12450 - Understanding A New Class of MidIR Transients

Cycle: 19, 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?*
01	(1) SN-1999BW ANY	ACS/WFC WFC3/IR	1	23-May-2011 21:40:18.0	yes
02	(2) SN-2001AC ANY	ACS/WFC WFC3/IR	1	23-May-2011 21:40:25.0	yes
03	(3) SN-2002BU ANY	ACS/WFC WFC3/IR	1	23-May-2011 21:40:32.0	yes
04	(4) SN-2003GM ANY	ACS/WFC WFC3/IR	1	23-May-2011 21:40:39.0	yes
05	(5) SN-2008S ANY	ACS/WFC WFC3/IR	1	23-May-2011 21:40:45.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
06	(6) NGC-300OT ANY	ACS/WFC WFC3/IR	1	23-May-2011 21:40:51.0	yes

6 Total Orbits Used

ABSTRACT

There is a new class of stellar transients whose progenitors are completely obscured (probably) extreme AGB stars, where the dust in the surviving wind appears to reform after the transient and again cloak the system. Whether these are true supernovae or a new class of stellar eruption is unclear, so the key question is whether or not the star survived. However, their present day emission appears to be due to optically thick dust (shock) heated by the ejecta from the transient, so we must understand the evolution of this emission and the dust optical depths before we can determine the survival of the stars. We propose a combination of Spitzer, Hubble and Chandra observations to characterize 6 of the new transients and a comparison sample of 5 supernovae with late time emission due to shocks and 3 luminous variable outbursts with late time emission due to a surviving star surrounded by ejected matter. The SST data will characterize the shock luminosity and its rate of decay, both exploring the physics of dusty shocks and setting limits on the flux from any surviving star. The nearIR HST data will tightly constrain the optical depth of the dust and potentially allow us to see through it to any surviving star. If the emission is from a dusty shock, there must be Xray emission, and the amount of soft Xray absorption will determine the the absorbing column densities.

OBSERVING DESCRIPTION

The primary target will be observed with WFC3/IR in the J and H bands. We use two dithered exposures in each filter.

The goal of the ACS parallels is to build the archival imaging of nearby galaxies in order to identify the progenitors of supernovae in the future. The filter is chosen to be one of F814W, F555W or F436W depending on the data already present in the archive. A weak ORIENT constraint is used where necessary to ensure that ACS lies on the galaxy.

An WFC3/IR monitoring observation of SN2008S is already scheduled for August 2011 as part of our previous program 12331. We have added a timing constraint to force the observation

for this proposal into the next visibility window in 2012.

Visit

Proposal 12450, Visit 01 Tue May 24 01:40:56 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 150D TO 190 D

