



14660 - Morphology and Orientation of QSO Absorber Host Galaxies at $z < 1.5$ Detected with VLT/MUSE1/st

Cycle: 24, Proposal Category: GO

(Availability Mode: SUPPORTED)

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) HE0238-1904	ACS/WFC	1	18-Jan-2017 21:03:31.0	yes
02	(3) TRIPLETPB6291Q0107	ACS/WFC	1	18-Jan-2017 21:03:32.0	yes
03	(5) Q1354+048	ACS/WFC	1	18-Jan-2017 21:03:33.0	yes
05	(7) TEX0206-048	ACS/WFC	1	18-Jan-2017 21:03:34.0	yes
06	(2) 3C57	ACS/WFC	1	18-Jan-2017 21:03:35.0	yes

5 Total Orbits Used

ABSTRACT

Gas accretion and galactic winds are two of the most important, but also most poorly understood ingredients of models for the evolution of galaxies. QSO absorption line spectroscopy enables us to study the gas around galaxies, nearly all of which is far too diffuse to see in emission. This unbiased method allows us to probe even low-mass galaxies, which dominate the galaxy number counts and are likely to be closest to absorbers, and is ideal for studying metal-enriched gas in galaxy outflows or inflows. Because outflowing gas is thought to be most prominent in the directions perpendicular to the disk, while infalling gas may be strongest in the plane of the disk, knowing the orientation of the galaxy relative to the line of sight of the QSO is critical. However, the usefulness of absorption line studies is generally limited by the small number of galaxies at close impact parameters to the QSO line of sight for which redshifts are available. To remedy this, we have successfully used the MUSE integral field unit on the Very Large Telescope to detect and obtain redshifts for hundreds of galaxies < 250 kpc from the sight lines to 16 luminous QSOs at $0.4 < z < 1.5$ for which high-quality archival HST/COS data (~ 200 orbits) is available. While MUSE is highly efficient at detecting and localizing galaxies close to QSO sight lines, the image quality is insufficient to determine the morphologies and orientations of the detected objects. We propose to use ACS/WFC to obtain high-resolution images of our MUSE fields in order to determine the relation between QSO absorbers (including HI, OVI, SiIV, CIV, NV, and MgII), and galaxy position angle and morphology.

OBSERVING DESCRIPTION

We request a total of 6 orbits for this program, covering 7 fields total, with two of these fields being obtained in one ACS pointing. The objects PB6291 and Q0107-0235 are QSOs within 1 arcmin of one another on the sky, and therefore we require only a single pointing to cover both. For these two objects (PB6291 and Q0107-0235), we must arrange the orientation at 32 degrees in order to fit both MUSE fields of view within the ACS field of view without overlapping the chip gap. We account for dithering in this fit. This heavily restricts the window in which this visit can be

completed.

Each of the 7 QSOs at $0.4 < z(\text{QSO}) < 1.5$ requested here will be observed for one orbit with ACS/WFC in the F814W filter. The F814W filter is chosen to probe the optical continuum and for its high sensitivity of the galaxies in the range $z < 1.5$, which are detected by MUSE in optical nebular emission (one or more of H-alpha, [O III](4959,5007), and [O II](3727)). The approximate transmission range of this filter is 6625A-9495A, for which the corresponding rest wavelength range is 6022A-8630A for a $z \sim 0.1$ galaxy and 3312A-4747A for a $z = 1$ galaxy. These galaxies are correlated with hydrogen and metal absorption line systems detected in high-quality UV spectra of the QSOs with HST/COS ($R \sim 18,000$, $S/N = 10-20$), particularly HI, C IV, O VI, and Si IV.

We use the ACS ETC to determine the S/N of the faintest objects we will detect in a single orbit (~ 2400 sec integration time) in the F814W band, based on magnitudes measured in the available archival fields. A spiral type galaxy at $z \sim 0.1$ with an I-band magnitude of 26 spanning 2 arcsec in diameter can be detected in a single orbit at a $S/N \sim 6$, while the same galaxy at $z \sim 1$ can be detected in a single orbit at a $S/N \sim 8$. These numbers are supported by the detections we have already made in the archival fields.

