17089 - Characterizing Primitive Asteroids

Cycle: 30, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Amanda R. Hendrix (PI) (Contact)	**Planetary Science Institute**
Dr. Faith Vilas (CoI)	Planetary Science Institute

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) THEMIS	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:14.0	yes
02	(2) PALMA	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:15.0	yes
03	(3) CYBELE	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:16.0	yes
04	(4) HILDA	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:17.0	yes
05	(6) ODA	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:17.0	yes
06	(5) THULE	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:18.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
52	(2) PALMA	STIS/CCD STIS/NUV-MAMA	1	09-May-2023 09:00:19.0	yes

7 Total Orbits Used

ABSTRACT

Primitive classes of asteroids, namely those of the B, P, D and C-complex types, are not well characterized in terms of surface composition due to a lack of diagnostic spectral features at visible-near infrared (VNIR) wavelengths. This presents a critical problem because these are important objects due to their primitive nature and their links to early solar system processes. Indeed, the upcoming Lucy mission will visit C-type asteroid Donaldjohanson and several Trojan asteroids (P and D type asteroids). However, despite a lack of spectral features at VNIR wavelengths, these objects do exhibit varying strengths of UV absorption, as observed by the International Ultraviolet Explorer (IUE), which may be related to volatile abundance and thermal history. We propose to observe 6 low-albedo class main belt asteroids to characterize them in terms of their UV spectral shape. We will test the hypothesis that a spectral trend with heliocentric distance should be present, based on the changing thermal and compositional environment.

OBSERVING DESCRIPTION

This program will observe 6 outer main belt asteroid targets using STIS, with one target per orbit/visit. Each visit will include two exposures: one longer exposure using G230L/MAMA and a shorter one using G430L/CCD. The CCD exposures will use offset pointing for CTE mitigation.

Visit

Proposal 17089, Visit 01, completed Tue May 09 13:00:19 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 30-SEP-2022:00:00:00 AND 05-OCT-2022:00:00:00

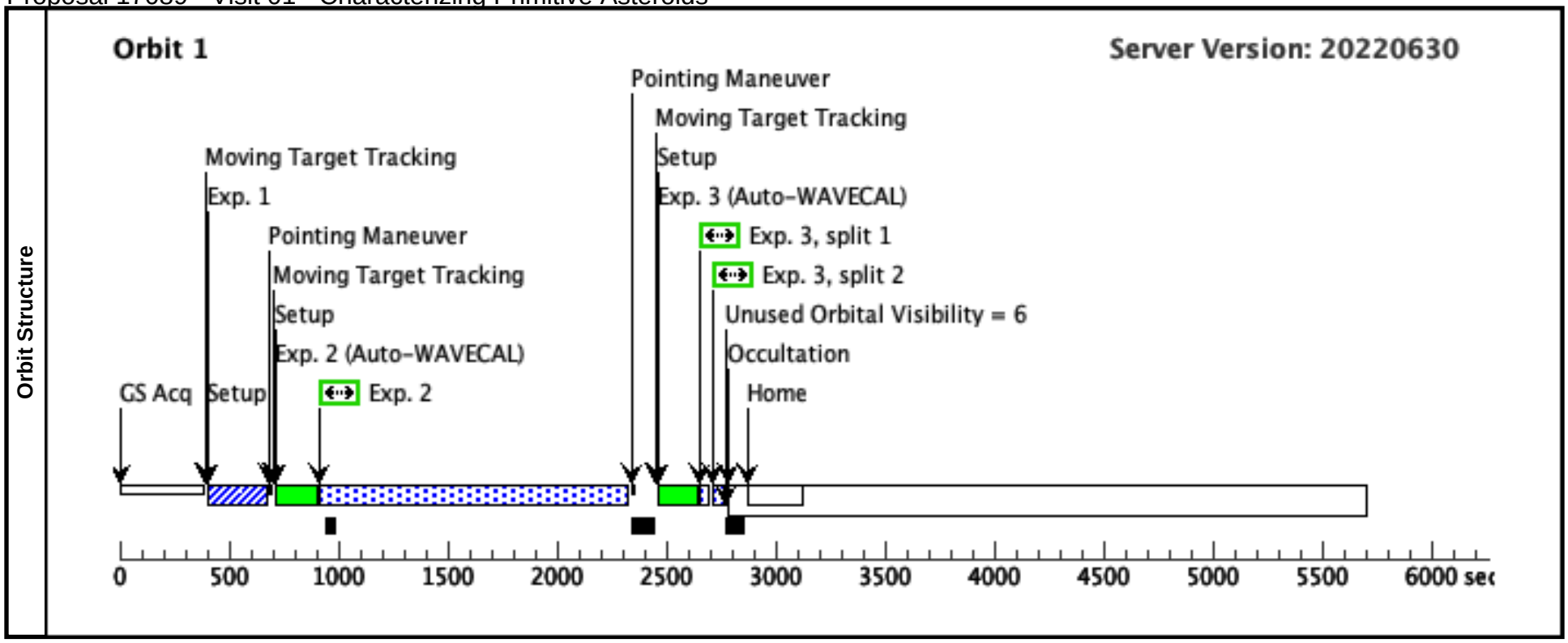
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	THEMIS	TYPE=ASTEROID,A=3.13487934907 2954,E=0.1259217958378979,I=0.752 323904777179 ,O=35.92116269669565,W=106.60677 72864299,M=22.35714114467564,EQ UINOX=J2000,EPOCH=06-MAR-2014:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=24 Themis asteroid

