15906 - Imaging planetary perturbations in the epsilon Eridani debris disk

Cycle: 27, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Andras Gaspar (PI) (Contact)	**University of Arizona**	**agaspar@as.arizona.edu**
Dr. George Rieke (CoI)	University of Arizona	ghrieke@gmail.com
Dr. Kate Y.L Su (CoI)	University of Arizona	ksu@as.arizona.edu
Dr. Nicholas Ballering (CoI)	The University of Virginia	nb2ke@virginia.edu
Dr. Glenn Schneider (CoI)	University of Arizona	gschneider@as.arizona.edu
Dr. Charles A. Beichman (CoI)	Jet Propulsion Laboratory	chas@ipac.caltech.edu
Dr. Marie Ygouf (CoI)	Jet Propulsion Laboratory	marie.ygouf@jpl.nasa.gov
Dr. Jarron Michael Leisenring (CoI)	University of Arizona	jarronl@email.arizona.edu
Dr. Ewan S Douglas (CoI)	University of Arizona	douglase@email.arizona.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) EPSILON-ERIDANI	STIS/CCD	1	18-Dec-2020 12:00:15.0	yes
02	(1) EPSILON-ERIDANI	STIS/CCD	1	18-Dec-2020 12:00:18.0	yes
03	(2) EPSILON-ERIDANI-PSF	STIS/CCD	1	18-Dec-2020 12:00:20.0	yes
04	(1) EPSILON-ERIDANI	STIS/CCD	1	18-Dec-2020 12:00:22.0	yes
05	(1) EPSILON-ERIDANI	STIS/CCD	1	18-Dec-2020 12:00:24.0	yes
06	(1) EPSILON-ERIDANI	STIS/CCD	1	18-Dec-2020 12:00:26.0	yes
07	(2) EPSILON-ERIDANI-PSF	STIS/CCD	1	18-Dec-2020 12:00:28.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
08	(1) EPSILON-ERIDANI	STIS/CCD	1	18-Dec-2020 12:00:30.0	yes

8 Total Orbits Used

ABSTRACT

With a Jupiter-like exoplanet in an orbit similar to that of Jupiter itself (Mawet et al. 2019) and an asteroid-analog belt just interior to it (Su et al. 2017), eps Eridani (0.8 Msun, 400-800 Myr old) has a fascinating resemblance to our expectations for a much younger Solar System. It also has an unusual intermediate debris belt, with characteristics deduced from modeling the spectral energy distribution of the entire star-plus-debris-disk system in the mid-infrared. This belt appears to extend over the region from ~ 8 to ~ 20 AU, corresponding to the orbits of Uranus and Neptune in the solar system, but it is currently unresolved. There is also an outer belt at ~ 60 AU seen in the far infrared and mm-wave. At a distance of only 3.2 pc, this system offers a unique opportunity to study an exoplanetary system at high physical resolution. We propose to image the intermediate and outer belts at high signal to noise and resolution of ~ 0.2 AU. The HST/STIS images will probe the gravitational influence of unseen planets on the intermediate and outer belts, and constrain the grain properties at these locations. The intermediate belt in particular is likely to be highly structured due to sculpting by unseen planets in orbits between that of the Jupiter-like one and the outer Kuiper-like belt. This study will test indirectly for the presence of planets far below our current limits for direct detection and substantially advance our understanding of debris disks in general, as well as revealing processes that may have shaped the early Solar System.

OBSERVING DESCRIPTION

Overview

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We will observe epsilon Eridani and its PSF delta Eridani with our STIS coronagraphic program. The program uses 8 orbits, of which 6 will be used to take data of our target and 2 to observe the calibrator.

Our PSF calibrator, delta Eridani, has been used in prior programs as a calibrator for epsilon Eridani. It is a single star, without IR thermal excess, and spatially close to the star in the sky (<2.6 deg). Most importantly, the Delta(B-V) between the two stars is only around 0.04 mag. The two stars are close in stellar spectral type, therefore delta Eridani is the ideal PSF calibrator.

To minimize thermal slew at the beginning of our observing sequences (V1 and V5), we request our PC to schedule our observing sequences following an observing program relatively close in the sky (within 30 deg), ideally minimized.

Exposure details
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Guide Star Acq: We require pointing and roll control with 2-FGS guiding. Single-FGS guiding does not offer sufficient target position stability for coronagraphy.

Each visit (after its Guide Star acquisition) begins with a mode-2 target acquisition and is followed by a sequence of exposures (by CR-SPLIT) at the WedgeA1.8 and WedgeB1.8 positions.

Target Acquisitions: We expose our TA images to a SNR of well over 100 using the STIS ETC. We also use the F25ND3 filtered images to photometrically obtain target:PSF template brightness ratios in the broad STIS passband. The STIS Target Acquisition ETC was used to determine the eposure times for all acquisition images. Further calculations are given in the exposure comments.

Exposure times: The exposure times are designed to reach ~80% of full-well depth (25,000 cts). The exposure times are based on GO 15217, which observed both stars at WA1.0. At 0.9" from the star, the maximum count was ~ 5600 counts in 2.3 s for epsilon Eridani and similar count rate in 1.9 s for delta Eridani.

The orbits are filled completely. We integrate 2x7 CR-SPLIT images at both positions. The data are read-out at full frame imaging after 7 CR-SPLITS, hence the imaging methodology. To fill the orbits completely, we add an additional 3 CR-SPLIT image at the WEDGEA1.8 position.

Visits, links, and interlinked PSF observations
==========

Epsilon Eridani and its matched PSF star (delta Eridani) is observed in two "sets" of four single-orbit visits (V1-V4 and V5-V8). Three visits are used to observe the science target in each set (V1, V2, and V4 [for the second set V5, V6, V8]), and one (each) the PSF star [V3 and V7]. These four visits within each set must be executed in sequential, contiguous orbits (i.e., back to back with no interruptions except Earth occultation).

The three science target visits in each set are at different RELATIVE orientation of *NOMINALLY* -30, 0, and +30 degrees from nominal roll, with the second science target observation at nominal roll. The 3rd orbit (visit) in each 4-visit set is of the PSF template star paired with the science target. The PSF template is very close in the sky to the science target (2.59 degrees). As a result we, anticipate that with scheduling of the second science orbit at nominal roll, the PSF calibration star will also be at or close to its nominal roll and usually these two orbits will have nearly the same celestial orientation angle.

The first "repeated" orbit (V5) should be scheduled at either a +90 deg or -90 deg relative orientation from the first (V1).
APT does not have the capability to specify allowable multiple (in this case two) relative orientations. Therefore, we advise our PC that although the parity of the first orbit in the second set's (V5) relative orientation was found schedulable by APT, if for some reason it turns out not to be, our PC may freely change the sign of this relative offset range from positive to negative (or vice versa). In doing so the signs on the relative orientations (and ranges if any) on the Visit V6 and V8 Orient Froms must also be changed in concert. Either positive or negative Orients From of appx |90| are acceptable on Visit V5, with corresponding sign changes on Visits V6 and V8.

-------- Realtime Justification --------

We have no real-time requirments.

------ Calibration Justification -------

We ask for no SPECIAL calibrations for this proposal (and called none out in Phase 1). We did not because we ASSUME that STScI will acquire GAIN=4 (supported mode) bias, DARK, and flat-field frames (and derived hot/bad pixel maps) as part of their Cycle 27 calibration plan in support of approved Cycle 27 science programs. If this is NOT the case then we must obtain GAIN=4 calibration reference bias/dark data as part of our program using NON-POINTED (internal) orbits only.

--------- Additional Comments ----------

None

Visit

Proposal 15906, V1-Epsilon-Eridani (01), completed Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT -30D TO -20.0D FROM 02

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	EPSILON-ERIDANI	RA: 03 32 54.8234 (53.2284308d) Dec: -09 27 29.43 (-9.45817d) Equinox: J2000	Proper Motion RA: -0.065025066 sec of time/yr Proper Motion Dec: 0.020266 arcsec/yr Parallax: 0.3122191" Epoch of Position: 2015.5	V=3.73	Reference Frame: ICRS

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

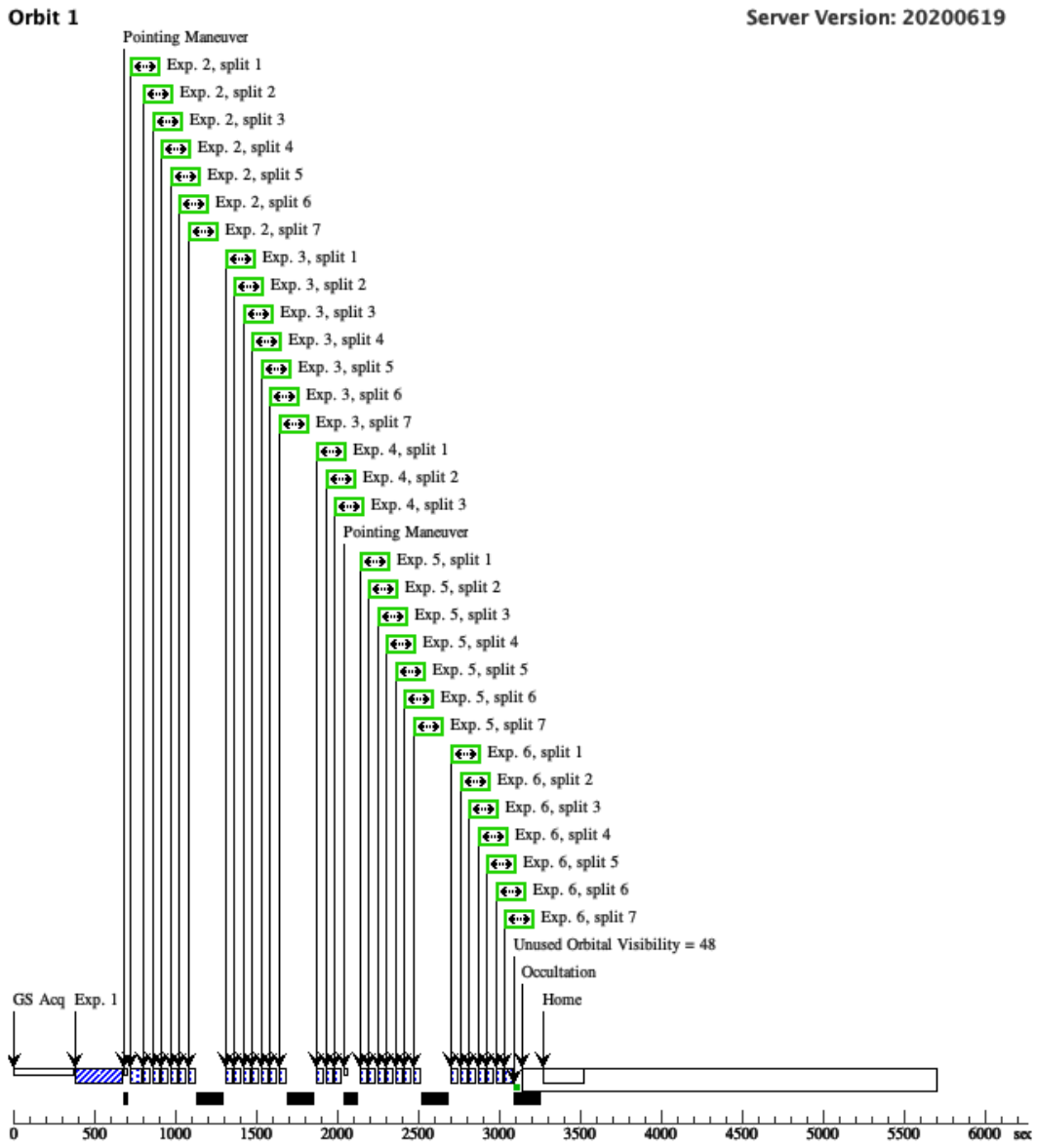
GAIA DR2 source ID: 5164707970261630080
Category=STAR
Description=[DISK, G V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani_V1_ACQ (STIS.ta.1365452)	(1) EPSILON-ERIDANI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1BN3		0.1 Secs (0.1 Secs) *[==>]*	*[1]*
	Comments: Saturation in 0.33 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani_V1_EXP1	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
3	Epsilon-Eridani_V1_EXP2	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
4	Epsilon-Eridani_V1_EXP3	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=3; GAIN=4			30.9 Secs (30.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
5	Epsilon-Eridani_V1_EXP4	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								

	6	Epsilon-Eridani_V1_EXP5	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4	72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.							

Orbit Structure



Visit

Proposal 15906, V2-Epsilon-Eridani (02), completed Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; AFTER_01 BY 0.5_Orbits TO 1.2_Orbits

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	EPSILON-ERIDANI	RA: 03 32 54.8234 (53.2284308d) Dec: -09 27 29.43 (-9.45817d) Equinox: J2000	Proper Motion RA: -0.065025066 sec of time/yr Proper Motion Dec: 0.020266 arcsec/yr Parallax: 0.3122191" Epoch of Position: 2015.5	V=3.73	Reference Frame: ICRS

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

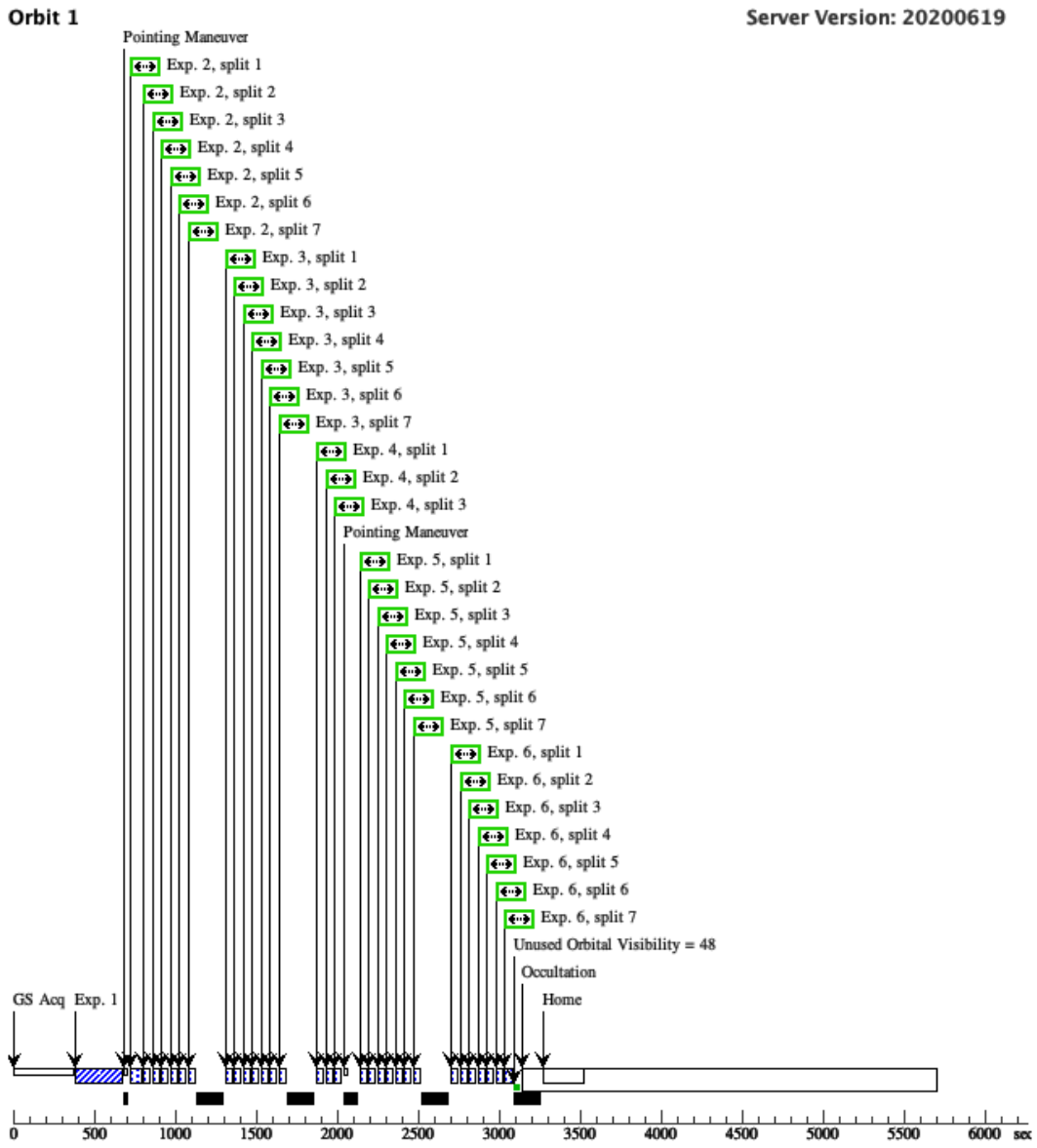
GAIA DR2 source ID: 5164707970261630080
Category=STAR
Description=[DISK, G V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani_V2_ACQ (STIS.ta.1365452)	(1) EPSILON-ERIDANI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1BN3		0.1 Secs (0.1 Secs) *[==>]*	*[1]*
	Comments: Saturation in 0.33 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani_V2_EXP1	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
3	Epsilon-Eridani_V2_EXP2	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
4	Epsilon-Eridani_V2_EXP3	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=3; GAIN=4			30.9 Secs (30.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
5	Epsilon-Eridani_V2_EXP4	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								

	6	Epsilon-Eridani_V2_EXP5	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4	72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.							

