X11a Very Large Star Formation in LBGs at $z \sim 5$?

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We obtained stellar masses, star formation rates, star formation ages, and color excesses of Lyman Break Galaxies at $z \sim 5$ through Spectral Energy Distribution fitting using IRAC data (channels 1 and 2) covering a rest-frame wavelength of 6000-7000 Å. We chose the sample LBGs from our LBG sample with $z' < 26.5$ mag obtained in a field including the GOODS-N. We used the IRAC data publicly available in the GOODS-N and that taken by us in the flanking field where limiting magnitudes are 1-1.5 mag brighter. A total area covered by IRAC is ~ 400 arcmin^2 (more than double of the GOODS-N area). We used the LBGs that are detected both in IRAC channel1 and channel2, and further restricted it by selecting the LBGs that are free from contamination by neighboring objects in IRAC images. Final sample size is 64. The SED fitting we used is a traditional one: Bruzal and Charlot 2003 stellar synthesis model, constant star formation history, Salpeter IMF with 0.2 $Z_\odot$, and Calzetti extinction curve. We also test other star formation histories, abundances, extinction laws, etc, to show the robustness of the results. We found most of the LBGs show very large intrinsic star formation rates of $10^2 - 10^3 M_\odot$ yr^{-1}. They also show very large specific star formation rates of 10–100 Gyr^{-1}. Compared with SFRs and SSFRs at lower redshifts, they are getting smaller as z decreases. We may be witnessing a population of very active star forming galaxies at the redshift. However, in our knowledge, no theoretical model predict the presence of such population (except for rare individual object). We will discuss implications of the results.