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Discontinuum Critical Signal/Noise Density Matrix

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Abstract

Discontinuum critical signal /noise density matrices have been extracted out of theoretical formalisms modeling Super luminous Gage Integrated Quantum Astrophysics with algebra gage physics. These formalism quantifications empower in analyzing gravity oscillations biosciences quantum astrophysical natural existence processes of universes within multiverse. Algorithmic equations with correlating figures representing graphic solutions of algebra gage physics form a core of further grand unifying efforts. These breakthroughs help to pursue further progress for scientific whole world physics community with ansatz novel models that author is continuing to pursue with theoretical extraction of key variables and critical parameter that will promulgate designing experimental investigations to validate, while verifying observations with meaningful measurements that are consistent with data obtained at global level from particle physics large hadron colliders as well as signals out of astrophysical high resolution universal telescopes. Author has explored how absolute zero universal matrix originated living gage multiverse matrices generating ordered energy signals with hod Pauli Dirac Planck stabilizing circuit assemblage. Mechanism of prime factorization in conjunction with magic square symmetry is explained mathematically with rigorous process of unitary gage matrix properties, analyzing universes with multiverse natural processes evolving inorganic and living universe organic existence. Author has exemplified simple observable measurements that all of us see on a day-to-day basis of interacting super forces, particularly gravity in terms of signal/noise factor.

Keywords: Quantum, Gravity; Critical Density Matrix; Signal/noise ratio; Algebra; Gage; Discontinuum; Physics; Grand unifying Algorithm; Magic Square Symmetry; Absolute Matrix; Prime factorization; Multiverse; Gravity oscillations; Universal zero-point fluctuations

Introductory Remarks

Here, author will provide a comprehensive short-listed citation of recent works having already more extensive literature surveys. Hence, this article can be taken to provide mini review rather than quoting references for each of the statements that will appear in this paper [1-29]. Author will attempt to provide a short review of work done, alongside collaborative efforts of scientists over the whole earth. To resolve many inconsistencies with grand unifying physics today, specifically Standard Model, String Theories, Supersymmetry, Quantum Chromodynamics, as

well as several gravitational theories patching to quantum theories having particle physics, particular aspects with point dynamics have been considered. Point matrices with gradient zero-point vacuum fields and the vortex microblackhole point fields have been advanced by the author in conjunction with experimental observational measurements of coauthor Emmanouil Markoulakis, applying Helmholtz decomposition fundamentals. Gaging mechanical aspects to charge electromagnetic fields with subsequent unitizing provided a technique to extend point to astrophysical levels. Author's collaborative projects with paper article publications coauthoring Christopher O'Neill, Manuel Malaver, John Hodge, Wenzhong Zhang, and Emory Taylor have generated breakthrough ansatz gage dissipative discontinuum point-PDP-hod-Plenum-particle physics that are scalable to mesoscopic observables, correlating to macro all the way to astrophysical observational measurements.

Applying density matrix theories, from a rigorous pure mathematical algorithm relating micro to macro physics, author has shown how mesoscopic observables, theory to observations possibly prior validating experimental observational measurements, pulled out to demonstrate real nature of interactive existence. Advancing probability functions to signal/noise density point matrix modeling, author will again demonstrate here discontinuum nature with conscious energies versus human experience to reveal true nature existing in micro, mesoscopic, macro astrophysics extending to multiverse aspects. A technique is revealed that will simply comprehend how gravity starts to act normally with all other superforces. Particle momenta versus wave momenta are considered fundamentally based on point switches, signal/noise appearing from out of rotational momenta. These specific quantifiability provides means to explain inconsistencies with the well-known singularity, matter/antimatter asymmetry, vacuum, and the ultraviolet catastrophes, as well as double slit anomalies experimental measurements.

