11968 - The Light Echoes around V838 Monocerotis: Cycle 16 DD

Cycle: 16, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Howard E. Bond (PI)	**Space Telescope Science Institute**	**bond@stsci.edu**
Dr. Romano Corradi (CoI) (ESA Member)	Isaac Newton Group, Observatorio del Roque de los Muchachos	rcorradi@ing.iac.es
Dr. Lisa A. Crause (CoI)	South African Astronomical Observatory	lisa@saao.ac.za
Dr. Michael A. Dopita (CoI)	Australian National University	Michael.Dopita@anu.edu.au
Dr. Arne A. Henden (CoI)	American Association Of Variable Star Observers	arne@aavso.org
Dr. Zolt Levay (CoI)	Space Telescope Science Institute	levay@stsci.edu
Dr. Ulisse Munari (CoI) (ESA Member)	Universita di Padova	munari@pd.astro.it
Dr. Nino Panagia (CoI)	Space Telescope Science Institute	panagia@stsci.edu
Dr. William B. Sparks (CoI)	Space Telescope Science Institute	sparks@stsci.edu
Dr. Sumner G. Starrfield (CoI)	Arizona State University	sumner.starrfield@asu.edu
Dr. Ben E. Sugerman (CoI)	Goucher College	ben.sugerman@goucher.edu
Dr. R. Mark Wagner (CoI)	The Ohio State University Research Foundation	rmw@as.arizona.edu
Dr. Richard L. White (CoI)	Space Telescope Science Institute	rlw@stsci.edu

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	7	16-Dec-2008 21:12:09.0	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	7	16-Dec-2008 21:12:19.0	yes

14 Total Orbits Used

ABSTRACT

This is a DD program in which we propose to obtain WFPC2 imaging of the light echo around V838 Mon in late 2008 or early 2009. We were awarded Cycle 17 time to image the echo with ACS at 2 epochs (3+4 orbits). To obtain data of similar quality with WFPC2 requires 7 orbits at 2 different pointings. Because of the SM4 delay, we are therefore requesting a 14-orbit DD program for Cycle 16, leaving the Cycle 17 allocation unchanged for continued monitoring of the event in late 2009 and 2010.

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, quickly becoming the most spectacular display of the phenomenon yet seen. These light echoes provide the means to accomplish three unique types of measurements based on continued HST imaging: (1) study MHD turbulence at high resolution and in 3 dimensions; (2) construct the first unambiguous and fully 3-D map of a circumstellar dust envelope; (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 a novel geometric technique.

Because of the extreme rarity of light echoes, this program of regular monitoring provides the only opportunity to achieve such results during the HST lifetime. We propose WFPC2 imaging in late 2008/early 2009, in order to continue the mapping of the circumstellar dust and to accomplish the other goals listed above.

OBSERVING DESCRIPTION

This is a 14-orbit DD program for imaging of the light echo around V838 Mon with the WFPC2. Images will be taken in broad-band V (F606W). We will use 2 pointings of 7 orbits each, with dithering, to cover nearly the entire echo.

The observations should be done before the end of the target visibility season in early 2009.

Visit

Proposal 11968, Visit 01 Wed Dec 17 02:12:25 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: BETWEEN 15-DEC-2008:00:00:00 AND 01-MAR-2009:00:00:00

