16750 - Inhomogeneities and pristine gas infall in the ISM

Cycle: 29, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

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) -CHI-OPH WAVE	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	11-Oct-2022 17:00:18.0	yes
02	(2) HD-110432 WAVE	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	11-Oct-2022 17:00:19.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(3) HD-154368 WAVE	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	4	11-Oct-2022 17:00:20.0	yes
04	(4) -RHO-OPH-A WAVE	STIS/CCD STIS/NUV-MAMA	1	11-Oct-2022 17:00:21.0	yes
05	(5) -TET01-ORI-C WAVE	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	11-Oct-2022 17:00:22.0	yes
06	(6) HD-206267 WAVE	STIS/CCD STIS/NUV-MAMA	1	11-Oct-2022 17:00:23.0	yes
07	(7) HD-207198 WAVE	STIS/CCD STIS/NUV-MAMA	1	11-Oct-2022 17:00:23.0	yes
08	(8) -KAP-AQL WAVE	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	11-Oct-2022 17:00:24.0	yes

15 Total Orbits Used

ABSTRACT

Is the neutral ISM in the Galaxy clumpy? Does pristine gas infalling on the disk immediately mix with the metal-enriched gas? Recent medium-resolution STIS studies found frequent sub-solar metallicities in the neutral ISM, integrated along the line of sight, suggesting the contribution of low-metallicity gas. Intriguingly, in some cases deviations from the expected depletion patterns were observed for volatile elements. One possible explanation for both effects is a mix between metal/dust-rich and pristine gas (low metallicity and zero depletion) in the ISM. Indeed, an inhomogeneous ISM mix has been recently observed in high-resolution STIS observations of HD 62542. Here we propose to target 8 lines of sight that show potential contribution of pristine gas in the following ways: 1) low metallicity integrated along the line of sight, 2) deviations in the depletion of the volatile elements, and 3) complex/asymmetric kinematics, as measured from lower-resolution studies. The STIS high-resolution will enable a component-by-component analysis to characterize the depletion properties of individual clumps. Our primary goal is to constrain dust-rich and dust-free ISM clumps towards our targets. In addition, we aim at roughly constraining the metallicity of these ISM clumps by exploring the parameter space that can reproduce the observed deviations of the volatile elements. This way we will characterize the inhomogeneities in the ISM

and unveil the potential presence of clumps of pristine gas. While chemical evolution models show that infalling pristine gas is necessary to sustain star formation and reproduce the observed abundances, its presence in the ISM is yet to be confirmed.

OBSERVING DESCRIPTION

We aim at characterising the ISM chemical and kinematical properties by studying narrow metal lines in the far and near UV associated with the ISM toward Galactic stars. We target 8 hot bright stars that have previous STIS E230M observations. Here we use STIS high resolution spectroscopy (R~114,000) to characterise the individual components of the line profiles in individual gas clouds along lines of sight. We deploy the E140H and E230H settings in order to detect a wide range of ions. The E140H setting at a central wavelength of 1271 A will cover transitions from SiII, MnII, MgII, PII, OI, SII, NiII, CII, and CuII. The E230H setting at a central wavelength of 2113 A will cover transitions of ZnII, CoII, CrII, and FeII lines. The minimum set of ions that we need to characterise to fulfil our scientific goals are: ZnII, CrII, OI.

Five out of eight targets will be observed with both the E140H and E230H settings. The other three targets (Rho-Oph-A, HD 206267 and HD 207198) will be observed only with the E230H setting in a single orbit per target, because E140H archival data exists already. For all except for one target, one orbit per setting will ensure the minimum required S/N of 50. For our faintest target HD 154368 two orbits per setting will be necessary to reach a S/N of ~50, for a total of four orbits for this target.

The structure of each visit is structured as follows: first we acquire the target with a normal acquisition and an additional peakup target acquisition in case of slits narrower than 0.1", then we plan the science exposures, each with an attached wavelength calibration (in occultation). For the visits including both settings, the science exposure and wavelength calibration for the E140H setting will be done in the second orbit to maximise the S/N for the weakest lines. We increased the science exposure time to fill unused time in each the orbit.

We deploy a range of slit apertures for the science exposures, which were chosen to both ensure the safety of the MAMA detectors and maximise the photon collection. We note that in several cases the expected count rate is above 40% of the nominal bright limit. We investigate the variability range of these targets from the General Catalog of Variable Stars (http://www.sai.msu.su/gcvs/) and ensure that the expected count-rate with the selected aperture will not exceed the MAMA bright limit in case the star is at its brightest state. Overall, we expect S/N values between ~50 and ~100.

The aperture of the peak acquisition was set to match the aperture of the first science exposure.

The orientation of the long slit (31") is specified for Theta Ori-C to avoid neighbouring sources that could contaminate the spectrum. For the other stars with a long slit (Chi-Oph, HD 206267 and Kap-Aql) no preferred orientation is needed.

