13770 - Measuring the Milky Way Mass with the Proper Motion of Leo T

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	(1) LEO-T	ACS/WFC WFC3/UVIS	3	23-Jul-2014 21:38:39.0	yes
02	(1) LEO-T	ACS/WFC WFC3/UVIS	3	23-Jul-2014 21:38:43.0	yes
03	(1) LEO-T	ACS/WFC WFC3/UVIS	3	23-Jul-2014 21:38:46.0	yes
04	(1) LEO-T	ACS/WFC WFC3/UVIS	3	23-Jul-2014 21:38:49.0	yes

12 Total Orbits Used

ABSTRACT

The Milky Way has long been used to study galaxy evolution and cosmology, but these studies are currently limited by the large uncertainty in its dark matter halo mass. The halo mass is poorly constrained mainly because it is difficult to find appropriate tracers of the potential at large Galacto-centric distances. Satellite galaxies are the best such tracers, and recent cosmological simulations have shown a well-defined relationship between a satellite's orbital energy -- which depends on halo mass -- and its infall time. The recently discovered dwarf galaxy Leo T is an optimal candidate for measuring the halo mass in two respects. It is the most distant of the MW satellites, providing a probe of the mass distribution at large scales. It is also the only MW dwarf spheroidal galaxy with any gas; this makes it very likely that Leo T is currently falling into to MW for the first time. We propose to measure the bulk proper motion of Leo T using ACS/WFC in order to reconstruct its orbit. Using a well developed method of measuring the stellar proper motions with respect to an absolute reference frame composed of distant galaxies, we will be able to achieve a proper motion uncertainty of 0.03 mas/yr with a two year time baseline. Previous similar HST proper motion programs have shown that this precision is well within reach. A proper motion measurement of this precision, combined with the knowledge of Leo T's infall epoch, will allow for a determination of the mass of the MW within 400 kpc from the Galaxy, which is otherwise impossible. This knowledge will significantly reduce one of the largest uncertainties in interpreting the Milky Way in cosmological context.

OBSERVING DESCRIPTION

To measure the PMs of our target dwarf galaxies we plan to observe them in two epochs separated by ~2 years. In order to reach our goal of 1 mas astrometric precision for stars at i = 23, we require an integration time of t = 950 s for each image in F606W, slightly less than half of an HST orbit. We require 24 dither positions to sample the pixel phase as well as produce galaxy templates with high signal to noise. In order to aid in selection of dwarf galaxy members, we request short exposures in the F814W filter in the beginning of each orbit to provide colors for the stars. Observations with t = 427 & 565 s will provide the 3-10% photometry necessary to construct useful color magnitude diagrams of these sources. We have split the observations for this cycle into 4 visits of 3 orbits each. These observations should be taken in within 30 days of each other to optimally combine the data.

These observations should be performed at an ORIENT of 278.982 degrees to match the orientation of observations from cycle 20. We request that these observations in cycle 22 be performed at the end of cycle 22 (after Nov. 2015) in order to maximize the time baseline between cycle 20 and cycle 22. This time baseline will significantly increase the precision of the proper motion measurements compared to observations near the beginning of the cycle.

Visit

Proposal 13770, Visit 01, implementation Thu Jul 24 01:38:51 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 278.982D TO 278.982 D; AFTER 01-NOV-2015:00:00:00; GROUP 01,02,03,04 WITHIN 30D

Comments: This is the first visit for imaging the Leo T Dwarf Spheroidal Galaxy. 3 orbits are required to complete this visit. For each visit we will do a set of 6-point dithering. The ORIENT should be as close to 278.982 as possible in order to match the first epoch of observation to limit systematic uncertainties in the proper motion measurements. We request that these visits should be completed within 30 days of each other to ensure that there is no significant proper motion between the visits in order to optimally combine the data for this epoch. We request that the visits be made in late 2015 in order to obtain the longest time baseline for the proper motion measurement -- this will enable a significantly better proper motion measurement compared to observing in the beginning of Cycle 22.

Fixed Targets

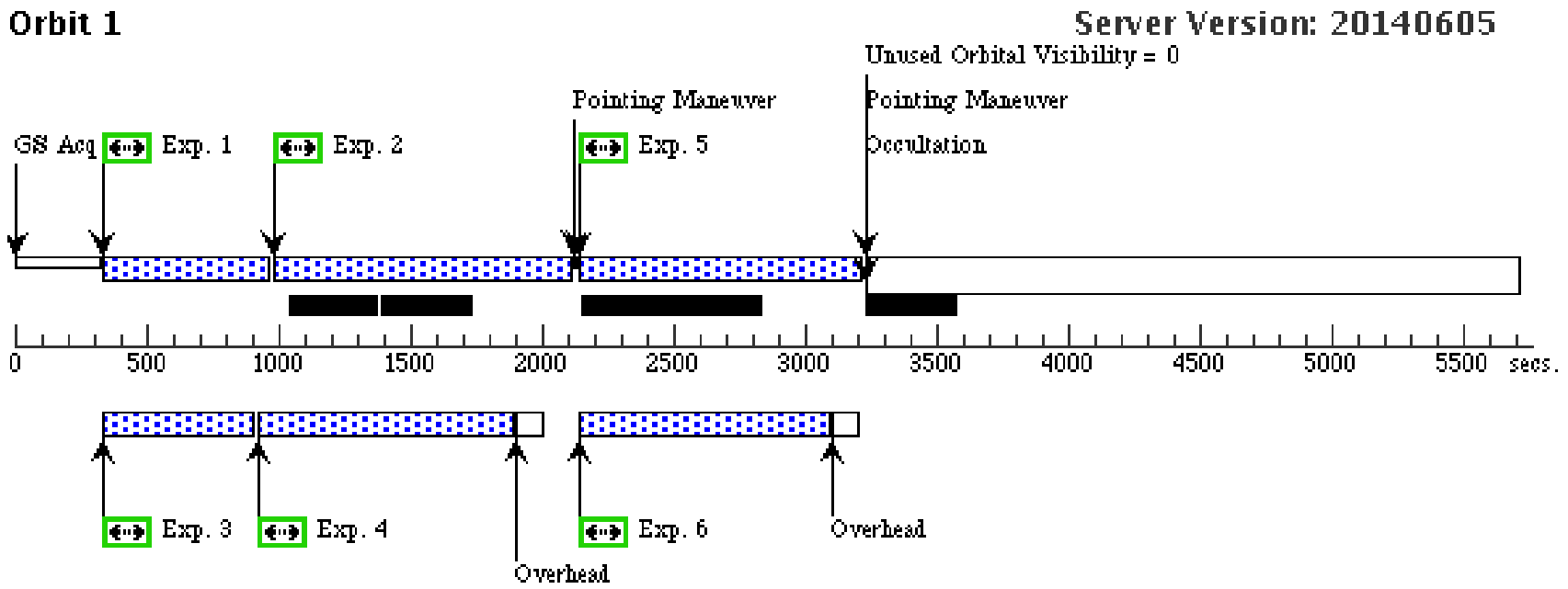
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LEO-T	RA: 09 34 53.6100 (143.7233750d) Dec: +17 02 43.01 (17.04528d) Equinox: J2000		V=20	Reference Frame: ICRS

