



14040 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

Cycle: 22, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
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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) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:38.0	yes
02	(1) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:40.0	yes
03	(1) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:41.0	yes
04	(1) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:42.0	yes
05	(1) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:43.0	yes
06	(1) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:44.0	yes
11	(1) 2014S4-GIBBS	WFC3/UVIS	1	20-Jan-2015 21:12:45.0	yes

7 Total Orbits Used

ABSTRACT

We triggered our Target of Opportunity program (GO-13864: Hubble Imaging of a Newly-Discovered Main-Belt Comet) in October, on the new active asteroid P/2014 S4 (Gibbs). The results are exciting, and are consistent with an asteroid ice-sublimator caught in an early stage of development and showing rapid morphological changes. We request 6 orbits of Hubble DD time (1 orbit every ~3 weeks until the object enters Hubble's solar exclusion zone) to capitalize on this early detection. We will examine the evolution of this body so as to better understand the activity mechanism. P/2014 S4 is particularly interesting because it orbits in a region of the asteroid belt of likely importance for the origin of water on the Earth.

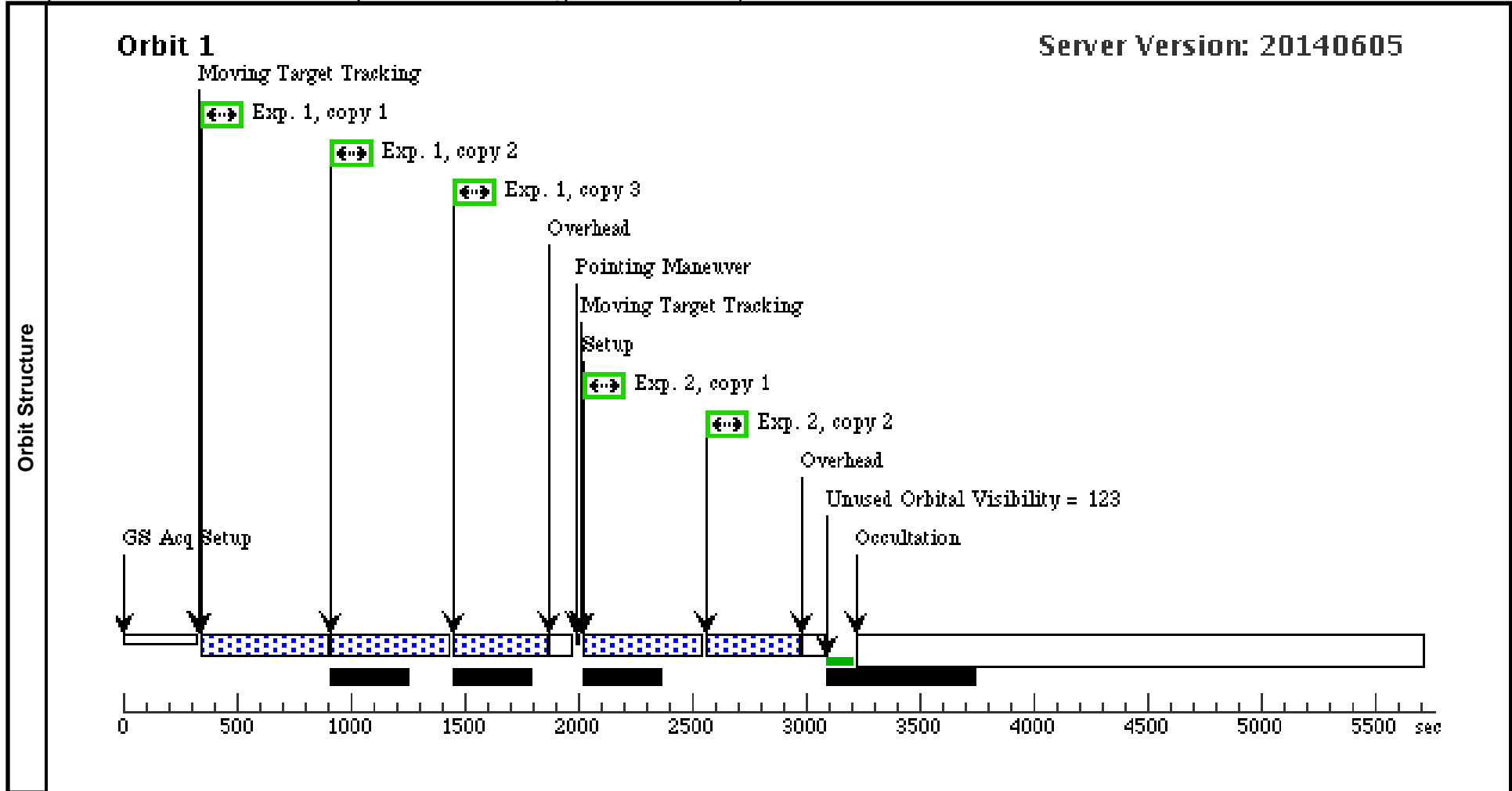
