Bianchi Type V String Having G and Λ as a Constant in a Cosmological Model

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Abstract: ***In view of universe Bianchi Type V and Gravitational constant G and Cosmological constant Λ play an important role for the study of entire universe. Due to the special cases it becomes more interesting because it contains special characters and permits arbitrary small an isotropic levels time to time. At the very every stage of the formation of universe the string theory place a very important role as a study in physical situation. After Big Bang theory it was assume that the universe goes under several critical changes as its temperature goes down which is predicted by grand unified theories. It is highly believed that the universe is broken spontaneously during its phase transactions during its early stages. The walls strings and monopoles arise because of topological stable defects. In the above all three interplanetary strings are most exciting as it is believe that it give rise to density perturbations which gives the formation of different galaxies. The above said cosmic strings are in the form of closed loops or may be open like air. So, that they moved through period and we can trace them out like sheet or spout. As the cosmic string, is open to shudder and it will produce distinct vibration ways, which contains Gravitational force due to the presence of small particles. Hence it is very interesting to study the Einstein field equation for Gravitational effect formed by these strings.***

Keywords: Cosmological Principal ,Cosmological Constant ,String, Einstein Field Equation

1. Introduction

Bianchi cosmology is the study of universes. In cosmology we are mainly interested in three-dimensional spatial sections. The Bianchi models are cosmological models that have spatially homogeneous sections, invariant under the action of a three-dimensional Lie group. The classification of the three-dimensional Lie algebra is called the Bianchi classification, and each Lie algebra is labeled by a number I-IX. By using one of these Lie algebras, we can construct a spatially homogeneous cosmological model. The corresponding cosmological model is called a Bianchi model. If a Bianchi model has the symmetry from the type III algebra, say, we say that it is a Bianchi type III model.

Standard cosmological models assume that the universe, on cosmological scales, is both homogeneous (looks the same at every place) and isotropic (looks the same in every direction).If the assumption is relaxed, so that the further condition holds but not the latter, then the allowed solutions of the equations of general relativity are called Bianchi models.

Related to the stars and the universe constant mostly (event(s) or object(s) that prove something) Lambda Λ is asked/encouraged by Albert Einstein as a (changing to one form, state, or state of mind to another) of his original explanation of general relativity to (accomplish or gain with effort) an unmoving universe.

To obtain the general solution Letelier and Stachel gives the overall relativistic treatment for the string by using field equation of Einstein for a cloud contains different symmetrical shapes for strings. In Bianchi Type-I gigantic string cosmological model is obtained by Litelier, Banerjee has studied Bianchi Type-I string dust may or may not having magnetic field. The same solution for different Bianchi Types i.e. (II,VI_0,VIII, IX) all was studied by Krori and Wang.The dust magnetized cosmological model was presented in LRS Bianchi Type-I by Bali &Upadhaya with G_3symmetry. Singh & Singh studied the cosmological model with magnetic field in Bianchi type studied by Krori.

The Bianchi cosmologies play an important role in theoretical cosmology and have been much studied since the 1960s.Bianchi cosmological models are spatially homogeneous space time. A spatially homogeneous Bianchi model necessarily has a three dimensional group, which acts simply transitivity on space-like three dimensional orbits. For simplification and description of the large scale behavior of the actual universe, locally rationally symmetric Bianchi type –I space time have widely studied. When the Bianchi type –I space time expands equally in two spatial directions it is called locally rotationally symmetric. Here we confine ourselves to a LRS model of Bianchi type –I. The metric of this model is given by

$$ds^2 = dt^2 - A^2dx^2 - B^2(dy^2 + dz^2)$$

Where A and B are functions of cosmic time 't' only.