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1821021)	(1) THEMIS	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1813257)	(1) THEMIS	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1395 Secs (1395 Secs)	
								[==>]	***[1]***
3	(1813261)	(1) THEMIS	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A				20 Secs (20 Secs)	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20220630
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 6
Occultation
Home
Moving Target Tracking
Exp. 1
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 2 (Auto-WAVECAL)
GS Acq
Setup
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Proposal 17089 - Visit 02 - Characterizing Primitive Asteroids

Visit

Proposal 17089, Visit 02, failed Tue May 09 13:00:20 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 30-SEP-2022:00:00:00 AND 21-OCT-2022:00:00:00

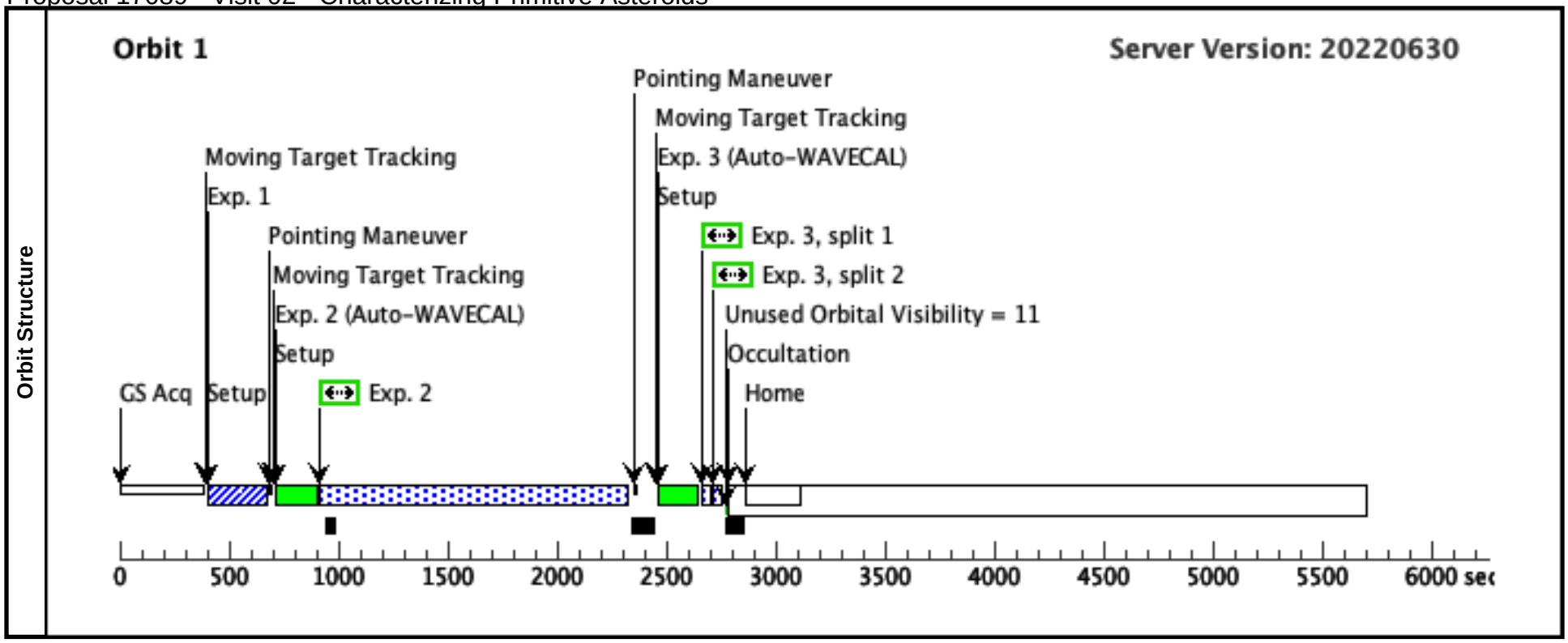
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PALMA	TYPE=ASTEROID,A=3.150020513122523,E=0.2611380629859947,I=23.82974621034009,O=327.4141080476642,W=115.4331094124759,M=341.0547634869388,EQUINOX=J2000,EPOCH=02-JAN-2012:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=asteroid 372 Palma

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1820963)	(2) PALMA	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1813873)	(2) PALMA	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1400 Secs (1400 Secs)	
								[==>]	***[1]***
3	(1813876)	(2) PALMA	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A				10 Secs (10 Secs)	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20220630
Pointing Maneuver
Moving Target Tracking
Exp. 3 (Auto-WAVECAL)
Setup
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 11
Occultation
Home
Moving Target Tracking
Exp. 1
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
GS Acq
Setup
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17089, Visit 03, completed Tue May 09 13:00:20 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 30-SEP-2022:00:00:00 AND 04-OCT-2022:00:00:00

