12872 - Characterizing the mass accretion rates in young low-mass stars at low metallicity

Cycle: 20, 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	(1) LH95	ACS/WFC WFC3/UVIS	1	10-Jul-2012 21:20:15.0	yes
02	(1) LH95	ACS/WFC WFC3/UVIS	1	10-Jul-2012 21:20:25.0	yes
03	(1) LH95	ACS/WFC WFC3/UVIS	1	10-Jul-2012 21:20:32.0	yes
04	(1) LH95	ACS/WFC WFC3/UVIS	1	10-Jul-2012 21:20:38.0	yes

4 Total Orbits Used

ABSTRACT

Mass accretion from circumstellar disks onto young pre-main sequence (PMS) stars is a key aspect in the evolution of both the central star and the surrounding material.

Over the past few years, new observational studies have improved dramatically our knowledge on these accretion processes, in particular thanks to the Hubble Space Telescope. A recent work in the Orion Nebula Cluster - the prototypical few Myr old Galactic star formaing region - allowed us to obtain very accurate measurements of mass accretion rates (Mdot) for ~700 PMS stars. This enabled the analysis of the dependence of Mdot with stellar mass and age with unprecedented accuracy.

Moreover, several recent works based on HST Halpha photometry have investigated accretion rates in metal-poor young regions of the Magellanic Clouds (MCs). These studies demonstrate a clear anti-correlation of Mdot with metallicity, but results are limited to intermediate mass stars (M~1Msun).

We aim at completing the parameter space of these studies, i.e., study Mdot for low mass stars (down to 0.3 Msun, the peak of the initial mass function) in the Magellanic Clouds.

This can be achieved through deep Halpha imaging of a particular region of the LMC, LH 95, whose low-mass PMS population has been already well characterized by us down to 0.2Msun. The methods we will use to derive Mdot from the proposed observations, together with the data already in our hands, have been fully tested in other regions of the MCs. The proposed observations will enable us to probe the role of metallicity in low-mass star formation, in order to set additional constraints on PMS theory.

OBSERVING DESCRIPTION

This program is awarded 4 primary orbits with ACS/WFC observations plus 4 parallell orbits with WFC3/UVIS.

*The primary observations include, overall, 10 exposures in the ACS/WFC in the filter F658N, on a single pointing (with some dithering between them)

*The parallel WFC3/UVIS will image in 3 filters: F555W (2 orbits, visit 1 and 3), F814W (1 orbit, visit 2), F656N (1 orbit, visit 4), for a total of 12 exposures

As requested in Phase I, the orient angle must be constrained in order keep our parallel WFC3 observations pointed on the nearby cluster LH91.

Therefore all these four orbits must be scheduled with an orient angle between 160 and 164.

As requested in Phase I, and if this this is possible during the scheduling of the HST Cycle 20, we would like to have the 4 orbits of this program (4 visits), scheduled as far as possible in time from each other, withing the visibility period. This is useful for us to monitor stellar variability in our targeted cluster LH95. This means that whereas the 4 visits could be carried out sequentially, one after the other, we would benefit if they were scheduled in different (well separated) days.

REAL TIME JUSTIFICATION

N/A

CALIBRATION JUSTIFICATION

N/A

ADDITIONAL COMMENTS

Important comments concerning the scheduling of this program are described in the "Observing Description".

Visit

Proposal 12872, Visit 01 Wed Jul 11 01:20:44 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 160D TO 164 D

