



## 16434 - Imaging of AG Car

Cycle: 28, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

### INVESTIGATORS

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### 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) AG-CAR	WFC3/UVIS	2	08-Feb-2021 12:00:26.0	yes
02	(1) AG-CAR	WFC3/UVIS	3	08-Feb-2021 12:00:27.0	yes
03	(1) AG-CAR	WFC3/UVIS	2	08-Feb-2021 12:00:28.0	yes
04	(1) AG-CAR	WFC3/UVIS	3	08-Feb-2021 12:00:29.0	yes

10 Total Orbits Used

## **ABSTRACT**

We propose to obtain WFC3 imaging of the Luminous Blue Variable AG Car, and the nebula around it, with 3 medium or broadband filters to image the reflection nebula, as well as the Ha+NII narrowband filter to image the gas around AG Car.

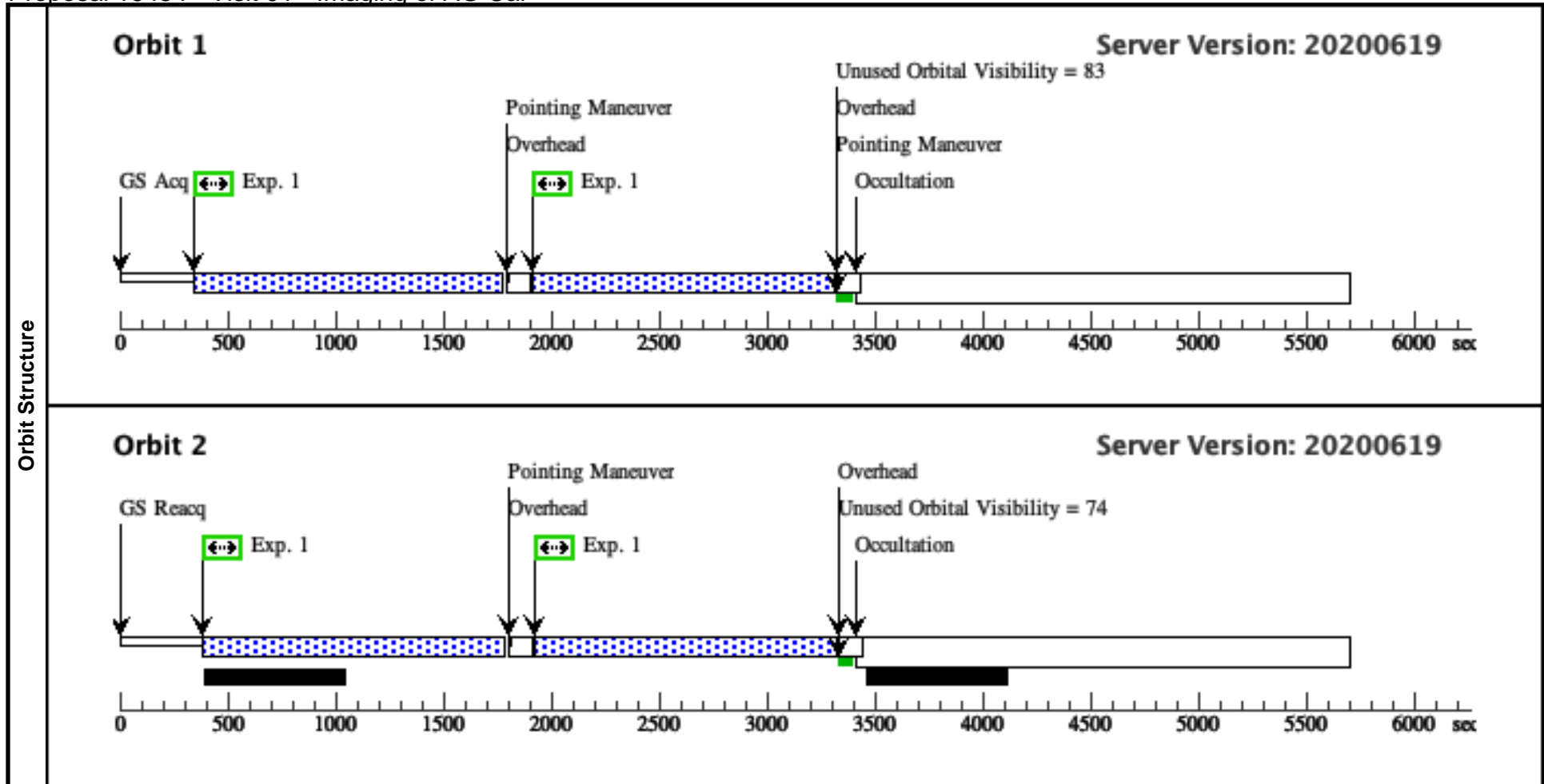
## **OBSERVING DESCRIPTION**

We will obtain high signal-to-noise (S/N) imaging of the Luminous Blue Variable AG Car with new broad, medium and narrow band observations from UV to NIR to image the wind outflow and dust reflection nebula using the WFC3/UVIS instrument using the F275W, F547M, F657N, and F845M filters. These new images will complement existing archival observations in F547M and F658N taken with the PC chip of WFPC2. We will obtain new high S/N observations in F657N with WFC3/UVIS to increase the poor S/N of imagery that exists in the archival data as well as add to the outlying nebula which fell off of earlier PC chip exposures. We will also obtain new high S/N observations in F547M, a line-free filter which will show the dust scattering continuum. To better image the structure of the dust in the reflection nebula and maximize the slight color differences in scattered light caused by differences in the dust, we will obtain new medium band observations in F275W and F845M, which are both regions selected for containing no or few emission lines which trace the hot gas rather than scattering dust. The UV capabilities of Hubble will provide a long lever-arm to extract subtle color differences in the scattered light. The bright star in the