18065 - Alpha-1 Hercules (M5 Ib-II): Wind Acceleration from an Oxygen-rich AGB star in a Coeval System

Cycle: 33, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Graham M. Harper (PI) (Contact)	**University of Colorado at Boulder**
Dr. Edward F. Guinan (CoI)	Villanova University

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) 1-ALF-HER	STIS/CCD STIS/NUV-MAMA	3	11-Aug-2025 12:00:56.0	yes
02	(1) 1-ALF-HER	STIS/CCD STIS/NUV-MAMA	3	11-Aug-2025 12:00:57.0	yes
03	(1) 1-ALF-HER	STIS/CCD STIS/NUV-MAMA	3	11-Aug-2025 12:00:57.0	yes
04	(1) 1-ALF-HER	STIS/CCD STIS/NUV-MAMA	3	11-Aug-2025 12:00:58.0	yes
05	(1) 1-ALF-HER	STIS/CCD STIS/NUV-MAMA	2	11-Aug-2025 12:00:59.0	yes
06	(1) 1-ALF-HER	STIS/CCD STIS/FUV-MAMA	3	11-Aug-2025 12:00:59.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
07	(1) 1-ALF-HER	STIS/CCD STIS/FUV-MAMA	3	11-Aug-2025 12:01:00.0	yes

20 Total Orbits Used

ABSTRACT

Oxygen-rich AGB stars are at the nexus of mass-loss mechanisms for cool evolved stars. K through mid-M red giants show signatures of rapid wind acceleration and magnetic wave-driven winds (outflows), while carbon-rich AGB stars lose mass through a combination of pulsation and radiation pressure - driving dusty outflows. However, this combined mechanism does not work for low-amplitude oxygen-rich AGB stars.

We propose high and medium-spectral resolution, high signal-to-noise ratio, near and far-ultraviolet STIS observations of the oxygen-rich M5 Ib-II AGB star alpha-1 Her. These will be used to measure the wind acceleration and wind turbulence gradient which will help determine whether alpha-1 Her has a magnetic wave-driven, or an unrecognized hybrid radiation pressure-driven outflow. Absorption in the FUV CO Fourth-Positive Electronic bands will enable a sensitive analysis of the properties of the molecular wind component.

The coeval alpha Hercules system has well determined stellar masses, radii, effective temperatures, and evolutionary age, making it an excellent system to study the full context of the mass-loss process in this O-rich M-type AGB star. These observations will help constrain where, evolutionarily, magnetic processes transition to pulsational radiation-driven flows - permitting more reliable mass-loss rate and chemical enrichment predictions for galactic evolution models for subsequent generations of stars and their planets.

This suite of spectra will be an invaluable addition to the existing Hubble Archive, adding to the very under-represented class of cool evolved M stars.

OBSERVING DESCRIPTION

Note on astronomical terminology: ALF1-HER (our target) is the M5 II AGB star, while ALF2-HER is the spectroscopic binary companion (A9 IV-V+G8 III) at 4.84" separation from ALF1-HER. In some papers these two systems are sometimes called ALF HER A and ALF HER B, we are following notation of Theiring & Reimers (1993 A&A 274, 838)

Photometry

	alf1 Her	alf2Her A	alf2 Her B
Spec-Type	M5 Ib-II	G8 III	A9 IV-V
V	3.5	5.4	6.6
B-V	1.70	0.8	0.4

For further information relevant to this proposal see the detailed UV study (IUE) by Thiering & Reimers 1993 A&A 274, 838-846

SCIENCE OBSERVING PLAN:

20 Orbits are requested for 7 Visits, to keep each Visit to a maximum 3 orbits

Spectral Setting	Aperture (" x ")	Wavelength Range (Ang)	Orbits #	~S/N continuum Res. Elem.)
E140M-1425	0.2 x 0.2	1150-1700	6	10
E230M-1978	0.2 x 0.2	1610-2365	5	30
E230H-2263	0.2 x 0.09	2135-2396	3	50
E230H-2513	0.2 x 0.09	2379-2650	3	50
E230H-2762	0.2 x 0.09	2621-2887	2	40
E230H-2962	0.2 x 0.2	2823-3095	1	20

The high-spectral resolution, R~100, 000, E230H NUV spectra contain the numerous emission lines
required to analyze and map the wind acceleration region and characterize the chromopsheric plasma. The diagnostics include
electron-density sensitive C II] 2325 Ang. Mult. which provides the best estimates of the chromospheric
electron density and turbulence, collisionally excited emission lines, including Si II] 2350 Ang, Al II] 2669 Ang,
Mg II h & k, 100's of NUV Fe II which cover 4 orders of magnitude in optical depth, and photoexcited Fe I uv 44 (2823+2844 A).

The E230H settings will use the recommended 0.2x0.09 arcsec aperture to obtain high spectral-resolution.

A short E230H-2962 spectrum will be obtained through the photometric 0.2x0.2 arcsec aperture
in the first Visit. This will be used to set the absolute flux scaling for the subsequent narrow aperture
spectra, and extend the wavelength coverage to 3095 Ang.

To measure the FUV CO Fourth-Positive electronic absorption bands both the E140M-1425 and E230M-1978 settings are required.
The E230M setting will also cover the three small wavelength gaps in the E140M spectra and enable complete spectra coverage joining the E230H sepctra. The FUV spectral-resolution of R~45, 000 corresponds
to a FWHM = 6.5 km s-1 which is very well matched to the expected tubulent line widths in the accelerating outflow and is needed to capture the narrow CO lines.
The 0.2x0.2 arcssec aperture is selected for the FUV spectra to maximize throughput, while having good spectral resolution and avoiding scattered light from the spectroscopic companion.

For the ETC for the NUV science observations we took a "lucky spectra" approach - chosing and coadding the IUE LWP spectra which by chance had the least contamination from ALF2-HER
(i.e. the differing selected positions and actual PA of large aperture) - "iue_m5ii.etc". For the FUV we merged an IUE beta Gru (M4.5 III) spectrum with a STIS spectra of gamma Cru (M3.5 III) and scaled by the
angular diameters squared "alf1_Her_angdiam.etc".

ACQUISITION:

ALF1-HER is in a very long period wide-binary system: ~3, 600 yr, where the spectroscopic binary companion (A9 V+G8 III) separation is 4.84" with PA=104.6 deg (Hipparcos).
The ALF2-HER Her binary does not vary in flux, while the M5 Ib-II star is a SRc variable with delta V = +/- 0.5 mag. The separate V magnitudes for ALF1-HER and ALF2-HER are 3.5 and 5.4,
respectively. The V band variability of total range +/- 0.5 refers to extremes at long time ranges, and more typically its range is +/- 0.3 Mag.
Currently AAVSO photometry shows for March-May 2025: ALF1-HER V=3.03-3.45, i.e. slightly brighter than catalog value of 3.5

COORDINATES:
The coordinates and proper motions ingested by the APT from SIMBAD are from Hipparcos (Van Leeuwen 2007 -New Reduction) which is tied to

ICRS. We have verified that the APT proper motions are essentially correct
by propagating the Hipparcos Epoch 1991.25 position of ALF2-HER to the GAIA Epoch 2015.50 (dT=24.25 yr). GAIA has an ICRS astrometric solution for the companion (only) and the two positions are within 0.15 arcsec.
Therefore the position of ALF1 HER at Epoch 2026.5 should good to 0.2 arcsec. The STIS 5x5arcsec scan box should not include the companion at 4.84 arcsec.

*** Note I am uncertain as to what the right figure in the Target Confirmation pdf is meant to show.

ACQ:
The M supergiant will be acquired at optical long wavelengths on the CCD with the F25ND5 filter. Using the STIS Target Acquisition ETC with the Pickles models (M5 III,
G8 III) and Bruzual model(A7 V) scaled to the individual V-mags, the M5 II star has a count rate 13 times higher than ALF2-HER.

For the STIS Imaging ETC we estimated the intrinsic M5 II fluxes using 3800-8500 Ang spectrophotometry of Kiehling (1987 A&AS 69, 465) and 13 narrow band photometry of Johnson & Mitchell, merged with IRTF Spex
low resolution sperctra at the long NIR wavelengths. A Kurucz synthetic model G8 III star contribution was then subtracted (A9 star is negligible).
ETC file "aher_m5iii.etc"

ACQ/PEAK:
For all science exposures using the small 0.2x0.9 science aperture we will perform a CCD peak-up to ensure maximum throughput.
Note we will also perform an ACQ/PEAK for Visit 1 for the E230H-2962 0.2x0.2 observation because the 2 subsequent exposures use the 0.2x0.09 arcsec aperture.

