MINIMUM CONTRADICTIONS EVERYTHING - ETHER AND FORCES' UNIFICATION

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Abstract

According to previous works it has been stated that it is impossible to describe precisely the physics of everything. However a minimum contradictions everything can be described i.e. its equations, related to space-time waves geometry and forces can be stated. Purpose of this work is to show how a general gravitation formula, applied either to gravitational (*g*) or to electromagnetic (*em*) space-time matter field, is powerful enough to describe all forces i.e. strong, gravitation, electromagnetic and what is regarded as weak force. Verification to this is offered through Newton's and Coulomb's laws derivation on the basis of the general formula mentioned. This verification is extended to relativity gravitation law and to Lorentz' force. An other purpose is to show that weak force does not exist and that radiation is produced not because of a particular force but because of boundary conditions imposed.

1. Introduction

The various theories of physics are based on axioms which by definition are arbitrary. Perhaps axioms' arbitrariness is the reason of theories' contradictions which have been till now revealed. Basic purpose of previous papers was to show that there is a privileged set of axioms in physics and this is the set of axioms on which our basic communication system is based. It can be proved that this system is contradictory. When, despite this contradiction we communicate in a way that we consider logical, this means that we try to understand things through minimum possible contradictions since contradictions are never vanished[1,2,3]. The claim for minimum contradictions which in an application area is compatible with Okham 's razor[4], despite being completely general, can lead by itself to the statement of a minimum contradictions physics unified theory. Under certain simplifications both the relativity theory and the QM can derive; space-time is stochastic and its geometry is described by the aid of a Ψ wave function[5]. The electromagnetic (*em*) space-time is a space-time whose all magnitudes are considered imaginary and behave exactly like the gravitational (*g*) one; the (*em*) space-time coexists with the (*g*) one, the two of them being interconnected[6,7]. On this basis, a space-time QM can be made. According to this paper Quantum Space-Time – Ether is the substance within which the things exist and from which the things are made. On this basis minimum contradictions ether geometry and forces can be found; they describe quantum gravity in general through a unified gravitational acceleration formula. This formula can apply:
1. to the *strong nuclear force* (quantum gravity),
2. to *gravitation* [by the aid of this general formula, under certain simplifications, applied to (*g*) and (em) space, Newton and Coulomb (attraction-repulsion) laws derive],
3. to the *electromagnetic force*,
4. to *weak force* (for reasons following)

According to the spirit of this work any infinitesimal area of reality is described, by the aid of a Hypothetical Measuring Field (HMF), by local equivalent particle fields regarded as extended to the infinity. These local fields obey to Schröndinger's relativistic equations applied either for (*g*) or (*em*) space-time -in absence of potential- and energy and momentum conservation equations. On this basis (*g*) and (*em*) forces, in presence of radiation, can be described by the general formula mentioned and this is compatible with what is regarded as weak force. eak force is not a particular force; we can show that radiation is produced not because of a particular force but because of boundary conditions imposed. In this way basic requirements for a theory of everything (TOE) to be stated can be regarded as fulfilled.

2. Equations of Minimum Contradictions Ether-Everything [6]

On the basis of the claim for minimum contradictions we have the set of equations which all together characterize a Matter Space-Time Field as a whole. Since this field includes everything, this equation set can be regarded as Equations of Minimum Contradictions Everything. As long as ether is regarded as the substance within things exist and from which things are made, the equations set mentioned can be regarded as Equations of Minimum Contradictions Ether-Everything. These equations are the following[6]:

1. *Space-Time Wave Equations:*

$$\frac{\partial}{\partial x_i}\frac{\Box\Psi_g(\boldsymbol{r},t)}{\Psi_g}=0 \qquad (i=1,2,3,4) \tag{1}$$

$$\frac{\partial}{\partial x_i}\frac{\Box\Psi_{em}^g(\boldsymbol{r},t)}{\Psi_{em}^g}=0 \qquad (i=1,2,3,4) \tag{2}$$

