JWST Proposal 1279 (Created: Monday, June 12, 2023 at 2:00:25 PM Eastern Standard Time) - Overview



1279 - Thermal emission from Trappist-1 b

Cycle: 1, Proposal Category: GTO

INVESTIGATORS

Name	Institution		
Dr. Pierre-Olivier Lagage (PI) (ESA Member)	Commissariat a l'Energie Atomique (CEA)		
Dr. Jeroen Bouwman (CoI) (ESA Member) (Contact)	Max Planck Institute for Astronomy		

OBSERVATIONS

Folder	Observation	Label	Observing Template	Science Target
MIRIM	TRAPPIST-1b			
	1	TRAPPIST-1 b Eclipse	MIRI Imaging	(1) TRAPPIST-1B
	6	Repeat Visit 1.1	MIRI Imaging	(1) TRAPPIST-1B
	2	TRAPPIST-1 b Eclipse	MIRI Imaging	(1) TRAPPIST-1B
	3	TRAPPIST-1 b Eclipse	MIRI Imaging	(1) TRAPPIST-1B
	4	TRAPPIST-1 b Eclipse	MIRI Imaging	(1) TRAPPIST-1B
	5	TRAPPIST-1 b Eclipse	MIRI Imaging	(1) TRAPPIST-1B

ABSTRACT

The aim is to detect the thermal emission from the TRAPPIST-1 b exoplanet, an Earth mass like transiting exoplanet.

The emission will be obtained from photometric observations of eclipses of the exoplanet.

Given the temperature of the exoplanet, around 400 K, we will use the MIRI instrument.

Five eclipses are needed to expect a Signal over Noise ratio at the 5 sigma level when using the 12.8 microns filter.

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The program is conducted in coordination with a similar program from Tom Greene; the difference between the two programs being just the use of a different MIRI filter (15.0 microns versus 12.8 microns).

This program is considered as a first step towards future ambitious programs, requiring tens of eclipses to characterize spectroscopically the atmosphere of Earth mass temperature exoplanets.

OBSERVING DESCRIPTION

We want to observe five eclipses of the Trappist-1 b exoplanet with MIRI in the imager mode (filter: F1280W).

The observations have to be done in time-series mode with no dither, with target acquistion and in full array mode to monitor at the same time a nearby relative bright star.

We do not allow for parallel observations given the high level of stability required.

The observations are time constrained; they have to start phased for eclipses.

Proposal 1279 - Targets - Thermal emission from Trappist-1 b

	_	boodi 1210 Targoto	Thermal emission mem mappier i b							
	7	# Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous					
بِ	, ((1) TRAPPIST-1B	RA: 23 06 29.3600 (346.6223333d)	Proper Motion RA: 922.1 mas/yr						
4			Dec: -05 02 29.20 (-5.04144d)	Proper Motion Dec: -471.9 mas/yr						
2	3		Equinox: J2000	Parallax: 0.08258"						
۱£	:			Epoch of Position: 2000						
ة ا	<u> </u>		by the targetselector and retrieved from the SIMBAD data	abase.						
Ĭ	TRAPPIST-1 star and b planet									
		Category=Star Description=[Exoplanet Systems, Exoplanets, M dwarfs, M stars]								
	1	Extended=NO	•							

Proposal 1279 - Observation 1 - Thermal emission from Trappist-1 b

Proposal 1279, Observation 1: TRAPPIST-1 b Eclipse1

Mon Jun 12 19:00:25 GMT 2023

Miscellaneous

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: For these high precission time series observations we want to use the full array of MIRI to include a nearby background star to be used a calibraton object to monitor changes in the instrument and or telescope. This will ensure we can reach a higth photometric photometric stability. To make sure both target star and calibration star are within MIRI imager FOV we specified a source offset and PA restrictions. Further, as this is a time series observation, we specified a narrow phase range during which the observations should start to ensure the secondary eclipse is properly covered.

Targ. Coord. Corrections

Proper Motion RA: 922.1 mas/yr Proper Motion Dec: -471.9 mas/yr

Given the relatively long time between the submission of the proposal and the observations, the period may need to be updated.

Diagnostics (TRAPPIST-1 b Eclipse1 (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.

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

	#	Name	Target Coordinates
S	(1)	TRAPPIST-1B	RA: 23 06 29.3600 (346.6223333d)
gets			Dec: -05 02 29.20 (-5.04144d)

Equinox: J2000

Parallax: 0.08258" Epoch of Position: 2000

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

TRAPPIST-1 star and b planet

Category=Star

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

Extended=NO

Subarray Template

FULL

ents	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Eleme		F1280W	FASTR1	17	280	1	None	1	280	13983.427	89674
a E											
Spectral											
၂ င္စ	5										

Phase 0.42659 to 0.45419 with period 1.51087081 Days and zero-phase 2457322.51736 HJD

Aperture PA Range 51 to 90 Degrees (V3 46.16455103 to 85.16455103)

Offset 25.0 arcsec, -48.5 arcsec

Time Series Observation

No Parallel Attachments

Special Requirements

Proposal 1279 - Observation 6 - Thermal emission from Trappist-1 b
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Observation Proposal 1279, Observation 6: Repeat Visit 1.1 Diagnostic Status: Warning

Mon Jun 12 19:00:25 GMT 2023

Observing Template: MIRI Imaging

Comments: replace visit1.1 which has been skipped

Diagnostics

(Repeat Visit 1.1 (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.

	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous				
က္က	(1)	TRAPPIST-1B	RA: 23 06 29.3600 (346.6223333d)	Proper Motion RA: 922.1 mas/yr					
ē	Dec: -05 02 29.20 (-5.04144d) Equinox: J2000		Dec: -05 02 29.20 (-5.04144d)	Proper Motion Dec: -471.9 mas/yr					
arg			Equinox: J2000	Parallax: 0.08258"					
ΙË				Epoch of Position: 2000					
ě	Comments:	This object was generated by the	targetselector and retrieved from the SIMBAD database.						
l îĒ	TRAPPIST-I	This object was generated by the star and b planet							

Category=Star

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

Template Subarray

FULL

ents	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Eleme	1	F1280W	FASTR1	17	280	1	None	1	280	13983.427	89674
ra E											
Spectral	-										

Phase 0.42659 to 0.45419 with period 1.51087081 Days and zero-phase 2457322.51736 HJD Aperture PA Range 51 to 90 Degrees (V3 46.16455103 to 85.16455103) Special Requirements

Offset 25.0 arcsec, -48.5 arcsec Time Series Observation No Parallel Attachments

Proposal 1279 - Observation 2 - Thermal emission from Trappist-1 b

Proposal 1279, Observation 2: TRAPPIST-1 b Eclipse1

Mon Jun 12 19:00:25 GMT 2023

Miscellaneous

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: For these high precission time series observations we want to use the full array of MIRI to include a nearby background star to be used a calibraton object to monitor changes in the instrument and or telescope. This will ensure we can reach a higth photometric photometric stability. To make sure both target star and calibration star are within MIRI imager FOV we specified a source offset and PA restrictions. Further, as this is a time series observation, we specified a narrow phase range during which the observations should start to ensure the secondary eclipse is properly covered.

Given the relatively long time between the submission of the proposal and the observations, the period may need to be updated.

Diagnostics (TRAPPIST-1 b Eclipse1 (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.

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

	#	Name	Target Coordinates	Targ. Coord. Corrections
တ	(1)	TRAPPIST-1B	RA: 23 06 29.3600 (346.6223333d)	Proper Motion RA: 922.1 mas/yr
ets			Dec: -05 02 29 20 (-5 04144d)	Proper Motion Dec: -471 9 mas/vr

Equinox: J2000 Parallax: 0.08258" Epoch of Position: 2000

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

TRAPPIST-1 star and b planet

Category=Star

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

Extended=NO

Template Subarray

Fixed Targ

Special Requirements

FULL

ents	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Eleme	1	F1280W	FASTR1	15	315	1	None	1	315	13983.427	89674
ralE											
Spectral											

Phase 0.42659 to 0.45419 with period 1.5108794 Days and zero-phase 2459785.2533425996 HJD

Time Series Observation No Parallel Attachments

Proposal 1279 - Observation 3 - Thermal emission from Trappist-1 b

Proposal 1279, Observation 3: TRAPPIST-1 b Eclipse1

Mon Jun 12 19:00:25 GMT 2023

Miscellaneous

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: For these high precission time series observations we want to use the full array of MIRI to include a nearby background star to be used a calibraton object to monitor changes in the instrument and or telescope. This will ensure we can reach a higth photometric photometric stability. To make sure both target star and calibration star are within MIRI imager FOV we specified a source offset and PA restrictions. Further, as this is a time series observation, we specified a narrow phase range during which the observations should start to ensure the secondary eclipse is properly covered.

Given the relatively long time between the submission of the proposal and the observations, the period may need to be updated.

Diagnostics (TRAPPIST-1 b Eclipse1 (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.

	# Name	Target Coordinates						
တ	(1) TRAPPIST-1B	RA: 23 06 29.3600 (346.6223333d)						
Targets		Dec: -05 02 29.20 (-5.04144d)						
l g		Equinox: J2000						
ΙË								
Fixed	Comments: This object was generated by the targetselector and retrieved from the SIMBAD databa							
I <u>:</u> ≚	TRAPPIST-1 star and b planet							
	Category=Star							

Proper Motion RA: 922.1 mas/yr Proper Motion Dec: -471.9 mas/yr

> Parallax: 0.08258" Epoch of Position: 2000

Targ. Coord. Corrections

Category=Star

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

Extended=NO

Subarray Template

FULL

ents	? #	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Fleme		F1280W	FASTR1	15	315	1	None	1	315	13983.427	89674
E	J										
Spectral											
Īσ	5										

Phase 0.42659 to 0.45419 with period 1.5108794 Days and zero-phase 2459785.2533425996 HJD

Time Series Observation No Parallel Attachments

No Parallel Attachments

Special Requirements

Proposal 1279 - Observation 4 - Thermal emission from Trappist-1 b

Proposal 1279, Observation 4: TRAPPIST-1 b Eclipse1 Mon Jun 12 19:00:25 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: For these high precission time series observations we want to use the full array of MIRI to include a nearby background star to be used a calibraton object to monitor changes in the instrument and or telescope. This will ensure we can reach a higth photometric photometric stability. To make sure both target star and calibration star are within MIRI imager FOV we specified a source offset and PA restrictions. Further, as this is a time series observation, we specified a narrow phase range during which the observations should start to ensure the secondary eclipse is properly covered. Given the relatively long time between the submission of the proposal and the observations, the period may need to be updated.

(TRAPPIST-1 b Eclipse1 (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.

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1) TRAPPIST-1B RA: 23 0		RA: 23 06 29.3600 (346.6223333d)	Proper Motion RA: 922.1 mas/yr	
		Dec: -05 02 29.20 (-5.04144d)	Proper Motion Dec: -471.9 mas/yr	
		Equinox: J2000	Parallax: 0.08258"	
			Epoch of Position: 2000	
Comments: Tl	his object was generated by the	targetselector and retrieved from the SIMBAD database.		
<i>‡</i>	Tomments: T	1) TRAPPIST-1B	TRAPPIST-1B RA: 23 06 29.3600 (346.6223333d) Dec: -05 02 29.20 (-5.04144d)	1) TRAPPIST-1B RA: 23 06 29.3600 (346.6223333d) Proper Motion RA: 922.1 mas/yr Dec: -05 02 29.20 (-5.04144d) Proper Motion Dec: -471.9 mas/yr Equinox: J2000 Parallax: 0.08258" Epoch of Position: 2000

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

Template Subarray

FULL

ents	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Eleme	1	F1280W	FASTR1	15	315	1	None	1	315	13983.427	89674
tralE											
Spectral	-										

Special Requirements Phase 0.42659 to 0.45419 with period 1.5108794 Days and zero-phase 2459785.2533425996 HJD

Time Series Observation No Parallel Attachments

Proposal 1279 - Observation 5 - Thermal emission from Trappist-1 b

Proposal 1279, Observation 5: TRAPPIST-1 b Eclipse1

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: For these high precission time series observations we want to use the full array of MIRI to include a nearby background star to be used a calibraton object to monitor changes in the instrument and or telescope. This will ensure we can reach a higth photometric photometric stability. To make sure both target star and calibration star are within MIRI imager FOV we specified a source offset and PA restrictions. Further, as this is a time series observation, we specified a narrow phase range during which the observations should start to ensure the secondary eclipse is properly covered. Given the relatively long time between the submission of the proposal and the observations, the period may need to be updated.

Mon Jun 12 19:00:25 GMT 2023

Miscellaneous

Diagnostics (TRAPPIST-1 b Eclipse1 (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.

Name **Target Coordinates** Targ. Coord. Corrections (1) TRAPPIST-1B RA: 23 06 29.3600 (346.6223333d) Proper Motion RA: 922.1 mas/yr **Fixed Targets** Dec: -05 02 29.20 (-5.04144d) Proper Motion Dec: -471.9 mas/yr

Parallax: 0.08258" Equinox: J2000 Epoch of Position: 2000

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

TRAPPIST-1 star and b planet

Category=Star

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

Extended=NO

Template Subarray

FULL

ents	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Eleme	1	F1280W	FASTR1	15	315	1	None	1	315	13983.427	89674
ral E											
pect											
Spectral											

Phase 0.42659 to 0.45419 with period 1.5108794 Days and zero-phase 2459785.2533425996 HJD

Time Series Observation No Parallel Attachments

No Parallel Attachments

Special Requirements