In a single orbit, we will obtain four images with a standard four point line dither. This offset will allow us to eliminate detector artifacts and cosmic rays in addition to offering a better sampling of the ACS chip gap (minimum of three exposures at each pixel with this pattern). The MUSE field of view is 1 arcmin x 1 arcmin. Therefore, we will position the QSO within the ACS field of view (3 arcmin x 3 arcmin) at the WFC1 focal point.

We propose standard observations as laid out in the ACS handbook. The single orbit observations for a visibility time of 54 minutes will proceed as follows:

Guide star acquisition (6 minutes) - WFC overhead for the first exposure (4 minutes) - Spacecraft slew (0.5 minutes) - First science exposure (20 minutes) - WFC overhead for subsequent science exposure (2.5 minutes) - Second science exposure (21 minutes)

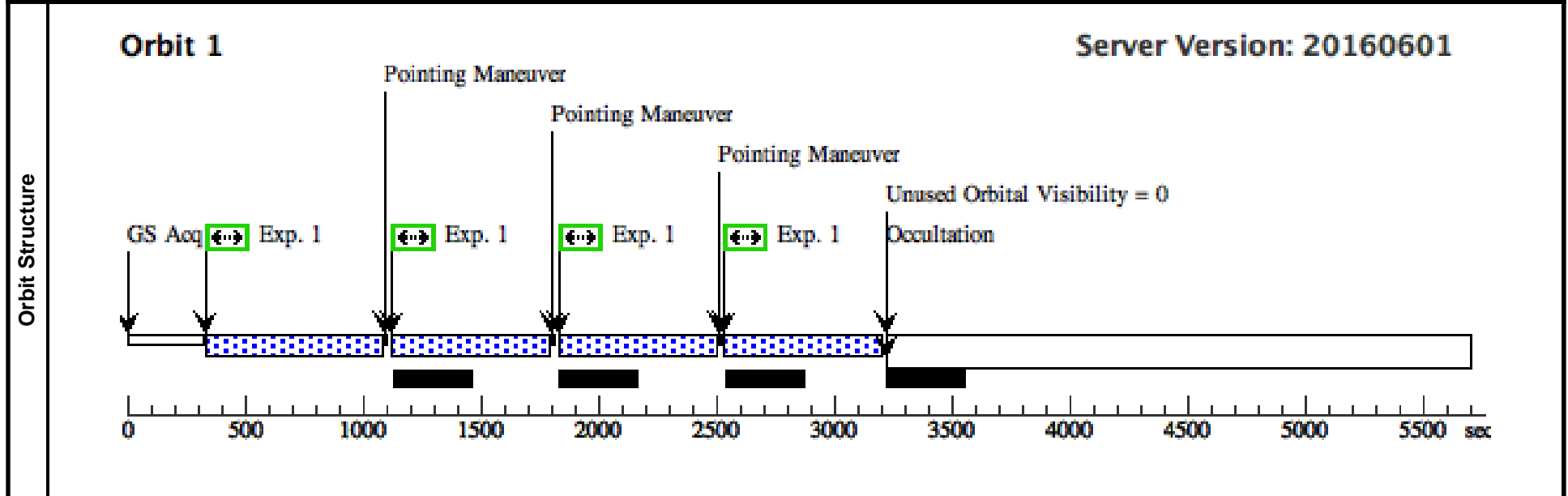
This is a total on-source integration time of 41 minutes, and a total orbit time of 54 minutes.

