *[==>]*	 ***[2]***

Orbit Structure





Visit

Proposal 15352, COS-knotB-splitG130andG160 (09), completed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: ORIENT 40D TO 60 D; ORIENT 220D TO 240 D

Comments: orient constraint chosen to optimise dispersion direction

Diagnostics

(COS-knotB-splitG130andG160 (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(COS-knotB-splitG130andG160 (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(g130-1222 (09.003)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g130-1222 (09.004)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g130-1291 (09.005)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g130-1291 (09.006)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g160-1577 (09.007)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g160-1577 (09.008)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g160-1611 (09.009)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

(g160-1611 (09.010)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d) Dec: -33 33 17.02 (-33.55473d) Equinox: J2000	Radial Velocity: 6126 km/sec	V=15.99+/-0.05 FUV=1.93E-14 erg/s/cm2	Reference Frame: ICRS

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

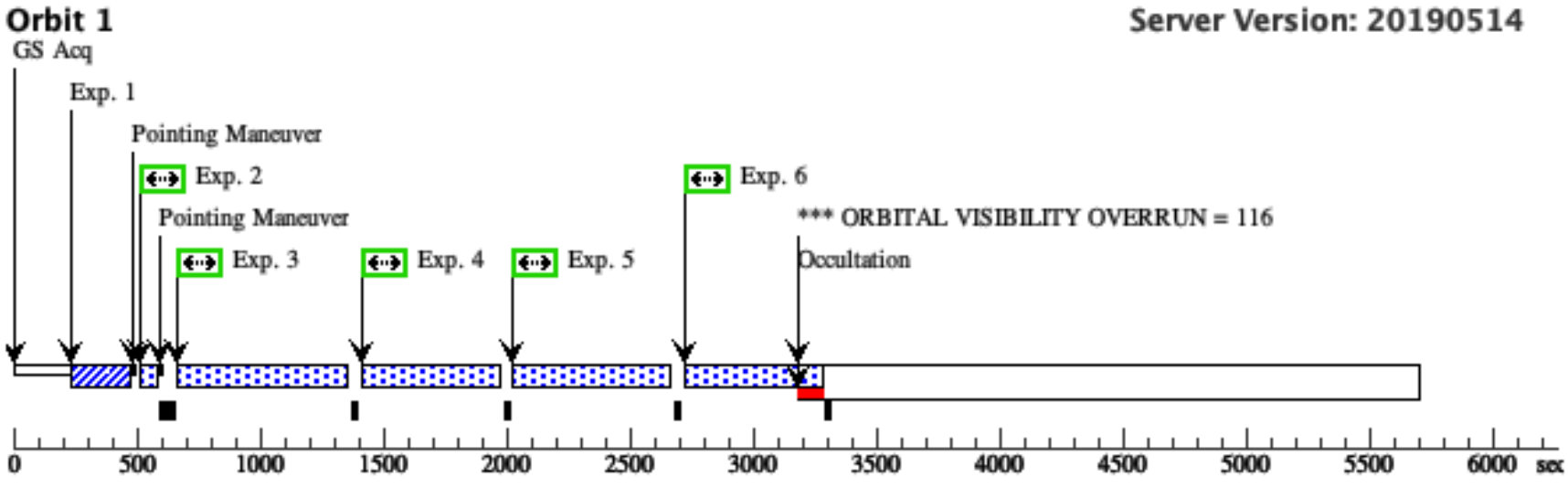
(5)	KNOT-B	Offset from HARO11-KNOT-C RA Offset: -0.249 Secs Dec Offset: 0.3 Arcsec		V=16.56+/-0.05 FUV=5.3E-15 erg/s/cm2	Offset Position (KNOT-B)

