



# 17845 - Betelgeuse: The Great Dimming Redux?

Cycle: 32, Proposal Category: GO

(Availability Mode: SUPPORTED)

## INVESTIGATORS

<i>Name</i>	<i>Institution</i>
<b>Dr. Andrea Dupree (PI) (Contact)</b>	<b>Smithsonian Institution Astrophysical Observatory</b>
Thomas Calderwood (CoI)	American Association Of Variable Star Observers
Dr. Caroline Huang (CoI)	Smithsonian Institution Astrophysical Observatory
Dr. Thomas Granzer (CoI) (ESA Member)	Leibniz-Institut für Astrophysik Potsdam (AIP)
Dr. Kateryna Kravchenko (CoI) (ESA Member)	Max Planck Institute for Extraterrestrial Physics
Dr. Lynn D Matthews (CoI)	Massachusetts Institute of Technology
Dr. Miguel Montarges (CoI) (ESA Member)	Observatoire de Paris - Section de Meudon
Prof. Klaus G Strassmeier (CoI) (ESA Member)	Leibniz-Institut für Astrophysik Potsdam (AIP)
Michael Weber (CoI) (ESA Member)	Leibniz-Institut für Astrophysik Potsdam (AIP)
Prof. Pierre Kervella (CoI) (ESA Member)	Observatoire de Paris
Dr. Morgan MacLeod (CoI)	Smithsonian Institution Astrophysical Observatory
Dr. alain jorissen (CoI) (ESA Member)	Universite Libre de Bruxelles

## 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) -ALF-ORI	STIS/CCD STIS/NUV-MAMA	4	15-Nov-2024 13:04:07.0	yes
02	(1) -ALF-ORI	STIS/CCD STIS/NUV-MAMA	3	15-Nov-2024 13:04:09.0	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>
03	(1) -ALF-ORI	STIS/CCD STIS/NUV-MAMA	3	15-Nov-2024 13:04:10.0	yes
04	(1) -ALF-ORI	STIS/CCD STIS/NUV-MAMA	3	15-Nov-2024 13:04:12.0	yes
05	(1) -ALF-ORI	STIS/CCD STIS/NUV-MAMA	3	15-Nov-2024 13:04:14.0	yes

16 Total Orbits Used

### **ABSTRACT**

The historic Great Dimming of the red supergiant Betelgeuse in 2020 was initiated at a propitious confluence of maximum outflow of the 400-day fundamental mode of pulsation and the 2200-day Long Secondary Period. This condition will occur again sometime between Fall 2024 and Spring 2025. We propose to follow its behavior. Spatially resolved ultraviolet spectra of the star achievable with STIS can provide the connecting link between the convective activity on the stellar surface and the formation of a dust cloud in the outer atmosphere. This campaign will probe the entire atmosphere, from the photosphere to the circumstellar environment, with a combination of ground-based interferometric/AO imaging, radio observations, and optical and UV spectroscopy, creating a comprehensive contemporaneous sampling of the star, its variation with time, and the effects on its extended atmosphere. We should learn whether the event of 2019-2020 was a 'random' occurrence or results from oscillation phase superposition.

Two visits are requested during Cycle 31, and 5 visits during Cycle 32 (16 orbits) to obtain spatially resolved ultraviolet spectra at this unique time.

### **OBSERVING DESCRIPTION**

We propose to obtain short slit echelle spectra of Betelgeuse with the medium resolution E230M grating in the wavelength range of 2303 to 3111Å. We will use the small (0.1" x 0.025") slit for maximum spatial resolution. Only with this supported slit can we take full advantage of the

## Proposal 17845 (STScI Edit Number: 0, Created: Friday, November 15, 2024, 1:04:14PM Eastern Standard Time) - Overview

STIS/HST resolution. Betelgeuse has no record of flaring and previous STIS observations demonstrate that the STIS detectors are not subject to any danger. We plan 1 orbit in the first visit with the E230H grating to investigate the behavior of blended line features. For 5 visits: 1 visit (4 orbits), 4 visits (3 orbits) TOTAL 16 orbits These visits will take advantage of the small aperture (0.1X0.3 arsec) to obtain spatially resolved ultraviolet spectra of the supergiant Betelgeuse. Chromospheric emission lines reveal dynamics, densities, and emission measures of the chromospheric plasma. We plan to cover the optical diameter of the star (42 mas) with a center pointing, and offsets at +/-25 mas. Then followed by pointing off the optical disk and offset to +/- 50 mas, and +/-75 mas. (Not in this order, but designed to appropriately fill the time available.: sequence of o) We have used the ETC for STIS, assuming a Castelli/Kurucz model of a M2 supergiant, and normalizing it to the observed STIS flux (from MAST) near 2786A (to avoid Mg II emission) for various pointing offsets on the star at different dates. We used spectra from the 'normal' state of Betelgeuse (not the spectra taken during 2019 Sep-Nov). Ideally a range of exposure times would be used in response to the varying stellar flux. However, we cannot predict the ultraviolet flux level a priori, as it is not related to the optical V-magnitude. We therefore have selected an average value. This is a pattern we have used since 2019 and it works. The center exposure requires 7.9 minutes; the offset at +/-25 mas and +/-50 mas require 9-10 minutes, and at +/-75 mas, 20-30 minutes. At the declination of Betelgeuse, each HST orbit allows 49-52 minutes on target. These spectra will require guide star acquisition, target acquisition, and two peak ups with the small slit (0.1" x 0.025") during the first orbit of a visit. This takes 31.7 minutes; then we offset to -75 mas for a 1155 dec exposure. Orbit 2 is followed by offset to -50 mas as for a 606 sec exposure, offset to -25 mas for 530 sec exposure, offset to 0 (center) for a 472 sec exposure,, and to +25 mas for a 569 sec exposure. In the 3rd orbit, we offset to +50 mas for a 606 sec exposure, followed by an offset to +75 mas for a 1944 sec exposure. In the first visit, we are including another orbit which will extend to +/-100 mas where there may be indications of the presence of a companion star. The following 4 visits will only require 3 orbits. Total of 16 orbits.

