15825 - The evolving magnetic lives of young Suns

Cycle: 27, Proposal Category: GO

(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) V-V993-TAU	COS/FUV COS/NUV	3	18-Mar-2021 16:00:12.0	yes
Z1	(1) V-V993-TAU	COS/FUV COS/NUV	3	18-Mar-2021 16:00:13.0	yes
02	(4) -KAP01-CET	COS/FUV COS/NUV	2	18-Mar-2021 16:00:14.0	yes
03	(6) -EPS-ERI	COS/FUV COS/NUV	2	18-Mar-2021 16:00:15.0	yes
04	(7) -9-CET	COS/FUV COS/NUV	3	18-Mar-2021 16:00:16.0	yes
Z2	(6) -EPS-ERI	COS/FUV COS/NUV	2	18-Mar-2021 16:00:17.0	yes

15 Total Orbits Used

ABSTRACT

This is a coordinated HST+XMM-Newton program to address the conditions that affect habitability on Earth-like planets around Sun-like stars. Both wavelength regimes (far-UV with HST, X-rays with XMM) are needed to constrain models sufficiently to represent realistic conditions. An approved TESS program for our targets will provide additional information on surface inhomogeneities (spots) and their sizes and locations so that that can be taken into account as well. The FUV and X-ray fluxes from young stars are erosive of a planet's atmosphere, particularly for hydrogen, but also for oxygen and nitrogen, both chemically important elements.

OBSERVING DESCRIPTION

This program aims to acquire high-S/N FUV spectroscopy of nearby 'solar type' (G and K dwarf) stars so the high energy radiation and particle environments can be estimated as inputs to exoplanet atmopshere models. We use COS over STIS as it is the only way to acheive high-S/N obsrvations in weak, but important, FUV tracers Fe XXI 1354 and O IV] 1401 (required to estimate the X-ray and stellar wind conditions). Other essential travers for estimating the complete EUV environment are C II 1335 and Si IV 1394/1403, and when possible C III 1175 and N V 1240 to complete the FUV temperature coverage and enable estimates of the EUV irradiance.

These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

The HST observing plan is built off the successful MUSCLES Treasury Survey (13650), and acquires targets with a COS ACQ/IMAGE as these stars are all within 50 pc and have high quality Hipparchos or Gaia data available. We observe in G130M lam1291 to cover all of these lines. We restrict observations to FP-POS = 3 and 4 as they are the only two supported modes that access all of these tracers simultaneously. Two targets, kappa1 Cet and epsilon Eri, have stellar LyA profiles that exceed the COS bright limit, so we will observe with segment A only for these targets.

We cleared the fields with the APT BOT tool and created ETC runs for all targets/modes during the Phase II preparation.

Visit

Proposal 15825, V993_Tau_G130M (01), failed Thu Mar 18 20:00:17 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

Diagnostics

(V993_Tau_G130M (01)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

(V993_Tau_G130M (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(V993_Tau_G130M (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-V993-TAU	RA: 04 27 35.8914 (66.8995475d) Dec: +15 35 21.09 (15.58919d) Equinox: J2000	Proper Motion RA: 104.992 mas/yr Proper Motion Dec: -24.069 mas/yr Parallax: 0.0209248" Epoch of Position: 2000 Radial Velocity: 39.39 km/sec	V=7.404	Reference Frame: ICRS

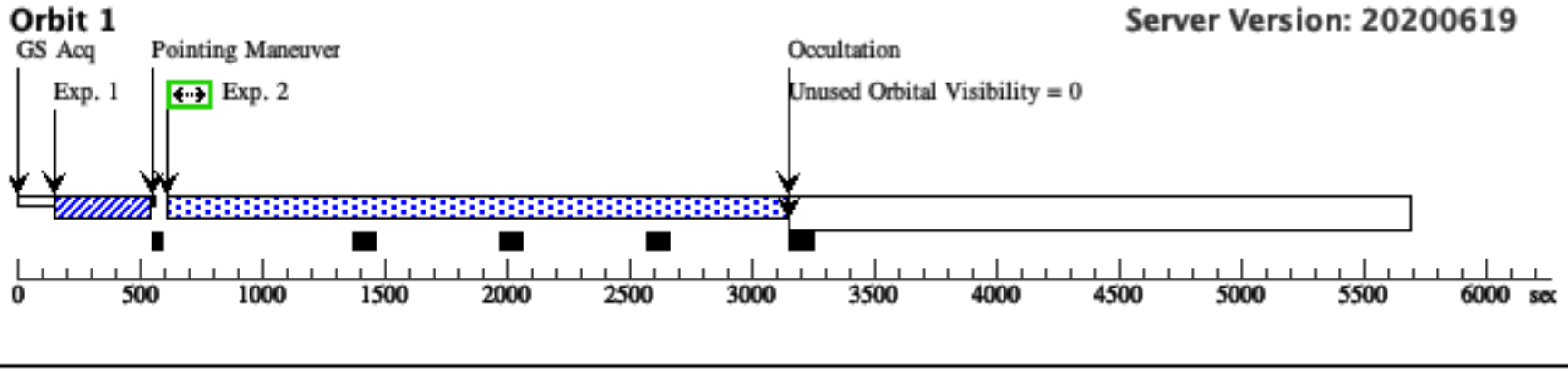
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database, 2018 Gaia coords.

