14049 - Dust to Dust: Monitoring the Evolution of the New Class of Self-Obscured Transient

Cycle: 22, 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	WFC3/IR	1	03-Feb-2015 21:12:26.0	yes
02	(2) SN-2002BU	WFC3/IR	1	03-Feb-2015 21:12:28.0	yes
03	(3) SN-2008S	WFC3/IR	1	03-Feb-2015 21:12:29.0	yes
04	(4) NAME-NGC-300-OT2008-1	WFC3/IR	1	03-Feb-2015 21:12:31.0	yes

4 Total Orbits Used

ABSTRACT

The goal of this proposal is to understand a new class of explosive transients associated with the most massive AGB stars. Today these sources are true creatures of the mid-IR, being optically invisible and very faint in the near-IR. By coarsely monitoring them with Spitzer and HST we can examine the evolution of the luminosity, dust optical depth and dust radius/temperature at a key time when their observed fluxes are approaching those of the two known progenitors. At its very simplest, if they do not stop fading in the mid-IR or start to brighten in the near-IR, then they are almost certainly examples of the theoretically expected but observationally missing electron capture supernovae (ecSNe). The exciting result from

Cycle 10 is that the sources continued to fade and two are becoming substantially fainter than their progenitors. If this continues in Cycle 11, the ecSNe interpretation becomes increasingly probable.

OBSERVING DESCRIPTION

Each observation is done as a 3 point line dither in F160W and F110W combined with one extra F110W exposure -- the latter is adjusted to come as close as possible to using the available time

Each of the images is done as a STEP100 sequence

Two of the targets, SN2002bu and SN2008S, are not placed at field center, but offset. In particular, this places another old SN in the field of view of the SN2008S observations. These pointings have all been used successfully in previous WFC3/IR observations of the targets.

Visit

Proposal 14049, Visit 01 Wed Feb 04 02:12:32 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)

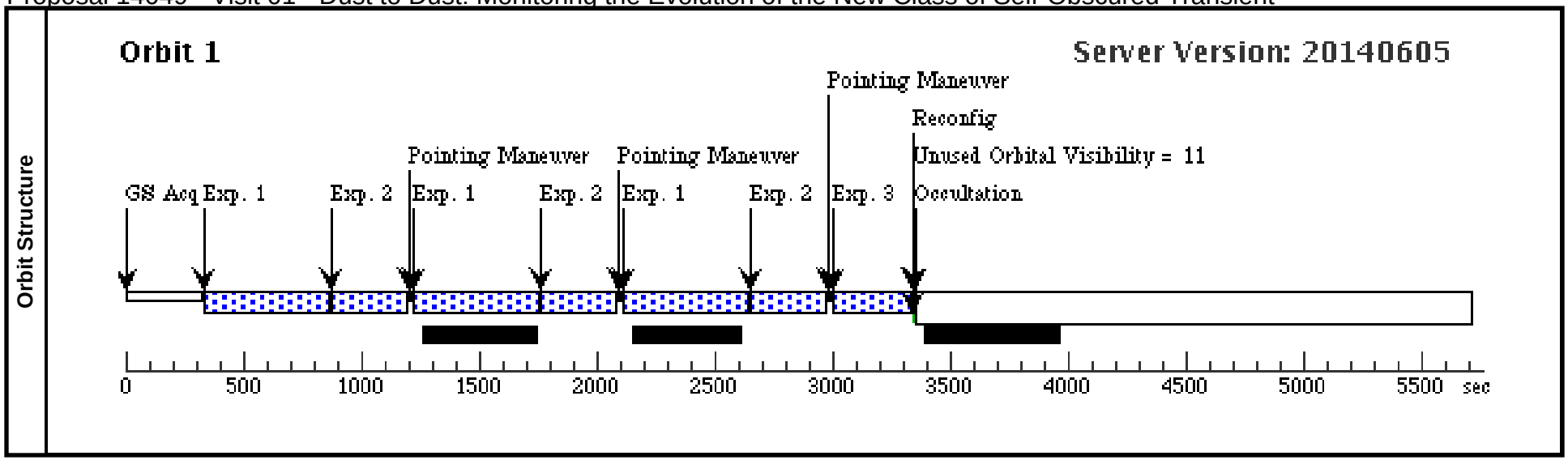
Fixed Targets

#	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: SIMBAD

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 (Total)/[Actual Dur.]	Orbit
1		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 01 (1)	499.231969 Secs (1497.696 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=9; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 01 (1)	299.231323 Secs (897.694 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(1) SN-1999BW	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=9; SAMP-SEQ=STEP100			299.231323 Secs (299.231 Secs) *[==>]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20140605
Pointing Maneuver
Reconfig
Pointing Maneuver
Pointing Maneuver
Unused Orbital Visibility = 11
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14049, Visit 02 Wed Feb 04 02:12:32 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)

