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The Spontaneously Fields and Wave Propagation Providing the Possible Self-Sourced Variations and the Most Elementary Structures: The Inflective Photon, the Vortex Photon, and the Sourced Photon with the Torsionally Inflective Spaces and Coordinates

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Abstract

The torsionally inflective coordinate systems family is developed. The wave propagation is evaluated in the torsionally inflective circularly cylindrical coordinate system. The topic is applied for developing the sub structures in the photon. The sub structure is configured with three infinitesimal torsional inflectors join at their common inflective points in a photon. The flows are calculated with the paths of sub structures for a photon from the canonically leading equations of motion with the modifications for the time energy.

1. Introduction

This contribution comes from evaluation studies of the specific questions while *Topological Scattering Model for Unified Particle Interactions*, *TSMfUPIs* [1] was prepared when it goes to consider the universally physical and surface topologies related to those problems for developing the *Physical and Surface Theory of Everything*, *PASTET* in the *TSMfUPIs*. The specific questions involve some discussions about a priory primitive principle: (a) What there is inside the electrical charge doublet? (b) What there is inside the photon singlet? (c) etc. The answers come from the use of torsional and inflective structures. The discussions give the developments of the inflective [2-8], the torsional [9], and the torsionally inflective spaces, coordinates systems' families and the fields and waves related to the topologies on these coordinates and spaces [2-9].

The physical laws are built for relating to the photon behaviors by considering three infinitesimal inflectors [2] as the ingredients of a photon. The folding frequency contributes the creation phases of sub-atomic, sub-sub-atomic structures of these inflectors. The approach collects the photon in three categories: (a) The inflective photon, (b) The vortex photon, and (c) The sourced photon. The inflective and torsional flows open a way to discuss the possibility of the simplest particular topological mechanism for both the intelligence and the memory able processes embedded in the physical laws. The photon center is at the inflection point. The inflective photon uses the L^{left} and L^{right} parts of the inflective curve as arms providing its movement. The Author calls central photon both photon center and inflection point. The parametric equations are L_{ϕ}^{inf}, L_{θ}^{inf}, and L_{ϕ}^{inf} of the inflective path L^{inf}, that the Author calls the elevator path, the circulator path, and propagator path, respectively.

2. The Torsionally Curved Inflective Paths

The torsion $\tau^{inf}(s,P)$ applies around tangential line on a curve while the point P moves in the positive direction of s on the curve $L^{inf}(s)$ involving an inflection point P^I, continuously, at $\forall P \in L^{inf}(s)$. If the circularly cylindrical continuously torsional coordinates [9] are in use as coinciding the axis-z to the tangential lines at $\forall P \in L^{inf}(s)$ in here, locally then this simultaneous inflection and torsion scheme translates to an axial torsion on the right-handed orthonormal moving trihedron of the triplet $(\vec{t}, \vec{b}, \vec{n}^*)$ on the inflective path $L^{inf}(s)$ (see Figure 1.).

The torsionally inflective events are in two categories according to the torsion axis for the rational cases: 1. The torsion axis is tangential to the inflective path at every point of the path. 2. The torsion axis is a straight-line passing from the inflection point. The 2nd category involves two

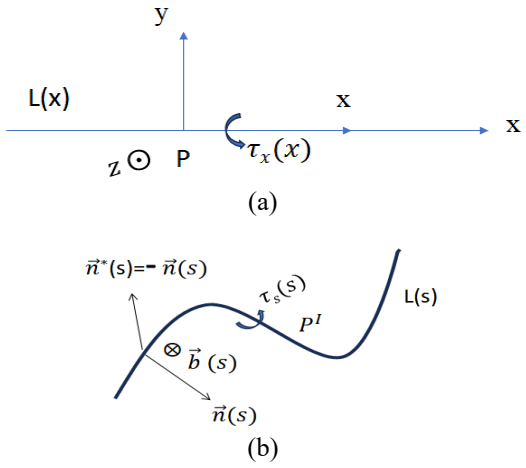

Figure 1. (a) The torsional straight-line L(x). (b)The torsionally inflective structure: The torsion $\tau_s(s, P)$ applies around the tangential line on $P \in L(s)$ while the point P moves in positive direction of L(s) involving an inflection point P^I.

categories: (a) The straight-line coincides to the axis of the L^{inf}; i.e., the axis-x, axis-y, and/or axis-z in Figure 2. (b) The combinations or unifications of the cases in the category (a).

2.1 The Torsionally Inflective Spaces and Coordinates

The modifications are studied on the circularly cylindrical inflective coordinates [2-8]. The modifications are about the method in [9]. The inflective coordinates are designed according to the coordinate direction $\vec{t}$ with the guidance of the moving trihedron. The circularly cylindrical torsionally inflective coordinates system is discussed for the source distributions in section 3 below. The flows are calculated from the *Canonically Leading Equation*s, *CLE*s of motion with the modifications for the inclusion of the time energy term [10].

3. The Torsionally Inflective Structures

The spontaneous flows occur toward the concave sides from the convex sides of the structures involving the inflective and/or the torsional paths and both of these paths. The flows do not define any source for those categories of spontaneous flows as an initial condition; unfortunately, the continuity needs at least one inclusion of the specifically additional conditions and/or building of the principally additive singularities for those spontaneous flows. The principally additive singularities create the sources for continuous flows. The specifically additional conditions build scattering structures as the environment for propagation abilities. The last category is the sourced flows. The sourced flows give the sourced photon propagations, those are discussed in the section 4.3 below.

