16914 - In the Belly of the Beast: Star Cluster Formation and Evolution in the Centers of local LIRGs

Cycle: 29, 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?*
01	(1) VV340A	WFC3/UVIS	1	28-Oct-2022 12:02:52.0	yes
Z1	(1) VV340A	WFC3/UVIS	1	28-Oct-2022 12:02:53.0	yes
02	(2) UGC5101	WFC3/UVIS	1	28-Oct-2022 12:02:54.0	yes
03	(3) MRK273	WFC3/UVIS	1	28-Oct-2022 12:02:54.0	yes
04	(4) NGC5135	WFC3/UVIS	1	28-Oct-2022 12:02:55.0	yes
05	(5) IRASF10565+2448	WFC3/UVIS	1	28-Oct-2022 12:02:56.0	yes
06	(6) ESO420-G013	WFC3/UVIS	1	28-Oct-2022 12:02:56.0	yes
Z6	(6) ESO420-G013	WFC3/UVIS	1	28-Oct-2022 12:02:57.0	yes
07	(7) IRASF01364-1042	WFC3/UVIS	1	28-Oct-2022 12:02:57.0	yes
08	(8) IIIZW035	WFC3/UVIS	1	28-Oct-2022 12:02:58.0	yes
09	(4) NGC5135	WFC3/UVIS	1	28-Oct-2022 12:02:58.0	yes
Z9	(4) NGC5135	WFC3/UVIS	1	28-Oct-2022 12:02:59.0	yes
10	(6) ESO420-G013	WFC3/UVIS	1	28-Oct-2022 12:03:00.0	yes

13 Total Orbits Used

ABSTRACT

We propose WFC3/UVIS F336W, F438W, and F814W observations for 8 Luminous Infrared Galaxies (LIRGs) in the Great Observatories All-Sky LIRG Survey (GOALS) scheduled for JWST Cycle 1 (GO1) observations. With a proprietary period of 0 days for 50% of the GO1 LIRGs, observations taken now will provide the concurrent WFC3/UVIS imaging necessary to reliably age-date the star clusters detected in these systems. In addition to our science goals these data will be made available for use by the community immediately, ensuring the maximum science return for the inaugural JWST Cycle. Recent HST observations provide evidence that the rate of cluster destruction in the nuclear regions of LIRGs is higher than that in their extranuclear regions, and higher than that observed in normal star-forming galaxies. The combination of HST and JWST NIRSPEC and MIRI IFU observations make possible a complete inventory of the properties of star clusters in the nuclear regions. The HST filters are needed to

break the age-reddening degeneracy, and the JWST IFU observations will detect hydrogen recombination and PAH emission associated with the most embedded nuclear clusters. We will measure key properties such as the fraction of star formation residing in clusters, the nuclear and extranuclear cluster destruction rates, and the cluster formation efficiency. No telescopes other than the combination of HST and JWST are capable of obtaining the deep, high-resolution data required for such a multi-wavelength study of star clusters in LIRGs.

OBSERVING DESCRIPTION

HST images will be obtained using the WFC3/UVIS in imaging mode with the broad-band F336W filter as well as the broad-band F438W and F814W filters for two galaxies (NGC 5135 and ESO 420-G013). For the remaining 6 galaxies the new F336W observations will be paired with our pre-existing ACS/WFC F435W and F814W observations. The ACS/WFC and WFC3/UVIS cameras have comparable fields of view (202"x202" and 162"x162", respectively), and cover sufficient area to enable observations of these LIRGs in a single pointing.

The clusters observed in this sample of LIRGs have M_V= -8 to -16 mag and apparent F435W (B) magnitudes typically in the range B ~ 21-25.5 mag. We have made use of instantaneous starburst models from Bruzual & Charlot (2003) to estimate the observed magnitudes in the F336W filter. For a 100 Myr starburst (F336W - F435W = -0.53 mag) and a conservative apparent magnitude of B=25.5 mag, we find that we can reach a signal-to-noise ratio, SNR, of approximately 10 with F336W, F438W, and F814W in roughly 2600, 1300, and 1300 seconds respectively. Note that if the clusters are younger, their spectral energy distributions peak even higher in bluer filters, and are therefore 1-2 magnitudes brighter than described above. Thus, in the absence of dust, the achieved SNR will be significantly higher.

We model our observing strategy based on other studies of star clusters in luminous infrared galaxies (GO 14066 and GO 15472) and use a custom 4-pt dither pattern for each source designed to (1) remove the gap between the chips (1.2 arcsec) (2) sub-sample the PSF (half pixel or a third of a pixel shift have been included if the pattern is a multiple of 2 or 3, respectively), and (3) to remove droplets (shift of 4 arcsec required). The 4-pointing pattern has the following coordinates in arcsec: (0,0), (-3.69,1.31), (-2.5, -2.44), (1.19,-3.75). For the F438W we modify the WFC3-UVIS-GAP-LINE patten to include a third pointing at (0,0). For the F814W we adopt the standard WFC3-UVIS-GAP-LINE pattern. Thus the patterns are (0,0), (-0.092, -1.203), (0.092, 1.203) and (-0.089, -1.203), (0.089, 1.203) respectively.

Further, the main body of the galaxy has been placed at the UVIS2-FIX location (which is more sensitive in the UV, and therefore, optimal to detect clusters), or at the UVIS-FIX location in order to fully map the galaxy if it has very extended tidal features. We use the latter aperture for VV340A, UGC5101, NGC5135, and Mrk 273. Finally, we observe in the ACCUM mode, and include a FLASH of 10 seconds with the CR_SPLIT=NO

parameter to mitigate CTE losses.