Orbit Structure



Visit

Proposal 15906, V3-Epsilon-Eridani-PSF (03), completed Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; AFTER_02 BY 0.5_Orbits TO 1.2_Orbits

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	EPSILON-ERIDANI-PSF Alt Name1: DELTA-ERIDANI	RA: 03 43 14.8024 (55.8116767d) Dec: -09 45 36.67 (-9.76019d) Equinox: J2000	Proper Motion RA: -0.006187066667 sec of time/yr Proper Motion Dec: 0.743335 arcsec/yr Parallax: 0.1102170" Epoch of Position: 2015.5	V=3.54	Reference Frame: ICRS

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

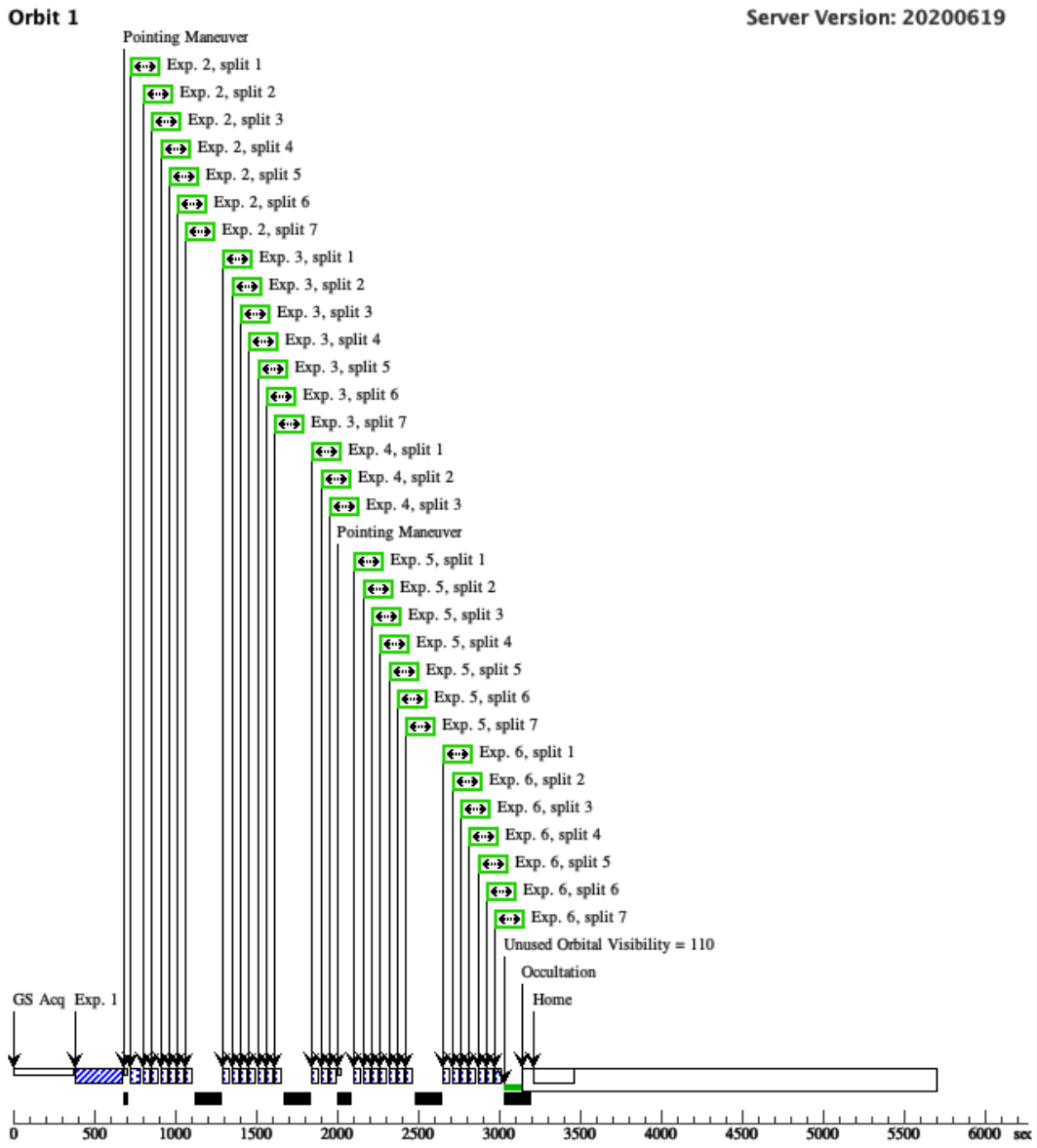
GAIA DR2 source 5164120762332790528
Category=CALIBRATION
Description=[POINT SPREAD FUNCTION]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani-PSF-ACQ (STIS.ta.1365509)	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1BN3		0.1 Secs (0.1 Secs) *[==>]*	***[1]***
	Comments: Saturation in 0.27 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani-G1-EXP1	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			58.1 Secs (58.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure.								
3	Epsilon-Eridani-G1-EXP2	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			58.1 Secs (58.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure.								
4	Epsilon-Eridani-G1-EXP3	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=3; GAIN=4			24.9 Secs (24.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	Comments: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure.								
5	Epsilon-Eridani-G1-EXP4	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4			58.1 Secs (58.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure.								

	6	Epsilon-Eridani-G1-EXP5	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4	58.1 Secs (58.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure.							

