



## 17445 - Masses of Be+sdO binaries with visual orbits

Cycle: 31, Proposal Category: GO

(Availability Mode: SUPPORTED)

### INVESTIGATORS

<i>Name</i>	<i>Institution</i>
<b>Dr. Douglas Russell Gies (PI) (Contact)</b>	<b>Georgia State University Research Foundation</b>
Dr. Geraldine J. Peters (CoI)	University of Southern California
Dr. Luqian Wang (CoI)	Yunnan Astronomical Observatory, CAS
Robert Klement (CoI)	Georgia State University Research Foundation

### VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) HD-41335 WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:18.0	yes
04	(1) HD-41335 WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:19.0	yes
03	(1) HD-41335 WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:20.0	yes
05	(2) -KAP-DRA WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:20.0	yes
55	(2) -KAP-DRA WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:21.0	yes
06	(2) -KAP-DRA WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:22.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
07	(2) -KAP-DRA WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:22.0	yes
08	(3) HD-161306 WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:23.0	yes
09	(3) HD-161306 WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:23.0	yes
10	(3) HD-161306 WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:24.0	yes
11	(4) 7-VUL WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:24.0	yes
12	(4) 7-VUL WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:25.0	yes
13	(4) 7-VUL WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:26.0	yes
14	(5) -60-CYG WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:27.0	yes
15	(5) -60-CYG WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:27.0	yes
16	(5) -60-CYG WAVE	STIS/CCD STIS/FUV-MAMA	1	30-Jul-2024 14:00:28.0	yes

16 Total Orbits Used

## **ABSTRACT**

Massive stars are often created in close binary systems that are destined to exchange mass and angular momentum. The more massive component will begin transferring photospheric gas to its companion when it attains a physical size becomes comparable to its Roche surface. The mass donor will eventually be stripped of its outer envelope to become a hot He star, and the mass gainer will be spun up to near critical rotation. The rapidly rotating Be stars may have formed through such close binary interaction, and a large fraction of them may exist as Be+He binaries, which have been called Be+sdO systems in published research papers. Searches for the hot He stars are only feasible with ultraviolet spectroscopy. Here we propose to

obtain FUV spectroscopic observations for five Be+sdO binaries systems that were recently angularly resolved through near-IR long baseline interferometry with the CHARA Array. The visual orbits combined with distances yield the total system masses, but to obtain individual masses requires spectroscopic orbits from radial velocities. Our goals here are to confirm the detection of the stripped helium stars in these Be binaries, determine their orbital elements through measurements of the Doppler shifts, find the individual masses, and refine the physical properties of both components from the reconstruction of individual component spectra using Doppler tomography. We aim to compare the fundamental physical parameters of these systems with evolutionary models to estimate their ages and to trace their formation processes through the mass transfer.

### **OBSERVING DESCRIPTION**

We propose to obtain high dispersion, FUV spectroscopic observations of five Be+sdO binary systems that are directly resolved through interferometric observations. The FUV observations will be made with HST/STIS in a configuration that covers the spectral range of 1150-1710 Angstroms using the E140M grating and MAMA detector. This wavelength range and spectral resolution are needed to detect the signal of the stripped helium stars.

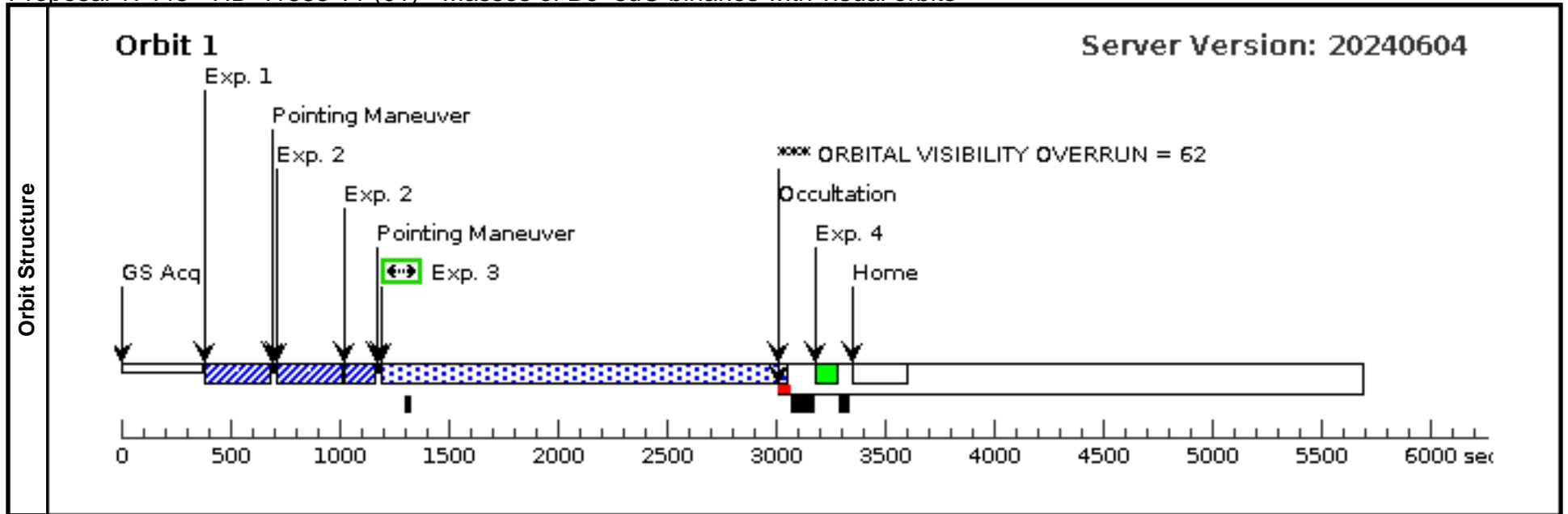
All the targets have 54 to 61 minutes of visibility in each orbit. By deducting 6 minutes for guide star acquisition, 6 minutes for STIS target acquisition, 6 minutes for target peak-up, and 8 minutes for STIS overhead science observations, there remains 29 minutes (1740 seconds) science exposure time in one orbit. We used the HST/STIS exposure time calculator (ETC) and the existing IUE spectra of three targets to determine the net spectral signal-to-noise ratio (S/N). For the two targets without IUE spectra, HD 161306 and 7 Vul, we adopted model spectra associated with the Be and sdO stars that were fit to published photometry and TD1 UV fluxes. A  $S/N > 40$  per resolution element is achieved for each target for the integration time available in one orbit. Because all the targets are bright in the UV, a neutral density filter is selected for each target (except in the case of HD 161306) to avoid exceeding the bright limit of the MAMA detector.

We request three visits to each target (a total of 15 visits) to confirm the detection of the subdwarf in the Be binary systems and measure the subdwarf radial velocities. Based on the well-determined orbital periods from prior spectroscopic studies, we plan to schedule the first and second visits near the two orbital quadrature phases and the third visit near a conjunction phase ( $\pm 10\%$  phase interval). One conjunction phase is set in the "v2" visit, but the second conjunction phase is also acceptable (see Comments block for v2). This phase distribution will record the extreme and middle Doppler shifts of each stellar component, and this is sufficient to determine the mass ratio and perform the Doppler tomography reconstruction of the spectra).