Visit

Proposal 16750, CHI-OPH (01), completed Tue Oct 11 21:00:24 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

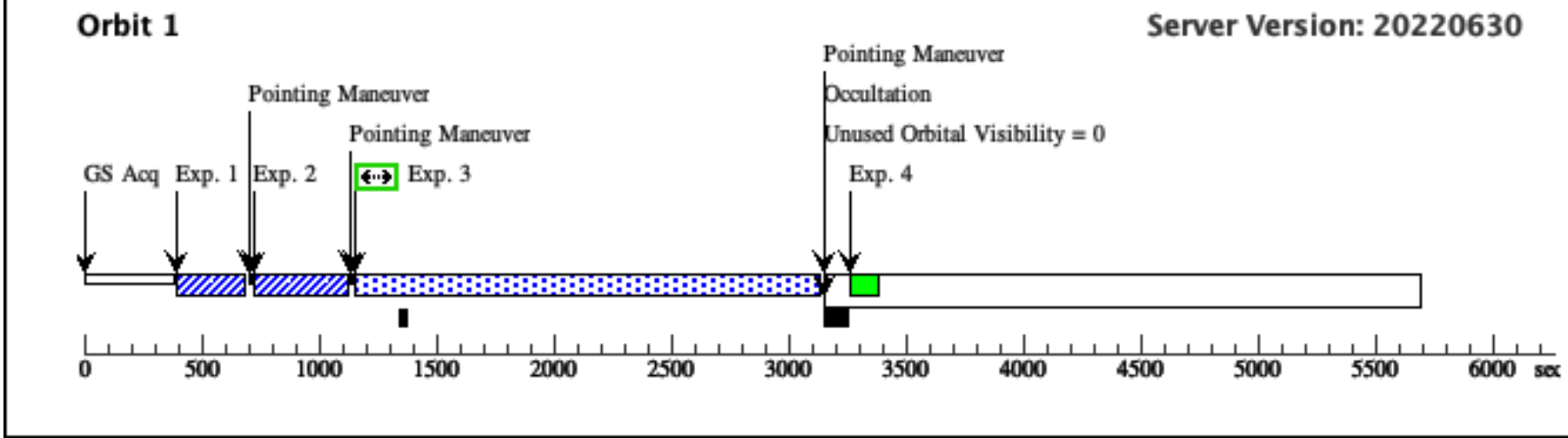
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-CHI-OPH	RA: 16 27 1.4291 (246.7559546d) Dec: -18 27 22.82 (-18.45634d) Equinox: J2000	Proper Motion RA: -3.8022339068468665E-4 sec of time/yr Proper Motion Dec: -0.021119999905749864 arcsec/yr Epoch of Position: 2015.5	V=4.43	Reference Frame: ICRS

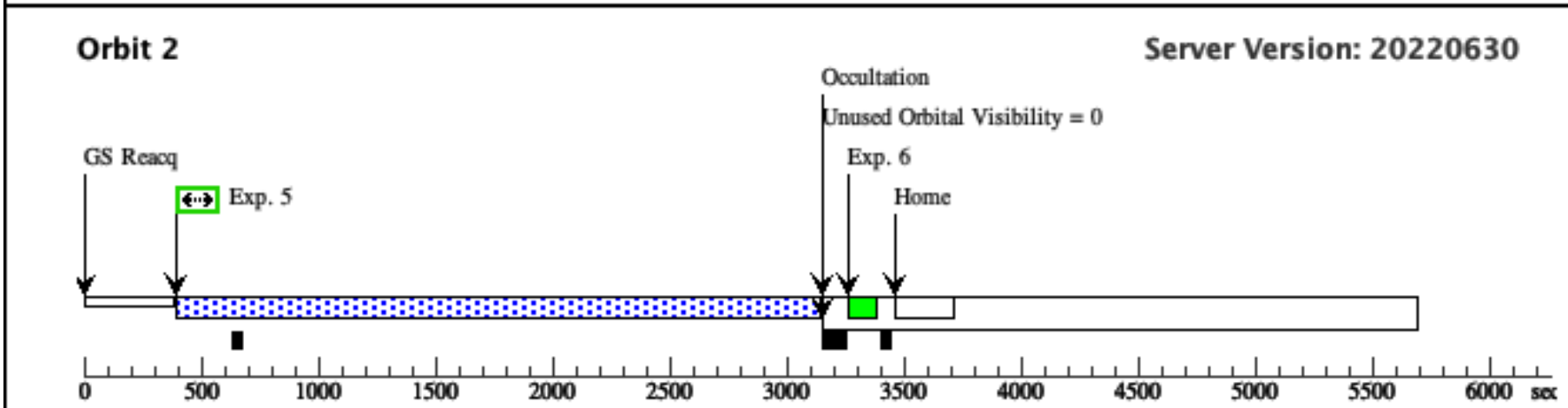
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[B0-B2 V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	CHI-OPH ACQ (STIS.ta.1541243)	(1) -CHI-OPH	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
2	CHI-OPH ACQPEAK (STIS.sp.1529890)	(1) -CHI-OPH	STIS/CCD, ACQ/PEAK, 31X0.05NDA	G430M 3165 A				1 Secs (1 Secs) *[==>]*	***[1]***
3	CHI OPH 230 (STIS.sp.1684300)	(1) -CHI-OPH	STIS/NUV-MAMA, ACCUM, 31X0.05NDA	E230H 2113 A	WAVECAL=NO			1866 Secs (1807 Secs) *[==>1807.0 Secs]*	***[1]***
4	CHI-OPH WAVE230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2113 A				*[==>]*	***[1]***
5	CHI-OPH 140 (STIS.sp.1541044)	(1) -CHI-OPH	STIS/FUV-MAMA, ACCUM, 31X0.05NDB	E140H 1271 A	WAVECAL=NO			2536 Secs (2519 Secs) *[==>2519.0 Secs]*	***[2]***
6	CHI-OPH WAVE140	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.09	E140H 1271 A				*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16750, HD110432 (02), completed Tue Oct 11 21:00:25 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

