Quantum Meteorological Resonator: Theoretical Framework

Mikhail L. Arushanov
Research Hydrometeorological Institute, 72 Chingiz Aitmatov Str., Tashkent 100052, Uzbekistan
E-mail: mikl-arushanov@rambler.ru

This paper proposes a novel scientific paradigm that establishes a transition from the probabilistic models of classical physics to a deterministic model of Absolute Balance (the Zero-Universe concept). We substantiate the framework of the Zero-Universe as an infinite fractal splitting of the primordial rest state, wherein information exhibits non-local properties and time acts as an active physical substance. The pivotal element of this work is the direct application of the Zero-Universe non-locality physics to the problem of weather forecasting. For the first time, a universal predictive differential equation is derived and presented in an explicit form, synthesizing non-locality, the energy of substantial time (following N. A. Kozyrev's causal mechanics), physical vacuum vortex dynamics, and the fractal structure of atmospheric nodes. A fundamentally new approach to solving this equation is introduced. In contrast to conventional methods of numerical integration, the solution within the Zero-Universe framework is based on the phase decoding of a deterministic code embedded in the imaginary component of time (it). It is demonstrated that the future state of the atmosphere is already formed as an "informational image" within the Zero-State, potentially enabling an ultra-high-precision forecast using a constant time lag. Furthermore, we outline the conceptual scheme of a "Quantum Meteo-Resonator", where plants serve as ideal biological sensors that resolve the atmospheric equation via direct non-local resonance. Finally, a pathway toward the conscious management of the planetary fractal, and consequently, the mitigation of catastrophic weather events, is delineated.

1 Introduction

Meteorology, as a science, is inherently secondary; it is entirely constructed upon the physical picture of the world accepted in a specific era. However, while fundamental physics has undergone several conceptual revolutions over the past century — ranging from relativity to quantum nonlocality — meteorology remains stalled within the ideology of the 19th-century classical determinism. It continues to "push air molecules", attempting to predict the behavior of the whole through the sum of its parts.

The conceptual inertia in meteorology lies in the fact that while fundamental physics has long operated with concepts of "informational connectivity" and "nonlocal interactions", meteorology still treats the atmosphere as a mechanical conglomerate of local gas volumes that interact only through direct contact. This rift between the theoretical avant-garde and meteorological practice has reduced modern forecasting to mere "cosmetic repairs" of obsolete ideas using supercomputers. The power of the hardware increases, but the outdated calculation logic remains unchanged. Consequently, long-term weather forecasts stagnate at an accuracy level of 65–70%.

To bridge this gap, meteorology must make an ideological leap. It must recognize that long-term weather processes are governed not by local pressure drops, but by the dynamics of the Absolute Balance within the fractal Zero Universe [1–9]. This marks a transition from the "physics of collisions" to the "physics of states", where information is nonlocal, and time serves as the primary carrier of process energy. Only through this paradigm shift can meteorology move from the tail end of physics to its avant-garde. Such a formulation resolves all critiques regarding the "accuracy" of current models; they are accurate only within the framework of their archaic logic, which no longer corresponds to reality.

This paper explores the concept of the Quantum Meteorological Resonator, a device based on the principles of nonlocality and the fractal dynamics of the Zero Universe. We justify the transition from passive probability computation to active resonant reading of Absolute Balance states, presenting the resonator as a necessary technological interface for the direct diagnosis of dynamic weather patterns in substantial time.

2 Predictive equation of the atmospheric continuum state

The first step toward shifting the meteorological paradigm was taken by Prof. S. M. Korotaev [10], who proposed searching for the underlying cause of macroscopic processes (including weather) not within local interactions, but rather within quantum non-locality [11–14] and the transfer of entropy through the substance of time. Korotaev's equation [10]

$$\frac{dS_d}{dt} = \sigma \int \frac{1}{x^2}\frac{ds}{dt}\,\delta\left(t^2 - \frac{x^2}{v^2}\right)dV \qquad (1)$$

is postulated heuristically, and its validity is confirmed by its subsequent agreement with experimental data.

In Eq. (1), dS_d/dt represents the rate of entropy change of the detector (the response of the "measuring device" to external processes); ds/dt is the specific density of entropy production within an elementary volume dV of the source; $\sigma \approx \hbar^4/m_e^2c^4$ is the non-local coupling coefficient (where $\hbar$ is Planck's reduced constant, m_e is the electron mass, and c is the speed of light); x is the spatial distance, t is time, and v is the effective propagation velocity. The Dirac delta function $\delta(x, v, t)$ represents the key element of non-locality in this equation. It establishes a rigid connection between an event at a specific point of the source and the response at the detector's location, reflecting both retarded and advanced potentials. In the context of forecasting, this implies that information regarding the future state of a weather pattern is already "recorded" within the field structure and can be decoded instantaneously.

Equation (1) must be considered as a first approximation to the complex equation of the atmospheric continuum, demonstrating the mechanism of signal transmission via entropy and non-locality. The equation describing the predictive state of the atmospheric continuum is derived from the following conditions and propositions.

Let S be the state of the Universe (information/structure). Within the "Zero-Universe framework" $S \to 0$; however, due to the active nature of time t, a continuous splitting into opposites, Ψ and $-\overline{\Psi}$, takes place. In other words, the equation of the Dynamic Zero can be represented as a system where the structural variation over time is proportional to the pre-existing complexity (fractality):

$$\frac{d\Psi(t)}{dt} + \frac{d\overline{\Psi}(t)}{dt} = 0\,, \tag{2}$$

where $\overline{\Psi}(t)$ is the conjugate structure (conjugate fractal). Thus, $\Psi(t)$ and $\overline{\Psi}(t)$ represent mutually complementary hierarchical structures.

In Eq. (2), Ψ represents the manifest fractal node, and $\hat{A}(E_t)$ is the infinite division operator that depends on the infinite energy of time. The solution to Eq. (2) is an exponential function, reflecting the infinite and accelerating growth of fractal complexity.

In quantum mechanics, the wave function Ψ inherently contains the imaginary unit, which is utilized to describe the wave-like nature of the world (e.g., the Schrödinger and Euler equations). Within our framework, where time is treated as an active substance, the imaginary time unifies space and time into a single continuum.

The ideal dynamic balance of the Zero must be formulated via an equation wherein the second derivative with respect to the state (the acceleration of realization) is proportional to the energy of time. To achieve this, we utilize the Laplace equation in the complex domain:

$$\frac{\partial^2\Psi}{\partial z^2} + \frac{1}{C_2^2}\frac{\partial^2\Psi}{\partial (it)^2} = 0\,, \tag{3}$$

where C_2 is N. A. Kozyrev's [15, 16] constant of the course of time, which possesses the dimensions of velocity. The constant C_2 connects distinct points within space-time without the transfer of energy in the classical sense, acting effectively as an information channel. Within the framework of the Zero-Universe concept, this explains why the second derivative with respect to the state (the realization) is so rigidly linked to the energy of time: they are integral components of a single, indivisible flow. Consequently, we obtain the transition of a potential from the imaginary time it into the physical dimension z.

The solution to Eq. (3) is a complex exponential function that describes the Universe as an infinite wave:

$$\Psi(z, t) = A \cdot e^{i(kz-\omega t)}, \tag{4}$$

where A is the amplitude of realization of a specific fractal node, which determines exactly how much time energy has been expended on this given fractal node. While in quantum mechanics A^2 represents the probability of finding a particle [17, 18], within the Zero-Universe concept, it denotes the degree of manifestation of a fractal node (holographicity, meaning that a minor part, i.e., the node, reflects the whole). Since the final sum must remain Zero, each positive $+A$ within the system always corresponds to a negative $-A$ (for instance, a cyclone and an anticyclone in meteorology).

Based on the aforementioned premises, we express the predictive complex equation of the atmospheric continuum state in the following form:

$$\frac{\partial\Psi(\vec{r}, it)}{\partial(it)} = \hat{L}_{\text{non}}\Psi(\vec{r}, it) + \sum n = 1^{\infty} A_n \cdot \text{rot}\,\vec{V}_{\text{et}}^{(n)}\,. \tag{5}$$

In Eq. (5), the non-local operator $\hat{L}_{\text{non}}$ acts as an analogue to the classical pressure gradient: within a non-local Universe, the weather state at any given point depends instantaneously on the state of the entire system, representing an integral capture of the complete planetary fractal. In other words, "weather" knows everything about itself all at once — this is not merely an image, but rather the fundamental physics of the system.