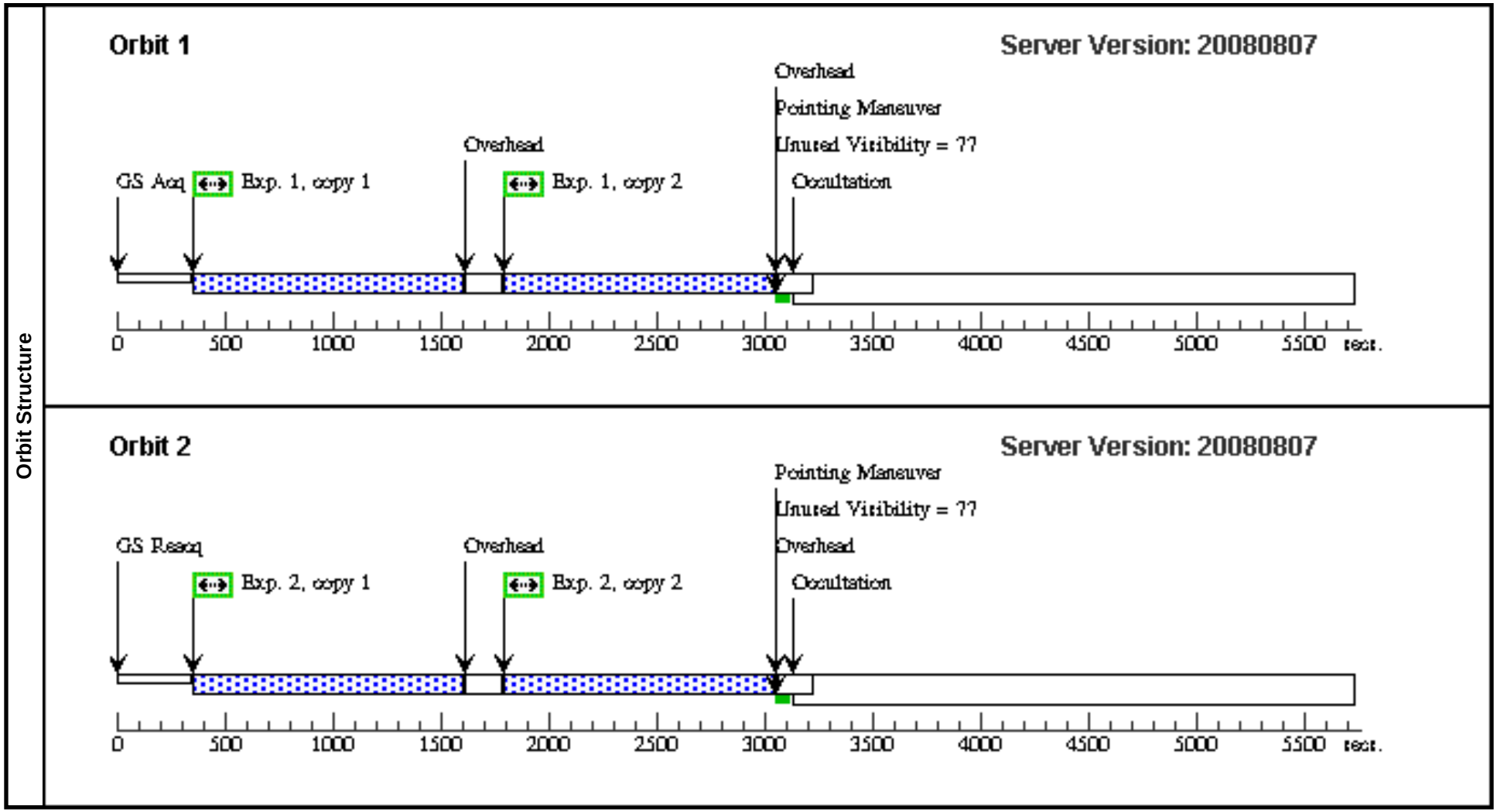
Fixed Targets

#	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

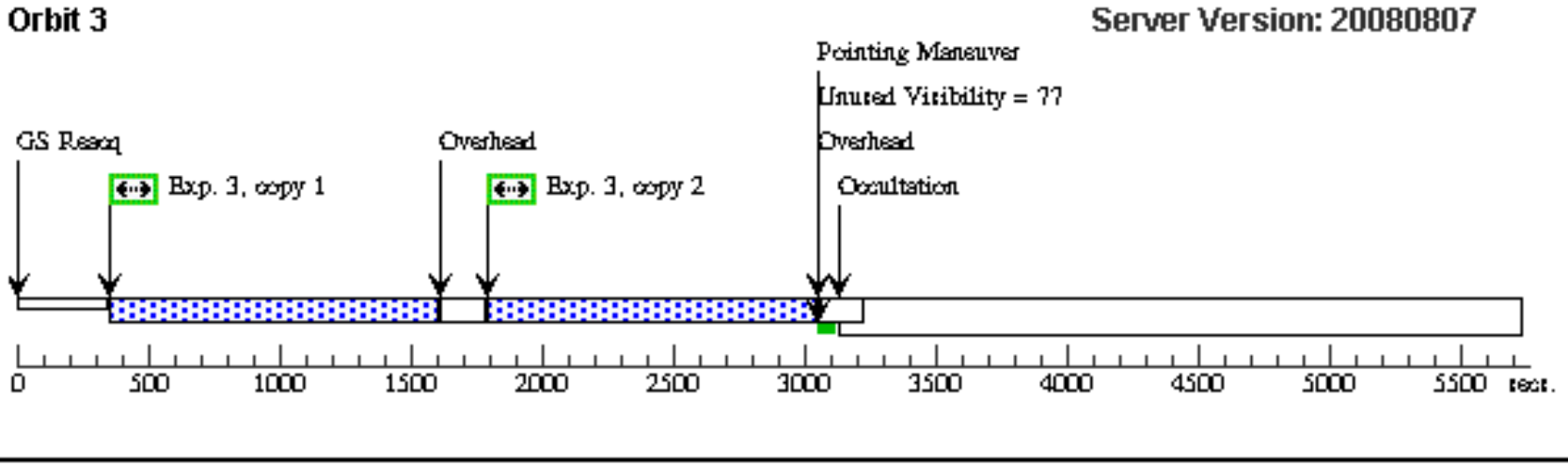
Comments: Geometric center of light echo, based on ACS images obtained in September 2006.