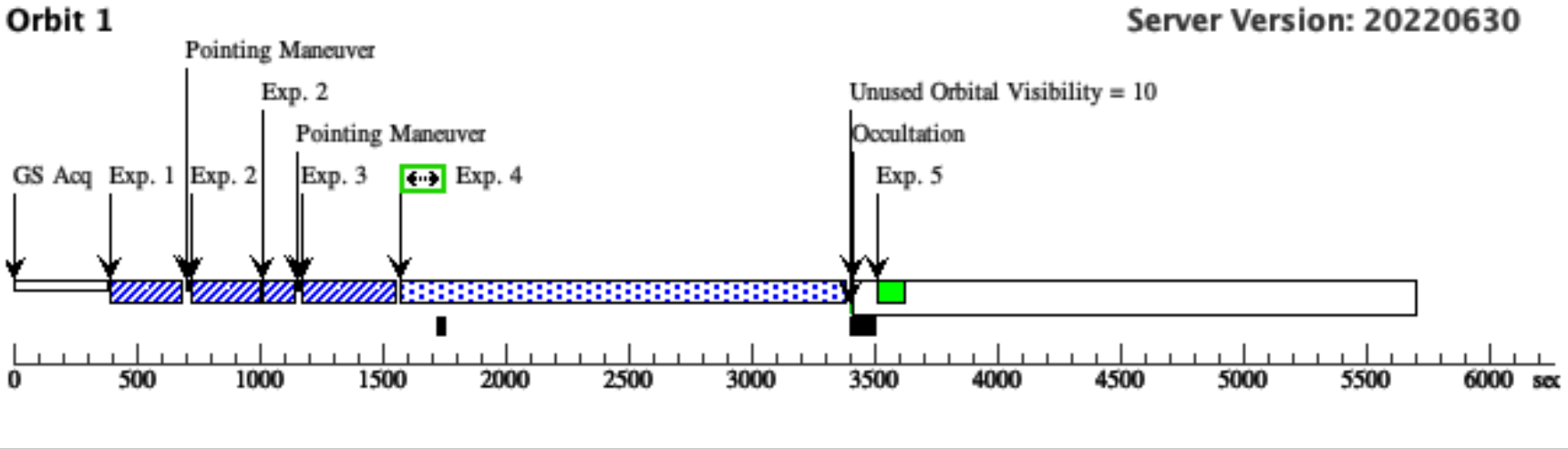
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD-110432	RA: 12 42 50.2370 (190.7093208d) Dec: -63 03 31.11 (-63.05864d) Equinox: J2000	Proper Motion RA: -0.001841035614849054 sec of time/yr Proper Motion Dec: -0.003984000022683176 arcsec/yr Epoch of Position: 2015.5	V=5.31	Reference Frame: ICRS

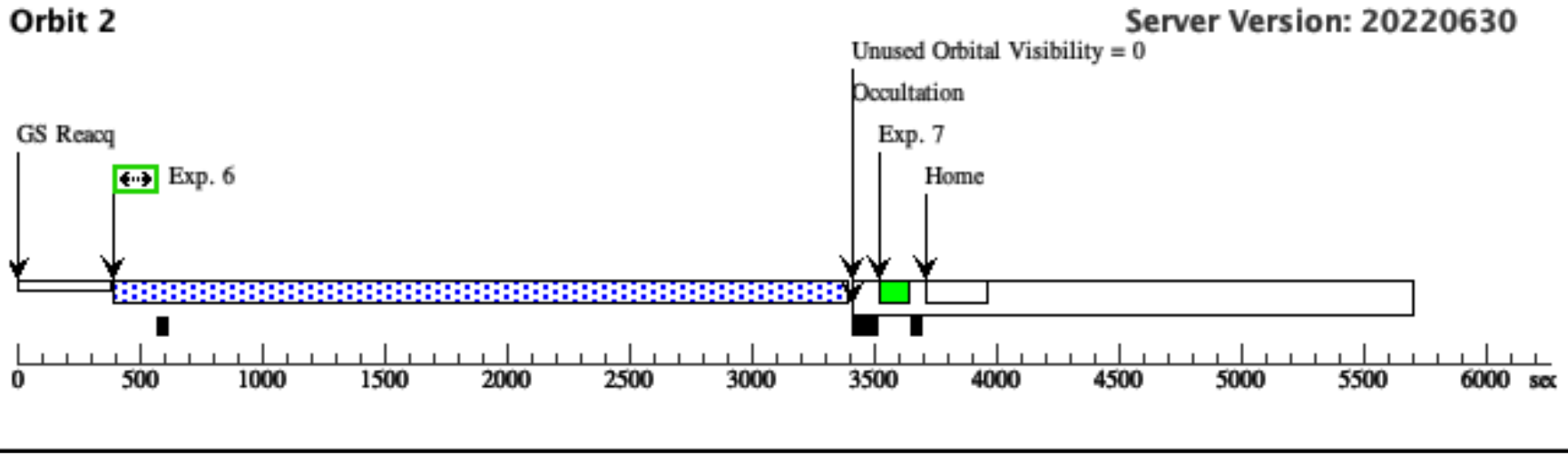
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[B0-B2 III-I]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	HD11 ACQ (STIS.ta.1541244)	(2) HD-110432	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	*[1]*
2	HD11 ACQ PEAK (STIS.sp.1729150)	(2) HD-110432	STIS/CCD, ACQ/PEAK, 0.2X0.09	G230LB 2375 A				0.5 Secs (0.5 Secs) *[==>]*	*[1]*
3	HD11 ACQ PEAK (2) (STIS.sp.1729154)	(2) HD-110432	STIS/CCD, ACQ/PEAK, 0.1X0.03	G230LB 2375 A				1 Secs (1 Secs) *[==>]*	*[1]*
4	HD11 230 (STIS.sp.1541055)	(2) HD-110432	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230H 2113 A	WAVECAL=NO			2040 Secs (1667 Secs) *[==>1667.0 Secs]*	*[1]*
5	HD11 WAV E230	WAVE	STIS/NUV-MAMA, ACCUM, 0.1X0.03	E230H 2113 A				*[==>]*	*[1]*
6	HD11 140 (STIS.sp.1541063)	(2) HD-110432	STIS/FUV-MAMA, ACCUM, 0.1X0.03	E140H 1271 A	WAVECAL=NO			2828 Secs (2828 Secs) *[==>2828.0 Secs]*	*[2]*
7	HD11 WAV E140	WAVE	STIS/FUV-MAMA, ACCUM, 0.1X0.03	E140H 1271 A				*[==>]*	*[2]*

