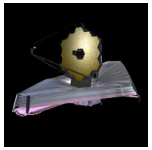

9252 - Confirming a Planet Orbiting Our Closest Solar Twin

Cycle: 3, Proposal Category: DD

INVESTIGATORS

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OBSERVATIONS

Folder	***Observation***	***Label***	***Observing Template***	***Science Target***
Apr2025				
	1	eps Mus Position A. use offset star G9	MIRI Coronagraphic Imaging	(1) NEW-EPS-MUS-OFFSET-G9
	2	eps Mus Position A BACKGROUND	MIRI Coronagraphic Imaging	(2) NEW-EPS-MUS-BACKGROUND1
	3	Observe Eps Mus at position of AcenB for PSF reference	MIRI Coronagraphic Imaging	(1) NEW-EPS-MUS-OFFSET-G9

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	4	Alpha Cen A F1550 Roll 1 Offset star G5	MIRI Coronagraphic Imaging	(8) AlphaCenOffsetStarG5
	5	Alpha Cen A F1550 - BACKGROUND	MIRI Coronagraphic Imaging	(4) Final_Acen_Bkgnd1
	6	Alpha Cen A F1550 Roll 2 Offset star G5	MIRI Coronagraphic Imaging	(8) AlphaCenOffsetStarG5
	7	Alpha Cen A F1550 - BACKGROUND	MIRI Coronagraphic Imaging	(6) Final_Acen_Bkgnd2
	8	offset star for eps Mus. Offset G9. Obs 2	MIRI Coronagraphic Imaging	(1) NEW-EPS-MUS-OFFSET-G9
	9	offset star for eps Mus. BACKGROUND	MIRI Coronagraphic Imaging	(2) NEW-EPS-MUS-BACKGROUND1
	10	Observe Eps Mus at position of AcenB for PSF reference	MIRI Coronagraphic Imaging	(1) NEW-EPS-MUS-OFFSET-G9

ABSTRACT

Cycles 1 and 3 observations have detected a promising candidate gas giant planet orbiting within the Habitable Zone of a nearby solar-type star. Two distinct point source-like objects are seen in MIRI F1550C coronagraphic data at separations of ~1.5" in locations consistent with a bound 1.5 au semi-major axis orbit. Archival imaging data and the MIRI data themselves show conclusively that these two sources are not stationary background objects. However, both Cycle 1 and 3 observations suffered from guide star failures and yielded science observations at only one telescope angle roll per epoch. The lack of contemporaneous two-roll sequences degrades the ability to reject speckle artifacts and thus to confirm that our closest solar-type neighbor is orbited by a giant planet heated by the central star. Director's Discretionary Time is necessary to take advantage of the next window of observability in Cycle 3 between in mid-late April 2025 to provide definitive confirmation of the presence of a gravitationally bound companion (as opposed to speckle artifacts), to increase the S/N of the point source detection for improved characterization, and to deliver a critical new data point for orbit determination that will facilitate rapid community follow-up observations.

OBSERVING DESCRIPTION

The proposed Director's Discretionary Time (DDT) program follows the previous JWST program in choosing the MIRI F1550C FQPM mask for a number of reasons: (1) minimum impact of wavefront drifts; (2) sensitivity to planets heated by the primary star to 200-300 K; (3) minimum contamination by background objects with Rayleigh-Jeans photospheres; and (4) sensitivity to exozodical emission at the ~5-10 Zodi level at 1-2 au. The detailed observing sequence proposed here is identical to the previously executed programs: (1) a reference star is observed using a 9-point

