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Optical and near-infrared color distributions of the NGC 4874 globular cluster system

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Abstract. Examining both optical and optical-infrared color distributions of the globular cluster (GC) systems in large elliptical galaxies is the key to study how non-linearities in the color-metallicity relations of their GC systems are linked to bimodal optical color distributions. In order to do this for the core of the Coma cluster of galaxies (Abell 1656), centered on the giant elliptical galaxy NGC 4874, we have combined F160W (H_{160}) near-infrared (NIR) imaging data acquired with the Wide Field Camera 3 IR Channel (WFC3/IR), installed on *Hubble Space Telescope* (*HST*) in 2009, with F475W (g_{475}) and F814W (I_{814}) optical imaging data from the *HST* Advanced Camera for Surveys (ACS). Since optical-NIR color distributions of extragalactic GC systems reflect the underlying features of the metallicity distributions, we have probed not only optical $g_{475}-I_{814}$ and optical-NIR $I_{814}-H_{160}$ color distributions but also the color-color relation for this GC system. The features of these color distributions have been quantitatively analyzed using the Gaussian Mixture Modeling code. We find that brighter GCs have a much redder mean color than fainter ones. The optical color distribution of the GC system in the Coma cluster core shows the typical bimodality, while the evidence for bimodality is significantly weaker in the optical-NIR color distribution.

Keywords. galaxies: elliptical and lenticular, cD, galaxies: individual (NGC 4874), galaxies: star clusters

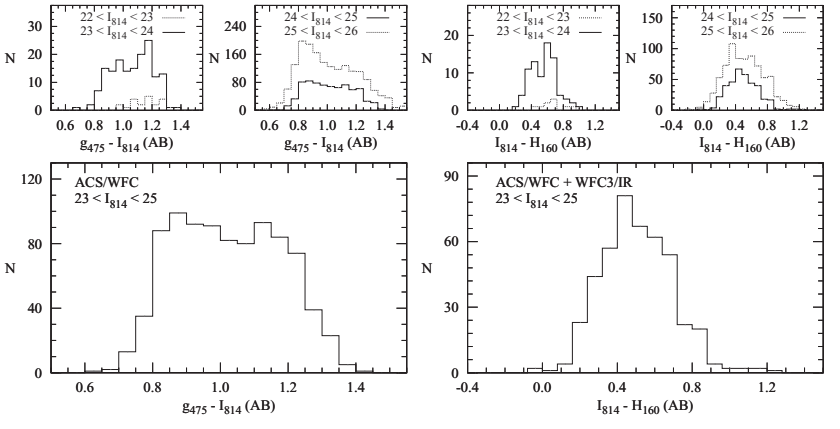

Figure 1. Top panels: The ACS $g_{475}-I_{814}$ and ACS+WFC3/IR $I_{814}-H_{160}$ color distributions for different I_{814} magnitude ranges for matched GC candidates across the bands. Bottom panels: Same as top panels but in the broader magnitude range and with color errors less than 0.2 mag.