SAFETY CONSIDERATIONS:

The brighest sources in the IUE 10x20 arcsec large aperture are the alpha Hercules system: alf1Her M5 Ib-II (our target) and alf2 Her (G8 III + A9 IV-V) (the companion binary)

For safety ETC checks we use the isolated IUE Large Aperture spectra of the A9 IV-V + G8 II binary.
For wave > 1978 Ang. we combine LWP20790 and LWP20791 (HIRES) to get good S/N without saturation
For wave < 1978 Ang. we combine SWP05843 and SWP42045 (LORE) to get good S/N without saturation
These are merged into rhe ascii file "alf2_her.etc" and used in the following ETC simulations

E230H-2962 (0.2x0.2) : STIS.sp.2024976
E230H-2762 (0.2x0.09): STIS.sp.2024430
E230H-2513 (0.2x0.09): STIS.sp.2024432
E230H-2263 (0.2x0.09) :STIS.sp.2024436
E230M-1978 (0.2x0.2) : STIS.sp.2024439
E140M-1425 (0.2x0.2) : STIS.sp.2024440

No warnings are present when these are run through the STIS specgtroscopic ETC.

Note: the APT BOT returns warning on the observations
The GSC2 Health and Safety Warning for a star with V=3.35 B-V=1.36 (which is the alpha Her system) but is assumed in the BOT to be an O5 V star.
The four unknown sources have the same V=3.37 but no color. These are again ALF-HER, our target

Since there have been many IUE 10x20 arcsec observations with different PAs sweeping out a box of 20x20 arcsec no other UV is seen. Futhermor absolute fluxes recorded by the UV TD 1 satellite through the large 17x11.7 arcmin slot
are (Thompson, G. I. et al. 1995 VizieR II/59B/catalog) 2365+/-165 A=2.4E-12, 1965+/-165 A=2.9-12, and 1565+/-165 A=7.8E-13 erg cm-2 s-1 A-1 (Humphries, C. M. et al. 1976 A&A 49, 389-406) - which are similaer to the
IUE fluxes.

End of Observing Description

Visit

Proposal 18065, Visit 01

Mon Aug 11 16:01:00 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: (none)

Comments: First Visit

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	ACQ/PEAK (STIS.sp.2023000)	(1) 1-ALF-HER	STIS/CCD, ACQ/PEAK, 0.2X0.09	G430M 5471 A				0.3 Secs (0.3 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 80

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	Photometric NUV E230 H-2962 0.2x 0.2 (STIS.sp.2025048)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2962 A				1520.0 Secs (1520 Secs) *[==>]*	***[1]***

Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

Photometric 0.2x0.2 observation to help photometrically calibrate subsequent observations in this Visit. S/N @ 3000A ~20 per res elem

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
4	NUV E230 H-2762 0.2x 0.09 (1 of 2) (STIS.sp.2025049)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2762 A				2564.0 Secs (2564 Secs) *[==>]*	***[2]***

Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

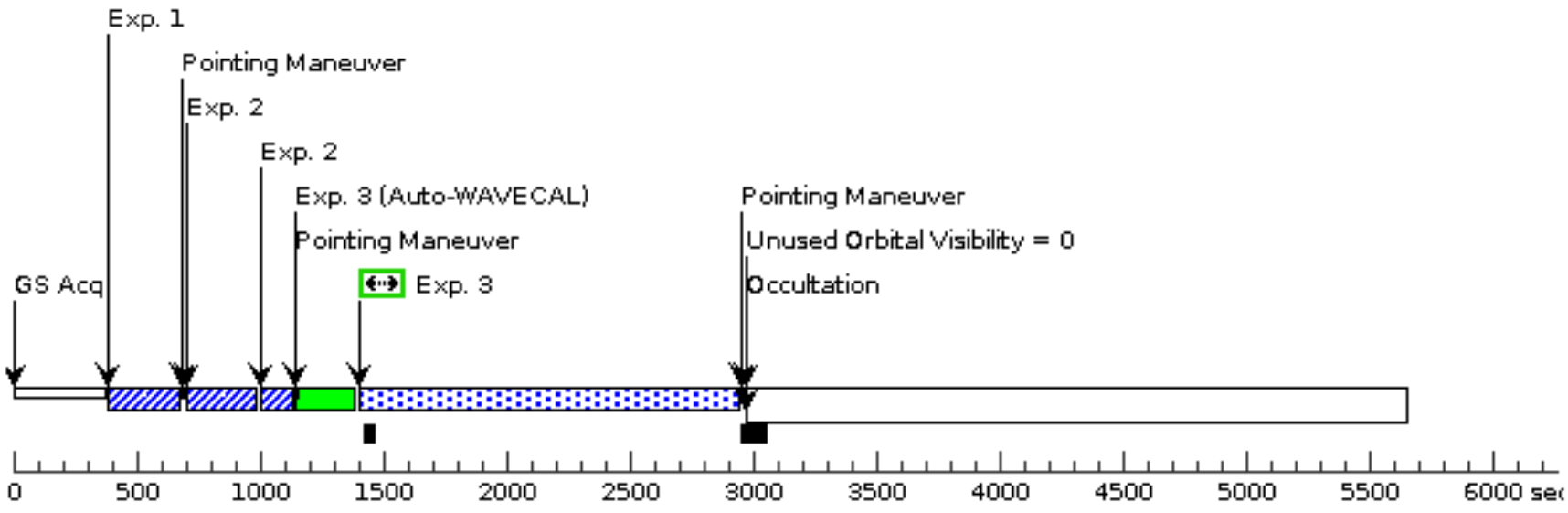
Observation 1 of 2 in same setting to get total observing time S/N ~ 26 @ 2730 (continuum) - emission lines higher

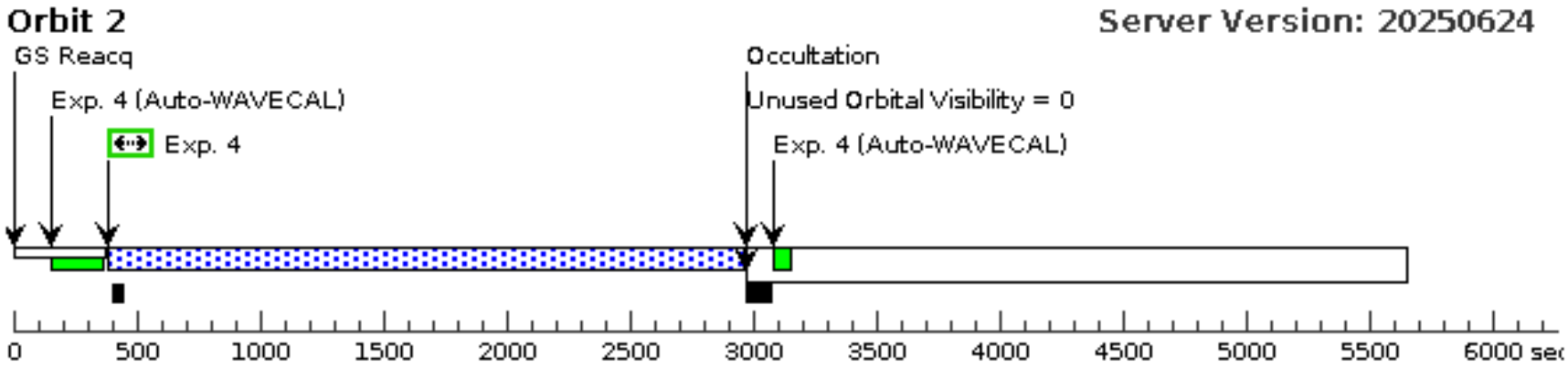
	5	NUV E230 H-2762 0.2x 0.09 (2 of 2) (STIS.sp.20 25049)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2762 A	2564.0 Secs (2564 Secs) *[==>]*	***[3]***

