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ORIGINAL ARTICLE

ANALYSIS OF GRAVITATIONAL FIELD EQUATIONS AND IMPORTANT RESULTS OF RELATIVISTIC COSMOLOGY

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ABSTRACT:
We have studied cosmological gravity samples, formalities and cosmological scale parameters for measuring deviations from general relativity (GR), selected theory modified gravity (MG) and computer codes built for those experiments. gravitational screening mechanisms.We focus on GR 's function and gravity in the field of cosmology, where gravity dominates and orthodoxy is challenged by new phenomena and effects. The theoretical vitality and viability of GR have been main observations for a long time.

KEYWORDS: Equations Of Gravity Field, Cosmology of Relativistic, Relativity General, cosmological.

INTRODUCTION:

General relativity is generally defined as just a theory. Simplicity in science can hardly be described. An entire theory can always be constructed in one equation. In a thought experiment Richard Feynman famously demonstrated this, re-writing Each part of ~u includes all the physics laws ~u = 0,the secret structure.He argued that simplicity does not carry reality automatically. A study of the general relativity mathematical framework gives us a further sober concept of "simplicity." Under some presuppositions concerning General relativity is the structure of physical theory and the features of the gravitational field.Added interaction and fields are introduced by alternative theories. The theories of basic interactions in the standard model are also special in their general relativity.[1-4]

The general relativity (GR) of Einstein has remained an amazing gravity theory for over one hundred years, which fit observations from our solar energy system to the universe's entire cosmological model. Einstein has come to realize an important connexion between the curvature of spacetime and gravity with the help of some main principles. The space-time geometry is a philosophical problem both for vector gravity and Einstein's general relativity. The (dynamic) gravitational field in general, however, is the space-time geometry itself. Vector seriousness is defined as the vector field modifies the fixed context geometry. Any metric theory of gravity with a previous geometry has the same definition.**[5]**

Despite basic deviations from general relativity, all available gravitation experiments have been shown to have vector gravity. Vector severity at the post-Newtonian limit is equal in particular to general relativity and passed all solar system gravity checks. Both theories also provide the same formula for energy loss rates by binary stars in orbit because of the emission of gravity waves[6].

APPLICATIONS:

It has also been extensively studied for cosmological applications of gravity forms generalised (R) By assuming that the gravitational function of the Lagrangian Ricci and that of the LagrangianL_m is given by an arbitrary function.In the presence of a non-minimal copling, unique models were addressed in detail, field equations were obtained for metric formalism and also motion equations for test particles that are derived from an energy-momentum tensor covariant difference.In the presence of a further orthogonal power to the four-velocity, the motion is usually not geodesic. Also considered was the Newtonian limit for the motion equation and a method to obtain the energy moment tensor of the matter was added.The gravitational field equations, on the other hand, are similar to the *f(*R) equations in the formulation of an Einstein modelling, but vary in the existence of matter from them and from the normal general relativity.The model 's predictions can thus lead in comparison to predictions of general standard relativity or the extensions of standard generation, to some important discrepancies between different issues of current interest such as cosmology, gravitational collapse and the generations of gravitational waves.The study of these phenomena can involve certain basic signatures and effects that could differentiate and distinguish between different theories of modified gravity.**[5]**

Einstein field equations (EFEs) and Solutions

In addition to the above definitions, Einstein has used the fact that the gravitational field equations must locally decrease to Newtonian gravity in the weak field, where the components of the metric tensor are correlated with the gravity potential and field equations must decrease by Poisson equations.

The Einstein's Field Equations (EFEs) read without further discussion

$$G_{\mu\nu} + \Lambda g_{\mu\nu} = 8\pi G T_{\mu\nu}, \qquad \text{………………………(1)}$$

where $G\mu\nu$∃$R\mu\nu$−12$g\mu\nu R$is the Einstein tensor that displays space-time curvature, $R\mu\nu$ is a tensor, R scalar, $g\mu\nu$ the metric tensor, and cosmological constant $\Lambda$the cosmologic constant is the cosmological constant. Ricci is the cosmological constant.We use units like c=1 all over. In RHS the energy momentum tensor is the source(content) of the space time.

$$T_{\mu\nu} = (\rho + p)\, u_\mu u_\nu + p g_{\mu\nu} + q_\mu u_\nu + u_\mu q_\nu + \pi_{\mu\nu}, \qquad \text{……………….(2)}$$

where $u\mu$is the 4-vector tangent velocity (e.g. the global cosmic fluid particle-line tangent field), normalised by $u\mu u\mu$ =−1,ρ is the density of mass-energy in the relativistic sense; ρ is the isotropic stress;$q\mu$the flow of power,And $\pi\mu\nu$is an anisotropic stress, all relative to $u\mu$, trace-free strain. The ρ, **p**, $q\mu$, and $\pi\mu\nu$are time and space functions.[7]

The cosmic fluid has been believed to be well defined by a perfect fluid (i.e., qμ=0 and πμν=0) in standard cosmology.at the cosmic level of history which comprises baryons, dark matter, radiogenesis and a cosmological constant.

$$T_{\mu\nu} = (\bar{\rho} + \bar{p})\, u_\mu u_\nu + \bar{p} g_{\mu\nu}, \qquad \text{………………………(3)}$$

Where the three last (2) conditions are set to zero and the over bar averages the volume over time and is now only time-functional.

This was derived by Einstein and Hilbert simultaneously with their names on the curvature section of the action. The GR action with a constant cosmological term

$$S_{GR} = \int d^4x\sqrt{-g}\left[\frac{R-2\Lambda}{16\pi G} + \mathscr{L}_M\right], \qquad \text{.....................(4)}$$

Where g is the metric tensor determinant, and L*M*for the matter fields is the Lagrangian. Equation (4) variations regarding the gμμ μ, give equations above (1). Field equation.

Cosmological gravitational sample theory

An appreciated "break" that nature in cosmology has offered us is that we have two measurement categories and samples to use. For example, distance measurements and expansion rate limit the background and the geometry of the universe to a category of samples.The second group constrains the development and history of the creation and unification of systems through universe space and time. We should not only blend it, but also contrast it for accuracy.

CONCLUSION:

For another 100 years, GR could well survive. After all, the gravity of Newton was about 200 years General relativity has recently reached its height as theory has been attracted by data and computing power.In the history of general relativity, we are at a critical point. We are about to confirm all its predictions over its entire area of validity without a fair doubt. We saw how modern cosmology faces huge questions that influence the very foundations of physics.

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