2. *Energy Conservation:*

$$\partial_t\left(\frac{\partial_t\Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)}+\alpha\frac{\partial_t\Psi_{em}^g(\boldsymbol{r},t)}{\Psi_{em}^g(\boldsymbol{r},t)}\right)=0 \tag{3}$$

3. *Momentum Conservation:*

$$\partial_t\left(\frac{\nabla\Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)}+\alpha\frac{\nabla\Psi_{em}^g(\boldsymbol{r},t)}{\Psi_{em}^g(\boldsymbol{r},t)}\right)=0 \tag{4}$$

4. *Geometry of (g) space-time i.e. mean relative time and mean relative length in a direction $\boldsymbol{n}$ at a point $(\boldsymbol{r},t)$:*

$$\overline{tr}(\boldsymbol{r},t)=\frac{ic}{2h}\frac{\partial_t\Psi}{(\Psi\Box\Psi)^{1/2}}\left(\Psi^*\partial_t\Psi-\Psi\partial_t\Psi^*\right) \tag{5}$$

$$\overline{lr}_n(\boldsymbol{r},t)=-\frac{ih}{2}\frac{\Psi}{\Box\Psi}\left(1-c^2\frac{\partial^2\Psi/\partial x_n^{\;2}}{\partial^2\Psi/\partial t^2}\right)^{1/2}\left(\Psi^*\partial_t\Psi-\Psi\partial_t\Psi^*\right) \tag{6}$$

5. *Geometry of (em) space-time i.e. mean relative time and mean relative length in a direction $\boldsymbol{n}$ at a point $(\boldsymbol{r},t)$:*

$$\overline{tr}_{em}(\boldsymbol{r},t)=-\frac{\alpha c}{2h}\frac{\partial_t\Psi_{em}^g}{(\Psi_{em}^g\Box\Psi_{em}^g)^{1/2}}\left(\Psi_{em}^{g\,*}\partial_t\Psi_{em}^g-\Psi_{em}^g\partial_t\Psi_{em}^{g\,*}\right) \tag{7}$$

$$\overline{lr}_{nem}(\boldsymbol{r},t)=-\frac{h}{2\alpha}\frac{\Psi_{em}^g}{\Box\Psi_{em}^g}\left(1-c^2\frac{\partial^2\Psi_{em}^g/\partial x_n^{\;2}}{\partial^2\Psi_{em}^g/\partial t_t^{\;2}}\right)^{1/2}\left(\Psi_{em}^{g\,*}\partial_t\Psi_{em}^g-\Psi_{em}^g\partial_t\Psi_{em}^{g\,*}\right) \tag{8}$$

where α is the fine structure constant, Ψ_g, Ψ_{em}^g are the gravitational and the electromagnetic space-time wave functions, which are identical with equivalent local particle Ψ functions, and $(\mathbf{r}, t)$ is a point of the hypothetical measuring field (HMF). Eqs(1,2) describe Schrödinger's relativistic equations.
Eq(3) describes the energy conservation principle.
Eq(4) describes the momentum conservation principle.
Eqs(5,6) describe the mean relative time and the mean relative length in a direction $\boldsymbol{n}$ of (*g*) space-time.
Eqs(7,8) describe the mean relative time and the mean relative length in a direction $\boldsymbol{n}$ of (*em*) space-time
It is noted that the electromagnetic (*em*) field for the same reasons as the (*g*) does, is described with the aid of an electromagnetic (*em*) hypothetical measuring field through electromagnetic coordinates $(\mathbf{r}_{em}, t_{em})$. However the (*em*) HMF coexists with the (*g*) HMF while $(\mathbf{r}_{em}, t_{em})$ corresponds to $(\mathbf{r}, t)$ through a scale so that:

$$\frac{\partial x_{ig}}{\partial x_{iem}} = i\alpha \quad (i = 1,2,3,4) \tag{9}$$

If $\Psi_{em}(\mathbf{r}_{em}, t_{em})$ is the (*em*) space-time wave function we define as function $\Psi_{em}^g(\mathbf{r}, t)$ a function for which is valid that:

$$\Psi_{em}(\mathbf{r}_{em}, t_{em}) = \Psi_{em}^g(\mathbf{r}, t) \tag{10}$$

This is the reason why spacetime as a whole i.e. Minimum Contradictions Ether Everything can be described by means only of coordinates $(\mathbf{r}, t)$ of (*g*) space-time.

3. Minimum Contradictions Quantum Gravity[5,7,9]

3.1 General
In section 2 the minimum contradictions particle space-time geometry has been defined. This is a space-time quantum geometry enriched with matter properties as the ones of energy and momentum. The purpose of this chapter is to show the dynamic properties of this space-time i.e. to define the acceleration imposed on the unit of mass which exists at a point $(\boldsymbol{r}, t)$. This acceleration is closed with what we call gravitational.

3.2 Unified Equation
Energy of a space-time particle field is distributed according to probability density function $\boldsymbol{P}(\boldsymbol{r}, t)$. For mean relative time we have [5,7,9]:

$$\overline{tr}(\boldsymbol{r}, t) = \frac{\langle E \rangle}{(E_0 / V_0)} P(\boldsymbol{r}, t) = \frac{\langle E \rangle}{DE_0} P(\boldsymbol{r}, t) \tag{11}$$

where DE_0 is the energy density of the reference space-time. The energy

$$\langle E \rangle P(\boldsymbol{r}, t) dr^3 \tag{12}$$

corresponds to a mass

$$d\overline{m} = \frac{\langle E \rangle}{c^2} P(\boldsymbol{r},t) dr^3 \tag{13}$$

Space-time which corresponds to this mass can be regarded in any infinitesimal neighborhood of $(\boldsymbol{r},t)$ as flat. In order for that mass to move in a direction x_i from the energy level

$$\langle E \rangle P(\boldsymbol{r},t) dr^3 \tag{14}$$

to the energy level

$$\langle E \rangle (P(\boldsymbol{r},t) + \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} dx_i) dr^3 \tag{15}$$

a force $d\vec{F}$ is needed so that $d\vec{F} dx_i$ equals the diference of the mentioned energy i.e.:

$$d\boldsymbol{F} dx_i = \langle E \rangle \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} dx_i dr^3 \tag{16}$$

Because of Newton's Law we have:

$$d\boldsymbol{F} = d\overline{m} \mathbf{g}_{xi} \tag{17}$$

The magnitude $\mathbf{g}_{xi}$ can be regarded as the component of the gravitational acceleration of the field in the direction x_i, since it represents the force which must be applied to a unit of mass at every point $(\boldsymbol{r}, t)$ in order that energy will be distributed according to the probability density function $P(\boldsymbol{r},t)$. Because of Eqs(13,16,17) we obtain:

$$d\overline{m}\mathbf{g}_{xi} = \frac{\langle E \rangle}{c^2} P(\boldsymbol{r},t) dr^3 \mathbf{g}_{xi} = \langle E \rangle \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} dx_i dr^3 \tag{18}$$

$$\mathbf{g}_{xi} = \frac{c^2}{P(\boldsymbol{r},t)} \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} \tag{19}$$

Taking into account Eqs(11,19) we obtain in general that:

$$\mathbf{g}(\boldsymbol{r},t) = \frac{c^2}{P(\boldsymbol{r},t)} \nabla P(\boldsymbol{r},t) = \frac{c^2}{\overline{tr}(\boldsymbol{r},t)} \nabla \overline{tr}(\boldsymbol{r},t) \tag{20}$$

Taking into account the probability density function of Schröndinger's relativistic equation and Eq(20) we obtain:

$$\mathbf{g}(\boldsymbol{r},t) = \frac{c^2 \nabla \left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right)}{\left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right)} \tag{21}$$

