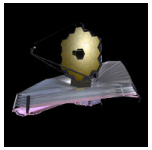

3279 - Calibrating NIRISS order 3 for very bright time-series observations with JWST

Cycle: 2, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
Dr. Jens Hoeijmakers (PI) (ESA Member)	**Lund University**
Prof. Kevin Heng (CoI) (ESA Member)	Ludwig Maximilian Universitat of Munich
Prof. Lars A. Buchhave (CoI) (ESA Member)	Technical University of Denmark-DTU Space
Dr. Mercedes Lopez-Morales (CoI)	Smithsonian Institution Astrophysical Observatory
Dr. Neale Gibson (CoI) (ESA Member)	University of Dublin, Trinity College
Dr. Joao Manuel Mendonca (CoI) (ESA Member)	Technical University of Denmark-DTU Space
Prof. Brice-Olivier Demory (CoI) (ESA Member)	University of Bern
Dr. Hannah Diamond-Lowe (CoI) (ESA Member)	Technical University of Denmark-DTU Space
Mr. Mark Fortune (CoI) (ESA Member)	University of Dublin, Trinity College
Andrea Guzman Mesa (CoI) (ESA Member)	University of Bern
Dr. Matthew Hooton (CoI) (ESA Member)	University of Cambridge
Dr. Brett M. Morris (CoI)	Space Telescope Science Institute
Chloe Fisher (CoI) (ESA Member)	University of Oxford
Prof. Adam J. Burgasser (CoI)	University of California - San Diego
Ms. Bibiana Prinoth (CoI) (ESA Member)	Lund University
Mr. Nicholas Borsato (CoI) (ESA Member)	Lund University
Dr. Brian Thorsbro (CoI) (ESA Member)	Lund University
Dr. Nestor Espinoza (CoI) (US Admin CoI)	Space Telescope Science Institute
Dr. Daniel Kitzmann (CoI) (ESA Member)	University of Bern
Natalie Allen (CoI)	The Johns Hopkins University
Dr. Amelie Gressier (CoI)	Space Telescope Science Institute

Name	*Institution*
Anna Lueber (CoI) (ESA Member)	University of Bern
Can Jan Akin (CoI) (ESA Member)	Ludwig Maximilian Universitat of Munich
Kathryn Jones (CoI) (ESA Member)	University of Bern
Dr. Meng Tian (CoI) (ESA Member)	Ludwig Maximilian Universitat of Munich
Mr. Erik Andreas Meier Valdes (CoI) (ESA Member)	University of Bern

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Transit 1/1				
	1		NIRISS Single-Object Slitless Spectroscopy	(1) HD-133112

ABSTRACT

The exquisite sensitivity makes JWST sensitive to saturation when observing bright stars. In particular shorter wavelengths are quickly lost when observing strategies that rely on limited saturation or faster read-out modes are used. This is particularly problematic for some of the most important exoplanet systems, that have very bright host stars (J<6), and that are consequently nearly or completely inaccessible by JWST, even though these systems are best suited for spectroscopic follow-up

NIRISS SOSS Order #3 covers wavelengths between 600 and 924 nm, and has a weak effective throughput compared to the brighter Orders #1 and #2, and has consequently not been commissioned. However, it's inefficiency makes it less susceptible to saturation and ideal for situations in which moderate spectral resolution (R~2000) spectroscopy of very bright sources is required. In this proposal, we aim to perform calibration time-series observations of a bright exoplanet transit, to determine the effectiveness and stability of Order #3, as well as to assess the performance of Order 2 and 1 under conditions of extreme saturation. These observations may later be used to motivate the commissioning of NIRISS SOSS Order 3 as a supported mode for general observations of very bright targets with JWST, at relatively short wavelengths.

OBSERVING DESCRIPTION

This proposal aims to observe a transit of the bright (J=6.2) exoplanet system WASP-189 using NIRISS SOSS. The observations will purposefully saturate orders 1 and 2 to obtain high count rates in order 3, which we aim to extract and use to isolate TiO bands in the planet spectrum. This will prove that order 3 can be used to obtain stable science-grade spectra, such that JWST NIRISS can be used on much brighter sources than is currently possible with any of the other instrument modes.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	HD-133112	RA: 15 02 44.8157 (225.6867321d) Dec: -03 01 53.35 (-3.03149d) Equinox: J2000	Proper Motion RA: -0.0033695819847724936 sec of time/yr Proper Motion Dec: -0.023754999938319088 arcsec/yr Epoch of Position: 2015.5	

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

Observation

Proposal 3279, Observation 1 Mon Jan 22 17:01:09 GMT 2024

Diagnostic Status: Warning

Observing Template: NIRISS Single-Object Slitless Spectroscopy

Comments: TA is performed using SOSSFAINT (because J=6.2) and good SNR (100-150) is obtained for 5 groups.

Diagnostics

(Observation 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.

(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)	HD-133112	RA: 15 02 44.8157 (225.6867321d) Dec: -03 01 53.35 (-3.03149d) Equinox: J2000	Proper Motion RA: -0.0033695819847724936 sec of time/yr Proper Motion Dec: -0.023754999938319088 arcsec/yr Epoch of Position: 2015.5	

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

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	1 HD-133112	SOSSBRIGHT	F480M	NISRAPID	7	1	1	0.384	145284

Template

Subarray	Include Short First Exposure and F277W Exposure?
SUBSTRIP256	false

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	NISRAPID	7	857	1	857	37684.415	145284

Special Requirements

Phase 0.9069 to 0.9222 with period 2.7240330 Days and zero-phase 2458926.5416960 HJD
Aperture PA Range 250 to 300 Degrees (V3 249.43873283 to 299.43873283)
Time Series Observation
No Parallel Attachments