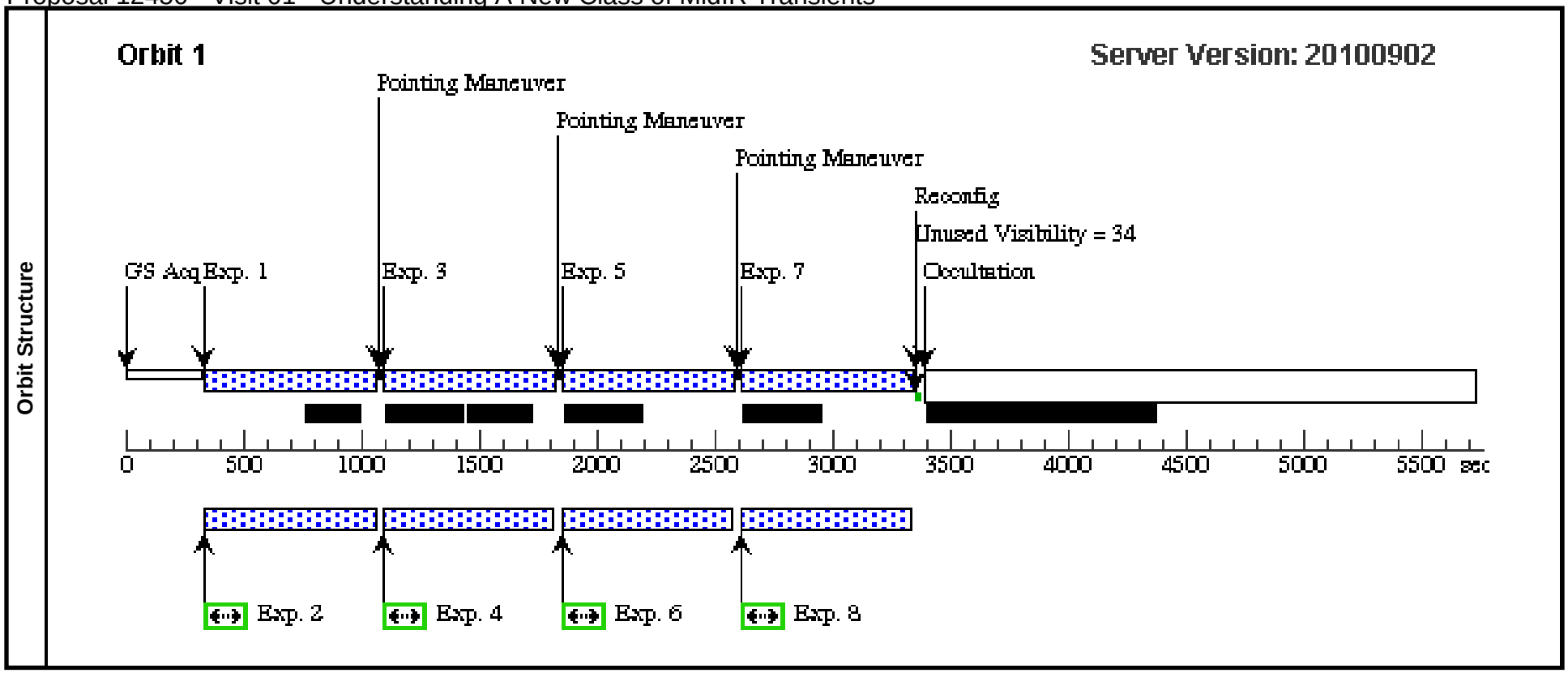
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN-1999BW	RA: 10 19 46.8100 (154.9450417d) Dec: +45 31 35.00 (45.52639d) Equinox: J2000		V=17.8	Reference Frame: NED

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Prime + Parallel Group 1-2 in Visit 01	*[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC	F435W			Prime + Parallel Group 1-2 in Visit 01	600 Secs *[==>521.0 Secs]*	***[1]***
3		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.52,0.195	Prime + Parallel Group 3-4 in Visit 01	*[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC	F435W			Prime + Parallel Group 3-4 in Visit 01	600 Secs *[==>]*	***[1]***
5		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.325,0.52	Prime + Parallel Group 5-6 in Visit 01	*[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC	F435W			Prime + Parallel Group 5-6 in Visit 01	600 Secs *[==>]*	***[1]***
7		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG +0.195,-0.325	Prime + Parallel Group 7-8 in Visit 01	*[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC	F435W			Prime + Parallel Group 7-8 in Visit 01	600 Secs *[==>]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20100902
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 34
GS Acq
Exp. 1
Exp. 3
Exp. 5
Exp. 7
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 2
Exp. 4
Exp. 6
Exp. 8

Visit

Proposal 12450, Visit 02 Tue May 24 01:40:57 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: (none)

