



12529 - What Powers Nature's Most Luminous Supernovae?

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Prof. Alicia M. Soderberg (PI) (Contact)	Harvard University	asoderberg@cfa.harvard.edu
Dr. Laura Chomiuk (CoI)	Smithsonian Institution Astrophysical Observatory	lchomiuk@cfa.harvard.edu
Dr. Ryan Chornock (CoI)	Harvard University	rchornock@cfa.harvard.edu
Dr. Armin Rest (CoI)	Space Telescope Science Institute	arest@stsci.edu
Prof. Edo Berger (CoI)	Harvard University	eberger@cfa.harvard.edu
Dr. Ryan Foley (CoI)	Smithsonian Institution Astrophysical Observatory	rfoley@cfa.harvard.edu
Dr. Suvi Gezari (CoI)	The Johns Hopkins University	suvi@pha.jhu.edu
Dr. Mark E. Huber (CoI)	University of Hawaii	mhuber@ifa.hawaii.edu
Dr. Stephen J. Smartt (CoI) (ESA Member)	The Queen's University of Belfast	s.smartt@qub.ac.uk
Dr. Roger A. Chevalier (CoI)	The University of Virginia	rac5x@virginia.edu
Dr. Emily Levesque (CoI)	University of Colorado at Boulder	emily.levesque@colorado.edu
Prof. Robert P. Kirshner (CoI)	Harvard University	kirshner@cfa.harvard.edu
Prof. Christopher W. Stubbs (CoI)	Harvard University	stubbs@physics.harvard.edu
Mr. Ian Czekala (CoI)	Harvard University	iczekala@cfa.harvard.edu
Mr. Nathan Sanders (CoI)	Harvard University	nsanders@cfa.harvard.edu
Dr. Howie Marion (CoI)	Harvard University	gmarion@cfa.harvard.edu

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) SN1	ACS/WFC	1	11-Sep-2012 03:37:48.0	yes
02	(1) SN1	ACS/WFC	1	11-Sep-2012 03:37:52.0	yes

<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>
03	(1) SN1	ACS/WFC	1	11-Sep-2012 03:37:55.0	yes
04	(1) SN1	ACS/WFC	2	11-Sep-2012 03:37:58.0	yes
05	(2) PS1-11AIB	ACS/WFC	1	11-Sep-2012 03:38:04.0	yes
06	(2) PS1-11AIB	WFC3/IR	1	11-Sep-2012 03:38:13.0	yes
07	(2) PS1-11AIB	ACS/WFC	1	11-Sep-2012 03:38:19.0	yes
08	(2) PS1-11AIB	ACS/WFC	1	11-Sep-2012 03:38:25.0	yes
09	(2) PS1-11AIB	WFC3/IR	1	11-Sep-2012 03:38:32.0	yes

10 Total Orbits Used

ABSTRACT

Thanks to the recent advent of wide-field transient surveys, supernovae with extreme peak luminosities, $M < -22$ mag, are being revealed at alarming rates. The origin of these events is hotly debated and popular ideas range from pair instability supernovae to central engine driven explosions. The Pan-STARRS survey, now in full operation, provides an unprecedented opportunity to discovery and study this new class of ultra-luminous at typical redshifts of $z \sim 1$. Here we propose (non-disruptive) HST Target-of-Opportunity observations of nature's most luminous supernovae to crack the mystery of what powers these beasts.

OBSERVING DESCRIPTION

We will trigger on one ultra-luminous SNe discovered with Pan-STARRS at redshifts of $z > 0.5$ for HST imaging and possible one grism spectrum to search for H α .

REAL TIME JUSTIFICATION

We request a response time of several days to 2 weeks.

ADDITIONAL COMMENTS

This is a slow response ToO program.

Proposal 12529 - Visit 01 - What Powers Nature's Most Luminous Supernovae?