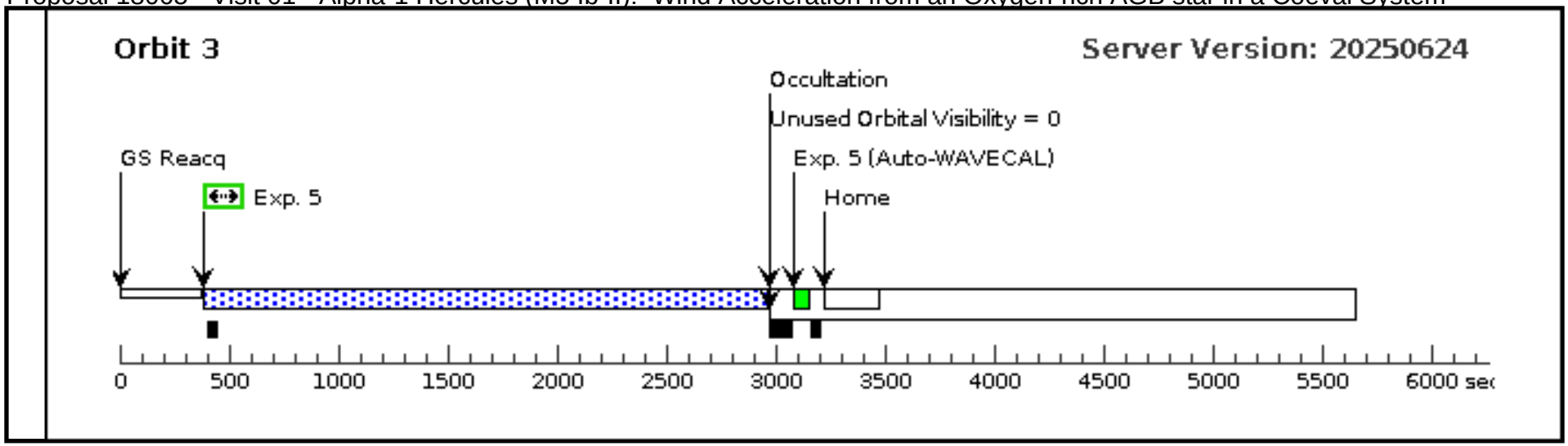
Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

Observation 2 of 2 in same setting to get total observing time S/N ~ 26 2730 continuum.

Orbit Structure



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4500
5000
5500
6000 sec

Visit

Proposal 18065, Visit 02

Mon Aug 11 16:01:00 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

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SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	ACQ/PEAK (STIS.sp.2023000)	(1) 1-ALF-HER	STIS/CCD, ACQ/PEAK, 0.2X0.09	G430M 5471 A				0.3 Secs (0.3 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 80

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	NUV E230H-2513 0.2x0.09 (1 of 3) (STIS.sp.2025050)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2513 A				1553.0 Secs (1553 Secs) *[==>]*	***[1]***

Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

S/N ~ 8.5 @2400.0 S/N emission lines ~20.

Observation 1 of 3 in same setting to get total observing time S/N in emission lines ~ 40

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
4	NUV E230H-2513 0.2x0.09 (2 of 3) (STIS.sp.2025050)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2513 A				2564.0 Secs (2564 Secs) *[==>]*	***[2]***

Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

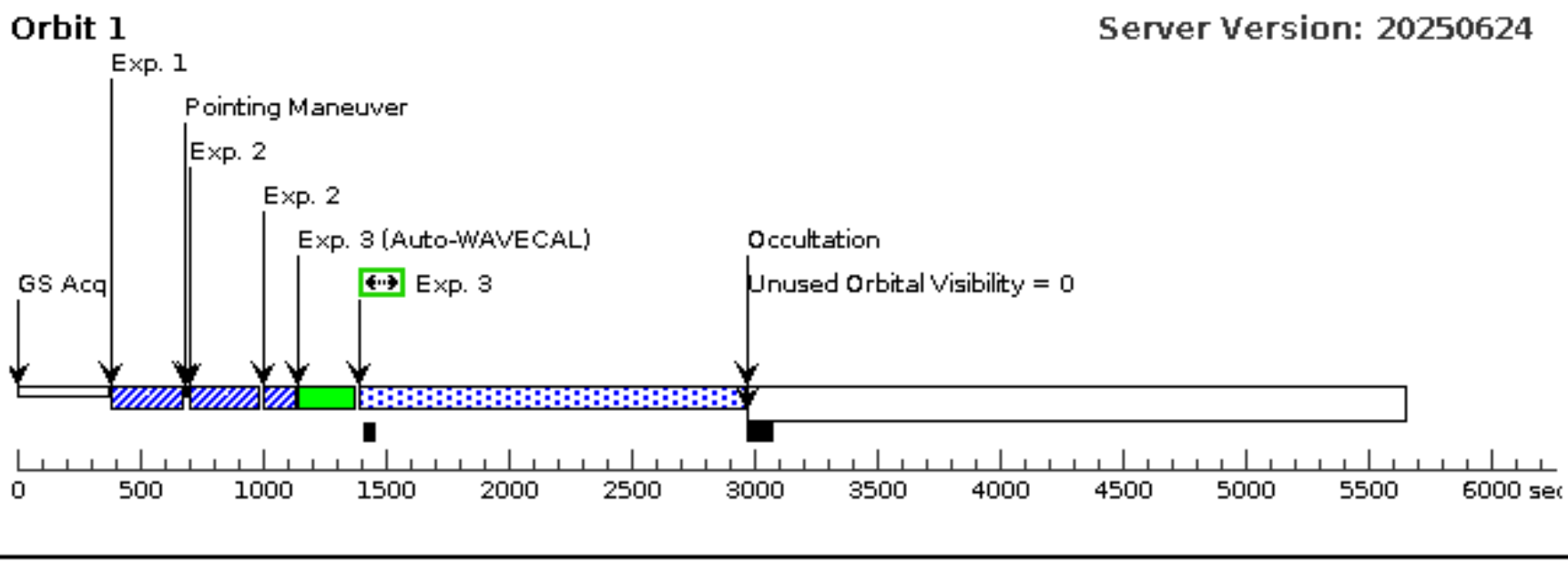
Observation 2 of 3 in same setting to get total observing time S/N ~ 40 i emission lines

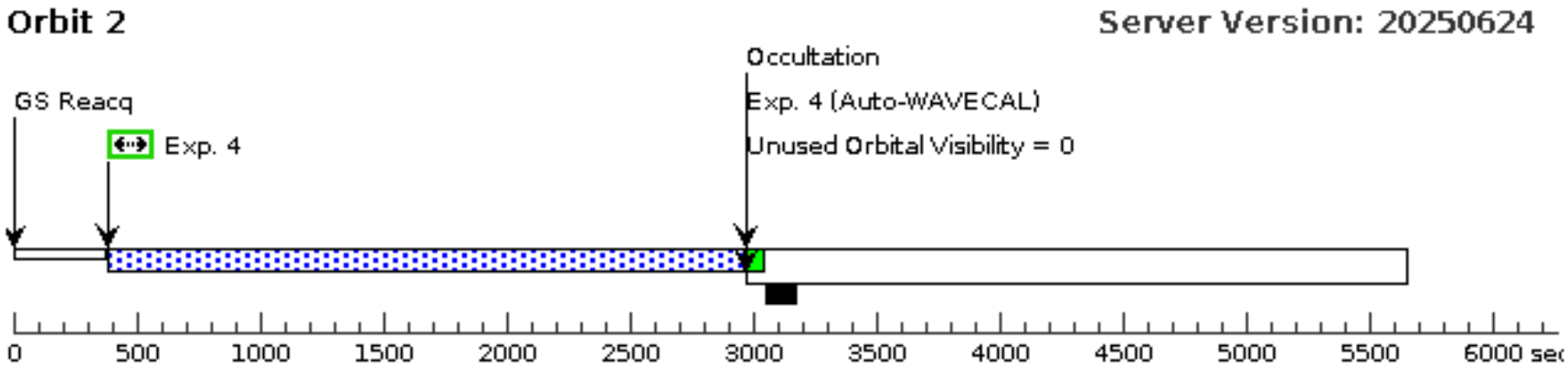
	5	NUV E230 H-2513 0.2x 0.09 (3 of 3) (STIS.sp.20 25050)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2513 A	2564.0 Secs (2564 Secs)	
						[==>]	***[3]***

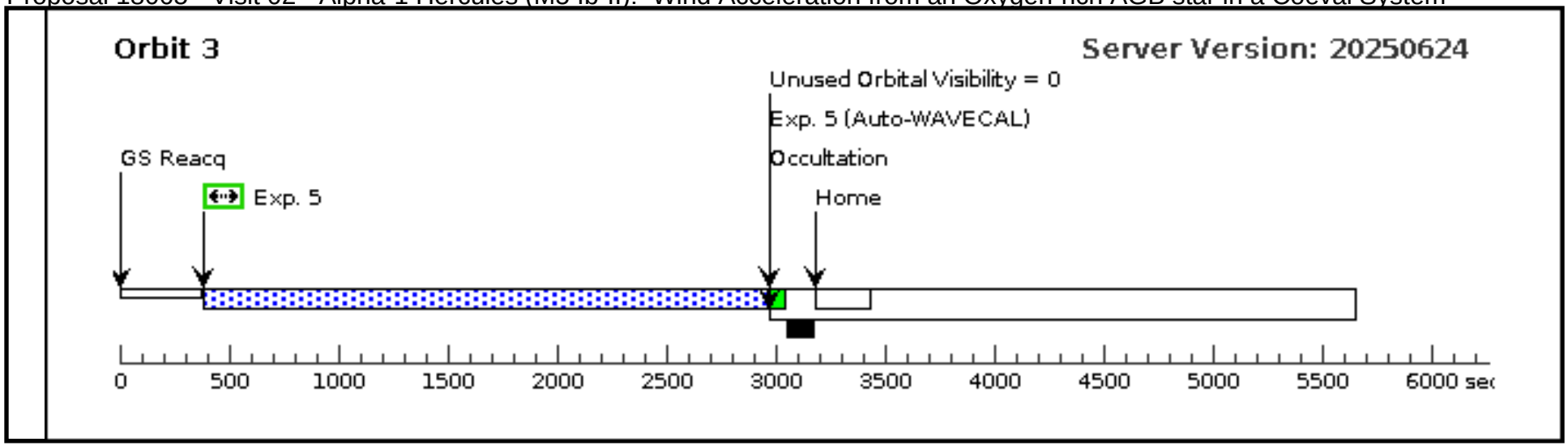
Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

