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Tachyonic DGP cosmological model with an exponential potential: Dynamical System approach

In this work we use the dynamical system approach to study the stability of a normal DGP model in which we assume that a tachyon scalar field plays the role of dark energy. We consider an exponential potential ($V_0 e^{\alpha\phi}$) for the tachyon field. We write the main equations of the model. Then, with attention to these equations, we introduce a set of new dimensionless dynamical variables and obtain their evolutionary equations. Putting these equations equal to zero and solving them simultaneously, we find three critical points for the model. Using linear perturbation theory, we calculate corresponding eigenvalues and discuss about the stability conditions of them and also respective cosmological epochs. One of the most interesting features of this work is that one of these critical points depends on a new variable $() = -V/V^{3/2}$. By assuming this point moves slowly enough, we can consider this dynamical critical point as an instantaneous fixed critical point and see how the universe tends to evolve for different values of parameter λ.

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