16644 - The ionizing output of galaxies undergoing the most extreme feedback

Cycle: 29, Proposal Category: GO

(UV Initiative)

(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?*
11	(1) J0826+43	ACS/SBC	1	02-Mar-2022 11:01:14.0	yes
21	(2) J0944+09	ACS/SBC	2	02-Mar-2022 11:01:15.0	yes
22	(2) J0944+09	ACS/SBC	2	02-Mar-2022 11:01:15.0	yes
31	(3) J1104+59	ACS/SBC	2	02-Mar-2022 11:01:16.0	yes
41	(4) J1506+54	ACS/SBC	1	02-Mar-2022 11:01:17.0	yes
51	(5) J1713+28	ACS/SBC	2	02-Mar-2022 11:01:17.0	yes
52	(5) J1713+28	ACS/SBC	2	02-Mar-2022 11:01:18.0	yes
53	(5) J1713+28	ACS/SBC	1	02-Mar-2022 11:01:18.0	yes
61	(6) J0905+57	ACS/SBC	1	02-Mar-2022 11:01:19.0	yes

14 Total Orbits Used

ABSTRACT

Pinning down the processes at work during the last phase-change of our universe - the epoch of reionization, EoR - remains of paramount importance. While enormous progress has been made on many fronts, we still do not know the nature of the population of objects that was responsible. Recent results suggest that the rapid conclusion of the EoR should have been driven by an ensemble of very compact star-forming galaxies. The major missing piece of this puzzle, however, is knowledge of their emergent ionizing luminosity, and how this varies with galaxy type. How Lyman continuum radiation (LyC) escapes from galaxies presents an ongoing challenge that requires empirical confrontation.

Recent surveys at low redshift, where the ionizing flux can be measured, have implicated feedback from star-formation in the emission of LyC: winds are likely necessary to clear dense gas from the ISM. However no strong conclusions can currently be drawn, due to a limited dynamic range in existing surveys. Here we propose to test this feedback-based hypothesis by stretching it to its absolute limit along one axis of the parameter space: we will observe the direct LyC output of galaxies undergoing the most extreme feedback. The proposed starbursts have star-formation densities and outflow velocities an order of magnitude higher than any currently surveyed in LyC. We expect that if there is any population that is stripping its own interstellar medium, leaving channels clear for LyC escape, then it is this one. We will use the results of this very efficient program (six galaxies in just 14 orbits) to empirically evaluate the role to similar compact starbursts in cosmic reionization.

OBSERVING DESCRIPTION

This program will obtain ultraviolet slitless spectroscopy of galaxies, using the PR130L element in the solar blind channel of ACS. We will also obtain direct imaging of each target using the F125LP filter.

The sample comprises six extremely compact star-forming galaxies with redshifts between 0.4 and 0.75. The targets will be observed for between 1 and 5 orbits each, depending upon brightness. The strategy within an orbit therefore depends upon the number of orbits, and breaks down as follows:
- For targets requiring one orbit, the PR130L observation is split into two exposures in the middle of the orbit, and dithered using (small) POS-TARGs for PSF recovery. Direct images are taken before the first spectrum and after the second.
- For targets requiring two orbits, the same splitting is used but the PR130L spectra are almost a whole orbit in length; the second spectrum (and direct image) is taken during the second orbit.
- For targets requiring more than two orbits we do the same as above. However these observations are split into visits of 2-orbit length, in order to minimize the influence of dark current; this increases rapidly with temperature (time since observations begin), and becomes detrimental after two orbits.

The six targets are labelled 1-6 in APT. Visit numbers begin with the corresponding numbers. E.g. 11 is the single visit to observe target #1. Visits 51,52,53 are the three split visits to observe target #5.