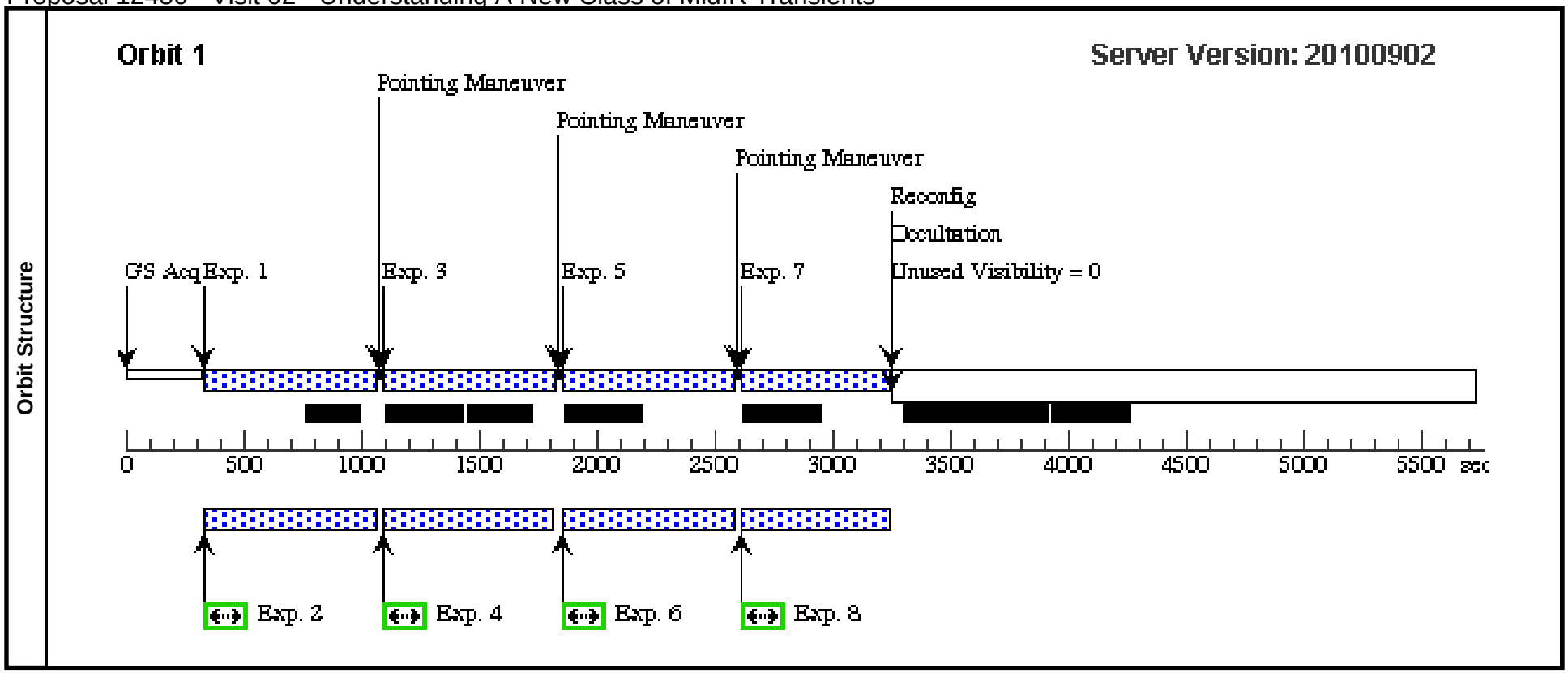
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SN-2001AC	RA: 11 03 12.8000 (165.8033333d) Dec: +27 58 31.00 (27.97528d) Equinox: J2000		V=18.2	Reference Frame: NED

Comments: Offset from centering on SN (11 03 15.3700 +27 58 29.50) to better cover galaxy