Author has arranged sections within this paper as follows: Section 2 emphasizes RESULTS/DISCUSSIONS. Section 2.1 provides computing critical signal/noise matrix physics, that author achieved having peer-reviewed publications listed at Reference section. Section 2.2 explains how computing per Section 2.1 signal/noise matrix will analyze gravity oscillations biosciences natural processes quantum astrophysical universes versus multiverse, justified by algorithmic equations with correlating figures graphic representations of algebra gage physics. Section 4 summarizes what the paper presents briefly with key aspects that will help in reader to pursue further with ansatz novel models that author is continuing to pursue with theoretical and experimental investigations, validating verifications observations meaningful measurements on a global level.

Results/Discussions

Computing Critical Signal/Noise Matrix Physics

While signal profiles with [1] give velocity aspects, PDP circuit mechanism [2] eventually give operational critical density systems signal/noise matrix originating super luminous vacuum quanta to particle transition. This will provide universal property characterization of fundamental energy generating processes that naturally evolves, shown as event emerging timeline.

Gravity originated after infinite extent nebular superluminous, however, dark energy like eternal multiverse probabilistically produced PDP circuit mechanism with monopoles-electron-positron-hod-Plenum clocking assemblages [2,3]. One may surmise, based on these, gravity helped differentiating existence versus dark matter to form geodesics within stellar constellation astronomical matter systems. These universal systems within multiverse realistically promulgate, eventually sustaining ever changing inorganic versus organic varied life forms.

Gradient vortex modeling point fields provided progenitor partial differential equations of superluminous vacuum quanta [1]. Gage PDP circuit mechanism provided hod Plenum PDP assemblages creating energy matter particle real universe; these mechanisms have dissipative discontinuum physics characteristics, helping in configuring observables especially giving mesoscopic authenticity while validating these theoretical modeling protocol [3-6].

Further matrix simulation physics computing programming algorithms experimental observational measurements will confirm validity of models towards grand unifying physical mathematical Sciences. We have order of magnitude evaluation of PDP circuit to be about 10^{-26} m, that is correspondingly h*c metrics, that approximately estimates the discontinuum length to have values as well in that scale [2,3,7]. Critical values with signal/noise density matrix may then be computed from these theoretical models with programmed simulations alongside experimental measurements [7-10]. They will then determine conditional criteria with superforces, coming into action at each level of interaction. Particularly, gravity that wasn't possible to quantify with any of existing theoretical physics may become realistically computable with these ansatz breakthrough approaches!!

Signal/Noise ("Γ"] Explains Gravity Oscillations Biosciences Natural Processes

With the signal/noise rules derived elsewhere, it is possible to explain the action of gravity based on critical

signal/noise density matrix principle or i-rule, exemplified by mesoscopic observables there [3,4-6]. Additionally, one can think of a card of a card deck, having only one side marking visibly. However, one card typically will give higher "Γ" than" Γ_{cr}", i. e. ($\Gamma > \Gamma_{cr}$); hence per model i-rule, the card has tendency to combine to form a deck or so we will intuitively perform manually that operation. Much like the simple harmonic motion, for example, simple pendulum situations, such actions will lead to Γ dipping to less than Γ_{cr}, i. e. ($\Gamma < \Gamma_{cr}$), then combination will get distributed or multiplied, simply expressed like: $\Gamma_{ij} =>::<= \Pi_{i,j}\left(\Gamma_{ij}\right)$, where =>::<= logic symbol denoting reversible aspects, depending on whether $\Gamma >$ or $< \Gamma_{cr}$. We can thus explain situations where oscillations will happen and there will then establish optimum Γ oscillations around Γ_{cr}. This will typically correspond to gravity oscillations within geodesics as well. We know that lattice vibrations, absolute zero spin oscillations, as well as "zitterbewegung" zero-point oscillations all have this feature in common [1-3]. Further, these oscillations may arise due to hod-Plenum-PDP circuit mechanism within super luminous vacuum quanta as a "perpetual motion machine", that undergoing vacuum friction manifests by creating matter "inertia" [3]. They are explainable with reminiscent property exhibited explainable by this signal/noise principle or model i-rule, eventually to validate by experimental observations measurements ongoing. One point clarifying signal/noise decimal fraction aspect. Simple arithmetic multiplication of decimal fractions will have value less than both the decimal fractions, and then vice versa. This will apply to "Γ" since magnitude of the density matrix signal/noise is between 0 and 1. It is high note to realize that oscillations of "Γ", such as "zitterbewegung" around "Γ_{cr}" will be "offset oscillations". This also will be true of zero-point fluctuations, specifically, this "offset oscillations" will mean like a "raised ground" or "Γ_{cr}" is shift or elevated level, due to "Γ_{cr}" of "Γ" oscillatory behaviors.

