

Halo K-Giant Stars from LAMOST: Kinematics and Galactic Mass Estimate

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Abstract. We analyze line-of-sight velocities of over 3000 halo K-giant stars from the second data release of the spectral survey LAMOST (Zhao *et al.* 2012). We find a nearly constant velocity dispersion profile, with no large dips or peaks, in a Galactocentric radial range of 10 – 30 kpc, in accord with earlier analyses (Battaglia *et al.* 2005, 2006; Xue *et al.* 2008, 2014) (see Fig. 1). Previous studies of halo star radial velocity dispersions in a reference frame centered on the Galactic Center have detected dips within this radial range (Sommer-Larsen *et al.* 1994; Kafle *et al.* 2012, 2014). We use the stars to make estimates of the enclosed mass out to 40 kpc from the Galactic Center using the method of Evans *et al.* (2011). Tens of thousands of such stars are expected to become available to this analysis by the end of the five-year survey.

Keywords. Galaxy: halo — stars: individual (K giants) — stars: kinematics and dynamics

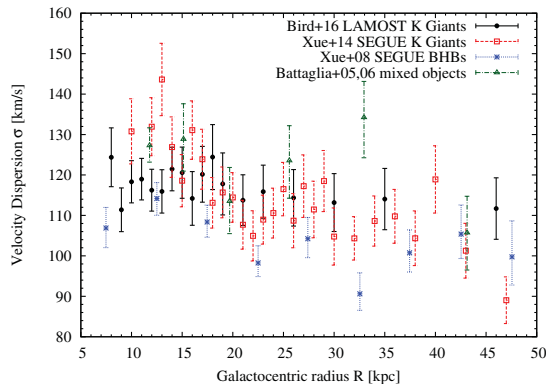


Figure 1. Comparison of line-of-sight halo velocity dispersions from Bird *et al.* (2016) LAMOST K giants, Xue *et al.* (2014) SEGUE K giants, Xue *et al.* (2008) SEGUE blue horizontal branch stars (BHBs), and Battaglia *et al.* (2005, 2006) mixed objects as a function of Galactocentric radius in spherical coordinates. The profiles follow a flattened distribution.

References

- Battaglia, G., Helmi, A., Morrison, H., *et al.* 2005, *MNRAS*, 364, 433
— 2006, *MNRAS*, 370, 1055
Bird, S. A., Liu, C., Shen, J., & Xue, X. X. 2016, in preparation
Evans, N. W., An, J., & Deason, A. J. 2011, *ApJ*, 730, L26
Kafle, P. R., Sharma, S., Lewis, G. F., & Bland-Hawthorn, J. 2012, *ApJ*, 761, 98
— 2014, *ApJ*, 794, 59
Sommer-Larsen, J., Flynn, C., & Christensen, P. R. 1994, *MNRAS*, 271, 94
Xue, X. X., Rix, H. W., Zhao, G., *et al.* 2008, *ApJ*, 684, 1143
Xue, X.-X., Ma, Z., Rix, H.-W., *et al.* 2014, *ApJ*, 784, 170
Zhao, G., Zhao, Y.-H., Chu, Y.-Q., Jing, Y.-P., & Deng, L.-C. 2012, *RAA*, 12, 723