15217 - Imaging the predicted asteroid belt analogue around Epsilon Eridani

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Ewan S Douglas (PI) (Contact)	**University of Arizona**	**douglase@email.arizona.edu**
Dr. John Henry Debes (CoI)	Space Telescope Science Institute	debes@stsci.edu
Dr. Bin Ren (CoI)	California Institute of Technology	ren@caltech.edu
Dr. Hannah Jang-Condell (CoI)	University of Wyoming	hjangcon@uwyo.edu
Dr. Christopher C. Stark (CoI)	Space Telescope Science Institute	cstark@stsci.edu
Prof. Kerri L Cahoy (CoI)	Massachusetts Institute of Technology	kcahoy@mit.edu
Dr. Marshall Perrin (CoI)	Space Telescope Science Institute	mperrin@stsci.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) -EPS-ERI	STIS/CCD	1	10-Aug-2020 15:00:30.0	yes
02	(1) -EPS-ERI	STIS/CCD	1	10-Aug-2020 15:00:38.0	yes
03	(1) -EPS-ERI	STIS/CCD	1	10-Aug-2020 15:00:45.0	yes
04	(1) -EPS-ERI	STIS/CCD	1	10-Aug-2020 15:00:51.0	yes
05	(1) -EPS-ERI	STIS/CCD	1	10-Aug-2020 15:00:57.0	yes
06	(1) -EPS-ERI	STIS/CCD	1	10-Aug-2020 15:01:03.0	yes
07	(2) -DEL-ERI	STIS/CCD	1	10-Aug-2020 15:01:10.0	yes
08	(2) -DEL-ERI	STIS/CCD	1	10-Aug-2020 15:01:16.0	yes

8 Total Orbits Used

ABSTRACT

We propose to take advantage of the STIS coronagraphic mode and advances in speckle subtraction techniques to probe for scattered light from Epsilon Eridani's predicted asteroid belt analog. This proposal tests for the presence of visible scattered light from a warm dust ring at 1 arcsecond with a 5e-5/as^2 contrast, predicted from observations of the 24 micron excess. Dust morphology and scattered light brightness (exozodi) present a significant challenge to future exoplanet imaging missions, and Epsilon Eridani is an excellent sunlike candidate for future exoplanet direct imaging missions due its easily accessible habitable zone.

Either a detection of scattered light from this circumstellar dust population or a non-detection will place valuable constraints on the dust composition, morphology, and transport mechanisms at work in the system and inform future direct imaging efforts of this nearby star system.

OBSERVING DESCRIPTION

We propose multi-roll, dithered, STIS Wedge A1.0 coronagraphic observations of Epsilon Eri and a calibration star, Delta Eridani. Extrapolating from known coronagraphic PSF wings and the count rates in the (partially-saturated) 12 second Wedge 1.0 eps Eri observation from proposal #8896, we estimate 2.3 second exposures will remain unsaturated near the inner-working angle of the wedge (0.5 arcsec). At this exposure time, six orbits will allow us to test for the predicted narrow warm belt, supplemented by two additional calibration star orbits. A different roll angle for each orbit, will minimize degeneracy between coronagraphic speckles and astrophysical sources while the calibration star will prevent self-subtraction of the expected face-on disk.

We will reduce the data using three approaches, classical and Karhunen-Lou've Image Plane (KLIP) (Soummer et al., 2012) PSF subtraction after alignment of images via radon transform, techniques previously demonstrated with the STIS BAR5 coronagraph (Debes & Ren (2017)) as well as reduction using g vectorized Nonnegative Matrix Factorization (Zhu 2016, Debes and Ren in Prep). KLIP reduction provides superior performance near the star, while classical subtraction reaches deeper contrasts at larger angles and NMF avoids over-subtraction of extended objects.

Consecutive orbits and dithering during each orbit are required to ensure accurate reference and speckle subtraction, and to reduce speckle noise due to instrument drift and pointing variations.

Reaching the contrasts proposed requires highly accurate PSF subtraction. Since the eps Eri system is nearly face-on, simply rolling on the star could

lead to disk self-subtraction and a PSF calibration with a similar color is essential for accurate subtraction of the PSF wings (Schneider et al., 2014). We employ two orbits observing Delta Eridani, a K0 IV star of comparable color and similar magnitude and close (on-sky) proximity to eps Eri. This proximity will minimize speckle variations between the two targets by maintaining a similar spacecraft attitude.

Update 8 Aug 2018:
Decreasing

Visit

Proposal 15217, Eps Eri First Visit (01), completed Mon Aug 10 19:01:19 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; AFTER 06 BY 0 D TO 30 D

Comments: Initial orientation unconstrained, each subsequent observations roll adds 15-25 degrees.

Repointings removed after preliminary analysis of visits 4-6 shows no improvement.

Diagnostics

(Eps Eri First Visit (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d)	Proper Motion RA: -975.17 mas/yr	V=3.73	Reference Frame: ICRS
		Dec: -09 27 29.73 (-9.45826d)	Proper Motion Dec: 19.49 mas/yr		
		Equinox: J2000	Parallax: .31094"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 32 55.84496 -09 27 29.7312 (Optical) [1.84 1.75 90] A 2007A&A...474..653V.
Uncertainties from 007A&A...474..653V via Vizier.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, DISK, EXTRA-SOLAR PLANETARY SYSTEM]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) -EPS-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Eps Eri First Visit (01)	.1 Secs (0.1 Secs) *[==>]*	 ***[1]***

Comments: Acq Exposure time calculation gives a 3x margin on saturation (occurs at 0.31 sec): http://etc.stsci.edu/etc/results/STIS.ta.1006837/
No ACQ-PEAK as advised by CS.

	2	(1) -EPS-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Eps Eri First Visit (01)	2.3 Secs X 95 (233.5 Secs)	

		[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]* *[==>(Copy 33)]* *[==>(Copy 34)]* *[==>(Copy 35)]* *[==>(Copy 36)]* *[==>(Copy 37)]* *[==>(Copy 38)]* *[==>(Copy 39)]* *[==>(Copy 40)]* *[==>(Copy 41)]* *[==>(Copy 42)]* *[==>(Copy 43)]* *[==>(Copy 44)]* *[==>(Copy 45)]*	***[1]***

		[==>(Copy 46)] *[==>(Copy 47)]* *[==>(Copy 48)]* *[==>(Copy 49)]* *[==>(Copy 50)]* *[==>(Copy 51)]* *[==>(Copy 52)]* *[==>(Copy 53)]* *[==>(Copy 54)]* *[==>(Copy 55)]* *[==>(Copy 56)]* *[==>(Copy 57)]* *[==>(Copy 58)]* *[==>(Copy 59)]* *[==>(Copy 60)]* *[==>(Copy 61)]* *[==>(Copy 62)]* *[==>(Copy 63)]* *[==>(Copy 64)]* *[==>(Copy 65)]* *[==>(Copy 66)]* *[==>(Copy 67)]* *[==>(Copy 68)]* *[==>(Copy 69)]* *[==>(Copy 70)]* *[==>(Copy 71)]* *[==>(Copy 72)]* *[==>(Copy 73)]* *[==>(Copy 74)]* *[==>(Copy 75)]* *[==>(Copy 76)]* *[==>(Copy 77)]* *[==>(Copy 78)]* *[==>(Copy 79)]* *[==>(Copy 80)]* *[==>(Copy 81)]* *[==>(Copy 82)]* *[==>(Copy 83)]* *[==>(Copy 84)]* *[==>(Copy 85)]* *[==>(Copy 86)]* *[==>(Copy 87)]* *[==>(Copy 88)]* *[==>(Copy 89)]* *[==>(Copy 90)]*	

