The Quantum Electromagnetism and Gravity Waves in Inflective Spaces with Topological Transformations of De-formations and Re-formations: Designing an Elementary Particle

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Abstract

The gravity waves, electromagnetic waves, and the most primitive elementary particle creation processes from completely null space are built by using the topological presentations, TPs with both event independent approach, EIA and process independent approach, PIA. The creation of gravity waves are explained by a building mechanism with the self-capability of elementary sets of thing spaces from single point spaces as a many-sided self-optimization process of the degenerations in single point space structures. The reason of invariancies are explained. The time is explained as a process dissipating an energy ingredient. Deriving the equations for waves and particles from the TPs and time energy in inflective spaces are worked for above said purposes.

1 Introduction

The study in this paper is on the fundamental topological processes applicable to processes creating electromagnetism, gravity, and elementary particles from null space, NS. The fundamental topological principles of event independenntness, FTPoEI are presented with an approach different than the perspectives in open literature in [1]-[3]. According to FTPoEI approach every process, P, has topological presentation, TP to have capability for appearing in their domains. These TPs may not be in forms of known mathematical equations, but they are in forms arranged with curves and surfaces functionally related to each other in a scheme being constituted with a structure in a stabiling state that has been harmonized according to every observer in all directions. Every P, builds coming into being themselves up by the leading of the formation of that scheme and partially improve themselves according to this scheme. The functioning of this scheme is spontaneously assembled with an optimization process, OP. This OP is a control and command mechanism that involves all assembling, directing, and inspecting by itself until the aim of that P, is constructed. That OP passes into the place of self-optimization as a leading process after the construction could be finished. We call many-sided optimization, m-sO the concept of stabiling state that has been harmonized according to every observer in all directions. The m-sO constitutes building P, in its aim, A, from every direction according to every observer even if it is not built yet. We call a Process of an Aim, PoA all types of Ps said above. The ingredients of any PoA are members of T,S birthed from a sPS in a NS [1]-[3]. The principal elements, PrEs of the set defining the mechanism in the structures for any event of any P, are correlated with measurable sets, MSs for the each of interaction processes in PrEs group according to the principal axiom of pure existence given at §5 in [1]. Each MS has ingredients of the measures, MRs, depending on some activities among PrEs in the T,S of PoA. The system of the PoA arranges some acts to make the T,S reaching to its aim. We call activity, Act, the MRs of these arrangements. The Acts are put the scheme of events in PoA. The independence of the MRs on the Acts is defined with suitable topological transformations, TTs and Measure Functional, MF defined from MR and Act with the equation (5) in [1].

The sPS flits between P and P* according to the concavity effect in topological universes as explained in section 4 in [2]. There are momentary passes of both inwards-to-outwards and outwards-to-inwards. The appearance of this activity is like a pulse of light. These flicks incarcerate T,S [2]. The sPS construes this flicker activity as a push/pull, p/p effect, E[p/p] [3]. The flicker activity is the determiner of universal invariants in the physical process, P, of both gravity and photon created by the Topological Processes, TPs [1]-[3]. Let the occurance of event E pushes the occurance of event F and alternatively, let the occurance of event F pulls the event E. Then the events E and F are correlated to each other with p/p effect.

2 The Reality of Aiming the Time

All things, beside peoples live in the dominance of (e, n, p) that is equivalent to the triplet (-, 0, +) governed in the environ of (Energy, Photon, Frequency, Momentum) quartet. The first marker of the quartet involves all category of energy ingredients, i.e., electromagnetic, heat, pressure, etc. The second marker forms the most primitive and primary ingredient of building the physical universe, PU [1]-[3]. The quartet meshes a spatial topology in the PU. All the events fill a database listed in order. That order creates our time concept designed as arranging an array in a sequencing coordinate in Euclidean space. That sequencing coordinate changed to a dimension with Schwarzschild metric in Riemannian space. The self-occurrence approach to PUs forms the ordering reality, RoA of time as fitting to the energy marker in the quartet for initializing the environ realizing the PU. The RoA of aim, RoA interprets the ordering reality of time concept as an ingredient generating a process dissipating
an energy. This RoA brings the question below:

