14257 - Far UV spectroscopic measurements of the deuterium abundance of comets

Cycle: 23, 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?*
34	(3) C2013US10	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:11.0	yes
35	(3) C2013US10	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:13.0	yes
38	(5) C2013US10-OFFSET	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:14.0	yes
36	(3) C2013US10	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:15.0	yes
37	(3) C2013US10	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:16.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
39	(4) C2013X1	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:17.0	yes
40	(4) C2013X1	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:18.0	yes
41	(4) C2013X1	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:19.0	yes
42	(4) C2013X1	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:20.0	yes
43	(6) C2013X1-OFFSET	STIS/CCD STIS/FUV-MAMA	1	01-Dec-2015 21:09:21.0	yes

10 Total Orbits Used

ABSTRACT

We propose to use STIS Echelle spectroscopy to measure the deuterium to hydrogen ratio in two ToO comets to investigate the origin of their water ice. The deuterium abundance of water in comets preserves information about the formation conditions of our solar system, while also constraining the possible contribution of cometary water to Earth's oceans. The D/H values in JF comets and the ice ratios (CO/CO2/H2O) in both Jupiter Family and Oort Cloud comets call into question the details of the dynamical processes for populating the modern reservoirs for these two dynamical classes. However, currently too few D/H ratios have been measured in comets to allow for a meaningful interpretation. With a dedicated observing campaign we will measure the ratio between Ly-alpha emission from deuterium and hydrogen atoms from two different comets. We have defined strict conditions that ensure the quality of our measurement which we will use to trigger our ToO request. HST is essential for these observations as it is the only telescope that has the spectroscopic capabilities in the Far ultraviolet that is needed for these measurements.

OBSERVING DESCRIPTION

We plan to observe two Target of Opportunity comets, each for 5 orbits (totaling 10 orbits). These visits both consist of the following observations:

- 4 orbits with STIS/FUV MAMA using the E140M grating, centered on the nucleus to measure the D/H ratio
- 1 orbit with the same set up, but pointing off the nucleus where the comet's Ly-a emission is optically thin.

We have identified two potential targets (C/2013 US10 Catalina and C/2013 X1 Panstarrs), but these comets are currently still far from the Sun and the extrapolation of their brightness are not yet reliable. Additionally, at least one or two bright new comets are discovered every year, and a better target might present itself. We therefore request these observations in the Target of Opportunity category.

We have combined archival observations by HST with ETC estimates to provide realistic estimates for D/H measurements and to optimize our observing strategy. Comet C/2001 Q4 (NEAT) was observed with HST/STIS between April 23rd to 27th, 2004. To get an estimate of the brightness of the DI line, we scale the measured flux of comet NEAT by the heliocentric distance r, geocentric distance D, and its water production Q (ignoring the Swings effect on the fluorescent efficiency of the Ly-a line as we will only observe at dD > 20 km/s), and the same D/H ratio as to comet NEAT.

For each comet, we request a total of 5 consecutive orbits, in all of which we use STIS' E140M grating with the 0.2" x 6" slit. This slit was used successfully to detect D in C/NEAT and provides a five-fold improvement in sensitivity compared to the standard 0.2" x 0.2" slit. Four of these orbits should be centered at the comet's nucleus. We request that one orbit is offset by a large distance from the nucleus, so that we can measure the H Ly- emission in a region of the coma where it is optically thin. From these data we can derive a highly reliable H production rate, which is needed for the D/H ratio. This offset should be toward the Sun along the comet-Sun axis to have the minimum column from the Sun to the comet.

After each spectroscopic observation, we will acquire a short STIS/CCD exposure to allow us to determine the exact position in the coma with respect to the nucleus. We will use the F28x50LP filter or the F28x50OII if predicted count rates of the comet are too high.

Observing conditions are constrained by the combination of optimum brightness and a relative geocentric velocity large enough to Doppler shift the comet's line away from the telluric Ly-a, dD > 20 km/s. We have identified two potential targets and have worked out the observing details for those observations, but will monitor their development to trigger our TOOS. Both comets' geocentric velocity is large enough so that the lower resolution E140M grating (R = 45,800) can be used to separate the telluric and cometary line. Should one of the targets be observable only during a smaller geocentric velocity, we will consider using the E140H grating instead.

A. C/2013 US10 (Catalina)
The current prediction is C/2013 US10 is best oberved between Dec 15-31, 2015. Using mv 5, Q_gas~3x10^29/s, r= 1.0 AU, D=1.25 AU, the STIS ETC predicts an excellent SNR of 12 for the DI Ly-a line using the E140M grating. At this distance and production rate, the 5th orbit should have an offset of 100 arcsec from the nucleus towards the Sun.

B. C/2013 X1 (Panstarrs)

Observing conditions for C/2013 X1 would be best between May 11 - June 11, 2016. Using mv 6.7, Q_gas~8x10^28/s, r= 1.5 AU, D=0.74 AU, we calculate a FoM of 0.14 and a flux of 2.1 x 10-15 erg/s/cm2. For this scenario, the ETC yields a SNR of 5. At this distance and production rate, the 5th orbit should have an offset of 45 arcsec from the nucleus towards the Sun.

