10th International Conference on Gravitation and Cosmology: New Horizons and Singularities in Gravity (ICGC 2023)



Contribution ID: 311

Type: Oral

Model-independent reconstruction of the evolution of dark energy using Gaussian process regression

We study the evolution of the dark energy density parameter and the equation of the state parameter. We also study other relevant background quantities related to the late time cosmic acceleration such as deceleration parameter and effective equation of state of dark energy. This study is mainly based on the Hubble parameter data from the cosmic chronometer observations. Other cosmological datasets like cosmic microwave background and the measurement of the present value of the Hubble parameter are used. We use the Gaussian process regression analysis to find the derivative of the Hubble parameter data w.r.t redshift. From the combinations of the Hubble parameter data and its derivative, we study the dynamic evolution of the dark energy. This study is independent of any cosmological model. We find evidence for a dynamical dark energy behavior. We also find that at lower redshifts (z

lesssim 1), the $\Lambda {\rm CDM}$ model is around 1 σ away from the obtained mean of a relevant quantity.

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Session Classification: Cosmology

Track Classification: Cosmology