



13176 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Cycle: 20, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Prof. Daniel Apai (PI) (Contact)	University of Arizona	apai@as.arizona.edu
Dr. Esther Buenzli (CoI)	University of Arizona	ebuenzli@email.arizona.edu
Davin C Flateau (CoI)	University of Arizona	dflateau@email.arizona.edu
Prof. Stanimir A. Metchev (CoI)	Stony Brook University	stanimir.metchev@stonybrook.edu
Dr. Mark S. Marley (CoI)	NASA Ames Research Center	mmarley@mail.arc.nasa.gov
Dr. Jacqueline Radigan (CoI)	Space Telescope Science Institute	radigan@stsci.edu
Dr. Patrick J. Lowrance (CoI)	California Institute of Technology	lowrance@ipac.caltech.edu
Dr. Adam Showman (CoI)	University of Arizona	showman@lpl.arizona.edu
Mr. Etienne Artigau (CoI)	Universite de Montreal	artigau@astro.umontreal.ca
Dr. Aren Heinze (CoI)	State University of New York at Stony Brook	aheinze@kirk.astro.sunysb.edu
Prof. Adam J. Burgasser (CoI)	University of California - San Diego	aburgasser@ucsd.edu
Dr. Subhanjoy Mohanty (CoI) (ESA Member)	Imperial College of Science	s.mohanty@imperial.ac.uk

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) SIMP0136	WFC3/IR	3	22-Jul-2013 21:06:24.0	yes
02	(1) SIMP0136	WFC3/IR	3	22-Jul-2013 21:07:30.0	yes
03	(2) 2M2228	WFC3/IR	4	22-Jul-2013 21:08:18.0	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>
04	(2) 2M2228	WFC3/IR	4	22-Jul-2013 21:08:58.0	yes
05	(5) 2M1821	WFC3/IR	3	22-Jul-2013 21:09:56.0	yes
06	(5) 2M1821	WFC3/IR	3	22-Jul-2013 21:10:58.0	yes
07	(6) 2M1507	WFC3/IR	4	22-Jul-2013 21:17:10.0	yes
08	(6) 2M1507	WFC3/IR	4	22-Jul-2013 21:23:36.0	yes

28 Total Orbits Used

ABSTRACT

Condensate clouds pose the most significant challenge to the understanding of ultracool atmospheres of brown dwarfs and giant exoplanets. In three ongoing Spitzer programs we have taken advantage of Spitzer's ability to obtain high-cadence uninterrupted observations to pioneer a new technique, rotational phase mapping, and successfully explored the properties of cloud covers in ~50 brown dwarfs. Among other exciting results we found that most brown dwarfs possess heterogeneous cloud cover, often with complex surface structures. Perhaps the most perplexing behavior seen in our surveys is light curve evolution on timescales as short as 5 hours and as long as a year. This unexpected behavior offers a unique opportunity to explore the dynamics of cloud layers, but requires multi-epoch data sets. We propose here to follow up a representative set of varying brown dwarfs via multi-epoch Spitzer and HST phase mapping to carry out the first quantitative exploration of cloud cover evolution. The proposed study will establish the first time-resolved multi-wavelength light curve library for brown dwarfs. Spitzer uniquely offers precise 3-5 micron photometry and continuous coverage that allow us to detect cloud structures a fraction of the size of the Great Red Spot on Jupiter in our targets. Combined with HST grism spectroscopy during a subset of the Spitzer observations, the Spitzer phase maps will allow us to disentangle the effects of cloud formation, differential rotation, large-scale rainout and dispersal of clouds. As different wavelengths probe different pressures and different rotational phases probe different latitudes we will be able to explore the two or even three-dimensional structure of the atmospheres. We will also constrain the dynamical and radiative timescales for brown dwarfs and compare these to theoretical predictions to identify the underlying atmospheric dynamics. This program will leave a unique legacy that will propel studies of ultracool atmosphere studies into a new era.

OBSERVING DESCRIPTION

This proposal will obtain time-resolved WFC3 grism spectra of brown dwarfs.

ADDITIONAL COMMENTS

Each target will be observed in two visits, with 3 or 4 orbits per visit depending on the target's rotational period. Because the observations aim to cover entire rotation periods of the sources it is critical that the observations in a given visit are scheduled back-to-back.

All targets are also observed with Spitzer in eight separate visits, and the HST scheduling must be coordinated in such a way that the HST visits take place during the longer Spitzer visits. For each target there are 8 long Spitzer visits and two shorter HST visits and the HST visits can take place during any two of the Spitzer visits.

Please, coordinate with the PI and the SSC regarding the optimal windows.

Our team has prepared a detailed analysis of the Spitzer windows and possible scheduling opportunities to help the HST-Spitzer coordination.

Thank you,

Daniel Apai

Proposal 13176 - Visit 01 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	Proposal 13176, Visit 01, implementation Tue Jul 23 01:23:59 GMT 2013 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100% <i>Comments: SIMP0136 visit 1, Direct Image F132N, G141 spectra</i>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(1)		SIMP0136	RA: 01 36 57.4300 (24.2392917d) Dec: +09 33 47.30 (9.56314d) Equinox: J2000	Proper Motion RA: 1.241 arcsec/yr Proper Motion Dec: -0.004 arcsec/yr Epoch of Position: 2010.4	V=(?) J=13.45	Reference Frame: ICRS

Proposal 13176 - Visit 01 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DirectImage F132N	(1) SIMP0136	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[1]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
2	SIMP0136 (Long Exp - G141)	(1) SIMP0136	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6			112.00801 Secs X 19 (2128.152 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[1]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
3	DirectImage F132N	(1) SIMP0136	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[2]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									

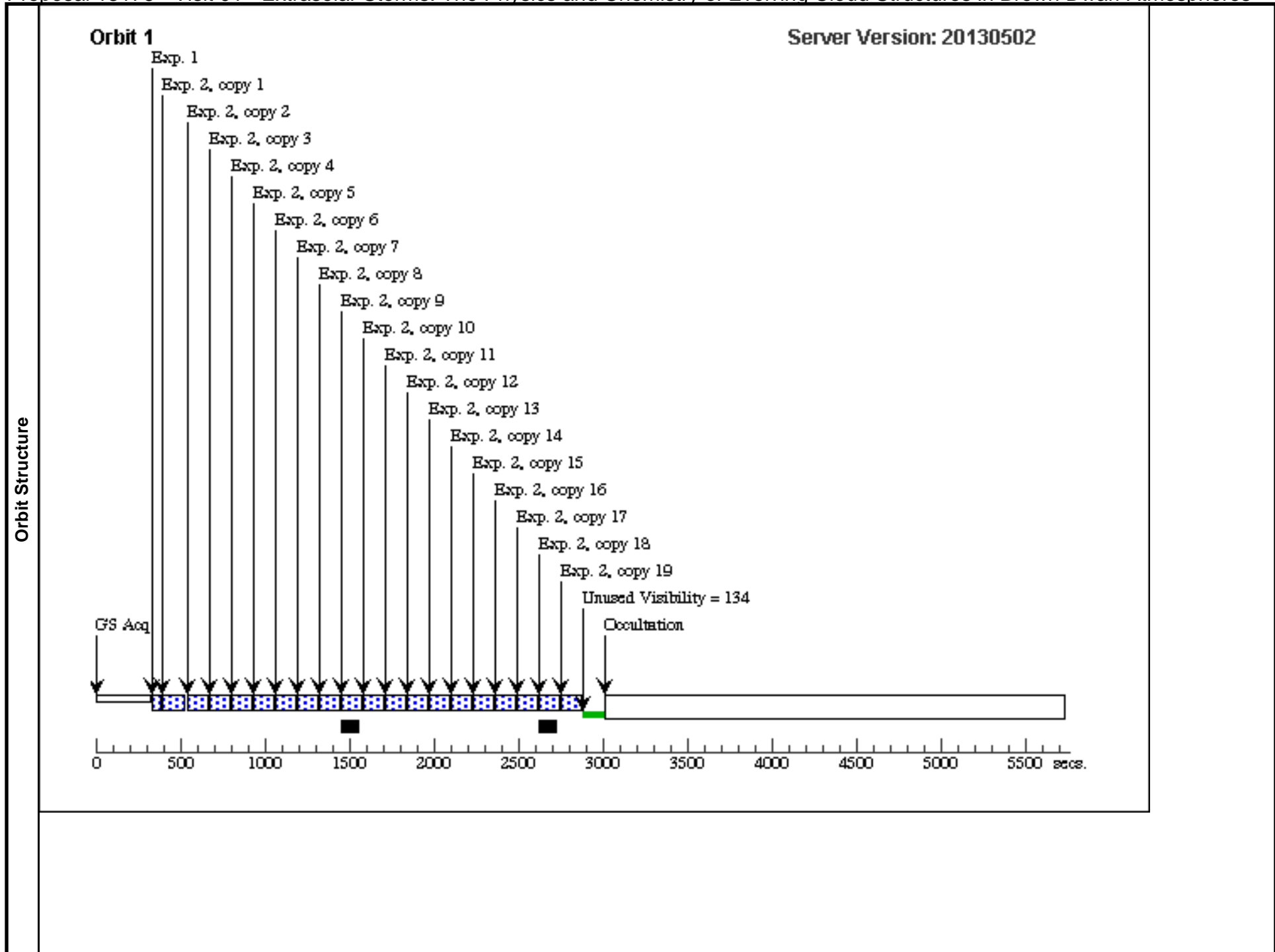
Exposures

Proposal 13176 - Visit 01 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

4	SIMP0136 (1) SIMP0136 Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Secs)	[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[2]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>							
5	DirectImage (1) SIMP0136 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10	22.317276 Secs (22.317 Secs)	[==>]	[3]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>							

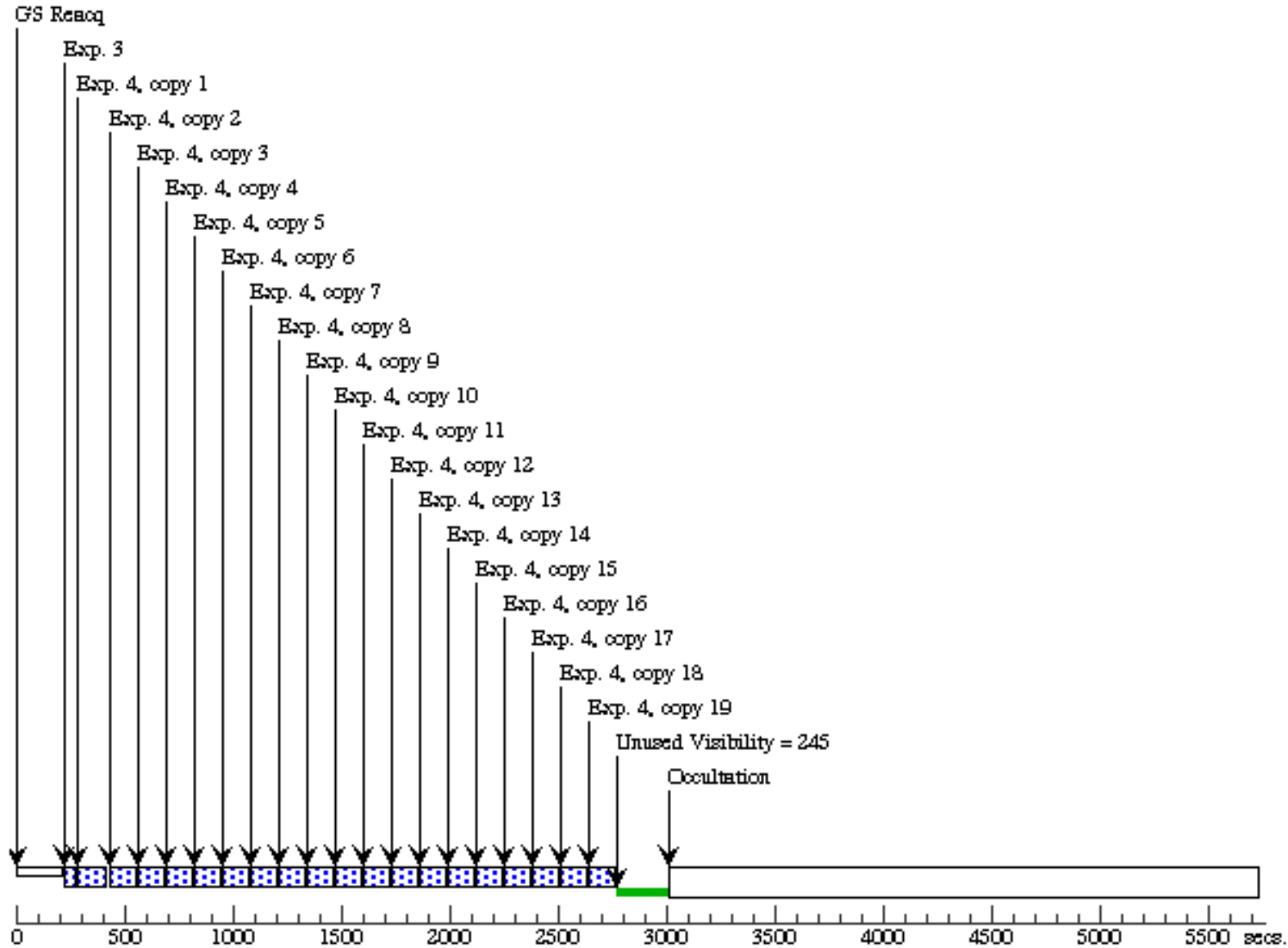
Proposal 13176 - Visit 01 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

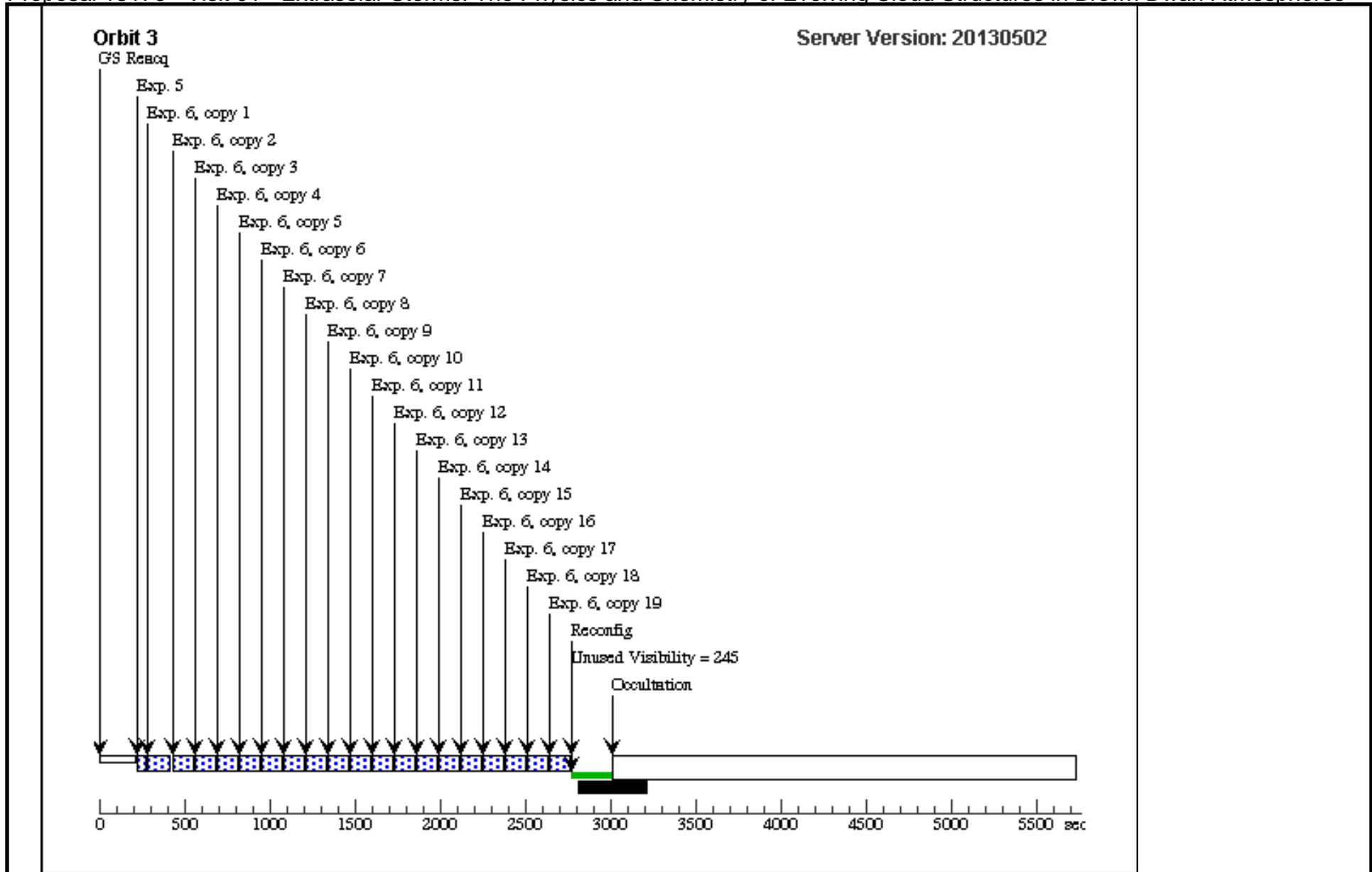
6	SIMP0136 (1) SIMP0136 Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Sec s)	[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[3]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>							