Visit

Proposal 14257, Comet 1 orbit 1 on nucleus (34), implementation Wed Dec 02 02:09:22 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: BETWEEN 15-DEC-2015:00:00:00 AND 31-DEC-2015:23:59:00

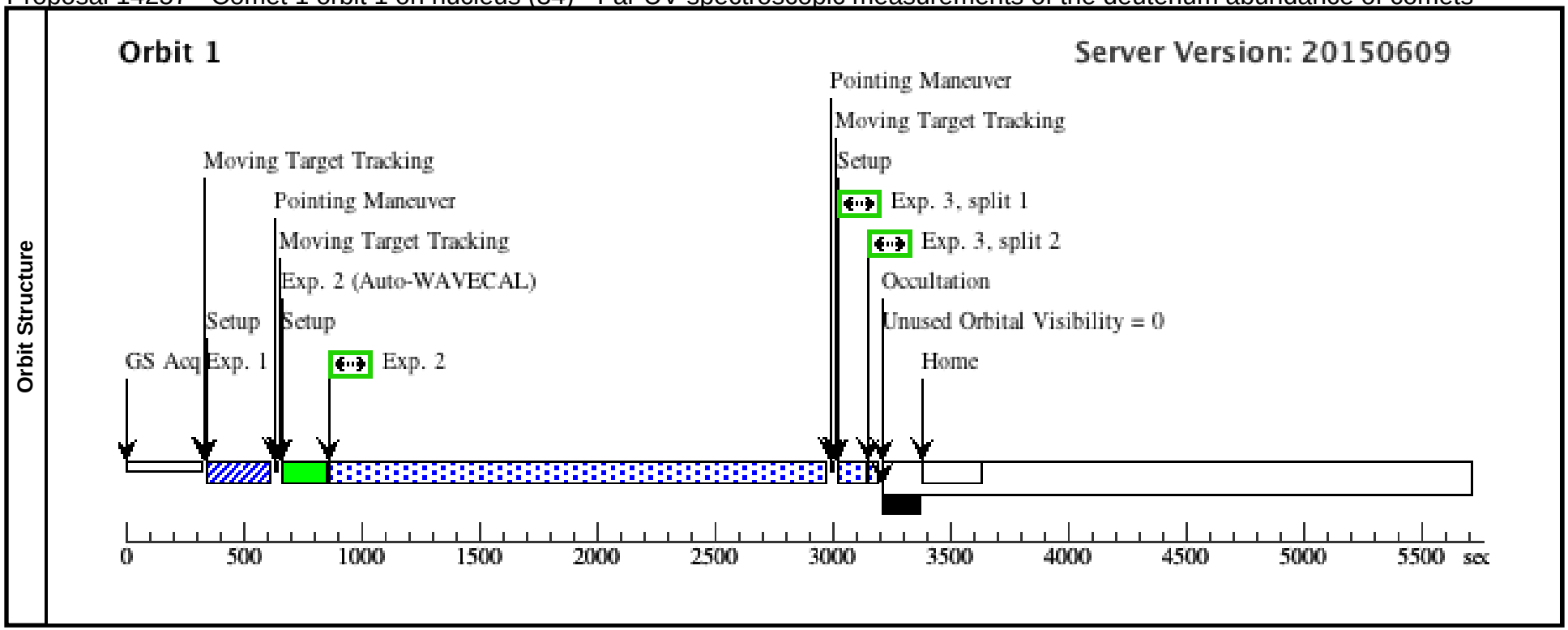
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	C2013US10	TYPE=COMET,Q=.82296868427144 07,E=1.000384580127557,I=148.8754 312250078 ,O=186.1395352627515 ,W=340.3513189554529 ,T=15-NOV-2015:17:00:00,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=02-NOV-2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #54
Predicted optimal observing time Dec 15-31, 2015
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(3) C2013US10	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(3) C2013US10	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(3) C2013US10	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3, split 1
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
Moving Target Tracking
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
Setup
GS Acq
Exp. 1
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 1 orbit 2 on nucleus (35), implementation Wed Dec 02 02:09:22 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 34 BY 0.9 Orbits TO 1.1 Orbits

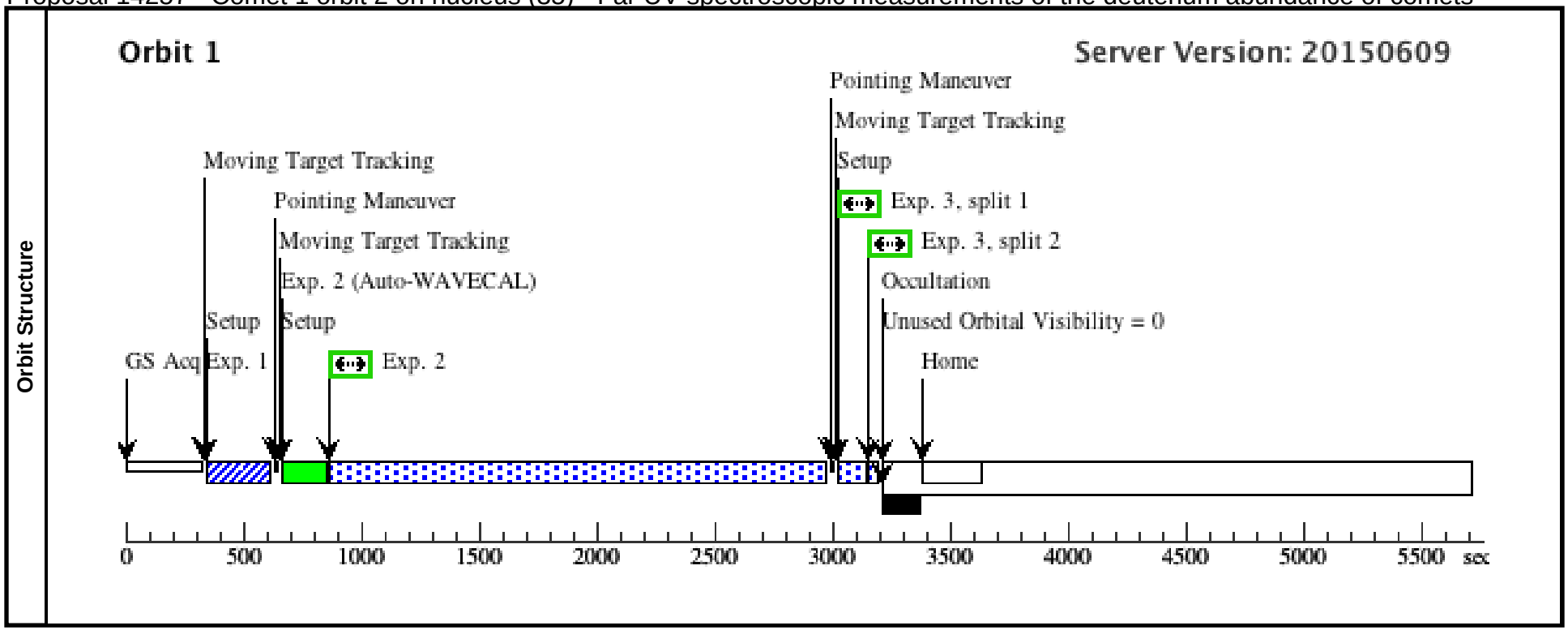
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	C2013US10	TYPE=COMET,Q=.82296868427144 07,E=1.000384580127557,I=148.8754 312250078 ,O=186.1395352627515 ,W=340.3513189554529 ,T=15-NOV-2015:17:00:00,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=02-NOV-2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #54
Predicted optimal observing time Dec 15-31, 2015
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(3) C2013US10	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(3) C2013US10	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(3) C2013US10	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3, split 1
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
Moving Target Tracking
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
Setup
GS Acq
Exp. 1
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 1 orbit 5 off nucleus (38), implementation Wed Dec 02 02:09:22 GMT 2015

