

[7GC-01] On the interpretation of color bimodality of extra-galactic globular clusters

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Globular cluster (GC) systems in most galaxies, particularly in ellipticals, show bimodal color distributions. Because broadband colors trace metallicity at old ages, this phenomenon has been commonly interpreted as bimodal metallicity distributions, implying the presence of two sub-populations in the globular cluster system within a galaxy. However, a new explanation has recently been proposed, in which the non-linear nature of color-metallicity relations induced by horizontal-branch stars can produce bimodal color distributions even from unimodal metallicity distributions. In this study, we put these two explanations to the test on the origin of color bimodality, using multi-band (U,B,V and I) photometry of globular clusters in NGC 1399, the central giant elliptical galaxy in Fornax galaxy cluster. We find significant changes in the morphology of color distributions when using different colors. The observation is also well reproduced by the Monte Carlo realization of GC color when a unimodal metallicity distribution and the theoretical non-linear color-metallicity relations are assumed. We discuss the implications regarding theories on galaxy formation and evolution.

[7GC-02] HST Pixel Analysis of NGC 5194

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We report the HST pixel analysis results of the interacting face-on spiral galaxy, NGC 5194 (M51), which is the first step of a new observational research project, PANCluG (Pixel Analysis of Nearby Cluster Galaxies). We derive several quantities describing the pixel color-magnitude diagram (pCMD) of NGC 5194, suitable for future comparisons with the pCMDs of other galaxies. We investigate the spatial distribution of pixel stellar populations, finding that the spiral arm pattern and the tidal interaction with NGC 5195 significantly affect the stellar populations in NGC 5194. We find that the pixels corresponding to the central active galactic nucleus (AGN) of NGC 5194 show a very tight sequence in the bright-end of the pCMD, of which spatial distribution seems to agree with the AGN torus region.