



## 1676 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Cycle: 1, Proposal Category: GO

### INVESTIGATORS

| <i>Name</i>                            | <i>Institution</i>       |
|--|--------------------------|
| <b>Dr. Catherine Espaillat (PI)</b>    | <b>Boston University</b> |
| Dr. Melissa McClure (CoI) (ESA Member) | Universiteit Leiden      |
| Dr. Nuria Calvet (CoI)                 | University of Michigan   |

### OBSERVATIONS

| <i>Folder</i> | <i>Observation</i> | <i>Label</i> | <i>Observing Template</i>           | <i>Science Target</i> |
|---------------|--------------------|--------------|-------------------------------------|-----------------------|
| UX Tau        |                    |              |                                     |                       |
|               | 1                  |              | MIRI Medium Resolution Spectroscopy | (1) UX-TAU-A          |
|               | 2                  |              | MIRI Medium Resolution Spectroscopy | (7) UX-TAU-A-BG       |
| RXJ1615.3     |                    |              |                                     |                       |
|               | 3                  |              | MIRI Medium Resolution Spectroscopy | (2) RXJ1615.3         |
|               | 4                  |              | MIRI Medium Resolution Spectroscopy | (8) RXJ1615.3-BG      |
| GM-Aur        |                    |              |                                     |                       |
|               | 5                  |              | MIRI Medium Resolution Spectroscopy | (5) GM-AUR            |
|               | 6                  |              | MIRI Medium Resolution Spectroscopy | (11) GM-AUR-BG        |
| SZ_Cha        |                    |              |                                     |                       |
|               | 7                  |              | MIRI Medium Resolution Spectroscopy | (6) SZ-CHA            |
|               | 8                  |              | MIRI Medium Resolution Spectroscopy | (12) SZ-CHA-BG        |

### ABSTRACT

Theoretical simulations suggest that the protoplanetary disk lifetime is dictated by the rate at which gas is eroded by photoevaporative winds created by high-energy radiation from the central star. However, photoevaporation models predict significantly different mass loss rates depending on

whether the photoevaporation is driven by the EUV or X-ray radiation field. These different mass loss rates lead to different timescales for disk clearing and hence the timescale by which giant planets must form. Here we propose to observe the [Ne II] 12.8 micron and [Ne III] 15.5 micron fine structure emission lines and measure the [Ne III]-to-[Ne II] line ratio, which has been put forward as a diagnostic of the high-energy radiation field. Specifically, the ratio of these Neon lines can distinguish between EUV vs. X-ray driven photoevaporation. We propose to use MIRI to observe the Neon lines given that JWST is the only facility that can observe the [Ne III] 15.5 micron line. These observations will characterize the high-energy radiation field and thus the efficiency of photoevaporation, providing constraints on the disk clearing timescale and the planet formation timescale in protoplanetary disks.

### **OBSERVING DESCRIPTION**

We will observe 4 targets with MIRI MRS in all channels for a total of 7.66 hrs, including overheads. We used existing IRS spectra to do our calculations in the ETC for all estimates reported below. We employ the same observation scheme for each of the 4 targets. Given the pointing accuracy of JWST ( $\sim 0.1''$ ), we do not require target acquisition; since our targets are point sources they will be reasonably well-centered within the FOV. We do not expect to resolve the emission from our targets, so we choose the default 4-point dither optimized for point sources and all wavelengths. We will use FAST readout for all spectral observations. The minimum recommended groups/integration for data reduction by the MIRI Handbook is 10. Using 10 groups/integration and 1 integration per exposure (1 total exposure), we obtain S/N for UX Tau A, RXJ1615.3, GM Aur, and SZ Cha of 50-120, 15-80, 20-120, 20-100, respectively. This will be sufficient to measure the line emission. For each observation, we also request a background observation taken with the same set up. To choose the background, we inspected DSS, 2MASS, and WISE images to select a nearby off-source area with no bright objects.

# Proposal 1676 - Targets - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

| #  | Name         | Target Coordinates   | Targ. Coord. Corrections  | Miscellaneous |
|--|--------------|--|---|---------------|
| (1)  | UX-TAU-A     | RA: 04 30 3.9934 (67.5166392d)<br>Dec: +18 13 49.47 (18.23041d)<br>Equinox: J2000    | Proper Motion RA: 12.850096450350785 mas/yr<br>Proper Motion Dec: -17.33528650730064 mas/yr<br>Epoch of Position: 2016  |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Star<br/>           Description=[Protoplanetary disks]<br/>           Extended=NO</p>            |              |  |   |               |
| (2)  | RXJ1615.3    | RA: 16 15 20.2310 (243.8342958d)<br>Dec: -32 55 5.10 (-32.91808d)<br>Equinox: J2000  | Proper Motion RA: -8.20461247281578 mas/yr<br>Proper Motion Dec: -23.410129875769925 mas/yr<br>Epoch of Position: 2016  |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Star<br/>           Description=[Protoplanetary disks]<br/>           Extended=NO</p>            |              |  |   |               |
| (5)  | GM-AUR       | RA: 04 55 10.9830 (73.7957625d)<br>Dec: +30 21 59.54 (30.36654d)<br>Equinox: J2000   | Proper Motion RA: 3.7476542353904416 mas/yr<br>Proper Motion Dec: -24.298265830169495 mas/yr<br>Epoch of Position: 2016 |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Star<br/>           Description=[Protoplanetary disks]<br/>           Extended=NO</p>            |              |  |   |               |
| (6)  | SZ-CHA       | RA: 10 58 16.7740 (164.5698917d)<br>Dec: -77 17 17.06 (-77.28807d)<br>Equinox: J2000 | Proper Motion RA: -23.466047892751526 mas/yr<br>Proper Motion Dec: 2.030140685800411 mas/yr<br>Epoch of Position: 2016  |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Star<br/>           Description=[Protoplanetary disks]<br/>           Extended=NO</p>            |              |  |   |               |
| (7)  | UX-TAU-A-BG  | RA: 04 30 5.5288 (67.5230367d)<br>Dec: +18 13 30.67 (18.22519d)<br>Equinox: J2000    |   |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Calibration<br/>           Description=[Telescope/sky background]<br/>           Extended=NO</p> |              |  |   |               |
| (8)  | RXJ1615.3-BG | RA: 16 15 20.1712 (243.8340467d)<br>Dec: -32 55 22.08 (-32.92280d)<br>Equinox: J2000 |   |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Calibration<br/>           Description=[Telescope/sky background]<br/>           Extended=NO</p> |              |  |   |               |
| (11)   | GM-AUR-BG    | RA: 04 55 12.1774 (73.8007392d)<br>Dec: +30 21 45.02 (30.36251d)<br>Equinox: J2000   |   |               |
| <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br/>           Category=Calibration<br/>           Description=[Telescope/sky background]<br/>           Extended=NO</p> |              |  |   |               |

Fixed Targets

## Proposal 1676 - Targets - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

|      |           |   |
|------|-----------|---|
| (12) | SZ-CHA-BG | RA: 10 58 25.0659 (164.6044413d)<br>Dec: -77 17 8.97 (-77.28582d)<br>Equinox: J2000 |
|------|-----------|---|

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*

*Category=Calibration*

*Description=[Telescope/sky background]*

*Extended=NO*

Proposal 1676 - Observation 1 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
|--|--|-------------------------|---|------------------------|------------------------|--|---------------------------|----------------------------|--------------------------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 1</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[Observation 2] |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
|  | (Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
| <b>Fixed Targets</b>   | <b>#</b>   | <b>Name</b>             | <b>Target Coordinates</b>   |                        |                        | <b>Targ. Coord. Corrections</b>  |                           |                            | <b>Miscellaneous</b>           |                      |                           |                            |                         |
|  | (1)  | UX-TAU-A                | RA: 04 30 3.9934 (67.5166392d)<br>Dec: +18 13 49.47 (18.23041d)<br>Equinox: J2000 |                        |                        | Proper Motion RA: 12.850096450350785 mas/yr<br>Proper Motion Dec: -17.33528650730064 mas/yr<br>Epoch of Position: 2016 |                           |                            |                                |                      |                           |                            |                         |
| <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br>Category=Star<br>Description=[Protoplanetary disks]<br>Extended=NO |  |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
| <b>Acquisition</b>   | <b>#</b>   | <b>Target</b>           | <b>Filter</b>   | <b>Readout Pattern</b> | <b>Groups/Int</b>      | <b>Integrations/Exp</b>  | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b>        |                      |                           |                            |                         |
|  | 1  | SAME                    | FND   | FAST                   | 4                      | 1  | 1                         | 11.1                       | 87582                          |                      |                           |                            |                         |
| <b>Template</b>  | <b>Primary Channel</b>   |                         | <b>Simultaneous Imaging</b>   |                        |                        | <b>Imager Subarray</b>   |                           |                            | <b>Grating Wheel Direction</b> |                      |                           |                            |                         |
|  | All MRS  |                         | NO  |                        |                        | FULL   |                           |                            | NEUTRAL                        |                      |                           |                            |                         |
| <b>Dithers</b>   | <b>#</b>   | <b>Dither Type</b>      |   |                        | <b>Optimized For</b>   |  |                           | <b>Direction</b>           |                                |                      |                           |                            |                         |
|  | 1  | 4-Point                 |   |                        | POINT SOURCE           |  |                           | NEGATIVE                   |                                |                      |                           |                            |                         |
| <b>Spectral Elements</b>   | <b>#</b>   | <b>Wavelength Range</b> | <b>Detector</b>   | <b>Filter</b>          | <b>Readout Pattern</b> | <b>Groups/Int</b>  | <b>Integrations/Exp</b>   | <b>Exposures/Dith</b>      | <b>Dither</b>                  | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|  | 1  | SHORT(A)                | MRSLONG   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 1  | SHORT(A)                | MRSSHORT  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 2  | MEDIUM(B)               | MRSLONG   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 2  | MEDIUM(B)               | MRSSHORT  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 3  | LONG(C)                 | MRSLONG   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 3  | LONG(C)                 | MRSSHORT  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |

Proposal 1676 - Observation 1 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 1, 2, Non-interruptible

Proposal 1676 - Observation 2 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                  |   |        |                          |            |                  |                 |               |                         |                    |                     |                  |
|--|--|------------------|---|--------|--------------------------|------------|------------------|-----------------|---------------|-------------------------|--------------------|---------------------|------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 2</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observation For: [Observation 1] |                  |   |        |                          |            |                  |                 |               |                         |                    |                     |                  |
|  | (Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                  |   |        |                          |            |                  |                 |               |                         |                    |                     |                  |
| <b>Fixed Targets</b>   | #  | Name             | Target Coordinates  |        | Targ. Coord. Corrections |            |                  |                 | Miscellaneous |                         |                    |                     |                  |
|  | (7)  | UX-TAU-A-BG      | RA: 04 30 5.5288 (67.5230367d)<br>Dec: +18 13 30.67 (18.22519d)<br>Equinox: J2000 |        |                          |            |                  |                 |               |                         |                    |                     |                  |
| <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br><i>Category=Calibration</i><br><i>Description=[Telescope/sky background]</i><br><i>Extended=NO</i> |  |                  |   |        |                          |            |                  |                 |               |                         |                    |                     |                  |
| <b>Acquisition</b>   | #  | Target           |   |        |                          |            |                  |                 |               |                         |                    |                     |                  |
|  | 1  | NONE             |   |        |                          |            |                  |                 |               |                         |                    |                     |                  |
| <b>Template</b>  | AcqFilter  | Primary Channel  |   |        | Simultaneous Imaging     |            |                  | Imager Subarray |               | Grating Wheel Direction |                    |                     |                  |
|  | FND  | All MRS          |   |        | NO                       |            |                  | FULL            |               | NEUTRAL                 |                    |                     |                  |
| <b>Dithers</b>   | #  | Dither Type      |   |        | Optimized For            |            |                  |                 | Direction     |                         |                    |                     |                  |
|  | 1  | 4-Point          |   |        | POINT SOURCE             |            |                  |                 | NEGATIVE      |                         |                    |                     |                  |
| <b>Spectral Elements</b>   | #  | Wavelength Range | Detector  | Filter | Readout Pattern          | Groups/Int | Integrations/Exp | Exposures/Dith  | Dither        | Total Dithers           | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|  | 1  | SHORT(A)         | MRSLONG   |        | FASTR1                   | 10         | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 1  | SHORT(A)         | MRSSHORT  |        | FASTR1                   | 10         | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSLONG   |        | FASTR1                   | 10         | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSSHORT  |        | FASTR1                   | 10         | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 3  | LONG(C)          | MRSLONG   |        | FASTR1                   | 10         | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 3  | LONG(C)          | MRSSHORT  |        | FASTR1                   | 10         | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |

Proposal 1676 - Observation 2 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 1, 2, Non-interruptible



Proposal 1676 - Observation 3 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
|--|--|-------------------------|---|------------------------|------------------------|--|---------------------------|----------------------------|--------------------------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 3</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[Observation 4] |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
|  | (Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
| <b>Fixed Targets</b>   | <b>#</b>   | <b>Name</b>             | <b>Target Coordinates</b>   |                        |                        | <b>Targ. Coord. Corrections</b>  |                           |                            | <b>Miscellaneous</b>           |                      |                           |                            |                         |
|  | (2)  | RXJ1615.3               | RA: 16 15 20.2310 (243.8342958d)<br>Dec: -32 55 5.10 (-32.91808d)<br>Equinox: J2000 |                        |                        | Proper Motion RA: -8.20461247281578 mas/yr<br>Proper Motion Dec: -23.410129875769925 mas/yr<br>Epoch of Position: 2016 |                           |                            |                                |                      |                           |                            |                         |
| <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br>Category=Star<br>Description=[Protoplanetary disks]<br>Extended=NO |  |                         |   |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
| <b>Acquisition</b>   | <b>#</b>   | <b>Target</b>           | <b>Filter</b>   | <b>Readout Pattern</b> | <b>Groups/Int</b>      | <b>Integrations/Exp</b>  | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b>        |                      |                           |                            |                         |
|  | 1  | SAME                    | FND   | FAST                   | 4                      | 1  | 1                         | 11.1                       | 87579                          |                      |                           |                            |                         |
| <b>Template</b>  | <b>Primary Channel</b>   |                         | <b>Simultaneous Imaging</b>   |                        |                        | <b>Imager Subarray</b>   |                           |                            | <b>Grating Wheel Direction</b> |                      |                           |                            |                         |
|  | All MRS  |                         | NO  |                        |                        | FULL   |                           |                            | NEUTRAL                        |                      |                           |                            |                         |
| <b>Dithers</b>   | <b>#</b>   | <b>Dither Type</b>      |   |                        | <b>Optimized For</b>   |  |                           | <b>Direction</b>           |                                |                      |                           |                            |                         |
|  | 1  | 4-Point                 |   |                        | POINT SOURCE           |  |                           | NEGATIVE                   |                                |                      |                           |                            |                         |
| <b>Spectral Elements</b>   | <b>#</b>   | <b>Wavelength Range</b> | <b>Detector</b>   | <b>Filter</b>          | <b>Readout Pattern</b> | <b>Groups/Int</b>  | <b>Integrations/Exp</b>   | <b>Exposures/Dith</b>      | <b>Dither</b>                  | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|  | 1  | LONG(C)                 | MRSLONG   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 1  | LONG(C)                 | MRSSHORT  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 2  | MEDIUM(B)               | MRSLONG   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 2  | MEDIUM(B)               | MRSSHORT  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 3  | SHORT(A)                | MRSLONG   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 3  | SHORT(A)                | MRSSHORT  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |

Proposal 1676 - Observation 3 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 3, 4, Non-interruptible

Proposal 1676 - Observation 4 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                  |  |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
|--|--|------------------|--|--------|----------------------|--------------------------|------------------|-----------------|---------------|-------------------------|--------------------|---------------------|------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 4</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observation For: [Observation 3] |                  |  |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
|  | (Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                  |  |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| <b>Fixed Targets</b>   | #  | Name             | Target Coordinates   |        |                      | Targ. Coord. Corrections |                  |                 | Miscellaneous |                         |                    |                     |                  |
|  | (8)  | RXJ1615.3-BG     | RA: 16 15 20.1712 (243.8340467d)<br>Dec: -32 55 22.08 (-32.92280d)<br>Equinox: J2000 |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.<br>Category=Calibration<br>Description=[Telescope/sky background]<br>Extended=NO |  |                  |  |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| <b>Acquisition</b>   | #  | Target           |  |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
|  | 1  | NONE             |  |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| <b>Template</b>  | AcqFilter  | Primary Channel  |  |        | Simultaneous Imaging |                          |                  | Imager Subarray |               | Grating Wheel Direction |                    |                     |                  |
|  | FND  | All MRS          |  |        | NO                   |                          |                  | FULL            |               | NEUTRAL                 |                    |                     |                  |
| <b>Dithers</b>   | #  | Dither Type      |  |        | Optimized For        |                          |                  | Direction       |               |                         |                    |                     |                  |
|  | 1  | 4-Point          |  |        | POINT SOURCE         |                          |                  | NEGATIVE        |               |                         |                    |                     |                  |
| <b>Spectral Elements</b>   | #  | Wavelength Range | Detector   | Filter | Readout Pattern      | Groups/Int               | Integrations/Exp | Exposures/Dith  | Dither        | Total Dithers           | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|  | 1  | LONG(C)          | MRSLONG  |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 1  | LONG(C)          | MRSSHORT   |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSLONG  |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSSHORT   |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 3  | SHORT(A)         | MRSLONG  |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|  | 3  | SHORT(A)         | MRSSHORT   |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |

Proposal 1676 - Observation 4 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 3, 4, Non-interruptible

Proposal 1676 - Observation 5 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                  |  |                 |                 |   |                    |                     |                         |               |                    |                     |                  |
|--|--|------------------|--|-----------------|-----------------|---|--------------------|---------------------|-------------------------|---------------|--------------------|---------------------|------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 5</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[Observation 6] |                  |  |                 |                 |   |                    |                     |                         |               |                    |                     |                  |
|  | (Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                  |  |                 |                 |   |                    |                     |                         |               |                    |                     |                  |
| <b>Fixed Targets</b>   | #  | Name             | Target Coordinates   |                 |                 | Targ. Coord. Corrections  |                    |                     | Miscellaneous           |               |                    |                     |                  |
|  | (5)  | GM-AUR           | RA: 04 55 10.9830 (73.7957625d)<br>Dec: +30 21 59.54 (30.36654d)<br>Equinox: J2000 |                 |                 | Proper Motion RA: 3.7476542353904416 mas/yr<br>Proper Motion Dec: -24.298265830169495 mas/yr<br>Epoch of Position: 2016 |                    |                     |                         |               |                    |                     |                  |
| <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br>Category=Star<br>Description=[Protoplanetary disks]<br>Extended=NO |  |                  |  |                 |                 |   |                    |                     |                         |               |                    |                     |                  |
| <b>Acquisition</b>   | #  | Target           | Filter   | Readout Pattern | Groups/Int      | Integrations/Exp  | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID        |               |                    |                     |                  |
|  | 1  | SAME             | FND  | FAST            | 4               | 1   | 1                  | 11.1                | 87576                   |               |                    |                     |                  |
| <b>Template</b>  | Primary Channel  |                  | Simultaneous Imaging   |                 |                 | Imager Subarray   |                    |                     | Grating Wheel Direction |               |                    |                     |                  |
|  | All MRS  |                  | NO   |                 |                 | FULL  |                    |                     | NEUTRAL                 |               |                    |                     |                  |
| <b>Dithers</b>   | #  | Dither Type      |  |                 | Optimized For   |   |                    | Direction           |                         |               |                    |                     |                  |
|  | 1  | 4-Point          |  |                 | POINT SOURCE    |   |                    | NEGATIVE            |                         |               |                    |                     |                  |
| <b>Spectral Elements</b>   | #  | Wavelength Range | Detector   | Filter          | Readout Pattern | Groups/Int  | Integrations/Exp   | Exposures/Dith      | Dither                  | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|  | 1  | LONG(C)          | MRSLONG  |                 | FASTR1          | 10  | 1                  | 1                   | Dither 1                | 4             | 4                  | 111.002             |                  |
|  | 1  | LONG(C)          | MRSSHORT   |                 | FASTR1          | 10  | 1                  | 1                   | Dither 1                | 4             | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSLONG  |                 | FASTR1          | 10  | 1                  | 1                   | Dither 1                | 4             | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSSHORT   |                 | FASTR1          | 10  | 1                  | 1                   | Dither 1                | 4             | 4                  | 111.002             |                  |
|  | 3  | SHORT(A)         | MRSLONG  |                 | FASTR1          | 10  | 1                  | 1                   | Dither 1                | 4             | 4                  | 111.002             |                  |
|  | 3  | SHORT(A)         | MRSSHORT   |                 | FASTR1          | 10  | 1                  | 1                   | Dither 1                | 4             | 4                  | 111.002             |                  |

Proposal 1676 - Observation 5 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 5, 6, Non-interruptible

Proposal 1676 - Observation 6 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                  |  |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
|--|--|------------------|--|----------------------|--------------------------|-----------------|------------------|-------------------------|---------------|---------------|--------------------|---------------------|------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 6</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observation For: [Observation 5] |                  |  |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
|  | (Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                  |  |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
| <b>Fixed Targets</b>   | #  | Name             | Target Coordinates   |                      | Targ. Coord. Corrections |                 |                  |                         | Miscellaneous |               |                    |                     |                  |
|  | (11)   | GM-AUR-BG        | RA: 04 55 12.1774 (73.8007392d)<br>Dec: +30 21 45.02 (30.36251d)<br>Equinox: J2000 |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
| Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.<br>Category=Calibration<br>Description=[Telescope/sky background]<br>Extended=NO |  |                  |  |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
| <b>Acquisition</b>   | #  | Target           |  |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
|  | 1  | NONE             |  |                      |                          |                 |                  |                         |               |               |                    |                     |                  |
| <b>Template</b>  | AcqFilter  | Primary Channel  |  | Simultaneous Imaging |                          | Imager Subarray |                  | Grating Wheel Direction |               |               |                    |                     |                  |
|  | FND  | All MRS          |  | NO                   |                          | FULL            |                  | NEUTRAL                 |               |               |                    |                     |                  |
| <b>Dithers</b>   | #  | Dither Type      |  | Optimized For        |                          |                 |                  | Direction               |               |               |                    |                     |                  |
|  | 1  | 4-Point          |  | POINT SOURCE         |                          |                 |                  | NEGATIVE                |               |               |                    |                     |                  |
| <b>Spectral Elements</b>   | #  | Wavelength Range | Detector   | Filter               | Readout Pattern          | Groups/Int      | Integrations/Exp | Exposures/Dith          | Dither        | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|  | 1  | LONG(C)          | MRSLONG  |                      | FASTR1                   | 10              | 1                | 1                       | Dither 1      | 4             | 4                  | 111.002             |                  |
|  | 1  | LONG(C)          | MRSSHORT   |                      | FASTR1                   | 10              | 1                | 1                       | Dither 1      | 4             | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSLONG  |                      | FASTR1                   | 10              | 1                | 1                       | Dither 1      | 4             | 4                  | 111.002             |                  |
|  | 2  | MEDIUM(B)        | MRSSHORT   |                      | FASTR1                   | 10              | 1                | 1                       | Dither 1      | 4             | 4                  | 111.002             |                  |
|  | 3  | SHORT(A)         | MRSLONG  |                      | FASTR1                   | 10              | 1                | 1                       | Dither 1      | 4             | 4                  | 111.002             |                  |
|  | 3  | SHORT(A)         | MRSSHORT   |                      | FASTR1                   | 10              | 1                | 1                       | Dither 1      | 4             | 4                  | 111.002             |                  |

Proposal 1676 - Observation 6 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 5, 6, Non-interruptible



Proposal 1676 - Observation 7 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|  |  |                         |  |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
|--|--|-------------------------|--|------------------------|------------------------|--|---------------------------|----------------------------|--------------------------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>   | <b>Proposal 1676, Observation 7</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[Observation 8] |                         |  |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
|  | (Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                         |  |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
| <b>Fixed Targets</b>   | <b>#</b>   | <b>Name</b>             | <b>Target Coordinates</b>  |                        |                        | <b>Targ. Coord. Corrections</b>  |                           |                            | <b>Miscellaneous</b>           |                      |                           |                            |                         |
|  | (6)  | SZ-CHA                  | RA: 10 58 16.7740 (164.5698917d)<br>Dec: -77 17 17.06 (-77.28807d)<br>Equinox: J2000 |                        |                        | Proper Motion RA: -23.466047892751526 mas/yr<br>Proper Motion Dec: 2.030140685800411 mas/yr<br>Epoch of Position: 2016 |                           |                            |                                |                      |                           |                            |                         |
| <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br>Category=Star<br>Description=[Protoplanetary disks]<br>Extended=NO |  |                         |  |                        |                        |  |                           |                            |                                |                      |                           |                            |                         |
| <b>Acquisition</b>   | <b>#</b>   | <b>Target</b>           | <b>Filter</b>  | <b>Readout Pattern</b> | <b>Groups/Int</b>      | <b>Integrations/Exp</b>  | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b>        |                      |                           |                            |                         |
|  | 1  | SAME                    | FND  | FAST                   | 4                      | 1  | 1                         | 11.1                       | 87577                          |                      |                           |                            |                         |
| <b>Template</b>  | <b>Primary Channel</b>   |                         | <b>Simultaneous Imaging</b>  |                        |                        | <b>Imager Subarray</b>   |                           |                            | <b>Grating Wheel Direction</b> |                      |                           |                            |                         |
|  | All MRS  |                         | NO   |                        |                        | FULL   |                           |                            | NEUTRAL                        |                      |                           |                            |                         |
| <b>Dithers</b>   | <b>#</b>   | <b>Dither Type</b>      |  |                        | <b>Optimized For</b>   |  |                           | <b>Direction</b>           |                                |                      |                           |                            |                         |
|  | 1  | 4-Point                 |  |                        | POINT SOURCE           |  |                           | NEGATIVE                   |                                |                      |                           |                            |                         |
| <b>Spectral Elements</b>   | <b>#</b>   | <b>Wavelength Range</b> | <b>Detector</b>  | <b>Filter</b>          | <b>Readout Pattern</b> | <b>Groups/Int</b>  | <b>Integrations/Exp</b>   | <b>Exposures/Dith</b>      | <b>Dither</b>                  | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|  | 1  | SHORT(A)                | MRSLONG  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 1  | SHORT(A)                | MRSSHORT   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 2  | MEDIUM(B)               | MRSLONG  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 2  | MEDIUM(B)               | MRSSHORT   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 3  | LONG(C)                 | MRSLONG  |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |
|  | 3  | LONG(C)                 | MRSSHORT   |                        | FASTR1                 | 10   | 1                         | 1                          | Dither 1                       | 4                    | 4                         | 111.002                    |                         |

Proposal 1676 - Observation 7 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 7, 8, Non-interruptible

Proposal 1676 - Observation 8 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Mon Sep 18 22:01:28 GMT 2023

|                          |  |                  |   |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
|--------------------------|--|------------------|---|--------|----------------------|--------------------------|------------------|-----------------|---------------|-------------------------|--------------------|---------------------|------------------|
| <b>Observation</b>       | <b>Proposal 1676, Observation 8</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observation For: [Observation 7] |                  |   |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
|                          | (Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                  |   |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| <b>Fixed Targets</b>     | #  | Name             | Target Coordinates  |        |                      | Targ. Coord. Corrections |                  |                 | Miscellaneous |                         |                    |                     |                  |
|                          | (12)   | SZ-CHA-BG        | RA: 10 58 25.0659 (164.6044413d)<br>Dec: -77 17 8.97 (-77.28582d)<br>Equinox: J2000<br><br><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i><br><i>Category=Calibration</i><br><i>Description=[Telescope/sky background]</i><br><i>Extended=NO</i> |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| <b>Acquisition</b>       | #  | Target           |   |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
|                          | 1  | NONE             |   |        |                      |                          |                  |                 |               |                         |                    |                     |                  |
| <b>Template</b>          | AcqFilter  | Primary Channel  |   |        | Simultaneous Imaging |                          |                  | Imager Subarray |               | Grating Wheel Direction |                    |                     |                  |
|                          | FND  | All MRS          |   |        | NO                   |                          |                  | FULL            |               | NEUTRAL                 |                    |                     |                  |
| <b>Dithers</b>           | #  | Dither Type      |   |        | Optimized For        |                          |                  | Direction       |               |                         |                    |                     |                  |
|                          | 1  | 4-Point          |   |        | POINT SOURCE         |                          |                  | NEGATIVE        |               |                         |                    |                     |                  |
| <b>Spectral Elements</b> | #  | Wavelength Range | Detector  | Filter | Readout Pattern      | Groups/Int               | Integrations/Exp | Exposures/Dith  | Dither        | Total Dithers           | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|                          | 1  | SHORT(A)         | MRSLONG   |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|                          | 1  | SHORT(A)         | MRSSHORT  |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|                          | 2  | MEDIUM(B)        | MRSLONG   |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|                          | 2  | MEDIUM(B)        | MRSSHORT  |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|                          | 3  | LONG(C)          | MRSLONG   |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |
|                          | 3  | LONG(C)          | MRSSHORT  |        | FASTR1               | 10                       | 1                | 1               | Dither 1      | 4                       | 4                  | 111.002             |                  |

Proposal 1676 - Observation 8 - EUV vs. X-ray Photoevaporation of Protoplanetary Disks

Special Requirements

Sequence Observations 7, 8, Non-interruptible