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 35 BY 0.9 Orbits TO 1.1 Orbits

Diagnostics

(Comet 1 orbit 5 off nucleus (38)) Warning (Form): A target acquisition should probably be performed before doing spectroscopy or coronography with STIS or COS.

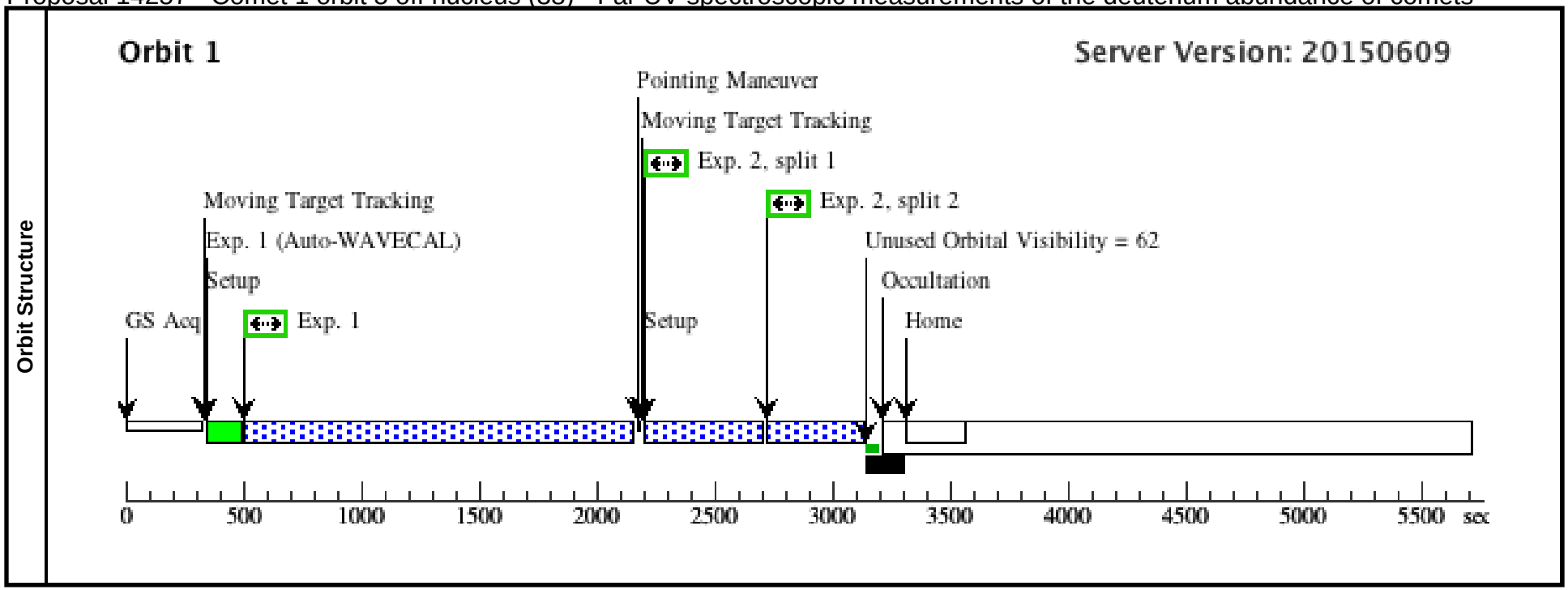
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(5)	C2013US10-OFFSET	TYPE=COMET,Q=.82296868427144 07,E=1.000384580127557,I=148.8754 312250078,O=186.1395352627515,W =340.3513189554529 ,T=15-NOV-2015:17:00:00,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=02-NOV-2014,EpochTimeScale=TDB	TYPE=POS_ANGLE,RAD=350,ANG =0,REF=SUN			EARTH

Comments: Orbital elements reference: JPL #54
Predicted optimal observing time Dec 15-31, 2015
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Spectroscopy (STIS.sp.730918)	(5) C2013US10-OFFSET	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				1632.0 Secs (1632 Secs) *[==>]*	*[1]*
2	CCD Science Image	(5) C2013US10-OFFSET	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (754.2 Secs) *[==>377.1 Secs (Split 1)]* *[==>377.1 Secs (Split 2)]*	*[1]*


