

Erratum: Probing the shape and history of the Milky Way halo with orbital spectral analysis

by Monica Valluri,¹★ Victor P. Debattista,²† Thomas R. Quinn,³ Rok Roškar⁴
and James Wadsley⁵

¹Department of Astronomy, University of Michigan, Ann Arbor, MI 48109, USA

²Jeremiah Horrocks Institute, University of Central Lancashire, Preston PR1 2HE, UK

³Astronomy Department, University of Washington, Box 351580, Seattle, WA 98195-1580, USA

⁴Department of Theoretical Physics, University of Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland

⁵Department of Physics and Astronomy, McMaster University, Hamilton, Ontario L8S 4M1, Canada

Key words: errata, addenda–Galaxy: evolution–Galaxy: formation–Galaxy: halo–Galaxy: kinematics and dynamics–Galaxy: structure–dark matter.

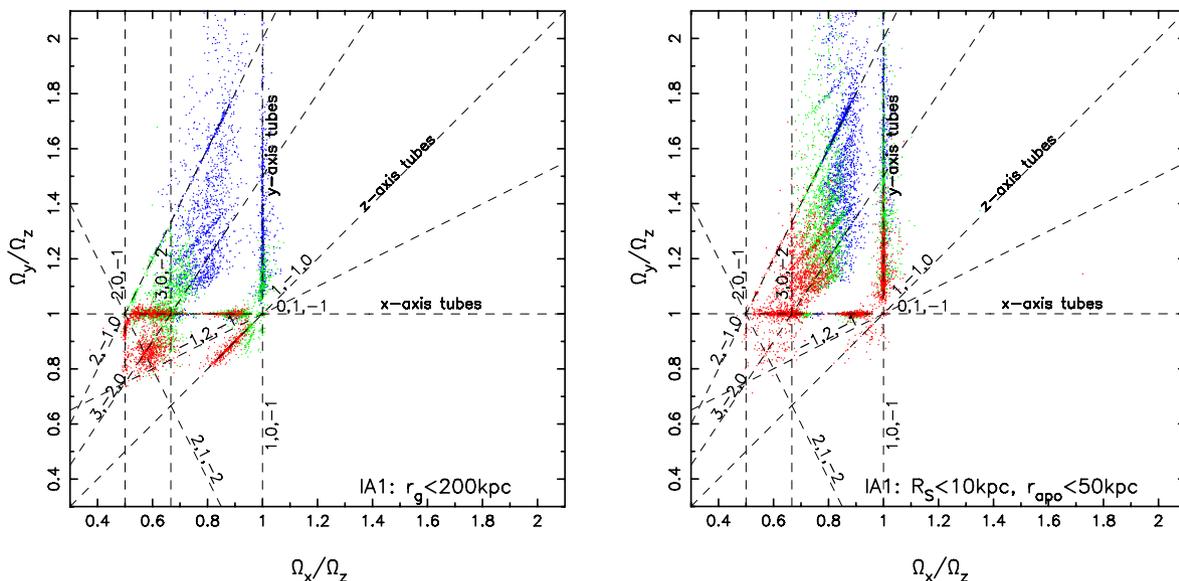


Figure 1. Left: frequency map of 10^4 halo orbits with $r_g < 200$ kpc after the disc grows perpendicular to the intermediate (y) axis in the triaxial potential (model IA1). Right: about 10^4 orbits from the inner halo of the same model. In the left-hand plot the y -axis tube family is populated by tightly bound (blue) points indicating that this family originates from resonant trapping by the disc. The fraction of orbits associated with this family is significantly increased in the solar neighbourhood plot (right).

The paper ‘Probing the shape and history of the Milky Way halo with orbital spectral analysis’ was published in MNRAS, 419, 1951 (2012). In Table 1, we reported values of r_{200} which followed the convention adopted previously (Debattista et al. 2008; Valluri et al. 2010), where this was defined as the radius at which $\rho = 200\rho_{\text{crit}}$ rather than the standard definition of r_{200} – the radius within which the enclosed mass has average density $200 \times \rho_{\text{crit}}$. r_{200} as determined by the standard definition is 170 kpc for model SNFWD and 379 kpc for models SA1, LA1, TA1, IA1 and SA2. The corresponding M_{200} for these models are 5.7×10^{11} and $6.3 \times 10^{12} M_{\odot}$, respectively. Other quantities in Table 1 remain unchanged. This change in the

value of r_{200} does not affect our results which are independent of this quantity.

In Section 3.2.2, we stated that for model LA1, all the points that clustered around the vertical resonance lines labelled ‘1, 0 and -1 y -axis tubes’ in Fig. 6 were intermediate-axis tubes. We have reanalysed the orbital characteristics of these orbits and find that they are all resonant box orbits and not y -axis tubes. In fact model LA1 has no intermediate-axis tubes. The points that cluster along the ‘1, 0 and -1 ’ line on the frequency map are resonant box orbits, which are elongated along the y -axis and provide the support for the enhanced mass density along the y -axis within the inner 25 kpc.

In Section 3.2.4, Fig. 8 (triaxial halo with an intermediate-axis disc) was incorrect due to mislabelling of the coordinate system in which the orbits were integrated. The standard coordinate system

★ E-mail: mvalluri@umich.edu

† RCUK Fellow.

used in this paper for the frequency maps has (x, y, z) representing the long, intermediate and short axes, respectively (see Fig. 4 of the published version). However, the data files used to generate the published version of Fig. 8 had the intermediate axis incorrectly labelled as z (rather than y by our standard convention). Consequently, in the discussion of the frequency map in Fig. 8, we claimed that there were intermediate-axis tubes at large radii. Fig. 1 of this erratum shows an updated version of the frequency maps in Fig. 8 of the published paper with the correct definition of y as the intermediate axis (and the axis about which the disc is symmetric). In these corrected frequency maps intermediate-axis tubes appear only at small radii. These orbits are generated by resonant trapping by the disc (as they are in all the other models in the published paper) and consequently appear at only small radii where the disc dominates.

The map shows a prominent clustering of tightly bound orbits along the vertical line corresponding to intermediate-axis tubes with $\Omega_x/\Omega_z = 1$ at values of $\Omega_y/\Omega_z > 1$. Since the disc is symmetric about the y -axis, at small radii the halo becomes more oblate in this region, with y as its symmetry axis. The appearance of the

intermediate-axis tubes in the vicinity of the disc in this model is consistent with what we found for other models. Because the inner part of the halo has been flattened by the disc, what was the intermediate-axis direction of the original triaxial potential and is still the intermediate axis of the global potential has become the short axis of the inner halo. Additionally, what was the short-axis direction of the original triaxial halo and is still the short axis of the global potential has now become the intermediate axis for the inner halo.

All other results in the published paper remain unchanged.

REFERENCES

- Debattista V. P., Moore B., Quinn T., Kazantzidis S., Maas R., Mayer L., Read J., Stadel J., 2008, *ApJ*, 681, 1076
 Valluri M., Debattista V. P., Quinn T., Moore B., 2010, *MNRAS*, 403, 525

This paper has been typeset from a $\text{\TeX}/\text{\LaTeX}$ file prepared by the author.