11217 - The Light Echoes around V838 Monocerotis

Cycle: 16, 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) V838-MON-ECHO-COPY	WFPC2	5	21-May-2007 16:02:38.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
02	(1) V838-MON-ECHO-COPY	WFPC2	5	21-May-2007 16:02:45.0	yes
03	(1) V838-MON-ECHO-COPY	WFPC2	5	21-May-2007 16:02:51.0	yes
04	(1) V838-MON-ECHO-COPY	WFPC2	5	21-May-2007 16:03:00.0	yes

20 Total Orbits Used

ABSTRACT

V838 Monocerotis, which burst upon the astronomical scene in early 2002, is a completely unanticipated new object. It underwent a large-amplitude and very luminous outburst, during which its spectrum remained that of an extremely cool supergiant. A rapidly evolving set of light echoes around V838 Mon was discovered soon after the outburst, and quickly became the most spectacular display of the phenomenon ever seen. These light echoes provide the means to accomplish three unique types of measurements based on continued HST imaging during the event: (1) Study effects of MHD turbulence at high resolution and in 3 dimensions; (2) Construct the first unambiguous and fully 3-D map of a circumstellar dust envelope in the Milky Way; (3) Study dust physics in a unique setting where the spectrum and light curve of the illumination, and the scattering angle, are unambiguously known. We have also used our HST data to determine the distance to V838 Mon through direct geometric techniques.

Because of the extreme rarity of light echoes, this is almost certainly the only opportunity to achieve such results during the lifetime of HST. We propose two visits during Cycle 16, in order to continue the mapping of the circumstellar dust and to accomplish the other goals listed above.

OBSERVING DESCRIPTION

This program contains two visits, 5 orbits each, for imaging of the light echo
around V838 Mon with the WFPC2. Images will be taken in V (F606). We will use 2 pointings with dithering to cover the entire echo.

The two visits during Cycle 16 are placed as far apart as possible, at the beginning
and end of the target visibility season. One visit will be in September 2007, and the other

in February 2008.

Visit

Proposal 11217, Visit 01 Mon May 21 20:03:03 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: BETWEEN 01-SEP-2007:00:00:00 AND 21-SEP-2007:00:00:00

Fixed Targets

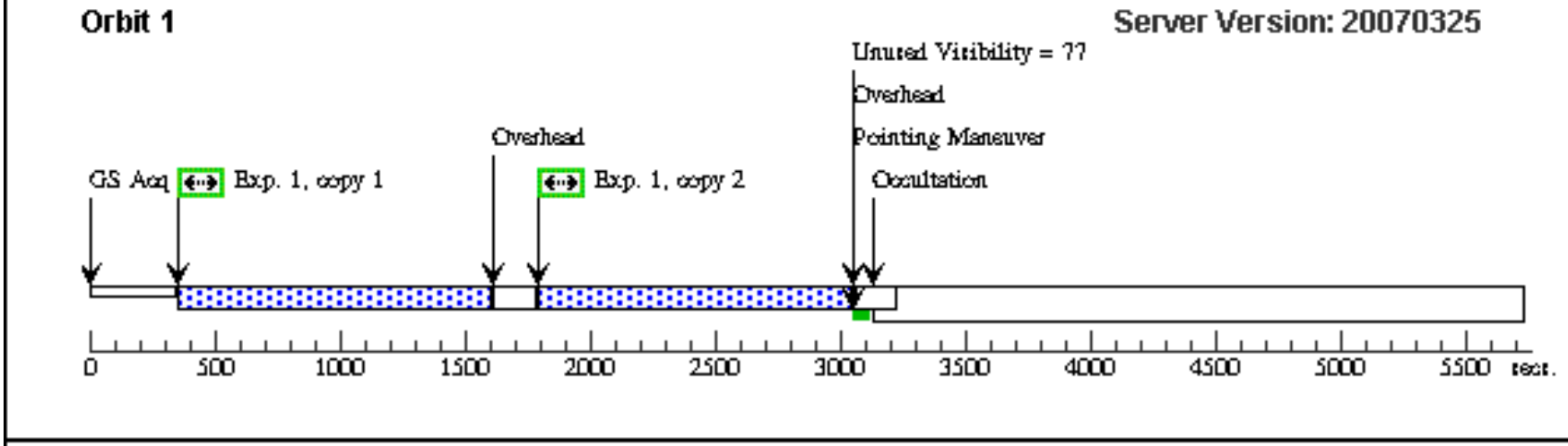
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V838-MON-ECHO-COPY	RA: 07 04 5.8200 (106.0242500d) Dec: -03 50 40.00 (-3.84444d) Equinox: J2000		V=15.5	Reference Frame: ICRS