Orbit Structure
Orbit 1
Server Version: 20150609
Pointing Maneuver
Moving Target Tracking
Exp. 2, split 1
Moving Target Tracking
Exp. 1 (Auto-WAVECAL)
Setup
Exp. 2, split 2
Unused Orbital Visibility = 62
Occultation
GS Acq
Exp. 1
Setup
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 1 orbit 3 on nucleus (36), implementation Wed Dec 02 02:09:22 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 38 BY 0.9 Orbits TO 1.1 Orbits

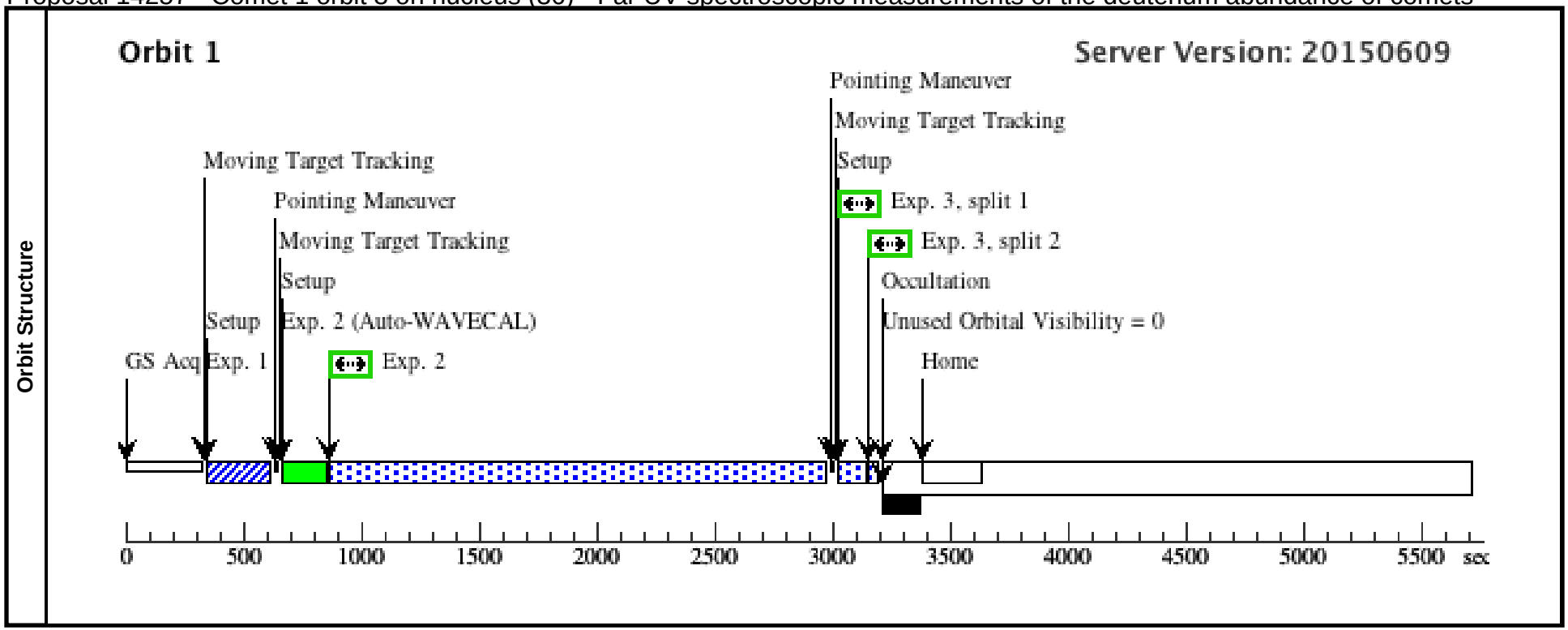
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	C2013US10	TYPE=COMET,Q=.82296868427144 07,E=1.000384580127557,I=148.8754 312250078 ,O=186.1395352627515 ,W=340.3513189554529 ,T=15-NOV-2015:17:00:00,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=02-NOV-2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #54
Predicted optimal observing time Dec 15-31, 2015
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(3) C2013US10	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(3) C2013US10	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(3) C2013US10	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
GS Acq
Moving Target Tracking
Setup
Exp. 1
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 2 (Auto-WAVECAL)
Exp. 2
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3, split 1
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 1 orbit 4 on nucleus (37), implementation Wed Dec 02 02:09:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 36 BY 0.9 Orbits TO 1.1 Orbits