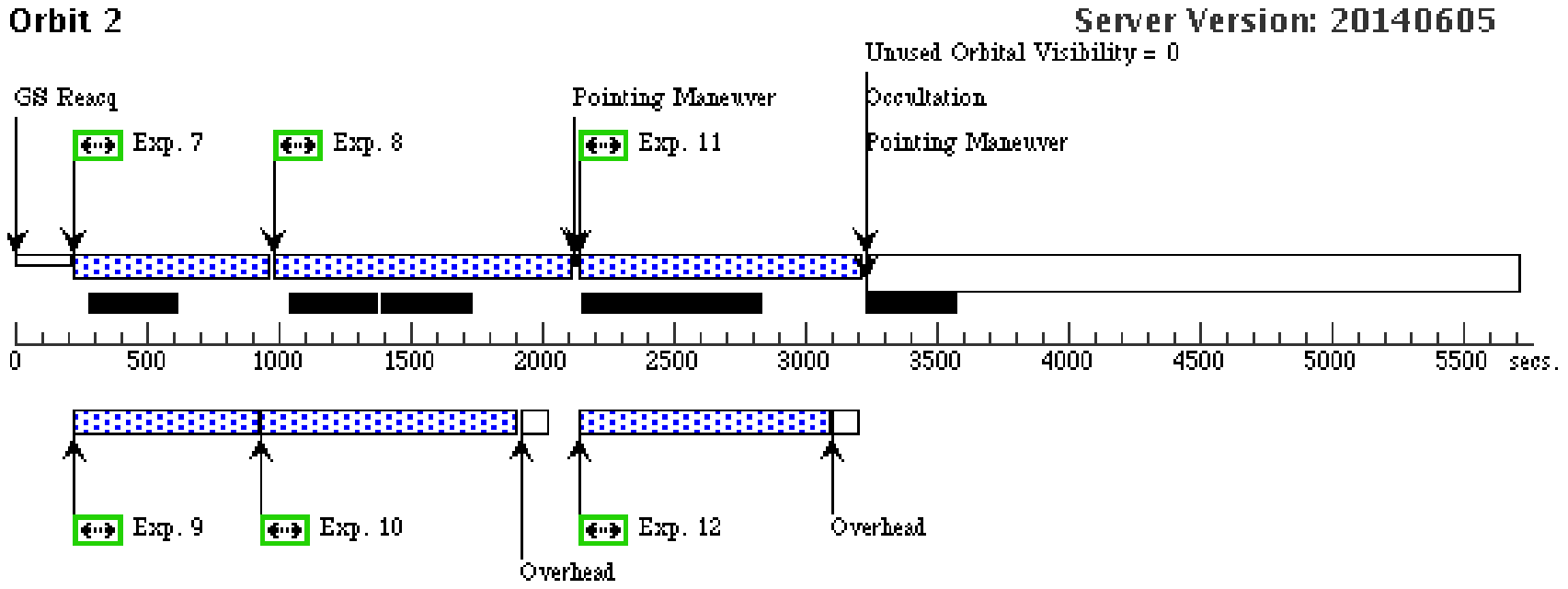
Exposures

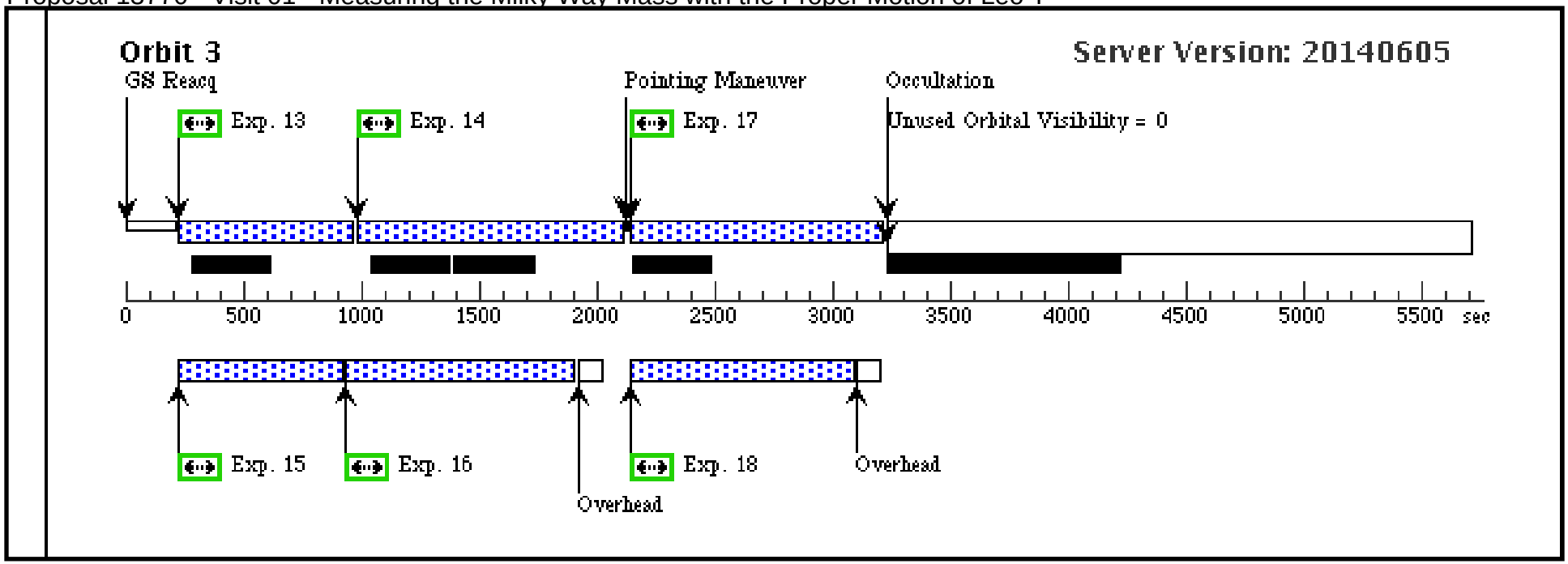
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	leot-acs-dither0	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.0000,0.0000	Sequence 1-6 Non-Int in Visit 01 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 01	427 Secs (427 Secs) *[==>]*	***[1]***
2	leot-acs-dither1	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.0000,0.0000	Sequence 1-6 Non-Int in Visit 01 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[1]***
3	leot-wfc3-dither0	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 01 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 01	427 Secs (427 Secs) *[==>]*	***[1]***
4	leot-wfc3-dither1	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 01 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[1]***
5	leot-acs-dither2	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.1740,0.1850	Sequence 1-6 Non-Int in Visit 01 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[1]***
6	leoi-wfc3-dither2	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 01 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[1]***
7	leot-acs-dither3a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.3232,0.1235	Sequence 7-12 Non-Int in Visit 01 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 01	565 Secs (565 Secs) *[==>]*	***[2]***
8	leot-acs-dither3	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.3232,0.1235	Sequence 7-12 Non-Int in Visit 01 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[2]***
9	leot-wfc3-dither3a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 01 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 01	565 Secs (565 Secs) *[==>]*	***[2]***

