

Review of: "A simple direct empirical observation of systematic bias of the redshift as a distance indicator"

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This article presents evidence of a difference in the mean redshift of galaxies that rotate in the same and opposite directions with respect to the Milky Way. The idea is interesting and the paper ends with a relevant conclusion: "Due to the unexplained tensions in cosmology, the unknown physics of galaxy rotation should be considered as a factor that can be associated with these tensions ..." The results may have some potential to explain the H_0 tension. However, the analysis presented may be made more sound and more clearly explained. Please find a few comments below focused on clarity of the text and uncertainties on the results:

- The sentence starting with "The relatively new JWST ..." requires a citation at the end of the sentence.
- "If the common distance indicators are complete, the standard cosmological theories are incomplete, or vice versa.": It is difficult to understand this sentence. Do you mean "If the common distance indicators are without significant bias"?
- "In addition to theories that shift from the standard cosmological model, other theories are based on the contention that the redshift as used to measure distances at cosmological scales might be an incomplete model" → The sentence is a bit confusing. Do you just want say "In some models that deviate from the standard cosmological model, the redshift measurements to estimate distances at cosmological scales are assumed to be biased"?
- "While the assumption that the redshift is not necessarily a complete indicator of the distance can explain these observations without modifying the standard cosmological models, there is no clear reproducible empirical evidence that the redshift might indeed be biased." --> "While the assumption that the redshift is not necessarily an unbiased indicator of the distance can explain these observations without modifying the standard cosmological model, there is no clear empirical evidence that supports this assumption."
- "provocative observations in nature," --> May be one can say: "interesting observations in nature".
- "The initial set of galaxies that meet these criteria in that field was 52,328" --> "The initial set of galaxies that meet these criteria in that field contained 52,328 objects"
- "The direction of the curves of the arms is determined by the sign of the slope, given that at least 30 peaks are identified in the radial intensity plot. If less than 30 peaks are identified the galaxy is not used, as its direction of rotation cannot be identified." → It would be good to indicate the motivation for using 30 peaks but not more or less peaks. Also, one could study and document the effect of using different numbers of peaks on the final results.
- Uncertainties
 - In the paper, it should be clearly explained how the uncertainties on the Z values are obtained (e.g the uncertainty in

0.09565 \pm 0.017) and if they contain any systematic uncertainties. One should get a feeling how trustworthy these uncertainties are.

- Add the uncertainty on the DeltaZ value, i.e. DeltaZ of $\sim 0.0065 \pm 0.0023$. In this case, the uncertainty on the difference shows that the difference is compatible with zero within 3 sigma. This would make the significance of the result easier to understand for a general reader.
- The uncertainties on the Delta values in all the tables in the article should be included.
- "The observed Δ between galaxies with opposite rotational velocities as shown here is between around 0.0065 to 0.012. If that difference is due to the rotational velocity, that difference corresponds to a velocity of between roughly 2,000 to 3,600 km·s⁻¹. That is about 5 to 8 times the rotational velocity of the Milky Way compared to the observed galaxies, which is $2 \cdot 220 \sim 440$ km·s⁻¹, assuming that the observed galaxies have the same rotational velocity as the Milky Way." → Here all ranges should be given taking the corresponding uncertainties into account.
- "Most objects with spectra in SDSS are concentrated in the part of the sky that is close to the Northern Galactic pole. If the redshift difference peaks at the Northern Galactic pole, it is expected that when using galaxies that are more distant from the Galactic pole the redshift difference Δ would decrease. ". → It is not so clear why the redshift difference should decrease. Could this be explained with a little bit more detail in the text?
- Are there other (or updated) surveys that could be used to reduce the uncertainties of the results or that could provide additional independent confirmation of the results?