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Gravitational Radiation: A Stimulating Flux of Energy

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Abstract: ***Newtonian gravitational constant establishes a very positive theory in understanding the wave theory of different dimension as a whole. Our work is to establish a relativistic conversion of gravitational radiation and wave energy into mechanical energy. When a body falls into Black hole its potential energy turns into heat and a gravitational radiation bursts quickly occurs in two phases. In its first phase, it starts with rise in brightness and in the next there occurs a quick decline in the brightness and turns into dark.***

Keywords: Gravitation, Radiation, Burst, wave, Energy, Black hole, etc

1. Introduction

The relation of conversion of gravitational radiation and wave energy into mechanical energy is possible mainly through two techniques: splitting and conformal mapping which have emerged in unified field theories. Several such waves travelling in space and when they reach in the region of black hole, the gravitational potential energy turns into bursts and then after gravitational radiation with flux of energy come into existence. Now, we want to construct a theory that can combine the principles underlying the above mentioned two theories. Theoretical physicists are convinced that a new quantum gravitational theory in relativistic approach will throw light on the basic difficulties of modern electro dynamics and strong interaction theory. The main feature of the problem of uneven phenomenon when one type of waves interferes into the path of other then the wave deviates from its original path and then it reaches to unprogrammed place. And perhaps due to such event, gravitational radiation changes its former path and takes another form of energy. Scientists have a wide ideas on this topic that existing quantum field theory must be accurately translated into wave theory to view that the solution of the problem requires an entirely new approach.

It has been discovered that Universe has Astrophysical object with very curved space time in their vicinities. These objects are pulsars, which are pulsars, which are neutron stars and possible quasars. Hence, it must be capable of describing quanta in significantly curved space time. To do this, the laws general relativity and quantum theory must be combined.

Now, we want to give a derivation of field equations. An essential ingredient in this approach towards the properties of space-time in the notion of conformal transformation. Let $(\tilde{M},g)$ be a Lorentz manifold with vanishing Einstein tensor. Assume this physical space- time the following conditions hold :

There exist a manifold (M,g) with boundary τ and a function Ω on M such that $\Omega \geq 0$ on M and $\Omega=0$, $d\Omega \neq 0$ on τ .

The physical manifold can be identified with the interior of M and the equation $g= \Omega^2 \bar{g}$ holds.

These conditions state that the physical manifold is conformal to the interior of the unphysical manifold M.

Another, interesting and important aspect of this project is the latest work on the "Effects of the generating elementary particle pairs in non-stationary models of the Universe". It can affect the gravitational transmutation of gravitation and the quanta of ordinary matter. Non-stationary effects and the transmutation process, pairs are generated by variations in the gravitational field, which cannot in principle be described in terms of particles.

2. Methodology

The objective of this investigation is to combine the principles of quanta field with theory of general relativity. This process is interpreted as the effect of generation (annihilation) of pairs in a non-stationary universe.

Hence, it would be highly enterprising to bring different kinds of waves and gravitational theories can be studied at the same time.

Another, an American physicist Webber finally announced his discovery of gravitational radiation. He had been pointed out that the gravitational signals were being received with increasing regularity; once a month, twice a month and then even more frequently. The direction where the signals were coming from the centre of galaxy and their polarization characterizes now being determined.

Most of gravitational theory is analyzed by analogy with electromagnetic field. This is also true for gravitational radiation, when an electromagnetic waves interacts with a charged body, the motion of the body can be viewed to a neutral object, which is not affected by the electromagnetic field.

Recently, Prof. Stephen Hawking pointed out that he has developed a relationship between the geometric of black holes and thermodynamics. His works paved the way for

providing a new impetus of formulae of unified theory of all force of nature. And hence, he accounts for the existence of the universe by integrating Einstein's General relativity with Quantum physics.

Energy Tensor for A Flow of Radiation: By the term the flow of radiation, we mean a distribution of electromagnetic energy and only one direction in which the radiant energy is flowing at the point. We may take the components of the energy tensor as being given in terms of electric and magnetic field strength E and H by the equations given by Tolman (1954)

$$T_0^{11} = -\frac{1}{2}(E_x^2 - E_y^2 - E_z^2 + H_x^2 - H_y^2 - H_z^2) \quad \ldots\ldots\ldots\ldots\ldots 2.1$$

$$T_0^{12} = -(E_x E_y + H_x H_y) \quad \ldots\ldots\ldots\ldots\ldots 2.2$$

$$T_0^{14} = (E_y H_z - E_z H_y) \quad \ldots\ldots\ldots\ldots\ldots 2.3$$

$$T_0^{44} = \frac{1}{2}(E_x^2 + E_y^2 + E_z^2 + H_x^2 + H_y^2 + H_z^2) \quad \ldots\ldots\ldots\ldots\ldots 2.4$$

The suffix 0 to a component of a tensor indicates that the component is evaluated in natural co-ordinates at the point of interest. For our convenience, suppose that the flow of radiation at the point of interest is in the x-direction and further that the radiation is polarized with the electric vector parallel to y-direction, we find,

$$E_x = E_z = H_x = H_z = 0 \; ; \; E_y = H_z \quad \ldots\ldots\ldots\ldots\ldots 2.5$$

And so the only surviving component of tensor $T_0^{\mu\vartheta}$ would be

$$T_0^{11} = T_0^{44} = T_0^{14} = \frac{1}{2}(E_y^2 + H_z^2) = \rho \quad \ldots\ldots\ldots\ldots\ldots 2.6$$

ρ being the density of the radiant energy at that point.

Having obtained the component of $T^{\mu\vartheta}$ for one system of co-ordinates, we can find them in any system of co-ordinates by tensor transformation by using line element

$$ds^2 = g_{\mu\vartheta}\, dx^{\mu} dx^{\vartheta} \quad \ldots\ldots\ldots\ldots\ldots 2.7$$

The components of $T^{\mu\vartheta}$ will be given by

$$T^{\mu\vartheta} = \frac{\partial x^{\mu}}{\partial x_0^{\alpha}} \frac{\partial x^{\vartheta}}{\partial x_0^{\beta}} T_0^{\alpha\beta} \quad \ldots\ldots\ldots\ldots\ldots 2.8$$

3. Conclusion

Gravitational radiation has a stimulating flux of energy, when two neutron stars come closer and their nuclei orbiting each other then both nuclei act as most powerful and discharge radiation with the high resource of energy. Theoretical physicists are convinced that a new quantum gravitational theory will reduce the basic problems of modern electrodynamics and strong interaction theory. Our conclusion gets good approach with Prof. Stephen W. Hawking who developed a relationship between the geometric of black holes and thermodynamics.

References

[1] Ehlers. J (1964) Gravitational Waves
[2] Lichnerer.A (1955) Theories Relativistes de la gravitation et de electromagnetism (Messon, Paris)
[3] Quantum Gravity !4 April, 2003 Abramowiez, M.A &M.J 1997
[4] Frank. J King, A.R & Baine, D.J 195, Accretion Power in Astrophysics,Cambridge university press p. 86
[5] Gemelli.G (1997) Geneneral Relativity Gravitation

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