15190 - Measuring the Intrinsic Lyman-alpha Profiles of High-Velocity G, K, and M dwarfs

Cycle: 25, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) HD-33793	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	3	18-Oct-2019 16:00:14.0	yes
02	(4) HD-191408	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	18-Oct-2019 16:00:15.0	yes
03	(3) -E-ERI	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	18-Oct-2019 16:00:17.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(5) NAME-BARNARDS-STAR	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	4	18-Oct-2019 16:00:19.0	yes
05	(6) HD-95735	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	4	18-Oct-2019 16:00:21.0	yes
06	(6) HD-95735	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	3	18-Oct-2019 16:00:23.0	yes

18 Total Orbits Used

ABSTRACT

H I Lyman alpha (LyA; 1216 A) is the brightest emission line in the UV spectrum of F-K dwarfs and is as bright as the rest of the entire 1150-3000 A emission from M dwarfs. Stellar LyA emission plays a critical role in the chemistry of exoplanet atmospheres, energy transport in the stellar chromosphere, and in probing the density structure of the ISM. Thus, accurately characterizing LyA is critically important. However, interstellar H I removes more than 50% of the stellar LyA flux even for the nearest stars, necessitating reconstruction from the observed line profile wings and an assumption concerning the shape of the line core. The Sun (a G2 dwarf) is the only star for which we have high-resolution direct observations of the line core shape, which is self-reversed. Self-reversal in the LyA line core likely depends on spectral type, so incorrect assumptions of the line core shape for stars cooler or more active than the Sun will result in erroneous intrinsic LyA fluxes. We propose to directly measure with high spectral resolution (STIS E140M) the LyA line cores of five high radial velocity stars (G8 V to M4 V). These will be the first measurements of the LyA line with large Doppler shifts and sufficient resolution to probe the LyA line core shape. We will quantify the self-reversal depth, width, and symmetry, and compare amongst the spectral types. STIS E230H spectra will measure the Mg II line core shapes to test whether they are a good proxy for the LyA core shape. This program will create the first publicly available LyA intrinsic profile templates for late-type stars and update widely-used stellar LyA databases like the MUSCLES Treasury Survey.

OBSERVING DESCRIPTION

The target list is composed of nearby (< 6 pc), high radial velocity (> +/-80 km/s) G, K, and M dwarfs. These targets will allow us to measure the shapes of the H I LyA (1216 A) and Mg II (2798, 2802 A) line cores as the line cores are Doppler shifted away from the interstellar H I and Mg II absorption and the geocoronal H I emission. To observe H I LyA (1216 A), we will use the STIS E140M grating with the narrow 52" x 0.05" slit to minimize geocoronal LyA contamination and separate the line core from the ISM absorption trough. We will also use the STIS E230H grating with the 0.2" x 0.2" slit to measure the Mg II (2798, 2802 A) line cores. All of these exposures will be obtained in time-tag mode to identify any flares.

Our sample includes two late G/early K type dwarfs, and three early-to-mid M dwarfs, including Barnard's Star (GJ 699), the 4th closest star to the Earth, and GJ 411 (HD 95735), the 6th closest star to Earth. This five-member sample spans G, K, and M spectral types to elucidate any dependence in the line core shapes on spectral type (this is expected to depend on the stellar surface magnetic fields).

Each of our five targets has its own visit. No visit has more than 4 orbits, and we have elected to obtain all of our LyA and Mg II observations contemporaneously as we are seeking correlations between these line core shapes and the shapes may vary on longer time scales with stellar activity/variability.

Exposure time calculations for the LyA observations (STIS E140M) were carried out using known or estimated fluxes, and in the case of Kapteyn's star (HD 33793), a fit to the COS G130M archival observation. Kapteyn's star (M1 V) and GJ 783A (HD 191408; K2.5 V) have archival Mg II (STIS E230H) observations, and this data was used in the ETC. For the remaining three stars (a G8 V, M2 V, and M4 V) without archival Mg II observations, we scaled the Mg II fluxes to match the appropriate distance and to correspond to approximately the appropriate spectral type.

Visit

Proposal 15190, Kapteyn E140M+E230H (01), completed Fri Oct 18 20:00:24 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: (none)

Diagnostics

(Kapteyn E140M+E230H (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

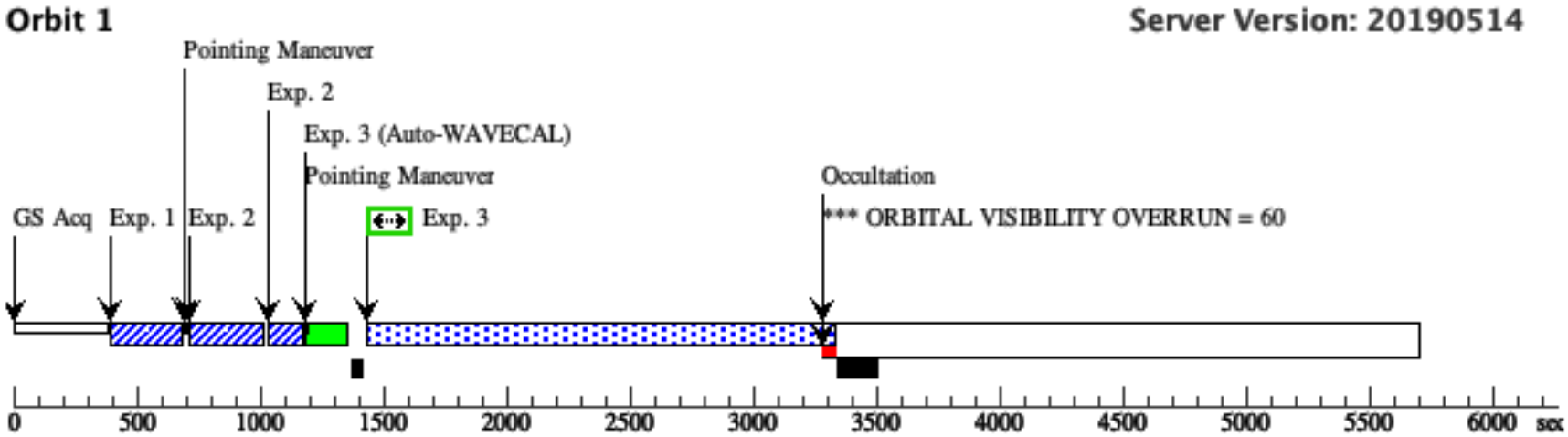
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-33793 Alt Name1: KAPTEYN-STAR Alt Name2: GJ-191	RA: 05 11 40.5811 (77.9190879d) Dec: -45 01 6.29 (-45.01841d) Equinox: J2000	Proper Motion RA: 6505.08 mas/yr Proper Motion Dec: -5730.84 mas/yr Parallax: 0.25566" Epoch of Position: 2000 Radial Velocity: 245.19 km/sec	V=8.853	Reference Frame: ICRS