Eq(21) is valid in the whole extent of a matter field since a matter field locally can be regarded as a particle field. Eqs(20,21) describe a unified equation which is valid everywhere. Eq(21) can be extended to (*em*) particle fields; thus we can write[6]:

$$\mathbf{g}_{em}(\boldsymbol{r},t) = \frac{i\alpha c^2 \nabla\left(\Psi_{em}^{g\,*}\partial_t \Psi_{em}^{g} - \Psi_{em}^{g}\partial_t \Psi_{em}^{g\,*}\right)}{\left(\Psi_{em}^{g\,*}\partial_t \Psi_{em}^{g} - \Psi_{em}^{g}\partial_t \Psi_{em}^{g\,*}\right)} \tag{22}$$

As it will be shown in the next section Eq(20) is compatible with Newton's Law for gravity. For the same reason Eq(20) is compatible to Coulomb's law.

3.3 Newton's Law Verification[10]

The term "verification" is not identified with the notion "proof"; it needs the existence of an obvious hypothesis; e.g. according to this paper there is no notion "point mass" which is necessary for the classical laws; thus, a simulation hypothesis is needed so that the classical laws can be regarded as deriving from the principles of this work.

Considering that gravitation can be simulated by a field which acts at a distance, we will have the notion of a potential which is created by various masses. If E is the total energy of a point mass m due to the field of a mass M, then this energy can be regarded as a function of r so that:

$$E = \int_r^{\infty} dE(r) \tag{23}$$

on condition that $E(\infty) = 0$. We notice that:

$$E(r) \le 0 \tag{24}$$

By definition $\langle V_E \rangle$ is volume mean value which contains energy E.

$d\langle V_E \rangle$ can be regarded as deriving from a volume dV_0 of the Hypothetical Measuring Field (HMF). Thus the ratio:

$$\frac{d\langle V_E \rangle}{dV_0} \tag{25}$$

expresses mean relative volume. By definition the mean values of a magnitude are regarded as being constant values of this magnitude in the whole extent of a field. Thus the mean relative volume of Eq(25) must be constant everywhere. Therefore $d\langle V_E \rangle$ must be independent of r. This means that for a symmetric spherical field we can write:

$$d\langle V_E \rangle = 4\pi r^2 f(r)dr \tag{26}$$

where $f(r)$ is a correction function so that $d\langle V_E \rangle$ is independent of r. This takes place when:

$$f(r) = C / r^2 \tag{27}$$

where C is a constant. Because of Eqs(26,27) we obtain:

$$d\langle V_E \rangle = 4\pi C dr \tag{28}$$

For $r = 1$ we have:

$$d\langle V_E \rangle = 4\pi 1^2 dr = 4\pi C dr, \quad C = 1, \tag{29}$$

$$\langle V_E \rangle = 4\pi r \tag{30}$$

For a particle field we have [5,7,9]:

$$E\langle V_E \rangle = hc \tag{31}$$

Because of Eqs(30,31) we obtain:

$$E = \frac{hc}{4\pi r} \tag{32}$$

We apply the simulation described on condition that any energy of mass m is due only to the field of mass M. If E_C is the energy that a point mass m obtains because of its motion, E_T is its total energy, and E_D is its dynamic energy (i.e. energy only due to the attraction by the field of mass M), then it will be valid that:

$$E_C = -E_T = E \tag{33}$$

$$E_T = E_D + E_C \tag{34}$$

$$E_D = -2E = -\frac{hc}{2\pi r} = -\frac{\hbar c}{r} \tag{35}$$

From Eq(35) we obtain the force $\boldsymbol{F}$ of attraction between masses M, m :

$$\boldsymbol{F} = \frac{dE_D}{d\boldsymbol{r}} = \frac{\hbar c}{r^2}\boldsymbol{e}_r \tag{36}$$

Where $\boldsymbol{e}_r$ is a unit vector parallel to $\boldsymbol{r}$ and towards the center.
For $dm = 0$ i.e. when the kinetic energy E_C relates to a circle motion we have that:

$$\boldsymbol{F} = m\mathbf{g} \tag{37}$$

where $\mathbf{g}$ is the acceleration caused by the force $\boldsymbol{F}$. Since $\boldsymbol{F}$ is proportional to both m and M we may assume that:

$$\hbar c = fMm \tag{38}$$

where f is a constant . This equation shows that m is not independent of M which at first sight is in contrast with Newton's law where m is independent of M . However Eq(35) refers to a particle field; thus particle pair M , m simulate this particle field.
From Eqs(36,37,38) we have:

$$\boldsymbol{F} = \frac{fMm}{r^2}\boldsymbol{e}_r \tag{39}$$

$$\mathbf{g} = \frac{fM}{r^2}\boldsymbol{e}_r \tag{40}$$

For $f = G$, relations (39,40) express the known Newton law for gravitation.
As was mentioned relation (39) is valid for particle pairs. However relation (40) can be regarded as a relation which gives the gravitational acceleration for any field created by a mass M on the condition that this mass is concentrated on one point. This acceleration can be regarded as acting on every particle of a set of particle masses which are considered to be concentrated on one point. *Thus, under the hypothesis that all elementary masses which constitute the mass* m *do not affect the field of mass* M *,* Newton's law for gravity derives for any point masses M, m i.e.:

$$\boldsymbol{F} = \frac{GMm}{r^2}\boldsymbol{e}_r \tag{41}$$

3.4 Compatibility of Unified Equation with Newton's Law
According to Eq(20) for a constant in time symmetric spherical particle field we have:

$$\mathbf{g}(r) = \frac{c^2}{P(r)}\frac{\partial P(r)}{\partial r} \tag{42}$$

where $P(r)$ is the probability density in the infinitesimal area around r .
$P(r)d\langle V_E\rangle$ represents the probability of energy to exist in the infinitesimal area of volume $d\langle V_E\rangle(r)$ around r, where, according to simulation of section 3.3, E and $\langle V_E\rangle$ are regarded as functions of r .
In an energy state $E(r)$ with $\langle V_E\rangle(r)$ the ratio:

$$\frac{d\langle V_E\rangle}{\langle V_E\rangle} \tag{43}$$

represents the probability of energy to exist in volume $d\langle V_E\rangle$ on condition that we have a unique energy state E. If $P(E)$ is the probability for the energy state E to exist then the term:

$$\frac{d\langle V_E\rangle}{\langle V_E\rangle}P(E) \tag{44}$$

represents the probability of energy to exist in volume $d\langle V_E\rangle(r)$. According to what was mentioned this probability equals to:

$$P(r)d\langle V_E\rangle(r) \tag{45}$$

Therefore we obtain that:

$$P(r)d\langle V_E\rangle = \frac{d\langle V_E\rangle}{\langle V_E\rangle}P(E) \tag{46}$$

In the case of a particle field because of Eqs(30,46) we have:

$$P(r) = \frac{P(E)}{4\pi r} \tag{47}$$

Therefore because of Eqs(42,47) we obtain:

$$\mathbf{g}(r) = \frac{c^2}{P(r)}\frac{\partial P(r)}{\partial r} = -\frac{c^2}{r} \tag{48}$$

Multiplying both parts of Eq(48) by m we have:

$$m\mathbf{g}(r) = -\frac{mc^2}{r} \tag{49}$$

The left part of this equation represents the force $\boldsymbol{F}$ due to the field acting on mass m. The nominator of right part represents the total energy of mass m which is created when an negligible rest mass m_0 moves by means of the field from the infinity until position r. Inversely mc^2 represents the energy required in order for this particle to escape the field. Thus we can write:

$$\boldsymbol{F} = m\mathbf{g}(r) \tag{50}$$

and

$$mc^2 = \int \boldsymbol{F}dr \tag{51}$$

Because of Eqs(49,50,51) it holds:

$$\boldsymbol{F}dr = -\frac{dr\int \boldsymbol{F}dr}{r} \tag{52}$$

By definition we have:

$$\boldsymbol{F} = \frac{dE(r)}{dr} \tag{53}$$

Thus because of Eqs(52,53) we obtain:

$$\frac{dE(r)}{E(r)} = -\frac{dr}{r} \tag{54}$$

and

$$\ln E(r) = -\ln r + C = -\ln r + \ln C' = \ln \frac{C'}{r} \tag{55}$$

However, since according to relation (24) $E(r)$ is negative, $\ln E(r)$ has no meaning. If we write Eq(43) in the following form:

$$\frac{d(-E(r))}{(-E(r))} = -\frac{dr}{r} \tag{56}$$

we will have:

$$\ln(-E(r)) = -\ln r + C = -\ln r + \ln C' = \ln \frac{C'}{r} \tag{57}$$

and

$$E(r) = -\frac{C'}{r} \tag{58}$$

We notice that this equation has the same form with the one of Eq(35). Working in the same way as in section 3.3 we can reach Eq(41). This shows the compatibility of unified Eqs(20,21) with Newton's law for gravity. Of course it is noted that what has been derived in the above analysis refers to the non deformable space of the HMF; therefore we expect a modification of Eq(41) so that we take into account the real distance which can be calculated according to the transformations of deformity which can be derived from Eqs(5,6).

We may notice that Newton's law has been derived on the basis of a simulation and assumption according to which is meaningful the notion of point mass and of a potential which is function of r. Eqs(35,48) show that for discrete values of E we have discrete values of r which means that there are only certain permitted values of r; they refer to mean values of E and r. Eqs(20,21) are more general and give information on the gravitational acceleration at any point $(\boldsymbol{r}, t)$ for any matter space-time distribution.

3.5 Relativistic Law

Eqs(37,41) are valid on condition that $dm = 0$. This implies that there is a constant velocity circle motion i.e. that $\dot{r} = 0$. Thus, in general, if $\dot{r} \neq 0$, formulae (37,41) should be modified. According to this paper, the gravitational (*g*) space is described by particle-gravitational waves. If the rest energy of a particle-gravitational wave is zero, then its velocity in the HMF equals the speed of light [11]. It can be proved that if gravitational waves are propagated from their source with a finite velocity c and therefore act on bodies at a distance with a correspondent delay, then Newton's law is modified so that the delay mentioned will be taken into account [12]. According to this work the speed of light equals the gravitational wave velocity $m_0 = 0$ [11]. On this basis, Gerber found a modified formula exactly the same as the relativistic formula which was given later by Einstein. Note that on the basis of this formula, Gerber predicted the same advance of Mercury's perihelion as the one predicted later by the relativity theory. Beyond it relativistic gravitation law is expected to be valid since according to this work when space-time is assumed as continuum relativity is completely valid [11].

3.6 Coulomb Law - Coexistence Scale of (em) with (g) Space-Time
Because of Eq(35) we have:

$$E_D = -\frac{\hbar c}{r} \quad (59)$$

Electromagnetic space, according to what was mentioned is a gravitational space with imaginary magnitudes. For this space, it is expected that Eq(59) is valid i.e. that:

$$E_{D,em} = -\frac{\hbar c}{r_{em}} \quad (60)$$

Replacing the factor $\hbar c$ by its equal e^2 / α we obtain that:

$$E_{D,em} = -\frac{e^2}{\alpha r_{em}} \quad (61)$$

where α is the fine structure constant. If we put :

$$E_{D,em} = iE_{D,em-g} \quad (62)$$

$E_{D,em-g}$ represents gravitational energy as being real. Thus, Eq(61) can be written in the following form:

$$E_{D,em-g} = -\frac{e^2}{i\alpha r_{em}} = -\frac{e^2}{r_g} \quad (63)$$

on condition that:

$$r_{em} = \frac{r_g}{i\alpha} \quad (64)$$

We notice that Eq(64) expresses the Coulomb potential, on condition that the imaginary (*em*) space coexists with the real (*g*) one and that its magnitudes correspond to the magnitudes of (*g*) space through a scale.