The data reduction and calibration of new and archival data will be done using the standard HST pipeline. IRAF, IDL and python will be used for additional data reduction and photometry within metric apertures. The cluster analysis will be done by using Source Extractor to identify clusters and IDL routines to extract aperture measurements of clusters and calculate luminosities. Similar analysis has been done on other F336W, F435W, and F814W datasets (Linden et al. 2017, 2021). Folding in the analysis data at other wavelengths from the Great Observatories All-Sky LIRG Survey (GOALS) will complete the interpretation of the HST dataset.

Visit

Proposal 16914, Visit 01, failed

Fri Oct 28 16:03:00 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

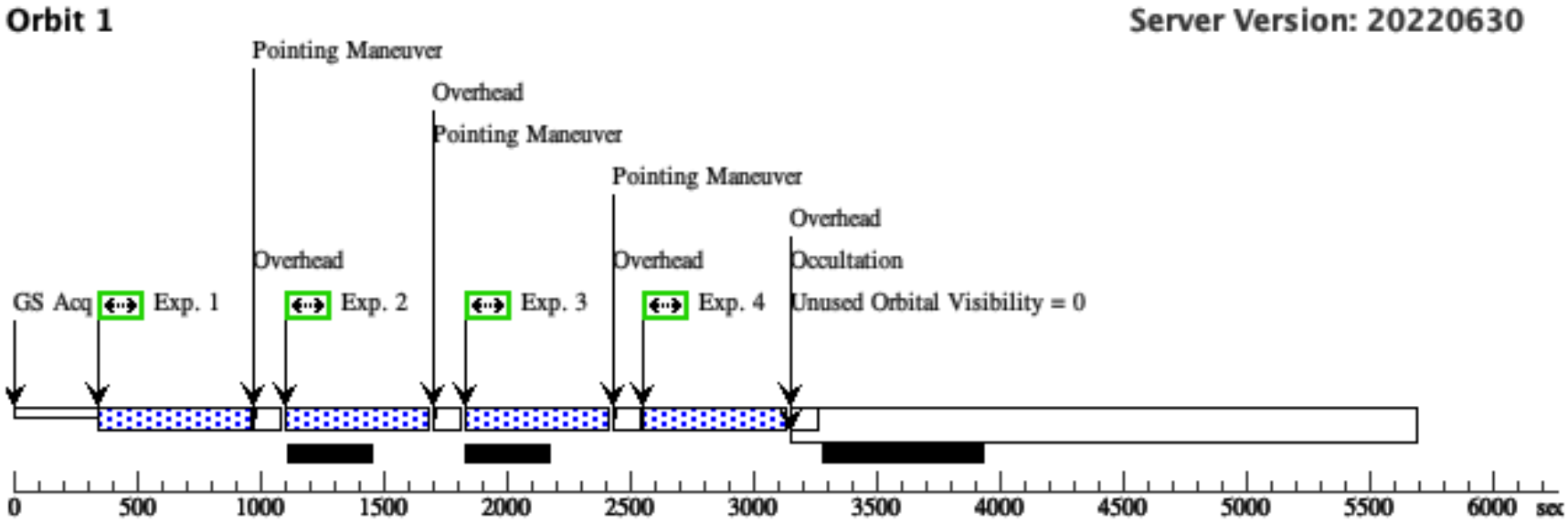
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	VV340A	RA: 14 57 0.8260 (224.2534417d) Dec: +24 37 4.12 (24.61781d) Equinox: J2000		V=15.7	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		591 Secs (588 Secs) *[==>588.0 Secs]*	 ***[1]***
2		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
3		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
4		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, HOPR1 (Z1), completed Fri Oct 28 16:03:00 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

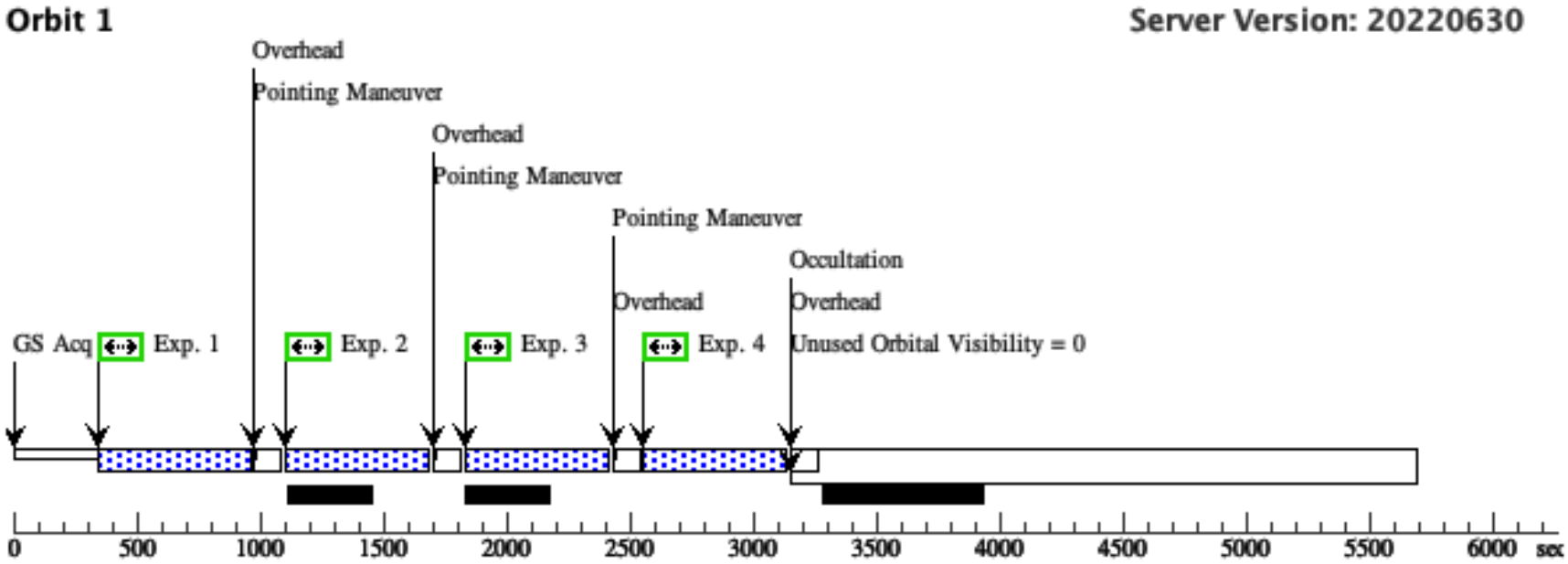
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	VV340A	RA: 14 57 0.8260 (224.2534417d) Dec: +24 37 4.12 (24.61781d) Equinox: J2000		V=15.7	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		591 Secs (588 Secs) *[==>588.0 Secs]*	 ***[1]***
2		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
3		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
4		(1) VV340A	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 02, completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