center of the nebula poses a challenge in reconstructing a public-quality image for release as the bleed trails from the saturated central star will be significant. To mitigate this, we request to schedule observations in both January and February, allowing the instrument to rotate between observations and sending the bleed trail to different parts of the nebula. In this way, images from each epoch can be combined and the bleed trails removed without losing detail in the nebula. In addition to archival F547M and F658N imaging, there exist archival FOS spectra and IUE spectra of AG Car and its nebula, which can be used to help guide exposure time calculations for F275W observations. AG Car is 10x times fainter at 2800Å than the frequently observed Eta Car, which was featured in a press release using F280N imaging in July, 2019. This suggests that the brightness difference is almost entirely due to the distance, as AG Car is 3x further away. Eta Car was observed with 3930s in F280N, which is 10x narrower than F275W. We here propose to use 4 orbits in F275W, two in January and two in February, to obtain a high S/N image of AG Car in F275W. The archival images in F658N totaled 1200s. Archival F547M images total 4200s. An additional 3 orbits each in January and in February for F547M, F657N, and F845M, would provide high S/N images in each filter and extend the coverage of the outer nebula which fell off the PC chip in archival observations. 6 orbits for optical observations in F547M, F657N, and F845M and 4 orbits for F275W gives a total of 10 orbits. Scheduling windows for AG Car are in early January and late February. In order to best treat the large bleed trails from the central star in the final image, we request to do half of our orbits in January and half in late February, so that the angle of the detector on the sky changes and takes the bleed trail (and large diffraction spikes) to another location in the nebula, allowing the data from one month to fill in the resulting gap in the other.

