15261 - The Pluto System in the Post-New Horizons Era: Opposition Effects, Rotations, and Orbital Stability

Cycle: 25, 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) PLUTO	WFC3/UVIS	1	06-Sep-2018 14:01:23.0	yes
02	(1) PLUTO	WFC3/UVIS	1	06-Sep-2018 14:01:25.0	yes
03	(1) PLUTO	WFC3/UVIS	1	06-Sep-2018 14:01:27.0	yes
04	(1) PLUTO	WFC3/UVIS	1	06-Sep-2018 14:01:28.0	yes
05	(1) PLUTO	WFC3/UVIS	1	06-Sep-2018 14:01:30.0	yes
10	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:31.0	yes
11	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:32.0	yes
12	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:34.0	yes
13	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:35.0	yes
20	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:37.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
21	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:39.0	yes
22	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:40.0	yes
23	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS	1	06-Sep-2018 14:01:41.0	yes

13 Total Orbits Used

ABSTRACT

Following the New Horizons flyby in 2015, we propose a two-cycle program to observe Pluto and its five moons in the post-encounter era, building on the rich legacy of observations obtained during and prior to the historic flyby. At opposition in Cycles 25-26, the Pluto system is visible at the smallest solar phase angle in 87 years. The system will be at true opposition when it crosses the line of nodes in July 2018, and as seen from Pluto, Earth will transit the solar disk. Such rare planetary alignments enable the characterization of small-scale surface texture and porosity as well as the direct measurement of the geometric albedo, rather than an estimation of its value from photometric models. Any variation among the regolith properties of Pluto's moons will test the long-standing hypothesis that ejecta exchange between the moons has altered their surfaces. We will also follow up on the surprising result from New Horizons and HST that the small moons are spinning rapidly and with high obliquities. Styx, Nix, and Hydra show hints of being in strong spin-orbit couplings with Charon, but confirmation requires the additional precision in measurements of their spin rates and polar precession rates proposed here. In addition, we will obtain new astrometry of the small moons, making it possible to determine their masses and bulk densities with much higher precision. Results from this program will enhance the scientific return from the New Horizons mission, providing images complementary to those obtained by the spacecraft on approach and achieving science objectives that cannot be met by either HST or New Horizons alone.

OBSERVING DESCRIPTION

This program consists of two types of visit types. Five visits are primarily for photometry within specific phase angle ranges near opposition, to study the opposition surge on all the bodies in the Pluto system. Eight visits are for astrometry and photometry, primarily to determine the orbits and rotation states of the four small moons. Rotation states are also needed to interpret the data near opposition. Four of these visits are scheduled before opposition and four after to ensure a long time baseline for orbit and rotation determinations. PERIOD constraints are included to ensure that we sample all rotational phases of tiny Styx, whose rotation state has been the most difficult to obtain with HST. ORIENT values have been selected so that the smallest moons, Kerberos and Styx, never land on the diffraction spikes of Pluto. The filters used here match those in Program 13667, so that the combined data sets sample a much longer time baseline and extend the phase angle coverage down to the very small phase angles not available to

Program 13667 in 2015.

Visit

Proposal 15261, OPPOSITION (01), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 150D TO 180 D; ORIENT 330D TO 360 D; BETWEEN 12-JUL-2018:09:35:00 AND 12-JUL-2018:11:35:00

Comments: Color photometry of Pluto and Charon at exact opposition. Additional long exposures to capture the small moons. Two POS TARGs designed to shift the system by 5.5 pixels along each axis midway through the visit. ORIENT adjusted to 66 or 246 in order to keep the moons away from the diffraction spikes of Pluto and Charon.

This visit images a rotational longitude between 188 and 195 on Styx.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

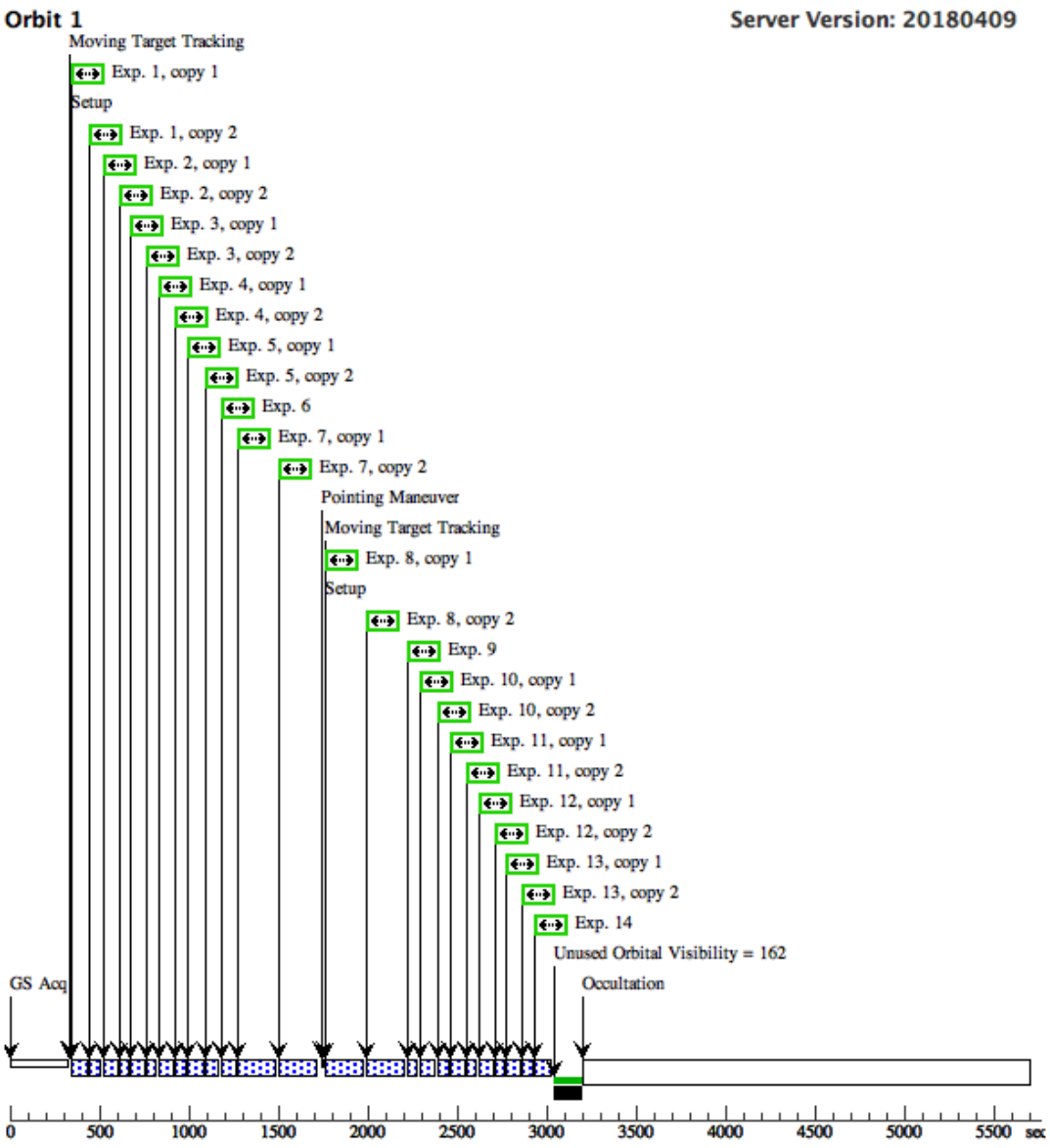
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	PLUTO	STD=PLUTO				EARTH

