Quantum Levitation: A Dual Interpretation from Standard Physics and Quarkbase Cosmology

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November 2025

Abstract

This first approach presents a dual interpretation of quantum levitation that unifies its standard superconducting description with the pressure–vorticity dynamics of Quarkbase Cosmology. Phenomena such as the Meissner effect, flux pinning, and flux quantization—traditionally modelled through London equations, Ginzburg–Landau theory, and the macroscopic wavefunction of Cooper pairs—are reinterpreted in terms of phase-coherent configurations of the etheric pressure field $\Psi(x, t)$. In this framework, magnetic fields correspond to confined tubes of Ψ-vorticity, and superconductors act as regions of high Ψ-phase coherence that geometrically reject or channel such vorticity. Quantum levitation emerges naturally from the pressure redistribution required to maintain coherence, while flux pinning appears as Ψ-vorticity trapped in microdomains of reduced phase uniformity, creating rigid energetic minima that lock a magnet in space. This approach provides a physically explicit medium-based account of superconducting levitation, clarifies the underlying mechanism in terms of etheric pressure gradients, and suggests new routes for engineered Ψ-coherent materials, contactless guiding structures, and advanced Quarkbase-based technologies.

Contents

1 What "quantum levitation" really is

When people refer to "quantum levitation," they are usually pointing to two related superconducting phenomena:

1.1 The Meissner Effect (type-I and type-II superconductors)

A superconductor expels magnetic fields from its interior when cooled below its critical temperature. As a result, a magnet can "float" above a superconductor due to the repulsion between the magnetic field and the induced supercurrents on the superconducting surface.

1.2 Flux pinning in type-II superconductors

In type-II materials, the magnetic field is not fully expelled. Instead, it penetrates the material as **quantized magnetic-flux vortices**. Defects in the material lattice pin these vortices in place. The consequence is striking: a magnet can become **locked in space**, not only levitating above the surface but also suspended laterally or even underneath the superconductor.

1.3 Standard formalism

The traditional theoretical framework involves:

- London equations + Ginzburg–Landau model (classical + effective quantum description).
- Quantization of magnetic flux:
$$\Phi = n \cdot \frac{h}{2e}.$$

This phenomenological machinery explains the effect well enough for engineering: Cooper pairs, gauge-symmetry breaking, effective photon mass inside the superconductor, finite penetration depth, quantized vortices, etc.

What it **does not** explain at the ultimate microscopic level is *what the vacuum is* or *why* these field configurations take the forms they do. They are treated as emergent consequences of electrons, lattice potentials, and gauge fields.

2 How traditional quantum physics interprets the phenomenon

In the standard quantum picture:

- Superconductivity is a **collective quantum state** where an enormous number of electrons share a single macroscopic wavefunction (an effective Bose condensate of Cooper pairs).

- This wavefunction has a global phase $\phi(x)$.
- Magnetic fields and currents are tied to gradients of this phase and to the vector potential $\mathbf{A}(x)$.

Flux quantization follows from the condition that the wavefunction must be single-valued around any closed loop:

$$\oint \left(\nabla\phi - \frac{2e}{\hbar}\mathbf{A}\right) \cdot d\mathbf{l} = 2\pi n.$$

From this:

- **Meissner effect**: the superconductor minimizes its energy by expelling magnetic field.
- **Flux pinning**: when the field is strong enough (or the material is type II), quantized vortices form and become trapped in defects → "frozen-in" levitation.

Quantum theory provides a **consistent mathematical formalism**, but it does not attempt to describe the physical substance of the vacuum or the deeper origin of these constraints.

3 Immediate translation into the language of Quark-base Cosmology

Within Quarkbase Cosmology:

- There are no fundamental "charges" or "fields."
- Everything arises from configurations of the **pressure field** $\Psi(x, t)$ of a frictionless etheric plasma ($\mu = 0$), with undeformable quarkbases acting as compact geometric discontinuities.
- Electromagnetism is pressure patterns + vorticity of the Ψ-field.
- Superconductivity (including graphene phenomena) is understood as:
  - A state of **phase coherence** of the Ψ-field within the quarkic lattice.
  - A set of pressure channels with extremely low resistance, where etheric deformation propagates without dissipation.

From this perspective, quantum/magnetic levitation becomes:

3.1 The superconductor as a region of high Ψ-phase coherence

- Its quarkic lattice enforces a nearly uniform phase of the Ψ-field.
- Certain pressure/vorticity configurations (classical B-fields) become energetically forbidden within that coherent region.

3.2 The magnet as a confined vorticity configuration of Ψ

- Magnetic field lines = tubes of etheric vorticity.
- A magnet is a quarkic configuration that sustains a stable vorticity pattern of the Ψ-field.

3.3 The Meissner effect as geometric incompatibility

There is an incompatibility between:

- the magnet's vorticity, and
- the coherent-phase region enforced by the superconductor.

The ether reorganizes itself to:

- push vorticity out of the coherent region,
- redirect the vorticity lines around the superconductor,
- creating a net pressure that physically lifts the magnet.

This is not "field exclusion" but **pressure-driven geometric rejection**:

> The superconductor imposes a phase condition on Ψ that **rejects** internal vorticity. The ether is forced to bend and compress the vortex lines outside, producing a net pressure that manifests as levitation.

4 Flux pinning in Quarkbase terms

In type-II superconductors:

- The vorticity cannot be entirely expelled.
- Instead, **discrete tubes of Ψ-vorticity** penetrate the coherent region.
- These tubes become pinned to microstructures where Ψ-coherence is slightly weaker.

This translates to:

4.1 The superconducting region is a near-constant-phase domain of Ψ

But it contains microstructures:

- vacancies,
- impurities,
- slight quarkbase-packing irregularities.

4.2 Vorticity localizes into filaments

Because smooth vorticity would break global coherence, the system minimizes energy by concentrating vorticity into discrete filaments.

4.3 Bringing the magnet close forces a global Ψ-reconfiguration

The system reorganizes to a static pattern where:

- vorticity filaments attach themselves ("weld") to defects,
- the magnet occupies the position of **minimum total Ψ-field energy** (magnet + superconductor + environment).

4.4 Explanation of levitation locking

If the magnet shifts:

- vorticity filaments must reconfigure,
- which costs a large amount of etheric pressure energy,
- producing a restoring force that keeps the magnet frozen in space.

Hence:

> **Flux pinning = Ψ-vorticity trapped in microregions of reduced coherence, producing a rigid energetic minimum for the magnet–superconductor position.**

5 Integration within Quarkbase Cosmology

5.1 A superconductor as a Ψ-phase condensate

Not merely electron pairing but a region where:

- the Ψ-field locks into a near-uniform phase,
- variations only appear as quantized vortices.

This fits: quantum mechanics = statistics of the deformed ether.

5.2 Flux quantization = vorticity quantization of the ether

Classically: $\Phi = n \cdot (h/2e)$. In Quarkbase:

- A $2\pi n$ phase condition corresponds to the Ψ-field completing an integer multiple of its fundamental etheric rotation around a loop.
- Origin:
  - discrete quarkbase geometry,
  - continuity of Ψ-phase across the medium.

5.3 Levitation as pressure-equilibrium

- The magnet imposes a vorticity pattern.
- The superconducting region demands phase coherence.
- The ether finds a configuration minimizing total Ψ-energy, and the equilibrium yields a **macroscopic pressure force** that levitates and stabilizes the magnet.

5.4 Relation to gravity in Quarkbase

- Gravity $= \nabla n_\Psi(x) =$ pressure-index gradient.
- The combined magnet–superconductor vorticity structure slightly perturbs n_Ψ.
- This yields a conceptual analogy:

  Magnetic levitation is a "micro-gravity inversion": etheric-pressure forces overpower the small gravitational gradient imposed by Earth.

5.5 Connection with graphene, Ψ-Cell and Ψ-Coil

Graphene interacts strongly with the ether (universal 2.3% absorption, coherence, superconductivity).

Therefore:

- Materials engineered for high Ψ-coherence and controlled vorticity could produce levitation-like phenomena intentionally.
- The Ψ-Cell and Ψ-Coil may be engineered analogues of this same principle:
  - the vorticity distribution can be specified geometrically,
  - anchoring points can be defined through lattice microstructure,
  - and useful work can be extracted from the resulting etheric pressure gradients.

5.6 A Quarkbase prediction

"Quark-optimized" superconductors—lattices designed to maximize Ψ-coherence and selective vorticity pinning—should:

- allow finer control of levitation,
- support rigid multi-object hover architectures,
- create **contactless guiding channels** purely via pressure/vorticity geometry.

6 Essential Differences Between Standard Physics and Quarkbase Cosmology

Traditional physics explains quantum levitation through:

- superconductivity,
- Meissner effect,
- quantized vortices and flux pinning.

In Quarkbase Cosmology, the same effects become:

- high Ψ-phase coherence inside the material,
- rejection or controlled routing of etheric vorticity,
- pressure-driven forces emerging from the geometric reorganization of Ψ.

Fundamental:

> Quantum levitation is not foreign to Quarkbase; it is a specific expression of how a coherent Ψ-field lattice (a superconductor) reorganizes etheric vorticity to minimize energy. The levitation force is the macroscopic manifestation of this pressure-field redistribution.

References

[1] F. London, *Superfluids, Vol. I: Macroscopic Theory of Superconductivity*. Wiley, New York (1950).

[2] V. L. Ginzburg and L. D. Landau, "On the Theory of Superconductivity," *Journal of Experimental and Theoretical Physics* (JETP), 20, 1064 (1950).

[3] M. Tinkham, *Introduction to Superconductivity*, 2nd ed. McGraw–Hill, New York (1996).

[4] P. G. de Gennes, *Superconductivity of Metals and Alloys*. Benjamin, New York (1966).

[5] A. A. Abrikosov, "On the Magnetic Properties of Superconductors of the Second Group," *Soviet Physics JETP*, 5, 1174 (1957).

[6] G. Blatter *et al.*, "Vortices in High-Temperature Superconductors," *Rev. Mod. Phys.* 66, 1125 (1994).

[7] C. Omeñaca Prado, *The Next Electromagnetic Revolution: Maxwell's Equations in the Framework of Quarkbase Cosmology*. Archive.org (2025).

[8] C. Omeñaca Prado, *Genesis Quarkbase: A New Genesis for Physics*. Archive.org (2025).

[9] C. Omeñaca Prado, *The Vacuum as a Plasma-Like Etheric Medium*. Archive.org (2025).

[10] C. Omeñaca Prado, *Optical Absorption, Quantum Hall Effect, and Superconductivity in Graphene*. Archive.org (2025).

[11] C. Omeñaca Prado, Ψ-*Cell: Coherent Pressure Battery Based on Quarkbase Cosmology*. Archive.org (2025).

[12] C. Omeñaca Prado, Ψ-*Coil: Cylindrical Pressure–Electromagnetic Converter*. Archive.org (2025).

[13] C. Omeñaca Prado, *Quantum Levitation: A Dual Interpretation from Standard Physics and Quarkbase Cosmology*. Archive.org (2025).