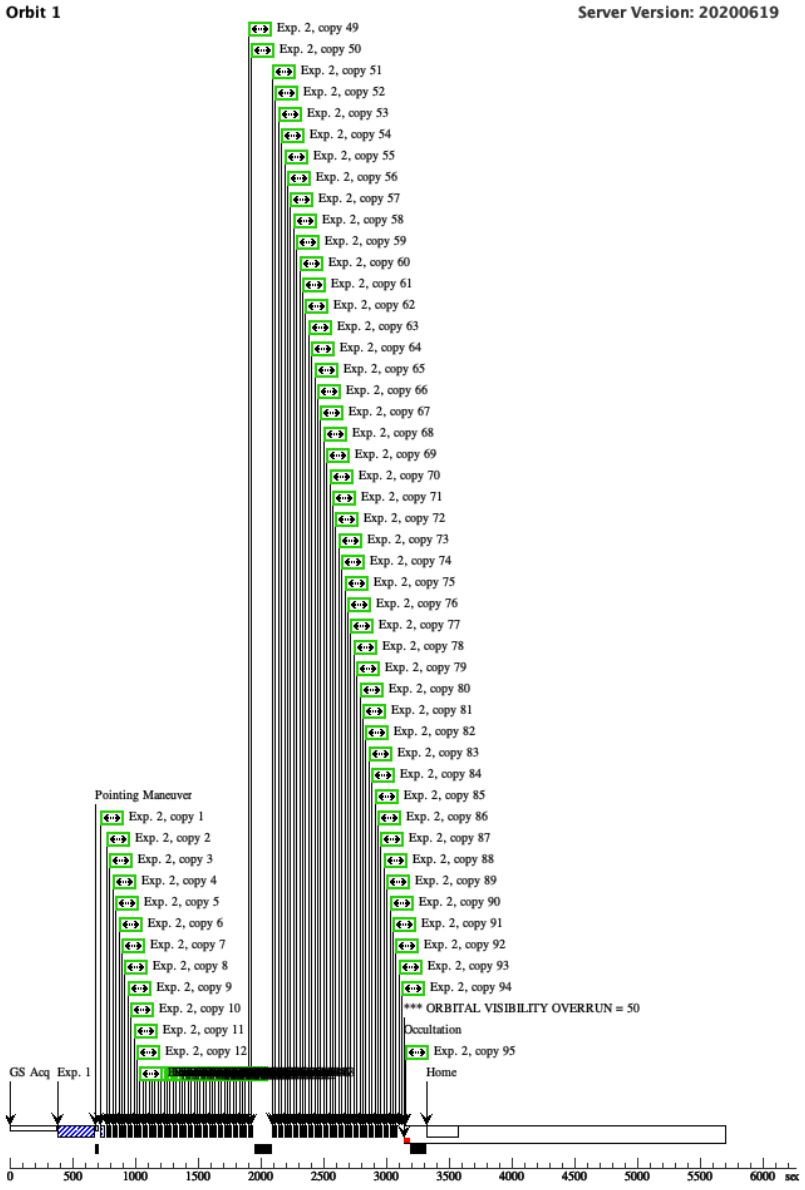
		[==>(Copy 91)] *[==>(Copy 92)]* *[==>(Copy 93)]* *[==>(Copy 94)]* *[==>17.3 Secs (Copy 95)]*	

Comments: SIZEAXIS2 is set to 110 to provide a 5.5 arcsec FOV (reduced from 190 or 10 arcsec to better sample the inner PSF following Su et al 2017's results showin the ring is likely to be between 0.5 as and 1 arcs econd from the star).
These exposures are balanced with 15 second "deep exposures" at the end of the sequence to place third STIS buffer dump at end of visit. Decreasing SIZEAXIS2 from 190 to 110 increased the number of exposures per pointing, allowing >10% increase in exposure time.

Deep exposures will saturate the core in that frame but maximizes the sensitivity for the number of frames available per orbit, we do not expect significant afterglow effects at levels below 50x full well (Instrument Scie nce Report STIS 2015-06 (v1)).

Su et al., The Inner 25 Au Debris Distribution in the Eri System. The Astronomical Journal 153 (5): 226. https://doi.org/10.3847/1538-3881/aa696b.

Orbit Structure



Visit

Proposal 15217, Eps Eri First Visit (02), completed Mon Aug 10 19:01:19 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; ORIENT 15D TO 20D FROM 01; AFTER 07 BY 0.8 Orbits TO 1.2 Orbits

Diagnostics

(Eps Eri First Visit (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d)	Proper Motion RA: -975.17 mas/yr	V=3.73	Reference Frame: ICRS
		Dec: -09 27 29.73 (-9.45826d)	Proper Motion Dec: 19.49 mas/yr		
		Equinox: J2000	Parallax: .31094"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 32 55.84496 -09 27 29.7312 (Optical) [1.84 1.75 90] A 2007A&A...474..653V.
Uncertainties from 007A&A...474..653V via Vizier.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, DISK, EXTRA-SOLAR PLANETARY SYSTEM]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) -EPS-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Eps Eri First Visit (02)	.1 Secs (0.1 Secs) *[==>]*	***[1]***

	2	(1) -EPS-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Eps Eri First Visit (02)	2.3 Secs X 95 (233.5 Secs)	

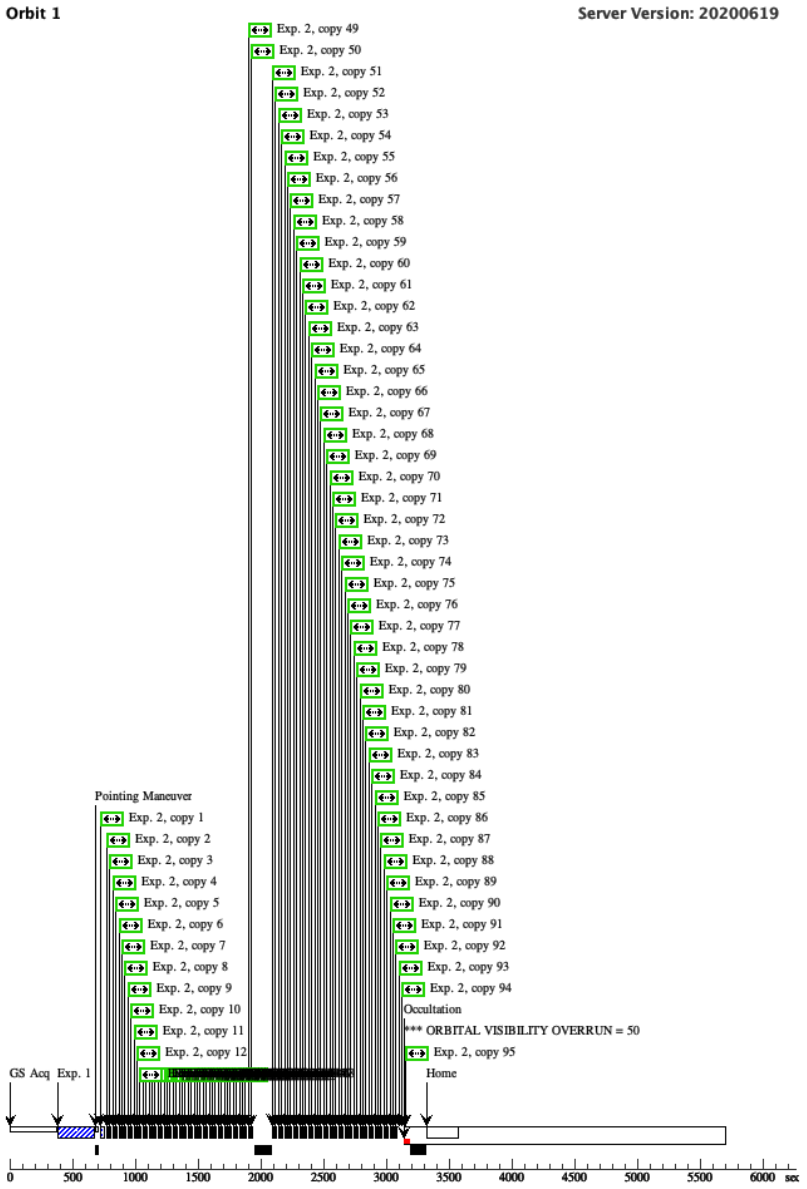
		[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]* *[==>(Copy 33)]* *[==>(Copy 34)]* *[==>(Copy 35)]* *[==>(Copy 36)]* *[==>(Copy 37)]* *[==>(Copy 38)]* *[==>(Copy 39)]* *[==>(Copy 40)]* *[==>(Copy 41)]* *[==>(Copy 42)]* *[==>(Copy 43)]* *[==>(Copy 44)]* *[==>(Copy 45)]*	***[1]***

		[==>(Copy 46)] *[==>(Copy 47)]* *[==>(Copy 48)]* *[==>(Copy 49)]* *[==>(Copy 50)]* *[==>(Copy 51)]* *[==>(Copy 52)]* *[==>(Copy 53)]* *[==>(Copy 54)]* *[==>(Copy 55)]* *[==>(Copy 56)]* *[==>(Copy 57)]* *[==>(Copy 58)]* *[==>(Copy 59)]* *[==>(Copy 60)]* *[==>(Copy 61)]* *[==>(Copy 62)]* *[==>(Copy 63)]* *[==>(Copy 64)]* *[==>(Copy 65)]* *[==>(Copy 66)]* *[==>(Copy 67)]* *[==>(Copy 68)]* *[==>(Copy 69)]* *[==>(Copy 70)]* *[==>(Copy 71)]* *[==>(Copy 72)]* *[==>(Copy 73)]* *[==>(Copy 74)]* *[==>(Copy 75)]* *[==>(Copy 76)]* *[==>(Copy 77)]* *[==>(Copy 78)]* *[==>(Copy 79)]* *[==>(Copy 80)]* *[==>(Copy 81)]* *[==>(Copy 82)]* *[==>(Copy 83)]* *[==>(Copy 84)]* *[==>(Copy 85)]* *[==>(Copy 86)]* *[==>(Copy 87)]* *[==>(Copy 88)]* *[==>(Copy 89)]* *[==>(Copy 90)]*	

[==>(Copy 91)]	
[==>(Copy 92)]	
[==>(Copy 93)]	
[==>(Copy 94)]	
[==>17.3 Secs (Copy 95)]	

Comments: same as visit 1.

Orbit Structure



Visit

Proposal 15217, Eps Eri First Visit (03), completed Mon Aug 10 19:01:19 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; ORIENT 15D TO 20D FROM 02; AFTER 02 BY 0.8 Orbits TO 1.2 Orbits

Diagnostics

(Eps Eri First Visit (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d)	Proper Motion RA: -975.17 mas/yr	V=3.73	Reference Frame: ICRS
		Dec: -09 27 29.73 (-9.45826d)	Proper Motion Dec: 19.49 mas/yr		
		Equinox: J2000	Parallax: .31094"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 32 55.84496 -09 27 29.7312 (Optical) [1.84 1.75 90] A 2007A&A...474..653V.
Uncertainties from 007A&A...474..653V via Vizier.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, DISK, EXTRA-SOLAR PLANETARY SYSTEM]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) -EPS-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Eps Eri First Visit (03)	.1 Secs (0.1 Secs) *[==>]*	***[1]***

	2	(1) -EPS-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Eps Eri First Visit (03)	2.3 Secs X 95 (233.5 Secs)	

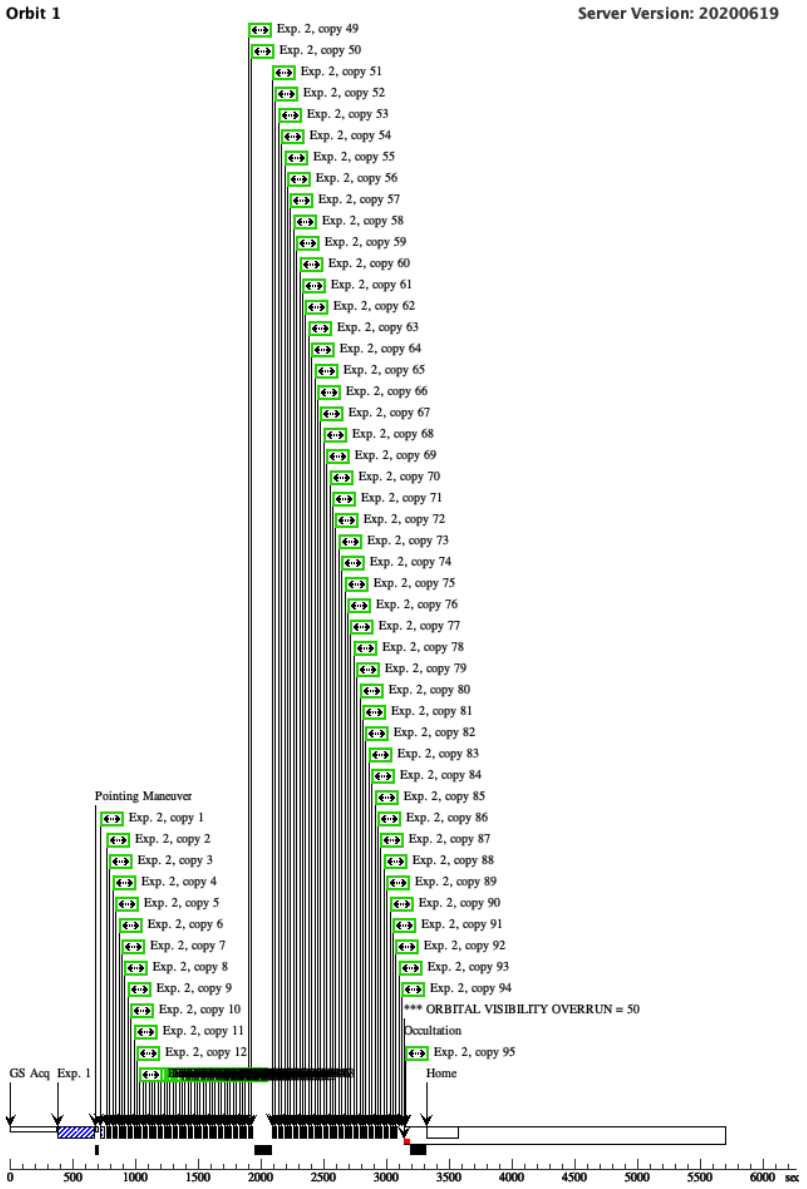
		[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]* *[==>(Copy 33)]* *[==>(Copy 34)]* *[==>(Copy 35)]* *[==>(Copy 36)]* *[==>(Copy 37)]* *[==>(Copy 38)]* *[==>(Copy 39)]* *[==>(Copy 40)]* *[==>(Copy 41)]* *[==>(Copy 42)]* *[==>(Copy 43)]* *[==>(Copy 44)]* *[==>(Copy 45)]*	***[1]***

		[==>(Copy 46)] *[==>(Copy 47)]* *[==>(Copy 48)]* *[==>(Copy 49)]* *[==>(Copy 50)]* *[==>(Copy 51)]* *[==>(Copy 52)]* *[==>(Copy 53)]* *[==>(Copy 54)]* *[==>(Copy 55)]* *[==>(Copy 56)]* *[==>(Copy 57)]* *[==>(Copy 58)]* *[==>(Copy 59)]* *[==>(Copy 60)]* *[==>(Copy 61)]* *[==>(Copy 62)]* *[==>(Copy 63)]* *[==>(Copy 64)]* *[==>(Copy 65)]* *[==>(Copy 66)]* *[==>(Copy 67)]* *[==>(Copy 68)]* *[==>(Copy 69)]* *[==>(Copy 70)]* *[==>(Copy 71)]* *[==>(Copy 72)]* *[==>(Copy 73)]* *[==>(Copy 74)]* *[==>(Copy 75)]* *[==>(Copy 76)]* *[==>(Copy 77)]* *[==>(Copy 78)]* *[==>(Copy 79)]* *[==>(Copy 80)]* *[==>(Copy 81)]* *[==>(Copy 82)]* *[==>(Copy 83)]* *[==>(Copy 84)]* *[==>(Copy 85)]* *[==>(Copy 86)]* *[==>(Copy 87)]* *[==>(Copy 88)]* *[==>(Copy 89)]* *[==>(Copy 90)]*	

[==>(Copy 91)]	
[==>(Copy 92)]	
[==>(Copy 93)]	
[==>(Copy 94)]	
[==>17.3 Secs (Copy 95)]	

Comments: same as visit 1.

Orbit Structure



Visit

Proposal 15217, Eps Eri Second Visit (04), completed Mon Aug 10 19:01:20 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; ORIENT -20D TO -15D FROM 01

Comments: This sequence of roll angles (04)-(06) can be scheduled either before or after the first 4, but simply should have the same angular seperations relative to (01) thru (03) and the same separation of days between them. The separation was chosen to keep a feature orbiting at the target separation small - shorter separations would be preferred.

Diagnostics

(Eps Eri Second Visit (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=0		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=0.01269	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d)	Proper Motion RA: -975.17 mas/yr	V=3.73	Reference Frame: ICRS
		Dec: -09 27 29.73 (-9.45826d)	Proper Motion Dec: 19.49 mas/yr		
		Equinox: J2000	Parallax: .31094"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 32 55.84496 -09 27 29.7312 (Optical) [1.84 1.75 90] A 2007A&A...474..653V.
Uncertainties from 007A&A...474..653V via Vizier.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, DISK, EXTRA-SOLAR PLANETARY SYSTEM]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) -EPS-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Eps Eri Second Visit (04)	.1 Secs (0.1 Secs) *[==>]*	***[1]***

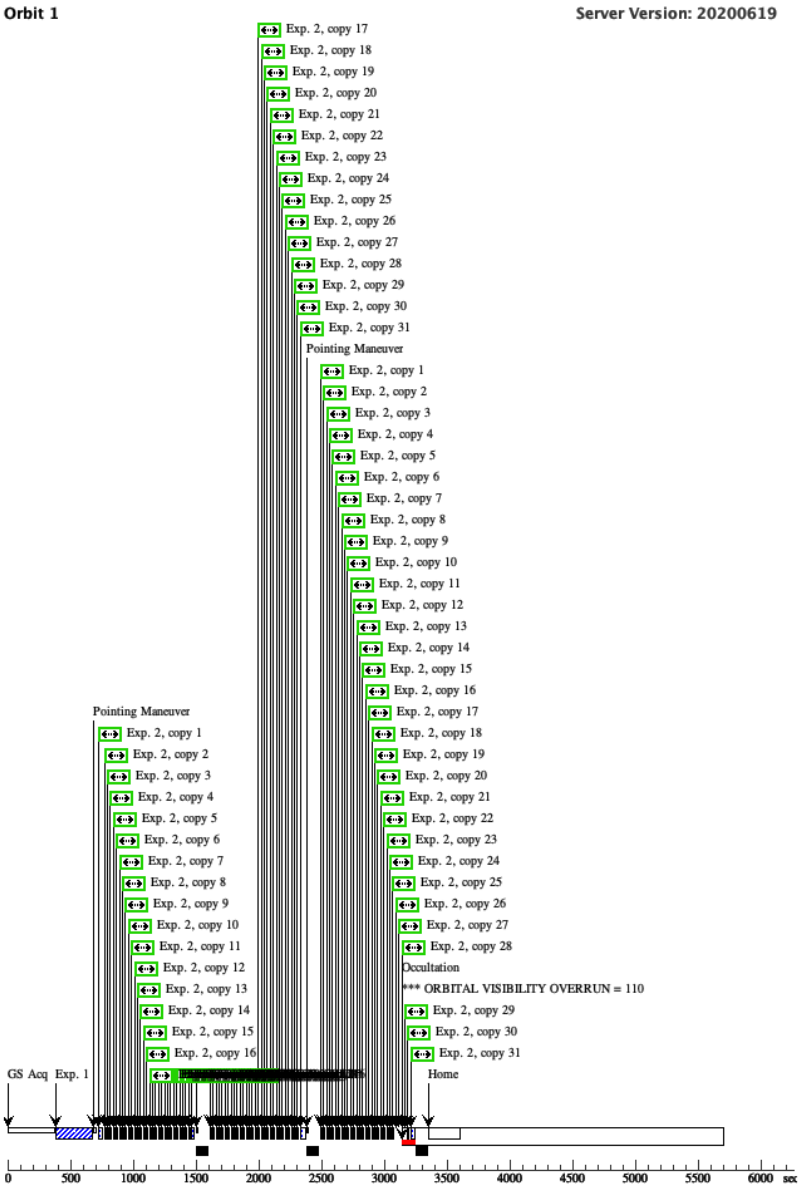
	2	(1) -EPS-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Eps Eri Second Visit (04) Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Eps Eri Second Visit (04) (1)	2.3 Secs X 31 (266.3 Secs)	

		[==>(Pattern 1, Copy 1)] *[==>(Pattern 1, Copy 2)]* *[==>(Pattern 1, Copy 3)]* *[==>(Pattern 1, Copy 4)]* *[==>(Pattern 1, Copy 5)]* *[==>(Pattern 1, Copy 6)]* *[==>(Pattern 1, Copy 7)]* *[==>(Pattern 1, Copy 8)]* *[==>(Pattern 1, Copy 9)]* *[==>(Pattern 1, Copy 10)]* *[==>(Pattern 1, Copy 11)]* *[==>(Pattern 1, Copy 12)]* *[==>(Pattern 1, Copy 13)]* *[==>(Pattern 1, Copy 14)]* *[==>(Pattern 1, Copy 15)]* *[==>(Pattern 1, Copy 16)]* *[==>(Pattern 1, Copy 17)]* *[==>(Pattern 1, Copy 18)]* *[==>(Pattern 1, Copy 19)]* *[==>(Pattern 1, Copy 20)]* *[==>(Pattern 1, Copy 21)]* *[==>(Pattern 1, Copy 22)]* *[==>(Pattern 1, Copy 23)]* *[==>(Pattern 1, Copy 24)]* *[==>(Pattern 1, Copy 25)]* *[==>(Pattern 1, Copy 26)]* *[==>(Pattern 1, Copy 27)]* *[==>(Pattern 1, Copy 28)]* *[==>(Pattern 1, Copy 29)]* *[==>(Pattern 1, Copy 30)]* *[==>15.0 Secs (Pattern 1, Copy 31)]* *[==>(Pattern 2, Copy 1)]* *[==>(Pattern 2, Copy 2)]* *[==>(Pattern 2, Copy 3)]* *[==>(Pattern 2, Copy 4)]* *[==>(Pattern 2, Copy 5)]* *[==>(Pattern 2, Copy 6)]* *[==>(Pattern 2, Copy 7)]* *[==>(Pattern 2, Copy 8)]* *[==>(Pattern 2, Copy 9)]* *[==>(Pattern 2, Copy 10)]* *[==>(Pattern 2, Copy 11)]* *[==>(Pattern 2, Copy 12)]* *[==>(Pattern 2, Copy 13)]*	***[1]***

		[==>(Pattern 2, Copy 14)] *[==>(Pattern 2, Copy 15)]* *[==>(Pattern 2, Copy 16)]* *[==>(Pattern 2, Copy 17)]* *[==>(Pattern 2, Copy 18)]* *[==>(Pattern 2, Copy 19)]* *[==>(Pattern 2, Copy 20)]* *[==>(Pattern 2, Copy 21)]* *[==>(Pattern 2, Copy 22)]* *[==>(Pattern 2, Copy 23)]* *[==>(Pattern 2, Copy 24)]* *[==>(Pattern 2, Copy 25)]* *[==>(Pattern 2, Copy 26)]* *[==>(Pattern 2, Copy 27)]* *[==>(Pattern 2, Copy 28)]* *[==>(Pattern 2, Copy 29)]* *[==>(Pattern 2, Copy 30)]* *[==>29.3 Secs (Pattern 2, Copy 31)]* *[==>(Pattern 3, Copy 1)]* *[==>(Pattern 3, Copy 2)]* *[==>(Pattern 3, Copy 3)]* *[==>(Pattern 3, Copy 4)]* *[==>(Pattern 3, Copy 5)]* *[==>(Pattern 3, Copy 6)]* *[==>(Pattern 3, Copy 7)]* *[==>(Pattern 3, Copy 8)]* *[==>(Pattern 3, Copy 9)]* *[==>(Pattern 3, Copy 10)]* *[==>(Pattern 3, Copy 11)]* *[==>(Pattern 3, Copy 12)]* *[==>(Pattern 3, Copy 13)]* *[==>(Pattern 3, Copy 14)]* *[==>(Pattern 3, Copy 15)]* *[==>(Pattern 3, Copy 16)]* *[==>(Pattern 3, Copy 17)]* *[==>(Pattern 3, Copy 18)]* *[==>(Pattern 3, Copy 19)]* *[==>(Pattern 3, Copy 20)]* *[==>(Pattern 3, Copy 21)]* *[==>(Pattern 3, Copy 22)]* *[==>(Pattern 3, Copy 23)]* *[==>(Pattern 3, Copy 24)]* *[==>(Pattern 3, Copy 25)]* *[==>(Pattern 3, Copy 26)]*	

		[==>(Pattern 3, Copy 27)] *[==>(Pattern 3, Copy 28)]* *[==>(Pattern 3, Copy 29)]* *[==>(Pattern 3, Copy 30)]* *[==>15.0 Secs (Pattern 3, Copy 31)]*	

Orbit Structure



Visit

Proposal 15217, Eps Eri Second Visit (05), completed Mon Aug 10 19:01:20 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; ORIENT -20D TO -15D FROM 04; AFTER 04 BY 0.8 Orbits TO 1.2 Orbits

Comments: This sequence of roll angles (04)-(06) can be scheduled either before or after the first 4, but simply should have the same angular seperations relative to (01) thru (03) and the same separation of days between them. (There does not appear to be a way to relate the two sets of visits in a reversable manner in APT but that would be OK for scheduling.) The time separation between sets was chosen to keep a feature orbiting at the target separation (3.0AU) from orbiting more than 1.5 pixels and shorter separations would be preferred.

Diagnostics

(Eps Eri Second Visit (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=0		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=0.01269	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d)	Proper Motion RA: -975.17 mas/yr	V=3.73	Reference Frame: ICRS
		Dec: -09 27 29.73 (-9.45826d)	Proper Motion Dec: 19.49 mas/yr		
		Equinox: J2000	Parallax: .31094"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 32 55.84496 -09 27 29.7312 (Optical) [1.84 1.75 90] A 2007A&A...474..653V.
Uncertainties from 007A&A...474..653V via Vizier.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, DISK, EXTRA-SOLAR PLANETARY SYSTEM]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) -EPS-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Eps Eri Second Visit (05)	.1 Secs (0.1 Secs) *[==>]*	***[1]***

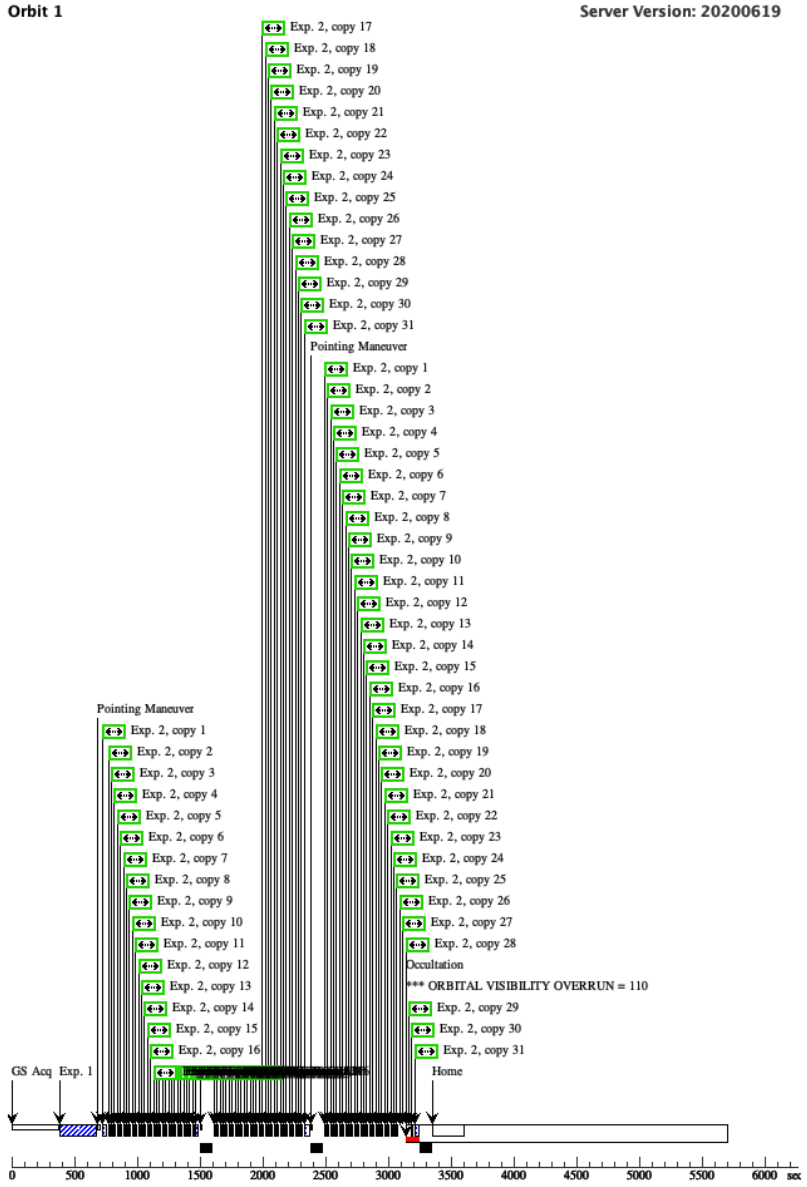
	2	(1) -EPS-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Eps Eri Second Visit (05) Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Eps Eri Second Visit (05) (1)	2.3 Secs X 31 (266.3 Secs)	

		[==>(Pattern 1, Copy 1)] *[==>(Pattern 1, Copy 2)]* *[==>(Pattern 1, Copy 3)]* *[==>(Pattern 1, Copy 4)]* *[==>(Pattern 1, Copy 5)]* *[==>(Pattern 1, Copy 6)]* *[==>(Pattern 1, Copy 7)]* *[==>(Pattern 1, Copy 8)]* *[==>(Pattern 1, Copy 9)]* *[==>(Pattern 1, Copy 10)]* *[==>(Pattern 1, Copy 11)]* *[==>(Pattern 1, Copy 12)]* *[==>(Pattern 1, Copy 13)]* *[==>(Pattern 1, Copy 14)]* *[==>(Pattern 1, Copy 15)]* *[==>(Pattern 1, Copy 16)]* *[==>(Pattern 1, Copy 17)]* *[==>(Pattern 1, Copy 18)]* *[==>(Pattern 1, Copy 19)]* *[==>(Pattern 1, Copy 20)]* *[==>(Pattern 1, Copy 21)]* *[==>(Pattern 1, Copy 22)]* *[==>(Pattern 1, Copy 23)]* *[==>(Pattern 1, Copy 24)]* *[==>(Pattern 1, Copy 25)]* *[==>(Pattern 1, Copy 26)]* *[==>(Pattern 1, Copy 27)]* *[==>(Pattern 1, Copy 28)]* *[==>(Pattern 1, Copy 29)]* *[==>(Pattern 1, Copy 30)]* *[==>15 Secs (Pattern 1, Copy 31)]* *[==>(Pattern 2, Copy 1)]* *[==>(Pattern 2, Copy 2)]* *[==>(Pattern 2, Copy 3)]* *[==>(Pattern 2, Copy 4)]* *[==>(Pattern 2, Copy 5)]* *[==>(Pattern 2, Copy 6)]* *[==>(Pattern 2, Copy 7)]* *[==>(Pattern 2, Copy 8)]* *[==>(Pattern 2, Copy 9)]* *[==>(Pattern 2, Copy 10)]* *[==>(Pattern 2, Copy 11)]* *[==>(Pattern 2, Copy 12)]* *[==>(Pattern 2, Copy 13)]* *[==>(Pattern 2, Copy 14)]*	***[1]***

		[==>(Pattern 2, Copy 15)] *[==>(Pattern 2, Copy 16)]* *[==>(Pattern 2, Copy 17)]* *[==>(Pattern 2, Copy 18)]* *[==>(Pattern 2, Copy 19)]* *[==>(Pattern 2, Copy 20)]* *[==>(Pattern 2, Copy 21)]* *[==>(Pattern 2, Copy 22)]* *[==>(Pattern 2, Copy 23)]* *[==>(Pattern 2, Copy 24)]* *[==>(Pattern 2, Copy 25)]* *[==>(Pattern 2, Copy 26)]* *[==>(Pattern 2, Copy 27)]* *[==>(Pattern 2, Copy 28)]* *[==>(Pattern 2, Copy 29)]* *[==>(Pattern 2, Copy 30)]* *[==>29.3 Secs (Pattern 2, Copy 31)]* *[==>(Pattern 3, Copy 1)]* *[==>(Pattern 3, Copy 2)]* *[==>(Pattern 3, Copy 3)]* *[==>(Pattern 3, Copy 4)]* *[==>(Pattern 3, Copy 5)]* *[==>(Pattern 3, Copy 6)]* *[==>(Pattern 3, Copy 7)]* *[==>(Pattern 3, Copy 8)]* *[==>(Pattern 3, Copy 9)]* *[==>(Pattern 3, Copy 10)]* *[==>(Pattern 3, Copy 11)]* *[==>(Pattern 3, Copy 12)]* *[==>(Pattern 3, Copy 13)]* *[==>(Pattern 3, Copy 14)]* *[==>(Pattern 3, Copy 15)]* *[==>(Pattern 3, Copy 16)]* *[==>(Pattern 3, Copy 17)]* *[==>(Pattern 3, Copy 18)]* *[==>(Pattern 3, Copy 19)]* *[==>(Pattern 3, Copy 20)]* *[==>(Pattern 3, Copy 21)]* *[==>(Pattern 3, Copy 22)]* *[==>(Pattern 3, Copy 23)]* *[==>(Pattern 3, Copy 24)]* *[==>(Pattern 3, Copy 25)]* *[==>(Pattern 3, Copy 26)]* *[==>(Pattern 3, Copy 27)]*	

		[==>(Pattern 3, Copy 28)] *[==>(Pattern 3, Copy 29)]* *[==>(Pattern 3, Copy 30)]* *[==>15 Secs (Pattern 3, Copy 31)]*	

Orbit Structure



Visit

Proposal 15217, Eps Eri Second Visit (06), completed Mon Aug 10 19:01:20 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; ORIENT -20D TO -15D FROM 05; AFTER 08 BY 0.8 Orbits TO 1.2 Orbits

Comments: This sequence of roll angles (04)-(06) can be scheduled either before or after the first 4, but simply should have the same angular seperations relative to (01) thru (03) and the same separation of days between them. (There does not appear to be a way to relate the two sets of visits in a reversable manner in APT but that would be OK for scheduling.) The separation was chosen to keep a feature orbiting at the target separation (3.0AU) from orbiting more than 1.5 pixels and shorter separations would be preferred.

Diagnostics

(Eps Eri Second Visit (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=0		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=0.01269	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	-EPS-ERI	RA: 03 32 55.8450 (53.2326875d)	Proper Motion RA: -975.17 mas/yr	V=3.73	Reference Frame: ICRS
		Dec: -09 27 29.73 (-9.45826d)	Proper Motion Dec: 19.49 mas/yr		
		Equinox: J2000	Parallax: .31094"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 32 55.84496 -09 27 29.7312 (Optical) [1.84 1.75 90] A 2007A&A...474..653V.
Uncertainties from 007A&A...474..653V via Vizier.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, DISK, EXTRA-SOLAR PLANETARY SYSTEM]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) -EPS-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Eps Eri Second Visit (06)	.1 Secs (0.1 Secs) *[==>]*	***[1]***

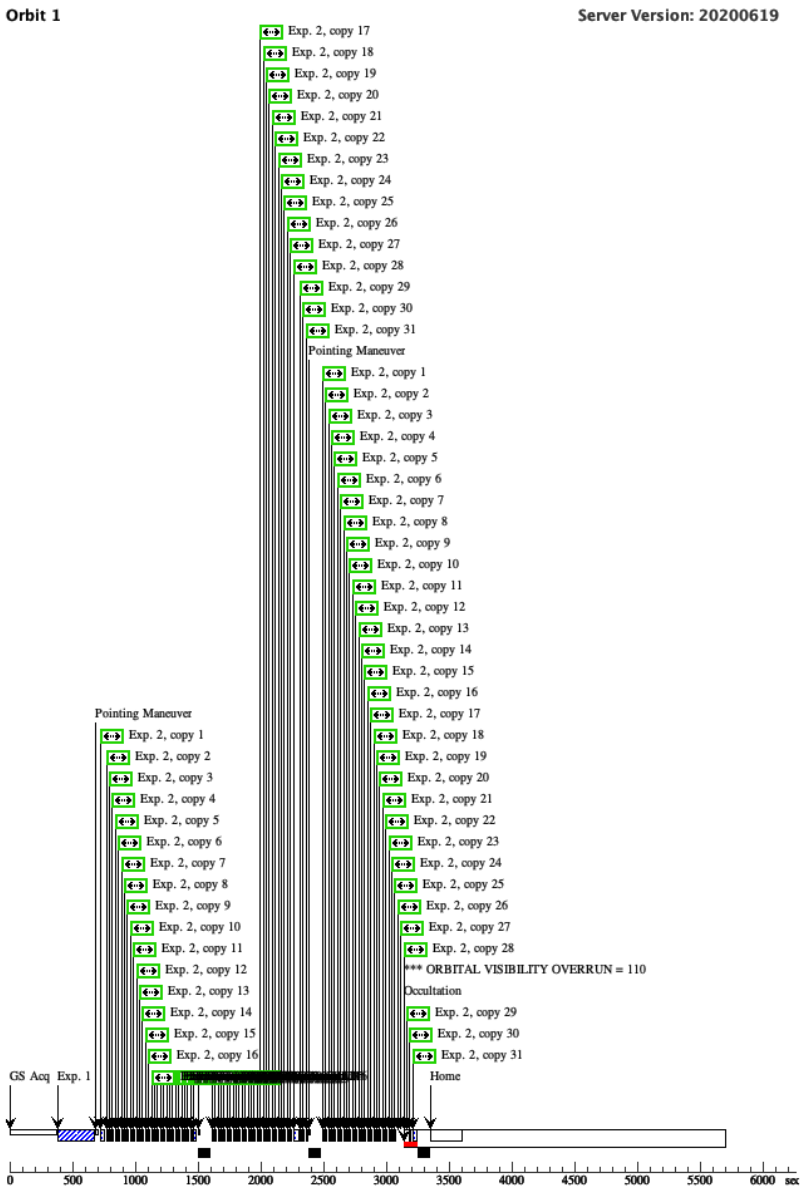
	2	(1) -EPS-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Eps Eri Second Visit (06) Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Eps Eri Second Visit (06) (1)	2.3 Secs X 31 (266.3 Secs)	

		[==>(Pattern 1, Copy 1)] *[==>(Pattern 1, Copy 2)]* *[==>(Pattern 1, Copy 3)]* *[==>(Pattern 1, Copy 4)]* *[==>(Pattern 1, Copy 5)]* *[==>(Pattern 1, Copy 6)]* *[==>(Pattern 1, Copy 7)]* *[==>(Pattern 1, Copy 8)]* *[==>(Pattern 1, Copy 9)]* *[==>(Pattern 1, Copy 10)]* *[==>(Pattern 1, Copy 11)]* *[==>(Pattern 1, Copy 12)]* *[==>(Pattern 1, Copy 13)]* *[==>(Pattern 1, Copy 14)]* *[==>(Pattern 1, Copy 15)]* *[==>(Pattern 1, Copy 16)]* *[==>(Pattern 1, Copy 17)]* *[==>(Pattern 1, Copy 18)]* *[==>(Pattern 1, Copy 19)]* *[==>(Pattern 1, Copy 20)]* *[==>(Pattern 1, Copy 21)]* *[==>(Pattern 1, Copy 22)]* *[==>(Pattern 1, Copy 23)]* *[==>(Pattern 1, Copy 24)]* *[==>(Pattern 1, Copy 25)]* *[==>(Pattern 1, Copy 26)]* *[==>(Pattern 1, Copy 27)]* *[==>(Pattern 1, Copy 28)]* *[==>(Pattern 1, Copy 29)]* *[==>(Pattern 1, Copy 30)]* *[==>15.0 Secs (Pattern 1, Copy 31)]* *[==>(Pattern 2, Copy 1)]* *[==>(Pattern 2, Copy 2)]* *[==>(Pattern 2, Copy 3)]* *[==>(Pattern 2, Copy 4)]* *[==>(Pattern 2, Copy 5)]* *[==>(Pattern 2, Copy 6)]* *[==>(Pattern 2, Copy 7)]* *[==>(Pattern 2, Copy 8)]* *[==>(Pattern 2, Copy 9)]* *[==>(Pattern 2, Copy 10)]* *[==>(Pattern 2, Copy 11)]* *[==>(Pattern 2, Copy 12)]* *[==>(Pattern 2, Copy 13)]*	***[1]***

