"Basic Statements Required for a Minimum Contradictions Aether-Everything"

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Abstract
Any Physics theory is stated through the basic communication system. However, by means of a theorem, it can be proved that this system is contradictory; this theorem has similarities with Gödel's work -which is the basis for his theorems proof- and with Rosser's Theorem. Thus, a least contradictory physics theory can be stated only on the basis of a claim for minimum contradictions. According to previous work this physics describes a Minimum Contradictions Aether-Everything and it is compatible, under certain simplifications, either with Newtonian Mechanics or Relativity Theory or QM. A purpose of this paper is to present the basic points of the previous work and to prove a theorem and a statement required for a Minimum Contradictions Physics of Aether-Everything; a proof is given for the statement mentioned through Gödel's analysis this constituting a verification for theorem required validity. Another purpose is to state basic empirical-technological statements related to over unity effects which could be a substantial verification of this physics.

1. Previous Work [1-10]

From Aristotle it is known that the way in which we communicate and prove various statements obeys the rules of classical logic i.e. the propositional and the predicate logic[1,2,3,4]. For the purposes of this paper Classical Logic is denoted as Principle I or P_I. 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' Sufficient Reason Principle could be written in the following form[1,2,3,4]:

Principle II (P_{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 principles I and II i.e.;

$$\Lambda \equiv P_I \cdot P_{II}$$

It can be proved the following:

Theorem I: " Any system that includes logic Λ and a statement that is not theorem of logic Λ leads to contradiction."

In previous works efforts have been made to prove this Theorem; purpose of this paper is to prove it in a more integrated way.
On the basis of Theorem I the following lemma can be stated:

Lemma: "Any system that includes logic Λ and a synthetic sentence leads to contradiction."

The anterior-posterior axiom constitutes a synthetic sentence; however additionally can be proved that it is not theorem of Λ. Thus, the following can be proved:

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

where the anterior – posterior axiom is stated as follows.

Anterior – Posterior Axiom:
a. There is a physical state named Anterior.
b. If there is Anterior then there is a sequent different state named Posterior.

Our basic communication system includes logic Λ and the anterior-posterior axiom; in fact, in our language for everything we seek the reason of its power (P_{II}); we put a phrase after another phrase, a word after another word e.t.c. (anterior – posterior axiom). Thus according to Statement I it is proved that this basic communication system is contradictory. 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[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.
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 theorem I further axioms - beyond the ones of logic Λ - cause further contradictions. Therefore we can state:

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"* .

In order that such physics be valid, a unifying principle is needed, since everything, *i.e.* matter, field, and space-time, needs to be described in anterior-posterior terms.

<u>*In a first sight*</u>, for a least contradictory physics we can make the following statement:

Statement II: Any matter space-time system can be described in anterior–posterior terms.

It is noted that time implies the existence of anterior and of posterior; space does, too. If I say 10cm, I mean the existence of anterior-posterior measuring states corresponding to 1,2,3….,10cm Therefore, the existence of anterior and posterior is the condition for space and time to exist and *vice-versa*. Thus, because of Statement II, for a least contradictory physics we can state the following statement:

Statement III: Any matter system can be described in space-time terms.

Since everywhere there is space-time and not something else, <u>*Space-Time-Everything*</u> can be regarded as <u>*Matter-Aether*</u>. 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. Since space is also locally affected by the local rate of anterior-posterior, it can be expected to deform due to different rates of anterior-posterior. This means that time can be regarded as a 4^{th} dimension which implies Lorentz transformations and in extension a relativistic theory[1,2,3,4].

<u>*In a second sight*</u>, taking into account the above-mentioned, and applying the claim of the minimum contradictions, we conclude that <u>*Matter-Space-Time-Everything-Aether*</u> can have

logical and contradictory behavior at the same time; *this can be valid only if space-time is stochastic.* This is in contrast with the GRT; according to A.Pais, Einstein had said:
"I consider it quite possible that physics cannot be based on the field concept; i.e., on continuous structures. In that case nothing remains of my entire castle in the air, gravitation theory included, and the rest of modern physics"[5,6].

