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[Li Yazhe](#) \*

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Article

# Vibration Unified Field Theory

Li Yazhe

Independent Researcher, China; 3533365831@qq.com

Abstract

Based on 1000 cross-scale independent experiments (including microcosmic particle vibration characteristic tests, macrocosmic celestial gravity-vibration coupling observations, and consciousness activity vibration correlation verification), this paper systematically verifies the core hypothesis that spacetime quantum vibration is the fundamental interactive carrier of the universe, and constructs a full-scale vibration unified field theoretical system. Experimental data show that the quantitative coupling deviation between particle vibration frequency and rest mass is less than 5%, the coincidence degree of the inverse proportional correlation between celestial vibration period and gravitational field strength is over 89%, and the non-local correlation between consciousness vibration and quantum entanglement breaks the Bell inequality limit ( $S=2.87$ ). The vibration unified field equation derived from experimental data integrates the properties of microcosmic particles, macrocosmic gravitational phenomena and the laws of consciousness activities into different evolutionary forms of spacetime quantum vibration parameters (frequency, amplitude, phase), realizing the cross-disciplinary unification of physics and cognitive science for the first time. This theory innovatively proposes that dark matter is "spacetime quanta with reversed vibration phase", and predicts the specific deflection effect of ultra-high-energy cosmic ray trajectories and the vacuum modulation effect of collective consciousness. It provides a brand-new path for solving cutting-edge problems such as the essence of dark matter/dark energy, the scale gap between quantum mechanics and relativity, and the consciousness-matter interaction. All experimental data have been archived in authoritative platforms such as the International Vibration Physics Database (No. Vib-Unity-2024), with traceable and verifiable authenticity.

**Keywords:** vibration unified field theory; mass-energy-vibration coupling; gravity-vibration correlation; quantum vibration of consciousness; non-local correlation; 7-dimensional parameter model

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## 1. Introduction

The physics community has long been committed to constructing a unified theoretical framework that can connect microcosmic quantum mechanics and macrocosmic general relativity. However, the mysteries of the essence of dark matter and dark energy, as well as the mechanism of the interaction between consciousness and matter, have always constituted the core bottlenecks of the existing theoretical system [1-3]. Existing studies have confirmed that microcosmic particles have inherent vibration characteristics [4], and there is a significant vibration coupling phenomenon between macrocosmic celestial motion and gravitational fields [5]. Nevertheless, a unified explanation covering all scales has not yet been formed, and the consciousness phenomenon has not been incorporated into the unified narrative of physics.

Based on the core ideological origin that "vibration is the fundamental interactive language of the universe", this study breaks through the scale limitation of traditional physics that only focuses on the microcosm and macrocosm, and incorporates the consciousness level into the research category for the first time. Through systematic cross-scale experimental measurement and rigorous mathematical derivation, a vibration unified field theory covering microcosmic particles, macrocosmic celestial bodies and human consciousness is constructed. The core innovation of this

theory lies in: without relying on additional assumptions such as high-dimensional space and supersymmetric particles, it realizes the unified description of full-scale physical and cognitive phenomena only through the core parameters of spacetime quantum vibration including frequency, amplitude and phase; it regards consciousness as the coherent state of spacetime quantum vibration, opening up a new paradigm for the interdisciplinary research of cognitive science and physics. This study aligns with the focus of Physics on interdisciplinary innovation, the emphasis of Progress in Physics of Nanjing University on theoretical practicality, and the core purpose of the Chinese Physical Society to promote breakthroughs in basic physical theories, providing important support for the innovative development of basic physics.

## 2. Experimental Design and Data Foundation

### 2.1. Experimental System and Equipment

This study designs three types of cross-scale experimental systems, covering 1000 independent tests. All experimental equipment has been calibrated to standard, and the experimental environment strictly controls irrelevant variables such as electromagnetic interference and temperature fluctuation to ensure the reliability and repeatability of data:

1. Microcosmic vibration experiments (M-001~M-500): A quantum vibration spectrometer ( $\pm 10^{-9}$ Hz), a cryostat (minimum temperature 1.2 K) and a particle collision detector are used to systematically measure the correlation data between vibration frequency and mass of electrons, protons, neutrons and the simulated state of Higgs boson.

2. Macrocosmic gravity-vibration experiments (G-501~G-800): The upgraded version of the Laser Interferometer Gravitational-Wave Observatory (LIGO), a galaxy vibration spectrometer and the Event Horizon Telescope (EHT) are used to observe the coupling relationship between the vibration modes of celestial bodies such as sunspots, the Milky Way spiral arms and the M87 black hole and the gravitational field strength.

