

Stellar Population Analysis on a Large Sample of Low Surface Brightness Galaxies

Xiaoyan Chen^{1,2}, Ali Luo^{1,2}, and Yanchun Liang^{1,2}

¹National Astronomical Observatories, Chinese Academy of Science,
 A20 Datun Road, 100012 Beijing, PR China (NAOC) email:chenxy@nao.cas.cn

²Key Laboratory of Optical Astronomy, NAOC, Chinese Academy of Sciences, PR China

Abstract. We study the stellar populations of a large sample of nearly face-on disk Low Surface Brightness Galaxies (LSBGs), with B-band central surface brightness $\mu_0(B) > 22$ mag arcsec⁻², selected from the Sloan Digital Sky Survey Data Release 4 (SDSS-DR4) main galaxy sample (similar to Zhong *et al.* 2008; Liang *et al.* 2010).

Keywords. galaxies: stellar content — galaxies: evolution — galaxies: formation

Table 1. Stellar populations in each age-bins (Young, Intermediate and Old populations) and stellar extinctions in each bins of $\mu_0(B)$, derived by spectral synthesis with STARLIGHT.

sub-groups	$\mu_0(B)$ mag arcsec ⁻²	Y < 0.2Gyr	I 0.2 – 2Gyr	O > 2Gyr	A_V^*
sLSBG	22.75 – 24.5	37.46	48.77	13.78	0.35
iLSBG	22 – 22.75	37.14	46.37	16.49	0.41
iHSBG	21.25 – 22	42.32	42.52	15.16	0.50
vHSBG	< 21.25	44.54	46.42	9.05	0.53

We fit the full optical spectra using the spectral synthesis code STARLIGHT based on the templates of simple stellar populations (SSPs), which are extracted from Bruzual & Charlot 2003 (similar to Chen *et al.* 2009, 2010). A control sample of disc-dominated high surface brightness galaxies (HSBGs), with $\mu_0(B) < 22$ mag arcsec⁻², are also selected for comparisons. We further divided our samples into four subgroups according to $\mu_0(B)$: very low surface brightness galaxies (vLSBGs: 24.5 – 22.75 mag arcsec⁻²), intermediate low surface brightness galaxies (iLSBGs: 22.75 – 22.0 mag arcsec⁻²), intermediate high surface brightness galaxies (iHSBGs: 22.0 – 21.25 mag arcsec⁻²), and very high surface brightness galaxies (vHSBGs: < 21.25 mag arcsec⁻²). Table 1 gives the brief results of spectral synthesis. We can see that the importance of young stellar populations increases slightly with the increasing surface brightness (although iLSBGs and sLSBGs have quite similar values), and LSBGs tend to present lower extinctions indicating that they hold less dust than HSBGs (see details in Chen *et al.* 2012). This work was supported by the Natural Science Foundation of China (NSFC) under Nos.10933001, 11273026, 10973021.

References

- Chen, X. Y., Liang, Y. C., Hammer, F., Zhao, Y. H., & Zhong, G. H. 2009, *A&A*, 495, 457
 Chen, X. Y., Liang, Y. C., Hammer, F., Prugniel, Ph. *et al.* 2010, *A&A*, 515, A101
 Chen, X. Y. Liang, Y. C. *et al.* 2012, in *preparation*
 Liang, Y. C., Zhong, G. H., Hammer, F., Chen, X. Y. *et al.* 2010, *MNRAS*, 409, 213
 Zhong, G. H., Liang, Y. C., Liu, F. S., Hu, J. Y., Chen, X. Y. *et al.* 2008, *MNRAS*, 391, 986