# Proposal 17845 - Visit 01 - Betelgeuse: The Great Dimming Redux?

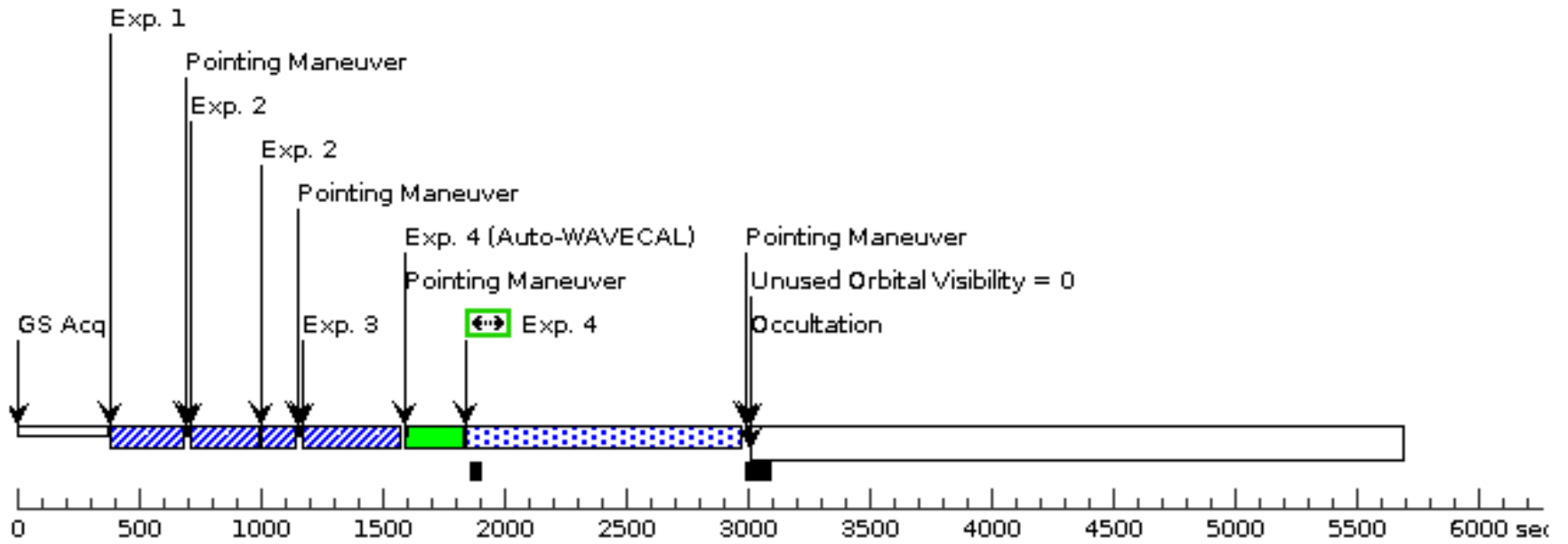
Fri Nov 15 18:04:14 GMT 2024

<b>Visit</b>	<b>Proposal 17845, Visit 01, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/NUV-MAMA, STIS/CCD Special Requirements: AFTER 30-NOV-2024:00:00:00					
	<b>Diagnostics</b>	(Visit 01) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE				
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(Visit 01) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
<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)	-ALF-ORI	RA: 05 55 10.3054 (88.7929392d) Dec: +07 24 25.43 (7.40706d) Equinox: J2000	Proper Motion RA: 27.54 mas/yr Proper Motion Dec: 11.3 mas/yr Epoch of Position: 2000	V=+0.42+/-0.2	Reference Frame: ICRS
Comments: Category=STAR Description=[M III-I, SUPERGIANT O]						

Proposal 17845 - Visit 01 - Betelgeuse: The Great Dimming Redux?

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	(1941767)	(1) -ALF-ORI	STIS/CCD, ACQ, F25ND5	MIRROR				1 Secs (1 Secs)		
									[==>]	[1]	
	2	(1942894)	(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.2X0.09	G230LB 2375 A				1.1 Secs (1.1 Secs)		
									[==>]	[1]	
	<i>Comments: 3 ptl inear peak up</i>										
	3	(1942895)	(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.1X0.03	G230LB 2375 A				1.9 Secs (1.9 Secs)		
									[==>]	[1]	
	<i>Comments: Spiral in 0.1X0.03 aperture</i>										
	4	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.075,n ull		1115 Secs (1115 Secs)		
									[==>]	[1]	
	5	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.050,n ull		606 Secs (606 Secs)		
								[==>]	[2]		
6	(1299112)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.025,0 .0		530 Secs (530 Secs)			
								[==>]	[2]		
7	(1299113)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A				472 Secs (472 Secs)			
								[==>]	[2]		
8	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG +0.025, null		589 Secs (589 Secs)			
								[==>]	[2]		
9	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG +0.050, null		606 Secs (606 Secs)			
								[==>]	[3]		
10	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG +0.075, null		1944 Secs (1944 Secs)			
								[==>]	[3]		
11	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG +0.100, null		1225 Secs (1225 Secs)			
								[==>]	[4]		
12	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.100,n ull		1305 Secs (1305 Secs)			
								[==>]	[4]		