Comments: Description=Pluto

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F438W 2 x 12s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F438W	FLASH=12	POS TARG 0.000,0.000	Sequence 1-14 Non-Int in OPPOSITION (01)	12 Secs X 2 (24 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
2	F555W 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=12	SAME POS AS 1	Sequence 1-14 Non-Int in OPPOSITION (01)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
3	F625W 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F625W	FLASH=12	SAME POS AS 1	Sequence 1-14 Non-Int in OPPOSITION (01)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F775W 2 x 9s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F775W	FLASH=12	SAME POS AS 1	Sequence 1-14 Non-Int in OPPOSITION (01)	9 Secs X 2 (18 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F845M 2 x 2 5s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	FLASH=12	SAME POS AS 1	Sequence 1-14 Non-Int in OPPOSITION (01)	25 Secs X 2 (50 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 1 x 3s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-14 Non-Int in OPPOSITION (01)	3 Secs (3 Secs) *[==>]*	***[1]***
7	F350LP, 2 x 175s, Pos 1	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-14 Non-Int in OPPOSITION (01)	175 Secs X 2 (350 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F350LP, 2 x 175s, Pos2	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-14 Non-Int in OPPOSITION (01)	175 Secs X 2 (350 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F350LP, 1 x 3s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 8	Sequence 1-14 Non-Int in OPPOSITION (01)	3 Secs (3 Secs) *[==>]*	***[1]***
10	F438W 2 x 12s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F438W	FLASH=12	SAME POS AS 8	Sequence 1-14 Non-Int in OPPOSITION (01)	12 Secs X 2 (24 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
11	F555W 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=12	SAME POS AS 8	Sequence 1-14 Non-Int in OPPOSITION (01)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
12	F625W 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F625W	FLASH=12	SAME POS AS 8	Sequence 1-14 Non-Int in OPPOSITION (01)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
13	F775W 2 x 9s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F775W	FLASH=12	SAME POS AS 8	Sequence 1-14 Non-Int in OPPOSITION (01)	9 Secs X 2 (18 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
14	F845M 1 x 2 5s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	FLASH=12	SAME POS AS 8	Sequence 1-14 Non-Int in OPPOSITION (01)	25 Secs (25 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15261, PHASE 0.02 DEG (02), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 65D TO 67 D; ORIENT 245D TO 247 D; BETWEEN 11-JUL-2018:16:00:00 AND 11-JUL-2018:20:00:00; BETWEEN 12-JUL-2018:23:30:00 AND 13-JUL-2018:03:30:00

Comments: Broadband photometry of the small moons at 0.017 to 0.023 degrees phase. Additional short exposures to study year-by-year changes in Pluto's rotation curve. ORIENT adjusted to 66 or 246 in order to keep the moons away from the diffraction spikes of Pluto and Charon.

If this visit is scheduled before opposition, it images rotational longitude between 105 and 125 on Styx; if it is scheduled after opposition, it images a rotational longitude between 250 and 270 on Styx;

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

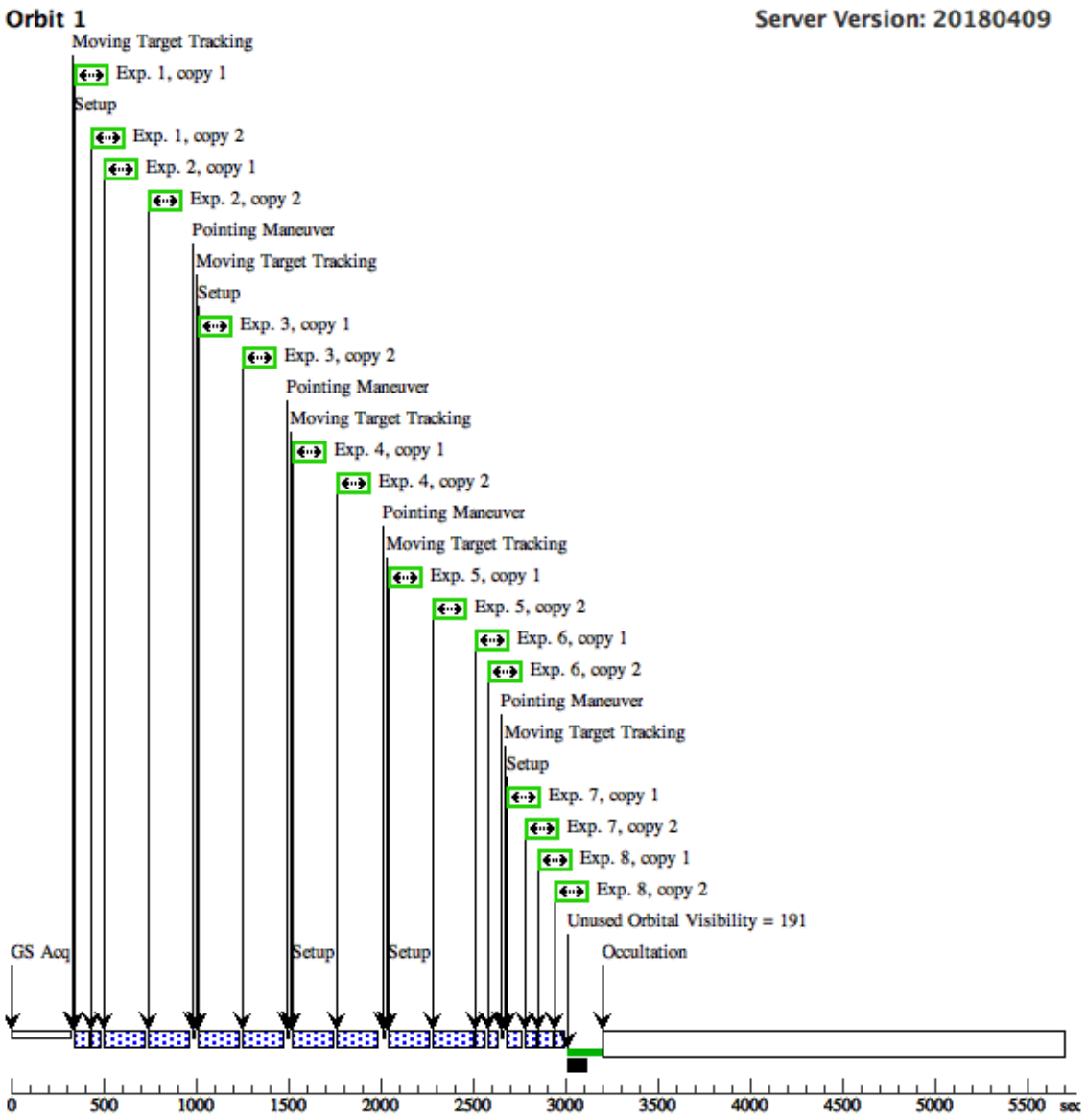
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	PLUTO	STD=PLUTO				EARTH

Comments: Description=Pluto

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 2 x 3 sec	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000	Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
2	F350LP, 2 x 185s, Pos 1	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	185 Secs X 2 (370 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
3	F350LP, 2 x 185s, Pos 2	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	185 Secs X 2 (370 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 185s, Pos 3	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	185 Secs X 2 (370 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 185s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	185 Secs X 2 (370 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 3s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 5	Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F438W, 2 x 12s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F438W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	12 Secs X 2 (24 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F555W, 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.02 DEG (02)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, PHASE 0.04-0.06 DEG (03), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 13D TO 13 D; ORIENT 193D TO 193 D; ORIENT 103D TO 103 D; ORIENT 283D TO 283 D; BETWEEN 13-JUL-2018:18:00:00 AND 14-JUL-2018:10:00:00; BETWEEN 10-JUL-2018:09 AND 11-JUL-2018:02; VISIBILITY INTERVAL 49 M

Comments: Broadband photometry of the small moons at 0.04 to 0.06 degrees phase. Additional short exposures to study year-by-year changes in Pluto's rotation curve. ORIENT adjusted to 68 or 248 in order to keep the moons away from the diffraction spikes of Pluto and Charon. The opportunity to observe the equivalent phase angle before opposition is unusable because Charon is too close to Styx.

