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Atomic Quantum Galvanomagnetism Theory

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Abstract: The establishment of galvanomagnetics properties inside the atom takes place here, giving sense, on axiomatic form, to a part of these properties. Some concepts are readjusted: quantum gravity is corrected and replaced by its real significance, and the atom pieces are identified through different quantum paths, among other things.

Keywords: Quantum mechanics, gauge theory, quantum field theory, quantum gravity, fluidity.

SUBJECT CLASSIFICATION

Mathematical Physics

Contents:

1. Introduction

In physics, sometimes they exist different forms to study the same things, depending on the perspective than we have used. These associations, in general, follow a concrete discipline and it helps to go forward than the precedents ways. This is the case, in a very schematic form, of the quantum mechanics. From the ambiguous denomination "quan-tum physics" we established an unsurmountable distance between the quantum field theory and the classical physics, which is not real. In fact, there are some indications than would be able to suggest a plausible connection between these categories, as some-thing necessary to commute and connect the aforementioned disciplines. This proposal is useful like starting point of a little more detailed analysis of these issues by means of a new look, and places us directly in different sense of some questions, as quantum gra-vity, for example.

All this give, in general, a better significance to the importance of the kinetic energy's origin through the quantum galvanomagnetism implementation, allowing to connect all those things and achieving then the structures distributed in the inside of the atom, arri-ving that way to the solution of the quantum Yang-Mills theory question (Clay Mathe-matical Institute Millennium's Problems).

2. Field's own time

There are an indication that reveals clearly than Lorentz force represents the electro-magnetic field's associated force, when this acts upon a particle on a generic form. So if we are talking about impulse, about force and relativity, we can't to ignore that into this action, inside the field, has to be a verifiable and correlative correspondence. In order to develop this, the first thing that we must avoid is to give the real to Lorentz force: apply that to the magnetic momentum on electrons by coupling creates the orbital fact through the magnetic field H.

Let's see how it happen in quantum terms. In science, always exists the possibility to combine the different elements in the way than this allows us approaching to a scheme the most complete possible of that than is being studied. So, the particles with spin $1/2$ have another configuration too, which we would be able to consider as a real extension of its magnetic momentum. Here takes place the possibility to fix the spin toward what we would be able to designate like ***orbits of precession***. It is on that point where issues like the azimuth component into spin transforms its precession on a cyclotronic frequen-cy being the most interesting incorporation given by a *primary* rotation frequency (that way):

$$\omega_p = \frac{eH}{mc} \qquad (1)$$

In order to focus better this subject, we will have to combine relativity and force of more ample form, by means of the different aspects than follows from any galvanomag-netic component on the spin. So, the first thing that we are going to do is a revision of the wave equations, and if we relate the dual cone, the especial relativity and these equations, we will verify that such potentiality at the electromagnetic field evidences the value for the mass gap: $c/4\pi\ [EH]$.

A more interesting interpretation can to be applied if we look now to the following: value $c/4\pi\ [EH]$ is the Poynting vector (electromagnetic field's energy's flow density), and in set with value $1/c^2\ [EH]$ produces the electromagnetic impulse: $1/4\pi c\ [EH]$. In that way, $1/c^2\ [EH]$ also indicates than the Poynting vector is the mass gap in relation to the quantum Yang-Mills theory, the value than when we divided it by c^2 is produced the electromagnetic field's impulse, the real significance of the field's effective mass:

$$\mu = \inf \mathrm{Spec}(\hat{\mathrm{H}})\backslash 0 = c/4\pi\ [EH] \qquad (2)$$

$$m = \mu/c^2 = 1/4\pi c\ [EH] \qquad (3)$$

Since some time ago, it is known that $1/4\pi c\ [EH]$ originates into the electromagnetic field, being that one the characteristic explanation of the electromagnetic impulse. Intro-ducing the scheme about polarization, we can discover this origin inside the electromag-netic symmetry, which distribution takes us to the field's electromagnetic potentials. It exist another way than allows us to visualize into a geometrical context the electromag-netic impulse, concreting differents configurations in relation to this interval: it converts any interaction into a projective anisotropy potentially. This is referred to adjudicate an own time to the field and on this form to place on its origin the distinguishable curvature from a purely rotational perspective, and converts the field on a potential pseudoparticle (for it is necessary to give to the energy and pressure tensor its importance in relation to the distributions than we would be able to classify and clarify, in order to prioritize the kinetic potential from the electromagnetic field). To make it possible we have to transfer the pressure into the field, transforming the electrostatic pressure on a pressure's charge.

