15926 - Testing the Hypothesis of a Low Metallicity Atmosphere for the Extremely Inflated Sub-Saturn-Mass Planet KELT-11b

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) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:19.0	yes
02	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:23.0	yes
03	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:25.0	yes
04	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:29.0	yes
05	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:32.0	yes
06	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:34.0	yes
07	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:37.0	yes
08	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:41.0	yes
09	(1) HD-93396	WFC3/IR	1	08-Dec-2020 10:00:43.0	yes

9 Total Orbits Used

ABSTRACT

We are now in an era of exoplanet characterization. Exoplanets are being intensively studied to measure the abundances of water and other metals in their atmospheres in order to place constraints on the location of their origin within a disk. Inflated sub-Saturn-mass planets bridge the divide between super-Earths and Jupiters, so constraints on their atmospheric composition and metallicities are particularly important for informing planet formation models.

Here, we propose to perform a detailed investigation of the atmosphere of the hot and extremely inflated sub-Saturn-mass planet KELT-11b. This is one of the best planets to study thanks to its very bright host, low mass and surface gravity, and high equilibrium temperature. An HST/WFC3 G141 transmission spectrum indicates that KELT-11b has a clearly sub-solar metallicity atmosphere, but additional data are needed to determine just how metal-poor the atmosphere is. The proposed observations to measure KELT-11b's transmission spectrum in the G102 band will not only lead to more precise metallicity constraints but will also reveal whether KELT-11b followed a rare planet formation pathway if the planet's metallicity is indeed ultra-low. In addition, with precise atmospheric metallicity constraints for the sub-Saturn-mass KELT-11b, we will be able to empirically test correlations between planet mass-planet metallicity and between stellar metallicity-planet metallicity.

The proposed observations of KELT-11b will ultimately add to a comparative study with the other inflated sub-Saturns discovered to date that can be used to better inform planet formation and evolution models as well as future observations with JWST.

OBSERVING DESCRIPTION

We will obtain time series spectroscopy of the KELT-11b planetary system with the WFC3 instrument during one transit of the planet. We will use the G102 grism and the 512x512 subarray. The observation will consist of 9 sequential HST orbits to obtain quasi-continuous coverage of the planet's transit. Nine orbits are required to observe the transit and measure the out-of-transit baseline flux level. The observation duration is longer than usual for exoplanet transit spectroscopy because the transit duration is over 7.0 hours thanks to the slightly evolved host star.

The 9 orbits have been defined as separate visits in APT, which forces WFC3 to do a complete buffer dump during occultation. This strategy follows that applied in program 15698 and allows us to ensure that we do not lose any observing time to buffer dumps that could occur during the middle of a traditional observing plan (i.e. containing a single visit with 9 orbits defined as non-interruptible sequences). We have sequenced the visits (orbits) so that all orbits should occur immediately after the first one, so we can obtain a "continuous" observation of 9 consecutive orbits to observe a transit of KELT-11b.

We will obtain a direct image of the target star with the F130N filter at the beginning of each orbit for wavelength calibration. The remainder of each orbit will consist of 46.696 s exposures with the NSAMP = 3, SPARS25 readout pattern. To keep the fluence below saturation, we will use spatial scan mode with a 0.96 arcsec/sec scan rate (yielding a total scan height of 345 pixels). Using past WFC3 observations of similar targets as a benchmark, we estimate the maximum expected per pixel counts to be below 40k electrons. To maximize the duty cycle of the observations, we will alternate between forward and reverse scanning along the detector. This is the same observational strategy we used extensively for transit/eclipse observations in our programs in previous cycles, including in our Cycle 25 Program 15255 for this same target, which yielded photon-noise limited light curves.

We have left at least 2 min of time unused in each orbit to allow for any pointing resets that may be necessary. We left approximately 5 min of time unused in orbits (visits) 4 and 8 to allow for gyro bias updates that may be necessary.

The proposed observations are time-critical and must be centered on the transit of the planet. Transits occur often (every 4.7 days), so there are many opportunities to observe the planet. The observations should also be scheduled to minimize impacts of crossing the South Atlantic Anomaly if possible.

The observations will not need to be coordinated with other observatories. When the HST observations are scheduled, we will arrange for simultaneous ground-based optical and IR photometry in order to trace the intrinsic variability of the system. These observations will be performed with small-to-mid-sized telescopes which are easily accessible to the world-wide KELT network of collaborators of the proposers.

In the case of reduced-gyro operations, the schedulability of our observations will likely be impacted by having few observing windows available for our target. Our spatial scan mode uses a rate of 0.96 arcsec/sec so would not be impacted by a limit placed on spatial scan speeds to be less than 5 arcsec/sec. We conclude that the greatest impact to our program in reduced gyro-observations would be the schedulability of our observations.

Visit

Proposal 15926, Transit 1.1 (01), scheduling Tue Dec 08 15:00:44 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: Period 4.7362085 D AND ZERO-PHASE HJD2457483.429658; SEQ 01,02,03,04,05,06,07,08,09 WITHIN 9 Orbits

Comments: This is the first visit/orbit of nine sequential orbits.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

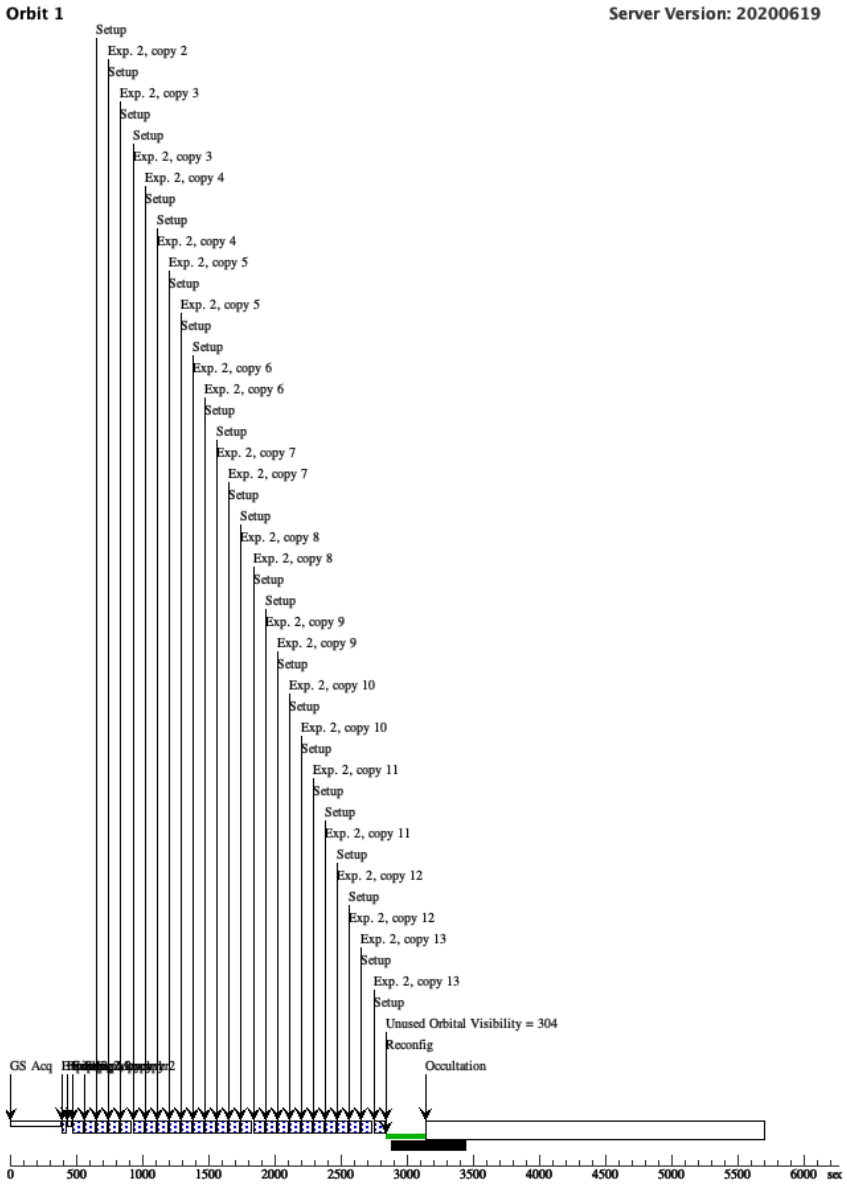
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9; PHASE 0.9265 TO 0.9397	Sequence 1-2 Non-Int in Transit 1.1 (01)	2.559081 Secs (2.559 Secs) *[==>]*	 ***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.1 (01)	46.695529 Secs X 13 (1214.084 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]*	 ***[1]***

Orbit Structure



Visit

Proposal 15926, Transit 1.2 (02), scheduling Tue Dec 08 15:00:44 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

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

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.2 (02)	2.559081 Secs (2.559 Secs)	
								[==>]	***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.2 (02)	46.695529 Secs X 13 (1214.084 Secs)	
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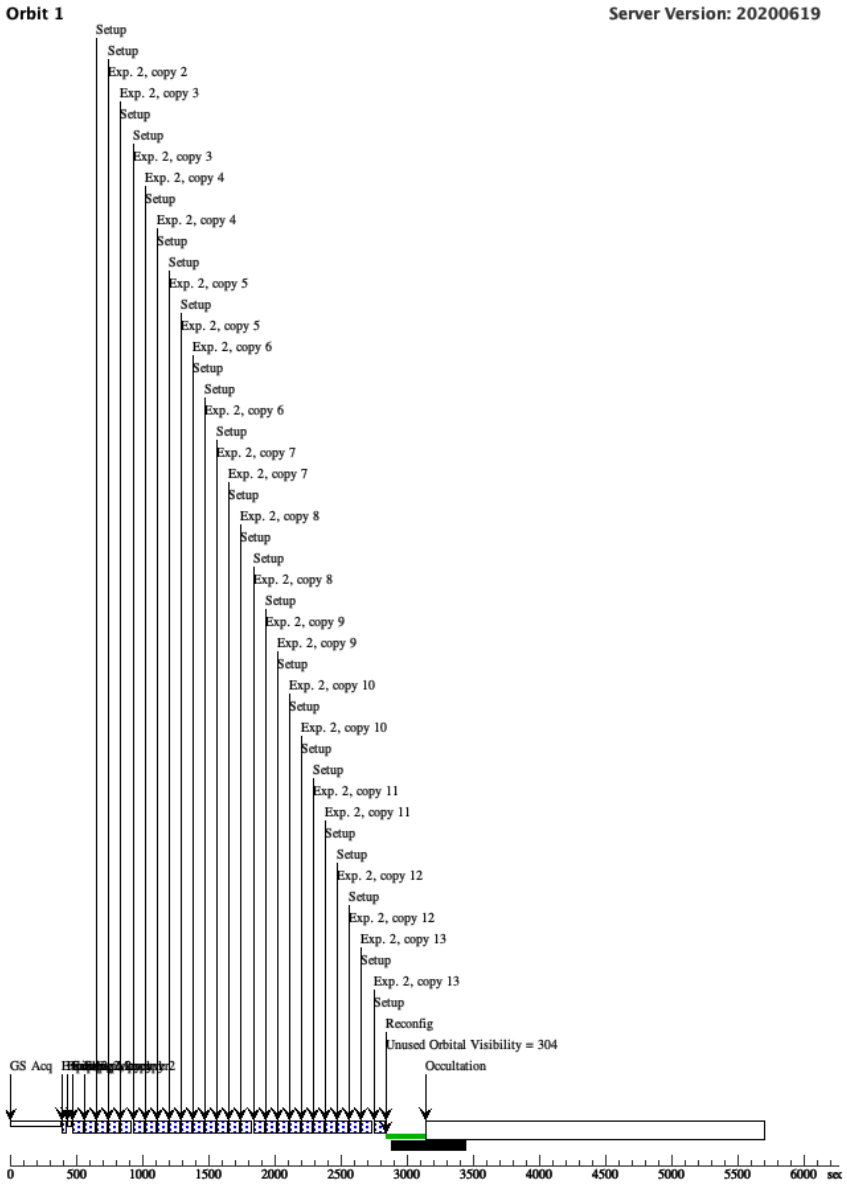
Orbit Structure



Visit

Proposal 15926, Transit 1.3 (03), scheduling Tue Dec 08 15:00:44 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

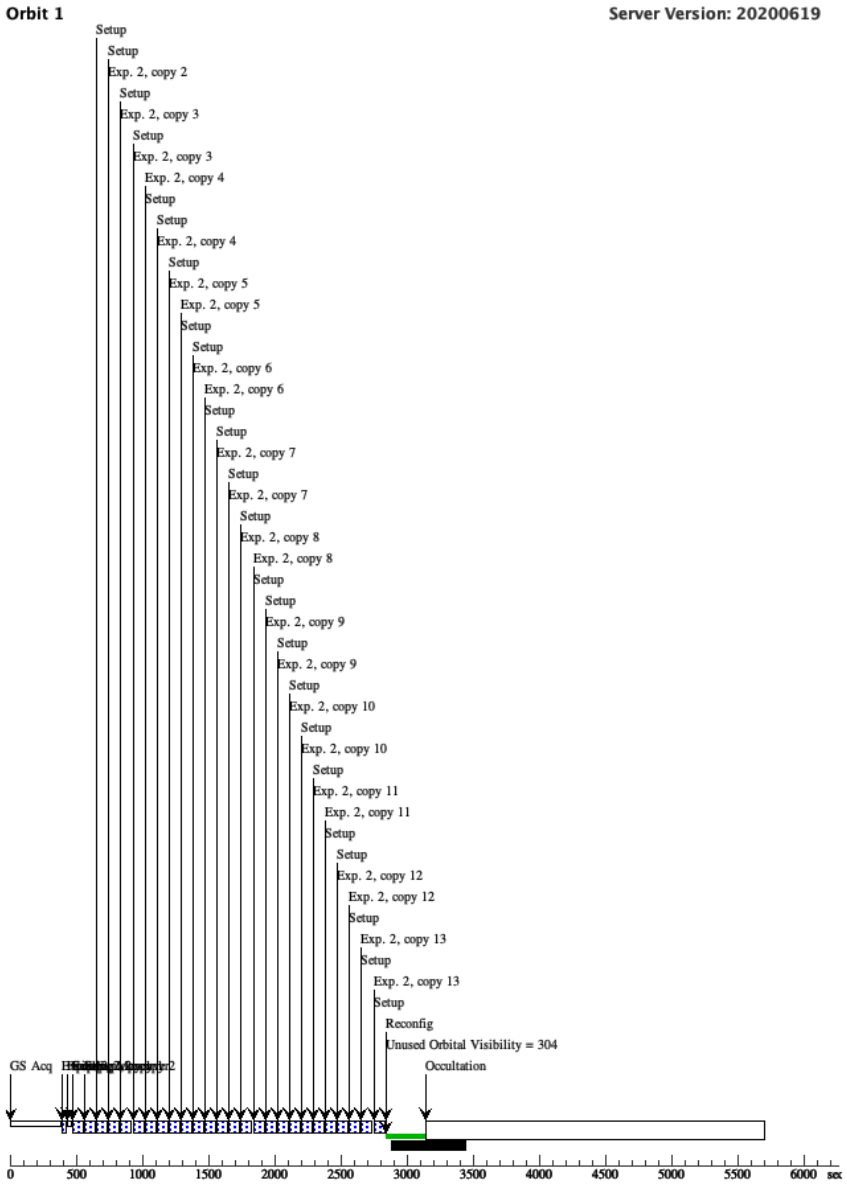
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.3 (03)	2.559081 Secs (2.559 Secs) *[==>]*	 ***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.3 (03)	46.695529 Secs X 13 (1214.084 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]*	 ***[1]***

Orbit Structure



Visit

Proposal 15926, Transit 1.4 (04), scheduling Tue Dec 08 15:00:45 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

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

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.4 (04)	2.559081 Secs (2.559 Secs)	
								[==>]	***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.4 (04)	46.695529 Secs X 13 (1214.084 Secs)	
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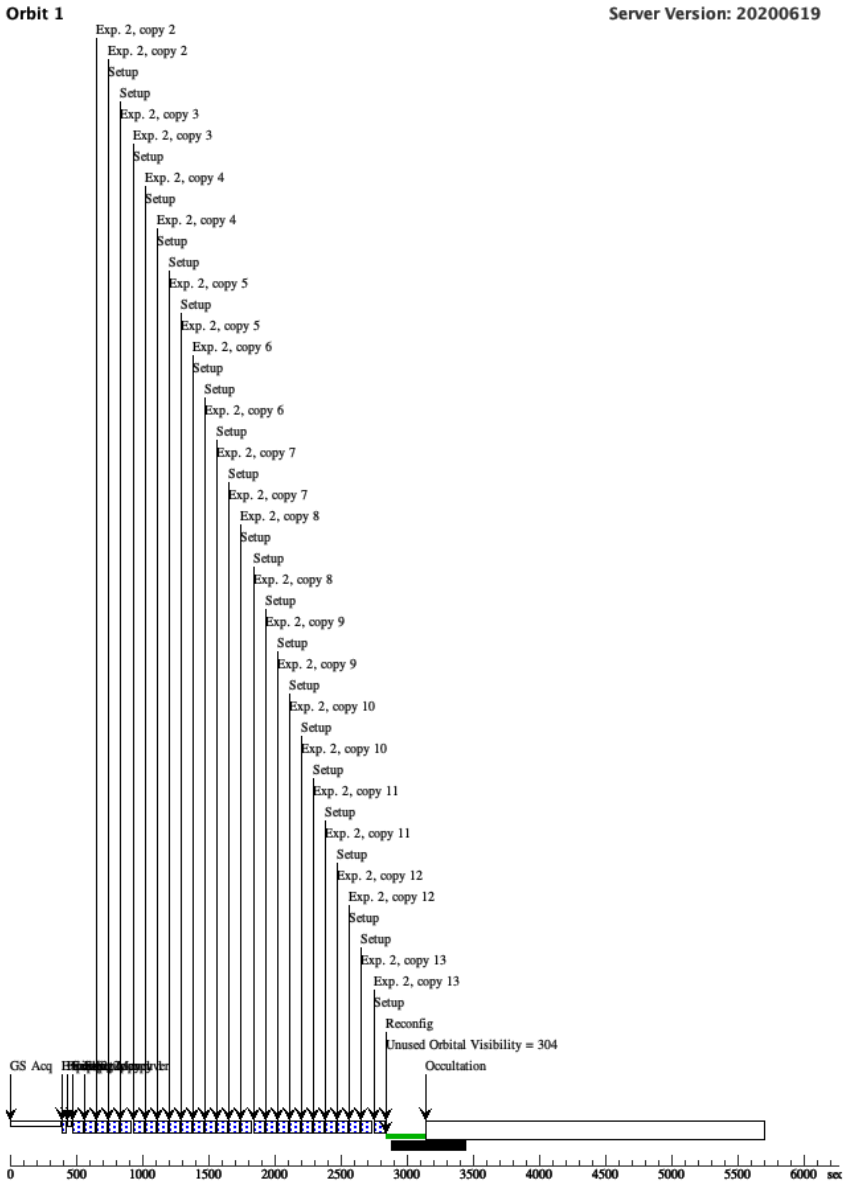
Orbit Structure



Visit

Proposal 15926, Transit 1.5 (05), scheduling Tue Dec 08 15:00:45 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

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

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.5 (05)	2.559081 Secs (2.559 Secs)	
								[==>]	***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.5 (05)	46.695529 Secs X 13 (1214.084 Secs)	
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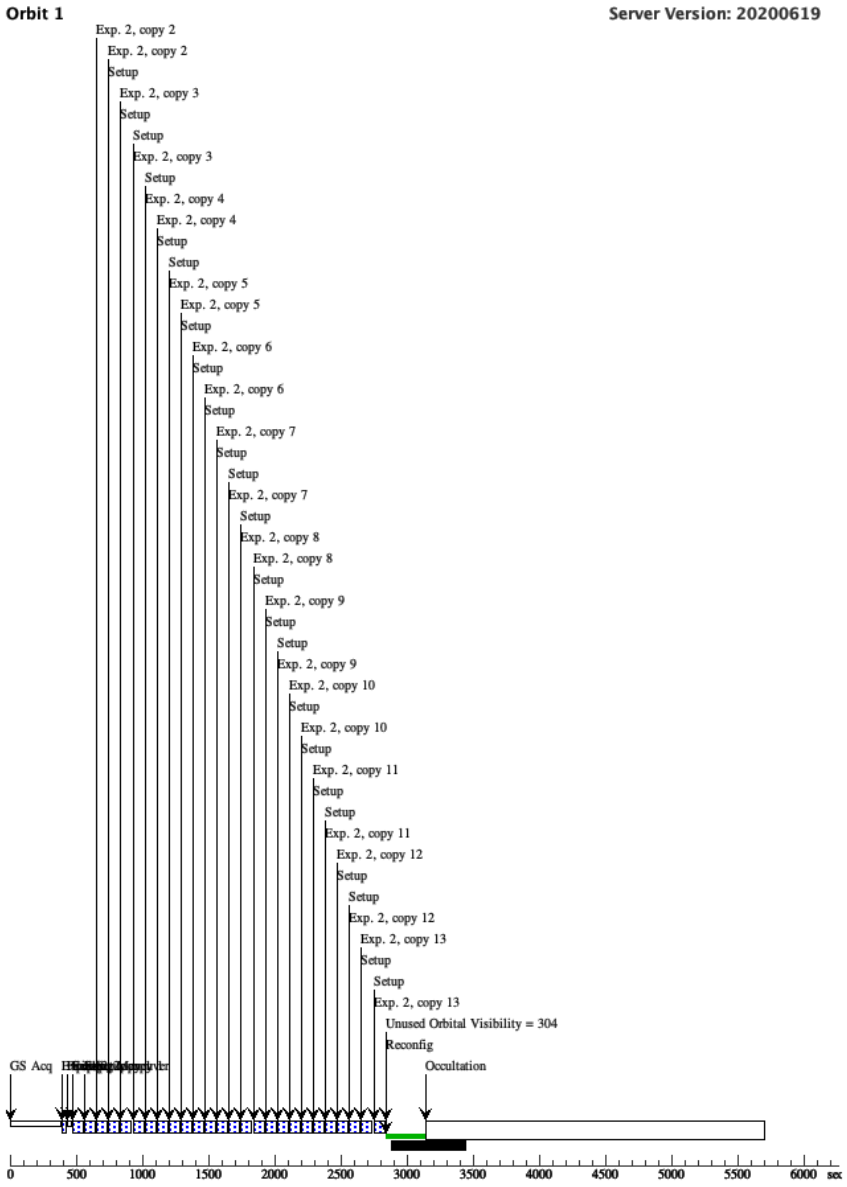
Orbit Structure



Visit

Proposal 15926, Transit 1.6 (06), scheduling Tue Dec 08 15:00:45 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

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

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.6 (06)	2.559081 Secs (2.559 Secs)	
								[==>]	***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.6 (06)	46.695529 Secs X 13 (1214.084 Secs)	
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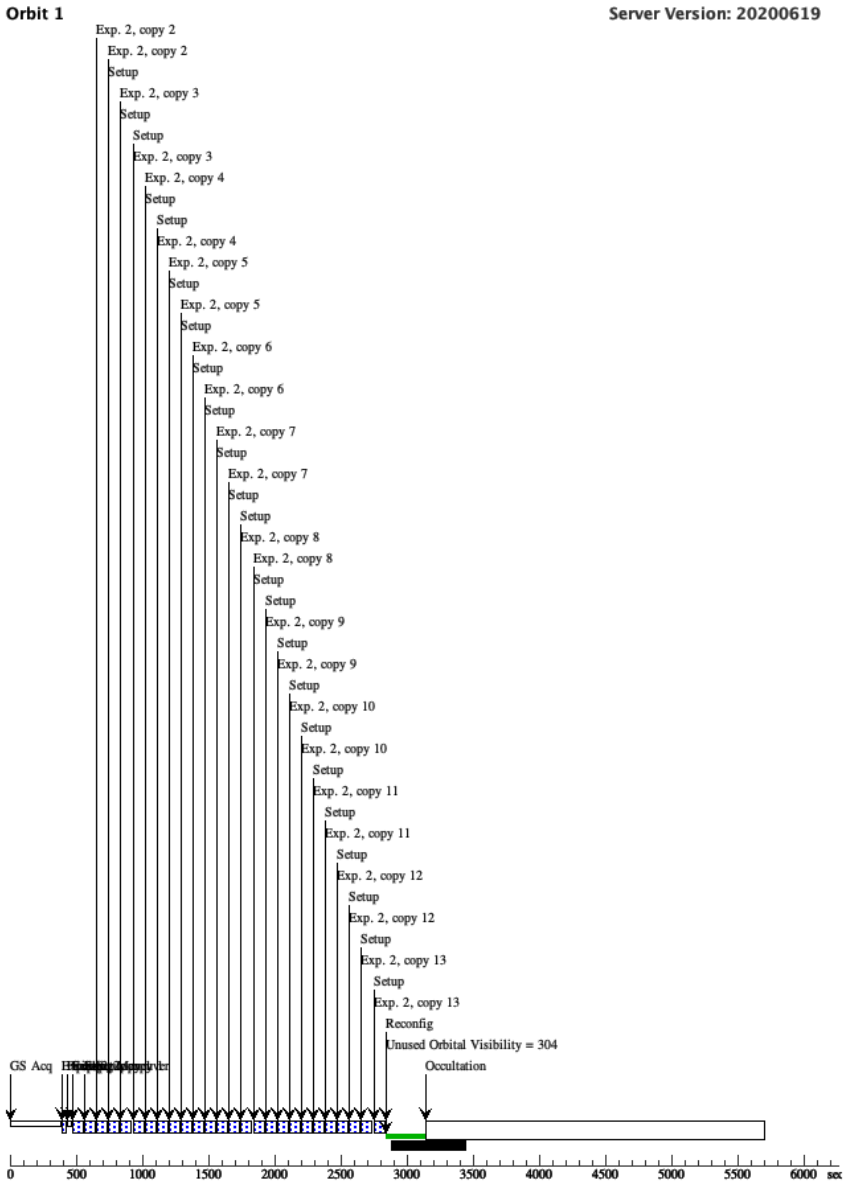
Orbit Structure



Visit

Proposal 15926, Transit 1.7 (07), scheduling Tue Dec 08 15:00:45 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

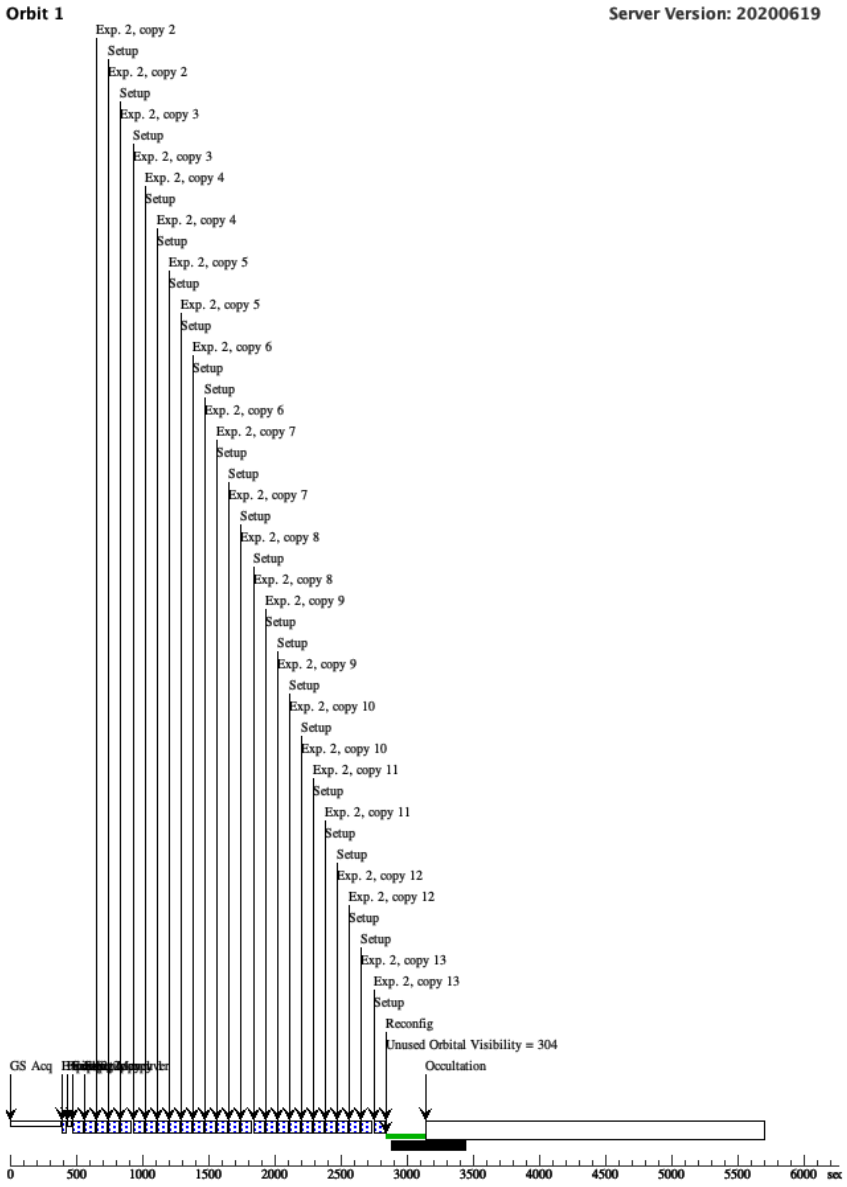
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.7 (07)	2.559081 Secs (2.559 Secs) *[==>]*	 ***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.7 (07)	46.695529 Secs X 13 (1214.084 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]*	 ***[1]***

Orbit Structure



Visit

Proposal 15926, Transit 1.8 (08), scheduling Tue Dec 08 15:00:45 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

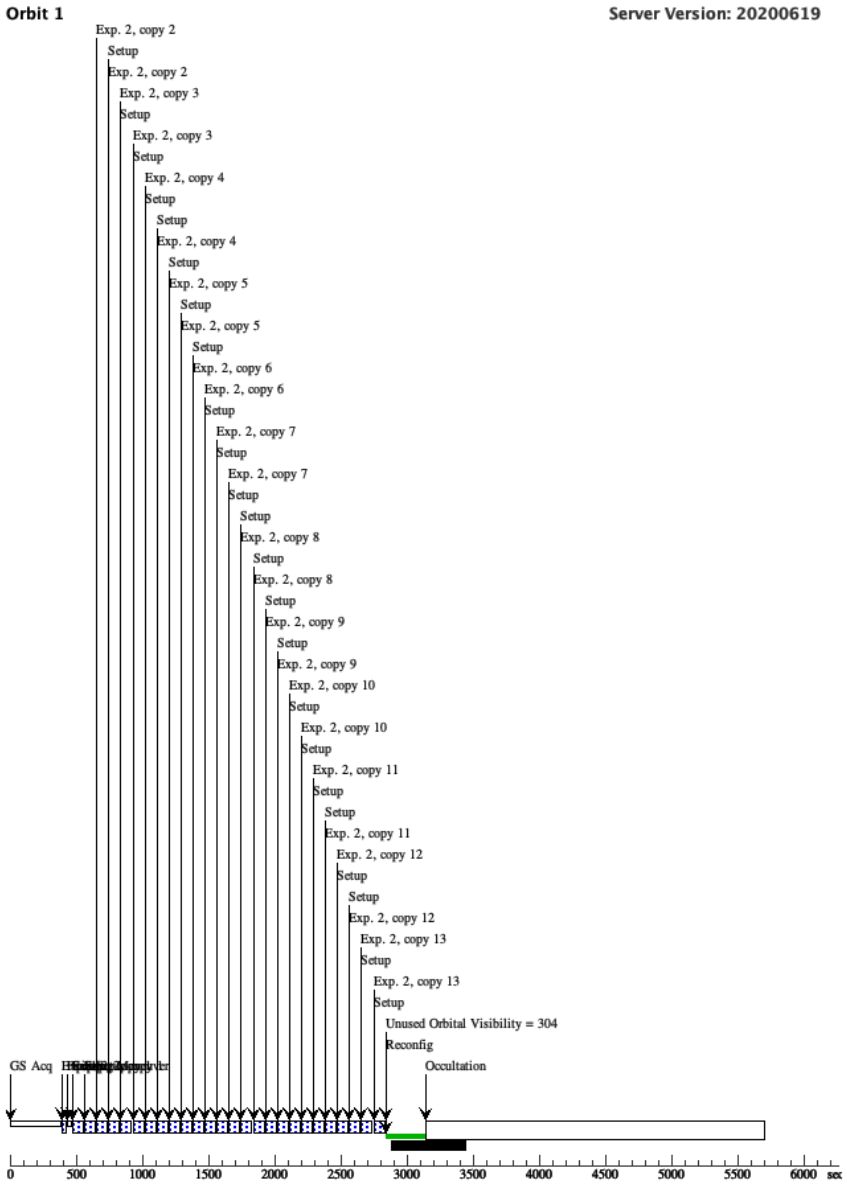
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

The proper motions and parallax come from Gaia DR2.
Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.8 (08)	2.559081 Secs (2.559 Secs) *[==>]*	 ***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.8 (08)	46.695529 Secs X 13 (1214.084 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]*	 ***[1]***

Orbit Structure



Visit

Proposal 15926, Transit 1.9 (09), scheduling Tue Dec 08 15:00:45 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-93396	RA: 10 46 49.7407 (161.7072529d) Dec: -09 23 56.49 (-9.39902d) Equinox: J2000	Proper Motion RA: -79.09104473978302 mas/yr Proper Motion Dec: -78.57561885699165 mas/yr Parallax: 0.01005624268" Epoch of Position: 2015.5	V=8.04 H=6.251	Reference Frame: SIMBAD

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Category=STAR
Description=[EXTRA-SOLAR PLANET, EXTRA-SOLAR PLANETARY SYSTEM]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	F130N	NSAMP=3; SAMP-SEQ=RAPID	POS TARG 0,-9	Sequence 1-2 Non-Int in Transit 1.9 (09)	2.559081 Secs (2.559 Secs)	
								[==>]	***[1]***
2		(1) HD-93396	WFC3/IR, MULTIACCUM, GRISM512	G102	NSAMP=3; SAMP-SEQ=SPARS25	POS TARG -16.5,-27.5; SPATIAL SCAN 0.96,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in Transit 1.9 (09)	46.695529 Secs X 13 (1214.084 Secs)	
								[==>(Copy 1, Forward)]	***[1]***
								[==>(Copy 1, Reverse)]	
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Orbit Structure