Proposal 17445 - HD-41335-v1 (01) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:28 GMT 2024

<b>Visit</b>	<b>Proposal 17445, HD-41335-v1 (01), completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 80.8875 D AND ZERO-PHASE HJD2459460.346										
	(HD-41335-v1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
<b>Diagnosics</b>											
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>		<b>Fluxes</b>	<b>Miscellaneous</b>				
	(1)	HD-41335 Alt Name1: HR-2142	RA: 06 04 13.5003 (91.0562513d) Dec: -06 42 32.23 (-6.70895d) Equinox: J2000	Proper Motion RA: -3.804 mas/yr Proper Motion Dec: 3.623 mas/yr Epoch of Position: 2000.		V=5.21+/-0.1 F(1425) = 4.1e-10 erg/s/cm^2/A ngstrom	Reference Frame: ICRS				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Coordinates from Gaia EDR3. Category=STAR Description=[B0-B2 V-IV, BE] Extended=NO											
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>		<b>Orbit</b>
	1	ACQ (STIS.ta.189 1554)	(1) HD-41335	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.15 TO 0.3 5		2.2 Secs (2.2 Secs) [==>]		[1]
	2	ACQ/PEAK (STIS.ta.189 1556)	(1) HD-41335	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]		[1]
	3	ACCUM (STIS.sp.18 91550)	(1) HD-41335	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1763 Secs) [==>1763.0 Secs ]		[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]		[1]
Comments: In Earth shadow											



Proposal 17445 - HD-41335-v2 (04) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:28 GMT 2024

<b>Visit</b>	<b>Proposal 17445, HD-41335-v2 (04), scheduling</b>				
	<b>Diagnostic Status: No Diagnostics</b>				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 80.8875 D AND ZERO-PHASE HJD2459460.346				

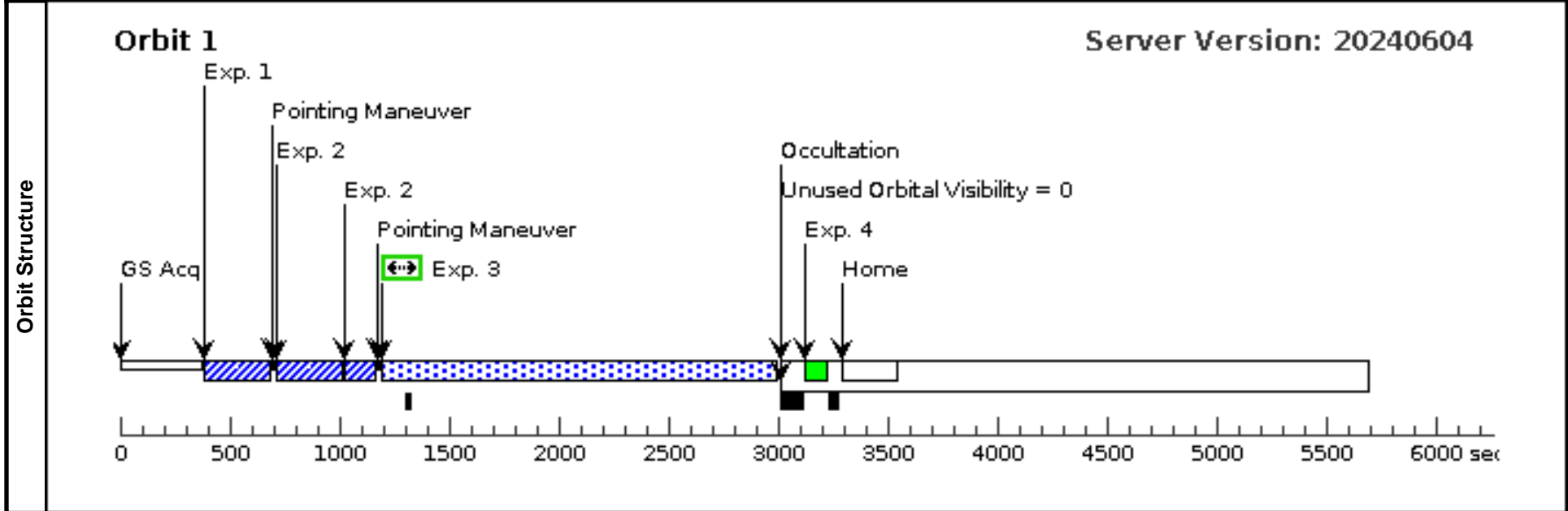
*Comments: The special requirement specifies binary phase interval 0.4 to 0.6, but phases 0.0 to 0.1 and 0.9 to 1.0 are also acceptable.*

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-41335	RA: 06 04 13.5003 (91.0562513d)	Proper Motion RA: -3.804 mas/yr	V=5.21+/-0.1	Reference Frame: ICRS
	Alt Name1: HR-2142	Dec: -06 42 32.23 (-6.70895d)	Proper Motion Dec: 3.623 mas/yr	F(1425) = 4.1e-10 erg/s/cm^2/A	
		Equinox: J2000	Epoch of Position: 2000.	ngstrom	

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B0-B2 V-IV, BE]  
Extended=NO*

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1554)	(1) HD-41335	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.40 TO 0.6 0		2.2 Secs (2.2 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1556)	(1) HD-41335	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91550)	(1) HD-41335	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1701 Secs) [==>1701.0 Secs]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

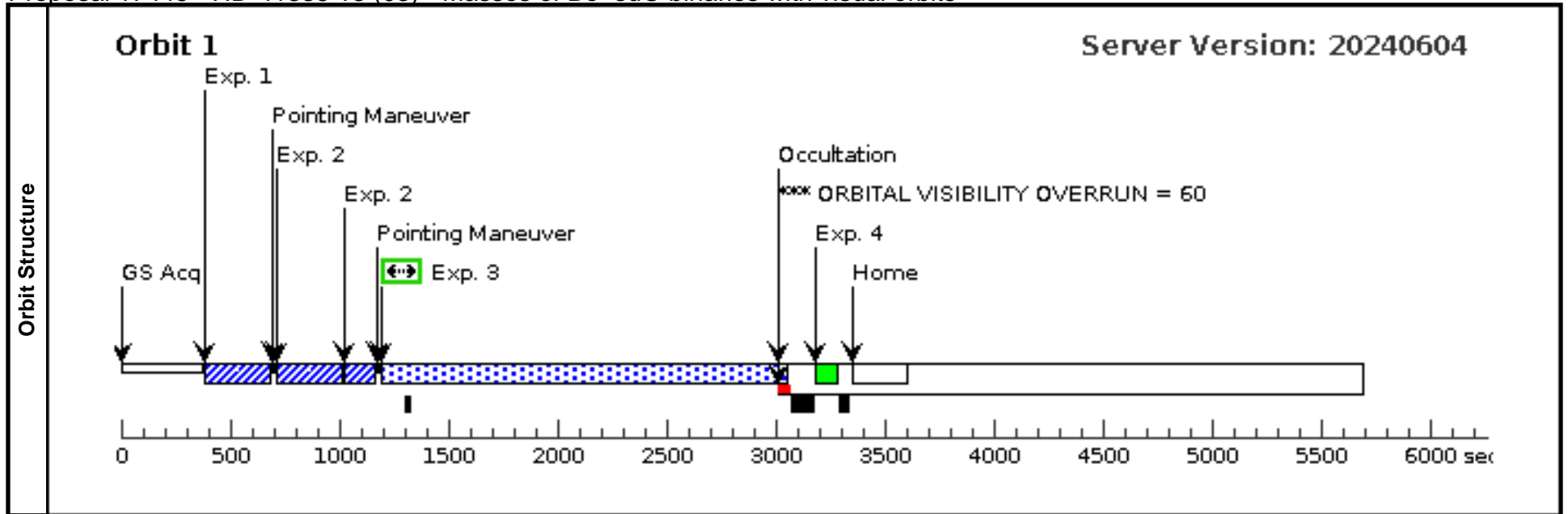
*Comments: In Earth shadow*



Proposal 17445 - HD-41335-v3 (03) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:28 GMT 2024

<b>Visit</b>	<b>Proposal 17445, HD-41335-v3 (03), completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 80.8875 D AND ZERO-PHASE HJD2459460.346									
	(HD-41335-v3 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
<b>Diagnosics</b>										
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(1)	HD-41335 Alt Name1: HR-2142	RA: 06 04 13.5003 (91.0562513d) Dec: -06 42 32.23 (-6.70895d) Equinox: J2000	Proper Motion RA: -3.804 mas/yr Proper Motion Dec: 3.623 mas/yr Epoch of Position: 2000.	V=5.21+/-0.1 F(1425) = 4.1e-10 erg/s/cm^2/A ngstrom	Reference Frame: ICRS				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Coordinates from Gaia EDR3. Category=STAR Description=[B0-B2 V-IV, BE] Extended=NO										
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	ACQ (STIS.ta.189 1554)	(1) HD-41335	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.65 TO 0.8 5		2.2 Secs (2.2 Secs) [==>]	[1]
	2	ACQ/PEAK (STIS.ta.189 1556)	(1) HD-41335	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
	3	ACCUM (STIS.sp.18 91550)	(1) HD-41335	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1761 Secs) [==>1761.0 Secs ]	[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]
Comments: In Earth shadow										