Analogous to above, one can explain biosciences natural processes such as cell divisions, that try to have dynamic balance of Γ versus Γ_{cr}, and thereby attendant oscillatory characteristics of cells multiplying and/or dividing to keep Γ in the range of optimum Γ_{cr}. We might extrapolate to say that will involve forming organs, skins, and connecting inorganic-organic forms via bone creations to evolve life forms. Many connected human actions, consciousness, experience, thought processes physics to metaphysics are eventually explainable with these argumentations. Presently, author will not further expand on these, except to say that it is quite applicable to expert bio scientist to explore possible genetic linkage with the signal/noise or "Γ" factor in the feedback loop mechanism, which seems to be true in the quantum, micro, mesoscopic, macro, as well as astrophysical levels of not only inorganic existentialism, but also organic existentialism.

Signal/noise matrix can be configured by considering directional eigen "ket" matrix times distributed corresponding eigen "bra" matrix to compute density matrix [6,8-11]. Procedures algorithmically laid out elsewhere [6] have been applied here as well. Typical "ket" matrix for complex angular momentum with {off, on} switching modes, giving signal/noise "Γ" at any point "Γ_{point}" with [point] = {states and/or modes} Example here: Ψ^{I}: component wave-function imaginary, Ψ^{ω}: component wave-function angular momentum, Ψ_{off} & Ψ_{on} are component wave-functions of switches modes off & on, and $\Gamma_{i,off,on,\omega} = \Gamma_{point}$, having [point] = $\{i, off, on, \omega\}$ variable gives following algorithm equation operationally [6]:

$$\begin{pmatrix} \Psi i \\ \Psi\omega \end{pmatrix} \left(\Psi_{off}, \Psi_{on}\right)) \; =>: \; :<= \left(\left[\left\{\left(\Gamma i,off,on,\omega\right)\right\}\right]\right) \qquad (1)$$

If $\Gamma_{i,\,off,\,on,\,\omega} > \Gamma_{cr}$ then matrices will combine, like "quantum entanglement", for example quantifying following argumentation ongoing: {if $\Gamma_{i,\,off,\,on,\,\omega} < \Gamma_{cr}$ then matrices will multiply with having "quantum decoherence"}, per critical signal/noise density matrix principle or i-rule, explained above earlier in this Section 3.

One can schematically construct absolute zero matrix trivially. We configure algorithmically null-nonabsolute matrix, inputting $\Gamma_{i,\,off,\,on,\,\omega} = 0$ in the Equation (1), quantifying mathematically complex density switches momentum matrix. We note that immediately they are forming magic square symmetry matrix [2,3,6] of 2×2, 3×3, and so on square matrices, with sum = 0!!, like Equation (2) shows.

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix} \qquad (2)$$

Since these magic squares matrices aren't having proper symmetry, prime factorization occurs [2,3], generating nonzero points with "$\Gamma_{i,\,off,\,on,\,\omega} \neq 0$" like Equation (3) shows.

$$\begin{pmatrix} 0 & \bullet & 0 & 0 & 0 & \bullet & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \bullet & 0 \\ 0 & 0 & \bullet & 0 & \bullet & 0 & 0 & 0 \\ \bullet & 0 & 0 & 0 & 0 & 0 & \bullet & 0 \\ 0 & 0 & 0 & \bullet & 0 & 0 & 0 & \bullet \\ 0 & 0 & 0 & 0 & 0 & \bullet & 0 & 0 \\ 0 & 0 & \bullet & 0 & 0 & 0 & 0 & 0 \\ \bullet & 0 & 0 & 0 & 0 & \bullet & 0 & \bullet \end{pmatrix} \quad (3)$$