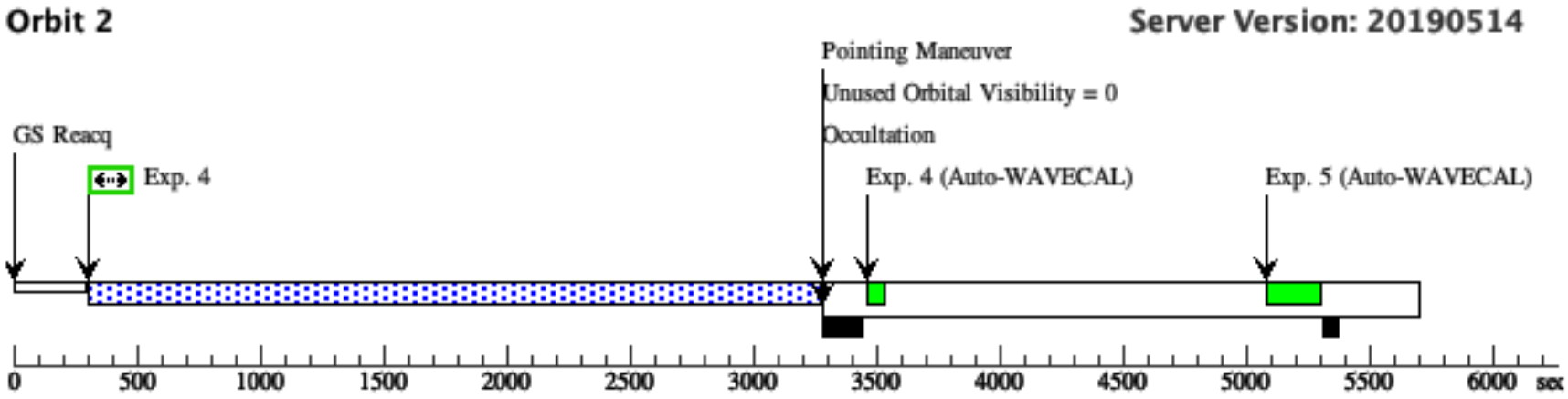
Comments:
Category=STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]
Extended=NO

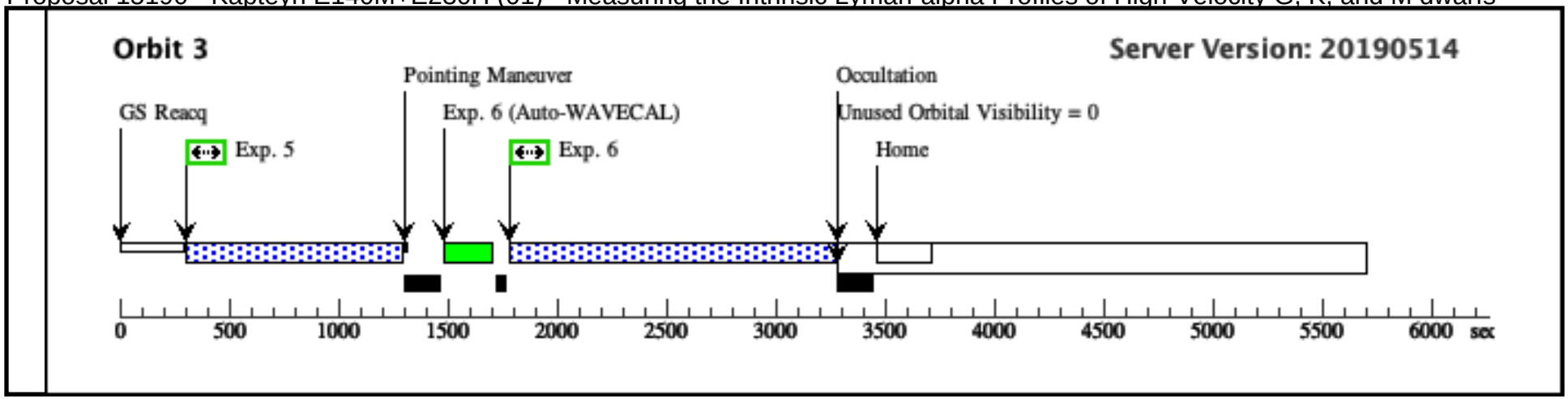
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1013471)	(1) HD-33793	STIS/CCD, ACQ, F25ND3	MIRROR				0.2 Secs (0.2 Secs) *[==>]*	*[1]*
2	ACQ/PEAK (STIS.ta.1013425)	(1) HD-33793	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.4 Secs (0.4 Secs) *[==>]*	*[1]*
3	Kapteyn E140M (STIS.sp.1013484)	(1) HD-33793	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1885 Secs (1885 Secs) *[==>]*	*[1]*
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 1932 s to 1945 s. The updated ETC run (0.2x0.06 at 1932 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile.								
4	Kapteyn E140M (STIS.sp.1014899)	(1) HD-33793	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			2953 Secs (2953 Secs) *[==>]*	*[2]*
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Exposure time maintained at 3093 seconds. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~13 at the peak of the emission line profile to ~14.								
5	Kapteyn E230H (STIS.sp.1024423)	(1) HD-33793	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230H 2713 A	BUFFER-TIME=500			976 Secs (976 Secs) *[==>]*	*[3]*
	Comments: The ETC Run has been updated to include a Kurucz spectral model of an early M dwarf, but it did not significantly change the output.								
6	Kapteyn E140M (STIS.sp.1014900)	(1) HD-33793	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1474 Secs (1474 Secs) *[==>]*	*[3]*
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 1461 s to 1474 s. The updated ETC run (0.2x0.06 at 1461 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~9 at the peak of the emission line profile to ~10.								

Orbit Structure



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GS Reacq
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Unused Orbital Visibility = 0
Exp. 5
Exp. 6
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
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sec

Visit

Proposal 15190, GJ 783A E140M+E230H (02), completed Fri Oct 18 20:00:24 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: BETWEEN 01-OCT-2017 AND 12-FEB-2018; BETWEEN 21-JUN-2018 AND 31-DEC-2018

Comments: To ensure that the Lyman alpha airglow emission coincides spectrally with the ISM absorption trough, Hubble must not observe this target between February 12 - June 21 (any year).

Diagnostics

(GJ 783A E140M+E230H (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(GJ 783A E140M+E230H (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

