



11518 - Mutual eclipses of a Kuiper belt-satellite system

Cycle: 16, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) 2003EL61	WFPC2	1	30-Apr-2008 21:38:10.0	yes
02	(1) 2003EL61	WFPC2	1	30-Apr-2008 21:38:14.0	yes
03	(1) 2003EL61	WFPC2	1	30-Apr-2008 21:38:17.0	yes
04	(1) 2003EL61	WFPC2	1	30-Apr-2008 21:38:19.0	yes
05	(1) 2003EL61	WFPC2	1	30-Apr-2008 21:38:21.0	yes

5 Total Orbits Used

ABSTRACT

Ground-based observations two weeks ago strongly suggest that the orbit of the small inner satellite of 2003 EL61, the 5th largest known dwarf planet, is possibly precisely edge-on and thus somewhere in the middle of a ~3 year long cycle of mutual eclipses, occultations, and transits. We

anticipate that with another year of ground-based observation we may have sufficient data to accurately predict the times and durations of these events, but by then the events may well be over. If events are indeed occurring, measurement of the timing and depths of such events provides a wealth of precise geometric information for constraining sizes, shapes, orbits, and dynamics of the system.

We propose to obtain 5 quick WFPC2 visits to 2003 EL61 over the ~19 day orbital period of the inner satellite to determine a precise orbit and predict mutual event times. We will instantly (within ~1 day of the end of the observations) make these predictions public to allow the maximum number of attempts to collect the data as possible.

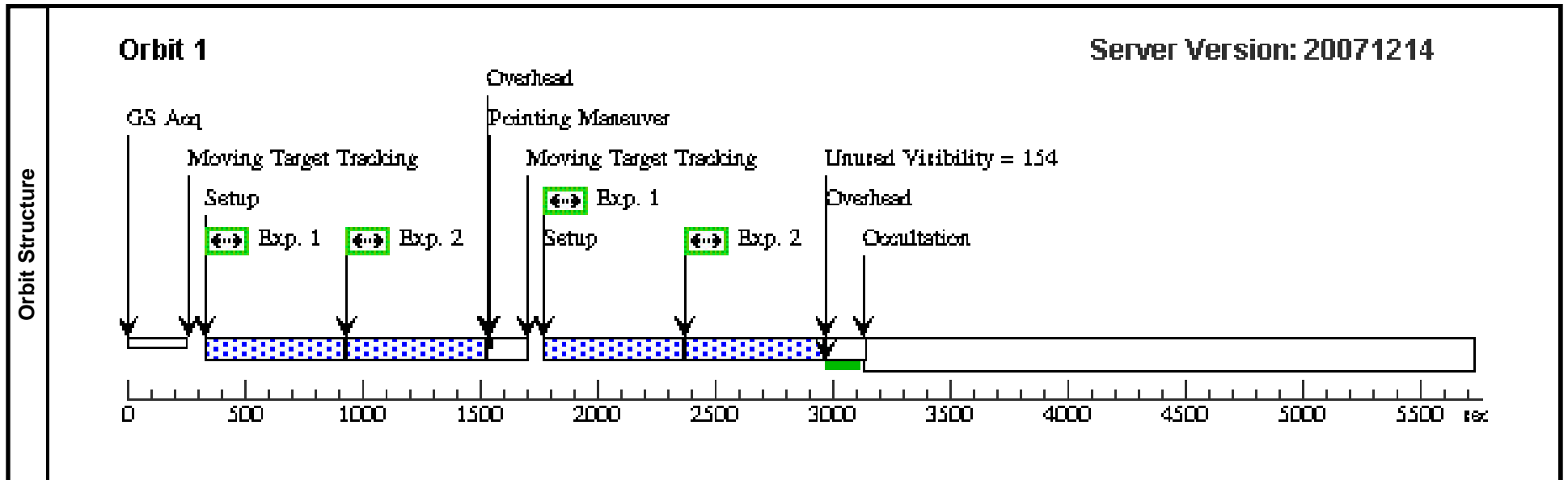
OBSERVING DESCRIPTION

A simple 2 color 4 image sequence with a dither in the middle of each orbit.