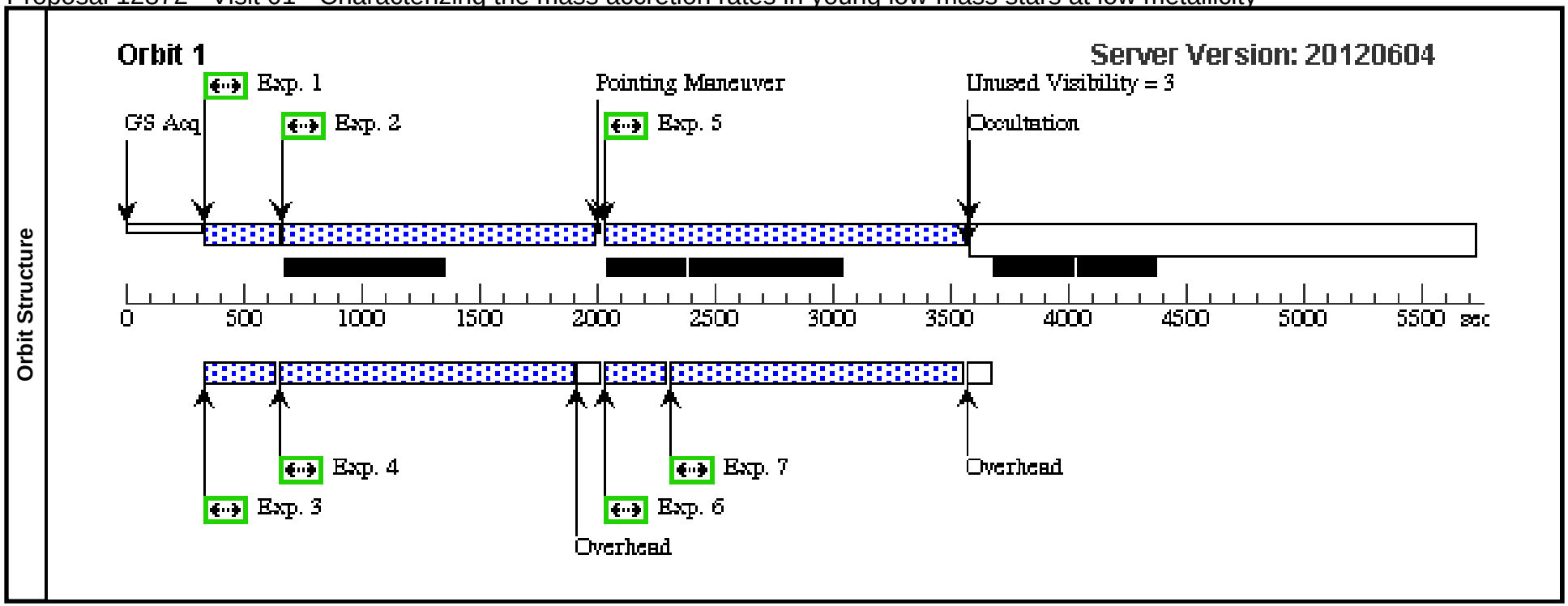
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LH95 Alt Name1: 2MASS-J05370431-6622007	RA: 05 37 5.0000 (84.2708333d) Dec: -66 21 47.00 (-66.36306d) Equinox: J2000		V=28	Reference Frame: ICRS

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

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG 2,-3	Prime + Parallel Group 1-4 in Visit 01	100 Secs *[==>106.0 Secs]*	 ***[1]***
2		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG 2,-3	Prime + Parallel Group 1-4 in Visit 01	1200 Secs *[==>1206.0 Secs]*	 ***[1]***
3		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Prime + Parallel Group 1-4 in Visit 01	150 Secs *[==>155.0 Secs]*	 ***[1]***
4		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Prime + Parallel Group 1-4 in Visit 01	1250 Secs *[==>1255.0 Secs]*	 ***[1]***
5		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG -2,3	Prime + Parallel Group 5-7 in Visit 01	1400 Secs *[==>1406.0 Secs]*	 ***[1]***
6		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Prime + Parallel Group 5-7 in Visit 01	150 Secs *[==>147.0 Secs]*	 ***[1]***
7		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Prime + Parallel Group 5-7 in Visit 01	1250 Secs *[==>1247.0 Secs]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20120604
Exp. 1
GS Acq
Exp. 2
Pointing Maneuver
Exp. 5
Unused Visibility = 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 4
Exp. 3
Overhead
Exp. 7
Exp. 6
Overhead

Visit

Proposal 12872, Visit 02 Wed Jul 11 01:20:46 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 160D TO 164 D