Tue Sep 11 07:38:40 GMT 2012

Visit	<p>Proposal 12529, Visit 01, withdrawn</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: ACS/WFC</p> <p>Special Requirements: ON HOLD</p> <p><i>Comments: This is visit 1 of 4 for the single target</i></p> <p><i>On Hold Comments: This is a ToO trigger on hold for discovery of the target supernova</i></p>																													
	<p>(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN</p> <p>(Visit 01) Warning (Orbit Planner): ACS EXPOSURE TIME ADJUSTED</p>																													
Diagnosics																														
Generic Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Criteria</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>SN1</td> <td>Pan-STARRS discovered, ultra-luminous SN at $z > 0.5$</td> <td>SUPERNOVA</td> </tr> </tbody> </table>										#	Name	Criteria	Description	(1)	SN1	Pan-STARRS discovered, ultra-luminous SN at $z > 0.5$	SUPERNOVA												
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1		(1) SN1	ACS/WFC, ACCUM, WFC	F775W				4000 Secs [=>4000 Secs]	[1]																					
Orbit Structure	<p>Orbit 1</p> <p style="text-align: right;">Server Version: 20120802</p> <p style="text-align: center;">*** VISIBILITY OVERRUN = 924</p> <p>The diagram shows a horizontal timeline from 0 to 5500 seconds. Key events are marked with arrows: 'GS Acq' at 0s, 'Exp. 1' (a green box) starting at approximately 300s, and 'Occultation' at approximately 3200s. A blue checkered bar represents the exposure period, which is interrupted by a red bar during the occultation. A black bar is shown at the end of the orbit around 4200s.</p>																													

Proposal 12529 - Visit 02 - What Powers Nature's Most Luminous Supernovae?

Tue Sep 11 07:38:42 GMT 2012

Visit	Proposal 12529, Visit 02, withdrawn Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: ON HOLD <i>Comments: This is visit 2 of 4 for the single target</i> <i>On Hold Comments: This is a ToO trigger on hold for discovery of the target supernova</i>																													
	(Visit 02) Warning (Orbit Planner): ACS EXPOSURE TIME ADJUSTED (Visit 02) Warning (Orbit Planner): VISIBILITY OVERRUN																													
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	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit																				
1		(1) SN1	ACS/WFC, ACCUM, WFC	F775W				4000 Secs [=>4000 Secs]	[1]																					
Orbit Structure	<p>Orbit 1 Server Version: 20120802</p> <p>*** VISIBILITY OVERRUN = 924</p> <p>The diagram shows a horizontal timeline from 0 to 5500 seconds. Key events are marked with arrows: 'GS Acq' at 0s, 'Exp. 1' (a green box with a camera icon) starting at approximately 300s, and 'Occultation' starting at approximately 3200s. A red bar below the timeline indicates the 'visibility overrun' period from approximately 3200s to 4100s. A blue checkered bar represents the exposure period from approximately 300s to 4100s. A black bar is shown from approximately 4100s to 4500s.</p>																													

Proposal 12529 - Visit 03 - What Powers Nature's Most Luminous Supernovae?

