12599 - The Light Echoes around V838 Monocerotis

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Howard E. Bond (PI)	**Space Telescope Science Institute**	**bond@stsci.edu**
Dr. Romano L.M. Corradi (CoI) (ESA Member)	Instituto de Astrofisica de Canarias	rcorradi@ing.iac.es
Dr. Lisa A. Crause (CoI)	South African Astronomical Observatory	lisa@saao.ac.za
Prof. 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. Zoltan Levay (CoI)	Space Telescope Science Institute	levay@stsci.edu
Dr. Ulisse Munari (CoI) (ESA Member)	Universita di Padova	munari@pd.astro.it
Prof. 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)	University of Arizona	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	ACS/WFC	6	05-Jul-2011 21:32:32.0	yes

6 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 yet 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 a novel direct geometric technique, and the results showed that V838 Mon had a maximum luminosity brighter than a classical nova.

Because of the extreme rarity of light echoes, this is almost certainly the only opportunity to achieve such results during the lifetime of HST. Similar intermediate-luminosity red transients are now being discovered in nearby galaxies, and it has become important to understand the physics of their outbursts and the nature of their progenitors. We propose one visit during Cycle 19, using ACS, in order to continue the mapping of the circumstellar dust and to accomplish the other goals listed above.

OBSERVING DESCRIPTION

This program contains one 6-orbit visit for imaging of the light echo around V838 Mon with the ACS/WFC. Images will be taken in I (F814W). We will use a 3-point dither to remove the gap between the chips, with 6 exposures at each of the 3 points. The observation should be done near the end of Cycle 19.

Visit

Proposal 12599, Visit 01 Wed Jul 06 01:32:40 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: PCS MODE FINE; SCHED 40%; BETWEEN 01-AUG-2012 AND 30-SEP-2012

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=true		(1)

Fixed Targets

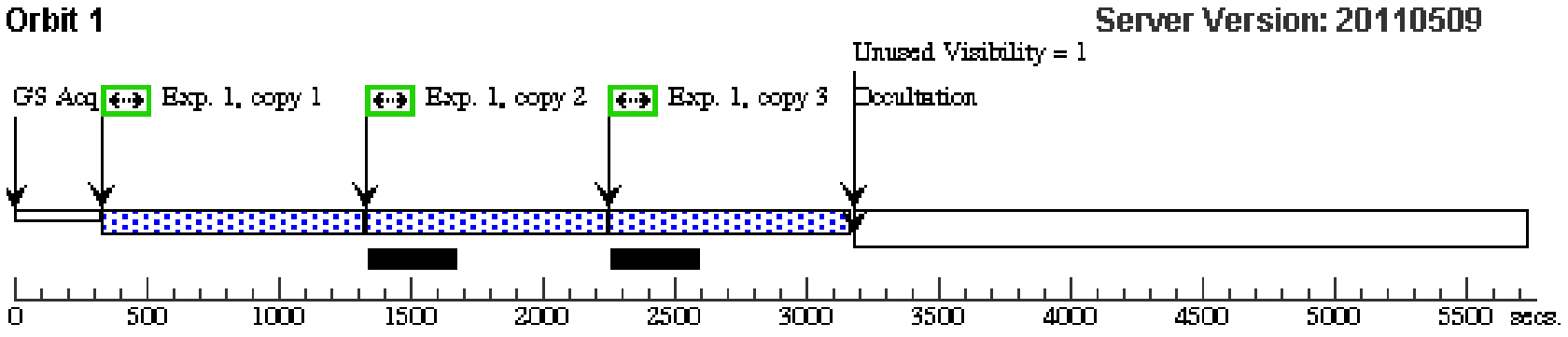
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V838-MON-ECHO-COPY	RA: 07 04 5.8200 (106.0242500d) Dec: -03 50 40.00 (-3.84444d) Equinox: J2000		V=15.5	Reference Frame: ICRS