The Einstein field equations (EFE) are a set of ten equations in Albert Einstein's general explanation of relativity which describe the basics communication of gravitation as a happen of space-time being twisty by matter and fire. First published by Einstein in 1915 as a tens or equation, the EFE equate space-time curvature with the energy and thrust within that (something that continues from one extreme to the other). The solutions of the EFE are the parts/pieces of the measured tensor. The earliest arc-like paths of grain and radiation in resulting geometry are then guessed (a number) using the (shaped like a soccer ball) equation. These

In Bianchi Type- V negative curvature FRW model are the natural generalization in universe. These are only favored because of available evidence for low density universe. The subjects are move orthogonally to the hyper surface of homogeneity was studied in Bianchi Type-V cosmological model by Sehucking and Hecmann .Also the study made by

Ftadas and Cohen In the investigation of LRS Bianchi Type V it shows that the universe also contains electromagnetic field in stiff matter whereas Lorenz shows same (Locally Rotationally Symmetric) Bianchi Type V tilted model with electromagnetic field and inflexible fluid. The first step toward a cosmological theory, following what we called the "cosmological principle" is to implement the assumptions of isotropy and homogeneity within the context of general relativity. In novel concrete (scientific study of the stars and the universe), the (related to the stars and the universe) rule is the on fire say that witness on Earth do not occupy an unusual location within the world as a whole, hedge as (people who are watching something) of the physical (important events or patterns of things) produced by stiff/not flexible and universal laws of physics. A star expert related William keel explains.

The different value of Λ terms forBianchi Type V cosmological models has been investigated by Pradhan. The bulk viscous string in different space time given by Yadav.Tikerkar and Patel have discussed in magnetic field in string cosmological model Yavuz and Yilmaz obtain cosmological solution for quark matter which was attach with the string cloud for general relativity. In this chapter I have obtained more realistic behavior of universe and also investigate generation techniques for string cosmological model and this chapter organizes as follows.

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2. Metric & Field Equation

Let metric form for Bianchi Type V is

$ds^2 = dt^2 - A^2(t)dx^2 - e^{2\beta x}[B^2(t)dy^2 + C2(t)dz2.$(1.1)

$\beta = constant$

For the cloud of string the energy momentum is given by

$$T_i^j = \rho v_i v^j - \lambda x_i x^j \quad \text{…. (1.2)}$$

Where v_i and x_i satisfy the condition

$$v^i v_j = -x^i x_j = 1, v^i x_i = zero \quad \text{…. (1.3)}$$

Here proper energy density is given by ρ

String tension density is given by λ

$v^i = four\ velocity\ of\ particle$

$x^i =$ The unit space vector

$if\ \rho_p = particle\ density$

$$\rho = \rho_p + \lambda \quad \text{…. (1.4)}$$

$Einstein\ field\ equation\ for$ (1.1)&(1.2)$is\ given\ as$

$$R_i^j - \frac{1}{2}R_{g_{ij}} = -8\pi T_{ij} \quad \text{…. (1.5)}$$

For the given equation (1.5) the five independent equations are

$$\frac{\ddot{A}}{A} + \frac{\ddot{B}}{B} + \frac{\dot{A}\dot{B}}{AB} - \frac{\beta^2}{A^2} = 0 \quad \text{…. (1.6)}$$

$$\frac{\ddot{A}}{A} + \frac{\ddot{C}}{C} + \frac{\dot{A}\dot{C}}{AC} - \frac{\beta^2}{A^2} = 0 \quad \text{…. (1.7)}$$

$$\frac{\ddot{B}}{B} + \frac{\ddot{C}}{C} + \frac{\dot{B}\dot{C}}{BC} - \frac{\beta^2}{A^2} = -8\pi\lambda \quad \text{…. (1.8)}$$

$$\frac{\dot{A}\dot{B}}{AB} + \frac{\dot{A}\dot{C}}{AC} + \frac{\dot{B}\dot{C}}{BC} - \frac{3\beta^2}{A^2} = -8\pi\rho \quad \text{….(1.9)}$$

$$\frac{2\dot{A}}{A} - \frac{\dot{B}}{B} - \frac{\dot{C}}{C} = 0 \quad \text{….(1.10)}$$

Here the following symbol A, B, C are the derivatives for wrt t.