Visit	Proposal 14660, HE0238-1904 (01), implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 345D TO 30 D; ORIENT 173D TO 212 D; ORIENT 235D TO 286 D		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=2.994 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.27 Angle Between Sides= Center Pattern=false	(1)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HE0238-1904	RA: 02 40 32.6000 (40.1358333d) Dec: -18 51 51.00 (-18.86417d) Equinox: J2000	Redshift: 0.631	V=15.0 z=0.631	Reference Frame: ICRS

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	HE0238-1904-01 (ACS.im.821755)	(1) HE0238-1904	ACS/WFC, ACCUM, WFC1	F814W	GAIN=2.0	POS TARG 40,0	Pattern 2, Exps 1-1 in HE0238-1904 (01) (2)	550 Secs (2182 Secs) [=>546.0 Secs (Pattern 1)] [=>546.0 Secs (Pattern 2)] [=>545.0 Secs (Pattern 3)] [=>545.0 Secs (Pattern 4)]	[1]

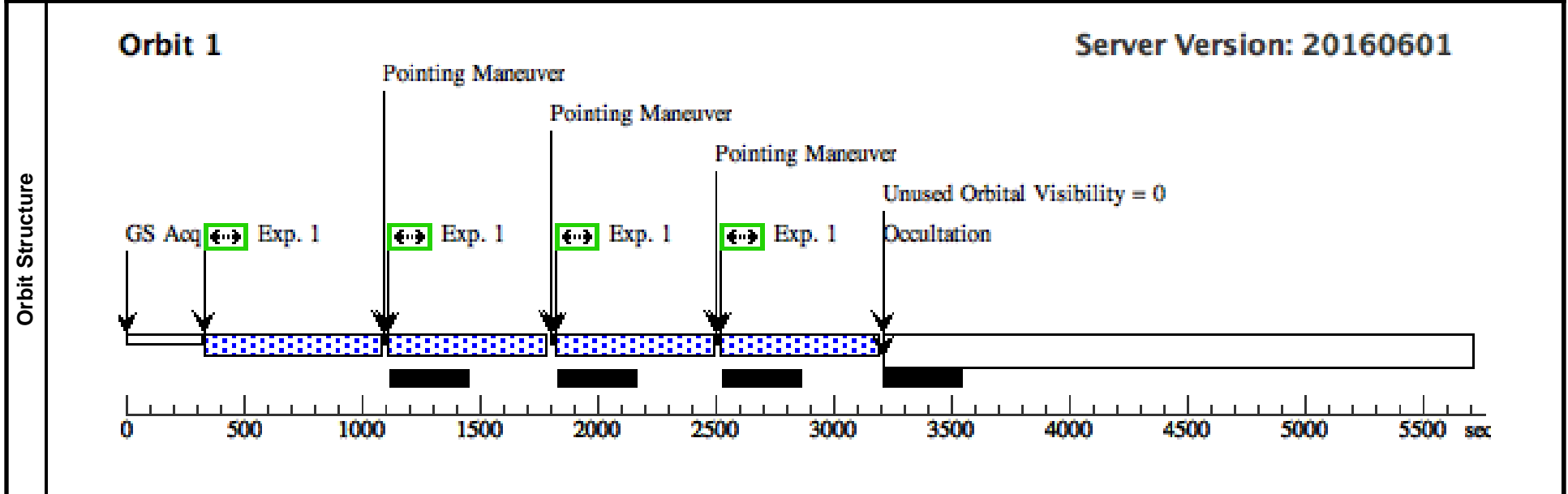


Visit	Proposal 14660, Tripletx2 (02), implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 30D TO 38 D <i>Comments: This visit observes two targets at the same time, PB6291 and Q0107-0235. Therefore the orientation is very strict and cannot be relaxed.</i>		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=2.994 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.27 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	TRIPLETPB6291Q0107	RA: 01 10 16.2684 (17.5677850d) Dec: -02 18 51.00 (-2.31417d) Equinox: J2000	Redshift: 0.956	V=17.6 z=0.956	Reference Frame: ICRS

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	PB6291-01 (ACS.im.82 1756)	(3) TRIPLETPB6291Q0107	ACS/WFC, ACCUM, WFC1	F814W	GAIN=2.0	POS TARG -20,-18	Pattern 2, Exps 1-1 in Tripletx2 (02) (2)	550 Secs (2171 Secs) [=>542.0 Secs (Pattern 1)] [=>543.0 Secs (Pattern 2)] [=>543.0 Secs (Pattern 3)] [=>543.0 Secs (Pattern 4)]	[1]

