

Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

Dimitri Mawet, Marie Ygouf, Jarron Michael Leisenring, K Thomas, Michael E Ressler, Gene Serabyn, Anthony Boccaletti, Renyu Hu, Jorge Llop-Sayson, Laurent Pueyo, et al.

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1618 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

Cycle: 1, Proposal Category: GO

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OBSERVATIONS

Folder Observation	Label	Observing Template	Science Target
Alpha Cen A			

Folder	Observation	Label	Observing Template	Science Target
	1	eps Mus Position A. us e offset star	MIRI Coronagraphic Imaging	(3) EPS-MUS-OFFSET
	5	eps Mus position B use offset star	MIRI Coronagraphic Imaging	(3) EPS-MUS-OFFSET
	2	Alpha Cen A F1550	MIRI Coronagraphic Imaging	(4) ALPHACENOFFSET
	3	Alpha Cen A F1550	MIRI Coronagraphic Imaging	(4) ALPHACENOFFSET
	4	offset star for eps Mus. Position A. Obs 2	MIRI Coronagraphic Imaging	(3) EPS-MUS-OFFSET
	6	offset star for eps Mus. Position B. Obs 2	MIRI Coronagraphic Imaging	(3) EPS-MUS-OFFSET

JWST Proposal 1618 (Created: Friday, August 27, 2021 at 4:00:15 PM Eastern Standard Time) - Overview

ABSTRACT

Alpha Centauri A is the closest solar-type star to the Sun and offers an unique opportunity to detect both a mature gas giant planet (consistent with existing radial velocity constraints) and a zodiacal dust cloud. A carefully planned observational sequence using the MIRI Coronagraph (F1550C) and innovative post-processing would be sensitive down to a radius limit of 0.5~0.7 R-Jupiter for planets within ~3 AU (~2.5") around alpha Cen A where models predict a region of stablity against disruption by alpha Cen B. These same observations would be sensitive to a level of zodiacal emission only a few times brighter than that of the Sun's, an unprecedented level not even achieved by ground based interferometers. The proposed observations would probe the limit of JWST high contrast imaging on a star that offers the best chance for the ultimate detection of Earth analogs by future ground and/or space based facilities. The experiment is admittedly high risk, but the prospect of directly imaging a planet around our closest stellar neighbor is an exciting one.

OBSERVING DESCRIPTION

The proposed scenario brackets the observations of alpha Cen with observations of a PSF reference star, eps Muscae, of comparable brightness to alpha Cen A. The date of the observation has been selected to minimize the change in pitch angle (solar offset) between the target and reference star so as to minimize changes in telescope's thermal environment.

Eps Mus will be observed with a 5 point dither pattern at the position of alpha Cen A behind the coronagraphic mask to increase the image diversity for improved PSF reconstruction. Eps Mus will also be observed at the position alpha Cen B without a dither pattern. We recognize that neither eps Mus (in this position) nor alpha Cen B will be behind the coronagraph which will result in saturating the cores of the PSF, but analysis of the post-processing shows that it is important to measure the speckle pattern from alpha Cen B near the position of alpha Cen A. The observation of alpha Cen is split to avoid the limit of 10,000 seconds for an individual observation.

JWST Proposal 1618 (Created: Friday, August 27, 2021 at 4:00:15 PM Eastern Standard Time) - Overview

Target acquisition (TA) for both alpha Cen and the PSF reference star eps Mus will be challenging due to two factors: 1) both stars are extremely bright and would saturate during the TA process; 2) the position of alpha Cen A is changing by up to 10 mas per day due to its combined proper motion, parallax and orbital motion. We address the first point for both stars by using nearby Gaia stars as the initial targets to be followed by an offset to the desired science or reference target. Offsets are given in the sense (alpha CenRA/DEC-OffsetStarRA/DEC) after rotation into the camera coordinate system. The Gaia stars and eps Mus have highly precise Gaia positions and proper motions. We will address the evolving position of alpha Cen A using the ALMA astrometry obtained by Akeson et al (2020) and update the offsets once the exact date of the observation is known. It may eventually prove necessary to treat alpha Cen as a moving target so as to mitigate its motion during the 5 hours of its observation (~0.4 mas/hr).

