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Metallicity gradients in the Milky Way thick disk as relic of a primordial distribution

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Abstract. We examine the evolution induced by secular processes of an initial, cosmologically motivated, radial chemical distribution, in a barred and an unbarred disk.

Keywords. galaxies: evolution - galaxies: formation

The simulations presented in Curir *et al.* (2012) describe two Milky Way (MW)-like exponential disks embedded in a suitable dark halo. The radial chemical function injected in the initial configuration of the N-body disk is justified with an inside-out disk formation model (Spitoni & Matteucci 2011).

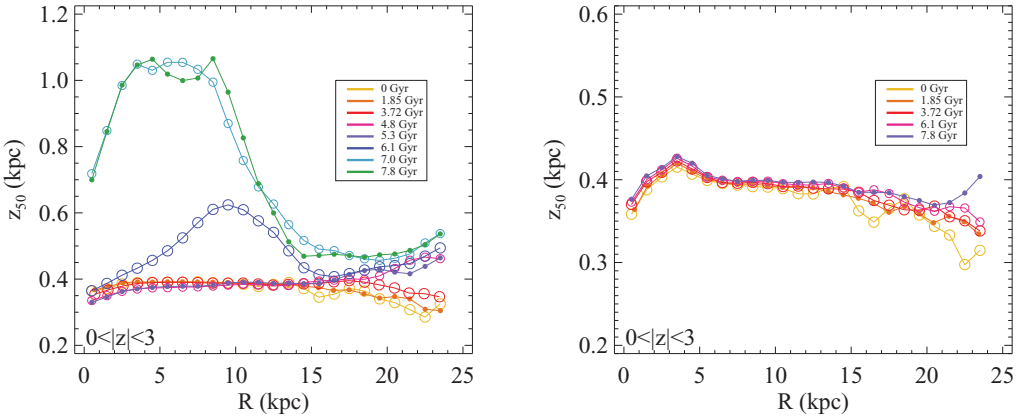

Figure 1. Median (z_{50}) of $|z|$ (distance to the disk plane) distribution at different radii and times for barred (left) and unbarred (right) disks.

We find that this chemical profile does not undergo major transformations after 6 Gyr of dynamical evolution in both disks examined. The final radial $[Fe/H]$ gradients in the solar neighborhood are positive and of the same order as those recently observed in the MW thick disk, in both the barred (Curir *et al.* 2014) and unbarred disks. Therefore the influence of the bar on the evolution of chemical features is negligible. On the other hand, the bar appears to have an important role in provoking a disk thickening and in eliciting a flare in the outer disk (Fig. 1).

References

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