Orbit 2

Server Version: 20130502





Proposal 13176 - Visit 02 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	Proposal 13176, Visit 02, implementation Tue Jul 23 01:24:04 GMT 2013 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100% <i>Comments: SIMP0136 visit 2, Direct Image F132N, G141 spectra</i>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	SIMP0136	RA: 01 36 57.4300 (24.2392917d) Dec: +09 33 47.30 (9.56314d) Equinox: J2000	Proper Motion RA: 1.241 arcsec/yr Proper Motion Dec: -0.004 arcsec/yr Epoch of Position: 2010.4	V=(?) J=13.45	Reference Frame: ICRS

Proposal 13176 - Visit 02 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DirectImage F132N	(1) SIMP0136	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[1]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
2	SIMP0136 (Long Exp - G141)	(1) SIMP0136	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6			112.00801 Secs X 19 (2128.152 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[1]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
3	DirectImage F132N	(1) SIMP0136	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[2]
<i>Comments: Direct Image in F132N to help wavelength calibration. Using the same POS TARG as for the G141 observations</i>									

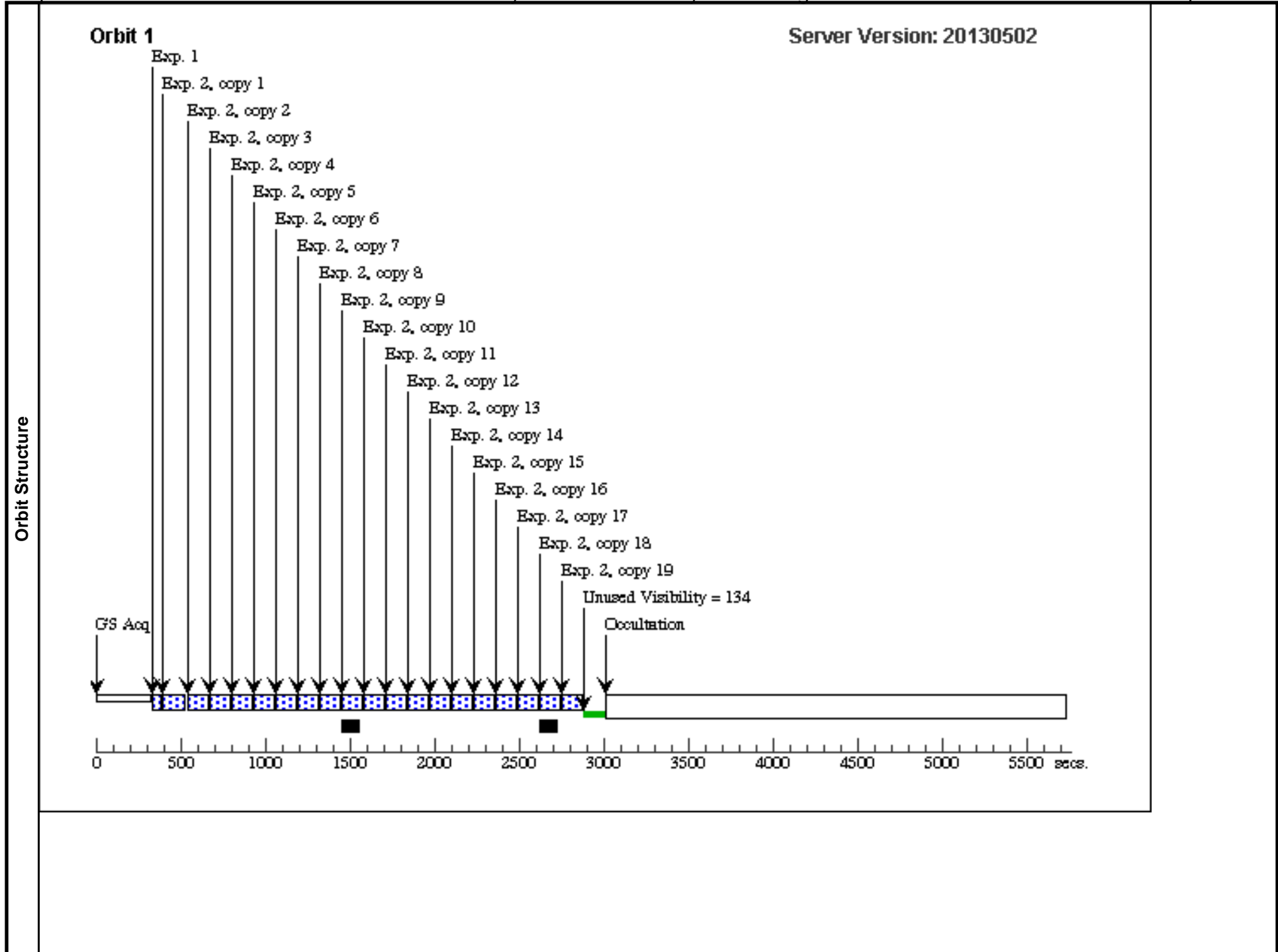
Exposures

Proposal 13176 - Visit 02 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

4	SIMP0136 (1) SIMP0136 Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Secs)	[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[2]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>							
5	DirectImage (1) SIMP0136 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10	22.317276 Secs (22.317 Secs)	[==>]	[3]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>							

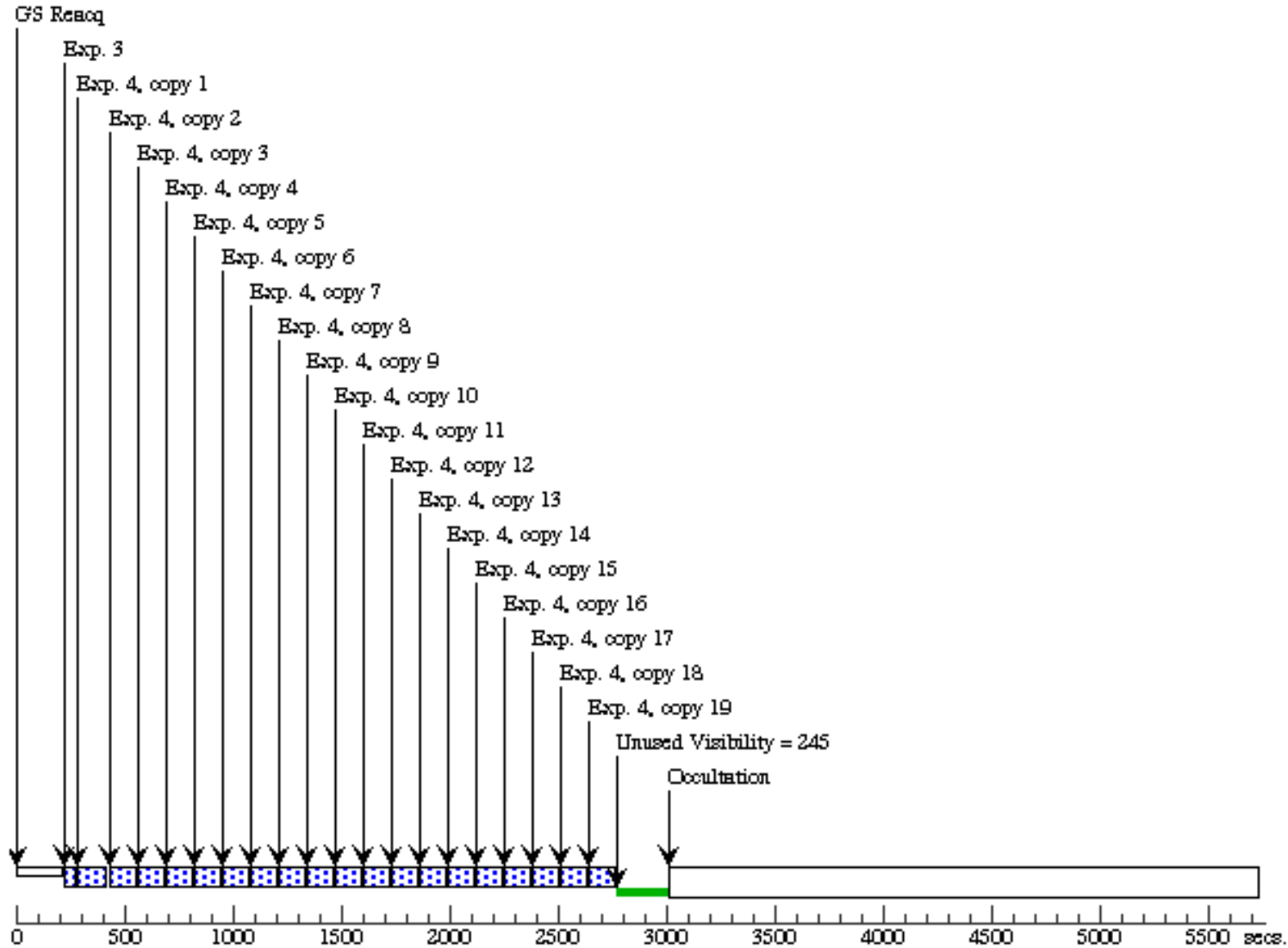
Proposal 13176 - Visit 02 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

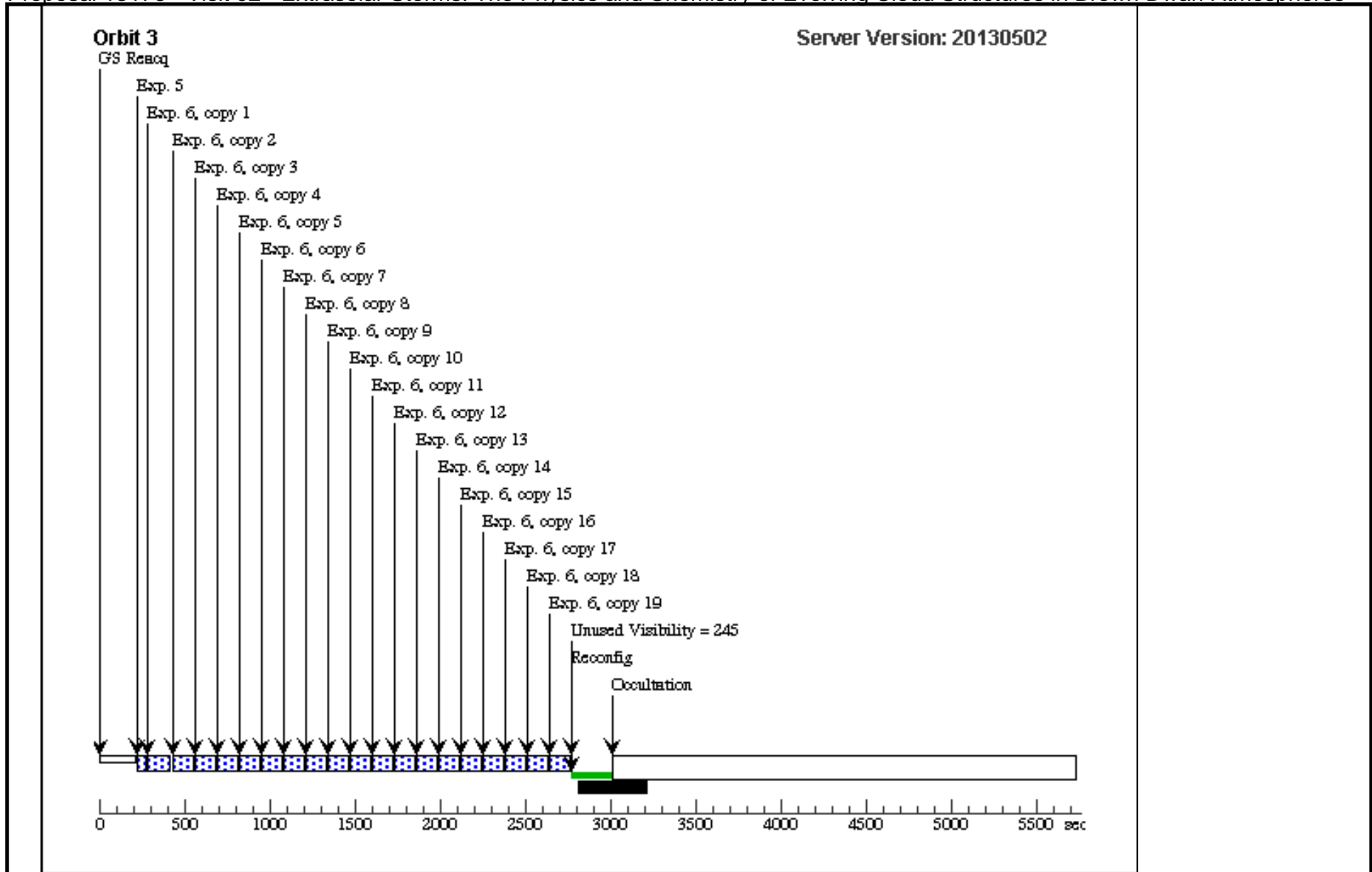
6	SIMP0136 (1) SIMP0136 Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Sec s) [=>(Copy 1)] [=>(Copy 2)] [=>(Copy 3)] [=>(Copy 4)] [=>(Copy 5)] [=>(Copy 6)] [=>(Copy 7)] [=>(Copy 8)] [=>(Copy 9)] [=>(Copy 10)] [=>(Copy 11)] [=>(Copy 12)] [=>(Copy 13)] [=>(Copy 14)] [=>(Copy 15)] [=>(Copy 16)] [=>(Copy 17)] [=>(Copy 18)] [=>(Copy 19)]	[3]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						



