

UV Colors of Globular Clusters in External Galaxies: Clue to the Galaxy Formation History

Hyun-chul Lee, Young-Wook Lee, Sukyoung Yi
Center for Space Astrophysics, Yonsei University

The star formation history in elliptical galaxies has been a focus of many debates lately. Whether elliptical galaxies formed in a monolithic collapse or via more recent interaction/merger activities between disk galaxies holds a clue to the study of the galaxy formation history and even to cosmology. Globular cluster systems in them are arguably the best probes, because they are bright for detection and feasible for analysis because of their simple nature. Optical/NIR data have shown that they often have bimodal metallicity distributions, indicating an episodic formation history. However, the ages of these formation epochs are uncertain, while accurate determination of their ages is critical in distinguishing different formation scenarios. Our models have shown that their ages can be estimated if multi-band photometric data, in particular including UV, are available. This is because the UV flux of an intermediate-to-old population is sensitive to its HB morphology, which is a good age indicator for the population. Such UV data are difficult to collect in large quantity because observing time with space telescopes with UV capability is highly competitive. The Galaxy Evolution Explorer, GALEX, will collect exactly this type of data not only of Local Group galaxies but also of external galaxies. Its AIS modes will detect thousands of globular clusters in the Local Group, and its DIS modes, if properly pointing, will collect numerous clusters in the galaxies in other clusters of galaxies.