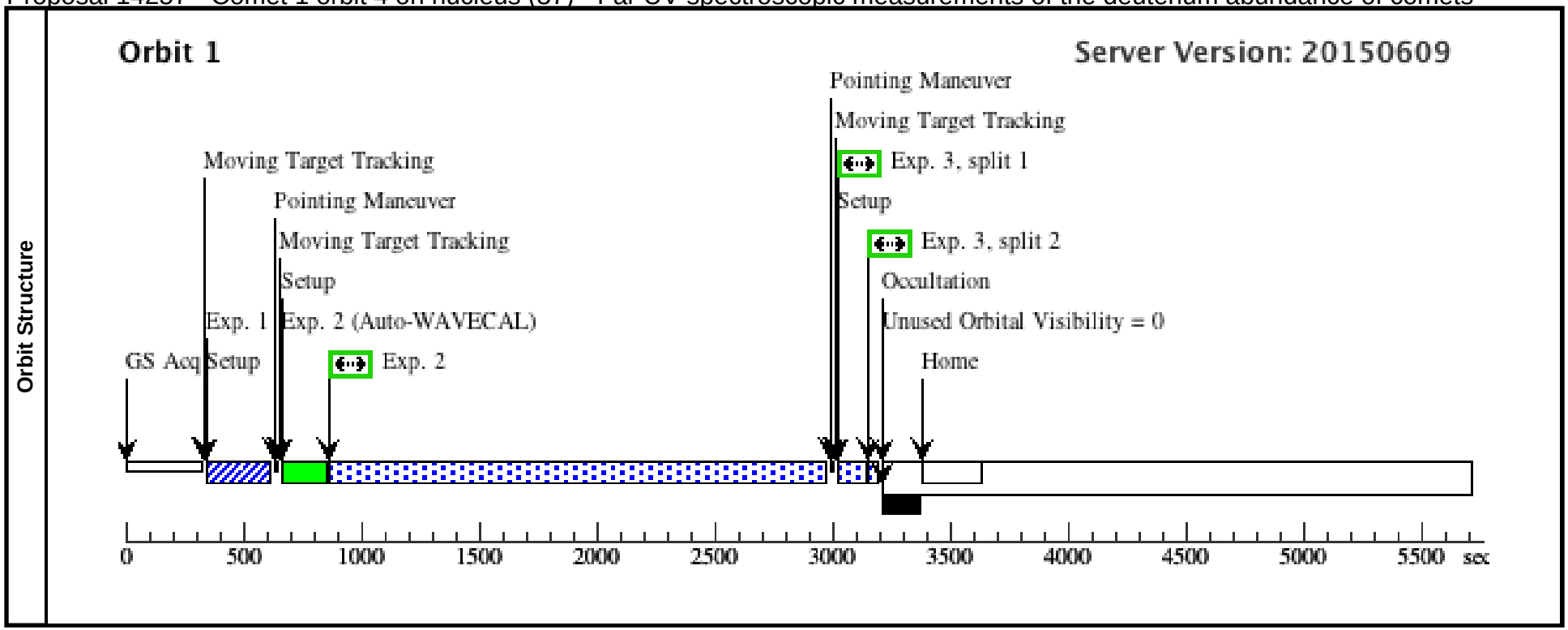
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	C2013US10	TYPE=COMET,Q=.82296868427144 07,E=1.000384580127557,I=148.8754 312250078 ,O=186.1395352627515 ,W=340.3513189554529 ,T=15-NOV-2015:17:00:00,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=02-NOV-2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #54
Predicted optimal observing time Dec 15-31, 2015
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(3) C2013US10	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(3) C2013US10	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(3) C2013US10	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
Pointing Maneuver
Moving Target Tracking
Exp. 3, split 1
Setup
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
Moving Target Tracking
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 1
Exp. 2 (Auto-WAVECAL)
GS Acq
Setup
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 2 orbit 1 on nucleus (39), implementation Wed Dec 02 02:09:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: (none)

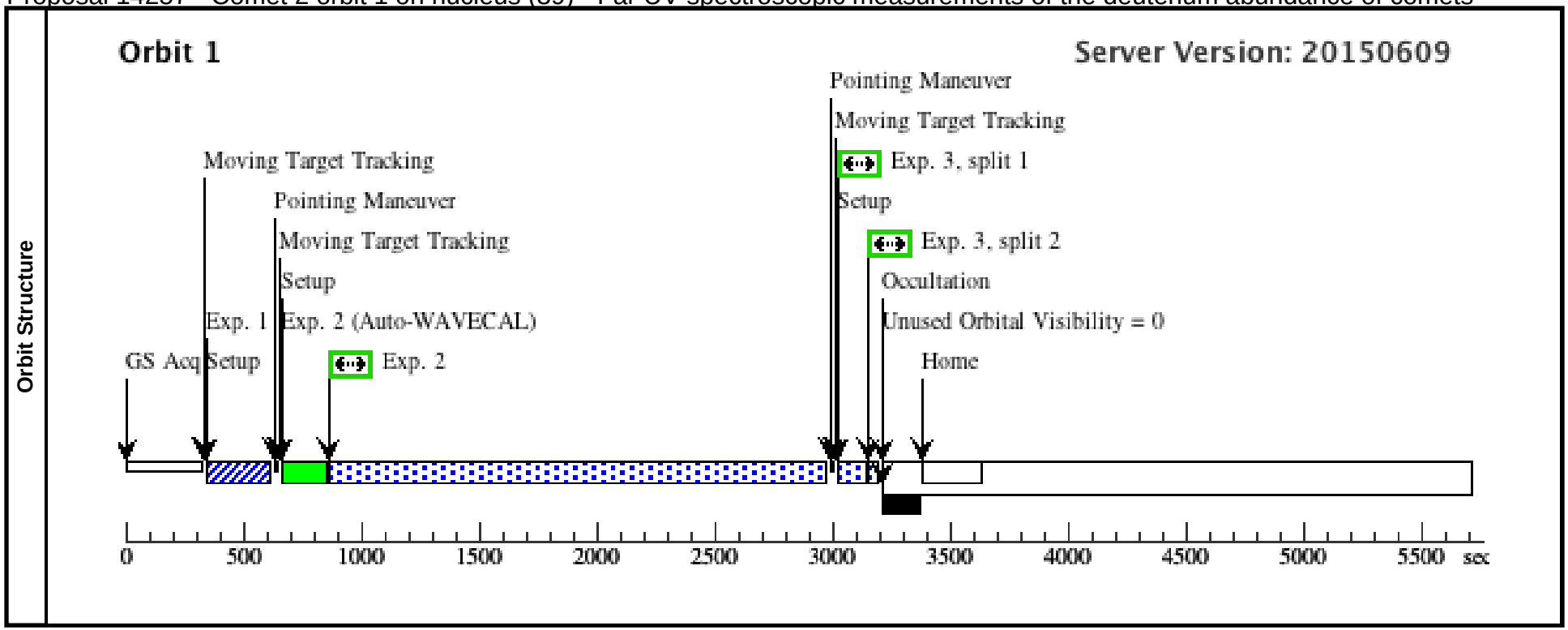
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	C2013X1	TYPE=COMET,Q=1.3146171893069 36,E=1.000766789426983,I=163.2302 932595663,O=130.949643359837,W= 164.4578194357824,T=20-APR- 2016:19:36:50,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=24-NOV- 2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #37
Predicted ptimal observing Time 1-7 June, 2016
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ i mage	(4) C2013X1	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscop y (STIS.sp.73 0918)	(4) C2013X1	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Scienc e Image	(4) C2013X1	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
GS Acq
Moving Target Tracking
Setup
Exp. 1
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 2 (Auto-WAVECAL)
Exp. 2
Pointing Maneuver
Moving Target Tracking
Exp. 3, split 1
Setup
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 2 orbit 2 on nucleus (40), implementation Wed Dec 02 02:09:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 39 BY 0 Orbits TO 1 Orbits