	10	leot-wfc3-dither3	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 01 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[2]***
	11	leot-acs-dither4	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.1005,0.3305	Sequence 7-12 Non-Int in Visit 01 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[2]***
	12	leoi-wfc3-dither4	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 01 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[2]***
	13	leot-acs-dither5a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.5030,0.0460	Sequence 13-18 Non-Int in Visit 01 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 01	565 Secs (565 Secs) *[==>]*	***[3]***
	14	leot-acs-dither5	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.5030,0.0460	Sequence 13-18 Non-Int in Visit 01 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[3]***
	15	leot-wfc3-dither5a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 01 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 01	565 Secs (565 Secs) *[==>]*	***[3]***
	16	leot-wfc3-dither5	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 01 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[3]***
	17	leot-acs-dither6	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.6770,0.2310	Sequence 13-18 Non-Int in Visit 01 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[3]***
	18	leoi-wfc3-dither6	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 01 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 01	950 Secs (950 Secs) *[==>]*	***[3]***

Orbit Structure



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Visit

Proposal 13770, Visit 02, implementation Thu Jul 24 01:38:52 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01; GROUP 02,01,03,04 WITHIN 30D

Comments: This is the second visit for imaging the Leo T Dwarf Spheroidal Galaxy. 3 orbits are required to complete this visit. For each visit we will do a set of 6-point dithering.

Fixed Targets

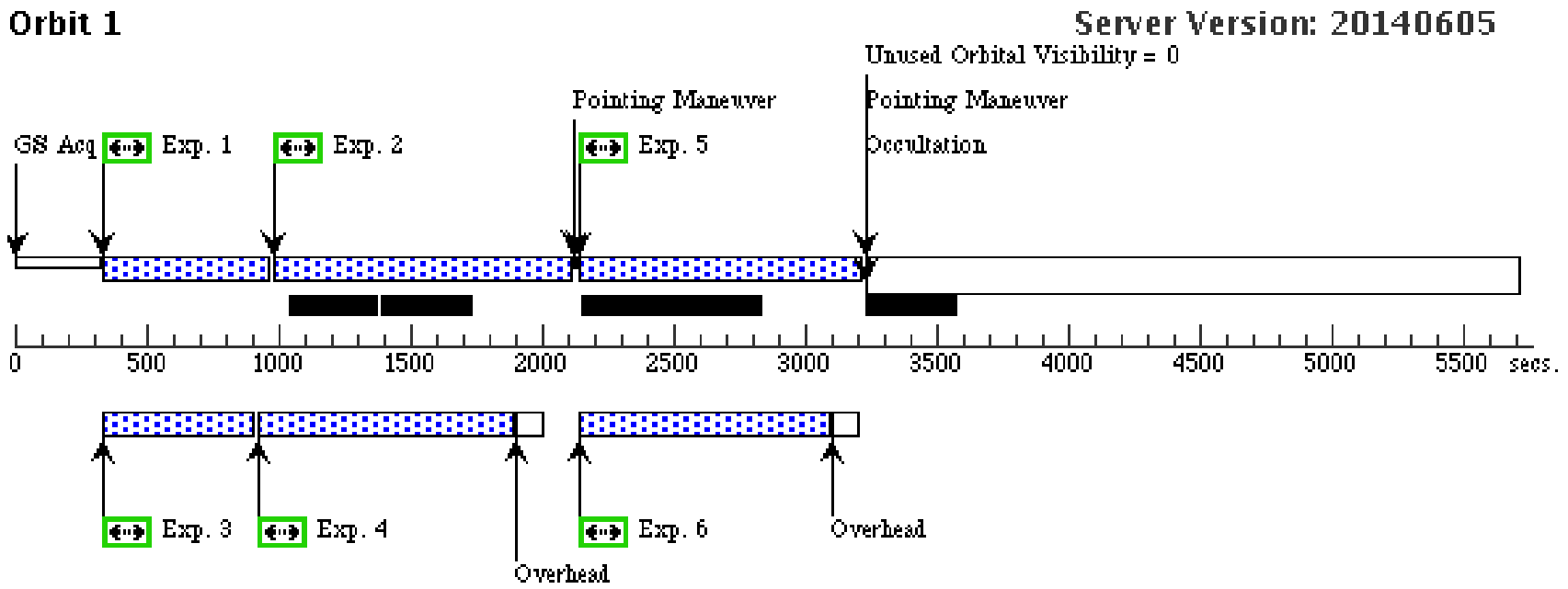
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LEO-T	RA: 09 34 53.6100 (143.7233750d) Dec: +17 02 43.01 (17.04528d) Equinox: J2000		V=20	Reference Frame: ICRS