Visit

Proposal 16644, Visit 11, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

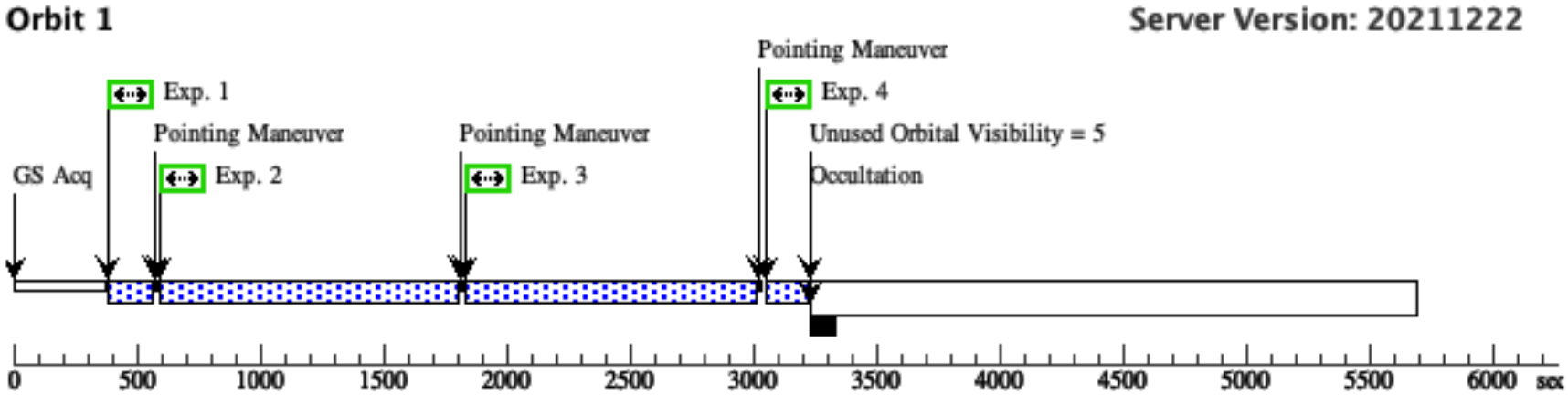
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	J0826+43	RA: 08 26 38.4096 (126.6600400d) Dec: +43 05 29.44 (43.09151d) Equinox: J2000		V=19.3 FUV=21.9 (AB)	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528424)	(1) J0826+43	ACS/SBC, ACCUM, SBC	F125LP				110 Secs (110 Secs)	
								[==>]	***[1]***
2	(1528449)	(1) J0826+43	ACS/SBC, ACCUM, SBC	PR130L				1150 Secs (1150 Secs)	
								[==>]	***[1]***
3	(1528449)	(1) J0826+43	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		1150 Secs (1150 Secs)	
								[==>]	***[1]***
4	(1528424)	(1) J0826+43	ACS/SBC, ACCUM, SBC	F125LP				110 Secs (110 Secs)	
								[==>]	***[1]***

Orbit Structure



Visit

Proposal 16644, Visit 21, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: Warning

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Diagnostics

(Visit 21) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

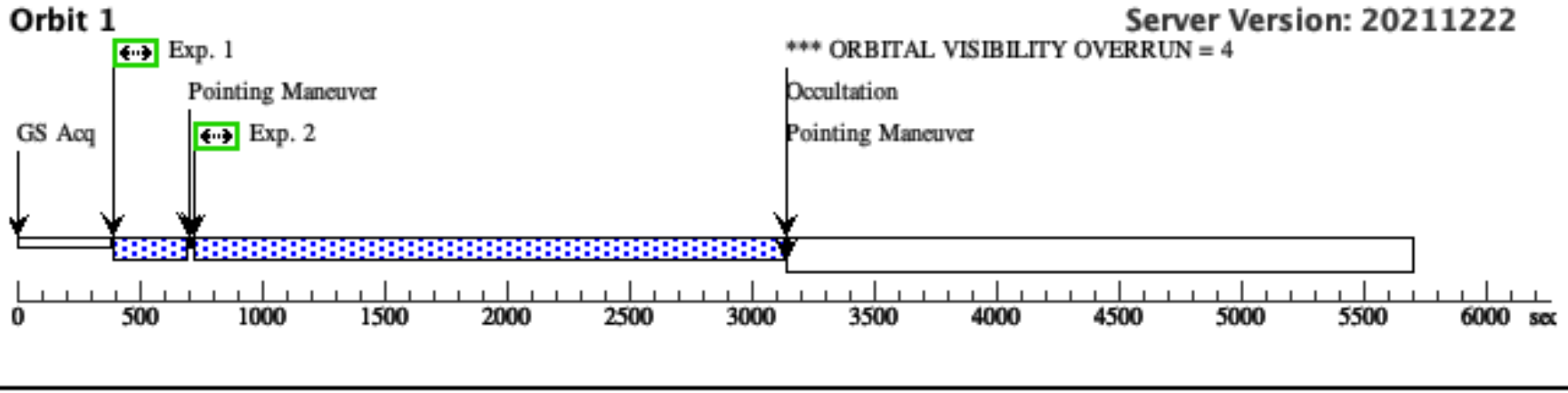
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	J0944+09	RA: 09 44 17.8512 (146.0743800d) Dec: +09 30 19.37 (9.50538d) Equinox: J2000		V=19.7 FUV=22.6 (AB)	Reference Frame: ICRS