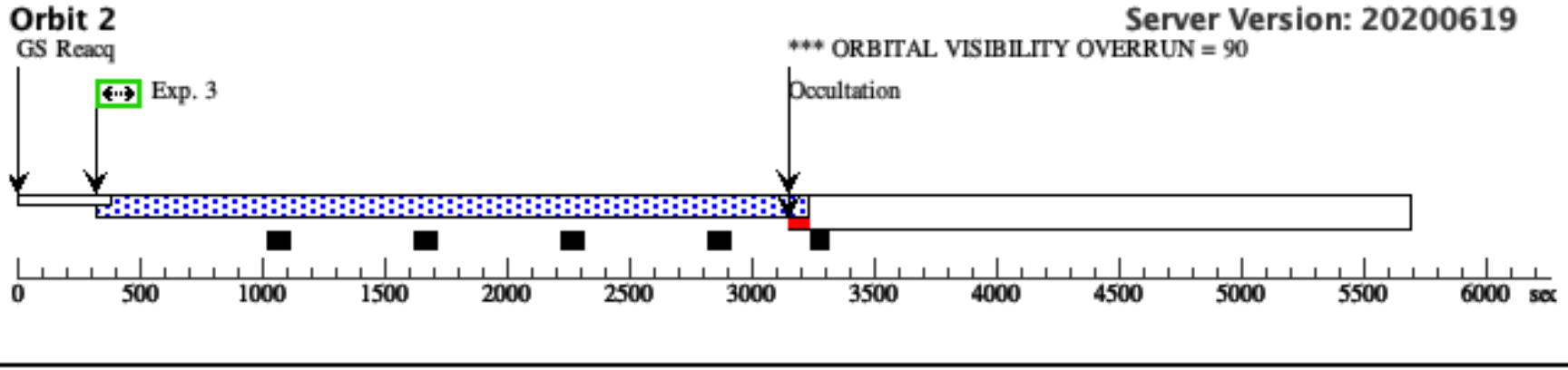
G0V
G130M: COS.sp.1365156 , 16ks to S/N = 10 @ 1401.2. (S/N = 7 in 8000s)
TA: COS.ta.1365369, T_exp = 45s (Castelli & Kurucz G0V)
*BOT: only the *OV* target star*
Category=EXT-STAR
Description=[G V-IV]
Extended=NO

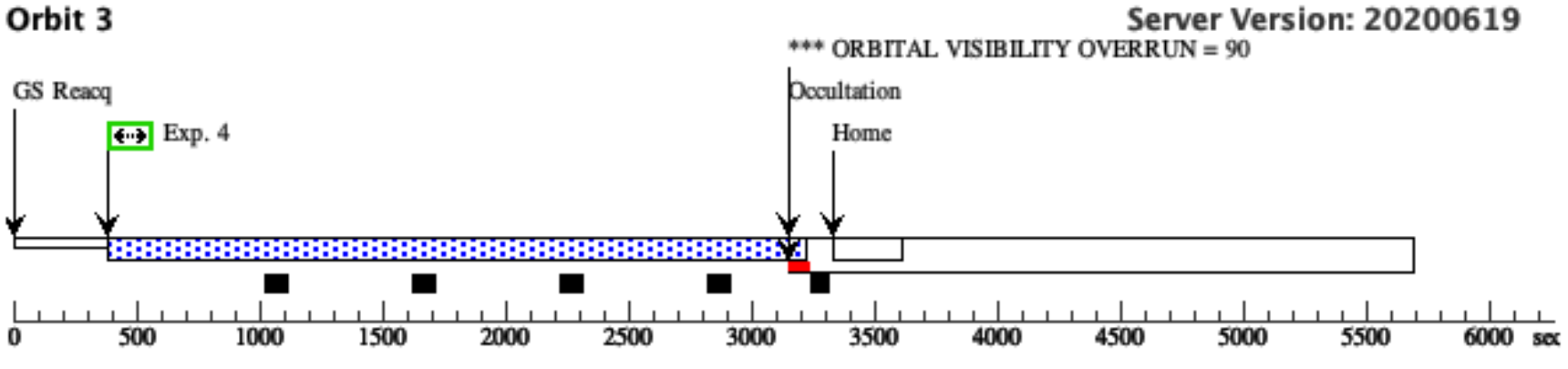
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	V993_Tau_ACQ (COS.ta.1365369)	(1) V-V993-TAU	COS/NUV, ACQ/IMAGE, BOA	MIRRORB				45 Secs (45 Secs) *[==>]*	*[1]*
2	V993_Tau_G130M_1 (COS.sp.1365156)	(1) V-V993-TAU	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4			2355 Secs (2355 Secs) *[==>]*	*[1]*
3	V993_Tau_G130M_2 (COS.sp.1365156)	(1) V-V993-TAU	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=3			2790 Secs (2790 Secs) *[==>]*	*[2]*
4	V993_Tau_G130M_3 (COS.sp.1365156)	(1) V-V993-TAU	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4			2790 Secs (2790 Secs) *[==>]*	*[3]*