Now we are going to visualize something better relativity's real significance, and all transformations in its real context. For that, a galvanomagnetism way have to be concre-tized, from a projective perspective of azimuth, just from the origin toward the point of application of the force, and whose momentum (of force) indicates us the perimeter of these oscillations by the two forward light cones case: **the spin precession**. This fact is based on the consideration of the existence of a curvature radius into the axis.[1]

Those *secondary centers* aren't, on direct form, the reference points for *zw*, but yes for *xy*, although in that case in relation to the axis, and in reference to the momentum of force. Lorentz's transformations shows themselves to be the distance from the secondary centers to the orbits, inside the spin precession's movement, being these transformations the references to apply, so, where the angle of nutation are zero, but exclusively to the spin properties. In that point we go to associate a rotational energy to the atomic nucleus adding a kinetic rotational momentum to the spherical atomic procedure (what flows, besides, into a set between mechanic and magnetic momentum = $\hbar^2 e/2mc$):

$$E_{rot} = hBJ(J+1) \qquad (4)$$

where B is the rotational constant, and which can be expressed into a rotational terms, on this form (we can to appreciate the field's effective mass into that constant as a spin's electromagnetic impulse):

$$F(J) = BJ(J+1) \qquad (5)$$

$$B = \hbar/4\pi Ic \qquad (6)$$

In general, the influence of the centrifugal element is one of the fundamental piece to be identified, being of such importance than its interpretation can represents the expla-nation of the relativistic fact. We would can to denominate that like the *centrifugal mo-mentum*. The aforementioned definition represents a piece to associate with the rotatio-nal constant ways (into rotational terms): $\hbar/4\pi Ic$, which transforms into an operator of Hamiltonian kind, when we divided it for $\hbar$. This observation derives from adapt the centrifugal momentum to the particles context and its equations of movement across the kinetic energy. All those conclusions allows us to place the centrifugal momentum insi-de the imaginary term i (in that case, i is not a complex number). So, $i = \hbar/2I$.

As we have seen until now, there are indications of the existence of situations that they can be identified for association with some characteristics of the atom: this fact is going to allow us to dissert about this issue of detailed form through a quantum assem-bled. With all these elements associates into a schematic way, we can go a little more far away into the kinetic energy's origin, inside the nuclear spin's context. Among other things, this reasoning will place the electrons into the atom *axiomaticly*. And for that, it will be necessary to go directly to the gauge fields and define its trajectories identifying first its principal characteristics: the waves than give contour to an ellipse (an electron's orbit), and which we can to associate with the following equation, inside the context of the gauge's field transformations:

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1. These extremes takes to associate the spin precession with the $\mathrm{Spin}^{\mathbb{C}}(n)$ group, and hence the electromagnetic impulse with the fundamental group $\pi_1\left(\mathrm{Spin}^{\mathbb{C}}(n)\right)$.

$$A'_\mu = G A_\mu G^{-1} + \frac{i}{g}(\partial_\mu G)G^{-1} \qquad (7)$$

3. Real Quantum Gravity

Later on, we will concrete an origin to the spin-orbit interaction, but now we will ma-ke a little derivation, on first instance, to the quantum gravity. On that way, and in order to don't disorientate us, we will eliminate, of a paradoxical form, all kind of connection with general relativity and of course, with any class of gravity (once and for all). In addition, we must to prioritize the real sense of its nomenclature across its equations, and to see, for example, than this nomenclature is incomplete: it is necessary to add the term *m* into the context of the Euclidean action partitions than represents really the canonical quantum gravity. On the other hand, and once we have clear the fact about the quantum galvanomagnetism as the enabler of the electromagnetic impulse we can to de-duce what keeps on for the *quantum version* of the "constraint" by the Wheeler-DeWitt equation:

$$\hat{\mathfrak{X}}_h = \hat{\mathcal{L}} = 0 \qquad (8)$$

That way, we can to concret an electromagnetic impulse for the electrons from the quantum variations given by the spin group $\pi_1(\mathrm{Spin}(p,q))$. Curiously, these variations would be the cause of the disparity on quantum measurements. This fact would be useful "to amend" the quantum gravity definition: it is inexact to adjudícate gravity on its precepts. These considerations are near to a more complex pro-posal, which allows to identify the several aspects and the different perspectives of this kaleidoscope, based in the consideration of the Euclidean action like an enabler of elec-tromagnetic induction whose time's variability is produced by means of the oscillations, so we can change the Euclidean action's integral adding a polarity to $V(x)$ and concre-ting an interval:

$$S_E = \int_0^{2\pi} \left(\frac{1}{2} m \left(\frac{dx}{d\tau} \right)^2 \pm V(x) \right) d\tau$$

(9)

The constrains into the quantum gravity are the electrostriction effect.

At this point, it seems too convenient to highlight the importance of a dual forward light cones on spin $1/2$, so let's establish now a parallelism with Laplace's law. We can to consider it like applicable to the duality into the forward light cones, in set with the followings curvature radiuses (see the illustration): $OA = R_1$ and $BA = R_2$ in A point inside the two planes OCD and BEF, mutually perpendicular. This configuration can aid us to give a geometric projection to instantons:

