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Unified Field Theory - *1. Universal Topology and First Horizon of Quantum Fields*

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Abstract Evolution from the classical dynamics $W = P$ to the spacetime interwoven $W = P + iV$ of modern physics, this paper demonstrates the yinyang physics of nature law: Universal Topology $W = P \pm iV$, that intuitively constitutes YinYang Manifolds and Dual Event Operations. Following the yinyang principle, its First Horizon naturally comes out with the YinYang Energy-State Equilibrium and YinYang Motion Dynamics, which replace the empirical "math law" and give rise to the general quantum fields to concisely include Schrödinger and Klein–Gordon Equations. As a result, this becomes a groundwork in the quest for Unified Physics: the workings of a life streaming of yinyang dynamics ...

Keywords: *unified field theories and models, spacetime topology, quantum fields in curved spacetime, quantum mechanics, theory of quantized fields, field theory*

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1. Introduction

From *Euclidean* space to *Newtonian* mechanics introduced in 1687, the scientific approach known as classical physics seeks to discover the physical laws that mathematically describe the motion of bodies with a basic philosophy for *Physical Existence* of space and *Virtual Existence* of time, which has no manifold relationship of virtual and physical coordinates. Throughout this first generation of physics, the world W is interpreted by the physical function $P(\mathbf{r},t)$ using a spatial manifold $M\{\mathbf{r}\}$ of three dimensions $\mathbf{r}$:

$$W = P\left(x_\mu, t\right) \tag{1.1a}$$

$$x_\mu \in M(\mathbf{r}) = \mathbf{r}\{x_1, x_2, x_3\} \tag{1.1b}$$

where time t is set as an independent parameter hidden to $M\{\mathbf{r}\}$.

As the second generation, modern physics couples the virtual $V\left(x_\mu, t\right)$ and physical $P\left(x_\mu, t\right)$ interweave into a single manifold $M\{\mathbf{r}+i\mathbf{k}\}$, known as *Minkowski* manifold [1], introduced in 1905.

$$W = P\left(x_\mu, t\right) + iV\left(x_\mu, t\right) \tag{1.2a}$$

$$x_\mu \in M\{r+ik\} = \{-ct, x_1, x_2, x_3\} \tag{1.2b}$$

where c is the speed of light. Although this model had advanced physical theories, it has diminished the virtual function $\{i \cdot i \mapsto -1\}$ into a single physical manifold $\{-ct, x_1, x_2 x_3\}$, paparell to the *Lagrange* [3] density $L = V - T$. As a consequence, *Einstein*, *Schrödinger Klein* and *Gordon*, the greatest minds of the twentieth century, had to invent the *Math Laws* as a means of empirical approach to intuit their well-known theories of general relativity and quantum mechanics successfully.

Today, with acceptance of quantum mechanics, physics has reached a consensus on the existence of virtual supremacy. With the duality of both virtual and physical dynamics, this manuscript claims the following remarks as a groundbreaking in the unified physics:

1. Embedded in the well-known formulae, the nature reveals us the philosophical law of YinYang Topology in the forms of yin $W = P + iV$ and yang $W = P - iV$, , each functions as the complementary, inseparable and reciprocal opponent to the other. Together, they operates a life streaming of the interwoven dynamics.
2. The law intuitively comes out with YinYang Manifolds $M\{\mathbf{r} \pm i\mathbf{k}\}$, the conjugate coordinates with the dual complex vectors $\mathbf{r} \pm i\mathbf{k}$, which presents a groundbreaking in the spacetime manifolds.
3. Each of the manifold basis instinctively gives rise to a set of the conjugate Event Operators $\partial_\mu \in \{\pm\partial_\kappa, \partial_r\}$ that replaces the empirical "math law" and ratifies the true philosophy to quantum mechanics.
4. With the operators, Yinyang Energy-State Equilibrium of First Horizon is reacted concisely as an infinite sum of series, elevating the meaning of a duality to Lagrangian density with its infinite accuracy beyond the second order of the traditional Energy Conservation.
5. The classic Motion Equation is boosted to play a vivid duality of yin and yang dynamics, which give rise to the first horizon: a pair of the general quantum fields, to

concisely include Schrödinger and Klein–Gordon equations, respectively.