OBSERVING DESCRIPTION

We repeat our strategy of obtaining five long F350LP exposures in each epoch (orbit), to maximize S/N and the rejection of artifacts (cosmic rays and star trails). Our visits sample the period leading up to solar avoidance in March 2015. Visit 01 suffered a loss of lock on 1 Dec 2014, so visit 11 is a HOPR repeat of it. Of course we can't recover the intended temporal sampling lost with visit 01, so at this point it makes sense to schedule visit 11 after solar avoidance in Sep or Oct 2015.

Proposal 14040 - Visit 01 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

Wed Jan 21 02:12:46 GMT 2015

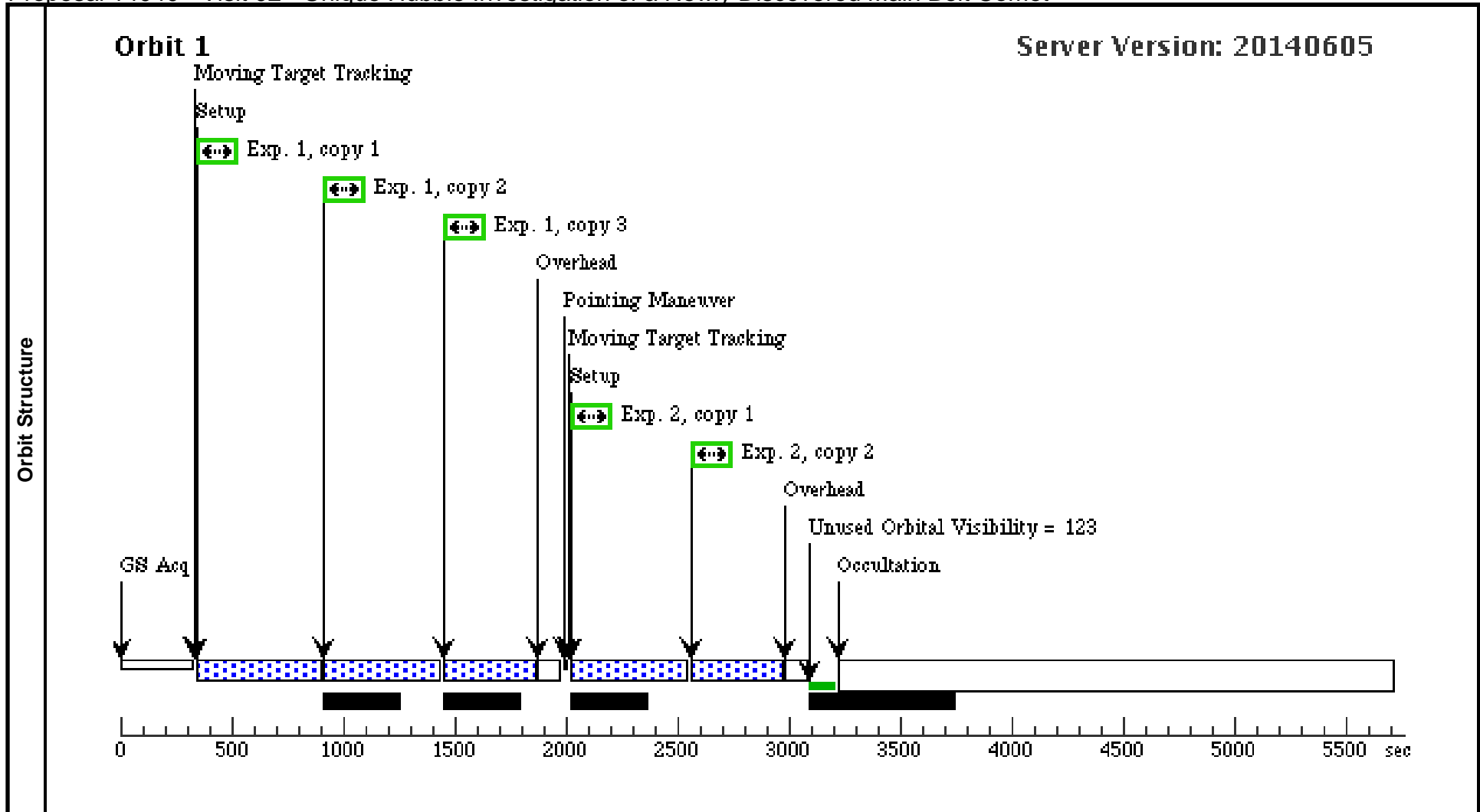
Visit	Proposal 14040, Visit 01, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 16-NOV-2014 AND 08-DEC-2014																																							
Solar System Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Level 1</th> <th>Level 2</th> <th>Level 3</th> <th>Window</th> <th>Ephem Center</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>2014S4-GIBBS</td> <td>TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB</td> <td></td> <td></td> <td></td> <td></td> <td>EARTH</td> </tr> </tbody> </table>	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center	(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB					EARTH																								
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Proposal 14040 - Visit 02 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