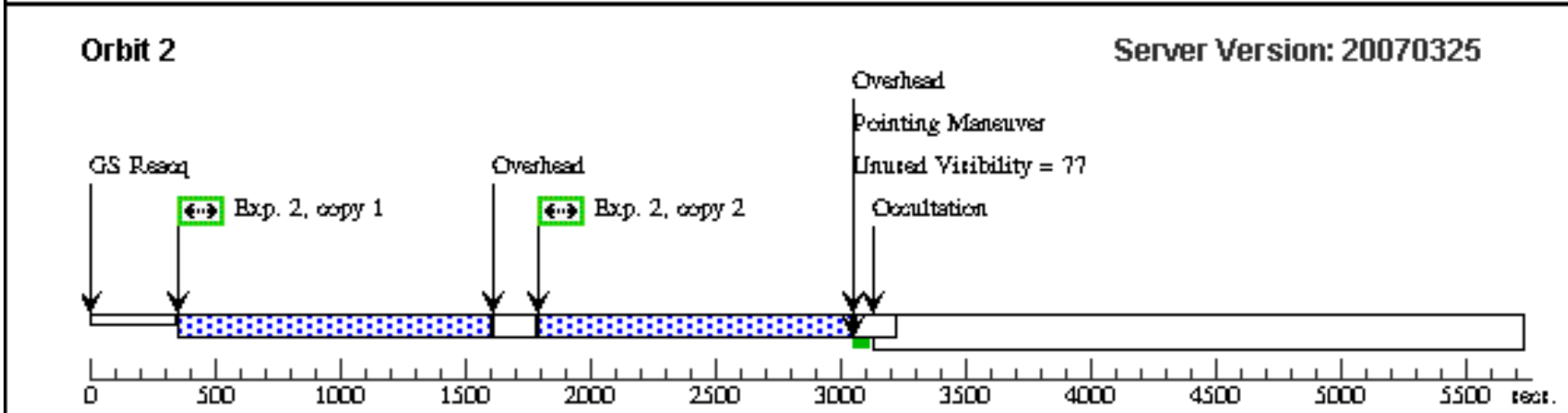
Comments: Geometric center of light echo, based on ACS images obtained in September 2006.

Exposures

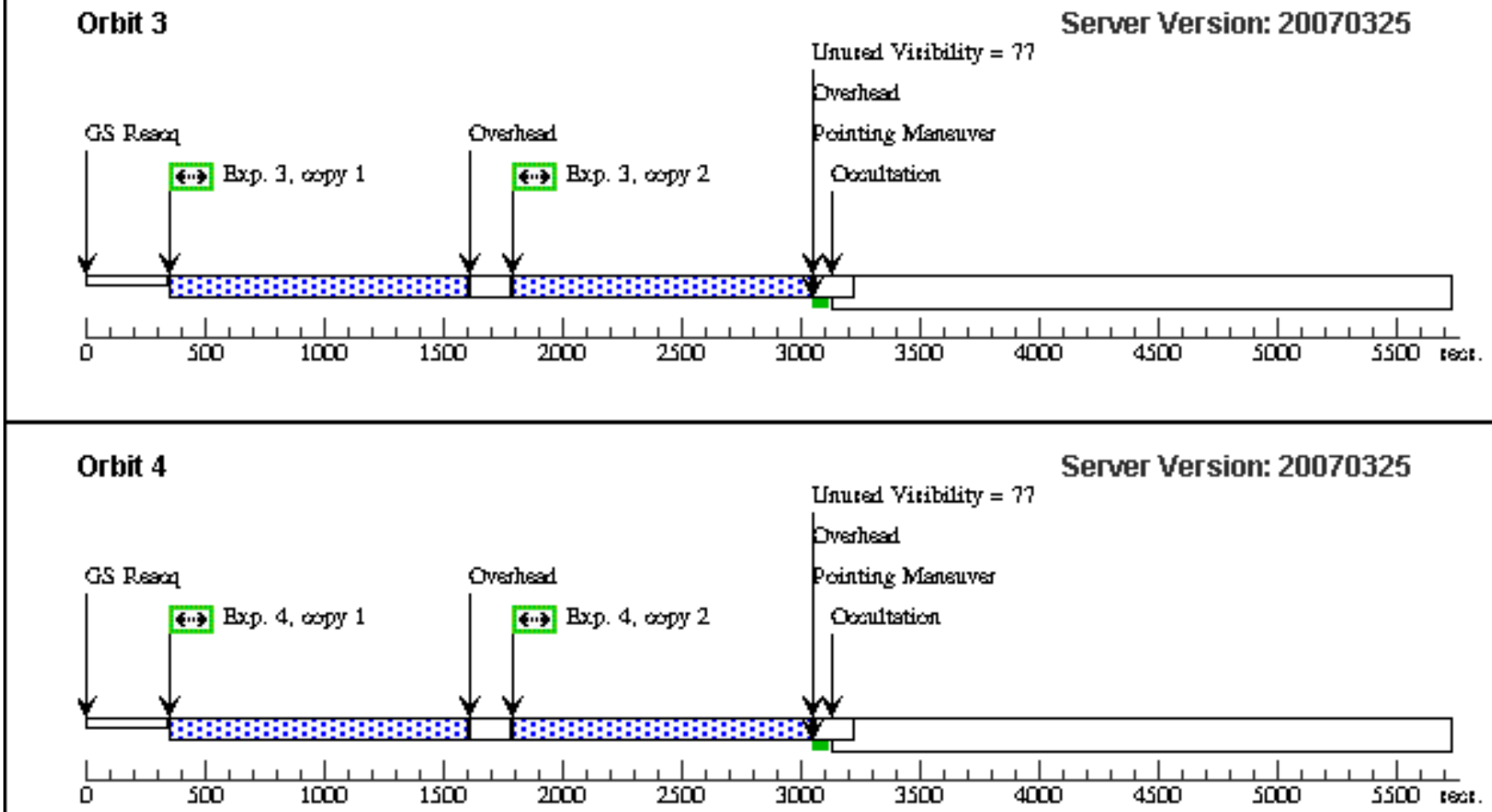
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.34,13.99		1100.0 Secs X 2 *[==>1100.0 Secs (Copy 1)]* *[==>1100.0 Secs (Copy 2)]*	***[1]***
2		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.838,14.239		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***
3		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 9.087,14.737		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[3]***
4		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.589,14.488		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[4]***
5		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.34,13.99		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[5]***

