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Observables physics general formalism

Abstract

Observables form the most important real physics proof processes that will make normal science. Since mathematics have integral part in quantifying physical phenomena, theory involves modeling hypothetical logic borne within observations. A proper theory will need to show pulling out observables from parameters using abstractions. These processes that have gotten derived elsewhere are reviewed here in a gist manner that author has been able to configure as a fundamentally grand unifying realistic physics without assumptive inconsistencies. Review here also shows corrections of errata in earlier publications to help applications to wider areas of not only physical sciences but also mathematical computing information technology algorithms' developments.

Iyer-Markoulakis formalism to gage micro to macro by applying Coulomb-Hilbert gage from mechanics of gradient vortex fields to electromagnetic fields and then to gravitational aspects have been explained. Quantitative derivation of a general potential wave quantum density commutator matrix physics, with subsequent gauge equivalent expressions have been advanced. Mathematical modeling has been briefed on theorizing point dynamics Helmholtz decomposition fields' quantum Hamiltonian matrix evolving with time. Partial differential equations that have gotten derived from these characteristic matrices for zero-point as well as microblackhole aspects of a point in sense-time-space dimensions have highlighted addressing real world complexity manifested by these pure logical equations. Gaging with algorithmically elaboratively extended analysis with observables provide fitting completions to the partial differential equations (P.D.E.) of energy and quantum field metrix within Iyer-Markoulakis-Hodge-O'Neill-Malaver-Zhang-Taylor formalisms that provide best hope towards grand unification of the four super forces that physics portrays to natural workings of the universe. Retrofitting Iyer Markoulakis gradient vortex gage fields eigen matrix formalism to Wenzhong Hodge scalar frictional vacuum theory of hod-Plenum, dissipative discontinuity of modeling gage physics, giving an Integral Model Astro Quantum PHYSICS has shown to be achievable. Matrix general form algorithm equation, having gage functional, signal/noise ratio, gage fields, wavefunction inner outer products, quantum density matrix as a function of gage time configured successfully. Application to observables practically for analysis has been exemplified to mesoscopic population pattern with gage fields of pressure and temperature.

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Introductory remarks

Primary theoretical modeling reported elsewhere[1] brought out fundamental point dynamics Helmholtz decomposition fields' quantum Hamiltonian matrix evolving with time. Partial differential equations were derived from these characteristic matrices for zero-point as well as microblackhole aspects of a point in sense-time-space dimensions. However, modifications would hereby be noted as regarding "icħ" and "2- icħ" terms, specifically in the partial differential equations (P.D.E.) of energy and quantum field metrix within Iyer-Markoulakis-Hodge-O'Neill-Malaver-Zhang-Taylor formalisms.[2]

Keynote algorithms equations highlights are given below with brief explanations. Refer to the citations provided at REFERENCE LIST PHYSICS LITERATURE[2-4] for complete derivations, analyses, as well as explanations with applicative interpretations.

Characterization of eigenstate energetics of zero-point vacuum quagmire P.D.E. is shown to be: $\nabla^3 E_g^{\mu\nu}.\nabla^2 E_{g,\mu\nu} = \nabla^3 E_{g,\mu\nu}.\nabla^2 E_g^{\mu\nu}$ giving gradient energy up and down fields, represented by the upper and lower indices of general reference frame "μν", per[1]. This equation shows that energy transfers between up field and down fields, with energy gradients varying correspondingly manifesting point dynamical actions. Such active point dynamical fields then can provide as sources, like white holes, that may exhibit quantum time reversal symmetries,[5] which in the case of point dynamics essentially micro-white holes, acting like micro-sources.

Similarly, microblackhole Hamiltonian operator eigenfields' rotational "r" tensor differential equations with Helmholtz rotational fields are given by two forms of P.D.E.s' of vortex fields' solutions. Quantum up and down fields are represented by the upper and lower indices of general reference frame "μν", with initial, i and the final, f time "t" evolution terms, with ħ: Planck constant.