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) SN-2001AC	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Prime + Parallel Group 1-2 in Visit 02	*[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 1-2 in Visit 02	600 Secs *[==>521.0 Secs]*	***[1]***
3		(2) SN-2001AC	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.52,0.195	Prime + Parallel Group 3-4 in Visit 02	*[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in Visit 02	600 Secs *[==>]*	***[1]***
5		(2) SN-2001AC	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.325,0.52	Prime + Parallel Group 5-6 in Visit 02	*[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 5-6 in Visit 02	600 Secs *[==>603.0 Secs]*	***[1]***
7		(2) SN-2001AC	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG +0.195,-0.325	Prime + Parallel Group 7-8 in Visit 02	*[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 7-8 in Visit 02	600 Secs *[==>503.0 Secs]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20100902
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Occultation
GS Acq
Exp. 1
Exp. 3
Exp. 5
Exp. 7
Unused Visibility = 0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 2
Exp. 4
Exp. 6
Exp. 8

Visit

Proposal 12450, Visit 03 Tue May 24 01:40:58 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: (none)

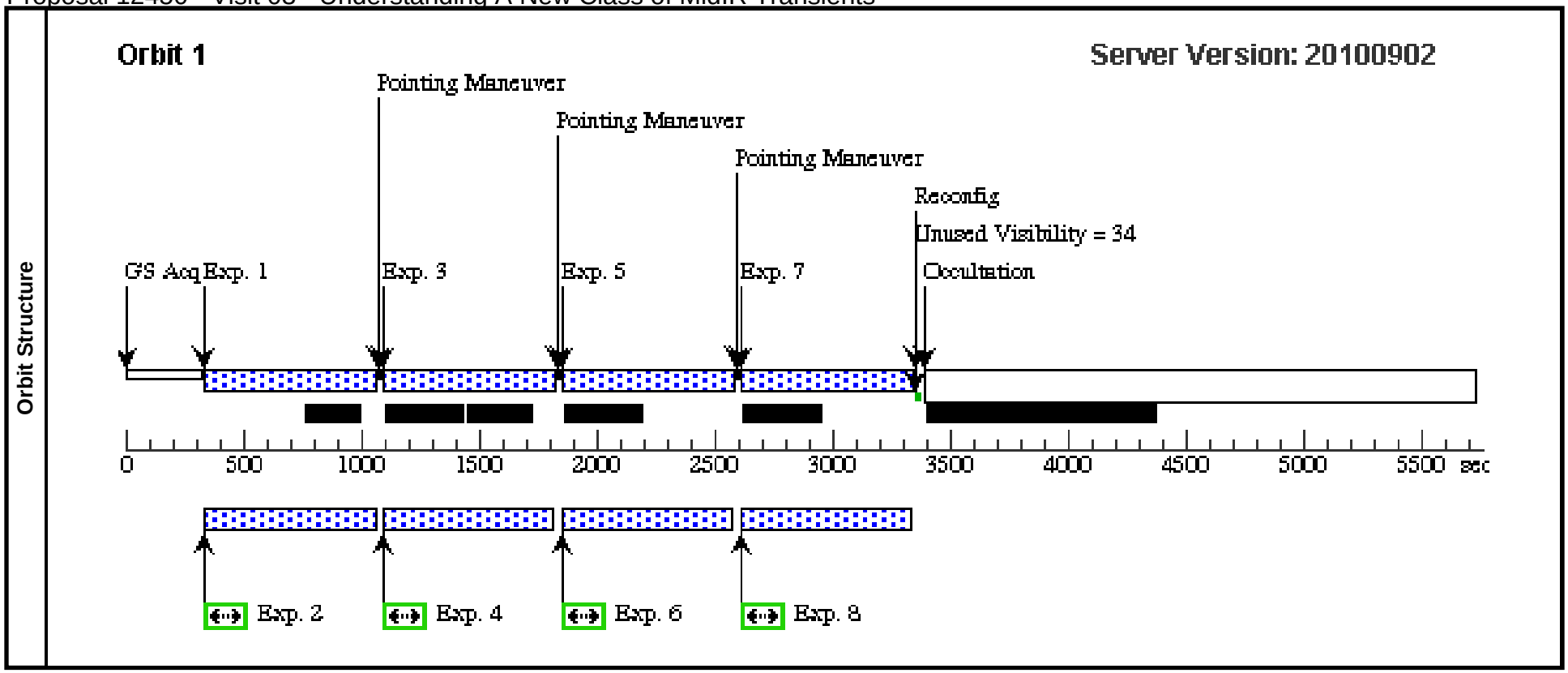
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN-2002BU	RA: 12 17 35.4000 (184.3975000d) Dec: +45 38 21.00 (45.63917d) Equinox: J2000		V=15.5	Reference Frame: NED