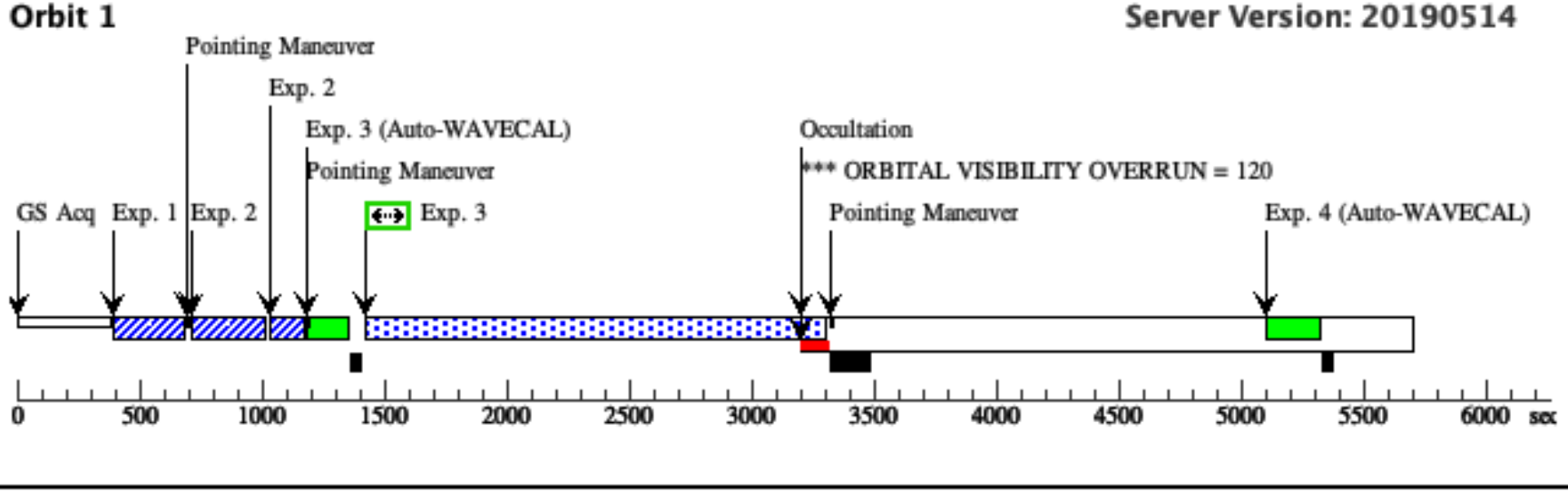
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	HD-191408	RA: 20 11 11.9383 (302.7997429d)	Proper Motion RA: 456.99 mas/yr	V=5.32	Reference Frame: ICRS
	Alt Name1: GJ-783-A	Dec: -36 06 4.36 (-36.10121d)	Proper Motion Dec: -1574.64 mas/yr		
	Alt Name2: HR-7703	Equinox: J2000	Parallax: 0.16625"		
			Epoch of Position: 2000		
			Radial Velocity: -126.90 km/sec		

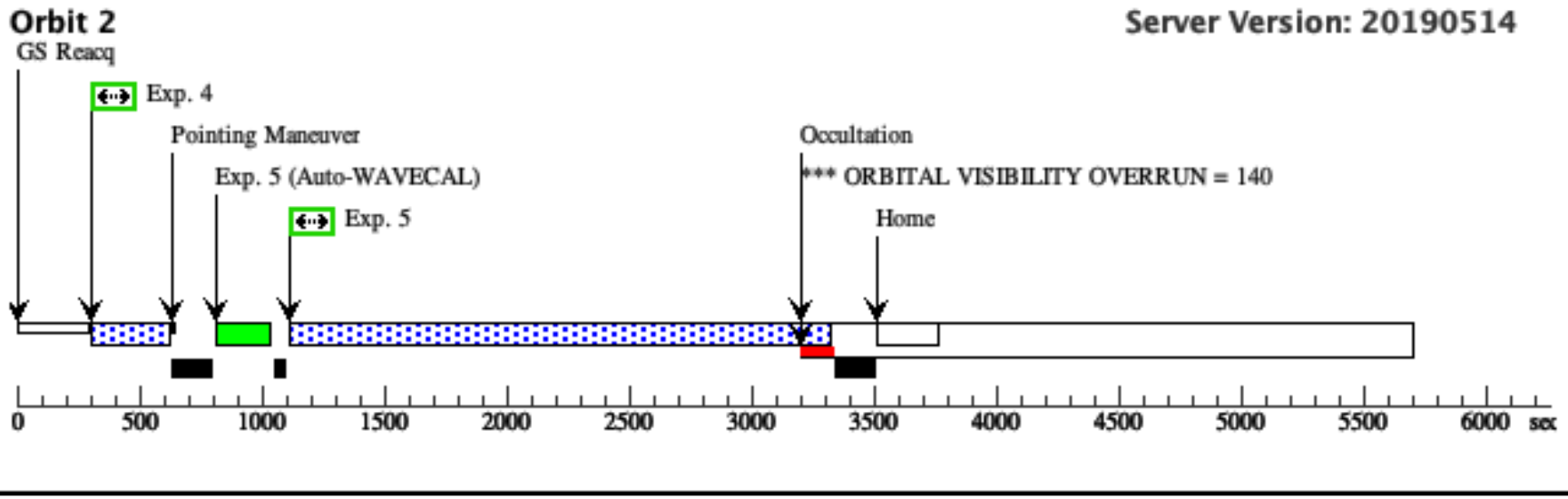
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[K V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1013505)	(4) HD-191408	STIS/CCD, ACQ, F25ND5	MIRROR				0.6 Secs (0.6 Secs)	
								[==>]	***[1]***
2	ACQ/PEAK (STIS.ta.1013509)	(4) HD-191408	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.2 Secs (0.2 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1014901)	(4) HD-191408	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1852 Secs (1865 Secs)	
								[==>1865.0 Secs]	***[1]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure decreased from 1852 s to 1865 s. The updated ETC run (0.2x0.06 at 1852 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~36 at the peak of the emission line profile to ~38.									
4	(STIS.sp.1024422)	(4) HD-191408	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230H 2713 A	BUFFER-TIME=165			300 Secs (306 Secs)	
								[==>306.0 Secs]	***[2]***
Comments: Re-running the orbit planner after changing all E140M apertures to 0.2x0.06 with auto-adjust to pack the orbits, this exposure time increased from 300 s to 306 s. The original ETC run is still included (for 300 s).									
The updated ETC Run includes a stellar model with more complete spectral coverage than before, so the buffer time has been reduced to account for the increased global count rate.									
5	(STIS.sp.1013546)	(4) HD-191408	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			2193 Secs (2199 Secs)	
								[==>2199.0 Secs]	***[2]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 2192 s to 2199 s. The updated ETC run (0.2x0.06 at 2192 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~39 at the peak of the emission line profile to ~42.									

Orbit Structure





Visit

Proposal 15190, E ERI E140M+E230H (03), completed Fri Oct 18 20:00:24 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: (none)

Diagnostics

(E ERI E140M+E230H (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(E ERI E140M+E230H (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