Orbit 2

Server Version: 20130502





Proposal 13176 - Visit 03 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	Proposal 13176, Visit 03, completed Tue Jul 23 01:24:06 GMT 2013 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100% <i>Comments: 2M2228 visit 1, Direct Image F132N, G141 spectra</i>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(2)		2M2228	RA: 22 28 29.0100 (337.1208750d) Dec: -43 10 29.50 (-43.17486d) Equinox: J2000	Proper Motion RA: 0.1023 arcsec/yr Proper Motion Dec: -0.3244 arcsec/yr Epoch of Position: 2010.5	V=(?) J=15.6	Reference Frame: ICRS
<i>Comments: Sp Type=T6.5 Proper Motion: 0.31"/yr (175degree) Burgasser et al. 2003 Current Position from WISE</i>						

Proposal 13176 - Visit 03 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	DirectImage F132N	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10	GS ACQ SCENARI O SINGLE	22.317276 Secs (22.317 Secs) [==>]	[1]	
	<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
	2	2M2228 (Long Exp - G141)	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11		223.738205 Secs X 10 (2237.382 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)]	[1]	
	<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
	3	DirectImage F132N	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10		22.317276 Secs (22.317 Secs) [==>]	[2]	
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>										
4	2M2228 (Long Exp - G141)	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11		223.738205 Secs X 10 (2237.382 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)]	[2]		
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>										
5	DirectImage F132N	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10		22.317276 Secs (22.317 Secs) [==>]	[3]		
<i>Comments: Direct Image in F132N to help wavelength calibration. Using the same POS TARG as for the G141 observations</i>										

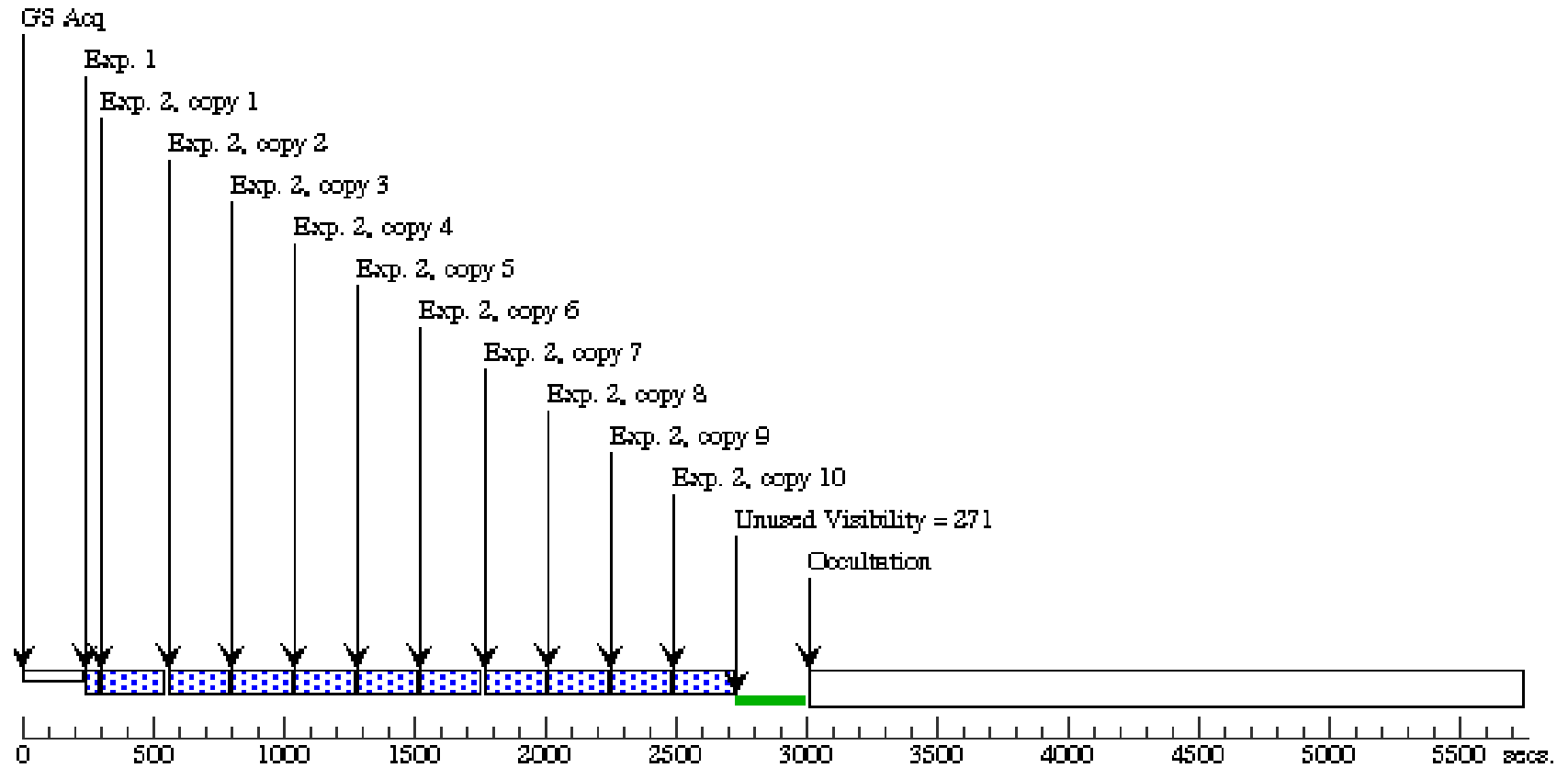
Proposal 13176 - Visit 03 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

6	2M2228 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11	223.738205 Secs X 10 (2237.382 Secs)	[3]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						
7	DirectImage F132N (2)	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	[4]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>						
8	2M2228 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11	223.738205 Secs X 10 (2237.382 Secs)	[4]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						

Server Version: 20130502

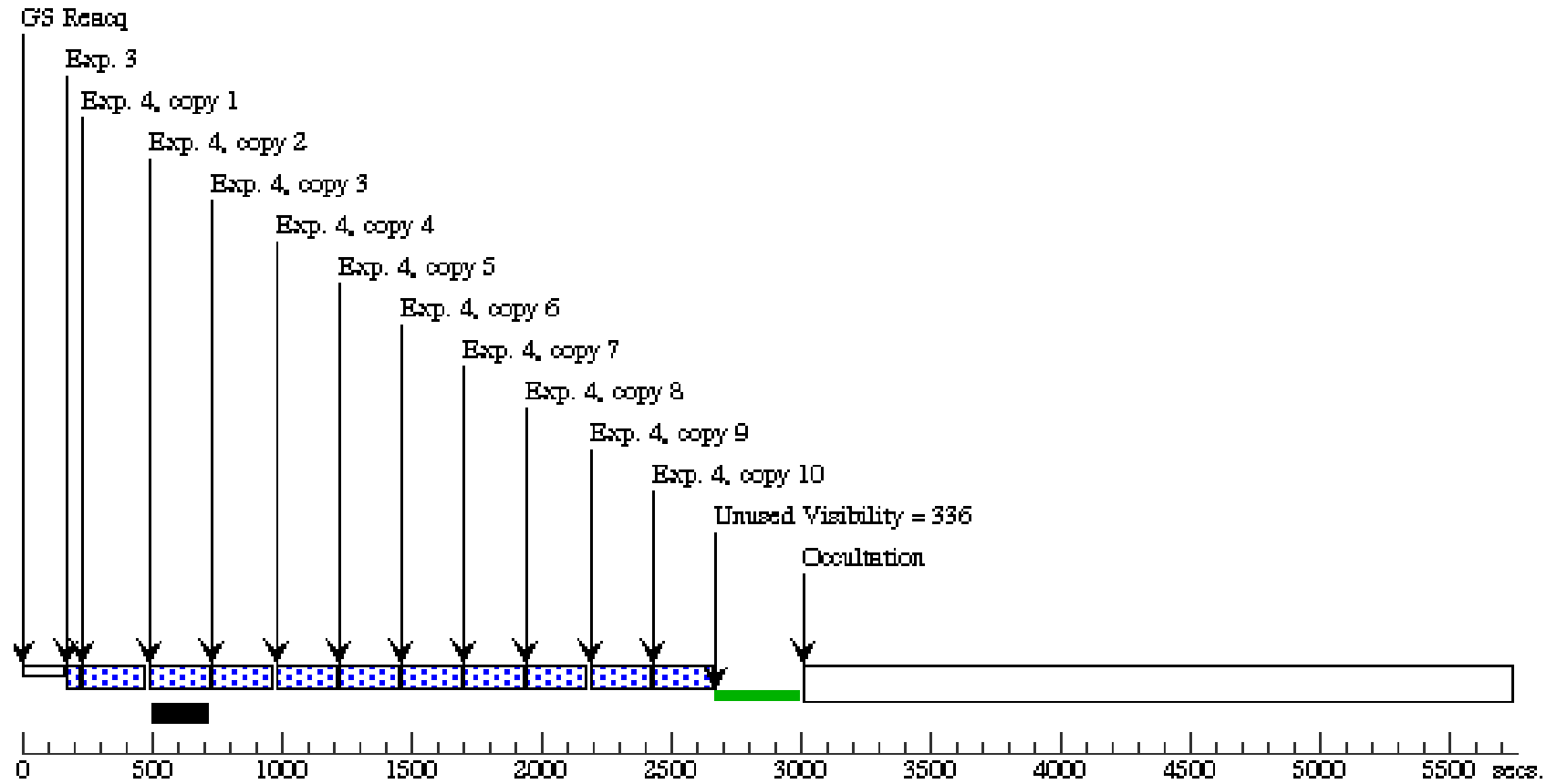
Orbit Structure

Orbit 1



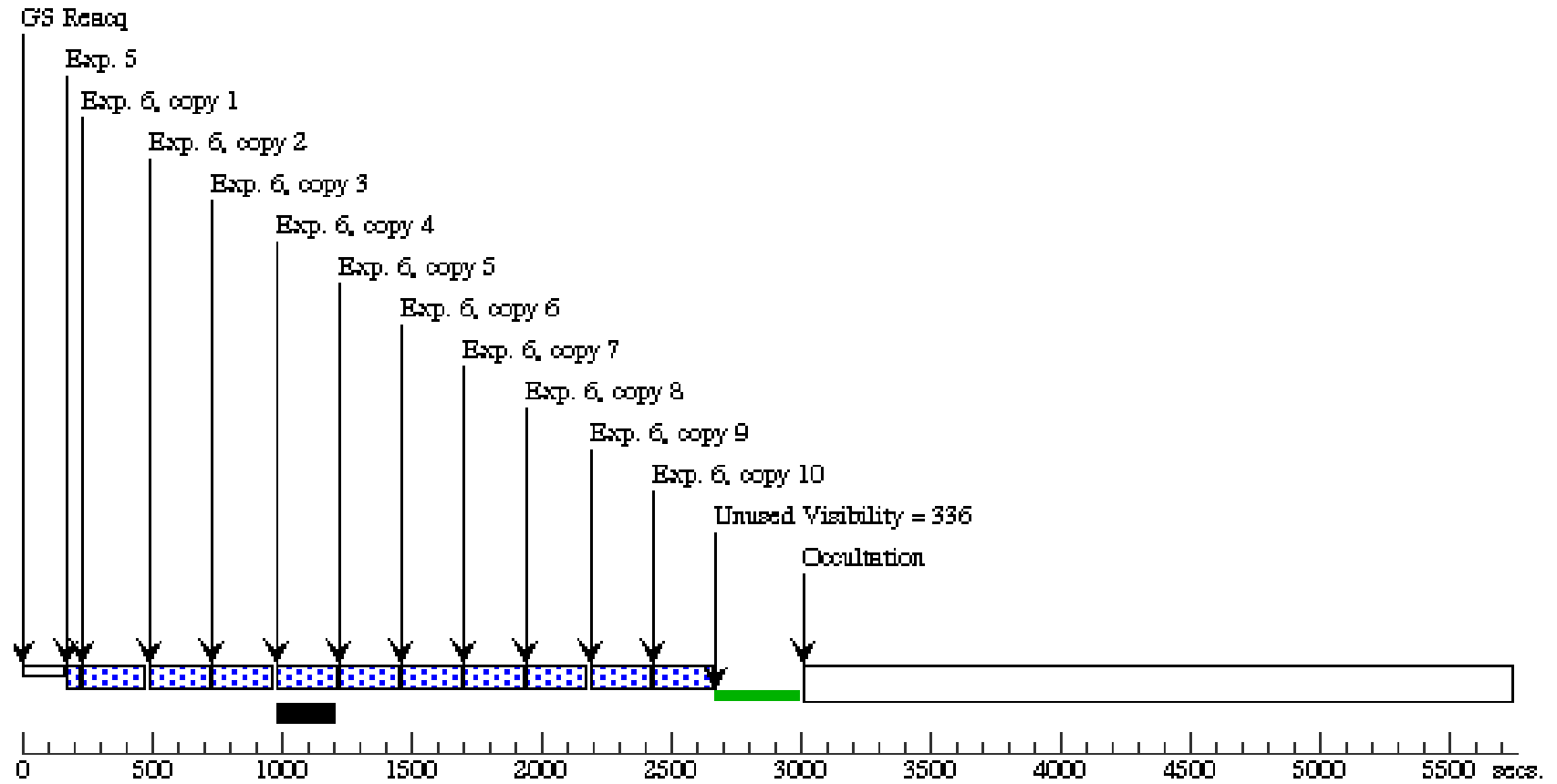
Orbit 2

Server Version: 20130502



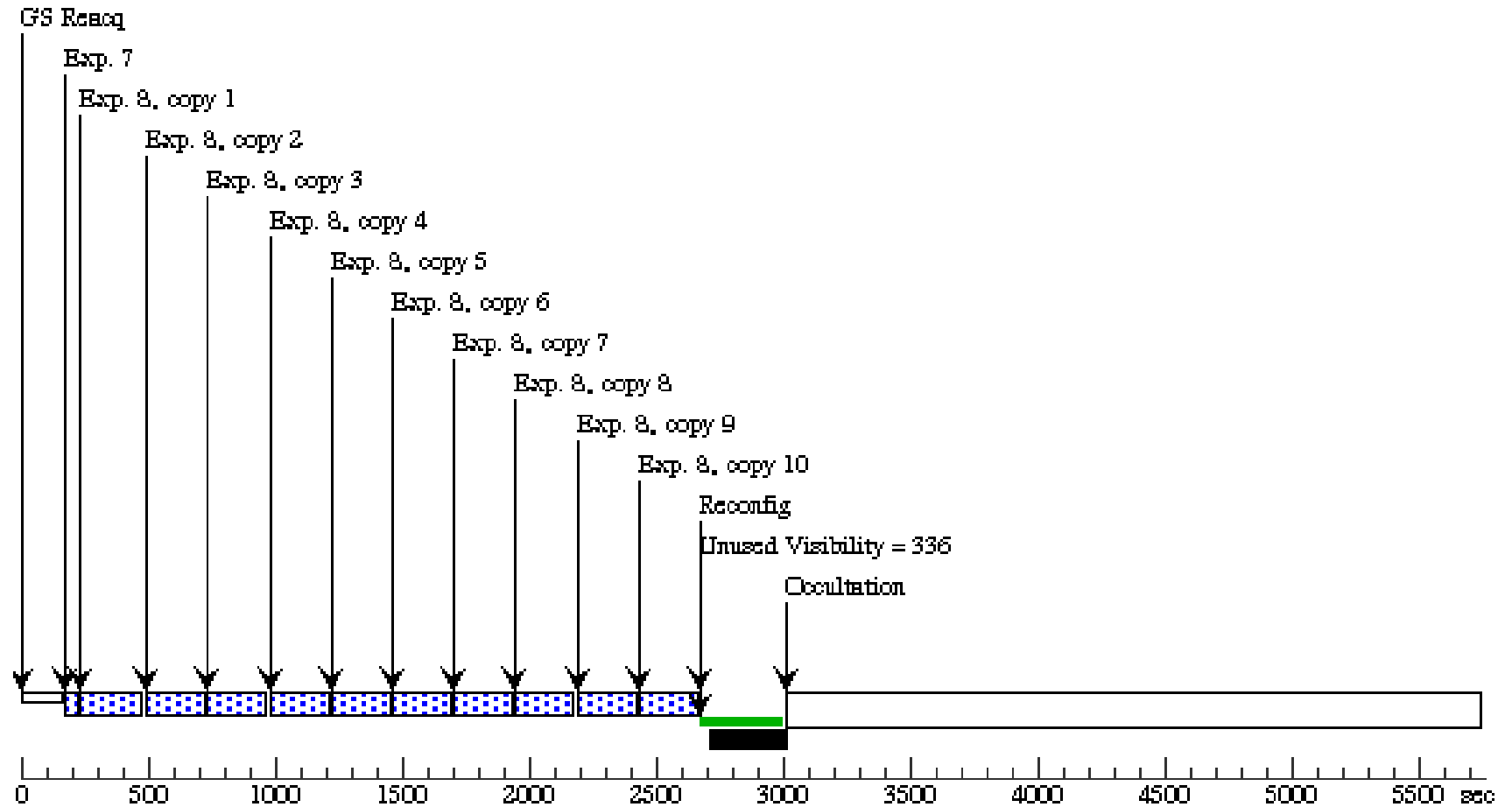
Orbit 3

Server Version: 20130502



Orbit 4

Server Version: 20130502



Proposal 13176 - Visit 04 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Tue Jul 23 01:24:08 GMT 2013

Visit	<p>Proposal 13176, Visit 04, scheduled</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: SCHED 100%</p> <p><i>Comments: 2M2228 visit 2, Direct Image F132N, G141 spectra</i></p>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(2)		2M2228	RA: 22 28 29.0100 (337.1208750d) Dec: -43 10 29.50 (-43.17486d) Equinox: J2000	Proper Motion RA: 0.1023 arcsec/yr Proper Motion Dec: -0.3244 arcsec/yr Epoch of Position: 2010.5	V=(?) J=15.6	Reference Frame: ICRS
<p><i>Comments: Sp Type=T6.5</i></p> <p><i>Proper Motion: 0.31"/yr (175degree) Burgasser et al. 2003</i></p> <p><i>Current Position from WISE</i></p>						

Proposal 13176 - Visit 04 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	DirectImage F132N	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10	GS ACQ SCENARI O SINGLE	22.317276 Secs (22.317 Secs) [==>]	[1]	
	<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
	2	2M2228 (Long Exp - G141)	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11		223.738205 Secs X 10 (2237.382 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)]	[1]	
	<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
	3	DirectImage F132N	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10		22.317276 Secs (22.317 Secs) [==>]	[2]	
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>										
4	2M2228 (Long Exp - G141)	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11		223.738205 Secs X 10 (2237.382 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)]	[2]		
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>										
5	DirectImage F132N	(2) 2M2228	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10		22.317276 Secs (22.317 Secs) [==>]	[3]		
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>										

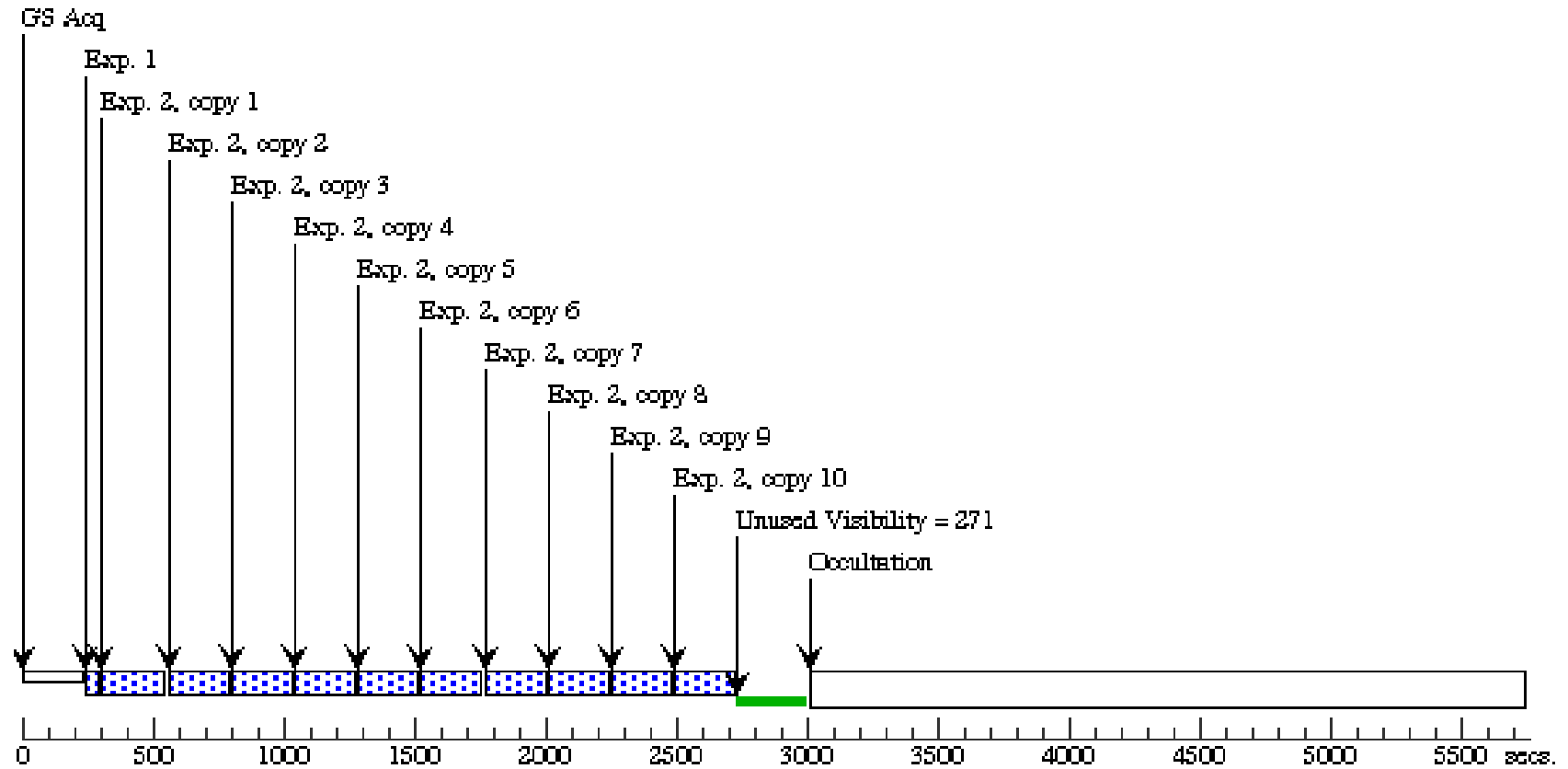
Proposal 13176 - Visit 04 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

6	2M2228 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11	223.738205 Secs X 10 (2237.382 Secs)	[3]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						
7	DirectImage F132N (2)	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	[4]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>						
8	2M2228 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=11	223.738205 Secs X 10 (2237.382 Secs)	[4]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						