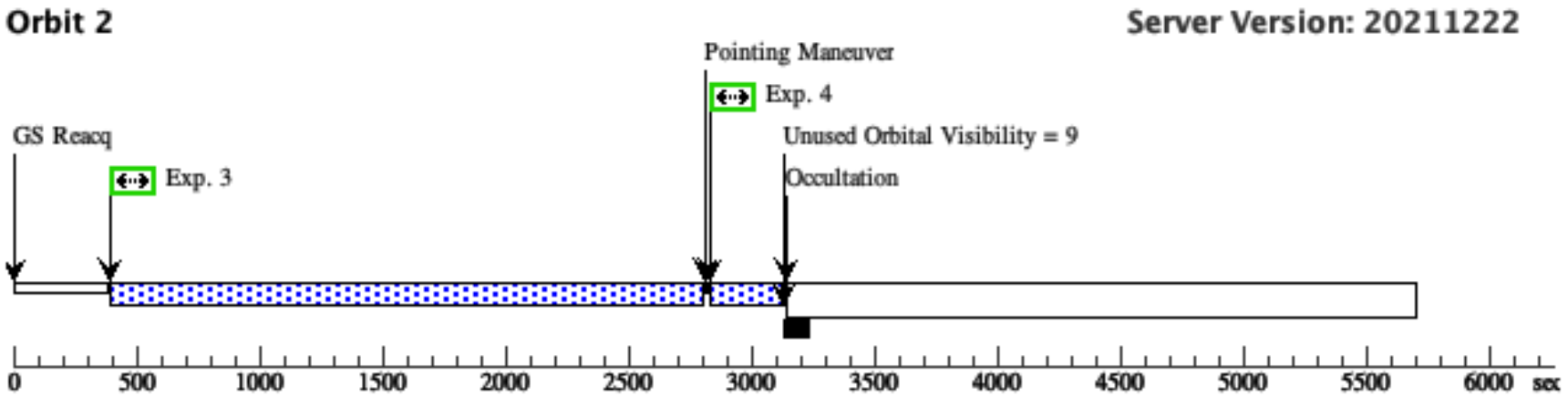
Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528430)	(2) J0944+09	ACS/SBC, ACCUM, SBC	F125LP		GS ACQ SCENARIO BASE1BE		230 Secs (230 Secs)	
								[==>]	***[1]***
2	(1528453)	(2) J0944+09	ACS/SBC, ACCUM, SBC	PR130L				2350 Secs (2350 Secs)	
								[==>]	***[1]***
3	(1528453)	(2) J0944+09	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		2380 Secs (2380 Secs)	
								[==>]	***[2]***
4	(1528430)	(2) J0944+09	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 16644, Visit 22, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

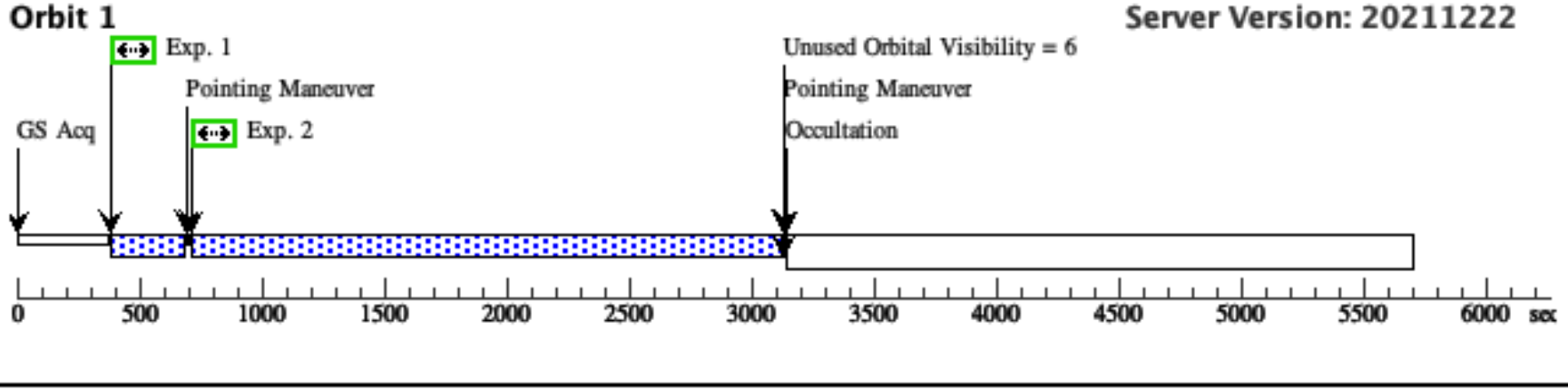
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	J0944+09	RA: 09 44 17.8512 (146.0743800d) Dec: +09 30 19.37 (9.50538d) Equinox: J2000		V=19.7 FUV=22.6 (AB)	Reference Frame: ICRS