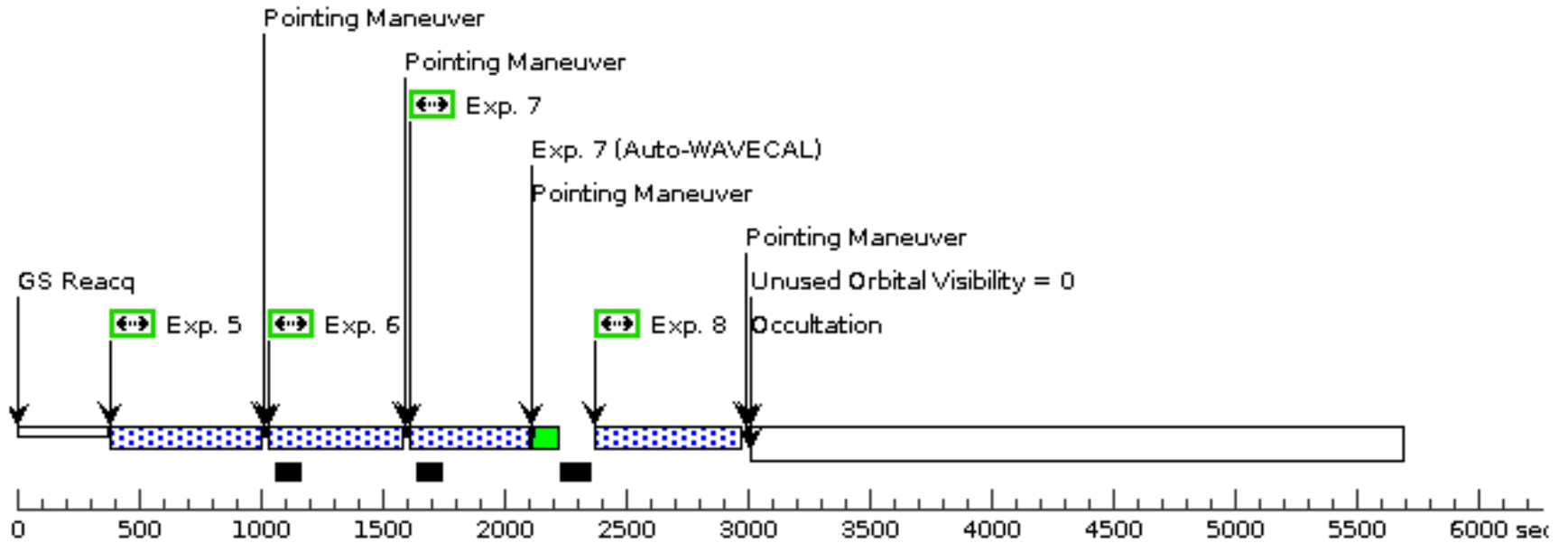
**Orbit 1**



Orbit Structure

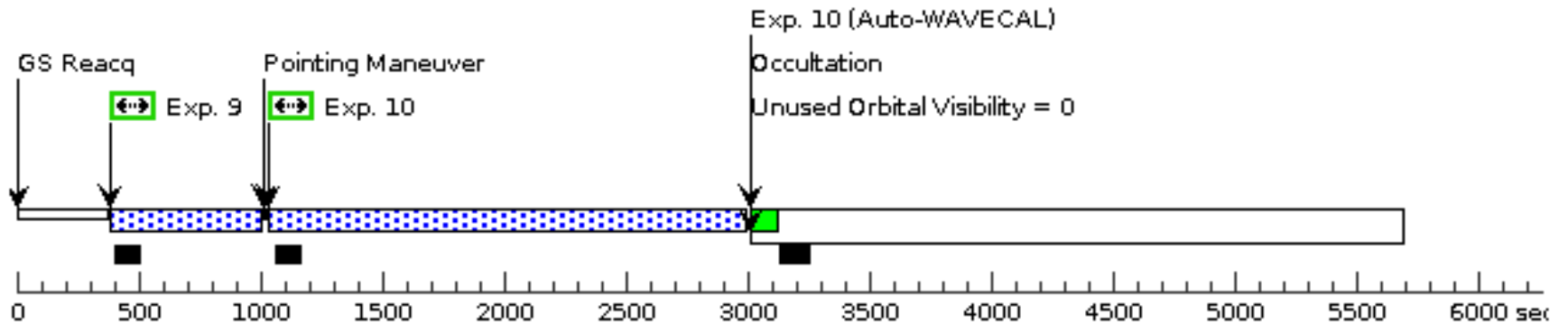
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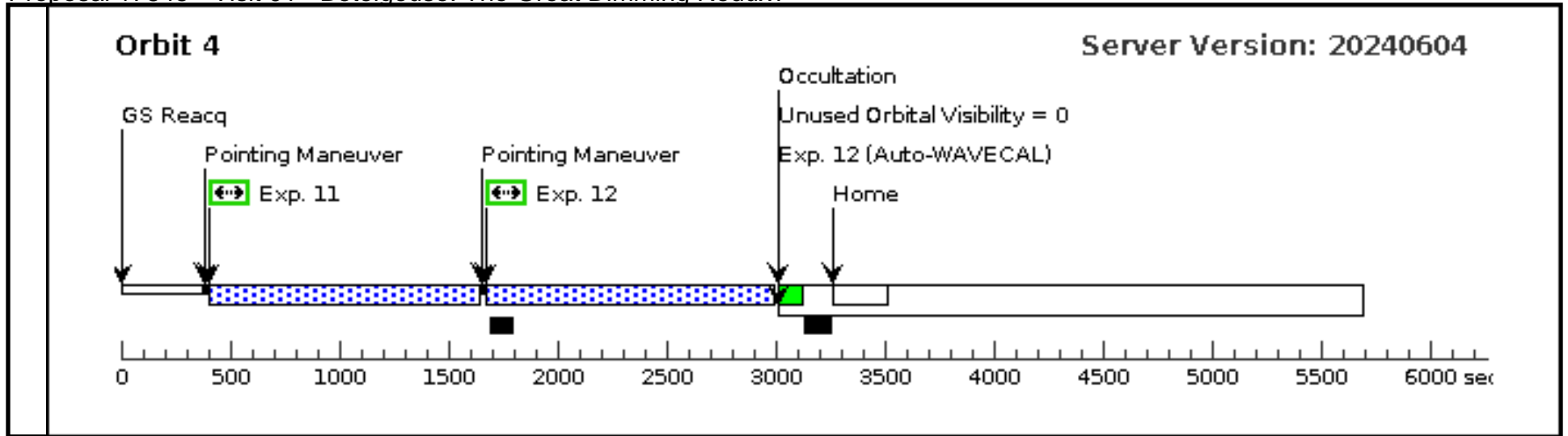
Server Version: 20240604



**Orbit 3**

Server Version: 20240604





# Proposal 17845 - Visit 02 - Betelgeuse: The Great Dimming Redux?

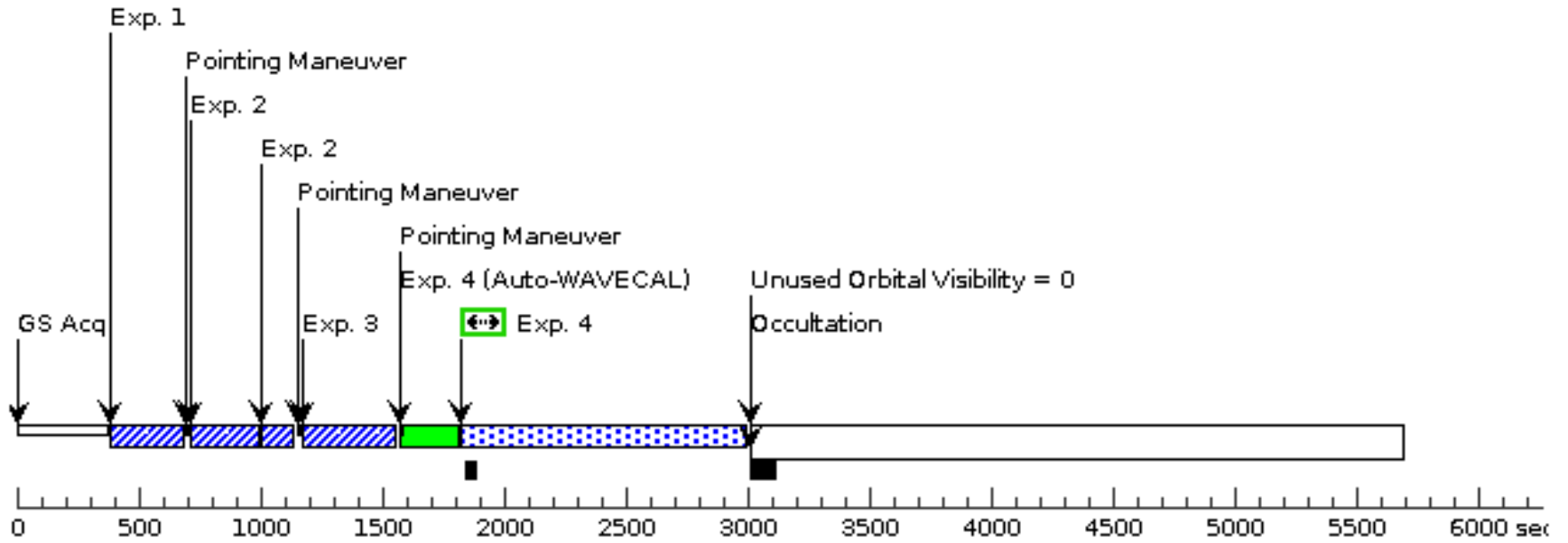
Fri Nov 15 18:04:15 GMT 2024

<b>Visit</b>	<b>Proposal 17845, Visit 02, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/NUV-MAMA, STIS/CCD Special Requirements: AFTER 01 BY 226 D TO 256 D					
	<b>Diagnostics</b>	(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE				
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(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
<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)	-ALF-ORI	RA: 05 55 10.3054 (88.7929392d) Dec: +07 24 25.43 (7.40706d) Equinox: J2000	Proper Motion RA: 27.54 mas/yr Proper Motion Dec: 11.3 mas/yr Epoch of Position: 2000	V=+0.42+/-0.2	Reference Frame: ICRS
<i>Comments:</i> Category=STAR Description=[M III-I, SUPERGIANT O]						

Proposal 17845 - Visit 02 - Betelgeuse: The Great Dimming Redux?

