Spectroscopy of z~5 Lyman Break Galaxies(LBGs) with GMOS Nod and Shuffle

Hiroki Kajino, Kouji Ohta(Kyoto Univ.), Ikuru Iwata(Okayama Astrophysical Observatory, NAOJ),
Kiyoto Yabe, Yuma Suraphong(Kyoto Univ.),
Masayuki Akiyama, Naoyuki Tamura, Kentaro Aoki(Subaru Telescope, NAOJ), Marcin Sawicki(St.Marry's Univ, Canada)

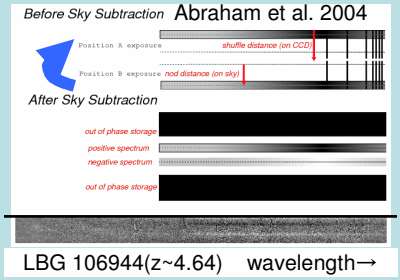
Introduction

We made a sample of z~5 LBGs using Subaru Suprime Cam.
The spectroscopic observations were made with GMOS-N, nod-and-shuffle technique.
We present results of the observations of these z~5 LBG candidates.

Observations

Instrument･･･GMOS-N
Field･･･GOODS-N and around GOODS-N
Target･･･2 masks
main 12 objects(z'<25 mag), others 6 objects(z'>25 mag 3, I-drop candidate 1, LAEs 2) Color selection criteria are below.
Exposure Time･･･ 10 hours and 8 hours,
Slit length･･･1"×8", 1"×9"
Pixel scale･･･2.74 Å/pixel×0.14"/pixel
Spectral resolution･･･8-9 Å (FWHM), seeing･･･0.6-0.9"

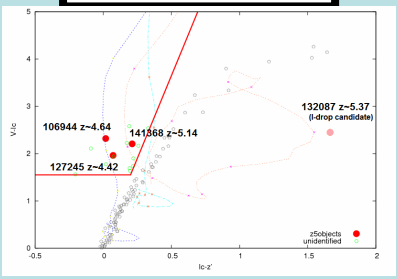
Nod & Shuffle



LBG 106944(z~4.64) wavelength→

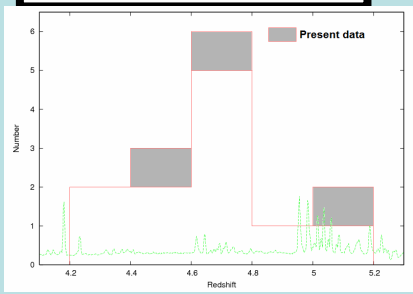
Nod and shuffle technique can accomplish very accurate sky subtraction, by Nodding the telescope and Shuffling the charges on the CCD along the slit.

Color Criteria



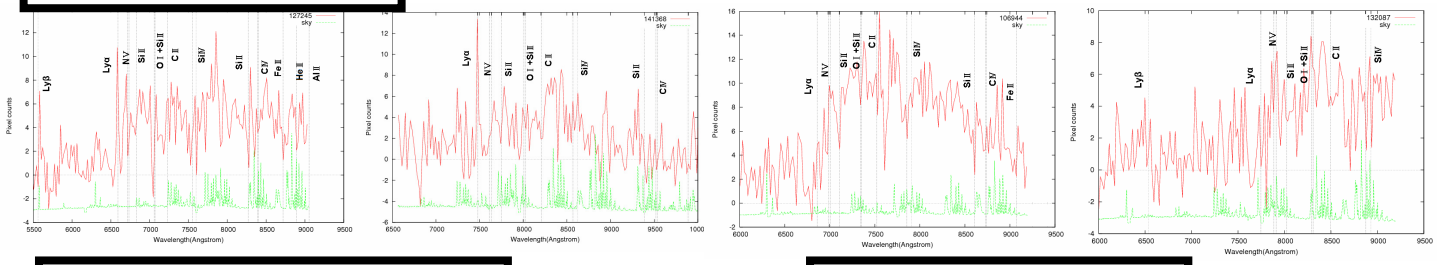
Color criteria of our LBG selection.
V-Ic > 7.0*(Ic-z') + 1.55
The color of Galactic stars, the color track of star-forming galaxies and early-type galaxies are also plotted.
In addition, we identified one I-drop candidate (132087) as a LBG at z~5.37

Redshift distribution

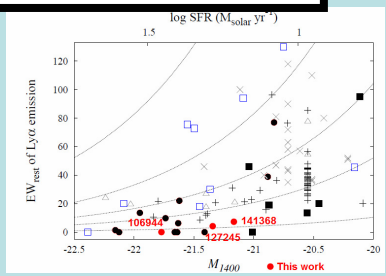


Redshift distribution of our spectroscopically identified LBGs and LBGs in Ando et al. 2004,2007.
The dotted line is the intensity of sky background where redshifted Ly α locates.

Spectrum of four LBGs



UV luminosity and Ly α EW



Present data points (red filled circles) are ploted in the diagram by Ando et al. (2006). Black filled symbols and open symbols represent LBGs and LAEs, respectively. The present results confirm the trend that UV luminous LBGs do not show Ly α emission line with a large EW, suggesting a luminosity dependent evolution of galaxies.

Summary and Future

We made optical spectroscopy of z~5 LBGs using GMOS with Nod-and-Shuffle capability.
Three LBGs are identified to be z~5 (average redshift of 4.7), and one i-drop out object to be z=5.4.
The three LBGs are brighter than M_UV=-21.0 mag and do not show strong Ly α emission lines, confirming the trend that UV luminous galaxies at the redshift do not show strong Ly α emission as shown by Ando et al. (2006).

The data analysis is still in progress.
We would like to examine the luminosity dependent evolution using the present data together with the previous data.