Orbit Structure







Visit

Proposal 15825, V993_Tau_G130M_HOPR (Z1), completed Thu Mar 18 20:00:18 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: This is a HOPR Repeat for failed visit 01
These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

Diagnostics

(V993_Tau_G130M_HOPR (Z1)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

(V993_Tau_G130M_HOPR (Z1)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(V993_Tau_G130M_HOPR (Z1)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-V993-TAU	RA: 04 27 35.8914 (66.8995475d) Dec: +15 35 21.09 (15.58919d) Equinox: J2000	Proper Motion RA: 104.992 mas/yr Proper Motion Dec: -24.069 mas/yr Parallax: 0.0209248" Epoch of Position: 2000 Radial Velocity: 39.39 km/sec	V=7.404	Reference Frame: ICRS

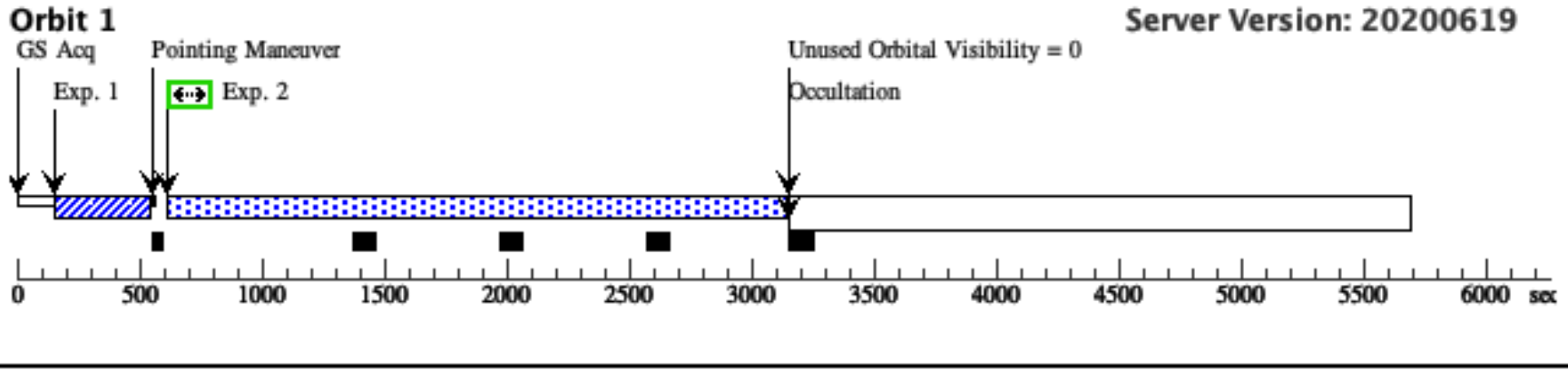
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database, 2018 Gaia coords.

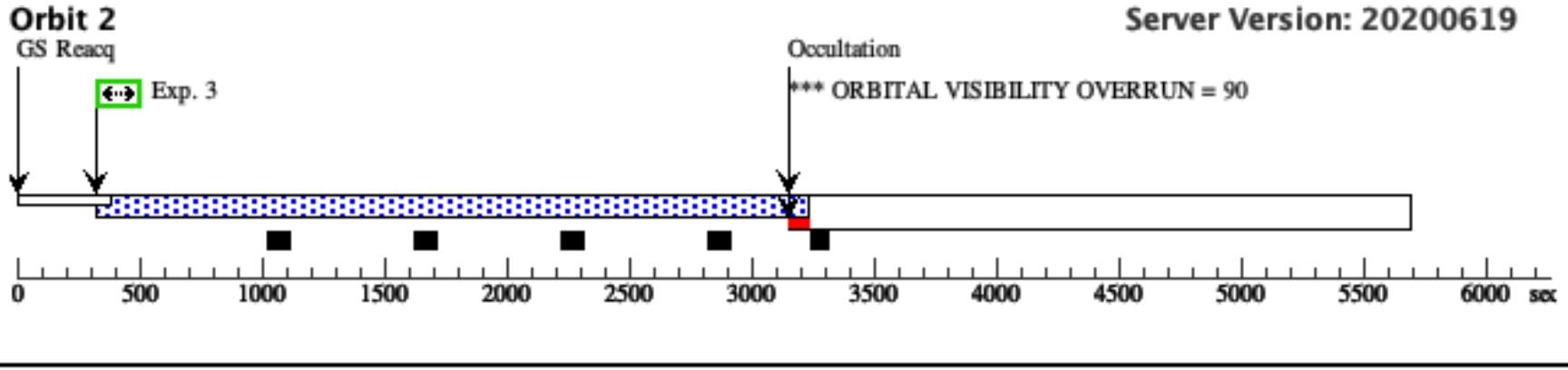
G0V
G130M: COS.sp.1365156 , 16ks to S/N = 10 @ 1401.2. (S/N = 7 in 8000s)
TA: COS.ta.1365369, T_exp = 45s (Castelli & Kurucz G0V)
*BOT: only the *OV* target star*
Category=EXT-STAR
Description=[G V-IV]
Extended=NO

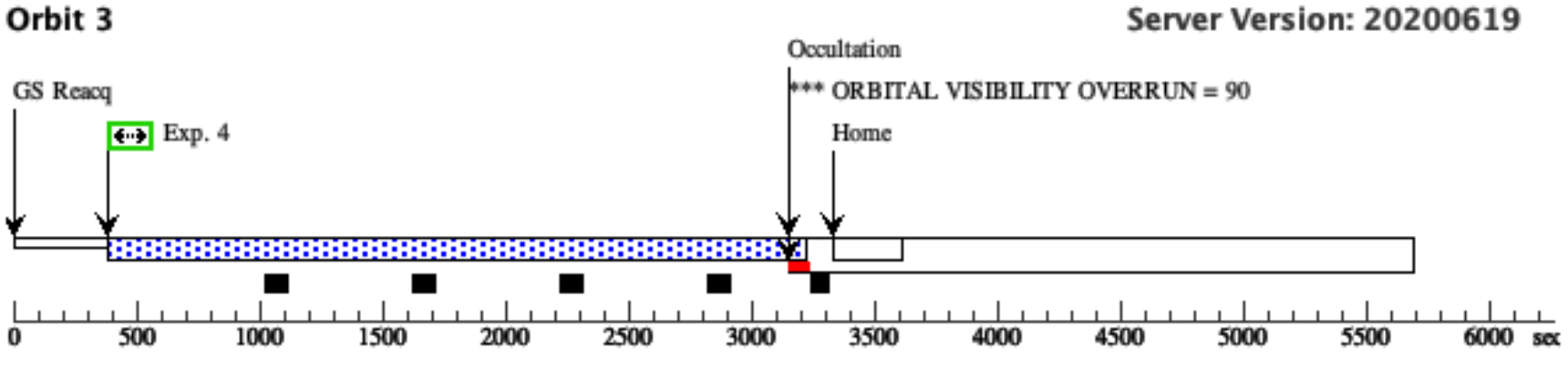
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	V993_Tau_ACQ (COS.ta.1365369)	(1) V-V993-TAU	COS/NUV, ACQ/IMAGE, BOA	MIRRORB				45 Secs (45 Secs) *[==>]*	 ***[1]***
2	V993_Tau_G130M_1 (COS.sp.1365156)	(1) V-V993-TAU	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4			2355 Secs (2355 Secs) *[==>]*	 ***[1]***
3	V993_Tau_G130M_2 (COS.sp.1365156)	(1) V-V993-TAU	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=3			2790 Secs (2790 Secs) *[==>]*	 ***[2]***
4	V993_Tau_G130M_3 (COS.sp.1365156)	(1) V-V993-TAU	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4			2790 Secs (2790 Secs) *[==>]*	 ***[3]***

Orbit Structure







Visit

Proposal 15825, kappa1_Cet_G130M (02), completed Thu Mar 18 20:00:18 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

Diagnostics

(kappa1_Cet_G130M (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(kappa1_Cet_G130M (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	-KAP01-CET	RA: 03 19 21.6960 (49.8404000d) Dec: +03 22 12.70 (3.37019d) Equinox: J2000	Proper Motion RA: 269.30 mas/yr Proper Motion Dec: 93.75 mas/yr Parallax: 0.10941" Epoch of Position: 2000 Radial Velocity: 18.8 km/sec	V=4.85	Reference Frame: ICRS

