



3077 - TRAPPIST-1 Planets: Atmospheres Or Not?

Cycle: 2, Proposal Category: GO

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Dr. Jeremy Leconte (CoI) (ESA Member)	Universite de Bordeaux

OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Phasecurve_b+c				
	1	phasecurve_b+c	MIRI Imaging	(1) TRAPPIST-1
	2	phasecurve_b+c	MIRI Imaging	(1) TRAPPIST-1

ABSTRACT

Small rocky planets are now known to be very frequent in temperate orbits around low-mass M-dwarfs. The most pressing question regarding these ubiquitous planets concerns their capacity to maintain significant secondary atmospheres despite the adverse environment (high XUV fluxes, winds) and history (long pre-main-sequence) brought by their small host stars. Here, we propose to use MIRI to determine unambiguously if the two inner planets of the TRAPPIST-1 system are bare rocks or not by complementing the Cycle 1 measurements of their daysides' thermal emission at 15microns with the observation of their combined thermal phase curve. The presence of an atmosphere around at least one of the two planets would not only be a very encouraging prospect for the presence of atmospheres around the five cooler outer planets of the system, but it would also represent a critical step in the study of M-dwarfs' rocky planets and their potential habitability.

OBSERVING DESCRIPTION

The program consists in a 57.7hr-long continuous TSO observation of TRAPPIST-1 with MIRI/imaging within the F1500W filter, without any dither to keep the star's PSF on the same pixels, using the FASTR1 read-out mode and the MIRI BRIGHTSKY array. It is divided in two visits, one composed of one exposure of 3473 integrations of 45 groups each, and the other composed of one exposure of 1863 integrations of 45 groups each.

Proposal 3077 - Targets - TRAPPIST-1 Planets: Atmospheres Or Not?

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	TRAPPIST-1	RA: 23 06 29.3685 (346.6223688d)	Proper Motion RA: 930.788 mas/yr	
		Dec: -05 02 29.04 (-5.04140d)	Proper Motion Dec: -479.0380000258665 mas/yr		
		Equinox: J2000	Parallax: 0.0802123"		
			Epoch of Position: 2000		
	<i>Comments: This object was generated by the target selector and retrieved from the SIMBAD database.</i>				
	<i>Category=Star</i>				
	<i>Description=[Exoplanet Systems, Exoplanets, M dwarfs]</i>				

Proposal 3077 - Observation 1 - TRAPPIST-1 Planets: Atmospheres Or Not?

Fri Oct 27 22:00:13 GMT 2023

Observation	<p>Proposal 3077, Observation 1: phasecurve_b+c</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI Imaging</p> <p><i>Comments: The observations consist in 57.7hr of continuous TSO imaging of TRAPPIST-1 with MIRI/F1500W (BRIGHTSKY, FASTR1) divided in two visits. There are two opportunities for these observations in Cycle 2. For the first one, the observations should start on 10-Nov-2023 at 19h +- 30 min. For the second opportunity, the observations should start on 22-Nov-2023 at 20h15 +- 30 min.</i></p>																															
Diagnostics	<p>(phasecurve_b+c (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.</p> <p>(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>																															
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Special Requirements	<p>Between Dates 10-NOV-2023:18:30:00 and 10-NOV-2023:19:30:00</p> <p>Between Dates 22-NOV-2023:19:45:00 and 22-NOV-2023:20:45:00</p> <p>Aperture PA Range 72.26514897 to 72.26514897 Degrees (V3 67.4297 to 67.4297)</p> <p>Time Series Observation</p> <p>No Parallel Attachments</p> <p>Sequence Observations 1, 2, Non-interruptible</p>																															

Proposal 3077 - Observation 2 - TRAPPIST-1 Planets: Atmospheres Or Not?

Fri Oct 27 22:00:13 GMT 2023

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