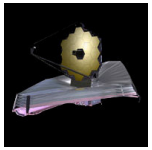

2734 - JWST Early Release Observation 8

Cycle: 0, Proposal Category: COM/ERO

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	HAT-P-18b NIRISS SOSS transit	NIRISS Single-Object Slitless Spectroscopy	(1) HAT-P-18
	2	WASP-96b NIRISS SOSS transit	NIRISS Single-Object Slitless Spectroscopy	(2) WASP-96

ABSTRACT

ERO observations of a transit of the HAT-P-18b exoplanet. This proposal contains NIRISS SOSS spectroscopy of a single transit.

OBSERVING DESCRIPTION

This is a 9-group per integration, 469-integration time-series exposure that aims to target transit of the exoplanet HAT-P-18b using NIRISS/SOSS. Our aim is to obtain a TSO sequence ousing the GR700XD disperser with the CLEAR filter using SUBSTRIP256 in order to capture both Order 1 and Order 2.

The exposure and special parameters for the Science Exposure were set as follows:

- Number of groups per integration: we use Pandexo and the JWST ETC to estimate these observing parameters. In particular, HAT-P-18b seems to saturate at 18 groups per integration using these tools. Following the JWST Documentation, we choose to target half this number of groups to reach the 9 groups per integrations used for the science observations.

- Number of integrations in the exposure: to define the total number of integrations, we again follow the JWST Documentation. With T14 = 2.71 hours being the transit duration, we use the dwell equation Tdwell = 0.75 hr + MAX(1 hr, T14/2) (before transit) + T14 (eclipse) + MAX(1 hr, T14/2)(after transit) + 1 hr (timing window) to find that we need a total of 7.15 hours to cover the event. Given each integration takes 54.94 seconds, we thus need a total of 469 integrations in our exposure.

- The orbital parameters were obtained by fitting the most recent TESS data for this system, obtained in Sectors 25 and 26 (see Patel & Espinoza, 2022). This has a forecasted uncertainty of about a minute for June 2022, which is when we expect to obtain these observations. This fit gave P = 5.5080234 +/- 0.0000056 and time-of-transit center of t0 = 2459033.31734 +/- 0.00022.

- We use the ExoCTK phase-constraint tool to define the phase-constraints (https://exoctk.stsci.edu/phase_constraint) ingested into the Special

Requirements section, using the ephemerides defined above. These are in line with the number of integrations defined above as well.

- We used the ExoCTK Contamination Calculator tool to find acceptable PA's for our observations as to avoid contamination for nearby targets. We included not only the closer 2MASS object to HAT-P-18b, but also the nearby sources detected by Gaia into this calculation.

- We define an F2777 exposure in order to isolate Order 1, which might help in decontaminating Order 1 and 2, as suggested in the JWST Documentation.

The exposure parameters for the Target Acquisition (TA) were calculated using the JWST ETC. In particular, we use the SOSSFAINT readout mode (Kmag = 10.234), and compute that the SNR for a 19-group TA exposure gives rise to a SNR of ~212, which is excellent for the purposes of centroiding --- and well below the number of groups before saturation (111).

-6/17/22 update: Add observation of WASP-96b to repeat failed observation of Hat-P-18b.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	HAT-P-18	RA: 17 05 23.1302 (256.3463758d) Dec: +33 00 44.37 (33.01232d) Equinox: J2000	Proper Motion RA: -0.0011188315643229703 sec of time/yr Proper Motion Dec: -0.03668899992135266 arcsec/yr Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Exoplanet Systems, Exoplanets, K dwarfs]* *Extended=NO*				
(2)	WASP-96	RA: 00 04 11.1377 (1.0464071d) Dec: -47 21 38.32 (-47.36064d) Equinox: J2000	Proper Motion RA: 0.0025189152082340975 sec of time/yr Proper Motion Dec: 0.0021920000000000004 arcsec/yr Epoch of Position: 2000	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Exoplanet Systems, Exoplanets, G dwarfs]* *Extended=NO*				

Observation

Proposal 2734, Observation 1: HAT-P-18b NIRISS SOSS transit Sat Jun 18 21:01:22 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Diagnostics

(HAT-P-18b NIRISS SOSS transit (Obs 1)) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.
(Exposure) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.
(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	HAT-P-18	RA: 17 05 23.1302 (256.3463758d) Dec: +33 00 44.37 (33.01232d) Equinox: J2000	Proper Motion RA: -0.0011188315643229703 sec of time/yr Proper Motion Dec: -0.03668899992135266 arcsec/yr Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Exoplanet Systems, Exoplanets, K dwarfs]
Extended=NO

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	1 HAT-P-18	SOSSFAINT	F480M	NISRAPID	19	1	1	1.024	87866

Template

Subarray	Include F277W Exposure?
SUBSTRIP256	true

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	NISRAPID	9	469	1	469	25776.465	87866
2	NISRAPID	9	11	1	11	604.565	87866

Special Requirements

Phase 0.9712540537079578 to 0.9788187764163899 with period 5.5080234 Days and zero-phase 2459033.31734 HJD
Aperture PA Range 175 to 215 Degrees (V3 174.43873283 to 214.43873283)
Time Series Observation
No Parallel

Observation

Proposal 2734, Observation 2: WASP-96b NIRISS SOSS transit Sat Jun 18 21:01:22 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Diagnostics

(WASP-96b NIRISS SOSS transit (Obs 2)) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.

(WASP-96b NIRISS SOSS transit (Obs 2)) Warning (Form): Record ETC Wkbk.Calc ID used to verify target acquisition.

(Exposure) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.

(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	WASP-96	RA: 00 04 11.1377 (1.0464071d) Dec: -47 21 38.32 (-47.36064d) Equinox: J2000	Proper Motion RA: 0.0025189152082340975 sec of time/yr Proper Motion Dec: 0.0021920000000000004 arcsec/yr Epoch of Position: 2000	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Exoplanet Systems, Exoplanets, G dwarfs]
Extended=NO

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	SOSSFAINT	F480M	NISRAPID	19	1	1	1.024	

Template

Subarray	Include F277W Exposure?
SUBSTRIP256	true

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	NISRAPID	14	280	1	280	23080.534	
2	NISRAPID	14	11	1	11	906.735	

Special Requirements

Phase 0.9549912539004579 to 0.9671557798733071 with period 3.4252602 Days and zero-phase 2459111.30170 HJD
Aperture PA Range 223 to 230 Degrees (V3 222.43873283 to 229.43873283)
Aperture PA Range 250 to 313 Degrees (V3 249.43873283 to 312.43873283)
Time Series Observation
No Parallel