Observation 3 of 3 in same setting to get total observing time S/N ~ 40 emission lines

Orbit Structure



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4500
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Visit

Proposal 18065, Visit 03 Mon Aug 11 16:01:01 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	*[1]*

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	ACQ/PEAK (STIS.sp.2023000)	(1) 1-ALF-HER	STIS/CCD, ACQ/PEAK, 0.2X0.09	G430M 5471 A				0.3 Secs (0.3 Secs) *[==>]*	*[1]*

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 80

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	NUV E230H-2263 0.2x0.09 (1 of 3) (STIS.sp.2025052)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2263 A				1553.0 Secs (1553 Secs) *[==>]*	*[1]*

Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

Wavelength Range: 2135-2396 Ang.

S/N ~ 20 in emission lines.
Observation 1 of 3 in same setting to get total observing time S/N ~ 40 at peak of strong lines.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
4	NUV E230H-2263 0.2x0.09 (2 of 3) (STIS.sp.2025052)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2263 A				2564.0 Secs (2564 Secs) *[==>]*	*[2]*

Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

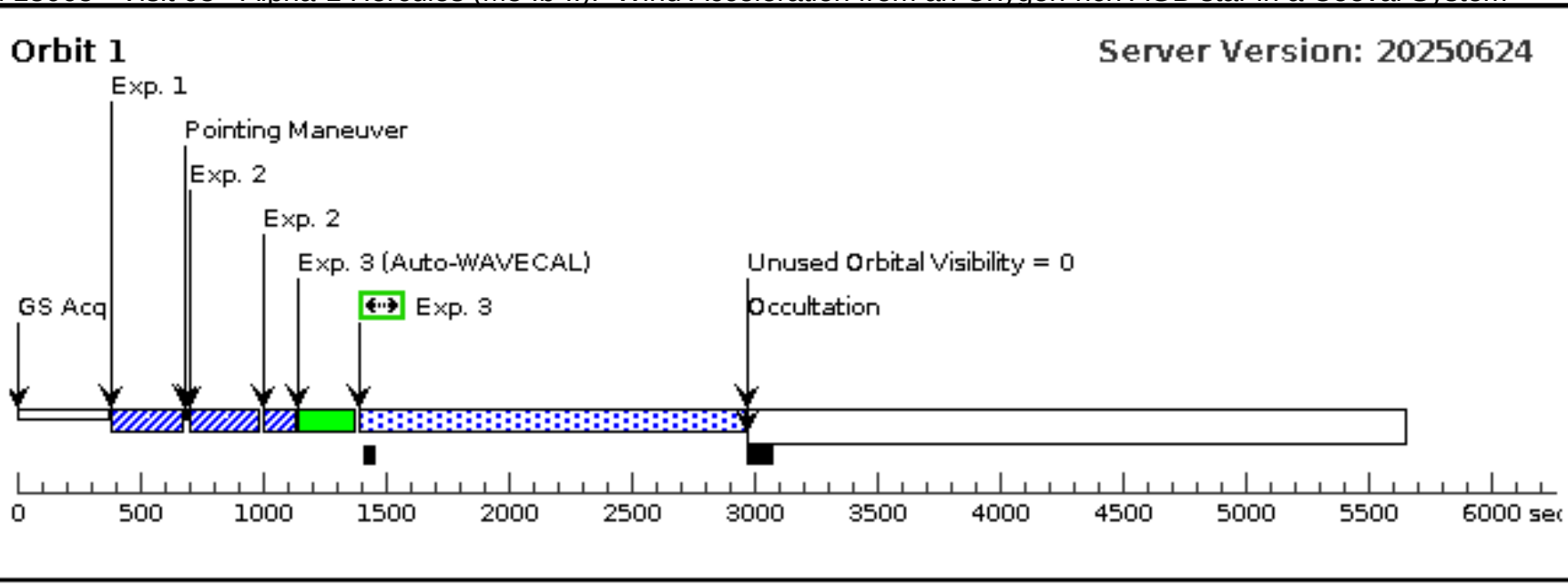
Wavelength Range: 2135-2396 Ang.
S/N ~ 20 in this spectrum
Observation 2 of 3 in same setting to get total observing time S/N ~ 40 in emission lines

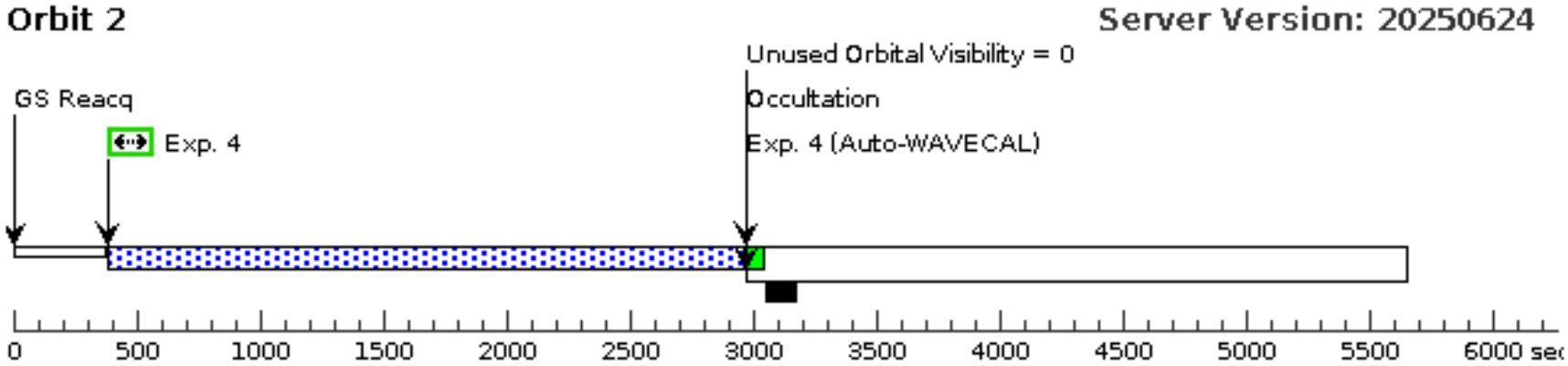
	5	NUV E230 H-2263 0.2x 0.09 (3 of 3) (STIS.sp.20 25052)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2263 A	2564.0 Secs (2564 Secs) *[==>]*	***[3]***

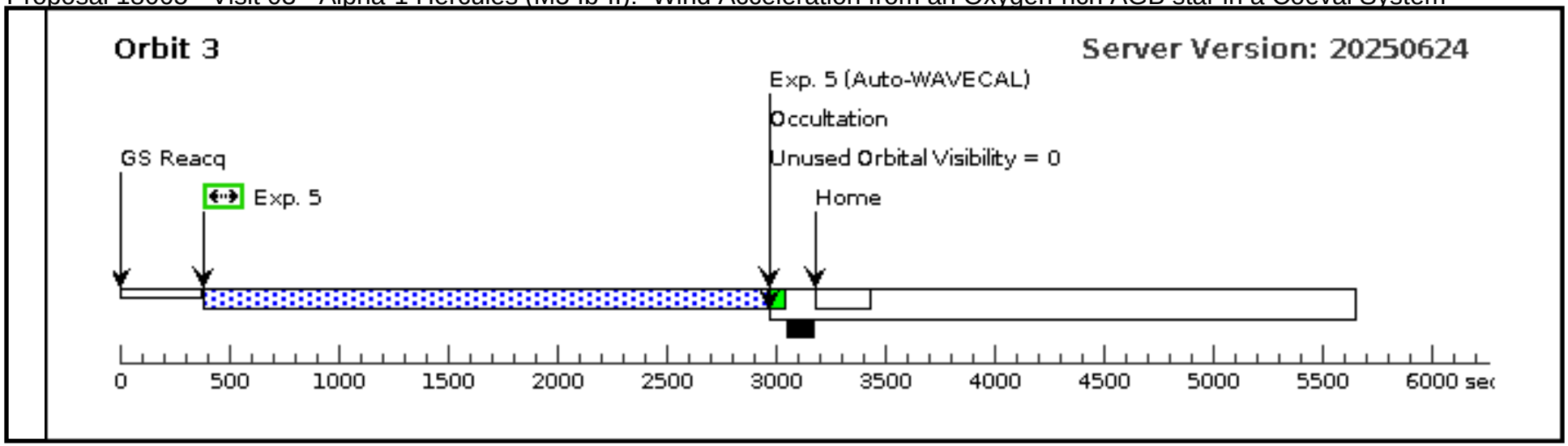
Comments: ETC input spectrum for S/N based on IUE "lucky" LWP HIRES spectra (i.e., the average of IUE MAST Archive spectra with the lowest G5 III + A7 IV contamination)