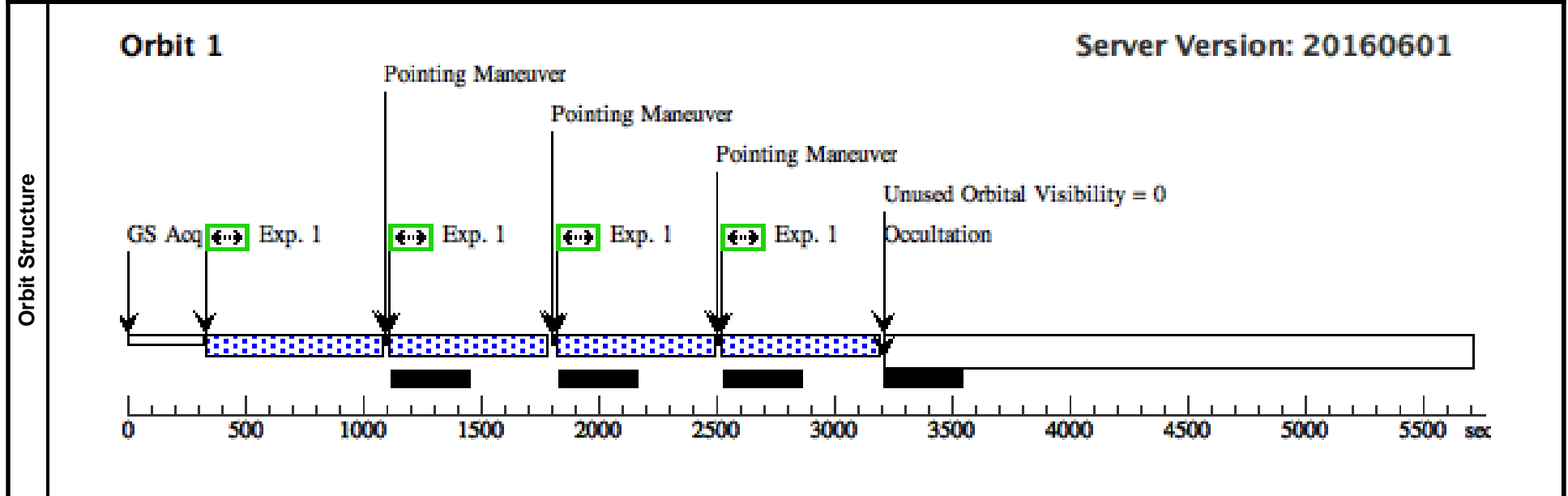


Visit	Proposal 14660, Q1354+048 (03), implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 355D TO 0 D; ORIENT 75D TO 170 D; ORIENT 263D TO 270 D; ORIENT 300D TO 330 D		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=2.994 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.27 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(5)	Q1354+048	RA: 13 57 26.2380 (209.3593250d) Dec: +04 35 42.14 (4.59504d) Equinox: J2000	Redshift: 1.234	V=17.23 z=1.234	Reference Frame: ICRS

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Q1354+048-01 (ACS.im.821757)	(5) Q1354+048	ACS/WFC, ACCUM, WFC1	F814W	GAIN=2.0	POS TARG -10,-10	Pattern 2, Exps 1-1 in Q1354+048 (03) (2)	545 Secs (2171 Secs) [=>542.0 Secs (Pattern 1)] [=>543.0 Secs (Pattern 2)] [=>543.0 Secs (Pattern 3)] [=>543.0 Secs (Pattern 4)]	[1]