The term A_n under the summation sign essentially indicates the quantization of the atmosphere, transforming a continuous continuum into a set of discrete levels or states: each cyclone, anticyclone, or front manifests as a macro-node with a specific amplitude A_i. The upper limit of the summation is set to infinity ("∞"), meaning that the number of splittings is infinite, spanning from atmospheric micro-turbulence up to planetary-scale vortices.

And finally, the term rot $\vec{V}_{\text{et}}^{(n)}$ in Eq. (5) is a physical vacuum [19] vortex representing vorticity within the primordial substance. Within the framework of the Zero-Universe, air particles are merely "foam" riding upon the underlying physical vacuum currents. In other words, within this framework, the weather forecasting procedure — in contrast to classical

numerical methods [20] — involves calculating the dynamics of physical vacuum tori, which ultimately generate atmospheric phenomena such as rain, snow, wind, and others.

3 Practical realization: the "Quantum Meteorological Resonator"

Since the energy of time is substantial and deterministic, the future state of the atmosphere is already "recorded" within the imaginary phase of Ψ. Consequently, forecasting the future state of the atmosphere reduces to determining the specific time t for which the amplitude A reaches a critical value (for instance, the onset of a storm or another meteorological phenomenon). Mathematically, this task shifts to finding the roots of the equation within the complex plane, i.e., calculating the phase shift of the physical vacuum vortex. Based on experimental data, S. M. Korotaev derived such shifts, which represent the time required for an "informational vortex" within the physical vacuum (or the imaginary phase) to materialize into a real alteration of the atmospheric state. Specifically, for solar activity, the shift for a cyclone amounted to 73 days [10], and 230–250 days in the context of analyzing long-period variations in the signals of electrotelluric sensors installed at the bottom of Lake Baikal [21]. In the latter case, the deep water column serves as a shield against local interference, allowing for the isolation of a "clean" signal of nonlocal coupling with atmospheric processes.

To transition from theory to practice, it is necessary to construct a device capable of resolving Eq. (5) based on the registration of phase synchronizations rather than numerical computations. It is proposed that the most suitable "instrument" for this purpose is a natural registrar — a biological sensor in the form of a plant that tunes into the weather, thereby becoming a "fractal node" identical to the atmospheric one. Instead of conventional instruments operating on binary code, a medium capable of sustaining the complex state of Ψ is required. The architecture of such a medium must replicate the branching of the plant's vascular system, enabling the device to possess infinite nestedness and capture the micro-splittings of the Zero across all scales of the physical vacuum. Under this architecture, the device will record not changes in pressure or temperature (the real component), but rather the phase advancement within the imaginary plane, registering the future event as an already existing informational pattern. In other words, such a resonator does not need to be programmed in the conventional sense; it must possess the inherent property of automatically striving toward balance, thereby yielding the precise solution to Eq. (5).

It is highly preferable to utilize not a single plant species but a triad of three distinct species integrated into a single device as the biological sensor, where each species corresponds to a specific hierarchical level. The operational efficiency of the meteorological resonator utilizing this triad is significantly enhanced due to the differing metabolic rates of the plants and their varying sensitivities to non-local signals. This triad may comprise a fern, a carnivorous plant (such as the Venus flytrap or sundews), and a moss.

The fern (*stasis/form*) is a living relic that has preserved a genomic and structural architecture that remained virtually unchanged for hundreds of millions of years [22]; it decodes long-term variations within the fractal structure of the "Zero-Universe", thereby establishing the "baseline" of the forecast. Fern leaves represent a classic self-similar fractal. If the underlying fabric of the Universe is fractal, the fern acts as a natural resonator whose geometry is maximally consonant with the fundamental code of Absolute Balance.

The carnivorous plant [23] (*dynamics/impulse*) registers sharp surges or critical displacement points of Absolute Balance via variations in the electrical potential of its traps. Carnivorous plants function essentially as biological triggers. While the fern acts as an "antenna", the carnivorous plant serves as a "fuse" or a phase-transition indicator. When a non-local signal reaches its peak, the carnivorous plant reacts to the energetic impulse well before this impulse materializes into a physical thunderstorm or storm in reality.

The function of the moss [24] is to establish the control loop. Within the "meteo-resonator" system, the moss performs the role of a "zero bus" or a bio-electrolyte.

Consequently, the fern acts as a fractal antenna capturing the structural and long-term patterns of Absolute Balance; the carnivorous plant operates as an impulse trigger that records critical jumps and phase transitions (energetic shocks); and the moss serves as a noise suppressor and stabilizer that integrates the "slow" fern and the "fast" carnivorous plant into a unified network.