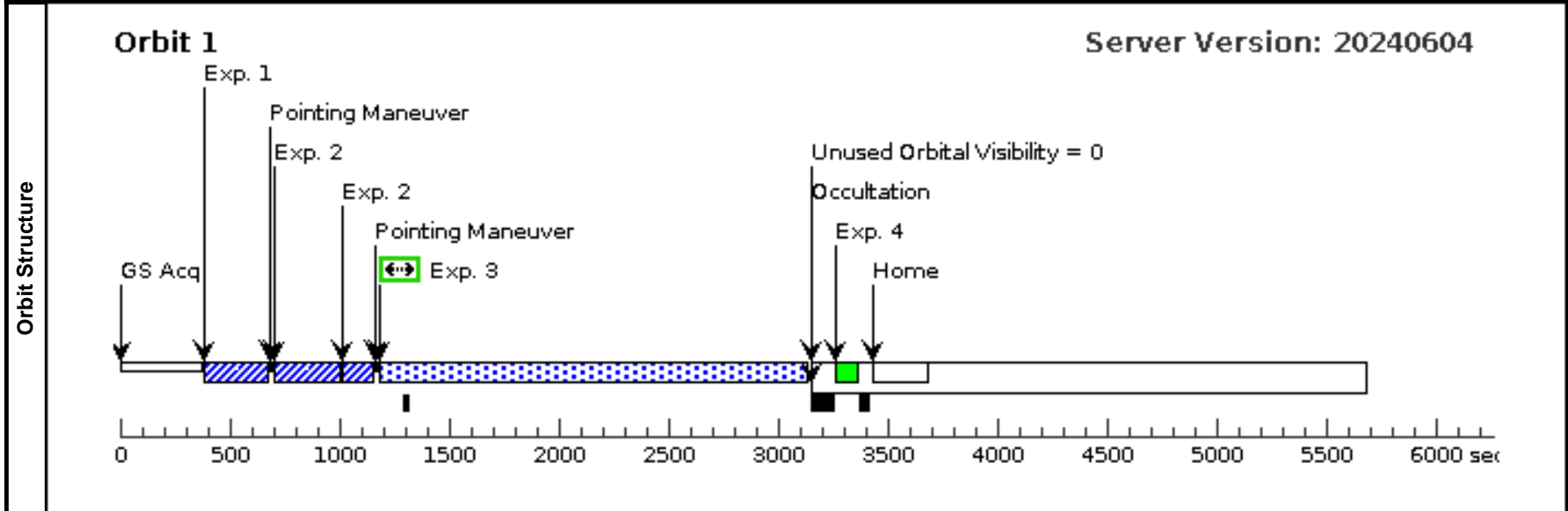
<b>Visit</b>	<b>Proposal 17445, -KAP-DRA-v1 (05), failed</b>				
	<b>Diagnostic Status: No Diagnostics</b>				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 61.5496 D AND ZERO-PHASE HJD2449934.7378				

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	-KAP-DRA	RA: 12 33 28.9433 (188.3705971d)	Proper Motion RA: -58.571 mas/yr	V=3.89	Reference Frame: ICRS
	Alt Name1: HD-109387	Dec: +69 47 17.66 (69.78824d)	Proper Motion Dec: 10.110 mas/yr	F(1425) = 8.1e-10 erg/s/cm^2/A	
	Alt Name2: HR-4787	Equinox: J2000	Epoch of Position: 2000	ngstrom	

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B6-B9.5 III-I, BE]  
Extended=NO*

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1558)	(2) -KAP-DRA	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.15 TO 0.3 5		0.6 Secs (0.6 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1582)	(2) -KAP-DRA	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91532)	(2) -KAP-DRA	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1848 Secs) [==>1848.0 Secs]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

*Comments: In Earth shadow*



Proposal 17445 - -KAP-DRA-v1 (55) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:28 GMT 2024

<b>Visit</b>	<b>Proposal 17445, -KAP-DRA-v1 (55)</b>				
	<b>Diagnostic Status: No Diagnostics</b>				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 61.5496 D AND ZERO-PHASE HJD2449934.7378				

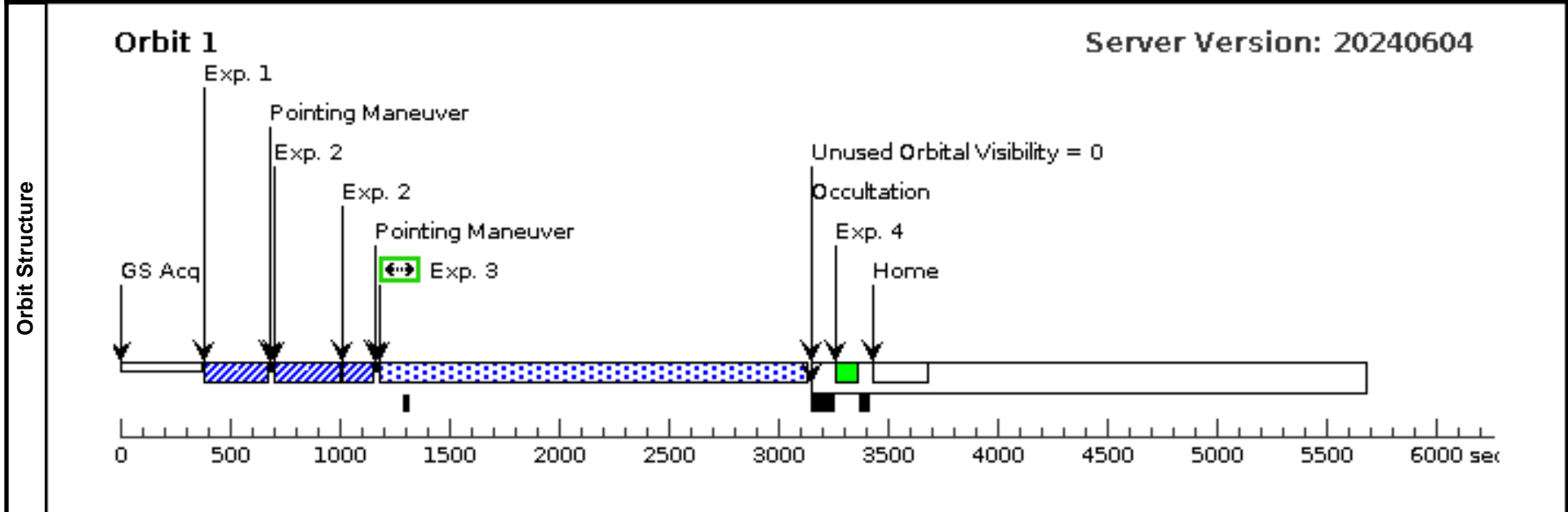
Comments: Repeat of failed visit 05

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	-KAP-DRA	RA: 12 33 28.9433 (188.3705971d)	Proper Motion RA: -58.571 mas/yr	V=3.89	Reference Frame: ICRS
	Alt Name1: HD-109387	Dec: +69 47 17.66 (69.78824d)	Proper Motion Dec: 10.110 mas/yr	F(1425) = 8.1e-10 erg/s/cm^2/A	
	Alt Name2: HR-4787	Equinox: J2000	Epoch of Position: 2000	ngstrom	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B6-B9.5 III-I, BE]  
Extended=NO

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1558)	(2) -KAP-DRA	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.15 TO 0.3 5		0.6 Secs (0.6 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1582)	(2) -KAP-DRA	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91532)	(2) -KAP-DRA	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1848 Secs) [==>1848.0 Secs ]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