As the outcome, this *Universal YinYang Topology* demonstrates the workings of the law towards the unified physics...

2. Universal Topology

Universe is the whole of everything in existence that operates under a system of topologically-ordered natural laws. This philosophy enlightens that the yin nature of physical P function is associated with its yang nature of virtual iV function to constitute a duality of the real world. In mathematics, it formulates the yinyang or complex-conjugate functions $W^{\pm}(x^{\mu})$ of one or more complex variables x^{μ} in the neighborhood regime of every point in its universe domain G. This yinyang law, for example, is naturely embedded in the well-known formulae of (6.5), (7.3) and (7.4), which reveals the following expressions, named *Universal Topolog*

$$W^{-} = P + iV \quad : W^{-}(x^{\mu}) \in G \qquad (2.1a)$$

$$W^{+} = P - iV \quad : W^{+}(x^{\mu}) \in G \qquad (2.1b)$$

where i marks an imaginary part as the conjugate of yinyang duality.

The *YinYang Topology* of equation (2.1) intuitively represents the yin and yang manifolds $M\{\mathbf{r} \pm i\mathbf{k}\}$ as a set of global functions G, each composed of events λ, constituted by hierarchical structures of one coordinate yang manifold of vector $\vec{\mathbf{q}}$ for virtual supremacy, and another coordinate manifold of yin vector $\overleftarrow{\mathbf{q}}$ for physical supremacy. These principles convey that both manifolds operate simultaneously and transforming with their associated vector basis. In complex analysis, the global characteristics of $W^{\pm} \in G(\lambda)$ are a set of holomorphic functions each with a dedicate manifold:

$$W^{-} = P(x^{\mu}, \lambda) + iV(x^{\mu}, \lambda) : x^{\mu} \in M\{\mathbf{r} \pm i\mathbf{k}\} \quad (2.2a)$$

$$W^{+} = P(x^{\mu}, \lambda) - iV(x^{\mu}, \lambda) : x^{\mu} \in M\{\mathbf{r} - i\mathbf{k}\} \quad (2.2b)$$

$$\mathbf{r} = \{x_1, x_2, x_3\} \;\; i\mathbf{k} = i\{ct, ...\} \equiv \{x_0, ...\} \qquad (2.3)$$

$$dW^2 = dW^{+} \cdot dW^{-} = g_{\mu\nu} dx^{\mu} dx^{\nu} \qquad (2.4)$$

The virtual position of $x_0 = ict$ naturally forms a conjugate duality of vectors for the real and imaginary coordinates and the dual event operators:

$$\vec{\mathbf{q}}\{+x_0, x_1, x_2, x_3\} = \mathbf{r} + i\mathbf{k} \mapsto \partial_{\mu} = \{\partial_{\kappa}^{-}, \partial_r\} \qquad (2.5)$$

$$\overleftarrow{\mathbf{q}}\{-x_0, x_1, x_2, x_3\} = \mathbf{r} - i\mathbf{k} \mapsto \partial_{\mu} = \{\partial_{\kappa}^{+}, \partial_r\} \qquad (2.6)$$

$$\partial_{\kappa}^{\mp} = \pm \mathbf{b}_0 \partial / \partial x_0 \;\; \partial_r := \mathbf{b}_{\alpha} \partial / \partial x_a \;\; a \in \{1,2,3\} \qquad (2.7)$$

where $\mathbf{b}_0$ and $\mathbf{b}_{\alpha}$ are the tetrad basis, a set of the operational symbols $(\leftarrow, ^{+})$ is defined for the virtual manifold and other set of $(\rightarrow, ^{-})$ is defined for the physical manifold, shown in the Figure:

