

Review of: "A Robust Assessment of the Local Anisotropy of the Hubble Constant"

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Potential competing interests: No potential competing interests to declare.

This paper is related to an important topic: the discrepancy between the H_0 estimates from Λ CDM modeling and from the “local” Universe SNIa distances. It discusses the limit at which this discrepancy appears and tries to tie it to a local anisotropy.

The paper is interesting and clearly written but, in my opinion, not convincing enough for me to recommend publication in its present state.

My main objection is about the statistical methodology, which is entirely based on a χ^2 estimate being more or less close to one. χ^2 estimators are reliable only for an unbiased data set of independent values affected by noise following a well-known probability distribution. The fact that the supernovae magnitudes given in the Pantheon+ sample fulfill these conditions is not discussed at all in the paper, and this is a key missing point. Even if elements of that discussion can be found in the Pantheon+ paper, the present paper should at least contain a critical summary of the topic.

The paper shows that removing the lowest redshift supernovae improves the agreement with the Λ CDM prediction, but this is not really new, and the conclusion statement “ Λ CDM predictions become consistent with the Pantheon+ data set when supernovae at redshift below 0.035” should be replaced by “removing the SN with $z < 0.035$ improves the agreement with the Λ CDM prediction” or be based on a much more detailed quantitative discussion.

Finally, the mention of tired photon models, supported by “3 ancient Nobel prizes,” made me uncomfortable. Tired photon models have been discarded by several strong arguments beyond redshift effects. If the more recent proposal by the author himself (Sanejouand 2022) overcomes these objections, this should be explicitly discussed or summarized in the paper.