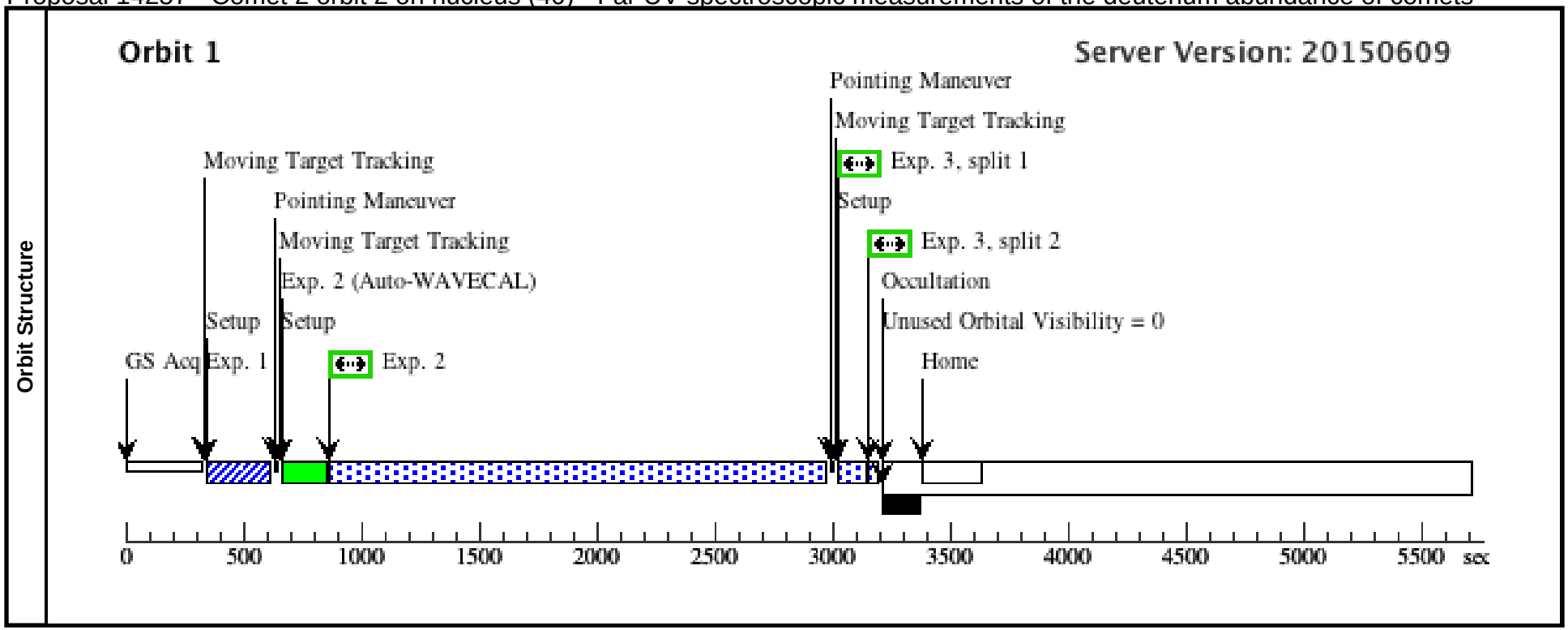
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	C2013X1	TYPE=COMET,Q=1.3146171893069 36,E=1.000766789426983,I=163.2302 932595663,O=130.949643359837,W= 164.4578194357824,T=20-APR-2016:19:36:50,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=24-NOV-2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #37
Predicted ptimal observing Time 1-7 June, 2016
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(4) C2013X1	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(4) C2013X1	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(4) C2013X1	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
Pointing Maneuver
Moving Target Tracking
Exp. 3, split 1
Setup
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
Moving Target Tracking
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
Setup
GS Acq
Exp. 1
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 2 orbit 3 on nucleus (41), implementation Wed Dec 02 02:09:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 40 BY 0 Orbits TO 1 Orbits

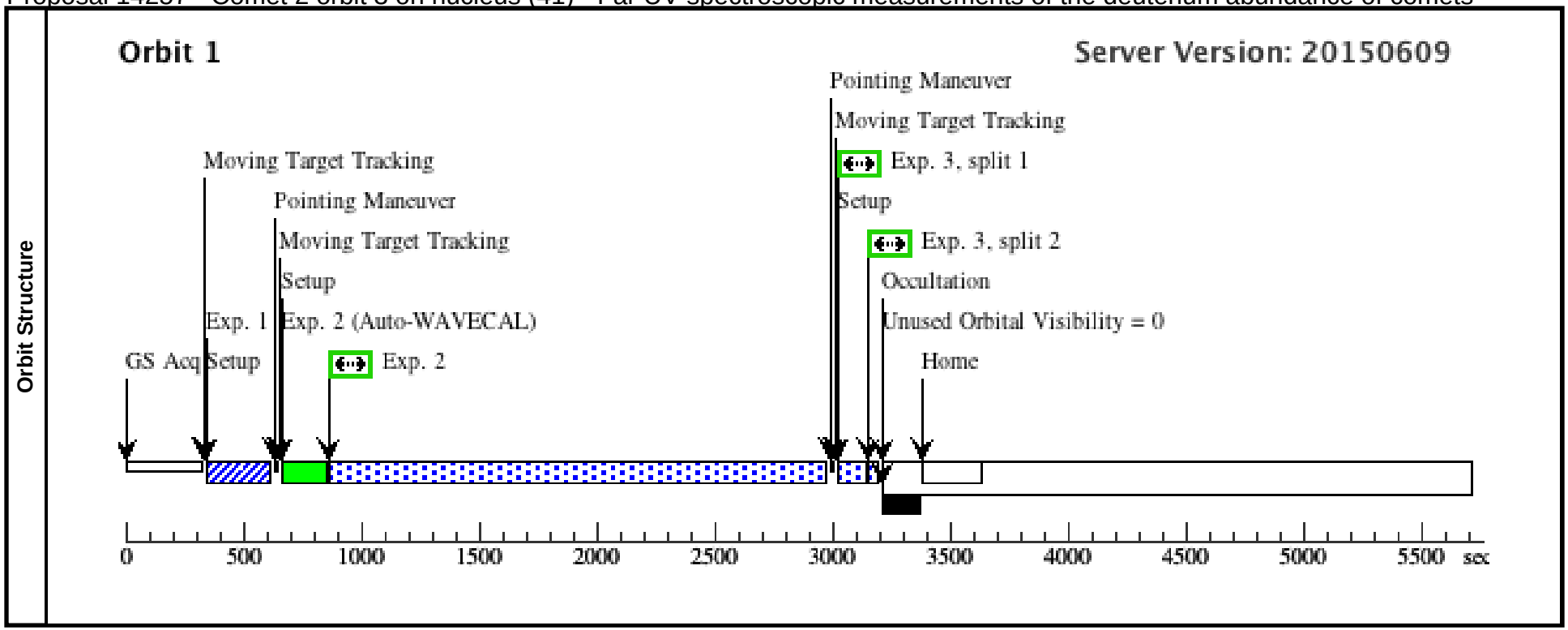
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	C2013X1	TYPE=COMET,Q=1.3146171893069 36,E=1.000766789426983,I=163.2302 932595663,O=130.949643359837,W= 164.4578194357824,T=20-APR- 2016:19:36:50,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=24-NOV- 2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #37
Predicted ptimal observing Time 1-7 June, 2016
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(4) C2013X1	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(4) C2013X1	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(4) C2013X1	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
GS Acq
Moving Target Tracking
Setup
Exp. 1
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 2 (Auto-WAVECAL)
Exp. 2
Pointing Maneuver
Moving Target Tracking
Exp. 3, split 1
Setup
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 2 orbit 4 on nucleus (42), implementation Wed Dec 02 02:09:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 41 BY 0 Orbits TO 1 Orbits

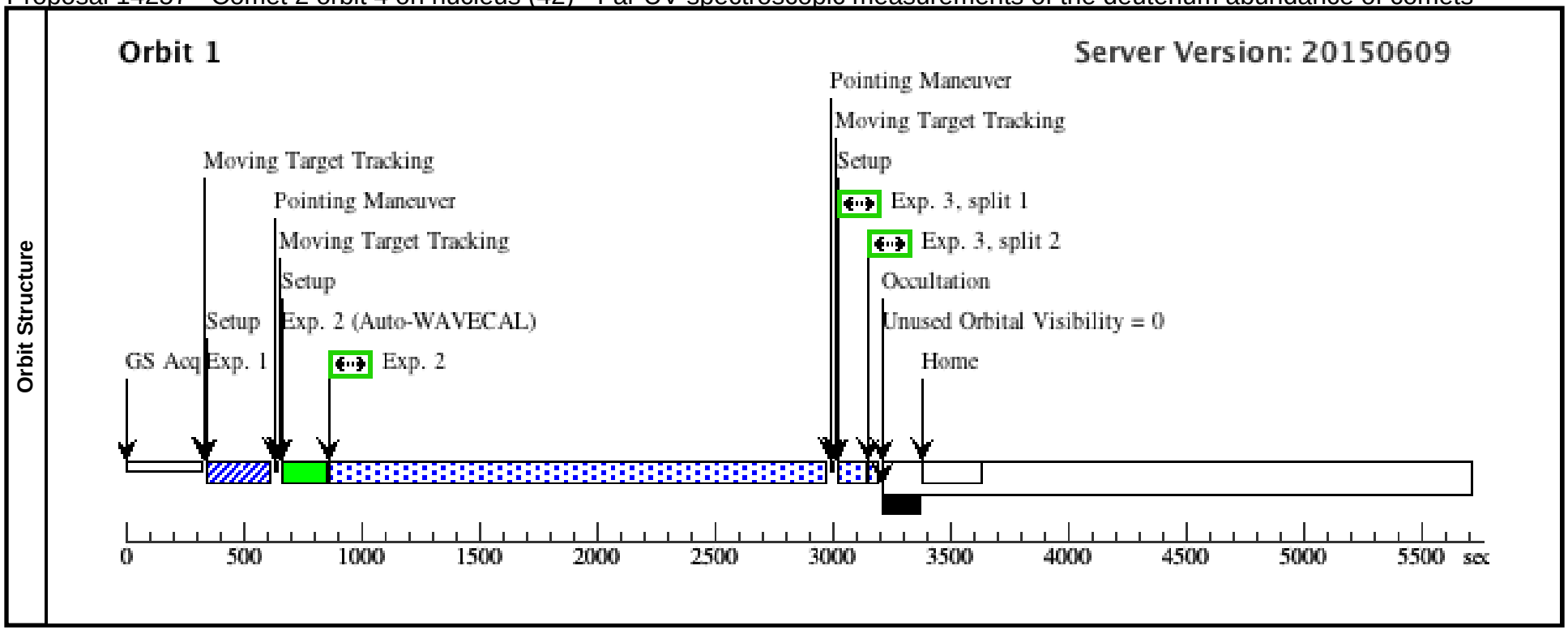
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	C2013X1	TYPE=COMET,Q=1.3146171893069 36,E=1.000766789426983,I=163.2302 932595663,O=130.949643359837,W= 164.4578194357824,T=20-APR-2016:19:36:50,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=24-NOV-2014,EpochTimeScale=TDB				EARTH

Comments: Orbital elements reference: JPL #37
Predicted ptimal observing Time 1-7 June, 2016
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ image	(4) C2013X1	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscopy (STIS.sp.730918)	(4) C2013X1	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Science Image	(4) C2013X1	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
GS Acq
Moving Target Tracking
Setup
Exp. 1
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 2 (Auto-WAVECAL)
Exp. 2
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3, split 1
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14257, Comet 2 orbit 5 off nucleus (43), implementation Wed Dec 02 02:09:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: AFTER 42 BY 0 Orbits TO 1 Orbits

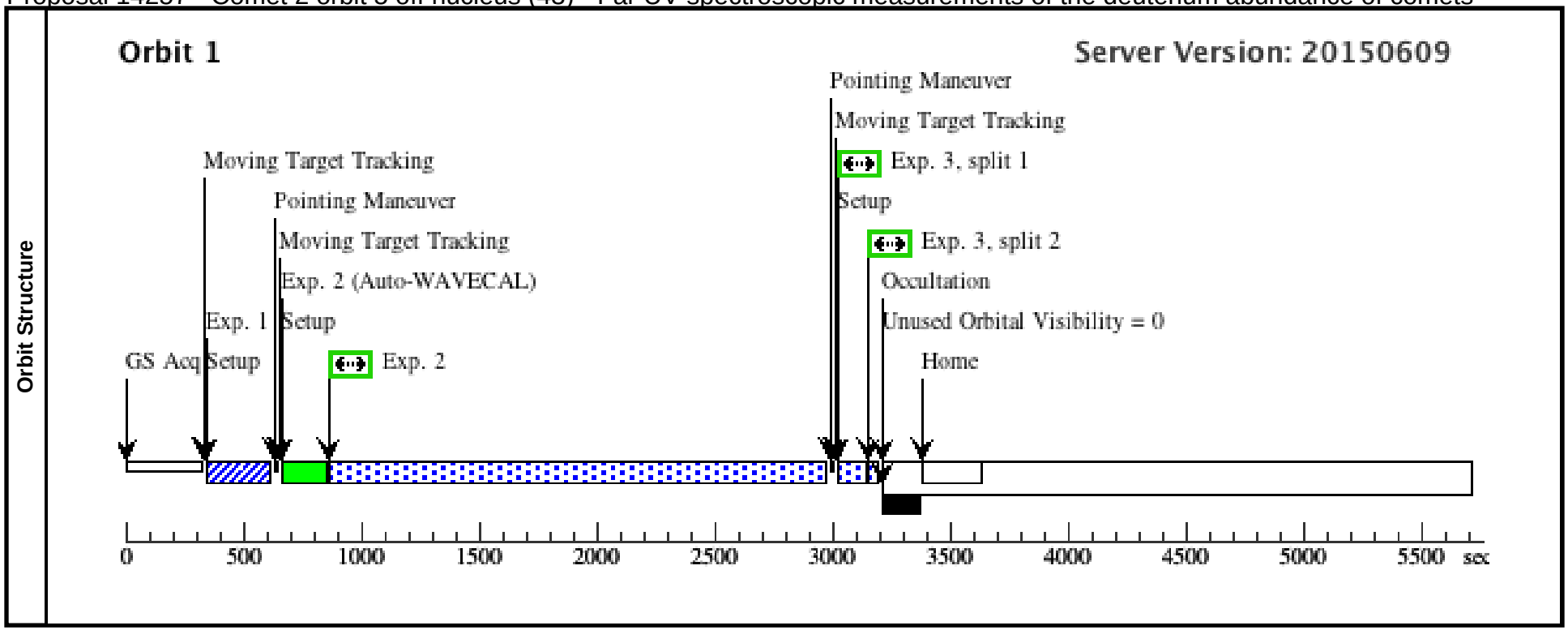
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(6)	C2013X1-OFFSET	TYPE=COMET,Q=1.3146171893069 36,E=1.000766789426983,I=163.2302 932595663,O=130.949643359837,W= 164.4578194357824,T=20-APR- 2016:19:36:50,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=24-NOV- 2014,EpochTimeScale=TDB	TYPE=POS_ANGLE,RAD=45,ANG= 0,REF=SUN			EARTH

Comments: Orbital elements reference: JPL #37
Predicted ptimal observing Time 1-7 June, 2016
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CCD ACQ i mage	(6) C2013X1-OFFS ET	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	Spectroscop y (STIS.sp.73 0918)	(6) C2013X1-OFFS ET	STIS/FUV-MAMA, ACCUM, 6X0.2	E140M 1425 A				2200 Secs (2095 Secs) *[==>2095.0 Secs]*	 ***[1]***
3	CCD Scienc e Image	(6) C2013X1-OFFS ET	STIS/CCD, ACCUM, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
GS Acq
Moving Target Tracking
Setup
Exp. 1
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
Exp. 2
Pointing Maneuver
Moving Target Tracking
Exp. 3, split 1
Setup
Exp. 3, split 2
Occultation
Unused Orbital Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec