X33a The stellar populations of Lyman Break Galaxies at $z \sim 5$ in the GOODS-N

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We present results of SED fitting analysis for Lyman Break Galaxies (LBGs) at $z \sim 5$ in the GOODS-N/MODS region. We used deep imaging data including U (KPNO MOSAIC), B, V, R, I_c, z' (Subaru S-Cam), J, H, K (Subaru MOIRCS), 3.6μm, and 4.5μm (Spitzer IRAC). We subtracted neighboring objects with GALFIT to avoid severe contamination in the IRAC images and obtained the sample of ∼130 LBGs at $z \sim 5$. By using the deepest NIR and the large sample, we constructed the observed SEDs and improved the results by Yabe et al. (2009).

Resulting stellar masses range from $10^8 M_\odot$ to $10^{11} M_\odot$ with median value of $3 \times 10^9 M_\odot$. The median stellar age, color excess, and star formation rate are 24 Myr, 0.25 mag, and $120 M_\odot$/yr, respectively. We compare the results with those of LBGs at $z = 2-3$. The stellar masses of LBGs increase from $z \sim 5$ to $z = 2-3$. The stellar ages of the LBGs at $z \sim 5$ are younger and the color excesses are larger than those of LBGs at $z = 2-3$. The star formation rates are higher than the $z = 2-3$ LBGs. We suggest that the LBGs at $z \sim 5$ are undergoing intense star formation making them dusty and they are dominated by younger stellar populations than in the case of $z = 2-3$ LBGs. By using the resulting stellar masses, we also derived the stellar mass function and the stellar mass density at $z \sim 5$.