Appendix C: Rheological Disinfection of the Schrödinger, Einstein and Dirac Equations via the OCEAN Project (FUH)

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Abstract

This technical appendix presents a rigorous derivation and physical reformatting of the fundamental equation of quantum mechanics within the FUH Paradigm (Fermionic Universe Hypothesis), the Einstein formula $E = mc^2$, and the Dirac equation.

1 Rheological Passport of Medium Notations

In the OCEAN project model, space-time is an expanded fermionic condensate with a strictly predefined discrete crystal lattice step Λ and a fundamental dynamic shear viscosity η:

$$\Lambda = 0.258 \times 10^{-9} \text{ m} \tag{1}$$

$$\eta = 1.2 \times 10^{-15} \text{ Pa} \cdot \text{s} \tag{2}$$

Classical quantum mechanics utilizes an abstract "slashed" Planck constant $\hbar$ to describe the microcosm, without understanding its physical nature. The FUH paradigm introduces the **Ideal Quantum of Action (The Shlyapik Constant)** W_{ideal}, which reflects the pure mechanical work of the Shlyapik Impulse on the relaxation trajectory of a vacuum foam cell ($W_{ideal} \equiv h$):

$$W_{ideal} = 6.628 \times 10^{-34} \text{ J} \cdot \text{s} \tag{3}$$

The connection to Dirac's reduction is strictly geometric and is expressed as:

$$\hbar = \frac{W_{ideal}}{2\pi} \tag{4}$$

2 Derivation of the Shlyapik — Schrödinger Equation

The traditional mainstream form of the wave equation, tied to an abstract "emptiness probability amplitude" ψ, has the form:

$$-\frac{\hbar^2}{2m}\nabla^2\psi + V\psi = E\psi \tag{5}$$

We perform a direct substitution of the quantum crutch $\hbar$ with the mechanical equivalent of the Medium's work (Equation 4), expanding the square of the numerator in the first term:

$$\left(\frac{W_{ideal}}{2\pi}\right)^2 = \frac{W_{ideal}^2}{4\pi^2} \tag{6}$$

Substituting the obtained expression into the common denominator of the inertial confinement of the mass defect $2m$, we perform a direct algebraic annihilation of mainstream garbage:

$$-\frac{\frac{W_{ideal}^2}{4\pi^2}}{2m}\nabla^2\psi = -\frac{W_{ideal}^2}{8\pi^2 m}\nabla^2\psi \tag{7}$$

Assembling the equation into its final, rectangular, and sovereign form, we obtain the **Shlyapik — Schrödinger Equation**:

$$-\frac{W_{ideal}^2}{8\pi^2 m}\nabla^2\psi + V\psi = E\psi \tag{8}$$

3 Deterministic Physical Meaning of the Operators

In contrast to the idealistic mainstream interpretation, equation (8) describes a strictly classical hydrodynamic process in the Ocean of the Universe:

- ψ **(The Psi-field)** — the real local density and concentration of the vacuum condensate. The ψ waves are physical compression and rarefaction waves of the Medium.
- $\nabla^2\psi$ **(The Laplacian)** — the operator of the elastic volumetric compression of the Medium. It serves as the mathematical measure of the rheological pressure gradient that arises during the deformation of the Ocean cells.
- **The** $8\pi^2$ **Coefficient** — a geometric invariant of the viscous shear momentum distribution across the eight vertices of the three-dimensional cubic cell of the vacuum framework.
- m — the inertial mass of a stable, twisted vortex defect in the vacuum foam.
- V — the static pressure profile of the Medium P_ψ within the interaction zone.

4 Rheological Basis of Mass in the OCEAN Project

Unlike mainstream physics, which postulates mass as an inherent property of an isolated material point or the result of a hypothetical Higgs field, the FUH model defines the baryon rest mass m as a local topological defect (a stable, twisted compression vortex) inside the crystalline fermionic condensate.

