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The Timeless Formulation of Quantum Mechanics: Energy-Frequency Duality and the Manifestation Formalism

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Abstract

We present a self-consistent, time-independent framework for quantum mechanics that removes temporal evolution from the foundations of physics, replacing it with an absolute energy-frequency paradigm. By defining the speed of light (c) not as a kinematic velocity but as a universal manifestation ratio between frequency and spatial extension, we derive the Timeless Master Wave Equation (TMWE). In this paradigm, physical reality is a static, higher-dimensional interference pattern where mass acts as a spatial coupling constant measuring a system's resistance to local manifestation. We introduce the manifestation operator $\hat{M}$ to formalize the transition from non-local wave states to localized spatial observables. This framework resolves long-standing conceptual conflicts between the absolute background time of quantum mechanics and the dynamic spacetime of general relativity, showing that temporal progression is an emergent phenomenon of observer-state resonance.

Keywords: Timeless, quantum mechanics, energy, frequency, duality, manifestation.

1. Introduction and postulates

Traditional physics models system dynamics through differential equations tied directly to time. Yet, treating time as a primary variable creates deep theoretical friction: quantum mechanics depends on a fixed, external clock, while general relativity models spacetime as a flexible, relative geometric block.

To bypass these conflicting temporal definitions, this framework uses energy conservation as its definitive invariant baseline. Eliminating the time coordinate from the foundational axioms allows for a complete mechanical rewrite built on two core assumptions:

1. The Energy-frequency identity [1]: Energy is inherently proportional to an intrinsic, time-independent periodic metric, frequency (f):

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$$E = hf \quad (1)$$

2. The constant manifestation metric: The value c operates as a static scaling factor translating frequency into spatial wavelength (λ), rather than representing a kinematic velocity through space:

$$c = f\lambda \quad (2)$$

Under this paradigm, frequency is decoupled from temporal duration (s^{-1}). Instead, it serves as a structural property of the wave geometry itself. Consequently, this model trades temporal progression for spatial resonance, describing a static, crystalline reality.

2. Derivation of the Timeless Master Wave Equation (TMWE)

2.1 Formalizing timeless kinetic energy

In standard quantum mechanics, the kinetic energy operator $\hat{K}$ is expressed via the momentum operator $\hat{p}$:

$$\hat{K} = \frac{\hat{p}^2}{2m} \quad (3)$$

Where the spatial representation of momentum is defined by the gradient:

$$\hat{p} = i \frac{\hbar}{2\pi} \frac{\partial}{\partial x} \quad (4)$$

From our second postulate, the wavevector (k), which describes spatial periodicity, becomes:

$$k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} \quad (5)$$

Substituting this structural wavevector into the de Broglie relation maps momentum directly to frequency and the manifestation ratio:

$$p = \frac{\hbar}{2\pi} k = \left(\frac{\hbar}{2\pi}\right) \left(\frac{2\pi f}{c}\right) = \frac{\hbar f}{c} \quad (6)$$

Squaring this relation yields the kinetic energy term within our timeless framework:

$$K = \frac{p^2}{2m} = \left(\frac{hf/c}{2m} \right)^2 = \frac{h^2 f^2}{2mc^2} \quad (7)$$

2.2 Constructing the timeless Hamiltonian

The Hamiltonian operator $\hat{H}$ describes the total energy of the system within a spatial potential landscape $V(x)$. The absolute energy eigenvalue equation for a physical state (x) is given by:

$$\hat{H}\psi(x) = E\psi(x) \quad (8a)$$

$$(\hat{K} + V(x))\psi(x) = hf\psi(x) \quad (8b)$$

To preserve structural consistency with standard wave mechanics while using our frequency-based parameters, the kinetic energy operator must retain its relationship to the second spatial derivative (representing wave curvature):

$$\hat{K} = -\frac{h^2}{8\pi^2 m} \frac{d^2}{dx^2} \quad (9)$$

To reconcile this with the structural relation in Equation (8), we define the full timeless Hamiltonian operator as:

$$\hat{H} = -\left(\frac{h^2 f^2}{8\pi^2 mc^2} \frac{d^2}{dx^2} \right) + V(x) \quad (10)$$

2.3 The fundamental equation

Equating the operator action to the absolute energy eigenvalue $hf\psi(x)$ yields:

$$hf\psi(x) = \left[-\frac{h^2}{8\pi^2 m} \frac{d^2}{dx^2} + V(x) \right] \psi(x) \quad (11)$$

Isolating the spatial derivative terms produces the standard form of the Timeless Master Wave Equation:

$$\frac{d^2\psi(x)}{dx^2} + \frac{8\pi^2 mc^2}{h^2 f^2} (hf - V(x))\psi(x) = 0 \quad (12)$$

3. The manifestation operator

To connect the unobserved wave geometry with localized physical observables, we introduce the manifestation operator $\hat{M}$. This operator maps the spatial gradient of the absolute energy density to a local projection.

