X45a Intrinsic scatter in star formation rate of galaxies with strong Hα at $z \sim 2$

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There is a correlation between stellar mass and star formation rate (SFR) of galaxies, which is known as star formation main sequence (SFMS). Measurement of SFMS and its scatter is important to understand galaxy evolution. Observed small scatter in the SFMS, $\sim$ 0.3 dex at $z \lesssim 2$, suggests that growth of galaxies is predominantly driven by gradual and continuous processes rather than short term starburst. However, recent simulations have not well reproduced the observed SFMS and specific star formation rate (sSFR), especially at z = 1–2. This discrepancy is probably due to not only a lack of our understanding of galaxy evolution, but also insufficiency of measurement accuracy, which arises from observational limitations and uncertainties. Specifically, for galaxies at high redshift, stellar mass can be overestimated when derived by SED fitting because such galaxies tend to have strong nebular emission lines which boost flux in filters. Therefore, precise measurement of SFMS and sSFR using accurate stellar mass and SFR is essential to constrain the galaxy evolution model. In this work, we examine the SFMS and sSFR for galaxies with strong Hα emission at $z \sim 2$ using the Fourstar Galaxy Evolution Survey (ZFOURGE) catalog. For the Ks band including redshifted Hα, we find that the difference between observed and stellar continuum magnitude is $\sim$ 3 times higher for lower mass galaxies than massive ones. Consequently, there are a number of low mass ($\lesssim 10^{8.5} M_{\odot}$) galaxies above the SFMS and constant sSFR. We also investigate the intrinsic scatter in them by creating scatter models to reproduce the observation assuming different shapes of distribution and completeness.