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) -ALF-ORI	STIS/CCD, ACQ, F25ND5	MIRROR				1 Secs (1 Secs)	
									[==>]	[1]
	2		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.2X0.09	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	3		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.1X0.03	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	4	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.075,n ull		1155 Secs (1155 Secs)	
									[==>]	[1]
	5	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.050,n ull		606 Secs (606 Secs)	
								[==>]	[2]	
6	(1299112)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.025,n ull		530 Secs (530 Secs)		
								[==>]	[2]	
	<i>Comments: 3 pt linear peakup; telescope returned to central dwell position.</i>									
7	(1299113)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A				472 Secs (472 Secs)		
								[==>]	[2]	
	<i>Comments: Spiral in 0.1X0.03 aperture.</i>									
8	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.025, null	569 Secs (569 Secs)		
								[==>]	[2]	
9	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.050, null	606 Secs (606 Secs)		
								[==>]	[3]	
10	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.075, null	1944 Secs (1944 Secs)		
								[==>]	[3]	

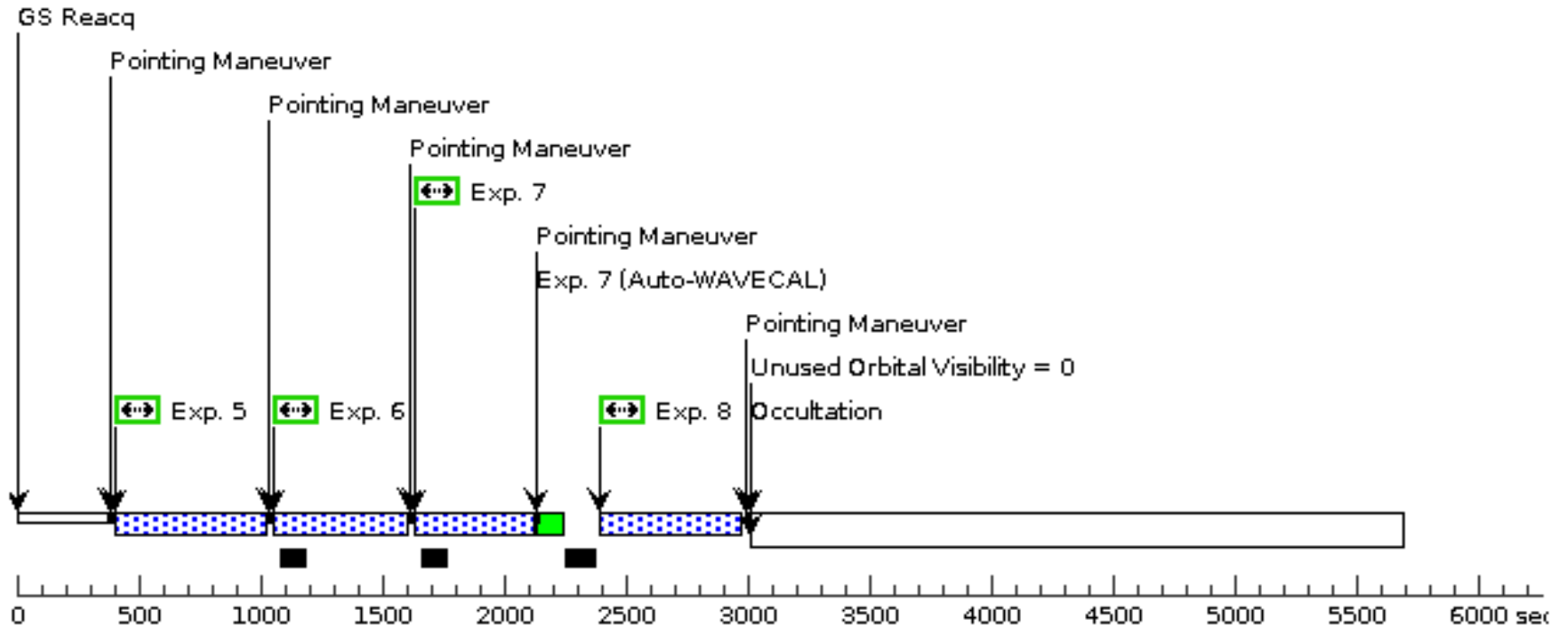
**Orbit 1**



Orbit Structure

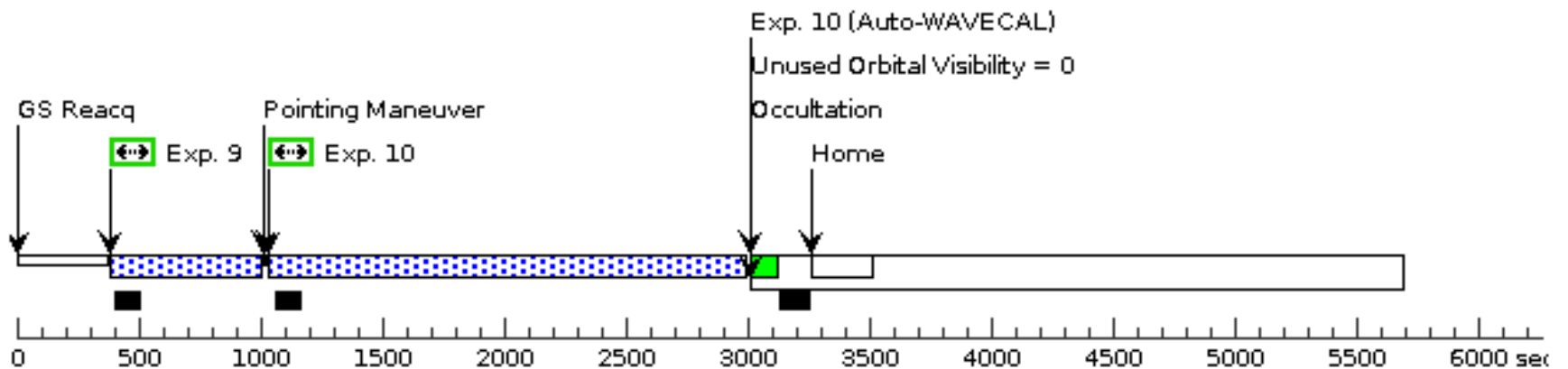
Server Version: 20240604

**Orbit 2**



**Orbit 3**

Server Version: 20240604



# Proposal 17845 - Visit 03 - Betelgeuse: The Great Dimming Redux?

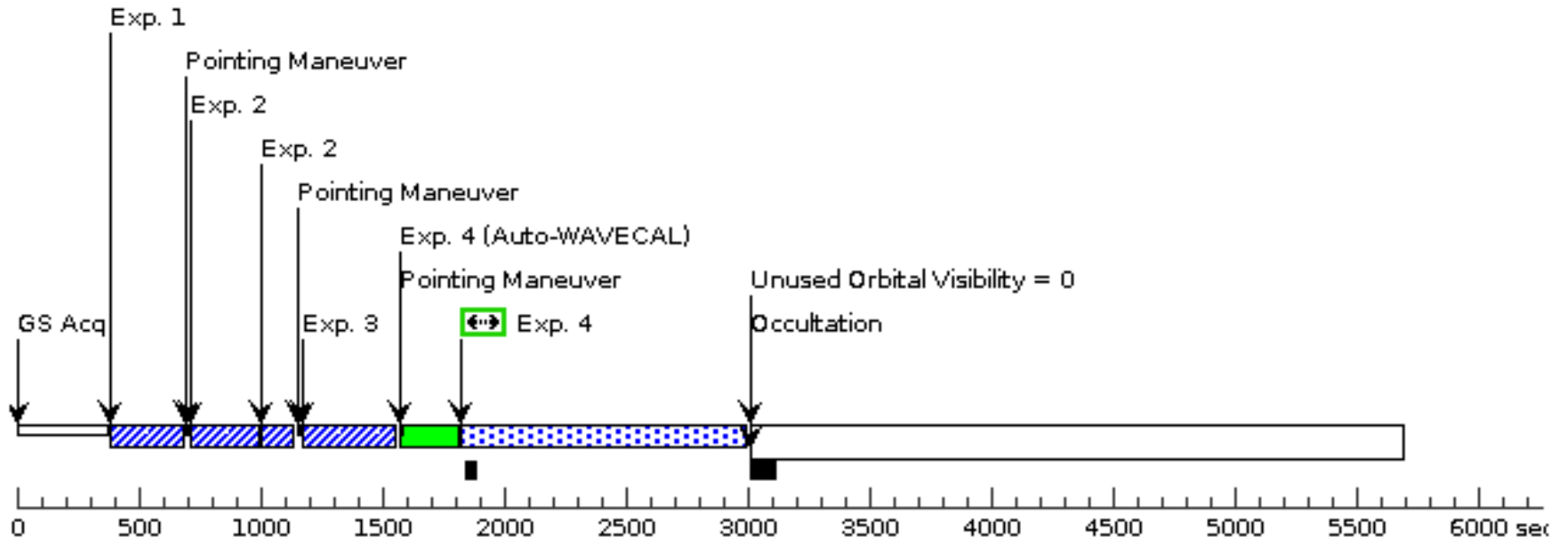
Fri Nov 15 18:04:15 GMT 2024

<b>Visit</b>	<b>Proposal 17845, Visit 03, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/NUV-MAMA, STIS/CCD Special Requirements: AFTER 02 BY 30 D TO 40 D					
	<b>Diagnostics</b>	(Visit 03) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE				