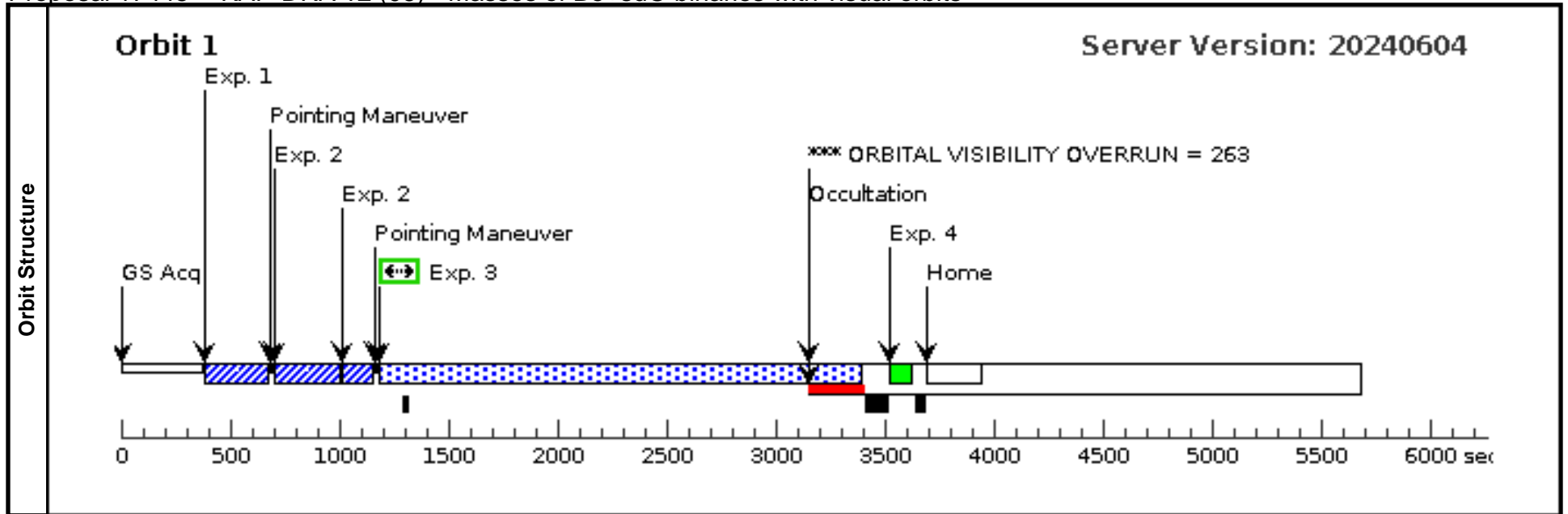
Comments: In Earth shadow



Proposal 17445 - -KAP-DRA-v2 (06) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:28 GMT 2024

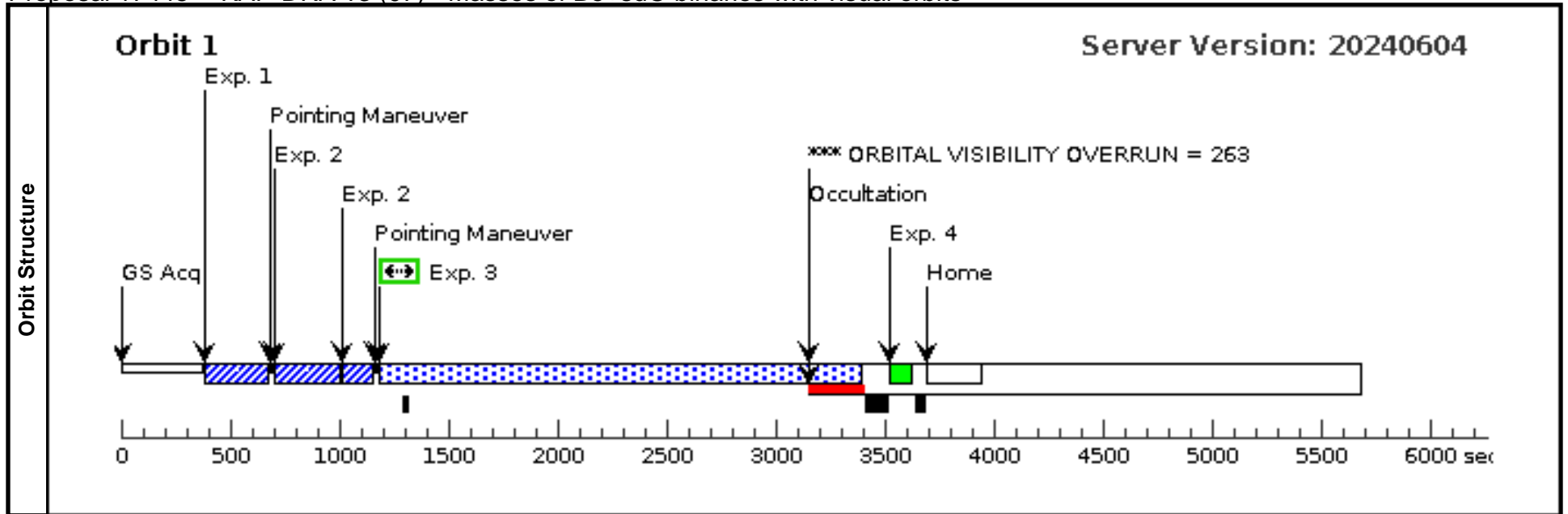
<b>Visit</b>	<b>Proposal 17445, -KAP-DRA-v2 (06), completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 61.5496 D AND ZERO-PHASE HJD2449934.7378 <i>Comments: The special requirement specifies binary phase interval 0.4 to 0.6, but phases 0.0 to 0.1 and 0.9 to 1.0 are also acceptable.</i>									
	(-KAP-DRA-v2 (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>		<b>Fluxes</b>	<b>Miscellaneous</b>			
	(2)	-KAP-DRA Alt Name1: HD-109387 Alt Name2: HR-4787	RA: 12 33 28.9433 (188.3705971d) Dec: +69 47 17.66 (69.78824d) Equinox: J2000	Proper Motion RA: -58.571 mas/yr Proper Motion Dec: 10.110 mas/yr Epoch of Position: 2000		V=3.89 F(1425) = 8.1e-10 erg/s/cm^2/A ngstrom	Reference Frame: ICRS			
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.                  Coordinates from Gaia EDR3.                  Category=STAR                  Description=[B6-B9.5 III-I, BE]                  Extended=NO</i>										
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	ACQ (STIS.ta.189 1558)	(2) -KAP-DRA	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.40 TO 0.6 0		0.6 Secs (0.6 Secs) [==>]	[1]
	2	ACQ/PEAK (STIS.ta.189 1582)	(2) -KAP-DRA	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
	3	ACCUM (STIS.sp.18 91532)	(2) -KAP-DRA	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (2111 Secs) [==>2111.0 Secs ]	[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]
<i>Comments: In Earth shadow</i>										



Proposal 17445 - -KAP-DRA-v3 (07) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:28 GMT 2024

<b>Visit</b>	Proposal 17445, -KAP-DRA-v3 (07), completed <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 61.5496 D AND ZERO-PHASE HJD2449934.7378									
	(-KAP-DRA-v3 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	-KAP-DRA Alt Name1: HD-109387 Alt Name2: HR-4787	RA: 12 33 28.9433 (188.3705971d) Dec: +69 47 17.66 (69.78824d) Equinox: J2000	Proper Motion RA: -58.571 mas/yr Proper Motion Dec: 10.110 mas/yr Epoch of Position: 2000	V=3.89 F(1425) = 8.1e-10 erg/s/cm^2/A ngstrom	Reference Frame: ICRS				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Coordinates from Gaia EDR3. Category=STAR Description=[B6-B9.5 III-I, BE] Extended=NO										
<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ (STIS.ta.189 1558)	(2) -KAP-DRA	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.65 TO 0.8 5		0.6 Secs (0.6 Secs) [==>]	[1]
	2	ACQ/PEAK (STIS.ta.189 1582)	(2) -KAP-DRA	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
	3	ACCUM (STIS.sp.18 91532)	(2) -KAP-DRA	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (2111 Secs) [==>2111.0 Secs ]	[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]
Comments: In Earth shadow										