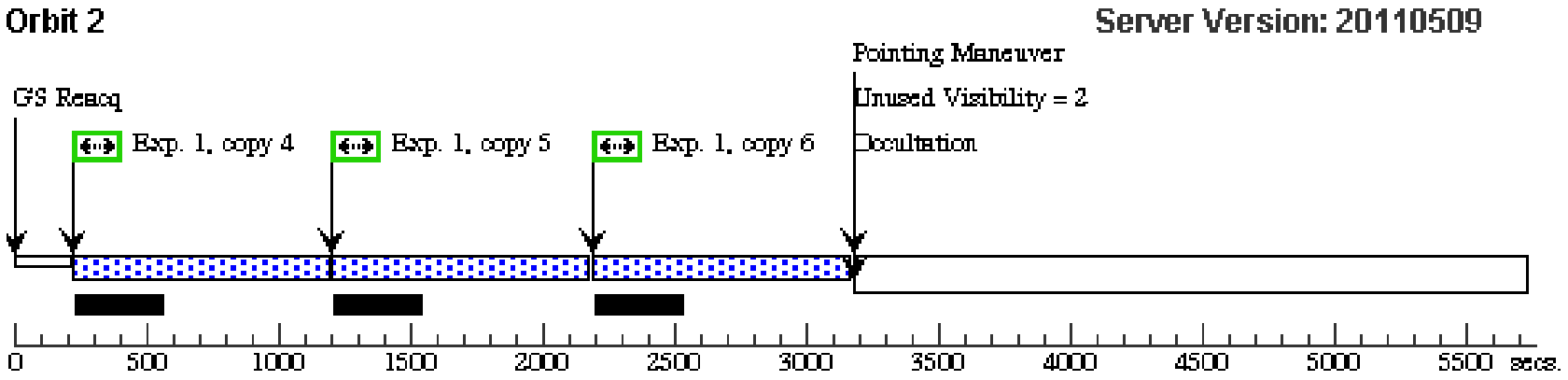
Comments: Geometric center of light echo, based on data from Cycle 14. 6/14/06: updated to ICRS reference frame, using galex website.

