X20a Photometric and Spectroscopic Properties of Lyα Blobs at $z = 5 - 7$ Identified with Subaru HSC

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Lyα blobs (LABs) are very luminous (log $(L_{\mathrm{Ly}\alpha}/[\mathrm{erg\ s^{-1}}]) \gtrsim 43.4$) and spacially extended Lyα emitters (LAEs). We have analyzed the HSC CHORUS narrowband imaging data with the HSC SSP broadband imaging data, and newly identified 2 LABs at $z = 4.9$ and 7.0, the latter of which marks the most distant extended Lyα source found to date. We combine our 2 LABs and the previously-known 5 LABs at $z = 5.7$ and 6.6 with the HSC data, and study statistical properties of the LABs at $z = 5 - 7$. We conduct careful point spread function (PSF) matching, and obtain the surface brightness profiles of Lyα emission. Our two-component exponential profile fitting shows that the best-fit parameters of the core and halo radii fall in the extrapolation of the Lyα radius-luminosity relation found in the diffuse Lyα halos of LAEs ($\log(L_{\mathrm{Ly}\alpha}/[\mathrm{erg\ s^{-1}}]) \sim 42 - 43$) identified by VLT/MUSE surveys. We find that our LAB at $z = 4.9$ has a strong CIV1548 emission line indicative of AGN. Spectroscopic data of our LABs exhibit a velocity gradient in Lyα, while the AGN LAB presents a large velocity width of Lyα emission. We compare these photometric and spectroscopic results with the numerical simulations, and discuss physical origins of the extended Lyα emission.