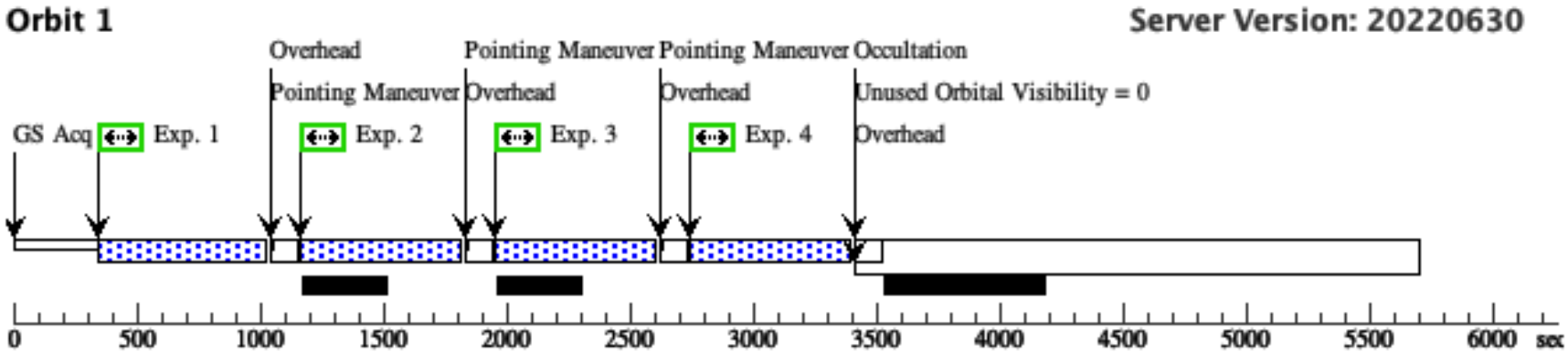
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	UGC5101	RA: 09 35 51.5950 (143.9649792d) Dec: +61 21 11.45 (61.35318d) Equinox: J2000		V=15.5	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) UGC5101	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		654 Secs (651 Secs) *[==>651.0 Secs]*	 ***[1]***
2		(2) UGC5101	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		654 Secs (651 Secs) *[==>651.0 Secs]*	 ***[1]***
3		(2) UGC5101	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		654 Secs (651 Secs) *[==>651.0 Secs]*	 ***[1]***
4		(2) UGC5101	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		653 Secs (650 Secs) *[==>650.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 03, completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

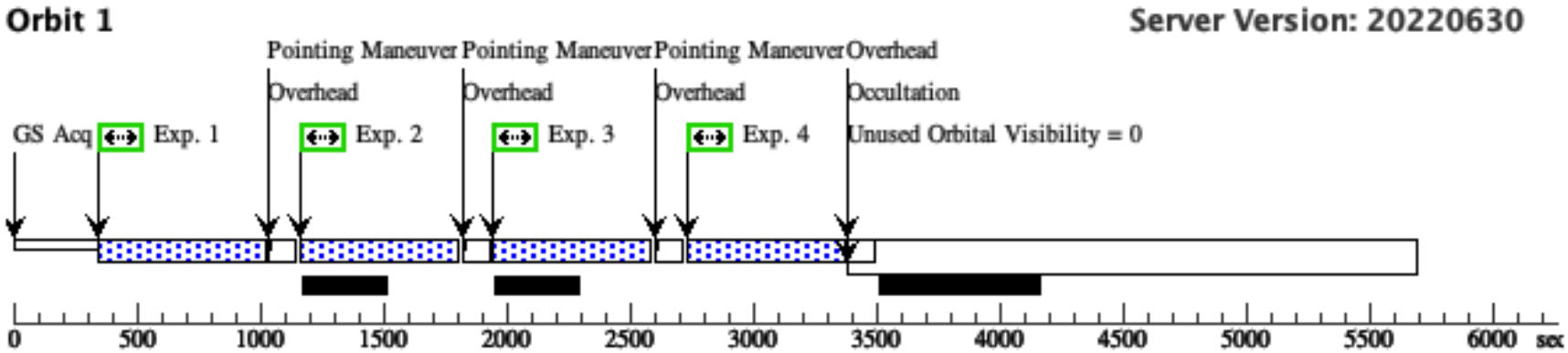
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	MRK273	RA: 13 44 42.1110 (206.1754625d) Dec: +55 53 12.65 (55.88685d) Equinox: J2000		V=14.9	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) MRK273	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		649 Secs (646 Secs) *[==>646.0 Secs]*	*[1]*
2		(3) MRK273	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		648 Secs (645 Secs) *[==>645.0 Secs]*	*[1]*
3		(3) MRK273	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		648 Secs (645 Secs) *[==>645.0 Secs]*	*[1]*
4		(3) MRK273	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		648 Secs (645 Secs) *[==>645.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 16914, Visit 04, completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

