MATHEMATICAL ANALYSIS OF COSMOLOGICAL MODELS WITH LINEARLY VARYING DECELERATION PARAMETER

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Abstract: Bianchi type-V is investigated using a decaying cosmological constant with perfect fluid. The study solves Einstein field equations by assuming that the deceleration parameter q is functionally connected to the Hubble parameter H, which yields the scale factor a. As cosmic time t increases, the cosmological model experiences exponential inflation. The physical characteristics and behavior of the cosmological model are also covered.

Keywords and Phrases: Deceleration parameter, cosmological term, perfect fluid, Bianchi type-V.

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1. Introduction

The theory of the deceleration parameter plays a vital role in the study of the universe's physical phenomenon, whether it is accelerating or decelerating cosmological model in Bianchi type-V. The frame of mind of the cosmologists is to believe that the universe is in the mode of accelerating expansion at present. Bianchi type-V cosmological models are engaging the authors to research because these models are homogeneous and anisotropic, giving a physically and geometrically well-shaped structure than the isotropic model of FRW (Friedmann Robert-Walker) models. This also draws the attention of researchers in the explanation of the early universe. Einstein's field equations explain the universe's evolution in the view of the equation of state for the matter content.