MAGIC

Science of the Cosmos

Contribution ID: **8** Type: **not specified**

Late Time Phenomena in f(T,\mathcal{T}) Gravity Framework: Role of H_0 Priors

This study explored the behavior of the $f(T, \mathcal{T})$ cosmological model with the use of various data set combinations. We also compared the results for this model between the Pantheon+ (without SH0ES) and the Pantheon+\&SH0ES (with SH0ES) data sets. Additionally, we incorporated data from BAO along with H_0 priors. We observed that integrating SH0ES data points leads to a higher estimation of H_0 than Pantheon+ (without SH0ES). In our analysis, we employed two recently published values of H_0 that have added to the ongoing tension regarding H_0. These priors significantly influence all cosmological parameters in our studies. We perform an extensive MCMC analysis for every combination of data sets, providing constraints on all cosmological parameters included in the model. We also computed the χ^2_{min} value for each combination of data sets to evaluate the chosen model against the standard ΛCDM model. After determining the best-fit values for the cosmological and model parameters in each of the combinations, we plotted the cosmological background parameters. Based on the behavior of these background cosmological parameters, we conclude that our selected models reflect the late-time cosmic dynamics of the Universe.

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