Inhomogeneous "$\Gamma_{i,\,off,\,on,\,\omega}$" shown per Equation (3) will make them to rearrange, having sum ≠ 0 magic square matrix with $\Gamma_{i,\,off,\,on,\,\omega} > \Gamma_{cr}$, as explained earlier about random fluctuations [1-3,12-15] out of the absolute genesis evolving onto zero point fluctuations or "zitterbewegung" oscillations [1-6,13-17]. Applying "i-rule", like above describing decimal fractional matrix arithmetic operational basics, $\Gamma_{ij} \Rightarrow :: \Leftarrow \Pi_{ij}(\Gamma_{ij})$, this condition will make matrices to combine, entangle, and/or eventually collapse to form blackhole, in general, dark matter. Consequently, with the blackhole and/or dark matter formation, dipping of the "$\Gamma_{i,\,off,\,on,\,\omega}$" below Γ_{cr} occur, causing decohered multiplication of matrices events, with "zitterbewegung" keeping the "Γ" factor oscillating within the range of Γ_{cr} harmonically dynamically. Resultant gage vacuum string metrics that originally author has derived elsewhere [2,3,6] are shown below summarily, having the Figures 1 and 2, depicting natural mechanism generating energy perpetually sustaining oscillations by Hod-Plenum-PDP assembly circuit model [3,6]. Author elsewhere put together these situations theoretically in terms of zero gage string metrics schematically sketching monopole-particle entities popping with gage vacuum [6] and per Equation (3). This will dissipate discontinuum physically, creating patrons, quasi-particles, particles, atoms, as well as mesoscopic to astrophysical entities [1-7,12-17] with algorithmically repeating matrix simulation population pattern rules, Equations (1) through (8), incorporating gage dissipative discontinuum physics [3].

String metrics [3,6,15,16] give gage absolute matrix. Physically, matrix sketch of quantum density monopoles, per PDP circuit assemblage enhanced modeling will look like, per Figures 1 & 2 schematics [6]:

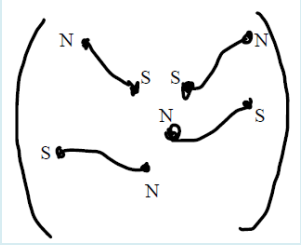

Figure 1: Matrix showing Dirac monopole strings with modon strings, transitorily [6].

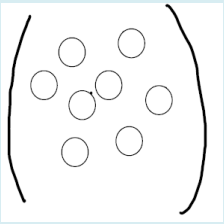

Figure 2: Matrix showing how NS monopoles embed per Figure 1 chirally [6].

Author developed mathematically following algorithms [3,5,6]. Integrated Physics Model quantum cosmological algorithm vacuum gage fields equation is given by [3]:

$$\left\|[\mathrm{Gg}]\mathrm{Pg}[\varepsilon_{GR}]^{-1}\left(<\left[\psi_E(t_g)\right]\left\|\left[\psi^M(tg)\right]>\right)[\varepsilon_{GR}]\right\| = \left\|\left[\rho_p(t_g)\right]*[\varepsilon_{GR}]\right\| = \Lambda_{gv} \quad (4)$$

Here in the Equation (4), $(<\Psi\mu(tg)|\Psi\mu(tg)>) = (<[\Psi_E(tg)]|\Psi^M(t_g)]>)$ is gage wave function inner product of the electric and magnetic tensor fields; $\left[\mathrm{G_g}\right]\mathrm{P_g}$ is Plenum* gradient functional; $\left[\rho_p(t_g)\right]$ is gage Plenum* quantum density matrix, $[\varepsilon_{GR}]$ stands for the quantum gage fields, $\Psi_E(t_g)$ is the wave function of gage electric fields, $\Psi^M(t_g)$ is the wavefunction of gage magnetic fields, (t_g) is gage time, and Λ_{gv} is the gage vacuum energy density equivalent to cosmological constant [18-29].