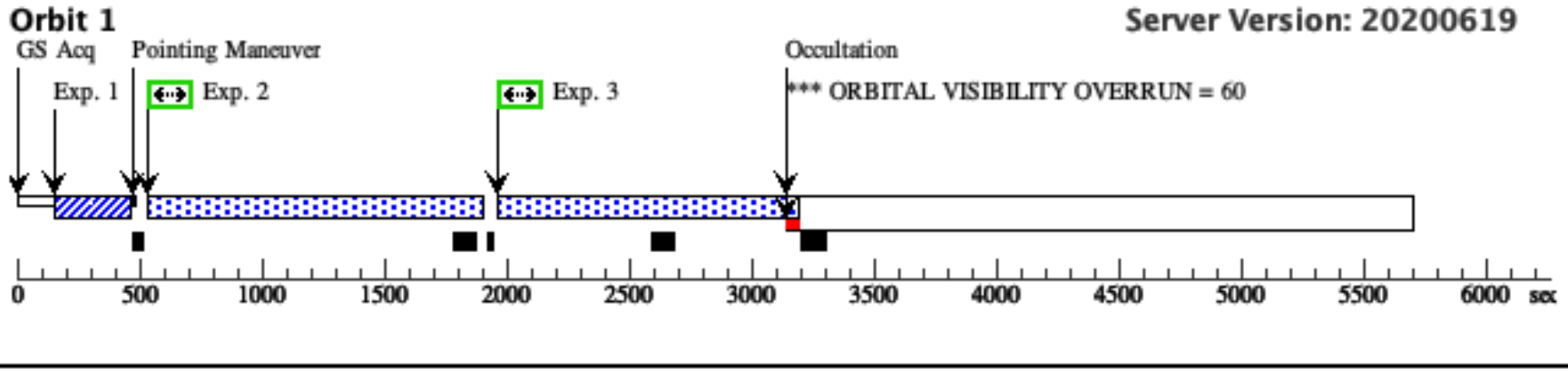
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

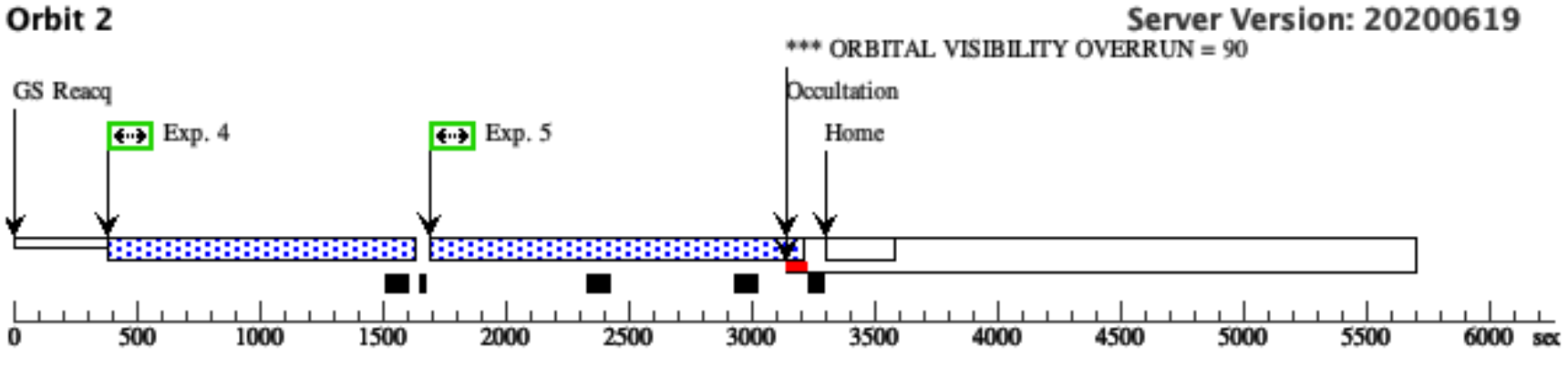
G5V
G130M: COS.sp.1365159 , 1500s to S/N = 10 @ 1401.2. BOP at LyA
TA: COS.ta.1365401 , Kurucz G5V, T_exp = 6s
BOT: cleared, all stars mis-ID'd target
Category=EXT-STAR
Description=[G V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	kappa1_Cet_ACQ (COS.ta.1365401)	(4) -KAP01-CET	COS/NUV, ACQ/IMAGE, BOA	MIRRORB		GS ACQ SCENARIO BASE1BE		6 Secs (6 Secs) *[==>]*	*[1]*
2	kappa1_Cet_G130M_1a (COS.sp.1365159)	(4) -KAP01-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1090; FP-POS=1; SEGMENT=A			1200 Secs (1200 Secs) *[==>]*	*[1]*
3	kappa1_Cet_G130M_1b (COS.sp.1365159)	(4) -KAP01-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=2; SEGMENT=A			1174 Secs (1174 Secs) *[==>]*	*[1]*
4	kappa1_Cet_G130M_2a (COS.sp.1365159)	(4) -KAP01-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1090; FP-POS=3; SEGMENT=A			1200 Secs (1200 Secs) *[==>]*	*[2]*
5	kappa1_Cet_G130M_2b (COS.sp.1365159)	(4) -KAP01-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4; SEGMENT=A			1471 Secs (1471 Secs) *[==>]*	*[2]*

Orbit Structure





Visit

Proposal 15825, eps_Eri_G130M (03), failed Thu Mar 18 20:00:18 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: BETWEEN 01-JAN-2021:00:00:00 AND 01-MAR-2021:00:00:00

Comments: These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

Diagnostics

(eps_Eri_G130M (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d) Dec: -09 27 29.73 (-9.45826d) Equinox: J2000	Proper Motion RA: -975.17 mas/yr Proper Motion Dec: 19.49 mas/yr Parallax: 0.31094" Epoch of Position: 2000 Radial Velocity: 16.4 km/sec	V=3.73	Reference Frame: ICRS