$$\nabla^2\varepsilon_{r,\mu\nu} - \left\{i\left(t_f - t_i\right)/\hbar\right\}[\varepsilon_{r,\mu\nu}\left(1+ln\left|\varepsilon_{r,\mu\nu}\right|\right]^{-1}(\nabla\varepsilon_{r,\mu\nu})^2 + \left\{i\left(t_f - t_i\right)/\hbar\right\}[\varepsilon_{r,\mu\nu}/\left(1+ln\left|\varepsilon_{r,\mu\nu}\right|\right] = 0$$

$$\nabla^2\varepsilon_r^{\mu\nu} - \left\{i\left(t_f - t_i\right)/\hbar\right\}[\varepsilon_r^{\mu\nu}\left(1+ln\left|\varepsilon_r^{\mu\nu}\right|\right]^{-1}(\nabla\varepsilon_r^{\mu\nu})^2 + \left\{i\left(t_f - t_i\right)/\hbar\right\}[\varepsilon_r^{\mu\nu}/\left(1+ln\left|\varepsilon_r^{\mu\nu}\right|\right] = 0$$

Each description associated to "(2- icħ)/icħ", such as value 10^{26} metric units will have to be modified to gage unitarization results that are briefly given below. Refer to the citations[2-4] provided at REFERENCE LIST PHYSICS LITERATURE for complete derivations, analyses, as well as explanations with applicative interpretations. These equations manifest mathematical aspects with event physics at the point micro-blackholes, that act as sinks. Transcendental nature of these functions talks about complex nature of vortex actions, that get energy from the zero-point sources acting like micro-white holes, briefly explained above. The first equation represents vortex down and the second equation represents vortex up fields actions. To solve these equations, specific examples of physical mechanisms have been considered to get algebra of the process physics, for example.[6]

Problem Solving Equation of zero_point with having energy function of the form with attractive-repulsive energy field constants yielded algebraic results:[6]

$$\left[w_{\mu\nu}(r)\right]^2 + q_{\mu\nu}(r)\, w_{\mu\nu}(r) + \left(t_f - t_i\right)^2 / \hbar^2 = 0$$

$$\left[w^{\mu\nu}(r)\right]^2 + q^{\mu\nu}(r)\, w^{\mu\nu}(r) + \left(t_f - t_i\right)^2 / \hbar^2 = 0$$

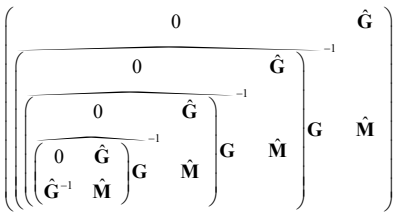
where w's are characterizing variables representing algebraic transcendental combinatorics to combine specifically the form of realistic attractive and the repulsive forces having quagmire vacuum quanta. These are equated as usually employed summations of algebra with typical proportionality of $1/r\,\hat{}\,2$ and $1/r\,\hat{}\,3$, where r is the distance action of field exerting force. Using the standard original definitions of the field to be equal to spatial differential of the force, the energy functional form has been written having combined attractive and repulsive force terms in energy form like $E = k_\alpha / r + k_\rho / r^2$. Equivalent action field-distance equation has been written as: $\varepsilon = k_3 / r\,\hat{}\,3 + k_4 / r\,\hat{}\,4 + k_5 / r\,\hat{}\,5 + k_6 / r\,\hat{}\,6$, which has been obtained by having twice differentiation of E with respect to r. It is quite noticeable to have complex algebra intertwined onto above equations, even for the simple case of attractive and repulsive force terms. We can surmise that complexities are expected, since they are dissipative evolutionary aspects that stem from point level, and thus can represent adequately mesoscopic to astrophysical nature of the universe. We can grapple with these equations only after proper transformations that will include gaging, that will be also specifically considered below, reviewing recent works author obtained after careful step-by-steps approaches undertaken by collaborating internationally with physicists, scientists, and particle astrophysicists around many continents. Related citations appear in the REFERENCE LIST PHYSICS LITERATURE, herein provided at the end of this mini review.[2,4]

These problem-solving approaches enable algebraically to substitute specifically this functionality into P.D.E.s of energy and field of the zero-point-microblackhole Helmholtz-Hamiltonian gradient vortex quantum dynamics. Basis of these forms arise out of that quintessence of the Iyer-Markoulakis formalism characterizing Dissipative Evolution Theory of a Superluminous Vacuum quanta, the fabric of space. Simulation programming with experimental measurements works is in the developmental stages presently to proof verify validating applicability with real systems of formalisms, pointing to observables at the quantum, micro, mesoscopic, astrophysical levels.