Elsewhere further, author has shown algorithmically, configuring constitutively quantum density matrix to obtain detailed signal/noise density matrix [3,6]; these are explained here too, listing equations showing sequences.

$$\begin{pmatrix} \varepsilon_\tau \\ \varepsilon_x \\ \varepsilon_y \\ \varepsilon_z \end{pmatrix} \left(\psi_{\Gamma^+_{\dot{O}}} \;\; \psi_{\Gamma^-_{\vartheta}} \;\; \psi_{\Gamma^+_{\vartheta}} \;\; \psi_{\Gamma^-_{\dot{O}}} \right) => :: <= \begin{pmatrix} \Gamma^-_t & \Gamma^{\dot{O}}_X & \Gamma^-_Y & \Gamma^{\dot{O}}_Z \\ \Gamma^{\vartheta}_t & \Gamma^+_X & \Gamma^{\vartheta}_t & \Gamma^+_Z \\ \Gamma^+_t & \Gamma^{\vartheta}_X & \Gamma^+_Y & \Gamma^{\vartheta}_Z \\ \Gamma^{\dot{O}}_t & \Gamma^-_X & \Gamma^{\dot{O}}_Y & \Gamma^-_Z \end{pmatrix} \quad (5)$$

or compactly,

$$[\Gamma_{XYZ}] => :: <= [\Gamma_{X'Y'Z}][\Gamma_{X''Y''Z''}] \ldots\ldots\ldots\ldots, \text{ with}$$

$$\left\{\Gamma_{X'Y'Z}, \Gamma_{X''Y''Z''}\right\} > [\Gamma_{XYZ}] \quad (6)$$

since

$$\sum_{i=1}^{n}\sum_{j=1}^{m}\Gamma_{ij} = 1 \quad (7)$$

noting that: $\varepsilon \equiv$ field, $\Psi \equiv$ wave function, $\Gamma \equiv$ signal/noise on XYZ coordinates, $[\rho] \equiv$ density matrix., with details provided there [6].

Algebra gage physics discontinuum equation (AI.5) [3], with $\mathbf{r}_{\text{discontinuum\_energy-fields}}(t) = \mathbf{r}\text{DEF}(t) = \mathbf{n}(t)$. DL + $\mathbf{r}_g(t)$, with $\mathbf{n}(t)$: number of discontinuum lengths, DL; $\mathbf{r}_g(t)$: DL gap length, provided discontinuum physics [7] gage transform of detailed quantification in Appendix [3]:

$$g\left[\mathbf{r}_{DEF}(t)\right] = g\left[\mathbf{n}(t).DL\right] + g\left[\mathbf{r}_g(t)\right] = g\left[\mathbf{n}(t)\right].g\left[DL\right] + g\left[\mathbf{r}_g(t)\right] = g\left[\mathbf{r}_g(t)\right] \quad (8)$$

with DEF, the discontinum energy field, defined elsewhere [7] links with DL, discontinumm length and the rg, gap length in evolving and/or in emerging time domain number line scalarwise.

Per gage physics [6], conjecture of gravity, with observable parameters quantum astrophysics, where $[\Gamma]$ matrix of signal/noise ratio determines existence of matter, while $[\rho]$: point density matrix pattern determines property of gravity. Magic square symmetry prime factorization [2,3,6] will eventually differentiate among inertial, charged, and neutral matter. If $\left[\rho_{\text{object}}\right] > \left[\rho_{cr}\right]$, then object will sink or fall in relational gravitational inertial environment. Otherwise, if $\left[\rho_{\text{object}}\right] < \left[\rho_{cr}\right]$, then object will levitate or float in that environment. These were explained having the proposition and observable physics with real measurable observations [3,6].

Summary Conclusions

Computation algebra gage physics theoretical derivations of discontinuum critical signal/noise matrix point density quanta, extracted out of Super luminous Gage Integrated Quantum Astrophysics modified formalism with algebra gage physics have empowered to analyze natural processes.