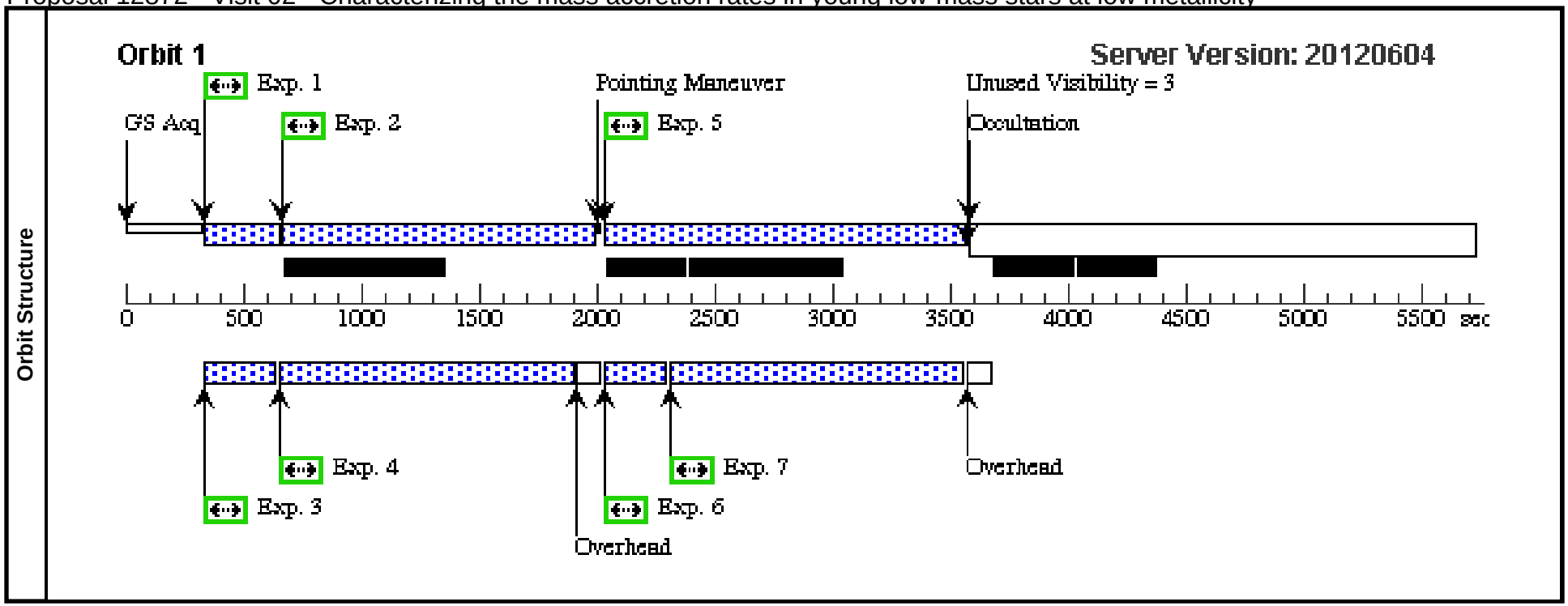
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LH95 Alt Name1: 2MASS-J05370431-6622007	RA: 05 37 5.0000 (84.2708333d) Dec: -66 21 47.00 (-66.36306d) Equinox: J2000		V=28	Reference Frame: ICRS

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

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG -3,2	Prime + Parallel Group 1-4 in Visit 02	100 Secs *[==>106.0 Secs]*	 ***[1]***
2		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG -3,2	Prime + Parallel Group 1-4 in Visit 02	1200 Secs *[==>1206.0 Secs]*	 ***[1]***
3		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Prime + Parallel Group 1-4 in Visit 02	150 Secs *[==>155.0 Secs]*	 ***[1]***
4		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Prime + Parallel Group 1-4 in Visit 02	1250 Secs *[==>1255.0 Secs]*	 ***[1]***
5		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG 3,-2	Prime + Parallel Group 5-7 in Visit 02	1400 Secs *[==>1406.0 Secs]*	 ***[1]***
6		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Prime + Parallel Group 5-7 in Visit 02	150 Secs *[==>147.0 Secs]*	 ***[1]***
7		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Prime + Parallel Group 5-7 in Visit 02	1250 Secs *[==>1247.0 Secs]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20120604
Exp. 1
GS Acq
Exp. 2
Pointing Maneuver
Exp. 5
Unused Visibility = 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 4
Exp. 3
Overhead
Exp. 7
Exp. 6
Overhead

Visit

Proposal 12872, Visit 03 Wed Jul 11 01:20:48 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 160D TO 164 D

