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Constraining über gravity with recent observations and studying the H_0 problem

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This work [arXiv:2301.07044v1] studies both ΛCDM and CDM models under the über gravity theory [arXiv:1710.09366], named üΛCDM 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 üΛCDM 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 ΛCDM through the Akaike and Bayesian information criteria. Both über gravity models and ΛCDM are equally preferred for most of the single samples, in particular, üΛCDM is not rejected by the CMB data. However, there is strong evidence against them for the joint analysis.

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