Orbit Structure





Visit

Proposal 16750, HD154368 (03), completed Tue Oct 11 21:00:25 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

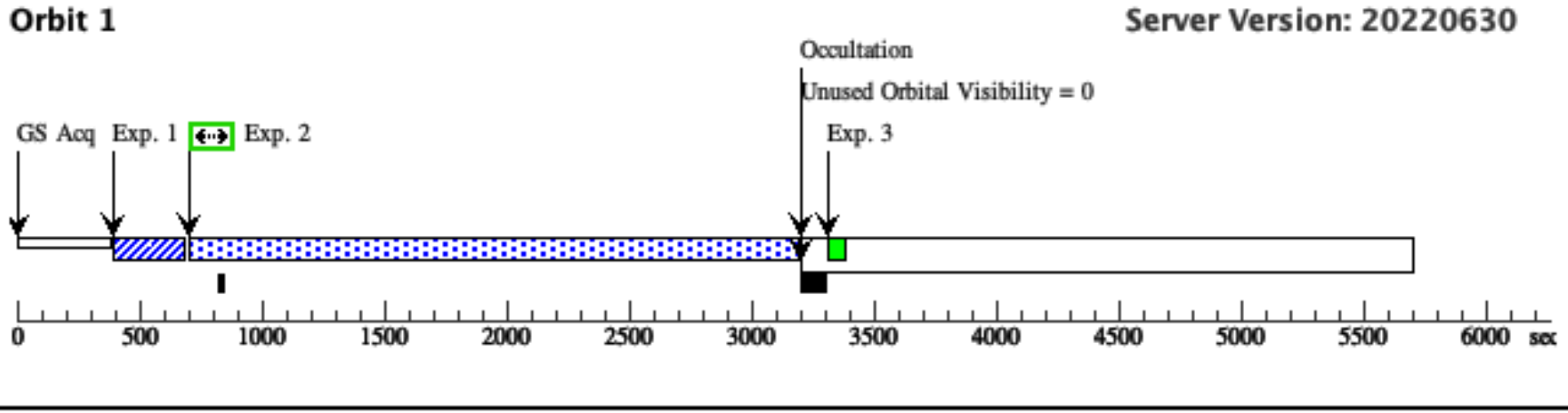
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HD-154368	RA: 17 06 28.3703 (256.6182096d) Dec: -35 27 3.79 (-35.45105d) Equinox: J2000	Proper Motion RA: 9.967944240423941E-5 sec of time/yr Proper Motion Dec: -0.0022060000674173352 arcsec/yr Epoch of Position: 2015.5	V=6.13	Reference Frame: ICRS

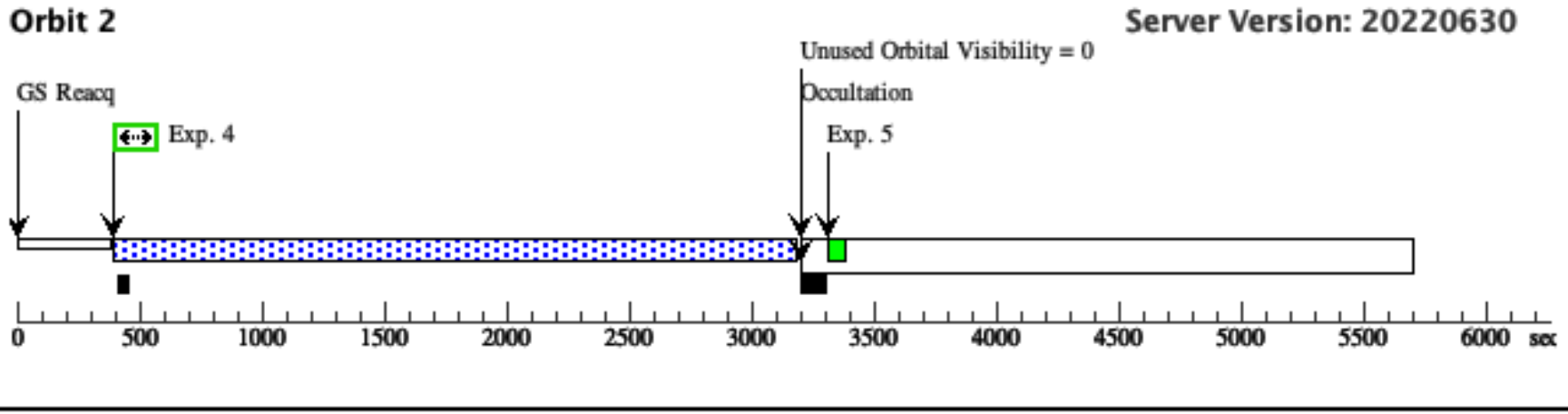
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[GIANT O]

