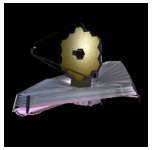

# 2278 - Illuminating Ice: A 3D View of Water Ice During Planet Formation

Cycle: 1, Proposal Category: GO

**INVESTIGATORS**

| *Name* | *Institution* |
|---|---|
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**OBSERVATIONS**

| *Folder* | *Observation* | *Label* | *Observing Template* | *Science Target* |
|---|---|---|---|---|
| Observation Folder | | | | |
| | 1 | PSF Cal LW | NIRCam Coronagraphic Imaging | (2) HD-314955 |
| | 2 | PSF Cal SW | NIRCam Coronagraphic Imaging | (2) HD-314955 |
| | 7 | PSF Cal SW Repeat | NIRCam Coronagraphic Imaging | (3) HD-172075 |
| | 3 | V4046 Sgr SW Roll 1 | NIRCam Coronagraphic Imaging | (1) V4046-SGR |
| | 4 | V4046 Sgr SW Roll 2 | NIRCam Coronagraphic Imaging | (1) V4046-SGR |
| | 8 | V4046 Sgr SW Roll 2 Repeat | NIRCam Coronagraphic Imaging | (1) V4046-SGR |
| | 9 | V4046 Sgr SW Roll 2 Repeat | NIRCam Coronagraphic Imaging | (1) V4046-SGR |
| | 5 | V4046 Sgr LW Roll 1 | NIRCam Coronagraphic Imaging | (1) V4046-SGR |
| | 6 | V4046 Sgr LW Roll 2 | NIRCam Coronagraphic Imaging | (1) V4046-SGR |

**ABSTRACT**

Ice is an essential ingredient in both the initial formation process of planets and for setting planets' initial compositions. However, the distribution of ice during planet formation is currently poorly constrained. We propose to map the 3.1 micron H2O ice feature in the outer regions (>53 au; 0.735") of the fascinating V4046 Sgr protoplanetary disk system. The primary goal of this proposal is to localize the spatial extent of the H2O ice disk, to shed light on ice abundances and transport during planet formation. Ground-based coronagraphic imaging reveals >39 stars within the boundaries of V4046 Sgr's gas-rich disk (4" CO radius), making it an ideal target for an ice study. We plan to map V4046 Sgr's ices spectro-photometrically using NIRCam coronagraphic images covering 1.82 -- 4.3 micron, allowing us to fit the 3.1 micron absorption depth to pinpoint the presence of ice. We expect to detect both ice absorption against the background stars and reflected light from the disk, if ice is present. These two constraints offer complimentary approaches to examine both surface and midplane ice populations, allowing us to produce the first three-dimensional ice map of a planet-forming disk.

**OBSERVING DESCRIPTION**

We propose to image the disk of V4046 Sgr in five filters, F182M, F250M, F300M, F335M, and F444W, using NIRCam in Coronagraphy mode to constrain the distribution of ice (radial and vertical). These five filters were chosen to allow us to accurately measuring the depth of the H2O ice feature at 3 micron (using F300M and F335M) on top of the dust continuum flux (whose shape will be measured with F182M, F250M, and F444W, along with archival VLT J and H band coronagraphy). With NIRCam's coronagraphy mode, we will be able to measure both:
1) the albedo variations in the reflected light from the disk down to about 53 au (0.735" IWA at 4.3 micron) to search for water ice in the disk surface on small grains, and
2) the pure absorption depth at 3 micron against background stars to measure the total water ice column, including the midplane.

We have estimated our sensitivity requirements to significantly detect (25 sigma) the closest identified background star at a projected distance of 1.7" in all five filters. This sensitivity enables us to simulatenously image the disk in reflected light with all five filters at >= 10 sigma at 1" and 2-5 sigma at 2". Given the substantial drop in albedo at 3 micron when water is present (~90-100%), we should be able to determine if water is present in the surface at this same significance level when compared to adjacent wavelengths not impacted by H2O. In the case of background star absorption, this SNR will allow us to detect water ice down to ~100x below interstellar ice abundances (i.e., the removal scenario).

To obtain the cleanest possible images of the disk and background stars, we have chosen to use a PSF reference star with a similar spectral type (K7) located 7.32 degrees away from our science target. The PSF reference also has a similar H-band magnitude (7.227) to V4046 Sgr (7.435; note the V4046 Sgr magnitude factors in both stars of the closely separated binary, 9 Rsun). In addition, given the crowded field we also request to image the

disk with two roll angles 10-14 degrees apart.

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |
| *Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*<br>*Category=Star*<br>*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*<br>*Extended=YES* | | | | |
| (2) | HD-314955 | RA: 18 01 42.5392 (270.4272467d)<br>Dec: -25 52 33.69 (-25.87603d)<br>Equinox: J2000 | Proper Motion RA: 1.8523859904439124E-4 sec of time/yr<br>Proper Motion Dec: -2.770000037344289E-4 arcsec/yr<br>Epoch of Position: 2015.5 | |
| *Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*<br>*Category=Star*<br>*Description=[K dwarfs]*<br>*Extended=NO* | | | | |
| (3) | HD-172075 | RA: 18 39 39.9584 (279.9164933d)<br>Dec: -35 17 29.91 (-35.29164d)<br>Equinox: J2000 | Proper Motion RA: -0.24899999999999997 mas/yr<br>Proper Motion Dec: 12.602 mas/yr<br>Epoch of Position: 2000 | |
| *Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*<br>*Category=Star*<br>*Description=[K stars]*<br>*Extended=NO* | | | | |

## Observation

**Proposal 2278, Observation 1: PSF Cal LW**

Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Error**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(PSF Cal LW (Obs 1)) Error (Form): Short Filter is a required field.

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(PSF Cal LW (Obs 1)) Error (Form): Short Filter is a required field.

(PSF Cal LW (Obs 1)) Error (Form): Short Filter is a required field.

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

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (2) | HD-314955 | RA: 18 01 42.5392 (270.4272467d)<br>Dec: -25 52 33.69 (-25.87603d)<br>Equinox: J2000 | Proper Motion RA: 1.8523859904439124E-4 sec of time/yr<br>Proper Motion Dec: -2.770000037344289E-4 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[K dwarfs]*
*Extended=NO*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F335M | FAINT | RAPID | 3 | 1 | 1 | 0.203 | 60822.28 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK335R | true | SUB320A335R | 5-POINT-BOX |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 3 | 1 | 1 | 32.21 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | F250M | DEEP8 | 7 | 4 | 5 | 20 | 2758.533 | 60822.21 |
| 2 | | F300M | DEEP8 | 5 | 4 | 5 | 20 | 1903.301 | 60822.19 |
| 3 | | F335M | DEEP8 | 7 | 4 | 5 | 20 | 2758.533 | 60822.23 |
| 4 | | F444W | DEEP8 | 10 | 5 | 5 | 25 | 5051.726 | 60822.20 |

| | |
|---|---|
| **PSF References** | PSF Reference: true |
| **Special Requirements** | No Parallel Attachments<br>Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible |

## Observation

**Proposal 2278, Observation 2: PSF Cal SW** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Error**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(PSF Cal SW (Obs 2)) Error (Form): Long Filter is a required field.

(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) | HD-314955 | RA: 18 01 42.5392 (270.4272467d)<br>Dec: -25 52 33.69 (-25.87603d)<br>Equinox: J2000 | Proper Motion RA: 1.8523859904439124E-4 sec of time/yr<br>Proper Motion Dec: -2.770000037344289E-4 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[K dwarfs]*
*Extended=NO*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F210M | BRIGHT (ND Square) | RAPID | 65 | 1 | 1 | 12.017 | 60822.29 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK210R | true | SUB640A210R | 5-POINT-BOX |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 10 | 6 | 6 | 697.89 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F182M | | SHALLOW4 | 4 | 7 | 5 | 35 | 2930.805 | 60822.27 |

| | |
|---|---|
| **PSF References** | PSF Reference: true |
| **Special Requirements** | No Parallel Attachments<br>Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible |

## Observation

**Proposal 2278, Observation 7: PSF Cal SW Repeat** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Warning**

Observing Template: NIRCam Coronagraphic Imaging

## 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 |
|---|---|---|---|---|
| (3) | HD-172075 | RA: 18 39 39.9584 (279.9164933d) | Proper Motion RA: -0.24899999999999997 mas/yr | |
| | | Dec: -35 17 29.91 (-35.29164d) | Proper Motion Dec: 12.602 mas/yr | |
| | | Equinox: J2000 | Epoch of Position: 2000 | |

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

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F210M | BRIGHT (ND Square) | BRIGHT1 | 65 | 1 | 1 | 23.665 | 155945.24 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK210R | true | SUB640A210R | 9-POINT-CIRCLE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 10 | 6 | 6 | 697.89 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F182M | F300M | BRIGHT2 | 8 | 2 | 9 | 18 | 1281.236 | 160852 |

| | |
|---|---|
| **PSF References** | PSF Reference: true |
| **Special Requirements** | No Parallel Attachments<br>Sequence Observations 7, 8, Non-interruptible |

## Observation

**Proposal 2278, Observation 3: V4046 Sgr SW Roll 1** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Error**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(V4046 Sgr SW Roll 1 (Obs 3)) Error (Form): Long Filter is a required field.

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

(V4046 Sgr SW Roll 1 (Obs 3)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*
*Extended=YES*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F210M | BRIGHT (ND Square) | RAPID | 65 | 1 | 1 | 12.017 | 60822.24 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK210R | true | SUB640A210R | NONE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 10 | 6 | 6 | 697.89 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F182M | | SHALLOW4 | 6 | 12 | 1 | 12 | 1507.148 | 60822.16 |

| | |
|---|---|
| **PSF References** | PSF Cal SW (Obs 2) (PSF Reference; Filters [F182M/null])<br>Additional Justification: false |
| **Special Requirements** | Aperture PA Range 264 to 283 Degrees (V3 263.96811481 to 282.96811481)<br>No Parallel Attachments<br><br>Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible<br>Aperture PA Offset 4 from 3 by 10 to 14 Degrees (Same offsets in V3) |

## Observation

**Proposal 2278, Observation 4: V4046 Sgr SW Roll 2** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Error**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(V4046 Sgr SW Roll 2 (Obs 4)) Error (Form): Long Filter is a required field.

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

(V4046 Sgr SW Roll 2 (Obs 4)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*
*Extended=YES*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F210M | BRIGHT (ND Square) | RAPID | 65 | 1 | 1 | 12.017 | 60822.24 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK210R | true | SUB640A210R | NONE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 10 | 6 | 6 | 697.89 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F182M | | SHALLOW4 | 6 | 12 | 1 | 12 | 1507.148 | 60822.16 |

| | |
|---|---|
| **PSF References** | PSF Cal SW (Obs 2) (PSF Reference; Filters [F182M/null])<br>Additional Justification: false |
| **Special Requirements** | No Parallel Attachments<br><br>Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible<br>Aperture PA Offset 4 from 3 by 10 to 14 Degrees (Same offsets in V3) |

## Observation

**Proposal 2278, Observation 8: V4046 Sgr SW Roll 2 Repeat** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Warning**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(V4046 Sgr SW Roll 2 Repeat (Obs 8)) 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 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*
*Extended=YES*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F210M | BRIGHT (ND Square) | SHALLOW4 | 65 | 1 | 1 | 59.155 | 155945.24 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK210R | true | SUB640A210R | NONE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 10 | 6 | 6 | 697.89 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F182M | F300M | SHALLOW2 | 4 | 30 | 1 | 30 | 2260.968 | 160852 |

| | |
|---|---|
| **PSF References** | PSF Cal SW Repeat (Obs 7) (PSF Reference; Filters [F182M/F300M])<br>Additional Justification: false |
| **Special Requirements** | No Parallel Attachments<br>Sequence Observations 7, 8, Non-interruptible |

## Observation

**Proposal 2278, Observation 9: V4046 Sgr SW Roll 2 Repeat** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Warning**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(V4046 Sgr SW Roll 2 Repeat (Obs 9)) Warning (Form): PSF Reference observations should be SEQ NON-INT.

(V4046 Sgr SW Roll 2 Repeat (Obs 9)) 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 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*
*Extended=YES*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F210M | BRIGHT (ND Square) | SHALLOW4 | 65 | 1 | 1 | 59.155 | 155945.24 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK210R | true | SUB640A210R | NONE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 10 | 6 | 6 | 697.89 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F182M | F300M | SHALLOW2 | 4 | 30 | 1 | 30 | 2260.968 | 160852 |

| | |
|---|---|
| **PSF References** | PSF Cal SW Repeat (Obs 7) (PSF Reference; Filters [F182M/F300M])<br>Additional Justification: false |
| **Special Requirements** | No Parallel Attachments |

## Observation

**Proposal 2278, Observation 5: V4046 Sgr LW Roll 1** Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Error**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(V4046 Sgr LW Roll 1 (Obs 5)) Error (Form): Short Filter is a required field.