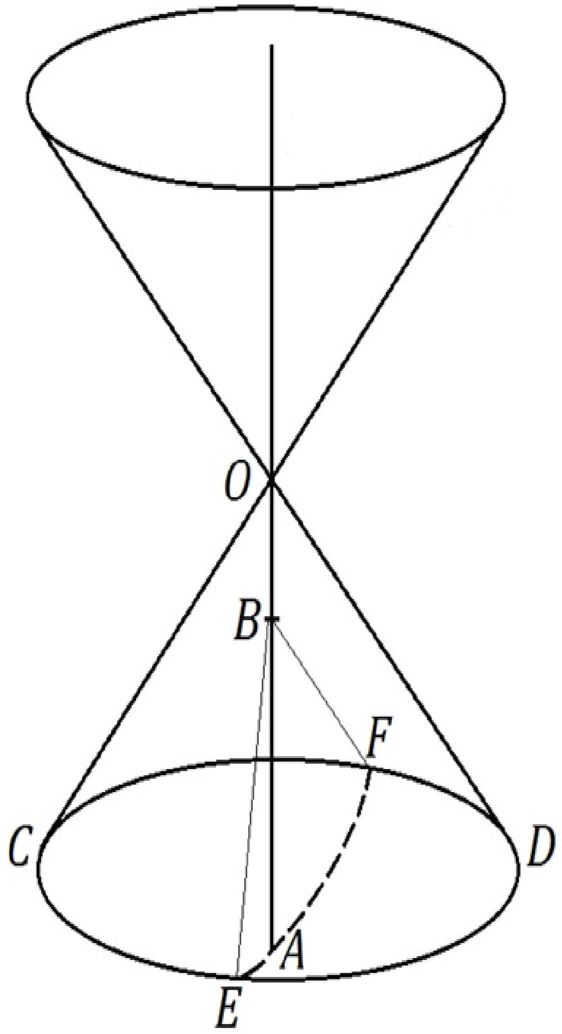

Figure 1. The spin precession (the forward light cones) with the curvature radius, for cause of the pressure, and the two planes OCD and BEF, mutually perpendiculars.

However we have to see first some circumstances and details, like the significance of the fractions after some distributions and before many integrals too: everything seems to indicate than that's due to the opposition of two forces: one centripetal and one centrifu-gal. The centrifugal one is represented into a $1/2$ inverted context on this form:

$$\frac{1}{2}\int_{\mathbb{R}^4} \mathrm{Tr}\,[*\,\mathbf{F}\wedge\mathbf{F}] \tag{10}$$

In fact, this expression is inverted literally: its conjecture is based on a extrem view of the *traveled distance*, and for extension to all the instanton's sequence.

4. Geometric Interpretation of the 3-Sphere

Let's go now to make an exercise of identification by different concepts (on a general form) about the form and the paths into the 3-sphere. Once assumed than its relation with the instantons reveal something nuclear, we can see, for example, a magnetic field (in blue) into the parallels path. Hyper-parallels, however, show two mathematical abe-rrations, among other things (3 x 3 frequencies without birefraction projection), like the curvature radius into the spin's precession. There are, besides (in green), three central li-nes than seems the characteristics of a piezoelectric on dimension six [2]: the $\mathrm{S}(3)$ group.

This group would be able to be the intermediary for the isotopic gauge invariace, into the $\mathrm{S}(n)$ modality. The circles in red area are nuclear confinements: apparently, the big ring contour is the position points of what it would be able to be quarks and anti-quarks; there are too four little rings than corresponds to the forward light cones, and represents an electrostriction procedure.

Let's go now to revise the scalar action of the gauge theory and to appreciate its inter-nal diversity:

$$S = \int d^4x \sum_{i=1}^{n} \left[\frac{1}{2} \partial_\mu \varphi_i \partial^\mu \varphi_i - \frac{1}{2} m^2 \varphi_i^2 \right] \tag{11}$$

The most important thing here is to see the results of the application, into the gauge group G, of a ponderomotive action. The second term inside this equation, the negative one, is the mathematical trace of gravity inside the atom: the *real quantum gravity*.

The infinitesimal transformations have a top around 1/8: this fact is what indicates the B.P.S.T. action. This action follows the same inverse nomenclature on its mathematical formalism. That way, we arrive to what we would be able to denominate like the infini-tesimal kinetic potential for any distribution. Therefore, and once assumed this extreme, we can to connect this overlap with the origin of its variations inside the atom, where the kinetics variations will come determined by the covariant derivative action inside the lo-cally gauge invariant Lagrangian:

$$\mathcal{L}_{\mathrm{loc}} = \frac{1}{2} (D_\mu \Phi)^T D^\mu \Phi - \frac{1}{2} m^2 \Phi^T \Phi \tag{12}$$

This Lagrangian is preceded by the density's one, which estructure derives basicly of the scalar action into the gauge theory, the equation (11):

$$\mathcal{L} = \frac{1}{2} (\partial_\mu \Phi)^T \partial^\mu \Phi - \frac{1}{2} m^2 \Phi^T \Phi \tag{12b}$$

We can also to see how gravity operates, and that is from the Yang-Mills Lagrangian for the gauge field:

$$\mathcal{L}_{gf} = -\frac{1}{4} \mathrm{Tr}\,(\mathbf{F}^2) = -\frac{1}{4} F^a_{\mu\nu} F_a^{\mu\nu} \tag{13}$$

2. A ponderomotive action class procedure.

There are three red rings more than we can to relate to the *forward tube* in the middle and on the polar top, whose range of displacement is $\pi/2$ (Hopf coordinates). The other four (the little ones) rings associates to the double forward light cones are a complex combination across the instanton number *k*:

$$k = \frac{1}{4\pi^2}\int_{\mathbb{R}^4} |\mathbf{F}|^2 d^4x \qquad (14)$$

where **F** defines a field-strength than will represents at the end the *electrostriction field-strength* for any kind of impulse into $\mathrm{SO}(4)$ through $\mathrm{SU}(2)$ x $\mathrm{SU}(2)$:

$$\mathbf{F}(x) = \frac{1}{(|x|^2+1)^2}\, dxd\overline{x} \qquad (15)$$

So we can to undertake the most important association connecting **F** with *G* into the gauge group *when G = G(x)*: the lack of commutation's cause is due to the Φ deviation.