This visit images a rotational longitude between 340 and 100 on Styx.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

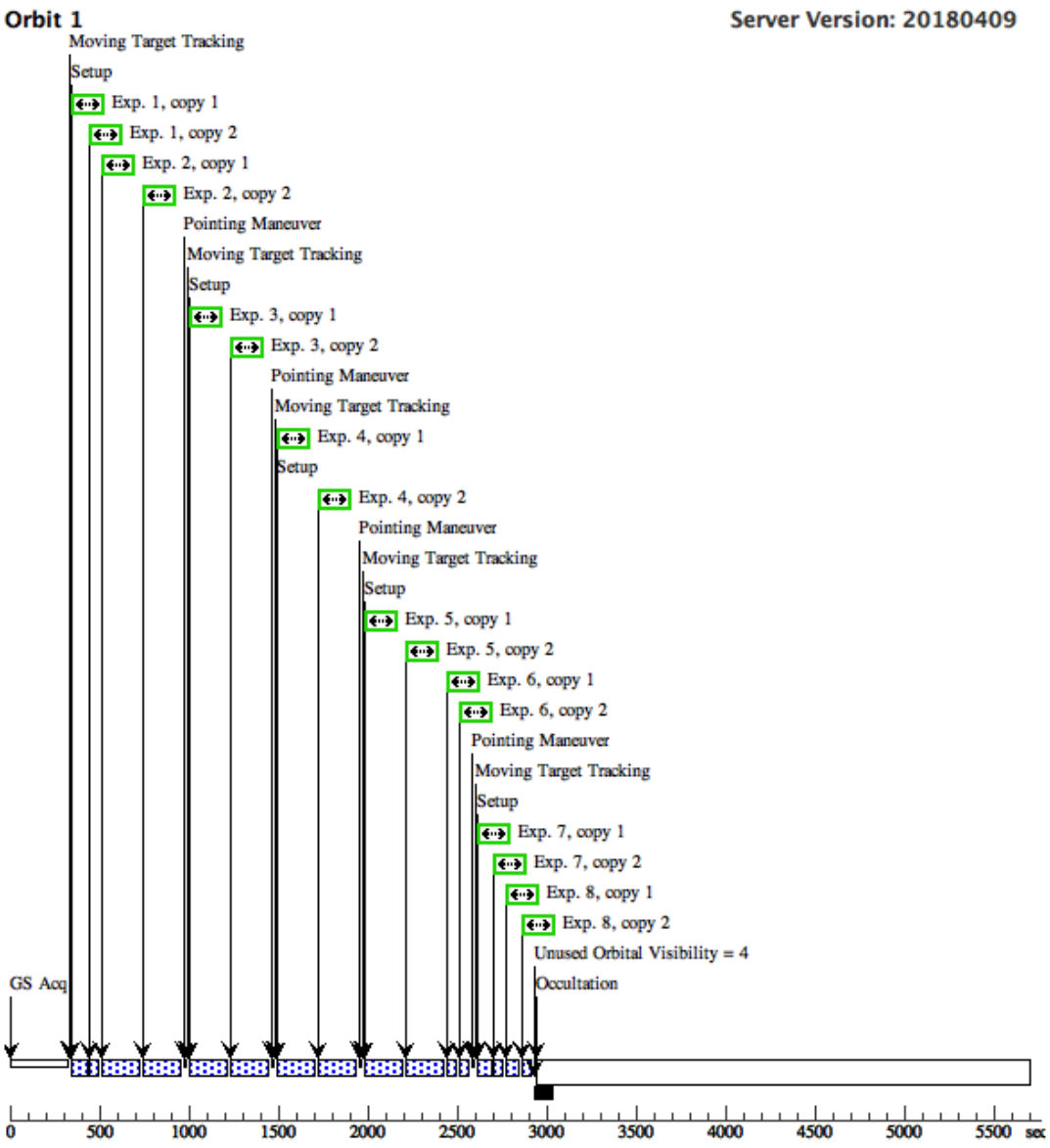
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	PLUTO	STD=PLUTO				EARTH

Comments: Description=Pluto

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 2 x 3s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000	Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	3 Secs X 2 (15 Secs) *[==>7.5 Secs (Copy 1)]* *[==>7.5 Secs (Copy 2)]*	***[1]***
2	F350LP, 2 x 190s, Pos 1	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	190 Secs X 2 (348 Secs) *[==>174.0 Secs (Copy 1)]* *[==>174.0 Secs (Copy 2)]*	***[1]***
3	F350LP, 2 x 190s, Pos 2	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	190 Secs X 2 (348 Secs) *[==>174.0 Secs (Copy 1)]* *[==>174.0 Secs (Copy 2)]*	***[1]***
4	F350LP, 2 x 190s, Pos 3	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	190 Secs X 2 (348 Secs) *[==>174.0 Secs (Copy 1)]* *[==>174.0 Secs (Copy 2)]*	***[1]***
5	F350LP, 2 x 190s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	190 Secs X 2 (348 Secs) *[==>174.0 Secs (Copy 1)]* *[==>174.0 Secs (Copy 2)]*	***[1]***
6	F350LP, 2 x 3s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 5	Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	3 Secs X 2 (15 Secs) *[==>7.5 Secs (Copy 1)]* *[==>7.5 Secs (Copy 2)]*	***[1]***
7	F625W, 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F625W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	6 Secs X 2 (15 Secs) *[==>7.5 Secs (Copy 1)]* *[==>7.5 Secs (Copy 2)]*	***[1]***
8	F775M, 2 x 9s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F775W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.04-0.06 DEG (03)	20 Secs X 2 (15 Secs) *[==>7.5 Secs (Copy 1)]* *[==>7.5 Secs (Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, PHASE 0.09-0.12 DEG (04), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 91D TO 91 D; BETWEEN 15-JUL-2018:11:00:00 AND 16-JUL-2018:11:00:00

Comments: Broadband photometry of the small moons at 0.09 to 0.12 degrees phase. Additional short exposures to study year-by-year changes in Pluto's rotation curve. ORIENT adjusted to 87 in order to keep the moons away from the diffraction spikes of Pluto and Charon. This opportunity is better than the equivalent opportunity before opposition because of the better positions of the moons relative to Charon and the diffraction spikes.

This visit images a rotational longitude between 170 and 280 on Styx.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

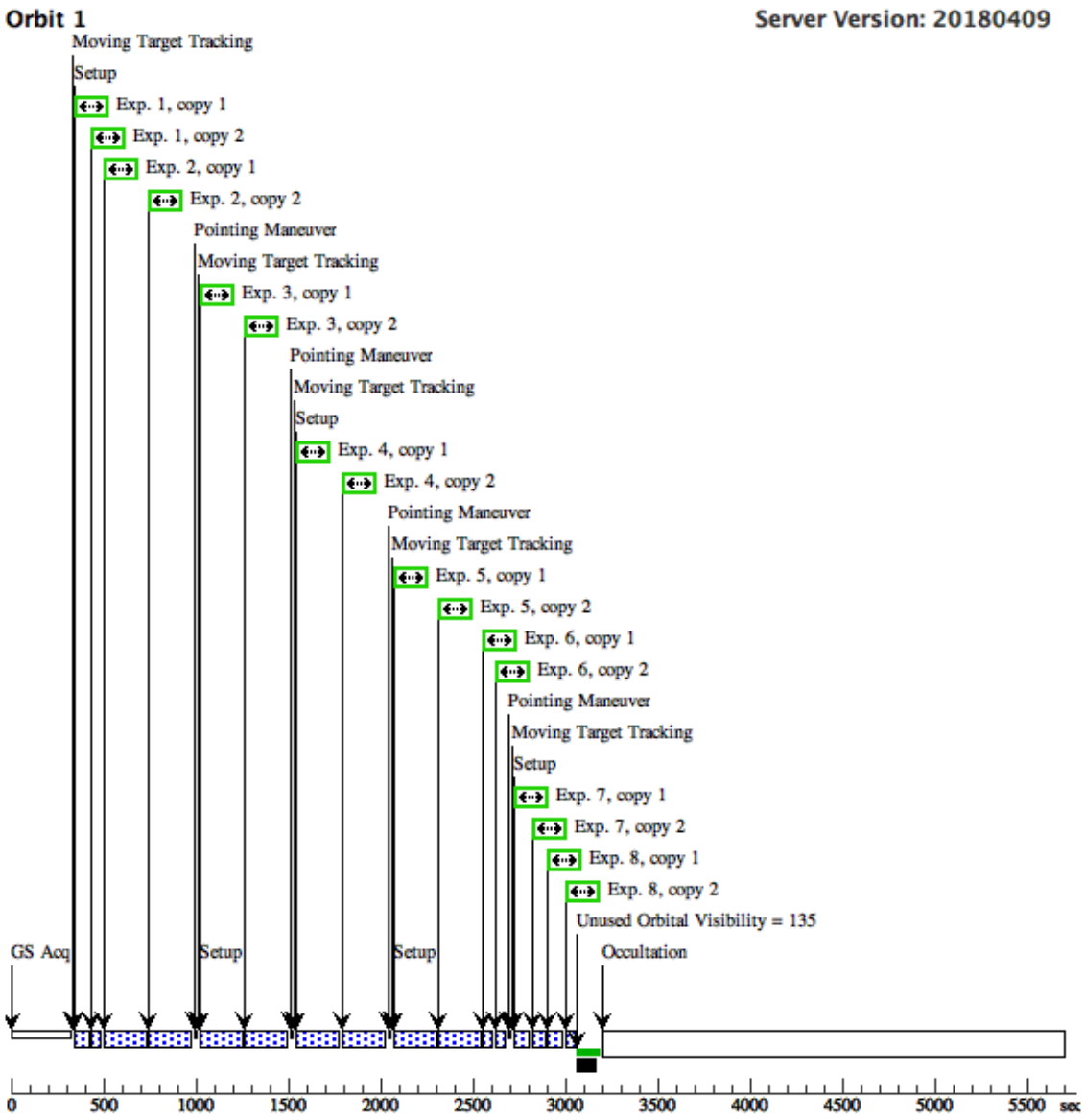
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	PLUTO	STD=PLUTO				EARTH

