[GC19] COLOUR-DEPENDENT VARIATION OF GLOBULAR CLUSTER COLOUR DISTRIBUTION

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The origin of the well-known bimodal colour distributions of extragalactic globular cluster (GC) systems has been the topic of much interest and ongoing debate. It is widely agreed that the presence of two distinct GC sub-populations with different metallicities is responsible for the observed GC colour bimodality. Recently, however, an alternative explanation has been offered by Yoon, Yi & Lee (2006), in which the non-linear transformation from metallicity to colours gives rise to colour bimodality, without resorting to distinct GC sub-systems within individual galaxies. Two discrete sub-populations with different metallicities will cause the ratio of blue GCs to red ones to remain unaltered regardless of the bandpasses. By contrast, the Yoon et al. (2006) scenario predicts systematic variation in the morphology of GC colour distribution histograms depending on the bandpasses used. We analysed the data from the previous multi-band GC observations for a comparison with the predicted number ratio variation. The results demonstrate that the relative fraction of blue and red GCs indeed varies when different colours are adopted. A comprehensive future analysis on other GC systems will offer more robust constraints on the origin of GC colour bimodality.
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[GC20] Globular Cluster Formation in Hierarchical Merger Paradigm

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We investigate the formation and evolution of globular cluster (GC) systems of early-type galaxies in dense environments in the hierarchical merger paradigm. We use semi-analytic prescriptions that include chemical evolution. We have simulated the GC systems of early-type (bulge to total ratio $\geq$ 0.7) galaxies of mass $\geq 1.0 \times 10^{10}$ $M_{\odot}$. We consider the evolution of GC mass function due to the stellar mass loss, two-body relaxation and gravitational shock, to name a few. We consider various preferred modes of GC formation; e.g., dynamically-hot environments such as major mergers or initial collapse. Also we think that the accretion of dwarf galaxy can be a significant factor of GC formation in merger environment. Metallicity distribution function (MDF) appears to mainly depend on the star formation history of galaxy. We present theoretical MDFs of GCs for varieties in galaxy mass and in dark matter halo mass. When compared to the empirical MDFs currently pursued by many observational projects, they will be useful for unveiling the formation history of early-type galaxies.