**Question 1 (Reality of Aiming the Time, RₐT):** Is the time a dissipative energy?

**Experiment 1 (Loosing and re-gaining process for distance- The walking reality experiment):** If some time passed then we cannot gain it again (the Passed Time, [TPT]). Let us consider walking a distance L in a convenient path and measure the time we spent, say [TPT]. We walk back the same path spending time of [TPT]. If we walk a distance L then we can walk back so we may re-gain the distance L. At the first stage of walking event, we begin in a path with distance L as in front of us. At the second stage of event order the path with distance L stays at our back. The path is still behind of us, but domain is same in 1st and 3rd stages according to the coordinate lines directions. This situation is comprehensible as a re-gaining process for distances in the Rₐ of PU. The state of the path and L is the same at 1st and 3rd stages but the markers of time are different: the [TPT] at 1st stage but [TPT]@[TPT]=[TPT]@[TPT] at the 3rd stage. We can gain a spatial loose, but we may not re-gain a temporal loose. In classical approach, CA we put t instead of [TPT] and write t₁+t₂=t₃ instead of [TPT]@[TPT]=[TPT] in there [TPT] corresponds to an energy ingredient while t corresponds to an ordering sequence parameter in event process and assigned to the span between consecutive elements in that sequence.

**Principle 1 (Un-preservability of time):** The spatial processes may be conservable but temporal processes may not be conservable.

**Result 1:** (a) Temporal events are dissipative processes therefore temporal realities are energy ingredients. (b) If there is some time spent then at least one thing exists generated by the dissipation of an energy ingredient, say time energy $T^t$ that corresponds to the time span, say $t^t$.

**Question 2:** (a) What are the amounts of the $T^t$ and $t^t$ corresponding to each other? (b) Can any kind of energy, i.e., heat, electromagnetic, pressure, etc, be transferrable to $T^t$?

**Experiment 2 (Loosing and re-gaining process for volume- The compressing-decompressing reality experiment):** Let us re-arrange the experiment 1 for a vacuum volume in a piston instead of path distance in walking exercise. Let us begin with a volume of length L in a circularly cylindrical piston at a thermodynamical equilibrium state. The distance $ΔL$ is lost at the piston rod side by pulling the piston rod. The $ΔL$ is re-gained at the piston rod side by pushing the rod. Let us compress the volume V. If the pushing force of the piston rode is not prevented, that means it is not pushed back in somehow, then the volume V keeps a packed energy. This packed energy is a T₂ in Tₛ. The reverse exhausts the energy doped (embedded) in V so the T₂ is pushed to Y₂.

If there exists nonexistence, only then there is not any particle, any energy, besides, the time does not exist in their classical approaches. The construing processes of a sPS for its inwards and/or outwards may be transformed to an energy mapping, topologically, therefore the TT of construing process of a sPS may be defined as an ingredient of energy, say kinetic-like energy equivalence for outwards and potential-like energy equivalence for inwards in the topological space of mapping of inwards/outwards Acts of sPS, say $[\text{owsAct}_{ows}]$. The inwards/outwards Acts of sPS may be transformed to coordinate differences $d^2$ and/or $d^3$. There is a single but binary state for $[\text{owsAct}_{ows}]$ that is 1ws and/or 1os, only. The coordinate differenting for TT of $[\text{owsAct}_{ows}]$ differs from ordinary differentiating due to the singularity coming from binary nature of the process so we use $d_\theta^2$ and/or $d_\phi^3$ instead of $d^2$ and/or $d^3$ and call binary differential $d_B$. The self-construing process of sPS for itself is an Act connected to $t^t=(1ws)\epsilon_{ows} \oplus (1os)\epsilon_{ows}$ in the TT domain topology of sPS, say $[TTsPS]$. The 1ws and 1os are the states for inwards and outwards Acts of sPS, respectively. The $\epsilon_{ows}$ and $\epsilon_{ows}$ are the unit vectors directing the 1ws/ows Acts of sPS in $[TTsPS]$.

### 3 Formations of Elementary Particles

The principle below relates the gradation and degradation processes between distinct states of Pₛ between NS and Tₛ. Let Yₑ and Vₑ be Tₛs in NS and Tₛ, respectively.

