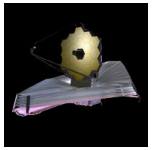

1879 - Opening the era of direct metallicity measurements in high redshift galaxies

Cycle: 1, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	7	COSMOS_final_APA_wgts_obs7_replan_F	NIRSpec MultiObject Spectroscopy	(28) cosmos_zsel_final

ABSTRACT

We propose to obtain "direct", electron temperature (Te)-based metallicity measurements at the cosmic noon (1.6<z<3) by means of deep (40 hours on source) observations with the NIRSpec Micro-shutter assembly (MSA) of a sample of ~60 galaxies within the COSMOS field, aimed at detecting

the elusive [O III]4363 and [S II]4069 auroral lines.
The leap in sensitivity provided by JWST compared to 10-meters class ground-based telescopes will finally open the era of systematic, unbiased detections of metallicity-sensitive auroral lines at high redshift, representing an unprecedented improvement over currently available datasets. This measurements will provide the key to break many of the degeneracies afflicting the physical interpretation of high redshift galaxy spectra.
By simultaneously targeting auroral and strong nebular lines (i.e. [O II]3727, [O III]5007, [N II]6585, [S II]6718,32), we will be able to derive accurate calibrations for strong-line metallicity diagnostics. Calibrations tailored to the high-redshift Universe are necessary to correctly interpret the cosmic evolution of metallicity scaling relations, as probed by current and future surveys.
Our exceptionally deep spectroscopy will also allow the study of other weak spectroscopic features, including broad wings in high S/N, high spectral resolution nebular line profiles tracing galactic winds, and detailed studies of the attenuation law by using multiple Balmer lines (Ha, Hbeta, Hgamma, Hdelta).

OBSERVING DESCRIPTION

Our programme is primarily aimed at detecting the [O III]4363 and [S II]4069 auroral lines in a sample of ~ 60 galaxies at redshift 1.6<z<3 within the COSMOS field, with the NIRSpec MSA in MOS mode.
Deep (~36 hours on source) integrations in the G140M/F100LP filter are required to obtain such detections with SNR >= 3 in all of our targets.
Complementary, shallower observations (~6.5 hours on source) in the G235H/F170LP filter are required to cover the full set of nebular emission lines of interest for the entire target redshift range (e.g. [O II]3727,[O III]5007, Hbeta, Ha, [N II]6584, [S II]6718,32).
Considering 42 groups per integration and 1 integration per exposure, with the NRSIRS2 readout pattern a total of 42 exposures are required to complete the total integration time in G140M/F100LP. These are achieved with a 3-shutter slitlets nodding, replicated 14 times.
In the G235H/F170LP, ~6.5 hours of integration are achieved combining 26 groups (1 integration) within one exposure, with the 3-shutter slitlets nodding replicated 4 times for a total of 12 exposures.

Proposal 1879 - Targets - Opening the era of direct metallicity measurements in high redshift galaxies

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(28)	cosmos_zsel_final	RA: 10 00 29.4287 (150.1226196d) Dec: +02 19 23.44 (2.32318d) Equinox: J2000		

Comments:
Description=[]

Observation

Proposal 1879, Observation 7: COSMOS_final_APA_wgts_obs7_replan_F Mon Apr 17 23:01:35 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec MultiObject Spectroscopy

Diagnostics

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

(Visit 7:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(28)	cosmos_zsel_final	RA: 10 00 29.4287 (150.1226196d) Dec: +02 19 23.44 (2.32318d) Equinox: J2000		

Comments:
Description=[]

Acquisition

#	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	Filter: CLEAR; Readout: NRSRAPIDD6; 12 sources in 4 quads; [Optimal TA Accuracy]	SAME	CLEAR	Auto Acq MSA Config	NRSRAPIDD6	3	1	4	687.153	
2	Filter: CLEAR; Readout: NRSRAPIDD6; 12 sources in 4 quads; [Optimal TA Accuracy]	SAME	CLEAR	Auto Acq MSA Config	NRSRAPIDD6	3	1	4	687.153	

Template

TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold
MSATA	No	MSA Center	primary (782 sources)	filler (1168 sources)	jwst-nirspec-hr	1.5

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	1081	150.090917	2.196757	23.756000518798828	1	42101	150.431630	2.179277	23.19099998474121
1	1105	150.092348	2.196756	23.150999069213867	1	42445	150.112800	2.196486	23.113000869750977
1	3687	150.076758	2.233027	25.007999420166016	1	42464	150.096636	2.196282	24.024999618530273
1	4532	150.097443	2.245442	24.830999374389648	1	42567	149.793049	2.201759	24.243999481201172
1	4792	150.112347	2.249487	23.572000503540039	1	42623	150.090881	2.203958	23.509000778198242
1	40962	150.485051	2.124498	23.246999740600586	1	43679	150.384354	2.257828	24.1299991607666
Visit	**ID**	**RA**	**Dec**	**Magnitude**	**Visit**	**ID**	**RA**	**Dec**	**Magnitude**
2	1081	150.090917	2.196757	23.756000518798828	2	42101	150.431630	2.179277	23.19099998474121
2	1105	150.092348	2.196756	23.150999069213867	2	42445	150.112800	2.196486	23.113000869750977
2	3687	150.076758	2.233027	25.007999420166016	2	42464	150.096636	2.196282	24.024999618530273
2	4532	150.097443	2.245442	24.830999374389648	2	42567	149.793049	2.201759	24.243999481201172
2	4792	150.112347	2.249487	23.572000503540039	2	42623	150.090881	2.203958	23.509000778198242
2	40962	150.485051	2.124498	23.246999740600586	2	43679	150.384354	2.257828	24.1299991607666

Spectral Elements

#	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
1	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
2	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
3	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
4	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
5	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
6	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
7	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
8	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
9	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
10	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
11	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
12	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
13	1 (G140M/F100LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	8840.867
14	2 (G235M/F170LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	6652.534

#	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
15	2 (G235M/F170LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	6652.534
16	2 (G235M/F170LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	6652.534
17	2 (G235M/F170LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	6	6652.534
18	3 (G235H/F170LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	3	5295.767
19	3 (G235H/F170LP)	c1	3 Shutter Slitlet	150.09682004166666 Degrees 2.2182130555555557 Degrees	247.84948064258901			3	3	5295.767

Special Requirements

Group Visits within 53.0 Days
Visits Same PA
MSA Scheduled Aperture PA 247.8502697 to 247.8502697 Degrees (V3 109.2757 to 109.2757)
Maximum Reference Stars 12