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New Holographic Dark Energy and Viscosity Effect in Modified $f(R,T)$ Theory

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ABSTRACT

The objective of this paper is to examine a new holographic dark energy model in the context of modified $f(R,T)$ gravity theory, utilizing a flat Friedmann-Robertson-Walker model incorporating bulk viscosity. The primary focus of this article revolves around the concept that the negative pressure induced by bulk viscosity could potentially serve as the driving force behind dark energy, contributing to the expansion of the universe. In this particular model, we consider $f(R,T) = R + \lambda T$, where R represents the Ricci scalar, T as trace of the energy-momentum tensor and λ as a constant. Here we assume bulk viscosity to be directly proportional to Hubble's parameter ($\zeta \propto H$), i.e., $\zeta = \zeta_0 H$, where ζ is assumed to be bulk viscosity coefficient, ζ_0 is a constant and H is Hubble's parameter. We precisely determine the solution for variable viscous new HDE model and examine every possible condition, i.e., deceleration and acceleration that contributes to the universe's evolution. Later on, we discuss two diagnostic parameters, statefinder $\{r, s\}$ and Om to distinguish our model from the other existing dark energy models.

Keywords: Dark energy; New Holographic dark energy; Bulk viscosity

How to Cite

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