Orbit Structure

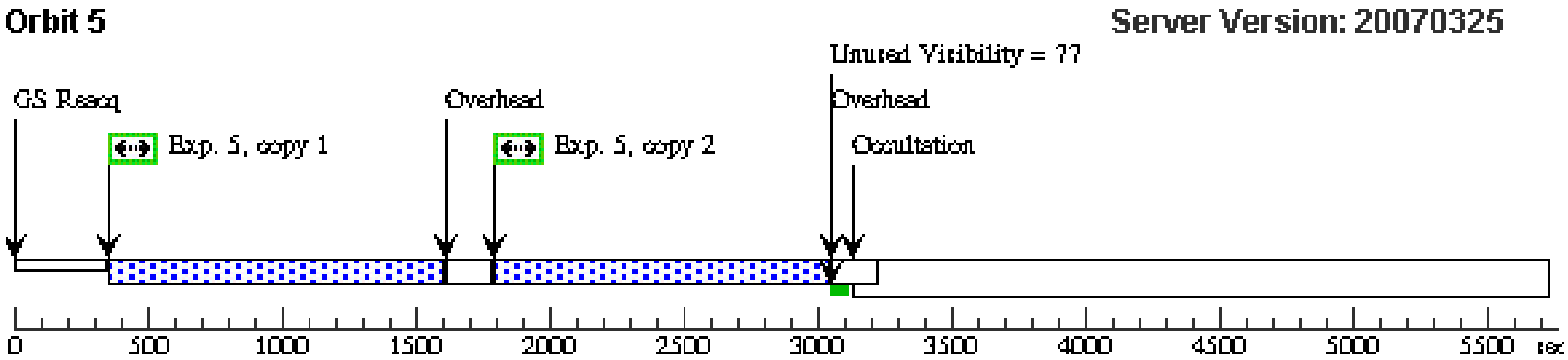




Orbit Structure (continued)



Orbit Structure (continued)



Visit

Proposal 11217, Visit 02 Mon May 21 20:03:04 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: SAME ORIENT AS 01; BETWEEN 01-SEP-2007:00:00:00 AND 21-SEP-2007:00:00:00

Fixed Targets

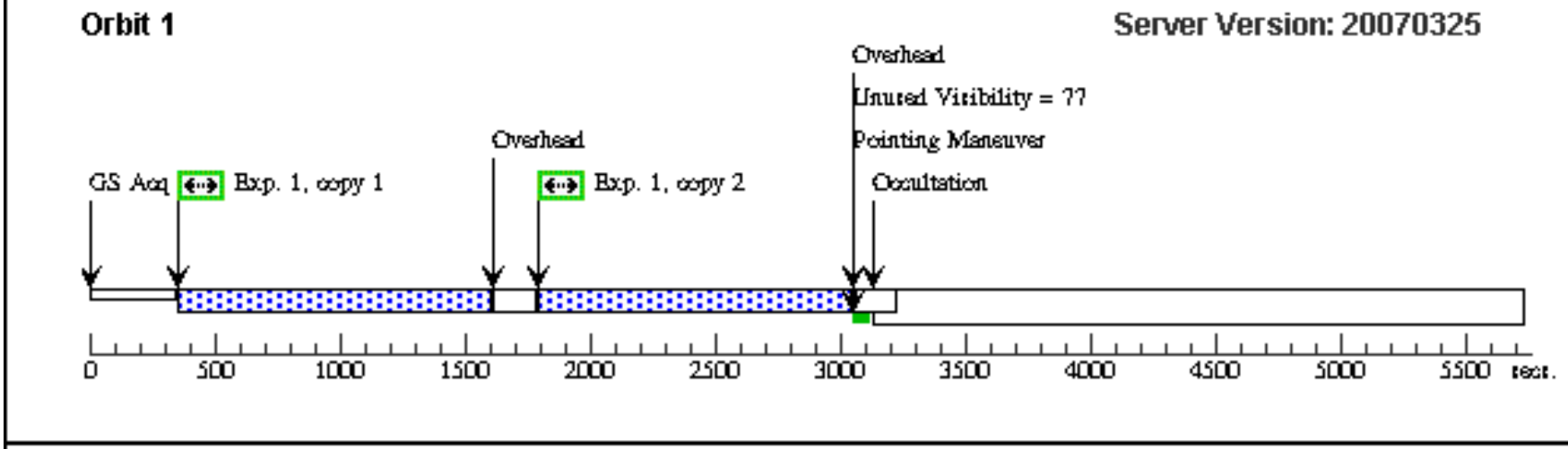
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V838-MON-ECHO-COPY	RA: 07 04 5.8200 (106.0242500d) Dec: -03 50 40.00 (-3.84444d) Equinox: J2000		V=15.5	Reference Frame: ICRS

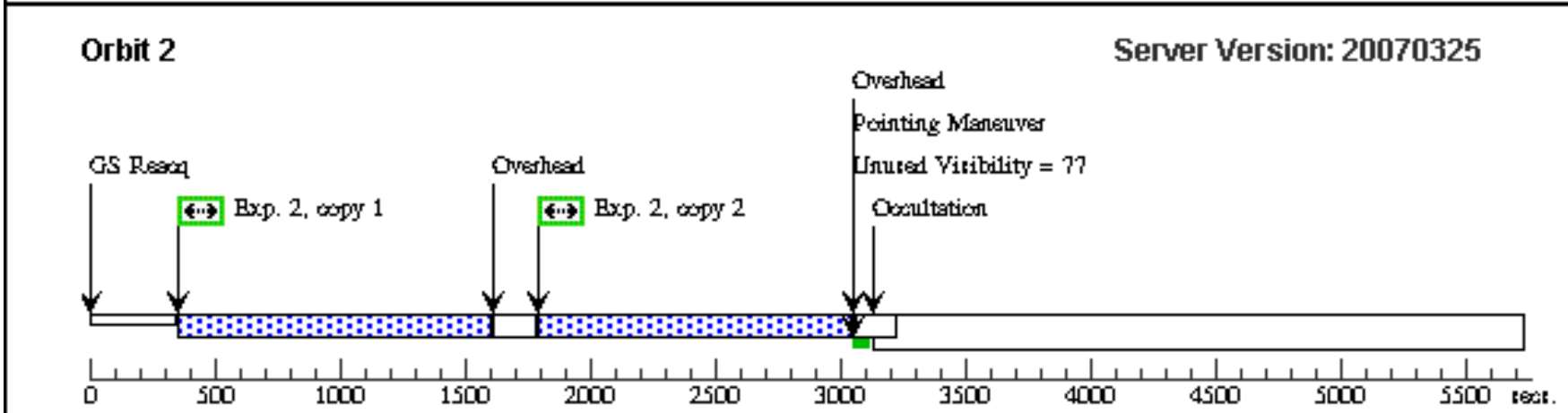
Comments: Geometric center of light echo, based on ACS images obtained in September 2006.