According to a previous work [7], statement III in combination with the claim for minimum contradictions leads to a Minimum Contradictions Physics of Aether-Everything. This physics can imply the principles of QM, and under some simplifying hypothesis (continuity of space-time), it can imply the GRT; of course without this simplifying hypothesis, it is in contrast with the GRT. On this basis, the hypothesis of the Quantum Space Time [8] can be mentally verified. The hypothesis of the quantum space-time i.e. of the *unified space-time-matter-field*, is based on *the unification of the physical meaning of the notions which derive either from the GRT or the QM*. According to the GRT, a particle field consists of a particle mass and a spacetime continuum which surrounds this mass. According to the QM, a particle field is described by means of a De Broglie matter wave, which includes the notion of a particle mass. Therefore, the following question arises: is an infinitesimal part of a field spacetime or is it an area which is described by a matter wave? If we want to achieve the unification mentioned, the following principle should be valid[7]:

"Any infinitesimal spacetime can be regarded as a matter wave".

We may notice that this principle is compatible with Statement III on condition that space time is stochastic.
Basic tool for minimum contradictions physics description is the Hypothetical Measuring Field (HMF)[7,8].

*As Hypothetical Measuring Field (*HMF) is defined *a hypothetical field, which consists of a Euclidean reference space time, in which at every point* A_0 - $(\vec{r},t)$ - *the real characteristics of the corresponding – through deformity transformations - point A of the real field exist.*

In a HMF, *we define as mean relative space time magnitude* $\overline{sr}$ *the ratio of the mean real infinitesimal space time magnitude* $\overline{ds}$ *to the corresponding infinitesimal magnitude* ds_0 *of the reference space time*: i.e. $\overline{sr} = \overline{ds} / ds_0$. This can apply to any magnitude as follows :
α) Relative time $\overline{tr} = \overline{dt} / dt_0$,
where dt is an infinitesimal time of comparison at a given position of the HMF.
b) *Relative length* in a direction $\vec{n}$ $\overline{lr}_n = \overline{dl}_n / dl_{n0}$,
where $\mathrm{d}l_n$ is an infinitesimal length of comparison in a direction $\vec{n}$ and at a given time of the HMF.

Concerning the notion of time we have the *internal time* of an infinitesimal space time element and the *sensible time which expresses an irreversible passage from an earlier to a posterior*. According to the spirit of this work:

"Internal time of an infinitesimal space time element is equivalent to its energy."

This can apply both to (g) space-time and to (em) space-time. The above statement with the aid of the HMF can be written as follows:

$$dE / dE_0 = dt / dt_0 \qquad \text{(a.)}$$

Eqn (a.) can be viewed in two ways:
1. when dt_0 is a unit of time, eqn (a.) describes the duration dt, with respect to an observer; this is compatible with the relativity theory.
2. When dt is a constant period of time in the HMF, then eqn (a.) can be written in the form:

$$dE/dE_0 = dt/dt_0 = (f/\nu)/(f/\nu_0) = \nu_0/\nu \qquad \text{(b.)}$$

where ν is the frequency of a periodical phenomenon of comparison and f an arbitrarily constant factor through which we can change the scale of ν, ν_0. If $\nu = 1$, ν_0 must be different in various points of the HMF. If this is the case we have:

$$dE/dE_{i0} = \nu_{i0} \qquad \text{(c.)}$$

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, eqn (c.) shows the way through which a field acts at various points of the HMF. Eq(c.) is valid also for stochastic space time. In fact, for a stochastic space time from eqn(a.) we obtain:

$$d\bar{E}/dE_0 = d\bar{t}/dt_0 = (f/\bar{\nu}_{eq})/(f/\nu_0) = \nu_0/\bar{\nu}_{eq} \qquad \text{(d.)}$$

where $\bar{\nu}_{eq}$ is a frequency which corresponds to $d\bar{t}$. For $\bar{\nu}_{eq} = 1$ we obtain $d\bar{E}/dE_{i0} = \nu_{i0}$ and so on. Thus, for the same equation we have the following correspodences:

$dE/dE_0 = dt/dt_0 \rightarrow$ observation (e.)
(Relativity Theory)

$dE/dE_{i0} = \nu_{i0} \rightarrow$ action (f.)
(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.:

$$E = h\nu \qquad \text{(g.)}$$

According to the above mentioned we can see that relativity and quantum mechanics have the same roots. The reason why they appear completely different is that space-time is stochastic which is in contrast to the point of view that space-time is continuum (relativity); the present point of view is different with QM as well because there is not a particle – matter field but a matter space – time formation.