(Visit 03) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
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(Visit 03) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
<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)	-ALF-ORI	RA: 05 55 10.3054 (88.7929392d) Dec: +07 24 25.43 (7.40706d) Equinox: J2000	Proper Motion RA: 27.54 mas/yr Proper Motion Dec: 11.3 mas/yr Epoch of Position: 2000	V=+0.42+/-0.2	Reference Frame: ICRS
<i>Comments:</i> Category=STAR Description=[M III-I, SUPERGIANT O]						

Proposal 17845 - Visit 03 - Betelgeuse: The Great Dimming Redux?

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) -ALF-ORI	STIS/CCD, ACQ, F25ND5	MIRROR				1 Secs (1 Secs)	
									[==>]	[1]
	2		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.2X0.09	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	3		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.1X0.03	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	4	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.075,n ull		1155 Secs (1155 Secs)	
									[==>]	[1]
	5	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.050,n ull		606 Secs (606 Secs)	
								[==>]	[2]	
6	(1299112)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.025,n ull		530 Secs (530 Secs)		
								[==>]	[2]	
	<i>Comments: 3 pt linear peakup; telescope returned to central dwell position.</i>									
7	(1299113)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A				472 Secs (472 Secs)		
								[==>]	[2]	
	<i>Comments: Spiral in 0.1X0.03 aperture.</i>									
8	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.025, null	569 Secs (569 Secs)		
								[==>]	[2]	
9	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.050, null	606 Secs (606 Secs)		
								[==>]	[3]	
10	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.075, null	1944 Secs (1944 Secs)		
								[==>]	[3]	