**Principle 2 (The most primitive principle of degradation and/or gradation processes):** The $V$ₑ becomes a $P$ₑ with a pushing effect of the $Y$ₑ to pass itself outwards by itself. The $V$ₑ pulls the $Y$ₑ because of asking to return to its original state through the p/p effect process.

The most primitive object in the Pₑ of $V$ₑ appears and then disappears due to the degradation into the Pₑ of $Y$ₑ in microcosmic MR. Sequential gradation and degradation processes may catch other $V$ₑ′ graded from another $Y$ₑ′. The $V$ₑ pushes $V$ₑ′ and then $V$ₑ′ pushes $V$ₑ as an appearance of push/pull between $Y$ₑ and $V$ₑ from Pₛ. The gradations of $V$ₑ′, $V$ₑ′′, and etc., are increased the effect of pulling among members of $V$ₑ totally; therefore, degradation of $V$ₑ becomes very rare because $Y$ₑ$\otimes Y$ₑ$\equiv Y$ₑ′′, always. If the quantity of $V$ₑ becomes increasing up to infinity then $V$ₑ cannot be degraded into $P$ₛ of $Y$ₑ′′ domain and $Y$ₑ′′ cannot be graded into $P$ₛ of $V$ₑ′′ domain any more. This condition removes the disappearance the $V$ₑ and generation of $V$ₑ′′ from $V$ₑ after all. If there are two collections of $V$ₑ′′, only, close to each other then they will appear as pulling each other because of both $V$ₑ and $V$ₑ′ pull $Y$ₑ. There are a single pulling effect but a pair of pulling effects in this case in $P$ₛ of $Y$ₑ′′ domain. This situation generates isolated two $V$ₑ′′ in $P$ₛ of $V$ₑ′′ domain and the effect between them changes to pulling effect because they will remember and call their original state in their history. We denote the result of $F^{pp}$ as $F^{pp}$ and call forcing force. The residue of tendency to return into $P$ₛ of $Y$ₑ′′ domain is construed as gravity.
4 The Design of Gravity Topologies

A point itself in a topological space, TS is a complete space at its inside. This complete space is schemed in two forms: i) structured with a topology and/or ii) unstructured topologically; this means any topology is not formed in this space yet. The interface point, PI of two neighbor point spaces is an imaginary point. If we separate two neighbor point spaces PSs and PS1 from each other, then this interface point is vanished or cancelled or removed from P. The PI in here is something like the pseudo-germ of the point in a Riemannian geometry. An isolated Single Point is a space by itself. We call Point Space, sPS this single point either it is isolated, and/or it is not isolated from the other single points [1]. There is infinite amount of principal directions for any sPS. Our perceptions can detect only three of them but a fourth of them is derived from three of them with evaluations and measured by devices fabricated according to the algorithm of these evaluations. The specific coefficient in these evaluations is known as time and it makes our understandings of P,e,s easy more than models excepting the concept of time; therefore, adding principal dimensions more than all three spatial directions are dimensions imaginarily embedded into our model for construing the events, but do not come from the true P. This is a half-to-half proof of the availability of gradation and degradation of TSs of Vc from entities of Ye by a construing algorithm. This algorithm designs Gravity Topologies, GTs. The pseudo-coordinate of time is removed by the use of Result 1 in §2 and time energy in §6.

Result 2: (a) There are sPSs more than one in a T1S, always. (b) There are more than one alternative PS, PSs in-to-in an PSs, always.

If an PS is degenerated, then the new PSs occur to make compact and preserving the PSs on PSs structures [1]-[3]. If a PS is degenerated, then new PSs occur to make compacting and preserving the PSs to hold the PSs as existed for both Vc domain and/or Ye domain. The degeneration of both PSs and/or PS involve accompaniment both PSs and/or PSs. While a PS builds a TS there is not any condition restricting and/or preventing the penetration of PS and/or PSs in each other. The reason of this situation comes from they are not different members from each other since any topology on both PS and PSs is not designed yet. Building process in there goes together a topology that the occurrence of the process sketches its mesh structure. A control mechanism begins to work when the process of building TS finishes. PSs cannot penetrate in PSs after the control conditions are processed at near environ of PS but if an PS succeeds to penetrate in a PS it pulls other PSs in PS to build new PSs, this creates T1S in the PS.