Comments: Description=Pluto

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 2 x 3s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000	Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
2	F350LP, 2 x 190s, Pos 1	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
3	F350LP, 2 x 190s, Pos 2	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 190s, Pos 3	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 190s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 3s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 5	Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F845M, 2 x 20s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	20 Secs X 2 (40 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F438W, 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F438W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.09-0.12 DEG (04)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, PHASE 0.18-0.22 DEG (05), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 231D TO 231 D; ORIENT 250D TO 250 D; BETWEEN 04-JUL-2018:23:00:00 AND 05-JUL-2018:23:00:00

Comments: Broadband photometry of the small moons at 0.18 to 0.22 degrees phase. Additional short exposures to study year-by-year changes in Pluto's rotation curve. ORIENT adjusted to 274 in order to keep the moons away from the diffraction spikes of Pluto and Charon. This opportunity is better than the equivalent opportunity after opposition because Styx will be too close to Charon at that time.

This visit images a rotational longitude between 90 and 190 on Styx.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

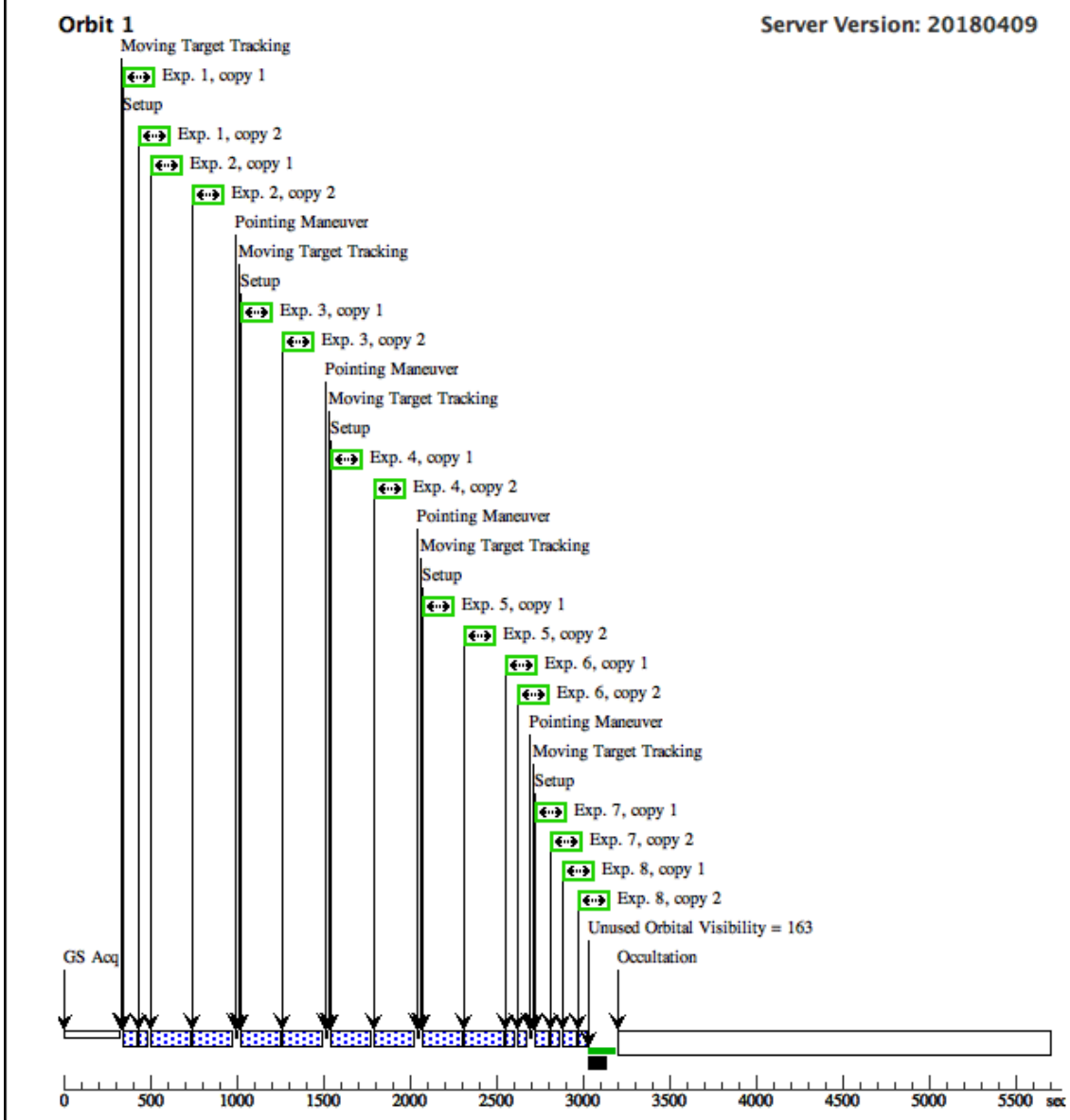
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	PLUTO	STD=PLUTO				EARTH

Comments: Description=Pluto

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 2 x 3s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000	Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
2	F350LP, 2 x 190s, Pos 1	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
3	F350LP, 2 x 190s, Pos 2	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 190s, Pos 3	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 190s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	190 Secs X 2 (380 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 3s, Pos 4	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 5	Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F555W, 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F625W, 2 x 6s	(1) PLUTO	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F625W	FLASH=12		Sequence 1-8 Non-Int in PHASE 0.18-0.22 DEG (05)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 0-90 BEFORE OPP (10), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 263D TO 263 D; BETWEEN 01-JAN-2018:00:00:00 AND 01-APR-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458148.22

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 0-90 assuming a 3.24 day period.
Scheduled before opposition, with phase > 0.3 degrees.
Timing restricted to March 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

