

[EVC-26] Structural Parameters of Galaxies in the Virgo Cluster

Suk Kim¹, Wonhyeong Yi¹, Soo-Chang Rey¹, Eon-Chang Sung², Helmut Jerjen⁴,
 Thorsten Lisker³, Youngdae Lee¹, Woong Lee¹, Jiwon Chung¹, and Mina Pak¹
¹*Dept. of Astronomy and Space Science, Chungnam National University, Korea,*
²*Korea Astronomy & Space Science Institute, Korea,* ³*Zentrum fur Astronomie der*
⁴*Universitat Heidelberg, Germany,* ⁴*Australian National University, Australia*

We present structural parameters of galaxies in the Extended Virgo Cluster Catalog (EVCC), new catalog of galaxies in the Virgo cluster using homogeneous Sloan Digital Sky Survey (SDSS) Data Release 7 (DR7) data. The EVCC covers more extended region of the Virgo cluster than that of the Virgo Cluster Catalog (VCC) and presents updated morphologies of galaxies using multi-band images and spectral features. We obtain the surface brightness profiles of galaxies using ellipse task in IRAF. Based on the analysis of surface brightness profile, we construct a catalog of various structural parameters of galaxies, i.e. central surface brightness, effective radius, sérsic index, effective surface brightness, and mean effective surface brightness. Taking advantage of these structural parameters in various parameter spaces, we refine criteria of dividing giant elliptical and dwarf elliptical galaxies. In addition, we found that bulge dominated galaxies have larger sérsic index and brighter central surface brightness than disk dominated galaxies. At a fixed magnitude, dwarf elliptical galaxies, dwarf lenticular galaxies, and dwarf irregular low surface brightness (LSB) galaxies show larger effective radii than giant elliptical galaxies, giant lenticular galaxies, and irregular high surface brightness (HSB) galaxies, respectively. Dwarf elliptical galaxies and dwarf irregular LSB galaxies occupy the similar structural parameter spaces. We suggest that giant elliptical galaxies and dwarf elliptical galaxies may have different origin.

[EVC-27] Ultraviolet Color-Magnitude Relations of Early-type Dwarf Galaxies in the Virgo Cluster

Suk Kim¹, Soo-Chang Rey¹, Eon-Chang Sung², Helmut Jerjen³, Thorsten Lisker⁴,
 Youngdae Lee¹, Jiwon Chung¹, Wonhyeong Yi¹, and Mina Pak¹
¹*Dept. of Astronomy and Space Science, Chungnam National University, Korea,*
²*Korea Astronomy & Space Science Institute, Korea,* ³*Zentrum fur Astronomie der*
⁴*Universitat Heidelberg, Germany,* ⁴*Australian National University, Australia*

We present ultraviolet (UV) color-magnitude relations (CMRs) of early-type dwarf galaxies in the Virgo cluster, combining Galaxy Evolution Explorer (GALEX) UV data with SDSS optical data, based on the Extended Virgo Cluster Catalog (EVCC). We find that dwarf lenticular galaxies (dS0s) show a surprisingly distinct and tight locus separated from that of ordinary dEs, which is not clearly seen in previous CMRs. The dS0s in UV CMRs follow a steeper sequence than dEs and show bluer UV-optical color at a given magnitude. We explore the observed CMRs with population models of a luminosity-dependent delayed exponential star formation history. The observed CMR of dS0s is well matched by models with relatively long delayed star formation. The dS0s are most likely transitional objects at the stage of subsequent transformation of late-type progenitors to ordinary red dEs in the cluster environment. Most early type dwarf galaxies with blue UV colors ($FUV-r < 6$ and $NUV-r < 4$) are identified as those showing spectroscopic hints of recent or ongoing star formation activities. In any case, UV photometry provides a powerful tool to disentangle the diverse subpopulations of early-type dwarf galaxies and uncover their evolutionary histories. lenticular galaxies, and irregular high surface brightness (HSB) galaxies, respectively. Dwarf elliptical galaxies and dwarf irregular LSB galaxies occupy the similar structural parameter spaces. We suggest that giant elliptical galaxies and dwarf elliptical galaxies may have different origin.