3.7 Lorentz' force
For the same reason as in section 3.5 the electrical forces in general are not restricted to the ones of Coulomb's field. Thus we may assume that magnetic induction is taken into account. Such a force is expected to be Lorentz' force; this is compatible with analysis relative to this subject by P. Beckmann [12].

4. Forces' Unification

4.1 Photons

According to the claim for minimum contradictions Ψ is a complex statistically interpreted wave function and this implies that [11]:

$$m_0 \neq 0 \tag{65}$$

Thus the question is raised of whether photons $(m_0 = 0)$ exist and are compatible with the basic claim of this work. Photon is an oscillating matter space-time field which has no energy when the oscillation stops. Therefore photon has sense only when it is regarded as travelling within "non existing space-time". The notion of "non existing space-time" derives from the fact that space-time is stochastic and therefore there is a probability not to exist. Photons play key role in quantum states formation and in the conversion of one kind of space-time into another [11]; their action is taken into account by space-time Ψ wave functions described by the equation set of minimum contradictions everything [6]. However we should distinguish the notion of photons from the notion of radiation since radiation refers to a space-time wave within existing space-time which implies that it has rest mass either of (*g*) or (*em*) space-time [4,13,14]; thus we may assume that speed of radiation approaches to the ideal speed of light in an asymptotic way[4]. If this is the case radiation constitutes space-time formation generally described by the equations of Minimum Contradictions Ether-Everything of section 2.

4.2 Basic Interaction Forces

Eqs(20,21,22) describe the forces of (*g*) and (*em*) space-time matter fields. They derive on the basis that there is a probability density function through which space-time either (*g*) or (*em*) are distributed. Thus they correspond to quantum gravity applied either to (*g*) or (*em*) space-time. A verification to this has been offered in sections 3.3 and 3.4 through Newton's law derivation on the basis of the general formulae described by Eqs(20,21,22). It is also explained the reason why the relativity gravitation law derives. For the same reasons Coulomb's law and Lorentz' force are verified since equations related to (*em*) space-time have the same form with the ones related to (*g*) one. On this basis we have:

1. A unified formula for quantum gravity applied to strong force of (*g*) space-time.
2. A unified formula for electromagnetic force at quantum level of electromagnetic interaction.
3. Verification of gravitation Newton law on the basis of general formula of Eqs(20,21). The reason why the relativity gravitation law is valid has been shown.
4. Verification of Coulomb law on the basis of general formula of Eqs(20,21) applied to (*em*) space-time. For the same reason as in 3 an electromagnetic force beyond Coulomb's field is implied; therefore we may assume that this corresponds to Lorentz' force.
5. It remains the weak force i.e. the force which is regarded as responsible for radiation. For this force we may notice the following.

According to section 4.1, Eqs(20,21,22) and equations of section 2 can apply to a system regarded as a whole where existence of radiation is taken into account. Therefore through these equations the state to which weak force corresponds and what is regarded as weak force are described. On this basis there is not weak force. What we mean by weak force falls into the category of (*g*) and (*em*) forces in general on condition that creation or existence of radiation appears in the general system described by Eqs(20,21,22) and equations of section 2. An example of radiation production without any force can be understood by the following example. According to Eq(31) for a particle field we have:

$$\langle E \rangle = \frac{hc}{\langle V \rangle} \tag{66}$$

$$\langle V \rangle \uparrow \Rightarrow \langle E \rangle \downarrow \tag{67}$$

Thus, in the case described by relation (67), for reasons of energy balance, photon emission is needed since any energy change takes place through photons [10,11]. On this basis black holes radiation can be explained [9]; in this case $\langle V \rangle \uparrow$ is compatible with universe's expansion. Therefore we notice that radiation is produced not because of a particular force but because of boundary conditions imposed.

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