"On a Minimum Contradictions Physics"

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Any Physics theory is stated through the basic communication system. However it can be proved that this system is contradictory; thus a least contradictory theory can be stated only on the basis of a claim for minimum contradictions. Purpose of this paper is to show that Physics can be regarded as consequence of principles of thought; this Physics is compatible, under certain simplifications, with Newtonian mechanics, relativity theory and QM; finally this Physics describes a Minimum Contradictions Everything. A theoretical basis is provided for the explanation of gravielectric phenomena including the thrust that appears in asymmetric capacitors systems

Introduction

From Aristotle it is known that the way in which we communicate obeys the rules of logic. These rules are the rules of identification. These rules are included in the following principle [1,2]:

Principle I: "A is A; A is not ∼A; It is not possible that something is A and ∼A at the same time".

Apart from these rules Aristotle also stated the causality principle according to which for everything a reason-cause is needed. Leibniz expanded the causality principle and claimed more generally that something is valid if it can be logically proved by something else that is valid. So, Leibniz principle could be written in the following form [1,2]:

Principle II: "No statement is valid if it cannot be logically proved through some valid statements different from it."

We name logic Λ the system which includes the principles I and II. We feel that logic Λ is valid, but we don't know a priori whether it is valid or not. When we already speak logically, it means that we have decided to communicate and we cannot but, most generally, think that [2]:

$$\Lambda \vee \sim \Lambda \qquad (1)$$

which means that either logic Λ is valid or logic Λ is not valid. So, our consideration takes the widest credibility.   On this basis in general it can be proved the following [2,3]:

Theorem I: "Any system which includes the logic Λ and at least a statement A which is not theorem of logic Λ leads to contradiction."

It can be proved that the anterior-posterior axiom in arithmetic is not theorem of Λ. Thus, the following can be stated [1,2,3]:

Statement I: " Any system that includes logic Λ and the anterior-posterior axiom leads to contradiction."

This statement is compatible with Gödel's inference which is the basis for his Theorems proof. However, in order for this statement to derive it is not required any arbitrary hypothesis as in Gödel's inference is (arbitrary hypothesis that there is an algorithm through which only the true statements can derive) [1,3].

Our basic communication system consists of Λ and the anterior-posterior axiom; in fact we put every word or phrase after another; therefore it obeys Statement I. However, we notice that statement I cannot be stated because it is based on the basic communication system which, according to statement I itself, is contradictory. *Thus, statement I imposes silence*. When we communicate, we use a hidden claim according to which "*what is accepted as valid is what includes the minimum possible contradictions*" since the contradictions cannot be vanished [1,2,3,4]**.** According to this hidden claim we obtain a logical and an illogical dimension. In fact, through this axiom we try to approach logic (minimum possible contradictions) but at the same time we expect something illogical since the contradictions cannot be vanished.

Minimum Contradictions Physics [1,2]

The systems of axioms we use in Physics include the communication system and, therefore, their contradictions are minimized when they are reduced to the communication system itself; because of statement I further axioms - beyond the ones of logic Λ- cause contradictions.

Therefore, we have minimum contradictions in Physics when it is based only on the basic communication system, i.e. on logic Λ and on the 'anterior-posterior axiom' [1,2].

However time implies the existence of anterior and of posterior; space does, too. If I say 10 cm, I mean the existence of 1,2,...,9,10; *i.e.*, the existence of anterior and of posterior. Therefore, the existence of anterior and posterior is the condition for space and time to exist and *vice versa*. This leads to the fact that *minimum contradictions physics is expressed in spacetime terms*. Since everywhere there is space-time and not something else, *spacetime can be regarded as matter itself*. A matter system, in general, has differences within its various areas. This means that a matter system, in general, is characterized by different rates of anterior - posterior (time) within its various points.

