Topology of the Galaxy Distribution in the Hubble Deep Fields

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We have studied topology of the distribution of the high redshift galaxies identified in the Hubble Deep Field (HDF) North and South. The two-dimensional genus is measured from the projected distributions of the HDF galaxies at angular scales from 3.8″ to 6.1″. We have also divided the samples into three redshift slices with roughly equal number of galaxies using photometric redshifts to see possible evolutionary effects on the topology. The genus curve of the HDF North clearly indicates clustering of galaxies over the Poisson distribution while the clustering is somewhat weaker in the HDF South. This clustering is mainly due to the nearer galaxies in the samples. We have also found that the genus curve of galaxies in the HDF is consistent with the Gaussian random phase distribution with no significant redshift dependence.