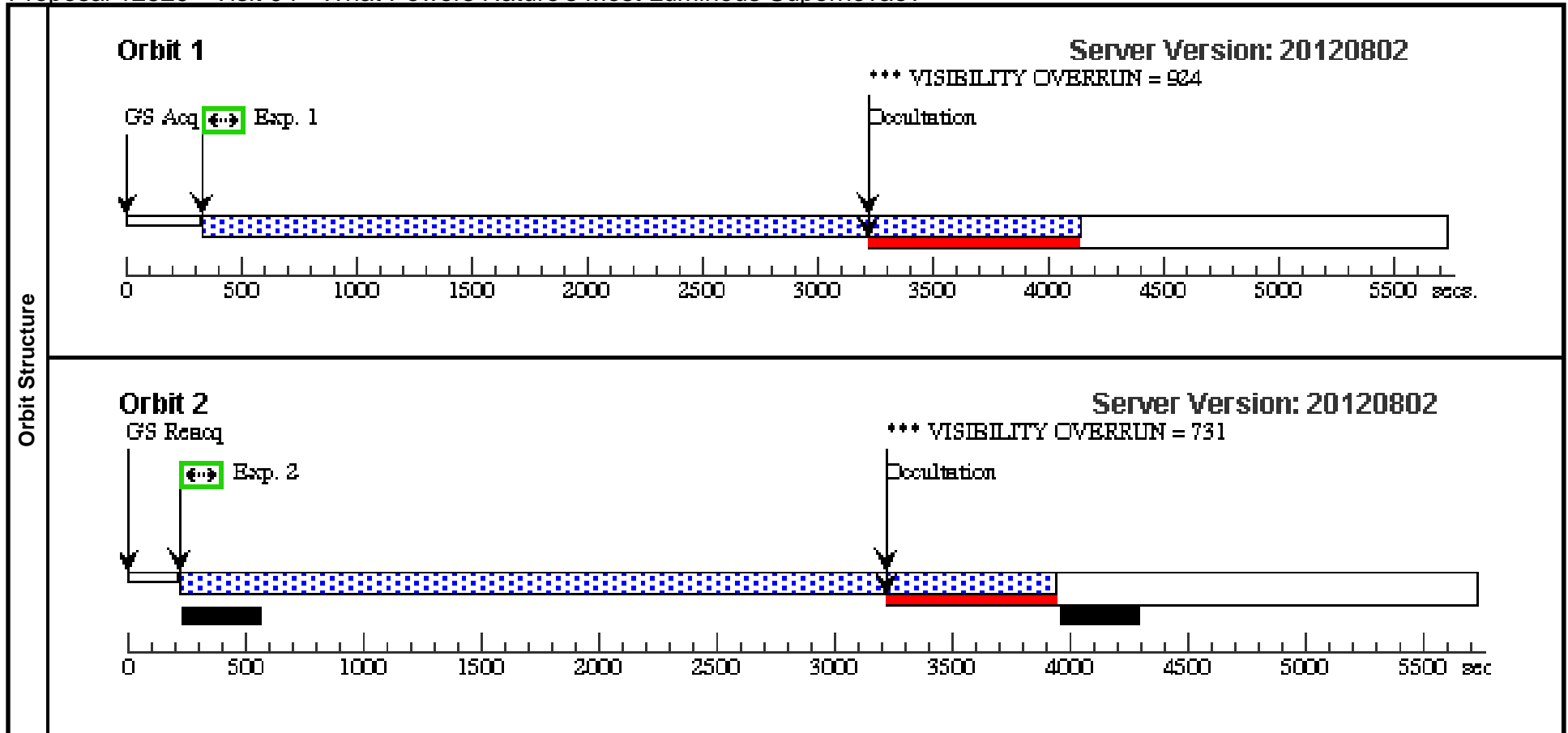
Tue Sep 11 07:38:42 GMT 2012

Visit	Proposal 12529, Visit 03, withdrawn Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: ON HOLD <i>Comments: This is visit 3 of 4 for the single target</i> <i>On Hold Comments: This is a ToO trigger on hold for discovery of the target supernova</i>																													
	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 03) Warning (Orbit Planner): ACS EXPOSURE TIME ADJUSTED																													
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1		(1) SN1	ACS/WFC, ACCUM, WFC	F775W				4000 Secs [=>4000 Secs]	[1]																					
Orbit Structure	<p>Orbit 1 Server Version: 20120802</p> <p>GS Acq [] Exp. 1</p> <p>Occultation *** VISIBILITY OVERRUN = 924</p> <p>0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 sec</p>																													

Proposal 12529 - Visit 04 - What Powers Nature's Most Luminous Supernovae?

Tue Sep 11 07:38:43 GMT 2012

Visit	Proposal 12529, Visit 04, withdrawn Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: ON HOLD <i>Comments: This is visit 4 of 4 for the single target</i> <i>On Hold Comments: This is a ToO trigger on hold for discovery of the target supernova</i>																																																										
	Diagnosics (Visit 04) Warning (Orbit Planner): ACS EXPOSURE TIME ADJUSTED (Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 04) Warning (Orbit Planner): ACS EXPOSURE TIME ADJUSTED (Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN																																																										
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit																																																		
1		(1) SN1	ACS/WFC, ACCUM, WFC	F775W				4000 Secs																																																			
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2		(1) SN1	ACS/WFC, ACCUM, WFC	F775W				4000 Secs																																																			
								[==>]	[2]																																																		
Exposures																																																											



Proposal 12529 - Visit 05 - What Powers Nature's Most Luminous Supernovae?