Solar System Targets

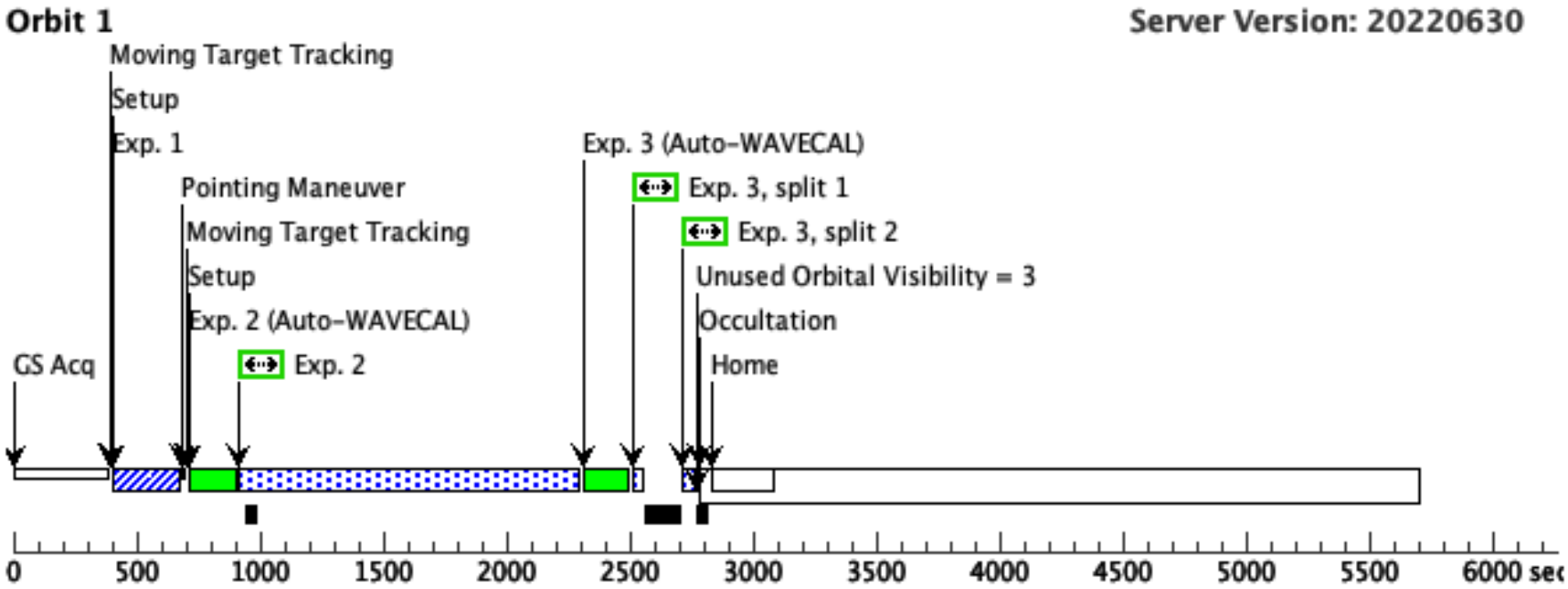
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	CYBELE	TYPE=ASTEROID,A=3.43377615989 0824,E=0.105263696768593,I=3.5483 44737993872 ,O=155.8055828192899,W=105.73083 96447282,M=317.6871541471297,EQ UINOX=J2000,EPOCH=02-SEP-2007:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=asteroid 65 Cybele

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1821022)	(3) CYBELE	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
2	(1813881)	(3) CYBELE	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1368 Secs (1368 Secs) *[==>]*	 ***[1]***
3	(1813882)	(3) CYBELE	STIS/CCD, ACCUM, 52X0.2	G430L 4300 A				20 Secs (20 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17089, Visit 04, implementation Tue May 09 13:00:20 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 13-JUN-2023:00:00:00 AND 14-JUN-2023:03:30:00; BETWEEN 14-JUN-2023:04:30:00 AND 15-JUN-2023:04:30:00; BETWEEN 15-JUN-2023:05:30:00 AND 15-JUN-2023:08:00:00; BETWEEN 15-JUN-2023:09:00:00 AND 04-JUL-2023:00:00:00