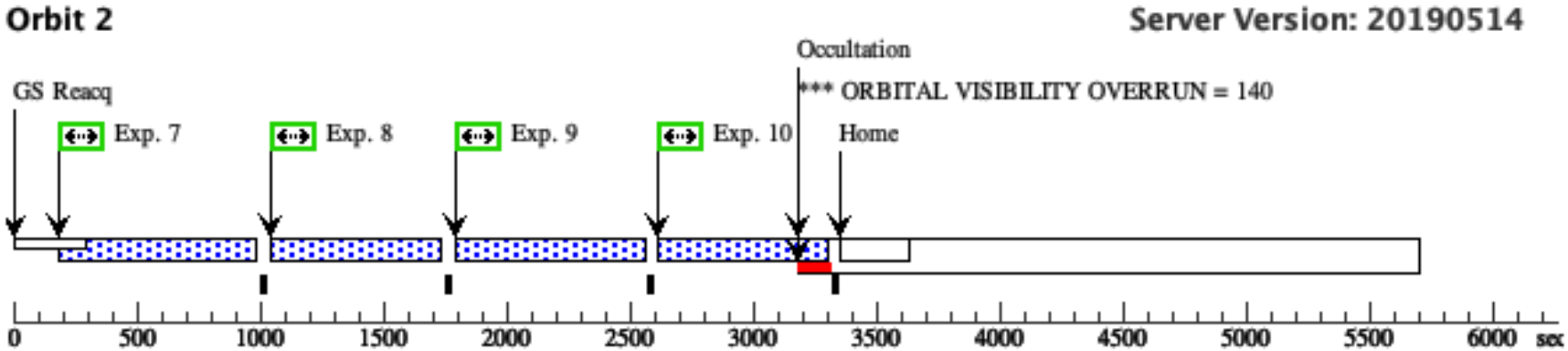
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).
Category=EXT-CLUSTER
Description=[EMISSION LINE NEBULA, MULTIPLE NUCLEI, NUCLEUS, STAR FORMING REGION]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007750)	(2) HARO11-KNOT -C	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs)	
								[==>]	***[1]***
Comments: ETC run assuming quasi-point source with total intensity scaled down accordingly. *Based on existing COS/NUV imaging with MIRROR B and ACS/SBC/F140LP imaging we estimate the peak pixel intensity to be a factor of 8.4 fainter than the ETC prediction for a true point source.*									
2	NUV-image (1007777)	(5) KNOT-B	COS/NUV, ACCUM, PSA	MIRRORA				60 Secs (60 Secs)	
								[==>]	***[1]***
3	g130-1222 (1007775)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=2; BUFFER-TIME=15 000			510 Secs (510 Secs)	
								[==>]	***[1]***
4	g130-1222 (1007775)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=15 000			510 Secs (510 Secs)	
								[==>]	***[1]***
5	g130-1291 (1007775)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=15 000			503 Secs (503 Secs)	
								[==>]	***[1]***
6	g130-1291 (1007775)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=15 000			504 Secs (504 Secs)	
								[==>]	***[1]***
7	g160-1577 (1007773)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=10 000; FP-POS=2			640 Secs (640 Secs)	
								[==>]	***[2]***
8	g160-1577 (1007773)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=10 000; FP-POS=3			640 Secs (640 Secs)	
								[==>]	***[2]***
9	g160-1611 (1007773)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=10 000; FP-POS=3			639 Secs (639 Secs)	
								[==>]	***[2]***
10	g160-1611 (1007773)	(5) KNOT-B	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=10 000; FP-POS=4			639 Secs (639 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 15352, STIS-slit-2-visit-1 (04), completed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 141.5D TO 143.5 D; ORIENT 321.5D TO 323.5 D

Diagnostics

(STIS-slit-2-visit-1 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.5070	Center Pattern=false		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d)	Radial Velocity: 6126 km/sec	V=15.99+/-0.05	Reference Frame: ICRS
		Dec: -33 33 17.02 (-33.55473d)		FUV=1.93E-14 erg/s/cm2	
		Equinox: J2000			