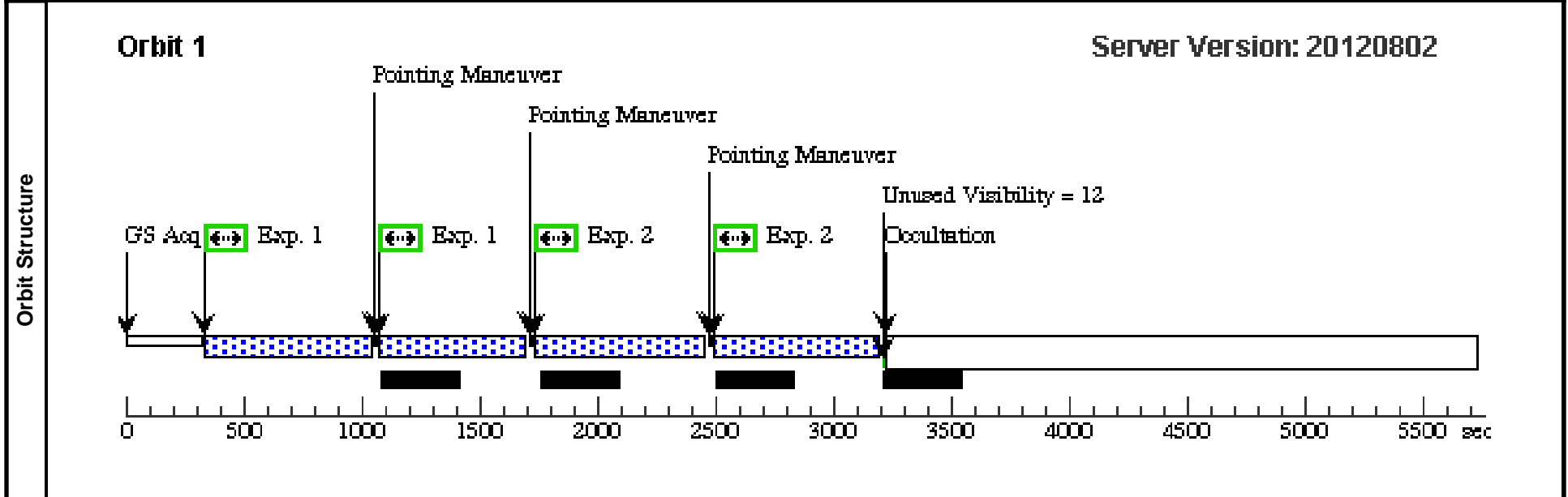
Tue Sep 11 07:38:47 GMT 2012

Visit	Proposal 12529, Visit 05, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: BEFORE 30-SEP-2012:00:00:00 Comments: This is epoch 1 for PSI-11aib with ACS (1 orbit; griz)		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	PS1-11AIB	RA: 22 18 12.2170 (334.5509042d) Dec: +01 33 32.01 (1.55889d) Equinox: J2000	Epoch of Position: 2000 Redshift: 1.0	V=22	Reference Frame: PanStarrs

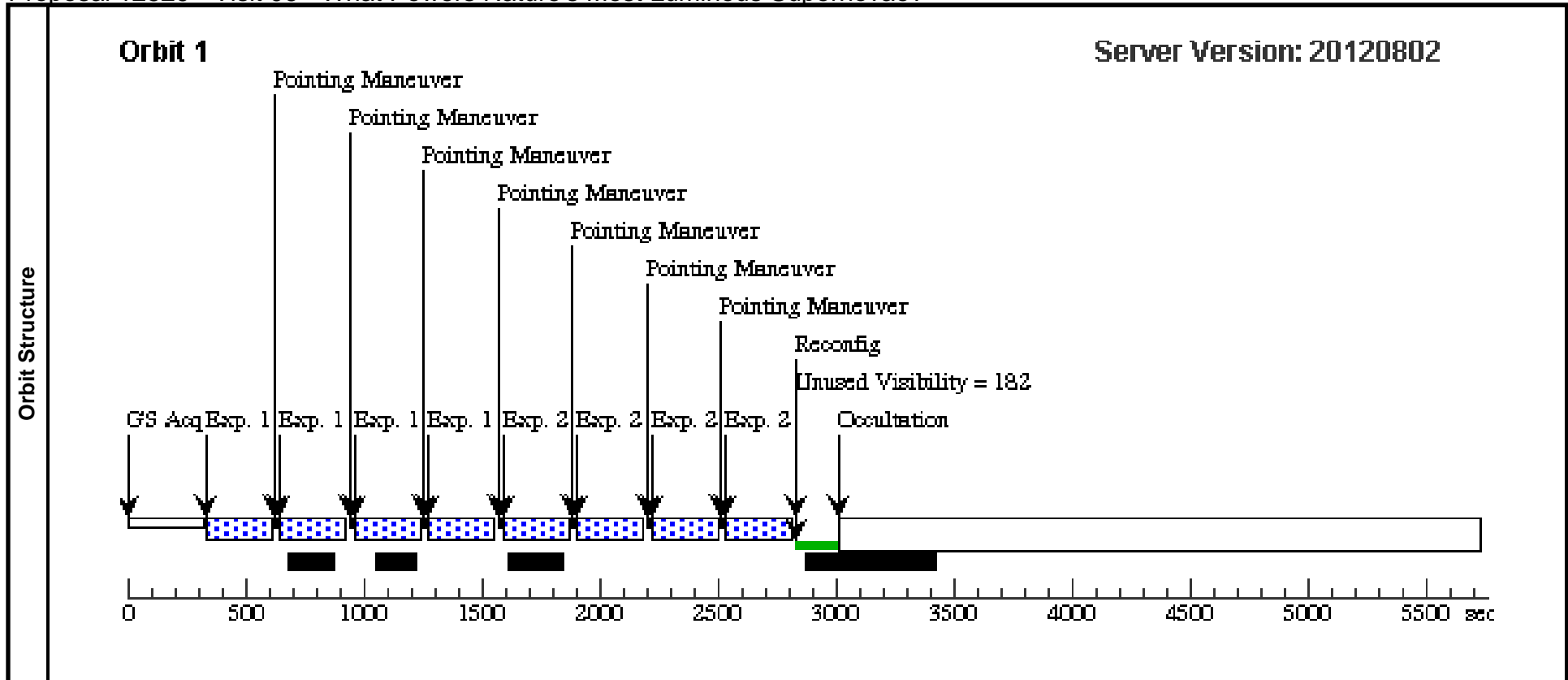
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(2) PS1-11AIB	ACS/WFC, ACCUM, WFC1-CTE	F625W			GS ACQ SCENARIO BASE1B3	Pattern 1, Exps 1-1 in Visit 05 (1)	500 Secs [=>(Pattern 1)] [=>(Pattern 2)]
2		(2) PS1-11AIB	ACS/WFC, ACCUM, WFC1-CTE	F775W				Pattern 1, Exps 2-2 in Visit 05 (1)	580 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]



Proposal 12529 - Visit 06 - What Powers Nature's Most Luminous Supernovae?

Tue Sep 11 07:38:48 GMT 2012

Visit	Proposal 12529, Visit 06, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100%; BEFORE 30-SEP-2012:00:00:00 Comments: This is epoch 1 for PS1-11aib with WFC3 (1 orbit; JH)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	PS1-11AIB	RA: 22 18 12.2170 (334.5509042d) Dec: +01 33 32.01 (1.55889d) Equinox: J2000	Epoch of Position: 2000 Redshift: 1.0	V=22	Reference Frame: PanStarrs				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(2) PS1-11AIB	WFC3/IR, MULTIACCUM, IR	F110W	SAMP-SEQ=SPARS 50; NSAMP=6			Pattern 2, Exps 1-1 in Visit 06 (2)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2		(2) PS1-11AIB	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 50; NSAMP=6			Pattern 2, Exps 2-2 in Visit 06 (2)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]



Proposal 12529 - Visit 07 - What Powers Nature's Most Luminous Supernovae?