(V4046 Sgr LW Roll 1 (Obs 5)) Error (Form): Short Filter is a required field.

(V4046 Sgr LW Roll 1 (Obs 5)) Error (Form): Short Filter is a required field.

(V4046 Sgr LW Roll 1 (Obs 5)) Error (Form): Short Filter is a required field.

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

(V4046 Sgr LW Roll 1 (Obs 5)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*
*Extended=YES*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F335M | FAINT | RAPID | 5 | 1 | 1 | 0.304 | 60822.26 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK335R | true | SUB320A335R | NONE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 5 | 1 | 1 | 53.684 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | F250M | DEEP8 | 6 | 10 | 1 | 10 | 1165.458 | 60822.21 |
| 2 | | F300M | DEEP8 | 5 | 10 | 1 | 10 | 951.65 | 60822.19 |
| 3 | | F335M | DEEP8 | 5 | 15 | 1 | 15 | 1427.476 | 60822.23 |
| 4 | | F444W | DEEP8 | 8 | 15 | 1 | 15 | 2389.612 | 60822.20 |

| | |
|---|---|
| **PSF References** | PSF Cal LW (Obs 1) (PSF Reference; Filters [null/F444W, null/F250M, null/F300M, null/F335M])<br>Additional Justification: false |
| **Special Requirements** | Aperture PA Range 264 to 283 Degrees (V3 263.94571388 to 282.94571388)<br>No Parallel Attachments<br><br>Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible<br>Aperture PA Offset 6 from 5 by 10 to 14 Degrees (Same offsets in V3) |

## Observation

**Proposal 2278, Observation 6: V4046 Sgr LW Roll 2**

Wed Aug 23 22:00:52 GMT 2023

**Diagnostic Status: Error**

Observing Template: NIRCam Coronagraphic Imaging

## Diagnostics

(V4046 Sgr LW Roll 2 (Obs 6)) Error (Form): Short Filter is a required field.

(V4046 Sgr LW Roll 2 (Obs 6)) Error (Form): Short Filter is a required field.

(V4046 Sgr LW Roll 2 (Obs 6)) Error (Form): Short Filter is a required field.

(V4046 Sgr LW Roll 2 (Obs 6)) Error (Form): Short Filter is a required field.

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

(V4046 Sgr LW Roll 2 (Obs 6)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | V4046-SGR | RA: 18 14 10.4862 (273.5436925d)<br>Dec: -32 47 35.33 (-32.79315d)<br>Equinox: J2000 | Proper Motion RA: 2.7685539642971556E-4 sec of time/yr<br>Proper Motion Dec: -0.052754000080312835 arcsec/yr<br>Epoch of Position: 2015.5 | |

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=Star*
*Description=[Compact binary stars, Disk stars, K dwarfs, T Tauri stars]*
*Extended=YES*

## Acquisition

| # | Target | Filter | Target Brightness | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SAME | F335M | FAINT | RAPID | 5 | 1 | 1 | 0.304 | 60822.26 |

## Template

| Module | Coronagraphic Mask | Obtain Astrometric Confirmation Images? | Subarray | Dither Pattern |
|---|---|---|---|---|
| A | MASK335R | true | SUB320A335R | NONE |

## Confirmation

| # | Conf. Readout Pattern | Conf. Groups/Int | Conf. Integrations/Exp | Conf. Total Integrations | Conf. Total Exposure Time | Conf. Total Dithers |
|---|---|---|---|---|---|---|
| 1 | RAPID | 5 | 1 | 1 | 53.684 | 1 |

## Spectral Elements

| # | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | F250M | DEEP8 | 6 | 10 | 1 | 10 | 1165.458 | 60822.21 |
| 2 | | F300M | DEEP8 | 5 | 10 | 1 | 10 | 951.65 | 60822.19 |
| 3 | | F335M | DEEP8 | 5 | 15 | 1 | 15 | 1427.476 | 60822.23 |
| 4 | | F444W | DEEP8 | 8 | 15 | 1 | 15 | 2389.612 | 60822.20 |

| | |
|---|---|
| **PSF References** | PSF Cal LW (Obs 1) (PSF Reference; Filters [null/F444W, null/F250M, null/F300M, null/F335M])<br>Additional Justification: false |
| **Special Requirements** | No Parallel Attachments<br><br>Sequence Observations 1, 2, 3, 4, 5, 6, Non-interruptible<br>Aperture PA Offset 6 from 5 by 10 to 14 Degrees (Same offsets in V3) |