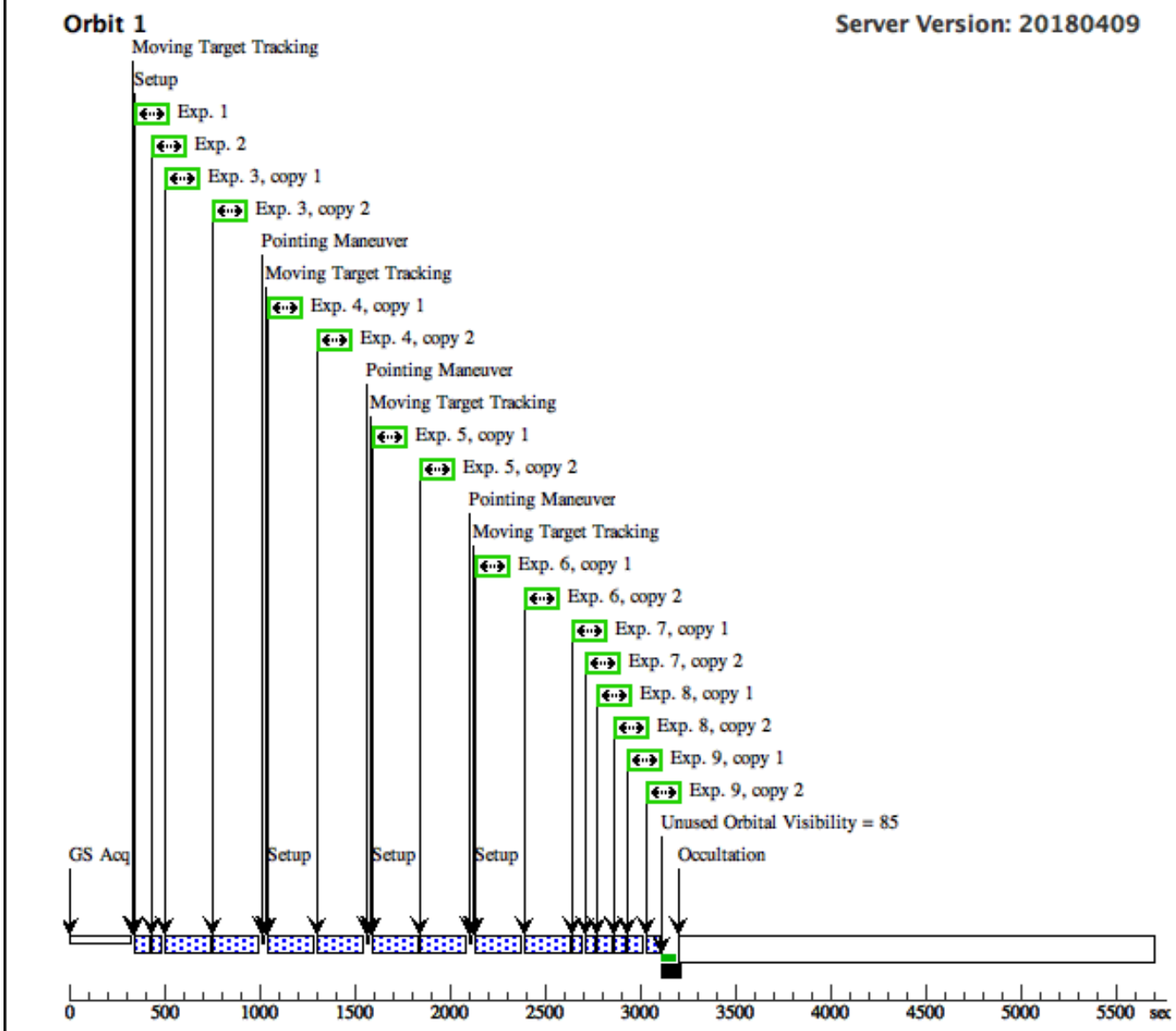
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 0-90	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0 TO 0.25	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 205s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	205 Secs X 2 (410 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 205s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	205 Secs X 2 (410 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 205s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	205 Secs X 2 (410 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 205s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	205 Secs X 2 (410 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F775W, 2 x 9s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F775W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	9 Secs X 2 (18 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F845M, 2 x 20s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 0-90 BEFORE OPP (10)	20 Secs X 2 (40 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 90-180 BEFORE OPP (11), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 79D TO 81 D; ORIENT 259D TO 261 D; BETWEEN 01-MAY-2018:00:00:00 AND 02-JUL-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458148.22

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 90-180 assuming a 3.24 day period.
Scheduled before opposition, with phase > 0.3 degrees.
Timing restricted to May-June 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

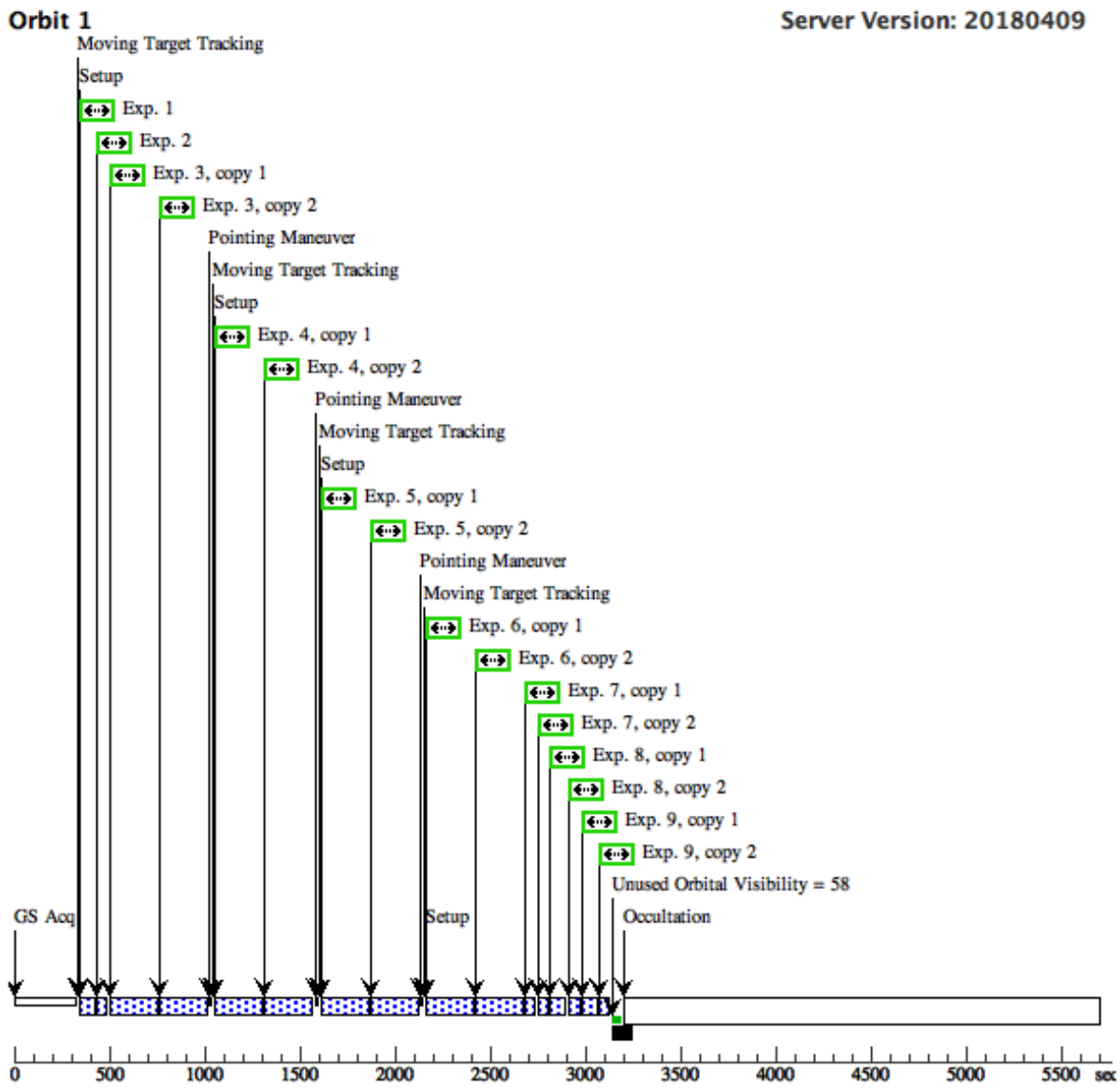
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 90-180	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0.25 TO 0.5	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F438W, 2 x 12s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F438W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	12 Secs X 2 (24 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F555W, 2 x 6s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 90-180 BEFORE OPP (11)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 180-270 BEFORE OPP (12), completed Thu Sep 06 18:01:43 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 256.5D TO 256.6 D; BETWEEN 01-JAN-2018:00:00:00 AND 01-MAY-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458148.22

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 180-270 assuming a 3.24 day period.
Scheduled before opposition, with phase > 0.3 degrees.
Timing restricted to before May to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

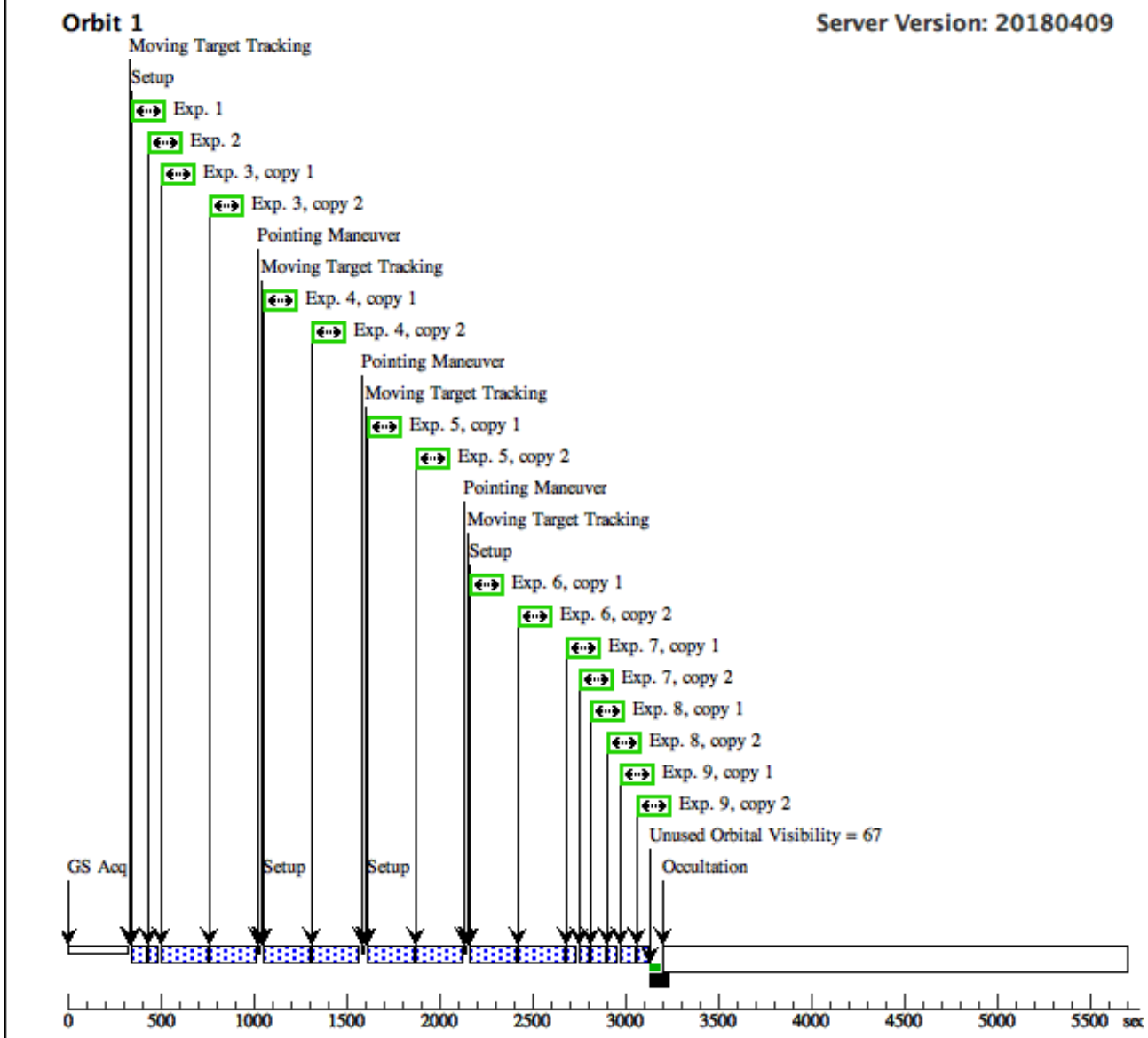
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 180-270	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0.5 TO 0.75	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F625W, 2 x 6s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F625W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F775W, 2 x 9s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F775W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 180-270 BEFORE OPP (12)	9 Secs X 2 (18 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 270-360 BEFORE OPP (13), completed Thu Sep 06 18:01:44 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 79D TO 81 D; ORIENT 259D TO 261 D; BETWEEN 01-APR-2018:00:00:00 AND 01-JUN-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458148.22

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 270-360 assuming a 3.24 day period.
Scheduled before opposition, with phase > 0.3 degrees.
Timing restricted to April-May 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

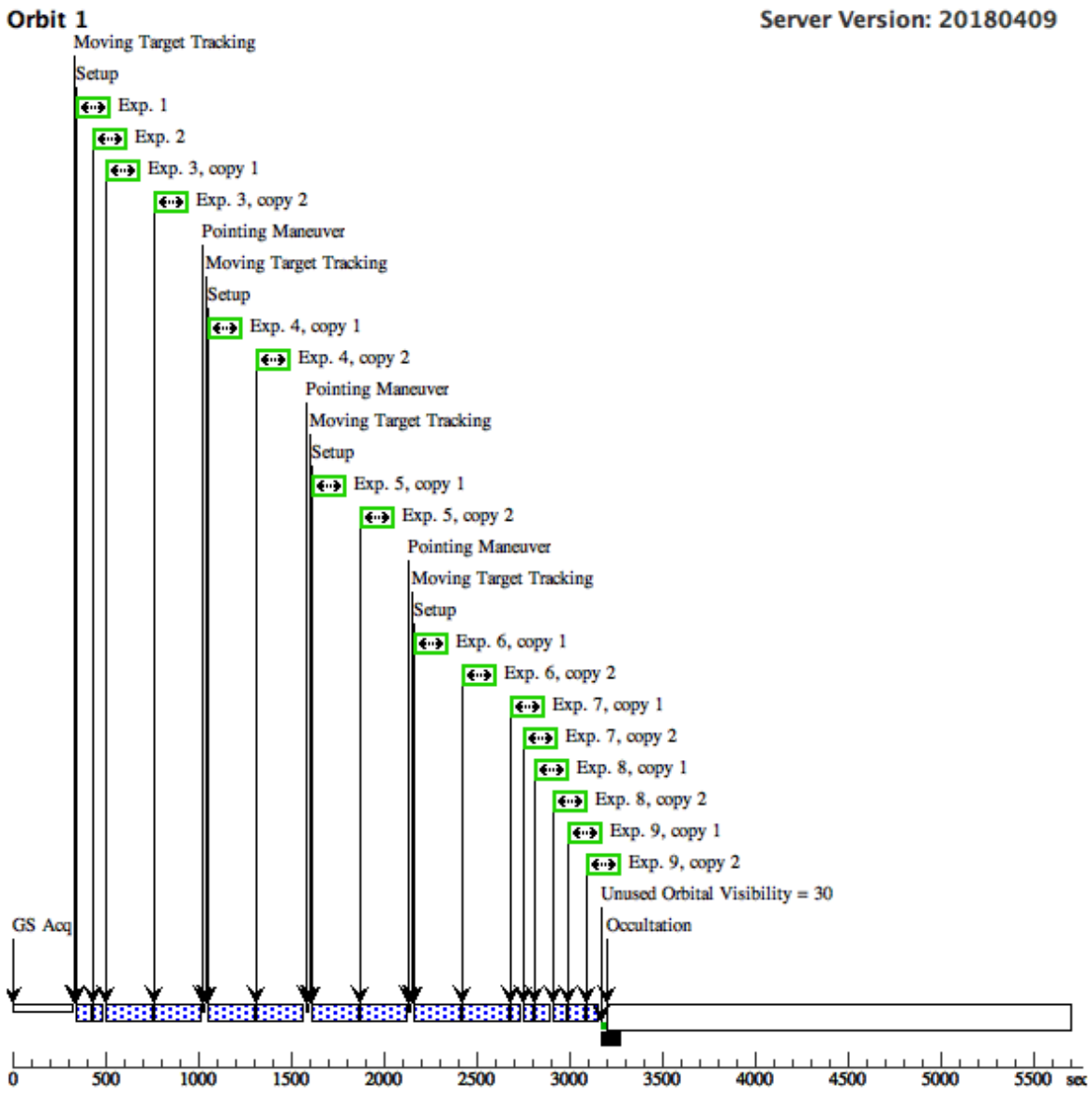
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 270-360	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0.75 TO 1.	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 3 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F845M, 2 x 20s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	20 Secs X 2 (40 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F438W, 2 x 12s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F438W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 270-360 BEFORE OPP (13)	12 Secs X 2 (24 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 0-90 AFTER OPP (20), completed Thu Sep 06 18:01:44 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 79D TO 81 D; ORIENT 259D TO 261 D; BETWEEN 22-JUL-2018:00:00:00 AND 01-OCT-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458300.5

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 0-90 assuming a 3.24 day period.
Scheduled before opposition, with phase > 0.3 degrees.
Timing restricted to August-September 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

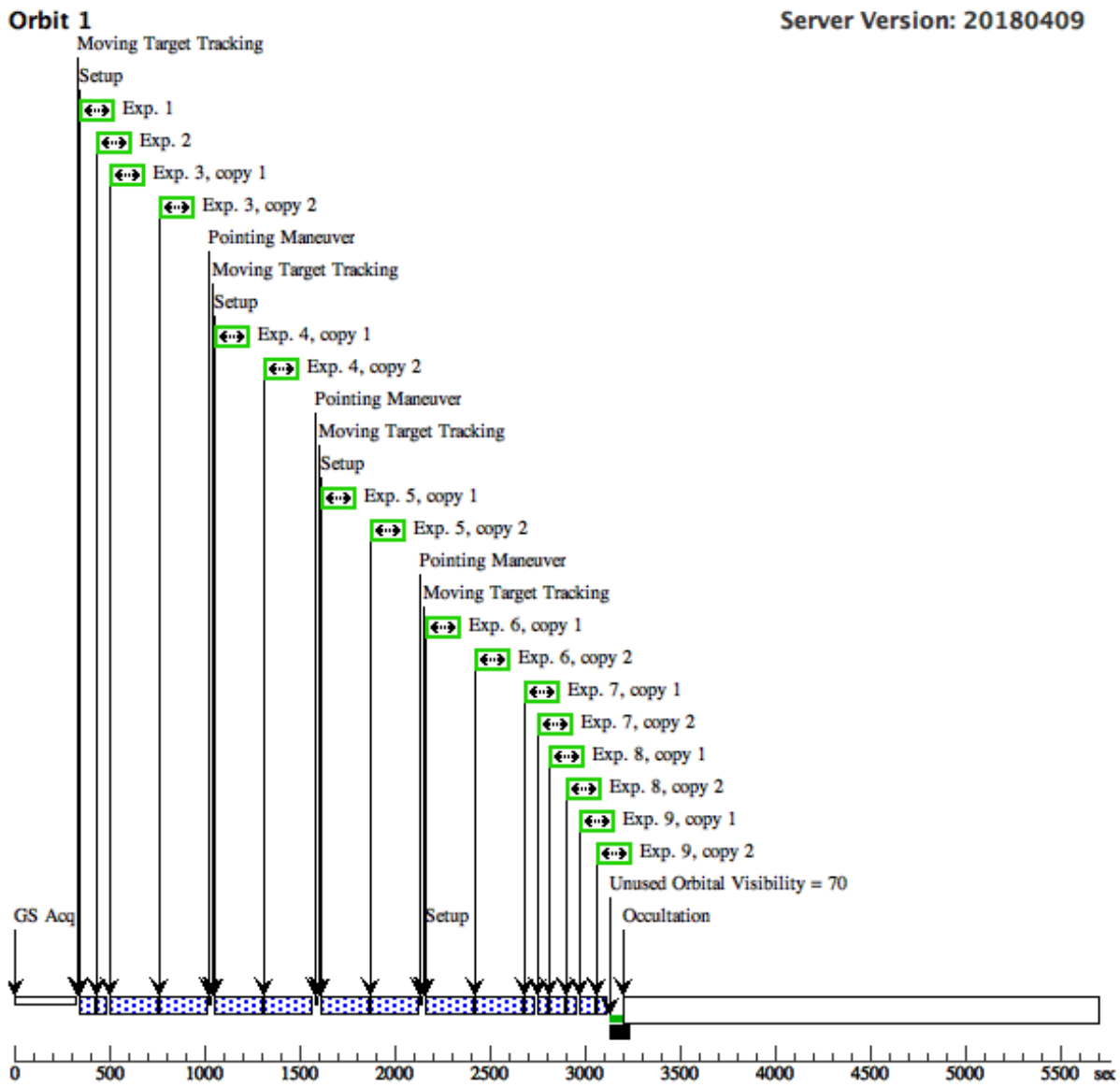
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 0-90	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0 TO 0.25; GS ACQ SCENARIO BASE1B3	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F555W, 2 x 6s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F625W, 2 x 6s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F625W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 0-90 AFTER OPP (20)	6 Secs X 2 (12 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 90-180 AFTER OPP (21), scheduling Thu Sep 06 18:01:44 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 76D TO 76 D; BETWEEN 22-JUL-2018:00:00:00 AND 01-OCT-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458300.5

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 90-180 assuming a 3.24 day period.
Scheduled after opposition, with phase > 0.3 degrees.
Timing restricted to late September 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

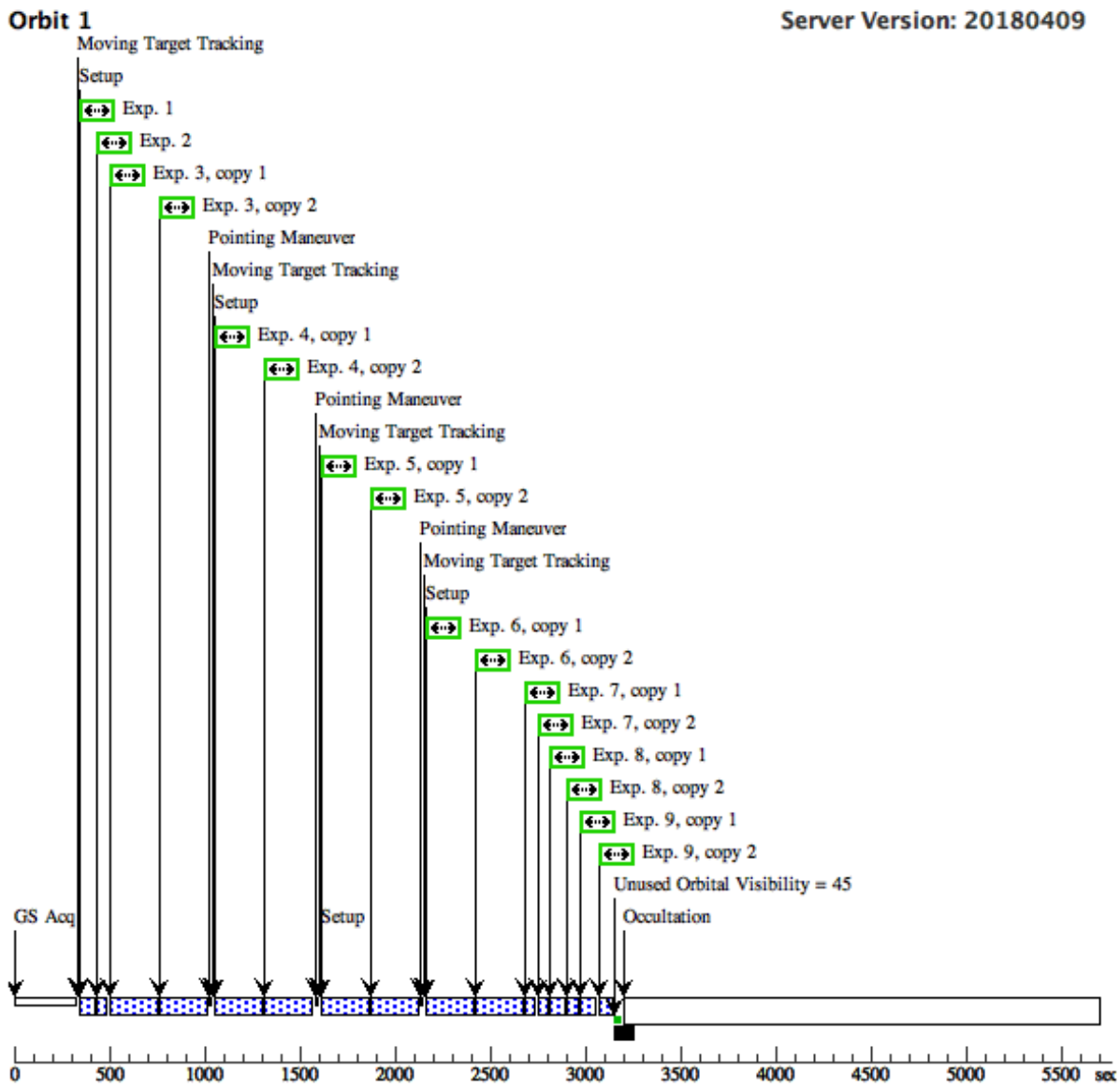
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 90-180	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0.25 TO 0.5; GS ACQ SCENARIO BASE1B3	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F775W, 2 x 9s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F775W	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	9 Secs X 2 (18 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F845M, 2 x 20s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 90-180 AFTER OPP (21)	20 Secs X 2 (40 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 180-270 AFTER OPP (22), completed Thu Sep 06 18:01:44 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 79D TO 81 D; ORIENT 259D TO 261 D; BETWEEN 22-JUL-2018:00:00:00 AND 01-OCT-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458300.5