The offset star for alpha Cen A is a Gaia star located 16" (13") away in 2022 (2023) away with an inferred K magnitude (from Gaia colors) of K=13.6. It is observed in TA for FQPM/F1550 mode with F560W and achieves SNR~140 in 15 sec. The offset star for eps Mus is a Gaia star located 25" away with an inferred K magnitude (from Gaia colors) of K=11.4. It is observed in TA for FQPM/F1550 mode with F560W and achieves SNR~32 in 8 sec.

A number of interloper stars will appraoch alpha Cen A during the next few years due to alpha Cen's large proper motion. One is quite faint (S2) and is a minor issue in 2022-23. A second (S5) is significantly brighter and becomes a more serious issue in 2026 and beyond. For this reason we want to schedule the observations as early as possible to ensure the maximum areal coverage for exoplanet discovery and the potential for future follow-up observations.

We have elected to NOT use two roll angles since we are expecting to find planets within only the central 1-2" where the 2nd roll offers no advantage and would require a considerable overhead in total clock time.

Proposal 1618 - Targets - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

	# Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(3) EPS-MUS-OFFSET	RA: 12 17 34.6051 (184.3941879d)	Proper Motion RA: -7.09 mas/yr	
		Dec: -67 57 13.07 (-67.95363d)	Proper Motion Dec: 0.496 mas/yr	
		Equinox: J2000	Parallax: 0.00013"	
6			Epoch of Position: 2015.5	
Target	Comments: Category=Calibration Description=[Target acquisition test] Extended=NO			
Fixed	(4) ALPHACENOFFSET	RA: 14 39 22.3404 (219.8430850d)	Proper Motion RA: -8.2 mas/yr	
Ĭ		Dec: -60 50 0.78 (-60.83355d)	Proper Motion Dec: -1.88 mas/yr	
		Equinox: J2000	Parallax: 0.0001"	
			Epoch of Position: 2015.5	
	Comments: Category=Calibration Description=[Target acquisition test] Extended=NO			

Proposal 1618 - Observation 1 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