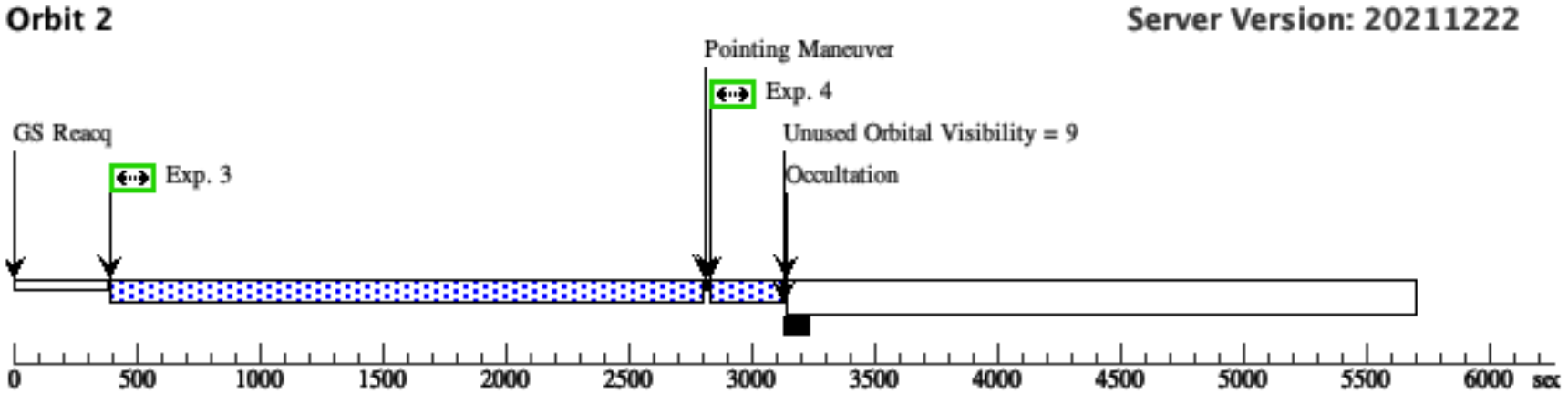
Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528430)	(2) J0944+09	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs) *[==>]*	 ***[1]***
2	(1528453)	(2) J0944+09	ACS/SBC, ACCUM, SBC	PR130L				2350 Secs (2350 Secs) *[==>]*	 ***[1]***
3	(1528453)	(2) J0944+09	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		2380 Secs (2380 Secs) *[==>]*	 ***[2]***
4	(1528430)	(2) J0944+09	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs) *[==>]*	 ***[2]***

Orbit Structure





Visit

Proposal 16644, Visit 31, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

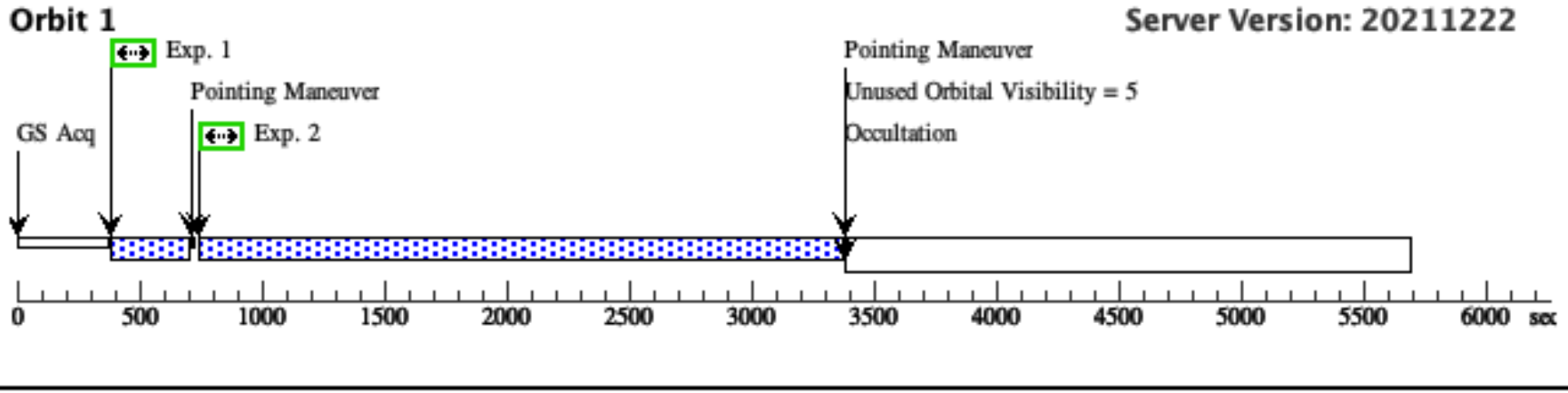
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	J1104+59	RA: 11 04 37.4592 (166.1560800d) Dec: +59 46 39.61 (59.77767d) Equinox: J2000		V=19.7 FUV=21.0 (AB)	Reference Frame: ICRS

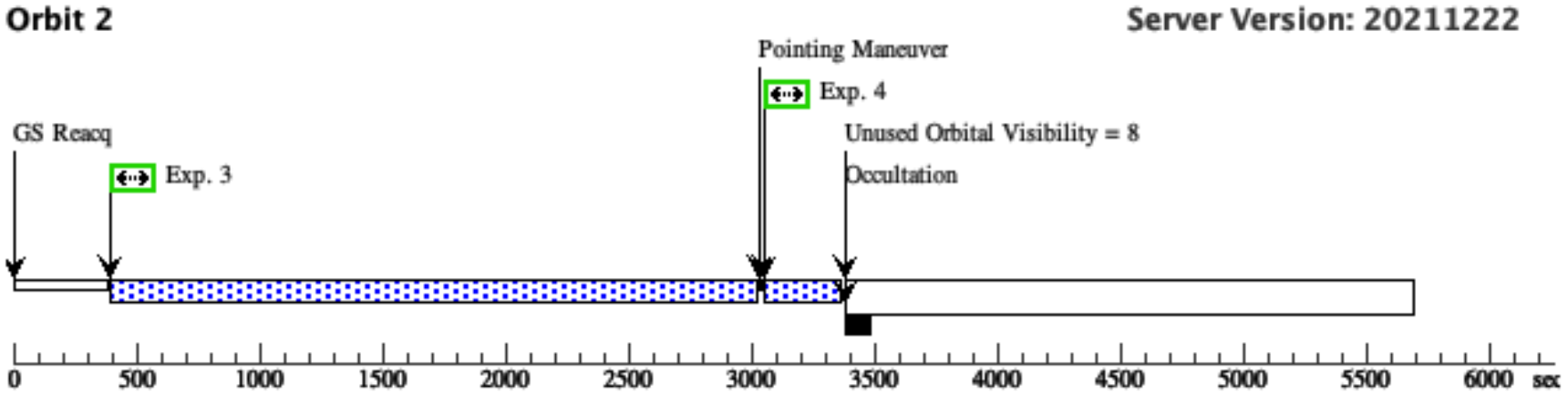
Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528433)	(3) J1104+59	ACS/SBC, ACCUM, SBC	F125LP				255 Secs (255 Secs) *[==>]*	 ***[1]***
2	(1528454)	(3) J1104+59	ACS/SBC, ACCUM, SBC	PR130L				2570 Secs (2570 Secs) *[==>]*	 ***[1]***
3	(1528454)	(3) J1104+59	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		2600 Secs (2600 Secs) *[==>]*	 ***[2]***
4	(1528433)	(3) J1104+59	ACS/SBC, ACCUM, SBC	F125LP				255 Secs (255 Secs) *[==>]*	 ***[2]***

Orbit Structure





Visit

Proposal 16644, Visit 41, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

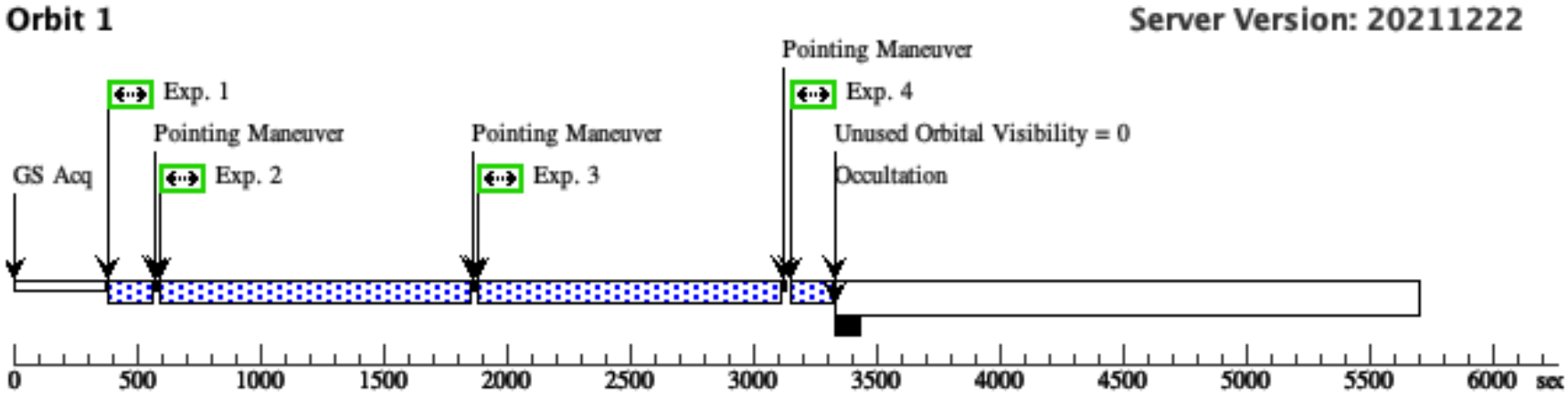
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	J1506+54	RA: 15 06 36.3000 (226.6512500d) Dec: +54 02 20.90 (54.03914d) Equinox: J2000		V=19.1 FUV=21.7 (AB)	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528427)	(4) J1506+54	ACS/SBC, ACCUM, SBC	F125LP				110 Secs (110 Secs)	
								[==>]	***[1]***
2	(1528450)	(4) J1506+54	ACS/SBC, ACCUM, SBC	PR130L				1200 Secs (1200 Secs)	
								[==>]	***[1]***
3	(1528450)	(4) J1506+54	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		1200 Secs (1200 Secs)	
								[==>]	***[1]***
4	(1528427)	(4) J1506+54	ACS/SBC, ACCUM, SBC	F125LP				110 Secs (110 Secs)	
								[==>]	***[1]***