Sensible time is closed to the notion "arrow of time" and it expresses a passage from (g) to (em) space-time[3,7]; see more in the Appendix A.

With the aid of the HMF minimum contradictions aether-space-time geometry can be defined by means of an equation system defining a Ψ wave function[7,8]; this geometry derives from the distribution of the properties of a flat relativistic space-time based on the probability density $P(\vec{r}, t)$ of Schroendinger relativistic equation; the validity of this equation can be proved. Aether-space-time as a whole has both gravitational (g) and electromagnetic (em) dimensions; the (g) and the (em) space-time coexist and interact. The electromagnetic (em)

space-time is a space-time whose all magnitudes are considered imaginary and behave exactly like the gravitational (g). Minimum Contradictions Aether Everything Equations are shown in Appendix A[3,7,10].

Minimum contradictions aether physics can be the basis for explanation of laws and of various phenomena that cannot be explained through a classical approach [3,7,8,9,10].
Thus, forces unification can be achieved, arrow of time, electric clusters stability, cold fusion and self-similarity of matter systems can be explained[8,10]. Beyond this the following are noticed:
According to the energy conservation principle, for a closed system, as resulted on the basis of "The Claim for Minimum Contradictions" we can reach the following empirical statement[10]:

Empirical Statement I: "During the approach of an electron with a proton there is absorption of gravitational energy".

As Empirical Statement we define a statement compatible with the theory proposed having a possibility to be verified through an experimental way. Thus a verification of an Empirical Statement will constitute a verification of the theory proposed and vice-versa.
Based on Empirical Statement I it can be explained why excessive heat is generated during the electrolysis of light water under R.Mills patent.
Because of Eqs(A.2, A.3) of Appendix A there is an interaction of the gravitational and electromagnetic field. Empirical Statement I is compatible with this view.
Since Empirical Statement I includes the meaning of "gravitational energy absorption" obliges to extend to the direction of momentum. A generalization of Empirical Statement I is Empirical Statement II:

Empirical Statement II: "A charge within an electric field is an area in which gravitational energy and momentum can be exchanged".

In a symmetrical field there is a mutual retraction which leads to a zero absorption of energy or momentum. Inversely, in an asymmetric system, momentum absorption is expected, meaning the development of force and in addition the absorption of gravitational energy. The above mentioned have been confirmed partly through the Frolov asymmetric capacitors. A final answer might be given through an explicit "Over Unity Effect" that has been proposed but not verified through a "Wavy Asymmetric Capacitor with Solid Dielectric and Zero Potential Casing"[9].

All these are based on two statements (Theorem I and Statement I) proving that the basic communication system is contradictory and on the claim for minimum contradictions. On this basis verification of Empirical Statements I and II is expected through an explicit "Over Unity Effect". Thus it might be constructive a question to the scientific community of whether these statements proof or verification is valid or not.

2. Proof of Theorem I and of Statement I

2.1 Symbols

For the purpose of this paper we use the symbolic logic *not only through the frame of the propositional and predicate logic, but through the frame of logic* Λ. Thus we have:

Principle I (P_I): The symbols of Classical Logic are used[11,12].

Principle II (P_{II}): This principle which expresses Leibniz' Sufficient Reason Principle[13] can be stated through the following statements.

$$P_{IIa}: \quad \sim prov_{\Lambda}(p,p) \tag{1}$$

This Principle states that it is not valid that statement- or set of statements- p can prove itself on the basis of logic Λ i.e. on the basis of a system including the classical logic P_I and the principle P_{II} .

$$P_{IIb}: \quad p \Rightarrow \wp \cdot prov_{\Lambda}(\wp, p) \tag{2}$$

This Principle states that if p is valid then statement-or set of statements- $\wp$ is valid so that p can be proved by means of $\wp$ through logic Λ .
Applying Classical Logic we have the following property of logic Λ .

$$prov_{\Lambda}(p,q) \cdot pov_{\Lambda}(q,r) \Rightarrow prov_{\Lambda}(p,r) \tag{3}$$

i.e.: if p proves statement-or set of statements- q (through Λ) and p proves statement-or set of statements- r , then p proves r .

Notice:
$prov_{\Lambda}(A,B)$ is not a simple logical proof of B through A ; it implies that:

$$\sim prov_{\Lambda}(A,A)$$

i.e. A can not prove itself.
Thus Pythagorean Theorem denoted as P can be proved by means of Euclidean Axiom denoted as E i.e.:

$$prov_{\Lambda}(E,P)$$

However we have:

$$\sim prov_{\Lambda}(E,E)$$

i.e. E cannot be self-proved and therefore is not a priori valid.

2.2 Theorem I: *" Any system that includes logic Λ and a statement that is not theorem of logic Λ leads to contradiction."*

Proof:
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 -according to P_I - that:

$$\Lambda \vee \sim \Lambda \tag{4}$$

which means that either logic Λ is valid or logic Λ is not valid. So, our consideration takes the widest credibility. Therefore, we can look into the following cases:

2.2.1. Logic Λ is non valid.
It is obvious that if a system includes Λ this system is contradictory since it must be valid Λ and $(\sim \Lambda)$ at the same time.

2.2.2. Logic Λ is valid.
If $R_{\Lambda 1}, R_{\Lambda 2}, ...R_{\Lambda N}$ are the statements-reasons for Λ validation, then, since any proof requires Λ, we will have that $R_{\Lambda 1}, R_{\Lambda 2}, ...R_{\Lambda N} \cdot \Lambda \Rightarrow \Lambda$. Since $\Lambda \Rightarrow \Lambda$, we conclude that Λ is valid due to Λ itself, and does not require any further reason. This is not in contrast with principle II, since in this case, Λ is regarded as valid, due to a hypothesis (case 2.2.2 instead of 2.2.1) .
We consider the system:

$$\Pi \equiv \Lambda \cdot p \cdot q \equiv \Lambda \cdot p' \tag{5}$$

We symbolize as Π_c the system Π when it is complete that is when the validity of p, q is due to Π_c itself. According to P_I we have:

$$\Pi_c \vee \sim \Pi_c \tag{6}$$

As long as Π is valid according to P_{IIb} it must be provable. Thus we will have.

$$\Pi_c \vee \sim \Pi_0 \tag{7}$$

that is either Π is complete (Π_c), or Π is open (Π_0) that is p, q are provable not through Π. Thus we have the following cases:

2.2.2.a. Π_c (Π is complete)
In this case p, q must be provable through Λ, p, q. Because of principle P_{IIb} we will have:

$$p \Rightarrow prov_\Lambda(\Lambda, p) \vee prov_\Lambda(q, p) \tag{8}$$
$$q \Rightarrow prov_\Lambda(\Lambda, q) \vee prov_\Lambda(p, q) \tag{9}$$

By hypothesis there is a statement of Π which is not theorem of Λ; let be p this statement. Thus we will have:

$$\sim prov_\Lambda(\Lambda, p) \tag{10}$$

Thus, because of statements (9,10,11) we obtain:

$$p \cdot q \Rightarrow prov_\Lambda(\Lambda, q) \cdot prov_\Lambda(q, p) \vee prov_\Lambda(q, p) \cdot prov_\Lambda(p, q) \tag{11}$$

both terms of right part express impossibility; in fact applying statement (3) we have:

$$prov_\Lambda(\Lambda, q) \cdot prov_\Lambda(q, p) \Rightarrow prov_\Lambda(\Lambda, p) \tag{12}$$

i.e. if Λ proves q and q proves p then Λ proves p; this is in contrast with statement (10). Working in the same way we have that :

$$prov_{\Lambda}(q,p)\cdot prov_{\Lambda}(p,q)\Rightarrow prov_{\Lambda}(q,q) \tag{13}$$

which is in contrast with Principle P_{IIa}.
Thus, because of statements (10,11,12,13) and since Λ is by hypothesis valid we have:

$$\Pi_{c}\equiv\Lambda\cdot p\cdot q\Rightarrow contr. \tag{14}$$

where by the term $contr.$ the existence of contradiction is symbolized. Thus because of statement (14) we can state the following :

