The intriguing life of massive galaxies
Proceedings IAU Symposium No. 295, 2012
D. Thomas, A. Pasquali & I. Ferreras, eds.

doi:10.1017/S1743921313005218

The stellar metallicity distribution in intermediate-latitude fields

Xiyan Peng[1], Cuihua Du[2] and Zhenyu Wu[1]

[1] National Astronomical Observatories, Chinese Academy of Sciences
100012, Beijing, China
email: pengxiyan12@gmail.com

[2] College of Physical Sciences, University of Chinese Academy of Sciences
100049, Beijing, China

Abstract. Based on BATC and SDSS photometric data, we adopt the spectral energy distribution (SED) fitting method to evaluate stellar metallicities in the Galaxy. We find that the mean metallicity shifts from metal-rich to metal-poor with the increase of distance from the Galactic Centre.

Keywords. Star: abundances, Galaxy: disc, Galaxy: formation, Galaxy: halo, Galaxy: structure.

1. Stellar Atmospheric Parameter Estimation

We combine 15 BATC colors with 5 SDSS colors for the sample stars. We use a theoretical library of synthetic stellar spectra from Lejeune, Cuisinier & Buser (1997) to derive synthetic colors of the BATC and SDSS photometric system. The sample SEDs simulation with template SEDs can be used to derive the parameter of sample stars (Du *et al.* 2004).

2. Results

Metallicity variation with Galactic longitude. The mean metallicity is about -1.5 ± 0.2 dex in the interval $10 < r \leqslant 20$ kpc and -1.3 ± 0.1 dex for $8 < r \leqslant 10$ kpc. The mean metallicity smoothly decreases from -0.4 to -0.8 at $0 < r \leqslant 5$ kpc. For $4 < r \leqslant 8$ kpc, the overall distribution of mean metallicity has a maximum at $l \sim 200°$. This feature may reflect a fluctuation from streams (such as the Monoceros stream) that are accreted from nearby galaxies (Peng *et al.* 2012).

The vertical metallicity gradient. We find that the vertical abundance gradient for the thin disk ($0 < z < 2$ kpc) is d[Fe/H]/dz $\sim -0.21 \pm 0.05$ dex kpc^{-1}, and the vertical gradient -0.16 ± 0.06 dex kpc^{-1} at z distance interval $2 < z \leqslant 5$ kpc where the thick disk stars are dominant. The vertical gradient d[Fe/H]/dz $\sim -0.05 \pm 0.04$ dex kpc^{-1} is found over the z distance interval $5 < z \leqslant 15$ kpc. Therefore, there is little or no gradient in the halo (Peng *et al.* 2012).

References

Du, C.-H., Zhou, X., Ma, J., Shi, Y. R., Chen, A. B. C., Jiang, Z. J., & Chen, J. S. 2004, *AJ*, 128, 2265

Lejeune, T., Cuisinier, F., & Buser, R. 1997, *AAS*, 125, 229

Peng, X. H., Du, C.-H., & Wu, Z. H. 2012, *MNRAS*, 422, 2756