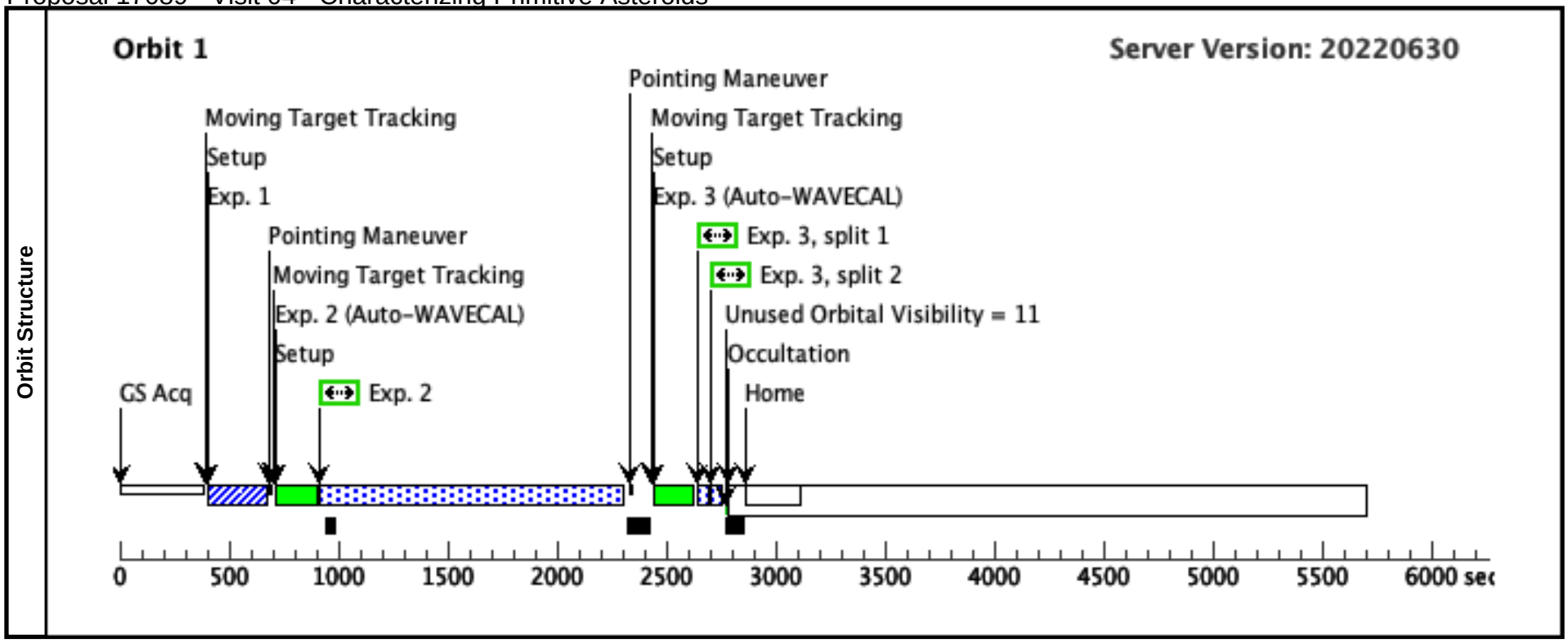
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	HILDA	TYPE=ASTEROID,A=3.97237456936 7627,E=0.1384991297739193,I=7.827 75693904481 ,O=228.1742371275046,W=38.810743 00877074,M=255.8899187990015,EQ UINOX=J2000,EPOCH=26-FEB-2013:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=asteroid 153 Hilda

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1821023)	(4) HILDA	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1813889)	(4) HILDA	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L				1380 Secs (1380 Secs)	
				2376 A				*[==>]*	***[1]***
3	(1813890)	(4) HILDA	STIS/CCD, ACCUM, 52X0.2E1	G430L				30 Secs (30 Secs)	
				4300 A				*[==>(Split 1)]* *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20220630
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 11
Occultation
Home
Moving Target Tracking
Exp. 1
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
Exp. 2
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Proposal 17089 - Visit 05 - Characterizing Primitive Asteroids

Visit

Proposal 17089, Visit 05, completed Tue May 09 13:00:20 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 20-OCT-2022:00:00:00 AND 01-DEC-2022:00:00:00

