BVRI CCD Surface Photometry of the Dwarf Elliptical Galaxies NGC 185 and NGC 205

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NGC 185 and NGC 205 are peculiar dwarf elliptical galaxies in the Local Group. We present BVRI CCD surface photometry for the central(6'.35 × 6'.35) regions of NGC 185 and NGC 205 obtained using the Palomar 1.5m telescope. Surface photometry was derived from the CCD images using elliptical annulus aperture photometry and two ellipse fitting methods.

Structural parameters at $\gamma \geq 30''$(=90 pc) of NGC 185 are measured: the ellipticity $\simeq$ 0.2 and the position angle 50. Surface brightness profiles of NGC 185 are flat in the central regions and decrease exponentially in the piuter regions. Radial color distributions show that all colors remain nearly constant in the outer region of γ 20''(=60 pc) and become bluer toward the center.

Structural parameters of NGC 205 at $\gamma \geq 30''$(=120 pc) are measured: the ellipticity $\simeq$ 0.3-0.5 and the position angle $\simeq$ -15. Surface brightness profiles get extremely brighter toward the center in the nucleus(γ 4''=16 pc), remain a little flat at intermediate radius and decrease exponentially at larger radius. While all colors remain nearly constant in the outer region of $\gamma \geq 18''$(=70 pc), they get bluer in the central regions.

It is the young blue stars in the central regions of each galaxy that are believed to make the colors blue in the central regions of each galaxy. this interpretation is supported by the previous detection of young stars, dark clouds, and neutral hydrogen gases in the central regions of NGC 185 and NGC 205. No color gradient in the outer regions of NGC 185 and NGC 205 indicates that the stars in the outer region of each galaxy formed coevally.

The Effective Temperatures, Radii, and Masses of Dwarf Cepheids

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Using the flux values determined with the infrared flux method(IRFM) developed by Blackwell and Lynas-Gray (1993), we derived the empirical relationship between flux(Fv) and (V-K) colour appropriate to Dwarf Cepheids. For three Dwarf Cepheids of CY Aqr, YZ Boo and SZ Lyn where both VK photometry and radial velocities are available from the literature, effective temperatures were determined using the intrinsic Stromgreen indices, model atmosphere grides for (V-K), and tne relation between temperature and (V-K) colour. then, by applying the infrared surface brightness method, radii and distances hence masses and absolutel magnitudes were estimated for three different effective temperatures. It was found that the average mass of these

variable is about 0.5 solar mass and this result supports tje hyphothesis that Dwarf Cepheids are pre-white dwarf objects. It was also confirmed that the temperatures determined with IRFM are most successful in the application of the surface brightness method to the radius estimation of Dwarf Cepheids.

젊은 산개성단의 UBV CCD측광 II - NGC 6871과 NGC 2129

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서울대학교 천문대 24인치 반사망원경을 이용하여 Cyg OB3 성협의 핵심성단인 NGC 6871과 B형 거성이 있는 젊은 산개성단 NGC 2129에 대한 UBV CCD 측광을 수행하였다. NGC 6871의 경우 Cyg OB3 성협의 구성별로 얻은 색초과비 (R=3.3, E(U-V)/E(B-V)=0.76)을 적용하여 얻은 이 성단의 거리지수는 $V_0 - M_V = 11.^m2 \pm 0.^m3$ (d = 1.7 kpc), 성간적색화 $E(B-V) = 0.^m472 \pm 0.^m085$로 비교적 큰 차등소광을 보였다. NGC 2129의 경우 일반적으로 사용되는 색 초과비 (R=3.1, E(U-V)/E(B-V)=0.72)를 사용하여 $V_0 - M_V = 11.^m4 \pm 0.^m3$ (d = 1.9 kpc), $E(U-B) = 0.^m736 \pm 0.055$를 얻었다.

성광소광이 보정된 색지수와 기존의 분광분류를 이용하여 얻은 관측적 HR도와 Schaller et al. (1992)의 항성진화모형으로부터 이 성단의 나이와 초기질량함수를 도출하였다. NGC6871의 대표나이는 약 7.5Gyr (나이범위 : 2.5~10.5 Myr)이며, 초기질량함수의 기울기 $\Gamma(\equiv d \log \xi / d \log m) = -1.4 \pm 0.1$ 를 얻었다. NGC2129 의 경우 대표나이는 약 19.5 Gyr (나이범위 : 10.8~19.5 Myr), 질량함수의 기울기 $\Gamma = -1.3 \pm 0.1$ 를 얻었다. 이들 두 성단의 질량함수의 기울기는 Salpeter (1995)가 얻은 태양 인근 낱별들의 초기질량함수의 기울기와 비슷하다.

HST Observations of the Dwarf Spheroidal Galaxy Leo I

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Leo I is a dwarf spheroidal galaxy discoverd in 1950 during the course of the first Palomar sky survey(harrington and Wilson 1950, PASP, 62, 118). It had been considered to be the most distant satellite galaxy bound to the Galaxy. recently the deepest ground-based observations of leo I with a lomiting magnitide of I 24 mag found a striking result that the upper part of the main-sequence of leo I is seen around the level of $V \simeq 23$ mag ($M_V \simeq +1$ mag), which is much brighter than those of the typical globuler clusters and other dwarf spheroidal galaxies in the Local Group. In addition, there was seen little evidence of the typical horizontal branch in the color-magnitude digram of Leo I. these results showed that leo I may be the youngest dwarf spheroidal galaxies in the Local Group(Lee et al. 1993, AJ, 106, 1420). However,