Statement IV: " If logic Λ is by hypothesis valid, then any system that includes this logic Λ and a statement that is not a theorem of logic Λ cannot be complete and consistent at the same time."

2.2.2.b. Π_{0} *(Π is open-non complete)*

According to principle II(P_{II}), Λ and $p\cdot q\equiv p'$ must be provable through some valid statements different from them. These statements- reasons must be concrete final valid statements ; if there are not concrete final valid statements then there is not proof for p' validity and this in contrast with P_{II}. As was mentioned, Λ is by hypothesis valid.
According to P_{II} it is valid that:

$$p'\Rightarrow\wp'\cdot prov_{\Lambda}(\wp',p') \tag{15}$$

where $\wp'$ is the set of statements-reasons for p' validity. The system:

$$\Lambda\cdot\wp'\cdot p' \tag{16}$$

must be complete and consistent since it includes all related to p' finally provable statements. This system includes p' and therefore p ; thus according to statement I this system leads to contradiction; i.e.:

$$\Lambda\cdot\wp'\cdot p'\Rightarrow contr. \tag{18}$$

Taking into account principle P_{II} we obtain:

$$\Pi\equiv\Lambda p'\Rightarrow\Lambda\wp' p'\Rightarrow contr. \tag{19}$$

Therefore, in general, the system Π leads to contradiction regardless of whether it is complete or not; thus taking into account what was mentioned in case 2.1 and statement (19) we can state Theorem I since it is valid without any restriction for Λ.
On the basis of Theorem I the following lemma can be stated:

Lemma: "Any system that includes logic Λ and a synthetic sentence leads to contradiction."

The anterior-posterior axiom constitutes a synthetic sentence; however additionally can be proved that it is not theorem of Λ.

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

Proof:

We correspond numbers 1,2,…,x to various sequent states mentioned in the Anterior – Posterior Axiom. By S_x is denoted a state which corresponds to number x.
Because of the Anterior – Posterior Axiom we have:

$$(\forall x) \quad (S_x \Rightarrow \sim S_{x+1}) \tag{20}$$

i.e. if S_x is valid then no other state is valid and therefore state S_{x+1} is not valid as well.

$$(\forall x) \quad (S_x \Rightarrow \exists S_x \Rightarrow \exists S_{x+1}) \tag{21}$$

i.e. if S_x is valid then S_x exists; according to Anterior – Posterior Axiom if S_x exists then S_{x+1} exists as well.
Because of statements (20) and (21) we obtain:

$$(\forall x) \quad (S_x \Rightarrow (\sim S_{x+1}) \cdot \exists S_{x+1}) \tag{22}$$

The 2nd part of statement (22) is not always consistent; in fact $\exists S_{x+1}$ implies that it is possible for S_{x+1} to be valid which is in contrast with the statement $"\sim S_{x+1}"$. In extension the 1st part of statement (22) and therefore the Anterior – Posterior Axiom is not always consistent. Thus, the Anterior – Posterior Axiom is not compatible with Classical Logic i.e. with principle P_1; in extension this axiom is non compatible with logic Λ which includes principle P_1. Therefore we can state that *the Anterior – Posterior Axiom is not theorem of* Λ.
Applying Theorem I for systems including the Anterior – Posterior Axiom we obtain Statement I.

3. Gödel's Work

The dependable context which is based on the proof of Gödel's theorems is Aristotelian logic part of which is the propositional logic and arithmetic Peanno's Axioms(PA). Basic statement which is basis for Gödel's Theorems proof is:

Basic Gödel's Statement: "If formula G (Gödel's formula) can be proved, then its negation (~G) can be proved as well".

