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

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Potential competing interests: No potential competing interests to declare.

In my opinion, this is a nice paper that makes an important point for the consideration of cosmologists. By using several galactic databases, the author finds the raw fact that the average redshift for galaxies that rotate in the same direction as the Milky Way is different to the corresponding redshift of galaxies that rotate in the opposite direction to the Milky Way.

The analysis is convincing enough and the anomaly disclosed in this work is, surely, meritorious of further studies and it challenges the standard idea that rotation does not contribute to redshifts. The main strength of the paper is the gathering of evidence showing that this anomaly really exists according to the last observations of redshifts of galaxies. On the other hand, there are some weaknesses in the paper that I would recommend to improve:

The author cites some recent work by Lavery et al as a possible mechanism for giving rise to rotation phenomena as the one discussed in the paper. However, the work of Lavery et al. refers to light backscattered by the rotating body and it emerges as a consequence of the change in orbital-angular momentum of the ray as it approaches the black hole Therefore, I see no connection with the problem at hand in this paper, i. e., the observed different among the redshift of different spiral galaxies and the Lavery et al'effect. I think that the author would briefly explain the experiments that were really carried out as well as their implications for the observed rotation anomaly

The author should say that galactic redshifts are averaged over many galaxies, of different types. Consequently, the implications of the author' rotational anomaly result for the H0 tension are unclear. A brief section or paragraph discussing the suitability of the author's study for the Hubble tension problem in cosmology should be included. In this comparison, it would be necessary to take into account the different proportion of galaxies: spiral, irregular, elliptical, etc and its role in the weighted average for the redshift. Last data suggest that elliptical galaxies are minoritaty and that they constitute only a 15 % of the total number of galaxies in the Universe.

(iii) The authors says that: "the difference should increase when the observed galaxies are close to the Galactic Pole". I think that this requires further elaboration and some tentative explanation. It suggests that there is a preferred axis in the Universe but it seems that the chance alignment of this axis with the North-South Galactic axis in the Milky Way would break down the cosmological principle.

It seems that to explain this preferred alingment of galaxies we would require a model for an expanding universe with a rotation axis. I think that there is no such model at the moment with a large-scale axis within the Universe (excluding Gödel's model that do not consider expansion).

Another option is the Kerr-de Sitter model discovered by Brandon Carter in 1968:

B. Carter, Phys. Rev. 174 (1968), 1559-1571 doi:10.1103/PhysRev.174.1559

But this is, perhaps, too simple.

Embedded Kerr black holes in more complicated theories have also been investigated recently:

https://arxiv.org/pdf/2305.17129.pdf

Have the author any idea about this ? Some words should be included in the discussion/conclusions sections about the need of some new models to explain the perplexing evidence of the galactic rotation asymmetry.