[구GC-29] HST Pixel Analysis of NGC 5195

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We report the HST pixel analysis results of the interacting S0 galaxy, NGC 5195 (M51B), using the HST/ACS images in the F435W, F555W and F814W (BVI) bands. After 4x4 binning of the HST/ACS images to secure sufficient signal-to-noise ratio for each pixel, we derive several quantities describing the pixel color-magnitude diagram (pCMD) of NGC 5195, such as blue/red color cut, red pixel sequence parameters, blue pixel sequence parameters and blue-to-red pixel ratio. Those parameters reflect the internal properties of NGC 5195 like age, metallicity, dust content and galaxy morphology. To investigate the spatial distributions of stellar populations, we divide pixel stellar populations using the pixel color-color diagram and population synthesis models. As a result, we find that the tidal interaction with NGC 5194 significantly affects the stellar populations in their dust content and mean stellar age.

[구GC-30] Constraining Physical Properties of High-redshift Galaxies : Effects of Star-formation Histories

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Constraining physical (or stellar population) properties - such as stellar mass, star-formation rate, stellar population age, and dust-extinction - of galaxies from observation is crucial in the study of galaxy evolution.

This is very challenging especially for high-redshift galaxies, and a widely-used method to estimate physical properties of high-redshift galaxies is to compare their photometric spectral energy distributions (SEDs) to spectral templates from stellar population synthesis models.

I will show that the SED-fitting results of high-redshift galaxies are strongly dependent on the assumed forms of star-formation histories.

I will also present the results of SED-fitting analysis of observed Lyman-break galaxies which show that parametric models with gradually increasing star-formation histories provide better estimates of physical parameters of high-redshift ($z>3$) star-forming galaxies than traditionally-used exponentially declining star-formation histories.

This result is also consistent with the predictions from the modern galaxy formation models.