Wavelength Range: 2135-2396 Ang.
Observation 3 of 3 in same setting to get total observing time S/N ~ 40 in emission lines

Orbit Structure



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Exp. 5 (Auto-WAVECAL)
Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 5
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 18065, Visit 04 Mon Aug 11 16:01:01 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

2	NUV E230M-1978 0.2x0.2 (1 of 3) (STIS.sp.2025053)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				2076.0 Secs (2076 Secs) *[==>]*	***[1]***

Comments: ETC input spectrum for S/N based on hybrid of IUE beta Gru (M5 III) and HST-STIS gamma Cru (M3.5 III) - scaled by stellar angular diameters and a small ISM reddening correction

Wavelength Range: 1610-2365 Ang.

S/N~ 4 in continuum, ~20 in emission lines
Observation 1 of 3 in same setting to get total observing time to achive S/N~ 40 in chromospheric emission lines.

3	NUV E230M-1978 0.2x0.2 (2 of 3) (STIS.sp.2025053)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				2564.0 Secs (2564 Secs) *[==>]*	***[2]***

Comments: ETC input spectrum for S/N based on hybrid of IUE beta Gru (M5 III) and HST-STIS gamma Cru (M3.5 III) - scaled by stellar angular diameters and a small ISM reddening correction

Wavelength Range: 1610-2365 Ang.

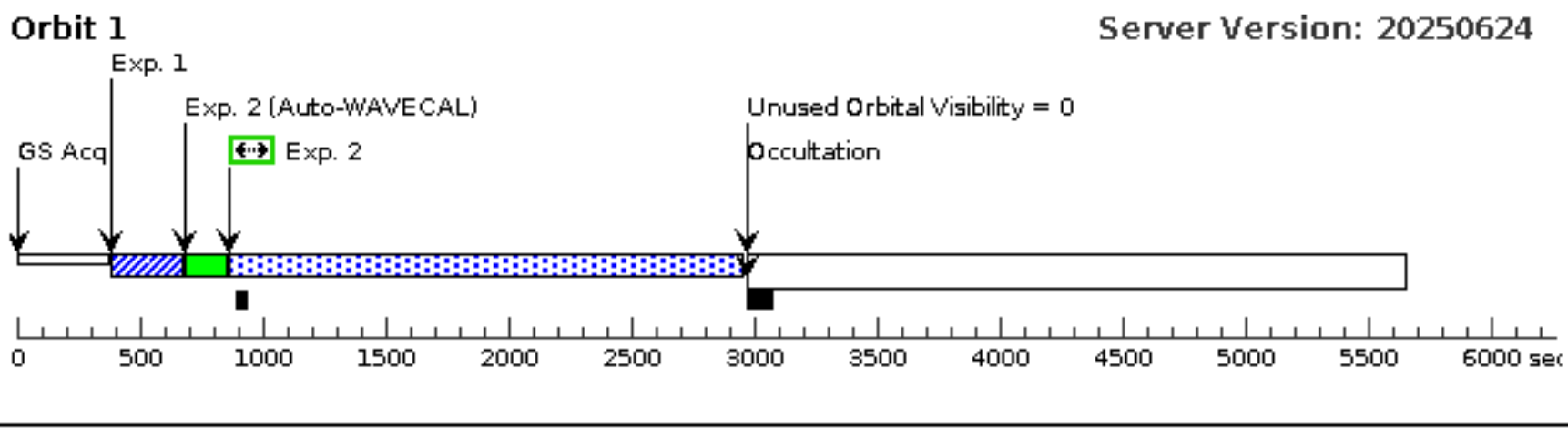
Observation 2 of 3 in same setting to get total observing time S/N ~ 40

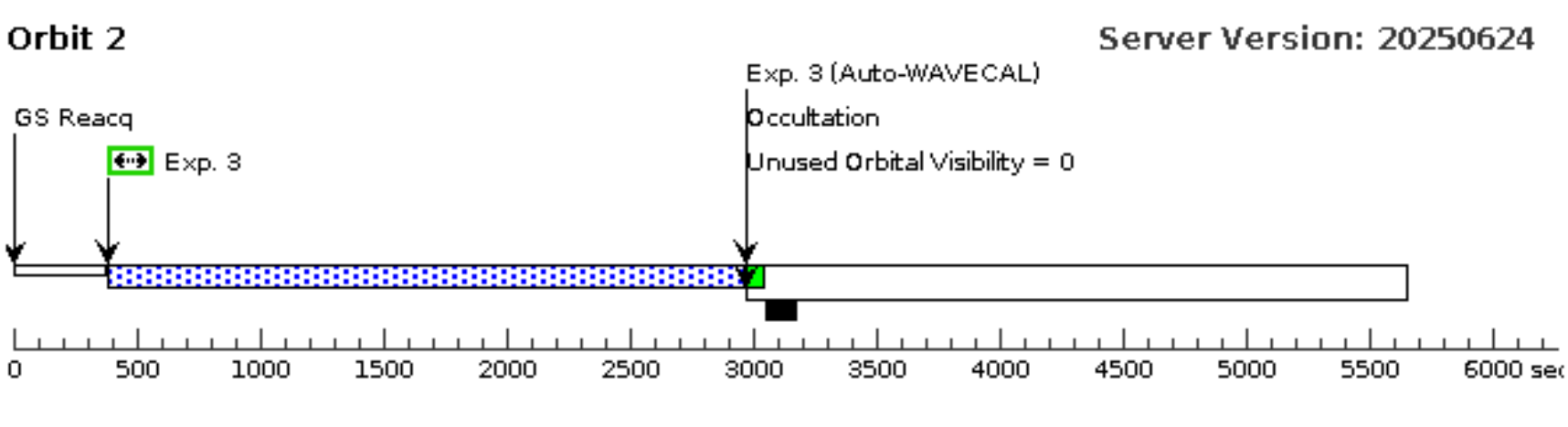
4	NUV E230M-1978 0.2x0.2 (3 of 3) (STIS.sp.2025053)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				2564.0 Secs (2564 Secs) *[==>]*	***[3]***

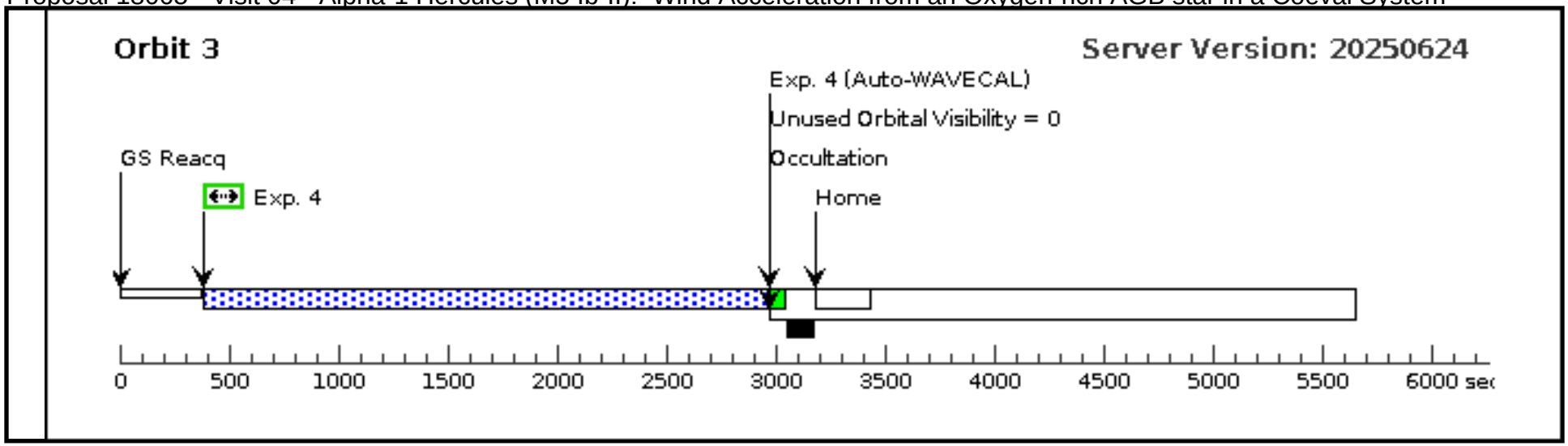
Comments: ETC input spectrum for S/N based on hybrid of IUE beta Gru (M5 III) and HST-STIS gamma Cru (M3.5 III) - scaled by stellar angular diameters and a small ISM reddening correction