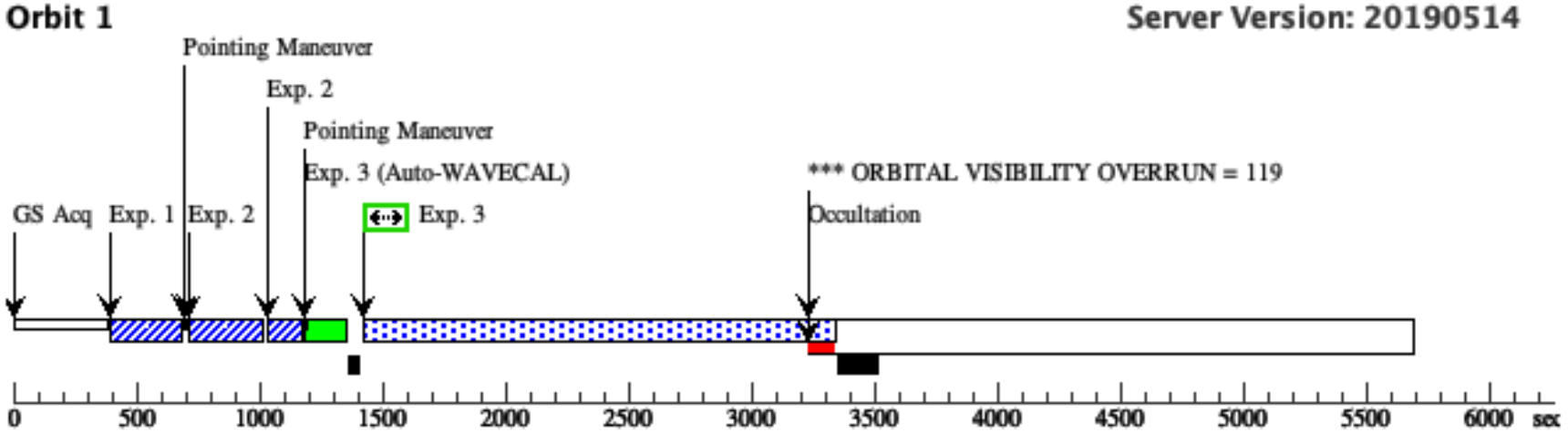
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	-E-ERI	RA: 03 19 55.6509 (49.9818787d)	Proper Motion RA: 3038.34 mas/yr	V=4.27	Reference Frame: ICRS
	Alt Name1: GJ-139	Dec: -43 04 11.22 (-43.06978d)	Proper Motion Dec: 726.58 mas/yr		
	Alt Name2: HD-20794	Equinox: J2000	Parallax: 0.16547"		
			Epoch of Position: 2000		

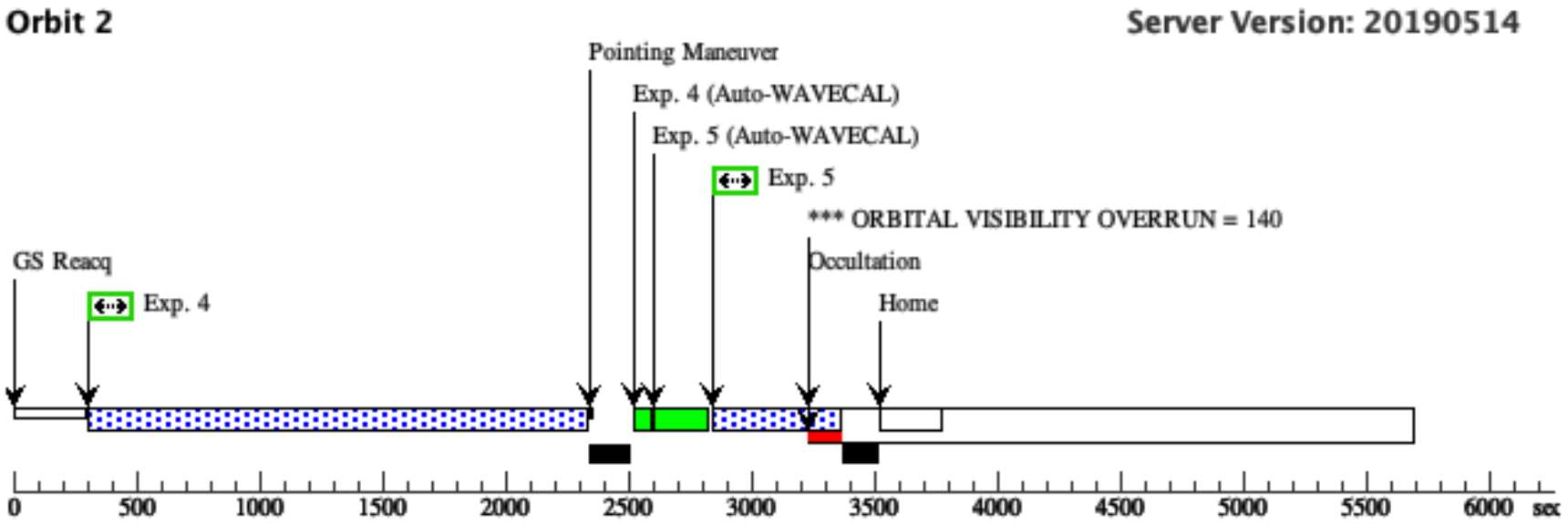
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, G V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1013557)	(3) -E-ERI	STIS/CCD, ACQ, F25ND5	MIRROR				0.6 Secs (0.6 Secs) *[==>]*	 ***[1]***
2	ACQ/PEAK (STIS.ta.1013562)	(3) -E-ERI	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
	Comments: Exp time reduced from 0.2s to 0.1s to reduce the likelihood of saturation.								
3	(STIS.sp.1014903)	(3) -E-ERI	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1903 Secs (1903 Secs) *[==>]*	 ***[1]***
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 1890 s to 1903 s. The updated ETC run (0.2x0.06 at 1890 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~19 at the peak of the emission line profile to ~21.								
4	(STIS.sp.1013570)	(3) -E-ERI	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1978 Secs (2016 Secs) *[==>2016.0 Secs]*	 ***[2]***
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 1965 s to 1978 s. The updated ETC run (0.2x0.06 at 1965 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~20 at the peak of the emission line profile to ~21.								
5	(STIS.sp.1024420)	(3) -E-ERI	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2713 A				465 Secs (503 Secs) *[==>503.0 Secs]*	 ***[2]***
	Comments: ETC Run was updated to include a Kurucz stellar model and the higher global count rates resulted in recommended buffer times that were below the minimum 99 s. Thus, the mode has been changed from TIME-TAG to ACCUM. This change resulted in some unused orbit visibility time, so the adjusted total exposure time is now 503 seconds, which does not appear to significantly change the detectory safety (STIS.sp.1024426).								

Orbit Structure





Visit

Proposal 15190, BARNARD STAR E140M (04), completed Fri Oct 18 20:00:24 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: BETWEEN 01-OCT-2017 AND 04-JAN-2018; BETWEEN 05-JUN-2018 AND 31-DEC-2018

Comments: To ensure that the Lyman alpha airglow emission coincides spectrally with the ISM absorption trough, Hubble must not observe this target between January 4 - June 5 (any year).

Diagnostics

(BARNARD STAR E140M (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BARNARD STAR E140M (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BARNARD STAR E140M (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BARNARD STAR E140M (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	NAME-BARNARDS-STAR Alt Name1: GJ-699 Alt Name2: V2500-OPH	RA: 17 57 48.4980 (269.4520750d) Dec: +04 41 36.21 (4.69339d) Equinox: J2000	Proper Motion RA: -798.58 mas/yr Proper Motion Dec: 10300 mas/yr Parallax: 0.54831" Epoch of Position: 2000 Radial Velocity: -110.51 km/sec	V=9.511	Reference Frame: ICRS