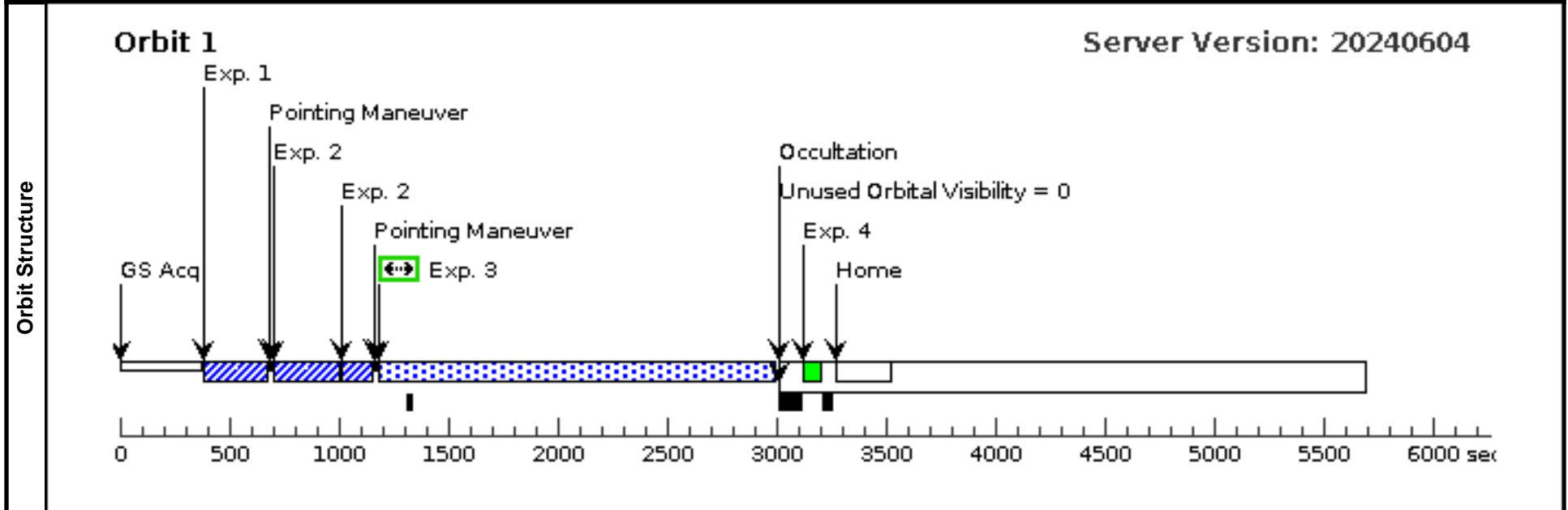
<b>Visit</b>	Proposal 17445, HD-161306-v1 (08), scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 99.314 D AND ZERO-PHASE HJD2459758.92				

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HD-161306	RA: 17 45 7.7041 (266.2821004d)	Proper Motion RA: -1.765 mas/yr	V=8.30	Reference Frame: ICRS
	Alt Name1: MWC-271	Dec: -09 48 54.45 (-9.81513d)	Proper Motion Dec: -9.589 mas/yr	F(1425) = 1.71e-12 erg/s/cm^2/ Angstrom	
		Equinox: J2000	Epoch of Position: 2000		

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B3-B5 V-IV, BE]  
Extended=NO*

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1561)	(3) HD-161306	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	PHASE 0.15 TO 0.3 5		0.2 Secs (0.2 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1566)	(3) HD-161306	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.2 Secs (0.2 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91535)	(3) HD-161306	STIS/FUV-MAMA, ACCUM, 52X0.05	E140M 1425 A	WAVECAL=NO			2195 Secs (1689 Secs) [==>1689.0 Secs ]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

*Comments: In Earth shadow*



Proposal 17445 - HD-161306-v2 (09) - Masses of Be+sdO binaries with visual orbits

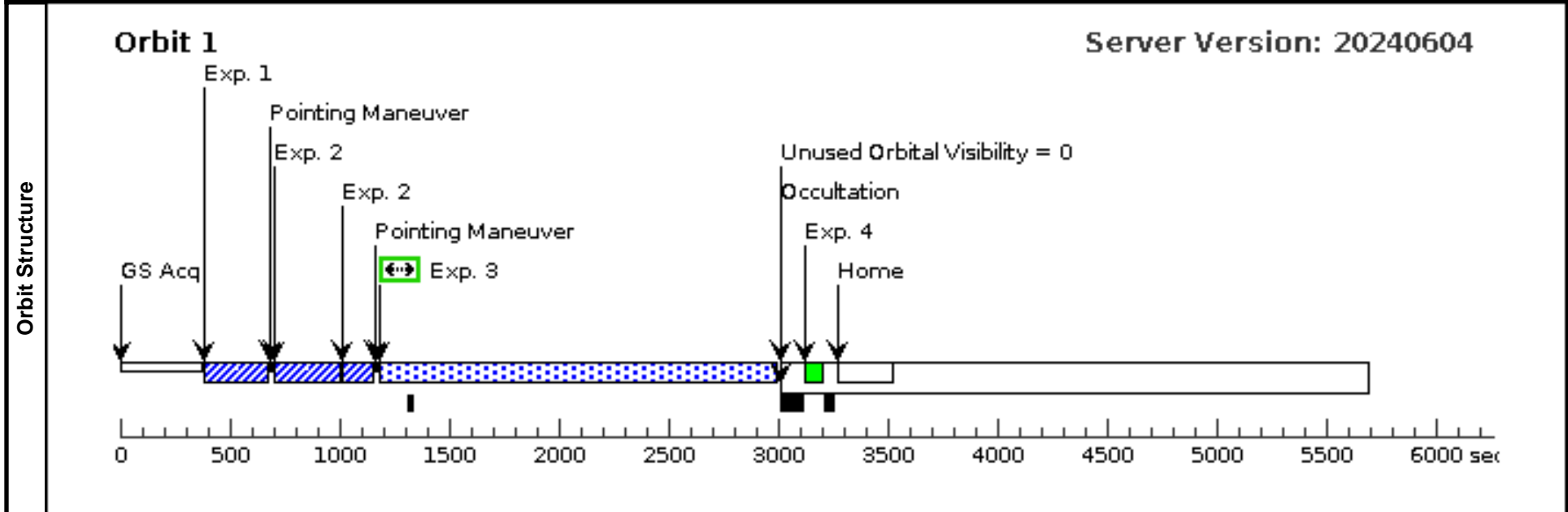
Tue Jul 30 18:00:28 GMT 2024

<b>Visit</b>	<b>Proposal 17445, HD-161306-v2 (09), scheduling</b>				
	<b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 99.314 D AND ZERO-PHASE HJD2459758.92 <i>Comments: The special requirement specifies binary phase interval 0.4 to 0.6, but phases 0.0 to 0.1 and 0.9 to 1.0 are also acceptable.</i>				

<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	HD-161306	RA: 17 45 7.7041 (266.2821004d)	Proper Motion RA: -1.765 mas/yr	V=8.30	Reference Frame: ICRS
		Alt Name1: MWC-271	Dec: -09 48 54.45 (-9.81513d)	Proper Motion Dec: -9.589 mas/yr	F(1425) = 1.71e-12 erg/s/cm^2/ Angstrom	
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.                  Coordinates from Gaia EDR3.                  Category=STAR                  Description=[B3-B5 V-IV, BE]                  Extended=NO</i>					

<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ (STIS.ta.189 1561)	(3) HD-161306	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	PHASE 0.40 TO 0.6 0		0.2 Secs (0.2 Secs) [==>]	[1]
	2	ACQ/PEAK (STIS.ta.189 1566)	(3) HD-161306	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.2 Secs (0.2 Secs) [==>]	[1]
	3	ACCUM (STIS.sp.18 91535)	(3) HD-161306	STIS/FUV-MAMA, ACCUM, 52X0.05	E140M 1425 A	WAVECAL=NO			2195 Secs (1689 Secs) [==>1689.0 Secs]	[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