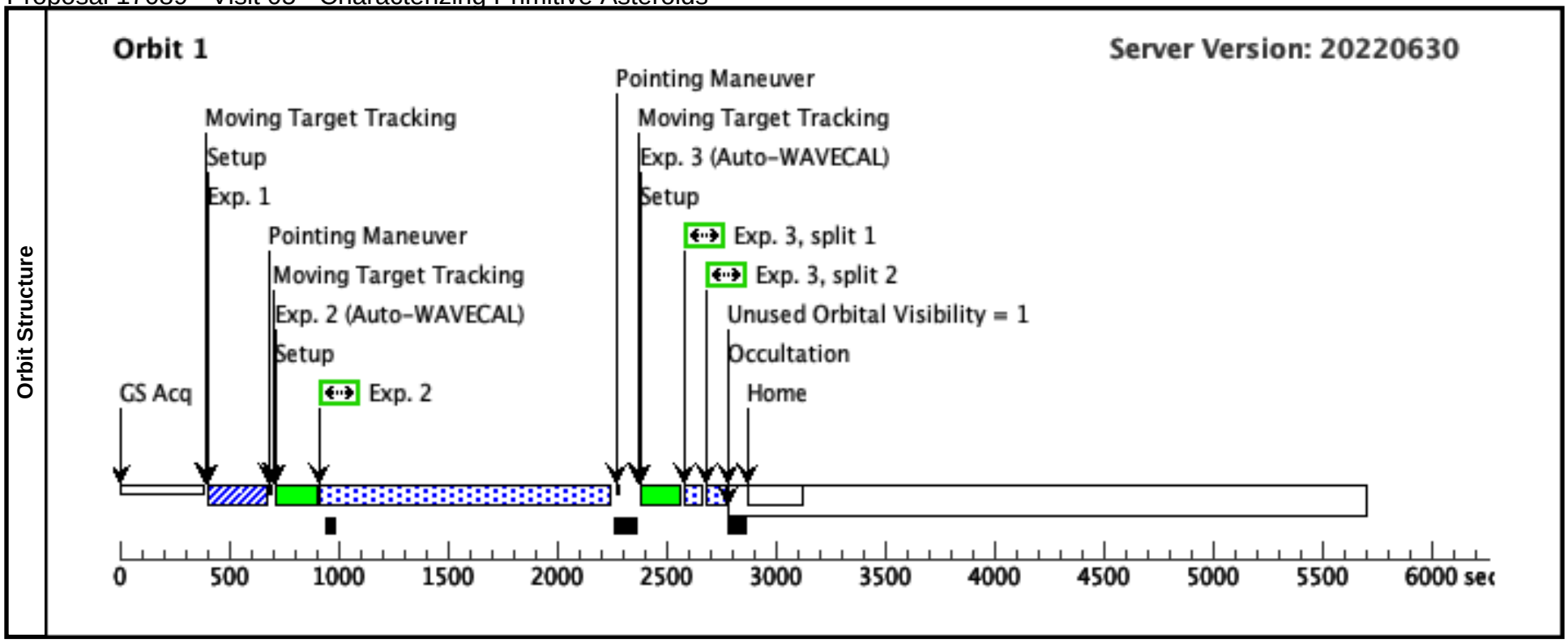
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(6)	ODA	TYPE=ASTEROID,A=3.749793930356727,E=0.09491125273812136,I=9.742818840181293,O=156.731126886498,W=220.9524602429168,M=18.02049356168965,EQUINOX=J2000,EPOCH=25-MAY-2015:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=asteroid 1144 Oda

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1821024)	(6) ODA	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	***[1]***
2	(1826510)	(6) ODA	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1320 Secs (1320 Secs) *[==>]*	***[1]***
3	(1826511)	(6) ODA	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A				100 Secs (100 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20220630
Moving Target Tracking
Setup
Exp. 1
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
GS Acq
Exp. 2
Pointing Maneuver
Moving Target Tracking
Exp. 3 (Auto-WAVECAL)
Setup
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 1
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17089, Visit 06, completed Tue May 09 13:00:20 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 02-DEC-2022:00:00:00 AND 11-DEC-2022:00:00:00