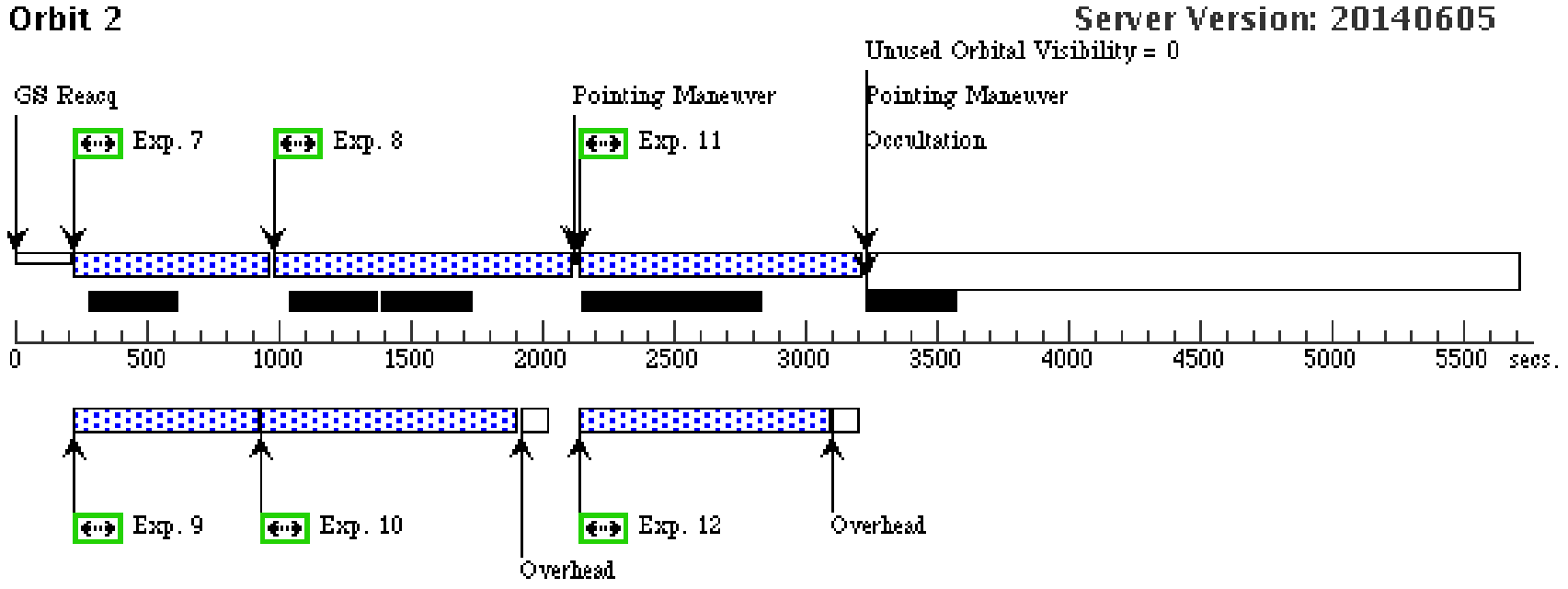
Exposures

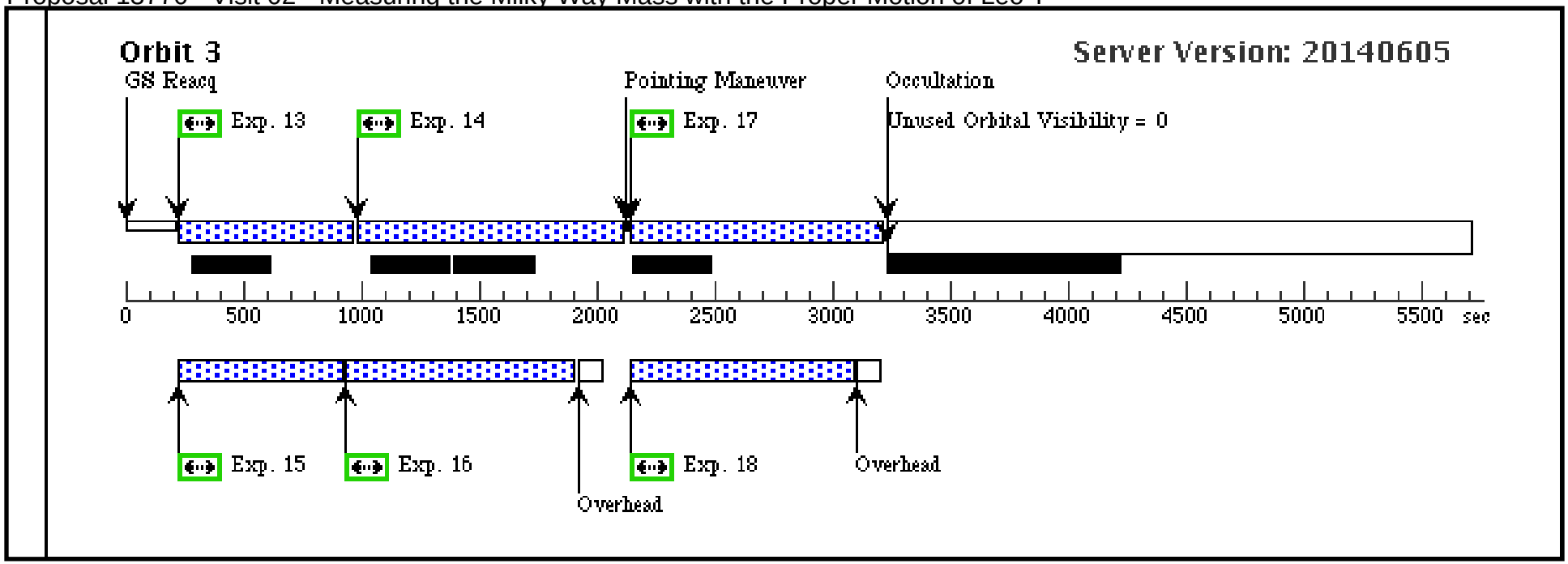
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	leot-acs-dither7a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.8262,0.1695	Sequence 1-6 Non-Int in Visit 02 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 02	427 Secs (427 Secs) *[==>]*	***[1]***
2	leot-acs-dither7	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.8262,0.1695	Sequence 1-6 Non-Int in Visit 02 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[1]***
3	leot-wfc3-dither7a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 02 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 02	427 Secs (427 Secs) *[==>]*	***[1]***
4	leot-wfc3-dither7	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 02 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[1]***
5	leot-acs-dither8	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.6035,0.3765	Sequence 1-6 Non-Int in Visit 02 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[1]***
6	leoi-wfc3-dither8	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 02 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[1]***
7	leot-acs-dither9a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.1180,0.5180	Sequence 7-12 Non-Int in Visit 02 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 02	565 Secs (565 Secs) *[==>]*	***[2]***
8	leot-acs-dither9	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.1180,0.5180	Sequence 7-12 Non-Int in Visit 02 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[2]***
9	leot-wfc3-dither9a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 02 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 02	565 Secs (565 Secs) *[==>]*	***[2]***