*Comments: In Earth shadow*



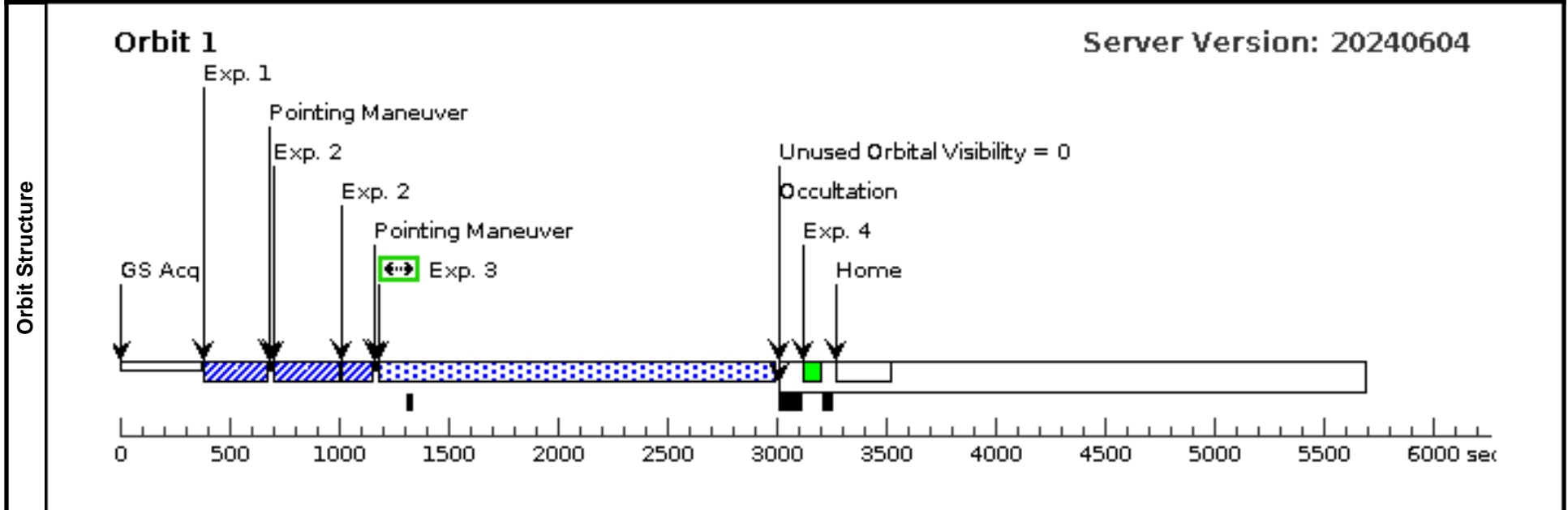
<b>Visit</b>	Proposal 17445, HD-161306-v3 (10), scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 99.314 D AND ZERO-PHASE HJD2459758.92				

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HD-161306	RA: 17 45 7.7041 (266.2821004d)	Proper Motion RA: -1.765 mas/yr	V=8.30	Reference Frame: ICRS
	Alt Name1: MWC-271	Dec: -09 48 54.45 (-9.81513d)	Proper Motion Dec: -9.589 mas/yr	F(1425) = 1.71e-12 erg/s/cm^2/ Angstrom	
		Equinox: J2000	Epoch of Position: 2000		

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B3-B5 V-IV, BE]  
Extended=NO*

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1561)	(3) HD-161306	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	PHASE 0.65 TO 0.8 5		0.2 Secs (0.2 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1566)	(3) HD-161306	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.2 Secs (0.2 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91535)	(3) HD-161306	STIS/FUV-MAMA, ACCUM, 52X0.05	E140M 1425 A	WAVECAL=NO			2195 Secs (1689 Secs) [==>1689.0 Secs]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

*Comments: In Earth shadow*



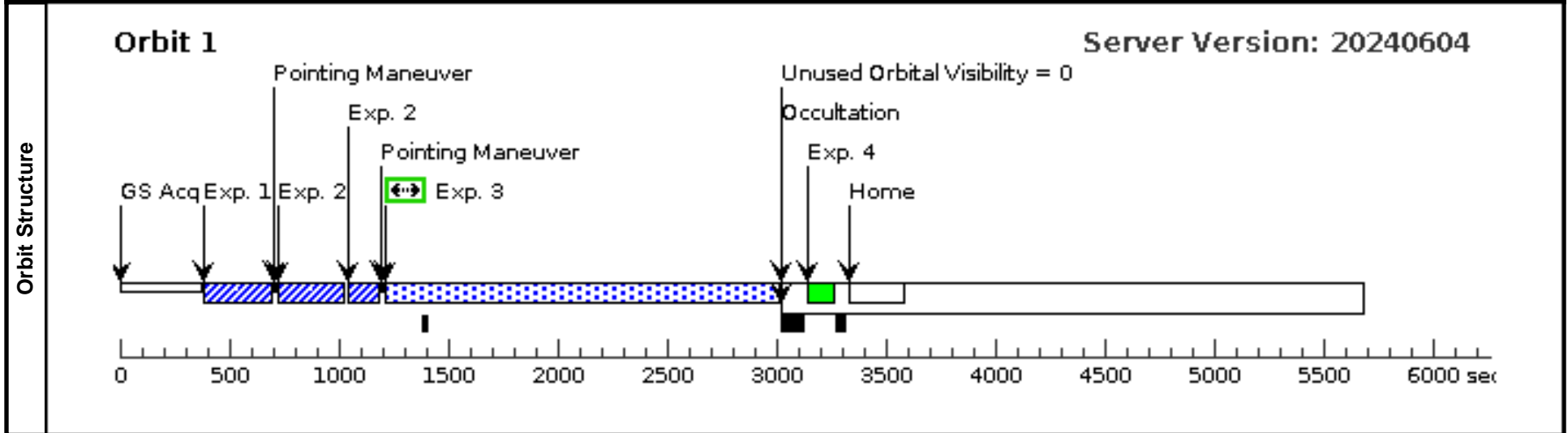
Proposal 17445 - 7-VUL-v1 (11) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:29 GMT 2024

<b>Visit</b>	<b>Proposal 17445, 7-VUL-v1 (11), completed</b>				
	<b>Diagnostic Status: No Diagnostics</b>				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 69.5331 D AND ZERO-PHASE HJD2459848.10				

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	7-VUL	RA: 19 29 20.8977 (292.3370738d)	Proper Motion RA: 2.291 mas/yr	V=6.326	Reference Frame: ICRS
	Alt Name1: HD-183537	Dec: +20 16 47.07 (20.27974d)	Proper Motion Dec: -15.856 mas/yr	F(1425) = 8.5e-11 erg/s/cm^2/A	
	Alt Name2: HR-7409	Equinox: J2000	Epoch of Position: 2000	ngstrom	
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>					
<i>Coordinates from Gaia EDR3.</i>					
<i>Category=STAR</i>					
<i>Description=[B3-B5 V-IV, BE]</i>					
<i>Extended=NO</i>					

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1568)	(4) 7-VUL	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.15 TO 0.3 5		6.2 Secs (6.2 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1573)	(4) 7-VUL	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.3 Secs (0.3 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91546)	(4) 7-VUL	STIS/FUV-MAMA, ACCUM, 31X0.05NDB	E140M 1425 A	WAVECAL=NO			2195 Secs (1638 Secs) [==>1638.0 Secs]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]
<i>Comments: In Earth shadow</i>									



Proposal 17445 - 7-VUL-v2 (12) - Masses of Be+sdO binaries with visual orbits

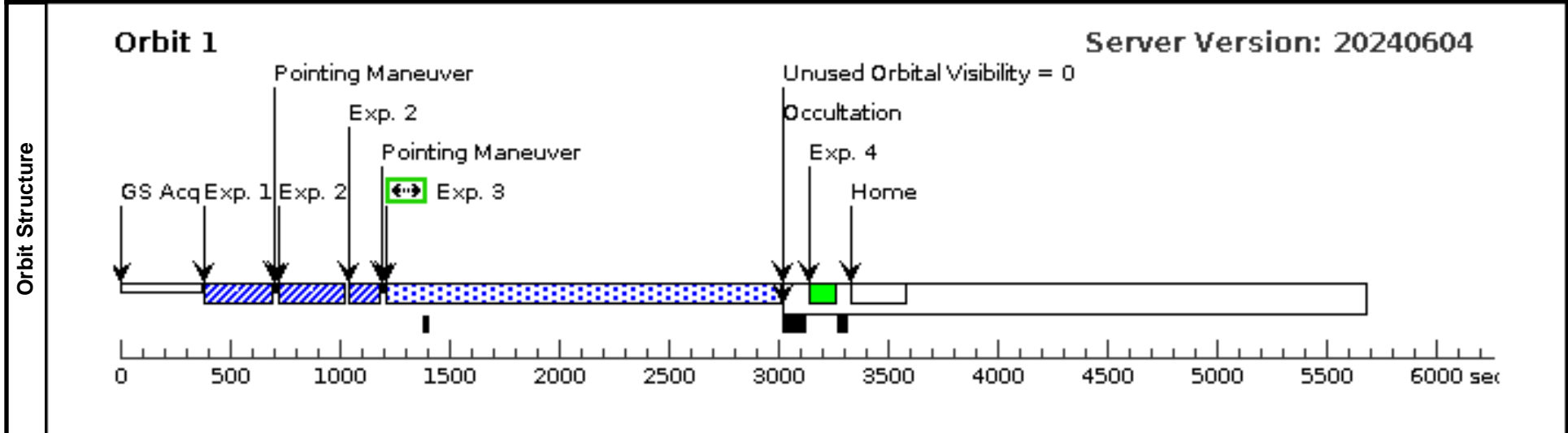
Tue Jul 30 18:00:29 GMT 2024

<b>Visit</b>	<b>Proposal 17445, 7-VUL-v2 (12), scheduling</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 69.5331 D AND ZERO-PHASE HJD2459848.10 <i>Comments: The special requirement specifies binary phase interval 0.4 to 0.6, but phases 0.0 to 0.1 and 0.9 to 1.0 are also acceptable.</i>				
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<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>
	(4)	7-VUL Alt Name1: HD-183537 Alt Name2: HR-7409	RA: 19 29 20.8977 (292.3370738d) Dec: +20 16 47.07 (20.27974d) Equinox: J2000	Proper Motion RA: 2.291 mas/yr Proper Motion Dec: -15.856 mas/yr Epoch of Position: 2000	V=6.326 F(1425) = 8.5e-11 erg/s/cm^2/A ngstrom	Reference Frame: ICRS
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.                  Coordinates from Gaia EDR3.                  Category=STAR                  Description=[B3-B5 V-IV, BE]                  Extended=NO</i>						

<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ (STIS.ta.189 1568)	(4) 7-VUL	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.40 TO 0.6	0		6.2 Secs (6.2 Secs) [==>]
2	ACQ/PEAK (STIS.ta.189 1573)	(4) 7-VUL	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR					0.3 Secs (0.3 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91546)	(4) 7-VUL	STIS/FUV-MAMA, ACCUM, 31X0.05NDB	E140M 1425 A	WAVECAL=NO				2195 Secs (1638 Secs) [==>1638.0 Secs ]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A					[==>]	[1]

*Comments: In Earth shadow*



Proposal 17445 - 7-VUL-v3 (13) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:29 GMT 2024

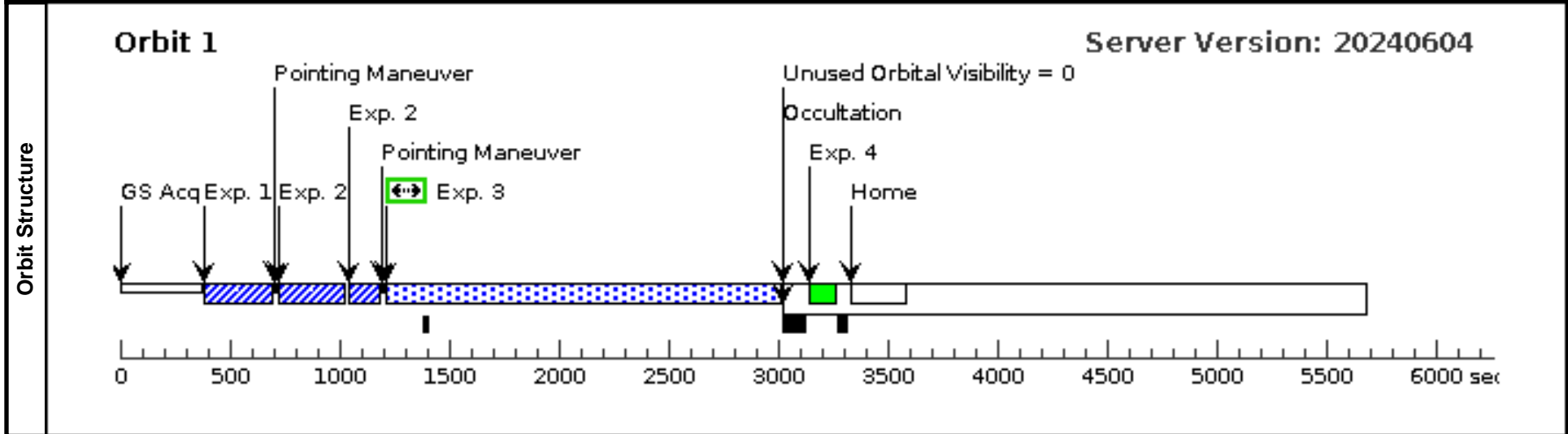
<b>Visit</b>	<b>Proposal 17445, 7-VUL-v3 (13), scheduling</b>				
	<b>Diagnostic Status: No Diagnostics</b>				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 69.5331 D AND ZERO-PHASE HJD2459848.10				

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	7-VUL	RA: 19 29 20.8977 (292.3370738d)	Proper Motion RA: 2.291 mas/yr	V=6.326	Reference Frame: ICRS
	Alt Name1: HD-183537	Dec: +20 16 47.07 (20.27974d)	Proper Motion Dec: -15.856 mas/yr	F(1425) = 8.5e-11 erg/s/cm^2/A	
	Alt Name2: HR-7409	Equinox: J2000	Epoch of Position: 2000	ngstrom	

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B3-B5 V-IV, BE]  
Extended=NO*

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1568)	(4) 7-VUL	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.65 TO 0.8 5		6.2 Secs (6.2 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1573)	(4) 7-VUL	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.3 Secs (0.3 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91546)	(4) 7-VUL	STIS/FUV-MAMA, ACCUM, 31X0.05NDB	E140M 1425 A	WAVECAL=NO			2195 Secs (1638 Secs) [==>1638.0 Secs ]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

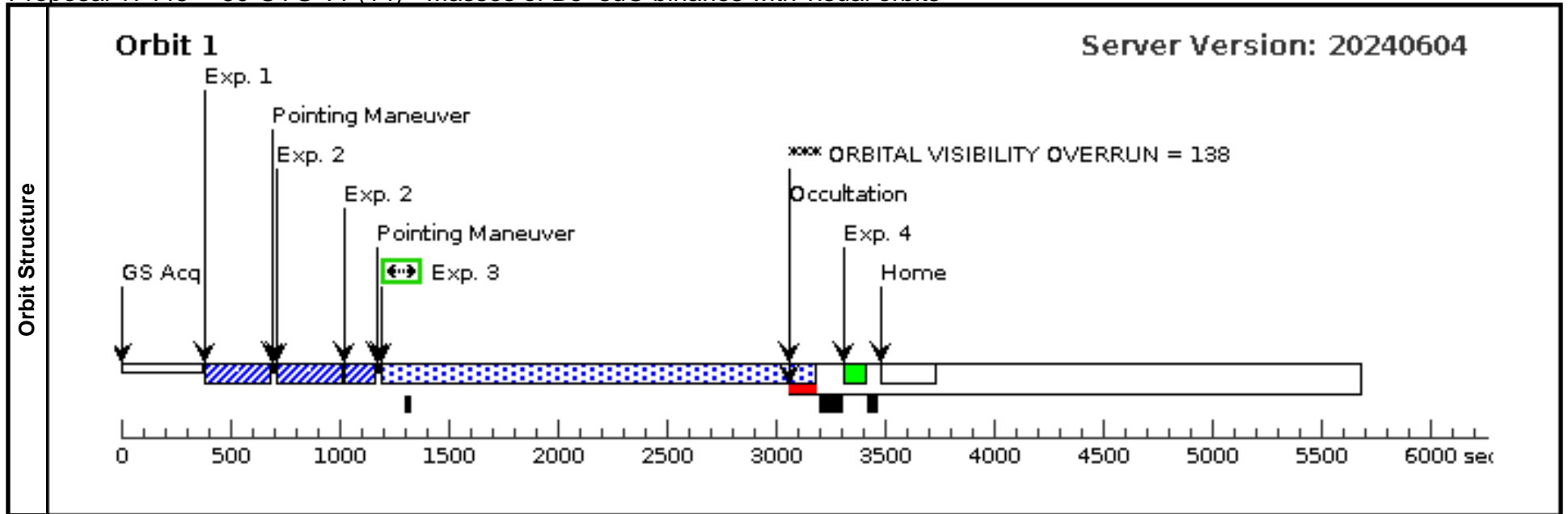
*Comments: In Earth shadow*



Proposal 17445 - -60-CYG-v1 (14) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:29 GMT 2024