Tue Sep 11 07:38:49 GMT 2012

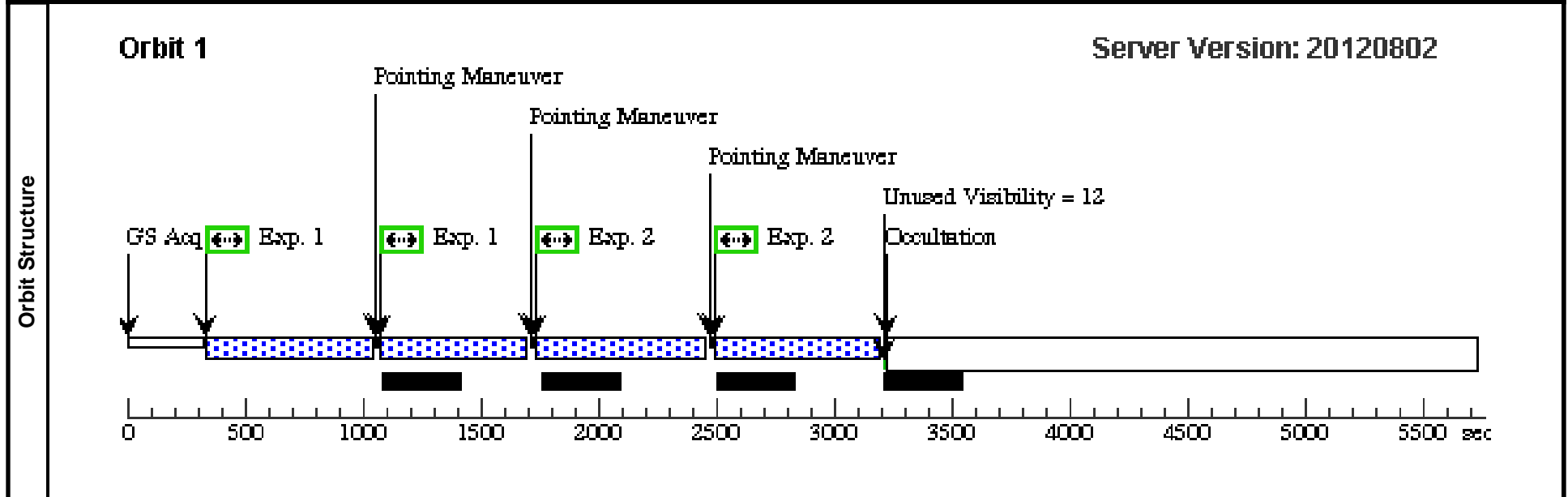
Visit	Proposal 12529, Visit 07, implementation		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: ACS/WFC		
	Special Requirements: AFTER 05 BY 100 D TO 150 D		

Comments: This is epoch 2 for PS1-11aib with ACS (1 orbit; griz)

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	PS1-11AIB	RA: 22 18 12.2170 (334.5509042d) Dec: +01 33 32.01 (1.55889d) Equinox: J2000	Epoch of Position: 2000 Redshift: 1.0	V=22	Reference Frame: PanStarrs

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1		(2) PS1-11AIB	ACS/WFC, ACCUM, WFC1-CTE	F625W			GS ACQ SCENARIO BASE1B3	Pattern 1, Exps 1-1 in Visit 07 (1)	500 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	2		(2) PS1-11AIB	ACS/WFC, ACCUM, WFC1-CTE	F775W				Pattern 1, Exps 2-2 in Visit 07 (1)	580 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]



Proposal 12529 - Visit 08 - What Powers Nature's Most Luminous Supernovae?