Fixed Targets

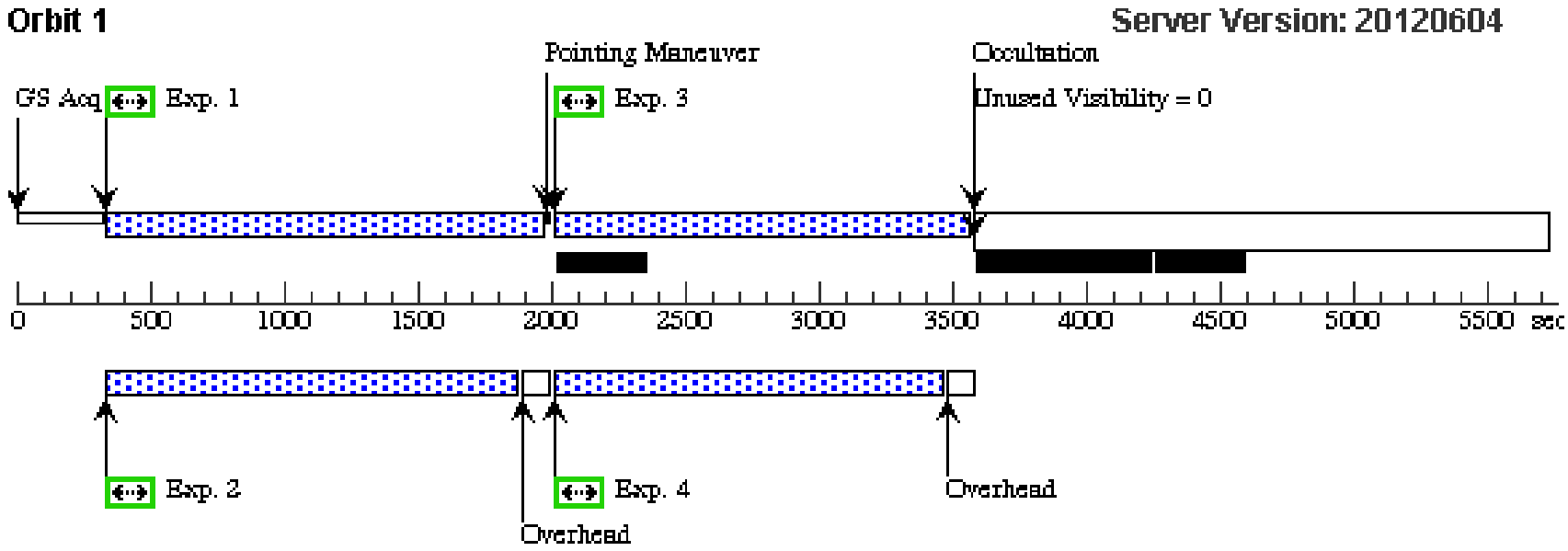
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LH95 Alt Name1: 2MASS-J05370431-6622007	RA: 05 37 5.0000 (84.2708333d) Dec: -66 21 47.00 (-66.36306d) Equinox: J2000		V=28	Reference Frame: ICRS

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

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG 1,4	Prime + Parallel Group 1-2 in Visit 03	1350 Secs *[==>1431.0 Secs]*	 ***[1]***
2		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Prime + Parallel Group 1-2 in Visit 03	1350 Secs *[==>1515.0 Secs]*	 ***[1]***
3		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG -1,-4	Prime + Parallel Group 3-4 in Visit 03	1350 Secs *[==>1431.0 Secs]*	 ***[1]***
4		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Prime + Parallel Group 3-4 in Visit 03	1350 Secs *[==>1455.0 Secs]*	 ***[1]***

Orbit Structure



Visit

Proposal 12872, Visit 04 Wed Jul 11 01:20:49 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 160D TO 164 D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LH95 Alt Name1: 2MASS-J05370431-6622007	RA: 05 37 5.0000 (84.2708333d) Dec: -66 21 47.00 (-66.36306d) Equinox: J2000		V=28	Reference Frame: ICRS

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

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG 1.7,-1.7	Prime + Parallel Group 1-2 in Visit 04	1350 Secs *[==>1432.0 Secs]*	 ***[1]***
2		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N			Prime + Parallel Group 1-2 in Visit 04	1350 Secs *[==>1515.0 Secs]*	 ***[1]***
3		(1) LH95	ACS/WFC, ACCUM, WFCENTER	F658N		POS TARG -1.7,1.7	Prime + Parallel Group 3-4 in Visit 04	1350 Secs *[==>1432.0 Secs]*	 ***[1]***
4		(1) LH95	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N			Prime + Parallel Group 3-4 in Visit 04	1350 Secs *[==>1455.0 Secs]*	 ***[1]***

Orbit Structure