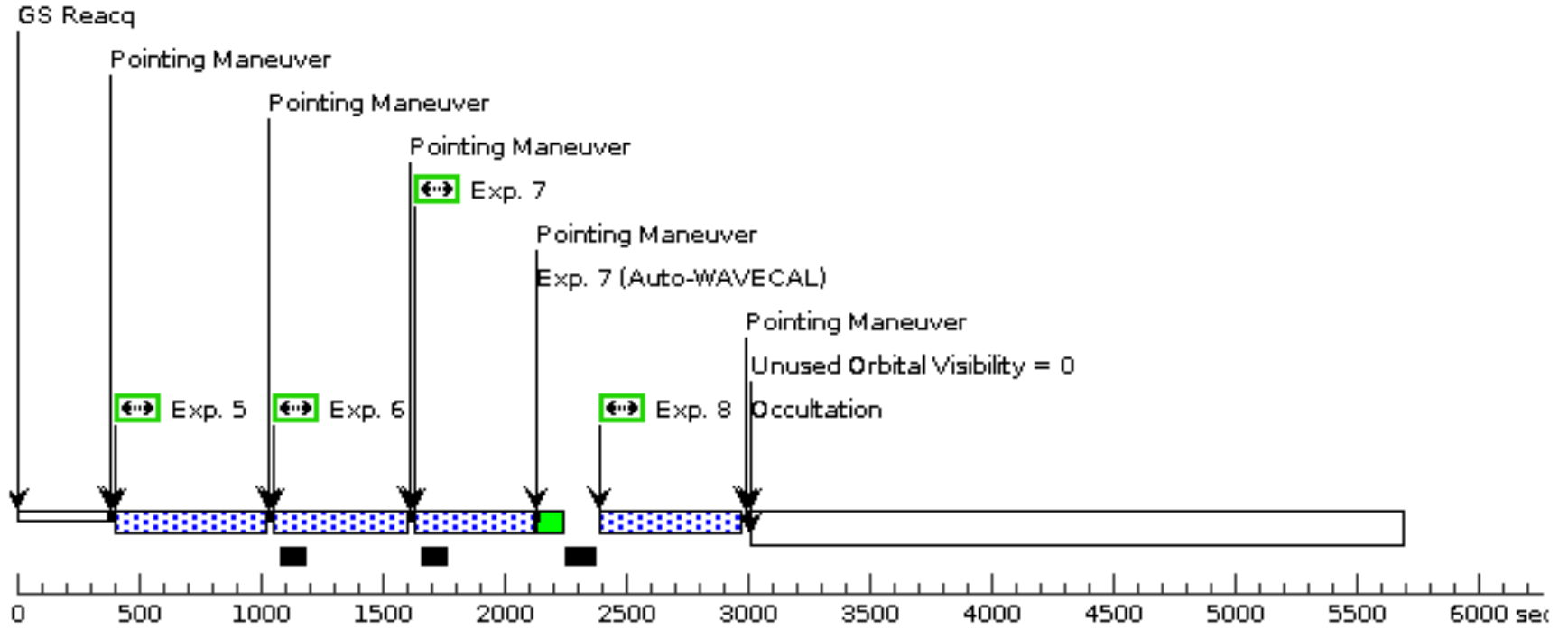
**Orbit 1**



Orbit Structure

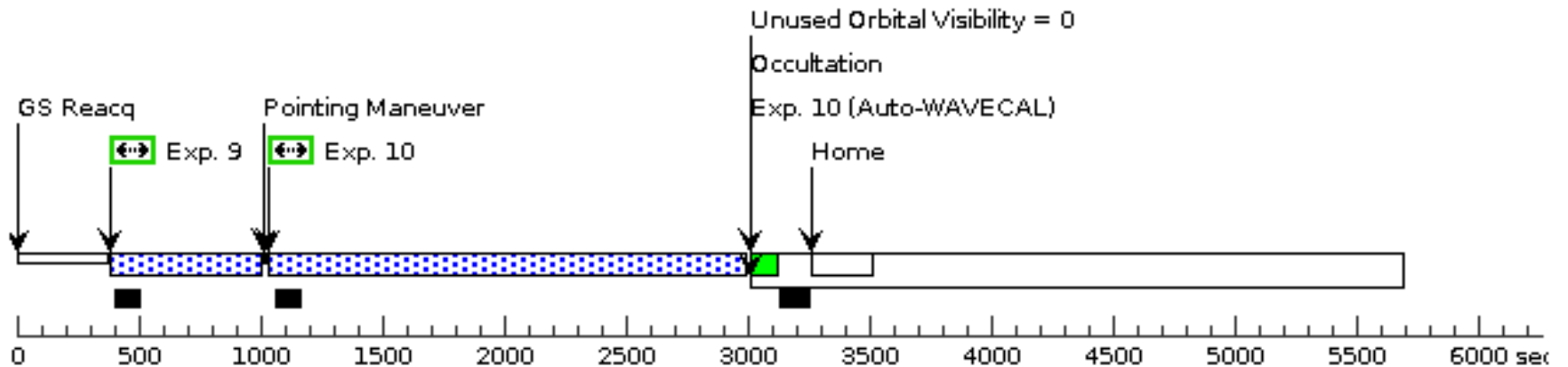
Server Version: 20240604

**Orbit 2**



**Orbit 3**

Server Version: 20240604



# Proposal 17845 - Visit 04 - Betelgeuse: The Great Dimming Redux?

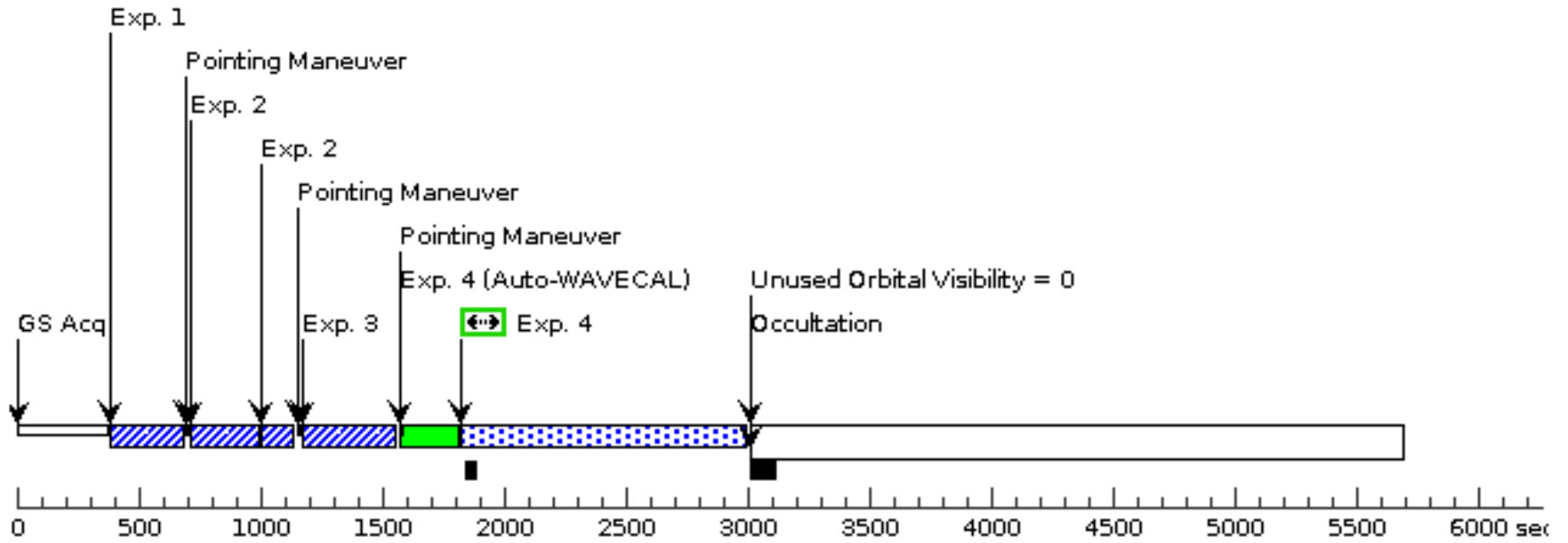
Fri Nov 15 18:04:15 GMT 2024

<b>Visit</b>	<b>Proposal 17845, Visit 04, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/NUV-MAMA, STIS/CCD Special Requirements: AFTER 20-MAR-2024:00:00:00; AFTER 03 BY 30 D TO 45 D					
	<b>Diagnostics</b>	(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE				
(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
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(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
<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)	-ALF-ORI	RA: 05 55 10.3054 (88.7929392d) Dec: +07 24 25.43 (7.40706d) Equinox: J2000	Proper Motion RA: 27.54 mas/yr Proper Motion Dec: 11.3 mas/yr Epoch of Position: 2000	V=+0.42+/-0.2	Reference Frame: ICRS
Comments: Category=STAR Description=[M III-I, SUPERGIANT O]						

Proposal 17845 - Visit 04 - Betelgeuse: The Great Dimming Redux?