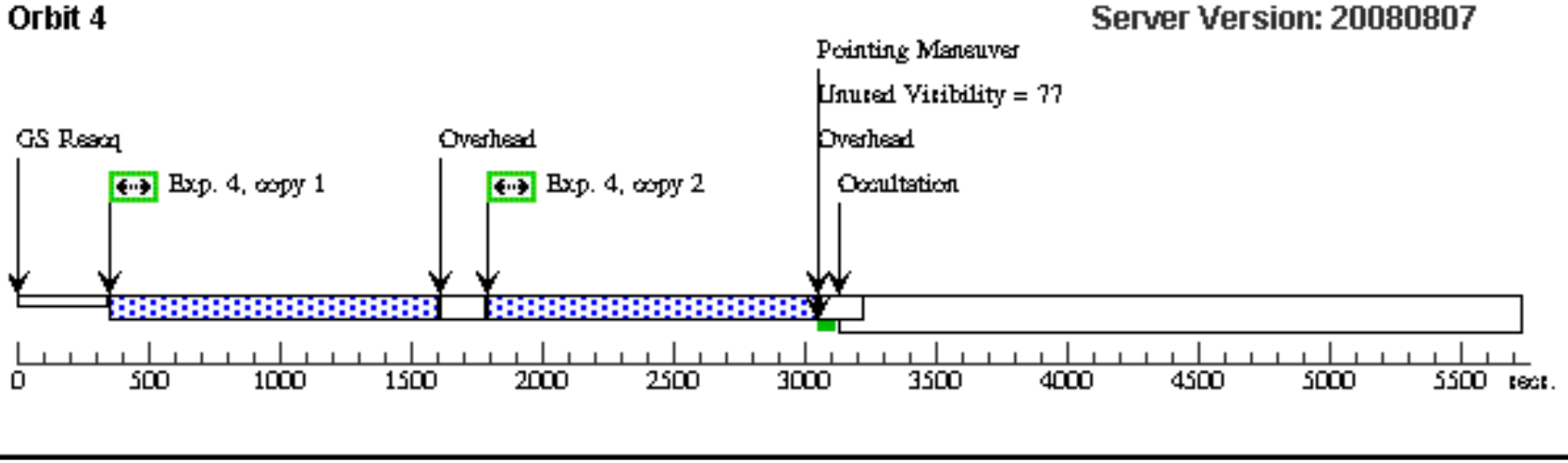
Exposures

#	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]***
6		(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)]*	***[6]***
7		(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)]*	***[7]***