	10	leot-wfc3-dither9	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 02 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[2]***
	11	leot-acs-dither10	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.2920,0.7030	Sequence 7-12 Non-Int in Visit 02 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[2]***
	12	leoi-wfc3-dither10	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 02 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[2]***
	13	leot-acs-dither11a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.4412,0.6415	Sequence 13-18 Non-Int in Visit 02 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 02	565 Secs (565 Secs) *[==>]*	***[3]***
	14	leot-acs-dither11	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.4412,0.6415	Sequence 13-18 Non-Int in Visit 02 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[3]***
	15	leot-wfc3-dither11a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 02 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 02	565 Secs (565 Secs) *[==>]*	***[3]***
	16	leot-wfc3-dither11	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 02 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[3]***
	17	leot-acs-dither12	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.2185,0.8485	Sequence 13-18 Non-Int in Visit 02 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[3]***
	18	leoi-wfc3-dither12	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 02 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 02	950 Secs (950 Secs) *[==>]*	***[3]***

Orbit Structure



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Exp. 18
Overhead
Overhead

Visit

Proposal 13770, Visit 03, implementation Thu Jul 24 01:38:52 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01; GROUP 03,01,02,04 WITHIN 30D

Comments: This is the third visit for imaging the Leo T Dwarf Spheroidal Galaxy. Visit 3 and 4 repeats together repeats the 12 point dither pattern from visit 1 and 2, but offset to cover the chip gap in ACS. 3 orbits are required to complete this visit. For each visit we will do a set of 6-point dithering. We request that these visits should be completed within 30 days of each other to ensure that there is no significant proper motion between the visits in order to optimally combine the data for this epoch.

Fixed Targets

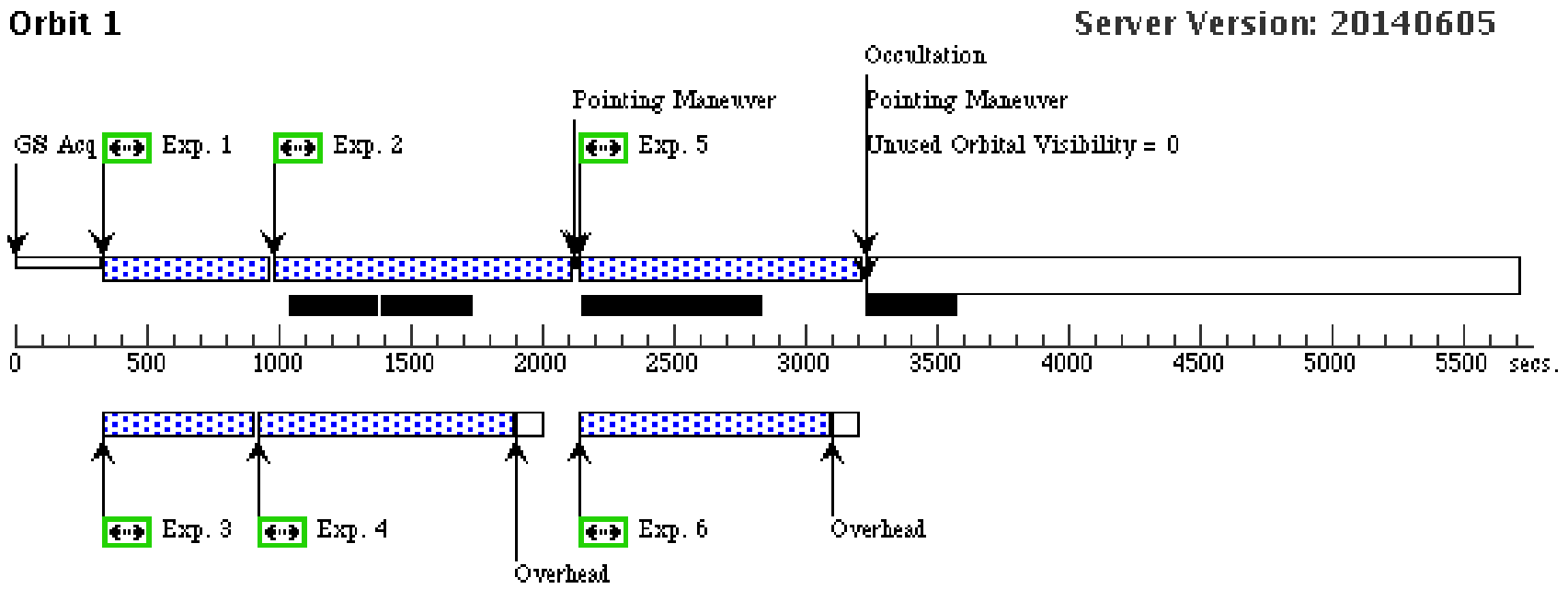
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LEO-T	RA: 09 34 53.6100 (143.7233750d) Dec: +17 02 43.01 (17.04528d) Equinox: J2000		V=20	Reference Frame: ICRS

