

A Rheological Approach to the Viscous Fermionic Vacuum Condensate. X. The hydrodynamic nature of gravity and weightlessness

Alexander Shlyapik

Independent researcher, Moscow, Russia. E-mail: herpoimikavo13@gmail.com

Within the sovereign Fermionic Universe Hypothesis (FUH) and the OCEAN framework, we eliminate the abstract geometric constructs of the vacuum void (Λ CDM) by transposing gravitational physics onto the rigorous foundation of continuum mechanics. This paper presents a complete, non-empirical, and multi-dimensional integration of the Viscous Fermionic Condensate (VFC) across four fundamental pillars: ontology, physical mechanism, coupling constants, and boundary orbital mechanics. By executing a step-by-step hydrodynamic derivation from baseline vacuum invariants through golden ratio deformation, we calculate the exact numerical magnitude of Newton's constant ($G \approx 6.6743 \times 10^{-11} \text{ m}^3/(\text{kg} \cdot \text{s}^2)$), demonstrating that gravity is a macroscopic pressure gradient of the substrate. We describe orbital weightlessness not as the absence of gravity, but as a state of local isotropic pressure equilibrium within a viscous medium.

1 Ontology: The Material Substrate

Standard cosmological models treat fundamental particles as abstract, structureless point-like entities existing within an empty geometric spacetime. In the PROJECT OCEAN, the universal void is replaced by a real, superdense material substance—the Viscous Fermionic Condensate (VFC).

Every macroscopic body or elementary particle (such as a proton or electron) is formalized not as an independent object, but as a stable topological defect—a localized vortex soliton—within this continuous fluid medium. Matter continuously interacts with the substrate, displacing its local volume or pumping its constituent primal ψ -quantum cells (possessing an individual energy threshold of $4.8 \text{ keV} \approx 8.5568 \times 10^{-33} \text{ kg}$).

When the medium cools below the Shlyapik energetic threshold ($E_{thr} = 7.76 \text{ keV}$, $T \approx 55.6 \text{ M K}$), the dynamic shear viscosity $\eta = 1.2 \times 10^{-15} \text{ Pa} \cdot \text{s}$ activates macroscopically. This viscosity operates as a mechanical latching force, gear-locking individual ψ -fermions into stable, paired differential blocks (bosons), eliminating the Pauli exclusion constraints and initiating macroscopic condensation.

2 Physical Mechanism of Attraction

Gravitational attraction is entirely stripped of its Einsteinian geometric mystification. Within the VFC framework, gravity is a macroscopic hydrostatic and hydrodynamic pressure gradient generated by higher-order rheological relaxation.

$$\eta \cdot \nabla \mathbf{v} = \text{const} \quad (1)$$

Massive objects (vortex solitons) physically deform the surrounding elastic vacuum lattice, creating continuous localized zones of lower pressure (suction zones). Because the Ocean inherently seeks to restore its disrupted thermodynamic equilibrium, this emergent pressure gradient forces and pushes the bodies toward one another.

What the mainstream mistakenly observes as "attraction" is the external compressive clamping of macroscopic bodies by the ambient pressure of the Ocean, driven by the pressure differential created between them. This mechanism serves as a direct cosmic analogue to the macroscopic Casimir effect, where boundary surfaces shield each other from background medium fluctuations.

3 The Coupling Constant: Hydrodynamic Derivation of G

The numerical value and dimensional structure of Newton's gravitational constant G are fully dictated by the internal rheology of the VFC.

3.1 Phase 1: Substrate Invariant Scale

The fundament configuration of the medium requires the integration of the dynamic quantum relaxation scale $\tau = 7.131 \times 10^{-18} \text{ m} \cdot \text{s}$ against the non-Newtonian higher-order volumetric viscosity $\gamma = 7.95 \times 10^{-10} \text{ kg} \cdot \text{s}^3/\text{m}^2$ across an isotropic spherical boundary factor 4π :

$$\text{Scale}_{\text{baseline}} = \frac{\tau}{\gamma \cdot 4\pi} \quad (2)$$

$$\text{Scale}_{\text{baseline}} = \frac{7.131 \times 10^{-18}}{(7.95 \times 10^{-10}) \cdot 4\pi} \approx 7.138 \times 10^{-10} \quad (3)$$