The structural design of the quantum meteorological resonator consists of a multilayered chamber fabricated from copper and aluminum, shaped as a pyramid with a height of 1–1.5 meters, possessing the specific angles of the golden ratio. The internal layers of the shell are also proportioned in accordance with the golden ratio. This arrangement generates a "harmonic gate" that exclusively transmits the coherent signal of the Zero.

The elimination of the influence of photosynthesis on the phase signal frequency is achieved through the total light insulation of the chamber. This translates the plant from a photosynthetic state into a regime of pure informational exchange, thereby ensuring that the non-local phase shift serves as the sole source of bioelectricity within the plant.

In addition to the triad, for verification purposes (acting as an independent controller), a torsion balance enclosed within a vacuum shell is placed inside the chamber. The registration of its deviations is recorded by a non-contact capacitive sensor, which sustains the concept of "informational silence" within the pyramid.

An analog summer assembled on precision chips and a computing unit are connected to the bio-sensor and the torsion balance via a fiber-optic cable (Figure 1).

Fig. 1: Components of the quantum meteorological resonator.

Within this configuration of the meteorological resonator, which completely eliminates local "noise" (such as wind gusts or raindrops hitting a windowsill), any alterations in the electrical activity within the plant tissues are induced exclusively by the non-local phase shift. This implies that the plants do not respond to the immediate weather outside the "window", but rather react to modifications in the structure of Absolute Balance according to Eq. (5), which will materialize in the physical world at a future time.

The life support of the plants and the maintenance of their "biological wakefulness" without external stimuli inside an isolated golden pyramid, which functions as a Faraday cage, must be executed via an artificial life-support system. Crucially, this system itself must become an integral part of the control loop. To achieve this, the plant roots are immersed in a continuously circulating nutrient solution. This medium fulfills not only nutritional functions but also acts as an additional informational conductor (the memory of water) that structurally interconnects the biological triad.

To sustain the core vital functions of the plants without introducing noise, an ultra-weak, frequency-fixed light source (deep red spectrum) is utilized. Once the biological sensor adapts to these background conditions, it establishes a benchmark state; consequently, any subsequent deviations in its bioelectric potentials will register precisely the external phase shift. To depress the internal metabolic demands of the plants — inducing a state of controlled dormancy or bradymetabolism — it may be necessary to maintain the system at a reduced temperature. This ensures that the response of the biological sensor is driven solely by the fundamental oscillations of Absolute Balance.

The life-support system (the delivery of water and light) is rigidly synchronized with the golden ratio geometry of the pyramid itself to prevent the introduction of chaos into the measurements. This condition is operationalized through the generation of proportional rhythms: the intervals between watering cycles and the volume of the supplied fluid correspond to one another via the golden ratio constant of 1.618. This rhythm is perceived by the plants as a natural harmonic background that generates no "informational noise" Furthermore, the intensity of the LEDs escalates non-linearly, following the Fibonacci sequence, which renders the life-support environment completely invisible to the phase-shift detector. Finally, the micro-electrode attachment points and the nutrient feed tubes are positioned strictly within the geometric tricks of the pyramid (at the golden ratio nodes along its height axis), thereby eliminating any parasitic vortices and resonances inside our Faraday cage.

4 Conclusion

In conclusion, the transition from the probabilistic chaos of classical meteorology to the deterministic Absolute Balance model establishes a new paradigm in climate science. The universal forecasting equation introduced in this study not only refines existing models but fundamentally transforms the nature of predictive analysis, shifting it from a numerical approximation to the deciphering of an explicit informational code of the future.

Utilizing substantial time and phase decoding within the imaginary component enables the surmounting of the "predictability limit" in long-term weather forecasting, a barrier previously considered absolute. A key aspect of this concept is its physical implementation via the Quantum Meteorological Resonator. Recognizing biological systems as natural computing interfaces provides a path toward ecologically sound technologies for monitoring planetary fractals. Consequently, this framework lays the foundation for high-precision, long-range forecasting and facilitates a transition from passive observation to the conscious stabilization of atmospheric processes and the mitigation of natural disasters.