Proposal 16434 - Visit 01 - Imaging of AG Car

Mon Feb 08 17:00:29 GMT 2021

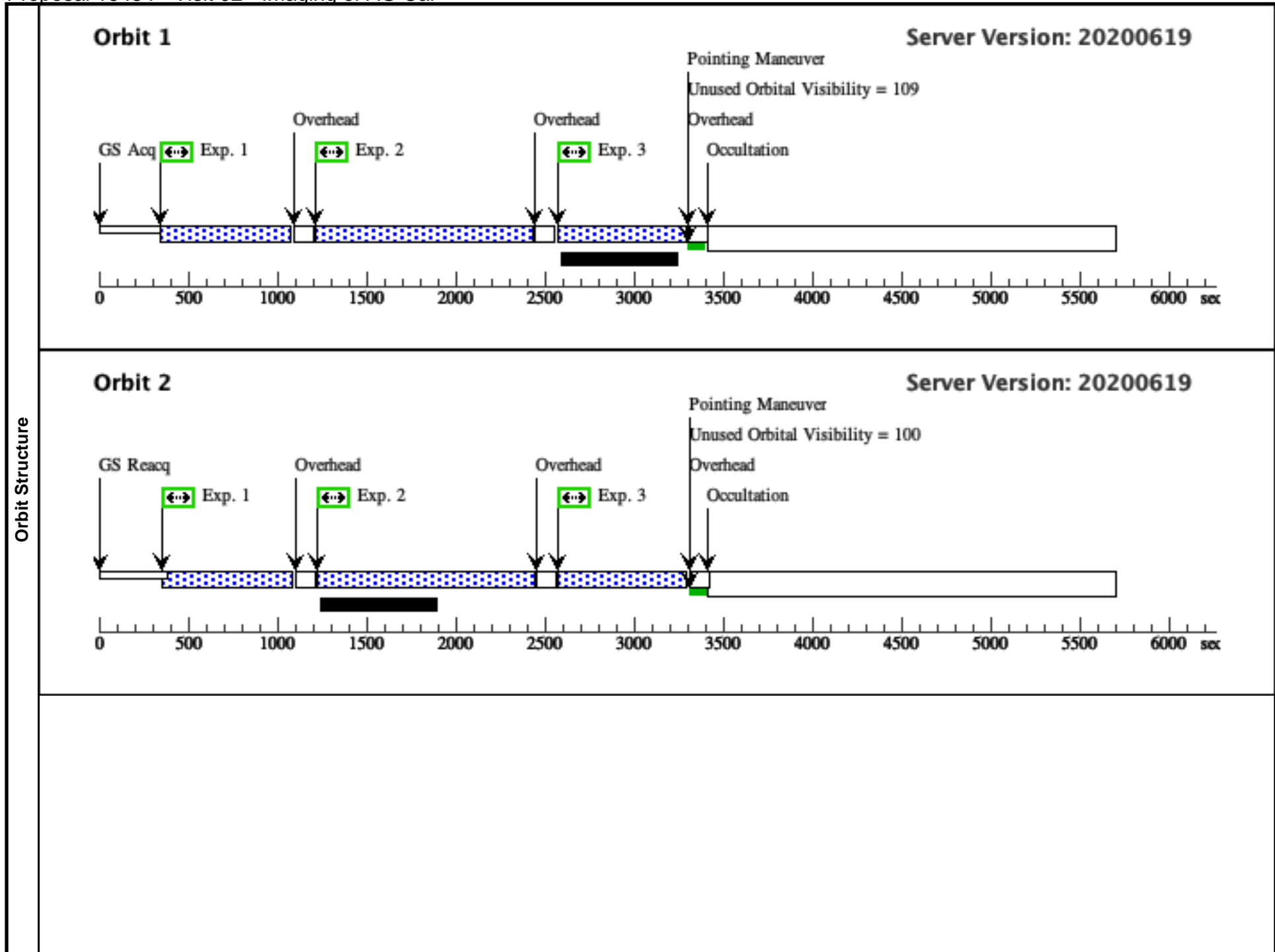
<b>Visit</b>	<b>Proposal 16434, Visit 01, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 301D TO 309 D									
	(Exposure 1 (Pattern 4, Exps 1-1 in Visit 01)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser									
<b>Diagnosics</b>										
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(4)	Pattern Type=LINE Purpose=DITHER Number Of Points=4 Point Spacing=2.5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=86 Angle Between Sides= Center Pattern=false			(1)				
<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)	AG-CAR	RA: 10 56 11.5681 (164.0482004d) Dec: -60 27 12.78 (-60.45355d) Equinox: J2000	Proper Motion RA: -6.355335037111536E-4 sec of time/yr Proper Motion Dec: 0.001873 arcsec/yr Epoch of Position: 2015.5	V=6.96	Reference Frame: SIMBAD				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[LUMINOUS BLUE VARIABLE]										
<b>Exposures</b>	<b>#</b>	<b>Label</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		(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS2-FIX	F275W	FLASH=15		Pattern 4, Exps 1-1 in Visit 01 (4)	1400 Secs (5600 Secs)	
	[=>(Pattern 1)]									
	[=>(Pattern 2)]									
[=>(Pattern 3)]										
[=>(Pattern 4)]										
[1]										
[2]										