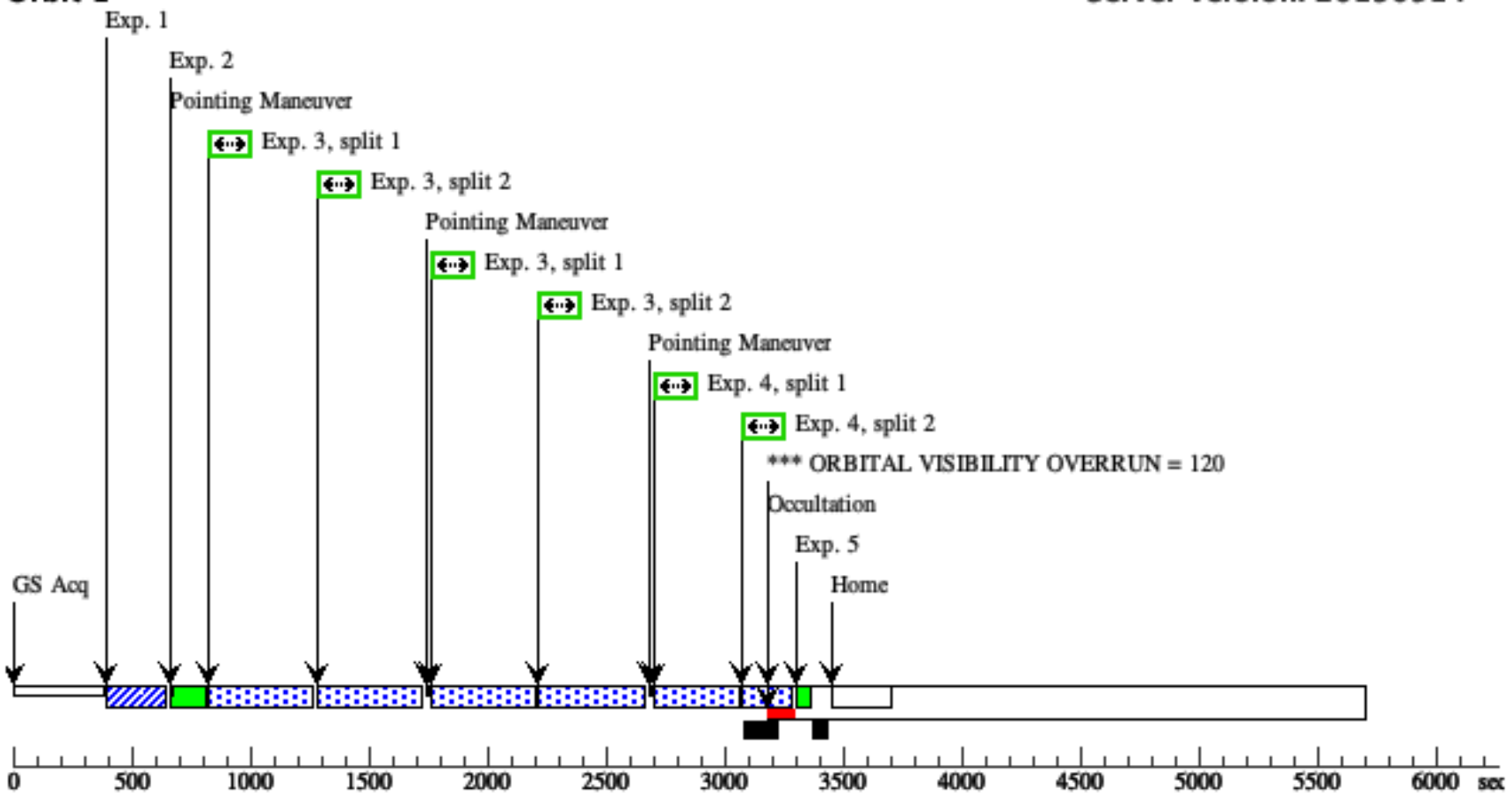
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007781)	(2) HARO11-KNOT-C	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			5 Secs (5 Secs) *[==>]*	*[1]*
2	wave430	WAVE	STIS/CCD, ACCUM, 52X0.2	G430M 5093 A				*[==>]*	*[1]*
3	g430m/5093	(2) HARO11-KNOT-C	STIS/CCD, ACCUM, 52X0.2	G430M 5093 A	CR-SPLIT=2; WAVECAL=NO		Pattern 1, Exps 3-3 in STIS-slit-2-visit-1 (04) (1)	822 Secs (1644 Secs) *[==>(Pattern 1, Split 1)]* *[==>(Pattern 1, Split 2)]* *[==>(Pattern 2, Split 1)]* *[==>(Pattern 2, Split 2)]*	*[1]*
4	g750m/6768	(2) HARO11-KNOT-C	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2			351 Secs (351 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	*[1]*
5	wave750	WAVE	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A				*[==>]*	*[1]*