There is another important question, referred to the periodicities given by π into the atom. This fact is connected with Boot periodicity and with the *OK*-theory, and with the energy levels of every quantum number into the rotational constant, thus as with the *co-lor field* characteristics. Besides it seems than the $\mathrm{O}(n, F)$ conjecture, the Gram-Schmidt process, is the equivalence of the Hilbert space into the (atomic) axiomatic context. In fact, the $\mathrm{O}(n, F)$ group projects the functionality of *f* into equations (4.23) and (4.24) of the *Axioms for Euclidean green's functions*. So the interchange mode between those equations represents, axiomaticly, the instanton's Chern-Simons form, or the spin-orbit interaction taked apart (the *m* index represents the spin quantum number). This perspec-tive place the Hilbert and the periodicities into a volumetric energy shape, being that the most relevant and important fact. But still are more: equaling π to 1, into the instanton number context, and concretly on the spherical polar coordinates context, it happens something very interesting, based on the fact about find an equivalence between $2\pi^2$ and $2n^2$. This extrem is applicable to the 3-sphere's tridimensional volu-me, $2\pi^2r^3$, and gives the atomic measure on $\mathbb{R}^4$ for $\mathrm{SO}(4) = \mathrm{S}^3 \mathrm{x}\, \mathrm{S}^3$: $\frac{1}{2}2\pi^2r^4$. So it works out than it is necessary to choose the elements and to interpret what they signify really, and although this seems somewhat obvious. On that way, we can see that the de-rivation $S^1 \to S^3 \to S^2$ into the Hopf coordinates context is a redundance based on the intersection betwen $S^3$and S^2 as such. Besides, we can to associate this process with the *phase of oscillations*, and compare the instanton number with a wave number.

5. The "Spin-Orbit Interaction"

The spin-orbit interaction is anything less a Coulomb interaction and, in any case, the combination of the magnetic momentum with the magnetic field is a made thing: the cy-clotronic frequencies. Really, this is a preamble in order to go step by step and to update that concept in relation to what's been shown. Of more concise form, it could be said than the spin-orbit interaction is an *impulsive* cyclotronic frequency than complements the orbital momentum, which seems to be the principal component of the electron's or-bit (a Hall effect *in the bud*). And what's more important: the orbital momentum is ano-ther cyclotronic frequency so the vacumm value on Ω_n are the energy distance between every orbital level.

In fact, π marks the quantum distance between levels across *n*, but into a coordinate way, as we well see later. Nevertheless π represents the half of a frequency (cyclotronic frequency), inside the phase of oscillations context, so then, the space that encompass *n* is a time lag existence between *i* and *j*. The orbital momentum is one frecuency as such which split into two to give form to the electron's orbit, and conforming, in relation to the energy's fine levels, a displacement whose identification helps to understand better this skein of halves: the Lamb displacement, which equivalence is included too into the axiomatic frame (lemma 8.7) as $re^{i\theta}$, with $r \in (0, t_0)$. Later we will see what's that.

For the moment we will direct our attention to a very interesting question: the *lag dis-tance* produced by the difference between the refraction's indexes than fix the principal tensions difference. This is apllicable to the orbital partitions in tandem with the energy fine levels split, respectively. These conclusions are based on the combination in optics about the interference of the polarized rays, on the one hand, and the Whertheim equa-tion on the other [3]. It shows a double birefraction's existence into the atomic frame, for cause of the crossed fields (is noteworthy than, into this context, the integer number is one half). So, we would can to describe the electrons orbits as a result of a piezoelectric effect by means of a tangential tensions, and even to include them into a matrix...

All permutations of symmetries are a set of combinations between the orbital momen-tum and the electromotive force *as a whole*, and depending if the orbital momentum is divided or not, as in the previous section. Therefore, the covariance has to be aplicable to the electromotive force and to the orbital momentum like an extensible possibility for the ellipse covariance, that is: the volumetric elasticity module, which is relativistic to the elliptic length into a volume (the Hodge dual). This property includes too the tension relations and according to what's been shown about the Whertheim equation the normal tensions corresponds adjudicate them to the orbital momentum. Hence, here they are the equations than would represent what we know as the orbital momentum *in essence*, the Yang-Mills action's integral calculated through the Yang-Mills field's lagrangian:

$$S_{YM} = \frac{1}{4g^2}\int_{\mathcal{M}} \mathrm{Tr}\,[* \mathbf{F}(x) \wedge \mathbf{F}(x)] d^4x =$$

$$= \int_{\mathcal{M}} \mathcal{L}_{YM}(\mathbf{F}(x), x)\left(\sqrt{|g|}dx^1 \wedge \ldots \wedge dx^n\right) \qquad (16)$$

Many of these things and more are deductible by the **Lemma 5.2** on *Axioms for Eu-clidean green's functions* geometrically, which represents in essence a double birefrac-tion, and the starting point to the kinetic energy for the orbital momentum and to the electromotive force added to the orbital momentum, *n* -1 and *n* = 2, from a kind of osci-llatory modulation than circumscribes the *k* index to the radius and in set with π delimits the cyclotronic frequency. In fact, the partitions are *oscillatory diffractions*. This is what indicates the unity's partition of Ω_n (pag. 100), and the square root of $|g|$ inside the or-bital momentum: the limit of *k*.