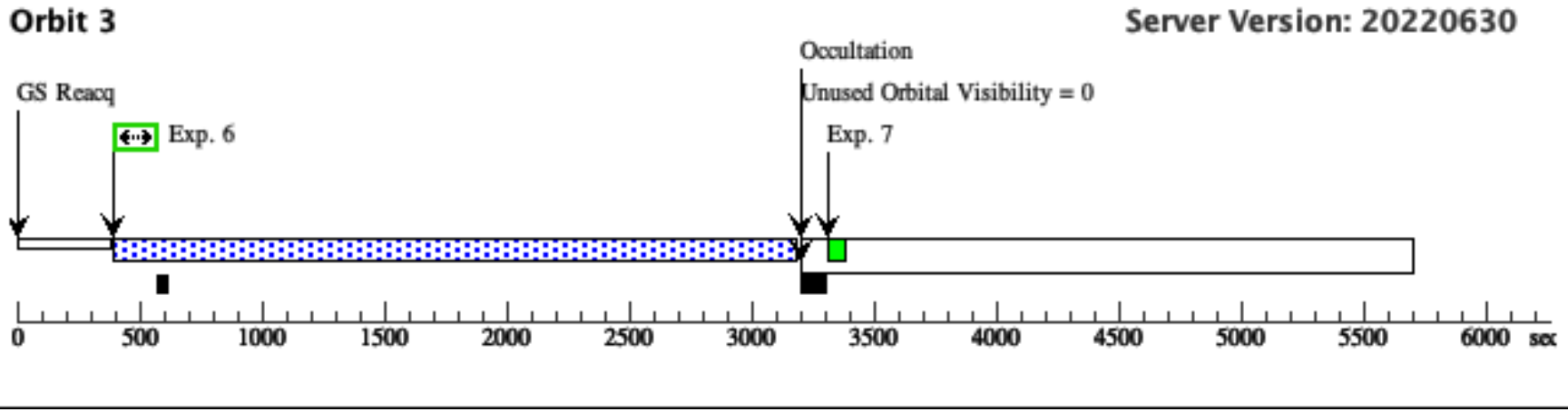
Exposures

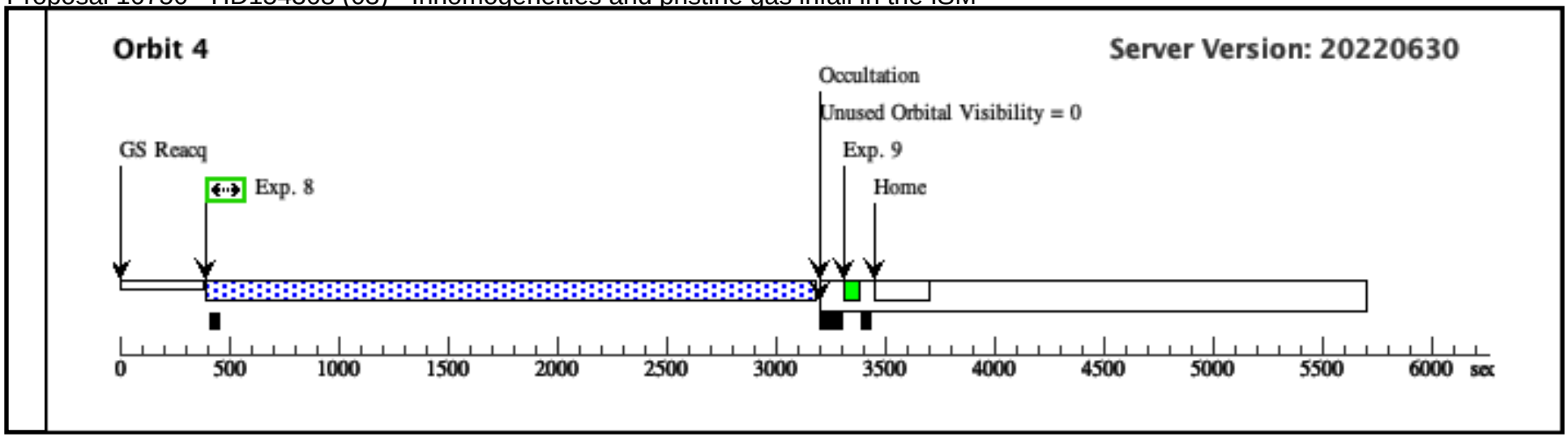
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	HD15 ACQ (STIS.ta.1541245)	(3) HD-154368	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
2	HD15 230 (1) (STIS.sp.1541074)	(3) HD-154368	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A	WAVECAL=NO			2365 Secs (2369 Secs) *[==>2369.0 Secs]*	***[1]***
3	HD15 WAV E230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A				*[==>]*	***[1]***
4	HD15 230 (2) (STIS.sp.1541074)	(3) HD-154368	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A	WAVECAL=NO			2778 Secs (2778 Secs) *[==>2778.0 Secs]*	***[2]***
5	HD15 WAV E230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A				*[==>]*	***[2]***
6	HD15 140 (1) (STIS.sp.1541090)	(3) HD-154368	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140H 1271 A	WAVECAL=NO			2617 Secs (2617 Secs) *[==>2617.0 Secs]*	***[3]***
7	HD15 WAV E140	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140H 1271 A				*[==>]*	***[3]***
8	HD15 140 (2) (STIS.sp.1541090)	(3) HD-154368	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140H 1271 A	WAVECAL=NO			2778 Secs (2778 Secs) *[==>2778.0 Secs]*	***[4]***
9	HD15 WAV E140	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140H 1271 A				*[==>]*	***[4]***

Orbit Structure





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3500
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sec

Visit

Proposal 16750, RHO-OPH (04), completed Tue Oct 11 21:00:25 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: ORIENT 40D TO 170 D; ORIENT 220D TO 350 D