Definition 1 (The Purest Dust): We call purest dust, pD the 1st T1S coming into being at the earliest formation stage of T1S from NS. The purest dust, tPD is the 1st initial T1S iff there exists available one. The collections of pDs are Pure Dusts Family, pDF.

If the first T1S that is de-generated from a sPS with Topological Perturbations, TPs by itself, then the deformations in sPSs continue until a topology is performed that is controlled by the community of first T1Ss. T1Ss create themselves from NS as ensuring the total MR of NS stays the same at early stages of gravity in T1Ss. These most primitive T1Ss are entities of Pure Dusts Family, pDF. A T1S comes into a P, like a sPS incarcerated into a topological form. The fundamental ingredients design the elementary particles in PSs. When a fundamental particle incarcerated in a T1S it perturbs the topological structure of T1S around itself in all.

Example: Not only the mass but a photon too deforms the topology of the space around itself according to E=mc² activities. Act is to construe something like energy by NS. The independence of MR on the Acts obeys the rule of TTs that brings principal pseudo-direction time as time energy, T² into Vc.

The MR defines known constant h given by Planck and construes the invariance of speed of light, c in environ detectable by us as shown in equations (1)-(2):

\[ h = E_p \times (1/T_\tau), \ c = h \times (1/M_{ph}) \times (1/T_\tau). \]  

\[ \lim_{sPS \to ph} (E_{PS}/M_{PS}) = (T_1)^2 \cdot c = \text{constant}. \]  

The E, M, and T are energy, momentum, and period and indices ph and L are photon and light, respectively. The reason of invariance is L’Hospital’s rule applied in equation (2). The purest dust, PD or pDF forms the space around themselves that they are construed as appearance of pure illumination only by the outwards T1Ss; i.e., there is nothing except illumination, i.e., there is not any source of this Act. The words typed bold and italic are concepts defined into physics first here as explaining the formation steps of P. The equation (4) below generates the formation of zero Acts, i.e., like zero-energy, having non-zero TTs and these TTs are irreversible as being proved in (3)-(5):

\[ \{TT \ of \ E/M \} = \{TT \ of \ 1\}. \]  

\[ TT^{-1}[1] = 0. \]  

\[ TT^{-1}[1] = TT[0] = TT[1] \equiv 1. \]  

Entirely good construing P3 depends on evaluations of formations, de-formations, and re-formations in P, with topological structures designed in inductive operators.

5 The Designing Elementary Particles

The de-formations at the sPSs of a NS create the T1Ss. These de-formations are self-designed with TTs. The independence of the MRs on the Acts is defined with suitable TTs. The PS activity is construable iff the TTs of both NS and PS are supplying equation (6) below because of section 5 in [1], where NS is Null Ball:
The NB is an ingredient of NS and has MR zero. If a MR except zero is related to a sPS then we call Point Ball and illustrate with PB. Every NB has ingredients from two PBs at least so that equation (7) below is supplied, where MRs of PB\(^{-}\) and NB are equivalently identical:

\[
\text{MR(NB)} = \text{MR(PB)} \oplus \text{MR(PB)} \oplus \text{MR(PB)}.
\]

(7)

The ingredients PB\(^{-}\) and PB\(^{+}\) meshes topology of T\(_{\text{S}}\); hence, a P\(_{\text{p}}\) begins to form. We call pins these MRs. The PB\(^{-}\) and PB\(^{+}\) has TTs with presentations in Dirac’s \(\delta\) distribution and TTs defined in equations (6)-(7). We call re-formation from de-formation these TTs.

5.1 The Physical Presentations from TTs

The wave functions in circularly cylindrical inflective sPSs are given with circularly inflective series seng(x\(\text{c}^{2}/p\)), s\(_{c}\)(x\(\text{c}^{2}/p\)), and T\((\text{i}\cdots\text{s})\)\(_{c}\)(x\(\text{c}^{2}/p\)) [1]-[4]. TTs come from these solutions. The Act of sPS expanding the sprig to PB\(^{-}\), PB\(^{+}\) and PB\(^{+}\) meshing topology of T\(_{\text{S}}\) is worked in inflective space. We call inflective sphere the form of sprig. The inflective surface is definition of continuous collections of inflective points. It is derived that PBs have forms of sub-structures of subatomic ingredients in P\(_{\text{s}}\). The pins are evaluable by TTs of Legendre’s Functions’ decompositions [1]. Both occurrence and formation Acts obey inversion of Act scheme.

6 The Time Energy and Time Span

The measure of time span second has the definition of 1 s=9192631770\(\Delta\gamma_{\text{cs}}\) in atomic clock where \(\Delta\gamma_{\text{cs}}\) is cesium hyperfine frequency [5]. On other hand s=Wb/V in electromagnetically equivalence scheme, i.e., 1 second corresponds to the 1 unit of magnetic flux passing 1 unit of electrical potential difference; therefore, the \(t\) is construable as working on a flux dissipating a potential difference. The \(\mathrm{w}_{\text{e}}\) and ows Acts of sPS may be projected as a flux and construing process may be transferred to a potential scheme. The \(T\) gains physical realizability by doing above said projection and transferring. The \(\mathrm{w}_{\text{e}}\) Act and ows Act correspond to state potential, \(S\) but it must be emphasized that the state potential in here is not the known potential states in atomic orbit and there is not a resemblance between these two terms. The potential in \(S\)\(^{+}\) interprets the construing process in sPS Acts so it may be thought like construing potential or construing ability, more precisely. The ability is projectable to some kinds of energy, power, potential, etc. As a 1\(^{\text{st}}\) step, let us begin with considering kinetic energy, \(E_{k} = (m/2)v^{2}\)\(\cdot\) where m is mass, \(v\) is velocity vector, and \(v \ll c\), in classical mechanics applying the above said approach. We get below projection for temporal speed variation \(\dot{t}\)\(^{+}\) by using \(\dot{v} = \partial \vec{v}/\partial t\)\(^{+}\) and \((d_{B}S)^{2} = (d_{B}x)^{2} + (d_{B}y)^{2} + (d_{B}z)^{2}\):

\[
(d_{B}t)^{2} = \frac{m}{2k}(d_{B}S_{t})^{2}.
\]

(8)

The equation (8) gives the temporal acceleration below, where \(\partial /\partial s_{t} = \frac{\partial s_{t}}{\partial s_{t}}\cdot \text{grad}_{x_{t}}\) and \(s_{t}\) is \(\mathrm{w}_{\text{e}}\) and ows:

\[
\frac{d^{2}}{d\tilde{t}^{2}} = \frac{2h}{m} \frac{d^{2}}{d(s_{t})^{2}}.
\]

(9)

Result 3: (i) The \(t\)\(^{+}\) corresponds to a distribution with the density of mass per energy in unit spatial displacement.

(ii) The time energy \(T\)\(^{+}\) corresponds to a mass distribution in an energy packet with the density of \((2E_{k}/m)^{-1/2}\) at a spatial displacement process.

If we place (9) in D’Alembert operator, \(\Delta - \partial^{2}/\partial (ct)^{2}\) then we get equations below for generation processes of particle and/or photon in a wave packet from a sPS in nonrelativistic case, respectively, where \(\Delta_{h}\) is Laplace’s operator written with \(d_{0}\) and \(\Psi\) is an eigenfunction:

\[
\Delta_{h}\Psi = \left(\frac{\partial}{\partial y}\right)^{2} \frac{\partial^{2}\Psi}{\partial(s_{t})^{2}} = 0.
\]

(10)

\[
\Delta_{h}\Psi = \frac{\partial^{2}\Psi}{\partial(s_{t})^{2}} = 0.
\]

(11)

The solutions of (10)-(11) in inflective spaces are worked.

7 Conclusions

The P\(_{\text{s}}\)s for elementary particles, gravity, and QED are built by using TPs with an event and process independent approach. The P\(_{\text{s}}\) given with wave equation are derived from TPs. The invariance mechanisms are proven with TTs. The reason of gravity is explained. The TPs building elementary particle, gravity, and electromagnetism from completely NS are given with single TT and unique P\(_{\text{p}}\).

References