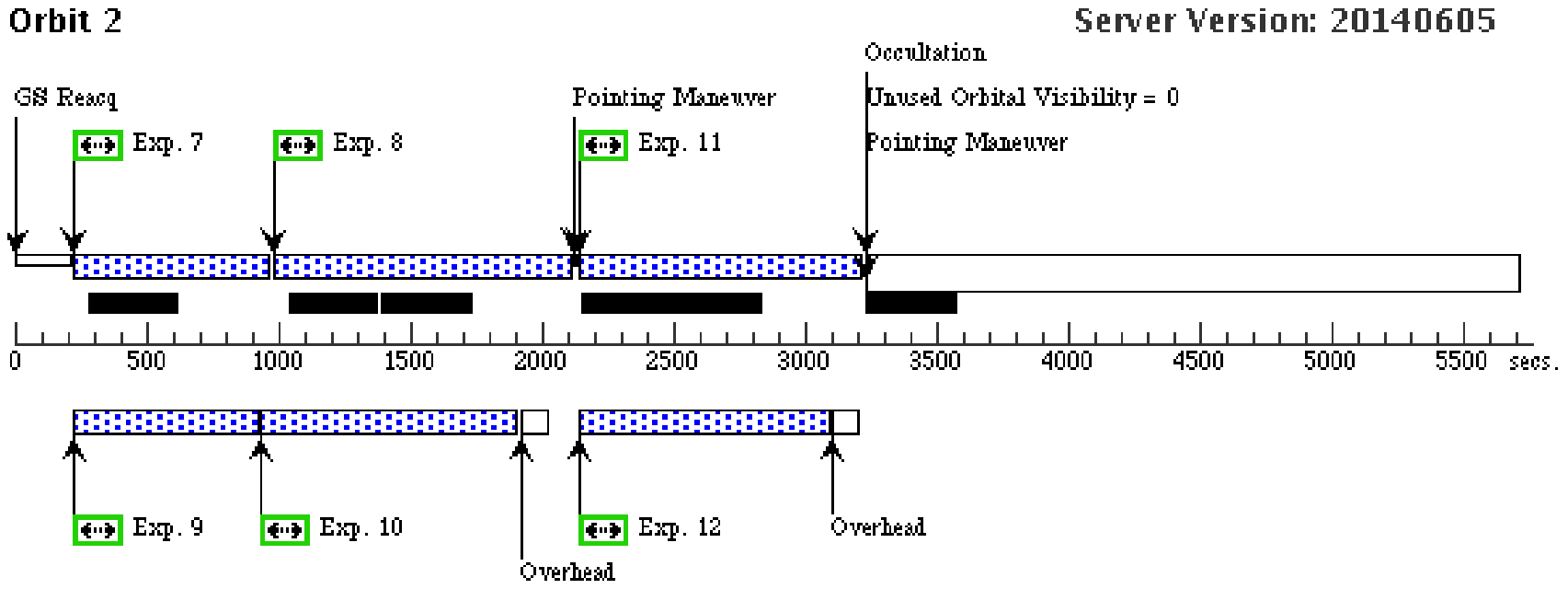
Exposures

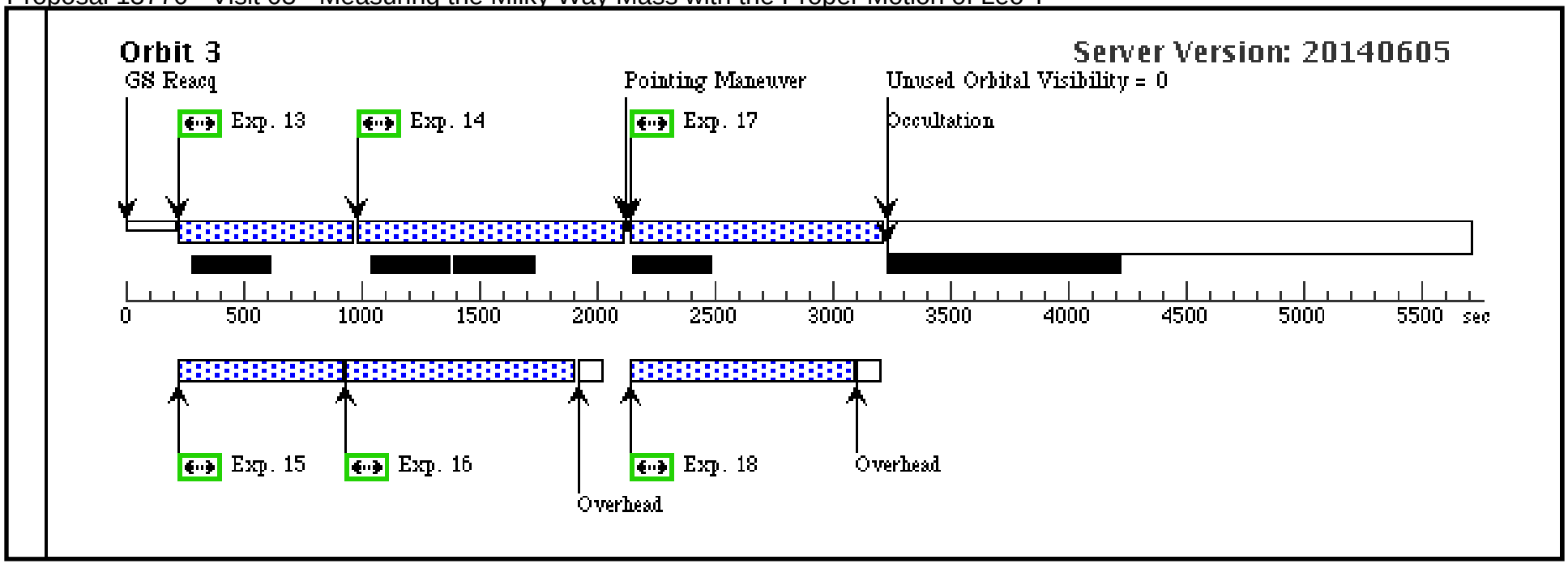
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	leot-acs-dither0	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.2470,2.9840	Sequence 1-6 Non-Int in Visit 03 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 03	427 Secs (427 Secs) *[==>]*	***[1]***
2	leot-acs-dither1	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.2470,2.9840	Sequence 1-6 Non-Int in Visit 03 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[1]***
3	leot-wfc3-dither0	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 03 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 03	427 Secs (427 Secs) *[==>]*	***[1]***
4	leot-wfc3-dither1	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 03 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[1]***
5	leot-acs-dither2	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.4210,3.1690	Sequence 1-6 Non-Int in Visit 03 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[1]***
6	leoi-wfc3-dither2	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 03 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[1]***
7	leot-acs-dither3a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.5702,3.1075	Sequence 7-12 Non-Int in Visit 03 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 03	565 Secs (565 Secs) *[==>]*	***[2]***
8	leot-acs-dither3	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.5702,3.1075	Sequence 7-12 Non-Int in Visit 03 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[2]***
9	leot-wfc3-dither3a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 03 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 03	565 Secs (565 Secs) *[==>]*	***[2]***

	10	leot-wfc3-dither3	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 03 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[2]***
	11	leot-acs-dither4	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.3475,3.3145	Sequence 7-12 Non-Int in Visit 03 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[2]***
	12	leoi-wfc3-dither4	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 03 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[2]***
	13	leot-acs-dither5a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.7500,3.0300	Sequence 13-18 Non-Int in Visit 03 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 03	565 Secs (565 Secs) *[==>]*	***[3]***
	14	leot-acs-dither5	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.7500,3.03	Sequence 13-18 Non-Int in Visit 03 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[3]***
	15	leot-wfc3-dither5a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 03 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 03	565 Secs (565 Secs) *[==>]*	***[3]***
	16	leot-wfc3-dither5	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 03 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[3]***
	17	leot-acs-dither6	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.9240,3.2150	Sequence 13-18 Non-Int in Visit 03 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[3]***
	18	leoi-wfc3-dither6	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 03 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 03	950 Secs (950 Secs) *[==>]*	***[3]***

Orbit Structure



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3000
3500
4000
4500
5000
5500
sec
Exp. 15
Exp. 16
Exp. 18
Overhead
Overhead

Visit

Proposal 13770, Visit 04, implementation Thu Jul 24 01:38:52 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01; GROUP 04,01,02,03 WITHIN 30D

Comments: This is the fourth visit for imaging the Leo T Dwarf Spheroidal Galaxy. 3 orbits are required to complete this visit. For each visit we will do a set of 6-point dithering. The limits to the ORIENT of 278.982 is chosen to minimize the number of bright sources in the field, as well as to fully image the from the center of the galaxy to the half-light radius at about 1'. We request that these visits should be completed within 30 days of each other to ensure that there is no significant proper motion between the visits in order to optimally combine the data for this epoch.