Server Version: 20130502

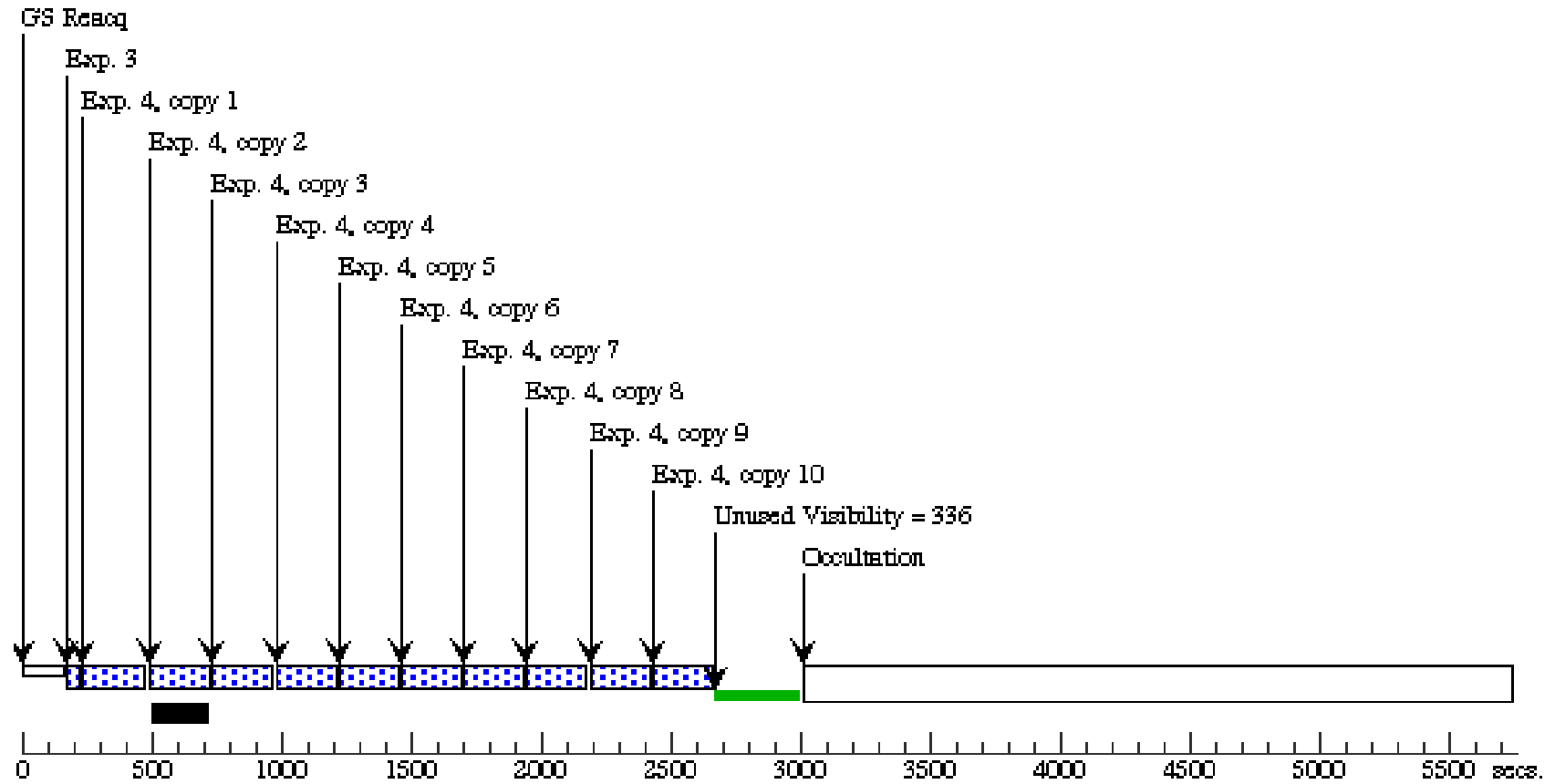
Orbit Structure

Orbit 1



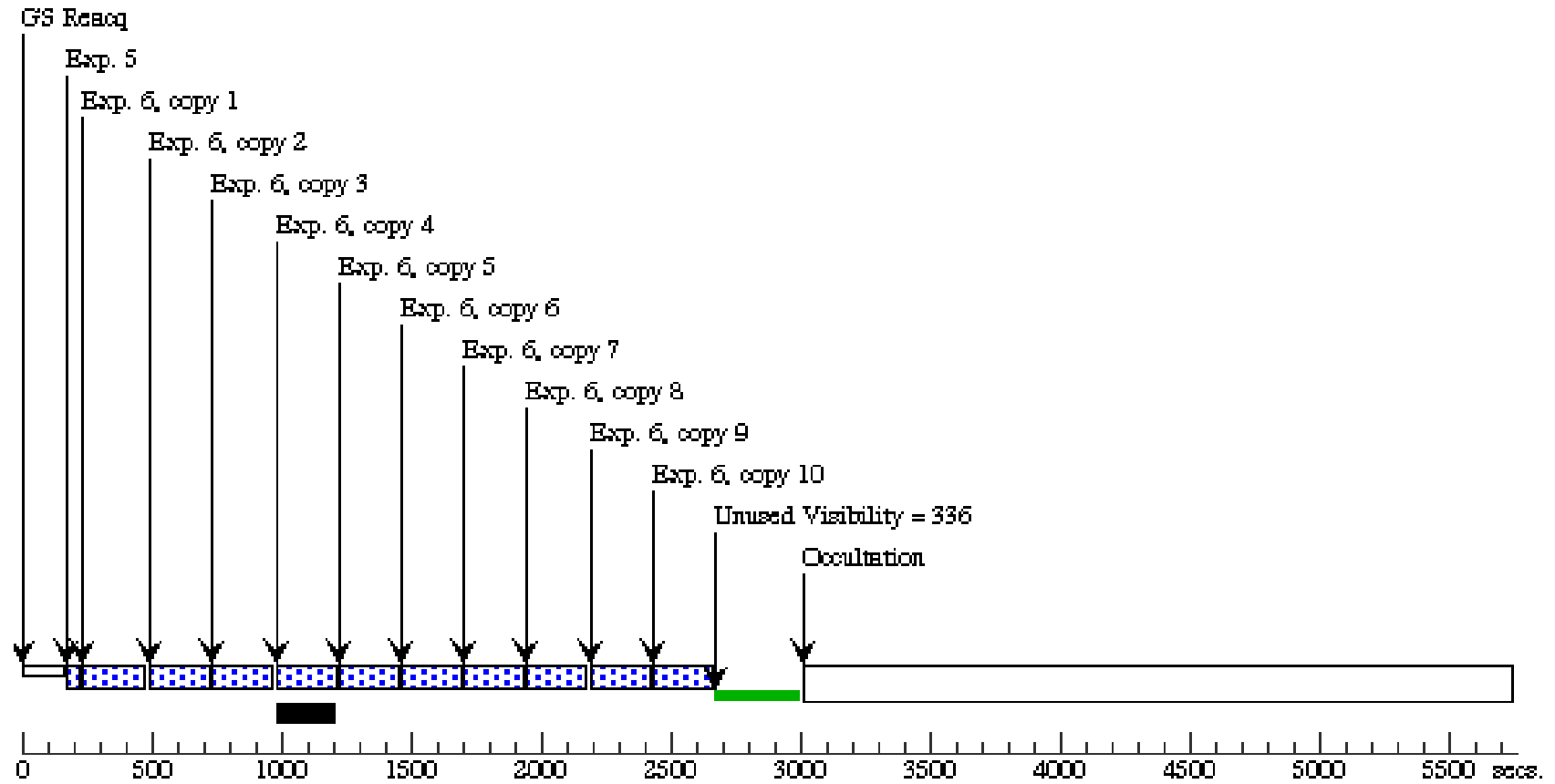
Orbit 2

Server Version: 20130502



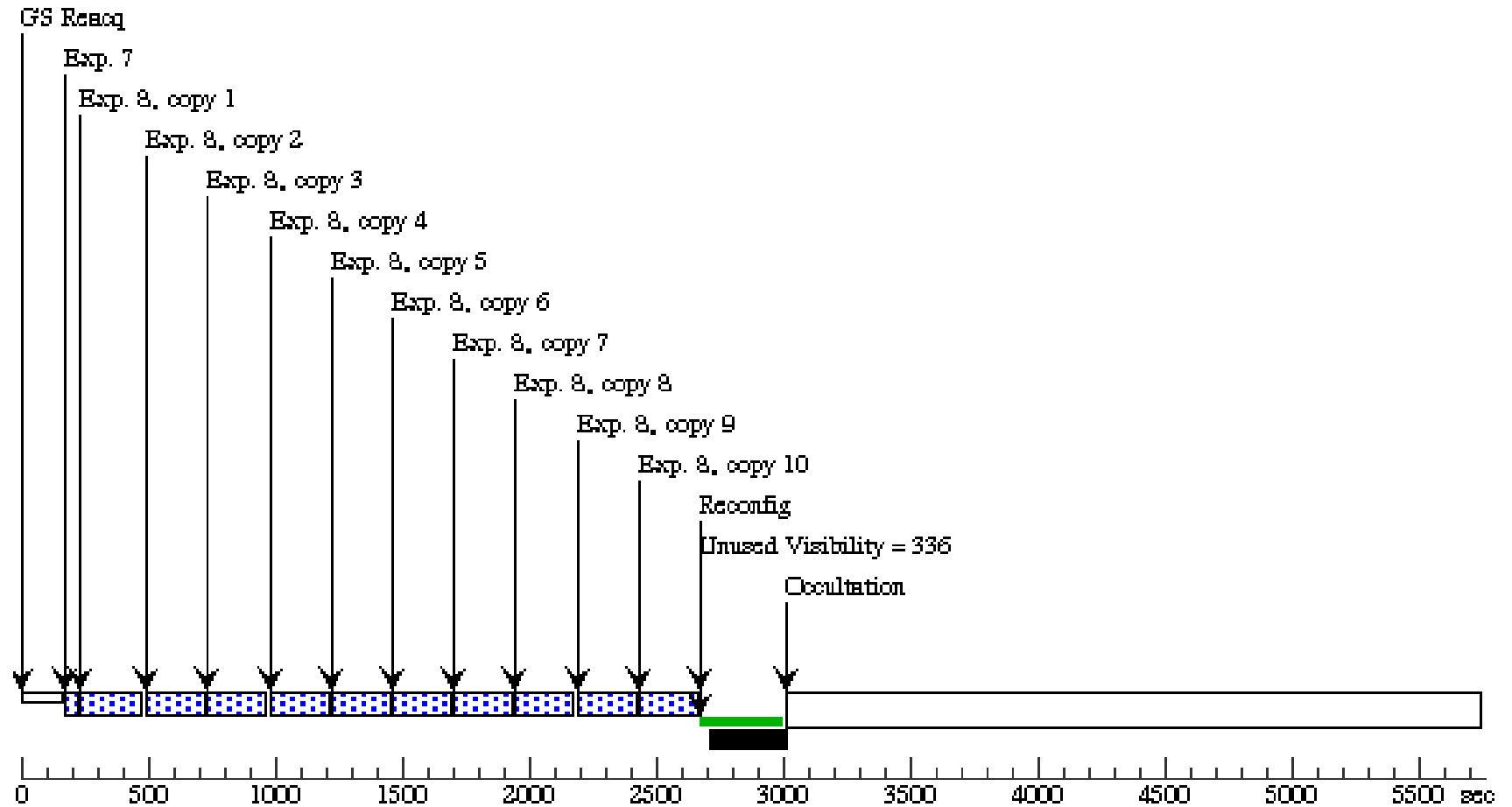
Orbit 3

Server Version: 20130502



Orbit 4

Server Version: 20130502



Proposal 13176 - Visit 05 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	<p>Proposal 13176, Visit 05, completed Tue Jul 23 01:24:10 GMT 2013</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: SCHED 100%; ORIENT 18.7D TO 22.7 D; ORIENT 30.7D TO 190.7 D; ORIENT 198.7D TO 202.7 D; ORIENT 210.7D TO 10.7 D</p> <p><i>Comments: M1821 visit 1, Direct Image F132N, G141 spectra</i></p>												
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(5)</td> <td>2M1821</td> <td>RA: 18 21 28.3300 (275.3680417d) Dec: +14 13 58.44 (14.23290d) Equinox: J2000</td> <td>Proper Motion RA: 0.235 arcsec/yr Proper Motion Dec: -0.229 arcsec/yr Epoch of Position: 2010.3</td> <td>V=(?) J=13.43 H=12.39 K=11.65</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table> <p><i>Comments: Proper motion from Kirkpatrick et al. 2010, ApJS 190 100 Current position from WISE</i></p>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(5)	2M1821	RA: 18 21 28.3300 (275.3680417d) Dec: +14 13 58.44 (14.23290d) Equinox: J2000	Proper Motion RA: 0.235 arcsec/yr Proper Motion Dec: -0.229 arcsec/yr Epoch of Position: 2010.3	V=(?) J=13.43 H=12.39 K=11.65
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous								
(5)	2M1821	RA: 18 21 28.3300 (275.3680417d) Dec: +14 13 58.44 (14.23290d) Equinox: J2000	Proper Motion RA: 0.235 arcsec/yr Proper Motion Dec: -0.229 arcsec/yr Epoch of Position: 2010.3	V=(?) J=13.43 H=12.39 K=11.65	Reference Frame: ICRS								

Proposal 13176 - Visit 05 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DirectImage F132N	(5) 2M1821	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[1]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
2	2M1821 (Lo ng Exp - G1 41)	(5) 2M1821	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6			112.00801 Secs X 19 (2128.152 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[1]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
3	DirectImage F132N	(5) 2M1821	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[2]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									

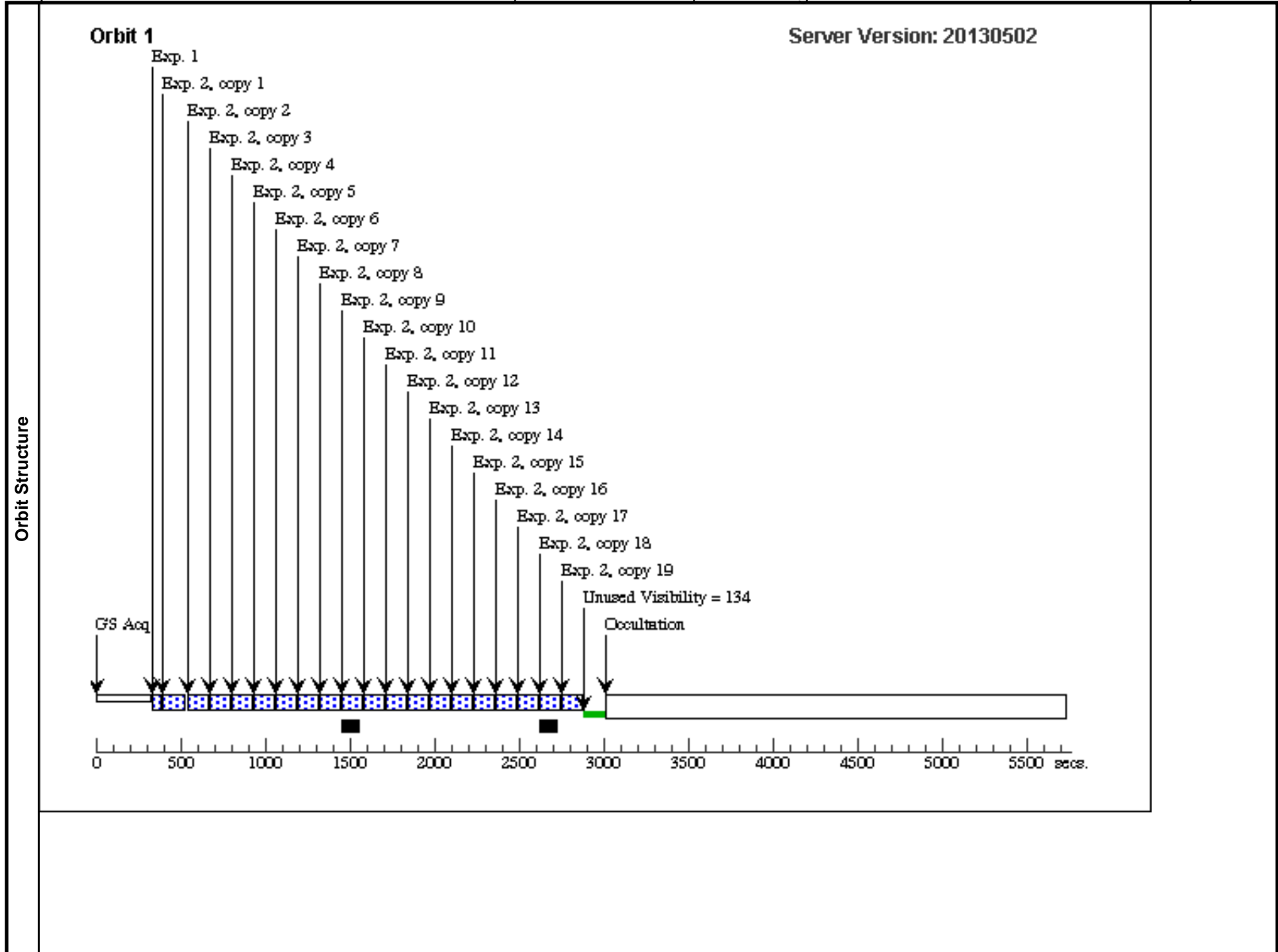
Exposures

Proposal 13176 - Visit 05 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

4	2M1821 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Secs)	
<p><i>Comments: Must be coordinated with Spitzer IRAC observations</i></p>					<p>[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]</p>	[2]
5	DirectImage (5) 2M1821 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	
<p><i>Comments: Direct Image in F132N to help wavelength calibration.</i></p>					[==>]	[3]

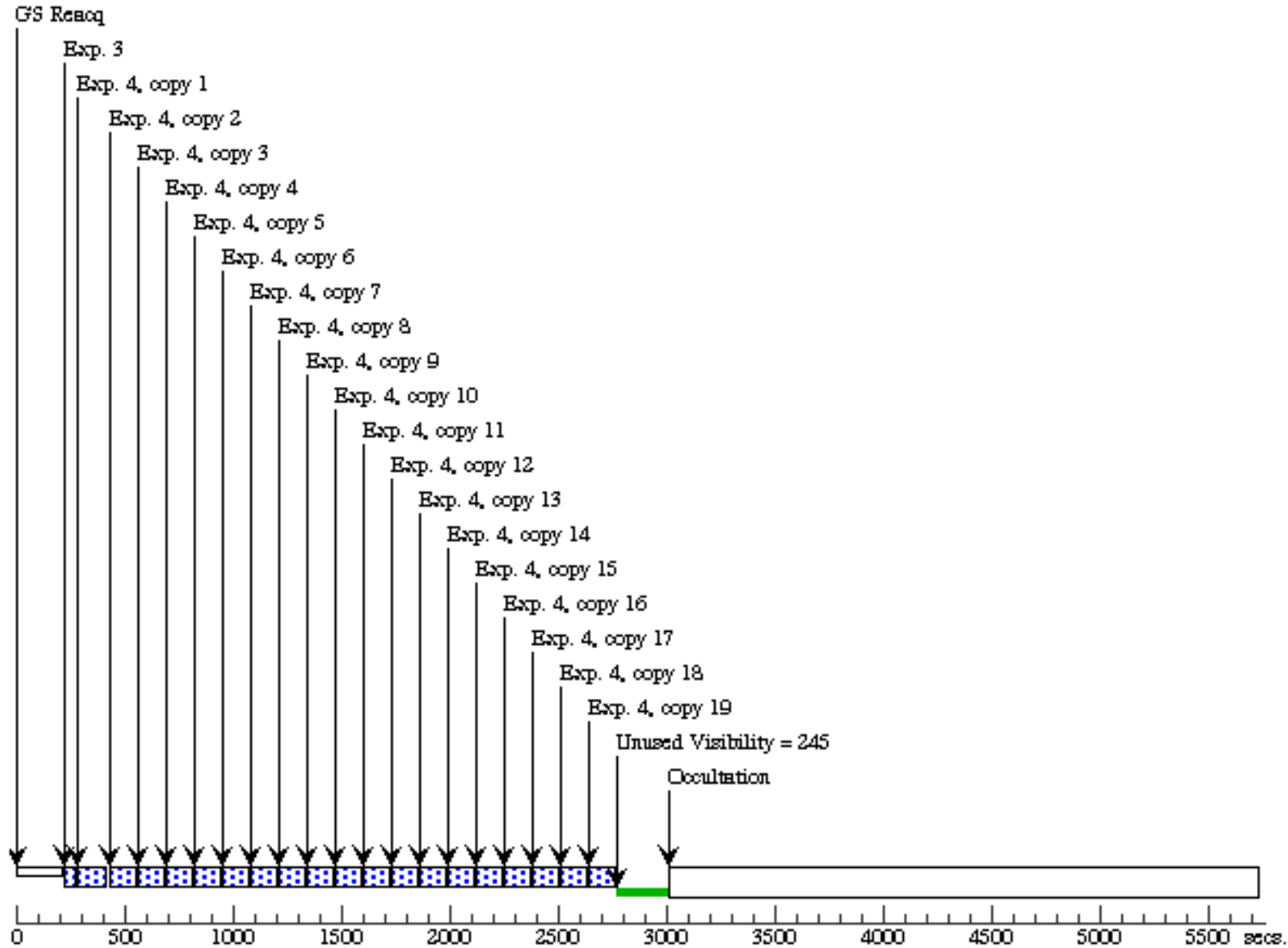
Proposal 13176 - Visit 05 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