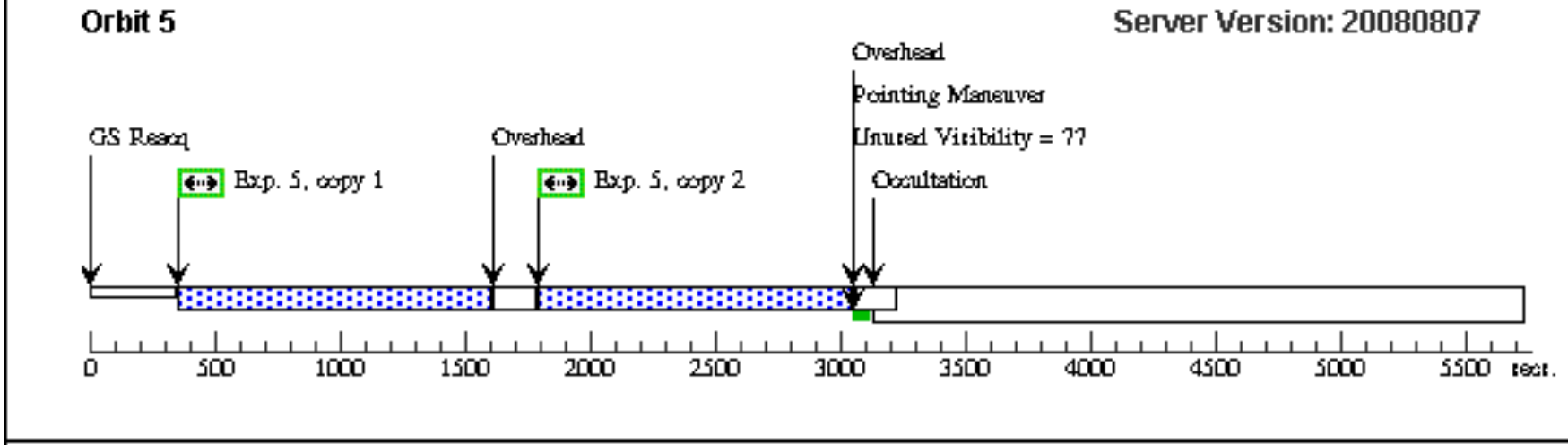

Orbit Structure
Orbit 1
Server Version: 20080807
Overhead
Pointing Maneuver
Unused Visibility = ??
Overhead
GS Acq
Exp. 1, copy 1
Exp. 1, copy 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.
Orbit 2
Server Version: 20080807
Pointing Maneuver
Unused Visibility = ??
GS Reacq
Overhead
Overhead
Exp. 2, copy 1
Exp. 2, copy 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.

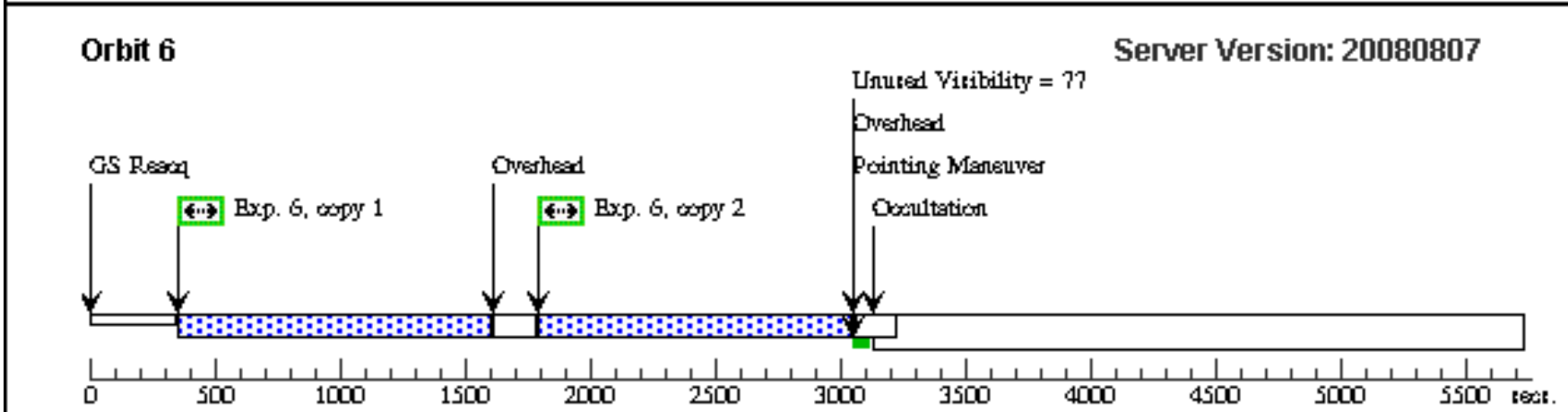
Orbit Structure (continued)



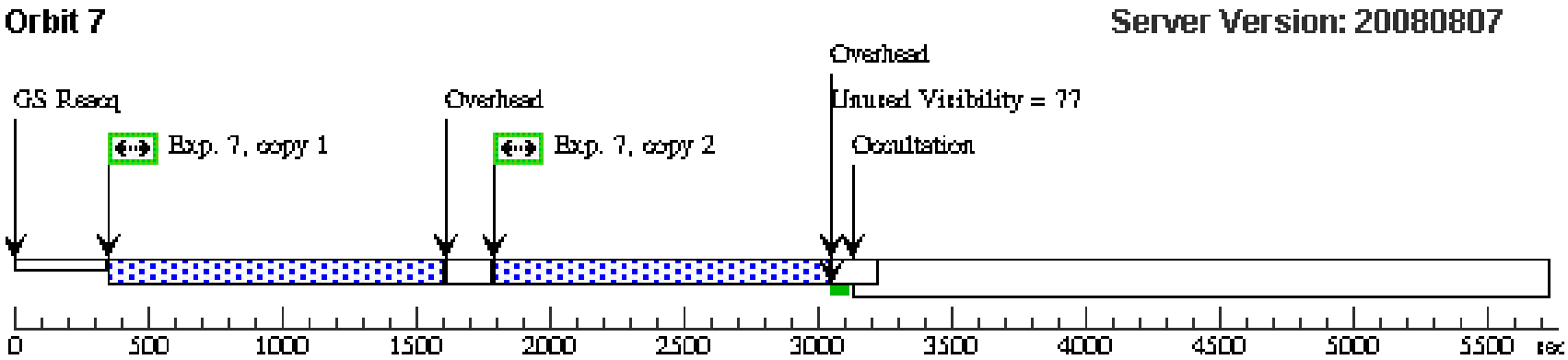


Orbit Structure (continued)





Orbit Structure (continued)



Visit

Proposal 11968, Visit 02 Wed Dec 17 02:12:27 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: SAME ORIENT AS 01; BETWEEN 15-DEC-2008:00:00:00 AND 01-MAR-2009:00:00:00

Fixed Targets

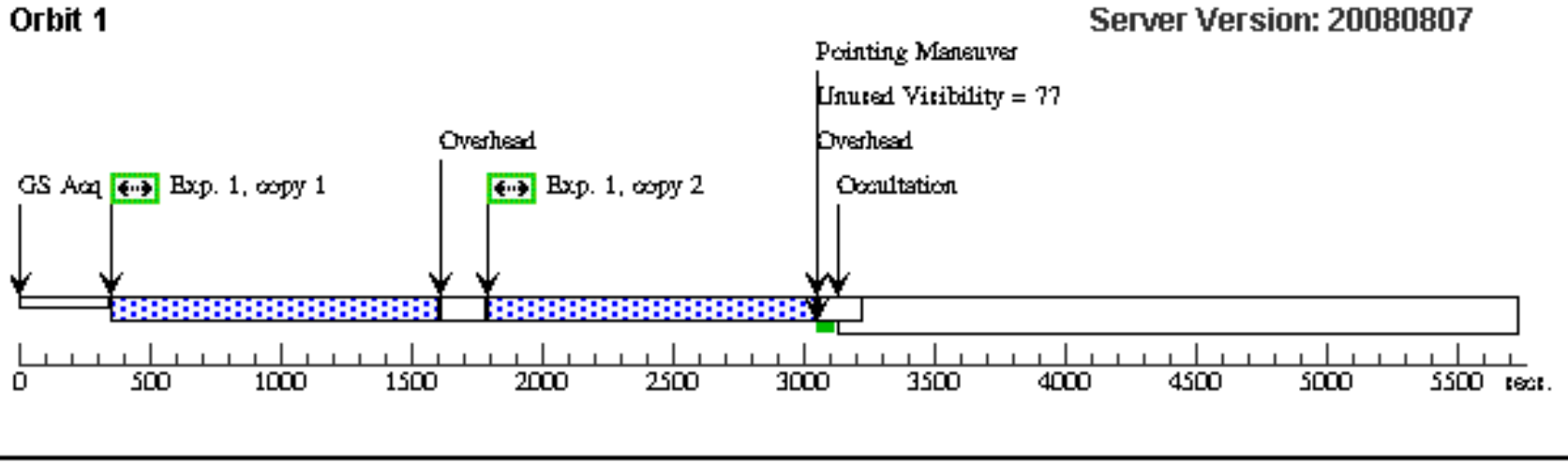
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V838-MON-ECHO-COPY	RA: 07 04 5.8200 (106.0242500d) Dec: -03 50 40.00 (-3.84444d) Equinox: J2000		V=15.5	Reference Frame: ICRS

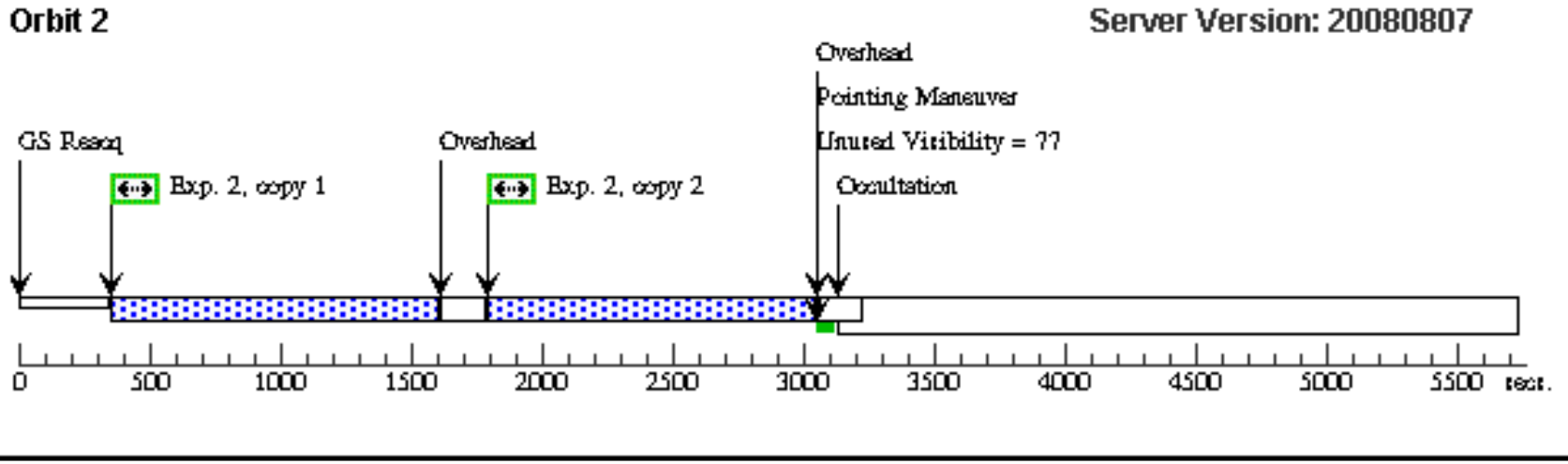
Comments: Geometric center of light echo, based on ACS images obtained in September 2006.