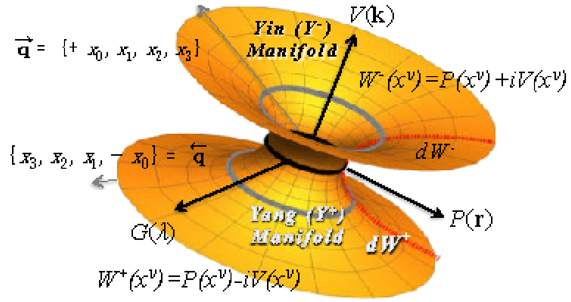

Figure 1. Universal YinYang Topology

Both manifolds simultaneously govern and alternatively perform the event operations as the unified dynamics. Exploring a yinyang duality of the virtual opponent $\pm iV$, we are entering a holistic world $W = P \pm iV$ of the universe ...

From the yinyang equations of (2.1), the Yinyang Topology represents a duality principle of physical and virtual functions:

$$P(x_{\nu}) = \frac{1}{2}[W^{+}(x_{\mu}) + W^{-}(x_{\mu})] \;: W^{\pm} \subset W \qquad (2.8)$$

$$V(x_{\nu}) = \frac{i}{2}[W^{+}(x_{\mu}) - W^{-}(x_{\mu})] \;: W^{\pm} \subset W \qquad (2.9)$$

Composed into a symmetric $P(x_{\mu})$, W^{-} is in physical primacy of yin dominant to the processes of formations or reproductions. Likewise, composed into an antisymmetric $V(x_{\mu})$, W^{+} is in virtual primacy of yang dominant to the processes of generations or annihilations. This means that the yinyang duality of $W^{\mp}$ is the complementary opposition of inseparable and reciprocal pairs of all natural states.

Therefore, we have mathematically derived that the YinYang Topology of physical and virtual, space and time, or yin and yang manifolds presents the two-sidedness of any event, each dissolving into the other in alternating streams that form and operate horizons of life situations, movements, or actions through continuous helix-circulations in a universe topology, which lay behind the context of the main philosophical interpretation of quantum mechanics and beyond ...

3. YinYang Operations

In analysis of the operational functions $f(\lambda)$ for an event λ, the first horizon involves the state densities ρ_{ϕ}, space and time exposition Γ, and state entropy S_{ψ} towards the global equilibrium environment G. Assuming the energy state functions of ϕ^{-} as yin states, and ϕ^{+} as yang states, the state density ρ_{ψ} of the first horizon can be expressed by:

$$\rho_{\phi} = \phi^{+}(x^{\mu}, \lambda)\phi^{-}(x^{\mu}, \lambda) \;: x^{\mu} \in M\{\mathbf{r} \pm i\mathbf{k}\} \qquad (3.1)$$

where the superscript signs of "-" and "+" indicate the yin and yang as a twin in equilibrium.

In a manifold, the entropy is a measure of the specific number of ways in which the manifold operations could be arranged towards either order or disorder. The state entropy $S_\phi \in G$ can be written as the following, assuming the operational function $f(\lambda)$ for the global property at an event λ:

$$dS_\phi = -k_s \int f(\lambda)\rho_\phi d\Gamma = \int L(\phi_n^-, \partial_\mu \phi_n^-, \phi_n^+, \partial_\nu \phi_n^+) d\Gamma \quad (3.2)$$

where k_s is a constant and L is an energy density. Apparently, it implies the event operation of λ is equivalent to the operator of ∂_μ. Because of the complex manifolds, the conjugate vectors $\vec{\mathbf{q}}$ and $\bar{\mathbf{q}}$ of equations of (2.5) and (2.6) represent that an event λ has a conjugate pair of yinyang operators, shown as the following:

$$\partial_\mu \in \{\partial_\kappa^-, \partial_r\} \mapsto \partial_\kappa^- \phi_n^- = +\frac{\partial \phi_n^-}{\partial x_0}, \partial_r \phi_n^- := \nabla \phi_n^- \quad (3.3a)$$

$$\partial_\mu \in \{\partial_\kappa^+, \partial_r\} \mapsto \partial_\kappa^+ \phi_n^+ = -\frac{\partial \phi_n^+}{\partial x_0}, \partial_r \phi_n^+ := \nabla \phi_n^+ \quad (3.3b)$$

A complex manifold yields a holomorphic function and is complex differentiable in a neighborhood of every point in its domain, such that an operational process can be represented as an infinite sum of terms that are calculated from any operator λ of the function's derivatives at an initial point λ_0, shown as the following

$$f(\lambda) = f(\lambda_0) + f'(\lambda_0)(\lambda - \lambda_0) + \ldots \frac{f^n(\lambda_0)(\lambda - \lambda_0)^n}{n!} \quad (3.4)$$

known as the *Taylor* and *Maclaurin* series [4], introduced in 1715. Because the event process λ is operated in complex composition of the yinyang coordinates, it yields a linear function in a form of operational addition: $f(\partial_\kappa + \partial_r) = f(\partial_\kappa) + f(\partial_r)$, where the global vectors of each manifolds $\{\mathbf{r} \pm i\mathbf{k}\}$ can constitute their orthogonal coordinate system $\mathbf{r} \cdot \mathbf{k} = 0$, respectively.

4. First Horizon of Energy Equilibrium

During yinyang dynamics, the first horizon density $\phi_n^- \phi_n^+$ is incepted at $\lambda_0 = 0$ by its yang evolution of $\lambda = \partial_\kappa^\pm$. This event evolution defines its yang operations on the energy state density in the form of kinetic energy density $-T$. The "-" sign represents the physical kinetics is a mirror or antisymmetric effect operated by the yang operation $f(\partial_\tau)$ of equation (3.4).

$$f(\partial_\kappa^\mp)(\phi_n^- \phi_n^+) = \left(\frac{\kappa_\tau}{2}\partial_\tau^\mp + \kappa_{\tau 2}\partial_\kappa^2 + \ldots\right)(\phi_n^- \phi_n^+) := \pm iT$$
$$= \frac{\kappa_\tau}{2}\left(\frac{\partial \phi_n^-}{\partial x_0}\phi_n^+ - \phi_n^- \frac{\partial \phi_n^+}{\partial x_0}\right) \quad (4.1)$$
$$= \kappa_{\tau 2}\left(\frac{\partial^2 \phi_n^-}{\partial x_0^2}\phi_n^+ - 2\frac{\partial \phi_n^-}{\partial x_0}\frac{\partial \phi_n^+}{\partial x_0} + \phi_n^- \frac{\partial \phi_n^+}{\partial x_0^2}\right) + \ldots$$

where κ_τ and $\kappa_{\tau 2}$ are coefficients of the first and second orders defined as the virtual state constants.

Considering the global event $f(\lambda_0)$, it operates on the timestate density to form the initial "local" energy λ_0 as the internal energy density V_l, known as the potential $V(\mathbf{r}, \lambda_0)$ of the system:

$$f(\lambda_0)(\phi_n^- \phi_n^+) = V(\mathbf{r}, \lambda_0)(\phi_n^- \phi_n^+) := V_l \quad (4.2)$$

Meanwhile, the yin function $f(\partial_r)$ of the equation (3.4) at $\lambda_0 = 0$ operates the event duality known as physical potential V_r:

$$f(\partial_r)(\phi_n^- \phi_n^+) = (\kappa_r \nabla + \kappa_{r2}\nabla^2 \ldots)(\phi_n^- \phi_n^+) := V_r$$
$$= \kappa_r(\nabla \phi_n^- \phi_n^+ + \phi_n^- \nabla \phi_n^+) \quad (4.3)$$
$$+\kappa_{r2}(\nabla^2 \phi_n^- \phi_n^+ + 2\nabla \phi_n^- \nabla \phi_n^+ + \phi_n^- \nabla^2 \phi_n^+) + \ldots$$

where κ_r and κ_{r2} are coefficients of the first and second orders defined as the yin state constants.

