Distribution and evolution of high-z galaxies in the Subaru / XMM-Newton Deep Survey Field (SXDF)

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Abstract. We present results from our on-going study of the distribution and evolution of high-z galaxies. We exploited the large area coverage (∼1.3 deg\textsuperscript{2}) of the Subaru / XMM-Newton Deep Survey field (SXDF) to search for Lyman-break galaxies (LBGs) and Ly\textsc{α} Emitters (LAEs) at 3 < z < 7. We have found filamentary large scale structures, which are made of LAEs, with ∼10 to 40 Mpc (in commoving units) scale voids as early as at z = 5.7. Galaxies at this redshift show clustering of ∼1 Mpc in diameter (in physical unit). The inferred star formation rate density of these clustering is ∼130 times the mean of the whole area, indicates burst of star formation activities. Combined with the UKIDSS/UDS photometry, the optical+near-IR SED fitting provides the estimate of masses for some of these high-z galaxies. Preliminary results indicate a number of galaxies at z > 5 have already grown up to ∼10\textsuperscript{11} solar mass.

Keywords. cosmology: large-scale structure, galaxies: distance and redshifts, evolution

1. Discussion

The Subaru / XMM-Newton Deep Survey field (Sekiguchi \textit{et al.} 2004) has been a focus of our studies of the high redshift galaxies (Ouchi \textit{et al.} 2005, Sekiguchi \textit{et al.} 2006). The field has a deep multi-bands optical and near-infrared data set by Subaru Telescope and by the UKIRT WFCAM (Casali \textit{et al.} 2006, in preparation) respectively, which can be exploited for selecting high-redshift galaxy candidates. The large area coverage of the SXDF resulted a discovery of structures by the LAEs and voids as early as at z = 5.7 (Ouchi \textit{et al.} 2005). Also, with the early UKIDSS/UDS (Lawrence \textit{et al.} 2006) data, McLure \textit{et al.} (2006) found a few of the LBGs at z > 5 with the stellar mass up to ∼10\textsuperscript{11} solar mass.

References

Sekiguchi, K. \textit{et al.} 2004, \textit{Astrophysics and Space Science Library} 301, 169