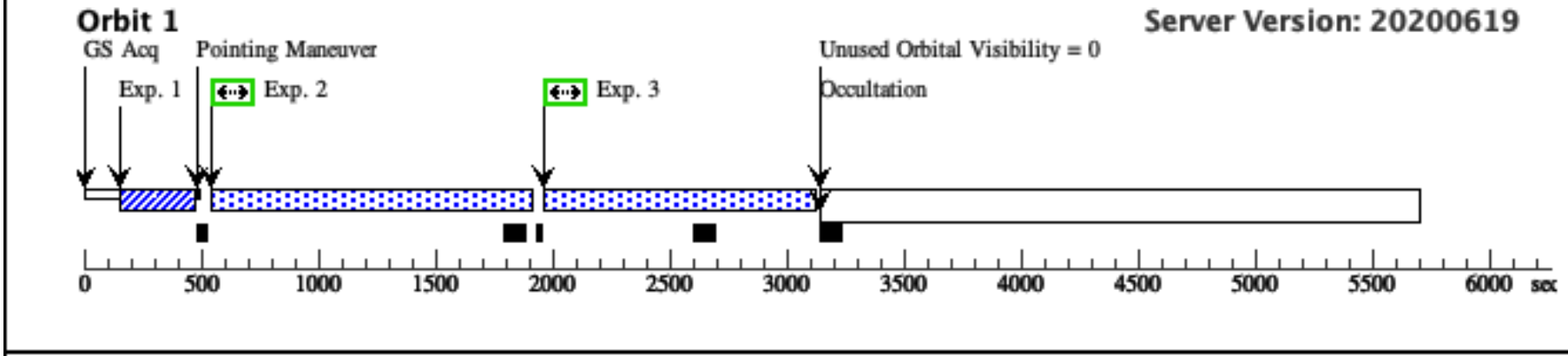
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

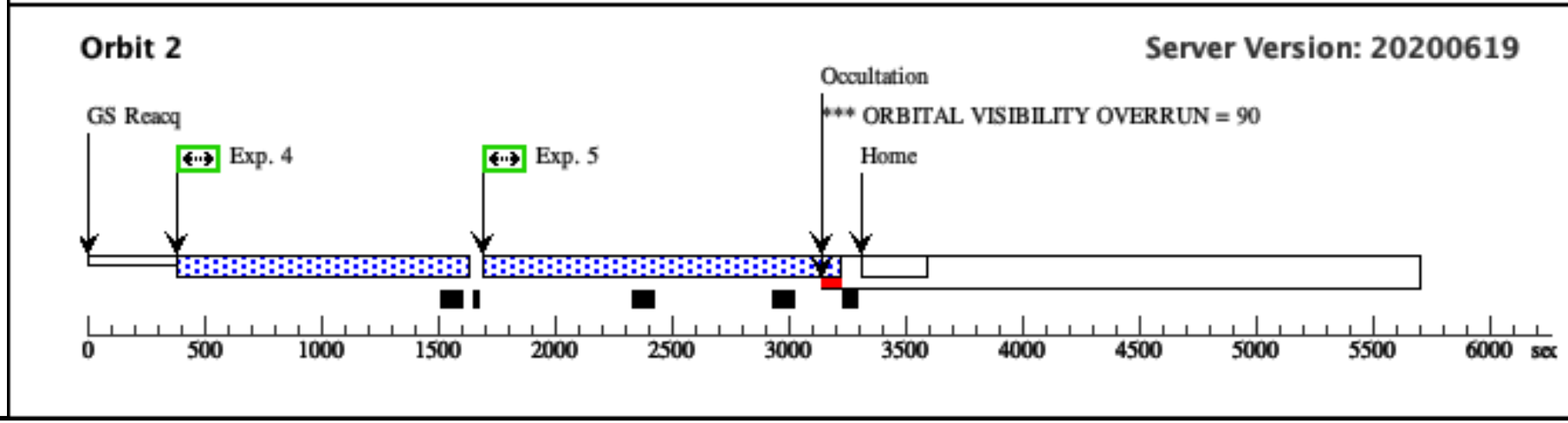
K2V
G130M: COS.sp.1365155 , 522s to S/N = 10 @ 1401.2. BOP at LyA
TA: COS.ta.1365403 , Castelli & Kurucz K2V, T_exp = 10s
BOT: cleared. All mis-ID'd target star
Category=EXT-STAR
Description=[K V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	eps_Eri_ACQ (COS.ta.1365403)	(6) -EPS-ERI	COS/NUV, ACQ/IMAGE, BOA	MIRRORB				10 Secs (10 Secs) *[==>]*	*[1]*
2	eps_Eri_G130M_1a (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1090; FP-POS=1; SEGMENT=A			1200 Secs (1200 Secs) *[==>]*	*[1]*
3	eps_Eri_G130M_1b (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=2; SEGMENT=A			1109 Secs (1109 Secs) *[==>]*	*[1]*
4	eps_Eri_G130M_2a (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1090; FP-POS=3; SEGMENT=A			1200 Secs (1200 Secs) *[==>]*	*[2]*
5	eps_Eri_G130M_2b (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4; SEGMENT=A			1474 Secs (1474 Secs) *[==>]*	*[2]*

