

X17a Exploration of High Redshift Galaxies with Subaru/HSC CHORUS Survey

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We present the Ly α luminosity function (LF) derived from 34 Ly α emitters (LAEs) at $z = 7.0$ on the sky of 3.1 deg^2 , the largest sample compared to those in the literature obtained at a redshift $z \gtrsim 7$. The LAE sample is made by deep large-area Subaru narrowband observations conducted by the Cosmic HydrOgen Reionization Unveiled with Subaru (CHORUS) project. The $z = 7.0$ Ly α LF of our project is consistent with those of the previous DECam and Subaru studies at the bright and faint ends, respectively, while our $z = 7.0$ Ly α LF has uncertainties significantly smaller than those of the previous study results. Exploiting the small errors of our measurements, we investigate the shape of the faint to bright-end Ly α LF. We find that the $z = 7.0$ Ly α LF shape can be explained by the steep slope of $\alpha \simeq -2.5$ suggested at $z = 6.6$, and that there is no clear signature of a bright-end excess at $z \simeq 7$ claimed by the previous work, which was thought to be made by the ionized bubbles around bright LAEs whose Ly α photons could easily escape from the partly neutral IGM at $z \simeq 7$. In our program, we have identified a remarkable overdensity at $z = 7$ (z7OD), whose three brightest members are already spectroscopically confirmed as LAEs at $z = 6.936, 6.922, \text{ and } 6.931$. We discuss the future observation plans to reveal the nature of the z7OD and its role in understanding the topology of the cosmic reionization.