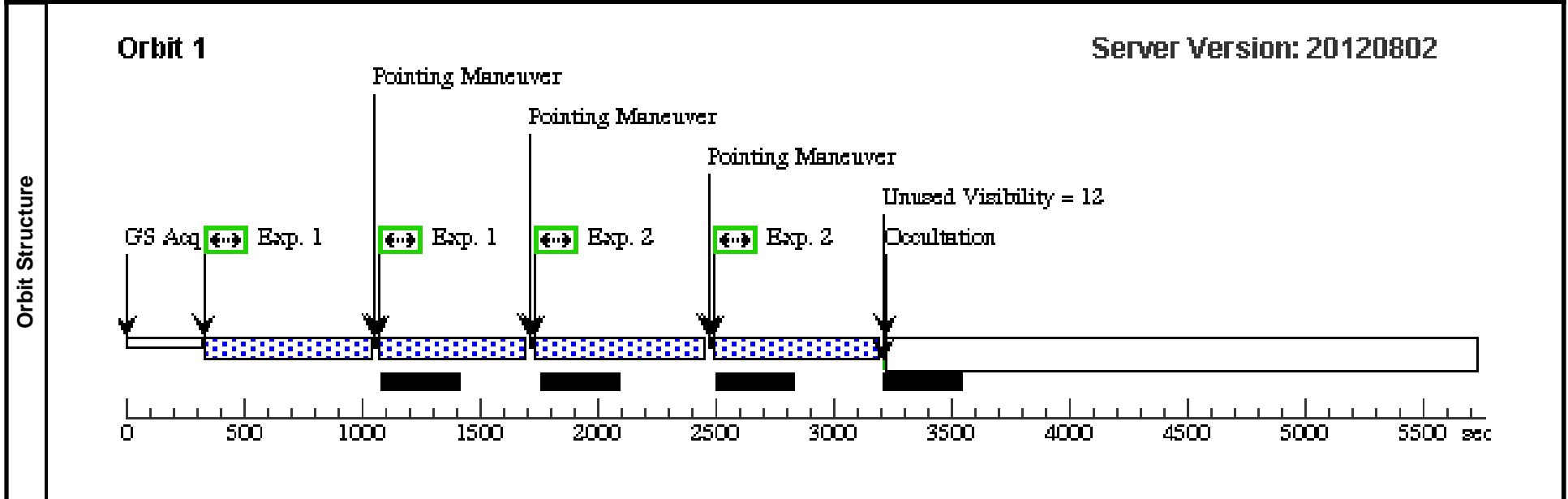
Tue Sep 11 07:38:50 GMT 2012

Visit	Proposal 12529, Visit 08, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: AFTER 05 BY 200 D TO 365 D Comments: This is epoch 2 for PS1-11aib with ACS (1 orbit; griz)		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false	(1), (2)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	PS1-11AIB	RA: 22 18 12.2170 (334.5509042d) Dec: +01 33 32.01 (1.55889d) Equinox: J2000	Epoch of Position: 2000 Redshift: 1.0	V=22	Reference Frame: PanStarrs

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(2) PS1-11AIB	ACS/WFC, ACCUM, WFC1-CTE	F625W		GS ACQ SCENARI O BASE1B3	Pattern 1, Exps 1-1 i n Visit 08 (1)	500 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	2		(2) PS1-11AIB	ACS/WFC, ACCUM, WFC1-CTE	F775W			Pattern 1, Exps 2-2 i n Visit 08 (1)	580 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]



Proposal 12529 - Visit 09 - What Powers Nature's Most Luminous Supernovae?

Tue Sep 11 07:38:50 GMT 2012

Visit	Proposal 12529, Visit 09, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100%; AFTER 05 BY 200 D TO 365 D <i>Comments: This is epoch 3 for PS1-11aib with WFC3 (1 orbit; JH)</i>									
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures
(2)		Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365		Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false					(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous		
	(2)	PS1-11AIB	RA: 22 18 12.2170 (334.5509042d) Dec: +01 33 32.01 (1.55889d) Equinox: J2000		Epoch of Position: 2000 Redshift: 1.0		V=22	Reference Frame: PanStarrs		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(2) PS1-11AIB	(2) PS1-11AIB	WFC3/IR, MULTIACCUM, IR	F110W	SAMP-SEQ=SPARS 50; NSAMP=6	GS ACQ SCENARI O BASE1B3	Pattern 2, Exps 1-1 i n Visit 09 (2)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]
	2	(2) PS1-11AIB	(2) PS1-11AIB	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 50; NSAMP=6		Pattern 2, Exps 2-2 i n Visit 09 (2)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]

