

# COLOUR-DIFFERENCES AMONG GLOBULAR CLUSTER SYSTEMS

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**ABSTRACT.** It is shown that the published colour-distributions of globular cluster systems surrounding nearby elliptical galaxies disagree with each other. While part of the discrepancies are introduced by zero-point errors, uncertainties in photometric transformations and other systematic differences between individual studies, independent measurements of the same cluster systems indicate that systematic errors are smaller than the observed off-sets. This implies that the latter differences are intrinsic.

## Results

Globular Cluster Systems (GCS) are generally regarded as almost uncontaminated fossils of the earliest stellar populations in any galaxy. Their luminosity functions were found to be fairly universal, a result which might indicate that their formation processes were very similar in different galaxies.

By comparing the average colours of the globular clusters of the early-type galaxies which have been published in the literature, with the colour-distribution of the GCS of the Milky Way and M31, it is found that the former are significantly redder, in spite of being still bluer than the starlight of the corresponding host galaxies.

The different colours for early-type galaxies are to be expected since the disk and halo clusters of the Galaxy have different colour-distributions, and any other system is unlikely to contain the same mixture of GCS populations as found in the Milky Way.

One might expect that at least the colour-distributions of the globulars associated with the spheroidal component of early-type galaxies is similar in all objects. It is important to note however, that the colours and metallicities of the GCS of these large early-type galaxies are closer to those of the disk GCs of the Galaxy than to those galactic GCs associated with the halo.

Comparisons of different measurements of GC colour-distributions is hampered by technical problems (zero-point errors, insufficient transformations between different colour systems, etc.), which make an accurate absolute photometry of objects at 22 mag difficult. In addition different degrees of contamination by background galaxies (which have a broader colour-distribution), and radial colour-gradients in the GCSs may introduce off-sets between different studies. We have found, however that the latter complications introduce changes in the colour-distributions negligible in comparison with the empirically determined differences among observed GCSs. The colours derived by different groups using different material and even different photometric systems are often in better agreement with each other than the differences found in different early-type galaxies. Although the number of independent studies is still small, the present material indicates measurable differences among GCSs of different galaxies. The clusters would therefore be important tracers, but their properties are unlikely to be as universal as thought previously.