dither pattern at the start and end of the overall sequence to enable Reference Star Differential Imaging (RDI); (2) the primary star is observed at two telescope roll angles to provide angular diversity and reject residual speckles; and (3) the reference star is placed at the position of the binary companion star on the MIRI detector to assist in subtracting out its speckles at the position of the primary star, 7 arcsec away.
An observing window of +/- 1 week around April 25, 2025, places the point source detection in a favorable position with respect to the boundaries of the FQPM and the line of residuals from the binary companion star. The exact date of the observation will be set in conjunction with the STScI planning team(s) to enable: (1) a good selection of guide stars; (2) selection of suitably bright Gaia offset stars (at F1000W, for target acquisition) which are not compromised by diffraction artifacts from the primary and binary companion star at the chosen V3 angles; and (3) minimizing the change in solar angle between the observations of reference and science stars. Once the date and initial start time of the observational sequence is set, the detailed timing of the observations will be adjusted to take account of the motion of the primary star (~10 mas/day due to proper motion and parallax as seen from JWST's L2 orbit) so that the star can be accurately placed behind the FQPM. These steps were all successfully demonstrated in the previous JWST programs.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NEW-EPS-MUS-OFFSET-G9	RA: 12 17 26.1870 (184.3591125d) Dec: -67 58 6.07 (-67.96835d) Equinox: J2000	Proper Motion RA: -6.0517 mas/yr Proper Motion Dec: -0.49837 mas/yr Parallax: 0.000180" Epoch of Position: 2016	
Comments: *Category=Calibration* *Description=[Point spread function]* *Extended=NO*				
(2)	NEW-EPS-MUS-BACKGROUND1	RA: 12 16 54.1500 (184.2256250d) Dec: -68 12 6.10 (-68.20169d) Equinox: J2000		
Comments: *Category=Calibration* *Description=[Coronagraphic, External flat field]*				
(3)	AlphaCen-Offset-StarG0	RA: 14 39 30.6305 (219.8776271d) Dec: -60 49 42.18 (-60.82838d) Equinox: J2000	Proper Motion RA: -3.7898 mas/yr Proper Motion Dec: -1.0139 mas/yr Parallax: 0.0003202" Epoch of Position: 2016	
Comments: *Category=Star* *Description=[Exoplanet Systems]* *Extended=NO*				
(4)	Final_Acen_Bkgnd1	RA: 14 46 12.5300 (221.5522083d) Dec: -62 37 38.75 (-62.62743d) Equinox: J2000	Proper Motion RA: 0 mas/yr Proper Motion Dec: 0 mas/yr Parallax: 0.0" Epoch of Position: 2024.2	
Comments: *Category=Calibration* *Description=[Coronagraphic, External flat field]* *Extended=YES*				
(5)	Acen-Ofset--Star-G3	RA: 14 39 20.1323 (219.8338846d) Dec: -60 50 15.47 (-60.83763d) Equinox: J2000	Proper Motion RA: -4.4592 mas/yr Proper Motion Dec: -2.9465 mas/yr Parallax: 0.0003997" Epoch of Position: 2016	
Comments: *Category=Calibration* *Description=[Coronagraphic]* *Extended=NO*				
(6)	Final_Acen_Bkgnd2	RA: 14 46 12.0000 (221.5500000d) Dec: -62 37 33.00 (-62.62583d) Equinox: J2000	Proper Motion RA: 0 mas/yr Proper Motion Dec: 0 mas/yr Parallax: 0.0" Epoch of Position: 2024.2	
Comments: *Category=Calibration* *Description=[Coronagraphic, External flat field]* *Extended=YES*				

	(7)	AlphaCen-Offset-StarG7	RA: 14 39 21.1066 (219.8379442d) Dec: -60 50 22.28 (-60.83952d) Equinox: J2000	Proper Motion RA: -5.2596 mas/yr Proper Motion Dec: -5.4394 mas/yr Parallax: 0.0005615" Epoch of Position: 2016
	Comments: *Category=Calibration* *Description=[Target acquisition test]* *Extended=NO*			
	(8)	AlphaCenOffsetStarG5	RA: 14 39 31.2225 (219.8800938d) Dec: -60 50 40.40 (-60.84456d) Equinox: J2000	Proper Motion RA: -2.7054 mas/yr Proper Motion Dec: -2.6299 mas/yr Parallax: 0" Epoch of Position: 2016
	Comments: *Category=Calibration* *Description=[Astrometric]* *Extended=NO*			

Observation

Proposal 9252, Observation 1: eps Mus Position A. use offset star G9 Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Error

Observing Template: MIRI Coronagraphic Imaging

Background Observations:[]

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 precise Gaia positions and proper motion values. 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. 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.

This TA positions eps mus behind the coronagrphic mask

Diagnostics

(eps Mus Position A. use offset star G9 (Obs 1)) Error (Form): This target requires similar background exposures that are linked in a non-interruptible group/sequence.