Wavelength Range: 1610-2365 Ang.
Observation 3 of 3 in same setting to get total observing time S/N ~ 40

Orbit Structure



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Exp. 4 (Auto-WAVECAL)
Unused Orbital Visibility = 0
Occultation
GS Reacq
Exp. 4
Home
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1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 18065, Visit 05 Mon Aug 11 16:01:01 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	NUV E230M-1978 0.2x0.2 (1 of 3) (STIS.sp.2025053)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				2076.0 Secs (2076 Secs) *[==>]*	***[1]***

Comments: ETC input spectrum for S/N based on hybrid of IUE beta Gru (M5 III) and HST-STIS gamma Cru (M3.5 III) - scaled by stellar angular diameters and a small ISM reddening correction

Wavelength Range: 1610-2365 Ang.

Observation 1 of 2 in same setting to get total observing time to achive S/N~ 40 in chromospheric emission lines.

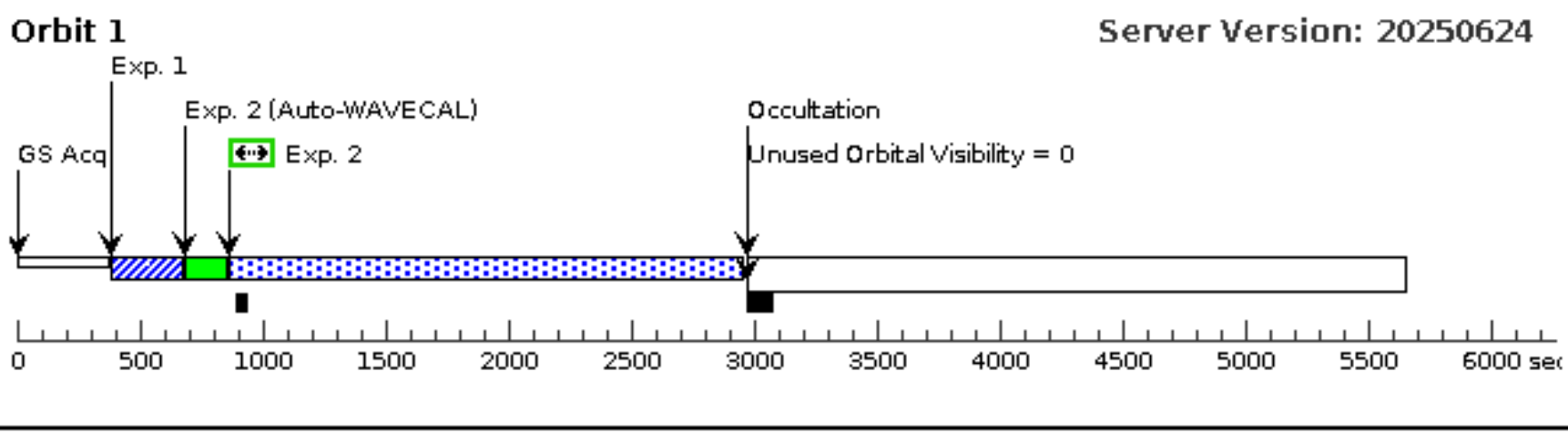
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	NUV E230M-1978 0.2x0.2 (2 of 3) (STIS.sp.2025053)	(1) 1-ALF-HER	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				2564.0 Secs (2564 Secs) *[==>]*	***[2]***

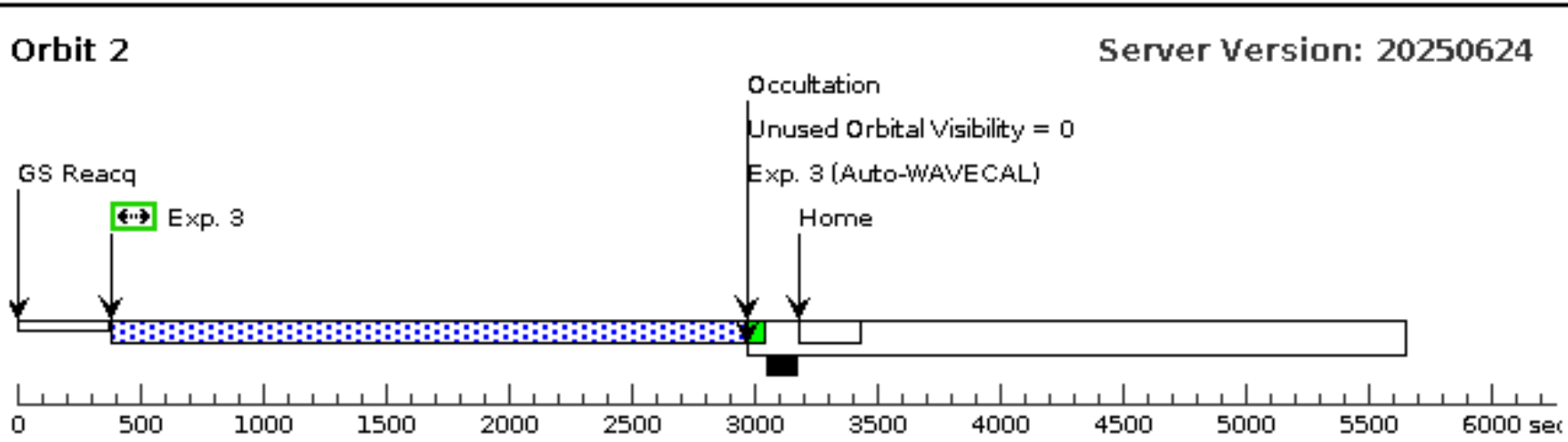
Comments: ETC input spectrum for S/N based on hybrid of IUE beta Gru (M5 III) and HST-STIS gamma Cru (M3.5 III) - scaled by stellar angular diameters and a small ISM reddening correction

Wavelength Range: 1610-2365 Ang.
S/N~ 4 continuum, ~20 emission lines

Observation 2 of 2 in same setting to get total observing time S/N ~ 40 in chromospheric emission lines.

Orbit Structure





Visit

Proposal 18065, Visit 06

Mon Aug 11 16:01:01 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

2	FUV E140M-1425 0.2x0.2 (1 of 3) (STIS.sp.2025055)	(1) 1-ALF-HER	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				2106.0 Secs (2106 Secs) *[==>]*	***[1]***

Comments: Using scaled bgru-gcru template for ETC.

Wavelength Range: 1140-1720 Ang.

1st Visit (of 2) to collect a total of 6 identical E140M spectra
Observation 1 of 3 in Visit 6 with same setting to get total observing time to achive S/N~ 10 in chromospheric emission lines and FUV chromospheric continuum - intrinsically faint stellar spectrum.

3	FUV E140M-1425 0.2x0.2 (2 of 3) (STIS.sp.2025055)	(1) 1-ALF-HER	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				2564 Secs (2564 Secs) *[==>]*	***[2]***

Comments: Using scaled bgru-gcru template for ETC.

Wavelength Range: 1150-1700 Ang.

1st Visit (of 2) to collect 6 identical E140M spectra
Observation 2 of 3 in this Visit 6 with same setting to get total observing time to achive S/N~ 10 in chromospheric emission lines and FUV chromospheric continuum - intrinsically weak stellar signal.

