

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.

The presence of systematic biases in redshift measurements - and hence in distance estimates based on redshift - is an intriguing topic. The author suggests that there is a systemic difference (of the order of ~ 0.01) in redshift estimates depending on the relative spin orientation of the galaxies in a sample constrained within ± 10 degrees from the galactic pole. The effect is large, far above the rotational velocities of most massive galaxies. The implications for cosmology could be important, and the H_0 tension altogether disappear if this bias is taken into account.

The design of the experiment is professionally presented, and the main implication for H_0 briefly but quantitatively analyzed. My general comment on the results is that the method developed by the author is still missing some controls, and should be further tested.

*) The method measures the slope as of the brightest pixels in the galaxy images as a function of the polar angle. However, there is no indication about how nuclear redshifts are measured, and of the biases they could be subjected to (morphological type; presence of emission components; tidal disruptions; aperture effects, etc.)

*) From the data extracted in the image the spin can be derived only assuming that arms trail or lead. The wide majority of galaxies show trailing spiral arms, but it is not true for all.

In addition, the SpArcFiRe annotated sample provides a difference that is one order of magnitude lower than one obtained with the first sample presented by the author. Can an error rate of 15% explain such a huge reduction in the amplitude of the effect? The significance of the results is not so high, mostly at a 2-3 sigma level.

The suggested explanation (and allusively favored) is extraordinary: "... unexpected anomaly in the geometry of the Universe and its large-scale structure." Extraordinary claims need extraordinary evidence. Such evidence is as yet not provided by the paper. A more thorough calibration in terms of morphological types, nuclear spectra, etc. closely matching the samples of galaxies that rotate in the same direction relative to the Milky Way and of galaxies that rotate in the opposite direction should be carried out.