Submitted on May 23, 2026

References

1. Hartle J.B., Hawking S.W. Wave function of the Universe. *Physical Review D*, 1983, v. 28, no. 12, 2960–2975.
2. Lovejoy S. Fractal properties of rain, and a fractal model. *Tellus A: Dynamic Meteorology and Oceanography*, 1985, v. 37, no. 3, 209–232.
3. Carey S.W. The Expanding Earth. Elsevier, Amsterdam, 1988 (Russian edition: Carey S. Earth, Universe, Cosmos. Mir, Moscow, 1991).
4. Panchelyuga V.A., Shnoll S.E. On the local-time effect in cosmic physical factors. *Progress in Physics*, 2007, v. 3, issue 2, 55–56.
5. Fishman L.Ya. Fractal Dynamics of Open Systems. Nauka, Moscow, 2012 (*in Russian*).
6. Krauss L.M. A Universe from Nothing: Why There Is Something Rather Than Nothing. Free Press, New York, 2012.
7. Lovejoy S., Schertzer D. The Weather and Climate: Emergent Laws and Multifractal Cascades. Cambridge University Press, Cambridge, 2013.
8. Hawking S. Brief Answers to the Big Questions. Bantam Books, New York, 2018 (Russian edition: Hawking S. Brief Answers to the Big Questions. Eksmo, Moscow, 2019).
9. Arushanov M.L. Principles of Nonlocal Meteorology. Hydrometeorology Publishing, Tashkent, 2024 (*in Russian*).

10. Korotaev S.M. Heliogeophysical effects of the nonlocality of the shadow of the future in the present. *Quantum Magic*, 2004, v. 1, issue 2, 2219–2240.
11. Bell J.S. On the Einstein Podolsky Rosen paradox. *Physics Physique Fizika*, 1964, v. 1, no. 3, 195–200.
12. Freedman S.J., Clauser J.F. Experimental test of local hidden-variable theories. *Physical Review Letters*, 1972, v. 28, no. 14, 938–941.
13. Clauser J.F., Horne M.A. Experimental consequences of objective local theories. *Physical Review D*, 1974, v. 10, no. 2, 526–535.
14. Aspect A. Proposed experiment to test separable hidden-variable theories. *Physics Letters A*, 1975, v. 54, no. 2, 117–118.
15. Kozyrev N.A. Causal or asymmetrical mechanics in linear approximation. *Pulkovo Observatory Reports*, Pulkovo, 1958 (*in Russian*).
16. Kozyrev N.A. Selected Works. Leningrad University Press, Leningrad, 1991 (*in Russian*).
17. Renou M.O., Trillo D., Weilenmann M., Thinh L.P., Tavakoli A., Gisin N., Ac'in A., Navascu'es M. Quantum theory based on real numbers can be experimentally falsified. *Nature*, 2021, v. 599, no. 7886, 603–607.
18. Wu K.D., Kondra T.V., Rana S., Scandolo C.M., Xiang G.Y., Li C.F., Guo G.C., Streltsov A. Testing real-quantum theory with entangled photons. *Physical Review Letters*, 2022, v. 128, no. 4, 040402.
19. Shipov G.I. Theory of Physical Vacuum. Moscow, NT-Center, 1993 (*in Russian*).
20. Belov P.N., Borisenkov E.P., Panin B.D. Numerical Methods of Weather Forecasting. Gidrometeoizdat, Leningrad, 1989 (*in Russian*).
21. Korotaev S.M., Serdyuk V.O., Kiktenko E.O., Budnev N.M., Gorohov J.V. Results of the Baikal experiment on observations of macroscopic nonlocal correlations in reverse time. In: *Unified Field Mechanics: Natural Science Beyond the Veil of Spacetime, Proceedings of the IX Symposium Honoring Mathematical Physicist Jean-Pierre Vigier*, ed. by Amoroso R.L., Kauffman L.H., Rowlands P., World Scientific, Singapore, 2016, 481–488.
22. Bomfleur B., McLoughlin S., Vajda V. Fossilized nuclei and chromosomes reveal 180 million years of genomic stasis in royal ferns. *Science*, 2014, v. 343, no. 6177, 1376–1377.
23. Böhm J., Scherzer S., Krol E. et al. The Venus flytrap Dionaea muscipula counts prey-induced action potentials to induce host digestive enzyme production. *Current Biology*, 2016, v. 26, no. 3, 286–295.
24. Oliver M.J., Mishler V.R. Desiccation tolerance in bryophytes: A review. *The Bryologist*, 2005, v. 108, no. 2, 211–231.