		[==>(Pattern 2, Copy 14)] *[==>(Pattern 2, Copy 15)]* *[==>(Pattern 2, Copy 16)]* *[==>(Pattern 2, Copy 17)]* *[==>(Pattern 2, Copy 18)]* *[==>(Pattern 2, Copy 19)]* *[==>(Pattern 2, Copy 20)]* *[==>(Pattern 2, Copy 21)]* *[==>(Pattern 2, Copy 22)]* *[==>(Pattern 2, Copy 23)]* *[==>(Pattern 2, Copy 24)]* *[==>(Pattern 2, Copy 25)]* *[==>(Pattern 2, Copy 26)]* *[==>(Pattern 2, Copy 27)]* *[==>29.3 Secs (Pattern 2, Copy 28)]* *[==>(Pattern 2, Copy 29)]* *[==>(Pattern 2, Copy 30)]* *[==>(Pattern 2, Copy 31)]* *[==>(Pattern 3, Copy 1)]* *[==>(Pattern 3, Copy 2)]* *[==>(Pattern 3, Copy 3)]* *[==>(Pattern 3, Copy 4)]* *[==>(Pattern 3, Copy 5)]* *[==>(Pattern 3, Copy 6)]* *[==>(Pattern 3, Copy 7)]* *[==>(Pattern 3, Copy 8)]* *[==>(Pattern 3, Copy 9)]* *[==>(Pattern 3, Copy 10)]* *[==>(Pattern 3, Copy 11)]* *[==>(Pattern 3, Copy 12)]* *[==>(Pattern 3, Copy 13)]* *[==>(Pattern 3, Copy 14)]* *[==>(Pattern 3, Copy 15)]* *[==>(Pattern 3, Copy 16)]* *[==>(Pattern 3, Copy 17)]* *[==>(Pattern 3, Copy 18)]* *[==>(Pattern 3, Copy 19)]* *[==>(Pattern 3, Copy 20)]* *[==>(Pattern 3, Copy 21)]* *[==>(Pattern 3, Copy 22)]* *[==>(Pattern 3, Copy 23)]* *[==>(Pattern 3, Copy 24)]* *[==>(Pattern 3, Copy 25)]* *[==>(Pattern 3, Copy 26)]*	

[==>(Pattern 3, Copy 27)]
[==>(Pattern 3, Copy 28)]
[==>(Pattern 3, Copy 29)]
[==>(Pattern 3, Copy 30)]
[==>15.0 Secs (Pattern 3, Copy 31)]

Orbit Structure



Visit

Proposal 15217, Delta Eri First Observation (07), completed Mon Aug 10 19:01:20 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; AFTER 01 BY 0.8 Orbits TO 1.2 Orbits

Comments: Orientation unconstrained. Directly follows first three epsilon eridani orbits in order to minimize changes in telescope state.

Diagnostics

(Delta Eri First Observation (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	-DEL-ERI	RA: 03 43 14.9009 (55.8120871d) Dec: -09 45 48.21 (-9.76339d) Equinox: J2000	Proper Motion RA: -93.16 mas/yr Proper Motion Dec: 743.64 mas/yr Parallax: 0.11061" Epoch of Position: 2000	V=3.54	Reference Frame: ICRS

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 43 14.90088 -09 45 48.2084 (Optical) [2.54 1.93 79] A 2007A&A...474..653V
Uncertainties from 007A&A...474..653V via Vizier.
Category=CALIBRATION
Description=[POINT SPREAD FUNCTION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) -DEL-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Delta Eri First Observation (07)	.1 Secs (0.1 Secs) *[==>]*	 ***[1]***

Comments: Exposure time of 0.1 second with ND3 filter gives SNR=345 and the time to saturation is 0.25, a 2.5x margin, acquition exposure time calculator run using Pickles K0IV star: http://etc.stsci.edu/etc/results/STIS.ta.1012385/

	2	(2) -DEL-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Delta Eri First Observation (07)	1.9 Secs X 99 (201 Secs)	

		[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]* *[==>(Copy 33)]* *[==>(Copy 34)]* *[==>(Copy 35)]* *[==>(Copy 36)]* *[==>(Copy 37)]* *[==>(Copy 38)]* *[==>(Copy 39)]* *[==>(Copy 40)]* *[==>(Copy 41)]* *[==>(Copy 42)]* *[==>(Copy 43)]* *[==>(Copy 44)]* *[==>(Copy 45)]*	***[1]***

[==>(Copy 46)]
[==>(Copy 47)]
[==>(Copy 48)]
[==>(Copy 49)]
[==>(Copy 50)]
[==>(Copy 51)]
[==>(Copy 52)]
[==>(Copy 53)]
[==>(Copy 54)]
[==>(Copy 55)]
[==>(Copy 56)]
[==>(Copy 57)]
[==>(Copy 58)]
[==>(Copy 59)]
[==>(Copy 60)]
[==>(Copy 61)]
[==>(Copy 62)]
[==>(Copy 63)]
[==>(Copy 64)]
[==>(Copy 65)]
[==>(Copy 66)]
[==>(Copy 67)]
[==>(Copy 68)]
[==>(Copy 69)]
[==>(Copy 70)]
[==>(Copy 71)]
[==>(Copy 72)]
[==>(Copy 73)]
[==>(Copy 74)]
[==>(Copy 75)]
[==>(Copy 76)]
[==>(Copy 77)]
[==>(Copy 78)]
[==>(Copy 79)]
[==>(Copy 80)]
[==>(Copy 81)]
[==>(Copy 82)]
[==>(Copy 83)]
[==>(Copy 84)]
[==>(Copy 85)]
[==>(Copy 86)]
[==>(Copy 87)]
[==>(Copy 88)]
[==>(Copy 89)]
[==>(Copy 90)]

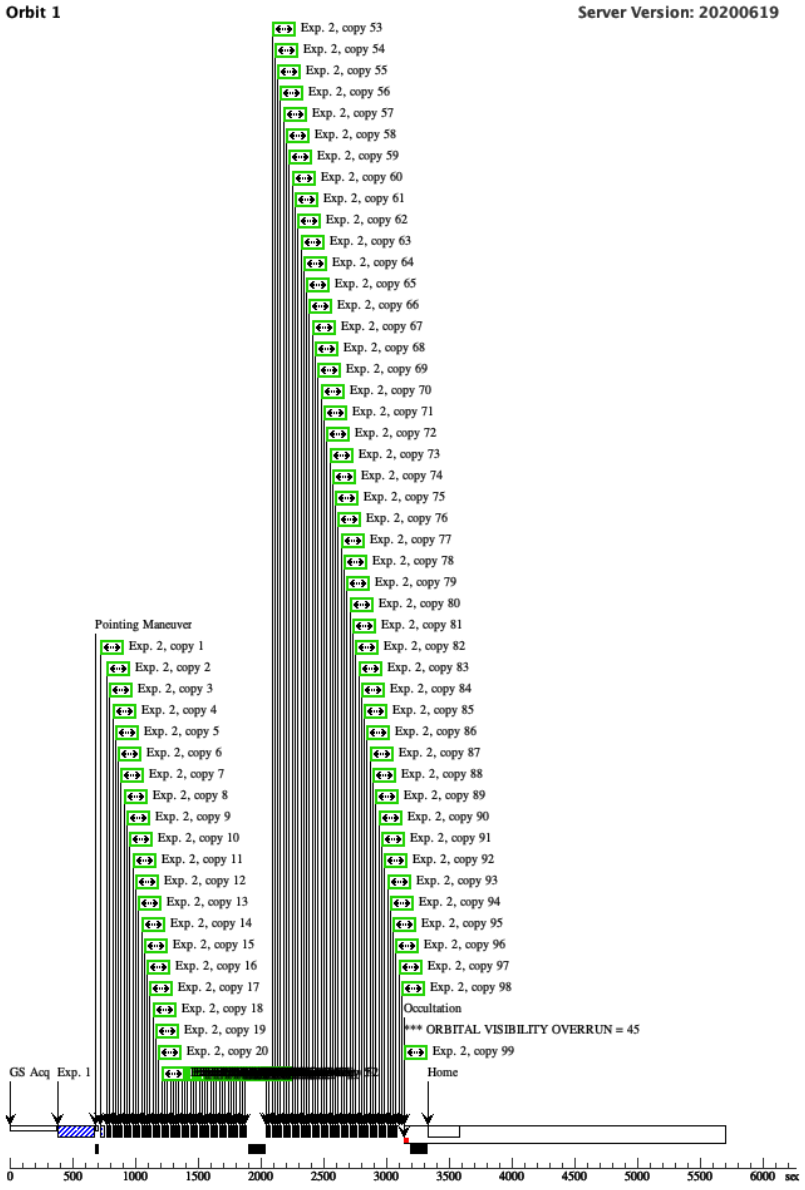
		[==>(Copy 91)] *[==>(Copy 92)]* *[==>(Copy 93)]* *[==>(Copy 94)]* *[==>(Copy 95)]* *[==>(Copy 96)]* *[==>(Copy 97)]* *[==>(Copy 98)]* *[==>14.8 Secs (Copy 99)]*	

Comments: Exposure time rescaled from Eps Eri using the 20% increased flux from Delta Eri.

Deep (~15 sec) exposure at the end of each set to match Eps Eri.

Auto-adjusted last frame of central pointing to fill out exposure time.

Orbit Structure



Visit

Proposal 15217, Delta Eri Second Observation (08), completed Mon Aug 10 19:01:21 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; AFTER 05 BY 0.8 Orbits TO 1.2 Orbits

Comments: Orientation unconstrained. Directly follows second three epsilon eridani orbits in order to minimize changes in telescope state.

Diagnostics

(Delta Eri Second Observation (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=0		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=0.01269	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	-DEL-ERI	RA: 03 43 14.9009 (55.8120871d)	Proper Motion RA: -93.16 mas/yr	V=3.54	Reference Frame: ICRS
		Dec: -09 45 48.21 (-9.76339d)	Proper Motion Dec: 743.64 mas/yr		
		Equinox: J2000	Parallax: 0.11061"		
			Epoch of Position: 2000		

Comments: Coordinates from Simbad, APT keeps rounding J2000 coordinates, they should be:
ICRS coord. (ep=J2000) : 03 43 14.90088 -09 45 48.2084 (Optical) [2.54 1.93 79] A 2007A&A...474..653V
Uncertainties from 007A&A...474..653V via Vizier.
Category=CALIBRATION
Description=[POINT SPREAD FUNCTION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) -DEL-ERI	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT	GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Delta Eri Second Observation (08)	.1 Secs (0.1 Secs) *[==>]*	 ***[1]***

Comments: Exposure time of 0.1 second with ND3 filter gives SNR=345 and the time to saturation is 0.25, a 2.5x margin, acquition exposure time calculator run using Pickles K0IV star: http://etc.stsci.edu/etc/results/STIS.ta.1012385/

	2	(2) -DEL-ERI	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=110; CR-SPLIT=NO; GAIN=4	Sequence 1-2 Non-Int in Delta Eri Second Observation (08) Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Delta Eri Second Observation (08) (1)	1.9 Secs X 32 (226.3 Secs)	

		[==>(Pattern 1, Copy 1)] *[==>(Pattern 1, Copy 2)]* *[==>(Pattern 1, Copy 3)]* *[==>(Pattern 1, Copy 4)]* *[==>(Pattern 1, Copy 5)]* *[==>(Pattern 1, Copy 6)]* *[==>(Pattern 1, Copy 7)]* *[==>(Pattern 1, Copy 8)]* *[==>(Pattern 1, Copy 9)]* *[==>(Pattern 1, Copy 10)]* *[==>(Pattern 1, Copy 11)]* *[==>(Pattern 1, Copy 12)]* *[==>(Pattern 1, Copy 13)]* *[==>(Pattern 1, Copy 14)]* *[==>(Pattern 1, Copy 15)]* *[==>(Pattern 1, Copy 16)]* *[==>(Pattern 1, Copy 17)]* *[==>(Pattern 1, Copy 18)]* *[==>(Pattern 1, Copy 19)]* *[==>(Pattern 1, Copy 20)]* *[==>(Pattern 1, Copy 21)]* *[==>(Pattern 1, Copy 22)]* *[==>(Pattern 1, Copy 23)]* *[==>(Pattern 1, Copy 24)]* *[==>(Pattern 1, Copy 25)]* *[==>(Pattern 1, Copy 26)]* *[==>(Pattern 1, Copy 27)]* *[==>(Pattern 1, Copy 28)]* *[==>(Pattern 1, Copy 29)]* *[==>(Pattern 1, Copy 30)]* *[==>(Pattern 1, Copy 31)]* *[==>12.4 Secs (Pattern 1, Copy 32)]* *[==>(Pattern 2, Copy 1)]* *[==>(Pattern 2, Copy 2)]* *[==>(Pattern 2, Copy 3)]* *[==>(Pattern 2, Copy 4)]* *[==>(Pattern 2, Copy 5)]* *[==>(Pattern 2, Copy 6)]* *[==>(Pattern 2, Copy 7)]* *[==>(Pattern 2, Copy 8)]* *[==>(Pattern 2, Copy 9)]* *[==>(Pattern 2, Copy 10)]* *[==>(Pattern 2, Copy 11)]* *[==>(Pattern 2, Copy 12)]*	***[1]***

[==>(Pattern 2, Copy 13)]
[==>(Pattern 2, Copy 14)]
[==>(Pattern 2, Copy 15)]
[==>(Pattern 2, Copy 16)]
[==>(Pattern 2, Copy 17)]
[==>(Pattern 2, Copy 18)]
[==>(Pattern 2, Copy 19)]
[==>(Pattern 2, Copy 20)]
[==>(Pattern 2, Copy 21)]
[==>(Pattern 2, Copy 22)]
[==>(Pattern 2, Copy 23)]
[==>(Pattern 2, Copy 24)]
[==>(Pattern 2, Copy 25)]
[==>(Pattern 2, Copy 26)]
[==>(Pattern 2, Copy 27)]
[==>(Pattern 2, Copy 28)]
[==>(Pattern 2, Copy 29)]
[==>(Pattern 2, Copy 30)]
[==>(Pattern 2, Copy 31)]
[==>24.8 Secs (Pattern 2, Copy 32)]
[==>(Pattern 3, Copy 1)]
[==>(Pattern 3, Copy 2)]
[==>(Pattern 3, Copy 3)]
[==>(Pattern 3, Copy 4)]
[==>(Pattern 3, Copy 5)]
[==>(Pattern 3, Copy 6)]
[==>(Pattern 3, Copy 7)]
[==>(Pattern 3, Copy 8)]
[==>(Pattern 3, Copy 9)]
[==>(Pattern 3, Copy 10)]
[==>(Pattern 3, Copy 11)]
[==>(Pattern 3, Copy 12)]
[==>(Pattern 3, Copy 13)]
[==>(Pattern 3, Copy 14)]
[==>(Pattern 3, Copy 15)]
[==>(Pattern 3, Copy 16)]
[==>(Pattern 3, Copy 17)]
[==>(Pattern 3, Copy 18)]
[==>(Pattern 3, Copy 19)]
[==>(Pattern 3, Copy 20)]
[==>(Pattern 3, Copy 21)]
[==>(Pattern 3, Copy 22)]
[==>(Pattern 3, Copy 23)]
[==>(Pattern 3, Copy 24)]

		[==>(Pattern 3, Copy 25)] *[==>(Pattern 3, Copy 26)]* *[==>(Pattern 3, Copy 27)]* *[==>(Pattern 3, Copy 28)]* *[==>(Pattern 3, Copy 29)]* *[==>(Pattern 3, Copy 30)]* *[==>(Pattern 3, Copy 31)]* *[==>12.4 Secs (Pattern 3, Copy 32)]*	

Orbit Structure