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NEW-EPS-MUS-OFFSET-G9	RA: 12 17 26.1870 (184.3591125d)	Proper Motion RA: -6.0517 mas/yr	
		Dec: -67 58 6.07 (-67.96835d)	Proper Motion Dec: -0.49837 mas/yr	
		Equinox: J2000	Parallax: 0.000180"	
			Epoch of Position: 2016	

Comments:
Category=Calibration
Description=[Point spread function]
Extended=NO

Acquisition

#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	FND	1	FASTGRPAVG8	44	1	1	84.367	198489

Template

Repeat observation
NO

Dithers

#	Dither Type
1	9-POINT-SMALL-GRID

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	400	1	9	3600	26746.131	59296.4

PSF References	PSF Reference: true
Special Requirements	Between Dates 25-APR-2025:01:00:00 and 25-APR-2025:02:00:00 Aperture PA Range 42.83544897 to 42.83544897 Degrees (V3 38.0 to 38.0) Offset 10.962126544114566 arcsec, -46.629943715286394 arcsec No Parallel Attachments

Observation

Proposal 9252, Observation 2: eps Mus Position A BACKGROUND Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI Coronagraphic Imaging

Background Observation For: []

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 precise Gaia positions and proper motion values. 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. 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.

This TA positions eps mus behind the coronagrphic mask

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	NEW-EPS-MUS-BACKGROUND1	RA: 12 16 54.1500 (184.2256250d) Dec: -68 12 6.10 (-68.20169d) Equinox: J2000		

Comments:
Category=Calibration
Description=[Coronagraphic, External flat field]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Repeat observation	Background Quadrant
F560W	NO	1

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	400	1	1	400	2971.792	59296.4

PSF References	Additional Justification: false
Special Requirements	Aperture PA Range 42.83544897 to 42.83544897 Degrees (V3 38.0 to 38.0) No Parallel Attachments

Observation

Proposal 9252, Observation 3: Observe Eps Mus at position of AcenB for PSF reference Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Error

Observing Template: MIRI Coronagraphic Imaging

Background Observations:[]

Diagnostics

(Observe Eps Mus at position of AcenB for PSF reference (Obs 3)) Error (Form): This target requires similar background exposures that are linked in a non-interruptible group/sequence.

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NEW-EPS-MUS-OFFSET-G9	RA: 12 17 26.1870 (184.3591125d) Dec: -67 58 6.07 (-67.96835d) Equinox: J2000	Proper Motion RA: -6.0517 mas/yr Proper Motion Dec: -0.49837 mas/yr Parallax: 0.000180" Epoch of Position: 2016	

Comments:
Category=Calibration
Description=[Point spread function]
Extended=NO

Acquisition

#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	1 NEW-EPS-MUS-OFFSET-G9	FND	1	FASTGRPAVG8	44	1	1	84.367	198489

Template

Repeat observation
NO

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	1250	1	1	1250	9287.36	

PSF References	PSF Reference: true
Special Requirements	Aperture PA Range 42.83544897 to 42.83544897 Degrees (V3 38.0 to 38.0) Offset 8.1591977471 arcsec, -38.1513950645 arcsec No Parallel Attachments

Observation

Proposal 9252, Observation 4: Alpha Cen A F1550 Roll 1 Offset star G5 Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Error

Observing Template: MIRI Coronagraphic Imaging

Background Observations:[]

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 precise Gaia positions and proper motion values. 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. 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.

Diagnostics

(Alpha Cen A F1550 Roll 1 Offset star G5 (Obs 4)) Error (Form): This target requires similar background exposures that are linked in a non-interruptible group/sequence.

(Alpha Cen A F1550 Roll 1 Offset star G5 (Obs 4)) Warning (Form): Coronagraphic Science and PSF Reference observations should be executed contiguously via a Group/Sequence Observations Link.

(Alpha Cen A F1550 Roll 1 Offset star G5 (Obs 4)) Warning (Form): Science observations should be linked to at least one other compatible science observation by an Aperture PA Offset of 1-14 degrees

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 4:1) 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
(8)	AlphaCenOffsetStarG5	RA: 14 39 31.2225 (219.8800938d) Dec: -60 50 40.40 (-60.84456d) Equinox: J2000	Proper Motion RA: -2.7054 mas/yr Proper Motion Dec: -2.6299 mas/yr Parallax: 0" Epoch of Position: 2016	

Comments:
Category=Calibration
Description=[Astrometric]
Extended=NO

Acquisition

#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F1000W	1	FASTGRPAVG8	86	1	1	164.9	180933.1

Template

Repeat observation
NO

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	1250	1	1	1250	9287.36	59296.2

PSF References	eps Mus Position A. use offset star G9 (Obs 1) (PSF Reference; Filters [F1550C]) Additional Justification: false
Special Requirements	After Date 25-APR-2025:13:00:00 Aperture PA Range 351.83544897 to 351.83544897 Degrees (V3 347.0 to 347.0) Offset -51.78856 arcsec, -53.932949 arcsec No Parallel Attachments

Observation

Proposal 9252, Observation 5: Alpha Cen A F1550 - BACKGROUND Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI Coronagraphic Imaging

Background Observation For: []

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 precise Gaia positions and proper motion values. 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. 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.

Diagnostics

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 5:1) 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
(4)	Final_Acen_Bkgnd1	RA: 14 46 12.5300 (221.5522083d) Dec: -62 37 38.75 (-62.62743d) Equinox: J2000	Proper Motion RA: 0 mas/yr Proper Motion Dec: 0 mas/yr Parallax: 0.0" Epoch of Position: 2024.2	

Comments:
Category=Calibration
Description=[Coronagraphic, External flat field]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Repeat observation	Background Quadrant
F560W	NO	1

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	1250	1	1	1250	9287.36	59296.2

PSF References	Additional Justification: false
Special Requirements	Aperture PA Range 351.83544897 to 351.83544897 Degrees (V3 347.0 to 347.0) No Parallel Attachments

Observation

Proposal 9252, Observation 6: Alpha Cen A F1550 Roll 2 Offset star G5 Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Error

Observing Template: MIRI Coronagraphic Imaging

Background Observations:[]

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 precise Gaia positions and proper motion values. 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. 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.

Diagnostics

(Alpha Cen A F1550 Roll 2 Offset star G5 (Obs 6)) Error (Form): This target requires similar background exposures that are linked in a non-interruptible group/sequence.

(Alpha Cen A F1550 Roll 2 Offset star G5 (Obs 6)) Warning (Form): Coronagraphic Science and PSF Reference observations should be executed contiguously via a Group/Sequence Observations Link.

(Alpha Cen A F1550 Roll 2 Offset star G5 (Obs 6)) Warning (Form): Science observations should be linked to at least one other compatible science observation by an Aperture PA Offset of 1-14 degrees

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 6:1) 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
(8)	AlphaCenOffsetStarG5	RA: 14 39 31.2225 (219.8800938d) Dec: -60 50 40.40 (-60.84456d) Equinox: J2000	Proper Motion RA: -2.7054 mas/yr Proper Motion Dec: -2.6299 mas/yr Parallax: 0" Epoch of Position: 2016	

Comments:
Category=Calibration
Description=[Astrometric]
Extended=NO

Acquisition

#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F1000W	1	FASTGRPAVG8	86	1	1	164.9	180933.1

Template

Repeat observation
NO

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	1250	1	1	1250	9287.36	59296.2

PSF References	offset star for eps Mus. Offset G9. Obs 2 (Obs 8) (PSF Reference; Filters [F1550C]) Additional Justification: false
Special Requirements	After Date 25-APR-2025:19:30:00 Aperture PA Range 0.83544897 to 0.83544897 Degrees (V3 356.0 to 356.0) Offset -59.59341180652874 arcsec, -45.16805619075654 arcsec No Parallel Attachments

Observation

Proposal 9252, Observation 7: Alpha Cen A F1550 - BACKGROUND Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI Coronagraphic Imaging

Background Observation For: []

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 precise Gaia positions and proper motion values. 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. 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.

Diagnostics

(Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(6)	Final_Acen_Bkgnd2	RA: 14 46 12.0000 (221.5500000d)	Proper Motion RA: 0 mas/yr	
		Dec: -62 37 33.00 (-62.62583d)	Proper Motion Dec: 0 mas/yr	
		Equinox: J2000	Parallax: 0.0"	
			Epoch of Position: 2024.2	

Comments:
Category=Calibration
Description=[Coronagraphic, External flat field]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Repeat observation	Background Quadrant
F560W	NO	1

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	1250	1	1	1250	9287.36	59296.2

PSF References	Additional Justification: false
Special Requirements	Aperture PA Range 0.83544897 to 0.83544897 Degrees (V3 356.0 to 356.0) No Parallel Attachments

Observation

Proposal 9252, Observation 8: offset star for eps Mus. Offset G9. Obs 2 Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Error

Observing Template: MIRI Coronagraphic Imaging

Background Observations:[]

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 precise Gaia positions and proper motion values. 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. 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.

This TA positions eps mus behind the coronagrphic mask

Diagnostics

(offset star for eps Mus. Offset G9. Obs 2 (Obs 8)) Error (Form): This target requires similar background exposures that are linked in a non-interruptible group/sequence.

(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NEW-EPS-MUS-OFFSET-G9	RA: 12 17 26.1870 (184.3591125d)	Proper Motion RA: -6.0517 mas/yr	
		Dec: -67 58 6.07 (-67.96835d)	Proper Motion Dec: -0.49837 mas/yr	
		Equinox: J2000	Parallax: 0.000180"	
			Epoch of Position: 2016	

Comments:
Category=Calibration
Description=[Point spread function]
Extended=NO

Acquisition

#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	FND	1	FASTGRPAVG8	44	1	1	84.367	198489

Template

Repeat observation
NO

Dithers

#	Dither Type
1	9-POINT-SMALL-GRID

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	400	1	9	3600	26746.131	59296.4

PSF References	PSF Reference: true
Special Requirements	Aperture PA Range 42.83544897 to 42.83544897 Degrees (V3 38.0 to 38.0) Offset 10.961734391162809 arcsec, -46.629487191164884 arcsec No Parallel Attachments

Observation

Proposal 9252, Observation 9: offset star for eps Mus. BACKGROUND Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI Coronagraphic Imaging

Background Observation For: []

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 precise Gaia positions and proper motion values. 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. 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.

This TA positions eps mus behind the coronagrphic mask

Diagnostics

(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	NEW-EPS-MUS-BACKGROUND1	RA: 12 16 54.1500 (184.2256250d) Dec: -68 12 6.10 (-68.20169d) Equinox: J2000		

Comments:
Category=Calibration
Description=[Coronagraphic, External flat field]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Repeat observation	Background Quadrant
F560W	NO	1

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	400	1	1	400	2971.792	59296.4

PSF References	Additional Justification: false
Special Requirements	Aperture PA Range 42.83544897 to 42.83544897 Degrees (V3 38.0 to 38.0) No Parallel Attachments

Observation

Proposal 9252, Observation 10: Observe Eps Mus at position of AcenB for PSF reference Thu Apr 10 21:00:25 GMT 2025

Diagnostic Status: Error

Observing Template: MIRI Coronagraphic Imaging

Background Observations:[]

Diagnostics

(Observe Eps Mus at position of AcenB for PSF reference (Obs 10)) Error (Form): This target requires similar background exposures that are linked in a non-interruptible group/sequence.

(Visit 10:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NEW-EPS-MUS-OFFSET-G9	RA: 12 17 26.1870 (184.3591125d) Dec: -67 58 6.07 (-67.96835d) Equinox: J2000	Proper Motion RA: -6.0517 mas/yr Proper Motion Dec: -0.49837 mas/yr Parallax: 0.000180" Epoch of Position: 2016	

Comments:
Category=Calibration
Description=[Point spread function]
Extended=NO

Acquisition

#	Target	Filter	Quadrant	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	1 NEW-EPS-MUS-OFFSET-G9	FND	1	FASTGRPAVG8	44	1	1	84.367	198489

Template

Repeat observation
NO

Dithers

#	Dither Type
1	NONE

Spectral Elements

#	Coron Mask/Filter	Subarray	Mask	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4QPM/F1550C	MASK1550	4QPM	F1550C	FASTR1	30	1250	1	1	1250	9287.36	

PSF References	PSF Reference: true
Special Requirements	Aperture PA Range 42.83544897 to 42.83544897 Degrees (V3 38.0 to 38.0) Offset 9.5199684874 arcsec, -37.8173626478 arcsec No Parallel Attachments