X31b Derivation of Hα luminosity from multi band photometry for galaxies at $z \sim 2.3$

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

A correlation between star formation rate (SFR) and stellar mass of galaxies, which is known as star formation main sequence, is an important measurement to understand how galaxies evolve depending on their stellar mass. Scatter in the main sequence is related to star formation history of galaxies and expected to be large if short timescale processes are dominant. Therefore using a SFR indicator which is sensitive to short period star formation activity is essential to accurately measure the main sequence and its scatter. Hα emission line is the most sensitive tracer for instantaneous star formation because it originates from gaseous nebula ionized by most massive stars which have short lifetime ($\sim$ 10 Myr). At high redshift, however, UV continuum derived from SED fitting has been widely used as a SFR tracer except at a few specific redshift windows. Since the sensitive timescale of UV continuum is $\sim$ 1 Gyr, the main sequence measured by UV SFR lacks the information on shorter timescale fluctuation of star formation activity. In this presentation, we explain a method to derive Hα luminosity from multi band photometry. With deep near-infrared data of ZFOURGE catalog, Hα fluxes of galaxies at $2.1 < z < 2.5$ are derived by subtracting continuum flux from observed flux in Ks band, where the continuum flux is derived from SED fitting taking the contamination of emission lines into account. Hα SFR obtained by our method agrees well with UV+IR SFR. While the slope and normalization of our main sequence are consistent with typical values of previous studies, its scatter is $\sim$ 0.1 dex larger than what reported so far. We also show Hα luminosity function with our method and compare it with the result of HiZELS.