We evaluate a stationary plane-wave state:

$$\psi(x) = A \exp(i(kx + \phi)) \quad (13)$$

Taking the first spatial derivative gives:

$$\frac{d\psi(x)}{dx} = ik\psi(x) \quad (14)$$

Substituting our timeless wavevector expression $k = \frac{2\pi f}{c}$ transforms the derivative into:

$$\frac{d\psi(x)}{dx} = i \left(\frac{2\pi f}{c} \right) \psi(x) \quad (15)$$

Rearranging this expression isolates the state vector as a function of its spatial gradient:

$$\psi(x) = -i \left(\frac{c}{2\pi f} \right) \frac{d\psi(x)}{dx} \quad (16)$$

Scaling this projection by the absolute quantum of energy (hf) determines the eigenvalue for local manifestation:

$$\hat{M}\psi(x) = \frac{hf}{2\pi} \left(\frac{c}{f} \right) \left[-i \frac{d}{dx} \right] \psi(x) = -i \frac{hf}{2\pi c} \frac{d}{dx} \psi(x) \quad (17)$$

Where the operational form of the manifestation operator is defined as:

$$\hat{M} = -i \frac{hf}{2\pi c} \frac{d}{dx} \quad (18)$$

4. Analytical integration and the energy-density tensor

To establish a self-consistent foundation for this formalism, we must reconcile classical continuum mechanics with our timeless paradigm. Let the continuous energy density of a fundamental field be described by:

$$E(x, f) = E_0 \sin\left(\frac{2\pi}{\lambda}(x + \phi)\right) \quad (19)$$

The second spatial derivative of this field yields:

$$\frac{\partial^2 E}{\partial x^2} = -\left(\frac{2\pi}{\lambda}\right)^2 E_0 \sin\left(\frac{2\pi}{\lambda}(x + \phi)\right) = -\left(\frac{2\pi}{\lambda}\right)^2 E \quad (20)$$

We bridge this wave geometry with mechanics by introducing a time-independent, frequency-space analogue to the Newton-Hooke identity for continuous media:

$$\frac{dc}{df} = \left(\frac{KL^2}{M}\right) \left(-\frac{\lambda^2}{4\pi^2}\right) \frac{\partial^2 E}{\partial x^2} \quad (21)$$

Where K represents the structural network modulus, L is the characteristic spatial length, and M is the net mass of the manifestation domain. Substituting the second spatial derivative of energy simplifies the expression to:

$$\frac{dc}{df} = \left(\frac{KL^2}{M}\right) E$$

Because $\lambda = c/f$, its derivative (dc/df) does not track a kinematic acceleration over time. Instead, it describes a geometric scaling of energy density relative to its frequency domain. This allows us to define a scalar timeless invariant constant, Q

$$Q = \frac{E}{c^2} \quad (22)$$

While algebraically identical to Einstein's mass-energy equivalence [2], its physical interpretation is inverted within this framework: mass is not an intrinsic source of energy, but an emergent coupling constant measuring a system's resistance to local manifestation within spatial dimensions.

5. Groundbreaking physical and philosophical consequences

5.1 *The death of causality and the emergence of synchronicity*

Because the TMWE contains no time derivatives, temporal causality (A to B) is removed from the fundamental axioms of the theory. Linear sequences are an illusion of human perception, arising because consciousness interacts with the static field at a specific resonance frequency, similar to a stylus sampling a vinyl record. Physical processes are instead governed by harmonic resonance, where states are correlated across space by matching frequency components within the global energy field.

5.2 *Gravity as a frequency refraction gradient*

In this framework, gravity is stripped of its geometric spacetime metric tensor interpretation ($g_{\mu\nu}$) [3]. It is recast as a local refraction of energy waves within regions of high frequency

density. A concentration of localized mass reduces the local manifestation ratio, bending nearby energy patterns toward the higher density region via purely spatial refraction gradients.

5.3 Infinite locality and quantum entanglement

Because spatial position x is subordinate to the fundamental energy field $E(f)$, spatial separation is an emergent, secondary property. In the absolute wave layer, every point in the universe maintains immediate contact via phase resonance. Quantum entanglement requires no non-local signal transmission across distance; entangled entities are simply distinct spatial components of a single, unified frequency peak within the timeless field.

5.4 The observer as a phase-shift mechanism

The presence of the imaginary unit i in the manifestation operator proves that translating the non-local wave field into localized spatial metrics requires a distinct phase shift. The conscious observer acts as a frequency filter that provides the reference phase needed to localize an interaction coordinate. Without an observer or phase-modulating reference interaction, reality remains an uncollapsed, non-local standing wave.

6. Conclusion

By replacing a temporal background with a strict energy-frequency foundation, this framework moves from a universe of becoming to a universe of being. The equations $E = hf$ and $c = f/\lambda$ define an eternal geometric structure where change is not a property of the system, but an emergent feature of conscious perception. This approach provides a self-consistent alternative that resolves the foundational conflicts between general relativity and quantum mechanics by omitting time entirely from the primary laws of nature.

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