Fixed Targets

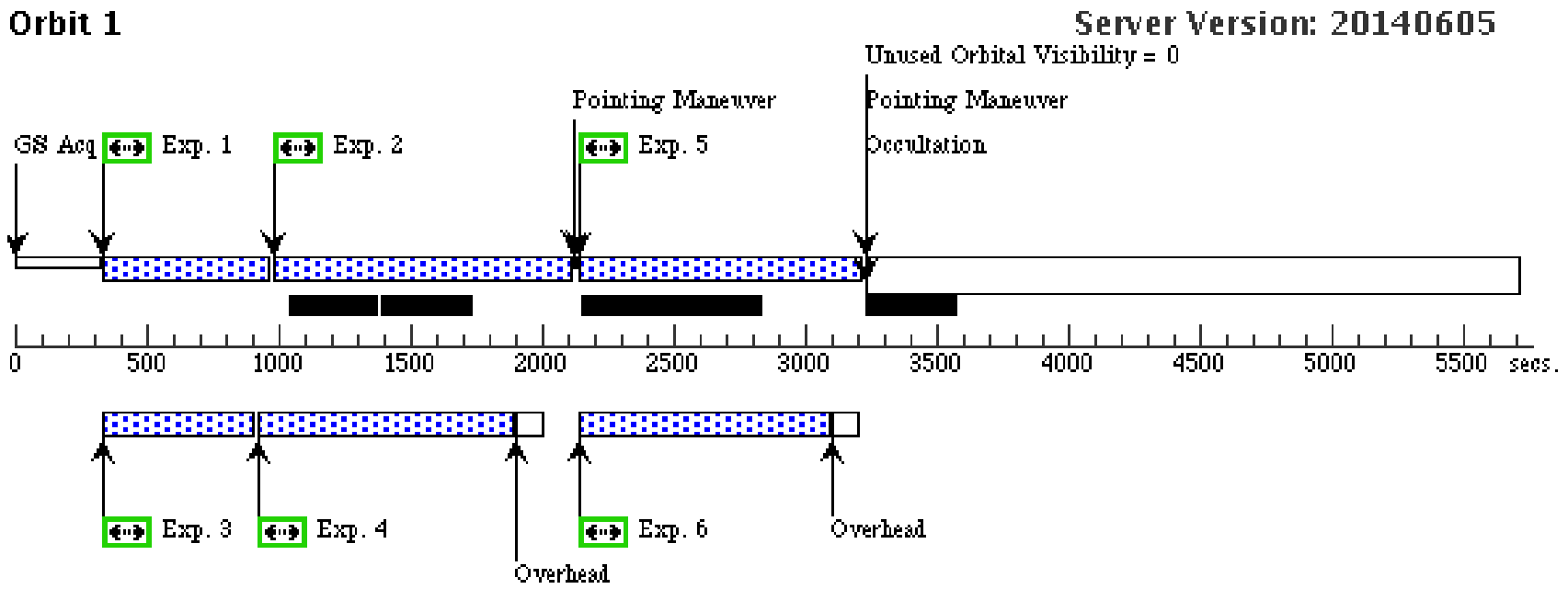
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LEO-T	RA: 09 34 53.6100 (143.7233750d) Dec: +17 02 43.01 (17.04528d) Equinox: J2000		V=20	Reference Frame: ICRS

