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Searching for hidden signals or systematics in the Pantheon+ and SH0ES SnIa samples

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The standard analysis of the Pantheon+ and SH0ES SnIa samples assumes that the SnIa absolute magnitude parameter M can be standardized to a single and isotropic value. If these assumptions are withdrawn and in particular if a transition of M is allowed at some distance scale from M_< at low distances to M_> at high distances then the quality of fit to the Pantheon+ data improves significantly and the two best fit values M_<, M_> are at about 2-3\sigma tension with each other. The origin of this effect is a combination of the uncorrected volumetric redshift bias systematic and a mild transition signal of the intrinsic SnIa luminosity at a distance of about 20Mpc. The implications of this inhomogeneity for the Hubble tension and the best fit values of cosmological parameters will be discussed. The isotropy of the SnIa absolute magnitude parameter and its dependence on distance bins will also be discussed using the hemisphere comparison method.

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