Orbit Structure



Visit

Proposal 15906, V4-Epsilon-Eridani (04), completed Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 20.0D TO 30D FROM 02; AFTER 03 BY 0.5 Orbits TO 1.2 Orbits

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	EPSILON-ERIDANI	RA: 03 32 54.8234 (53.2284308d) Dec: -09 27 29.43 (-9.45817d) Equinox: J2000	Proper Motion RA: -0.065025066 sec of time/yr Proper Motion Dec: 0.020266 arcsec/yr Parallax: 0.3122191" Epoch of Position: 2015.5	V=3.73	Reference Frame: ICRS

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

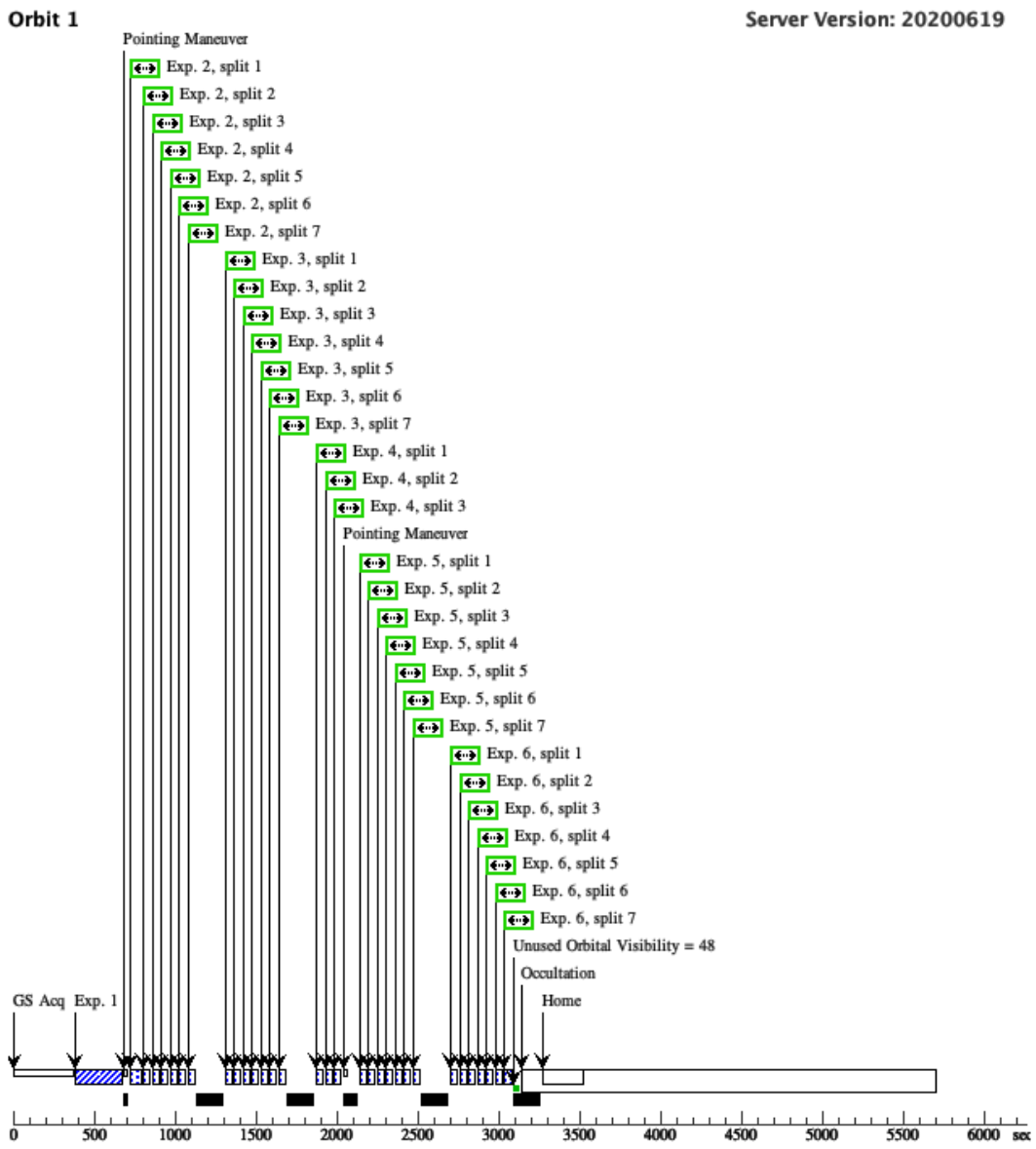
GAIA DR2 source ID: 5164707970261630080
Category=STAR
Description=[DISK, G V-IV]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani_V4_ACQ (STIS.ta.1365452)	(1) EPSILON-ERIDANI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1BN3		0.1 Secs (0.1 Secs) *[==>]*	*[1]*
	Comments: Saturation in 0.33 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani_V4_EXP1	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
3	Epsilon-Eridani_V4_EXP2	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
4	Epsilon-Eridani_V4_EXP3	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA1.8	MIRROR	CR-SPLIT=3; GAIN=4			30.9 Secs (30.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								
5	Epsilon-Eridani_V4_EXP4	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4			72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	*[1]*
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.								

	6	Epsilon-Eridani_V4_EXP5	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB1.8	MIRROR	CR-SPLIT=7; GAIN=4	72.1 Secs (72.1 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.							