Comments: Shifted to include more of the galaxy from12 17 37.1800 +45 38 47.40

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) SN-2002BU	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Prime + Parallel Group 1-2 in Visit 03	*[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 1-2 in Visit 03	600 Secs *[==>521.0 Secs]*	***[1]***
3		(3) SN-2002BU	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.52,0.195	Prime + Parallel Group 3-4 in Visit 03	*[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in Visit 03	600 Secs *[==>]*	***[1]***
5		(3) SN-2002BU	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.325,0.52	Prime + Parallel Group 5-6 in Visit 03	*[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 5-6 in Visit 03	600 Secs *[==>]*	***[1]***
7		(3) SN-2002BU	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG +0.195,-0.325	Prime + Parallel Group 7-8 in Visit 03	*[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 7-8 in Visit 03	600 Secs *[==>]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20100902
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 34
GS Acq
Exp. 1
Exp. 3
Exp. 5
Exp. 7
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 2
Exp. 4
Exp. 6
Exp. 8

Visit

Proposal 12450, Visit 04 Tue May 24 01:40:59 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: (none)

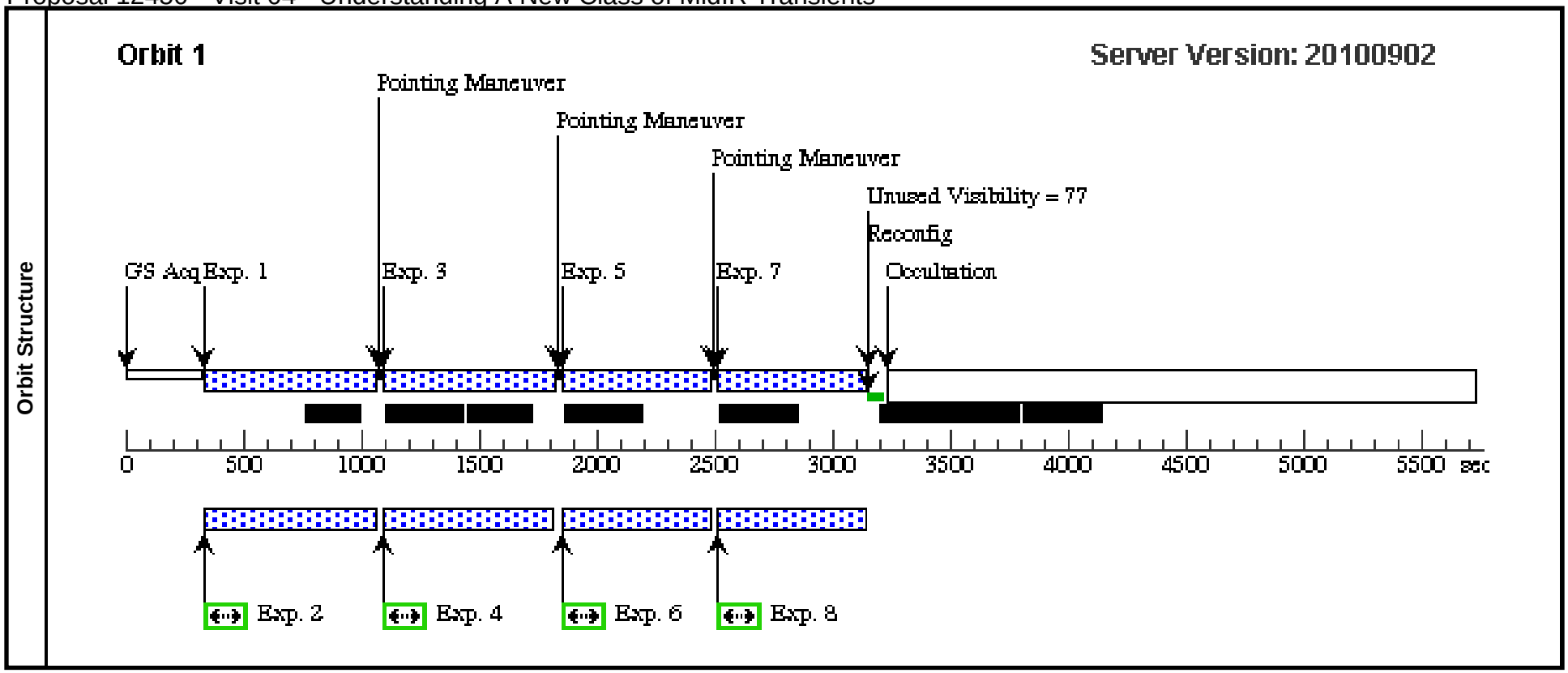
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN-2003GM	RA: 13 52 54.5000 (208.2270833d) Dec: -01 06 46.00 (-1.11278d) Equinox: J2000		V=17.0	Reference Frame: NED

