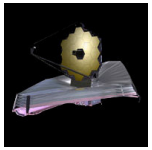

1263 - NIRSpec and MIRI Spectroscopy of QSOs - Part 2

Cycle: 1, Proposal Category: GTO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
MIRI - J1120				
	1	J1120 [WRIGHT_0501]	MIRI Medium Resolution Spectroscopy	(1) MIRI-J1120
	2	J1120-Imager [WRIGHT_0502]	MIRI Imaging	(2) MIRI-J1120-IMAGER
NIRSPEC - J1120				
	3	NIRSpec IFU observation of J1120 [FERRUIT_3053]	NIRSpec IFU Spectroscopy	(3) NIRSPEC-J1120+0641

ABSTRACT

This APT is for IFU Observations of the high-z QSO J1120 which is in common with the MIRI programme,
hence the programmes are merged to save slew.

The goals of both observations are to map the optical and near-IR nebular lines in the host galaxy circumgalactic region of this quasar at z=7.08.

MIRI, with its spectral coverage from 5 to 28 m and sensitivity, is the only instrument onboard JWST able to explore the optical and near-infrared spectrum and light distribution of galaxies and QSOs at redshifts above 6.7. A complete 5 to 28 spectrum (~0.6 to 3.5 microns rest-frame) of the currently known highest redshift (z of 7.0842) QSO J1120+0641 will be obtained together with MIRI imaging to map the first rest-frame near-IR light distribution of the host galaxy at ~0.2-0.3 arcsec angular resolution.

NIRISpec will observe this quasar with the IFS and with R2700 - band III grating, with the goal of tracing the distribution and kinematics of the main nebular emission lines and, in
particular, [OII], Hbeta, [OIII], [OI], Halpha. The ultimate goal is to trace the presence and properties of a quasar driven outflow and the dynamics and star formration of the host galaxy and
its close enviroment. This information will be precious to constrain the evolutionary processes of early massive galaxies hosting supermassive accreting black holes.

OBSERVING DESCRIPTION

MIRI MRS and Imager:

The purpose of the program is to get a full 5 - 30 um spectrum of J1120 using the 3 MRS configurations with simultaneous Imager observations (see additional note 1). In addition, we request the imaging of the target in two filters: F560W, F770W. To save slew and maneuvering overheads, we propose all observations to be "non-interruptible". The epoch (January 2020) was selected to guarantee low background conditions for MIRI.

The dithering strategies (4-pt, point source) were selected to optimize the PSF and detector effects in all MRS channels and Imager filters. These strategies could be subject to change without modifying the total charged time.

Constraints:

MIRI: the target should be observed in January to have low background.

NIRSpec: due to the bright stars in the field and MSA contamination issues, the V3 range between 55 to 130 should be avoided.

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NIRSpec IFU OBSERVATION:

This part corresponds to NIRSpec IFU Proposal ID: FERRUIT_3053

(NIRSpec contact person: Roberto Maiolino)

Proposal title "NIRSpec and MIRI spectroscopy of QSOs - part #2"

The NIRSpec IFU observation is done with the G395H grating and it is aimed aimed primarily at
mapping the strongest optical nebular lines (Hbeta, [OIII], Halpha, [NII]).

PA constraints are driven by the MIRI observation and by the requirement to avoid some bright stars to be in the NIRSpec MSA footprint.

In this specific case, if the target is positioned in the center of the IFU field of view then
at this specific redshift the brightest [OIII]5007 is located in the detectors gap over about half of
the field of view. Hence, we have offset the centering by -0.7 arcsec in the X-direction (we hope this
is in the instrument coordinates, not on sky), which will enable to properly map [OIII]5007 in the central +-0.7 arcsec
of the source.

We have adopted a "small" dither pattern, given the reduced effective field as a consequence of the
offset discussed above.

We are using no target acquisition (i.e. point-and-shoot).

At any of the constrained PA range there are Gaia GS that can be selected for guiding and which will ensure the proper location of the target within the IFU aperture, with the required accuracy.

We are using NRSIRS2RAPID for a better identification and rejection of cosmic rays.

Observation

Proposal 1263, Observation 1: J1120 [WRIGHT_0501] Wed Feb 21 00:04:39 GMT 2018

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	MIRI-J1120	RA: 11 20 1.4790 (170.0061625d) Dec: +06 41 24.30 (6.69008d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[Quasars]
Extended=NO

Acquisition

#	AcqTarget	AcqFilter	Acq Readout Pattern	Acq Groups/Int	Acq Integrations/Exp	Acq Total Integrations	Acq Total Exposure Time	Acq ETC Wkbk.Calc ID
1	Same Target as Observation	F560W	FAST	23	1	1	63.826	12566.0

Template

Primary Channel	*Simultaneous Imaging*	*Imager Subarray*
ALL	YES	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	ALL	Positive

Spectral Elements

#	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		IMAGER	F560W	FAST	103	3	1	Dither 1	4	12	3429.949	
1	SHORT(A)	MRSLONG		SLOW	36	1	1	Dither 1	4	4	3440.148	
1	SHORT(A)	MRSSHORT		SLOW	36	1	1	Dither 1	4	4	3440.148	
2		IMAGER	F1000W	FAST	103	3	1	Dither 1	4	12	3429.949	
2	MEDIUM(B)	MRSLONG		SLOW	36	1	1	Dither 1	4	4	3440.148	
2	MEDIUM(B)	MRSSHORT		SLOW	36	1	1	Dither 1	4	4	3440.148	
3		IMAGER	F1000W	FAST	103	3	1	Dither 1	4	12	3429.949	
3	LONG(C)	MRSLONG		SLOW	36	1	1	Dither 1	4	4	3440.148	
3	LONG(C)	MRSSHORT		SLOW	36	1	1	Dither 1	4	4	3440.148	

Special Requirements	
	Between Dates 01-JAN-2020 and 01-FEB-2020 Aperture PA Range 290.0 to 290.0 Degrees (V3 290.0 to 290.0) Group Observations 1, 2, Non-interruptible

Observation

Proposal 1263, Observation 2: J1120-Imager [WRIGHT_0502] Wed Feb 21 00:04:39 GMT 2018

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	MIRI-J1120-IMAGER	RA: 11 20 4.8679 (170.0202829d) Dec: +06 41 23.05 (6.68974d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[Quasars]
Extended=Unknown

Template

Subarray

FULL

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	4-Point-Sets	1	4		6	1	POINT SOURCE	POSITIVE	SMALL

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F560W	FAST	95	1	1	Dither 1	4	4	1054.515	
2	F770W	FAST	95	1	1	Dither 1	4	4	1054.515	

Special Requirements

Between Dates 01-JAN-2020 and 01-FEB-2020
Aperture PA Range 294.449705 to 294.449705 Degrees (V3 290.0 to 290.0)

Group Observations 1, 2, Non-interruptible

Observation

Proposal 1263, Observation 3: NIRSpec IFU observation of J1120 [FERRUIT_3053] Wed Feb 21 00:04:39 GMT 2018

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(3)	NIRSPEC-J1120+0641	RA: 11 20 1.4630 (170.0060958d) Dec: +06 41 23.79 (6.68994d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[High-redshift galaxies, Quasars]
Extended=Unknown

Template

TA Method

NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

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	185	1	false	true	NONE	4	4	10854.134	

Special Requirements

Aperture PA Range 138.893 to 162.893 Degrees (V3 2.5E-5 to 24.000025)
Aperture PA Range 269.893 to 138.793 Degrees (V3 131.000025 to 359.900025)
Offset -0.7 arcsec, 0.0 arcsec