X47a Properties of Hα emitters at $z \sim 2.1$–2.5 selected from broad-band photometry

寺尾恭範 (東京大学), Lee Spitler (Macquarie University), 本原顕太郎 (東京大学)

It is important to identify star forming galaxies (SFGs) at different redshifts and investigate their properties to understand galaxy evolution. Since constructing large spectroscopic SFG sample is difficult at high-z due to their faintness, many techniques have been developed to detect spectral features of galaxies, such as emission lines and multi-band colors, so that SFGs can be identified using only imaging data. Especially, the Hα emission line is one of the best tools for identifying SFGs because it is the most direct star formation tracer originating from hydrogen ionized by massive stars. That is why many narrow-band (NB) surveys have been carried out to detect the Hα emission line from distant galaxies. When using NB filters, however, large survey areas are needed to construct large samples due to narrow redshift windows corresponding to their band-widths. If the Hα emission line fluxes can be extracted from broad-band data, we can construct SFG samples much more effectively. In this work, we have derived the Hα fluxes of galaxies at $z \sim 2.1$–2.5 from K_s band data using the ZFOURGE multi-band catalog. Since fluxes observed in the K_s filter consist of stellar continuum and emission lines, it is essential to accurately estimate stellar continuum fluxes. Therefore we have performed SED fitting with emission line templates and identified ~ 2000 Hα emitters. Their luminosity function shows an excess compared to the result of a NB survey (HiZELS; Sobral et al. 2013) especially in the bright end. The excess can be mostly explained by missing flux in HiZELS considering Hα profiles depending on stellar masses of the galaxies. We also find our Hα star formation rate density is consistent with HiZELS regardless of the excess.