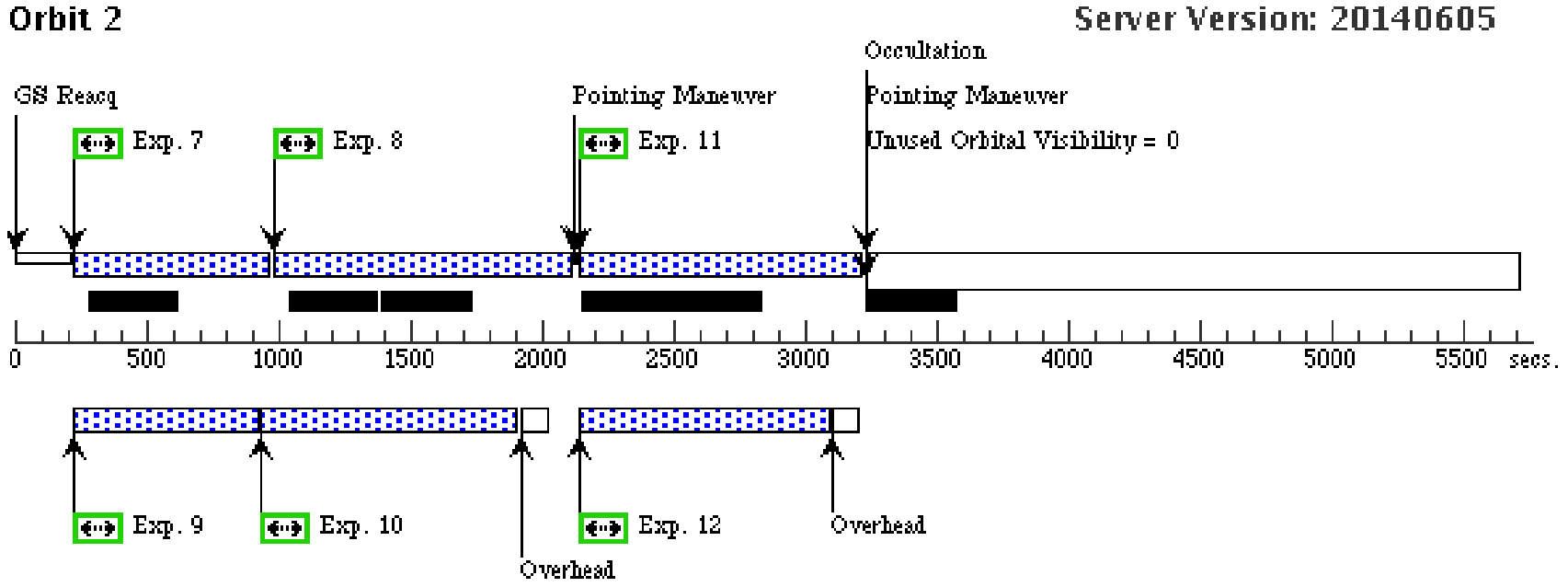
Exposures

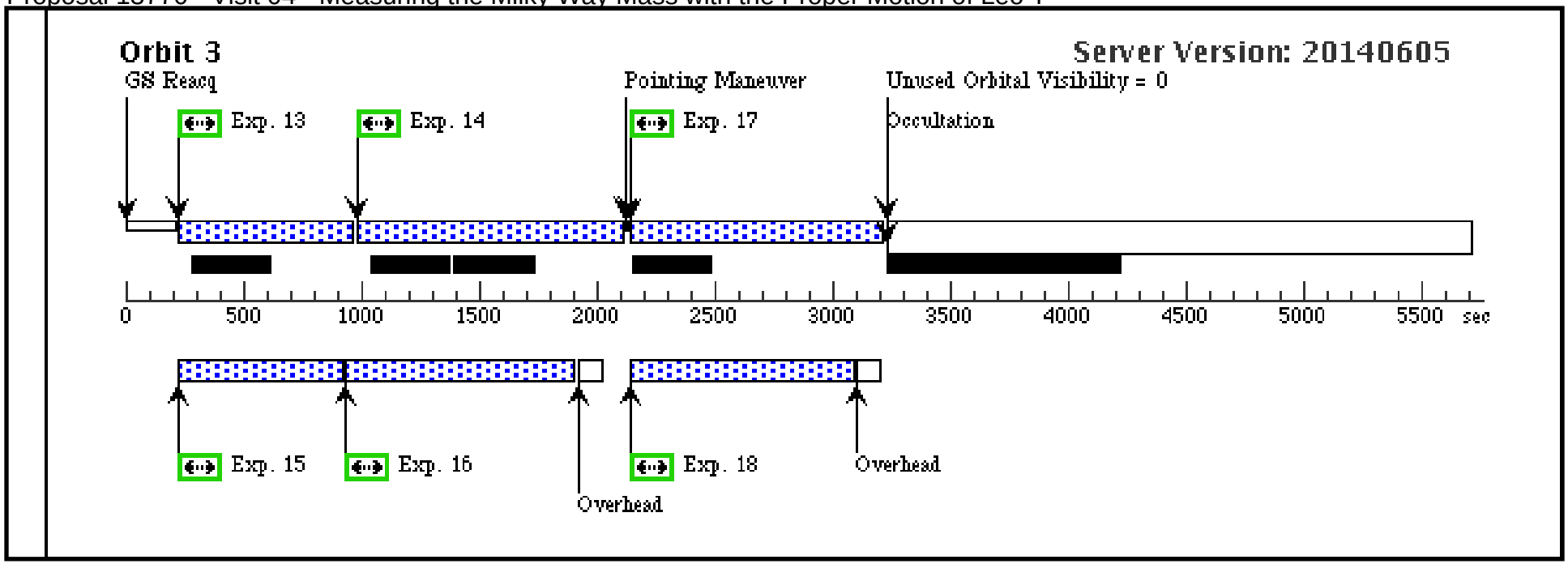
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	leot-acs-dither7a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 1.0732,3.1535	Sequence 1-6 Non-Int in Visit 04 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 04	427 Secs (427 Secs) *[==>]*	***[1]***
2	leot-acs-dither7	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 1.0732,3.1535	Sequence 1-6 Non-Int in Visit 04 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[1]***
3	leot-wfc3-dither7a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 04 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 04	427 Secs (427 Secs) *[==>]*	***[1]***
4	leot-wfc3-dither7	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 04 Prime + Parallel Group 1-4 in Sequence 1-6 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[1]***
5	leot-acs-dither8	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.8505,3.3605	Sequence 1-6 Non-Int in Visit 04 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[1]***
6	leoi-wfc3-dither8	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 1-6 Non-Int in Visit 04 Prime + Parallel Group 5-6 in Sequence 1-6 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[1]***
7	leot-acs-dither9a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.3650,3.5020	Sequence 7-12 Non-Int in Visit 04 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 04	565 Secs (565 Secs) *[==>]*	***[2]***
8	leot-acs-dither9	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.3650,3.5020	Sequence 7-12 Non-Int in Visit 04 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[2]***
9	leot-wfc3-dither9a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 04 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 04	565 Secs (565 Secs) *[==>]*	***[2]***

	10	leot-wfc3-dither9	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 04 Prime + Parallel Group 7-10 in Sequence 7-12 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[2]***
	11	leot-acs-dither10	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.5390,3.6870	Sequence 7-12 Non-Int in Visit 04 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[2]***
	12	leoi-wfc3-dither10	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 7-12 Non-Int in Visit 04 Prime + Parallel Group 11-12 in Sequence 7-12 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[2]***
	13	leot-acs-dither11a	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO	POS TARG 0.6882,3.6255	Sequence 13-18 Non-Int in Visit 04 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 04	565 Secs (565 Secs) *[==>]*	***[3]***
	14	leot-acs-dither11	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.6882,3.6255	Sequence 13-18 Non-Int in Visit 04 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[3]***
	15	leot-wfc3-dither11a	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 04 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 04	565 Secs (565 Secs) *[==>]*	***[3]***
	16	leot-wfc3-dither11	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 04 Prime + Parallel Group 13-16 in Sequence 13-18 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[3]***
	17	leot-acs-dither12	(1) LEO-T	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO	POS TARG 0.4655,3.8325	Sequence 13-18 Non-Int in Visit 04 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[3]***
	18	leoi-wfc3-dither12	(1) LEO-T	WFC3/UVIS, ACCUM, UVIS	F606W	CR-SPLIT=NO		Sequence 13-18 Non-Int in Visit 04 Prime + Parallel Group 17-18 in Sequence 13-18 Non-Int in Visit 04	950 Secs (950 Secs) *[==>]*	***[3]***

Orbit Structure



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sec
Exp. 15
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Overhead
Exp. 18
Overhead