Orbit Structure



Visit

Proposal 15906, V5-Epsilon-Eridani (05), implementation Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 54D TO 90D FROM 01

Diagnostics

(V5-Epsilon-Eridani (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	EPSILON-ERIDANI	RA: 03 32 54.8234 (53.2284308d) Dec: -09 27 29.43 (-9.45817d) Equinox: J2000	Proper Motion RA: -0.065025066 sec of time/yr Proper Motion Dec: 0.020266 arcsec/yr Parallax: 0.3122191" Epoch of Position: 2015.5	V=3.73	Reference Frame: ICRS

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

GAIA DR2 source ID: 5164707970261630080
Category=STAR
Description=[DISK, G V-IV]
Extended=NO

Exposures

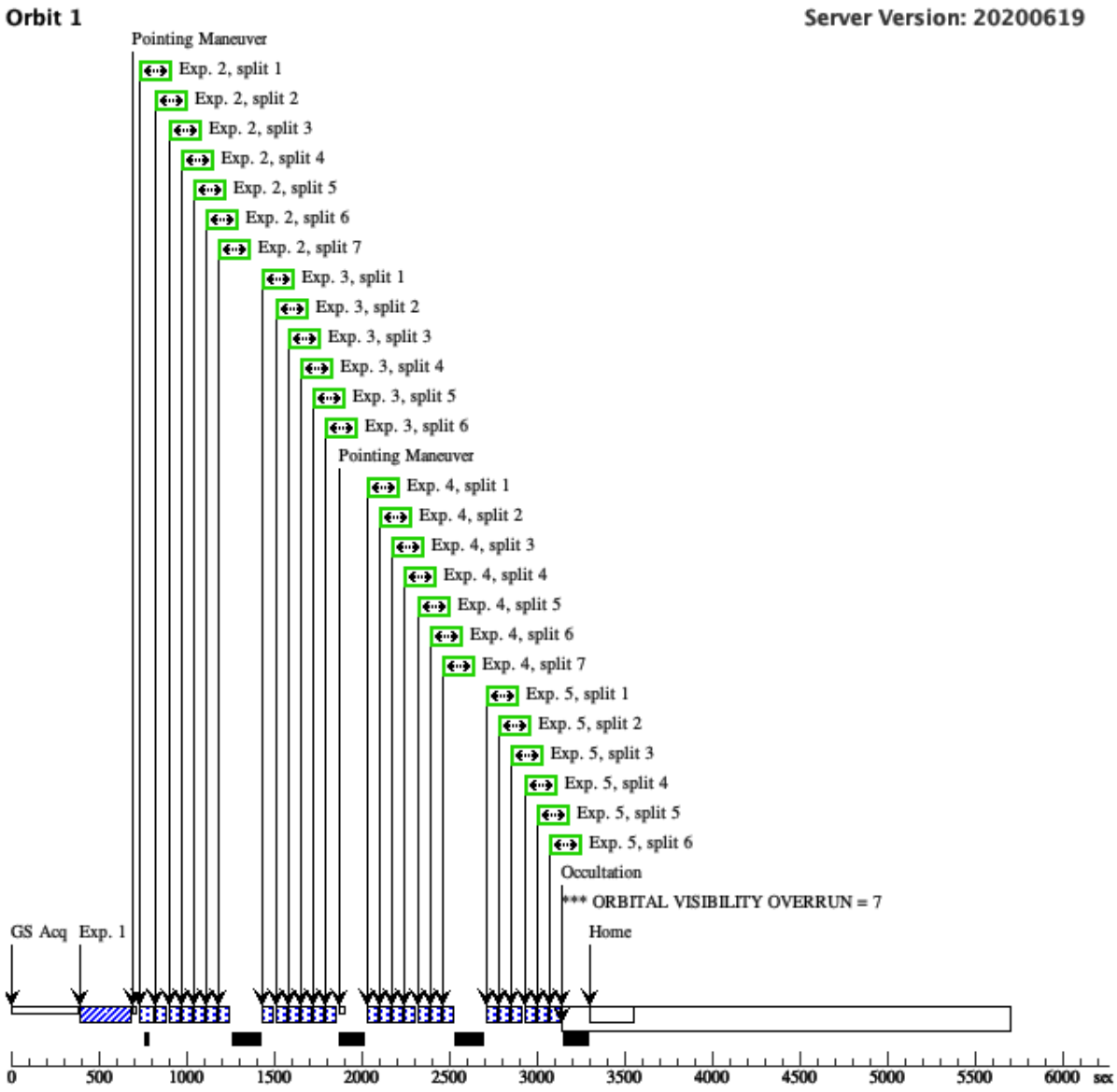
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani_V5_ACQ (STIS.ta.1365452)	(1) EPSILON-ERIDANI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
	Comments: Saturation in 0.33 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani_V5_EXP1	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=7; GAIN=4			196 Secs (196 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
3	Epsilon-Eridani_V5_EXP2	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=6; GAIN=4			168 Secs (168 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
4	Epsilon-Eridani_V5_EXP4	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=7; GAIN=4			196 Secs (196 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								

	5	Epsilon-Eridani_V5_EXP5	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=6; GAIN=4	168 Secs (168 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***

Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.

Re-planning for WA/WB2.5: increased exposure factor X2.72

Orbit Structure



Visit

Proposal 15906, V6-Epsilon-Eridani (06), implementation Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 22.0D TO 30D FROM 05; AFTER 05 BY 0.5 Orbits TO 1.2 Orbits

Diagnostics

(V6-Epsilon-Eridani (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	EPSILON-ERIDANI	RA: 03 32 54.8234 (53.2284308d) Dec: -09 27 29.43 (-9.45817d) Equinox: J2000	Proper Motion RA: -0.065025066 sec of time/yr Proper Motion Dec: 0.020266 arcsec/yr Parallax: 0.3122191" Epoch of Position: 2015.5	V=3.73	Reference Frame: ICRS

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

GAIA DR2 source ID: 5164707970261630080
Category=STAR
Description=[DISK, G V-IV]
Extended=NO