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) -ALF-ORI	STIS/CCD, ACQ, F25ND5	MIRROR				1 Secs (1 Secs)	
									[==>]	[1]
	2		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.2X0.09	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	3		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.1X0.03	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	4	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.075,n ull		1155 Secs (1155 Secs)	
									[==>]	[1]
	5	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.050,n ull		606 Secs (606 Secs)	
								[==>]	[2]	
6	(1299112)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.025,n ull		530 Secs (530 Secs)		
								[==>]	[2]	
	<i>Comments: 3 pt linear peakup; telescope returned to central dwell position.</i>									
7	(1299113)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A				472 Secs (472 Secs)		
								[==>]	[2]	
	<i>Comments: Spiral in 0.1X0.03 aperture.</i>									
8	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.025, null	569 Secs (569 Secs)		
								[==>]	[2]	
9	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.050, null	606 Secs (606 Secs)		
								[==>]	[3]	
10	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.075, null	1944 Secs (1944 Secs)		
								[==>]	[3]	

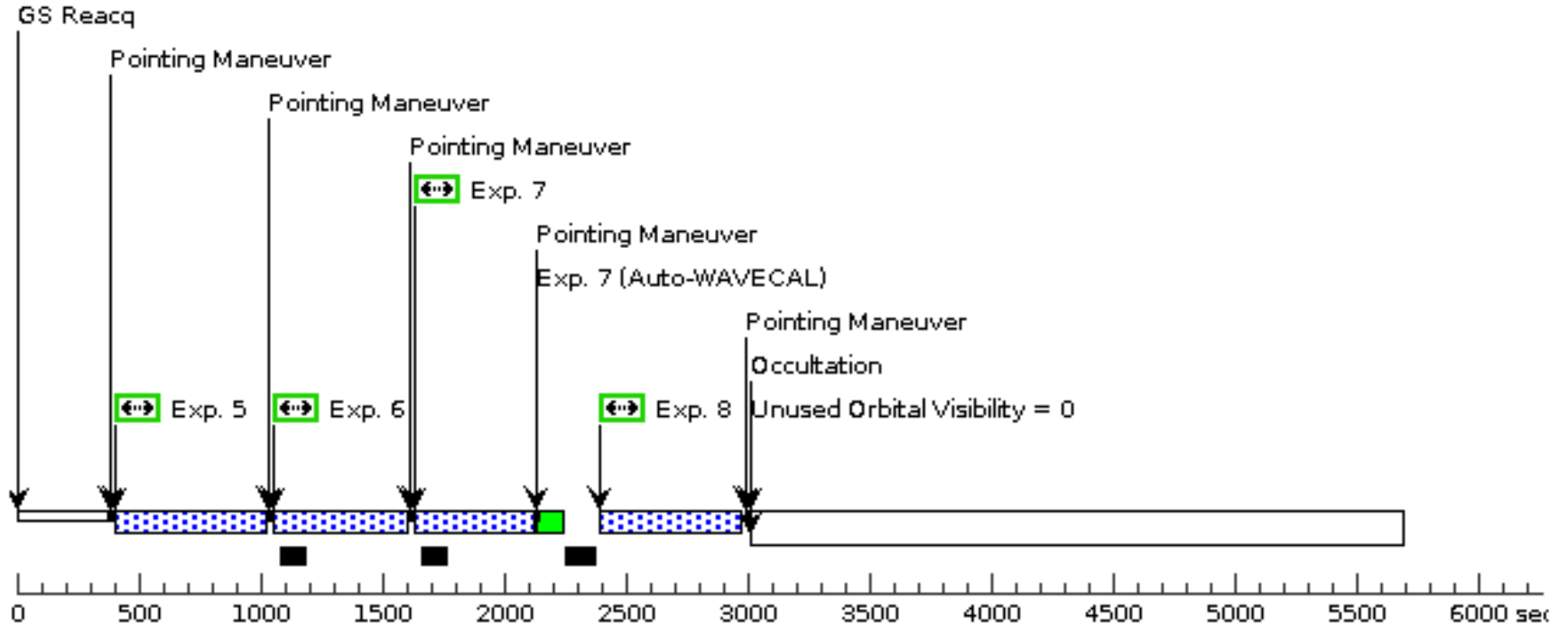
Orbit 1



Orbit Structure

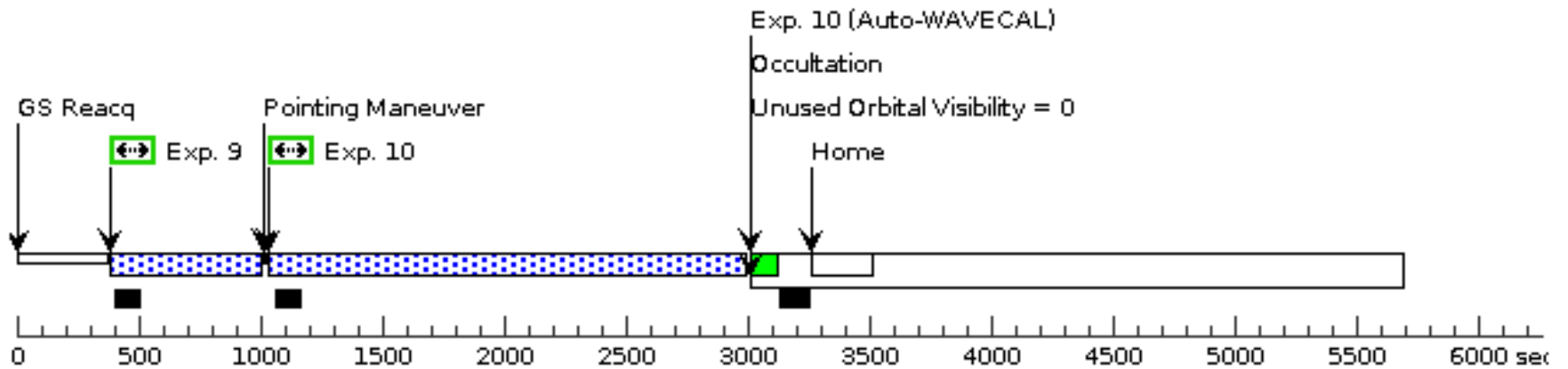
Server Version: 20240604

**Orbit 2**



**Orbit 3**

Server Version: 20240604



# Proposal 17845 - Visit 05 - Betelgeuse: The Great Dimming Redux?

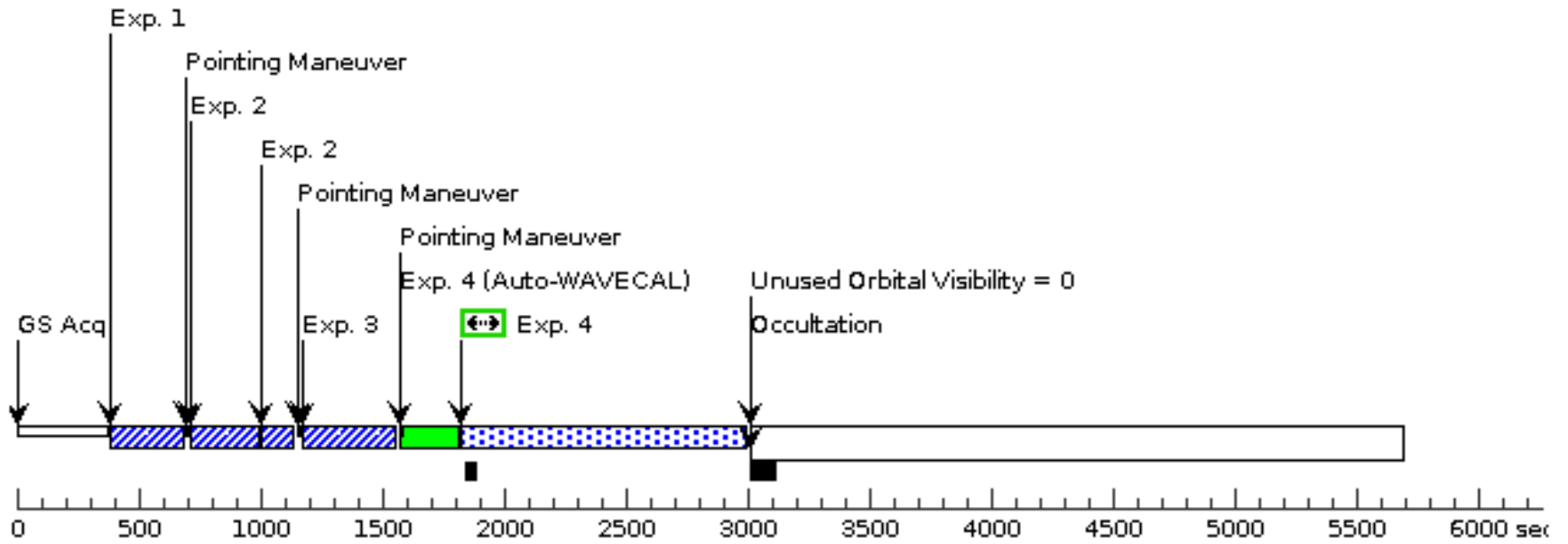
Fri Nov 15 18:04:15 GMT 2024

<b>Visit</b>	<b>Proposal 17845, Visit 05, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: STIS/NUV-MAMA, STIS/CCD Special Requirements: AFTER 20-MAR-2024:00:00:00; AFTER 04 BY 30 D TO 45 D					
	<b>Diagnostics</b>	(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE				
(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE						
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(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