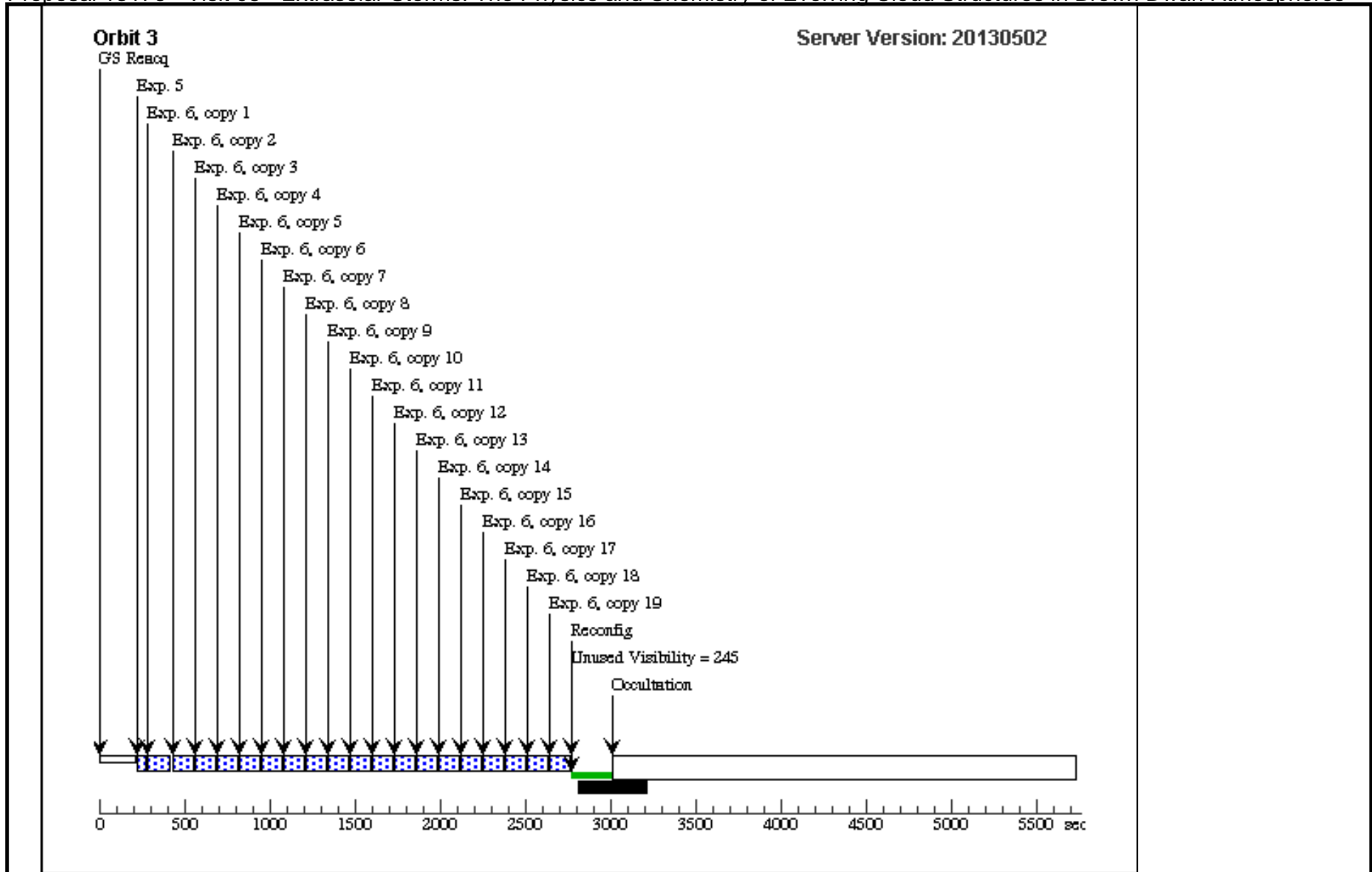
6	2M1821 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Secs)	[3]
					[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						



Orbit 2

Server Version: 20130502





Proposal 13176 - Visit 06 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	<p>Proposal 13176, Visit 06, completed Tue Jul 23 01:24:12 GMT 2013</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: SCHED 100%; ORIENT 18.7D TO 22.7 D; ORIENT 30.7D TO 190.7 D; ORIENT 198.7D TO 202.7 D; ORIENT 210.7D TO 10.7 D; AFTER 05 BY 15 D TO 3650 D</p> <p><i>Comments: M1821 visit 2, Direct Image F132N, G141 spectra</i></p>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(5)		2M1821	RA: 18 21 28.3300 (275.3680417d) Dec: +14 13 58.44 (14.23290d) Equinox: J2000	Proper Motion RA: 0.235 arcsec/yr Proper Motion Dec: -0.229 arcsec/yr Epoch of Position: 2010.3	V=(?) J=13.43 H=12.39 K=11.65	Reference Frame: ICRS
<p><i>Comments: Proper motion from Kirkpatrick et al. 2010, ApJS 190 100</i></p> <p><i>Current position from WISE</i></p>						

Proposal 13176 - Visit 06 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DirectImage F132N	(5) 2M1821	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[1]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
2	2M1821 (Lo ng Exp - G1 41)	(5) 2M1821	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6			112.00801 Secs X 19 (2128.152 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[1]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
3	DirectImage F132N	(5) 2M1821	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[2]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									

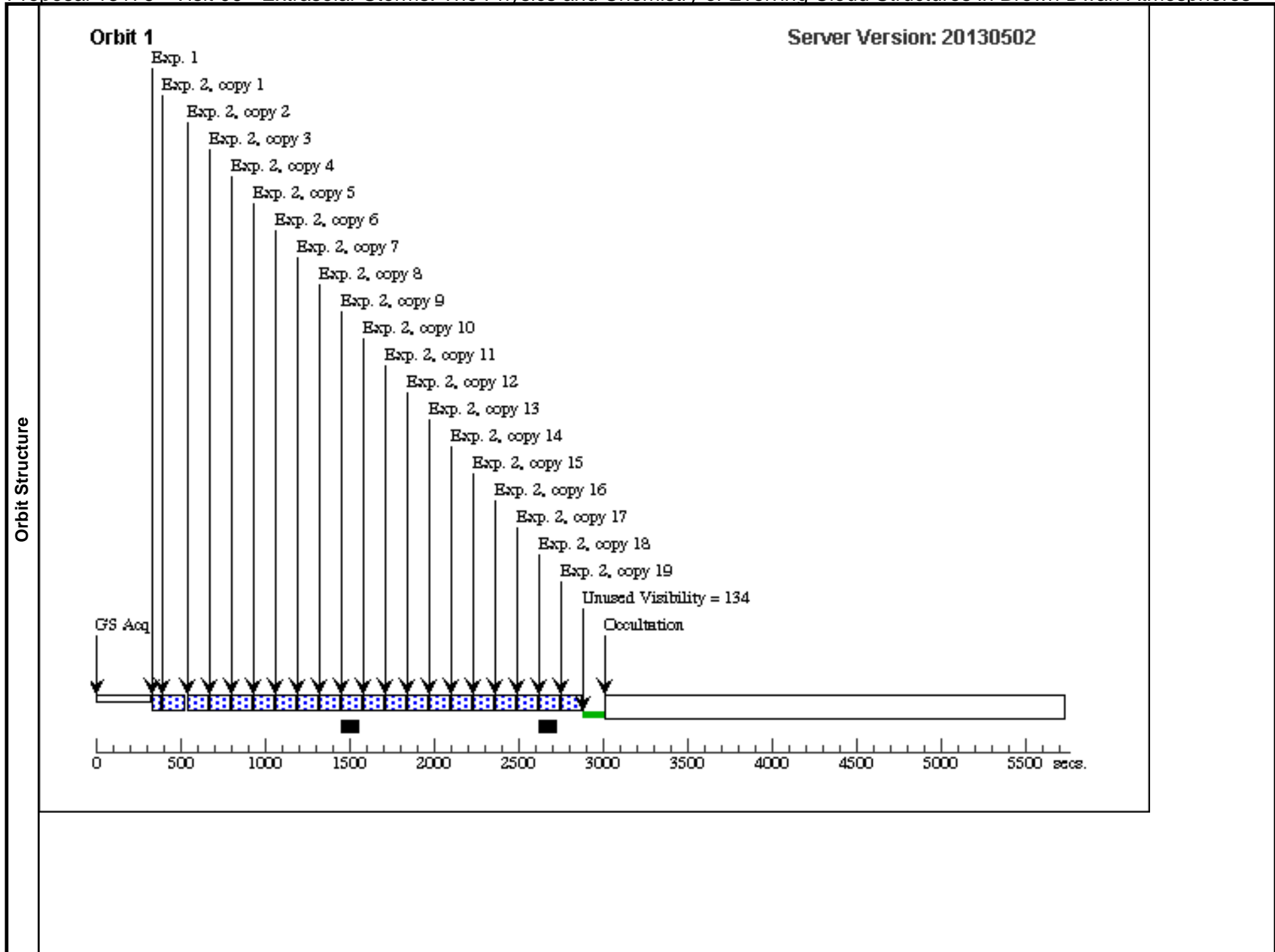
Exposures

Proposal 13176 - Visit 06 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

4	2M1821 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Secs)	
					[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	[2]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						
5	DirectImage (5) 2M1821 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10	22.317276 Secs (22.317 Secs)	
					[==>]	[3]
<i>Comments: Direct Image in F132N to help wavelength calibration. Using the same POS TARG as for the G141 observations</i>						

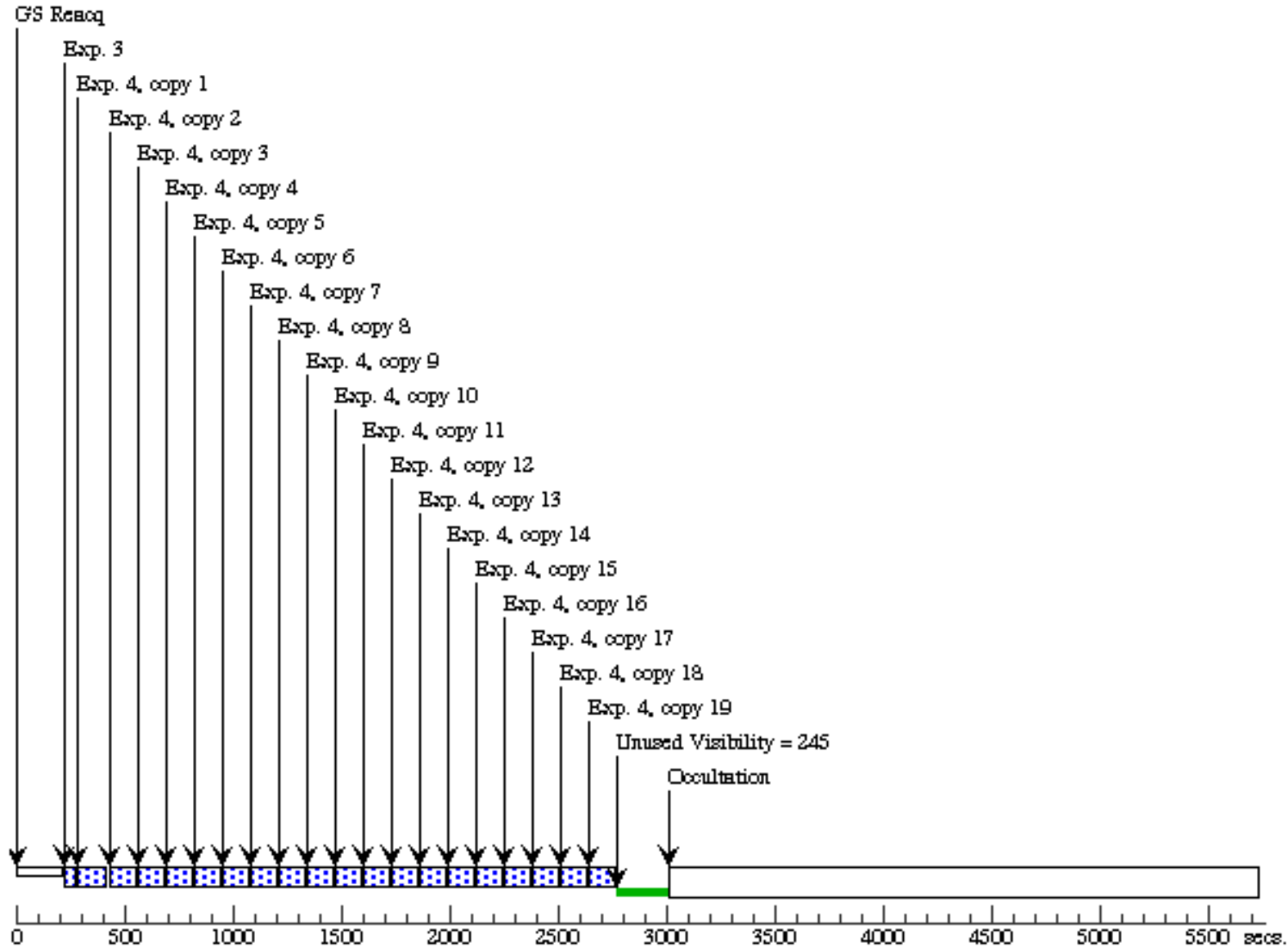
Proposal 13176 - Visit 06 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

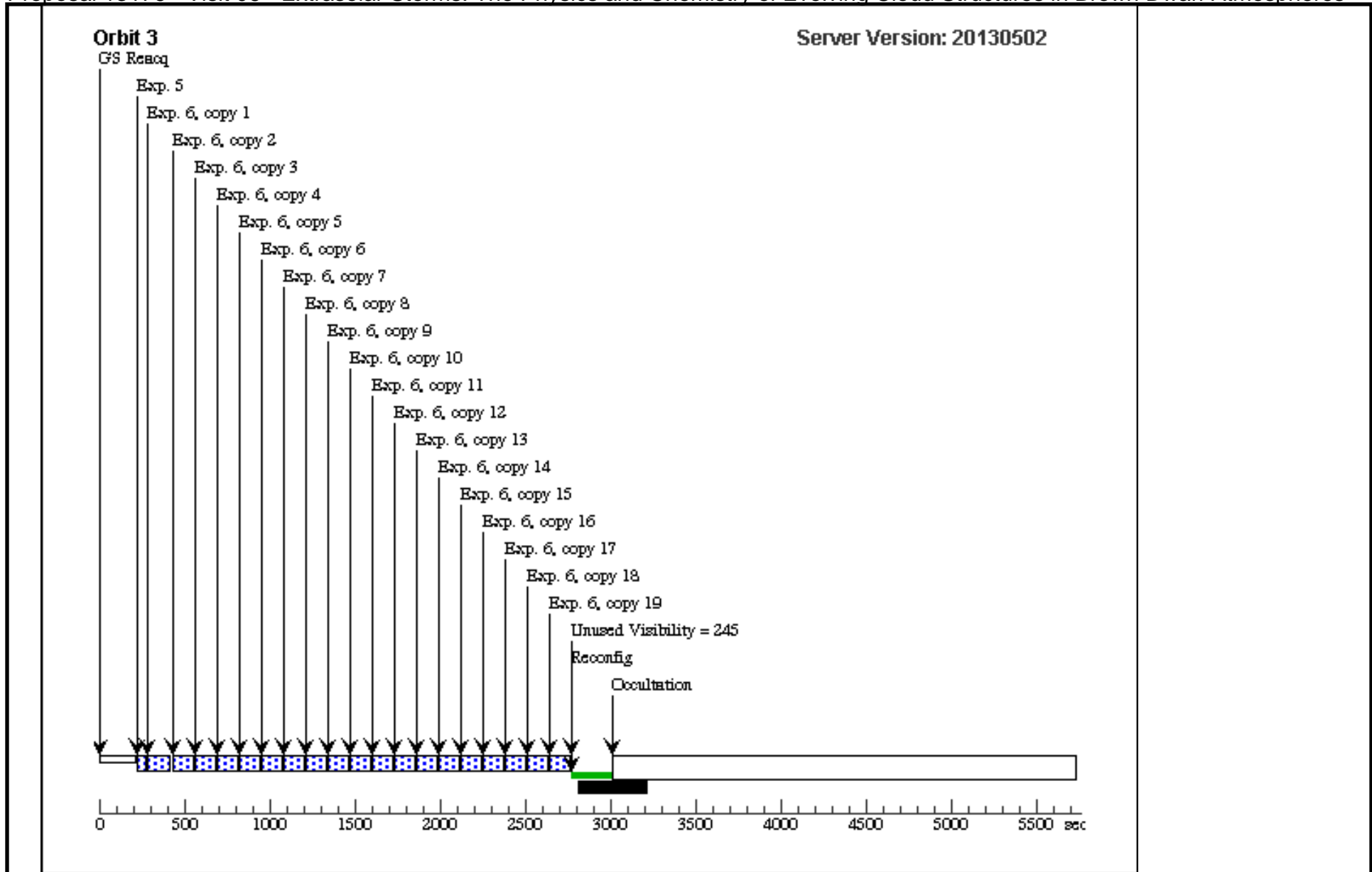
6	2M1821 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=6	112.00801 Secs X 19 (2128.152 Secs)	[3]
					[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)]	
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						



Orbit 2

Server Version: 20130502





Proposal 13176 - Visit 07 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	<p>Proposal 13176, Visit 07, completed Tue Jul 23 01:24:15 GMT 2013</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: SCHED 100%; ORIENT 5D TO 175 D; ORIENT 185D TO 355 D</p> <p><i>Comments: 2M1507 visit 1, Direct Image F132N, G141 spectra</i></p>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(6)		2M1507	RA: 15 07 47.5800 (226.9482500d) Dec: -16 27 49.22 (-16.46367d) Equinox: J2000	Proper Motion RA: -0.161 arcsec/yr Proper Motion Dec: -0.8885 arcsec/yr Epoch of Position: 2010.3	V=(?) J=12.83, K=11.31	Reference Frame: ICRS
<i>Comments: Current position from WISE</i>						

Proposal 13176 - Visit 07 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DirectImage F132N	(6) 2M1507	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[1]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									
2	2M1507 (Lo ng Exp - G1 41)	(6) 2M1507	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=4			67.315932 Secs X 30 (2019.478 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)] [==>(Copy 25)] [==>(Copy 26)] [==>(Copy 27)] [==>(Copy 28)] [==>(Copy 29)] [==>(Copy 30)]	[1]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
3	DirectImage F132N	(6) 2M1507	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[2]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									

Exposures

Proposal 13176 - Visit 07 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

4	2M1507 (Long Exposure - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS25; NSAMP=4	67.315932 Secs X 30 (2019.478 Secs)	[=>(Copy 1)] [=>(Copy 2)] [=>(Copy 3)] [=>(Copy 4)] [=>(Copy 5)] [=>(Copy 6)] [=>(Copy 7)] [=>(Copy 8)] [=>(Copy 9)] [=>(Copy 10)] [=>(Copy 11)] [=>(Copy 12)] [=>(Copy 13)] [=>(Copy 14)] [=>(Copy 15)] [=>(Copy 16)] [=>(Copy 17)] [=>(Copy 18)] [=>(Copy 19)] [=>(Copy 20)] [=>(Copy 21)] [=>(Copy 22)] [=>(Copy 23)] [=>(Copy 24)] [=>(Copy 25)] [=>(Copy 26)] [=>(Copy 27)] [=>(Copy 28)] [=>(Copy 29)] [=>(Copy 30)]	[2]
Comments: Must be coordinated with Spitzer IRAC observations							
5	DirectImage (6) 2M1507 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	[=>]	[3]
Comments: Direct Image in F132N to help wavelength calibration.							