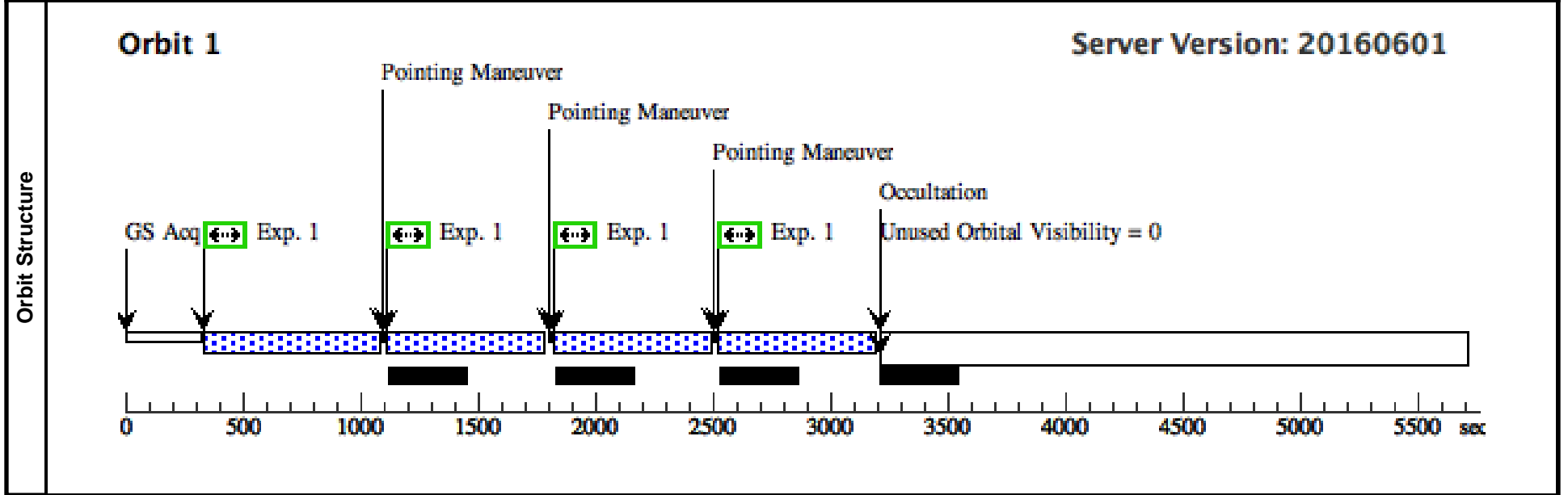


Visit	Proposal 14660, TEX0206-048 (05), implementation		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: ACS/WFC		
	Special Requirements: ORIENT 25D TO 55 D; ORIENT 125D TO 180 D; ORIENT 297D TO 346 D		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=2.994 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.27 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(7)	TEX0206-048	RA: 02 09 30.8000 (32.3783333d) Dec: -04 38 27.00 (-4.64083d) Equinox: J2000	Redshift: 1.128	V=17.2 z=1.128	Reference Frame: ICRS

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	TEX0206-048-01 (ACS.im.821760)	(7) TEX0206-048	ACS/WFC, ACCUM, WFC1	F814W	GAIN=2.0	POS TARG 0,0	Pattern 2, Exps 1-1 in TEX0206-048 (05) (2)	545 Secs (2171 Secs) [=>542.0 Secs (Pattern 1)] [=>543.0 Secs (Pattern 2)] [=>543.0 Secs (Pattern 3)] [=>543.0 Secs (Pattern 4)]	[1]



Proposal 14660 - 3C57 (06) - Morphology and Orientation of QSO Absorber Host Galaxies at z<1.5 Detected with VLT/MUSE1/st

Thu Jan 19 02:03:36 GMT 2017

Visit	Proposal 14660, 3C57 (06) Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 270D TO 103 D		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=2.994 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.27 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	3C57	RA: 02 01 57.1000 (30.4879167d) Dec: -11 32 34.00 (-11.54278d) Equinox: J2000	Redshift: 0.669	V=16.4 z=0.669	Reference Frame: ICRS

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	3C57 (ACS.im.82 1761)	(2) 3C57	ACS/WFC, ACCUM, WFC1	F814W			POS TARG 10,-10	Pattern 2, Exps 1-1 in 3C57 (06) (2)	550 Secs (2179 Secs) [=>544.0 Secs (Pattern 1)] [=>545.0 Secs (Pattern 2)] [=>545.0 Secs (Pattern 3)] [=>545.0 Secs (Pattern 4)]