Proposal 11518 - Visit 01 - Mutual eclipses of a Kuiper belt-satellite system

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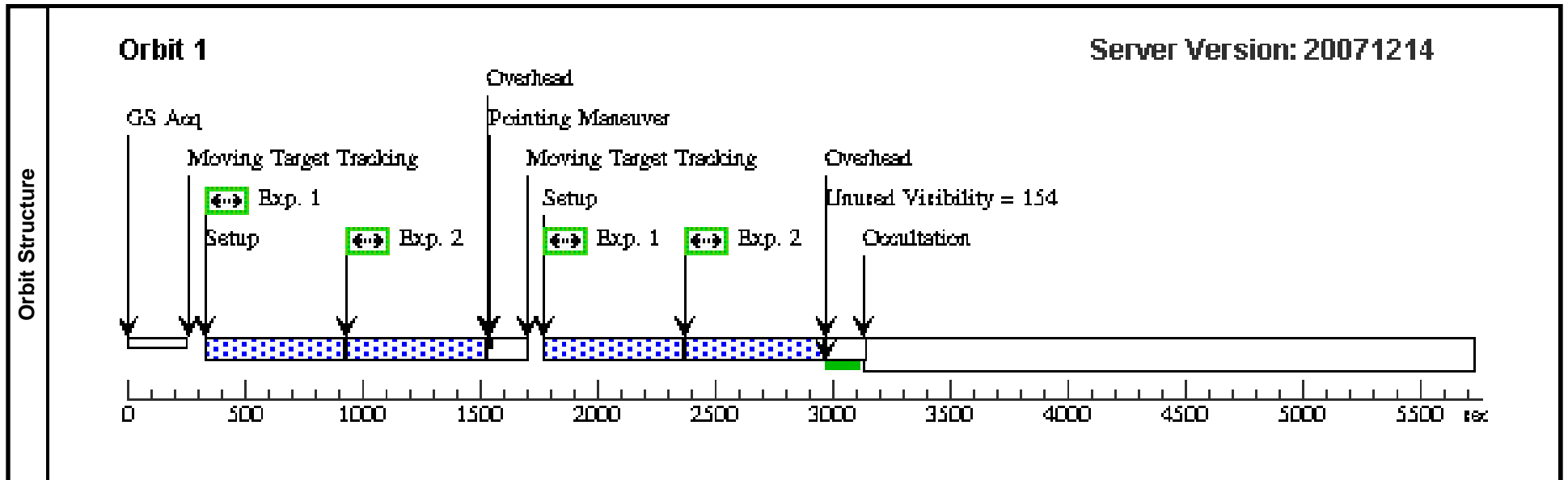
Visit	Proposal 11518, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 12-MAY-2008:01:00:00 AND 12-MAY-2008:03:00:00 Comments: 2003 EL61, 1st observation This visit should be scheduled as early as possible within the next scheduling period, which starts on May 12th.									
	Patterns	#	Primary Pattern			Secondary Pattern		Exposures		
(1)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false				(1-2)			
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	2003EL61	TYPE=ASTEROID,A=43.1895328502 9598 ,E=.1935368665567537 ,I=28.22278478945061,O=122.090440 581686,W=239.0521341253993,M=20 2.1241278203591,EQUINOX=J2000, EPOCH=14-MAY-2008:00:00:00 Comments: #136108				EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) 2003EL61	WFPC2, IMAGE, PC1	F606W		POS TARG -7.0,-8.0	Pattern 1-2 (1)		400.0 Secs	
							;		[==>(Pattern 1)]	
							GS ACQ SCENARI O SINGLE		[==>(Pattern 2)]	[1]
2	(1) 2003EL61	WFPC2, IMAGE, PC1	F814W		POS TARG -7.0,-8.0	Pattern 1-2 (1)		500.0 Secs		
								[==>(Pattern 1)]		
								[==>(Pattern 2)]	[1]	



Proposal 11518 - Visit 02 - Mutual eclipses of a Kuiper belt-satellite system

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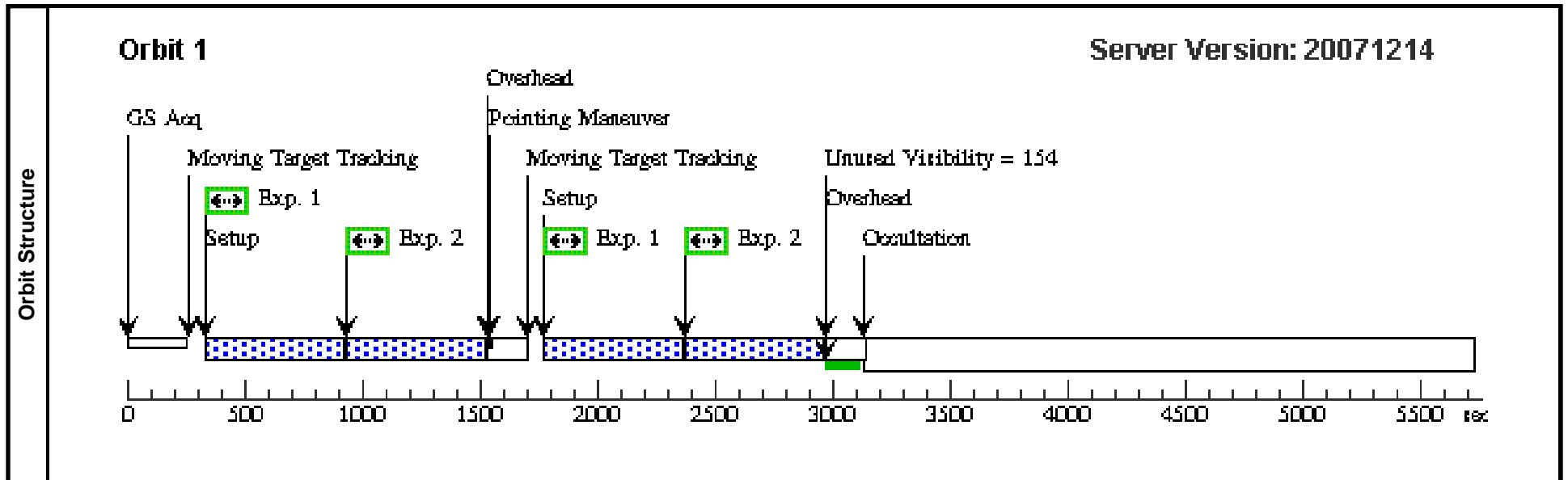
Visit	Proposal 11518, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 13-MAY-2008:16:00:00 AND 14-MAY-2008:02:00:00 Comments: 2003 EL61, 2nd observation										
	Patterns	#	Primary Pattern				Secondary Pattern				Exposures
(1)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false					(1-2)			
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
	(1)	2003EL61	TYPE=ASTEROID,A=43.1895328502 9598 ,E=.1935368665567537 ,I=28.22278478945061,O=122.090440 581686,W=239.0521341253993,M=20 2.1241278203591,EQUINOX=J2000, EPOCH=14-MAY-2008:00:00:00						EARTH		
Comments: #136108											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) 2003EL61	WFPC2, IMAGE, PC1	F606W	POS TARG -7.0,-8.0	Pattern 1-2 (1)	400.0 Secs				
								;	[=>(Pattern 1)]		[1]
							GS ACQ SCENARI	[=>(Pattern 2)]			
							O SINGLE				
2	(1) 2003EL61	WFPC2, IMAGE, PC1	F814W	POS TARG -7.0,-8.0	Pattern 1-2 (1)	500.0 Secs					
							[=>(Pattern 1)]			[1]	
							[=>(Pattern 2)]				



Proposal 11518 - Visit 03 - Mutual eclipses of a Kuiper belt-satellite system

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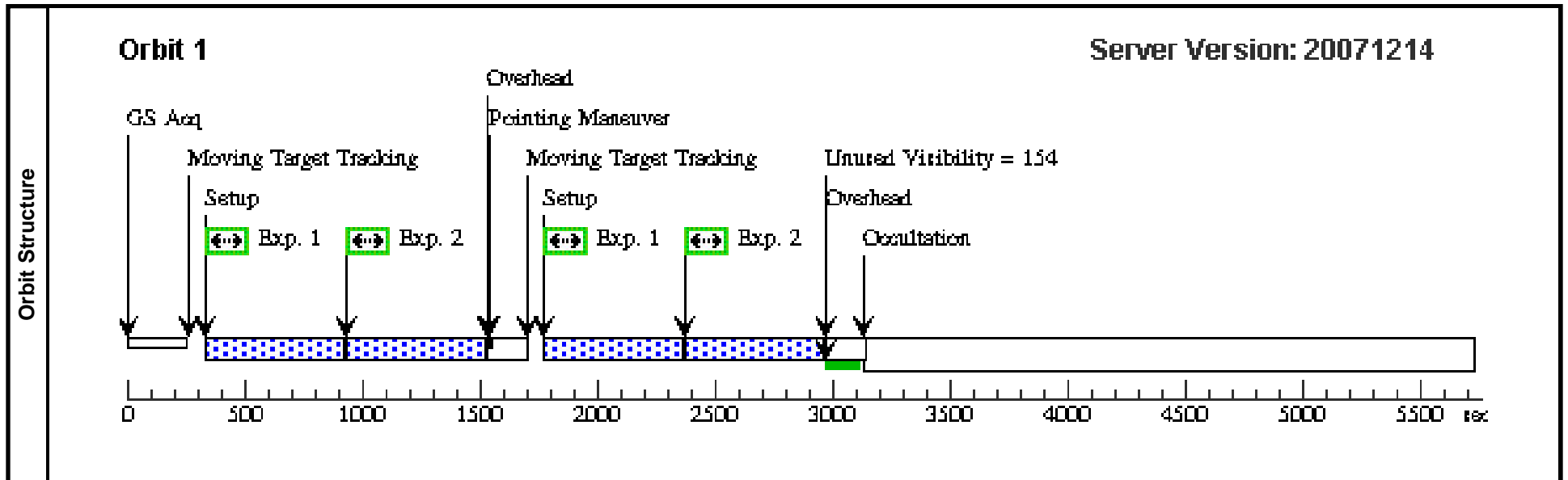
Visit	Proposal 11518, Visit 03, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 15-MAY-2008:11:00:00 AND 15-MAY-2008:21:00:00 Comments: 2003 EL61, 3rd observation										
	Patterns	#	Primary Pattern				Secondary Pattern				Exposures
(1)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false					(1-2)			
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
	(1)	2003EL61	TYPE=ASTEROID,A=43.1895328502 9598 ,E=.1935368665567537 ,I=28.22278478945061,O=122.090440 581686,W=239.0521341253993,M=20 2.1241278203591,EQUINOX=J2000, EPOCH=14-MAY-2008:00:00:00						EARTH		
Comments: #136108											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) 2003EL61	WFPC2, IMAGE, PC1	F606W	POS TARG -7.0,-8.0	Pattern 1-2 (1)	400.0 Secs				
								;	[=>(Pattern 1)]		[1]
							GS ACQ SCENARI	[=>(Pattern 2)]			
							O SINGLE				
2	(1) 2003EL61	WFPC2, IMAGE, PC1	F814W	POS TARG -7.0,-8.0	Pattern 1-2 (1)	500.0 Secs					
							[=>(Pattern 1)]			[1]	
							[=>(Pattern 2)]				



Proposal 11518 - Visit 04 - Mutual eclipses of a Kuiper belt-satellite system

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Visit	Proposal 11518, Visit 04, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 17-MAY-2008:06:00:00 AND 17-MAY-2008:16:00:00 Comments: 2003 EL61, 4th observation										
	Patterns	#	Primary Pattern				Secondary Pattern				Exposures
(1)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false					(1-2)			
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
	(1)	2003EL61	TYPE=ASTEROID,A=43.1895328502 9598 ,E=.1935368665567537 ,I=28.22278478945061,O=122.090440 581686,W=239.0521341253993,M=20 2.1241278203591,EQUINOX=J2000, EPOCH=14-MAY-2008:00:00:00						EARTH		
Comments: #136108											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) 2003EL61	WFPC2, IMAGE, PC1	F606W		POS TARG -7.0,-8.0	Pattern 1-2 (1)		400.0 Secs		
										[=>(Pattern 1)] [=>(Pattern 2)]	[1]
2	(1) 2003EL61	WFPC2, IMAGE, PC1	F814W		POS TARG -7.0,-8.0	Pattern 1-2 (1)		500.0 Secs			
									[=>(Pattern 1)] [=>(Pattern 2)]	[1]	



Proposal 11518 - Visit 05 - Mutual eclipses of a Kuiper belt-satellite system

Thu May 01 01:38:26 GMT 2008

Visit	Proposal 11518, Visit 05, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 19-MAY-2008:06:00:00 AND 19-MAY-2008:07:00:00 Comments: 2003 EL61, last observation This visit should be scheduled as late as possible within the 2003 EL61 visibility window.										
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
(1)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false						(1-2)		
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
	(1)	2003EL61	TYPE=ASTEROID,A=43.1895328502 9598 ,E=.1935368665567537 .I=28.22278478945061,O=122.090440 581686,W=239.0521341253993,M=20 2.1241278203591,EQUINOX=J2000, EPOCH=14-MAY-2008:00:00:00					EARTH			
Comments: #136108											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) 2003EL61	WFPC2, IMAGE, PC1	F606W		POS TARG -7.0,-8.0	Pattern 1-2 (1)		400.0 Secs		
										[=>(Pattern 1)]	
										[=>(Pattern 2)]	[1]
2	(1) 2003EL61	WFPC2, IMAGE, PC1	F814W		POS TARG -7.0,-8.0	Pattern 1-2 (1)			500.0 Secs		
									[=>(Pattern 1)]		
									[=>(Pattern 2)]	[1]	