	Proposal 1618,	Observation 1: ep	s Mus Position A	. use offset	star							Fri Aug 27 2	1:00:15 GMT 2021
n	Diagnostic State	e											
atic	0 1	olate: MIRI Corona											
Observation	position of alpha followed by an o precise Gaia pos	t Cen is changing b ffset to the desired sitions and proper t	by up to 10 mas pe science target. Of motion values. We	er day due to ffsets are giv e will addres	its proper motion, p en in the sense (alph s the evolving positio	ps Mus will be challe parallax and orbital m pa CenRA/DEC-Offse pn of alpha Cen A usi	notion. We address t tStarRA/DEC) after ing the ALMA astron	the first point for b rotation into the netry obtained by A	oth stars by using camera coordina Akeson et al (2020	g nearby Ga te system. T	aia stars i The Gaia s	as the initial tar stars and eps M	get to be us have highly
0	observation. It m	ay eventually prov	e necessary to tre	eat alpha Cer	n as a moving target	so as to mitigate its r	notion during the 5 l	hours of its observe	ation.				
		s eps mus behind th											
Diagnostics	(Visit 1:1) Warn	ing (Form): Overho	eads are provision	al until the v	Visit Planner has bee	n run.							
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D													
		ame		et Coordina			Targ. Coord. Corr			Miscella	neous		
Fixed Targets	(3) E	PS-MUS-OFFSET			51 (184.3941879d)		Proper Motion RA:	5					
arg		Dec: -67 57 13.07 (-67.95363d)					Proper Motion Dec	: 0.496 mas/yr					
Τį	Equinox: J2000					Parallax: 0.00013" Epoch of Position:	2015 5						
xec	Comments:						Lpoen of Fosition.	2015.5					
Ë	Category=Calib	ration arget acquisition te	eet]										
	Extended=NO	irger acquisition ie	31]										
tion	#	Target	Filter		Quadrant	Readout Pattern	Groups/Int	Integrations/	Exp Total Int	tegrations	Total E Time	Exposure E	TC Wkbk.Calc D
lisition	# 1	Target SAME	Filter F560W		Quadrant 1	Readout Pattern FASTGRPAVG8	Groups/Int 4	Integrations/	Exp Total Int	tegrations		I	
cquisition	#	5					•		•	tegrations	Time	I	D
Acquisitio	1	SAME					•		•	tegrations	Time	I	D
	1 Repeat observa	SAME			~		•		•	tegrations	Time	I	D
	1	SAME			~		•		•	tegrations	Time	I	D
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Template	1 Repeat observa	SAME			~		•		•	tegrations	Time	<u> </u>	D
Template	1 Repeat observa	SAME			~		4	1	•		Time	<u> </u>	D
Dithers Template	1 Repeat observa	SAME			~		4 Dither Type	1	•		Time	<u> </u>	D
Dithers Template	1 Repeat observa	SAME		Filter	~		4 Dither Type 5-POINT-SMAL	1	1	Total	<u>Time</u> 7.67	<u> </u>	D 9296.14
Dithers Template	1 Repeat observa NO # 1	SAME tion	F560W	Filter F1550C	1 1 Readout	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID	1	Total	Time 7.67	Total Exposure	D 9296.14
Dithers Template	1 Repeat observa NO # 1	SAME tion Coron Mask/Filter	F560W		1 Readout Pattern	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1 Total Dithers	Total Integrati	Time 7.67	Total Exposure Time	D 9296.14 • ETC Wkbk.Calc ID
Dithers Template	1 Repeat observa NO # 1	SAME tion Coron Mask/Filter	F560W		1 Readout Pattern	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1 Total Dithers	Total Integrati	Time 7.67	Total Exposure Time	D 9296.14 • ETC Wkbk.Calc ID
Dithers Template	1 Repeat observa NO # 1	SAME tion Coron Mask/Filter	F560W		1 Readout Pattern	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1 Total Dithers	Total Integrati	Time 7.67	Total Exposure Time	D 9296.14 • ETC Wkbk.Calc ID

Proposal 1618 - Observation 1 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

PSF References	PSF Reference: true
e	Offset 25.3847 arcsec, -3.6256 arcsec No Parallel Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible

Proposal 1618 - Observation 5 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

	Proposal 1618, Ob	servation 5: eps Mus p	osition B use offset	star						Fri Aug 2	7 21:00:15 GMT 2021
Ľ	Diagnostic Status:	0									
Itio	Observing Template	e: MIRI Coronagraphic	Imaging								
Observation	position of alpha Ce followed by an offse precise Gaia positic observation. It may	acquisition (TA) for bo en is changing by up to et to the desired science ons and proper motion v eventually prove neces:	10 mas per day due ta target. Offsets are gi values. We will addres vary to treat alpha Ce	o its proper motion, p wen in the sense (alph ss the evolving position n as a moving target (arallax and orbital n a CenRA/DEC-Offse m of alpha Cen A usi so as to mitigate its n	notion. We address t tStarRA/DEC) after ing the ALMA astrom notion during the 5 l	the first point for be rotation into the one netry obtained by A	oth stars by using camera coordinat Akeson et al (2020	g nearby Ga te system. Th	ia stars as the initial he Gaia stars and eps	target to be Mus have highly
		ositions eps Mus at the				¢					
Diagnostics	(Visit 5:1) Warning	(Form): Overheads are	provisional until the	Visit Planner has beer	a run.						
	# Nam	ne	Target Coordin	ates		Targ. Coord. Corr	rections		Miscellan	ieous	
Fixed Targets	(3) EPS-	-MUS-OFFSET	RA: 12 17 34.60	51 (184.3941879d)		Proper Motion RA:	-7.09 mas/yr				
rge	Dec: -67 57 13.07 (-67.95363d)					Proper Motion Dec	: 0.496 mas/yr				
Ta			Equinox: J2000			Parallax: 0.00013"	2015 5				
ted	Comments:					Epoch of Position:	2015.5				
Ē	Category=Calibrate Description=[Targe										
	Extended=NO		7 747 /	<u> </u>		~ ~ ~	T ()				
tior	#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/	Exp Total Int		Total Exposure Time	ETC Wkbk.Calc ID
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ate	•	n									
Template	•	n				Dither Type					
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Dithers Template	NO # 1 # CC	n Coron Mask Jask/Filter	Filter	Readout Pattern	Groups/Int	NONE	Exposures/Dith	Total Dithers	Total Integratio	Total Expos ons Time	ıre ETC Wkbk.Calc ID
Dithers Template	NO # 1 # CC M	Coron Mask	Filter F1550C		Groups/Int 5	NONE Integrations/Ex	-	Total Dithers			
Dithers Template	NO # 1 # CC M	Coron Mask Aask/Filter		Pattern	•	NONE Integrations/Ex p	-		Integratio	ons Time	Wkbk.Calc ID
Dithers Template	NO # 1 # CC M	Coron Mask Aask/Filter		Pattern	•	NONE Integrations/Ex p	-		Integratio	ons Time	Wkbk.Calc ID
Template	NO # 1 # CC M	Coron Mask Aask/Filter		Pattern	•	NONE Integrations/Ex p	-		Integratio	ons Time	Wkbk.Calc ID