Orbit Structure



Visit

Proposal 15352, STIS-slit-2-visit-2 (11), completed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: ORIENT 141.5D TO 143.5 D; ORIENT 321.5D TO 323.5 D; AFTER 04 BY 0.8 Orbits TO 1.2 Orbits

Comments: Should preferably be scheduled imediately after visit 'STIS-slit-2-visit-1'

Diagnostics

(STIS-slit-2-visit-2 (11)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS-slit-2-visit-2 (11)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d) Dec: -33 33 17.02 (-33.55473d) Equinox: J2000	Radial Velocity: 6126 km/sec	V=15.99+/-0.05 FUV=1.93E-14 erg/s/cm2	Reference Frame: ICRS

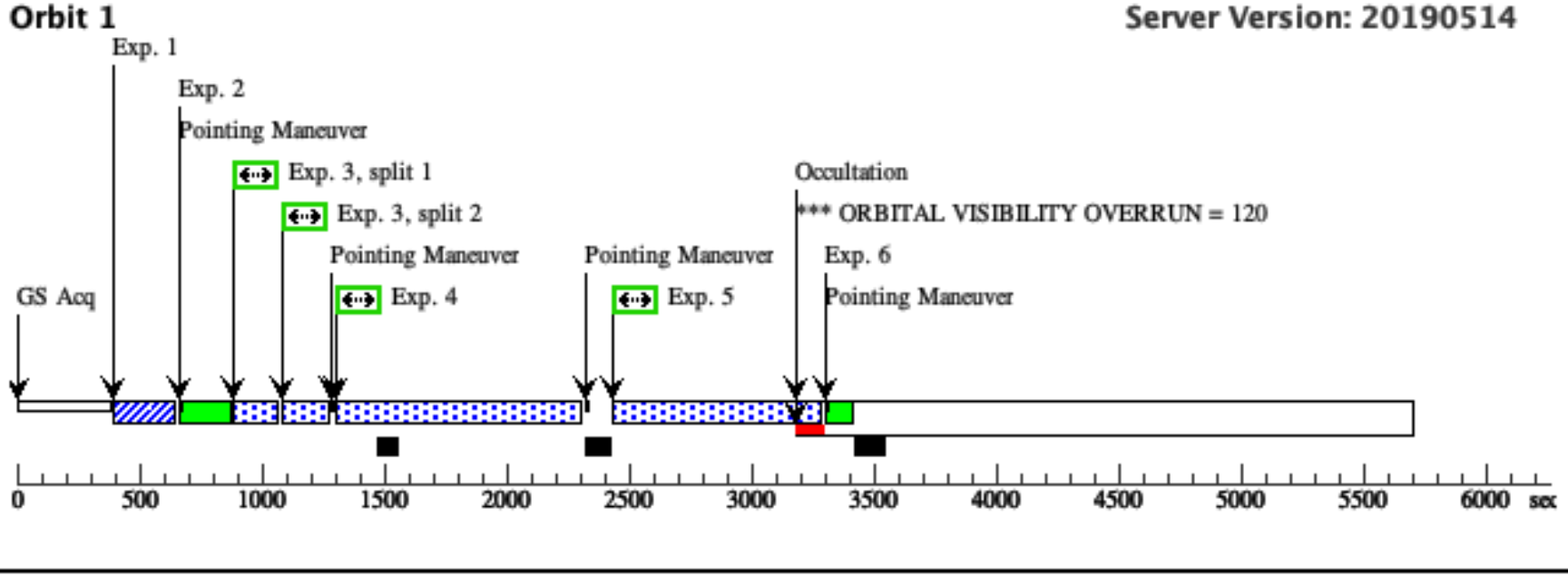
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

