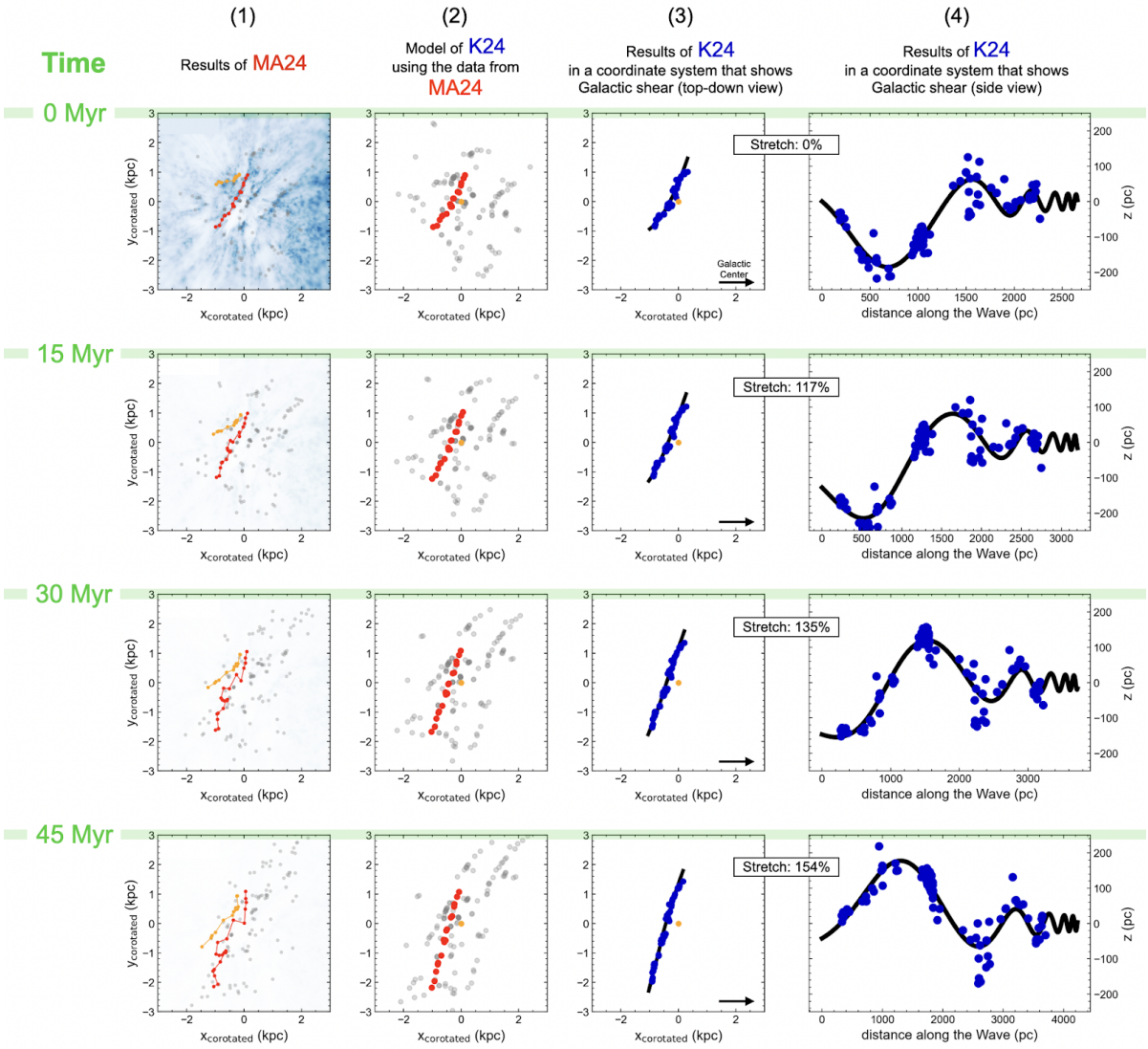

Figure R1: MA24 arrives at exactly the same physical picture as K24, subject to small differences in the peculiar velocities introduced by our differing stellar catalogs.

Column (1): Results of MA24. *We show the analysis performed in MA24 using the same co-rotated reference frame as in MA24. The Radcliffe Wave traced by YSO complexes is shown in red. We see that Galactic shear stretches the Radcliffe Wave by a factor of 1.3 at 30 Myr and by a factor of 1.5 at 45 Myr. The effect of phase mixing due to the non-zero peculiar motions perturbs the structure.*

Column (2): Reproduction of MA24. *Evolution of the YSO complexes from MA24 using the modeling and calculations of K24. The Radcliffe Wave traced by YSO complexes is again shown in red. By comparing Column (1) with Column (2), we see that we can reproduce the figures in MA24 using the method presented in K24.*

We note that we only have access to the positions of the YSO complexes used in MA24 but not to the corresponding velocities. Therefore, we instead use the expected velocities derived from

Galactic rotation together with a radial drift of 5 km s^{-1} away from the Galactic Center as initial conditions/starting velocities for the YSO complexes. This means that in Column (2) we do not include any additional residual/peculiar motions (in addition to Galactic rotation, shear, and in-plane drift) that cause the phase mixing in Column (1). Accordingly, in Column (2) the Radcliffe Wave is only stretched, but not disturbed, leading to the expected difference to Column (1), where the peculiar motions of the YSOs (to which we have no access) are included. The center of the LSR frame is shown in yellow. The YSO positions we used were downloaded from http://paperdata.china-vo.org/zjx/ysoassociation/uploadassociationpara.csv.

Column (3): Results of K24 (top-down view). *The same evolution of the Wave as presented in Supplementary Figure 5 in K24 (this is the interactive figure corresponding to Figure 1 in K24). The Radcliffe Wave traced by stellar clusters is shown in blue, the best fit is shown in black.*

In order to be able to compare our results with Columns (1) and (2), we show here the results of K24 in a co-rotated reference system instead of using the sheared and co-rotated reference system presented in K24. Note that we do not fade out the clusters here. For comparison, in Supplementary Figure 5 in K24 the clusters are already almost invisible at the time of the last snapshot (45 Myr), please see:

https://faun.rc.fas.harvard.edu/czucker/rkonietzka/radwave/interactive-figure5.html.

The center of the LSR frame is shown in yellow. The Galactic Center is located on the right, as indicated by the black arrow.

Column (4): Results of K24 (side view). *This is the side view corresponding to Column (3), i.e. we show the same evolution of the Radcliffe Wave as presented in Supplementary Figure 5 in K24. The Radcliffe Wave traced by stellar clusters is shown in blue, the best fit is shown in black. As in Column (3), we include the reference frame transformation to the reference frame that shows Galactic shear. We see that the Galactic shear only stretches the Wave, but does not destroy the oscillation.*

As in K24, in the columns (3) and (4) "the variation of the wave time in the interactive versions is obtained by evolving the best fit with time, while keeping the distances of the data to the fit constant." Accordingly, we do not observe any phase mixing in the columns (3) and (4), allowing the reader to focus on the oscillation, but making it necessary to fade out the data between 30 and 50 Myr, as shown in K24.

Overall, we see that by re-running the calculations and modeling as published in K24, but using the data presented in MA24, and comparing these results to the results of K24, we are able to demonstrate that MA24 arrives at exactly the same physical picture as K24.