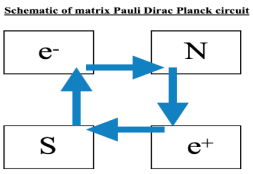
A brief overview of theoretical formalism with application to observables achieved by recent formalism author has advanced collaborating with international scientists will be examined below, Annotations of key guiding principles, quantifying equations, explanatory interpretations, exemplified observables, verifiable techniques with programming simulations algorithms, as well as future emphasis are further reviewed. Progressive sciences, technology, engineering, mathematics, automation, gage, and problem solving simplifying physical philosophies will start to get more attention in popular communications.

Problem solving with interpretive insights results, discussions, and conclusions

Proof formalism with pure metrix mathematical approach to physics formalism applications that have been recently presented at an international conference on combinatorics physics, as well as associated peer reviewed publications subsequently to it[7,8] have demonstrated ability of the Iyer-Markoulakis formalism to gage from micro to macro physics mathematically with quantum to mesoscopic to astroscopic nature describing algorithmically. These are achieved by applying Coulomb-Hilbert gage from mechanics of gradient vortex fields to electromagnetic fields and then to gravitational aspects, explained extensively in the author's REFERENCE LIST PHYSICS LITERATURE. For example, key result with such Coulomb-Hilbert gaging generates stringmetrics such as per: [7,8]



showing matrix graphic construct equation of charge asymmetry gauge metrics key, with $\hat{\mathbf{G}}^{-1}$ -> $\hat{\mathbf{G}}$ representing Coulomb gauge fermion charge of microblackhole from infinitv of vacuum to real space of the gauge field of radiation wave; 0 -> $\hat{\mathbf{M}}$, the diagonal Hilbert Higgs metrics maybe quantifying mass Higgs mechanistic field operator generator, signifying action to matter inertia effectively operating with gravitational field moving from vacuum to matter per. [7,8]



PDP circuit model has been illustrating essential monopoles-particles assemblage, providing like "perpetual motion machine" mechanism of quantum dark to light level universe!! This was made possible with the Helmholtz Hamiltonian mechanics electromagnetic physics gaging charge fields having novel quantum circuitry model, per REFERENCE LIST PHYSICS LITERATURE.[3] PDP circuit, i. e. Pauli Dirac Planck circuit assembly is like with e-: electron, and e+: positron particles; N: north, and S: south monopoles – flow of arrow shows gradient vortex matrix circuit has system corresponding Coulomb Hilbert gage like $\begin{pmatrix} \hat{\mathbf{M}}_{\mathbf{r},\mu\nu} & \hat{\mathbf{G}}_{\mathbf{g}}^{\mu\nu} \\ \hat{\mathbf{G}}_{\mathbf{g},\mu\nu} & \hat{\mathbf{M}}_{\mathbf{r}}^{\mu\nu} \end{pmatrix}$ $\{\hat{\mathbf{G}}_{\mathbf{g},\mu\nu}, \hat{\mathbf{G}}_{\mathbf{g}}^{\mu\nu}\}$ Coulomb gage, having Gilbertian nature with branching to Hilbert gauge down and up rotational vortex fields; also, $\{\hat{\mathbf{M}}_{\mathbf{r},\mu\nu}, \hat{\mathbf{M}}_{\mathbf{r}}^{\mu\nu}\}$, having M's like Higgs metrics mass of Higgs-Boson matter, quantifying inertia with gravitational field manifestations, having Amperian nature. These aspects have already been explained per Iyer O'Neill Malaver formalism,[3] conforming to partial differential equations of vortex and the gradient fields obtained per Iyer Markoulakis original formalism.[4]

Putting together Iyer Markoulakis O'Neill Malaver quantum astrophysics formalism with Wenzhong Hodge scalar frictional vacuum theory of hod-Plenum, dissipative discontinuity of modeling gage physics has been quite possible, as proved by a published recent article[2] in the Canadian Journal of Pure and Applied SCIENCES, listed here. Grand unifying algorithm with having parametrically system quantum density matrix, scalar potential matrix, and the wavefunction inner product as well as connecting functional gaged to vacuum solutions of magnetic hod Plenum* PDP assemblage transforms have been achieved. An Integrated Model quantum cosmological algorithm vacuum gage fields equation will have: [2]

$\left\| [Gg]Pg\ [\varepsilon_{GR}]^{-1}\left(<\left[\Psi_E(t_g)\right][\Psi^M(t_g)]>\right)[\varepsilon_{GR}]\right\| = \| [\rho_P(t_g)]^*[\varepsilon_{GR}] \| = \Lambda_{gv}$. Here, $\left[G_g\right]_{Pg}$ is gage wavefunction inner product of the electric and magnetic

tensor fields; $\left(<\Psi_{\mu}\left(t_g\right)|\Psi^{\mu}\left(t_g\right)>\right) = \left(<\left[\Psi_{E}\left(t_g\right)\right]\left[\Psi^{M}\left(t_g\right)\right]>\right)$ is Plenum* gradient functional; $\left[\rho_{P}\left(t_g\right)\right]$ is gage Plenum* quantum density matrix, and $\left[\varepsilon_{GR}\right]$ stands for the quantum gage fields. This formula thereby gives description of magnetic tensor action on electric tensor fields point gradient vortex discontinuity dissipative physics.