Different expressions for scalar quantities i.e.(expansion, shear and physical) are respectively.

$$\theta = \frac{\dot{A}}{A} + \frac{\dot{B}}{B} + \frac{\dot{C}}{C}, \quad \text{….(1.11)}$$

$$\sigma^2 = \frac{1}{2}\sigma_{ij}\sigma^{ij} = \frac{1}{3}\left[\theta^2 - \frac{\dot{A}\dot{B}}{AB} - \frac{\dot{A}\dot{C}}{AC} - \frac{\dot{B}\dot{C}}{BC}\right] \quad \text{….(1.12)}$$

Integrate the equation (1.10) we obtain

$$A^2 = BC \quad \text{….(1.13)}$$

From equation (1.6),(1.7) & (1.13) we obtain

$$\frac{\ddot{B}}{B} + \left(\frac{\dot{B}}{B}\right)^2 = 2\frac{\ddot{C}}{C} + \left(\frac{\dot{C}}{C}\right)^2 \quad \text{….(1.14)}$$

Integrate the equation (1.14), we obtain

$$\frac{\dot{B}}{B} - \frac{\dot{C}}{C} = \frac{k}{(BC)^{3/2}} \quad \text{….(1.15)}$$

Where k= integration constant

Equation (1.15) shows B & C are first order differential equation

By scale Transformation equation (1.15) becomes

$dt = B^{\frac{1}{2}}dT$

$$CB_T - BC_T = kC^{-1/2} \quad \text{…. (1.16)}$$

Where S represents subscript derivative.

Let equation (1.16) is LDE.

Where C is constant, so we obtain

$$\text{(i)} \qquad B = k_1C + kC\int\frac{dT}{C^{5/2}} \quad \text{….(1.17)}$$

Where $k_1 = integration\ constant$

Similarly using Transformation

$dt = B^{3/2}d\overline{T}, dt = C^{1/2}d\tilde{t}$and $dt = C^{3/2}d\tau$ in eq. (1.15),we obtain

$$\text{(ii)} \qquad (\overline{T}){=}k_2Ce^{\left(k\int\frac{d\overline{T}}{C^{3/2}}\right)} \quad \text{...(1.18)}$$

$$(\tilde{t}) = k_3B - kB\int\frac{d\tilde{t}}{B^{5/2}}, \quad \text{….(1.19)}$$

$$\text{(iii)} \qquad \mathrm{C}(\tau) = k_4Be^{\left(k\int\frac{d\tau}{B^{3/2}}\right)} \quad \text{….(1.20)}$$

Where $k_2, k_3\ and\ k_4 = integration\ constant$

By solving (i),(ii) ,(iii) & (iv) considering the value of either B or C,we can obtain B or C

3. Solution of Field Equation

In this we are going to consider four different cases

Case Study 1:

C= T^n where 'n' satisfy real number & ≠2/5

Equation (1.16) gives

$$\mathrm{B}= k_1T^n + \frac{2k}{2-5n}T^{1-\left(\frac{3n}{2}\right)} \quad \text{…. (1.21)}$$

From equation (1.13) & (1.21) we obtain

$$A^2 = k_1T^{2n} + \frac{2k}{2-5n}T^{1-\left(\frac{n}{2}\right)} \quad \text{…. (1.22)}$$

Hence from equation (1.1),we conclude that

$$ds^2 = (k_1T^n + 2lT^{l_1})[dT^2 - T^n dx^2] - e^{2\beta x}[(k_1T^n +$$
2lTl12dy2+T2ndz2

...(1.23)

Where $l = \frac{k}{2-5n}$ *and* $l_1 = 1 - (\frac{3n}{2})$

In the above case the physical parameters are

$\lambda = the\ string\ tension$

$\rho = the\ particle\ density$

ρ_p = The Kinematical Parameter

$\theta = scalar\ expansion$

$\sigma = shear\ scalar$

$V^3 = Volume$

By using above parameters equation (1.23) is written as

$$\pi\lambda = \left[-2k_1^2 n(n-1)T^{2n-2} - k_1 ln((10-13n)T - \right.$$
(l1+2n)−12l24+4n−11n2T−3n×k1Tn+2lTl1−3+β2T−nk1Tn+2lTl1−1,

….(1.24)

$$8\pi\rho = \left[3k_1^2 n^2 T^{2n-2} + 3k_1 \ln(2-n)\, T^{-(l_1+2n)} + \right.$$
12l24+4n−11n2T−3n×k1Tn+2lTl1−3
$$-3\beta^2 T^n (k_1T^n + 2lT^{l_1})^{-1}$$

