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Collapsing scenarios in K-essence emergent generalized Vaidya spacetime through $f(\bar{R},\bar{T})$ gravity

The primary objective of this research is to examine the potential for collapse in the generalized emergent Vaidya spacetime, utilizing the theoretical framework of $f(\bar{R},\bar{T})$ gravity, with a special emphasis on the K-essence theory. In this study, the non-standard Lagrangian of the Dirac-Born-Infeld type is employed to ascertain the emergent metric denoted as $\bar{G}_{\mu\nu}$. It is important to note that this metric does not exhibit conformal equivalence to the conventional gravitational metric. In this study, we utilize the function $f(\bar{R},\bar{T})$ to denote the additive nature of the emergent Ricci scalar ($\bar{R}$) and trace of the emergent energy-momentum tensor ($\bar{T}$). Based on our study, it is possible to ascertain that specific choices of $f(\bar{R},\bar{T})$ have the potential to give rise to the existence of a naked singularity as a consequence of gravitational collapse. Furthermore, different selections of the function $f(\bar{R},\bar{T})$ have been found to result in an expanding cosmos that is predominantly influenced by dark energy. In addition, the investigation showed the presence of both positive and negative masses, which may be comprehended as a gravitational dipole. Additionally, it has been shown that the K-essence theory possesses the capacity to serve as a framework for dark energy as well as a straightforward gravitational theory, hence enabling the exploration of other cosmological phenomena.

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