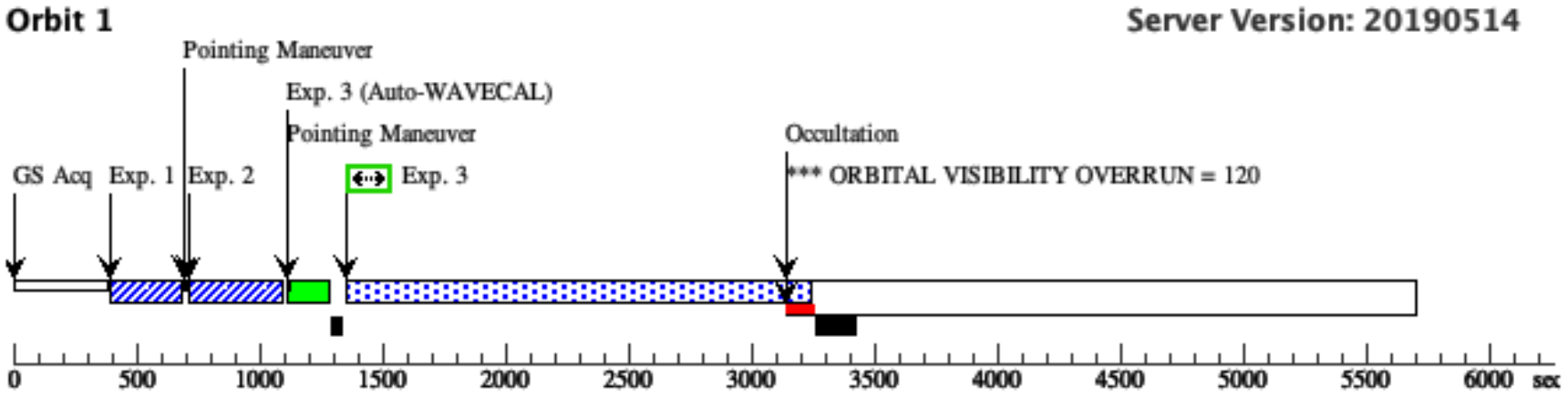
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[M V-IV]
Extended=NO

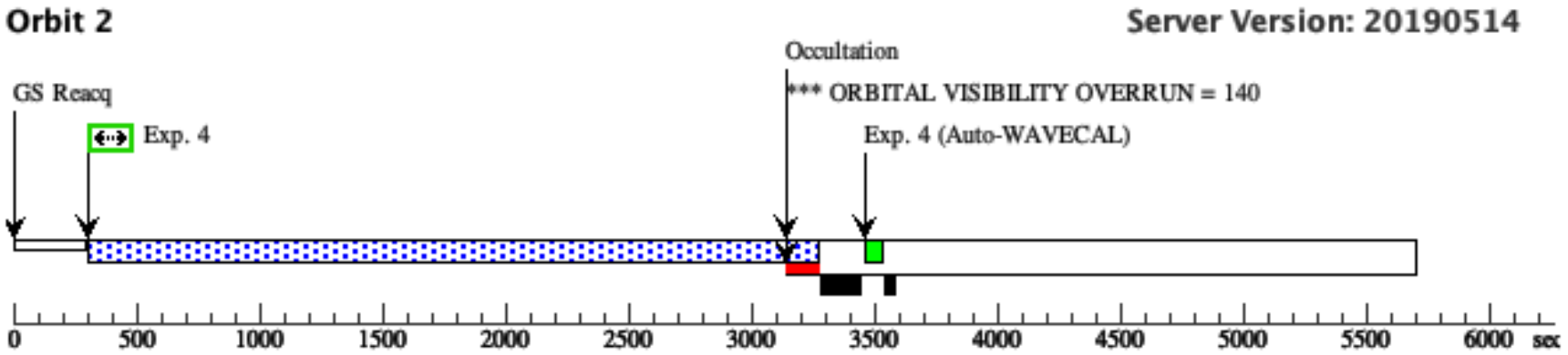
Exposures

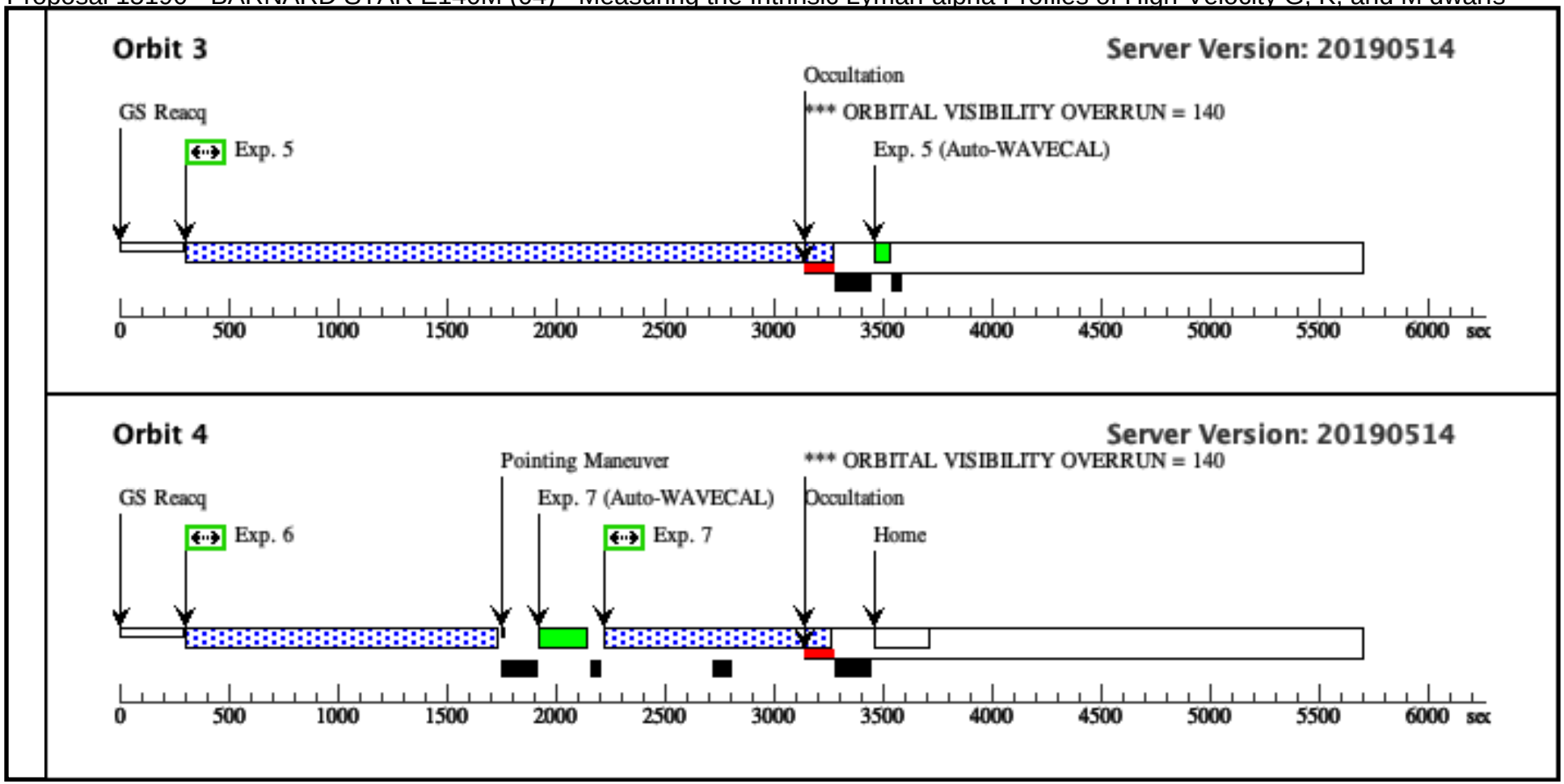
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1013594)	(5) NAME-BARNARDS-STAR	STIS/CCD, ACQ, F25ND3	MIRROR				0.4 Secs (0.4 Secs) *[==>]*	 ***[1]***
2	ACQ/PEAK (STIS.ta.1013603)	(5) NAME-BARNARDS-STAR	STIS/CCD, ACQ/PEAK, 0.1X0.03	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
3	(STIS.sp.1014905)	(5) NAME-BARNARDS-STAR	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1877 Secs (1877 Secs) *[==>]*	 ***[1]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time was increased from 1864 s to 1877 s. The updated ETC run (0.2x0.06 at 1864 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~23 at the peak of the emission line profile to ~24.									
4	(STIS.sp.1014906)	(5) NAME-BARNARDS-STAR	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			2950 Secs (2950 Secs) *[==>]*	 ***[2]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Exposure time maintained at 2950 seconds. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~27 at the peak of the emission line profile to ~29.									
5	(STIS.sp.1014906)	(5) NAME-BARNARDS-STAR	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			2950 Secs (2950 Secs) *[==>]*	 ***[3]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 2937 s to 2950 s. The updated ETC run (0.2x0.06 at 2937 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~27 at the peak of the emission line profile to ~29.									
6	(STIS.sp.1014915)	(5) NAME-BARNARDS-STAR	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1418 Secs (1418 Secs) *[==>]*	 ***[4]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. The exposure time was maintained at 1418 s. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~19 at the peak of the emission line profile to ~21.									
7	(STIS.sp.1024424)	(5) NAME-BARNARDS-STAR	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230H 2713 A	BUFFER-TIME=500			1029 Secs (1029 Secs) *[==>]*	 ***[4]***
Comments: Re-running the orbit planner after changing all of the E140M apertures to 0.2x0.06 and using auto-adjust to pack the orbits, this exposure time was increased from 1018 s to 1029 s. The original ETC run is still included (for 1018 s).									