Fixed Targets

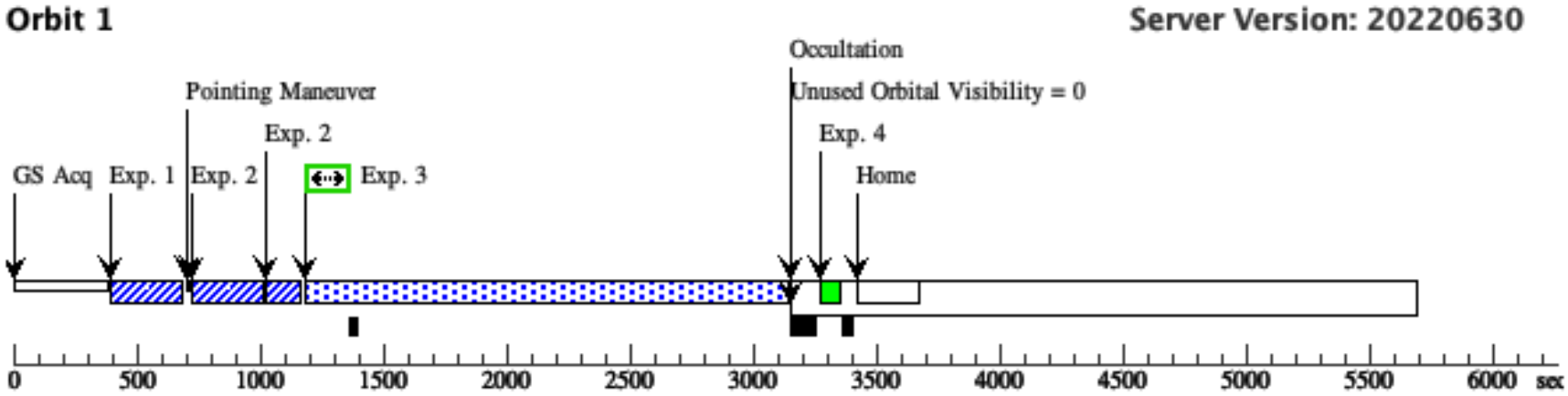
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	-RHO-OPH-A	RA: 16 25 35.1136 (246.3963067d) Dec: -23 26 50.19 (-23.44727d) Equinox: J2000	Proper Motion RA: -2.961908097891086E-4 sec of time/yr Proper Motion Dec: -0.02357200003189064 arcsec/yr Epoch of Position: 2015.5	V=5.05	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[B0-B2 V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	RHO ACQ (STIS.ta.1541246)	(4) -RHO-OPH-A	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
2	RHO ACQPEAK (STIS.sp.1529898)	(4) -RHO-OPH-A	STIS/CCD, ACQ/PEAK, 0.2X0.06	G430M 3165 A				1 Secs (1 Secs) *[==>]*	 ***[1]***
3	RHO 230 (STIS.sp.1541101)	(4) -RHO-OPH-A	STIS/NUV-MAMA, ACCUM, 0.2X0.06	E230H 2113 A	WAVECAL=NO			1786 Secs (1785 Secs) *[==>1785.0 Secs]*	 ***[1]***
4	RHO WAV E230	WAVE	STIS/NUV-MAMA, ACCUM, 0.1X0.09	E230H 2113 A				*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 16750, THETA-ORI-C (05), completed Tue Oct 11 21:00:25 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: ORIENT 10D TO 17 D; ORIENT 37D TO 90 D; ORIENT 112D TO 126 D; ORIENT 190D TO 197 D; ORIENT 217D TO 270 D; ORIENT 292D TO 306 D

Fixed Targets

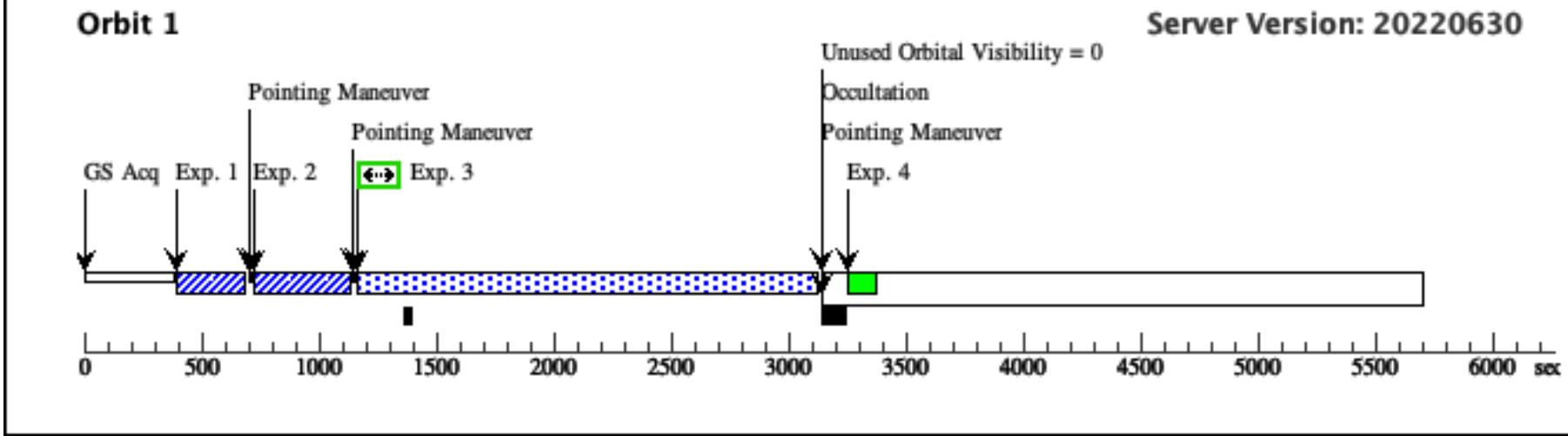
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	-TET01-ORI-C	RA: 05 35 16.4686 (83.8186192d) Dec: -05 23 22.91 (-5.38970d) Equinox: J2000	Proper Motion RA: 1.4135829637885254E-4 sec of time/yr Proper Motion Dec: -5.879999207536457E-4 arcsec/yr Epoch of Position: 2015.5	V=5.13	Reference Frame: ICRS