Definitions [1,2]

For the purposes of this paper the following definitions are useful:

i. *As reference space time we define a euclidean space time to which, through transformations of deformity, any field can correspond.*Any magnitude of it will be denoted by the subscript $_0$. A point A_0 of the

reference space time occupies by the action of the field a position $A \neq A_0$

ii. *As Hypothetical Measuring Field (HMF) is defined a hypothetical field, which consists of the reference space time, in which at every point A_0 the real characteristics of the corresponding point A of the real field exist.*

iii. *In a HMF, we define as relative space time magnitude sr the ratio of a real infinitesimal space time magnitude ds to the corresponding infinitesimal magnitude ds_0 of the reference space time*: i.e. $sr = ds/ds_0$. This can apply to any magnitude; e.g. *relative time* is $tr = dt/dt_0$ where dt is an infinitesimal time of comparison at a given position of the HMF. Relative space time magnitudes can apply either to a space time continuum, or to a statistical matter field; in the latter case the above magnitudes are denoted by $\overline{sr}, \overline{tr}$ where the over-bar denotes the local mean value.

iv. *We name energy dE of an infinitesimal space-time element its 'ability to exist'.*

Relativistic Behavior [1,2]

According to the spirit of this paper an infinitesimal space time element with energy dE exists on condition that some corresponding 'anterior-posterior' exist too. With respect to the HMF a space time element exists during a time dt which is different from the time dt_0 of the corresponding reference space time element. Various space-time elements in the HMF have different dt for the same dt_0. Thus, dt measures the duration i.e. the ability of a space time element to exist; this ability, according to definition iv is energy; when $dt = dt_0$ this ability is dE_0. Thus, we can write:

$$dE \sim dt \text{ and } dE/dE_0 = dt/dt_0 = tr \quad (2)$$

which is a relativistic relation.
On this basis what derives from the claim for minimum contradictions under the simplification-hypothesis that space time is continuum is compatible with the GRT; it is also compatible with the SRT and the Newtonean mechanics under the additional simplification that a particle space time formation can be simulated by a single particle [2].

De Broglie's Principles [1,2]

Eq. (2) can be viewed in two ways:
a. when dt_0 is a unit of time, Eq. (2) describes the duration dt, with respect to an observer and, as was mentioned, it leads to the relativity theory.
b. When dt is a constant period of time in the HMF, then Eq. (2) can be written in the form:

$$dE/dE_0 = dt/dt_0 = (f/v)/(f/v_0) = v_0/v \quad (3)$$

where v is the frequency of a periodical phenomenon of comparison and f an arbitrarily constant factor through which we can change the scale of v, v_0. If $v = 1$, v_0 must be different in various points of the HMF. If this is the case, v_0 represents the number of hits of a clock connected with a spacetime element in the unit of time which is observed in the reference spacetime and Eq. (3) can be written in the form:

$$dE/dE_{i0} = v_{i0} \quad (4)$$

where $dE_{jo} = dE_{i0}$ for $i \neq j$ and where i, j indicate points of the HMF. Since, according to this paper energy-matter is nothing else than a system with different and changing rate of anterior - posterior, Eq. (4) shows the way through which a field exists and acts at various points. It is noted that Eq. (4) can be extended to stochastic space-time. Thus, for the same equation we have the following correspondences:

$$dE/dE_0 = dt/dt_0 \rightarrow \text{ observation } \quad (5)$$
$$\text{(Relativity Theory)}$$

$$dE/dE_{i0} = v_{i0} \rightarrow \text{ action } \quad (6)$$
$$\text{(Quantum Mechanics)}$$

On this basis, we can reach the conclusion that De Broglie's principle for energy is valid for $E_0 = h$ (arithmetically) i.e.:

$$E = hv \text{ and } \lambda_{eq} = h/P \quad (7)$$

where λ_{eq} is the wave length of an equivalent photon of energy $E_{eq} = cP = (E^2 - m_0^2 c^4)^{1/2}$ [2].

Energy-Time Equivalence

Because of Eq. (2) we obtain:

$$dE = (dE_0/dt_0)dt = (E_0/\int dt_0)dt \quad (8)$$

If we put: $E_0 = h$ (arithmetically) and $\delta t_0 = \int dt_0 = 1$

because of Eq. (8) we obtain:

$$dE = hdt \text{ and } E = h\delta t \quad (9)$$

Equations (2,9) express the *Equivalence of Energy and Time.*

Space-Time Wave Function

According to the Claim for Minimum Contradictions, Matter Space Time, is stochastic and its energy, momentum and geometry are distributed according to a density probability function $P(\mathbf{r}, t)$ [1,2].

By the aid of Fourier analysis, for a relative spacetime magnitude of a particle field, it can be proved that [1,2]:

$$Sr \sim \Psi \quad (10)$$

where Ψ is solution of Schrödinger's relativistic equation, only on condition that it is a complex wave function which can be only statistically interpreted [1,2]. This wave function describes relative spacetime magnitude; i.e., the anterior-posterior (time) flow rate at various points of the HMF. Real magnitudes are distributed ac-

cording to Schrödinger's relativistic equation density probability function:

$$P(\mathbf{r},t) = (i\hbar / 2m_0 c^2)\left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^*\right) \quad (11)$$

This function, according to what until now has been accepted, cannot be interpreted as probability density because it is not always positive. A negative $P(\mathbf{r},t)$ would imply negative values of geometrical magnitudes [1]. This is at first sight incomprehensible. According to the claim for minimum contradictions, we try to apply logic but we have to expect contradictory behaviors; thus, negative values of geometrical magnitudes can be interpreted as contradictory-incomprehensible entities that appear because of our inadequate basic communication system. Of course, it would be constructive to investigate if these incomprehensible magnitudes appear as reactions to our communication system and constitute a reality that our basic communication system cannot approach. The negative magnitudes can be regarded as characterizing the anti-matter [2].

Minimum Contradictions Everything Equations

In order that further contradictions are avoided (Claim for Minimum Contradictions), a matter system in general should be described through the same principles that a particle field is. This is valid when a matter field locally behaves as a particle field. Thus, since stochastic spacetime is matter itself, we can reach the following conclusions [1,2]:

1. There does not exist a potential that acts from a far distance, but an action of matter-space-time itself in the whole extent of a matter system.
2. Any matter field locally behaves as a particle field.

These conclusions are the reason why final theory of everything equations can be stated [2]. However, matter can be either mass or charge. Thus, there exist both mass-gravitational (g) and charge-electromagnetic (em) spacetime. The (em) spacetime behaves as a (g) spacetime , since both are spacetime and obey the same principles but it is not. Thus, any time interval in the (em) spacetime is incomprehensible with respect to a coexisting (g) spacetime and it can be regarded as an imaginary number which is incomprehensible as well. Because of Eqs. (2,9) t*he energy of an (em) spacetime can be regarded as imaginary since it is equivalent to an (em) time interval. Therefore, in general, the electromagnetic energy can be regarded as imaginary.*

A gravitational spacetime energy E_g can be converted into an electromagnetic spacetime energy E_{em} by means of photons and vice versa; this being compatible with the first thermodynamic axiom [5]. In extension (em) mass and momentum are imaginary as well. Because of the fact that the interactions between the (g) and the (em) space-time take place through photons, we may assume that the momentum conservation principle is valid as well [2].

On this basis, a space-time-matter field in general, behaves locally as a particle-space-time field; if we put $c = \hbar = 1$ the following equations are valid [1,2,5,6,7].

$$\partial_{xi} \frac{\Psi_g(\mathbf{r},t)}{\Psi_g(\mathbf{r},t)} = 0 \ , \quad \partial_{xi} \frac{\Psi_{em}(\mathbf{r},t)}{\Psi_{em}(\mathbf{r},t)} = 0 \quad (i=1,2,3,4) \quad (12)$$

$$\partial_t \left(\frac{\partial_t \Psi_g(\mathbf{r},t)}{\Psi_g(\mathbf{r},t)} + i\alpha \frac{\partial_t \Psi_{em}(\mathbf{r},t)}{\Psi_{em}(\mathbf{r},t)}\right) = 0 \quad (13)$$

$$\partial_t \left(\frac{\nabla \Psi_g(\mathbf{r},t)}{\Psi_g(\mathbf{r},t)} + i\alpha \frac{\nabla \Psi_{em}(\mathbf{r},t)}{\Psi_{em}(\mathbf{r},t)}\right) = 0 \quad (14)$$

$$\mathbf{g}(\mathbf{r},t) = \frac{c^2}{P(\mathbf{r},t)} \nabla P(\mathbf{r},t) \quad (15)$$

$$\mathbf{g}_{em}(\mathbf{r},t) = \frac{i\alpha c^2}{P_{em}(\mathbf{r},t)} \nabla P_{em}(\mathbf{r},t) \quad (16)$$

where α is the fine structure constant, Ψ_g, Ψ_{em} are the gravitational and the electromagnetic space-time wave functions, which are identical with equivalent particle Ψ functions, and $(\mathbf{r},t)$ is a point of the hypothetical measuring field (HMF). Eqs. (12) describe Schrödinger's relativistic equations; Eq. (13) describes the energy conservation principle; Eq. (14) describes the momentum conservation principle; Eqs. (15,16) describe the gravitational acceleration of the (g) and the (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 [6]:

$$\frac{\partial x_{ig}}{\partial x_{iem}} = i\alpha \quad (17)$$

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

Minimum Contradictions Everything Geometry i.e. geometry of (g) and (em) space-time can be defined by means of Ψ_g, Ψ_g^*, Ψ_{em}, Ψ_{em}^* and their time partial derivatives[5].