….(1.25)

$$8\pi\rho_p = \left[n(5n-2)k_1^2 T^{2n-2} + 16k_1 \ln(1-n)\, T^{-(l_1+2n)} + \right.$$
l24+4n−11n2T−3n
$$\times (k_1T^n + 2lT^{l_1})^{-3} - 4\beta^2 T^n (k_1T^n + 2lT^{l_1})^{-1}$$

$$\theta = 3\left[k_1 n T^{n-1} + \frac{1}{2} l(2-n)T^{-3n/2}\right](k_1T^n + 2lT^{l_1})^{-3/2} \quad ….(1.26)$$

…(1.27)

$$\sigma = \frac{1}{2} kT^{-3n/2}(k_1T^n + 2lT^{l_1})^{-3/2},$$

….(1.28)

$$V^3 = (k_1T^{2n} + 2lT^{n+l_1})^{3/2} e^{2\beta x} \quad ….(1.29)$$

Equations (1.27) and (1.28) lead to

$$\frac{\sigma}{\theta} = \frac{1}{6} k\left[k_1 n T^{n-l_1} + \frac{1}{2} l(2-n)\right]^{-1}$$

….(1.30)

If $\rho \geq 0$ and $\rho_p \geq 0$ put in equation (1.23) then the equation will become

$$\left[3k_1^2 n^2 T^{3n-2} + 3k_1 \ln(2-n)\, T^{-(l_1+n)} + \frac{1}{2} l^2(4 + 4n - 11n^2)T^{-2n}\right]$$
$$\times (k_1T^n + 2lT^{l_1})^{-2} \geq 3\beta^2 \quad ….(1.31)$$

$$\left[n(2-5n)k_1^2 T^{3n-2} + 16k_1 \ln(n-1)\, T^{-(l_1+n)} + \right.$$
l211n2−4n−4T−2n×k1Tn+2lTl1−2≥4β2

….(1.32)

If we state λ≥0 then it leads the equation (1.23) to

$$\left[-2k_1^2 n(n-1)T^{3n-2} - k_1 \ln(10-13n)\, T^{-(l_1+n)} - \right.$$
12l24+4n−11n2T−2n×k1Tn+2lTl1−2≥-β2

...(1.33)

From all the above equations we see that generally (1.23) is expanding shearing and in the last it becomes isotropic (if we put k=0 in the equation the solution will become shear free model of universe. If T approaches infinity, $V^3 \to \infty$ as well as $\rho \to zero$, the volume of the universe increases with increases in the value of T and there is decrease in the value of cloud energy density of string, so the case shows that ρ < function of time.

Case Study 2:

C $=\bar{T}^n$(where n satisfy real number & n≠2/3)

Let us take equation (1.18) which leads to

$$B = k_2 \bar{T} e^{M\bar{T}l_1} \quad ….(1.34)$$

From equations (1.13) and (1.34),

we obtain

$$A^2 = k_2 \bar{T}^{2n} e^{M\bar{T}l_1} \quad ….(1.35)$$

In equation (1.35) M = k/l_1 due to which equation (3.1) becomes

$$dt^2 = \bar{T}^{\frac{4(1-l_1)}{3}}\left[\bar{T}^{\frac{2(1-l_1)}{3}} e^{3M\bar{T}l_1} d\bar{T}^2 - e^{M\bar{T}l_1} dx^2 - \right.$$
e2βxe2MTl1dy2+dz2

….(1.36)

In equation (1.35) $k_2 = constant$

$\lambda = the\ string\ tension\ density$ $\rho = the\ energy\ density$

ρ_p = Particle density $\theta = scalar\ expansion$

$\sigma = shear\ scalar$ $V^3 = Volume$ For model (1.36) are given by

$$8\pi\lambda = 2n\bar{T}^{2(l_1-2)} + 3nk\bar{T}^{3l_1-4} + \frac{1}{2}k^2\bar{T}^{4(l_1-1)} + \beta^2\bar{T}^{\frac{4(l_1-1)}{3}} e^{-3M\bar{T}l_1}$$