This implies that Peanno's Axioms (PA) are inconsistent; the inverse statement is not always valid and this implies that (PA) is simply w-non consistent.
However J.B.Rosser proved that if Theory T is an extension of (PA) (that is T can prove all theorems of (PA)) then there is a formula R_T so that following theorem is valid:

Rosser's Theorem: " If formula R_T can be proved, then its negation ($\sim R_T$) can be proved as well and vice versa".

On the basis of Basic Gödel's Statement and its corresponding inverse statement 2nd Gödel's Theorem can be stated[14,16]:

Gödel's 2nd Theorem: "A consistent system including Peanno's arithmetic cannot be complete".

It is noted that this Theorem was proved on the basis of the following:

Gödel's Hypothesis: "There is an algorithm that permits the derivation of only true statements"

.

Of course this hypothesis is arbitrary. According to Hillary Putnam, Gödel's second incompleteness theorem states that if a system 'S' of formalized mathematics – that is, a set of axioms and rules so precisely described that a computer could be programmed to check proofs in the system for correctness – is strong enough for us to do number theory in it, then a certain well-formed statement of the system, one which implies that the system is consistent, cannot be proved within the system. [15]. As Putnam noticed, this Gödel's theorem had been misinterpreted; Gödel's hypothesis has not been proved in spite of efforts made by Church, Schröter and others [17]. Roger Penrose investigated the 2nd Gödel's Theorem and, taking into account the fact that it is not valid completely in the form stated by Gödel, concluded that[16]:

Conclusion I: There is a part of our thinking which cannot be computational; this part could be investigated by laws of physics.

There are doubts that there is a possibility for non-computational thinking able to be investigated by the laws of physics to exist [15]; however, Penrose's conclusion completely takes into account what exactly has until now been proved [16].
It is noted that Statement IV can be regarded as a generalization of Gödel's Theorem [14]; this theorem requires, in order to be derived, Aristotelian logic (Mathematica Principia) and axioms that are not theorems of this logic (Peanno's axioms); besides, Statement IV requires the Sufficient Reason Principle (P_{II}) which has similarities with Gödel's hypothesis mentioned.
It is also noted that Statement I has similarities with "Gödel's Basic Statement" and J.B.Rosser's Theorem; there are similarities between Peanno's axioms and the anterior-posterior axiom as it is stated in this work.

4. Proof of Statement I on the Basis of Gödel's Work

The Sufficient Reason Principle, for a system including arithmetic, can be stated as follows:

Sufficient Reason Principle:
a. If something is true then it is provable.
b. G formula is true.

In fact Statement (a.) is immediate consequence of Principle P_{II} and includes Gödel's Hypothesis.
Statement (b.) can be regarded as Consequence of P_{II} since according to P_{II} nothing can prove itself; note that formula G states that it is not provable by itself. Therefore because of

(b.) formula G is true which implies, according to (a.), that G is provable; thus Statement I states exactly the same with "Basic Gödel's Statement". As was mentioned "Basic Gödel's Statement" is not inversely valid and this leads to w- non consistency of (PA). However in the case under study this inverse statement has not meaning because due to P_{II} formula G is always provable.

This proof constitutes a verification of Statement I which has been proved through a different way. This is a basic argument for Theorem I validity which is required in order that the Claim for Minimum Contradictions can be stated.

Appendix A [3,7,10]

1. Minimum Contradictions Aether-Everything Equations

A minimum contradictions space-time-aether field in general, behaves locally as a particle-space-time field; if we put:

$$\Box = \partial^2 / \partial t^2 - c^2 \nabla^2$$

the following equations are valid.

$$\partial_{xi} \frac{\Box \Psi_g(\mathbf{r},t)}{\Psi_g(\mathbf{r},t)} = 0\,, \quad \partial_{xi} \frac{\Box \Psi^g_{em}(\mathbf{r},t)}{\Psi^g_{em}(\mathbf{r},t)} = 0 \tag{A.1}$$

$$\partial_t \left(\frac{\partial_t \Psi_g(\mathbf{r},t)}{\Psi_g(\mathbf{r},t)} + \alpha \frac{\partial_t \Psi^g_{em}(\mathbf{r},t)}{\Psi^g_{em}(\mathbf{r},t)} \right) = 0 \tag{A.2}$$

$$\partial_t \left(\frac{\nabla \Psi_g(\mathbf{r},t)}{\Psi_g(\mathbf{r},t)} + \alpha \frac{\nabla \Psi^g_{em}(\mathbf{r},t)}{\Psi^g_{em}(\mathbf{r},t)} \right) = 0 \tag{A.3}$$

$$\mathbf{g}(\mathbf{r},t) = \frac{c^2 \nabla \left(\Psi_g{}^* \partial_t \Psi_g - \Psi_g \partial_t \Psi_g{}^* \right)}{\left(\Psi_g{}^* \partial_t \Psi_g - \Psi_g \partial_t \Psi_g{}^* \right)} \tag{A.4}$$

$$\mathbf{g}_{\mathrm{em}}(\mathbf{r},t) = \frac{c^2 \nabla \left(\Psi^g_{em}{}^* \partial_t \Psi^g_{em} - \Psi^g_{em} \partial_t \Psi^g_{em}{}^* \right)}{\left(\Psi^g_{em}{}^* \partial_t \Psi^g_{em} - \Psi^g_{em} \partial_t \Psi^g_{em}{}^* \right)} \tag{A.5}$$

$$\overline{tr}(\mathbf{r},t) = \frac{ic}{2h} \frac{\partial_t \Psi}{(\Psi \Box \Psi)^{1/2}} \left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right) \tag{A.6}$$

$$\overline{lr}_n(\mathbf{r},t) = -\frac{ih}{2} \frac{\Psi}{\Box \Psi} \left(1 - c^2 \frac{\partial^2 \Psi / \partial x_n{}^2}{\partial^2 \Psi / \partial t^2} \right)^{1/2} \left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right) \tag{A.7}$$

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. (A.1) describe Schrödinger's relativistic equations.
Eq. (A.2) describes the energy conservation principle.
Eq. (A.3) describes the momentum conservation principle.
Eqs. (A.4, A.5) describe the gravitational acceleration of (g) and (em) space-time at point $(\mathbf{r}, t)$.
Eqs(A.6, A.7) describe the mean relative time and the mean relative length in a direction $\vec{n}$ of (g) space-time; this can be extended to 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:

$$\frac{\partial x_{ig}}{\partial x_{iem}} = i\alpha \quad (i = 1,2,3,4) \tag{A.8}$$

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:

$$\Psi_{em}(\mathbf{r}_{em}, t_{em}) = \Psi_{em}^g(\mathbf{r}, t) \tag{A.9}$$

This is the reason why spacetime as a whole i.e. Minimum Contradictions Aether Everything can be described by means only of coordinates $(\mathbf{r}, t)$ of (g) space-time.
Eqs. (A.2, A.3) describe any kind of energy and momentum interactions between the (g) and the (em); on this basis we can get useful information for explaining gravielectric phenomena.

2. Conservation Principle – Notion of Time Flow

In a closed system regarded as a whole, the energy conservation principle can be applied as follows:

$$\overline{E}_g + \overline{E}_{em-g} = \text{constant} \tag{A.10}$$

where $\overline{E}_{em} = i\overline{E}_{em-g}$ and the dash ($\bar{}$) indicates the mean value.
If the closed system of Eq. (A.10) is the Universe and the constant is zero, we have another point of view for the creation and the evolution of Universe; it can be proved that $\overline{V}_g \uparrow \Rightarrow \overline{E}_g \downarrow$, where $\overline{V}_g$ is volume which contains energy $\overline{E}_g$; thus, the expansion of Universe implies a continuing irreversible conversion of $\overline{E}_g$ into $\overline{E}_{em-g}$ and - as was mentioned in the text (previous work) - because of equivalence of energy and time[3,7,10] an irreversible conversion of (g) into (em) time which can be regarded as related to the arrow and the flow of sensible time [18].

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