The inertial resistance of this vortex node is completely determined by the dynamic shear viscosity of the Medium η and the characteristic relaxation time of the defect τ_p:

$$\eta = 1.2 \times 10^{-15}\ \text{Pa} \cdot \text{s} \tag{9}$$

$$m = \eta\tau_s \tag{10}$$

The speed of light $c = 3 \times 10^8$ m/s in this model represents a strict upper limit on the propagation velocity of longitudinal and transverse elastic perturbations (compression waves) through the structural elements of the Ocean.

5 Derivation of the Shlyapik — Einstein Equation

The classical expression for mass-energy equivalence has the form:

$$E = mc^2 \tag{11}$$

Injecting the sovereign rheological definition of mass (Equation 10) directly into the relativistic invariant (Equation 11), we obtain the **Shlyapik — Einstein Equation**:

$$E = \eta\tau_s c^2 \tag{12}$$

6 Metrological Control and Unit Annihilation in SI

Let us verify the dimensional consistency of the resulting equation using the base matrices of the SI system (kilogram [kg], meter [m], second [s]). Since the dimension of dynamic viscosity is $[\eta] = \text{kg}/(\text{m} \cdot \text{s})$, we obtain:

$$[E] = [\eta] \cdot [\tau_s] \cdot [c^2] = \left(\frac{\text{kg}}{\text{m} \cdot \text{s}} \right) \cdot (\text{m} \cdot \text{s}) \cdot \left(\frac{\text{m}^2}{\text{s}^2} \right) \tag{13}$$

Performing a direct annihilation of the space-time invariants in the numerator and denominator ($\text{m} \cdot \text{s}/\text{m} \cdot \text{s} = 1$), we obtain:

$$[E] = \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2} \equiv [\text{J}] \tag{14}$$

7 Physical Interpretation: The Deformation Mechanism

The Shlyapik — Einstein Equation reveals the true microscopic picture of matter annihilation. The process of "transforming" mass into radiation is the mechanical straightening of locally compressed elements of the vacuum crystal framework.

Upon the destruction of a topological defect, the accumulated elastic strain potential of the Ocean lattice is instantly released, returning the Medium to a laminar, unperturbed equilibrium state, and dissipates in the form of a spherical wave dissipation (photons) at a scale factor of c^2. Mass is equivalent to energy in exactly the same way as the potential energy of a compressed mechanical spring is equivalent to the work it performs upon expanding.

8 Derivation of the Shlyapik — Dirac Equation

We perform a substitution of the abstract reduced Planck constant $\hbar$ with the **Ideal Quantum of Action (The Shlyapik Constant)** $W_{ideal} = 6.628 \cdot 10^{-34}$ J·s, which reflects the mechanical work of the Medium on the cell relaxation trajectory:

$$\hbar = \frac{W_{ideal}}{2\pi} \tag{15}$$

Simultaneously, the inertial rest mass of the defect m is replaced by the sovereign mass invariant of the Medium via the generalized substrate relaxation time τ_s:

$$m = \eta \tau_s \tag{16}$$

Injecting these equations directly into the original matrix framework, we obtain the **Shlyapik — Dirac Equation**:

$$\left(i \frac{W_{ideal}}{2\pi} \gamma^\mu \partial_\mu - \eta \tau_s c \right) \psi = 0 \tag{17}$$

9 Deterministic Physical Meaning of the Operators

The equation preserves the full mathematical precision of all matrix solutions in quantum electrodynamics, but translates them into the language of the classical mechanics of deformable media:

- **The Dirac Matrices** γ^μ — these are not abstract imaginary operators, but **coordinate stiffness vectors of the vacuum crystal lattice** along the four space-time axes of the Medium's deformation.

- **The Spin of a Particle** — this is a real, tangible **helical (torsional) rotation of a local section of the crystal framework**. As a defect moves through the Ocean, the Medium not only undergoes volumetric compression but also viscously twists in a spiral, generating a wave angular momentum.
- **Antimatter (The Positron)** — this is not a particle with "negative energy" from a fictional sea, but a local vortex of the Medium twisted **in the opposite direction (a mirror defect of the lattice rotation)**.

The process of electron-positron annihilation within the framework of the equation is the mutual cancellation of two oppositely directed vortices. The crystal grid of the Ocean instantly straightens into a laminar state of rest, releasing the accumulated elasticity potential in the form of photons at velocity c.

Conclusion: Consolidated Rheological Synthesis: The Schrödinger, Einstein and Dirac Equations

Within the framework of the **OCEAN project (FUH paradigm)**, the canonical equations of E. Schrödinger and A. Einstein do not require any changes to their alphanumeric form, but are completely cleansed of the quantum-relativistic idealistic interpretations of the mainstream. Each variable is directly linked to the deterministic mechanics of a discrete crystalline fermionic condensate (ψ-field) with a strict lattice step $\Lambda = 0.258 \times 10^{-9}$ m and a dynamic shear viscosity $\eta = 1.2 \times 10^{-15}$ Pa $\cdot$ s.

9.1 The Shlyapik — Schrödinger Condensate Map

When the reduced Dirac constant of action is expanded through the mechanical work along the cell relaxation trajectory ($W_{ideal} \equiv h$), the wave equation takes its exact, expanded form:

$$-\frac{W_{ideal}^2}{8\pi^2 m}\nabla^2\psi + V\psi = E\psi \tag{18}$$

The mathematical topology remains unchanged, but the physical meaning of the operators is completely rewritten:

- ψ represents the literal **local density and compression state** of the physical Medium.
- $\nabla^2\psi$ acts not as an abstract space-time curvature, but as a **volumetric compression operator**, measuring the exact pressure gradients that arise during the deformation of the discrete lattice.
- The coefficient $8\pi^2$ in the denominator arises as a geometric spatial invariant governing the symmetric distribution of viscous shear stresses across the 8 vertices of the cubic cell of the crystal framework.

9.2 The Shlyapik — Einstein Mass Invariant

The relativistic identity of energy preserves its familiar external interface but undergoes a complete microstructural deconstruction, defining mass not as an inherent parameter of an isolated point, but as a bounded topological vortex:

$$E = mc^2 \quad \text{where} \quad m = \eta\tau_s \tag{19}$$

Here, the inertial mass m is fully determined by the internal dynamic shear viscosity of the Medium (η), acting during the characteristic relaxation time (τ_s).

The transformation of mass into radiation energy at the maximum wave velocity squared (c^2) represents a completely mechanical process of **crystal lattice relaxation**. Upon the destruction of a local topological defect, the accumulated potential energy of structural deformation within the ψ-field is instantly released, returning the Medium to an unperturbed laminar equilibrium. The entire interaction proceeds identically to a compressed mechanical spring releasing its stored potential energy to perform work.

9.3 The Shlyapik — Dirac Matrix Stiffness Map

The relativistic wave equation of a fermion retains its exact alphanumeric matrix skeleton, but strips away the abstract magic of quantum spin and unobservable electron seas:

$$\left(i\frac{W_{ideal}}{2\pi}\gamma^{\mu}\partial_{\mu} - \eta\tau_s c \right)\psi = 0 \tag{20}$$

The algebraic mechanism is entirely preserved, but the physical substance of the operators is completely reformatted:

- γ^{μ} act not as abstract imaginary matrices, but as **coordinate stiffness vectors of the vacuum crystal lattice** along the four space-time deformation axes of the Medium.
- Particle spin represents a real, tangible **helical (torsional) rotation of a local section of the crystal framework**, where the moving defect viscously twists the Medium in a spiral, generating a wave angular momentum.
- Antimatter (the positron) is described not as a negative-energy hole in a fictional sea, but as a local vortex of the Medium twisted **in the opposite direction**, representing a mirror defect of the lattice rotation.

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