Proposal 1618 - Observation 5 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

PSF References	PSF Reference: true
e	Offset 33.1634 arcsec, -5.6352 arcsec No Parallel Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible

Proposal 1618 - Observation 2 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

(Proposal 1618, Observat	ion 2: Alpha C	en A F1550							Fri Aug 27	21:00:15 GMT 2021
ior	Diagnostic Status: Warn	ing									
vat	Observing Template: MIR	I Coronagraphic	c Imaging								
Observation	Comments: Target acquisition (TA) for both alpha Cen and the PSF reference star eps Mus will be challenging due to two factors: 1) both stars are extremely bright and would saturate during the TA process; 2) the position of alpha Cen is changing by up to 10 mas per day due to its proper motion, parallax and orbital motion. We address the first point for both stars by using nearby Gaia stars as the initial target to be followed by an offset to the desired science target. Offsets are given in the sense (alpha CenRA/DEC-OffsetStarRA/DEC) after rotation into the camera coordinate system. The Gaia stars and eps Mus have highly										
ð	precise Gaia positions and observation. It may eventu	l proper motion	values. We will addr	ess the evolving position	on of alpha Cen A usi	ing the ALMA astron	netry obtained by A	Akeson et al (2020	<i>)) and update th</i>	e offsets once the	exact date of the
cs	(Alpha Cen A F1550 (Obs								set of 1-14 degr	ees	
Diagnostics	(Visit 2:1) Warning (Form): Overheads ar	e provisional until th	e Visit Planner has bee	en run.						
bug											
Diaç											
	# Name		Target Coordi	nates		Targ. Coord. Cor	rections		Miscellaneou	15	
	(4) ALPHACE	NOFFSET	6	404 (219.8430850d)		Proper Motion RA			11150011411000		
get	Dec: -60 50 0.78 (-60.83355d)					Proper Motion Dec	•				
Tar			Equinox: J2000)		Parallax: 0.0001"					
Fixed Targets						Epoch of Position:	2015.5				
ixe	Comments: Category=Calibration										
ш	Description=[Target acqu	isition test]									
ſ	Extended=NO # Tar		Filter	Quadrant	Readout Pattern	CrownelInt	Integrations/	Even Total Int	togrations To	tal Europauna	ETC Wkbk.Calc
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ate	Repeat observation										
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Template											
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Dithers											
	# Coron	Mask	Filter	Readout	Groups/Int	Integrations/Ex	Exposures/Dith	Total Dithers	Total	Total Exposu	
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Proposal 1618 - Observation 2 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

 geps Mus Position A. use offset star (Obs 1) (PSF Reference; Filters [F1550C])

 eps Mus Position B use offset star (Obs 5) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 Additional Justification: false

 VERTURE PA Range 98 to 100.5 Degrees (V3 93.16574676 to 95.66574676)

 Offset 5.5662 arcsec, -11.81901 arcsec

 No Parallel

 Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible

Proposal 1618 - Observation 3 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

-	Proposal 1618, Obs	servation 3: Alpha	Cen A F1550							Fri Aug 27	21:00:15 GMT 2021
o	Diagnostic Status:	Warning									
/ati	Observing Template	e: MIRI Coronagrap	hic Imaging								
Observation	position of alpha Ce followed by an offse precise Gaia positio	en is changing by up et to the desired scient ons and proper motion	to 10 mas per day nce target. Offsets o on values. We will o	d the PSF reference star e due to its proper motion, p are given in the sense (alp) address the evolving positi ha Cen as a moving target	oarallax and orbital n ha CenRA/DEC-Offse on of alpha Cen A us	notion. We address : etStarRA/DEC) after ing the ALMA astron	the first point for b rotation into the netry obtained by P	oth stars by using camera coordina Akeson et al (2020	g nearby Gaia s te system. The G	tars as the initial t Faia stars and eps	target to be Mus have highly
S				servations should be linke					set of 1-14 degr	ees	
stic	(Visit 3:1) Warning	(Form): Overheads	are provisional unt	il the Visit Planner has bee	en run.						
Diagnostics											
	# Nam	ie	Target Co	ordinates		Targ. Coord. Cor	rections		Miscellaneou	IS	
Fixed Targets	(4) ALP	HACENOFFSET		22.3404 (219.8430850d) 0.78 (-60.83355d)		Proper Motion RA	: -8.2 mas/yr				
rge				Proper Motion Dec	:: -1.88 mas/yr						
Та			Equinox: J	2000		Parallax: 0.0001"	2017 5				
ed	C					Epoch of Position:	2015.5				
Fix	Comments: Category=Calibrati Description=[Targe Extended=NO										
Acquisition	#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/	Exp Total Int	tegrations To Tii	tal Exposure ne	ETC Wkbk.Calc ID
isit	1	SAME	F560W	1	FASTGRPAVG8	8	1	1	15.	34	59296.13
nb;											
Ac											
ate	Repeat observation	n									
blő	NO										
Template											
_	#					Dither Type					
ner	1					NONE					
Dithers											
		Coron Ma	sk Filt		Groups/Int	Integrations/Ex	Exposures/Dith	Total Dithers	Total	Total Exposu	
ner		1ask/Filter		Pattern	30	p 1250	1	1	Integrations	Time	Wkbk.Calc ID
len	1 40	QPM/F1550C 4Q	PM F15	50C FASTR1	30	1250	1	1	1250	9287.36	59296.2
Ш											
Spectral Elements											
) ec											
ร											

Proposal 1618 - Observation 3 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

 geps Mus Position A. use offset star (Obs 1) (PSF Reference; Filters [F1550C])

 eps Mus Position B use offset star (Obs 5) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 offset star for eps Mus. Position B. Obs 2 (Obs 6) (PSF Reference; Filters [F1550C])

 Additional Justification: false

 VERTURE PA Range 98 to 100.5 Degrees (V3 93.16574676 to 95.66574676)

 Offset 5.5662 arcsec, -11.819 arcsec

 No Parallel

 Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible

Proposal 1618 - Observation 4 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

