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Addressing the Hubble tension and a proposal to increase the accuracy of cosmological observables

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The Hubble tension denotes the discrepant values of H_0 obtained from direct measurements in the local Universe compared to those derived from the CMB. Observational programs often compare their data also with extensions to Λ CDM applying dynamical models of dark energy (DDE) with a time-dependent equation of state parameter w . They use the MCMC method to fit the Λ CDM extensions to their data, where they use the CPL model $w(a) = w_0 + w_a(1-a)$ as the parametrization of the DDE model. We discovered a degeneracy in the MCMC method and propose a complementary computational procedure as an extension to the MCMC method that breaks the degeneracy, where our results reveal that the CPL model $w(a) = -0.9 + 0.1(1-a)$ could provide a resolution to the Hubble tension problem. Moreover, we find that this approach can serve as a kind of consistency check for cosmological models and will increase the accuracy of inferred cosmological parameters significantly, in particular for Λ CDM extensions with DDE.

References

10.1051/0004-6361/202348955 - Astronomy & Astrophysics, Volume 686, id.A210, 20 pp. by Horst Foidl and Tanja Rindler-Daller

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