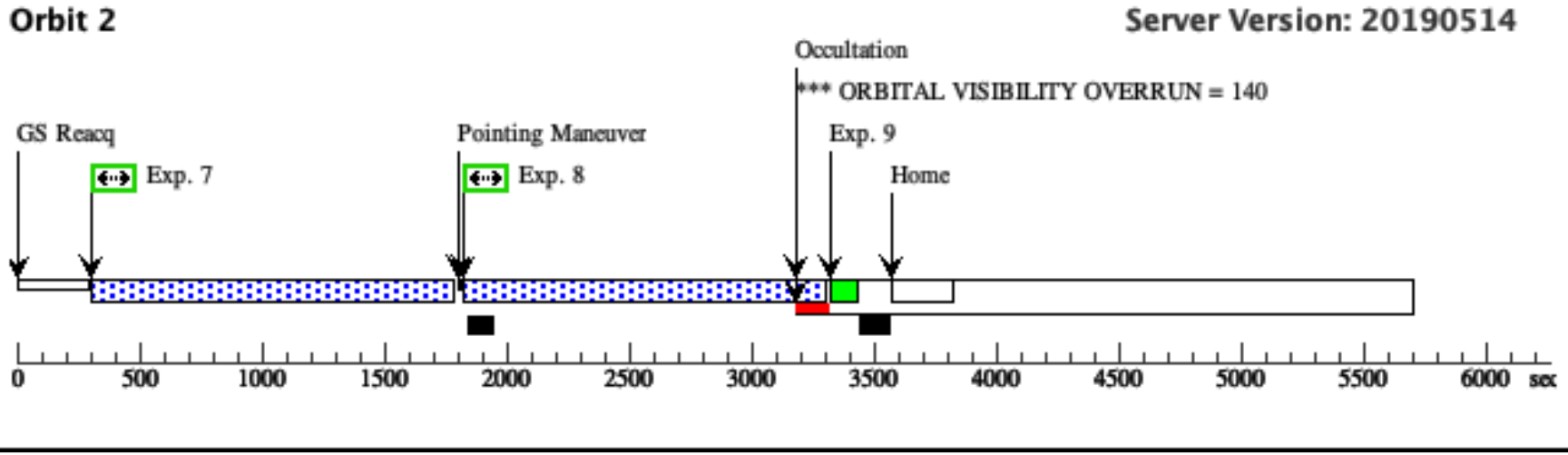
This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007781)	(2) HARO11-KNOT-C	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			5 Secs (5 Secs) *[==>]*	***[1]***
2	wave750	WAVE	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A				*[==>]*	***[1]***
3	g750m/6768	(2) HARO11-KNOT-C	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2; WAVECAL=NO	POS TARG null,0.5070		300 Secs (300 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
4	g140m/1222-1 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,0.25		837 Secs (837 Secs) *[==>]*	***[1]***
5	g140m/1222-2 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,-0.25		837 Secs (837 Secs) *[==>]*	***[1]***
6		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				*[==>]*	***[1]***
7	g140m/1222-3 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,-0.5		1469 Secs (1469 Secs) *[==>]*	***[2]***
8	g140m/1222-3 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				1469 Secs (1469 Secs) *[==>]*	***[2]***
9		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 15352, STIS-slit-1-visit-1 (12), completed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 230D TO 250 D; ORIENT 50D TO 70 D