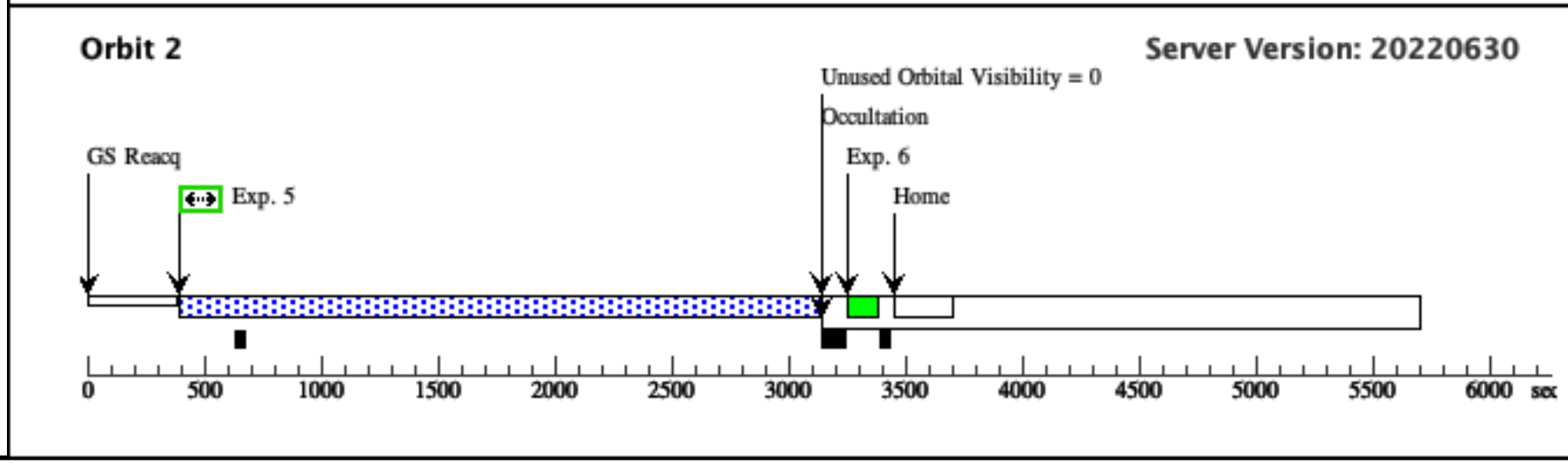
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[GIANT O]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	THETA ACQ (STIS.ta.1541247)	(5) -TET01-ORI-C	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
2	THETA ACQPEAK (STIS.sp.1529903)	(5) -TET01-ORI-C	STIS/CCD, ACQ/PEAK, 31X0.05NDA	G430M 3165 A				1.5 Secs (1.5 Secs) *[==>]*	***[1]***
3	THETA 230 (STIS.sp.1541119)	(5) -TET01-ORI-C	STIS/NUV-MAMA, ACCUM, 31X0.05NDB	E230H 2113 A	WAVECAL=NO			1786 Secs (1774 Secs) *[==>1774.0 Secs]*	***[1]***
4	THETA WAVE230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2113 A				*[==>]*	***[1]***
5	THETA 140 (STIS.sp.1541258)	(5) -TET01-ORI-C	STIS/FUV-MAMA, ACCUM, 31X0.05NDC	E140H 1271 A	WAVECAL=NO			2508 Secs (2507 Secs) *[==>2507.0 Secs]*	***[2]***
6	THETA WAVE140	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.09	E140H 1271 A				*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16750, HD206267 (06), implementation Tue Oct 11 21:00:25 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: ORIENT 225D TO 245 D; ORIENT 45D TO 65 D

Fixed Targets

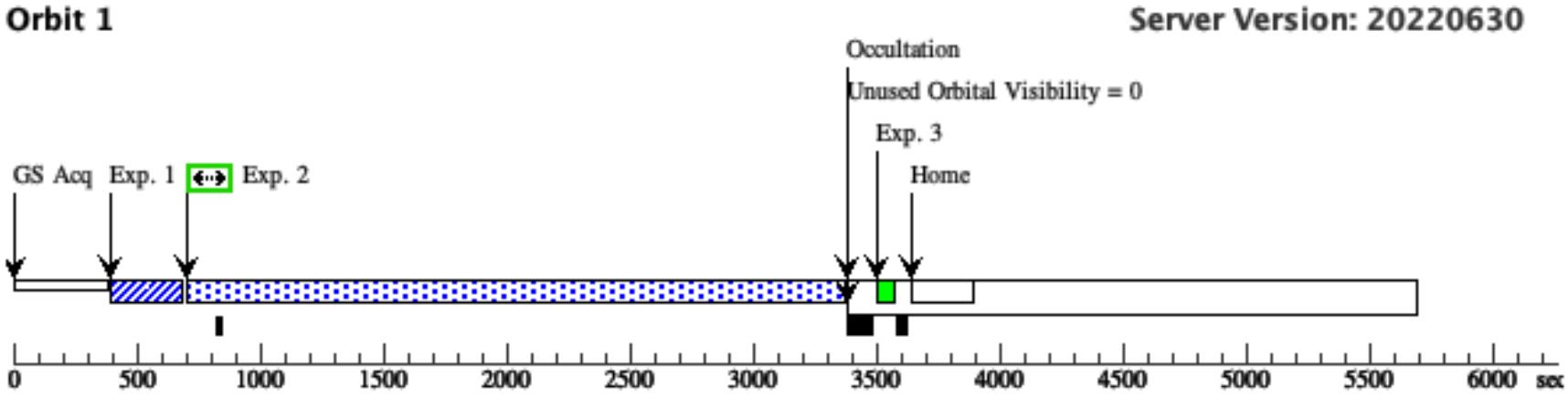
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	HD-206267	RA: 21 38 57.6126 (324.7400525d) Dec: +57 29 20.47 (57.48902d) Equinox: J2000	Proper Motion RA: -3.6666209945109126E-4 sec of time/yr Proper Motion Dec: -0.005764000093222421 arcsec/yr Epoch of Position: 2015.5	V=5.62	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[GIANT O]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	HD206 ACQ (STIS.ta.1541248)	(6) HD-206267	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
2	HD206 230 (STIS.sp.1541261)	(6) HD-206267	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A	WAVECAL=NO			2018 Secs (2558 Secs) *[==>2558.0 Secs]*	 ***[1]***
3	HD20 WAV E230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A				*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 16750, HD207198 (07), scheduling Tue Oct 11 21:00:25 GMT 2022