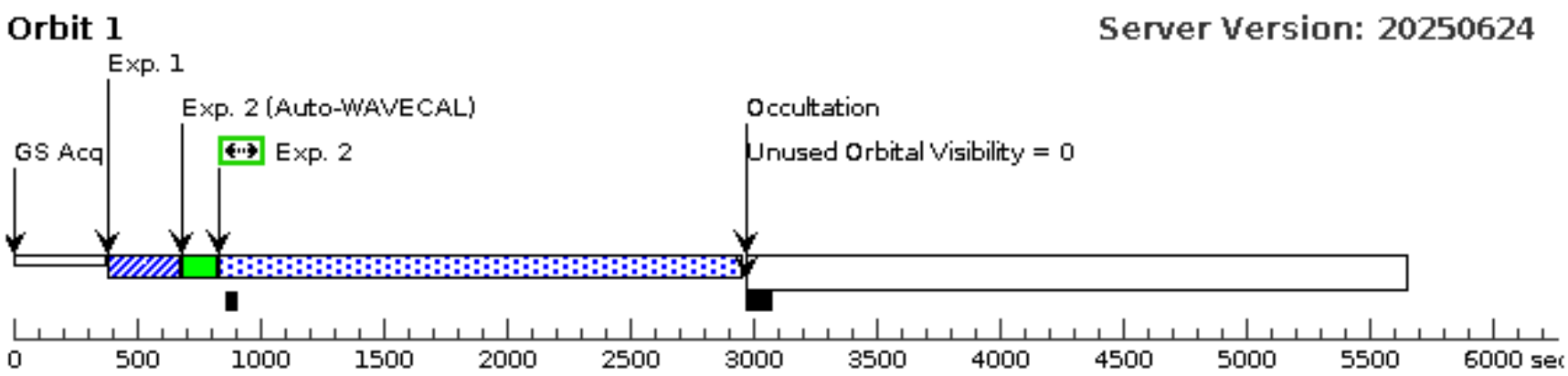
4	FUV E140M-1425 0.2x0.2 (3 of 3) (STIS.sp.2025055)	(1) 1-ALF-HER	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				2564 Secs (2564 Secs) *[==>]*	***[3]***

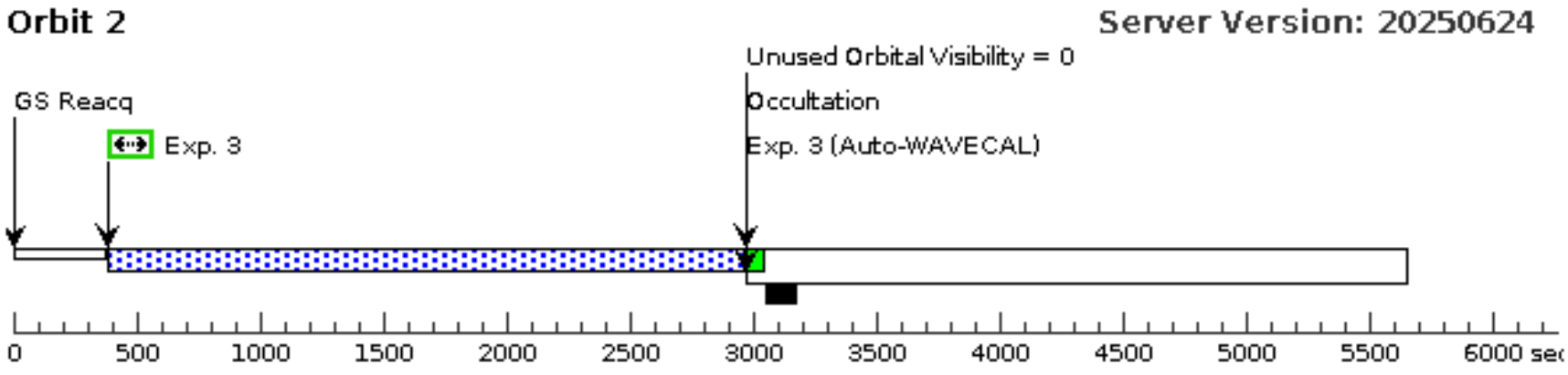
Comments: Using scaled bgru-gcru template for ETC.

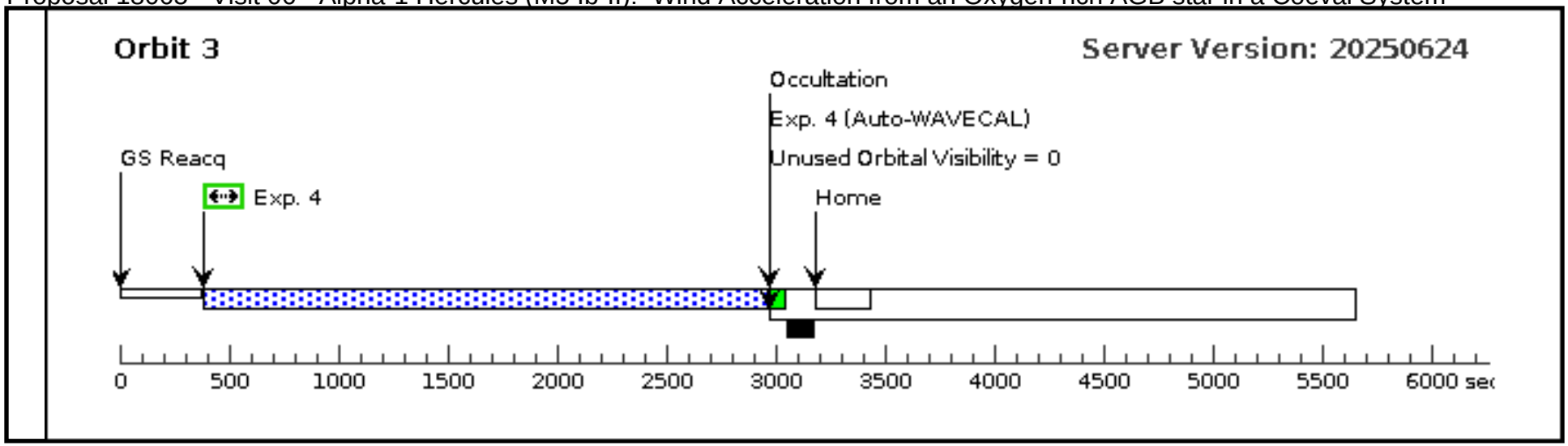
Wavelength Range: 1150-1700 Ang.

1st Visit (of 2) to collect a total of 6 identical E140M spectra
Observation 3 of 3 in this Visit 6 with same setting to get total observing time to achive S/N~ 10 in chromospheric emission lines and FUV chromospheric continuum - intrinsically weak stellar spectra

Orbit Structure



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Server Version: 20250624
Occultation
Exp. 4 (Auto-WAVECAL)
Unused Orbital Visibility = 0
GS Reacq
Exp. 4
Home
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2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 18065, Visit 07

Mon Aug 11 16:01:01 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1-ALF-HER Alt Name1: HIP84345 Alt Name2: RASALGETHI	RA: 17 14 38.8582 (258.6619092d) Dec: +14 23 25.23 (14.39034d) Equinox: J2000	Proper Motion RA: -7.320000000000001 mas/yr Proper Motion Dec: 36.07 mas/yr Parallax: 0.00907" Epoch of Position: 2000 Radial Velocity: -32.09 km/sec	V=3.5+/-0.5 Contiunuum Fluxes (erg cm-2 s-1 A-1): 1650A=3x(-14), 2000A=2(-14), 2330=1(-13)2510A =3x10(-13), 2740=6x10(-13), 3000A=8x10(-13), 3100A=1.5x(-12) & Lines: near 1550A peak 2(-13), Fe II 2250-2600 typically peak = 2(-12), 2600-2800 3(-12)	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.
Category=STAR
Description=[AGB STAR, CIRCUMSTELLAR MATTER, EMISSION LINE STAR, M V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ (STIS.im.2022970)	(1) 1-ALF-HER	STIS/CCD, ACQ, F25ND5	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	***[1]***

Comments: Using ETC v33.2:-

[1] use 3700-8500 Ang spectrophometry of alpha1 Her + alpha2 Her from Kiehling (1987 A&AS 69, 465-485), and checked against 13 narrow band photometry of Johnson & Mitchell (1975 corrected). V mag at mea n value 3.48
Add IRTF SpeX low-resolution spectra (8,500-20,000 Ang), scaled "down" by factor 0.6 to join Kiehling. [Reason for x0.6 could be calibration with some source variability (+/- 10% at 1.25 micron]

[2] A G5 III synthetic 1993 Kurucz spectrum is subtracted to yield the best estimate of the absolutely calibrated mean M5 II-Ib instrinsic optical spectrum.

SNR ~ 75

[3] Position of alpha1 Her at Epoch 2016.5.

alpha1 Her's binary companion (alpha2 Her) has a separation of 4.9 arcsec and PA=104 degrees (checked with Tycho Double Star Catalog) is a constant flux source (G8 III + A IV Thiering & Reimers 1993 A&A 27 4, 838).
The SIMBAD (Hipparcos Revised 1991.25 - van Leeuwen 2007) listed proper motions for the system are good agreement with the GAIA DR2 (2015.5) position of alpha2 Her (alpha1 Her is not given). We expect that 2 026 alpha1 Her
ATP coordinates for alpha1 Her should be good to 0.6 arcsec (this uncertainty is from the Hipparcos treatment of double stars).