Diagnostics

(STIS-slit-1-visit-1 (12)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.5070	Center Pattern=false		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d)	Radial Velocity: 6126 km/sec	V=15.99+/-0.05	Reference Frame: ICRS
		Dec: -33 33 17.02 (-33.55473d)		FUV=1.93E-14 erg/s/cm2	
		Equinox: J2000			

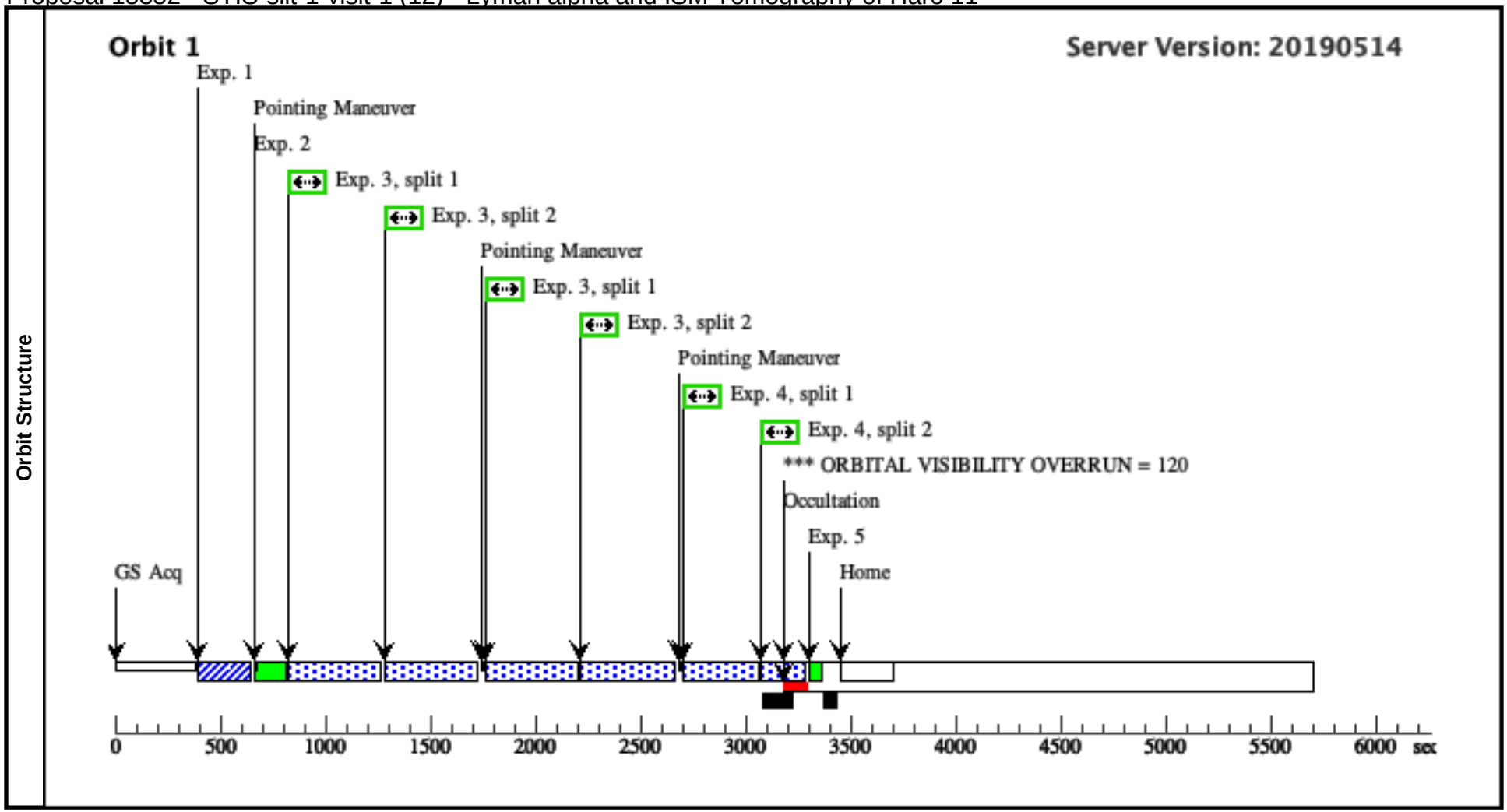
Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007781)	(2) HARO11-KNOT-C	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			5 Secs (5 Secs) *[==>]*	***[1]***
2	wave430	WAVE	STIS/CCD, ACCUM, 52X0.2	G430M 5093 A				*[==>]*	***[1]***
3	g430m/5093	(2) HARO11-KNOT-C	STIS/CCD, ACCUM, 52X0.2	G430M 5093 A	CR-SPLIT=2; WAVECAL=NO		Pattern 1, Exps 3-3 in STIS-slit-1-visit-1 (12) (1)	822 Secs (1644 Secs) *[==>(Pattern 1, Split 1)]* *[==>(Pattern 1, Split 2)]* *[==>(Pattern 2, Split 1)]* *[==>(Pattern 2, Split 2)]*	***[1]***
4	g750m/6768	(2) HARO11-KNOT-C	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2			351 Secs (351 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
5	wave750	WAVE	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A				*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15352, STIS-slit-1-visit-2 (13), completed Thu Nov 07 17:01:57 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: ORIENT 230D TO 250 D; ORIENT 50D TO 70 D; AFTER 12 BY 0.8 Orbits TO 1.2 Orbits

Comments: Should preferably be scheduled imediately after visit 'STIS-slit-1-visit-1'

Diagnostics

(STIS-slit-1-visit-2 (13)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS-slit-1-visit-2 (13)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HARO11-KNOT-C	RA: 00 36 52.7030 (9.2195958d) Dec: -33 33 17.02 (-33.55473d) Equinox: J2000	Radial Velocity: 6126 km/sec	V=15.99+/-0.05 FUV=1.93E-14 erg/s/cm2	Reference Frame: ICRS

Comments: V-band magnitude refers to total value in a 2.5 arcsec aperture (measured in HST/ACS/WFC/F550M image).
FUV refers to flux at 1530 Angstrom in 2.5 arcsec COS aperture (measured in HST/ACS/SBC/F140LP image).

This target is very compact, in an unconfused region of the galaxy, and hence ideal for target acquisition.
This source is, however, not a true point source. Its peak pixel counts for COS/NUV/MIRRORB and ACS/SBC/F140LP are both about a factor 8 lower than the ETC expectations for a true point source. Hence, using this source as a reference target with COS/NUV/MIRROR-A is safe.
Category=EXT-CLUSTER
Description=[NUCLEUS, STAR FORMING REGION]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	TargAcq (1007781)	(2) HARO11-KNOT-C	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			5 Secs (5 Secs) *[==>]*	 ***[1]***
2	wave750	WAVE	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A				*[==>]*	***[1]***
3	g750m/6768	(2) HARO11-KNOT-C	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2; WAVECAL=NO	POS TARG null,0.5070		300 Secs (300 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
4	g140m/1222-1 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,0.25		837 Secs (837 Secs) *[==>]*	 ***[1]***
5	g140m/1222-2 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,-0.25		837 Secs (837 Secs) *[==>]*	 ***[1]***
6		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				*[==>]*	***[1]***
7	g140m/1222-3 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A		POS TARG null,-0.5		1469 Secs (1469 Secs) *[==>]*	 ***[2]***
8	g140m/1222-3 (1007784)	(2) HARO11-KNOT-C	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				1469 Secs (1469 Secs) *[==>]*	 ***[2]***
9		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1222 A				*[==>]*	***[2]***

Orbit Structure