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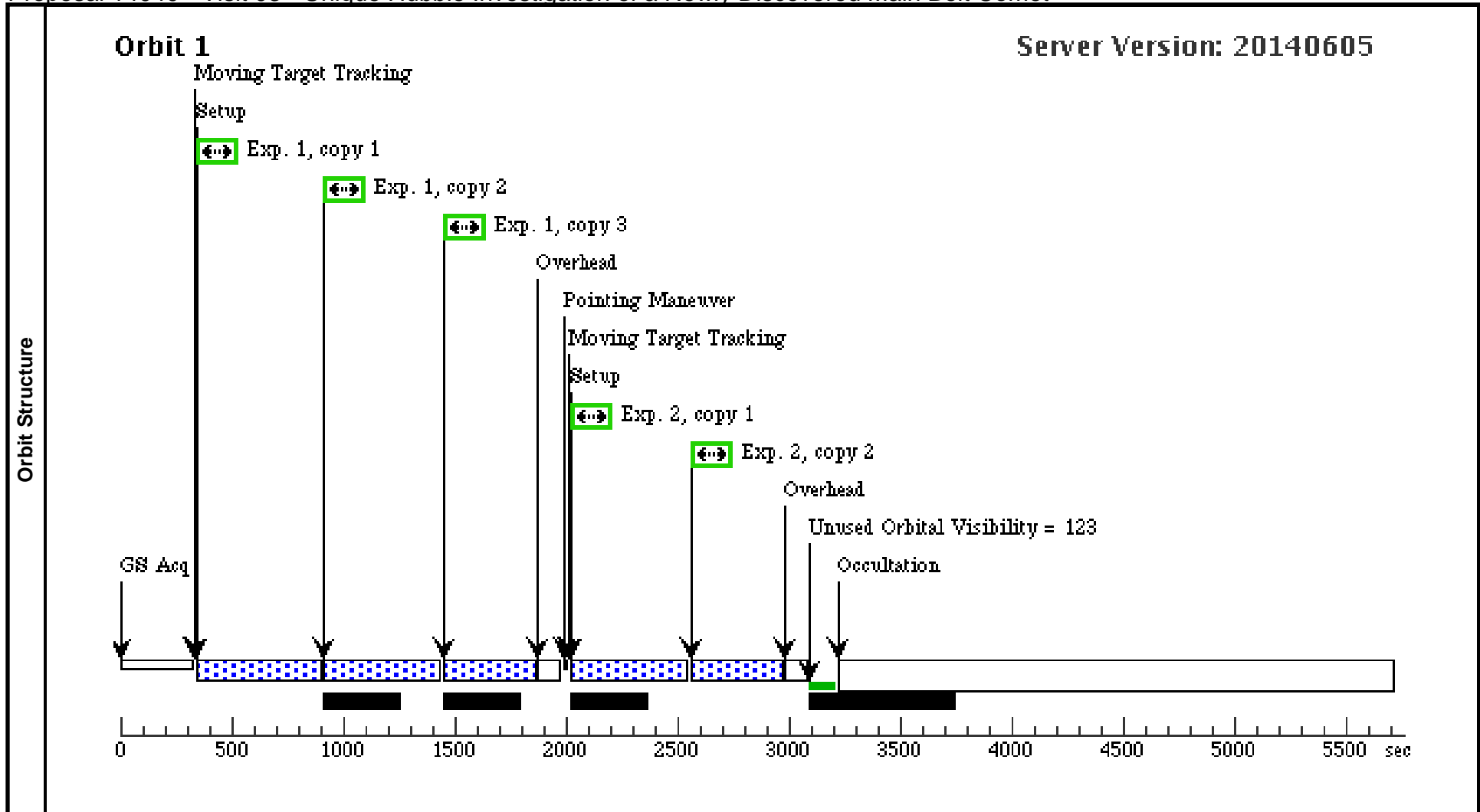
Visit	Proposal 14040, Visit 02, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 15-DEC-2014 AND 29-DEC-2014										
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO			410 Secs X 3 (1230 Secs)		
									[==>(Copy 1)]	[1]	
									[==>(Copy 2)]		
									[==>(Copy 3)]		
	2		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO	POS TARG 0.2,2.0		410 Secs X 2 (820 Secs)		
									[==>(Copy 1)]	[1]	
									[==>(Copy 2)]		