With equations of (4.1)-(4.3), it has derived the First Horizon of Yinyang State-Energy Equilibrium in the following form:

$$L^\mp = V \pm iT = [f(\partial_\kappa^\mp) + f(\lambda_0) + f(\partial_r)](\phi_n^- \phi_n^+) \quad (4.4)$$

which extends the yinyang meaning of the *Lagrangian*[3] density, introduced in 1788. It demonstrates that the *Energy-State* at the first horizon is operated by the yinyang operations.

5. Yinyang Motion Conservations

As a natural principle, one entropy decreases and dominants the intrinsic yin development of virtual into physical horizon, while, at the same time, the opponent entropy increases and dominants the intrinsic yang annihilation of physical resources into virtual domain. Applying to the equation of (4.4), this principle represents Yin and Yang Motion Equations, respectively:

$$\partial_\mu\left(\frac{\partial L}{\partial(\partial_\mu \phi)}\right) - \frac{\partial L}{\partial \phi} = 0 \quad (5.1a)$$

$$L = \{L^-, L^+\}, \phi \in \{\phi_n^-, \phi_n^+\}, \partial_\mu \in \{\partial_\kappa^\mp, \partial_r\} \quad (5.1b)$$

Extends to the *Euler-Lagrange* [3] equation, introduced in the 1750s, for yinyang actions of any dynamic system, the new sets of the variables ϕ and their operators ∂_μ signify that yinyang manifolds maintains equilibria formulations from each of the entropy extrema, simultaneously driving a duality of yinyang fields giving rise to the first horizon of quantum dynamics, shown in the next few sections.

6. Yin Quantum Dynamics

Rising from the yang fields of ϕ_n^+ and $\partial_\mu \phi_n^+$, the dynamic reactions under yin manifold give rise to the following motion equations of yin state fields ϕ_n^- approximated at the first and second orders of perturbations from equations of *(4.1)-(4.4)* in term of the yin state equilibrium of $L = (V_l + V_r) + iT$:

$$\frac{\partial L}{\partial \phi_n^+} = V\phi_n^- + \kappa_r \nabla \phi_n^- + \kappa_{r2}\nabla^2 \phi_n^- + \frac{\kappa_\tau}{2}\frac{\partial \phi_n^-}{\partial x_0} + \kappa_{\tau 2}\frac{\partial^2 \phi_n^-}{\partial x_0^2} \quad (6.1a)$$

$$\partial_\kappa^-(\frac{\partial L}{\partial(\partial_\tau \phi_n^+)}) = -\frac{\kappa_\tau}{2}\frac{\partial \phi_n^-}{\partial x_0} - 2\kappa_{\tau 2}\frac{\partial^2 \phi_n^-}{\partial x_0^2} \quad (6.1b)$$

$$\nabla(\frac{\partial L}{\partial(\nabla \phi_n^+)}) = \kappa_r \nabla \phi_n^- + 2\kappa_{r2}\nabla^2 \phi_n^- \quad (6.1c)$$

Upon these interwoven relationships, the yinyang motion equation of *(6.1)* determines a linear partial differential equation of the state function ϕ_n^- under the yin supremacy of physical dynamics:

$$3\kappa_{\tau 2}\frac{\partial^2 \phi_n^-}{\partial x_0^2} + \kappa_\tau \frac{\partial \phi_n^-}{\partial x_0} - \kappa_{r2}\nabla^2 \phi_n^- + V(\mathbf{r}, x_0)\phi_n^- = 0 \quad (6.2)$$

giving rise to the following *Yin Quantum Equation* from each of the respective opponents during their virtual interactions:

$$-\frac{3\hbar^2}{2\mu}\frac{\partial^2 \phi_n^-}{c^2 \partial t^2} - i\hbar \frac{\partial \phi_n^-}{\partial t} + \hat{H}\phi_n^- = 0 \quad (6.3a)$$

