

String cosmological models in $f(R, T)$ gravity with hybrid scale factor

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Abstract

The dynamical features of Bianchi type VI_h universe are investigated in a modified theory of gravity. We have restricted the value of the exponent $h = -1$ because of its importance in the space-time with regard to an isolated universe with null energy and momentum. We have considered two forms of modified gravity as $f(R, T) = R + 2f(T)$ and $f(R, T) = f(R) + f(T)$. In the present work, we have considered the general hybrid scale factor which at late time results into a constant deceleration parameter. In this combined form of the scale factor one form is on exponential expansion and the other is on power law expansion. The cosmic dynamics is dominated by the power law in the early phase, whereas it is dominated by the exponential factor at late phase. However, eventually, the hybrid scale factor pulls itself away towards later phase of evolution in a more dominant fashion which may mimic the accelerated expansion of the universe. In order to provide some anisotropic directional pressure, we have considered an anisotropic source along x-direction such as the presence of one dimensional cosmic strings. The effect of anisotropy on the dynamics of the universe as well the on the energy conditions are also studied.