Key examples successfully have analogized mesoscopic observables. Example of an applied problem-solving physics observable mesoscopic analogy quantum aspects has appeared at the Canadian Journal also listed here.[2] General form algorithm equation, having $\left[G_g\right]$: gage functional; Γ_{ij} : signal/noise ratio of i-j element of duck-swan population pattern matrix; $(\varepsilon_{GR)gv}$; gage fields of gradient and the vortex actions; $\left(<[\Psi_{\mathbf{d}}\left(t_g\right)]|[\Psi^{\mathbf{s}}\left(t_g\right)]>\right)$: wave function inner outer products; $[\boldsymbol{\rho}_{\mathbf{ds}}]$: quantum density matrix as a function of gage time, t_g, all applied to ducks-swans population patterns, with complete algorithmic equation in compact form like matrix:

$$\left[\mathbf{G}_g\right]\Gamma_{ij}[(\varepsilon_{GR})_{gv}]^{-1}\left(<[\boldsymbol{\Psi}_{\mathbf{d}}\left(t_g\right)]|[\boldsymbol{\Psi}^{\mathbf{s}}\left(t_g\right)]>\right)\left[\left(\varepsilon_{GR}\right)_{gv}\right]=\left[\rho_{\mathbf{ds}}\ \left(t_g\right)\right]*[\left(\varepsilon_{GR}\right)_{gv}].$$

Expanded matrix shown below has demonstrated analysis showing how the gage fields of pressure and temperature can affect duck-swan population pattern, conceptually brought out by expanded 2x2 matrix form like in the above general form algorithm equation, having gage functional, signal/noise ratio, gage fields, wave function inner outer products, quantum density matrix as a function of gage time, whereby in the Appendix III:[2]

$$\begin{pmatrix}[Gg]\Gamma_{ij}^{l}\\ [Gg]\Gamma_{ij}^{\xi}\end{pmatrix}\begin{pmatrix}\hat{\varepsilon}_{GR,v} & \hat{\varepsilon}_{GR}^{g}\\ \hat{\varepsilon}_{GR,g} & \hat{\varepsilon}_{GR}^{v}\end{pmatrix}^{-1}(\Psi d1\ \Psi d2)\begin{pmatrix}\Psi s1\\ \Psi s2\end{pmatrix}\begin{pmatrix}\hat{\varepsilon}_{GR,v} & \hat{\varepsilon}_{GR}^{g}\\ \hat{\varepsilon}_{GR,g} & \hat{\varepsilon}_{GR}^{v}\end{pmatrix}=$$

$$\begin{pmatrix}\Gamma_{ij}^{d1} & \Gamma_{ij}^{s2}\\ \Gamma_{ij}^{s1} & \Gamma_{ij}^{d2}\end{pmatrix}\begin{pmatrix}\hat{\varepsilon}_{GR,v} & \hat{\varepsilon}_{GR}^{g}\\ \hat{\varepsilon}_{GR,g} & \hat{\varepsilon}_{GR}^{v}\end{pmatrix}$$

which provide observables amenable to computer programming simulation, extendable to permutating population pattern sequel to get simulation algorithmic equation of the moving population greater than [2 × 2] matrix of mentioned example. Physics conjecture applying discontinuity dissipative models have capability to estimate speed profiles of photon in a vacuum, c; however, graviton may have speeds to c^4, while superluminal vacuum quanta may possess speeds more than c^4 but less than ∞. Measurement of scalar potential matrix operational profile of this algorithm equation matrix will require knowledge of scalar potential matrix that are obtainable with standardized experiment having controlled flow-pressure measurements to simulate analogically mechanics. This would augment construction of standard analog equivalent circuit that will help to translate to current-potential profiles. Statistically, for given population pattern, modulating scalar potential quantum density matrix with dynamic speeds profile helps to compute evolving observable energy density matrix explicitly. Thereby, power density profile computations of the quanta are possible. These are all brought out in published articles, listed here in the REFERENCE LIST PHYSICS LITERATURE.[2-4]