Exposures

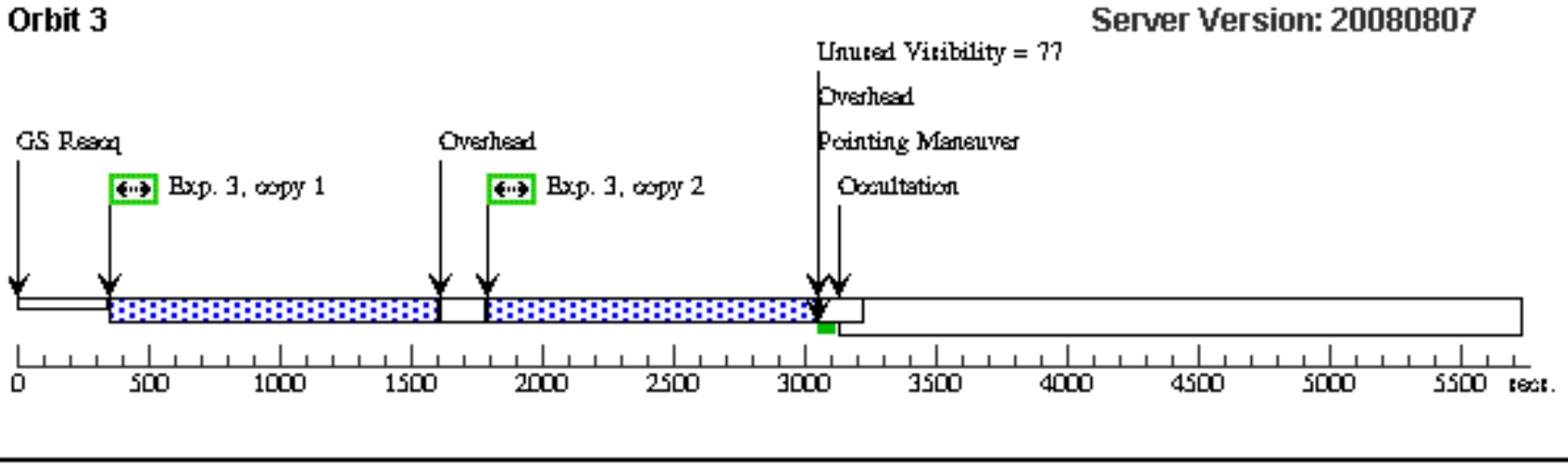
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) V838-MON-ECHO-COPY	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG -66.36,13.99		1100.0 Secs X 2 *[==>1100.0 Secs (Copy 1)]* *[==>1100.0 Secs (Copy 2)]*	***[1]***
2		(1) V838-MON-ECHO-COPY	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]***
6		(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)]*	***[6]***
7		(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)]*	***[7]***