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational longitude 180-270 assuming a 3.24 day period.
Scheduled after opposition, with phase > 0.3 degrees.
Timing restricted to July-August 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

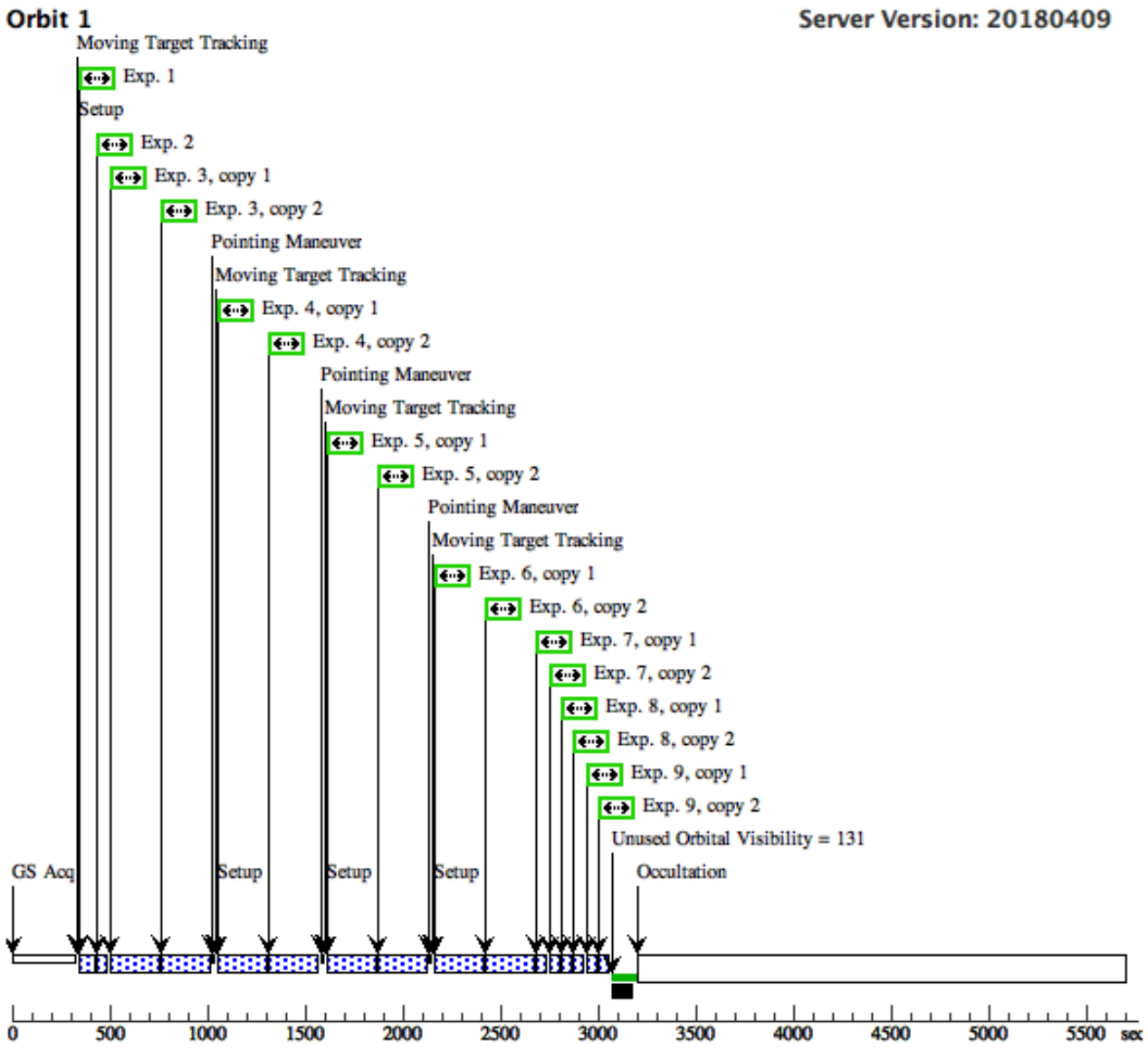
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 180-270	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0.5 TO 0.75; GS ACQ SCENARIO BASE1B3	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F438W, 2 x 12s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F555W, 2 x 6s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 180-270 AFTER OPP (22)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure



Visit

Proposal 15261, STYX LON 270-360 AFTER OPP (23), completed Thu Sep 06 18:01:44 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 30%; ORIENT 86D TO 88 D; BETWEEN 22-JUL-2018:00:00:00 AND 01-OCT-2018:00:00:00; Period 3.24 D AND ZERO-PHASE HJD2458300.5

Comments: Long exposures for the small moons through filter F350LP. Timed to prevent Styx and Kerberos from landing inside the diffraction spikes of Pluto, and to place Charon on the opposite side of the planet. POS TARG values re-position Pluto in steps of exactly 5.5 pixels along each axis.

Styx at rotational phase longitude 270-360 assuming a 3.24 day period.
Scheduled after opposition, with phase > 0.3 degrees.
Timing restricted to September 2018 to ensure a long time baseline during 2018.

Note: Changing the schedulability setting from 100 to 30 did not affect the valid observing windows at all, but it gave us several extra minutes of integration time on our targets.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	PLUTO-W-MOONS-ORIENT-80	STD=PLUTO			NOT OLG OF STYX BETWEEN 21 51, NOT OLG OF STYX BETWEEN 70 100, NOT OLG OF STYX BETWEEN 121 151, NOT OLG OF STYX BETWEEN 201 231, NOT OLG OF STYX BETWEEN 250 280, NOT OLG OF STYX BETWEEN 301 331, NOT OLG OF KERBEROS BETWEEN 23 49, NOT OLG OF KERBEROS BETWEEN 123 149, NOT OLG OF KERBEROS BETWEEN 203 229, NOT OLG OF KERBEROS BETWEEN 303 329, SEP OF CHARON STYX FROM EARTH GT 1.8", SEP OF CHARON KERBEROS FROM EARTH GT 1.6"	EARTH

Comments: Description=Pluto with Styx and Kerberos off Pluto's diffraction spikes, Styx off the saturation bloom, when ORIENT = 80 or 260

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F350LP, 1 x 3s, Pos 1, Styx phase 270-360	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	POS TARG 0.000,0.000; PHASE 0.75 TO 1; GS ACQ SCENARIO BASE1B3	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	3 Secs (3 Secs) *[==>]*	***[1]***
2	F350LP, 1 x 3s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	3 Secs (3 Secs) *[==>]*	***[1]***
3	F350LP, 2 x 210s, Pos 1	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		SAME POS AS 1	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
4	F350LP, 2 x 210s, Pos 2	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.217,-0.012	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
5	F350LP, 2 x 210s, Pos 3	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG -0.002,0.219	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
6	F350LP, 2 x 210s, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP		POS TARG 0.215,0.207	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	210 Secs X 2 (420 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
7	F350LP, 2 x 3 sec, Pos 4	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
8	F775W, 2 x 9s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
9	F845M, 2 x 20s	(2) PLUTO-W-MOONS-ORIENT-80	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	FLASH=12	SAME POS AS 6	Sequence 1-9 Non-Int in STYX LON 270-360 AFTER OPP (23)	3 Secs X 2 (6 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***

Orbit Structure