Orbit Structure





Visit

Proposal 15825, BE_Cet_G130M (04), completed Thu Mar 18 20:00:18 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

Diagnostics

(BE_Cet_G130M (04)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

(BE_Cet_G130M (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BE_Cet_G130M (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	-9-CET	RA: 00 22 51.7883 (5.7157846d) Dec: -12 12 33.97 (-12.20944d) Equinox: J2000	Proper Motion RA: 394.506 mas/yr Proper Motion Dec: 61.056 mas/yr Parallax: .0469258" Epoch of Position: 2000 Radial Velocity: -2.53 km/sec	V=6.39	Reference Frame: ICRS

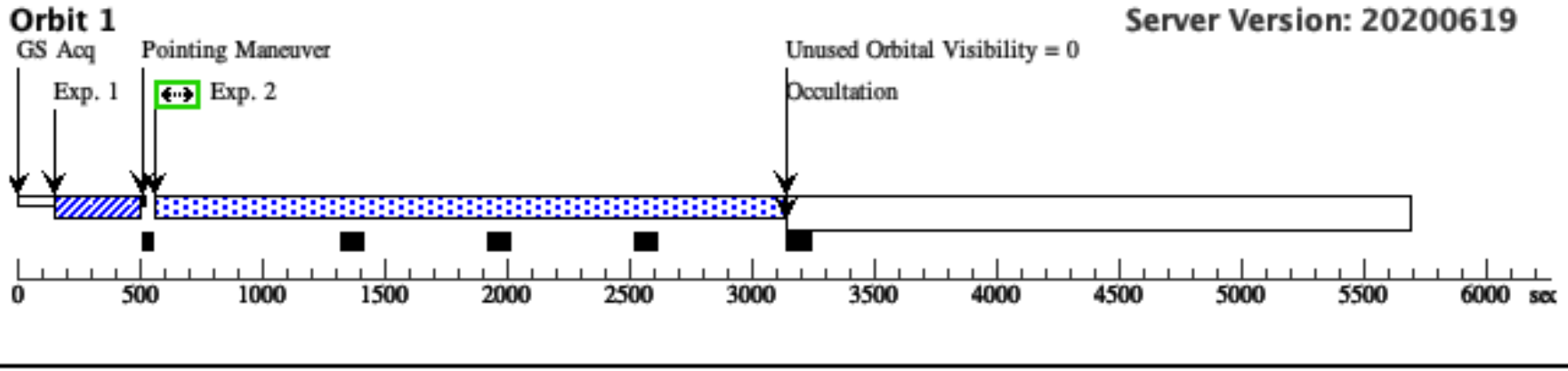
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 2018 Gaia coordinates.

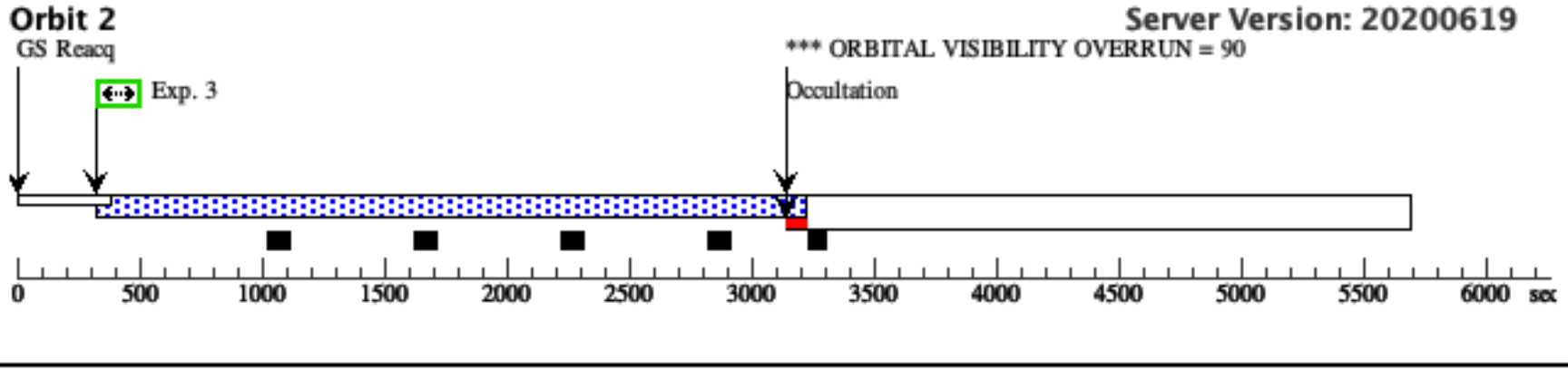
G3V
G130M: COS.sp.1365158 , 6200s to S/N = 10 @ 1401.2.
TA: COS.ta.1365402, Kurucz G2V, T_exp = 22s
BOT: cleared, all mis-ID'd target star
Category=EXT-STAR
Description=[G V-IV]
Extended=NO

