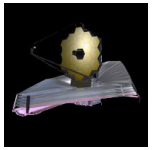

5119 - Resolving galaxy building blocks at high-z: the comprehensive picture of internal physical properties in an ultra-low-mass major merger system at z=5.2

Cycle: 3, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
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Dr. Gael Noirot (CoI)	Space Telescope Science Institute

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	NIRSpec IFU obs of ELG1+ELG2 system	NIRSpec IFU Spectroscopy	(1) ELG1+ELG2

ABSTRACT

In the hierarchical picture of structure formation, galaxies are expected to grow through successive mergers. Hierarchical galaxy growth has been well studied in the low-z universe, and it is now possible to study this assembly process in its early stages at high-z with JWST. We propose a NIRSpec/IFU observation of a gravitationally lensed, galaxy merger system of two ultra-low-mass galaxies at z=5.2. Although the two galaxies are only Log(M/Msun)~6.9 and intrinsically small, thanks to the high lensing magnification (~x20), this merging system is spatially resolved and can be

investigated in detail with JWST. We will obtain all the key rest-optical emission lines of Hbeta, Hgamma, [OIII]4959/5007, [OIII]4363, [NeIII]3867, and [OII]3727, aiming at mapping the spatially resolved interstellar medium properties down to ~40 pc scale and revealing the velocity field in this merging system. Combined with previous observations, this observation will enable us to derive the comprehensive picture of the internal structure within an ultra-low-mass galaxy merger system at high-z for the first time. This will include spatial maps of young stars, old stars and ionized gas, metallicity, and dust, and will let us unambiguously reveal how galaxy mergers govern low-mass galaxy evolution in the early stages of galaxy assembly.

OBSERVING DESCRIPTION

We propose a NIRSpec/IFU spectroscopy of a gravitationally lensed lowest-mass merger system at z=5.2 using G235M/F170LP. We request 24.01 hours observation including overheads, in order to detect all the emission lines of Hbeta, Hgamma, [OIII]4959/5007, [OIII]4363, [OII]3727, and [NeIII]3867 from this system. We will use NRSIRS2 readout pattern given the long exposure time. We also use 8-point large CYCLE dither pattern to have enough dithers to obtain a robust background sky spectrum and to resample datacube with a smaller pixel scale. We will have enough spaxels free from contamination and can obtain the background spectrum from them. We will observe the target with 20 groups for an integration, and requires 6 integrations per each exposure to achieve the requested sensitivity.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	ELG1+ELG2	RA: 04 17 31.8346 (64.3826442d) Dec: -11 53 57.91 (-11.89942d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[Dwarf galaxies, Emission line galaxies, High-redshift galaxies, Interacting galaxies, Lyman-break galaxies]
Extended=YES

Observation

Proposal 5119, Observation 1: NIRSpec IFU obs of ELG1+ELG2 system Wed Dec 11 21:00:17 GMT 2024

Diagnostic Status: Warning

Observing Template: NIRSpec IFU 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)	ELG1+ELG2	RA: 04 17 31.8346 (64.3826442d) Dec: -11 53 57.91 (-11.89942d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[Dwarf galaxies, Emission line galaxies, High-redshift galaxies, Interacting galaxies, Lyman-break galaxies]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	LARGE	1	16	

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	G235M/F170LP	NRSIRS2	20	3	false	true	NONE	16	48	70726.939	168179