$$\kappa_\tau = \hbar c, \kappa_{\tau 2} = \kappa_{r2} = \frac{\hbar^2}{2m*} \quad (6.3b)$$

where $\hbar$ is the *Planck* constant [7], introduced in 1900, m^* is the reduced mass, and $\hat{H}$ is defined as the relationship known as *Hamiltonian* [4], introduced in 1834 [5]. For the first order of the internal energy and kinetic-energy, equation (6.3) emerges as the *Schrödinger* equation [6] introduced in 1926, in the form of:

$$i\hbar \frac{\partial \phi_n^-}{\partial t} = \hat{H}\phi_n^- : \hat{H} \equiv \frac{-\hbar^2}{2m*}\nabla^2 + V(\mathbf{r}, x_0) \quad (6.4)$$

It represents the manifold dynamics as the function of yin fields rises from its opponent in the yang interactions during the first horizon of timespace evolutions.

As an evidence of duality operation, consider N oscillators of quantum objects in the yin manifold. Developed by Paul Dirac, the "ladder operator" method allows us to extract effectively the energy eigenvalues as the following [3]:

$$H = \hbar\omega \sum_{i=1}^{N}\left(a_i^\pm a_i^\mp \pm \frac{1}{2}\right) \quad (6.5a)$$

$$\hat{a}_i^\mp = \sqrt{\frac{m\omega}{2\hbar}}\left(r_i \pm \frac{i}{m\omega}Pi\right) \quad (6.5b)$$

where $\hat{a}_i^-$ is the operator for wave-mass of yin reproduction, while $\hat{a}_i^+$ is the operator for mass-wave of yang annihilation. Both of the operators simultaneously perform a duality of the virtual and physical reality of photons, which obey the law of *Universal Topology* - a *life streaming* of interwoven dynamics: $W = P \pm iV$.

7. Yang Quantum Dynamics

Rising from the yin fields of ϕ_n^- and $\partial_\mu \phi_n^-$ in parallel fashion, the dynamic reactions of the yang manifold give rise to the following motion equations of yang fields ϕ_n^+ approximated at the first and second orders of perturbations from equations of *(4.1)-(4.4)* in term of universal *yang* stae equilibrium $L = (V_l + V_r) - iT$:

$$\frac{\partial L}{\partial \phi_n^-} = V\phi_n^+ + \kappa_r \nabla \phi_n^+ + \kappa_{r2}\nabla^2 \phi_n^+ - \frac{\kappa_\tau}{2}\frac{\partial \phi_n^+}{\partial x_0} + \kappa_{\tau 2}\frac{\partial^2 \phi_n^+}{\partial x_0^2} \quad (7.1a)$$

$$\partial_\kappa^+(\frac{\partial L}{\partial(\partial_\tau \phi_n^-)}) = -\frac{\kappa_\tau}{2}\frac{\partial \phi_n^+}{\partial x_0} + 2\kappa_{\tau 2}\frac{\partial^2 \phi_n^+}{\partial x_0^2} \quad (7.1b)$$

$$\nabla(\frac{\partial L}{\partial(\nabla \phi_n^-)}) = \kappa_r \nabla \phi_n^+ + 2\kappa_{r2}\nabla^2 \phi_n^+ \quad (7.1c)$$

From these yinyang interwoven relationships, the motion equations of (5.1) determine a linear partial differential equation of the timestate ϕ_n^+, giving rise to the following *Yang Quantum Equation* from each respective opponent during their yin interactions:

$$-\kappa_{\tau 2}\frac{\partial^2 \phi_n^+}{\partial x_0^2} - \kappa_{r2}\nabla^2 \phi_n^+ + \hat{V}(\mathbf{r}, x_0)\phi_n^+ = 0 \quad (7.2)$$

As a result, it represents the yinyang dynamics as the function of the yang fields rising from its opponent in the yin interactions during the first horizon of yinyang evolutions.

For a free particle, the energy is known as the *Einstein* equation [2]: $\hat{V}\phi_n^+ = E\phi_n^+$, $E = mc^2$, introduced in 1905. This derives the following *Klein–Gordon* equation [3], introduced in 1928.

$$\frac{1}{c^2}\frac{\partial^2 \phi_n^+}{\partial t^2} - \nabla^2 \phi_n^+ + \left(\frac{mc}{\hbar}\right)^2 \phi_n^+ = 0 \quad (7.3a)$$

$$\kappa_{\tau 2} = \kappa_{r2} = \frac{\hbar^2}{m} = \frac{\hbar^2}{2m*} \quad (7.3b)$$

Rewritten in form of the dual operations, it becomes the following:

$$\left(\hat{b}^+ \hat{b}^- + 1\right)\phi_n^+ = 0 \quad (7.3c)$$

$$\hat{b}^\mp = \frac{\hbar}{mc}\left(i\frac{\partial}{\partial x_0} \pm \nabla\right) \quad (7.3d)$$

Demonstrating a duality of alternating actions, one operator $\hat{b}^-$ is a yin process for physical reproduction, and another operator $\hat{b}^+$ is a reverse yang process for virtual annihilation. Hence, they comply with and are governed by the law of *Universal Topology:* $W = P \pm iV$.

For another example, equation of (7.3) represents the energy-momentum conservation in form of $E^2 = W^- W^+$ as the following:

$$E^2 = (\mathbf{P}c + imc^2)(\mathbf{P}c - imc^2) \tag{7.4a}$$

$$-i\hbar\nabla \mapsto \mathbf{P}, -\hbar c\partial / \partial x_0 \mapsto E \tag{7.4b}$$

knoknown as the relativistic equation relating any object's rest or intrinsic mass m with total energy E and momentum $\mathbf{P}$. It functions as the relativistic yinyang fields, representing the law of *Universal YinYang Topology* - a *life streaming* of yinyang interwoven dynamics: $W^{\mp} = P \pm iV$.

8. Conclusion

Governed by the *Universal Topology* $W = P \pm iV$, the law comes out intuitively with the first horizon of quantum mechanics, shown by the following remarks:

i) A duality of the yin and yang manifolds:

$$M\left\{\mathbf{r} \pm i\mathbf{k}\right\} = \{\pm x_0, x_1, x_2, x_3\} \ : x_0 = ict \tag{8.1}$$

ii) A yinyang conjugate pair of event operations:

$$\partial_\mu \in \{\partial_\kappa^{\mp}, \partial_r\} \mapsto \partial_\kappa^{\mp}\phi_n^{\mp} = \pm\frac{\partial}{\partial x_0}\phi_n^{\mp}, \partial_r\phi_n^{\mp} := \nabla\phi_n^{\mp} \tag{8.2}$$

iii) First Horizon of YinYang State Equilibrium:

$$L = \left[V(x_\mu) + \frac{\hbar c}{2}\partial_\mu + \frac{\hbar^2}{2m*}\partial_\mu^2 + ...\right]\left(\phi_n^-\phi_n^+\right) \tag{8.3}$$

iv) A duality of Yinyang Quantum Fields:

$$\frac{3\hbar^2}{2m*c^2}\frac{\partial^2\phi_n^-}{\partial t^2} + i\hbar\frac{\partial\phi_n^-}{\partial t} = \hat{H}\phi_n^- : \hat{H} \equiv \frac{-\hbar^2}{2m*}\nabla^2 + V(\mathbf{r}, t) \tag{8.4}$$

$$\frac{1}{c^2}\frac{\partial^2\phi_n^+}{\partial t^2} - \nabla^2\phi_n^+ + \frac{m}{\hbar^2}V(\mathbf{r}, t)\phi_n^+ = 0 \tag{8.5}$$

From a duality of yinyang dynamics these formulations represent that YinYang Topology of manifolds and event operations gives rise to the first horizon of quantum mechanics.

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