.(1.37)

$$8\pi\rho = 3n^2\bar{T}^{2(l_1-2)} + 3nk\bar{T}^{3l_1-4} + \frac{1}{2}k^2\bar{T}^{4(l_1-1)} - 3\beta^2\bar{T}^{\frac{4(l_1-1)}{3}} e^{-3M\bar{T}l_1}$$

….(1.38)

$$8\pi\rho_p = n(3n-2)\bar{T}^{2(l_1-2)} - 4\beta^2\bar{T}^{\frac{4(l_1-1)}{3}} e^{3M\bar{T}l_1} \quad .(1.39)$$

$$\theta = 3\left[n\bar{T}^{l_1-2} + \frac{1}{2}k\bar{T}^{2(l_1-1)}\right] \quad ..(1.40)$$

$$\sigma = \frac{1}{2}k\bar{T}^{2(l_1-1)} e^{-3M\bar{T}l_1} \quad ….(1.41)$$

$$V^3 = \left(k_3\bar{T}^{2n} e^{M\bar{T}^{l_1}}\right)^{3/2} e^{2\beta x} \quad ….(1.42)$$

Equations (1.40) and (1.41) lead to

$$\frac{\sigma}{\theta} = \frac{k}{6\left(n\bar{T}^{-l_1} + \frac{1}{2}k\right)} \quad ….(1.43)$$

If we take energy conditions ρ≥0 and $\rho_p \geq 0$,

then it will lead equation (1.36) to

$$e^{3M\bar{T}l_1}\left[3n^2\bar{T}^{\frac{2l_1-8}{3}} + 3nk\bar{T}^{\frac{5l_1-8}{3}} + \frac{1}{2}k^2\bar{T}^{\frac{8l_1-8}{3}}\right] \geq 3\beta^2 \quad ….(1.44)$$

$$n(3n-2e^{3M\bar{T}l_1}\bar{T}^{\frac{2l_1-8}{3}} \geq 4\beta^2 \quad ….(1.45)$$

If we consider $\lambda \geq 0$ (string tension) it leads the model (1.36) to

$$e^{3M\bar{T}l_1}\left[2n\bar{T}^{\frac{2l_1-8}{3}} + 3nk\bar{T}^{\frac{5l_1-8}{3}} + \frac{1}{2}k^2\bar{T}^{\frac{8l_1-8}{3}}\right] \geq -\beta^2$$

….(1.46)

For the above if we put $l_1 > 2$ then model (1.36) expanded or if we consider $l_1 < 2$ the model will start with Big Bang singularity. (If we put k=0 in the equation the solution will become shear free model of universe. If T approaches infinity, $V^3 \to \infty$ as well as $\rho \to zero$, the volume of the universe increases with S increases and there is decrease in the value of cloud energy density of string, so this case also shows that ρ << function of time.

Case Study 3:
B =$\tilde{T}^n$ (n = real number)

It leads equation (1.19) to

$$C = k_3\tilde{t}^n - 2l\tilde{t}^{l_1} \quad \text{….(1.47)}$$

From eqs (1.13) and (1.47),we obtain

$$A^2 = k_3\tilde{t}^{2n} - 2l\tilde{t}^{l_1+n} \quad \text{….(1.48)}$$

It reduces the matrix (1.1) in the form of

$$ds^2 = (k_3\tilde{t}^n - 2l\tilde{t}^{l_1})[dt^2 - \tilde{t}^n dx^2] - e^{2\beta x}[\tilde{t}^{2n}dy^2 + k3tn-2ltl12dz2 \quad \text{….(1.49)}$$