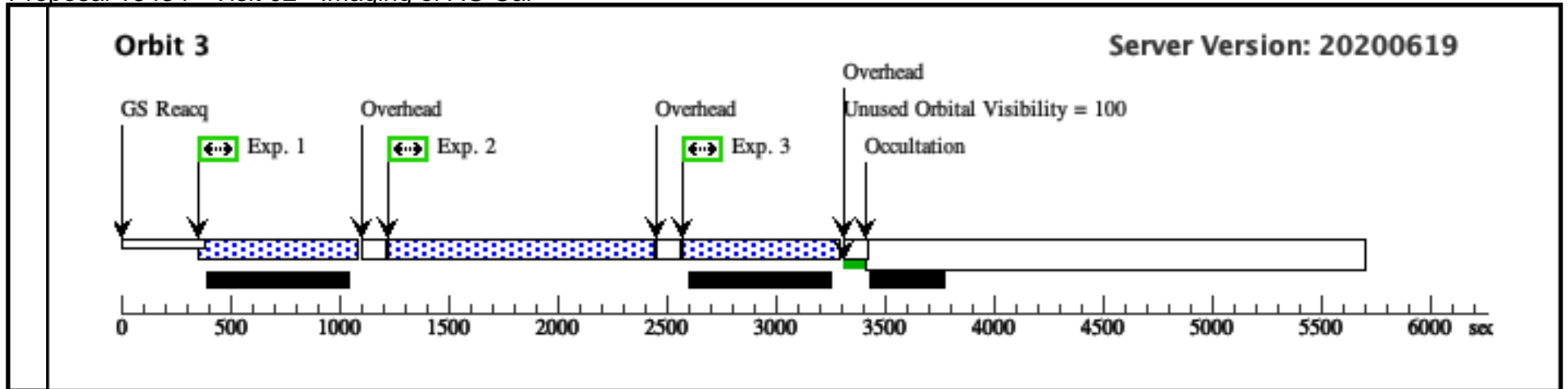


Proposal 16434 - Visit 02 - Imaging of AG Car

Mon Feb 08 17:00:30 GMT 2021

<b>Visit</b>	<b>Proposal 16434, Visit 02, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 01									
	(Exposure 1 (Pattern 5, Exps 1-3 in Visit 02)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser (Exposure 2 (Pattern 5, Exps 1-3 in Visit 02)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser (Exposure 3 (Pattern 5, Exps 1-3 in Visit 02)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser									
<b>Diagnos</b>										
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(5)	Pattern Type=LINE Purpose=DITHER Number Of Points=3 Point Spacing=2.5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=86 Angle Between Sides= Center Pattern=false			(1-3)				
<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)	AG-CAR	RA: 10 56 11.5681 (164.0482004d) Dec: -60 27 12.78 (-60.45355d) Equinox: J2000	Proper Motion RA: -6.355335037111536E-4 sec of time/yr Proper Motion Dec: 0.001873 arcsec/yr Epoch of Position: 2015.5	V=6.96	Reference Frame: SIMBAD				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[LUMINOUS BLUE VARIABLE]										
<b>Exposures</b>	<b>#</b>	<b>Label</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	(1) AG-CAR	(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS2-FIX	F547M	FLASH=8		Pattern 5, Exps 1-3 in Visit 02 (5)	700 Secs (2100 Secs)	
2	(1) AG-CAR	(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS2-FIX	F657N	FLASH=16			Pattern 5, Exps 1-3 in Visit 02 (5)	1200 Secs (3600 Secs)	
3	(1) AG-CAR	(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS2-FIX	F845M	FLASH=12			Pattern 5, Exps 1-3 in Visit 02 (5)	700 Secs (2100 Secs)	