Eqs. (12-14) describe any kind of energy and momentum interactions between the (g) and the (em) space to the whole extent of a system including its surrounding space. We don't know if this equation system can be solved since it rather refers to a fractal space [1]. However, we can get useful information for explaining gravielectric phenomena.

Gravielectric Phenomena Explanation

In a circle motion of a particle e.g. electron, an outside momentum is always required so that its momentum is continuously changing; this could take place through gravitational energy absorption which would imply a momentum interaction. Since electron's energy remains constant the energy absorbed should be radiated. This is compatible with Kozyrev radiation [8]. It is also compatible with electron's radiation as it has been described by C. Whitney [9]. Because of Eq. (11) the probability density $P_g(\mathbf{r},t)$ is function of Ψ_g, Ψ_g^*, and their time partial derivatives; the probability density $P_{em}(\mathbf{r},t)$ is function of Ψ_{em}, Ψ_{em}^*, and their time partial derivatives. Eqs. (12-14) show that the gravitational acceleration of the (g) space-time is interconnected with the gravitational acceleration

of the (em) space-time since they are functions of Ψ_g, Ψ_g^*, Ψ_{em}, Ψ_{em}^* and their time partial derivatives which, because of Eqs. (12-14), are interconnected. <u>Thus we might state that an electrical field creates a gravitational one and vice versa.</u>

The photon emission, because of energy level swift of an electron in the hydrogen atom could be due to gravitational energy absorption and not due to potential difference in proton's field; thus, the energy produced in various chemical interactions could originate from something material (matter space-time absorption) and not from a pure mathematical notion, as the notion of potential does [1,2].

On this basis we can explain the gravielectric thrust that appears in asymmetric capacitors [11-19]. In a moving charge within an electric field, the energy produced is due to gravitational space time energy absorbed; the force exerted is due to gravitational space time absorbed momentum change. In a moving electrostatic system, where there is no charge motion with respect to the existing field, the energy produced could be due to the gravitational space time energy absorbed while the thrust could be due to gravitational space time absorbed momentum change. If this is the case radiation might exist for energy balance. A gravitational field is created because of the existing electric field; this gravitational field can provide the energy and the momentum required. Most of the asymmetric capacitor systems described in [11-19] have been tested; however high thrust asymmetric capacitor systems are needed so that over-unity operation might be confirmed.

Discussion

On the basis of Thomas Kuhn's "The Structure of Scientific Revolutions", F. Müller has written that a new paradigm cannot constitute an evolution of an old theory [20]; there must be a new theory *i.e.* a new set of axioms commonly accepted. It is commonly known that basic target of modern physics is to find Everything Equations. According to this paper Everything cannot be precisely described. The only we can do is to approach A Minimum Contradiction Everything. However someone may notice the following:
Both (g) and (em) space-time are described by a complex space time wave function. The real component of such a function corresponds to an ideal (g) space-time while the imaginary component corresponds to an ideal (em) space-time. Thus, both (g) and (em) space-time can be regarded as result of a gravielectric oscillation. We reach to statistic interpretation of (g) and (em) space-time because of missing elements; (g) space-time can not exist without (em) and vice-versa. Thus the question is raised of whether a multi-dimensional space, including (em) dimensions or further measuring dimensions, can be determined when initial conditions are given. It is noted that a <u>measuring</u> dimension implies the existence of anterior and posterior which according to Statement I (Introduction) together with logic Λ lead to contradiction. Thus, in order to avoid contradictions the initial conditions should be out of spacetime or any other measuring dimension. If we where to find the truth i.e. to determine reality this truth should be able to be said, through a language which in turn requires "anterior-posterior". Thus, we can not determine Everything. There is a logical dimension which can reveal the visible to us order; there is also an illogical dimension which derives, not from a dogmatic metaphysical attitude but from something "logically necessary" since it is related to the seed of de-

cisions (initial conditions) which is out of space-time and it cannot be said because of our inadequate communication system. As long as we don't escape from this system the most consistent attitude is to consider space-time as stochastic.

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