4. The Torsionally Inflective Filamented Curves

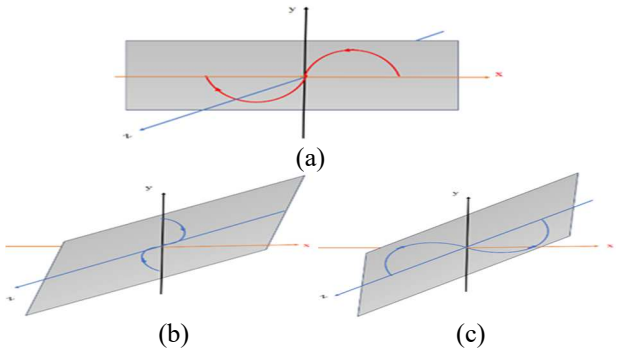

Figure 2. (a) ${}^{xy}_{p}\mathrm{I}^{rl}_{x}$:The inflector photon x to the left side from the right side. (b) ${}^{yz}_{p}\mathrm{I}^{rl}_{y}$:The inflector photon y to the right side from the left side. (c) ${}^{yz}_{p}\mathrm{I}^{rl}_{z}$:The inflector photon z to the left side from the right side.

The contribution includes the solution of wave propagation problems involving the sources distributed on the inflective and torsional paths in this section. These sources are in Figures 2 and 3.

4.2 The Vortex Photon

The *Vortex Photon*, V^xP involves 2 *Torsional Inflector*s, *TI*s in 2-dimensional space and 3 *TI*s in 3-dimensional space. The Author calls the *Surface* V^xP, SV^xP and the *Volume* V^xP, VV^xP the 2-dimensional V^xP and 3-dimensional V^xP, respectively. The VV^xP and SV^xP are in Figure 2(a) and Figure 2(b), respectively.

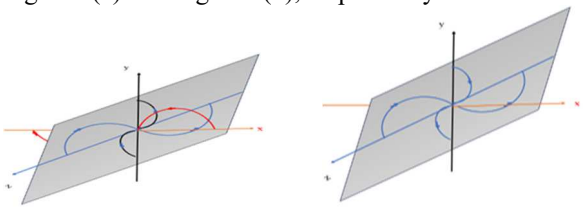

Figure 3. (a) ${}^{xyz}_{p}\mathrm{V}^{rl}_{xyz}$:The volume vortex photon xyz to the left side from the right side. (b) ${}^{yz}_{p}\mathrm{V}^{rl,lr}_{yz}$: The planar vortex photon yz to the right-y side from the left-y side and to the left-z side from the right-z side.

4.3 The Sourced Photon

The principally additive singularities create the sources for continuous flows. The sourced photons have paths providing the inclusion of specifically additional conditions and/or building of principally additive singularities for those spontaneous flows in sections 4.1 and 4.2.

5. The Applications

The process is developed for absolutely non-reflect ability structures for single photon propagation. The evaluation gives the principle below:

Principle 1 (*The Absolutely non-Reflect Ability Principle, AnRAP*). The process provides absolutely non-reflect ability boundary layer for single photon if and only if that boundary layer throws specific vortex photon.

5.1 The Self-Control and the Self-Memory Algorithms Embedded in the Photonic Principles and Rules

The vortex formed inflectors, those are joining at their common inflection points provide a topological form suitable to define and design both dynamic and static memory categories involving multi-decision phases. Three infinitesimal inflectors join at their common inflective points to create the topology of a self-memorable and self-decision element as the *Switch Distributed Parameter Circuit Memory Bundle*s, *SDPCMB*s involving the 3 categories below:

1. The *Switching Distributed Parameter Circuited Memory Bundle*, *SiDPCMB* provides possible dynamic memory.
2. The *Switched Distributed Parameter Circuited Memory Bundle*, *SeDPCMB* provides static, steady, and/or standing memory.
3. The *Switchable Memorable Distributed Parameter Circuitry Bundle Network*, *SwMeDPCrBN* is collections and unions of *SiDPCMB*s and *SeDPCM*Bs and provides the topology for the *Decision-Making Chain* Complexes Embedded in Field and Wave Forms, *DMCC*sEiFWFs.

The specifically meshed spontaneous complex field and/or wave forms' chains, that involve simple communication and intelligence gate mechanisms, open a topological scheme for neronalitic transmission and the *Decision Distributed Parameter Circuit Bundle Sample*s, *DDPCBS*s, those are embedded in their natural physical structures, spontaneously. These *DDPCBS*s are in the forms of *SDPCMB*s. The *SeDPCMB* chains generate memory related buildings. The *SiDPCMB* chains create the memory and decision related structures embedded in the topologically natural structures of the physical universes. The complexes of *SwMeDPCrBN*s design spontaneous intelligence with their selves' complete topological mechanisms so we get the *Universal Spontaneously Intelligence Principle*, *USIP* below [11-15]:

Principle 2 (*The Universal Spontaneously Intelligence Principle*, *USIP*). The simple union opens the understanding a self-dynamic wave-like design formation topology of spontaneously reconfigurable *SDPCMB* structures involving decision algorithmic logical-like gate mechanisms, embedded in the field and/or wave forms topology.

Result 1. The ingredients are in the forms of SDPCMs of the memory and the decision related naturally physical structures spontaneously embedded in the topological structures for the physical principles, laws, and rules of the physical processes.

6. Conclusions

The torsionally inflective coordinates systems family is developed involving both of the inflection and the torsion structures. The torsionally inflective circularly cylindrical coordinates system is given. The weighted torsionally inflective coordinates are defined providing the separable solutions of the wave equation. The solutions are given with the modified extended and the modified expanded separation methods for the wave equation related to the torsional and inflective source distributions. The solutions involve the inflective and torsional structures for the wave related boundary value problems. The torsionally inflective schemes are discussed for rotational and inflective trajectories around temporal axes for both the time energy and the time span.

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