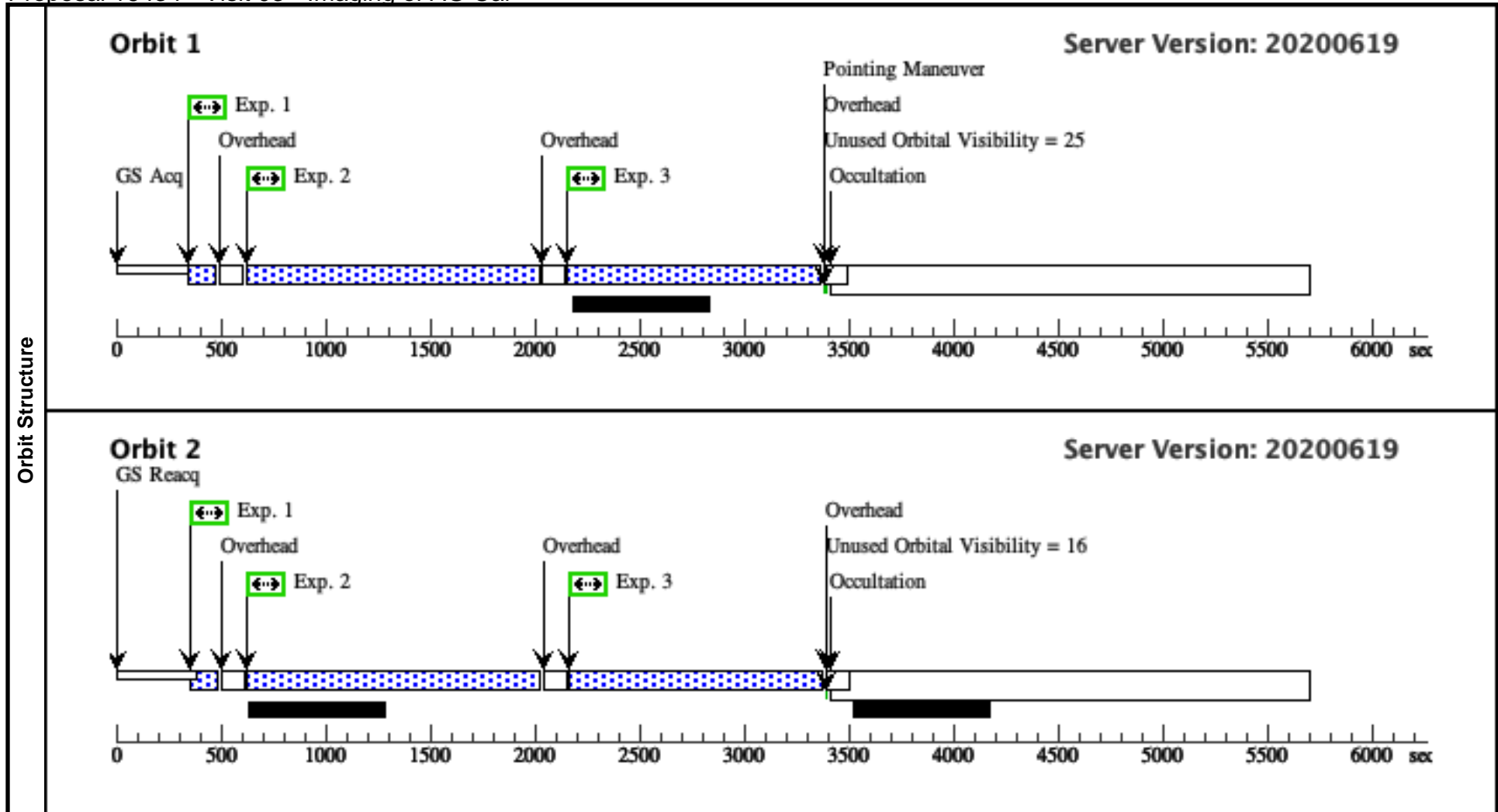




Proposal 16434 - Visit 03 - Imaging of AG Car

Mon Feb 08 17:00:30 GMT 2021

<b>Visit</b>	<b>Proposal 16434, Visit 03, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 352D TO 359.9 D									
	(Exposure 1 (Pattern 6, Exps 1-3 in Visit 03)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser (Exposure 2 (Pattern 6, Exps 1-3 in Visit 03)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser (Exposure 3 (Pattern 6, Exps 1-3 in Visit 03)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser									
<b>Diagnosics</b>										
<b>Patterns</b>	#	Primary Pattern		Secondary Pattern		Exposures				
	(6)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=86 Angle Between Sides= Center Pattern=false			(1-3)				
<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	AG-CAR	RA: 10 56 11.5681 (164.0482004d) Dec: -60 27 12.78 (-60.45355d) Equinox: J2000	Proper Motion RA: -6.355335037111536E-4 sec of time/yr Proper Motion Dec: 0.001873 arcsec/yr Epoch of Position: 2015.5	V=6.96	Reference Frame: SIMBAD				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[LUMINOUS BLUE VARIABLE]										
<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS1-FIX	F275W	FLASH=20		Pattern 6, Exps 1-3 in Visit 03 (6)	100 Secs (200 Secs)	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	[2]
	2		(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS1-FIX	F275W	FLASH=15		Pattern 6, Exps 1-3 in Visit 03 (6)	1400 Secs (2800 Secs)	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	[2]
3		(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS1-FIX	F657N	FLASH=15		Pattern 6, Exps 1-3 in Visit 03 (6)	1200 Secs (2400 Secs)		
								[=>(Pattern 1)]	[1]	
								[=>(Pattern 2)]	[2]	



Proposal 16434 - Visit 04 - Imaging of AG Car

Mon Feb 08 17:00:30 GMT 2021