Exposures

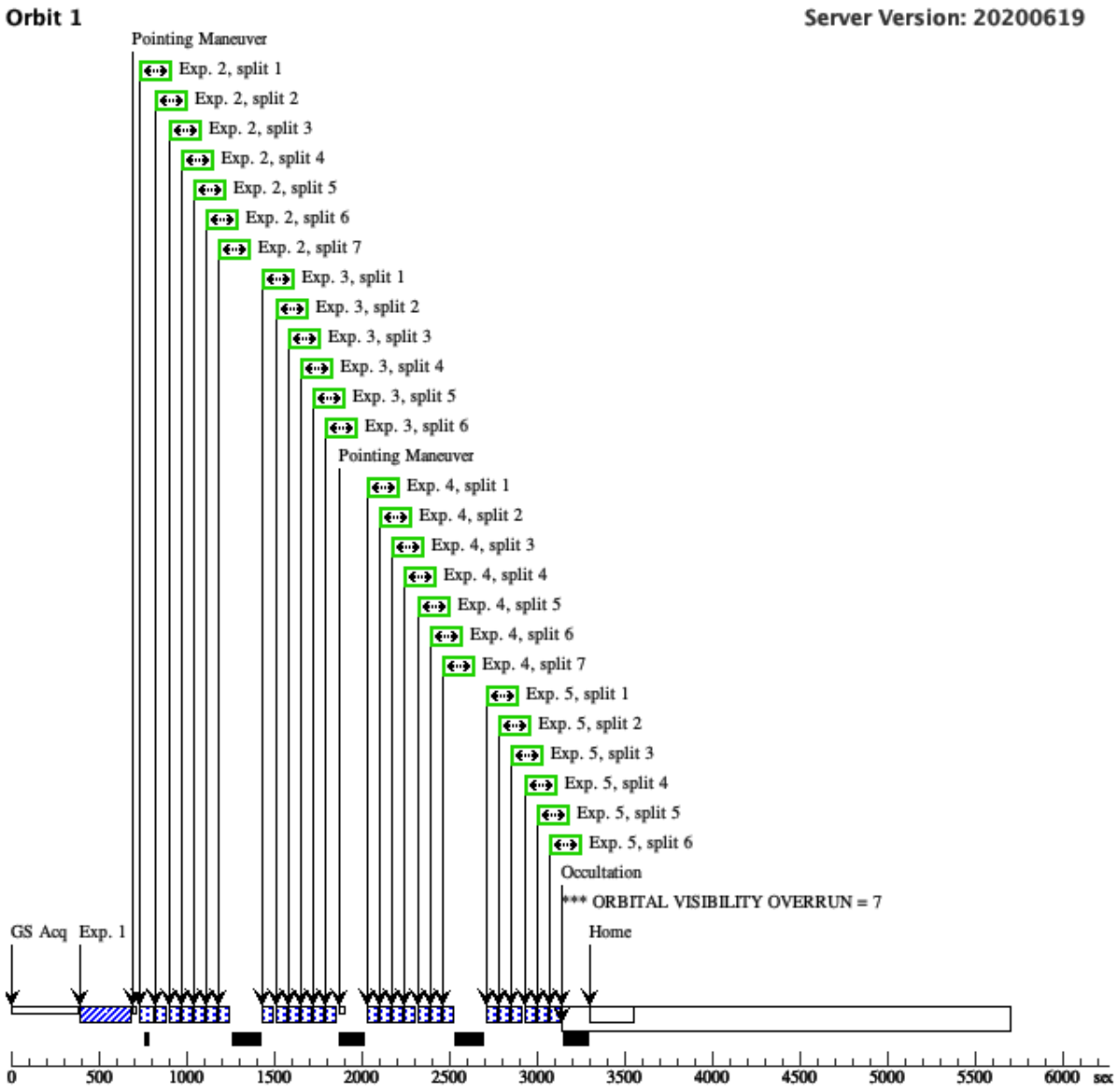
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani_V6_ACQ (STIS.ta.1365452)	(1) EPSILON-ERIDANI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
	Comments: Saturation in 0.33 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani_V6_EXP1	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=7; GAIN=4			196 Secs (196 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
3	Epsilon-Eridani_V6_EXP2	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=6; GAIN=4			168 Secs (168 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
4	Epsilon-Eridani_V6_EXP4	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=7; GAIN=4			196 Secs (196 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								

	5	Epsilon-Eridani_V6_EXP5	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=6; GAIN=4	168 Secs (168 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***

Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.

Re-planning for WA/WB2.5: increased exposure factor X2.72

Orbit Structure



Visit

Proposal 15906, V7-Epsilon-Eridani-PSF (07), implementation Fri Dec 18 17:00:31 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; AFTER_06 BY 0.5_Orbits TO 1.2_Orbits

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	EPSILON-ERIDANI-PSF Alt Name1: DELTA-ERIDANI	RA: 03 43 14.8024 (55.8116767d) Dec: -09 45 36.67 (-9.76019d) Equinox: J2000	Proper Motion RA: -0.006187066667 sec of time/yr Proper Motion Dec: 0.743335 arcsec/yr Parallax: 0.1102170" Epoch of Position: 2015.5	V=3.54	Reference Frame: ICRS

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

GAIA DR2 source 5164120762332790528
Category=CALIBRATION
Description=[POINT SPREAD FUNCTION]
Extended=NO