The fold tensor denotes a **pinch effect**. This issue could be appreciated into equations (5.1) and (6.9): the negatives signs denotes a cutoff (the h cutoff), and the *j* index on the distribution is the footprint for the *anomalous* magnetic momentum of the electrons (the "three addends"). It represents the logarithmic

3. As a referential example, attributable axiomaticly to the domain into the 4.5 section (the pure gauge set) and in relation with $L_+(\mathbb{C})$, where the Wightman function includes a prefixed $L_+^{\uparrow}$.

decrement for the three vectors e_r, e_s & e_t, the rings into the forward tube. These vectors are a compendium of the three rings into the forward tube of the proton-neutron pair, produced by a symmetric bilinear form (orthogonal basis), so *f* represents a scalar function within the atom (the pure gauge $\partial^\mu K_\mu$). In order to achieve that, authors was constructed a set of indexes variations and a limited interchanges, but things are still further complex: according to the time lag, we can to conclude than indexes *i* and *j* are the same thing, but unphased.

Special attention requires the following question: the anti_self-dual characteristic of the self-dual property. That's on line with the B.P.S.T. anti-instanton (and with the anti-symmetric tensors) which configuration is an atomic circumstance, and whose peculiari-ties we will see later.

6. Instantons on Gauge Group G

There are another way to focus these questions, and its through the non-trivial Yang-Mills equations in $\mathbb{R}^4$, whose configuration is that than follows:

$$0 \leq \frac{1}{2}\int_{\mathbb{R}^4} \mathrm{Tr}\left[\left(*\,\mathbf{F} + e^{-i\theta}\mathbf{F}\,\right) \wedge \left(\mathbf{F} + e^{i\theta} * \mathbf{F}\,\right)\right] = \tag{17}$$

$$= \int_{\mathbb{R}^4} \mathrm{Tr}\left[*\,\mathbf{F} \wedge \mathbf{F} + cos\theta\mathbf{F} \wedge \mathbf{F}\right]$$

Here the term $1/2$ is the spin-orbit reference: the spin quantum number level (m); the second part, on the rigth hand, includes a birefraction on its frame $(cos\theta)$ being this one a good starting point. In fact the equalization manage to make honor to it commitment, because this set represents on a first instance two elliptic orbits in a complex rotation for cause of the intersection of two planes on isometric form (see vector space: linear sub-space).

The wedge product is shaped into a volumetric elasticity module context. Besides, we will owe to locate the emplacement of the electron's orbits into a complex form. On that form, we can to associate it with the linear subgroup (vector space), which derives into an elliptic polarization of the orbital momentum. It would corresponds, into the special linear complex group context, to $L_+^\uparrow$ (section 4.2, pag. 94). It is possible also to include an explanation for the change of sign in the *e* exponent: is for cause of the "choice" of the time direction by the electrons. Is the same in both cases, but opposed, which takes us to the identification of electrons like points in $\mathbb{R}^4$, on section **2. Test Functions and Distributions** of the *Axioms*, pag. 85 (maybe it would be necessary to indicate than time's direction is referred to the orbit's sense). On second instance (into the rigth hand) gets established the oscillatory phase by the addition of the $L_+(\mathbb{C})$ group equivalence, which is preceded by the special linear complex group equivalence $SL(2,\mathbb{C})$ x $SL(2,\mathbb{C})$, its universal covering group.

Finally, it is necessary to add the interaction Lagrangian of the scalar gauge theory as an atomic circumstance which significance leads to identify the different class of gauge transformations than represents in essence all partitions as a whole, as we will see later:

$$\mathcal{L}_{\text{int}} = \frac{g}{2}\Phi^T A_\mu^T \partial^\mu \Phi + \frac{g}{2}(\partial_\mu \Phi)^T \mathrm{A}^\mu \Phi + \frac{g^2}{2}(\mathrm{A}_\mu \Phi)^T \mathrm{A}^\mu \Phi \tag{18}$$

All these conclusions lead to identify, besides, a proof for the existence of instantons (the nontrivial quantum Yang-Mills theory) on $\mathbb{R}^4$ for any compact, simple gauge group G, through this four equations, from a reflexive bilinear form context, into the Lie group $Z(\mathrm{Spin}(n, \mathbf{C}))$:

$$\mathrm{Ref}(\theta)\mathrm{Ref}(\phi) = \mathrm{Rot}\big(2(\theta - \phi)\big),$$

$$\mathrm{Rot}(\theta)\mathrm{Rot}(\phi) = \mathrm{Rot}(\theta + \phi),$$

(19)

$$\mathrm{Rot}(\theta)\mathrm{Ref}(\phi) = \mathrm{Ref}(\phi + \theta/2),$$

$$\mathrm{Ref}(\phi)\mathrm{Rot}(\theta) = \mathrm{Ref}(\phi - \theta/2).$$

Axiomaticly, the analogous to the previous proof are included into the **Lemma 8.8** of *Axioms for Euclidean green's functions*, at pages 109 and 110. On this way, we can to affirm than quantum galvanomagnetism spreads into volumetric shapes, and materiali-zes on diverse forms: by expansion, by refraction and by translation.

- *Planes of refraction*

This way, it seems clear that *quantum planes of rotations* are different than *canonical* ones (see *polar form of a complex number*): the firts ones are polar generators (the spin precession is the simplest exemple), and allows to detach the time lags.