<b>Visit</b>	<b>Proposal 16434, Visit 04, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 03									
	(Exposure 1 (Pattern 5, Exps 1-3 in Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser (Exposure 2 (Pattern 5, Exps 1-3 in Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser (Exposure 3 (Pattern 5, Exps 1-3 in Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser									
<b>Diagnosics</b>										
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(5)	Pattern Type=LINE Purpose=DITHER Number Of Points=3 Point Spacing=2.5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=86 Angle Between Sides= Center Pattern=false			(1-3)				
<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)	AG-CAR	RA: 10 56 11.5681 (164.0482004d) Dec: -60 27 12.78 (-60.45355d) Equinox: J2000	Proper Motion RA: -6.355335037111536E-4 sec of time/yr Proper Motion Dec: 0.001873 arcsec/yr Epoch of Position: 2015.5	V=6.96	Reference Frame: SIMBAD				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[LUMINOUS BLUE VARIABLE]										
<b>Exposures</b>	<b>#</b>	<b>Label</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	(1) AG-CAR	(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS1-FIX	F547M	FLASH=12		Pattern 5, Exps 1-3 in Visit 04 (5)	700 Secs (2100 Secs)	
	[=>(Pattern 1)]									[1]
	[=>(Pattern 2)]									[2]
	[=>(Pattern 3)]									[3]
	2	(1) AG-CAR	(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS1-FIX	F657N	FLASH=16		Pattern 5, Exps 1-3 in Visit 04 (5)	1200 Secs (3600 Secs)	
	[=>(Pattern 1)]									[1]
	[=>(Pattern 2)]									[2]
[=>(Pattern 3)]									[3]	
3	(1) AG-CAR	(1) AG-CAR	WFC3/UVIS, ACCUM, UVIS1-FIX	F845M	FLASH=12		Pattern 5, Exps 1-3 in Visit 04 (5)	700 Secs (2100 Secs)		
[=>(Pattern 1)]									[1]	
[=>(Pattern 2)]									[2]	
[=>(Pattern 3)]									[3]	

