[GC10] Photometric Estimation of the Ages and Metallicities of Galaxies

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To understand the formation of galaxies, we need to inspect many galaxies at various stages of formation/evolution. In this work, we study the properties of galaxies in the local universe, providing observational constraints to the models of galaxy formation. We obtain the ages and metallicities of galaxies by fitting the photometric data to galaxy evolution model (Bruzual and Charlot, 2003). Unfortunately, the ages and metallicities based on our observation data (Bohyunsan Optical Astronomical Observatory) are not consistent with those based on comparison data (Sloan Digital Sky Survey). This inconsistency is probably due to limitations of SED fitting using photometric data in a few bands. We decide to use this method just statistically, and estimate the ages and metallicities of SDSS DR4 galaxies. As a result, the slopes of age-metallicity tend to be steeper for late-type galaxies than for early-type galaxies. Higher-mass galaxy seems to be, on average, older and more metal-rich than lower-mass galaxy. These statistical trends are consistent with other studies.

[GC11] HST ACS Survey of HII regions in M51

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We present a result of surveying HII regions in M51, based on HST ACS Hα images taken by the Hubble Heritage Team. The size of the survey field is 7.2 arcmin x 10.2 arcmin. We subtracted the continuum from the Hα images using the combination of V(F555W) and I(F814W) images, and searched for HII regions in the resulting images using the HIIPHOT(Thilker, Braun, & Walterbos 2000).We have found about 14,600 HII regions. The sizes of the detected HII regions range from 10 pc to 130 pc, and the Hα luminosities of the HII regions are in the range of $L_{H_\alpha}=1\times10^{36}$ - 9×10^{38} ergs/s. The size distribution and luminosity function of the HII regions are well fit by the power law. The spatial distribution of the HII regions shows clearly a spiral structure, and is consistent with that of young star clusters.