Exposures

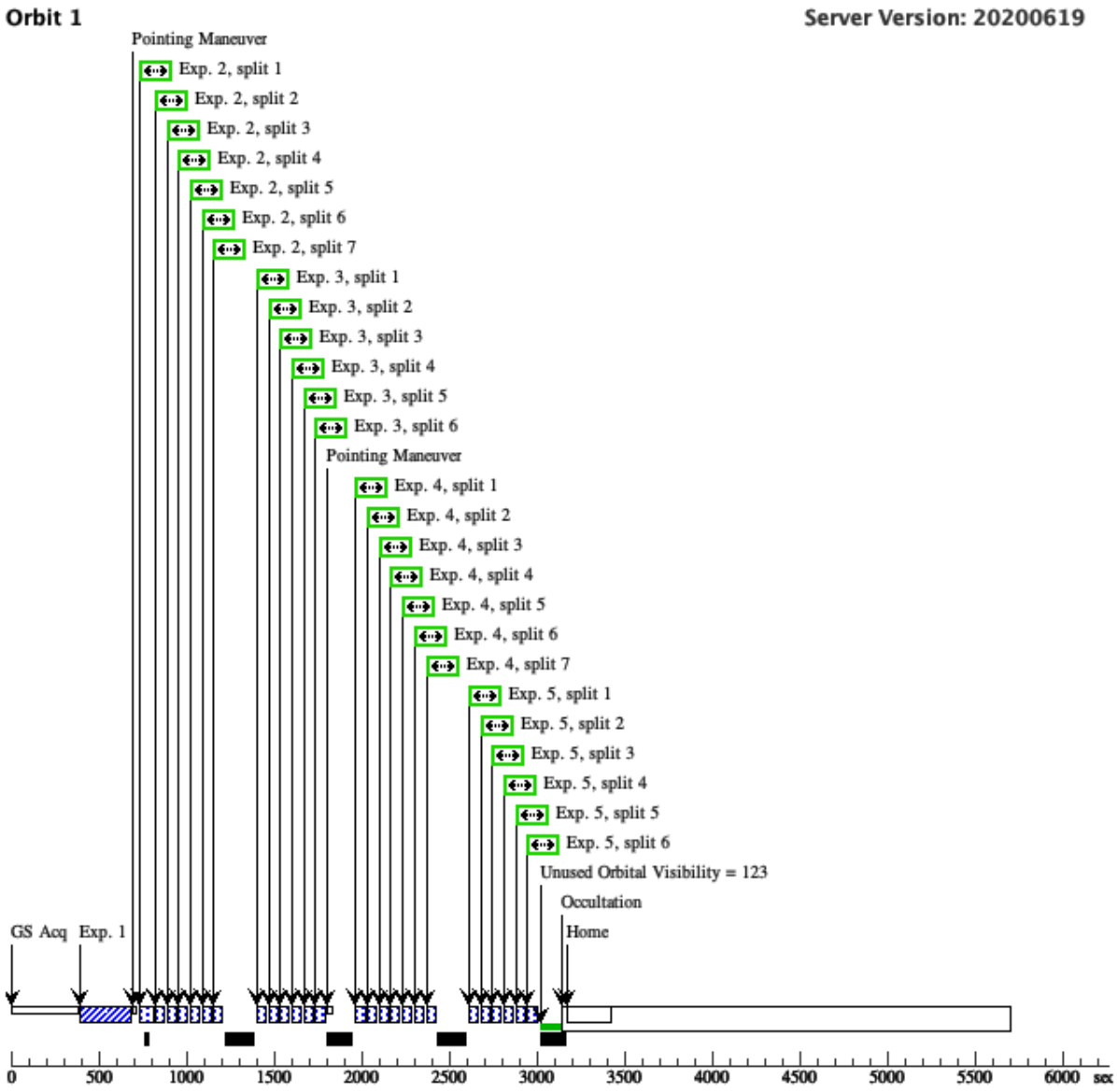
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Epsilon-Eridani-PSF-ACQ (STIS.ta.1365509)	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
	Comments: Saturation in 0.27 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani-G2-EXP1	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=7; GAIN=4			158.2 Secs (158.2 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
3	Epsilon-Eridani-G2-EXP2	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=6; GAIN=4			135.6 Secs (135.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***
	Comments: Original: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
4	Epsilon-Eridani-G2-EXP4	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=7; GAIN=4			158.2 Secs (158.2 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								

	5	Epsilon-Eridani-G2-EXP 5	(2) EPSILON-ERIDANI-PSF	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=6; GAIN=4	135.6 Secs (135.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***

Comments: Original: Observations of delta Eridani with Program ID 15217 at 0.9" have a peak of 5690 cts in 1.9 s. Scaled to 25,000 full well, we will be using an integration time of 8.3 seconds per exposure.

Re-planning for WA/WB2.5: increased exposure factor X2.72

Orbit Structure



Visit

Proposal 15906, V8-Epsilon-Eridani (08), implementation Fri Dec 18 17:00:32 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 44D TO 60D FROM 05; AFTER_07 BY 0.5_Orbits TO 1.2_Orbits

Diagnostics

(V8-Epsilon-Eridani (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	EPSILON-ERIDANI	RA: 03 32 54.8234 (53.2284308d) Dec: -09 27 29.43 (-9.45817d) Equinox: J2000	Proper Motion RA: -0.065025066 sec of time/yr Proper Motion Dec: 0.020266 arcsec/yr Parallax: 0.3122191" Epoch of Position: 2015.5	V=3.73	Reference Frame: ICRS

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

GAIA DR2 source ID: 5164707970261630080
Category=STAR
Description=[DISK, 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	Epsilon-Eridani_V8_ACQ (STIS.ta.1365452)	(1) EPSILON-ERIDANI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.1 Secs (0.1 Secs) *[==>]*	***[1]***
	Comments: Saturation in 0.33 seconds. Will integrate to only 0.1 s. That should be enough.								
2	Epsilon-Eridani_V8_EXP1	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=7; GAIN=4			196 Secs (196 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
3	Epsilon-Eridani_V8_EXP2	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEA2.5	MIRROR	CR-SPLIT=6; GAIN=4			168 Secs (168 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								
4	Epsilon-Eridani_V8_EXP4	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=7; GAIN=4			196 Secs (196 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***
	Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure. *Re-planning for WA/WB2.5: increased exposure factor X2.72*								

	5	Epsilon-Eridani_V8_EXP5	(1) EPSILON-ERIDANI	STIS/CCD, ACCUM, WEDGEB2.5	MIRROR	CR-SPLIT=6; GAIN=4	168 Secs (168 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]*	***[1]***

Comments: Original: Observations of epsilon Eridani with Program ID 15217 at 0.9" have a peak of 5600 cts in 2.3 s. Scaled to 25,000 full well, we will be using an integration time of 10.3 seconds per exposure.

Re-planning for WA/WB2.5: increased exposure factor X2.72

Orbit Structure