Exposures

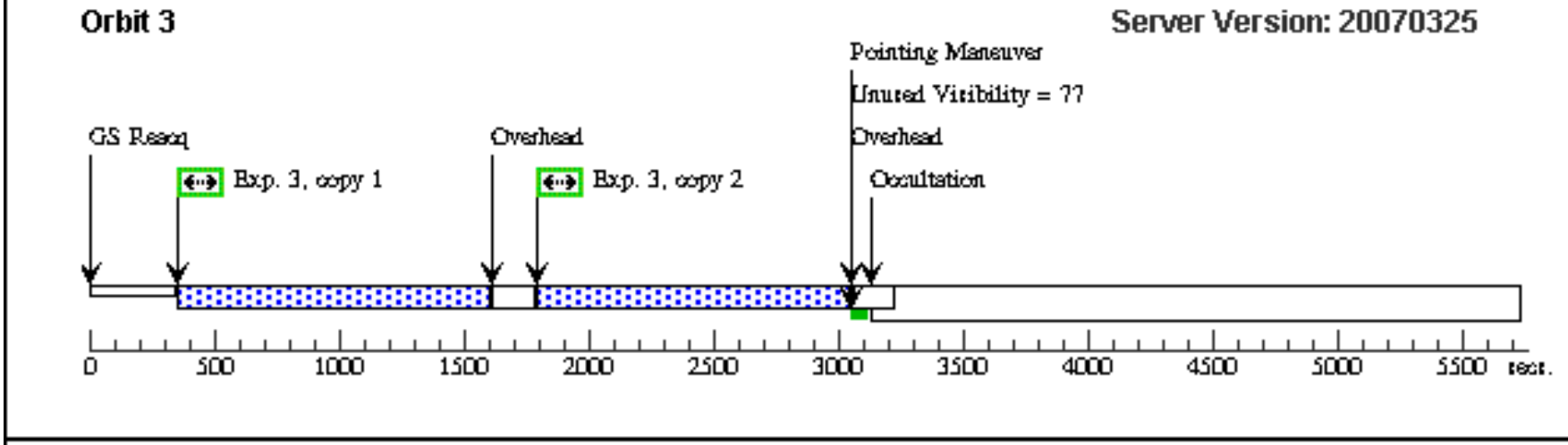
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.36,13.99		1100.0 Secs X 2 *[==>1100.0 Secs (Copy 1)]* *[==>1100.0 Secs (Copy 2)]*	***[1]***
2		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -65.862,14.239		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***
3		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -65.613,14.737		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[3]***
4		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.111,14.488		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[4]***
5		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.36,13.99		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[5]***