(Visit 05) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT						
<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)	-ALF-ORI	RA: 05 55 10.3054 (88.7929392d) Dec: +07 24 25.43 (7.40706d) Equinox: J2000	Proper Motion RA: 27.54 mas/yr Proper Motion Dec: 11.3 mas/yr Epoch of Position: 2000	V=+0.42+/-0.2	Reference Frame: ICRS
<i>Comments:</i> Category=STAR Description=[M III-I, SUPERGIANT O]						

Proposal 17845 - Visit 05 - Betelgeuse: The Great Dimming Redux?

Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) -ALF-ORI	STIS/CCD, ACQ, F25ND5	MIRROR				1 Secs (1 Secs)	
									[==>]	[1]
	2		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.2X0.09	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	3		(1) -ALF-ORI	STIS/CCD, ACQ/PEAK, 0.1X0.03	G230LB 2375 A				1 Secs (1 Secs)	
									[==>]	[1]
	4	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.075,n ull		1155 Secs (1155 Secs)	
									[==>]	[1]
	5	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.050,n ull		606 Secs (606 Secs)	
								[==>]	[2]	
6	(1299112)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A		POS TARG -0.025,n ull		530 Secs (530 Secs)		
								[==>]	[2]	
	<i>Comments: 3 pt linear peakup; telescope returned to central dwell position.</i>									
7	(1299113)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A				472 Secs (472 Secs)		
								[==>]	[2]	
	<i>Comments: Spiral in 0.1X0.03 aperture.</i>									
8	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.025, null	569 Secs (569 Secs)		
								[==>]	[2]	
9	(1526014)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.050, null	606 Secs (606 Secs)		
								[==>]	[3]	
10	(1525642)	(1) -ALF-ORI	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230M 2707 A			POS TARG +0.075, null	1944 Secs (1944 Secs)		
								[==>]	[3]	

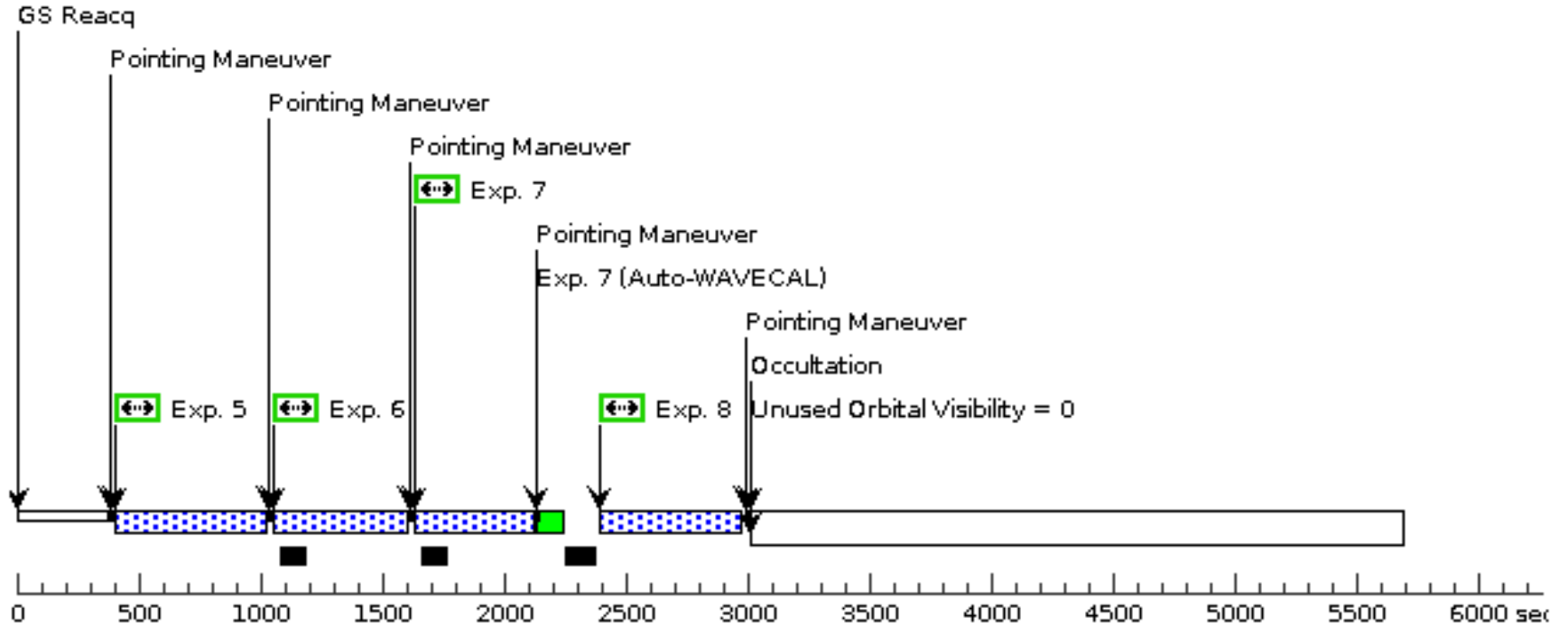
**Orbit 1**



Orbit Structure

Server Version: 20240604

**Orbit 2**



**Orbit 3**

Server Version: 20240604