The ETC run has been updated to include a Kurucz model of an early M dwarf in addition to the Mg H & K lines. This did not significantly change the output.

Orbit Structure



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Occultation
GS Reacq
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Exp. 5 (Auto-WAVECAL)
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1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 4
Server Version: 20190514
Pointing Maneuver
*** ORBITAL VISIBILITY OVERRUN = 140
GS Reacq
Exp. 7 (Auto-WAVECAL)
Occultation
Exp. 6
Exp. 7
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15190, GJ 411 E140M (05), failed Fri Oct 18 20:00:24 GMT 2019

Diagnostic Status: Warning

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

Special Requirements: (none)

Diagnostics

(GJ 411 E140M (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	HD-95735	RA: 11 03 20.1940 (165.8341417d)	Proper Motion RA: -580.27 mas/yr	V=7.52	Reference Frame: ICRS
	Alt Name1: GJ-411	Dec: +35 58 11.57 (35.96988d)	Proper Motion Dec: -4765.85 mas/yr		
	Alt Name2: LHS-37	Equinox: J2000	Parallax: 0.39264"		
			Epoch of Position: 2000		
			Radial Velocity: -84.69 km/sec		

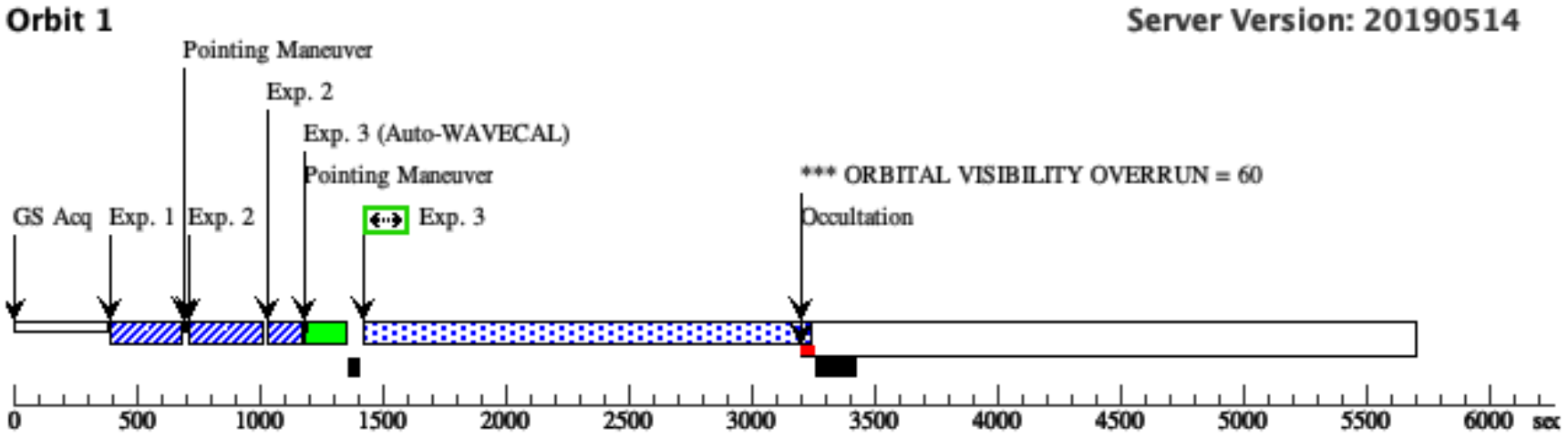
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]
Extended=NO