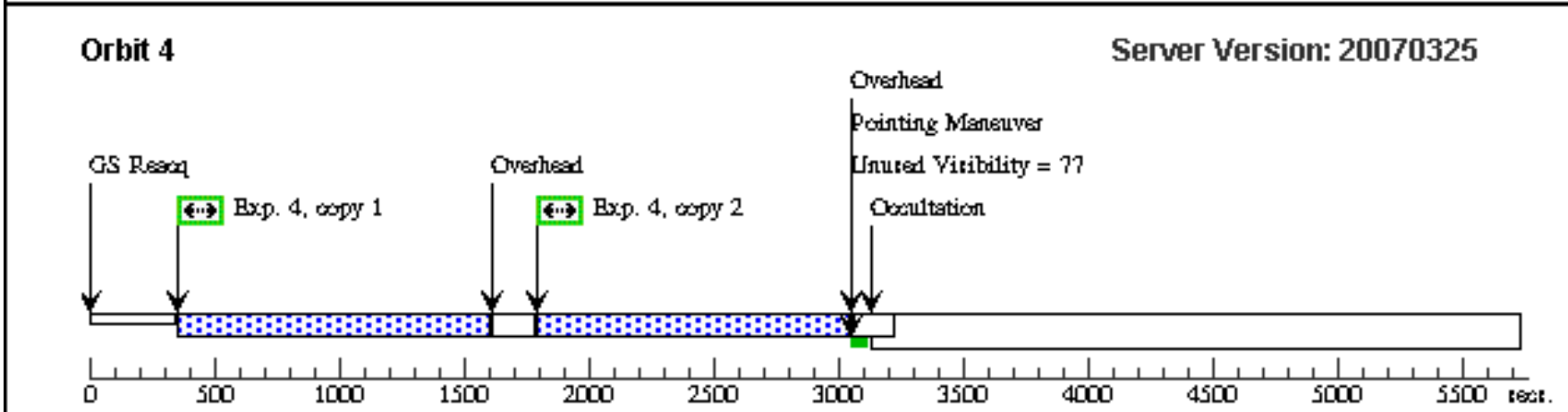
Orbit Structure



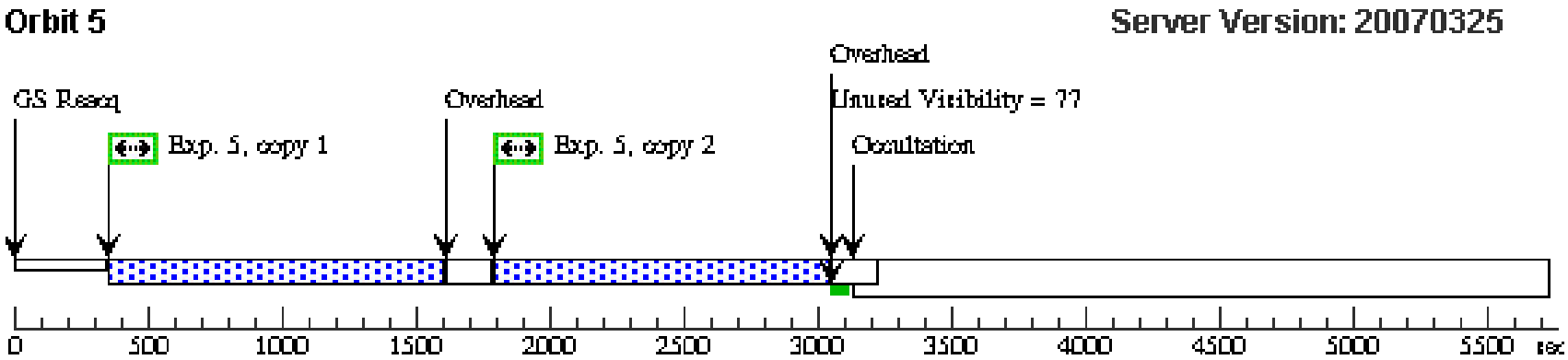


Orbit Structure (continued)





Orbit Structure (continued)



Visit

Proposal 11217, Visit 03 Mon May 21 20:03:05 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: BETWEEN 09-JAN-2008:00:00:00 AND 01-MAR-2008:00:00:00

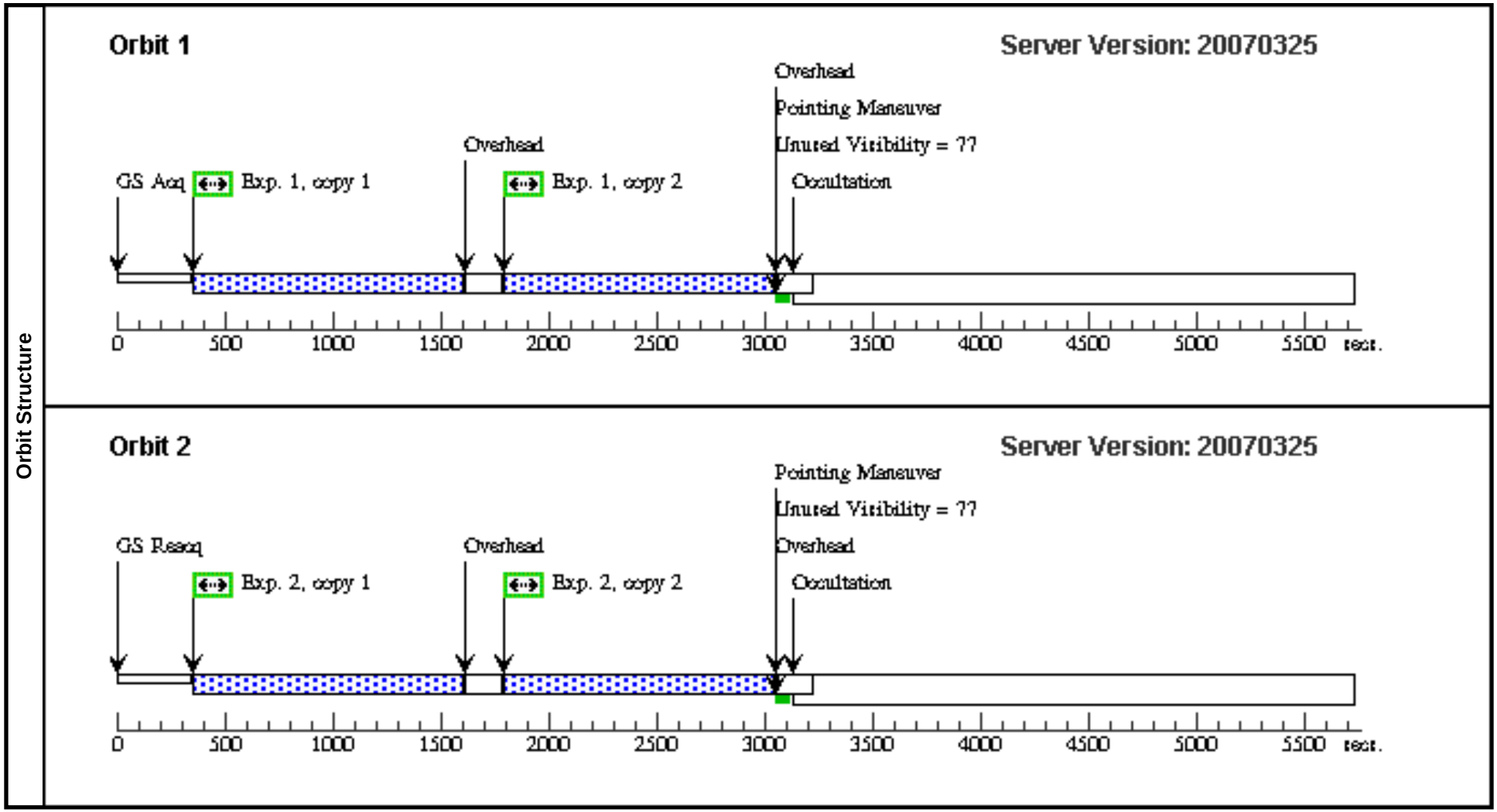
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V838-MON-ECHO-COPY	RA: 07 04 5.8200 (106.0242500d) Dec: -03 50 40.00 (-3.84444d) Equinox: J2000		V=15.5	Reference Frame: ICRS

Comments: Geometric center of light echo, based on ACS images obtained in September 2006.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.34,13.99		1100.0 Secs X 2 *[==>1100.0 Secs (Copy 1)]* *[==>1100.0 Secs (Copy 2)]*	***[1]***
2		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.838,14.239		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***
3		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 9.087,14.737		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[3]***
4		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.589,14.488		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[4]***
5		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 8.34,13.99		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[5]***


Orbit Structure
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Pointing Maneuver
Unused Visibility = ??
Overhead
GS Acq
Exp. 1, copy 1
Exp. 1, copy 2
Occultation
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500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.
Orbit 2
Server Version: 20070325
Pointing Maneuver
Unused Visibility = ??
GS Reacq
Overhead
Overhead
Exp. 2, copy 1
Exp. 2, copy 2
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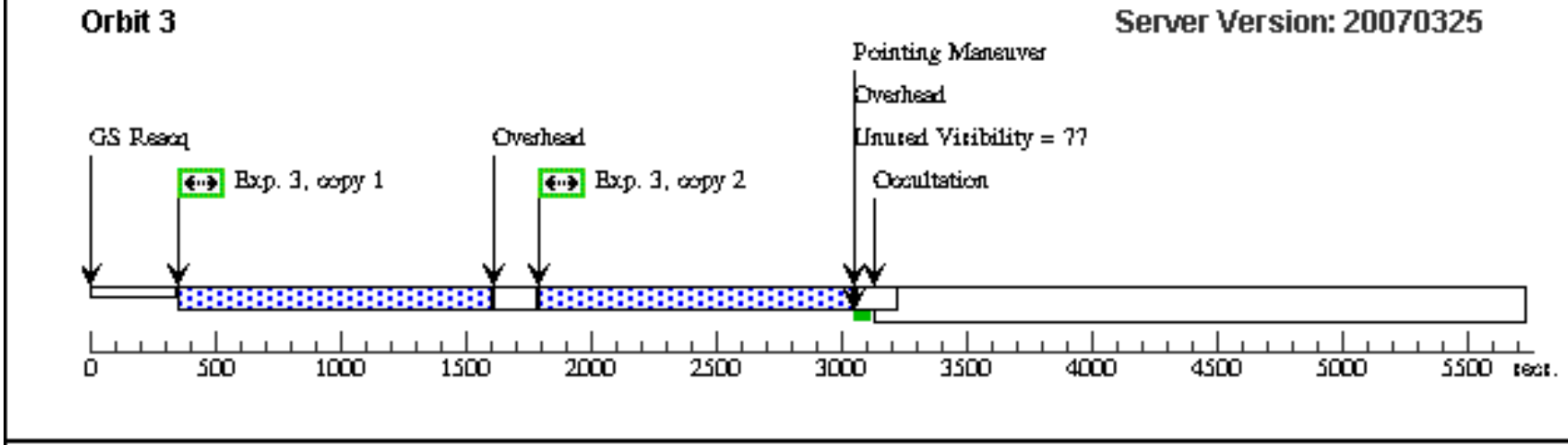
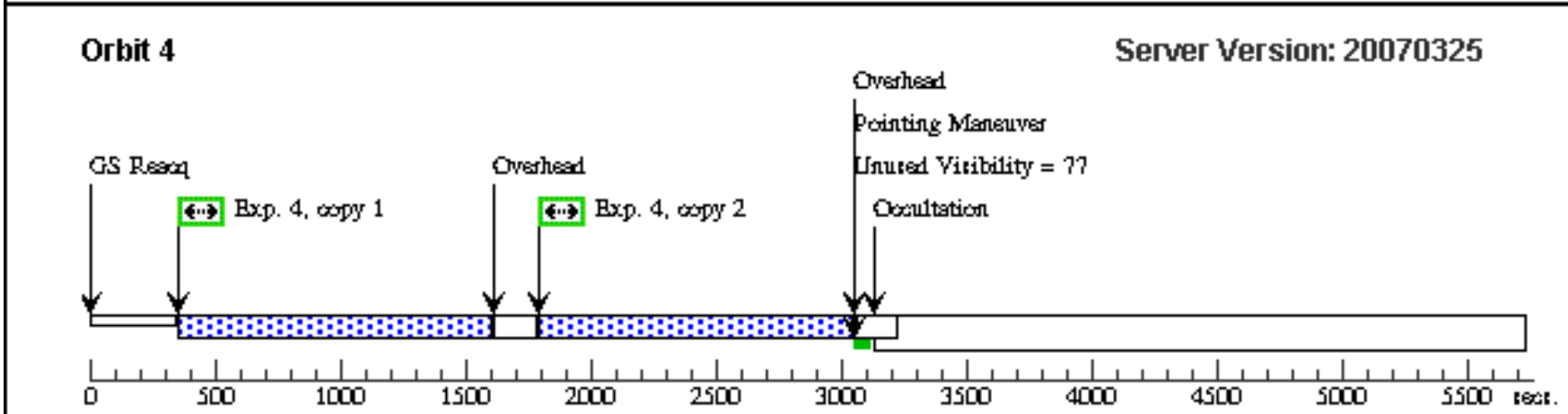
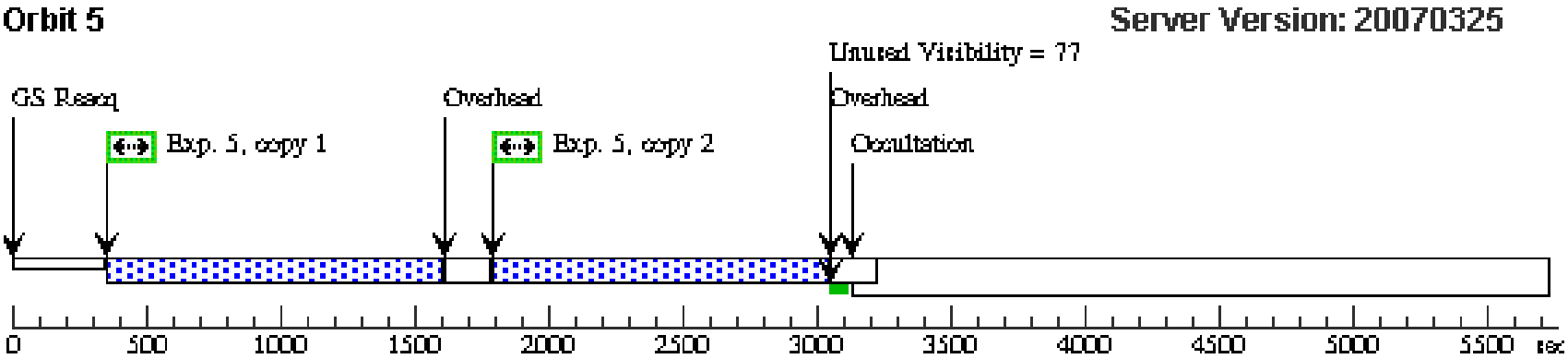
sec.