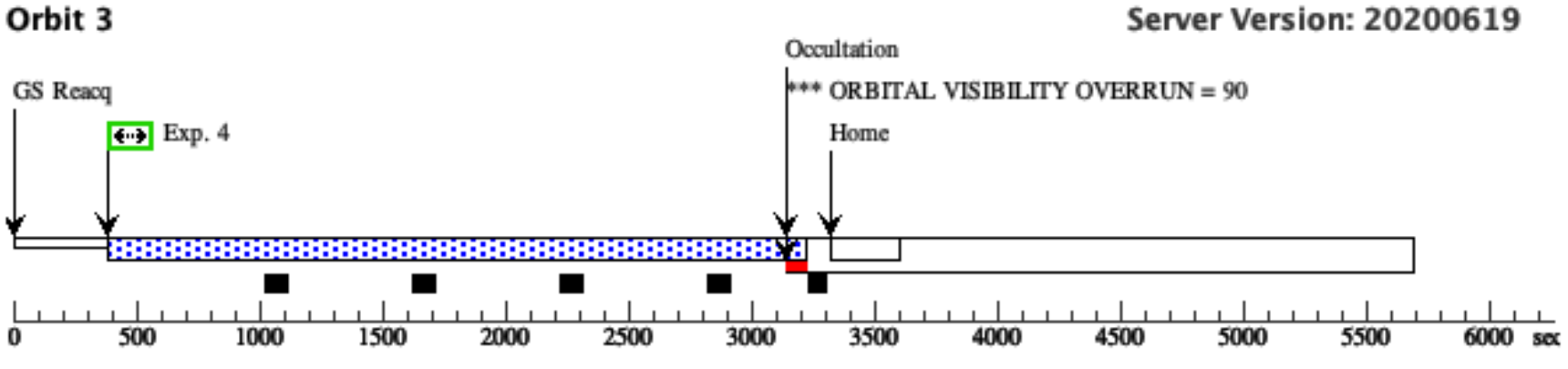
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	BE_Cet_ACQ (COS.ta.1365402)	(7) -9-CET	COS/NUV, ACQ/IMAGE, BOA	MIRRORB				22 Secs (22 Secs) *[==>]*	*[1]*
2	BE_Cet_G130M_1 (COS.sp.1365158)	(7) -9-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4			2394 Secs (2394 Secs) *[==>]*	*[1]*
3	BE_Cet_G130M_2 (COS.sp.1365158)	(7) -9-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=3			2783 Secs (2783 Secs) *[==>]*	*[2]*
4	BE_Cet_G130M_3 (COS.sp.1365158)	(7) -9-CET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4			2783 Secs (2783 Secs) *[==>]*	*[3]*

Orbit Structure







Visit

Proposal 15825, eps_Eri_G130M_HOPR (Z2) Thu Mar 18 20:00:18 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Comments: These observations need to be coordinated with XMM to be contemporaneous, as specified in the approved Phase I proposal.

Diagnostics

(eps_Eri_G130M_HOPR (Z2)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d) Dec: -09 27 29.73 (-9.45826d) Equinox: J2000	Proper Motion RA: -975.17 mas/yr Proper Motion Dec: 19.49 mas/yr Parallax: 0.31094" Epoch of Position: 2000 Radial Velocity: 16.4 km/sec	V=3.73	Reference Frame: ICRS

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

K2V
G130M: COS.sp.1365155 , 522s to S/N = 10 @ 1401.2. BOP at LyA
TA: COS.ta.1365403 , Castelli & Kurucz K2V, T_exp = 10s
BOT: cleared. All mis-ID'd target star
Category=EXT-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	eps_Eri_ACQ (COS.ta.1365403)	(6) -EPS-ERI	COS/NUV, ACQ/IMAGE, BOA	MIRRORB				10 Secs (10 Secs) *[==>]*	*[1]*
2	eps_Eri_G130M_1a (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1090; FP-POS=1; SEGMENT=A			1200 Secs (1200 Secs) *[==>]*	*[1]*
3	eps_Eri_G130M_1b (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=2; SEGMENT=A			1109 Secs (1109 Secs) *[==>]*	*[1]*
4	eps_Eri_G130M_2a (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1090; FP-POS=3; SEGMENT=A			1200 Secs (1200 Secs) *[==>]*	*[2]*
5	eps_Eri_G130M_2b (COS.sp.1365155)	(6) -EPS-ERI	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=600; FP-POS=4; SEGMENT=A			1474 Secs (1474 Secs) *[==>]*	*[2]*

Orbit Structure