Proposal 14040 - Visit 03 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

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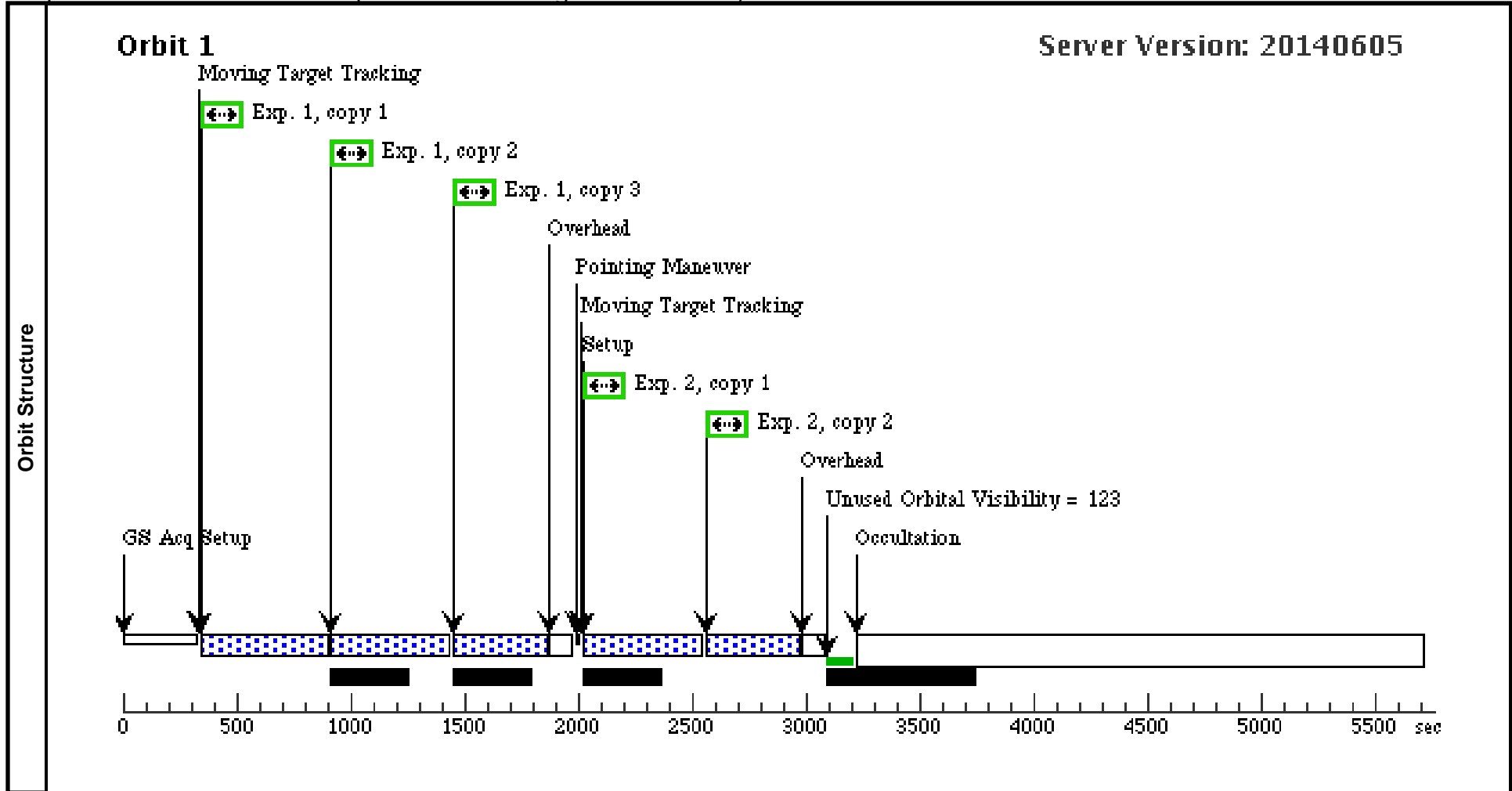
Visit	Proposal 14040, Visit 03, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 06-JAN-2015:22:00:00 AND 07-JAN-2015:22:00:00																																							
Solar System Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Level 1</th> <th>Level 2</th> <th>Level 3</th> <th>Window</th> <th>Ephem Center</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>2014S4-GIBBS</td> <td>TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB</td> <td></td> <td></td> <td></td> <td></td> <td>EARTH</td> </tr> </tbody> </table>	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center	(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB					EARTH																								
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(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB					EARTH																																	
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2		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO	POS TARG 0.2,2.0		410 Secs X 2 (820 Secs) [=>(Copy 1)] [=>(Copy 2)]	[1]																															