Author here has thoroughly considered on a fundamental level how gravity oscillations biosciences quantum astrophysical natural existence processes of universes within multiverse. Mesoscopic observables' simple examples eye-opening previously abstruse to demonstrably observationally measurable variables keying parametric algorithmic equations with correlating figures representing graphic solutions of algebra gage physics form a core of further grand unifying efforts. Quantum physical "ket-bra" outer inner product matrix operations ensuing into quantifying points signal/noise density matrix algebra gage physics provides a unique breakthrough theoretical physical mathematics to explore how gravity automatically flows onto other three super forces of weak, strong, and electromagnetic fields. These were compactly written as $[\Gamma_{XYZ}] =>::<= [\Gamma_{X'Y'Z}][\Gamma_{X''Y''Z''}]$ ……., with $\{\Gamma_{X'Y'Z,}\Gamma_{X''Y''Z''}\} > [\Gamma_{XYZ}]$, where $\Gamma \equiv$ signal/noise on XYZ coordinates with primes denoting differentiated coordinates, and $[\rho_{\text{object}}]$ less than or greater than $[\rho_{cr}]$ determining how object will sink or levitate in relational gravitational inertial environment, noting $[\rho] \equiv$ density matrix, cr: critical for object versus environment.

These theoretical physics derivations promulgate designs of ansatz novel experimental investigations to validate, while verifying observations with meaningful measurements that are consistent with data obtained at global level from particle physics large hadron colliders as well as signals out of astrophysical high resolution universal telescopes.

Knowhow is advanced of hitherto unknown logic of natural absolute matrix originating living gage multiverse matrices generating ordered energy signals with hod Pauli Dirac Planck stabilizing circuit assemblage. Prime factorization operating in conjunction with magic square symmetry has been exquisitely identified to be in the realm of mathematical rigorist process of unitary gage matrix properties, analyzing universes with multiverse natural processes evolving inorganic and living universe organic existence. Magic square symmetry prime factorization mechanism explains about processes universally differentiating among inertial, charged, and neutral matter, by considering gaged string metrics causing monopole-particle circuit assemblages within a super luminous vacuum quanta. Higher dimensional Dirac monopole like modon strings seem linking to super vibrational strings operating hod-Plenum* PDP vacuum frictional mechanism, modulated by {0, off, on} modes of switches, that have been analyzed by earlier formalisms author engaged on international scientific group level. Discontinuum physics formalism with algebra gage physics, derived earlier by author with six other coauthors has been highlighted here in this article explaining discontinuum equation. This equation algorithmic demonstrates knowhow of gage algebraic theory ansatz for analyzing discontinuum physics appropriately. It is enumerated briefly in the form: $\mathbf{r}_{\text{discontinuum\_energy-fields}}(t) = \mathbf{r}_{\text{DEF}}(t) = \mathbf{n}(t)$. DL + $\mathbf{r}_g(t)$, with $\mathbf{n}(t)$: number of discontinuum lengths, DL; $\mathbf{r}_g(t)$: DL gap length, provided quantification of gage transform to $g[\mathbf{r}_{\text{DEF}}(t)] = g[\mathbf{n}(t).\text{DL}] + g[\mathbf{r}_g(t)] = g[\mathbf{n}(t)].g[\text{DL}] + g[\mathbf{r}_g(t)] = g[\mathbf{r}_g(t)]$. DEF. Additionally, defining discontinuum energy field links with DL, discontinumm length and the r_g, gap length in evolving and/or in emerging scalarwise timeline occurring events will provide complete technique in applying ansatz gage algebra physical mathematics.

Author hopes having international collaborations to explore experimental grand unifying physics research giving observations alongside measurements to prove derived predictive observables algorithmically from theoretical physics equations parametrically. These theoretical mathematical physical sciences will promote progressive

meaningful effort to resolve crises with present physics with quantum relativity. Knowledgebase algorithms envisaging discontinuum algebra gage physics will help to integrate theoretical wholesomeness to key critical parametric variables that are even obvious at mesoscopic normal science observations. Hence such exploratory methods are ideally suitable for redesigning to even apply towards school projects. On a large-scale application to industries, these algorithmic exploratory techniques are then scalable to programmable technological breakthroughs with engineering mathematical sciences to solving global warming, mind/matter real life processes surviving consciously harmonical existence of organic and inorganic universes within multiverse infinitum.

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