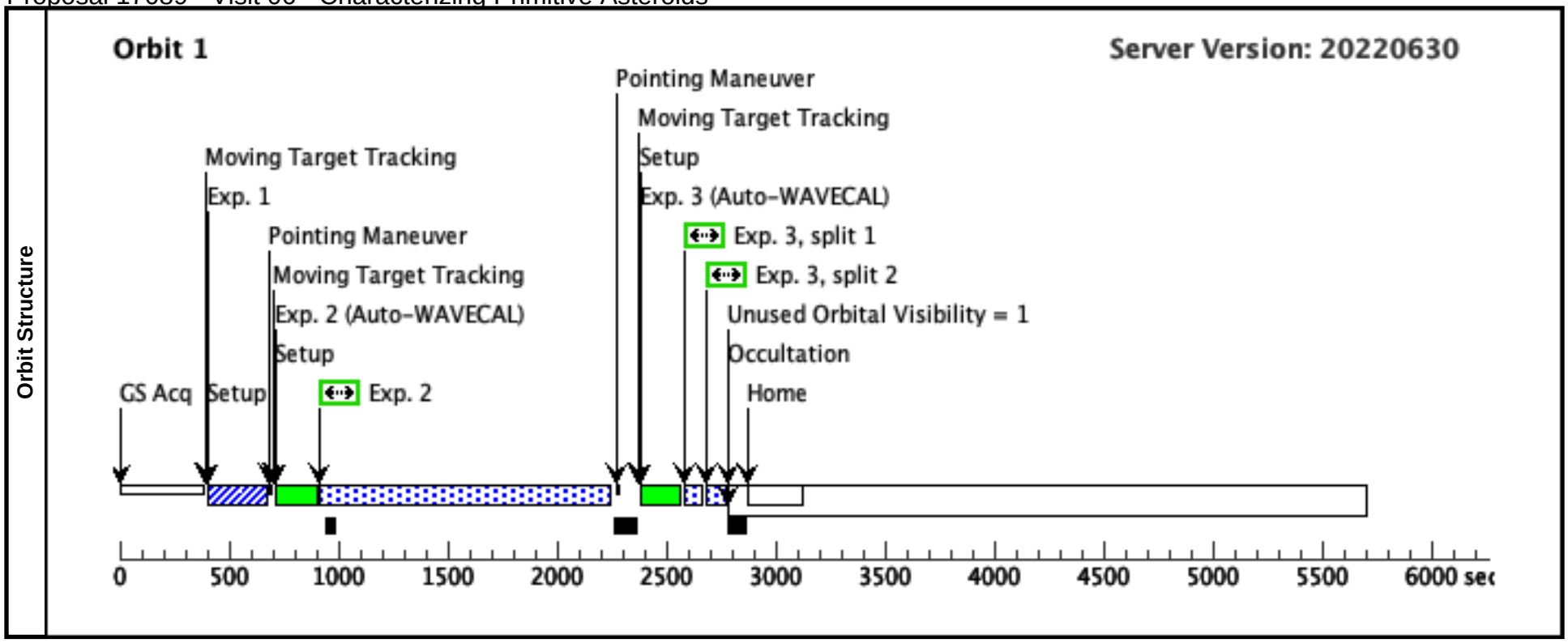
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(5)	THULE	TYPE=ASTEROID,A=4.28126706398 2855,E=0.00848426307328776 7,I=2.3 37510754510939 ,O=73.62783534541818,W=69.781034 70405526,M=261.8068918252008,EQ UINOX=J2000,EPOCH=08-APR-2013:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=asteroid 279 Thule

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1821025)	(5) THULE	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	***[1]***
2	(1826513)	(5) THULE	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1320 Secs (1320 Secs) *[==>]*	***[1]***
3	(1826514)	(5) THULE	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A				100 Secs (100 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20220630
GS Acq
Setup
Moving Target Tracking
Exp. 1
Pointing Maneuver
Moving Target Tracking
Exp. 2 (Auto-WAVECAL)
Setup
Exp. 2
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 1
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Proposal 17089 - Visit 52 - Characterizing Primitive Asteroids