Proposal 13176 - Visit 07 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

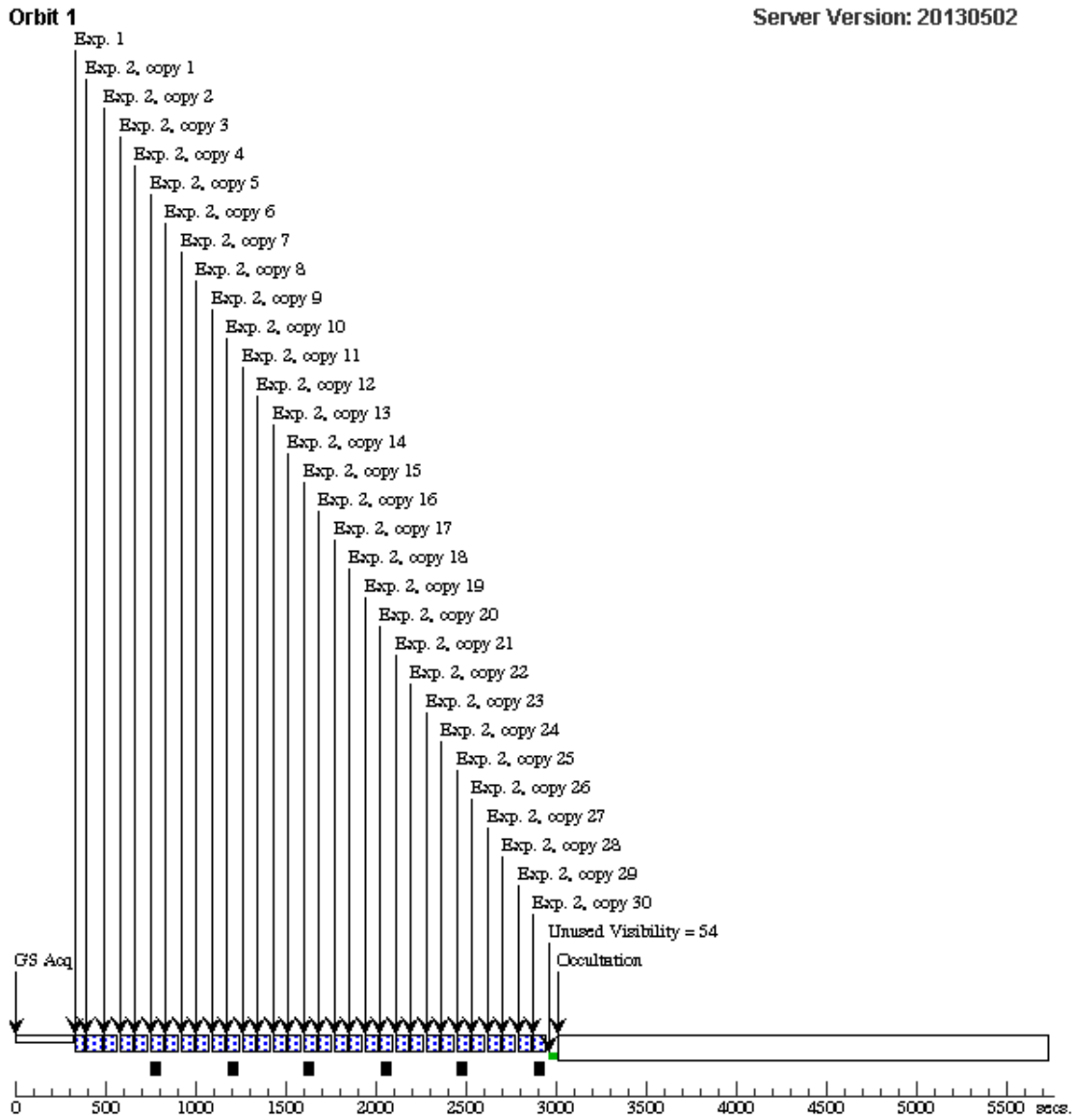
6	2M1507 (Long Exposure - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS25; NSAMP=4	67.315932 Secs X 30 (2019.478 Secs)	[3]
					[=>(Copy 1)] [=>(Copy 2)] [=>(Copy 3)] [=>(Copy 4)] [=>(Copy 5)] [=>(Copy 6)] [=>(Copy 7)] [=>(Copy 8)] [=>(Copy 9)] [=>(Copy 10)] [=>(Copy 11)] [=>(Copy 12)] [=>(Copy 13)] [=>(Copy 14)] [=>(Copy 15)] [=>(Copy 16)] [=>(Copy 17)] [=>(Copy 18)] [=>(Copy 19)] [=>(Copy 20)] [=>(Copy 21)] [=>(Copy 22)] [=>(Copy 23)] [=>(Copy 24)] [=>(Copy 25)] [=>(Copy 26)] [=>(Copy 27)] [=>(Copy 28)] [=>(Copy 29)] [=>(Copy 30)]	
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>						
7	DirectImage (6) 2M1507 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	[4]
					[=>]	
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>						

Proposal 13176 - Visit 07 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

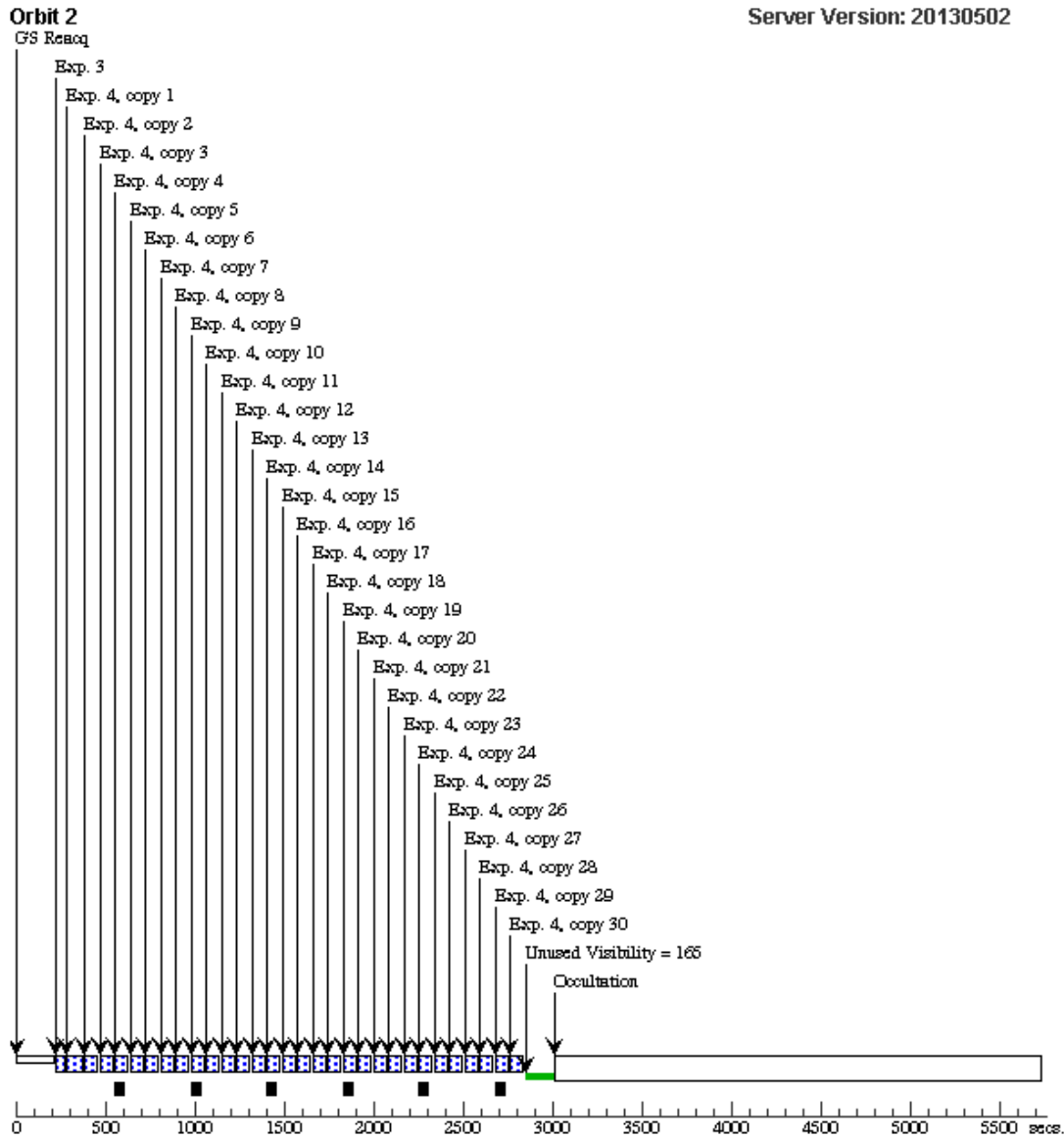
8	2M1507 (Long Exposure - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS25; NSAMP=4	67.315932 Secs X 30 (2019.478 Secs)	[4]
					[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)] [==>(Copy 25)] [==>(Copy 26)] [==>(Copy 27)] [==>(Copy 28)] [==>(Copy 29)] [==>(Copy 30)]	
Comments: Must be coordinated with Spitzer IRAC observations						

