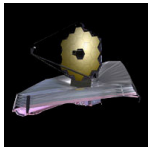

2750 - Spectroscopic follow-up of ultra-high-z candidates in CEERS: Characterizing true z > 12 galaxies and z~4-7 interlopers in preparation for JWST Cycle 2

Cycle: 1, Proposal Category: DD

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	90.75deg_final_0x0_0.01	NIRSpec MultiObject Spectroscopy	(1) CEERS-MSA-FINAL-DD
	2	final_0x0_EOSA	NIRSpec MultiObject Spectroscopy	(2) MSA-FINAL-CAT-MSATA

ABSTRACT

Through rapid analysis of early public JWST NIRCam data, several teams have submitted papers that present candidates for galaxies at remarkably high redshifts, z > 12, beyond the previous reach of HST. However, independent analyses of the same Early Release Observation (ERO) and Early Release Science (ERS) data have not always yielded consistent samples or photometric redshift estimates for the same objects. There is also the risk of (and possibly evidence for) contamination of very high-z color selection by dusty galaxies at lower redshifts. This begs the question: How many z > 12 galaxies are there really?

We propose to observe for 4.9 hours using a single NIRSpec MSA pointing to spectroscopically test three of the most interesting ultra-high-z candidates discovered so far, which conveniently fall within a ~1.3 arcmin diameter sky region in public DD-ERS NIRCam images from the Cosmic Evolution Early Release Science survey (CEERS, program ID 1345). Spectroscopic confirmation (or refutation) of these candidates early in JWST Cycle 1 is vital for the research community to refine plans, strategies, and expectations for future observations in JWST Cycle 2 and beyond. This requires observations as soon as the field is next visible, hence our request for DDT. The proposed observations can be scheduled in December 2022. We waive any proprietary period, and we commit to rapid turnaround and dissemination of results in time to inform Cycle 2 proposal preparation.

OBSERVING DESCRIPTION

The observation consists of a single standard NIRSpec MSA prism pointing (3-shutter slits, 3-nod pattern) targeting three main candidates with estimated redshifts z=14.3, z=16.7 and z~18 (possibly a z~5 interloper) plus several other z > 10 candidates.

The requested exposure time of ~5 hours is intended to allow a reliable differentiation between the Lyman-alpha break of a real ultra-high-z galaxy and the Balmer break of a low-z interloper for the faintest of our three primary targets.

The coordinates and orientation of the observations are chosen to maximize the z > 10 candidates in the MSA yield. The PA is also constrained to allow the early schedulability required to provide critical information on time for preparation of Cycle 2 proposals.

The chosen pointing and orientation also ensure that the NIRCam imaging parallel will overlap with a region of the EGS previously observed with HST WFC3 and ACS, CEERS NIRCam (in June 2022), and with other deep multi-wavelength ancillary data. The NIRCam filter selection adopts a similar observing strategy as that used in the the CEERS program. In this way, this observation will add extra depth in the F115W, F150W, F200W, F277W, F356W and F444W bands in the overlapping region, which will be extremely valuable for the study of very-high-z sources in the common field of view.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	CEERS-MSA-FINAL-DD	RA: 14 19 45.3655 (214.9390229d) Dec: +52 54 55.16 (52.91532d) Equinox: J2000		
Comments: *Description=[]*				
(2)	MSA-FINAL-CAT-MSATA	RA: 14 19 38.2147 (214.9092279d) Dec: +52 54 42.31 (52.91175d) Equinox: J2000		
Comments: *Description=[]*				

Observation

Proposal 2750, Observation 1: 90.75deg_final_0x0_0.01 Thu Feb 09 20:00:42 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec MultiObject Spectroscopy

Coordinated Parallel Template(s): NIRCam Imaging

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)	CEERS-MSA-FINAL-DD	RA: 14 19 45.3655 (214.9390229d) Dec: +52 54 55.16 (52.91532d) Equinox: J2000		

Comments:
Description=[]

Acquisition

NIRSpec MultiObject Spectroscopy	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	Filter: F140X; Readout: NRSRAPID; 8 sources in 3 quads; [Optimal TA Accuracy]	SAME	F140X	Auto Acq MSA Config	NRSRAPID	3	1	4	171.788	

Template

NIRSpec MultiObject Spectroscopy	NIRCam Imaging
TA Method: MSATA	Module: ALL
Obtain Confirmation Images: No	Subarray: FULL
Science Aperture: MSA Center	
Primary Candidate List: Primary_DD (1114 sources)	
Filler Candidate List: Fillers_DD (3688 sources)	
Spectral Overlap Map: jwst-nirspec-hr	
Spectral Overlap Threshold: 1.5	

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	2951	214.955345	52.951298	21.10416374454703	1	46689	214.920228	52.900744	22.68920493804344
1	3391	214.888779	52.915254	22.28680704611917	1	46726	214.979187	52.894848	22.06593739575985 3
1	6890	214.961879	52.910711	21.17504053646553 4	1	46731	214.970367	52.907135	21.5253344690316
1	10558	214.892950	52.907890	21.39986375548634 4	1	46744	214.958603	52.930576	22.03792778710791

Dithers

#	Dither Type
1	NONE

Spectral Elements

NIRSpec MultiObject Spectroscopy	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
1	2 (PRISM/CLEAR)	c1	3 Shutter Slitlet	214.93258791666668 Degrees 52.92228333333333 Degrees	90.744871602551 7			3	9	6696.301
2	1 (PRISM/CLEAR)	c1	3 Shutter Slitlet	214.93258791666668 Degrees 52.92228333333333 Degrees	90.744871602551 7			3	9	6039.8
3	1 (PRISM/CLEAR)	c1	3 Shutter Slitlet	214.93258791666668 Degrees 52.92228333333333 Degrees	90.744871602551 7			3	9	6039.8

Spectral Elements

NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F115W	F277W	MEDIUM8	10	2	6	3	6345.431	
2	F150W	F356W	MEDIUM8	9	2	6	3	5701.225	
3	F200W	F444W	MEDIUM8	9	2	6	3	5701.225	

Special Requirements

No Parallel Attachments
MSA Scheduled Aperture PA 90.7500197 to 90.7500197 Degrees (V3 312.17545 to 312.17545)

Observation

Proposal 2750, Observation 2: final_0x0_EOSA Thu Feb 09 20:00:42 GMT 2023

Diagnostic Status: Error

Observing Template: NIRSpec MultiObject Spectroscopy

Coordinated Parallel Template(s): NIRCam Imaging

Diagnostics

(final_0x0_EOSA (Obs 2)) Error (Form): This observation was created with an Aperture PA of 352.250 but it has been assigned an Aperture PA of 350.380

(Aperture PA) Error (Form): This observation was created with an Aperture PA of 352.250 but it has been assigned an Aperture PA of 350.380

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

(Visit 2:1) Warning (Form): The recommended value is 8 Reference Stars for this template.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	MSA-FINAL-CAT-MSATA	RA: 14 19 38.2147 (214.9092279d) Dec: +52 54 42.31 (52.91175d) Equinox: J2000		

Comments:
Description=[]

Acquisition

NIRSpec MultiObject Spectroscopy	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	Filter: F110W; Readout: NRSRAPIDD6; 7 sources in 3 quads; [Optimal TA Accuracy]	SAME	F110W	Auto Acq MSA Config	NRSRAPIDD6	3	1	4	687.153	

Template

NIRSpec MultiObject Spectroscopy	NIRCam Imaging
TA Method: MSATA	Module: ALL
Obtain Confirmation Images: No	Subarray: FULL
Science Aperture: MSA Center	
Primary Candidate List: Primary (42 sources)	
Filler Candidate List: Fillers (6634 sources)	
Spectral Overlap Map: jwst-nirspec-hr	
Spectral Overlap Threshold: 1.5	

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	3820	214.913096	52.945523	22.09686151755236	1	35710	214.913299	52.940740	21.50754770568384
1	6784	214.879290	52.894139	22.96772681214658 7	1	35803	214.877322	52.887628	23.32492690003972
1	16038	214.880961	52.926909	21.94589901858608 3	1	88139	214.910197	52.930543	23.29121279917091 8
1	29714	214.884008	52.923418	23.54880098227304 3					

Dithers

#	Dither Type
1	NONE

Spectral Elements

NIRSpec MultiObject Spectroscopy	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
1	2 (PRISM/CLEAR)	c1	3 Shutter Slitlet	214.90385791666665 Degrees 52.91636944444444 Degrees	352.2457269314271			3	9	6696.301
2	1 (PRISM/CLEAR)	c1	3 Shutter Slitlet	214.90385791666665 Degrees 52.91636944444444 Degrees	352.2457269314271			3	9	6039.8
3	1 (PRISM/CLEAR)	c1	3 Shutter Slitlet	214.90385791666665 Degrees 52.91636944444444 Degrees	352.2457269314271			3	9	6039.8

Spectral Elements

NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F115W	F277W	MEDIUM8	10	2	6	3	6345.431	
2	F150W	F356W	MEDIUM8	9	2	6	3	5701.225	
3	F200W	F444W	MEDIUM8	9	2	6	3	5701.225	

Special Requirements

No Parallel Attachments
MSA Scheduled Aperture PA 350.3797697 to 350.3797697 Degrees (V3 211.8052 to 211.8052)