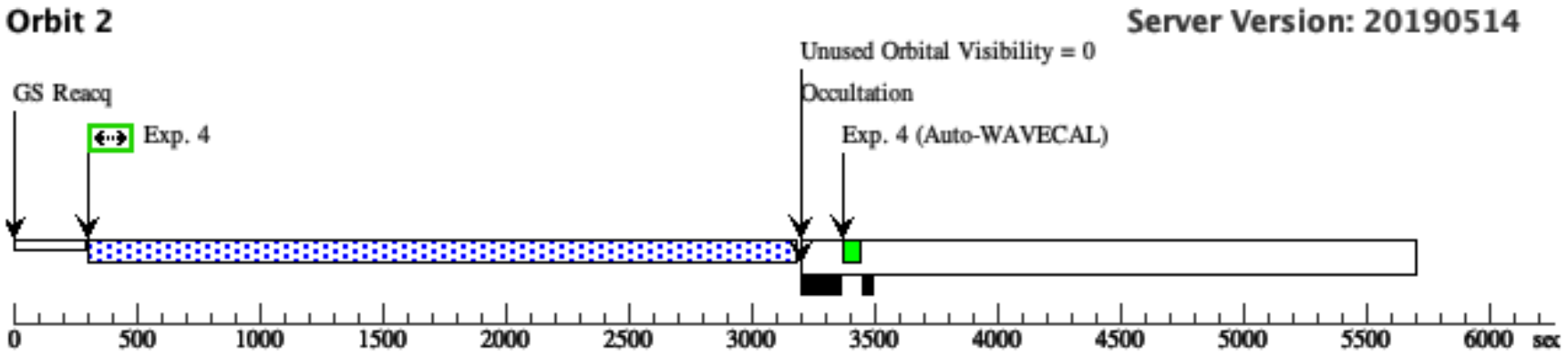
Exposures

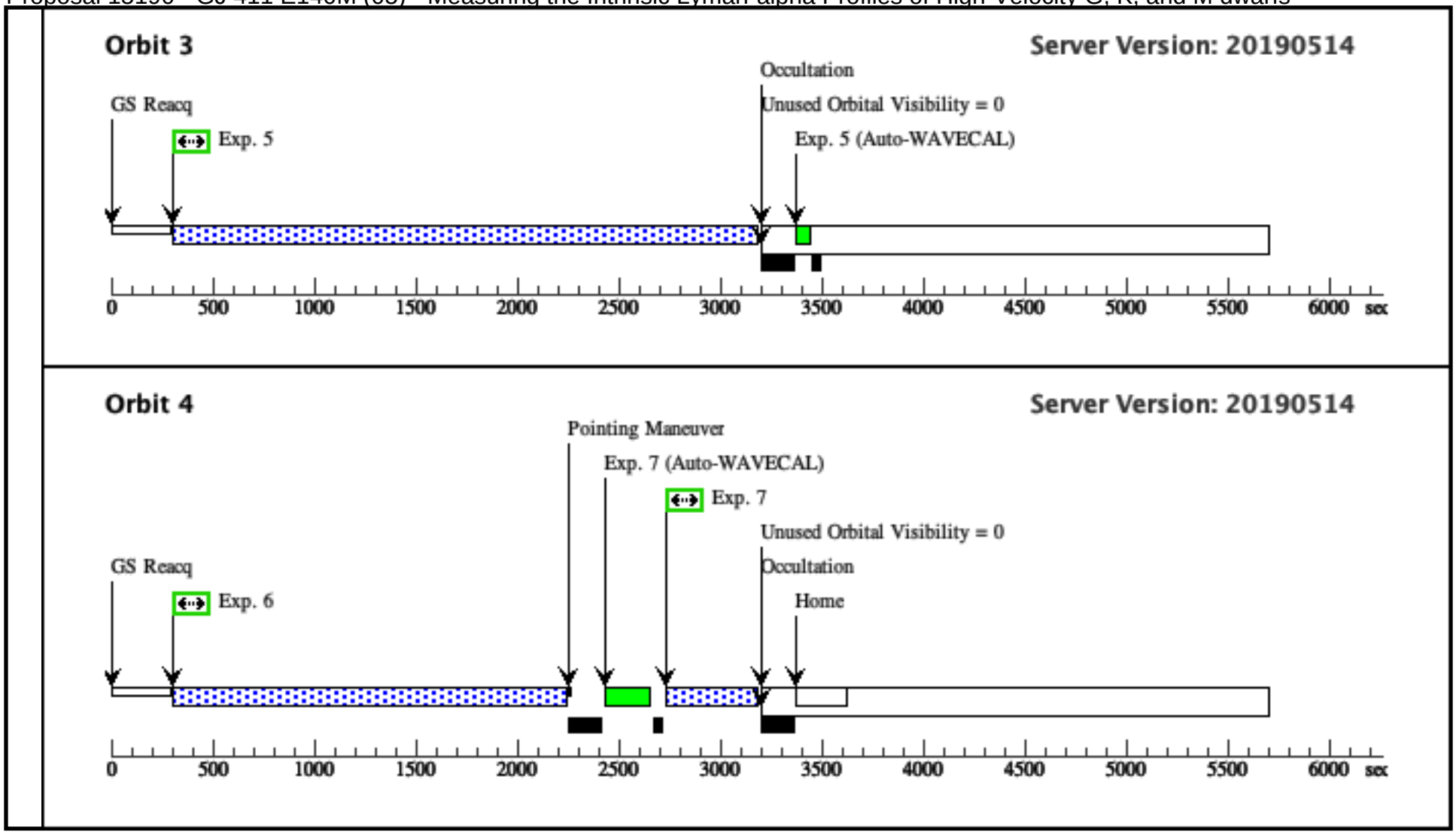
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1013682)	(6) HD-95735	STIS/CCD, ACQ, F25ND3	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	ACQ/PEAK (STIS.ta.1013692)	(6) HD-95735	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1014908)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1854 Secs (1807 Secs)	
								[==>1807.0 Secs]	***[1]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 1854 s to 1867 s. The updated ETC run (0.2x0.06 at 1854 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~30 at the peak of the emission line profile to ~33.									
4	(STIS.sp.1014909)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			3008 Secs (2868 Secs)	
								[==>2868.0 Secs]	***[2]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Exposure time maintained at 3008 seconds. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~39 at the peak of the emission line profile to ~41.									
5	(STIS.sp.1014910)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			2995 Secs (2868 Secs)	
								[==>2868.0 Secs]	***[3]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 2995 s to 3008 s. The updated ETC run (0.2x0.06 at 2995 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~38 at the peak of the emission line profile to ~41.									
6	(STIS.sp.1013725)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.06	E140M 1425 A	BUFFER-TIME=2000			1997 Secs (1927 Secs)	
								[==>1927.0 Secs]	***[4]***
Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Exposure time maintained at 1997 seconds. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~32 at the peak of the emission line profile to ~34.									
7	(STIS.sp.1024425)	(6) HD-95735	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230H 2713 A	BUFFER-TIME=400			508 Secs (438 Secs)	
								[==>438.0 Secs]	***[4]***
Comments: Re-running the orbit planner after changing all the E140M apertures to 0.2x0.06 and using auto-adjust to pack the orbits, this exposure time increased from 497 s to 508 s. The original ETC run is still liste d (for 497 s).									

The ETC was updated to include a Kurucz spectral model of an early M dwarf, but this did not significantly change the output.

Orbit Structure






Orbit 3
Server Version: 20190514
Occultation
Unused Orbital Visibility = 0
GS Reacq
Exp. 5
Exp. 5 (Auto-WAVECAL)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec
Orbit 4
Server Version: 20190514
Pointing Maneuver
Exp. 7 (Auto-WAVECAL)
Exp. 7
Unused Orbital Visibility = 0
Occultation
GS Reacq
Exp. 6
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 15190, GJ 411 E140M redo (06), implementation Fri Oct 18 20:00:24 GMT 2019

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	HD-95735	RA: 11 03 20.1940 (165.8341417d)	Proper Motion RA: -580.27 mas/yr	V=7.52	Reference Frame: ICRS
	Alt Name1: GJ-411	Dec: +35 58 11.57 (35.96988d)	Proper Motion Dec: -4765.85 mas/yr		
	Alt Name2: LHS-37	Equinox: J2000	Parallax: 0.39264"		
			Epoch of Position: 2000		
			Radial Velocity: -84.69 km/sec		