7. The Atomic Quantum Assembled

$$\mathbf{F} = d\mathbf{A} + \frac{1}{2}\,\mathbf{A} \wedge \mathbf{A} \tag{20}$$

There are some elements than, when we checking them, acquires an added sense, and allow to combine as tools to fit all the previous. So let's begin from the beginning. For it, we have to return to the 3-sphere to indicate the only ring than remain to enumerate: the smallest within the equatorial meridian line (in red). The aforementioned ring is ne-cessary to associate it to a spire within a magnetic bipole's frame. This possibility is fea-sible inside the nucleon, which acquires a bipolar magnetic momentum. This factor is associable to the exterior derivative $d\mathbf{A}$, inside $\mathbf{F} = d\mathbf{A} + \mathbf{A} \wedge \mathbf{A}$, and allows us to ad-vance toward the atomic nucleus across the equation (10). It shows an atomic nucleus: a proton and a neutron, and between them the asymptotic freedom. It is important to un-derstand the interaction between protons and neutrons inside the atom as an environment polarization, working with a Faraday's tensor into a deformation parameter produced by the anomalous magnetic momentum of the proton and the neutron as the exterior deriva-tive, that is, the gauge field intensity's tensor (the negative sign is pinch effect):

$$F^a_{\mu\nu} = \partial_\mu A^a_\nu - \partial_\nu A^a_\mu \quad (21)$$

The principal consequence of all this is the establishment of an *orbital momentum* in-to the atomic nucleus between a proton-neutron pair, which configuration conforms the complex rotation $e^{-i\alpha_a(x)T_a}q(x)$ for the nucleon's spinor field: $SL(2,\mathbb{C})$.

- *The Yukawa potential*

The pinch effect (figure 1) is a necessary condition than allows to obtain a mechanic balance between phases by the radial curvature: it generates the wedge product. Under this premise, it seems clear than exist a confusion between strong interaction and pinch effect in the Yukawa potential. In order to see that we must connect the coupling cons-tant α with that covariant derivative $D_\mu = \partial_\mu - ig_s\sum_a X_a A^a_\mu(x)$, and to associate the asymptotic freedom with an effective mass produced inside the nucleus (symmetric bili-near form). Thus, $SU(3)$ is not the Lie group on quantum chromodynamics, but $SO(3)$. Now we can frame the atomic nucleus on its Lagrangian, which includes the *gravitational factor*:

$$-\frac{1}{4}\, F^a_{\mu\nu} F^{\mu\nu}_a \quad (22)$$

For the electroweak case, that reference is into the quantum electrodynamics conjec-ture:

$$-\frac{1}{4} F_{\mu\nu} F^{\mu\nu} \quad (23)$$

These are *atomics* circumstances into the Q.C.D. and the Q.E.D. Lagrangians and res-ponds to its symmetric priorities, taking apart other situations based on interactions bet-ween particles like the conjectures about assign symmetric properties to a quantum field into a perturbative scheme (Feynmann diagrams): there we are trying with *oscillations*, but **not with symmetries.** Both equations includes too a negative mass $-m$ and $-mc^2$: a *mass defect* (the estriction cutoff). Besides the Q.E.D. Lagrangian must be modified in order to include impulse on its context, with $F_{\mu\nu}$ forming part of the Yang-Mills action:

$$\mathcal{L}_{\text{QED}} = \bar{\psi}(\gamma^\mu D_\mu - mc^2)\psi - \frac{1}{4} F_{\mu\nu} F^{\mu\nu} \quad (24)$$

So we have to modify, then, the covariant derivative (the *Lorentz force*) and the inter-action lagrangian too:

$$D_\mu = \partial_\mu - i(e/c)\, A_\mu \quad (25)$$

$$\mathcal{L}_{\text{int}} = (e/c)\bar{\psi}(x)\gamma^\mu\psi(x)A_\mu(x) \quad (26)$$

They exist quantum countermeasures which gives real sense to the anti_self-dual ter-minology through the following *counter-tensors*:

$$\mathcal{L}_{gf} = -\frac{1}{2}\mathrm{Tr}\left(F_{\mu\nu}F^{\mu\nu}\right) \tag{27}$$

$$F_{\mu\nu} = \frac{1}{ig}\left[D_\mu, D_\nu\right] \tag{28}$$

$$\left[D_\mu, D_\nu\right] = -igT^aF^a_{\mu\nu} \tag{29}$$

This is the gauge covariant derivative commutation: its commitment is to make decay the electromagnetic intensity by gravity, transforming that way the Yang-Mills action into the *electroweak field strength*. Thereby, we can to conclude than electroweak force rise from the fact to apply gravity into the electromagnetic intensity by means of a kind of *Gauss principle*. Hence, is on that point where we can to associate the equation (29) with the covariant derivative on quantum chromodynamics: this revoke the gluonic field and point to the **gravity's influence zone** as a reference starting point for the phase and the time lag:

$$A^a_\mu \to A^a_\mu - \frac{1}{g}\partial_\mu \alpha_a - f_{abc}a_bA^c_\mu \tag{30}$$

The atomic nucleus includes a quadripolar momentum than represents a chiral current which distribution is described 'axiomaticly' into the **Lemma 8.5**, the Cauchy-Riemann conditions, where the polarity signs overlap the polarity signs of s on page 92. The chi-ral current inside the atom is associable to the Seiberg-Witten theory, and on this form to the $V(x)$ Euclidean action's vector, inside the oscillatory context on equation (9). We can link too the tensor of energy and pressure with the electromagnetic field's tensor in-side the atom through the Faraday's tensor (the *non-abelian* case)[4] into that way:

$$F^a_{\mu\nu} = \begin{pmatrix} \rho & E_x/c & E_y/c & E_z/c \\ -E_x/c & -P_1 & B_z & -B_y \\ -E_y/c & -B_z & -P_2 & B_x \\ -E_z/c & B_y & -B_x & -P_3 \end{pmatrix} \tag{31}$$

On this form, we have arrived to the key than articulates the quantum field instantons with the classical instantons, which is necessary in order to complete this scheme [5]. This is what indicates the spherical polar coordinates on k (this is the *real* solution to the infi-nity's problem *from the edge*, narrowly related with the frequency's distribution into the spectrum):

$$k = \frac{6}{\pi^2}\mathrm{Vol}(S^3)\int_0^\infty \frac{r^3dr}{(r^2+1)^4} = \frac{1}{2\pi^2}\mathrm{Vol}(S^3) \tag{32}$$

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4. In other words: the $D * F$ alternative (the "non existent" gluonic field). The pressure is due to the electrostriction and ρ represents the volumetric charge's density ($\mathcal{D}_1$ on page 96 of *Axioms*).

5. It exist, for ρ, a skew-symmetric matrix (an special orthogonal matrix Ω). The exponential of this matrix is the piezoelectric effect, and arise as a result of the nuclear estriction (on diagonal).

This model represents the gauge invariance for the elliptic orbits into the infinitesimal transformations context. From this perspective, we can to verify the field deviation in *G*, due to the fold tensor as the anti-symmetric bridge for every transformation. And more-over: the logarithmic decrement is included at the beginning of this equation. Into the same way, we can to use the infinitesimal transformations into the non-Abelian gauge invariance to *fix* the scalar limits inside the atom given by the scalar field through the $F^{a}_{\mu\nu}$ rotationals, where every transformation is the results *a priori* of a Fourier transfor-mation, and also of a Fourier-Laplace transformation *a posteriori* (after inductance):

$$F^a_{\mu\nu} = \partial_\mu A^a_\nu - \partial_\nu A^a_\mu + g_s \sum_{bc} f^{\,a}_{\,bc} A^b_u A^c_\nu \qquad (33)$$

$$F^a_{\mu\nu} \rightarrow F^a_{\mu\nu} - g_s \sum_{cb} f^{\,b}_{\,ca} F^b_{\mu\nu} Ж_c \qquad (34)$$

Now we can to make reference to a very interesting thing, and it is in relation with the possibility of the association of an orbital momentum to the oscillation produced by the atomic nucleus between the proton and the neutron. That possibiltity is too real, and is based into the adjudication to this fact of the B.P.S.T. instanton, more concretely the re-gular Landau gauge:

$$A^a_\mu(x) = \frac{2}{g}\frac{\eta^a_{\mu\nu}(x-z)_\nu}{(x-z)^2+\varphi^2} \qquad (35)$$

The 't Hooft symbol denotes a gravitational circumstance between that instanton and it respective anti-instanton. This piece is examined with detail on the next section:

$$\eta^a_{\mu\nu} = \begin{cases} \epsilon^{a\mu\nu} & \mu,\nu = 1,2,3 \\ -\delta^{a\nu} & \mu = 4 \\ \delta^{a\mu} & \nu = 4 \\ 0 & \mu = \nu = 4 \end{cases} \qquad \eta^{-a}_{\mu\nu} = \begin{cases} \epsilon^{a\mu\nu} & \mu,\nu = 1,2,3 \\ \delta^{a\nu} & \mu = 4 \\ \delta^{a\mu} & \nu = 4 \\ 0 & \mu = \nu = 4 \end{cases} \qquad (36)$$

8. The Origin of the Spectrum Energy's Fine Levels

It seems clear that covariance into the elliptic orbits includes the energy's fine levels as a whole. But surprisingly, it is origined on a gravitational context. Let's see how from the electroweak footprint, and for that we have to use the *Higgs mechanism in a* $U(1)$ *theory*, and to understand its atomic significance (once we have come to that point). So let's place its covariant derivative (where $Q = I^w_3 - Y^w/2$ and $\sin\theta_w = g'/\sqrt{g^2+g'^2}$) on electron`s orbit:

$$D_\mu = \partial_\mu - ig\sin\theta_w Q A_\mu \qquad (37)$$

$$A'_\mu = G A_\mu G^{-1} + \frac{i}{g}\left(D_\mu G\right)G^{-1} \qquad (38)$$

On this form, we have added by coupling the fine level to the electron's orbit. In fact, the fine levels are produced by gravity on first instance, and the Lagrangian of the field for that commitment is a kinetic gravitational potential:

$$\mathcal{L}^{\Phi} = -D_{\mu}\Phi^{T}(x)D^{\mu}\Phi(x) - c^{2}(\Phi^{T}(x)\Phi(x) - v^{2}/2)^{2} \qquad (39)$$

This potential is origined on the atomic nucleus by $GM^2/\hbar c$, where M^2 is the nuclear mass. On that way, the impulse produced by this mechanism will be proportional to the field's decay on every frequency, taken only the necessary, and being all this process related with a special *inductance* context. The transformation of the covariant derivative is due to the $T(Ж) = \exp(ieQЖ)$ operator, where $Ж$ is a parameter between 0 and $2\pi/e$. It converts these elements into a tangential procedure [these things are included axiomaticly through the equations (4.12) and (8.12) of the *Axioms for Euclidean green's functions*: ξ_k^0 and q_k^0 are on direct relation with the energy's fine levels]. In that point, it seems clear than the mass (m^2) on equations (11) and (12) represents the Higgs boson equivalence. The *constant* on this mass is $i/\hbar$, and arise from here:

$$\partial^{\mu}\, {}^{B}_{\mu} = \frac{g^{2}C}{16\pi^{2}}\tilde{F}^{a}_{\mu\nu}F^{\mu\nu}_{a} \qquad (40)$$

We're able to observe than the rupture of symmetry into the aproximation Lagrangian $\mathcal{L}^{\Phi} \simeq \mathcal{L}^{mA} + \mathcal{L}^{H0} + \mathcal{L}^{AH}$ vanish with the locality Lagrangian in (12). Also, we can to include the equation (40) inside a *gravitational Lagrangian* as follows:

$$\mathcal{L}^{\infty} = \bar{\psi}(\gamma^{\mu}D_{\mu} - mc^{2})\psi - \frac{1}{4}\frac{g^{2}}{8\pi^{2}}\tilde{F}^{a}_{\mu\nu}F^{\mu\nu}_{a} \qquad (41)$$

This Lagrangian allows to recognize the gravitational effect into the orbital phases, and

the ambivalent character of atomic polarity across the $A_{\mu}(x) - \partial_{\mu}\psi(x)/eq = A'_{\mu}(x)$ transformation as reference for the equation (32).

The *Higgs mechanism in a $U(2)$ theory* is a gravitational question too, but into a mo-lecular context. The center of gravity of an axial molecule is an atomic projection (a nu-clear projection) of equivalence $-1/8$ into the lie group $Z(\mathrm{Spin}(p,q))$: *the electromag-netism*. This projection is the rotational $F^{a}_{\mu\nu} = \partial_{\mu}B^{a}_{\nu} - \partial_{\nu}B^{a}_{\mu} + g\sum_{bc}\ \Pi_{bac}B^{b}_{u}B^{c}_{v'}$ with its transformation $F^{a}_{\mu\nu} \to F^{a}_{\mu\nu} - g\sum_{bc}\ \Pi_{bac}F^{b}_{\mu\nu}Ж_{c}$ for a molecular axis, who-se conversions are feasible through $T(Ж_{a}) = I + ig\sum_{a}\ I^{w}_{a}\,Ж_{a} + ig'(Y^{w}/2)Ж'$ and I^{w}_{b}: $T(Ж_{a})I^{w}_{b}T^{+}(Ж_{a}) = I^{w}_{b} - g\sum_{ac}\Pi_{cab}Ж_{a}\ I^{w}_{c}$, and with D_{μ} inside (38).

9. The Navier-Stokes Equation's Solution for a fluid in $\mathbb{R}^3/\mathbb{Z}^3$

Lorentz covariance, as augmentative element, shows us an evidence of causal relation between time dilation and impulse addition. Thus, we can to adjudicate the mentioned dilation to the incorporation of any impulse produced by an applied external force to any kind of particle into a fluid. Let's take the example of the gravity force applied to a fluid: the effect produced into its particles is oscillatory. This way, we have to increase the time's period toward its real value, incorporating the delay according to its perturba-tion. That reasoning defines the existence of a time dilation, and it allows to resolve this problem. How?

$$\frac{\partial}{\partial t}u_i + \sum_{j=1}^{n} u_j \frac{\partial u_i}{\partial x_j} = \nu \Delta u_i - \frac{\partial p}{\partial x_i} + f_i(x,t) \qquad (42)$$

Appliying the chain rule to the time and the position components with $\xi = 1/2(x - t)$ and $\eta = 1/2(x + t)$, *also for the Laplacian in the space variables*:

$$\frac{\partial}{\partial t} = \frac{\partial \xi}{\partial t}\frac{\partial}{\partial \xi} + \frac{\partial \eta}{\partial t}\frac{\partial}{\partial \eta} \quad \& \quad \frac{\partial}{\partial x} = \frac{\partial \xi}{\partial x}\frac{\partial}{\partial \xi} + \frac{\partial \eta}{\partial x}\frac{\partial}{\partial \eta} \qquad (43)$$

$$\frac{\partial^2}{\partial x^2} = \frac{1}{4}\left(\frac{\partial}{\partial \xi} + \frac{\partial}{\partial \eta}\right)\left(\frac{\partial}{\partial \xi} + \frac{\partial}{\partial \eta}\right) \qquad (44)$$

Then, according to the volumetric elasticity's module $(T_{12} = T_{23} = T_{31} = 0)$ the vis-cosity remains unchanged, and time tends to infinity *(B solution)*. On this form, we ha-ve added the external impulse inside the mass than represents the momentum. This is valid for the appendix (8), and also for the (10) and the (11) ones, into the *B* statement.

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