Orbit Structure

Server Version: 20130502

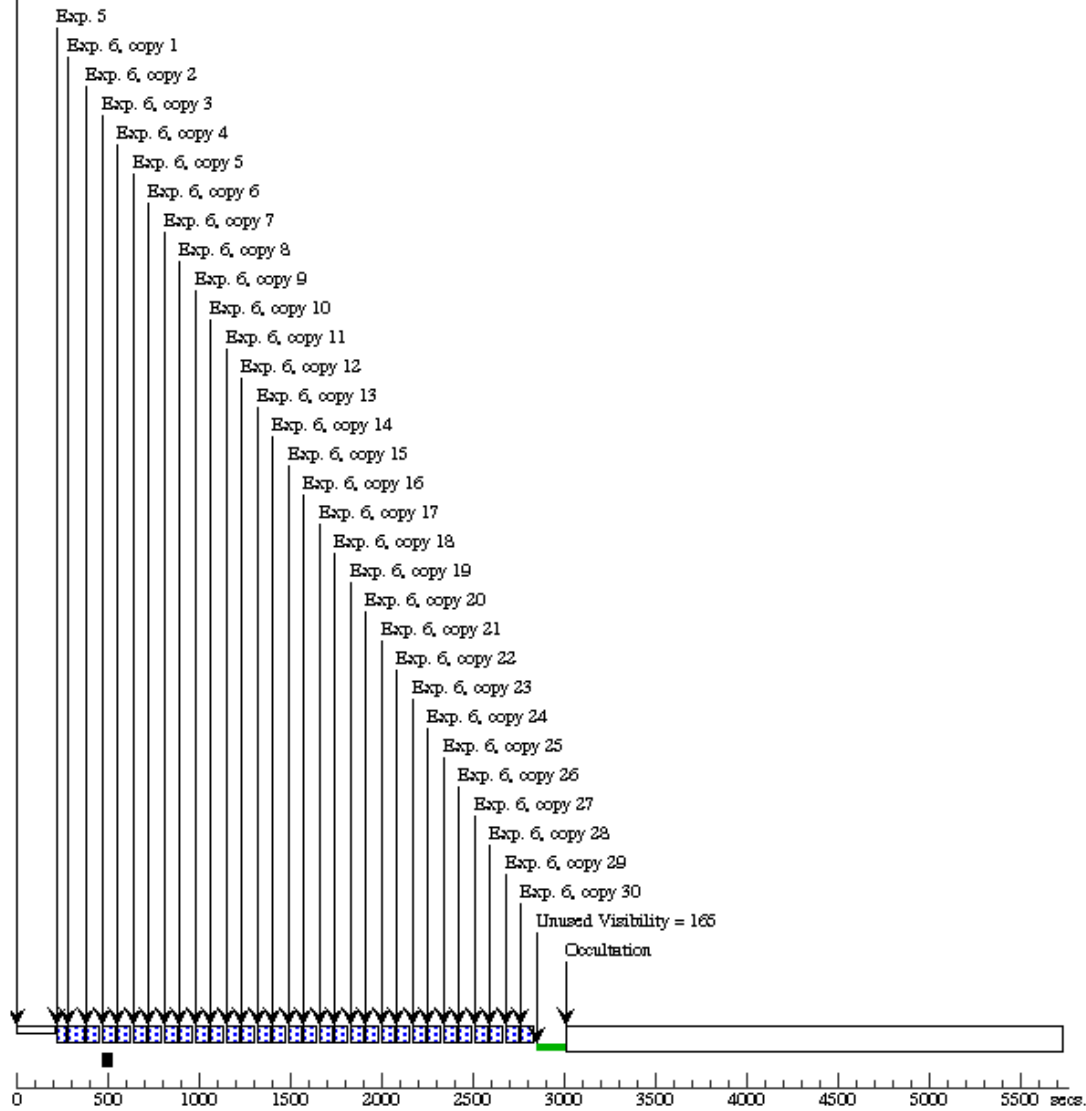


Server Version: 20130502



Server Version: 20130502

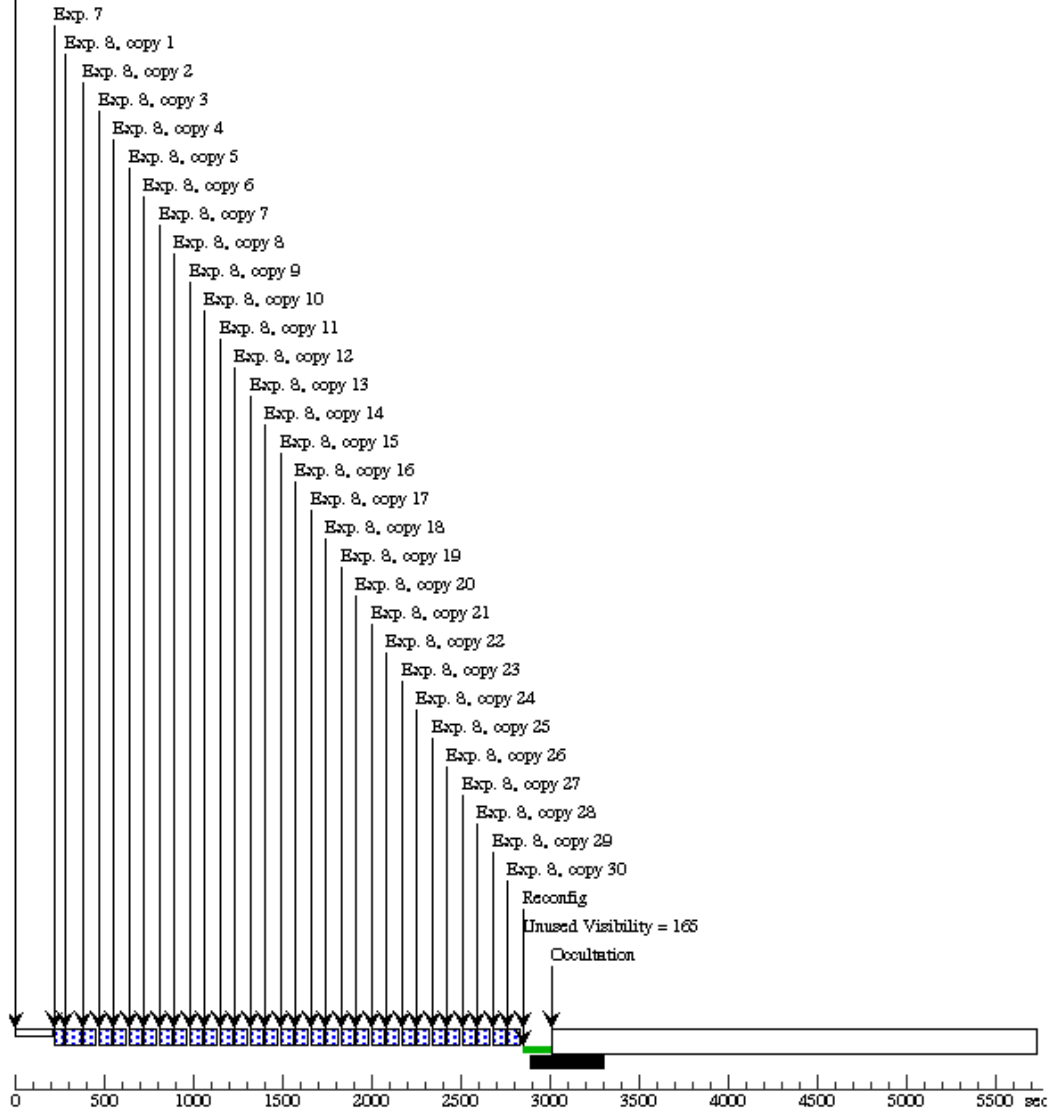
Orbit 3
GS Reacq



Server Version: 20130502

Orbit 4

GS Reacq



Proposal 13176 - Visit 08 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

Visit	<p>Proposal 13176, Visit 08, completed Tue Jul 23 01:24:18 GMT 2013</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: SCHED 100%; ORIENT 5D TO 175 D; ORIENT 185D TO 355 D; AFTER 07 BY 10 D TO 365 D</p> <p><i>Comments: 2M1507 visit 2, Direct Image F132N, G141 spectra</i></p>					
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
(6)		2M1507	RA: 15 07 47.5800 (226.9482500d) Dec: -16 27 49.22 (-16.46367d) Equinox: J2000	Proper Motion RA: -0.161 arcsec/yr Proper Motion Dec: -0.8885 arcsec/yr Epoch of Position: 2010.3	V=(?) J=12.83, K=11.31	Reference Frame: ICRS
	<i>Comments: Current position from WISE</i>					

Proposal 13176 - Visit 08 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DirectImage F132N	(6) 2M1507	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[1]
<i>Comments: Direct Image in F132N to help wavelength calibration. Using the same POS TARG as for the G141 observations</i>									
2	2M1507 (Lo ng Exp - G1 41)	(6) 2M1507	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 25; NSAMP=4			67.315932 Secs X 30 (2019.478 Secs) [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)] [==>(Copy 25)] [==>(Copy 26)] [==>(Copy 27)] [==>(Copy 28)] [==>(Copy 29)] [==>(Copy 30)]	[1]
<i>Comments: Must be coordinated with Spitzer IRAC observations</i>									
3	DirectImage F132N	(6) 2M1507	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPAR S10			22.317276 Secs (22.317 Secs) [==>]	[2]
<i>Comments: Direct Image in F132N to help wavelength calibration.</i>									

Exposures

Proposal 13176 - Visit 08 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

4	2M1507 (Long Exp - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS25; NSAMP=4	67.315932 Secs X 30 (2019.478 Secs)	[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)] [==>(Copy 25)] [==>(Copy 26)] [==>(Copy 27)] [==>(Copy 28)] [==>(Copy 29)] [==>(Copy 30)]	[2]
Comments: Must be coordinated with Spitzer IRAC observations							
5	DirectImage (6) 2M1507 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	[==>]	[3]
Comments: Direct Image in F132N to help wavelength calibration.							

Proposal 13176 - Visit 08 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

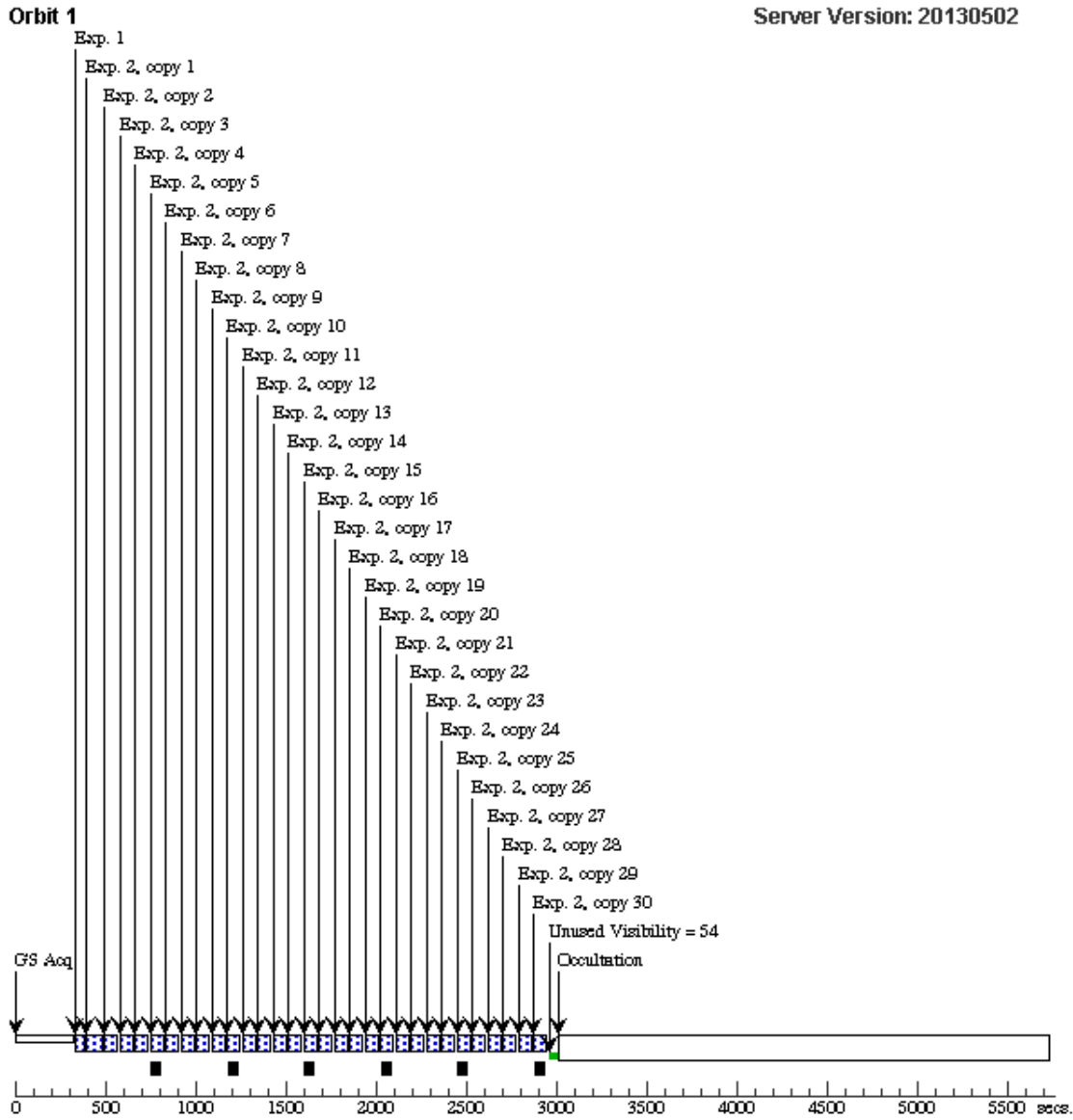
6	2M1507 (Long Exposure - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS25; NSAMP=4	67.315932 Secs X 30 (2019.478 Secs)	[=>(Copy 1)] [=>(Copy 2)] [=>(Copy 3)] [=>(Copy 4)] [=>(Copy 5)] [=>(Copy 6)] [=>(Copy 7)] [=>(Copy 8)] [=>(Copy 9)] [=>(Copy 10)] [=>(Copy 11)] [=>(Copy 12)] [=>(Copy 13)] [=>(Copy 14)] [=>(Copy 15)] [=>(Copy 16)] [=>(Copy 17)] [=>(Copy 18)] [=>(Copy 19)] [=>(Copy 20)] [=>(Copy 21)] [=>(Copy 22)] [=>(Copy 23)] [=>(Copy 24)] [=>(Copy 25)] [=>(Copy 26)] [=>(Copy 27)] [=>(Copy 28)] [=>(Copy 29)] [=>(Copy 30)]	[3]
Comments: Must be coordinated with Spitzer IRAC observations							
7	DirectImage (6) 2M1507 F132N	WFC3/IR, MULTIACCUM, GRISM256	F132N	NSAMP=4; SAMP-SEQ=SPARS10	22.317276 Secs (22.317 Secs)	[=>]	[4]
Comments: Direct Image in F132N to help wavelength calibration.							

Proposal 13176 - Visit 08 - Extrasolar Storms: The Physics and Chemistry of Evolving Cloud Structures in Brown Dwarf Atmospheres

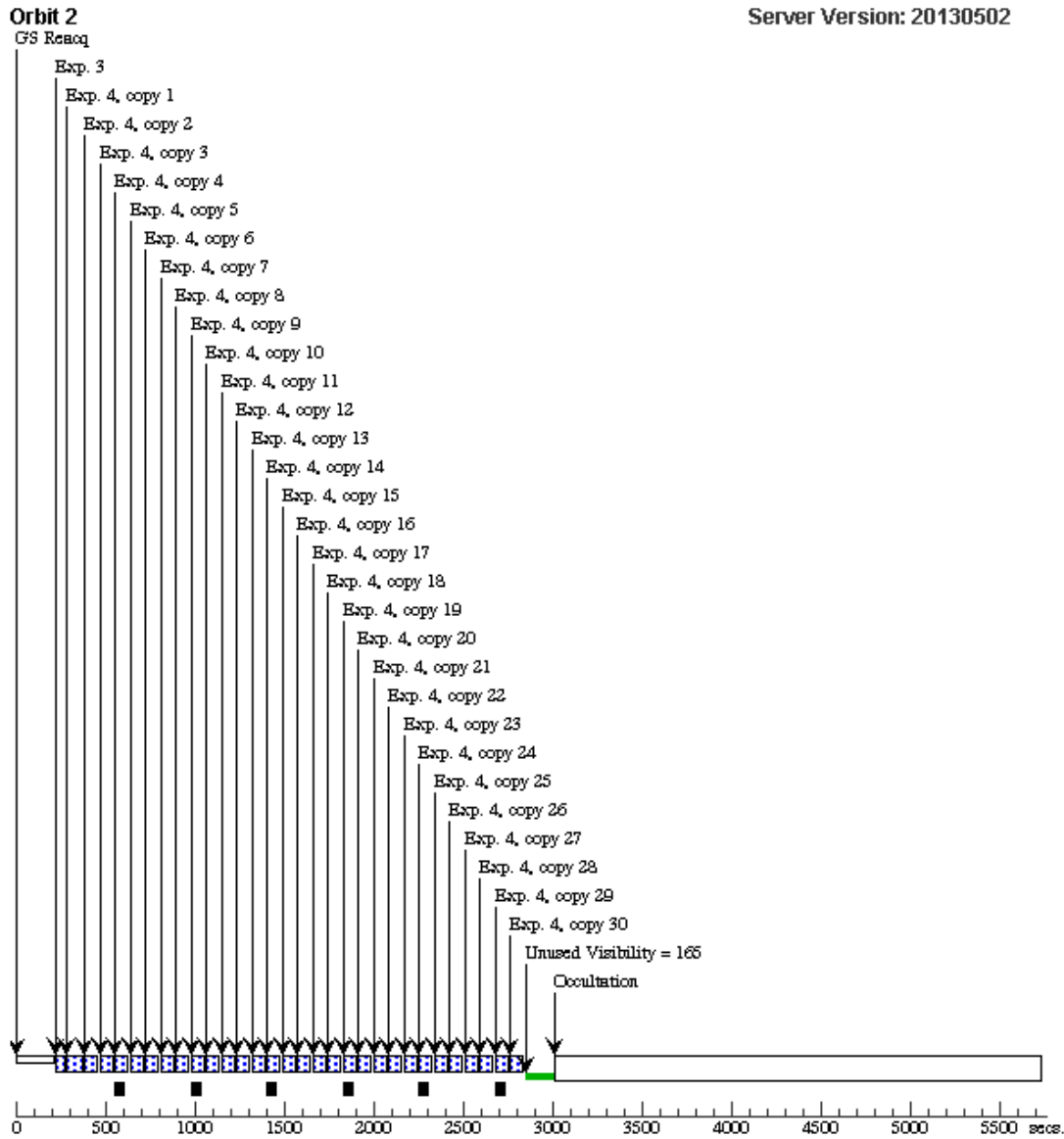
8	2M1507 (Long Exposure - G141)	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS25; NSAMP=4	67.315932 Secs X 30 (2019.478 Secs)	[4]
					[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)] [==>(Copy 25)] [==>(Copy 26)] [==>(Copy 27)] [==>(Copy 28)] [==>(Copy 29)] [==>(Copy 30)]	
Comments: Must be coordinated with Spitzer IRAC observations						

Orbit Structure

Server Version: 20130502



Server Version: 20130502



Server Version: 20130502

Orbit 3
GS Reacq