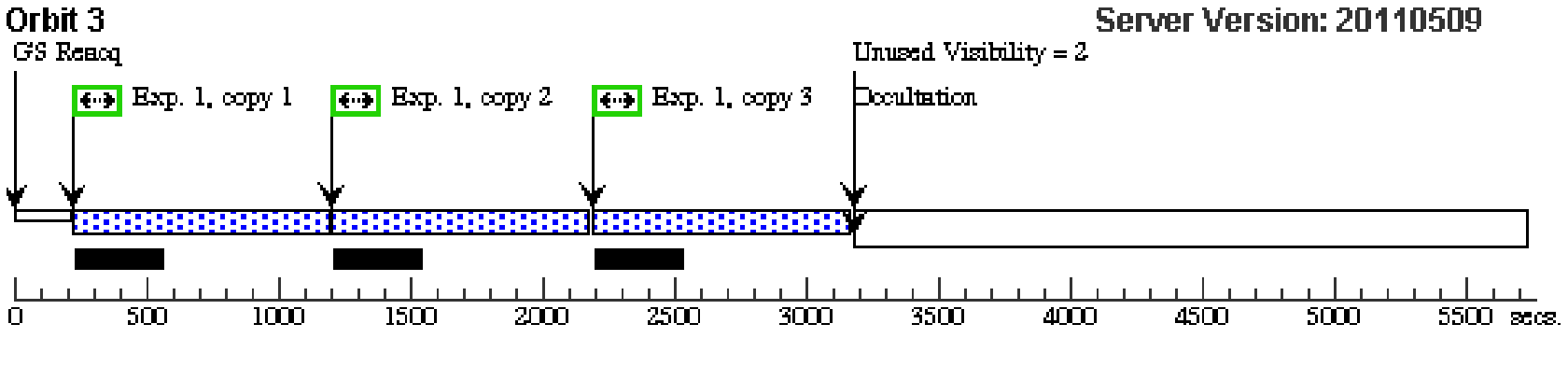
Exposures

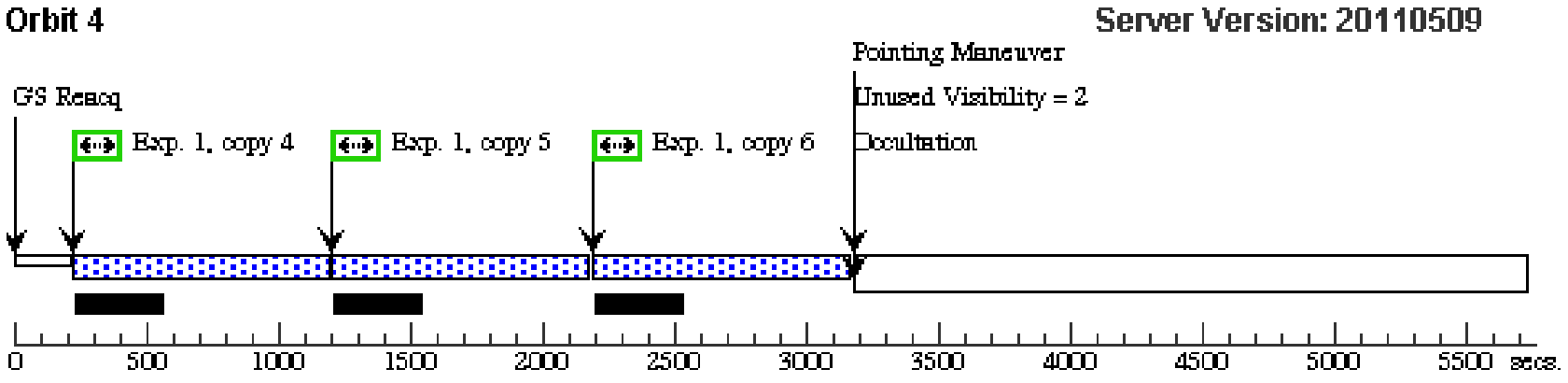
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) V838-MON-ECHO-COPY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Pattern 1, Exps 1-1 in Visit 01 (1)	750 Secs X 6	
								[==>784.0 Secs (Pattern 1, Copy 1)] *[==>784.0 Secs (Pattern 1, Copy 2)]* *[==>784.0 Secs (Pattern 1, Copy 3)]*	***[1]***
								[==>848.0 Secs (Pattern 1, Copy 4)] *[==>848.0 Secs (Pattern 1, Copy 5)]* *[==>848.0 Secs (Pattern 1, Copy 6)]*	***[2]***
								[==>848.0 Secs (Pattern 2, Copy 1)] *[==>848.0 Secs (Pattern 2, Copy 2)]* *[==>848.0 Secs (Pattern 2, Copy 3)]*	***[3]***
								[==>848.0 Secs (Pattern 2, Copy 4)] *[==>848.0 Secs (Pattern 2, Copy 5)]* *[==>848.0 Secs (Pattern 2, Copy 6)]*	***[4]***
								[==>848.0 Secs (Pattern 3, Copy 1)] *[==>848.0 Secs (Pattern 3, Copy 2)]* *[==>848.0 Secs (Pattern 3, Copy 3)]*	***[5]***
								[==>848.0 Secs (Pattern 3, Copy 4)] *[==>848.0 Secs (Pattern 3, Copy 5)]* *[==>848.0 Secs (Pattern 3, Copy 6)]*	***[6]***