Comments: Offset from 13 52 51.7200 -01 06 39.20 to include more of galaxy

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) SN-2003GM	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Prime + Parallel Group 1-2 in Visit 04	*[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 1-2 in Visit 04	600 Secs *[==>521.0 Secs]*	 ***[1]***
3		(4) SN-2003GM	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.52,0.195	Prime + Parallel Group 3-4 in Visit 04	*[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in Visit 04	600 Secs *[==>]*	 ***[1]***
5		(4) SN-2003GM	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.325,0.52	Prime + Parallel Group 5-6 in Visit 04	*[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 5-6 in Visit 04	600 Secs *[==>503.0 Secs]*	 ***[1]***
7		(4) SN-2003GM	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG +0.195,-0.325	Prime + Parallel Group 7-8 in Visit 04	*[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 7-8 in Visit 04	600 Secs *[==>503.0 Secs]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20100902
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 77
Reconfig
GS Acq
Exp. 1
Exp. 3
Exp. 5
Exp. 7
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 2
Exp. 4
Exp. 6
Exp. 8

Visit

Proposal 12450, Visit 05 Tue May 24 01:41:00 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 90D TO 210 D; AFTER 01-JAN-2012

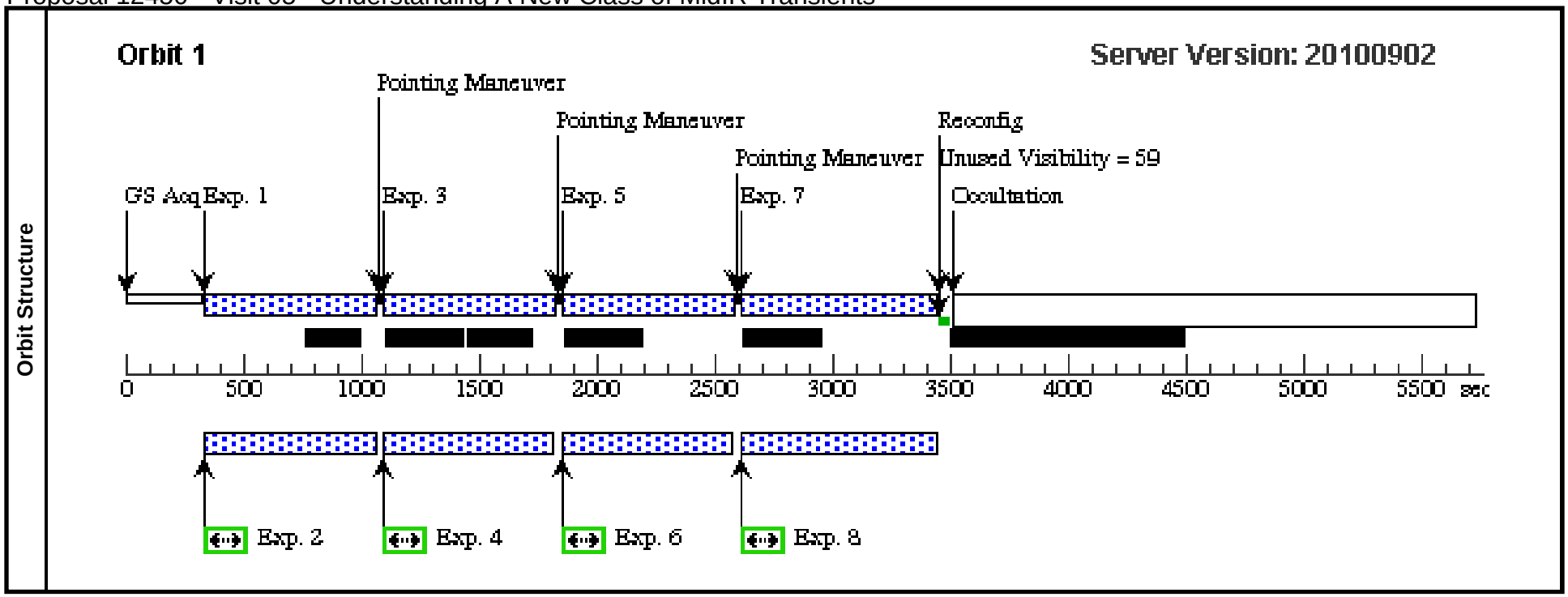
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SN-2008S	RA: 20 34 46.5000 (308.6937500d) Dec: +60 06 41.00 (60.11139d) Equinox: J2000		V=18.79	Reference Frame: NED

Comments: Shifted to capture several SN from 20 34 45.3300 +60 05 58.40

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(5) SN-2008S	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Prime + Parallel Group 1-2 in Visit 05	*[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 1-2 in Visit 05	600 Secs *[==>521.0 Secs]*	***[1]***
3		(5) SN-2008S	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.52,0.195	Prime + Parallel Group 3-4 in Visit 05	*[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in Visit 05	600 Secs *[==>]*	***[1]***
5		(5) SN-2008S	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.325,0.52	Prime + Parallel Group 5-6 in Visit 05	*[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 5-6 in Visit 05	600 Secs *[==>]*	***[1]***
7		(5) SN-2008S	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=14; SAMP-SEQ=STEP100	POS TARG +0.195,-0.325	Prime + Parallel Group 7-8 in Visit 05	*[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 7-8 in Visit 05	600 Secs *[==>703.0 Secs]*	***[1]***


Orbit Structure
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Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 59
GS Acq
Exp. 1
Exp. 3
Exp. 5
Exp. 7
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 2
Exp. 4
Exp. 6
Exp. 8

Visit

Proposal 12450, Visit 06 Tue May 24 01:41:00 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 245D TO 260 D