One may surmise that audio imaging genetic observables communication parity modifying with charging operator with creator generating multiple phases shifted transformations give rise to observable universe with nature of living with nonliving eternally seems evolving cosmos!! We see gradient vortex action fields of point dynamics having dissipative discontinuity superluminal quantum cyclical generation of ordered energy signals forming magnetic Hod Plenum* PDP assemblages. With emergent "curdling" process having "hod photons" to electrons-positrons pairs, upscales then build up protons, neutrons, and atoms, with gluonic links. Globalizing these to mesoscopic and astrophysical spiral elliptical galaxies' source-sink mechanism will enunciate concept of a cyclic universe. These are essential outcomes that the citations below show further detailed analyses with explanations.

Our ongoing efforts will include scientific methodologies to identify progenitor mechanisms of generation of energy and living existence of life in the universe. There are also paradigm shifts that may happen in terms of magnetic primary forces versus electric primary forces. What mechanisms ensure preventing gravitational collapse to a singularity and matter antimatter asymmetry will be key aspects of further research sciences with theoretical and experimental clever studies. We are encouraged by the PDP circuit model proposing magnetic field dynamics having monopole particle balancing to have like "perpetual motion machine" action that prevents collapse and even singularity. Intrinsically it proposes electrons-positrons inductively creating electric gaging fields, explaining weak nuclear form of the four super forces. These aspects weld together with Hod-STOE model claiming to explain three super forces of electromagnetic, gravitational, as well as strong nuclear forms. We believe that algorithm equation matrix pure mathematical proof formalism [Iyer and Malaver, 2021] has laid solidly foundation for parametric physics verifiable experimental designs obtained logically from formalisms configuring eigen gaging fields, quantum density matrix, coupling functional, probabilistic wavefunctions, signal/noise ratioing time space sense!!

Summary remarks

Modeling quanta point dynamical fields per Iyer Markoulakis O'Neill Malaver quantum astrophysics gage formalism provided a way to transform Helmholtz decomposition gradient vortex mechanics actions to electromagnetic events. These have quantitatively been thoroughly characterized by eigen matrices with equivalent partial differential equations of energy and quantum field metrix. Coulomb Hilbert gaging allowed to derive stringmetrics, giving fermions where $\widehat{-\mathrm{G}}^{-1}$ will represent a point mirror symmetry of $\hat{\mathbf{G}}$; using crystal point mathematical formalism "Rotation Matrix" point matrix reflection imaginary parity value may be achievable. Cross diagonal Higgs matter possibly characterize gravity metrics with deeper advancements.

To provide the best hopes towards grand unification of the four super forces that physics portrays of strong, weak, gravity, electromagnetism to natural workings of the universe, extending to higher principles have been achieved recently. Original developed model of Iyer Markoulakis O'Neill Malaver quantum astrophysics formalism has gotten put together with Wenzhong Hodge scalar frictional vacuum theory of hod-Plenum, dissipative discontinuity of modeling gage physics, giving an Integral Model Astro Quantum PHYSICS.

Observables mesoscopic have been extracted from resultant integrated quantitative gage physical formalisms. General form algorithm equation, having gage functional, signal/noise ratio, gage fields, wavefunction inner outer products, quantum density matrix as a function of gage time has been exemplified to mesoscopic example. Gage fields are pressure and temperature of population pattern with 2x2 matrix and a gage functional of modon strings as communicators provide algorithm to experiment with simulation programming.

Statistically, for given population pattern, modulating scalar potential quantum density matrix with dynamic speeds profile helps to compute evolving observable energy density matrix explicitly.

Thereby, power density profile computations of the quanta are possible.

Superluminal quantum cyclical generation of ordered energy signals forming magnetic Hod Plenum* PDP assemblages, with emergent "curdling" process having "hod photons" to electrons-positrons pairs can be globalized to mesoscopic and astrophysical spiral elliptical galaxies' source-sink mechanism to enunciate concept of a cyclic universe.

We are working to achieve Gage Integrated Quantum Astrophysical Model explaining universal mechanism naturally grand unifying forces to explain essence of existence of everything!! We hope to have consistent correlative results that will correspond to measurements and current Standard Model, Theory of Everything, Super String Theories, Symmetry and Entropy Principles that will synchronously link classical to General Relativistic Quantum PHYSICS!!

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