13311 - Precise Orbit Determination for a New Horizons KBO

Cycle: 21, 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?*
11	(1) A31006AP	WFC3/UVIS	1	14-Aug-2014 21:00:32.0	yes
12	(1) A31006AP	WFC3/UVIS	1	14-Aug-2014 21:00:34.0	yes

2 Total Orbits Used

ABSTRACT

The New Horizons (NH) spacecraft is on its way to study the Pluto system during a flyby after which the spacecraft will be retargeted to one or more Kuiper Belt Objects (KBOs) to learn about small KBOs and the Kuiper Belt population. We are actively carrying out dedicated ground-based observations to identify a target for NH to flyby and continue to improve our analysis algorithms. To date, we have 28 discoveries including five objects that are long-range reconnaissance candidates, two that are pre-Pluto encounter observation candidates and two that current orbit predictions require about a factor of 2 more propellant than available for the targeting maneuver. Our searches are continuing in to 2013. Unfortunately, NH's

trajectory line of site is within the galactic center (Sagittarius) making stellar confusion a major problem in obtaining precise astrometry and high precision orbits for these objects from the ground. HST's sensitivity, resolution and PSF stability are crucial components for determining precise orbits for these objects. We request 2 TOO orbits to be triggered in the event that a candidate object is found within the targetable region. These observations will provide the required high precision astrometry, will evaluate if the NH candidate is binary (~30%) and will make a preliminary color determination to assist in fly-by planning.

OBSERVING DESCRIPTION

We obtain 5-370 second exposures using a linear dither pattern on the NH KBO candidate. Both TOO orbits are planned to take the same set of exposures. This project imposes no orientation constraints and uses ordinary blind target acquisition. We tracking the object under FGS control, target motion rates are very slow, at most a few arcsec per hour. We are now requesting ToO activation to observe newly discovered KBO A31006AP ASAP, consistent with a non-disruptive ToO. Once tentative scheduling slots are identified we will check the fields for spoler stars.

Visit

Proposal 13311, Visit 11 Fri Aug 15 01:00:35 GMT 2014

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%

Diagnostics

(Visit 11) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=CELESTIAL		(1)
	Purpose=OTHER	Pattern Orientation=0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.75	Center Pattern=true		
	Line Spacing=			

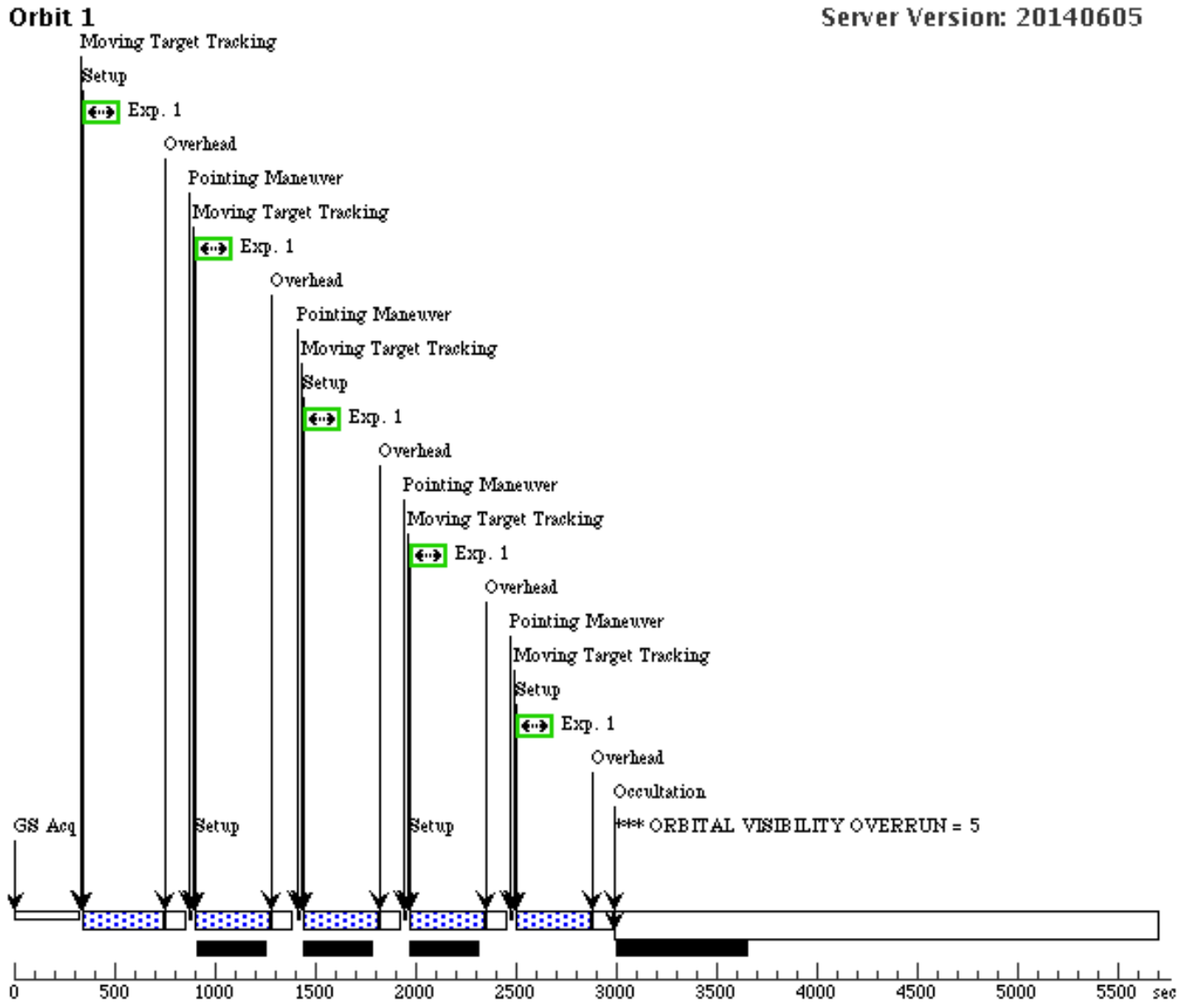
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	A31006AP	TYPE=ASTEROID,A=42.973765058193,E=0.11396475141900,I=3.0501788148877,O=147.05090589013,W=15.982597374200,M=105.16977073587,EQUINOX=J2000,EPOCH=24-JUL-2014:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) A31006AP	WFC3/UVIS, ACCUM, UVIS2	F350LP			Pattern 1, Exps 1-1 in Visit 11 (1)	370.0 Secs (1850 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	***[1]***
								[==>(Pattern 4)]	
								[==>(Pattern 5)]	

Orbit Structure



Visit

Proposal 13311, Visit 12 Fri Aug 15 01:00:35 GMT 2014

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; AFTER 11 BY 0.9 Orbits TO 1.3 Orbits; SEQ 11,12 WITHIN 1 D

Diagnostics

(Visit 12) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=CELESTIAL		(1)
	Purpose=OTHER	Pattern Orientation=0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.75	Center Pattern=true		
	Line Spacing=			

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	A31006AP	TYPE=ASTEROID,A=42.973765058193,E=0.11396475141900,I=3.0501788148877,O=147.05090589013,W=15.982597374200,M=105.16977073587,EQUINOX=J2000,EPOCH=24-JUL-2014:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) A31006AP	WFC3/UVIS, ACCUM, UVIS2	F350LP			Pattern 1, Exps 1-1 in Visit 12 (1)	370.0 Secs (1850 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	***[1]***
								[==>(Pattern 4)]	
								[==>(Pattern 5)]	

Orbit Structure