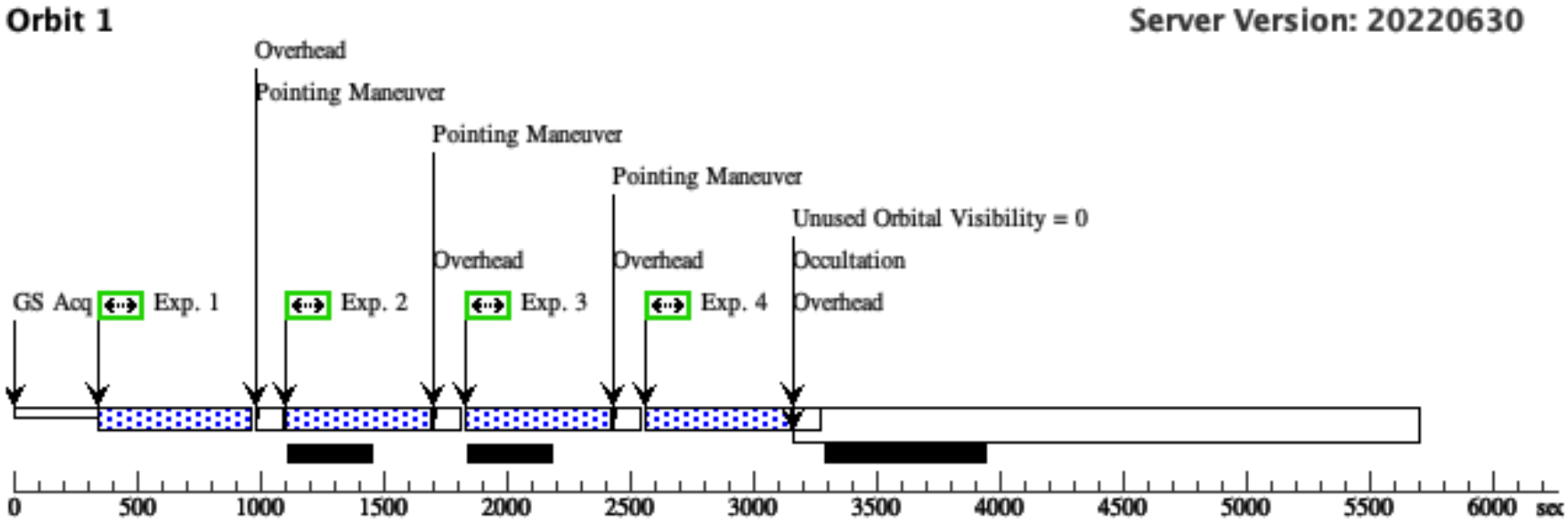
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC5135	RA: 13 25 44.0600 (201.4335833d) Dec: -29 50 1.20 (-29.83367d) Equinox: J2000		V=13.35	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		593 Secs (590 Secs) *[==>590.0 Secs]*	 ***[1]***
2		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		592 Secs (589 Secs) *[==>589.0 Secs]*	 ***[1]***
3		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		592 Secs (589 Secs) *[==>589.0 Secs]*	 ***[1]***
4		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		592 Secs (589 Secs) *[==>589.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 05, completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

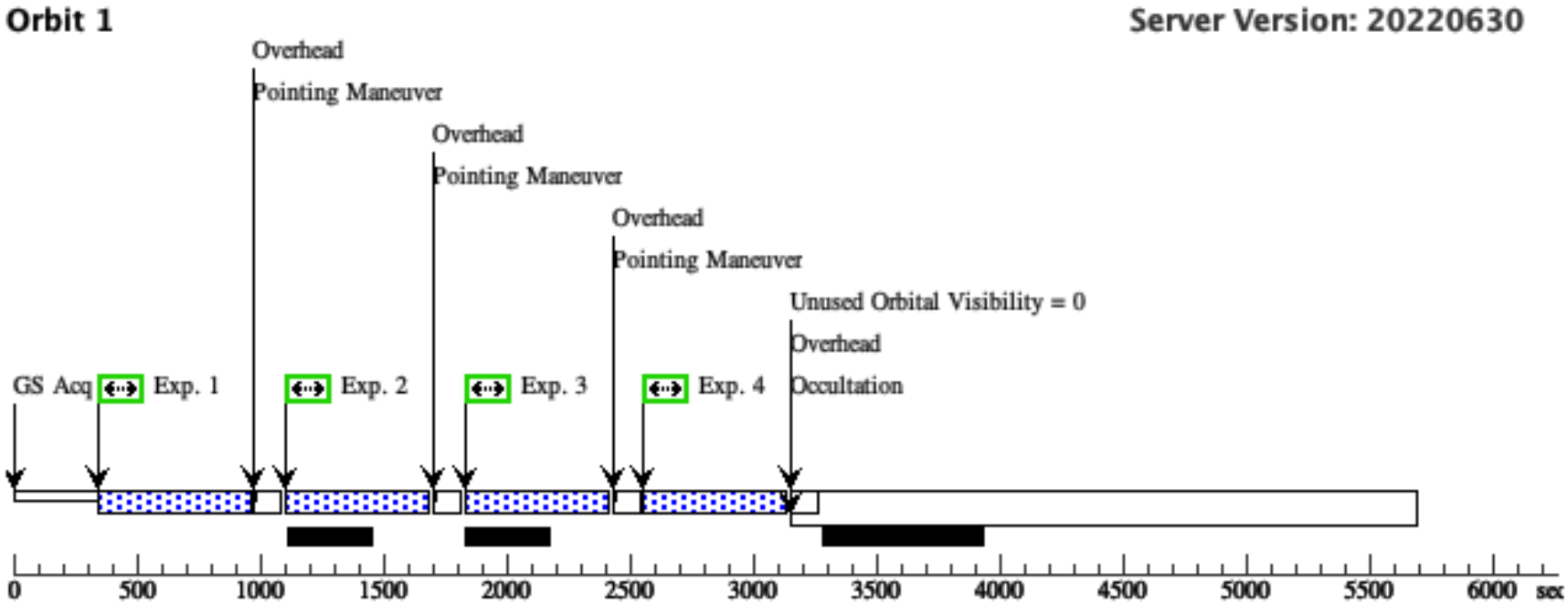
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	IRASF10565+2448	RA: 10 59 18.1180 (164.8254917d) Dec: +24 32 34.46 (24.54291d) Equinox: J2000		V=15.7	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) IRASF10565+2448	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		591 Secs (588 Secs) *[==>588.0 Secs]*	 ***[1]***
2		(5) IRASF10565+2448	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
3		(5) IRASF10565+2448	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
4		(5) IRASF10565+2448	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 06, failed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

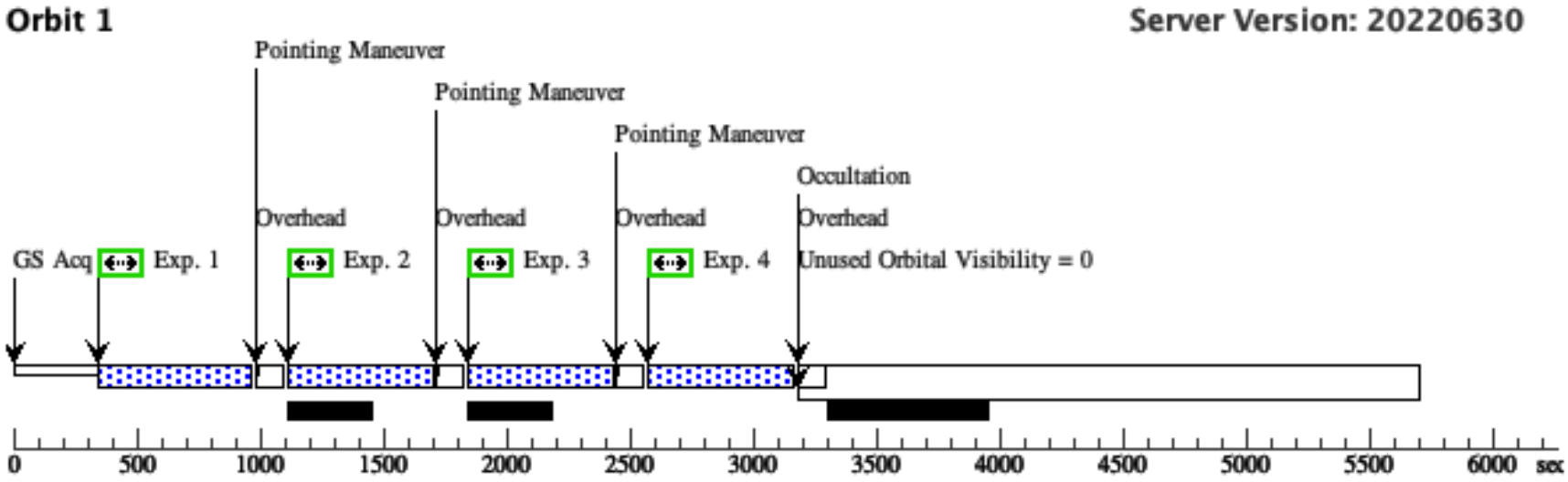
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	ESO420-G013	RA: 04 13 49.6900 (63.4570417d) Dec: -32 00 25.10 (-32.00697d) Equinox: J2000		V=13.3	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*
2		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*
3		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*
4		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 16914, HOPR_06 (Z6) Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

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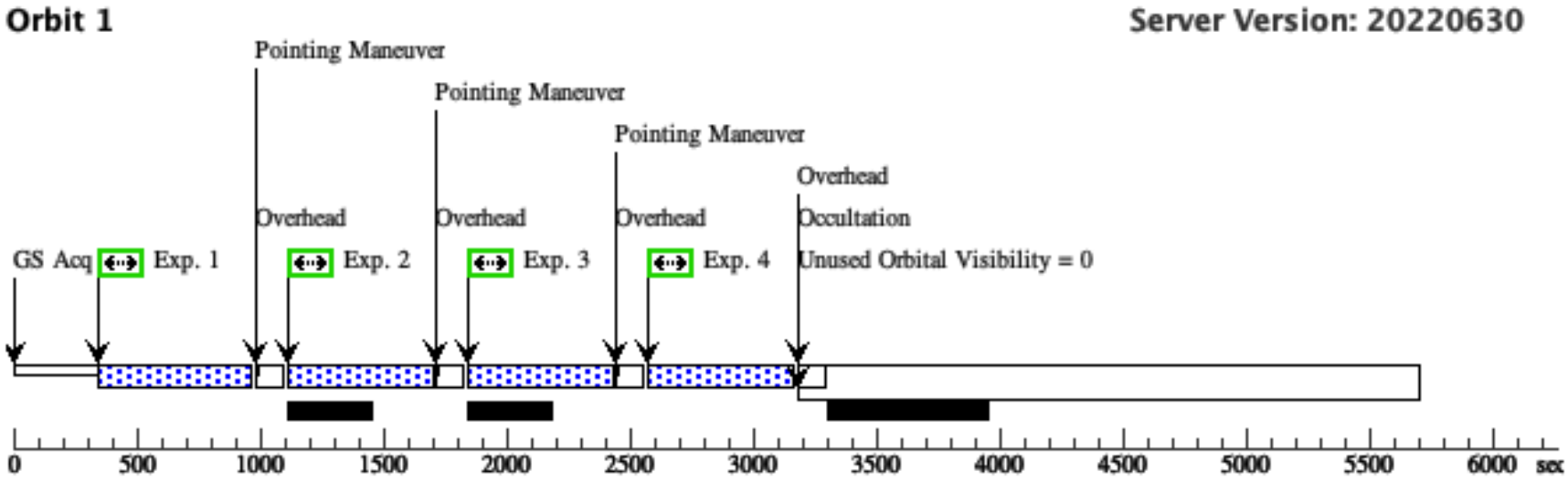
(6)	ESO420-G013	RA: 04 13 49.6900 (63.4570417d) Dec: -32 00 25.10 (-32.00697d) Equinox: J2000		V=13.3	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*
2		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*
3		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*
4		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		596 Secs (593 Secs) *[==>593.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 16914, Visit 07, scheduled Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

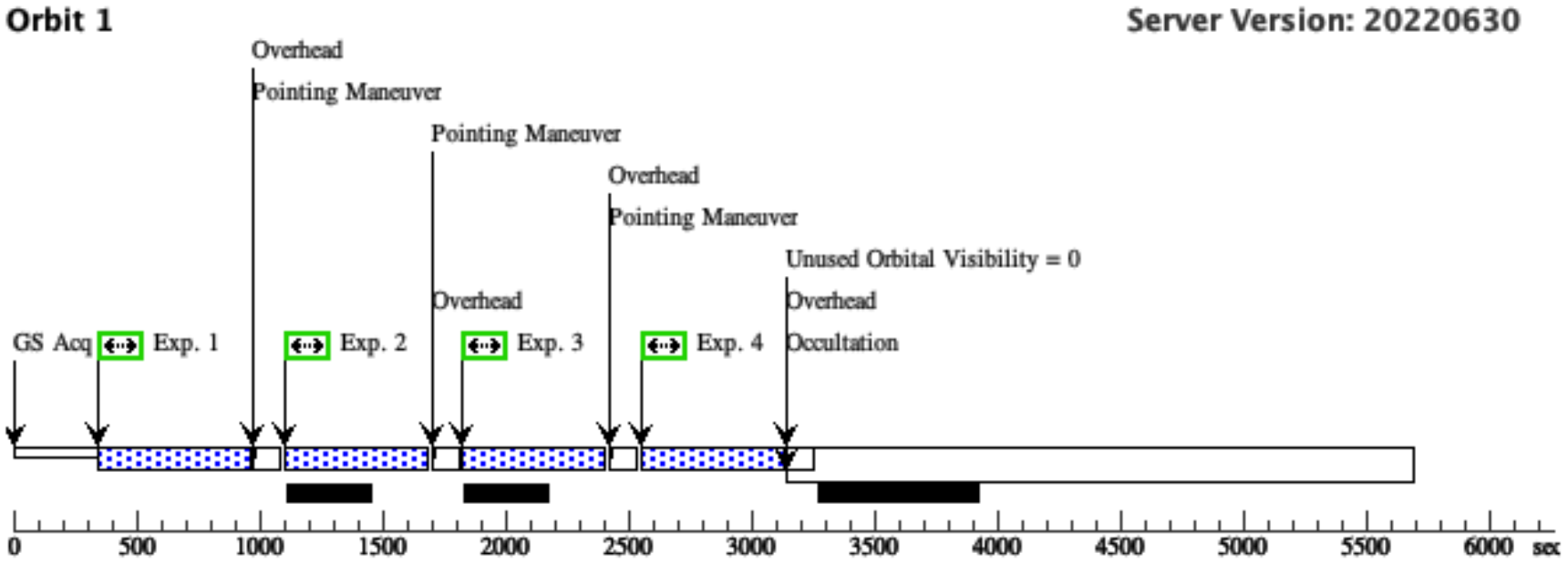
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	IRASF01364-1042	RA: 01 38 52.9210 (24.7205042d) Dec: -10 27 11.42 (-10.45317d) Equinox: J2000		V=16.77	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) IRASF01364-1042	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		589 Secs (586 Secs) *[==>586.0 Secs]*	 ***[1]***
2		(7) IRASF01364-1042	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		588 Secs (585 Secs) *[==>585.0 Secs]*	 ***[1]***
3		(7) IRASF01364-1042	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		588 Secs (585 Secs) *[==>585.0 Secs]*	 ***[1]***
4		(7) IRASF01364-1042	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		588 Secs (585 Secs) *[==>585.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 08, completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

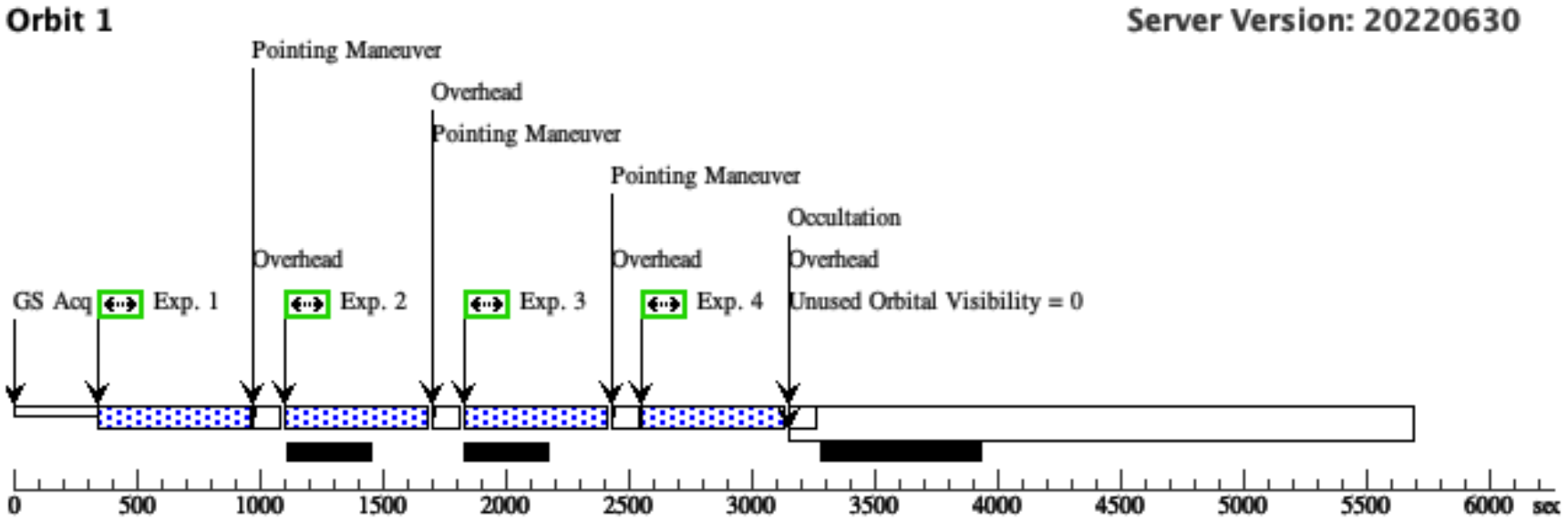
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	IIIZW035	RA: 01 44 30.5000 (26.1270833d) Dec: +17 06 5.00 (17.10139d) Equinox: J2000		V=14.81	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(8) IIIZW035	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
2		(8) IIIZW035	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -3.69,1.31		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
3		(8) IIIZW035	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG -2.5,-2.44		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***
4		(8) IIIZW035	WFC3/UVIS, ACCUM, UVIS-FIX	F336W	FLASH=20; CR-SPLIT=NO	POS TARG 1.19,-3.75		590 Secs (587 Secs) *[==>587.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 09, failed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

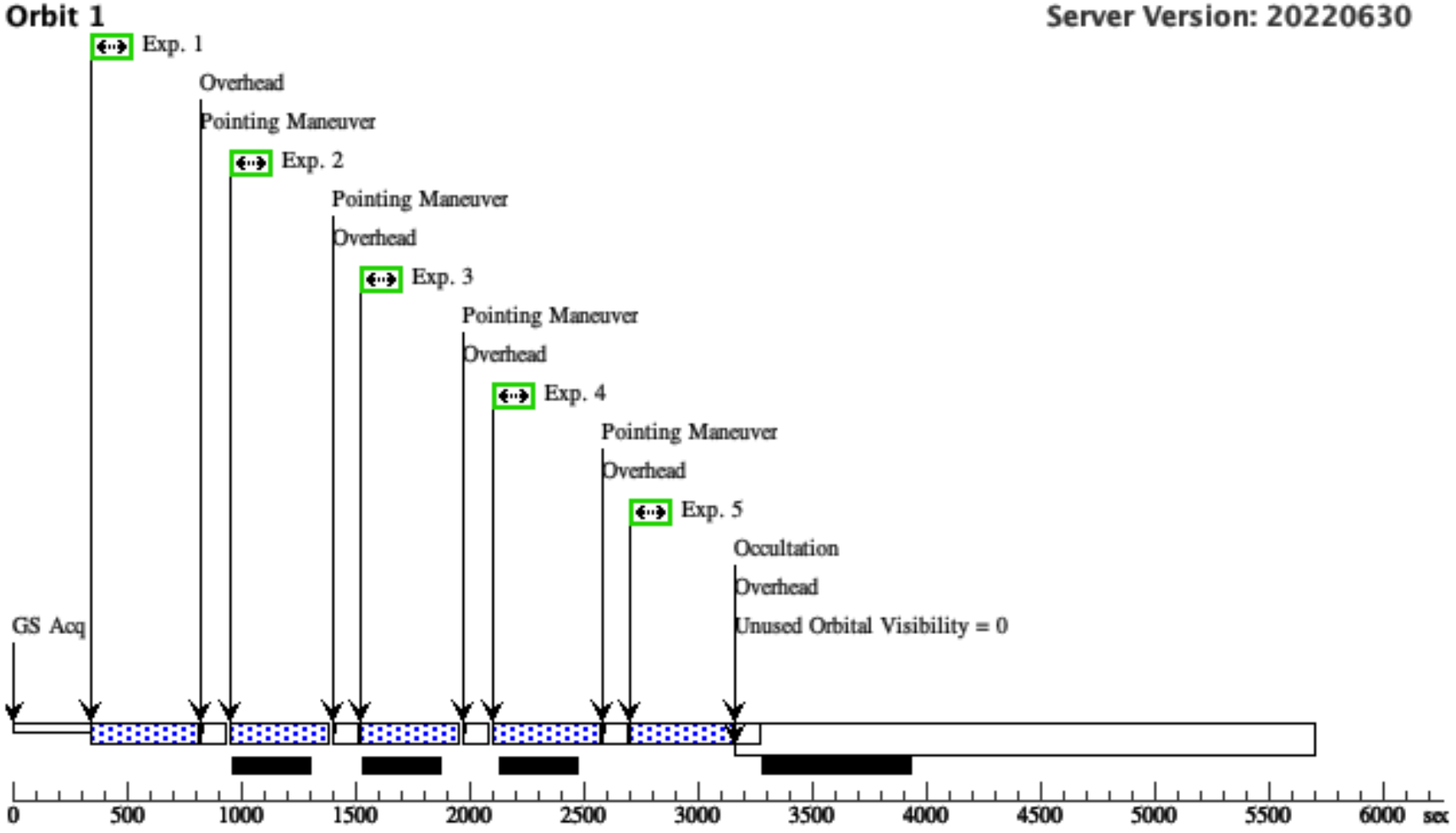
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC5135	RA: 13 25 44.0600 (201.4335833d) Dec: -29 50 1.20 (-29.83367d) Equinox: J2000		V=13.35	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
2		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG -0.092,-1.203		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
3		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG 0.092,1.203		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
4		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F814W	FLASH=6; CR-SPLIT=NO	POS TARG -0.089,-1.203		450 Secs (448 Secs) *[==>448.0 Secs]*	 ***[1]***
5		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F814W	FLASH=6; CR-SPLIT=NO	POS TARG 0.089,1.203		450 Secs (448 Secs) *[==>448.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, HOPR9 (Z9), completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