Proposal 14040 - Visit 04 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

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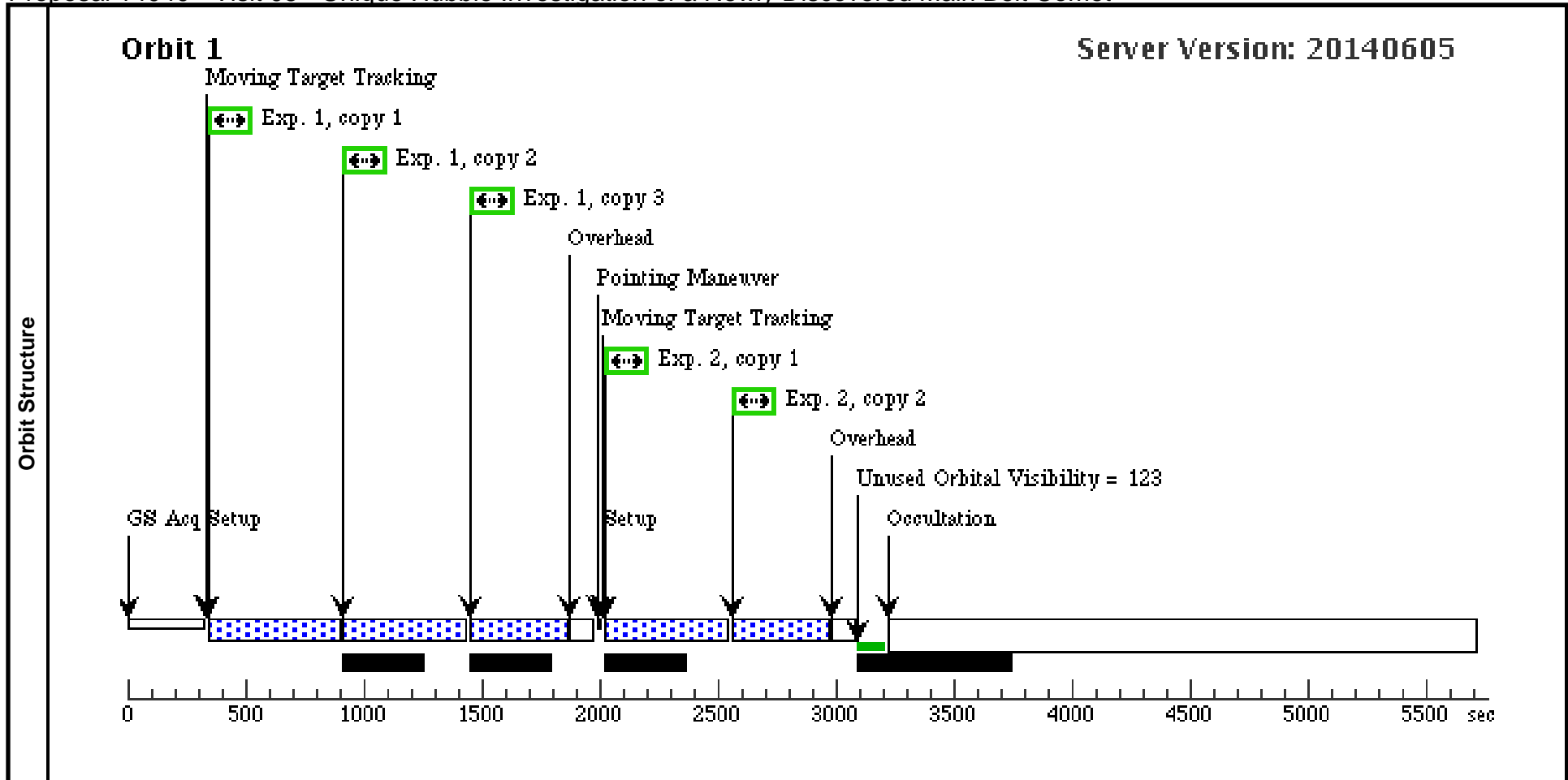
Visit	Proposal 14040, Visit 04, scheduled Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 21-JAN-2015 AND 04-FEB-2015									
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB				EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO				410 Secs X 3 (1230 Secs)	
									[==>(Copy 1)]	
									[==>(Copy 2)]	[1]
									[==>(Copy 3)]	
	2	(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO	POS TARG 0.2,2.0			410 Secs X 2 (820 Secs)	
									[==>(Copy 1)]	
									[==>(Copy 2)]	[1]