Orbit Structure



Visit

Proposal 16644, Visit 51, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

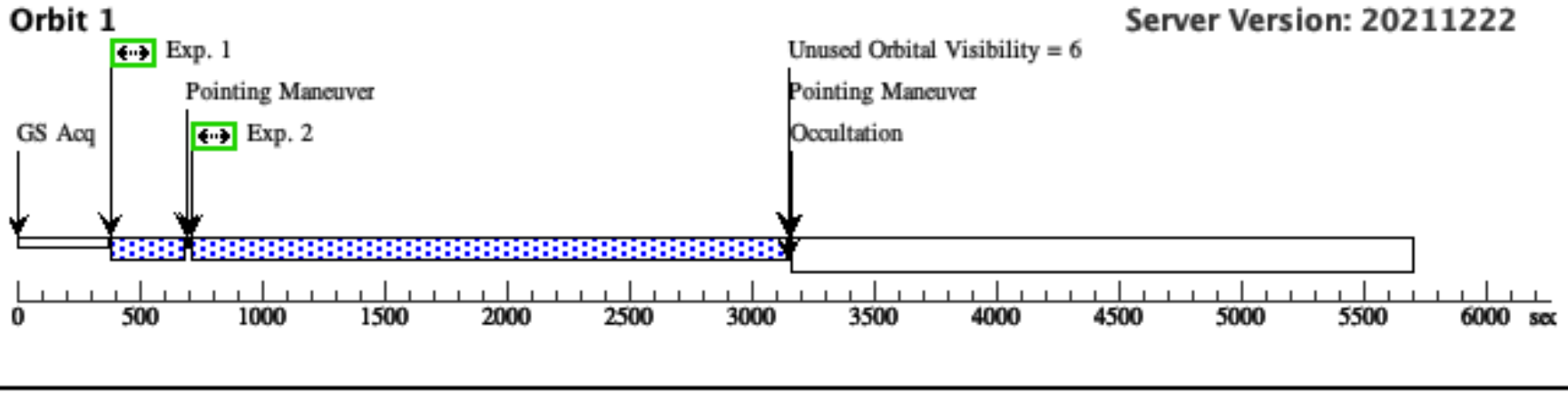
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	J1713+28	RA: 17 13 0.3912 (258.2516300d) Dec: +28 17 8.23 (28.28562d) Equinox: J2000		V=20.2 FUV=21.6 (AB)	Reference Frame: ICRS

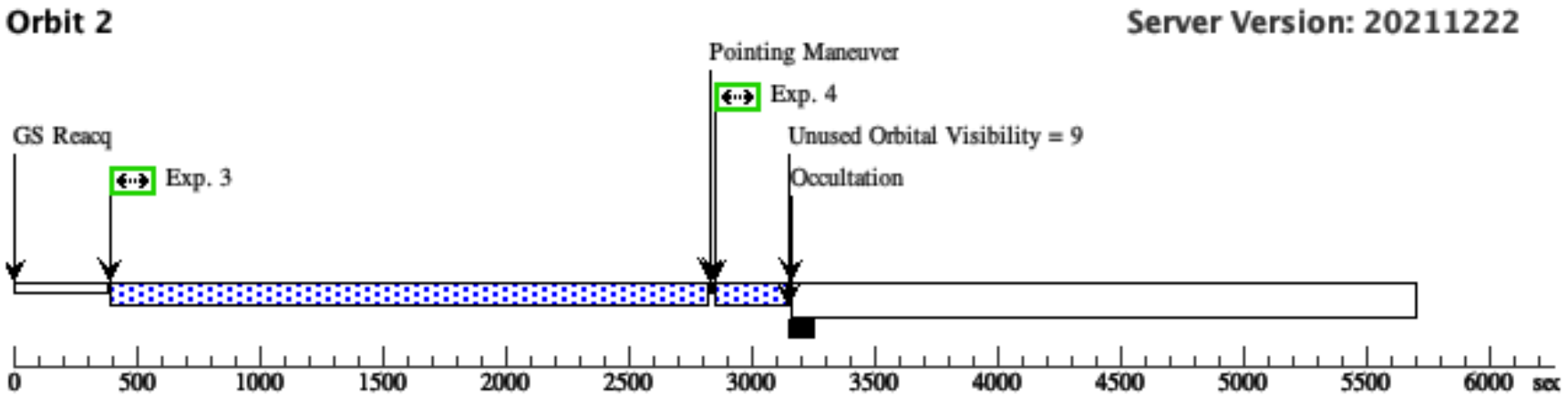
Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528437)	(5) J1713+28	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs)	
								[==>]	***[1]***
2	(1528455)	(5) J1713+28	ACS/SBC, ACCUM, SBC	PR130L				2370 Secs (2370 Secs)	
								[==>]	***[1]***
3	(1528455)	(5) J1713+28	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		2400 Secs (2400 Secs)	
								[==>]	***[2]***
4	(1528437)	(5) J1713+28	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 16644, Visit 52, scheduling Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

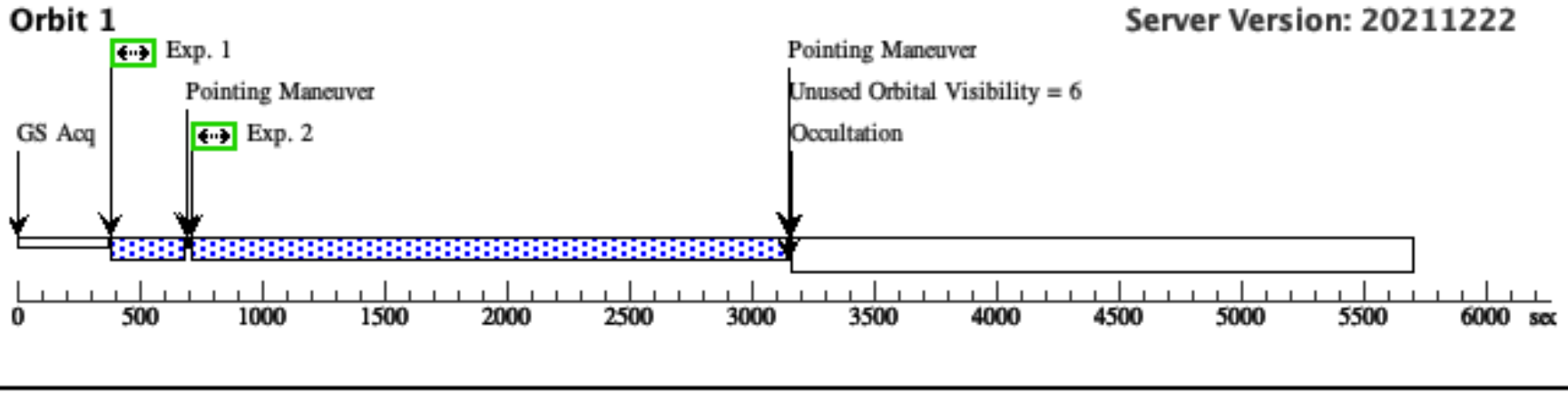
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	J1713+28	RA: 17 13 0.3912 (258.2516300d) Dec: +28 17 8.23 (28.28562d) Equinox: J2000		V=20.2 FUV=21.6 (AB)	Reference Frame: ICRS

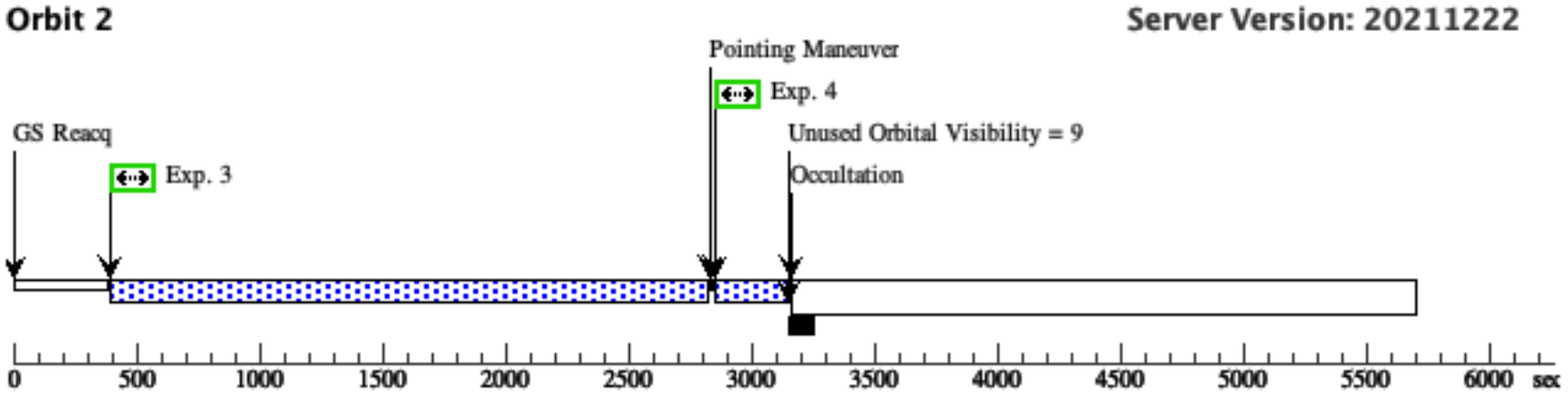
Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528437)	(5) J1713+28	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs)	
								[==>]	***[1]***
2	(1528455)	(5) J1713+28	ACS/SBC, ACCUM, SBC	PR130L				2370 Secs (2370 Secs)	
								[==>]	***[1]***
3	(1528455)	(5) J1713+28	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		2400 Secs (2400 Secs)	
								[==>]	***[2]***
4	(1528437)	(5) J1713+28	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 16644, Visit 53, scheduled Wed Mar 02 16:01:19 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

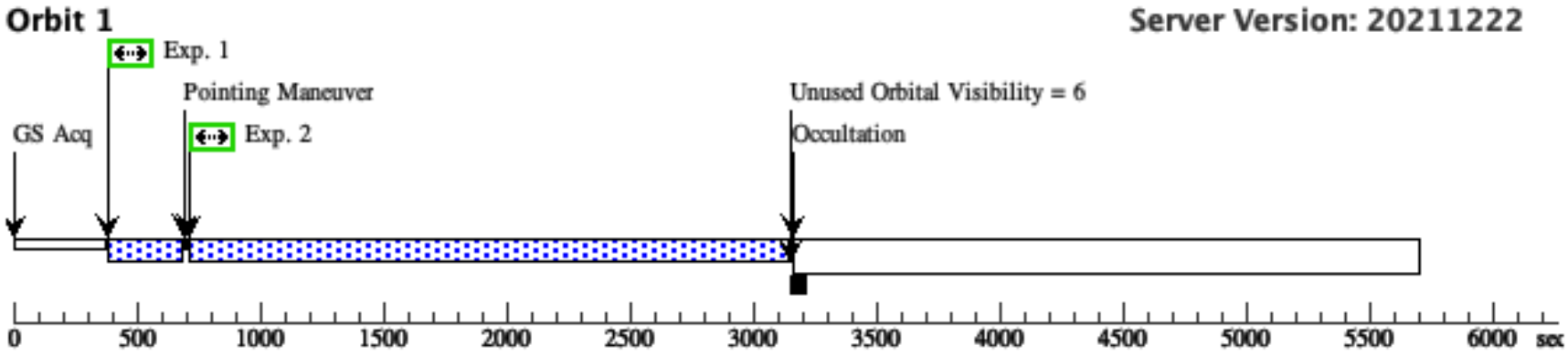
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	J1713+28	RA: 17 13 0.3912 (258.2516300d) Dec: +28 17 8.23 (28.28562d) Equinox: J2000		V=20.2 FUV=21.6 (AB)	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528437)	(5) J1713+28	ACS/SBC, ACCUM, SBC	F125LP				230 Secs (230 Secs)	
								[==>]	***[1]***
2	(1528455)	(5) J1713+28	ACS/SBC, ACCUM, SBC	PR130L				2370 Secs (2370 Secs)	
								[==>]	***[1]***

Orbit Structure



Visit

Proposal 16644, Visit 61, scheduling Wed Mar 02 16:01:20 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	J0905+57	RA: 09 05 23.6064 (136.3483600d) Dec: +57 59 12.44 (57.98679d) Equinox: J2000		V=19.5 FUV=21.0 (AB)	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[STARBURST]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1528429)	(6) J0905+57	ACS/SBC, ACCUM, SBC	F125LP				110 Secs (110 Secs)	
								[==>]	***[1]***
2	(1528451)	(6) J0905+57	ACS/SBC, ACCUM, SBC	PR130L				1225 Secs (1225 Secs)	
								[==>]	***[1]***
3	(1528451)	(6) J0905+57	ACS/SBC, ACCUM, SBC	PR130L		POS TARG 0.336,0.333		1225 Secs (1225 Secs)	
								[==>]	***[1]***
4	(1528429)	(6) J0905+57	ACS/SBC, ACCUM, SBC	F125LP				110 Secs (110 Secs)	
								[==>]	***[1]***

Orbit Structure