ACCELERATING COSMOLOGICAL MODELS WITH VARIABLE G AND Λ-TERM IN GENERAL RELATIVITY

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Abstract: In this paper, we have presented a new class of accelerating universe models with variable cosmological term $\Lambda(t)$ and gravitational constant $G(t)$ in the framework of general relativity. To get exact solution of Einstein's field equations for homogeneous and anisotropic Bianchi type-V space-time, a time varying deceleration parameters is considered as $q = -1 + \frac{n\alpha}{(\alpha+t)^2}$, where n, α are constants. The present model shows a point type singularity at origin. The results establish the quintessence like behavior of model initially, and approaches to ΛCDM model ultimately. Some geometrical and physical properties of the models have been evidenced, and conferred to derive the validity of models with respect to recent astrophysical observations. Stability of the model has been discussed through the means of $Om(z)$ diagnostic and state-finder analysis.

Keywords and Phrases: Bianchi-V universe, ΛCDM Model, Statefinders, Variable DP.

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1. Introduction

Experimental observations like Ia supernovae (SN Ia) observations [41, 46] have confirmed the accelerated expansion of the universe. The dark energy is assumed