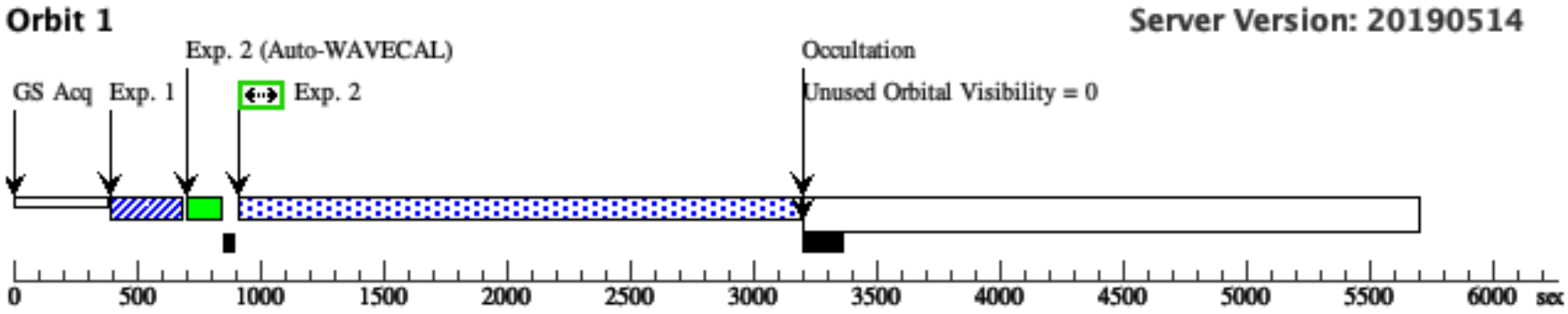
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]
Extended=NO

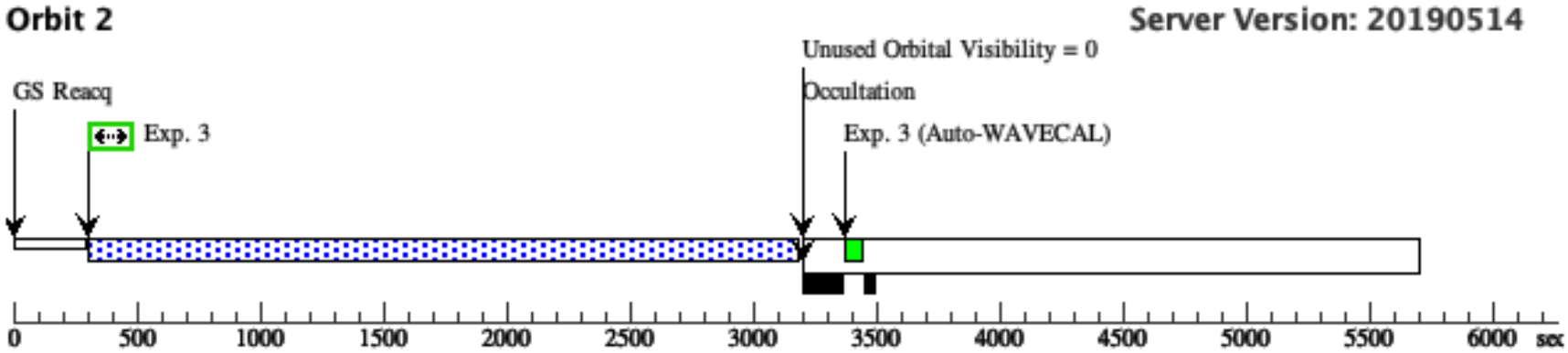
Exposures

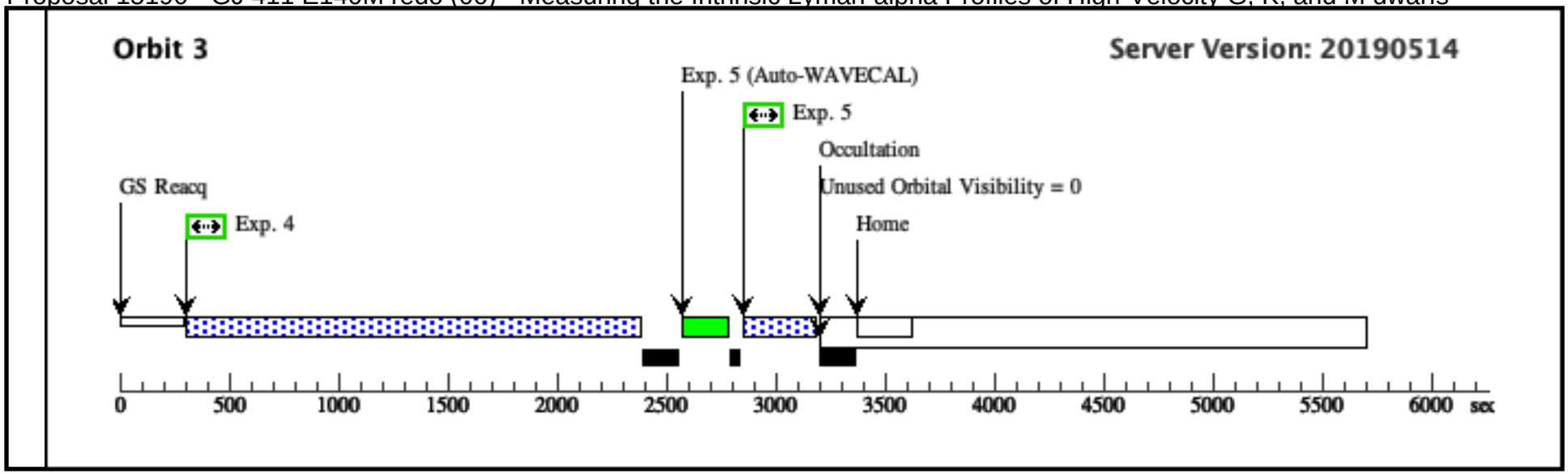
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1013682)	(6) HD-95735	STIS/CCD, ACQ, F25ND3	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(STIS.sp.1014908)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	BUFFER-TIME=2000			2260 Secs (2260 Secs)	
								[==>]	***[1]***
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Re-running the orbit planner and using auto-adjust to pack the orbits, the exposure time for this exposure increased from 1854 s to 1867 s. The updated ETC run (0.2x0.06 at 1854 s) shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~30 at the peak of the emission line profile to ~33.								
3	(STIS.sp.1014909)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	BUFFER-TIME=2000			2868 Secs (2868 Secs)	
								[==>]	***[2]***
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Exposure time maintained at 3008 seconds. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~39 at the peak of the emission line profile to ~41.								
4	(STIS.sp.1013725)	(6) HD-95735	STIS/FUV-MAMA, TIME-TAG, 0.2X0.2	E140M 1425 A	BUFFER-TIME=2000			2065 Secs (2065 Secs)	
								[==>]	***[3]***
	Comments: Changed to the 0.2"x0.06" slit to avoid order overlap in echelle mode. Exposure time maintained at 1997 seconds. The updated ETC run shows a marginal increase in the SNR per resel of the Lyman alpha profile, from ~32 at the peak of the emission line profile to ~34.								
5	(STIS.sp.1024425)	(6) HD-95735	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230H 2713 A	BUFFER-TIME=400			316 Secs (316 Secs)	
								[==>]	***[3]***
	Comments: Re-running the orbit planner after changing all the E140M apertures to 0.2x0.06 and using auto-adjust to pack the orbits, this exposure time increased from 497 s to 508 s. The original ETC run is still liste d (for 497 s).								

The ETC was updated to include a Kurucz spectral model of an early M dwarf, but this did not significantly change the output.

Orbit Structure






Orbit 3
Server Version: 20190514
Exp. 5 (Auto-WAVECAL)
Exp. 5
Occultation
Unused Orbital Visibility = 0
Home
GS Reacq
Exp. 4
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec