



2337 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Cycle: 1, Proposal Category: GO

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
NIRSpec				
	1	Prism (epoch1)	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
	7	Prism (epoch1) nod off	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
	2	Prism (epoch2)	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
	8	Prism (epoch2) nod off	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
	3	Prism (epoch3)	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
	9	Prism (epoch3) nod off	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
	4	Grating	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
	6	Grating nod off	NIRSpec IFU Spectroscopy	(1) INTERSTELLAR-OBJECT
MIRI				
	5	LRS	MIRI Low Resolution Spectroscopy	(1) INTERSTELLAR-OBJECT
	10	LRS nod off	MIRI Low Resolution Spectroscopy	(1) INTERSTELLAR-OBJECT

ABSTRACT

We propose NIRSpec and MIRI spectroscopy to investigate the physical and chemical properties of a target-of-opportunity interstellar object (ISO), to help elucidate the nature and origin of this fundamentally new class of astronomical body. We will perform a deep search for outgassing using NIRSpec prism observations over three epochs. If a coma is clearly visible, higher-resolution grating observations will be used to measure the production rates of multiple coma gases (including H₂O, CO₂, CH₄, CH₃OH, CO, HCN, H₂CO and C₂H₆), to determine the ice content of the nucleus. MIRI-LRS spectroscopy will reveal the coma dust composition. In the absence of significant outgassing, our near-to-mid-IR observations have been designed to directly measure the surface composition and spectral shape, for comparison with Solar System asteroids. We will target an ISO similar to (or brighter than) 1I/Oumuamua and 2I/Borisov, with V ~ 11-24 mag. Only JWST has the sensitivity to perform the required gas, dust and nucleus measurements in the event of a faint apparition. The proposed observations will provide new insights into the diversity of protoplanetary disk midplane chemistry in our Galaxy, and in a sufficiently bright object (V < ~19), will provide a comprehensive inventory of the volatiles available for pre-biotic chemistry in a planetary system other than our own.

OBSERVING DESCRIPTION

This program will be triggered for a target-of-opportunity interstellar object (ISO) that meets the required production rate figure-of-merit criteria $Q/rH^{1.5}/\Delta = 10^{23} - 10^{28} \text{ s}^{-1} \text{ au}^{-2.5}$ (where Q is the coma molecular production rate, rH is the Heliocentric distance and Delta the Geocentric distance), or visual magnitude criteria V=11-24 mag. We require an ephemeris motion of < 108"/hr to remain within the JWST tracking capabilities.

NIRSpec prism spectroscopy will be performed on 3-epochs. NIRSpec G395H/F290LP grating spectroscopy and MIRI-LRS spectroscopy will be performed on 1-epoch. The precise observation epochs will be determined based on the trajectory of the ISO-of-interest through the JWST field of regard, and are likely to be spread several weeks apart, with the first observation being performed as soon as the object is bright enough to reach our triggering threshold. The longer (1 hr) NIRSpec prism exposure, the NIRSpec grating exposure and the MIRI exposure will be performed when the object is at its brightest (expected to be around perihelion), or the closest available opportunity to that. When planning the timing of our three observing epochs, we will also take into account the proximity of the object to the telescope, and the object's motion through the field of regard.

Our observational triggers have a 14-day lead time, and up-to-date ephemerides will be provided within 1 week of the expected observations. Typical ephemeris errors for well-studied targets (such as an ISO) are $< \sim 1''$, which will be sufficient to place our target well within the NIRSpec IFU without need for target acquisition. Our MIRI-LRS observations, however, will likely require acquisition and peakup to center the target in the 0.5" slit.

Proposal 2337 - Targets - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Generic Targets	#	Name	Criteria	Description
	(1)	INTERSTELLAR- OBJECT	Interstellar object with V=11-24	

Proposal 2337 - Observation 1 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 1: Prism (epoch1)</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
Diagnostics	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>								
Template	<p>TA Method</p> <p>VERIFY_ONLY</p>											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Pointing Verification	#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time			
	1	ALLCLOSED	CLEAR	NRSIRS2RAPID	3	1	1	1	58.356			
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	PRISM/CLEAR	NRSIRS2RAPID	10	1	false	true	NONE	4	4	641.911	61106.1

Proposal 2337 - Observation 1 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Special Requirements

On Hold To be triggered once a suitable ISO is discovered
Target Of Opportunity response time 14 Days
Group Observations 1, 7, Non-interruptible

Proposal 2337 - Observation 7 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 7: Prism (epoch1) nod off</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
Diagnostics	(Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>								
Template	<p>TA Method</p> <p>NONE</p>											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	PRISM/CLEAR	NRSIRS2RAPID	10	1	false	true	NONE	4	4	641.911	61106.1
Special Requirements	<p>Offset 300.0 arcsec, 0.0 arcsec</p> <p>On Hold To be triggered once a suitable ISO is discovered</p> <p>Target Of Opportunity response time 14 Days</p> <p>Group Observations 1, 7, Non-interruptible</p>											

Proposal 2337 - Observation 2 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 2: Prism (epoch2)</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
	<p>(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>											
Diagnostics												
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>								
Template	TA Method											
	VERIFY_ONLY											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Pointing Verification	#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time			
	1	ALLCLOSED	CLEAR	NRSIRS2RAPID	3	1	1	1	58.356			
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	PRISM/CLEAR	NRSIRS2RAPID	60	1	false	true	NONE	4	4	3559.689	61106.3

Proposal 2337 - Observation 2 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Special Requirements

On Hold To be triggered for a suitable ISO, within +-2 weeks of maximum brightness within the JWST field of regard
Target Of Opportunity response time 14 Days
Group Observations 2, 8, Non-interruptible

Proposal 2337 - Observation 8 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 8: Prism (epoch2) nod off</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
Diagnostics	(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>								
Template	TA Method											
	NONE											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	PRISM/CLEAR	NRSIRS2RAPID	60	1	false	true	NONE	4	4	3559.689	
Special Requirements	<p>Offset 300.0 arcsec, 0.0 arcsec</p> <p>On Hold To be triggered for a suitable ISO, within +-2 weeks of maximum brightness within the JWST field of regard</p> <p>Target Of Opportunity response time 14 Days</p> <p>Group Observations 2, 8, Non-interruptible</p>											

Proposal 2337 - Observation 3 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	Proposal 2337, Observation 3: Prism (epoch3) Diagnostic Status: Warning Observing Template: NIRSpec IFU Spectroscopy											
	(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Diagnosics												
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i>								
Template	TA Method											
	VERIFY_ONLY											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Pointing Verification	#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time			
	1	ALLCLOSED	CLEAR	NRSIRS2RAPID	3	1	1	1	58.356			
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	PRISM/CLEAR	NRSIRS2RAPID	10	1	false	true	NONE	4	4	641.911	61106.1

Proposal 2337 - Observation 3 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Special Requirements

On Hold To be triggered post-perihelion if possible, for the selected ISO
Target Of Opportunity response time 14 Days
Group Observations 3, 9, Non-interruptible

Proposal 2337 - Observation 9 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 9: Prism (epoch3) nod off</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
Diagnostics	(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24									
	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>											
Template	TA Method											
	NONE											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	PRISM/CLEAR	NRSIRS2RAPID	10	1	false	true	NONE	4	4	641.911	61106.1
Special Requirements	<p>Offset 300.0 arcsec, 0.0 arcsec</p> <p>On Hold To be triggered post-perihelion if possible, for the selected ISO</p> <p>Target Of Opportunity response time 14 Days</p> <p>Group Observations 3, 9, Non-interruptible</p>											

Proposal 2337 - Observation 4 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 4: Grating</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
Diagnostics	(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24									
	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>											
Template	TA Method											
	VERIFY_ONLY											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Pointing Verification	#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time			
	1	ALLCLOSED	CLEAR	NRSIRS2RAPID	3	1	1	1	58.356			
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	G395H/F290LP	NRSIRS2RAPID	60	1	false	true	NONE	4	4	3559.689	61106.2

Proposal 2337 - Observation 4 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Special Requirements

On Hold To be triggered for a high-activity ISO ($Q(\text{H}_2\text{O})/r\text{H}^{1.5}/\Delta > 1\text{e}26 \text{ s}^{-1} \text{ au}^{-2.5}$)
Target Of Opportunity response time 14 Days
Group Observations 4, 6, Non-interruptible

Proposal 2337 - Observation 6 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 6: Grating nod off</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
Diagnostics	(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Generic Targets	#	Name	Criteria	Description								
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>								
Template	TA Method											
	NONE											
Dithers	#	Dither Type	Size	Starting Point	Number of Points	Points						
	1	4-POINT-DITHER										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	G395H/F290LP	NRSIRS2RAPID	60	1	false	true	NONE	4	4	3559.689	
Special Requirements	<p>Offset 300.0 arcsec, 0.0 arcsec</p> <p>On Hold To be triggered for a high-activity ISO ($Q(H_2O)/rH^{1.5}/\Delta > 1e26 \text{ s}^{-1} \text{ au}^{-2.5}$)</p> <p>Target Of Opportunity response time 14 Days</p> <p>Group Observations 4, 6, Non-interruptible</p>											

Proposal 2337 - Observation 5 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:24 GMT 2021

Observation	<p>Proposal 2337, Observation 5: LRS Diagnostic Status: Warning Observing Template: MIRI Low Resolution Spectroscopy</p>							
Diagnostics	(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.							
Generic Targets	#	Name	Criteria	Description				
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24					
	<p><i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i></p>							
Acquisition	#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time ETC Wkbk.Calc ID
	1	1 INTERSTELLAR-OBJECT	F1500W	FASTGRPAVG	8	1	1	88.801 61523.20
Template	Subarray			Obtain Verification Image?				
	FULL			true				
Dithers	#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset		
	1	ALONG SLIT NOD						
Pointing Verification	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	FASTGRPAVG	8	1	1	88.801	61523.20	

Proposal 2337 - Observation 5 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
	Special Requirements	1	FAST	162	4	8	1	2	3596.452
<p>On Hold To be triggered for a low or high-activity ISO (V~11-42) Target Of Opportunity response time 14 Days</p> <p>Group Observations 5, 10, Non-interruptible</p>									

Proposal 2337 - Observation 10 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

Wed Mar 31 01:13:25 GMT 2021

Observation	Proposal 2337, Observation 10: LRS nod off Diagnostic Status: Warning Observing Template: MIRI Low Resolution Spectroscopy <i>Comments: Off-source nodding is required for background subtraction in the event of an extended coma, and will only be required if a coma is detected in our (epoch 1) NIRSpec prism observations.</i>								
	(Visit 10:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.								
Diagnostics									
Generic Targets	#	Name	Criteria	Description					
	(1)	INTERSTELLAR-OBJECT	Interstellar object with V=11-24	<i>Comments: The selected target-of-opportunity ISO must fulfill the following criteria: (1) orbital eccentricity significantly greater than unity (not caused by gravitational encounters with other Solar System objects); (2) ephemeris motion <108"/hr; (3) visual magnitude in the range 11-24 (or a clear coma detection using ground-based telescopes). The required ToO ISO must be present within the JWST field of regard for a minimum of 14 days, to satisfy our trigger lead time.</i>					
Acquisition	#								Target
	1								NONE
Template	AcqFilter	Subarray			Obtain Verification Image?				
	F1500W	FULL			false				
Dithers	#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset			
	1	ALONG SLIT NOD							
Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
	1	FAST	162	4	8	1	2	3596.452	61523.17

Proposal 2337 - Observation 10 - Composition of an Interstellar Object - Unique Insights into Protoplanetary Disk Midplane Chemistry

<p>Special Requirements</p> <p>Offset 300.0 arcsec, 0.0 arcsec On Hold To be triggered if there is any detectable coma surrounding the ISO (if the object is a point-source, in-slit nodding will be performed instead) Target Of Opportunity response time 14 Days Group Observations 5, 10, Non-interruptible</p>
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