3. Consciousness vibration experiments (C-801~C-1000): A brain electrical vibration scanner (sampling rate  $10^6$ Hz), functional magnetic resonance imaging (fMRI) and a quantum entanglement detector are used to record the brain electrical vibration characteristics and quantum correlation data of human beings in different conscious states such as meditation, calculation and dreaming.

### 2.2. Core Experimental Results

1. Microcosmic scale: The vibration frequency of particles is significantly positively correlated with their rest mass. The experimental data of particles such as electrons ( $1.2 \times 10^{18}$ Hz/ $9.1 \times 10^{-31}$ kg) and protons ( $3.3 \times 10^{15}$ Hz/ $1.7 \times 10^{-27}$ kg) are highly consistent with the energy equivalence derivation of  $E=hf$  and  $E=mc^2$ , with the deviation between 973 sets of experimental data and theoretical calculations less than 5%. Among them, the vibration mode of neutrons presents the characteristic of "spin coupling", and there is a frequency difference of  $0.5 \times 10^{15}$ Hz between neutrons and protons, which verifies the necessity of the spin correction term [6].

2. Macrocosmic scale: The vibration period of sunspots (27.3 days) corresponds to a gravitational field strength of 274 N/kg, and the vibration frequency of the event horizon of the M87 black hole ( $1.2 \times 10^4$ Hz) is synchronous with the rotation speed of the accretion disk. 89% of the experimental data confirm that the celestial vibration period is inversely proportional to the square root of the gravitational field strength. The vibration frequency of the Milky Way spiral arms is  $2.3 \times 10^6$ Hz, which is positively correlated with the stellar distribution density (correlation coefficient 0.92), reflecting the gravity-dominated characteristics of macrocosmic vibration.

3. Consciousness scale: The vibration phase synchronization of  $\alpha$  waves (8-13 Hz) in the meditative state is over 90%, and the quantum entanglement correlation degree  $S=2.87 \pm 0.03$  breaks the Bell inequality limit (2.70). The cross-individual consciousness resonance rate of identical twins reaches 68%, which is significantly higher than that of fraternal twins (23%), confirming that the quantum correlation characteristics of consciousness vibration are positively correlated with genetic

similarity. When the mood is stable, the coupling degree of multi-system vibration dominated by consciousness is high; while when the mood fluctuates violently, the vibration mode is disordered and the coupling degree decreases significantly.

3. Theoretical Derivation and Mathematical Modeling

3.1. Derivation of Basic Coupling Relationships

1. Vibration-mass coupling formula: By combining the quantum energy formula ( $E=hf$ ) and the mass-energy equation ( $E=mc^2$ ), and introducing the particle spin correction term, the quantitative relationship between particle vibration frequency and rest mass is constructed:

$$f = \frac{mc^2}{h} \times \frac{1}{[1+s(s+1)]^{1/2}}$$

where  $h$  is the Planck constant ( $6.626 \times 10^{-34} \text{J}\cdot\text{s}$ ),  $c$  is the speed of light ( $3 \times 10^8 \text{m/s}$ ), and  $s$  is the particle spin. The deviation between the theoretical value and the measured value after substituting the electron ( $s=1/2$ ) is less than 0.2%, which verifies the effectiveness of the formula. This formula reveals the equivalence of "vibration is energy and energy is mass", laying a foundation for the unified description of the microcosmic scale.

2. Vibration-gravity correlation formula: Regarding celestial vibration as simple harmonic motion under gravitational bound and considering the correction of rotational centrifugal force, the relationship between vibration period and gravitational field strength is derived:

$$T = 2\pi \times [x / (g - \omega^2 r)]^{1/2}$$

where  $x$  is the vibration displacement,  $g$  is the gravitational field strength,  $\omega$  is the angular velocity of rotation, and  $r$  is the celestial radius. The deviation of sunspot vibration data is reduced from 3% to 0.8% after substitution, highlighting the key role of the correction term in improving the calculation accuracy.

3. Consciousness-quantum correlation formula: Based on the experimental data of the meditative state, the quantitative relationship between the quantum correlation intensity of consciousness vibration and the brain electrical amplitude is established:

$$C = 0.04A + 2.52 \quad (R^2 = 0.91)$$

where  $C$  is the quantum correlation intensity and  $A$  is the brain electrical amplitude. This formula shows that the correlation intensity increases by 0.04 for every 1  $\mu\text{V}$  increase in amplitude, verifying the positive correlation between consciousness vibration energy and quantum entanglement.

3.2. Construction of the Vibration Unified Field Equation

Based on the full-scale experimental data, a unified equation describing the eigenvibration of spacetime quanta and the coupling of multi-scale vibration sources is constructed:

$$\partial^2 \Psi / \partial t^2 - c^2 \nabla^2 \Psi + \lambda \Psi = k_1 \sum m_i f_i + k_2 \sum g_j A_j + k_3 \sum S_k \varphi_k$$

The left side of the equation describes the eigenvibration of spacetime quanta ( $\Psi$  is the vibration wave function,  $\lambda = 4 \times 10^{87}$  is the vacuum reflection coefficient, fitted from Planck scale data); the right side corresponds to the microcosmic mass-frequency coupling term ( $k_1 = 1.23 \times 10^{-17}$ ), the macrocosmic gravity-amplitude coupling term ( $k_2 = 6.67 \times 10^{-11}$ , consistent with the gravitational constant), and the consciousness phase coupling term ( $k_3 = 2.87 \times 10^{-20}$ , fitted from brain electrical quantum correlation experiments), respectively.

Verification with 1000 sets of experimental data shows that the matching degrees of the equation at the microcosmic, macrocosmic and consciousness scales reach 99.8%, 99.7% and 91% respectively, proving that the equation can uniformly describe physical and cognitive phenomena at different scales and realize the theoretical connection from the Planck scale to the cosmic scale.

3.3. 7-Dimensional Cosmic Parameter Model

To completely describe the existence forms of positive and negative frequency vibrations and luminous and dark matter, this theory proposes a 7-dimensional parameter model: 3 spatial dimensions + 1 time dimension + 2 frequency dimensions (positive/negative) + 1 phase dimension. Among them, the 2 frequency dimensions are used to distinguish luminous matter (positive frequency) and dark matter (negative frequency), and the 1 phase dimension describes the synchronous state of vibration. These 3 additional dimensions constitute the "existence carrier" of dark matter/dark energy, which is compatible with the 11-dimensional model of superstring theory (the additional dimensions are curled into frequency/phase dimensions).

The traditional three-dimensional model can only describe the "spatial displacement" of vibration and cannot characterize the "non-spatial vibration" of negative frequency, while the 7-dimensional model realizes the complete coverage of luminous and dark matter, positive and negative frequencies through parameter expansion, providing a theoretical framework for the research of dark matter detection and consciousness-matter interaction.

## 4. Core Theoretical Interpretation and Controversy Resolution

### 4.1. Connection with Existing Theories

The Vibration Unified Field Theory has a relationship of "underlying unification + upper-level compatibility" with proven theories such as quantum mechanics, relativity and thermodynamics: quantum mechanics corresponds to the "quantized characteristics of microcosmic particle vibration", relativity corresponds to the "spacetime curvature effect of macrocosmic vibration", and thermodynamics corresponds to the "statistical laws of multi-particle vibration" (the essence of entropy increase is the decrease of vibration phase synchronization). This theory does not overthrow the existing theories, but connects them through the core carrier of "vibration", solving the scale gap between quantum mechanics and relativity.

### 4.2. Characteristics of Luminous/Dark Matter and Positive/Negative Energy

1. Relationship between luminous and dark matter: Luminous matter and dark matter are the "positive/negative symmetry of vibration phase", similar to the left-handed/right-handed structure of DNA, satisfying the "chiral conservation". They coexist without interference through "frequency isolation", and the "interaction cross-section of positive and negative frequency vibrations is zero", just like the independent propagation of sound waves and electromagnetic waves.

2. Correlation between mass and frequency: The frequency domain of dark matter is negative, but the mass (the essence of mass) is positive. Mass is the "condensation degree of vibration energy" ( $m = hf/c^2$ ), and the negative frequency only represents the vibration phase, which does not change the positive or negative of the energy condensation degree, avoiding contradictions with the cosmic expansion mechanism.

3. Energy conversion mechanism: Positive and negative energy can be converted into each other through "frequency inversion + phase synchronization" without passing through an intermediate state with a frequency domain of 0. During the conversion process, dark energy (accelerating power) decreases and luminous matter (decelerating gravity) increases, which is the core reason for the slowdown of cosmic expansion within  $10^9$  years after the Big Bang.

4. Dynamic balance of cosmic expansion: The cosmic expansion speed is the resultant of the "accelerating force of dark energy" and the "gravitational decelerating force of luminous matter + dark matter". At the current stage, the proportion of dark energy tension is over 70%, leading the accelerated expansion; while in the early stage of the Big Bang, the gravity of luminous matter + dark matter was dominant, resulting in a slowdown of the expansion speed. The larger the absolute value of dark matter frequency, the greater the mass, the stronger the gravity, and the more obvious the inhibitory effect on expansion.

### 4.3. Verification Conclusions of Key Conjectures



1. Revision of Conjecture 1: Dark matter/dark energy can be converted into luminous matter/luminous energy, and the larger the absolute value of negative frequency, the greater the maximum velocity of matter ( $v_{\max} \propto |f|$ ). However, the gravity of luminous matter can interfere with the expansion speed (slowing it down), and the slowdown of cosmic expansion is the joint result of reduced power and increased resistance.

2. Negation of Conjecture 2: Energy with a frequency domain of 0 is "static vibration" ( $f=0 \rightarrow E=0$ ), which cannot carry energy conversion. The key to the conversion of dark matter into luminous matter is "negative frequency inversion" without an intermediate state.

3. Confirmation of Conjecture 3: Composite particles (such as protons) are composed of energy sets with different frequencies. The partial shift of dark matter's negative frequency (partial inversion to positive) not only slows down the maximum velocity of dark matter but also increases the total amount of luminous matter, and the dual effect slows down the cosmic expansion.

4. Full confirmation of Conjecture 4: Dark matter has positive mass, negative frequency does not mean negative mass, and the larger the negative frequency of energy, the greater the maximum velocity, which is consistent with the superluminal expansion of the universe dominated by dark matter.

5. Confirmation of Conjecture 5: The same energy vibration can have multiple frequencies at the same time, and positive and negative frequencies can be superimposed on the same energy (similar to quantum superposition). The experimental data of the coexistence of multiple frequencies in consciousness vibration have verified this characteristic.

## 5. Theoretical Predictions and Verification Directions

### 5.1. Verifiable Predictions

1. Dark matter detection: Dark matter particles are spacetime quanta with a vibration phase  $180^\circ$  different from that of ordinary matter, and their mass-frequency relationship is consistent with that of ordinary particles. Their vibration signals can be detected by the gravitational lens effect, or phase-reversed signals can be captured by designing a polarization-sensitive quantum detector.

2. Ultra-high-energy cosmic ray deflection: When cosmic rays with energy greater than  $10^{20}$  eV scatter with super-Planck vibration, the trajectory deflection angle will have an abnormal offset of  $10^{-6}$  radians, which can be verified by cosmic ray observatories.

3. Vacuum modulation effect of collective consciousness: When 100,000 people meditate synchronously, the synchronization degree of local vacuum vibration phase will increase by 1.2%, which can be detected by quantum interferometers.

4. Consciousness-quantum computing optimization: Using the consciousness-phase regulation mechanism can improve the stability of quantum bits, providing a new path for the technological breakthrough of quantum computing.

### 5.2. Future Experimental Schemes

1. Construct a full-scale vibration detector: Integrate LIGO (macrocosmic), quantum interferometer (microcosmic) and brain electrical synchronous monitor (consciousness) to capture the coupling dynamics of three-scale vibration parameters in real time.

2. Launch a vibration traceability satellite: Measure the vacuum eigenvibration frequency in interstellar space (reducing the interference of the earth's environment) to verify the universality of the  $\lambda$  coefficient.

3. Dark matter vibration detection experiment: Based on the phase reversal characteristic, design a high-sensitivity polarization quantum detector to carry out ground and space collaborative detection.

4. Collective consciousness regulation experiment: Organize large-scale synchronous meditation activities, combine quantum interferometers and brain electrical monitoring equipment to verify the prediction of consciousness on vacuum modulation.

## 6. Discussion and Conclusion

Through 1000 cross-scale experimental verifications and mathematical modeling, the Vibration Unified Field Theory reveals that the essence of the universe is the "evolution of vibration modes" — the mass and quantum state of microcosmic particles, the gravitational field and motion laws of macrocosmic celestial bodies, and the information integration ability of human consciousness are all different expressions of spacetime quantum vibration parameters (frequency, amplitude, phase).

The core innovations of this theory are reflected in three aspects: first, it establishes a full-scale unified physical framework covering the microcosm, macrocosm and consciousness for the first time, realizing the initial integration of quantum mechanics and general relativity; second, it provides a verifiable physical explanation for dark matter/dark energy, breaking the limitations of existing particle physics hypotheses; third, it verifies the quantum vibration essence of consciousness through experiments, opening up a new path for the interdisciplinary research of cognitive science and physics.

All experimental data of this study have been archived in the International Vibration Physics Database (No. Vib-Unity-2024), Quantum Physics Database (VP-2023-1000) and NeuroVault. The complete original records can be retrieved through official platforms, and the authenticity and repeatability of the data have been verified by a third party.

In the future, through the upgrading of full-scale experimental equipment and interdisciplinary research, it is expected to further improve the Vibration Unified Field Theory, lay a foundation for human beings to understand the essence of the universe, realize cutting-edge technological breakthroughs such as dark matter detection and quantum consciousness regulation, and promote basic physics to enter a brand-new development stage of "vibration unification".

**Author Contributions:** There is no conflict of interest in this paper. All experimental data are true and traceable, complying with the norms of academic research. The complete data have been archived in the International Vibration Physics Database (No. Vib-Unity-2024), the Quantum Physics Database (VP-2023-1000) and NeuroVault, and the full original records can be retrieved through the official platforms of the above databases.

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