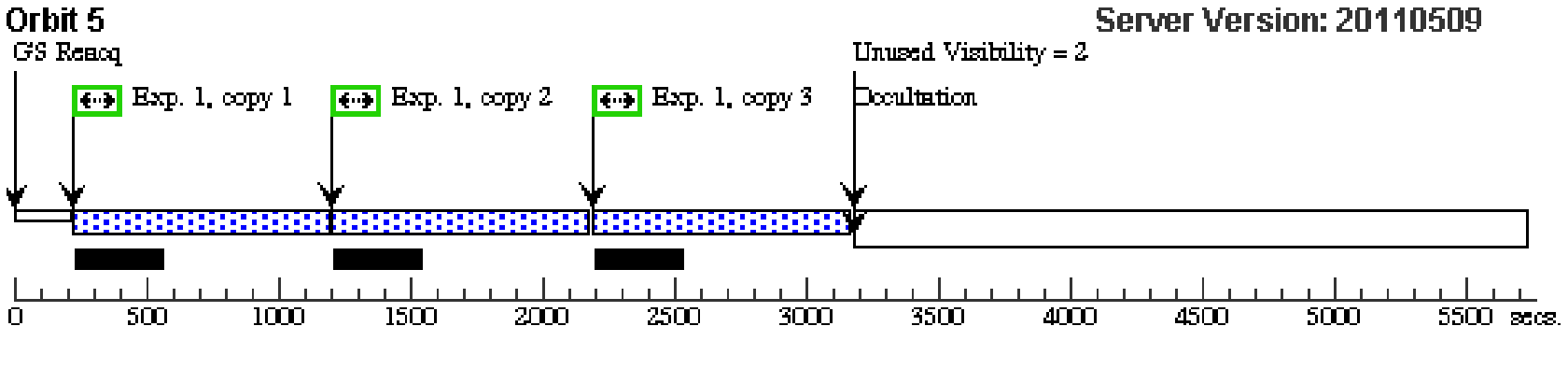
Orbit Structure

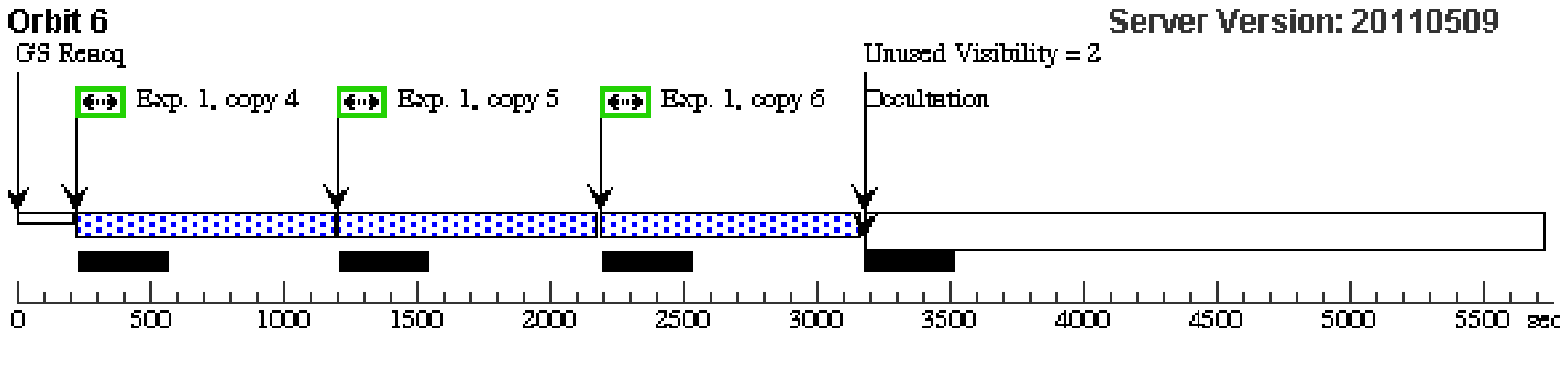







Orbit 4
Server Version: 20110509
Pointing Maneuver
GS Reacq
Unused Visibility = 2
Exp. 1, copy 4
Exp. 1, copy 5
Exp. 1, copy 6
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 5
Server Version: 20110509
GS Reacq
Unused Visibility = 2
Exp. 1, copy 1
Exp. 1, copy 2
Exp. 1, copy 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 6
Server Version: 20110509
GS Reacq
Unused Visibility = 2
Exp. 1, copy 4
Exp. 1, copy 5
Exp. 1, copy 6
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec