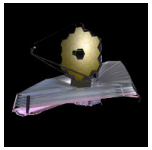

1209 - Probing the Cloud Properties of SIMP0136+0933

Cycle: 1, Proposal Category: GTO

INVESTIGATORS

Name	*Institution*
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Prof. Stanimir A. Metchev (CoI) (CSA Member)	The University of Western Ontario
Dr. David Lafreniere (CoI) (CSA Member)	Universite de Montreal
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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Simple staring sequence				
	1	Single staring visit	NIRISS Single-Object Slitless Spectroscopy	(1) SIMP-J013656.5+093347.3

ABSTRACT

SIMP0136 is one of the nearest isolated brown dwarfs to the Sun; this early-T dwarf lies in the temperature range where dust-bearing clouds, more typical of L dwarfs, sink below the photosphere. The inhomogeneous cloud coverage on its surface leads to rotation-induced variability at the 2-7% level over its 2.4 h rotation. Furthermore, the evolution of the cloud patterns leads to a modulation of the lightcurve over timescales of a few days. We propose to obtain time-resolved SOSS spectroscopy of this benchmark variable brown dwarf over an entire rotation. These observations will detect variability at the 20-70 sigma level for all resolution elements within a 10-min time bin. By probing dierent heights in the atmosphere, variability of dierent chemical species will trace the vertical extent of dust-clouds. Detection of out-of-equilibrium species, such as Cs, will provide insight into upwelling mechanisms in ultracool atmospheres. This work will have a strong bearing on the study of hot exoplanets; at a temperature of

1200 K, SIMP0136 is similar to numerous hot Jupiters. Proper description of dust behaviour is key in understanding transit spectroscopy data as dust clouds can readily mask the lower layers of an otherwise clear atmosphere.

OBSERVING DESCRIPTION

We propose to observe a bright brown dwarf with the SOSS mode and monitor its spectrum over a little more than a rotation period (2.4h). The object is much fainter than most SOSS targets. These observations will resolve the rotation period in ~10 minute bins.

Proposal 1209 - Targets - Probing the Cloud Properties of SIMP0136+0933

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	SIMP-J013656.5+093347.3	RA: 01 36 57.8999 (24.2412496d)	Proper Motion RA: 1238.2439374026383 mas/yr	
		Dec: +09 33 47.05 (9.56307d)	Proper Motion Dec: -16.155571796869925 mas/yr	
		Equinox: J2000	Parallax: 0.16344784569658697 "	
			Epoch of Position: 2016	

Comments: Do NOT use the 2MASS position as they will be about 23 arcsec off from the mid-2023 position. The target is in GAIA DR3, so we use these coordinates+PM+plx instead.
Category=Star
Description=[Brown dwarfs, Exoplanets, T dwarfs]
Extended=NO

Observation

Proposal 1209, Observation 1: Single staring visit

Thu Jul 06 21:00:54 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Diagnostics

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

(Visit 1:1) 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)	SIMP-J013656.5+093347.3	RA: 01 36 57.8999 (24.2412496d) Dec: +09 33 47.05 (9.56307d) Equinox: J2000	Proper Motion RA: 1238.2439374026383 mas/yr Proper Motion Dec: -16.155571796869925 mas/yr Parallax: 0.16344784569658697 " Epoch of Position: 2016	

Comments: Do NOT use the 2MASS position as they will be about 23 arcsec off from the mid-2023 position. The target is in GAIA DR3, so we use these coordinates+PM+plx instead.
Category=Star
Description=[Brown dwarfs, Exoplanets, T 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 SIMP-J013656.5+093347.3	SOSSFAINT	F480M	NISRAPID	19	1	1	0.93	25094

Template

Subarray	Include F277W Exposure?
FULL	false

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	NISRAPID	10	81	1	81	9566.462	

Special Requirements

Aperture PA Range 243 to 246 Degrees (V3 242.43873283 to 245.43873283)
No Parallel Attachments