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

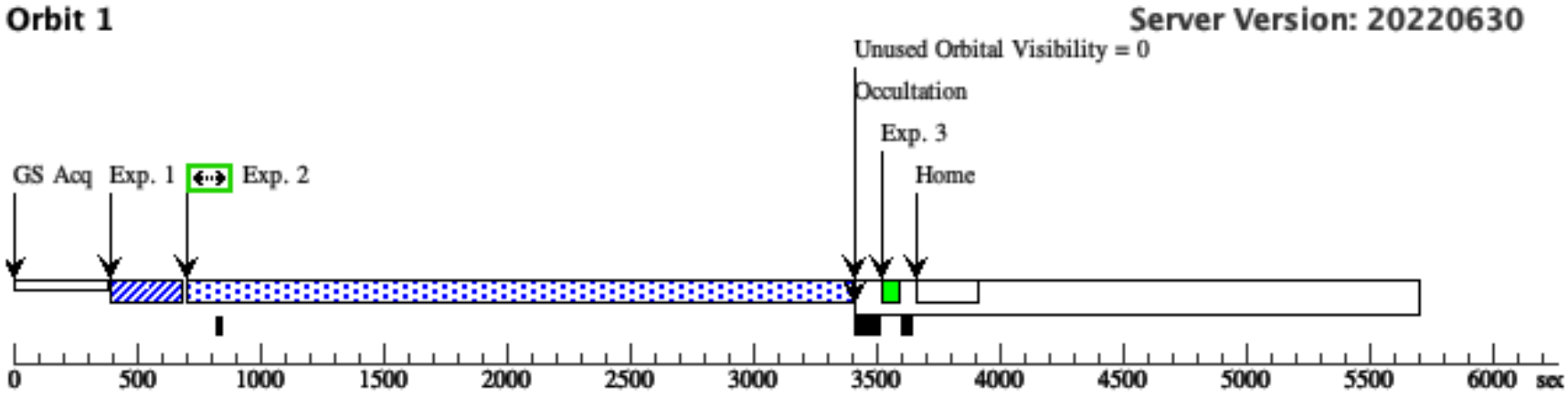
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	HD-207198	RA: 21 44 53.2711 (326.2219629d) Dec: +62 27 38.03 (62.46056d) Equinox: J2000	Proper Motion RA: -5.098490879455598E-4 sec of time/yr Proper Motion Dec: -9.730000101626501E-4 arcsec/yr Epoch of Position: 2015.5	V=5.94	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[GIANT O]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	HD207 ACQ (STIS.ta.1541249)	(7) HD-207198	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
2	HD207 230 (STIS.sp.1541271)	(7) HD-207198	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A	WAVECAL=NO			2030 Secs (2580 Secs) *[==>2580.0 Secs]*	 ***[1]***
3	HD207 WAVE230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230H 2113 A				*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 16750, KAP-AQL (08), completed Tue Oct 11 21:00:25 GMT 2022

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
(8)	-KAP-AQL	RA: 19 36 53.4512 (294.2227133d) Dec: -07 01 38.96 (-7.02749d) Equinox: J2000	Proper Motion RA: 1.0948919672787106E-4 sec of time/yr Proper Motion Dec: -0.0026500000785745215 arcsec/yr Epoch of Position: 2015.5	V=4.96	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[B0-B2 III-I]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	KAP ACQ (STIS.ta.1541250)	(8) -KAP-AQL	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	 ***[1]***
2	KAP ACQPEAK (STIS.sp.1529910)	(8) -KAP-AQL	STIS/CCD, ACQ/PEAK, 31X0.05NDA	G430M 3165 A				1.5 Secs (1.5 Secs) *[==>]*	 ***[1]***
3	KAP 230 (STIS.sp.1541286)	(8) -KAP-AQL	STIS/NUV-MAMA, ACCUM, 31X0.05NDA	E230H 2113 A	WAVECAL=NO			1786 Secs (1786 Secs) *[==>]*	 ***[1]***
4	KAP WAV E230	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.09	E230H 2113 A				*[==>]*	***[1]***
5	KAP 140 (STIS.sp.1541296)	(8) -KAP-AQL	STIS/FUV-MAMA, ACCUM, 31X0.05NDB	E140H 1271 A	WAVECAL=NO			2508 Secs (2508 Secs) *[==>]*	 ***[2]***
6	KAP WAV E140	WAVE	STIS/FUV-MAMA, ACCUM, 0.2X0.09	E140H 1271 A				*[==>]*	***[2]***

Orbit Structure