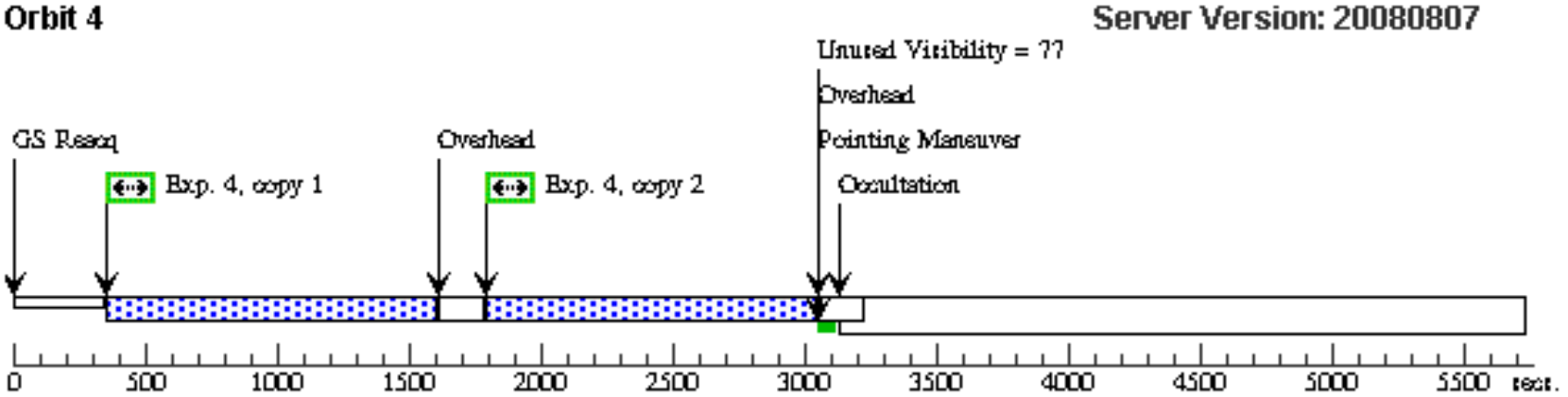
Orbit Structure



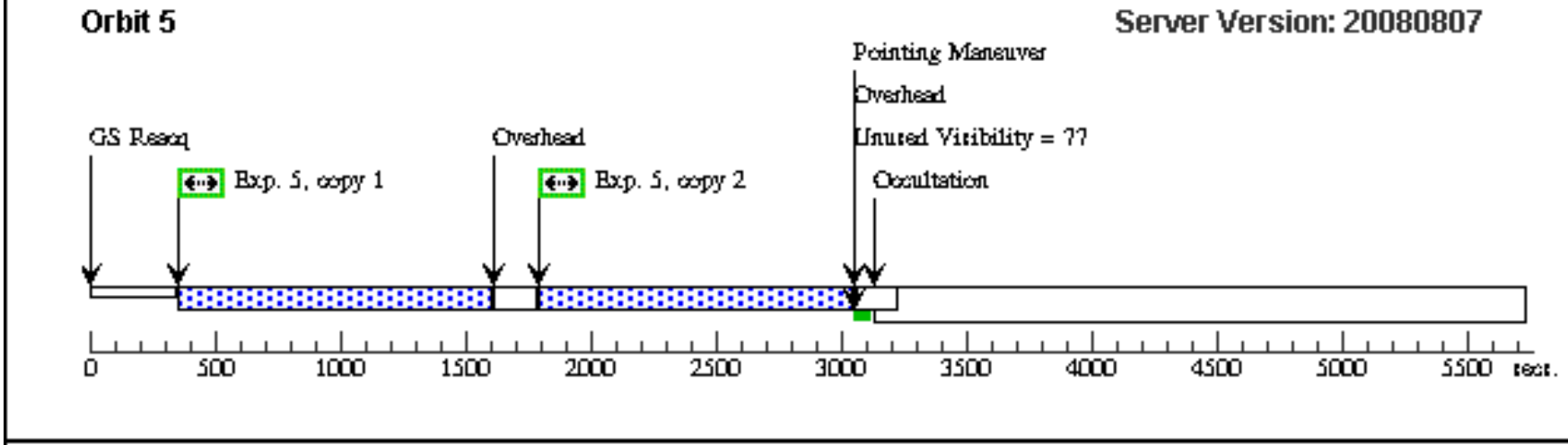


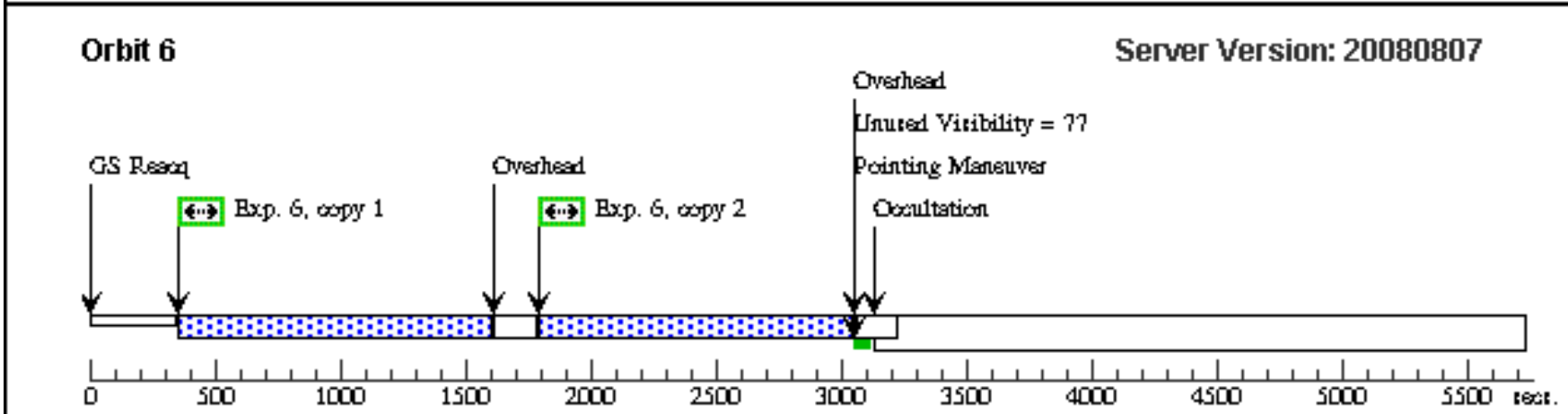
Orbit Structure (continued)





Orbit Structure (continued)





Orbit Structure (continued)