Orbit Structure (continued)





Orbit Structure (continued)



Visit

Proposal 11217, Visit 04 Mon May 21 20:03:06 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: SAME ORIENT AS 03; BETWEEN 09-JAN-2008:00:00:00 AND 01-MAR-2008:00:00:00

Fixed Targets

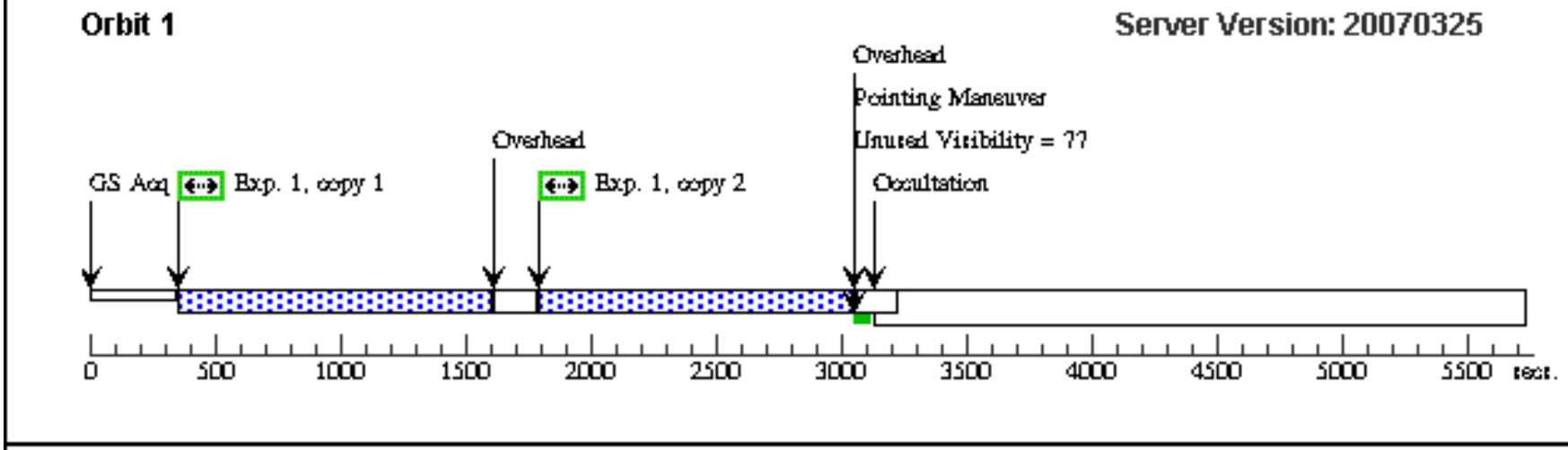
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V838-MON-ECHO-COPY	RA: 07 04 5.8200 (106.0242500d) Dec: -03 50 40.00 (-3.84444d) Equinox: J2000		V=15.5	Reference Frame: ICRS

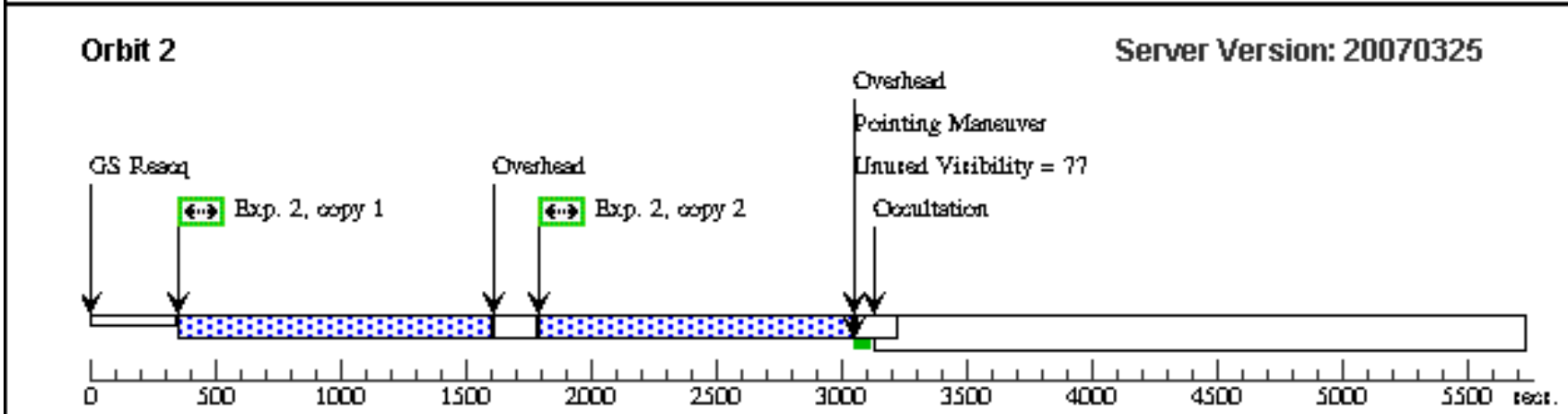
Comments: Geometric center of light echo, based on ACS images obtained in September 2006.

Exposures

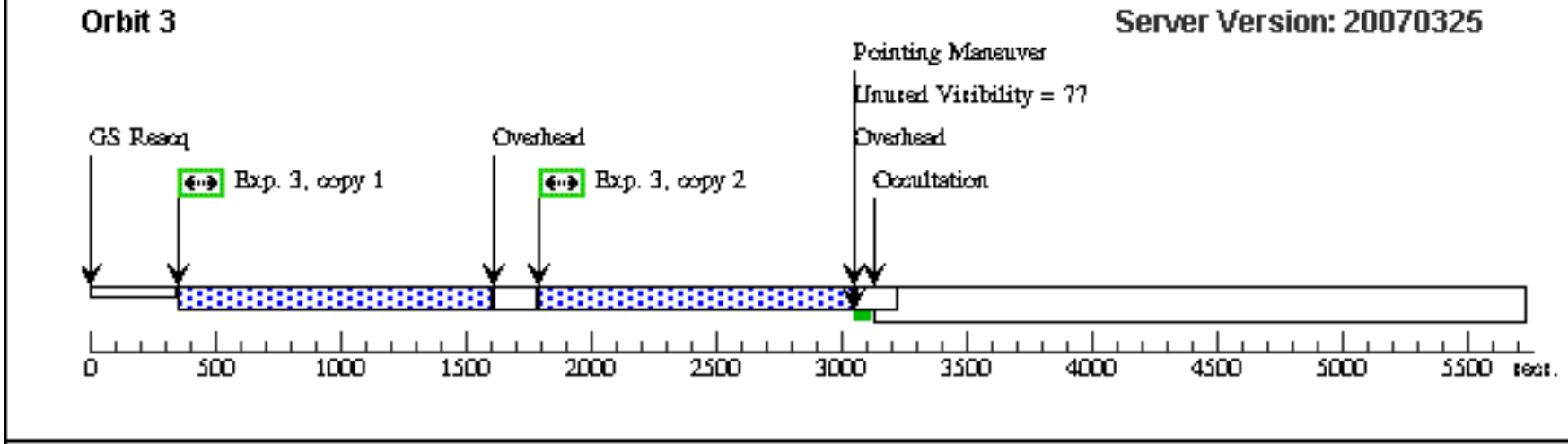
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.36,13.99		1100.0 Secs X 2 *[==>1100.0 Secs (Copy 1)]* *[==>1100.0 Secs (Copy 2)]*	***[1]***
2		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -65.862,14.239		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***
3		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -65.613,14.737		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[3]***
4		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.111,14.488		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[4]***
5		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.36,13.99		1100.0 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	***[5]***

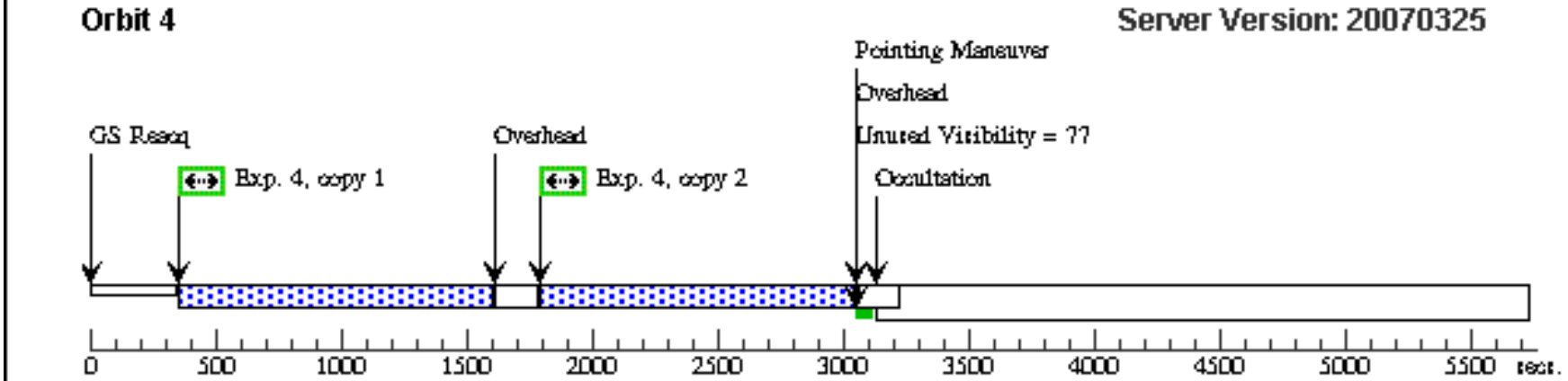
Orbit Structure





Orbit Structure (continued)





Orbit Structure (continued)