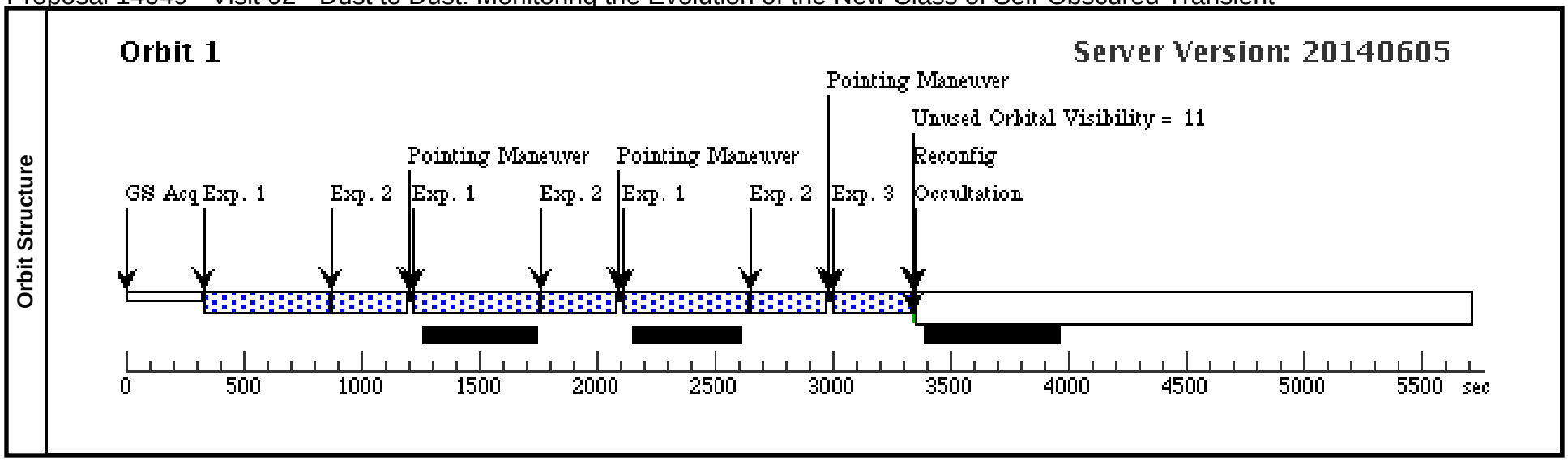
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SN-2002BU	RA: 12 17 35.4000 (184.3975000d) Dec: +45 38 21.60 (45.63933d) Equinox: J2000		V=15.5	Reference Frame: SIMBAD

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 (Total)/[Actual Dur.]	Orbit
1		(2) SN-2002BU	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 02 (1)	499.231969 Secs (1497.696 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(2) SN-2002BU	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=9; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 02 (1)	299.231323 Secs (897.694 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(2) SN-2002BU	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=9; SAMP-SEQ=STEP100			299.231323 Secs (299.231 Secs) *[==>]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20140605
Pointing Maneuver
Unused Orbital Visibility = 11
Pointing Maneuver
Pointing Maneuver
Reconfig
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14049, Visit 03 Wed Feb 04 02:12:32 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)

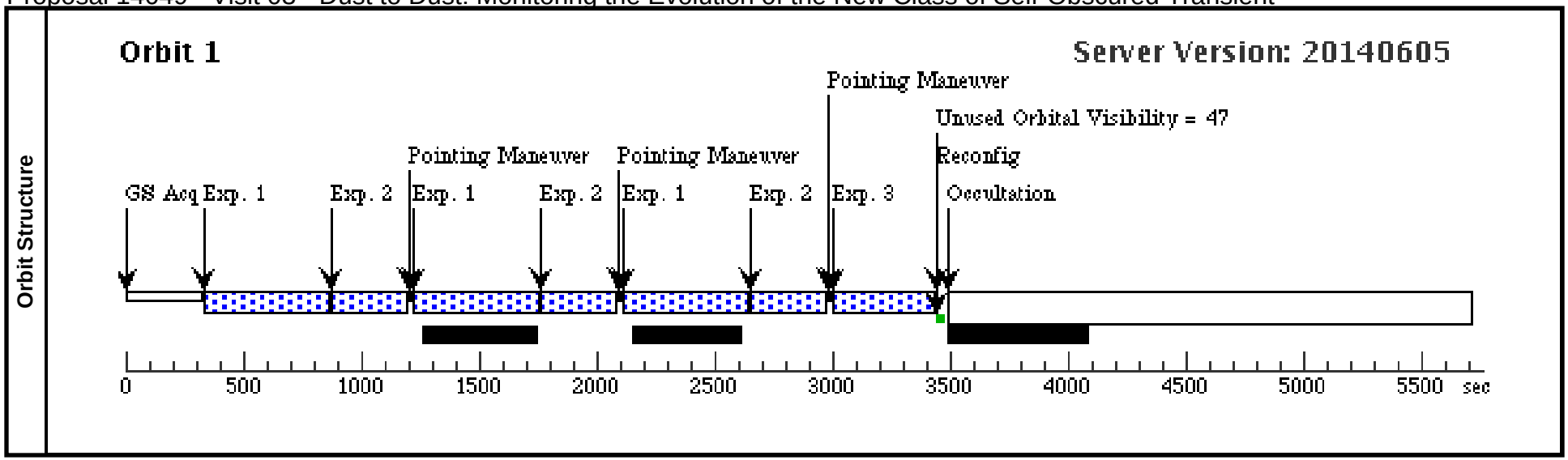
Fixed Targets

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

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 (Total)/[Actual Dur.]	Orbit
1		(3) SN-2008S	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 03 (1)	499.231969 Secs (1497.696 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(3) SN-2008S	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=9; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 03 (1)	299.231323 Secs (897.694 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(3) SN-2008S	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=10; SAMP-SEQ=STEP100			399.231646 Secs (399.232 Secs) *[==>]*	***[1]***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Server Version: 20140605
Pointing Maneuver
Unused Orbital Visibility = 47
Pointing Maneuver
Pointing Maneuver
Reconfig
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Exp. 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14049, Visit 04 Wed Feb 04 02:12:32 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)

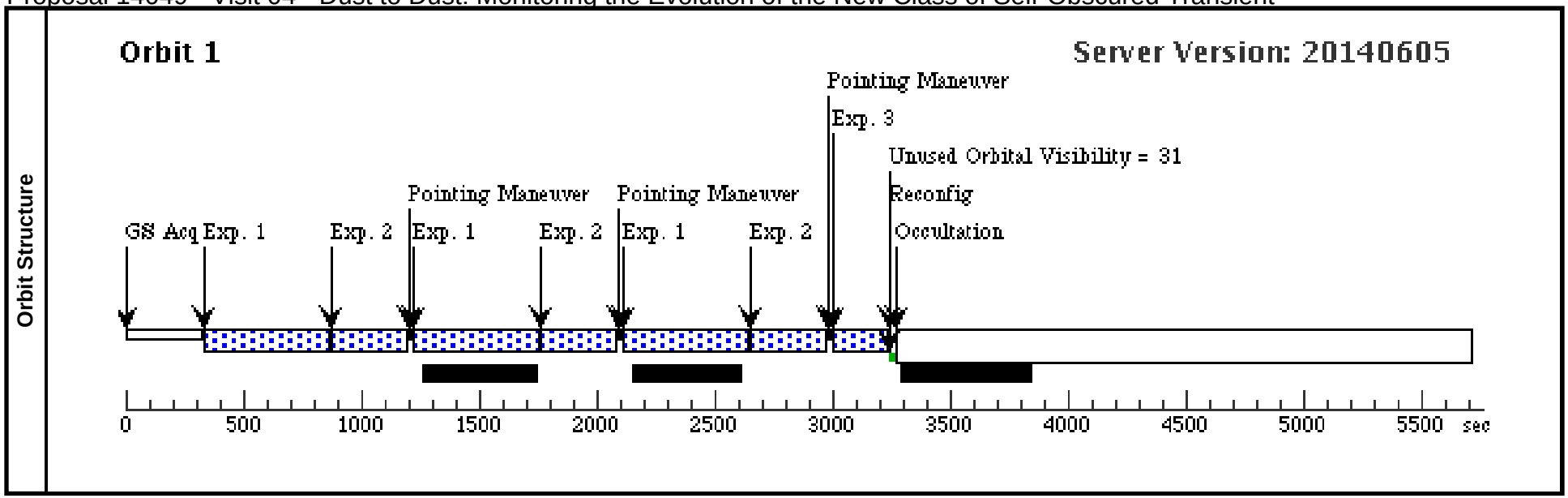
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NAME-NGC-300-OT2008-1	RA: 00 54 34.1600 (13.6423333d) Dec: -37 38 28.60 (-37.64128d) Equinox: J2000		V=25	Reference Frame: SIMBAD

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 (Total)/[Actual Dur.]	Orbit
1		(4) NAME-NGC-300-OT2008-1	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 04 (1)	499.231969 Secs (1497.696 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(4) NAME-NGC-300-OT2008-1	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=9; SAMP-SEQ=STEP100		Pattern 1, Exps 1-2 in Visit 04 (1)	299.231323 Secs (897.694 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(4) NAME-NGC-300-OT2008-1	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=8; SAMP-SEQ=STEP100			199.231 Secs (199.231 Secs) *[==>]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20140605
Pointing Maneuver
Exp. 3
Unused Orbital Visibility = 31
Pointing Maneuver
Pointing Maneuver
Reconfig
GS Acq
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Exp. 1
Exp. 2
Occultation
0
500
1000
1500
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sec