Given the 5x5 arcsec search box centered on the ATP position the binary should be excluded region. alpha2 Her's brightness should be >7x less than our target.

2	FUV E140M-1425 0.2x0.2 (1 of 3) (STIS.sp.2025055)	(1) 1-ALF-HER	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				2106.0 Secs (2106 Secs) *[==>]*	***[1]***

Comments: Using scaled bgru-gcru template for ETC.

Wavelength Range: 1140-1729 Ang. Get enough S/N to model the Fourth-Positive CO absorption. Will be the first useful observed AGB FUV continua!

2nd Visit (of 2) to collect a total of 6 identical E140M spectra
Observation 1 of 3 in same setting to get total observing time to achive S/N~ 10 in chromospheric emission lines and FUV chromospheric continuum - intrinsically weak stellar spectrum

3	FUV E140M-1425 0.2x0.2 (2 of 3) (STIS.sp.2025055)	(1) 1-ALF-HER	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				2564.0 Secs (2564 Secs) *[==>]*	***[2]***

Comments: Using scaled bgru-gcru template for ETC.

Wavelength Range: 1140-1729 Ang. Get enough S/N to model the Fourth-Positive CO absorption. Will be the first useful observed AGB FUV continua!

2nd Visit (of 2) to collect total of 6 identical E140M spectra
Observation 2 of 3 in this Visit in the same setting to get total observing time to achive S/N~ 10 in chromospheric emission lines and FUV chromospheric continuum - intrinsically weak stellar signal.

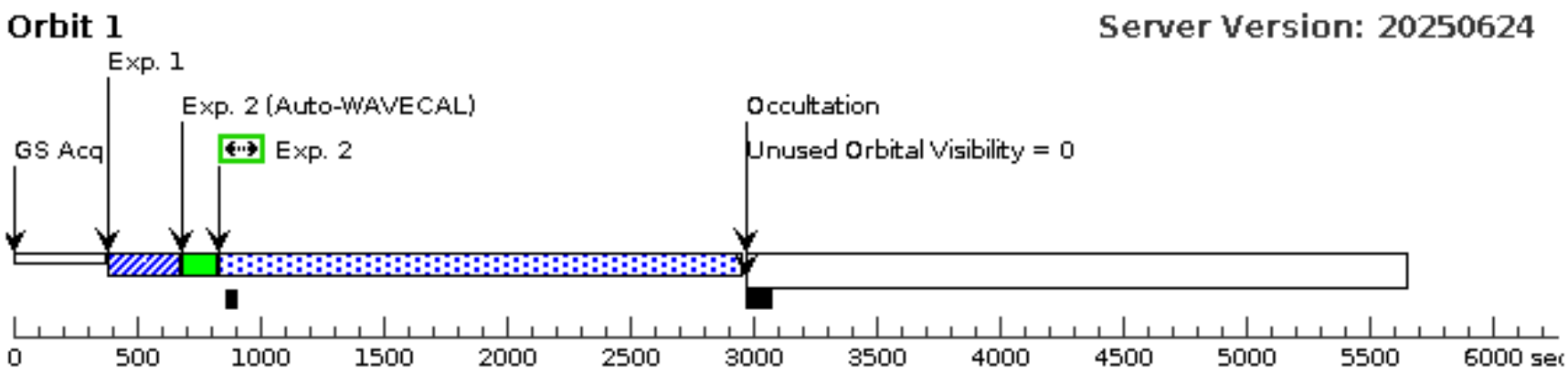
4	FUV E140M-1425 0.2x0.2 (3 of 3) (STIS.sp.2025055)	(1) 1-ALF-HER	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M 1425 A				2564.0 Secs (2564 Secs) *[==>]*	***[3]***

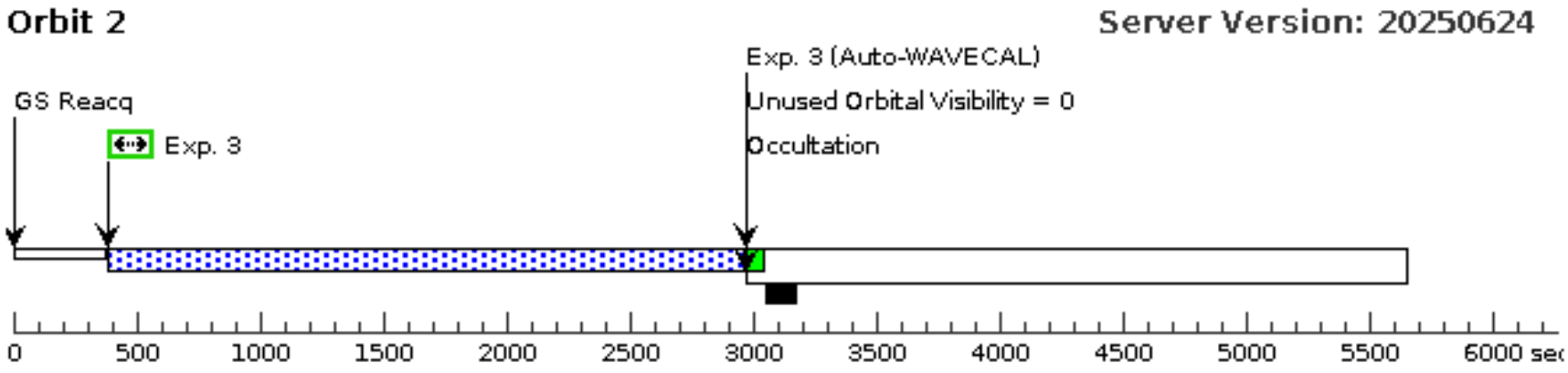
Comments: Using scaled bgru-gcru template for ETC.

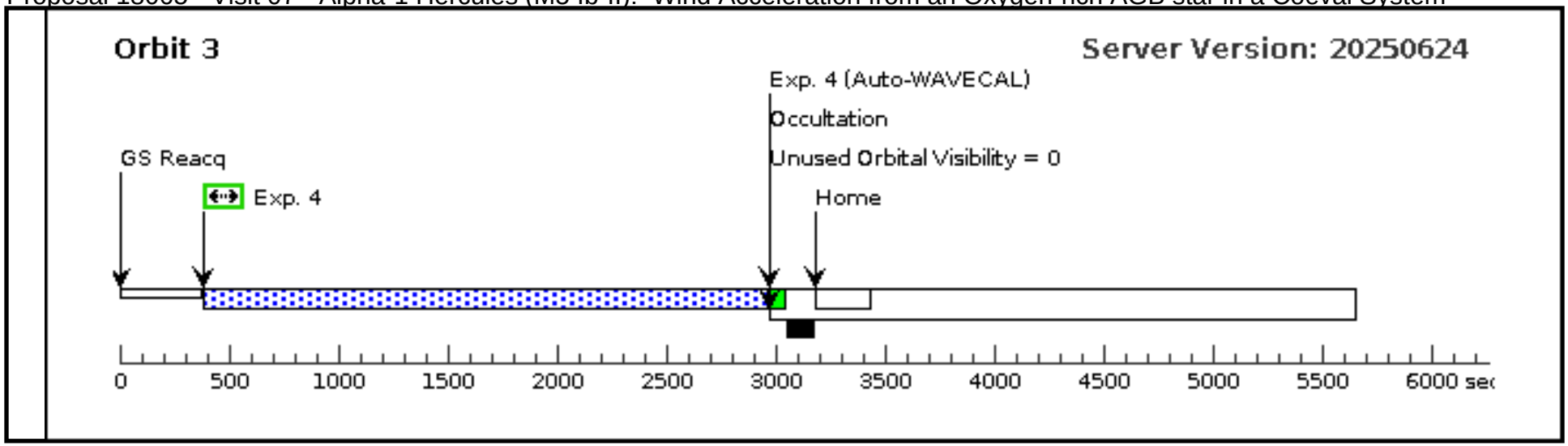
Wavelength Range: 1140-1729 Ang. Get enough S/N to model the Fourth-Positive CO absorption. Will be the first useful observed AGB FUV continua!

2nd Visit (of 2) to collect a total of 6 identical E140M spectra
Observation 3 of 3 in this Visit 7 in same setting to get total observing time to achive S/N~ 10 in chromospheric emission lines and FUV chromospheric continuum -intrinsically weak stellar source

Orbit Structure






Orbit 3
Server Version: 20250624
Exp. 4 (Auto-WAVECAL)
Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec