

# 1177 - MIRI observations of transiting exoplanets

Cycle: 1, Proposal Category: GTO

# **INVESTIGATORS**

Name	Institution	E-Mail
Dr. Thomas P. Greene (PI)	NASA Ames Research Center	tom.greene@nasa.gov
Everett Schlawin (CoI) (Contact)	University of Arizona	eas342@email.arizona.edu
Dr. Pierre-Olivier Lagage (CoI) (ESA Member)	Commissariat a l'Energie Atomique (CEA)	pierre-olivier.lagage@cea.fr
Dr. Marcia J. Rieke (CoI)	University of Arizona	mrieke@as.arizona.edu

# **OBSERVATIONS**

Folder	Observation	Label	Observing Template	Science Target
MIRI L	RS Transiting Pl	anets		
	1	WASP-80b TRANS	MIRI Low Resolution Spectroscopy	(1) WASP-80
	2	WASP-80b EMIS	MIRI Low Resolution Spectroscopy	(1) WASP-80
	3	WASP-69 b EMIS	MIRI Low Resolution Spectroscopy	(2) WASP-69
	4	GJ 436b EMIS	MIRI Low Resolution Spectroscopy	(3) GJ-436
	5	GJ 436b EMIS	MIRI Low Resolution Spectroscopy	(3) GJ-436
	6	HAT-P-26 b TRANS	MIRI Low Resolution Spectroscopy	(4) HAT-P-26B
MIRIM	Transiting Plane	ets		
	7	TRAPPIST-1 b Sec Eclipse	MIRI Imaging	(5) TRAPPIST-1B
	8	TRAPPIST-1 b Sec Eclipse	MIRI Imaging	(5) TRAPPIST-1B
	9	TRAPPIST-1 b Sec Eclipse	MIRI Imaging	(5) TRAPPIST-1B
	10	TRAPPIST-1 b Sec Eclipse	MIRI Imaging	(5) TRAPPIST-1B

JWST Proposal 1177 (Created: Tuesday, June 11, 2019 at 11:00:14 AM Eastern Standard Time) - Overview

Folder	Observation	Label	Observing Template	Science Target
	11	TRAPPIST-1 b Sec Ecl	MIRI Imaging	(5) TRAPPIST-1B
		ipse		

#### **ABSTRACT**

We will observe the 5 - 15 micron spectra or photometry of a set of transiting planets that are less massive and cooler than ones spectrally characterized so far with HST and Spitzer. These planets fall mostly in the temperature range 400 - 1000 K with 1 - 200 Earth mass. We seek to obtain transmission and emission spectra (both for at least one planet) to probe a wide range of atmospheric pressures (altitudes) and surface regions. Simulations of these spectra and information retrievals show that we can measure mixing ratios of dominant molecular species, measure metallicities, determine pressure-temperature profiles, and perhaps detect new species not seen before in exoplanet atmospheres. We plan to observe four ice or gas giant planet spectra with the MIRI LRS and make 5 secondary eclipse observations of TRAPPIST-1 b using the MIRI imager in the F1500W filter. These 11 MIRI observations are conducted under T. Greene's GTO program and correspond to Observation IDs GREENE\_0001-11 in the summary observation specification spreadsheet submitted in March 2017 with one change: HAT-P-19 b has been replaced with WASP-69 b. The TRAPPIST-1 observations and spectroscopic observations of WASP-107b are being done in collaboration with the European MIRI GTO team (Wright PI). The other observations are being done in collaboration with NIRCam GTO team (M. Rieke PI). We will use state-of-the-art modeling and retrieval framework to derive physical and chemical properties from the combined NIRCam and MIRI exoplanet spectra.

#### **OBSERVING DESCRIPTION**

This file contains the specifications of the MIRI component of our transiting planet spectroscopy and imaging photometry program.

Time-series observations will be taken using either the MIRI LRS in slitless mode (targets WASP-80 b, HAT-P-19 b, GJ 436 b, and HAT-P-26 b) or with the MIRI imager (TRAPPIST-1 b). Each science observation consists of a single exposure. The time-series templates in APT 25.2.2 (latest version) are incomplete for both of these modes so there are errors. We do not allow parallel observations (in line with other JWST time-series modes). We require precise target acquisition for all observations, a standard component of all other JWST time-series observations.

These observations have 2 types of timing constraints:

- 1. Precise timing starts phased with observing either transits or secondary eclipses as desired
- 2. PA constraints to avoid spectral contamination from nearby bright stars.

PA constraints for the MIRI Imager observations of TRAPPIST-1 are set to get a nearby K = 13.5 2MASS star in the imager field at the same time. I may wish to change this in the future to get a slightly brighter star instead. That will require entering a significant coordinate offset and changing the

JWST Proposal 1177 (Created: Tuesday, June 11, 2019 at 11:00:14 AM Eastern Standard Time) - Overview PA constraints.

I also specified V3 PA = 0 to 359.5 deg for otherwise unconstrained observations in order to achieve better visibilities (better guide star access)

We have chosen exposure parameters to achieve about 55 - 65% full-well (~110,000 - 135,00) electrons for the science integrations and slightly lower for target acquisition integrations.

This is a summary of our 11 observations. All

Obs#	Obs ID	TARGET	PHASE*	MODE / SUBARRAY**
1	GREENE_0002	WASP-80 b	1.0	LRS SLITLESSPRISM
2	GREENE_0001	WASP-80 b	0.5	LRS SLITLESSPRISM
3	GREENE_0003	WASP-69 b	0.5	LRS SLITLESSPRISM
4	GREENE_0004	GJ 436 b	0.5	LRS SLITLESSPRISM
5	GREENE_0005	GJ 436 b	0.5	LRS SLITLESSPRISM
6	GREENE_0006	HAT-P-26 b	1.0	LRS SLITLESSPRISM
7	GREENE_0007	TRAPPIST-1 b	0.5	MIRIM FULL
8	GREENE_0008	TRAPPIST-1 b	0.5	MIRIM FULL
9	GREENE_0009	TRAPPIST-1 b	0.5	MIRIM FULL
10	GREENE_0010	TRAPPIST-1 b	0.5	MIRIM FULL
11	GREENE_0011	TRAPPIST-1 b	0.5	MIRIM FULL

<sup>\*</sup>PHASE 0.5 corresponds to a secondary eclipse observation and 1.0 corresponds to a transit. Each observation has precise phase constraints.

In APT25.2.4, each observation gives errors for not dithering and exceeding 10,000 s. We have been assured that these limitations will be lifted once proper time-series modes are implemented, well before Cycle 1.

<sup>\*\*</sup> ALL Modes are time-series observations with precision target acquisition, do dither, no parallels

Proposal 1177 - Targets - MIRI observations of transiting exoplanets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-80	RA: 20 12 40.0319 (303.1667996d) Dec: -02 08 39.97 (-2.14444d) Equinox: J2000	Proper Motion RA: -0.008856802653901206 sec of time/yr Proper Motion Dec: -0.050428999907126126 arcsec/ Parallax: 0.0200565" Epoch of Position: 2015.5	'yr
Category= Descriptio	=Star on=[Exoplanet Systems, K dy	by the targetselector and retrieved from the SIMBAD database warfs, K stars]	•	
Extended= (2)  Comments	WASP-69	RA: 21 00 6.2319 (315.0259663d)  Dec: -05 05 41.49 (-5.09486d)  Equinox: J2000  by the targetselector and retrieved from the SIMBAD database	Proper Motion RA: 0.0022539720183223475 sec of time/yr Proper Motion Dec: -0.09343599992917007 arcsec/y Parallax: 0.0199871" Epoch of Position: 2015.5	т
Category=	=Star on=[Exoplanet Systems   K dy		(Outu 2013.5 Epoch)	
(3)  Comments Category=	GJ-436	RA: 11 42 12.1287 (175.5505362d) Dec: +26 42 11.04 (26.70307d) Equinox: J2000	Proper Motion RA: 0.06679350522402193 sec of time/yr Proper Motion Dec: -814.030 mas/yr Parallax: 0.1025015" Epoch of Position: 2015.5	
Comments Category= Descriptio Extended=	=Star on=[Exoplanet Systems, M dv	by the targetselector and retrieved from the SIMBAD database warfs, M stars]	1	
(4)	HAT-P-26B	RA: 14 12 37.5722 (213.1565508d) Dec: +04 03 33.90 (4.05942d) Equinox: J2000	Proper Motion RA: 37.8 mas/yr Proper Motion Dec: -142.9 mas/yr Parallax: 0.0070" Epoch of Position: 2015.5	
HAT-P-26 (Gaia 201. Category=	6 b: K = 9.6 mag, T* = 5079 5.5 Epoch) =Star on=[Exoplanet Systems, Exop	by the targetselector and retrieved from the SIMBAD database $K$ , $Tpl=1000~K$ , $Rp=6.2~Re$ , $Mp=19~Me$ planets, $K$ dwarfs, $K$ stars]	•	
(5)	TRAPPIST-1B	RA: 23 06 30.3341 (346.6263921d) Dec: -05 02 36.46 (-5.04346d) Equinox: J2000	Proper Motion RA: 930.9 mas/yr Proper Motion Dec: -479.4 mas/yr Parallax: 0.0804" Epoch of Position: 2015.5	
TRAPPIST Category=	T-1 star and b planet =Star on=[Exoplanet Systems, Exop	by the targetselector and retrieved from the SIMBAD database planets, M dwarfs, M stars]	(Gaia 2015.5 Epoch)	

<u>Pro</u>	<u>oposal 1177 - Observat</u>	<u>ilon 1 - Milki obse</u>	<u>rvations of transit</u>	<u>ling exoplanets</u>	5			
nc	Proposal 1177, Observation 1: WA	ASP-80b TRANS					Tue	Jun 11 16:00:14 GMT 2019
Observation	Diagnostic Status: Warning							
<u>2</u>	Observing Template: MIRI Low Res	solution Spectroscopy						
Se	Comments: All LRS observations are	e done in time-series mode w	ith precision target acquisit	ion and no dithers				
Ιŏ								
Diagnostics		ads are provisional until the '	Visit Planner has been run.		·			e exposure.
	# Name	Target Coordina			ord. Corrections		scellaneous	
ts	(1) WASP-80		9 (303.1667996d)	Proper M time/yr	otion RA: -0.00885680265	53901206 sec of		
ge		Dec: -02 08 39.97	7 (-2.14444d)	•	otion Dec: -0.0504289999	07126126 arcsec/vr		
Targets		Equinox: J2000		=	0.0200565"	07120120 tiresee, y1		
٦٦					Position: 2015.5			
Fixed	Comments: This object was generate	ed by the targetselector and r	etrieved from the SIMBAD	•				
证	Category=Star		enterea from the SIMBIB	aanaouse.(Gana 2013.5 1	spoon)			
	Description=[Exoplanet Systems, K Extended=NO	dwarfs, K stars]						
ΙΞ	# Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	<b>Total Integrations</b>	Total Exposure Ti	ime ETC Wkbk.Calc ID
ition		Filter F1000W	Readout Pattern FAST	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Ti	ime ETC Wkbk.Calc ID 24835.8
uisition	# Target	•	•					
cquisition	# Target	•	•					
Acquisition	# Target	•	•					
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Template	# Target  1 SAME  Subarray SLITLESSPRISM	•	•	12			1.908	
Template	# Target  1 SAME  Subarray SLITLESSPRISM  #	F1000W	FAST	12	1	1	1.908	24835.8
Template	# Target  1 SAME  Subarray SLITLESSPRISM  #	F1000W	FAST	12	1	1	1.908	24835.8
Dithers Template	# Target  1 SAME  Subarray SLITLESSPRISM  # 1	F1000W  Dither Type  NONE	FAST	12 Spectra	1	No. Spatial Steps	1.908 Spatial	24835.8
Dithers Template	# Target  1 SAME  Subarray SLITLESSPRISM  # 1	F1000W  Dither Type  NONE  dout Pattern G	FAST  No. Spectral Steps	12	al Step Offset	No. Spatial Steps	1.908  Spatia	24835.8  1 Step Offset
Dithers Template	# Target  1 SAME  Subarray SLITLESSPRISM  # 1  # Reac	F1000W  Dither Type  NONE  dout Pattern G	FAST  No. Spectral Steps	12 Spectra	al Step Offset	No. Spatial Steps  Total Expe	1.908  Spatia	24835.8  I Step Offset  TC Wkbk.Calc ID
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Template	# Target  1 SAME  Subarray SLITLESSPRISM  # 1  # Reac	F1000W  Dither Type  NONE  dout Pattern G	FAST  No. Spectral Steps	12 Spectra	al Step Offset	No. Spatial Steps  Total Expe	1.908  Spatia	24835.8  I Step Offset  TC Wkbk.Calc ID

Proposal 1177 - Observation 1 - MIRI observations of transiting exoplanets

ts	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
Spectral Elements	1	FAST	27	5006	5006	1	1	21496.164	24835.6
Special Requirements	Aperture PA Range 82 Aperture PA Range 11 Aperture PA Range 26	6114 with period 3.0678; 2.015224 to 94.015224 E 11.015224 to 172.015224 62.015224 to 273.015224 91.015224 to 352.015224 ion	Degrees (V3 77.565519 to Degrees (V3 106.56551 Degrees (V3 257.56551	9 89.565519) 19 to 167.565519) 19 to 268.565519)					

Pro	posal 1177 - Observation	n 2 - MIRI observa	tions of transit	ing exoplanets				
	Proposal 1177, Observation 2: WASP-						Tue Ju	n 11 16:00:14 GMT 2019
ä	Diagnostic Status: Warning							
≥	Observing Template: MIRI Low Resolut							
Observation	Comments: All LRS observations are do	ne in time-series mode with p	recision target acquisiti	on and no dithers				
_	(WASP-80b EMIS (Obs 2)) Warning (Fo	orm): Exposure Duration exc	eeds the limit of 10000.	) seconds. Above this lin	nit it is possible that a Hig	gh Gain Antenna move m	nay occur during the expo	osure.
Diagnostics	(Visit 2:1) Warning (Form): Overheads a	_			,			
	# Name	Target Coordinates		Targ. Co	ord. Corrections	Mi	scellaneous	
छ	(1) WASP-80	RA: 20 12 40.0319 (3	03.1667996d)		otion RA: -0.00885680265	53901206 sec of		
Targets		Dec: -02 08 39.97 (-2.	14444d)	time/yr	otion Dec: -0.0504289999	007126126 arcsec/yr		
ā		Equinox: J2000		=	).0200565"	07120120 arcsec/yr		
Epoch of Position: 2015.5								
Fixed	Comments: This object was generated by	v the targetselector and retrie	ved from the SIMBAD (					
╽╓	Category=Star		vea from the simbile t	anaouse.(Gana 2015.5 E	poen			
	Description=[Exoplanet Systems, K dwa Extended=NO	rfs, K stars J						
on	# Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	<b>Total Integrations</b>	Total Exposure Time	ETC Wkbk.Calc ID
Acquisition	1 SAME	F1000W	FAST	12	1	1	1.908	24835.8
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Confirmation	# Readout 1 FAST	Pattern Group	S/IIIt	Integrations/Exp	Total Integration	1.908	2483	Wkbk.Calc ID
nat	I FASI	12		1	1	1.500	2463	J.0
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Proposal 1177 - Observation 2 - MIRI observations of transiting exoplanets

ts	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
Spectral Elements	1	FAST	27	5006	5006	1	1	21496.164	24835.6
Special Requirements	Aperture PA Range 82 Aperture PA Range 11 Aperture PA Range 26	2.015224 to 94.015224 l 11.015224 to 172.01522 52.015224 to 273.01522 91.015224 to 352.01522	Degrees (V3 77.56551 4 Degrees (V3 106.56 4 Degrees (V3 257.56	55519 to 167.565519) 55519 to 268.565519)	D				

Pro	posal 1177 - Observ	ation 3 - MIRI obs	servations of transit	ting exoplanets				
on	Proposal 1177, Observation 3:	WASP-69 b EMIS					Tue Jur	11 16:00:14 GMT 2019
Observation	Diagnostic Status: Warning							
≥	Observing Template: MIRI Low							
pse	Comments: All LRS observations	are done in time-series mode	e with precision target acquisiti	ion and no dithers				
ō								
Diagnostics	(WASP-69 b EMIS (Obs 3)) War (Visit 3:1) Warning (Form): Ove			.0 seconds. Above this li	mit it is possible that a Hi	gh Gain Antenna move r	nay occur during the exp	osure.
	# Name	Target Coord			ord. Corrections		scellaneous	
ts	(2) WASP-69		319 (315.0259663d)	Proper Mo time/yr	otion RA: 0.00225397201	83223475 sec of		
Targets			1.49 (-5.09486d)	•	otion Dec: -0.0934359999	2017007 arcsac/yr		
a.		Equinox: J200	0	=	).0199871"	2917007 arcsec/yr		
Epoch of Position: 2015.5								
Fixed	Comments: This object was gene	rated by the targetselector ar	nd retrieved from the SIMRAD	•				
ĮŒ	Category-Star		a retrieved from the SIMBIB	unabase.(Gana 2015.5 E	росп)			
	Description=[Exoplanet Systems Extended=NO	, K dwarfs, K stars]						
ou	# Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	<b>Total Integrations</b>	Total Exposure Time	ETC Wkbk.Calc ID
Acquisition	1 SAME	F1000W	FAST	10	1	1	1.59	24835.8
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Template	Subarray							
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e								
Dithers	#	Dither Type	No. Spectral Steps	Spectra	l Step Offset	No. Spatial Steps	Spatial St	ep Offset
ΙĚ	1	NONE						
5	# R	eadout Pattern	Groups/Int	Integrations/Exp	Total Integration	s Total Expo	sure Time ETC	Wkbk.Calc ID
	I1 F	AST	10	1	1	1.59	2483	5.8
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Confirmation								

Proposal 1177 - Observation 3 - MIRI observations of transiting exoplanets

ts	# Read	lout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
Spectral Elements	1 FAST	Γ	14	10050	10050	1	1	22376.928	24835.11
Special Requirements	Phase 0.45713 to 0.46791 wit Time Series Observation No Parallel	h period 3.868138	32 Days and zero-phase 2	455748.83422 HJD					

<u>Pro</u>	posal 1177 - Observa	ation 4 - MIRI obse	rvations of transit	ting exoplanets	•			
on	Proposal 1177, Observation 4: 0	GJ 436b EMIS					Tue Ju	nn 11 16:00:14 GMT 2019
Observation	Diagnostic Status: Warning							
≥	Observing Template: MIRI Low l							
pse	Comments: All LRS observations	are done in time-series mode w	rith precision target acquisit	ion and no dithers				
-								
Diagnostics	(GJ 436b EMIS (Obs 4)) Warning (Visit 4:1) Warning (Form): Over	=		econds. Above this limit	it is possible that a High C	Gain Antenna move may	occur during the exposi	ıre.
	# Name	Target Coordin	ates	Targ. Co	ord. Corrections	Mi	scellaneous	
S	(3) GJ-436	RA: 11 42 12.12	87 (175.5505362d)		otion RA: 0.066793505224	402193 sec of		
Je		Dec: +26 42 11.0	04 (26.70307d)	time/yr				
Targets		Equinox: J2000		_	otion Dec: -814.030 mas/y	r		
Ϊ̈́̈					0.1025015" Position: 2015.5			
Fixed	Comments: This object was gener	rated by the targetselector and	ratriaved from the SIMRAD.			Enoch)		
匝	Category-Star		retrieved from the SIMBAD (	uatabase ana Gata jor tr	ie parailax.(Gaia 2015.5 L	гросп)		
	Description=[Exoplanet Systems, Extended=NO	M dwarfs, M stars]						
n	# Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	<b>Total Integrations</b>	Total Exposure Tim	e ETC Wkbk.Calc ID
Acquisition	1 SAME	F1500W	FAST	10	1	1	1.59	24835.8
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Template	Subarray							
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	ш	Dither Type	No. Spectral Steps	S4	al Step Offset	No. Spatial Steps	C4:-1 6	Step Offset
ē	1	NONE	No. Spectral Steps	Spectra	ıı Step Oliset	No. Spatial Steps	Spanars	otep Offset
Dithers		NONE						
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nat	I FA	AST 10	J	1	1	1.59	248	35.8
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Confirmation								

Proposal 1177 - Observation 4 - MIRI observations of transiting exoplanets

ts	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
Spectral Elements	1	FAST	5	21691	21691	1	1	17248.683	24835.2
Special Requirements	Aperture PA Range ( Time Series Observa No Parallel	55073 with period 2.6438 0 to 359.5 Degrees (V3 35 tion	38312 Days and zero-pha 55.550295 to 355.050295	se 2454510.80162 HJD )					

Pro	posal 1177 - Obse	rvation 5 - MIRI ob	servations of transi	ting exoplanets	3					
	Proposal 1177, Observation						Tue J	un 11 16:00:14 GMT 2019		
aţi.	Diagnostic Status: Warning									
<u> </u>	Observing Template: MIRI Lo									
Observation	Comments: All LRS observation	ons are done in time-series mo	de with precision target acquisit	ion and no dithers						
_	(GJ 436b EMIS (Obs 5)) War	ning (Form): Exposure Duratio	on exceeds the limit of 10000.0 s	econds. Above this limit	it is possible that a High (	Gain Antenna move may	occur during the expos	sure.		
Diagnostics		=	the Visit Planner has been run.				3			
	# Name	Target Coor			ord. Corrections		iscellaneous			
ध	(3) GJ-436		2.1287 (175.5505362d)	Proper M time/yr	otion RA: 0.06679350522	402193 sec of				
Targets			11.04 (26.70307d)	•	otion Dec: -814.030 mas/y	.7 <b>r</b>				
ā		Equinox: J20	000		0.1025015"	y1				
٦ ا					Epoch of Position: 2015.5					
Fixed	Comments: This object was ge	enerated by the targetselector	and retrieved from the SIMBAD	•		Epoch)				
Category=Star Description=[Exoplanet Systems, M dwarfs, M stars]										
	Description=[Exoplanet Syste Extended=NO	ems, M awarfs, M stars J								
on	# Targe	et Filter	Readout Pattern	Groups/Int	Integrations/Exp	<b>Total Integrations</b>	Total Exposure Tir	ne ETC Wkbk.Calc ID		
Acquisition	1 SAM	E F1500W	FAST	10	1	1	1.59	24835.8		
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ate	Subarray									
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Template										
_	#	Dither Type	No Spectral Stone	Cnostw	al Step Offset	No. Spatial Steps	Cnotial	Step Offset		
ē	1	NONE	No. Spectral Steps	Specir	ar Step Offset	No. Spatial Steps	Spauai	Step Offset		
Dithers		NONE								
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Į.	1	Readout Pattern FAST	Groups/Int	Integrations/Exp	Total Integration	1.59		CC Wkbk.Calc ID 835.8		
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Confirmation										

Proposal 1177 - Observation 5 - MIRI observations of transiting exoplanets

ts	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	<b>Total Exposure Time</b>	ETC Wkbk.Calc ID
Spectral Elements	1	FAST	5	21691	21691	1	1	17248.683	24835.2
Special Requirements	Phase 0.53496 to 0.55 Aperture PA Range 0 Time Series Observati No Parallel	5073 with period 2.6438 to 359.5 Degrees (V3 35 ion	8312 Days and zero-pha: 5.550295 to 355.050295	se 2454510.80162 HJD					

Pro	posal 1177 - Observa	ation 6 - MIRI obs	ervations of transit	ing exoplanet	3			
o	Proposal 1177, Observation 6: H	IAT-P-26 b TRANS					ר	Tue Jun 11 16:00:14 GMT 201
Observation	Diagnostic Status: Warning							
≥	Observing Template: MIRI Low R							
SS	Comments: All LRS observations of	are done in time-series mode	with precision target acquisit	on and no dithers				
ō								
cs	(HAT-P-26 b TRANS (Obs 6)) W	arning (Form): Exposure Du	ration exceeds the limit of 100	00.0 seconds. Above th	is limit it is possible that a	High Gain Antenna mov	e may occur during	g the exposure.
Diagnostics	(Visit 6:1) Warning (Form): Overh	heads are provisional until th	e Visit Planner has been run.					
2								
ag								
٥								
	# Name	Target Coordi	nates	Targ. C	oord. Corrections	Mi	scellaneous	
	(4) HAT-P-26B	RA: 14 12 37.5	722 (213.1565508d)	Proper N	Iotion RA: 37.8 mas/yr			
Targets		Dec: +04 03 33	3.90 (4.05942d)	Proper N	Iotion Dec: -142.9 mas/yr			
Ď		Equinox: J2000	)	Parallax	0.0070"			
l E				Epoch of	Position: 2015.5			
Fixed	Comments: This object was general HAT-P-26 b: $K = 9.6$ mag, $T^* = 5$ (Gaia 2015.5 Epoch) Category=Star Description=[Exoplanet Systems,	1079  K, Tpl = 1000  K, Rp = 0	5.2  Re, Mp = 19  Me	database.				
	Extended=NO	Exopiancis, R awarjs, R star	3)					
5	# Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure	Time ETC Wkbk.Calc ID
Acquisition	1 SAME	F560W	FAST	12	1	1	1.908	24835.8
lis								
b								
٧								
te	Subarray							
Template	SLITLESSPRISM							
Ĕ								
≝								
ร	#	Dither Type	No. Spectral Steps	Specti	al Step Offset	No. Spatial Steps	Spa	tial Step Offset
he	1	NONE			_			
Dithers								
	# Re	adout Pattern	Groups/Int	Integrations/Exp	Total Integration	as Total Expo	sure Time	ETC Wkbk.Calc ID
Confirmation	1 FA	-	12	1	1	1.908	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	24835.8
πa	171		- <b>-</b>	•	<u>.</u>	1.700		2.000.0
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J.								
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Proposal 1177 - Observation 6 - MIRI observations of transiting exoplanets

ts	# Readou	ıt Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
Spectral Elements	1 FAST		90	1678	1678	1	1	24018.221	24835.1
Special Requirements	Phase 0.95862 to 0.96847 with Aperture PA Range 17.015224 t Aperture PA Range 200.015224 Time Series Observation No Parallel	o 155.015224	Degrees (V3 12.56551	9 to 150.565519)					

Proposal 1177 - Observation 7 - MIRI observations of transiting exoplanets

Proposal 1177, Observation 7: TRAPPIST-1 b Sec Eclipse

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: All MIRI Imager observations are done in time-series mode with precision target acquisition and no dithers

PA constraints are set for the object to be near the center and to get the nearby 2MASS K = 13.5 star in the field

Offsets are set to minimal values to serve as a placeholder in I decide to move the star elsewhere in the array, pending on-orbit performance

(TRAPPIST-1 b Sec Eclipse (Obs 7)) 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.

Tue Jun 11 16:00:14 GMT 2019

(Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous			
S	(5)	TRAPPIST-1B	RA: 23 06 30.3341 (346.6263921d)	Proper Motion RA: 930.9 mas/yr				
gets			Dec: -05 02 36.46 (-5.04346d)	Proper Motion Dec: -479.4 mas/yr				
Tarç			Equinox: J2000	Parallax: 0.0804"				
ďΤ				Epoch of Position: 2015.5				
ec	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database (Gaia 2015.5 Epoch)							

TRAPPIST-1 star and b planet

Category=Star

Description=[Exoplanet Systems, Exoplanets, M dwarfs, M stars] Extended=NO

# Template Subarray

FULL

**Diagnostics** 

# Filter Readout	Pattern Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1 F1500W FAST	14	404	1	None	1	404	15695.626	24835.4
Spectral								
D   D								

Phase 0.41578 to 0.44339 with period 1.51087081 Days and zero-phase 2457322.51736 HJD

Aperture PA Range 74.449705 to 154.449705 Degrees (V3 70.0 to 150.0)

Aperture PA Range 254.449705 to 334.449705 Degrees (V3 250.0 to 330.0)

Offset 0.5 arcsec, 0.5 arcsec

Time Series Observation

No Parallel

Proposal 1177 - Observation 8 - MIRI observations of transiting exoplanets

Proposal 1177, Observation 8: TRAPPIST-1 b Sec Eclipse

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: All MIRI Imager observations are done in time-series mode with precision target acquisition and no dithers

PA constraints are set for the object to be near the center and to get the nearby 2MASS K = 13.5 star in the field

Offsets are set to minimal values to serve as a placeholder in I decide to move the star elsewhere in the array, pending on-orbit performance

Diagnostics (TRAPPIST-1 b Sec Eclipse (Obs 8)) 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.

Tue Jun 11 16:00:15 GMT 2019

(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
S	(5)	TRAPPIST-1B	RA: 23 06 30.3341 (346.6263921d)	Proper Motion RA: 930.9 mas/yr	
Jet	(5)		Dec: -05 02 36.46 (-5.04346d)	Proper Motion Dec: -479.4 mas/yr	
arç			Equinox: J2000	Parallax: 0.0804"	
F				Epoch of Position: 2015.5	
ê	Comments: Th	his object was generated by the t	argetselector and retrieved from the SIMBAD database (Ga	ia 2015.5 Epoch)	

TRAPPIST-1 star and b planet

Category=Star

Description=[Exoplanet Systems, Exoplanets, M dwarfs, M stars] Extended=NO

Template Subarray

**FULL** 

# Filter Readout	Pattern Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1 F1500W FAST	14	404	1	None	1	404	15695.626	24835.4
Spectral								
D   D								

Phase 0.41578 to 0.44339 with period 1.51087081 Days and zero-phase 2457322.51736 HJD

Aperture PA Range 74.449705 to 154.449705 Degrees (V3 70.0 to 150.0) Aperture PA Range 254.449705 to 334.449705 Degrees (V3 250.0 to 330.0)

Offset 0.5 arcsec, 0.5 arcsec

Special Requirements Time Series Observation

No Parallel

Proposal 1177 - Observation 9 - MIRI observations of transiting exoplanets

Proposal 1177, Observation 9: TRAPPIST-1 b Sec Eclipse

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: All MIRI Imager observations are done in time-series mode with precision target acquisition and no dithers

PA constraints are set for the object to be near the center and to get the nearby 2MASS K = 13.5 star in the field

Offsets are set to minimal values to serve as a placeholder in I decide to move the star elsewhere in the array, pending on-orbit performance

**Diagnostics** (TRAPPIST-1 b Sec Eclipse (Obs 9)) 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.

Tue Jun 11 16:00:15 GMT 2019

(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous	
ر ا	(5)	TRAPPIST-1B	RA: 23 06 30.3341 (346.6263921d)	Proper Motion RA: 930.9 mas/yr		
<b>1 2 3</b>	(5)		Dec: -05 02 36.46 (-5.04346d)	Proper Motion Dec: -479.4 mas/yr		
	<u>"</u>		Equinox: J2000	Parallax: 0.0804"		
ΙË	:			Epoch of Position: 2015.5		
9	Comn	nents: This object was generated i	by the targetselector and retrieved from the SIMBAD a	database (Gaia 2015.5 Epoch)		
۱÷	TRAP	nents: This object was generated in PIST-1 star and b planet orveStar				

Category=Star

Description=[Exoplanet Systems, Exoplanets, M dwarfs, M stars]

Extended=NO

#### Subarray

FULL

Template

ents	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Eleme	1	F1500W	FAST	14	404	1	None	1	404	15695.626	24835.4
ctra											
Spectral											

Phase 0.41578 to 0.44339 with period 1.51087081 Days and zero-phase 2457322.51736 HJD

Aperture PA Range 74.449705 to 154.449705 Degrees (V3 70.0 to 150.0)

Aperture PA Range 254.449705 to 334.449705 Degrees (V3 250.0 to 330.0)

Offset 0.5 arcsec, 0.5 arcsec

Time Series Observation

No Parallel

## Proposal 1177 - Observation 10 - MIRI observations of transiting exoplanets

Proposal 1177, Observation 10: TRAPPIST-1 b Sec Eclipse

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: All MIRI Imager observations are done in time-series mode with precision target acquisition and no dithers

PA constraints are set for the object to be near the center and to get the nearby 2MASS K = 13.5 star in the field

Offsets are set to minimal values to serve as a placeholder in I decide to move the star elsewhere in the array, pending on-orbit performance

Diagnostics (TRAPPIST-1 b Sec Eclipse (Obs 10)) 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.

Tue Jun 11 16:00:15 GMT 2019

(Visit 10:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
s	(5)	TRAPPIST-1B	RA: 23 06 30.3341 (346.6263921d)	Proper Motion RA: 930.9 mas/yr	
Jet	(5)		Dec: -05 02 36.46 (-5.04346d)	Proper Motion Dec: -479.4 mas/yr	
arg			Equinox: J2000	Parallax: 0.0804"	
Ë				Epoch of Position: 2015.5	
(eq	Comments: T	his object was generated by the	targetselector and retrieved from the SIMBAD database (Ga	uia 2015.5 Epoch)	

TRAPPIST-1 star and b planet

Category=Star

Description=[Exoplanet Systems, Exoplanets, M dwarfs, M stars] Extended=NO

Subarray

Template FULL

# Filter Readout	Pattern Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1 F1500W FAST	14	404	1	None	1	404	15695.626	24835.4
Spectral								
D   D								

Phase 0.41578 to 0.44339 with period 1.51087081 Days and zero-phase 2457322.51736 HJD

Aperture PA Range 74.449705 to 154.449705 Degrees (V3 70.0 to 150.0) Aperture PA Range 254.449705 to 334.449705 Degrees (V3 250.0 to 330.0)

Offset 0.5 arcsec, 0.5 arcsec

Time Series Observation

No Parallel

## Proposal 1177 - Observation 11 - MIRI observations of transiting exoplanets

Observation Proposal 1177, Observation 11: TRAPPIST-1 b Sec Eclipse

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: All MIRI Imager observations are done in time-series mode with precision target acquisition and no dithers

PA constraints are set for the object to be near the center and to get the nearby 2MASS K = 13.5 star in the field

Offsets are set to minimal values to serve as a placeholder in I decide to move the star elsewhere in the array, pending on-orbit performance

(TRAPPIST-1 b Sec Eclipse (Obs 11)) 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.

Tue Jun 11 16:00:15 GMT 2019

(Visit 11:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

	#	Name Target Coordinates		Targ. Coord. Corrections	Miscellaneous				
ြ	(5)	TRAPPIST-1B RA: 23 06 30.3341 (346.6263921d)		Proper Motion RA: 930.9 mas/yr					
get			Dec: -05 02 36.46 (-5.04346d)	Proper Motion Dec: -479.4 mas/yr					
arç			Equinox: J2000	Parallax: 0.0804"					
ΙË				Epoch of Position: 2015.5					
xed	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database (Gaia 2015.5 Epoch)								

TRAPPIST-1 star and b planet

Category=Star

Description=[Exoplanet Systems, Exoplanets, M dwarfs, M stars]

Extended=NO

# Template Subarray

**FULL** 

**Diagnostics** 

# Filter Readout	Pattern Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1 F1500W FAST	14	404	1	None	1	404	15695.626	24835.4
Spectral								
D   D								

Phase 0.41578 to 0.44339 with period 1.51087081 Days and zero-phase 2457322.51736 HJD

Aperture PA Range 74.449705 to 154.449705 Degrees (V3 70.0 to 150.0)

Aperture PA Range 254.449705 to 334.449705 Degrees (V3 250.0 to 330.0)

Offset 0.5 arcsec, 0.5 arcsec

Time Series Observation

No Parallel