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Kaluza-Klein cosmological model in $f(R,T)$ gravity with $\Lambda(T)$

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A class of Kaluza-Klein cosmological models in $f(R,T)$ theory of gravity have been investigated. In the work, we have considered the functional $f(R,T)$ to be in the form $f(R,T) = f(R) + f(T)$ with $f(R) = \lambda R$ and $f(T) = \lambda T$. Such a choice of the functional $f(R,T)$ leads to an evolving effective cosmological constant Λ which depends on the stress energy tensor. The source of the matter field is taken to be a perfect cosmic fluid. The exact solutions of the field equations are obtained by considering a constant deceleration parameter which leads to two different aspects of the volumetric expansion namely a power law and an exponential volumetric expansion. Keeping an eye on the accelerating nature of the universe in the present epoch, the dynamics and physical behaviour of the models have been discussed. From statefinder diagnostic pair we have found that the model with exponential volumetric expansion behaves more like a Lambda cold dark matter (ΛCDM) model.

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