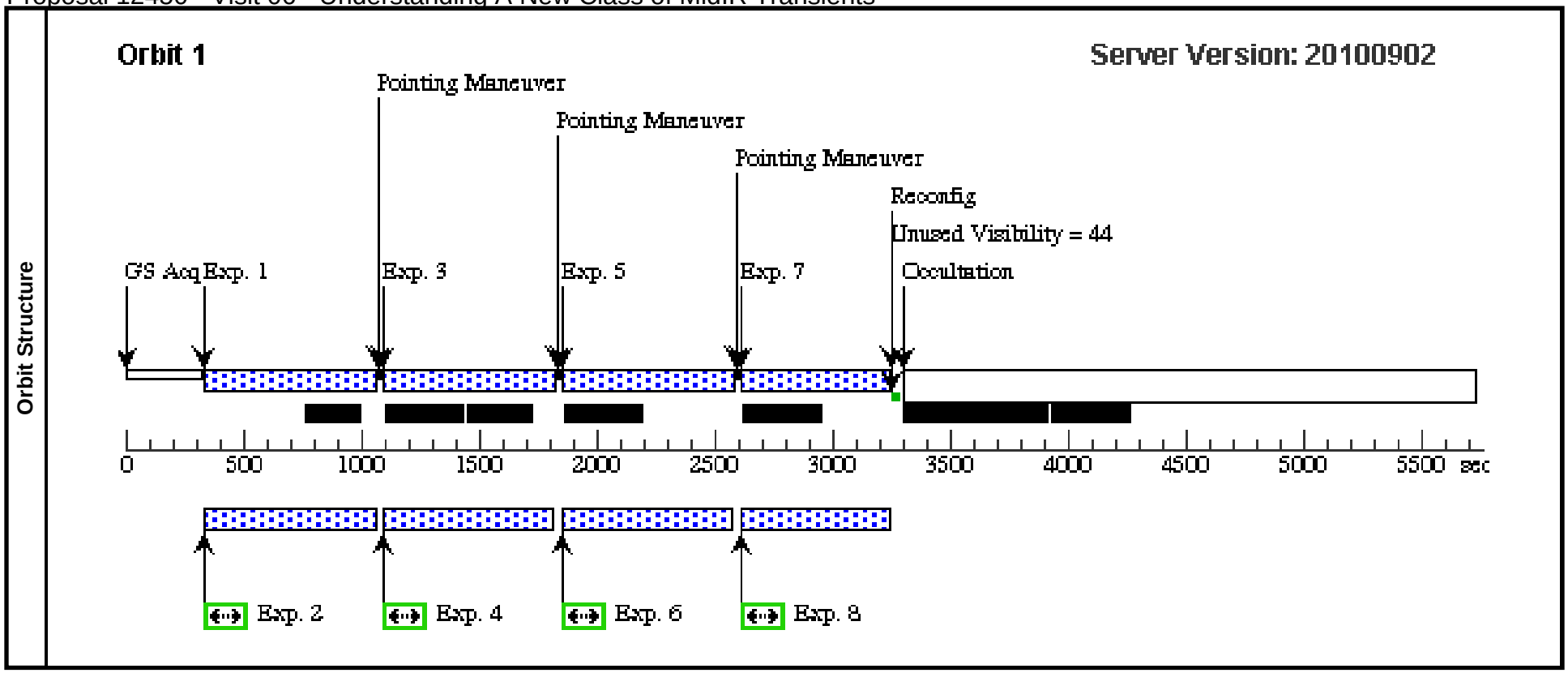
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	NGC-300OT	RA: 00 54 34.2000 (13.6425000d) Dec: -37 38 28.60 (-37.64128d) Equinox: J2000		V=2.2	Reference Frame: NED

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(6) NGC-300OT	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Prime + Parallel Group 1-2 in Visit 06	*[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 1-2 in Visit 06	600 Secs *[==>521.0 Secs]*	***[1]***
3		(6) NGC-300OT	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.52,0.195	Prime + Parallel Group 3-4 in Visit 06	*[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in Visit 06	600 Secs *[==>]*	***[1]***
5		(6) NGC-300OT	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100	POS TARG 0.325,0.52	Prime + Parallel Group 5-6 in Visit 06	*[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 5-6 in Visit 06	600 Secs *[==>]*	***[1]***
7		(6) NGC-300OT	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG +0.195,-0.325	Prime + Parallel Group 7-8 in Visit 06	*[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 7-8 in Visit 06	600 Secs *[==>503.0 Secs]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20100902
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 44
GS Acq
Exp. 1
Exp. 3
Exp. 5
Exp. 7
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 2
Exp. 4
Exp. 6
Exp. 8