

EXACT SOLUTIONS OF 5D KALUZA-KLEIN MODEL WITH PERFECT FLUID EQUATION OF STATE

Vijay Singh and Aroonkumar Beesham

University of Zululand, KwaDlangezwa, South Africa

We obtain the most general solution of the field equations of 5D Kaluza-Klein cosmological model with perfect fluid equation of state. We present a unified and systematic treatment by solving the field equations in a straight forward manner. The models filled with dust, vacuum energy and Zel'dovich matter are studied in detail. The dust and stiff matter models describe only a decelerated universe, whereas the vacuum energy model exhibits a transition from a decelerated to an accelerated phase. The extra dimension in dust and vacuum energy models exhibits contraction as well as expansion with suitable values of parameters. The extra dimension in stiff matter model describes expansion only.