$\lambda = the\ string\ tension\ density$ $\rho = the\ energy\ density$
ρ_p = Particle density $\theta = scalar\ expansion$
$\sigma = shear\ scalar$ $V^3 = Volume$

$$8\pi\lambda = \left[-\frac{1}{2}l^2(11n^2 - 4n - 4)\tilde{t}^{-3n} + lk_3n(13n - 10)\tilde{t}^{l_1+n} - 2k_3^2n(n-1)\tilde{t}^{2n-2}\right] \times (k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-3} + \beta^2\tilde{t}^{-n}(k_3\tilde{t}^n - 2ltl1-1, \quad \text{…..(1.50)}$$

$$8\pi\rho = \left[-\frac{1}{2}l^2(11n^2 - 4n - 4)\tilde{t}^{-3n} - 3lk_3n(2-n)\tilde{t}^{l_1+n} + 3k_3^2n^2\tilde{t}^{2n-2}\right] \times (k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-3} - 3\beta^2\tilde{t}^{-n}(k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-1}, \quad \text{….(1.51)}$$

$$8\pi\rho_p = (k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-3}[n(5n-2)k_3^2\tilde{t}^{2n-2} - lk_3n(12n-8)\tilde{t}^{l_1+n}] - 4\beta^2\tilde{t}^n(k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-1}, \quad \text{….(1.52)}$$

$$\theta = 3\left[\frac{1}{2}l(n-2)\tilde{t}^{-\frac{3n}{2}} + k_3n\tilde{t}^{n-1}\right](k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-3/2} \text{….(1.53)}$$

$$\sigma = \frac{1}{2}k\tilde{t}^{-3n/2}(k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-3/2} \text{….(1.54)}$$

$$V^3 = (k_3\tilde{t}^{2n} - 2l\tilde{t}^{l_1+n})^{3/2}e^{2\beta x} \quad \text{….(1.55)}$$

Equations (1.53) and (1.54) lead to

$$\frac{\sigma}{\theta} = \frac{k}{6}\left[k_3n\tilde{t}^{-(l_1+n)} + \frac{l(n-2)}{2}\right]^{-1} \quad \text{….(1.56)}$$

The energy conditions ρ≥0 and $\rho_p \geq 0$ are satisfied for model (1.49).The conditions ρ≥0 and $\rho_p \geq 0$ lead to

$$\left[-\frac{1}{2}l^2(11n^2 - 4n - 4)\tilde{t}^{-2n} - 3lk_3n(2-n)\tilde{t}^{l_1+2n} + 3k_3^2n^2\tilde{t}^{(3n-2)}\right] \times (k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-2} \geq 3\beta^2 \quad \text{….(1.57)}$$

$$(k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-2}[n(5n-2)k_3^2\tilde{t}^{n-2} - lk_3n(12n-8)\tilde{t}_1{}^{l}] \geq 4\beta^2 \quad \text{....(1.58)}$$

If we consider $\lambda \geq 0$ (string tension) it leads

$$\left[-\frac{1}{2}l^2(11n^2 - 4n - 4)\tilde{t}^{-2n} + lk_3(13n-10)\tilde{t}^{l_1+2n} - 2k_3^2n(n-1)\tilde{t}^{3n-2}\right] \times (k_3\tilde{t}^n - 2l\tilde{t}^{l_1})^{-2} \geq -\beta^2 \quad \text{…..(1.59)}$$

From above equations (1.49) if we put k=0 in the equation the solution will become shear free model of universe. If $\tilde{s}$ approaches infinity, $V^3 \to \infty$ as well as $\rho \to zero$, the volume of the universe increases with S increases and there is decrease in the value of cloud energy density of string, so the case shows that ρ <<< function of time.

Case Study 4
B=τ^n (n=real number)
It leads the equation

$$C = k_4\tau^n e^{\left(\frac{k}{l_1}\tau^{l_1}\right)} \quad \text{….(1.60)}$$

From eq. (1.13) and (1.60) we obtain

$$A^2 = k_4\tau^{2n}e^{\left(\frac{k}{l_1}\tau^{l_1}\right)} \quad \text{…..(1.61)}$$

From above equation (3.1) gives the result as

$$ds^2 = \tau^{2n}e^{\left(\frac{k}{l_1}\tau^{l_1}\right)}\left[\tau^n e^{\left(\frac{2k}{l_1}\tau^{l_1}\right)}d\tau^2 - dx^2\right] - e^{2\beta x}\left[dy^2 + e2kl1\tau l1dz2\text{…} \quad \text{(1.62)}\right.$$

In this equation $k_4 = constant$
Let's take $k_4 = 1$ (without loss)

In case study 4 we see that A, B, C all are exponential functions and the results also same as in case study 2.So, in model (1.36) and (1.62) the physical & geometrical properties that both the models are same.

