Constraining über gravity with recent observations and studying the H₀ problem

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This work [arXiv:2301.07044v1] studies both Λ CDM and CDM models under the über gravity theory [arXiv:1710.09366], named ü Λ CDM and üCDM respectively. We report bounds over their parameter phase-space using several cosmological data, in particular, the recent Pantheon+ sample. Based on the joint analysis, the best fit value of the "uber characteristic parameter is $z \oplus = 0.046^{+0.047}{-0.032}$ and $z \oplus = 1.382^{+0.020}{-0.021}$ at 68% confidence level for ü Λ CDM and üCDM respectively. Although über gravity can successfully mimics the cosmological constant, we find that the H0(z) diagnostic suggests the H0 tension is not alleviated. Finally, both models are statistically compared with Λ CDM through the Akaike and Bayesian information criteria. Both über gravity models and Λ CDM are equally preferred for most of the single samples, in particular, ü Λ CDM is not rejected by the CMB data. However, there is strong evidence against them for the joint analysis.

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