Visit

Proposal 17089, Visit 52, completed Tue May 09 13:00:20 GMT 2023

Diagnostic Status: No Diagnostics

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

Special Requirements: BETWEEN 31-JAN-2023:00:00:00 AND 22-FEB-2023:00:00:00

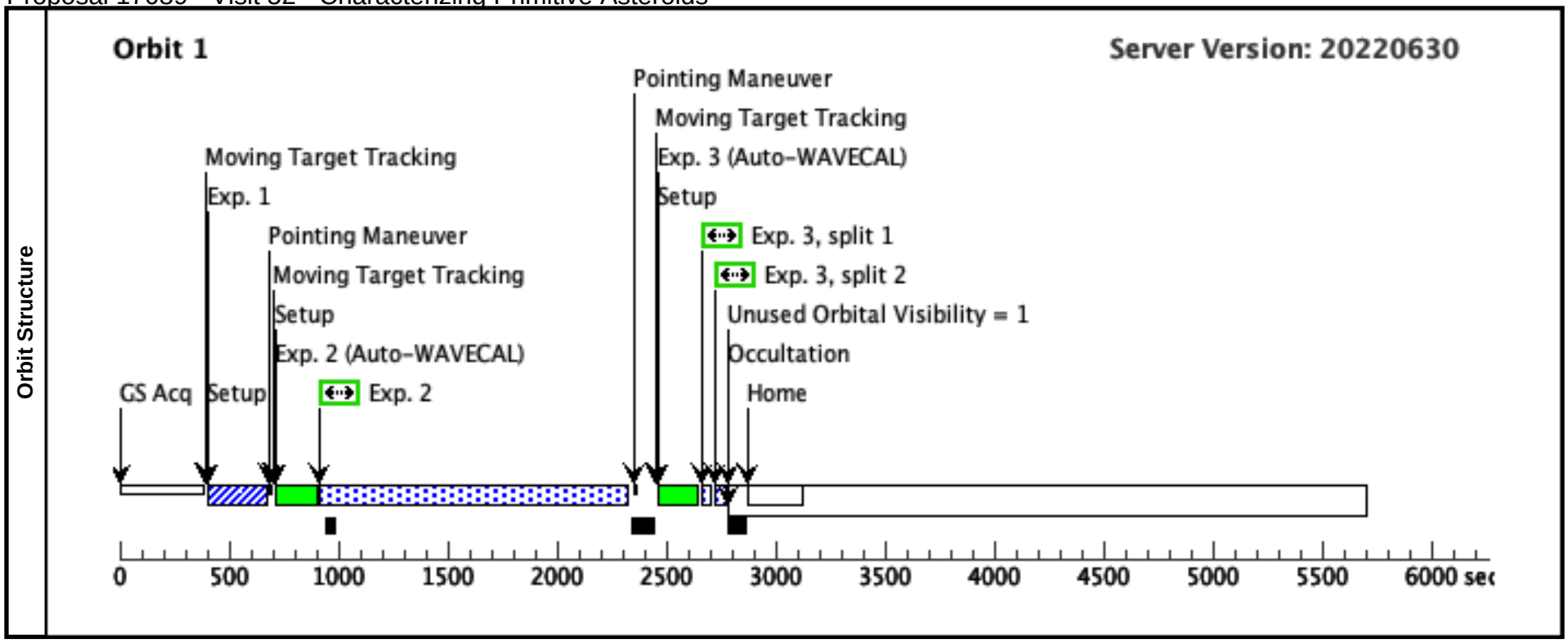
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PALMA	TYPE=ASTEROID,A=3.150020513122523,E=0.2611380629859947,I=23.82974621034009,O=327.4141080476642,W=115.4331094124759,M=341.0547634869388,EQUINOX=J2000,EPOCH=02-JAN-2012:00:00:00,EpochTimeScale=TDB				EARTH

Comments: Description=asteroid 372 Palma

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1838640)	(2) PALMA	STIS/CCD, ACQ, F28X50LP	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
2	(1838642)	(2) PALMA	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1400 Secs (1400 Secs) *[==>]*	 ***[1]***
3		(2) PALMA	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A				20 Secs (20 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20220630
Pointing Maneuver
Moving Target Tracking
Exp. 3 (Auto-WAVECAL)
Setup
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 1
Occultation
Home
Moving Target Tracking
Exp. 1
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 2 (Auto-WAVECAL)
GS Acq
Setup
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec