13723 - Multiband Observations of a Local Tadpole Galaxy

Cycle: 22, Proposal Category: GO

(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	(2) LEDA-36252-VISIT-1	WFC3/UVIS	2	26-Sep-2014 21:04:32.0	yes
02	(3) LEDA-36252-VISIT-2	WFC3/UVIS	3	26-Sep-2014 21:04:34.0	yes

5 Total Orbits Used

ABSTRACT

We propose WFC3 broadband and Halpha observations of a local tadpole galaxy with a starburst and low metallicity in the head suggestive of ram pressure triggering from cosmological inflow. Such head-tail structure dominates local ultra-low metallicity Blue Compact Dwarfs and it represents 10% of resolved galaxies in the Hubble UDF. We will identify star clusters and measure their properties, including masses and ages, two-point correlations for position as a function of mass and age, and the cluster mass distribution as a function of age. We will also determine the star formation fraction in clusters. These measurements can suggest definite processes for star formation including the importance of turbulent fragmentation. The presence of a super star cluster, if found, will be a model for the formation of metal-poor globular clusters in high redshift dwarf

galaxies, which could have formed in similar conditions. The Halpha observations will also show bright rims and nebular structures down to 10's of pc scales. Such structures can indicate pressure sources and nebular flow directions that allow us to understand gas motions inside the starburst head, including pressurized outflows and cosmological inflows. The head is so bright in Halpha that even if only 25% of the ionizing radiation escapes, an inflowing halo stream as far away as 1' will be ionized sufficiently on the surface for our observations to detect it. Thus the proposed galaxy, Kiso 5639, is a prime laboratory to study processes that may be related to cosmic accretion, starburst conditions in primitive galaxies, and the formation of metal-poor globular clusters.

OBSERVING DESCRIPTION

We will observe one source in two visits with seven total filters: FEC#/UVIS: F225W, F336W, F438W, F547M, F606W F814W and F657N

This is an observation of an elongated galaxy with a bright region at one end. We call this bright region the head and the fainter rest of the galaxy, the tail.

We expect Halpha emission from a region to the side of the galaxy, just off the bright head part. We expect there to be accreting cosmic gas at this place, and so bright emission of Halpha from the accreting gas.

There is also a bright star near the galaxy which we don't care about but which needs to be placed so that neither the diffraction spikes nor the channel leakage will cross the galaxy image.

Our constraints therefore are as follows:

Visit 1: The uv observations with filters F225W F336W should place the galaxy on chip 2, which is the most sensitive chip for FUV. These filters will be observed with one orbit for each filter and two orbits total in this visit.

Visit 2: The other observations can be on chip 1 and in particular, the Halpha observation with F657N, should be on chip 1 so that there is area available near the head part of the galaxy still on chip 2 to see the expected emission there. These filters will be observed with one orbit for F438W and F547M, another orbit for F606W and F814W, and a third orbit for F657N. There are 3 orbits total in this visit.

The galaxy should be placed on chips 2 (Visit 1) and 1 (Visit 2), respectively, so that there are at least 2 guide stars in the guide star field of views. This requires the galaxy to be slightly offset from the center of the chip in each case.

The orientation of the satellite should be such that the diffraction spikes from the nearby bright star and the channel leakage from the nearby bright star do not cross the galaxy image in any filter.

These constrains require two visits, as indicated, and therefore it requires time removed from the beginning of the second visit, which is when filters F437W and F537W will be observed, in order to find the guide stars for a second time.

The dithering strategy is as follows:

For the FUV filters, F225W and F336W, we will dither in a box "Dither Box" without requiring that the chip gap be filled in. The galaxy avoids the chip gap so this filling in is not necessary.

For the next 4 filters: F438W, F547M, F606W, and F814W, the exposure times are shorter for each filter and we will dither with 2 pointings "Dither Line". We cannot dither with more pointings because then the data dump cuts into the observing time.

For the 7th filter, F657N, we need to fill in the chip gap since we are looking for extended emission in this region. Thus we want the "Gap Line" dithering pattern, which has 2 pointing with one point on each side of the gap spacing.

Visit

Proposal 13723, LEDA-36252 (01), implementation Sat Sep 27 01:04:36 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(6)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1), (2)

Fixed Targets

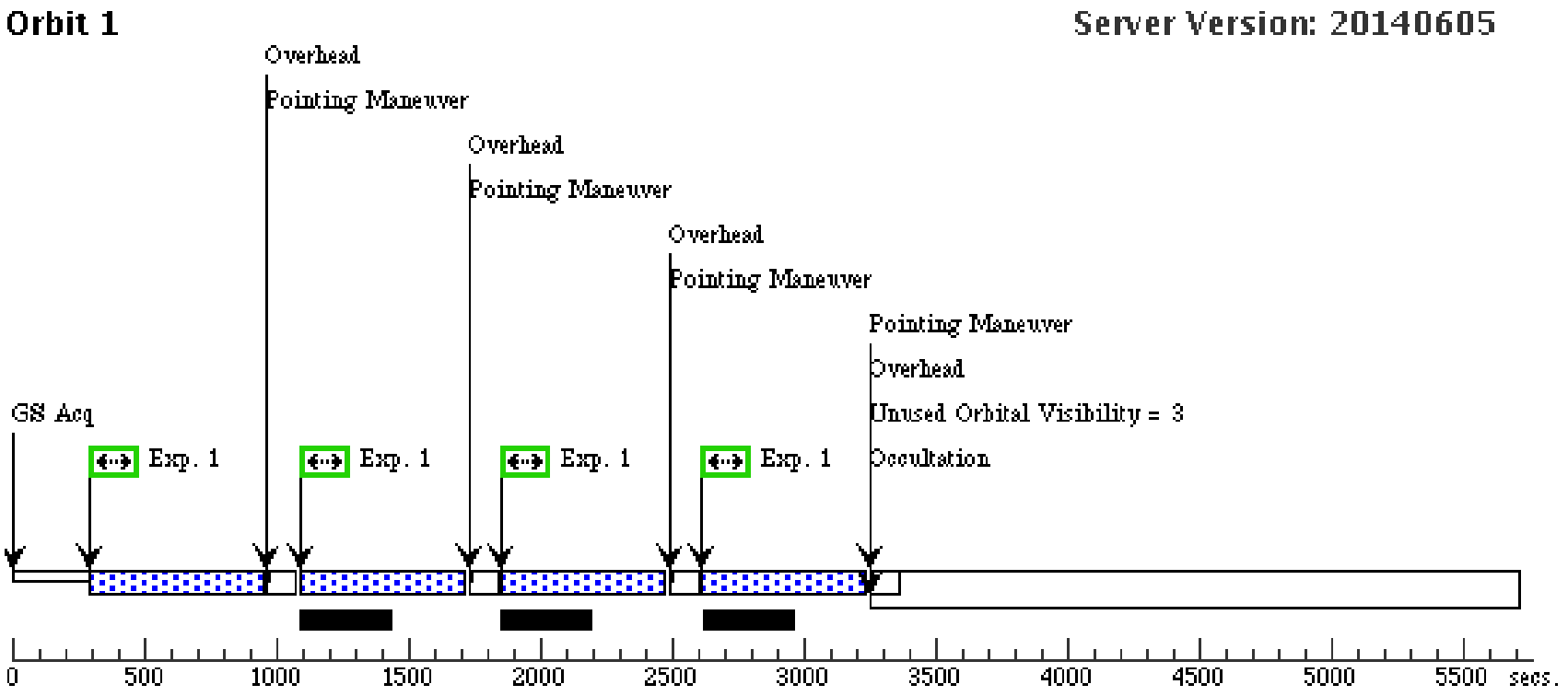
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	LEDA-36252-VISIT-1	RA: 11 41 9.4100 (175.2892083d) Dec: +32 25 27.21 (32.42422d) Equinox: J2000		V=17.8	Reference Frame: SIMBAD

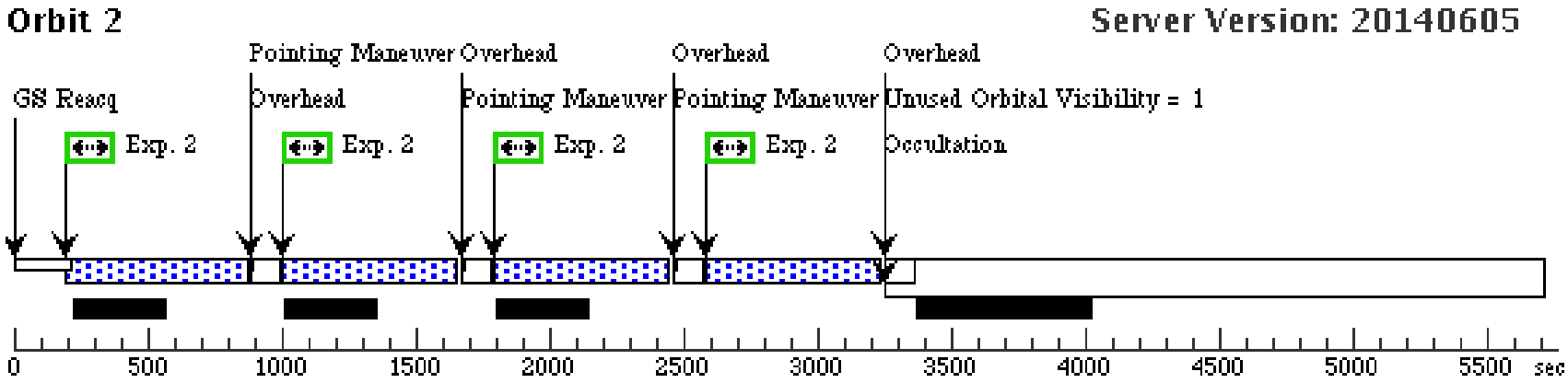
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F225W (625634)	(2) LEDA-36252-VISIT-1	WFC3/UVIS, ACCUM, UVIS2-FIX	F225W	FLASH=11	GS ACQ SCENARIO BASE1B3	Pattern 6, Exps 1-1 in LEDA-36252 (01) (6)	633 Secs (2508 Secs) *[==>627.0 Secs (Pattern 1)]* *[==>627.0 Secs (Pattern 2)]* *[==>627.0 Secs (Pattern 3)]* *[==>627.0 Secs (Pattern 4)]*	***[1]***
2	F336W (625650)	(2) LEDA-36252-VISIT-1	WFC3/UVIS, ACCUM, UVIS2-FIX	F336W	FLASH=10		Pattern 6, Exps 2-2 in LEDA-36252 (01) (6)	660 Secs (2624 Secs) *[==>656.0 Secs (Pattern 1)]* *[==>656.0 Secs (Pattern 2)]* *[==>656.0 Secs (Pattern 3)]* *[==>656.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 13723, LEDA-36252 (02), implementation Sat Sep 27 01:04:36 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 94D TO 99 D

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(4)	Pattern Type=WFC3-UVIS-GAP-LINE Purpose=MOSAIC Number Of Points=2 Point Spacing=2.414 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.759 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false	(5)
(5)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false			(1), (2), (3), (4)

Fixed Targets

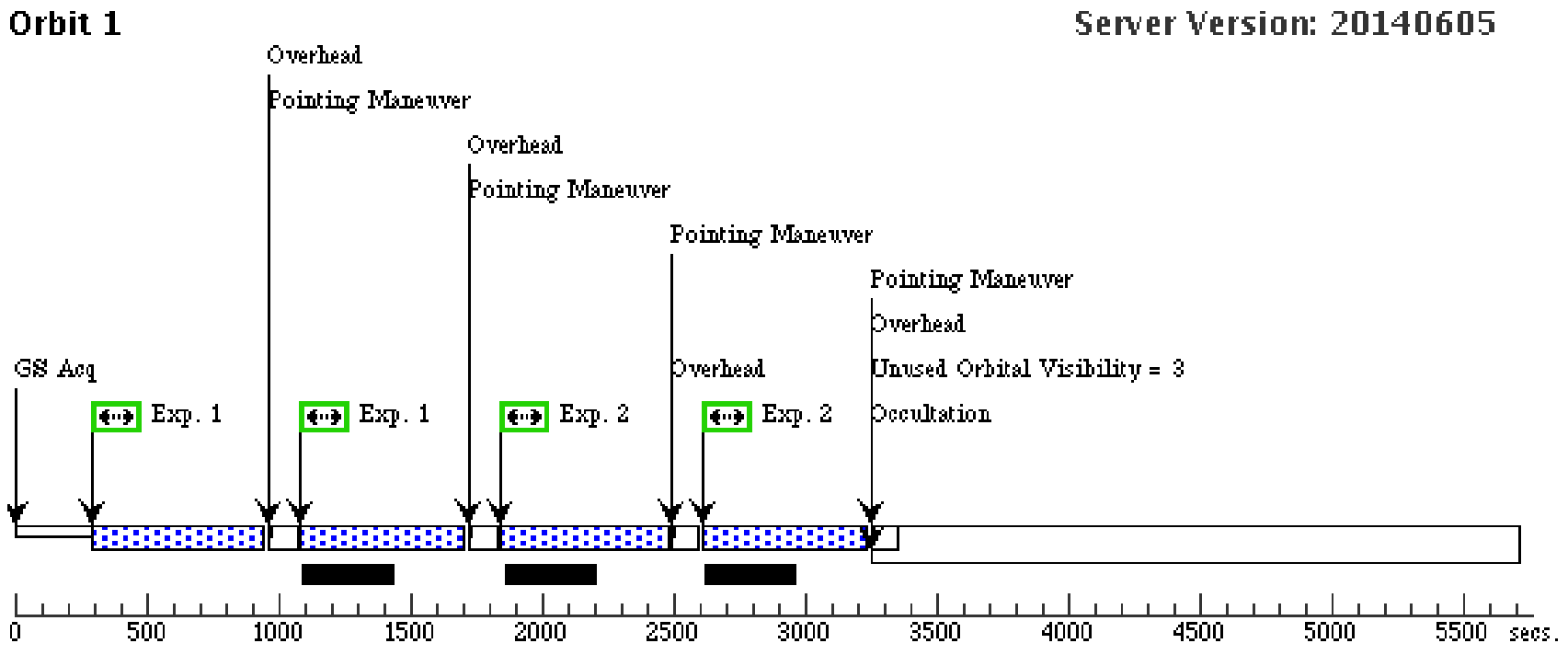
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	LEDA-36252-VISIT-2	RA: 11 41 8.7020 (175.2862583d) Dec: +32 25 40.21 (32.42784d) Equinox: J2000		V=17.8	Reference Frame: SIMBAD

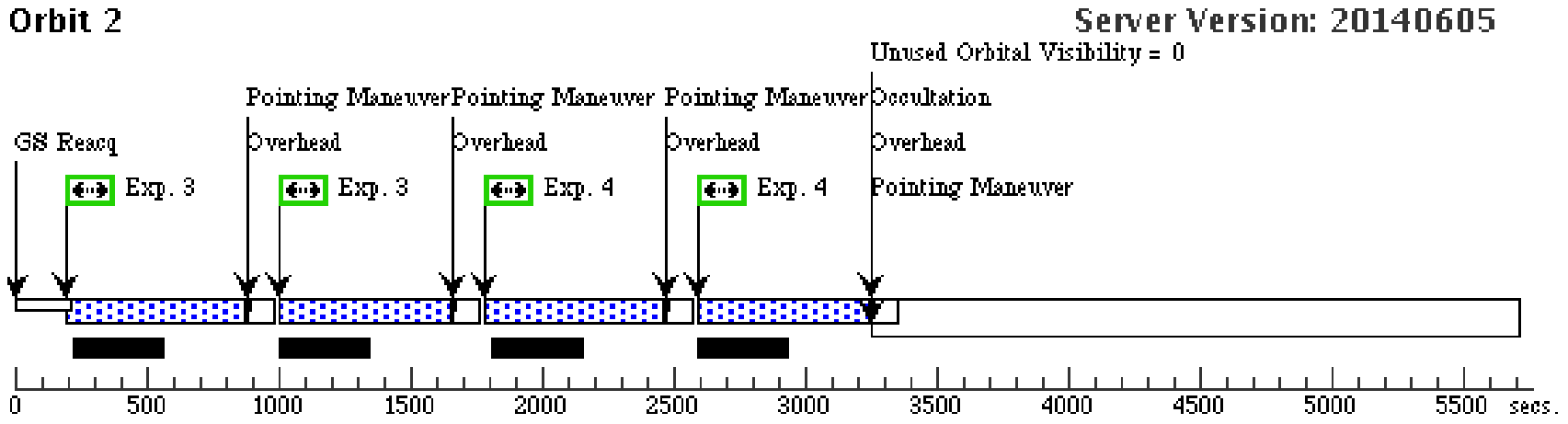
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

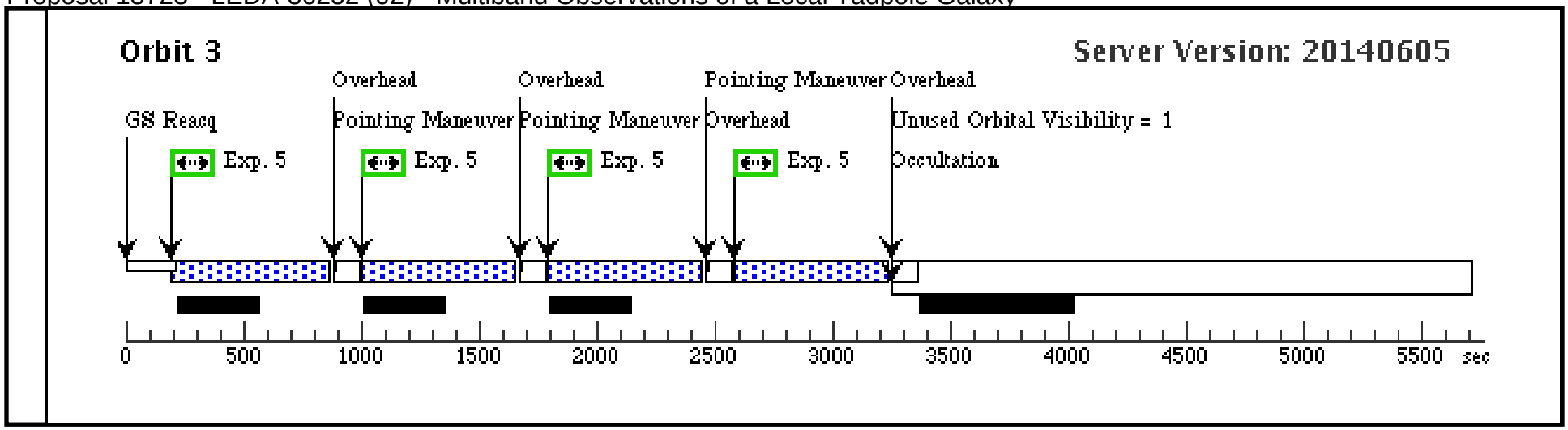
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F438W (637110)	(3) LEDA-36252-VISIT-2	WFC3/UVIS, ACCUM, UVIS1-FIX	F438W	FLASH=6		Pattern 5, Exps 1-1 in LEDA-36252 (02) (5)	627 Secs (1248 Secs) *[==>624.0 Secs (Pattern 1)]* *[==>624.0 Secs (Pattern 2)]*	***[1]***
2	F547M (637111)	(3) LEDA-36252-VISIT-2	WFC3/UVIS, ACCUM, UVIS1-FIX	F547M	FLASH=2		Pattern 5, Exps 2-2 in LEDA-36252 (02) (5)	627 Secs (1248 Secs) *[==>624.0 Secs (Pattern 1)]* *[==>624.0 Secs (Pattern 2)]*	***[1]***
3	F606W (625672)	(3) LEDA-36252-VISIT-2	WFC3/UVIS, ACCUM, UVIS1-FIX	F606W			Pattern 5, Exps 3-3 in LEDA-36252 (02) (5)	655 Secs (1310 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[2]***
4	F814W (625675)	(3) LEDA-36252-VISIT-2	WFC3/UVIS, ACCUM, UVIS1-FIX	F814W			Pattern 5, Exps 4-4 in LEDA-36252 (02) (5)	655 Secs (1310 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[2]***
5	F657N (625684)	(3) LEDA-36252-VISIT-2	WFC3/UVIS, ACCUM, UVIS1-FIX	F657N	FLASH=10		Pattern 4, Exps 5-5 in LEDA-36252 (02) (4)	660 Secs (2624 Secs) *[==>656.0 Secs (Pattern 1,1)]* *[==>656.0 Secs (Pattern 1,2)]* *[==>656.0 Secs (Pattern 2,1)]* *[==>656.0 Secs (Pattern 2,2)]*	***[3]***

Orbit Structure



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