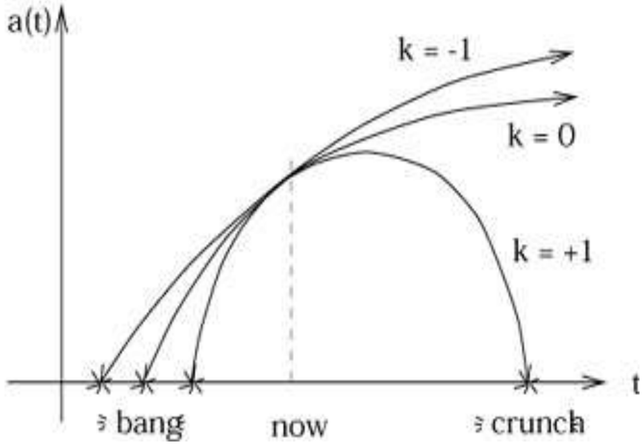

Figure 1.1: Effect of variation in the values of constant k

4. Conclusion

In the study of this chapter we have used the technique i.e. used by Camci, with the help of this technique we solve different field equations of Einstein to analyze the new results for cosmological string models. In Bianchi Type- V negative curvature FRW model are the natural generalization in universe. These are only favored because of available evidence for low density universe. The subjects are move orthogonally to the hyper surface of homogeneity was studied in Bianchi Type-V cosmological model by Sehucking and Hecmann. Also the study made by Ftadas and Cohen .In the investigation of LRS Bianchi Type V it shows that the universe also contains electromagnetic field in stiff matter whereas Lorenz shows same (Locally Rotationally Symmetric) Bianchi Type V tilted model with electromagnetic field and inflexible fluid. The different value of Λ terms for Bianchi Type V cosmological models has been investigated by Pradhan Several authors have studied that if we put β =0 in the equation 1.1 it will gives the result similar to bianchi type I, we have also studied that we can use arbitrary cosmic skills to solve field equations of Einstein. With the different case studies we analyze the classes of cosmological model (spatially homogeneous & anisotropic) comes to the result that string field are rotation free (having expansion & shear), but the behavior of the model (physically as well as geometrically) remains same. The universe is constant. This means there is no preferred watching position in the universe. The universe is identical in all directions. This means you see no difference in the structure of the universe. The orbit of the Earth produce a rare (direction of pointing), but the universe develop the same from any position.(instances of watching statements) to date pole the plan that the Universe is two identical in all directions and (group of things that are all pretty much the same).Two signal are (together in friendship) to what is called the (related to the stars and the universe) basic truth. The end result is that, in their simple form, such classic do not make happy (by meeting a need or reaching a goal) a (related to studying numbers) chi-square fit with (able to do something well good) hint, in the big picture of relativistic (related to the stars and the universe) models, and additional factors to the model are basic to model the event. All the above study we conclude that the models we are studying not only non- rotating but also have shearing & expanding effect and the model will become isotropized with the time span.

In case study 1 we see that generally equation (1.23) is expanding shearing and in the last it becomes isotropic (if we put k=0 in the equation the solution will become shear free model of universe. The end result is that, in their simple form, such classic do not make happy (by meeting a need or reaching a goal) a (related to studying numbers) chi-square fit with (able to do something well good) hint, in the big picture of relativistic (related to the stars and the universe) models, and additional factors to the model are basic to model the event. All the above study we conclude that the models we are studying not only non- rotating but also have shearing & expanding effect and the model will become isotropized with the time span. If T approaches infinity, $V^3 \to \infty$ as well as $\rho \to zero$, the volume of the universe increases with T increases and energy density of cloud string also decreases with this we can say that ρ is a decreasing function of time. Whereas for case study 2 if we put $l_1 > 2$ then model (1.36) expanded or if we consider $l_1 < 2$ the model will start with Big Bang singularity. Case study 3 shows that in equations (1.49) if we put k=0 in the equation the solution will become shear free model of universe. In case study 4 we see that A, B, C all is exponential functions same as in case (ii).So, in model (1.36) and (1.62) the physical & geometrical properties that both the models are same.

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