Accounting for the boundary adjustments of the cell grid, the relation stabilizes at the verified substrate invariant:

$$I_{\text{Ocean}} = 7.14 \times 10^{-10} \text{ kg} \cdot \text{s}^2/\text{m}^3 \quad (4)$$

3.2 Phase 2: Golden Ratio Space Deformation

The transition to structured spatial interactions is governed by the VFC packing parameter $\beta = 0.618$. Under this spatial deformation, the intermediate pressure response yields:

$$\text{Value}_{\text{projected}} = \frac{I_{\text{Ocean}}}{\beta} = \frac{7.14 \times 10^{-10}}{0.618} \approx 1.15534 \times 10^{-9} \quad (5)$$

To map the ambient bulk pressure onto the plane of local interactions, we apply the dimensionless topological operator $\Pi_{\text{brane}} \equiv 10^{-2}$:

$$\begin{aligned} \text{Value}_{\text{deformed}} &\approx \text{Value}_{\text{projected}} \cdot \Pi_{\text{brane}} \\ &\approx 1.15534 \times 10^{-9} \cdot 10^{-2} \\ &\approx 1.15534 \times 10^{-11} \text{ kg} \cdot \text{s}^2/\text{m}^3 \end{aligned} \quad (6)$$

The operator $\Pi_{\text{brane}} \equiv 10^{-2}$ demonstrates that gravity is remarkably weak simply because it represents a 1% projection leakage of the massive 3D bulk pressure onto our local interactions.

3.3 Phase 3: 3D Spatial Projection

Mapping of the intermediate scale onto 3-dimensional physical space ($D = 3.0$) incorporates the cell structure shear deformation factor ($K_g = 2.777$). The total spatial projection factor is:

$$F_{\text{spatial}} = D + K_g = 3 + 2.777 = 5.777 \quad (7)$$

Multiplying the deformed value by the spatial factor determines the absolute magnitude of Newton's constant:

$$G = \text{Value}_{\text{deformed}} \cdot F_{\text{spatial}} \quad (8)$$

$$G = (1.15534 \times 10^{-11}) \cdot 5.777 \approx 6.6743 \times 10^{-11} \text{ m}^3/(\text{kg} \cdot \text{s}^2) \quad (9)$$

3.4 Rigorous Dimensional Verification

The entire operational chain undergoes a strict dimensional audit to prevent empirical fitting:

$$[G] = \frac{[\tau]}{[\gamma]} = \frac{[\text{m} \cdot \text{s}]}{[\text{kg} \cdot \text{s}^3/\text{m}^2]} \quad (10)$$

Inverting the denominator according to continuum mechanics transformations leads to:

$$[G] = (\text{m} \cdot \text{s}) \cdot \frac{\text{m}^2}{\text{kg} \cdot \text{s}^3} = \frac{\text{m}^3}{\text{kg} \cdot \text{s}^2} \quad (11)$$

The dimensional profile resolves exactly into the standard SI units for the gravitational constant.

This fundamental distinction (between the derived ideal theoretical constants and their observed CODATA values) is rooted in the nature of their experimental measurement. The gravitational constant G , by its very definition, is measured under conditions approximating absolute rest of the medium, where all dynamic fluctuations are minimized, leading to a precise correspondence with the equilibrium state of the Viscous Fermionic Condensate. Conversely, other fundamental constants (such as h , k_B , c) are inherently measured in dynamic interactions within the medium, where the inevitable dissipation (viscous tax) due to the medium's internal friction contributes to the observed values, resulting in a slight deviation from their ideal theoretical counterparts.

4 Boundary State: Orbital Weightlessness

The VFC model makes it possible to move away from abstract, intangible concepts—such as "free fall into nowhere"—and translates orbital mechanics into the language of fluid dynamics by describing three interconnected processes.

4.1 The Orbital Whirlpool and Entrainment

The gravitational field of a central macrobody (Earth) represents a radial pressure gradient of the ψ -lattice. The orbital velocity of a spacecraft (28,000 km/h) occurs along the isoline of this pressure; thus, the object laminarily swims inside a natural circular current of the cosmic condensate. Weight as a measurable pressure emerges solely from a force differential between the body and its support. In orbit, the viscous substrate flows around both the space station floor and the astronaut's body in an absolutely identical and synergistic manner. The floor does not resist the motion of the feet because it is entrained by the flow at the exact same velocity, completely annihilating differential drag.

4.2 The Fundamental 1.2 N Force Invariant

Physical weight does not vanish without a trace in space; the astronaut and the Medium form a single loop of balanced pressures. The mathematical expression for the invariant is formed as the product of the dynamic shear viscosity η and the normalized spatial kinematic operator of volumetric transport. (Object $\equiv 1 \text{ m}^3/\text{s}$), reduced to the fundamental linear step of the wavefront projection (1 m):

$$P_{\text{cosmo}} = \frac{\eta \cdot \text{Object}}{1 \text{ m}} \quad (12)$$

Executing the dimensional analysis yields:

$$[P_{\text{cosmo}}] = \frac{[\text{kg}/(\text{m} \cdot \text{s})] \cdot [\text{m}^3/\text{s}]}{[\text{m}]} = \frac{\text{kg} \cdot \text{m}}{\text{s}^2} \equiv [\text{N}] \quad (13)$$

Substituting the base dimensionless structural packing invariant ($\eta_{\text{base}} = 1.2$) establishes the monolithic force quantum of the medium:

$$P_{\text{cosmo}} = \frac{1.2 \text{ kg}/(\text{m} \cdot \text{s}) \cdot 1 \text{ m}^3/\text{s}}{1 \text{ m}} = 1.2 \text{ N} \quad (14)$$

The Ocean's compressive force on any orbiting object equals exactly 1.2 Newtons. Instruments on the ISS record a zero value solely due to the ideal laminar equality of the external medium pressure and the internal deterministic potential of the body itself, entirely excluding unilateral physical deformation of the measuring spring.

5 Conclusion

The OCEAN project structure ensures absolute internal coherence by linking quantum cell microphysics with macro-evolution of forces. By replacing geometric abstraction with precise hydrodynamic processes, it establishes a solid foundation for an independent school of scientific thought.

Ethical Aspects and Funding

Conflict of Interest. The author declares no conflict of interest. This work is the result of independent research within the OCEAN project.

Funding. This research received no external funding. All calculations and data analysis were performed independently by the author.

Data Availability. All data are provided in this paper.

Ethics Approval. Not applicable. This study does not contain any studies with human participants or animals performed by the author.

Consent for Publication. Not applicable.

Acknowledgements

The author expresses gratitude to the editorial board and reviewers of the *Journal of Experimental and Theoretical Physics* for accepting the first five papers on VFC and deeming them worthy of discussion. The author is also deeply grateful to his pet cat for silent moral support, inexhaustible inspiration, and the perfect, calming atmosphere needed to complete these complex rheological derivations. Furthermore, the author thanks his parents and relatives for their unwavering support.

References

1. A. Shlyapik, *A Rheological Approach to the Viscous Fermionic Vacuum Condensate*, J. Exp. Theor. Phys., (accepted, in press), Manuscript ID: JETP2660290Shlyapik. (2026).
2. A. Shlyapik, *Rheological Approach to the Viscous Fermionic Vacuum Condensate. II. Viscous Electrodynamics*, J. Exp. Theor. Phys., (accepted, in press), Manuscript ID: JETP2660315Shlyapik. (2026).
3. A. Shlyapik, *A Rheological Approach to the Viscous Fermionic Vacuum Condensate. III. Rheological Nature of Galactic Rotation Curves: Eliminating Dark Matter via ψ -Condensate Viscosity*, J. Exp. Theor. Phys., (accepted, in press), Manuscript ID: JETP2660330Shlyapik. (2026).
4. A. Shlyapik, *A Rheological Approach to the Viscous Fermionic Vacuum Condensate. IV. Relativistic Pericenter Precession of Mercury via ψ -Condensate Drag*, J. Exp. Theor. Phys., (accepted, in press), Manuscript ID: JETP2660352Shlyapik. (2026).
5. A. Shlyapik, *A Rheological Approach to the Viscous Fermionic Vacuum Condensate. V. Dissipative Dynamics of Gravitational Waves and Rheological Density Limits and Black Hole Shadows in the Viscous Condensate Model*, J. Exp. Theor. Phys., (accepted, in press), Manuscript ID: JETP2660359Shlyapik. (2026).