<b>Visit</b>	<b>Proposal 17445, -60-CYG-v1 (14), completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 147.573 D AND ZERO-PHASE HJD2459650.29055									
	(-60-CYG-v1 (14)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
<b>Diagnosics</b>										
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(5)	-60-CYG Alt Name1: HD-200310 Alt Name2: HR-8053	RA: 21 01 10.9277 (315.2955321d) Dec: +46 09 20.80 (46.15578d) Equinox: J2000	Proper Motion RA: 7.724 mas/yr Proper Motion Dec: 1.656 mas/yr Epoch of Position: 2000	V=5.432 F(1425) = 6.4e-10 erg/s/cm^2/A ngstrom	Reference Frame: ICRS				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Coordinates from Gaia EDR3. Category=STAR Description=[B0-B2 V-IV, BE] Extended=NO										
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	ACQ (STIS.ta.189 1574)	(5) -60-CYG	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.12 TO 0.3 7		2.6 Secs (2.6 Secs) [==>]	[1]
	2	ACQ/PEAK (STIS.ta.189 1576)	(5) -60-CYG	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
	3	ACCUM (STIS.sp.18 91549)	(5) -60-CYG	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1889 Secs) [==>1889.0 Secs ]	[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]
Comments: In Earth shadow										



Proposal 17445 - -60-CYG-v2 (15) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:29 GMT 2024

<b>Visit</b>	<b>Proposal 17445, -60-CYG-v2 (15), scheduling</b>				
	<b>Diagnostic Status: No Diagnostics</b>				
	Scientific Instruments: STIS/CCD, STIS/FUV-MAMA				
	Special Requirements: Period 147.573 D AND ZERO-PHASE HJD2459650.29055				

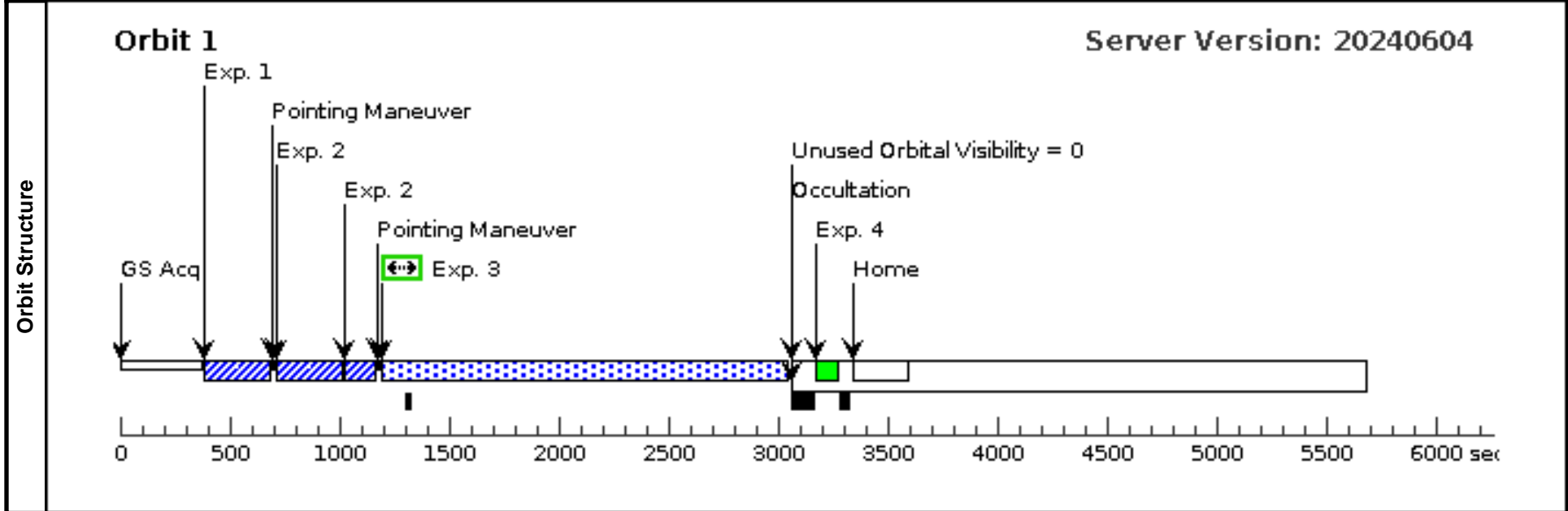
*Comments: The special requirement specifies binary phase interval 0.42 to 0.56, but phase interval 0.87 to 1.0 is also acceptable.*

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	-60-CYG	RA: 21 01 10.9277 (315.2955321d)	Proper Motion RA: 7.724 mas/yr	V=5.432	Reference Frame: ICRS
	Alt Name1: HD-200310	Dec: +46 09 20.80 (46.15578d)	Proper Motion Dec: 1.656 mas/yr	F(1425) = 6.4e-10 erg/s/cm^2/A	
	Alt Name2: HR-8053	Equinox: J2000	Epoch of Position: 2000	ngstrom	

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.  
Coordinates from Gaia EDR3.  
Category=STAR  
Description=[B0-B2 V-IV, BE]  
Extended=NO*

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.189 1574)	(5) -60-CYG	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.42 TO 0.56		2.6 Secs (2.6 Secs) [==>]	[1]
2	ACQ/PEAK (STIS.ta.189 1576)	(5) -60-CYG	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
3	ACCUM (STIS.sp.18 91549)	(5) -60-CYG	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1751 Secs) [==>1751.0 Secs]	[1]
4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]

*Comments: In Earth shadow*



Proposal 17445 - -60-CYG-v3 (16) - Masses of Be+sdO binaries with visual orbits

Tue Jul 30 18:00:29 GMT 2024

<b>Visit</b>	<b>Proposal 17445, -60-CYG-v3 (16), completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/CCD, STIS/FUV-MAMA Special Requirements: Period 147.573 D AND ZERO-PHASE HJD2459650.29055									
	(-60-CYG-v3 (16)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>		<b>Fluxes</b>	<b>Miscellaneous</b>			
	(5)	-60-CYG Alt Name1: HD-200310 Alt Name2: HR-8053	RA: 21 01 10.9277 (315.2955321d) Dec: +46 09 20.80 (46.15578d) Equinox: J2000	Proper Motion RA: 7.724 mas/yr Proper Motion Dec: 1.656 mas/yr Epoch of Position: 2000		V=5.432 F(1425) = 6.4e-10 erg/s/cm^2/A ngstrom	Reference Frame: ICRS			
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.                  Coordinates from Gaia EDR3.                  Category=STAR                  Description=[B0-B2 V-IV, BE]                  Extended=NO</i>										
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	ACQ (STIS.ta.189 1574)	(5) -60-CYG	STIS/CCD, ACQ, F25ND5	MIRROR	ACQTYPE=POINT	PHASE 0.59 TO 0.8 2		2.6 Secs (2.6 Secs) [==>]	[1]
	2	ACQ/PEAK (STIS.ta.189 1576)	(5) -60-CYG	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				0.1 Secs (0.1 Secs) [==>]	[1]
	3	ACCUM (STIS.sp.18 91549)	(5) -60-CYG	STIS/FUV-MAMA, ACCUM, 0.2X0.05ND	E140M 1425 A	WAVECAL=NO			2195 Secs (1889 Secs) [==>1889.0 Secs ]	[1]
	4	WAVECAL WAVE		STIS/FUV-MAMA, ACCUM, 0.2X0.06	E140M 1425 A				[==>]	[1]
<i>Comments: In Earth shadow</i>										