	Proposal 1618, Ob	servation 4: offset star	r for eps Mus. Positio	n A. Obs 2						Fri Aug 27	21:00:15 GMT 2021
n	Diagnostic Status:	8									
atic	6 1	e: MIRI Coronagraphic	6 6								
Observation	Comments: Target acquisition (TA) for both alpha Cen and the PSF reference star eps Mus will be challenging due to two factors: 1) both stars are extremely bright and would saturate during the TA process; 2) the position of alpha Cen is changing by up to 10 mas per day due to its proper motion, parallax and orbital motion. We address the first point for both stars by using nearby Gaia stars as the initial target to be followed by an offset to the desired science target. Offsets are given in the sense (alpha CenRA/DEC-OffsetStarRA/DEC) after rotation into the camera coordinate system. The Gaia stars and eps Mus have highly										
bs€		et to the desired science ons and proper motion v									
0		eventually prove neces.) una apaca	the officers ence	enter une of me
	This TA positions ep	ps mus behind the coror	nagrphic mask								
Diagnostics	(Visit 4:1) Warning	g (Form): Overheads are	provisional until the	Visit Planner has beer	ı run.						
ost											
ngr											
Di											
	# Nam	16	Target Coordina	ates		Targ. Coord. Corr	rections		Miscellane	eous	
ets	(3) EPS-	-MUS-OFFSET		51 (184.3941879d)		Proper Motion RA:	•				
ırge			Dec: -67 57 13.07	7 (-67.95363d)		Proper Motion Dec	: 0.496 mas/yr				
Ta			Equinox: J2000			Parallax: 0.00013"					
Fixed Targets	Comments:					Epoch of Position:	2015.5				
Εi	Category=Calibrat										
	Description=[Targe Extended=NO	et acquisition iesij									
tion	#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/H	Exp Total Int			ETC Wkbk.Calc ID
uisition	#	Target SAME	Filter F560W	Quadrant 1	Readout Pattern FASTGRPAVG8	Groups/Int 4	Integrations/H	Exp Total Int	<u> </u>	Time	
cquisition	#1		,	-	,	-		•	<u> </u>	Time	ID
Acquisitio	1	SAME	,	-	,	-		•	<u> </u>	Time	ID
_	1 Repeat observation	SAME	,	-	,	-		•	<u> </u>	Time	ID
_	1	SAME	,	-	,	-		•	<u> </u>	Time	ID
_	1 Repeat observation	SAME	,	-	,	-		•	<u> </u>	Time	ID
Template	1 Repeat observation	SAME	,	-	,	-		•	<u> </u>	Time	ID
Template	l Repeat observation NO	SAME	,	-	,	4	1	•	<u> </u>	Time	ID
Template	l Repeat observation NO	SAME	,	-	,	4 Dither Type	1	•	<u> </u>	Time	ID
Dithers Template	1 Repeat observation NO # 1 # C	SAME	F560W	-	,	4 Dither Type 5-POINT-SMAL	1	1	<u> </u>	Time 7.67 Total Exposu	ID 59296.14
Dithers Template	1 Repeat observation NO # 1 # C M M M M M M M M M M M M M M M M M	SAME n Coron Mask	F560W Filter	1 1 Readout	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1	Total	Time 7.67 Total Exposu	ID 59296.14
Dithers Template	1 Repeat observation NO # 1 # C M M M M M M M M M M M M M M M M M	SAME n Coron Mask	F560W Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1 Total Dithers	Total Integration	Time 7.67 Total Exposu Is Time	ID 59296.14 re ETC Wkbk.Calc ID
Dithers Template	1 Repeat observation NO # 1 # C M M M M M M M M M M M M M M M M M	SAME n Coron Mask	F560W Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1 Total Dithers	Total Integration	Time 7.67 Total Exposu Is Time	ID 59296.14 re ETC Wkbk.Calc ID
Dithers Template	1 Repeat observation NO # 1 # C M M M M M M M M M M M M M M M M M	SAME n Coron Mask	F560W Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type 5-POINT-SMAL Integrations/Ex p	1 L-GRID Exposures/Dith	1 Total Dithers	Total Integration	Time 7.67 Total Exposu Is Time	ID 59296.14 re ETC Wkbk.Calc ID

Proposal 1618 - Observation 4 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

PSF References	PSF Reference: true
e e	Offset 25.3847 arcsec, -3.6256 arcsec No Parallel Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible

Proposal 1618 - Observation 6 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

	Proposal 1618,	Observation 6: of	fset star for eps N	Mus. Positio	n B. Obs 2						Fri Aug 2	27 21:00:15 GMT 2021		
ç	Diagnostic Status: Warning													
	Observing Temp	late: MIRI Corona	graphic Imaging											
Observation												he TA process; 2) the		
sel	followed by an o	ffset to the desired	science target. O	ffsets are giv	its proper motion, p en in the sense (alph	a CenRA/DEC-Offse	etStarRA/DEC) after	rotation into the	camera coordina	te system. Th	he Gaia stars and ep	s Mus have highly		
ရ					s the evolving position is the evolving position is a moving target					0) and update	e the offsets once th	e exact date of the		
Ē		5 5 4	2		0 0	0	0	nours of its observe	mon.					
s					<u>a cen which will NO</u> Visit Planner has bee		ć							
Diagnostics	(visit 0.1) warm	ing (Poini). Overn	eads are provision		visit i faimer has bee	ii ruii.								
soc														
ا م														
ö														
Fixed Targets								Targ. Coord. Corrections Miscelland						
	(3) E	PS-MUS-OFFSET	RA:	RA: 12 17 34.6051 (184.3941879d)			Proper Motion RA	: -7.09 mas/yr						
		Dec: -67 57 13.07 (-67.95363d)					Proper Motion Dec: 0.496 mas/yr							
Tar		Equinox: J2000					Parallax: 0.00013"							
, Å							Epoch of Position: 2015.5							
ixe	Comments:													
ш		ration irget acquisition te	est]											
	Extended=NO													
			T 1*1 /											
tion	#	Target	Filter		Quadrant	Readout Pattern	Groups/Int	Integrations/	Exp Total In		Total Exposure Time	ETC Wkbk.Calc ID		
lisition	# 1	Target SAME	Filter F560W		Quadrant 1	Readout Pattern FASTGRPAVG8	Groups/Int 4	Integrations/	Exp Total Int					
cquisition	#1				-		-		•		Time	ID		
Acquisition	#1				-		-		•		Time	ID		
	# 1 Repeat observat	SAME			-		-		•		Time	ID		
	1	SAME			-		-		•		Time	ID		
	1 Repeat observat	SAME			-		-		•		Time	ID		
Template	1 Repeat observat	SAME			-		4		•		Time	ID		
Template	1 Repeat observat	SAME			-		4 Dither Type		•		Time	ID		
Template	1 Repeat observat	SAME			-		4		•		Time	ID		
Dithers Template	1 Repeat observat	SAME	F560W		-	FASTGRPAVG8	4 Dither Type NONE	1	1		<u>Time</u> 7.67	ID 59296.14		
Dithers Template	1 Repeat observat	SAME		Filter	-		4 Dither Type NONE		1		Time 7.67 Total Expo	ID 59296.14		
Dithers Template	1 Repeat observat	SAME tion	F560W		1 Readout	FASTGRPAVG8	4 Dither Type NONE Integrations/Ex	1	1	Total	Time 7.67 Total Expo	ID 59296.14		
Dithers Template	1 Repeat observat	SAME tion Coron Mask/Filter	F560W	Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type NONE Integrations/Ex p	1 Exposures/Dith	1 Total Dithers	Total Integratio	Time 7.67 Total Expo ons Time	ID 59296.14 sure ETC Wkbk.Calc ID		
Dithers Template	1 Repeat observat	SAME tion Coron Mask/Filter	F560W	Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type NONE Integrations/Ex p	1 Exposures/Dith	1 Total Dithers	Total Integratio	Time 7.67 Total Expo ons Time	ID 59296.14 sure ETC Wkbk.Calc ID		
Dithers Template	1 Repeat observat	SAME tion Coron Mask/Filter	F560W	Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type NONE Integrations/Ex p	1 Exposures/Dith	1 Total Dithers	Total Integratio	Time 7.67 Total Expo ons Time	ID 59296.14 sure ETC Wkbk.Calc ID		
Template	1 Repeat observat	SAME tion Coron Mask/Filter	F560W	Filter	1 Readout Pattern	FASTGRPAVG8	4 Dither Type NONE Integrations/Ex p	1 Exposures/Dith	1 Total Dithers	Total Integratio	Time 7.67 Total Expo ons Time	ID 59296.14 sure ETC Wkbk.Calc ID		

Proposal 1618 - Observation 6 - Searching Our Closest Stellar Neighbor for Planets and Zodiacal Emission

PSF References	PSF Reference: true
e	Offset 33.1634 arcsec, -5.6352 arcsec No Parallel Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible