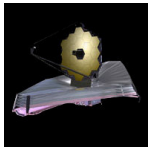

1353 - Transit and Eclipse Spectroscopy of a Hot Jupiter

Cycle: 1, Proposal Category: GTO

INVESTIGATORS

Name	*Institution*
Dr. Nikole Lewis (PI)	**Cornell University**
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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
WASP-17b				
	1	SOSS Transit	NIRISS Single-Object Slitless Spectroscopy	(1) WASP-17
	101	SOSS Transit Repeat	NIRISS Single-Object Slitless Spectroscopy	(1) WASP-17
	2	SOSS Eclipse	NIRISS Single-Object Slitless Spectroscopy	(1) WASP-17
	3	G395H Transit	NIRSpec Bright Object Time Series	(1) WASP-17
	4	G395H Eclipse	NIRSpec Bright Object Time Series	(1) WASP-17
	5	LRS Transit	MIRI Low Resolution Spectroscopy	(1) WASP-17
	6	LRS Eclipse	MIRI Low Resolution Spectroscopy	(1) WASP-17

ABSTRACT

We will construct both transmission and emission spectra of this planet over the entire 0.6-14 micron wavelength range using three transit observations (when the planet passes in front of host star) and three eclipse observations (when planet passes behind host star). Both the transmission and emission spectra will be obtained using a combination of NIRISS SOSS, NIRSpec SLIT1600 G395H, and MIRI LRS Slitless modes.

OBSERVING DESCRIPTION

ETC workbook ID is 86655

Ephemeris from Southworth (2012, MNRAS, 426, 1338) and confirmed via recent Hubble+Spitzer observations

Note that ephemeris for WASP-17b being pulled into ExoMAST is not reliable/correct.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

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

Observation

Proposal 1353, Observation 1: SOSS Transit Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Comments: ~exptime = 33647.040 s = 3600([4.4232]+[4.4232]) + 60*([30])*
inttime = 60.401 s = [5.49100]([10]+[1])*
nint = 557 = round(33647.040/60.401)
*exptime = 33643.357 s = [5.49100] * ([10]+[1]) * ([557])*
time_start = -17721.7 s = -0.5(33643.357) - 0.5*60*[30]*
*time_earlist = -18021.7 s = -17721.7 - 0.5*60*[10]*
*time_latest = -17421.7 s = -17721.7 + 0.5*60*[10]*
*phase_earlist = 0.944161 = 1 -18021.7/(3600*24*[3.7354845])*
*phase_latest = 0.946020 = 1 -17421.7/(3600*24*[3.7354845])*

Diagnostics

(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)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Exoplanet Systems, F stars]
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	0.93	86655

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	8	720	1	720	35615.866	86655
2	NISRAPID	8	10	1	10	494.665	

Special Requirements	Phase 0.936562637 to 0.947716922 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD Aperture PA Range 85 to 89 Degrees (V3 84.43873283 to 88.43873283) Aperture PA Range 99 to 110 Degrees (V3 98.43873283 to 109.43873283) Aperture PA Range 273 to 290 Degrees (V3 272.43873283 to 289.43873283) Time Series Observation No Parallel Attachments

Observation

Proposal 1353, Observation 101: SOSS Transit Repeat Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Comments: This observation is a TTRB-approved repeat of Obs 1 (SOSS Transit), which acquired the wrong guide star.

Diagnostics

(SOSS Transit Repeat (Obs 101)) 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 101:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Exoplanet Systems, F stars]
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	0.93	86655

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	8	720	1	720	35615.866	86655
2	NISRAPID	8	10	1	10	494.665	

Special Requirements	Phase 0.936562637 to 0.947716922 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD Aperture PA Range 85 to 89 Degrees (V3 84.43873283 to 88.43873283) Aperture PA Range 99 to 110 Degrees (V3 98.43873283 to 109.43873283) Aperture PA Range 273 to 290 Degrees (V3 272.43873283 to 289.43873283) Time Series Observation No Parallel Attachments Group Observations 2, 101 within 60 Days

Observation

Proposal 1353, Observation 2: SOSS Eclipse Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Comments: ~exptime = 33647.040 s = 3600([4.4232]+[4.4232]) + 60*([30])*
inttime = 60.401 s = [5.49100]([10]+[1])*
nint = 557 = round(33647.040/60.401)
*exptime = 33643.357 s = [5.49100] * ([10]+[1]) * ([557])*
time_start = -17721.7 s = -0.5(33643.357) - 0.5*60*[30]*
*time_earlist = -18021.7 s = -17721.7 - 0.5*60*[10]*
*time_latest = -17421.7 s = -17721.7 + 0.5*60*[10]*
*phase_earlist = 0.944161 = 1 -18021.7/(3600*24*[3.7354845])*
*phase_latest = 0.946020 = 1 -17421.7/(3600*24*[3.7354845])*

Diagnostics

(SOSS Eclipse (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.

(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
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Exoplanet Systems, F stars]
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	0.93	86655

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	8	720	1	720	35615.866	86655
2	NISRAPID	8	10	1	10	494.665	

Special Requirements	Phase 0.4365626373 to 0.4477169216 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD Aperture PA Range 85 to 89 Degrees (V3 84.43873283 to 88.43873283) Aperture PA Range 99 to 110 Degrees (V3 98.43873283 to 109.43873283) Aperture PA Range 273 to 290 Degrees (V3 272.43873283 to 289.43873283) Time Series Observation No Parallel Attachments Group Observations 2, 101 within 60 Days

Observation

Proposal 1353, Observation 3: G395H Transit Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Bright Object Time Series

Comments: ~exptime = 33647.040 s = 3600([4.4232]+[4.4232]) + 60*([30])*
inttime = 6.360 s = [0.15900]([40]+[0])*
nint = 5290 = round(33647.040/6.360)
*exptime = 33644.400 s = [0.15900] * ([40]+[0]) * ([5290])*
time_start = -17722.2 s = -0.5(33644.400) - 0.5*60*[30]*
*time_earlist = -18022.2 s = -17722.2 - 0.5*60*[10]*
*time_latest = -17422.2 s = -17722.2 + 0.5*60*[10]*
*phase_earlist = 0.944160 = 1 -18022.2/(3600*24*[3.7354845])*
*phase_latest = 0.946019 = 1 -17422.2/(3600*24*[3.7354845])*

Diagnostics

(G395H Transit (Obs 3)) 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 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

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

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	86655

Template

Subarray
SUB2048

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSRAPID	66	587	1	1	587	35486.78	86655

Special Requirements	Phase 0.936562637 to 0.947716922 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD Time Series Observation No Parallel Attachments Group Observations 3, 4 within 60 Days

Observation

Proposal 1353, Observation 4: G395H Eclipse Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Bright Object Time Series

Comments: ~exptime = 33647.040 s = 3600([4.4232]+[4.4232]) + 60*([30])*
inttime = 6.360 s = [0.15900]([40]+[0])*
nint = 5290 = round(33647.040/6.360)
*exptime = 33644.400 s = [0.15900] * ([40]+[0]) * ([5290])*
time_start = -17722.2 s = -0.5(33644.400) - 0.5*60*[30]*
*time_earlist = -18022.2 s = -17722.2 - 0.5*60*[10]*
*time_latest = -17422.2 s = -17722.2 + 0.5*60*[10]*
*phase_earlist = 0.944160 = 1 -18022.2/(3600*24*[3.7354845])*
*phase_latest = 0.946019 = 1 -17422.2/(3600*24*[3.7354845])*

Diagnostics

(G395H Eclipse (Obs 4)) 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 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

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

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	86655

Template

Subarray
SUB2048

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSRAPID	66	587	1	1	587	35486.78	86655

Special Requirements	Phase 0.4365626373 to 0.4477169216 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD Time Series Observation No Parallel Attachments Group Observations 3, 4 within 60 Days

Observation

Proposal 1353, Observation 5: LRS Transit Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Low Resolution Spectroscopy

Comments: ~exptime = 35447.040 s = 3600([4.4232]+[4.4232]) + 60*([60.0])*
inttime = 6.360 s = [0.15900]([40]+[0])*
nint = 5573 = round(35447.040/6.360)
*exptime = 35444.280 s = [0.15900] * ([40]+[0]) * ([5573])*
time_start = -19522.1 s = -0.5(35444.280) - 0.5*60*[60.0]*
*time_earlist = -19822.1 s = -19522.1 - 0.5*60*[10]*
*time_latest = -19222.1 s = -19522.1 + 0.5*60*[10]*
*phase_earlist = 0.938583 = 1 -19822.1/(3600*24*[3.7354845])*
*phase_latest = 0.940442 = 1 -19222.1/(3600*24*[3.7354845])*

Diagnostics

(LRS Transit (Obs 5)) 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 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

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

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F560W	FAST	22	1	1	3.499	86655

Template

Subarray	Obtain Verification Image?
SLITLESSPRISM	true

Dithers

#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset
1	NONE				

Pointing Verification

#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	PV ETC Wkbk.Calc ID	Filter
1	FASTR1	22	1	1	1	1	3.499		F560W

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTR1	175	638	1276	2	1	35716.249	86655

Special Requirements

Phase 0.936562637 to 0.947716922 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD
Aperture PA Range 96.83425324 to 112.83425324 Degrees (V3 91.99880427 to 107.99880427)
Aperture PA Range 280.83425324 to 300.83425324 Degrees (V3 275.99880427 to 295.99880427)
Time Series Observation
No Parallel Attachments
No Parallel Attachments

Group Observations 5, 6 within 60 Days

Observation

Proposal 1353, Observation 6: LRS Eclipse Fri Mar 03 00:01:29 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Low Resolution Spectroscopy

Comments: ~exptime = 35447.040 s = 3600([4.4232]+[4.4232]) + 60*([60.0])*
inttime = 6.360 s = [0.15900]([40]+[0])*
nint = 5573 = round(35447.040/6.360)
*exptime = 35444.280 s = [0.15900] * ([40]+[0]) * ([5573])*
time_start = -19522.1 s = -0.5(35444.280) - 0.5*60*[60.0]*
*time_earlist = -19822.1 s = -19522.1 - 0.5*60*[10]*
*time_latest = -19222.1 s = -19522.1 + 0.5*60*[10]*
*phase_earlist = 0.938583 = 1 -19822.1/(3600*24*[3.7354845])*
*phase_latest = 0.940442 = 1 -19222.1/(3600*24*[3.7354845])*

Diagnostics

(LRS Eclipse (Obs 6)) 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 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 6:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-17	RA: 15 59 50.9395 (239.9622479d) Dec: -28 03 42.46 (-28.06179d) Equinox: J2000	Proper Motion RA: -6.242534326250312E-4 sec of time/yr Proper Motion Dec: -0.009427000031791977 arcsec/yr Parallax: 0.0024811" Epoch of Position: 2015.5	

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

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F560W	FAST	22	1	1	3.499	86655

Template

Subarray	Obtain Verification Image?
SLITLESSPRISM	true

Dithers

#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset
1	NONE				

Pointing Verification

#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	PV ETC Wkbk.Calc ID	Filter
1	FASTR1	22	1	1	1	1	3.499		F560W

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTR1	175	638	1276	2	1	35716.249	86655

Special Requirements

Phase 0.4365626373 to 0.4477169216 with period 3.73548546 Days and zero-phase 2459359.28138246 HJD
Aperture PA Range 96.83425324 to 112.83425324 Degrees (V3 91.99880427 to 107.99880427)
Aperture PA Range 280.83425324 to 300.83425324 Degrees (V3 275.99880427 to 295.99880427)
Time Series Observation
No Parallel Attachments
No Parallel Attachments

Group Observations 5, 6 within 60 Days