Proposal 14040 - Visit 05 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

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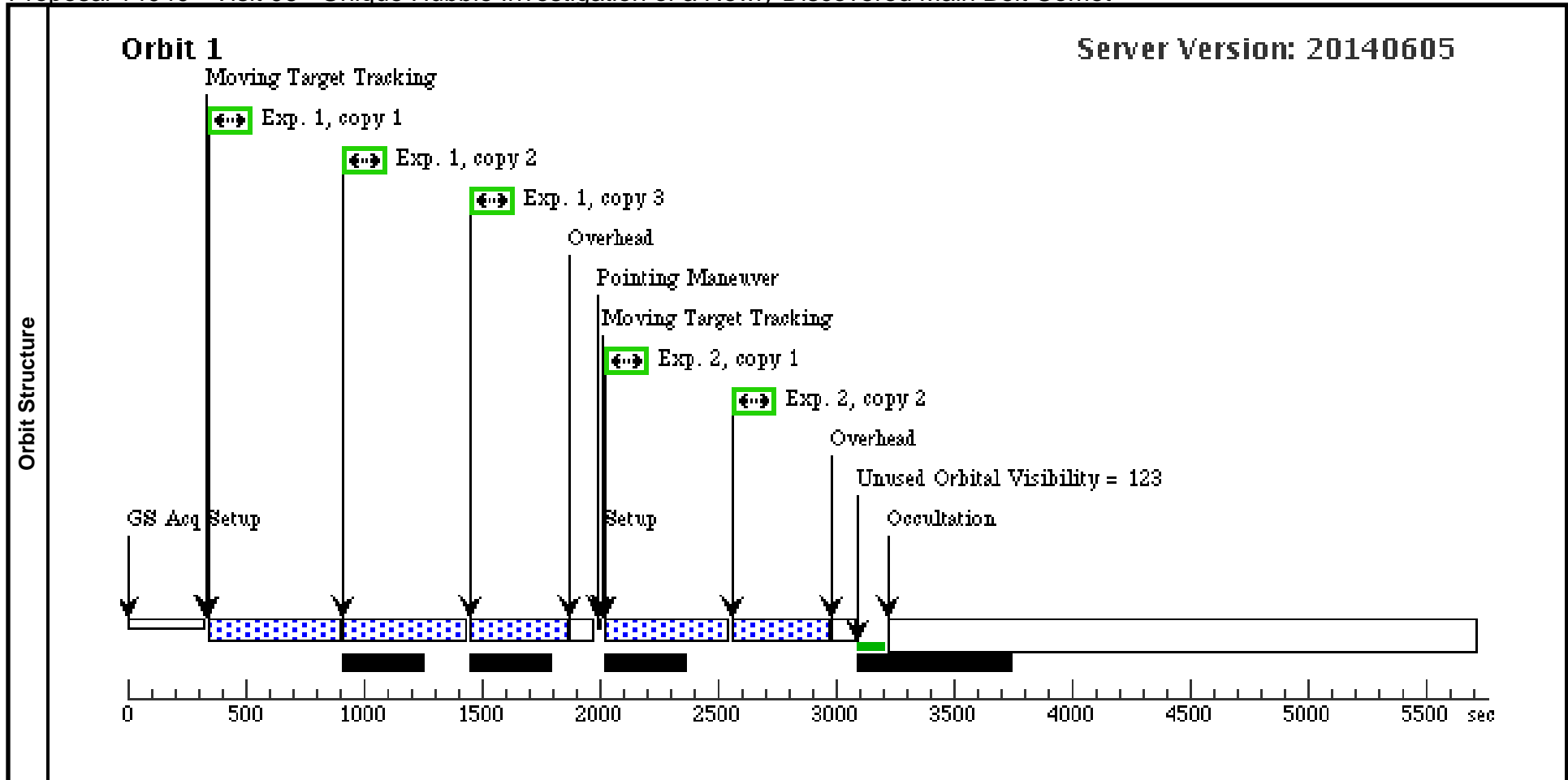
Visit	Proposal 14040, Visit 05, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 10-FEB-2015 AND 24-FEB-2015									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
	(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB					EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO			410 Secs X 3 (1230 Secs)	
									[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	2		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO	POS TARG 0.2,2.0		410 Secs X 2 (820 Secs)	
								[==>(Copy 1)] [==>(Copy 2)]	[1]	



Proposal 14040 - Visit 06 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

Wed Jan 21 02:12:47 GMT 2015

Visit	Proposal 14040, Visit 06, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 02-MAR-2015 AND 08-MAR-2015									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
	(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB					EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO			410 Secs X 3 (1230 Secs)	
									[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	2		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO	POS TARG 0.2,2.0		410 Secs X 2 (820 Secs)	
								[==>(Copy 1)] [==>(Copy 2)]	[1]	



Proposal 14040 - Visit 11 - Unique Hubble Investigation of a Newly Discovered Main Belt Comet

Wed Jan 21 02:12:47 GMT 2015

Visit	Proposal 14040, Visit 11, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 31-AUG-2015:00:00:00 AND 27-SEP-2015:00:00:00									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
	(1)	2014S4-GIBBS	TYPE=COMET,Q=2.3914377754622 8,E=0.2422061817783991 .I=10.96626376761609,O=106.494093 0053456,W=253.5249908690453,T=2 8-AUG- 2014:12:11:14,TTimeScale=TDB,EQ UINOX=J2000,EPOCH=19-JUN- 2013:00:00:00,EpochTimeScale=TDB					EARTH		
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	1		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO			410 Secs X 3 (1230 Secs)	
									[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	2		(1) 2014S4-GIBBS	WFC3/UVIS, ACCUM, UVIS2	F350LP	CR-SPLIT=NO	POS TARG 0.2,2.0		410 Secs X 2 (820 Secs)	
								[==>(Copy 1)] [==>(Copy 2)]	[1]	