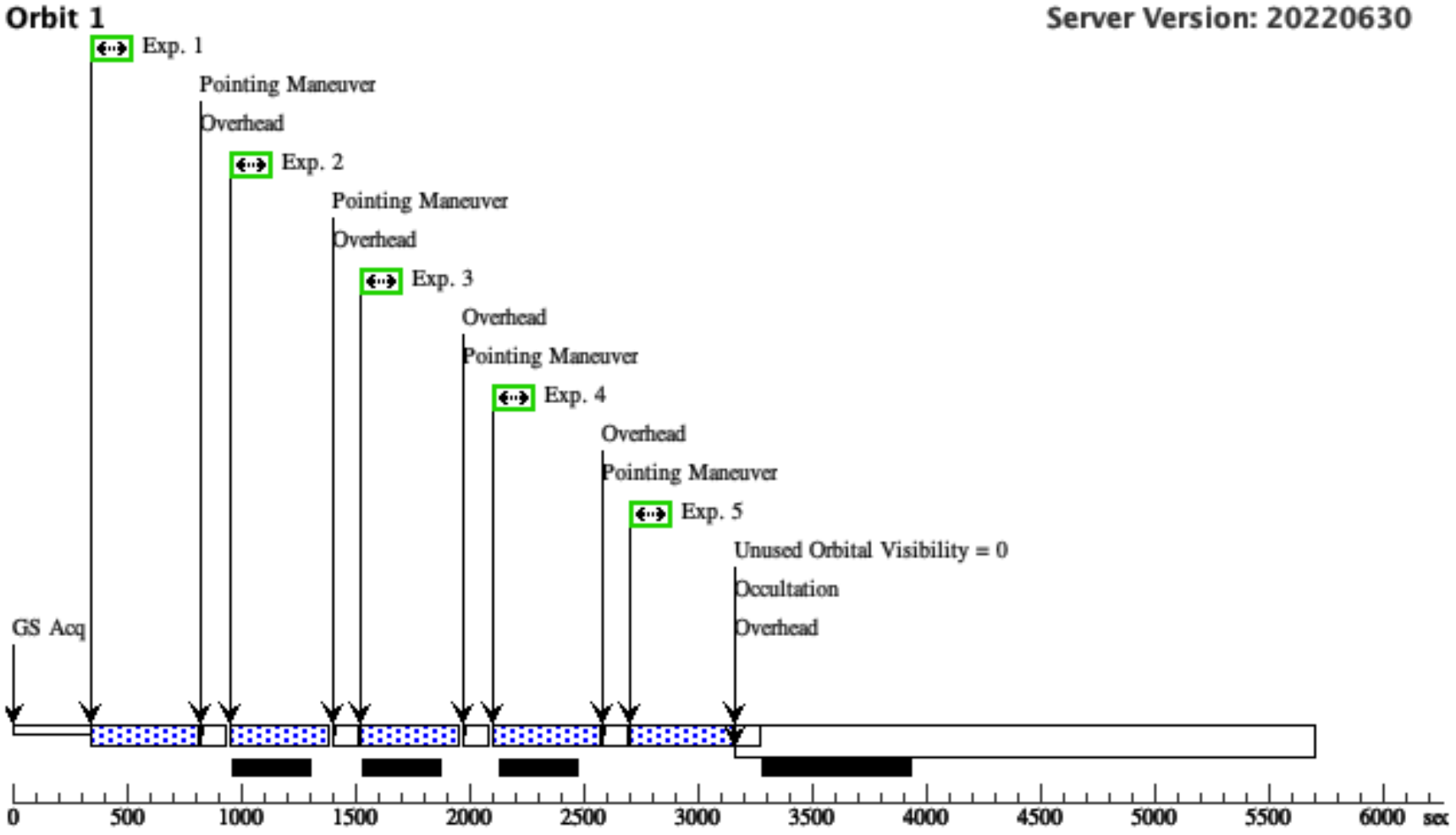
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC5135	RA: 13 25 44.0600 (201.4335833d) Dec: -29 50 1.20 (-29.83367d) Equinox: J2000		V=13.35	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
2		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG -0.092,-1.203		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
3		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG 0.092,1.203		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
4		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F814W	FLASH=6; CR-SPLIT=NO	POS TARG -0.089,-1.203		450 Secs (448 Secs) *[==>448.0 Secs]*	 ***[1]***
5		(4) NGC5135	WFC3/UVIS, ACCUM, UVIS-FIX	F814W	FLASH=6; CR-SPLIT=NO	POS TARG 0.089,1.203		450 Secs (448 Secs) *[==>448.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 16914, Visit 10, completed Fri Oct 28 16:03:01 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	ESO420-G013	RA: 04 13 49.6900 (63.4570417d) Dec: -32 00 25.10 (-32.00697d) Equinox: J2000		V=13.3	Reference Frame: SIMBAD

Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, STARBURST, ULTRALUMINOUS IR GAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG 0.0,0.0		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
2		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG -0.092,-1.203		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
3		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F438W	FLASH=20; CR-SPLIT=NO	POS TARG 0.092,1.203		438 Secs (436 Secs) *[==>436.0 Secs]*	 ***[1]***
4		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F814W	FLASH=6; CR-SPLIT=NO	POS TARG -0.089,-1.203		457 Secs (455 Secs) *[==>455.0 Secs]*	 ***[1]***
5		(6) ESO420-G013	WFC3/UVIS, ACCUM, UVIS-FIX	F814W	FLASH=6; CR-SPLIT=NO	POS TARG 0.089,1.203		458 Secs (456 Secs) *[==>456.0 Secs]*	 ***[1]***

Orbit Structure