

BLUE 'ELLIPTICAL' GALAXIES IN THE HUBBLE DEEP FIELD

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Abraham et al. (1996) studied the morphologically segregated galaxy count in the Hubble Deep Field (HDF) and found weak excess over the no-evolution prediction for early type (E/S0) galaxies. Dose the excess mean the mild evolution of galaxies ? To explore this problem, we studied the photometric properties of morphologically-selected early-type ('E') galaxies (ellipticals and S0s) in the Hubble Deep Field, based on the morphological catalog by van den Bergh et al. (1996). We compare the distribution of the HDF 'E' galaxies on the color - color diagram with the predicted loci expected from passive evolution for the various epoch of galaxy formation, z_f , which are derived by using the Simple Stellar Population (SSP) of GISSEL96 (Bruzual & Charlot 1996).

We found that a large fraction of these galaxies have very blue SED over the four (UBVI) band, which are never compatible with those for passively evolving old galaxies; any simple passive evolution model assuming the formation redshift which is greater than 3 cannot explain the distribution of these blue 'ellipticals' on the color - color diagram. Redshift of these blue 'E' galaxies, estimated by us with the photometric redshift method, are distributed over wide range ($z < 2$). We also attempted to fit the radial light profile of HDF 'E' galaxies using the version 2 image of HDF. More than a half of blue 'E' galaxies are well fitted by exponential law rather than de Vaucouleurs law. These results are not consistent with the interpretation of the mild evolution of early-type galaxies. The evolution of 'E' galaxies in the field seems to be more complicated than that in clusters of galaxies.

References

- Abraham, R. G. et al. 1996, MNRAS, 279, L47
van den Bergh, S. et al. 1996, AJ, 112, 359